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ABSTRACT BOOK

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on Lung Health of the
International Union Against
Tuberculosis and Lung Disease (The Union)**

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31 OCTOBER-4 NOVEMBER 2006**



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The International Journal of Tuberculosis and Lung Disease

SUPPLEMENT

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NOVEMBER 2006

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The International Journal of Tuberculosis and Lung Disease

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SYMPOSIA: THURSDAY 2 NOVEMBER 2006

IMPROVING THE DIAGNOSIS OF SMEAR-NEGATIVE AND EXTRA-PULMONARY TB IN HIV-PREVALENT SETTINGS

Smear-negative TB and EPTB in HIV-prevalent countries: the challenge for national programmes

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Setting: High HIV-prevalent countries with a special focus on sub-Saharan Africa.

Background: The tuberculosis disease burden continues to increase globally with the increase contributed primarily by the TB-HIV epidemic in Sub-Saharan Africa. While all forms of TB have increased, there has been an even greater increase in smear negative and extra-pulmonary forms of TB compared to smear positive PTB in these settings. In many sub-Saharan African countries the proportion of smear negative pulmonary TB is about equal or even higher than that of smear positive PTB. HIV infected smear negative PTB and EPTB patients have a poorer treatment outcome compared to smear positive PTB. It is probable that the poorer outcomes of HIV infected patients with smear negative PTB and EPTB is related to misdiagnosis of other HIV-related illness. Improving the diagnosis of smear negative PTB and EPTB and reducing the mortality rates in these patients is a major challenge that facing NTPs in countries with high HIV prevalence. The focus of TB control was previously aimed at identifying infectious cases of TB and less emphasis was placed on smear negative PTB and EPTB. With the changing epidemiological trends due attention must now be given to these forms of TB. There may be need to revise training manuals and guides accordingly. National TB control programmes will also need to develop appropriate communication

messages for these types of TB and provide resources for their diagnosis including X-ray equipment and supplies. The use of culture techniques has the potential to significantly improve the diagnosis of smear-negative PTB/EPTB but the countries with the greatest need for TB culture have the least capacity to roll out this service. It is critical that accurate data on smear negative PTB/EPTB is obtained by NTPs to track trends in incidence and outcomes of treatment for these forms of TB. It may also be useful to include more specific details on organs involved in disease.

Revising and developing algorithms for diagnosis of SNPTB and EPTB: WHO update

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The World Health Organization (WHO) has recently reviewed existing practice and evidence and issued new recommendations to expedite the diagnosis and management of smear-negative pulmonary and extra-pulmonary TB in HIV prevalent and resource constrained settings. The recommendations and the revised algorithms are particularly recommended to sub-Saharan Africa and other HIV prevalent settings, as defined by national authorities. The revised algorithms are based on the clinical condition of the patient, include HIV care and intended to expedite the diagnosis process. All TB suspects should be offered HIV counselling and testing. No trial of antibiotics is required to diagnose smear-negative TB; two sputum specimens, with one collected in the morning are sufficient; and a patient is considered smear positive if at least one of the two specimens is positive for AFB. Increasing clinical awareness and competence in managing and initiating TB treatment early in patients with serious illness thought to be due to extrapulmonary TB at first-level health facilities is recommended. After TB treatment has been initiated, every attempt should be made to confirm the diagnosis of TB. Chest radiography and sputum culture should be used to assist the diagnosis, whenever available. Both TB and HIV service providers need to implement the recommendations as they will respond to the dual epidemic. At the same time,

evaluation should be done to further build the evidence about the effectiveness and feasibility of the recommendations.

The role of the antibiotic trial in the diagnosis of smear-negative TB

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'Trial of antibiotic treatment' is widely used in TB programmes as one step in the process of diagnosing Pulmonary Tuberculosis. There is limited evidence though for the use of empiric antibiotic treatment to rule out TB as a cause of cough in HIV-infected persons. Few well designed studies have been carried out to investigate the characteristics of this 'test', when part of a standardised diagnostic flow chart. Although non-response to antibiotics increases the likelihood of TB, the converse is not true; response to antibiotics does not exclude TB in TB suspects living in HIV-prevalent settings. Programme managers should therefore exert caution in the interpretation of response to AB treatment, and be aware of advantages and disadvantages of this practice: inappropriate use of broad-spectrum antibiotics may also lead to drug resistance, treatment delay, and loss of patients because of prolonged symptoms. However, antibiotic treatment is appropriate for HIV-infected patients with cough, because bacterial infections are common, also in dually infected patients. Again, limited evidence exists in the choice of which AB to include in the diagnostic flow chart. Ideally this should be based on resistance studies on typical and atypical bacterial causes of community acquired pneumonia. This should be done at country level at maximum, to detect regional differences in resistance patterns. What is universally true is that Fluoroquinolones should be avoided because of their activity against *Mycobacterium tuberculosis*. More research about the effectiveness and use of an antibiotic trial in the diagnostic algorithm, and the choice of antibiotics particularly for PLWHA is needed.

Building capacity for mycobacterial sputum culture in a developing country: lessons from Thailand

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Background: The WHO's 2nd Global Plan recommends that countries increase capacity for mycobacterial sputum culture and drug susceptibility testing (DST). In Thailand, several laboratories can perform culture, but few do so routinely, particularly at the province level.

Method: Beginning in 2002, we established a network of laboratories capable of culturing mycobac-

teria on liquid and solid media in 3 provinces, and we increased existing capacity for culture and DST at National TB Reference Laboratory (NTRL) and the Bangkok municipal laboratory. The 3 province-level laboratories performed sputum culture and sent isolates to NTRL for identification and DST; the Bangkok municipal laboratory performed culture and DST for specimens from the city of Bangkok. To implement this network, we hired and trained staff, purchased equipment and supplies, provided on-site monitoring, and implemented an internet-based data management system.

Results: We trained 16 persons in culture and DST. Across the five total laboratories, the total number of cultures performed increased from 5000 in 2002 to nearly 10 000 in 2005. The number of isolates undergoing DST increased from 560 in 2003 to 3569 in 2005. In 2002, all sites relied on facsimile or mail to exchange data with NTRLC; in 2005, all sites began using a secure, internet-based server for this purpose. Major problems encountered during implementation in provinces included: inadequate specimen collection and processing prior to culture; contamination rates ranging from 10–15%; and delays in the culture and DST results report to clinicians.

Conclusion: We successfully established a network for mycobacterial culture and DST in a Thailand. Efforts are needed, however, to improve laboratory quality, through stricter adherence to standard operating procedures and closer integration of laboratory and clinical services. Operational research is needed to assess the impact that this network will have on strengthening TB control in Thailand.

HUMAN RESOURCES FOR CHILD LUNG HEALTH

Human resources and lessons learnt from the Malawi Child Lung Health Project

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The major objective of the Child Lung Health Project (CLHP) in Malawi, in keeping with the MDG 4, is the reduction of child mortality due to respiratory disease, especially severe/very severe pneumonia in children under 5 years of age. The CLHP took existing child health strategies, adapted and implemented them countrywide in a resource-poor country and ensured their success by training and supervising health care workers and the availability of antibiotics while generating quality health service information which was used to improve the quality of services.

The shortage of health care workers within the health care system, especially in the paediatric ser-

vices is a major problem in Malawi. In 2000, less than 10% of staff working within the government paediatric health services were trained in standard case management (SCM) of severe or very severe pneumonia, and the national average CFR for pneumonia was 18.6%.

It was essential for the CLHP to assist in strengthening the health system capacity to manage the delivery of health services. Training and close supervision were very effective in improving the clinical skills of the hospital health workers and directing limited resources to children at most risk.

There has been a marked improvement in quality of care and reduction in CFR for severe and very severe pneumonia: by December 2005 the overall CFR was 8.4—a reduction of 54.8% over the 2000 baseline.

This presentation will discuss:

- how more and better trained health workers can improve outcomes for children with pneumonia
- areas where strengthening of human resources is critical in the prevention and management of child lung disease
- the important role of research in child lung disease in the resource-limited setting.

Importance of human resources in the prevention and management of child TB

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Children contribute a significant proportion of the global tuberculosis (TB) caseload and experience considerable TB-related morbidity and mortality. Unfortunately, in endemic areas where the disease burden is highest, few children have access to preventive chemotherapy or anti-tuberculosis treatment. In reality, contact screening and the provision of preventive chemotherapy (to children <5 years) simply does not happen in many endemic countries, despite being recommended by the WHO and the Union. This is mainly due to resource constraints. Measures to maximize the benefit and minimize the impact on overburdened national TB programmes are discussed, including the potential value of; implementing simplified symptom-based screening, restricting the focus to high-risk children only, and optimizing the regimen. The effectiveness of any preventive therapy regimen is determined both by efficacy and adherence in real life. Children's poor access to anti-tuberculosis therapy in endemic countries is partially due to the diagnostic difficulties experienced in these settings and to limited awareness of the true extent of the problem. New diagnostic approaches and their potential utility in resource-limited settings are discussed, including the value of symptom-based approaches and novel T-cell-based assays, as well as the need to consider shortening the treatment duration in children with uncomplicated pauci-bacillary disease.

COMMUNITY MOBILISATION AND PARTNER INVOLVEMENT IN TB CONTROL

Overview of advocacy, communication and social mobilisation at the country level and experience from Mexico

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In recent years national governments have recognized that they cannot solve by themselves the complex problem that TB represents. In such scenario, advocacy, communication and social mobilization have proved efficient and effective tools in the combat against TB. The Mexican model is rooted in a communitary approach to TB control, aiming to increase public awareness, in order to move their will and gather material and human resources. Social mobilization and educational communication in health together integrate the essential combination to effectively face the determinant factors for the disease. Meanwhile, advocacy increases the sustainability of the interventions. Specific strategies implemented by the Mexican Government include: White Flag rising; integration of the National Committee Alto a la TB; participation of social ambassadors; strengthening the physical and technical infrastructure for the TB, as well as for the laboratory network; access to diagnosis and treatment through mobile units; availability of a Binational TB Card that contributes to guarantee referral of patients and continued treatment for migrants; close collaboration with the penitentiary authorities for TB control in prisons; establishment of a DOTS Nurse Network; improvement of therapeutic adherence and integral care of patients co-infected by TB and AIDS, and an alliance established with the pharmaceutical industry, among others. Success on the implementation of those strategies is reflected on the decrease of the actual TB mortality and morbidity rates: in 2004 Mexico achieved a reduction of 71% on the mortality rate as compared to the rate registered on 1990 and on 2005 achieved a reduction of 49% on the morbidity rate also in comparison to that registered on 1990. Moreover, there has also been an important increase on the financial resources devoted to the National TB Program, going from 4 million USD in 2000 to 75 million USD in 2005.

Community mobilisation in the Union Latin American Region

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Background: Many countries in Latin America are increasingly promoting the access to effective tuberculosis (TB) care through community health workers (CHW), including the participation of the affected

people and the civil society. The key principle of primary health care is community mobilisation and to increase the access to health attention in the rural areas where dispersed and poor populations live. STOP TB movements with varying degrees of success exist in different countries but very few of these experiences they have been documented or published and therefore they are still unknown.

Objective: To present the initiatives and good experiences on community mobilisation in Latin America.

Results: In the Latin America Region, the participation of the community health organizations including case finding, community DOT to improve treatment adherence, increasing community awareness, social support and lobbying local governments. Use the existing communication facilities available to disseminate information related to diagnosis and cure TB. Create a permanent discussion group on social mobilisation in Brazil through 'Estadual de ONGs en el Combate a la tuberculosis en Rio de Janeiro'.

Challenges: Include and ensure active participation from communities' organizations and civil society in preparing strategic plans to TB control. Develop guidelines for Community DOT to improve the opportune finding and cure of TB cases, in areas of difficult access to the health services in Latin America. Encourage the creation and organization of TB associations.

Implementing programmatic MDR-TB management by involving various partners: experiences from Manila, Philippines

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Aim: To describe programmatic multidrug resistant-TB (MDR-TB) management (PMTM) through various partners including community treatment partners (CTPs) and MDR-TB patients.

Design, setting and patients: This is a descriptive study of PMTM undertaken at a private-public mix DOTS (PPMD) at the Makati Medical Center from June 2001 to October 2005.

Main outcome measure: Treatment outcome of patients.

Methods: MDR-TB patients underwent skills training for livelihood and economic empowerment and group therapy sessions to address psychosocial issues. Through the organization 'Samahang Ligas Baga', MDR-TB patients have been empowered to engage in advocacy for TB control. Some MDR-TB patients have been trained to become treatment partners while they themselves are completing treatment. CTPs from 48 public DOTS centers, 4 faith-based organizations, 4 non-government organizations, one industrial clinic, and three PPMDs were trained on community-based PMTM. Eighty-seven (23%) of 377 MDR-TB pa-

tients enrolled in the program were endorsed to CTPs because of difficulty in attending the clinic.

Results: The treatment outcomes in the patients on community-based PMTM showed a significant increase in cure rate (83% vs. 54%) and conversely a significant decline in default rate (7% vs. 25%) compared to those on facility-based PMTM. However, excluding 23 early defaulters during the first six months of therapy, the decline in the default rate (7% vs. 17%) among MDR-TB patients managed through CTPs did not reach the level of statistical significance due to the small number studied.

Conclusion: Community-based implementation of MDR-TB care is feasible in the Metro Manila, Philippines. A significant decline in the default rate and increase in cure rates among patients underscore the benefit of community-based PMTM.

Outcome	Community-based*	Facility-based*	All patients
Treatment on-going	45	102	147
Patients with outcome	42	188	230
Cured	35 (83%) [†]	102 (54%) [†]	137 (60%)
Failed	2 (5%)	8 (4%)	10 (4%)
Default	3 (7%) [‡]	47 (25%) [‡]	50 (22%)
Died	2 (5%)	31 (16%)	33 (14%)

* Overall χ^2 , $P = 0.004$.

[†] $P = 0.000$.

[‡] $P = 0.012$.

Finding and curing TB cases: establishing community groups to enhance case finding and case holding—a part of the Global Fund TB projects in the Philippines

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Background: In 2003, the DOTS case detection rate was 68% in the Philippines. World Vision, through Global Fund support, engages the communities to further improve the TB Program.

Methods: World Vision engages civil society by organizing community-based support groups or TB Task Forces, composed mostly of community health volunteers, local political officials, youth, and teachers, including nurses and midwives from the local health facilities who act as advisers. This strategy actively engages the community in TB case detection, health education, advocacy and supervising treatment of TB patients in collaboration with the local public TB program. World Vision also develops and provides educational materials such as flipcharts, billboards, brochures and posters. Around 150 000 pieces of these items are already in circulation. World TB Day and the Lung Month events, community TB classes and other strategies are also used by the TB Task Forces to increase community awareness and participation.

Results: The Project is being implemented in 6 cities and 5 provinces. As of 1 May 2006, 213 TB Task Forces have been organized and 3362 community residents oriented on DOTS. These TB Task Force members were trained to identify TB symptomatics, refer them to DOTS facilities, act as treatment partners and provide health education to patients, their families and communities. The 213 TB Task Forces identified a total of 6823 symptomatics of which 871 were found to be new smear-positive cases which contributed to an increased case detection rate. For instance, in the project areas of Butuan City, finding TB symptomatics increased by 39% and new sm+ cases by 5% during the 18 months after project start, compared to a decrease of 26% and 24%, respectively in the non-project areas (Table).

Table TB case finding indicators in Global Fund project areas (11 Barangays) and in non-project areas (75 Barangays) of Butuan City, Southern Philippines

	Time before start of project		Time after start of project			
	2003		2004		2005	
	Jan–June	July–Dec	Jan–June	July–Dec	Jan–June	July–Dec
Butuan city						
GF project areas (<i>n</i> = 93 350)*						
TB symptomatics	432	479	455	821	564	512
New smear-positive cases	70	67	72	92	69	58
Non-project areas (<i>n</i> = 191 562)*						
TB symptomatics	1064	1423	818	836	822	786
New smear-positive cases	126	173	111	103	107	103
		During the 18 months before start of project		During the 18 months after start of project		
GF project areas						
TB symptomatics		1366		1897 (39% increase)		219 (5% increase)
New smear-positive cases		209				
Non-project areas						
TB symptomatics		3305		2444 (26% decrease)		313 (24% decrease)
New smear-positive cases		410				

* 2004 population.

Conclusion: When working in close collaboration with the local public TB programme, community participation by forming local support groups strengthens DOTS, especially case finding.

TUBERCULOSIS INFECTION CONTROL IN THE ERA OF HIV/AIDS AND MDR-TB

Risk of tuberculosis among staff at a Nairobi hospital

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Background: In sub-Saharan Africa, the dual pandemics of tuberculosis (TB) and HIV infection pose a serious threat for occupationally acquired TB among health care workers. Reports of elevated rates of TB in staff of an 1800-bed hospital in Nairobi, Kenya, led to an investigation to characterize the epidemiology of TB and HIV in this setting.

Methods: We conducted a case-control study to determine workplace factors associated with TB disease among hospital employees. Cases were all staff members diagnosed with TB from January 2003 to September 2005. Controls were randomly selected from the current staff listing of 4833 with no history of TB disease. Multivariate logistic regression was used to estimate associations.

Results: We interviewed 65 cases and 316 controls. Median age and sex were similar among cases and controls. HIV status was unknown in 30% of cases and 45% of controls. Among those who knew their HIV status, HIV infection was reported in 12 (27%) of 45 cases and 2 (1%) of 165 controls. Multivariate analysis indicated that factors independently associated with TB disease among staff included: >5 hours of patient contact per day (adjusted odds ratio [aOR] 6.5, 95% confidence interval [CI] 2.3–18.4), work in areas where TB patients receive care (aOR 2.2, 95% CI 1.1–4.4), HIV infection (aOR 3.3, 95% CI 1.4–7.8), and living in a slum (aOR 4.0, 95% CI 1.4–11.2).

Conclusion: We documented that hospital exposures and HIV status were associated with TB disease among staff at this Nairobi hospital. To protect health care workers, health care facilities should decrease potential *M. tuberculosis* transmission by improving early detection and treatment of TB cases, infection control practices and effective ventilation. Furthermore, it is important to encourage staff testing for HIV and offer optional reassignment for HIV-infected staff away from areas of high TB exposure.

Outbreak of MDR-TB among HIV-infected patients in Durban, South Africa

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Background: TB is the leading cause of death in HIV patients (pts) in Sub Saharan Africa. Integration of care and treatment for co-infected pts may improve outcome of both diseases but can be jeopardized by inadequate infection control facilities and practices and rising MDR-TB rates. We determined extent and consequences of MDR-TB in district hospital setting in rural South Africa with high TB and HIV rates.

Methods: Sputum culture surveillance and drug susceptibility testing for pts with known or suspected TB from 1/2005 to 3/2006. Spoligotyping of isolates resistant to all tested TB drugs (INH, RIF, ETH, STM, CIPRO, KANA).

Results: Of sputum cultures from 1540 pts: 536 (35%) positive for *M. tuberculosis*; of these, 221 (41%) MDR, and 53 XDR TB (24% of MDR isolates, 10% of all positive cultures). On spoligotyping, 90% of XDR pts had genetically similar strain. 56% XDR pts recently hospitalized and 66% not previously treated for TB. XDR TB mortality 98% (52/53); median survival after sputum collection 25 days (range 11–136). All 47 tested XDR pts were HIV-positive.

Conclusions: Increased surveillance in rural South Africa revealed high prevalence of MDR and XDR TB with evidence of recent nosocomial and community transmission in HIV co-infected pts. The presence and consequence of high rates of MDR/XDR TB and HIV is a deadly threat to gains in survival achieved by TB DOTS and antiretroviral therapy. Implementation and evaluation of facilities and procedures to reduce community and nosocomial transmission are urgently needed.

Administrative controls for TB infection control in Latvia

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Background: Nosocomial transmission of *Mycobacterium tuberculosis* is a great threat to public health. It causes occupational disease for health care workers (HCWs). To protect HCW three major areas of TB infection control (IC) measures exist: administrative—to reduce risk of exposure, infection, and disease through policies and practices; engineering—to facilitate dilution and removal of infectious droplet nuclei; and personnel respiratory protection.

Setting: TB incidence increased in Latvia since 1991 reaching peak in 1998 of 74 cases per 100 000 population accompanied by the emergence of multidrug-resistant TB (MDR-TB). In average 10% among new patients and 30% among retreatment cases was MDR-TB. Every year new TB and MDR-TB cases were registered among health care workers.

Objective: To describe implemented administrative IC at the TB and lung hospital, and to analyse TB and MDR-TB incidence among HCWs.

Intervention: Established IC program included three areas of controls. Administrative TB controls included 1) prompt isolation and treatment of TB patients; 2) rapid diagnostic techniques for early detection of MDR-TB; 3) effective IC work practice among HCWs; 4) assigned responsibilities with authority to monitor the IC; 5) education, training, and counselling of HCWs.

Results: Of an average 504 employed HCWs, starting from 1998 to 2004 pulmonary TB occurred in 5% or 27 cases (26% nurses, 26% physicians, 15% laboratory technicians, 33% nurse assistants and cleaners), 26% had MDR-TB. Highest incidence was in 2000 when 9 cases were diagnosed with decrease to zero cases in 2005.

Conclusions: IC measures can effectively prevented nosocomial transmission of TB and MDR-TB to HCWs. Administrative controls are a most important component of TB IC plan especially in settings with limited resources and high incidence of TB.

Environmental controls for TB infection control in the Russian Federation

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Background: The WHO TB control strategy has been implemented in Vladimir since 2000. There were lacking effective procedures for infection control (IC) and high TB rates among TB staff. Funding from WHO, CDC and regional budget supported substantial improvement of IC.

Objective: To evaluate the impact of IC on reducing occupational TB.

Design: Analysis of data on new TB cases in TB staff before and after IC improvement.

Results: Annual TB notification among RTBD staff before the joint DOTS project (2000) was 1083/100 000, compared to 45/100 000 resident population of Vladimir city. 38.5% of TB cases were nurses, 38.5% was paramedical personnel, 7.7% were both among technical and medical staff. In 2001, IC measures and procedures were improved and strengthened after inpatient RTBD departments moved to a new building; staff training; obligatory respiratory protection in high

risk areas; segregation of infectious and MDR-TB patients; UV germicidal lamps in all premises, sputum collection booths. Reconstruction of the ventilation system will be completed in 2006 to meet international requirements. Unique UV fixtures for decontamination of the exhausting air from the high risk zones were installed and tested in the building. As the result, occupational TB cases registered among RTBD staff from 2003 decreased sharply.

Conclusion: The incidence of occupational TB may be more than 20 times higher compared to the general population. Nurses and ancillary staff are among the highest risk groups. An intensive IC program sharply decreased the incidence of occupational TB. It is both practical and economically feasible to implement an effective IC program in TB institutions in the Russian Federation.

New tools and guidance for TB infection control

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The opportunities for HIV care and treatment created by new treatment initiatives promoting universal access are also creating unprecedented opportunities for persons with HIV-associated immunosuppression to be exposed to infectious tuberculosis (TB) cases within health care facilities, with the attendant risks of acquiring TB infection and developing TB disease. Infection control measures can reduce the risk of *Mycobacterium tuberculosis* transmission even in settings with limited resources, based on a three-level hierarchy of controls, including administrative or work practice, environmental, and respiratory protection. Further research is needed to define the most efficient interventions. The importance of preventing the transmission of *M. tuberculosis* in the era of expanding HIV care and treatment in resource constrained settings must be recognized and addressed.

TB WORK FORCE AND 2005 TB TARGETS: FROM OBSTACLE TO OPPORTUNITY IN THE WESTERN PACIFIC REGION

Reaching the 2005 TB targets in the Western Pacific Region

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Every day close to 1000 persons die from tuberculosis in the Western Pacific Region. Following the declaration of a 'tuberculosis crisis' in the Region, WHO established a Stop TB Special Project. The Project sought more aggressive anti-TB actions on the part of governments, private sector, and national and international partners, to enable the Region to achieve its goal of re-

ducing TB prevalence and mortality by half by 2010. The main strategy of the Special Project was the expansion of DOTS to reach region-wide coverage, detecting at least 70% of the infectious TB cases and curing at least 85% of them by the year 2005. The objectives, strategies and work plan of the Special Project, as well as the country 5-year national plans were considered ambitious but technically sound by the TB Technical Advisory Group (TAG) for the Western Pacific. The TAG comprises nine international independent TB experts who provide technical guidance, review progress and make recommendations to WHO and countries with regard to the implementation of TB control activities. From 2000–2005 the TAG met four times with country representatives and WHO and its partners. The past five years saw rapid progress in TB control. The staffing situation in the Region—in both countries and WHO—improved significantly. National action plans of Member States have been formulated, reviewed and approved. Progress in the Region was marked by four important ingredients—strong leadership by WHO; effective partnership; relentless inputs by TB workers at all levels; and sound technical advice—which resulted in strong government commitment, increased funding and successful DOTS implementation. These efforts eventually led to the Region achieving the 2005 TB targets. Countries in the Western Pacific Region are now much better placed to take on the remaining challenges to reducing the TB burden and mortality by half by 2010.

Political commitment: the role of leadership in China

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Background: The national TB prevalence survey in 2000 showed that only 33% of TB patients were detected, of which only 12% were treated under the NTP. DOTS coverage had reached 47% in 2001. It was in this context that the Government of China (GOC) decided to strengthen TB control. By the end of 2005 China had reached the global TB targets: 100% DOTS coverage; 79% case detection rate; and 92% cure rate. This can be attributed to the strong political commitment of the GOC and the leadership of Vice-Minister Wang Longde and the vice-Governors from 12 provinces with high burden of TB.

Leadership in TB control: Among Prof. Wang's first initiative was, obtaining working estimates of the TB burden at all levels, provided new impetus to case detection efforts. He convinced Vice-Premier Wu Yi to hold a national teleconference in September 2003 involving Vice-Governors of all provinces. The Vice Premier urged the Vice-Governors to take the necessary action to address the problem of TB, which resulted in an acceleration of DOTS expansion. A fur-

ther boost of commitment and leadership occurred during the High Level Meeting in Xian in December 2004, when the Vice-Minister generated strong commitment from Vice-Governors of 12 provinces with a high burden of TB.

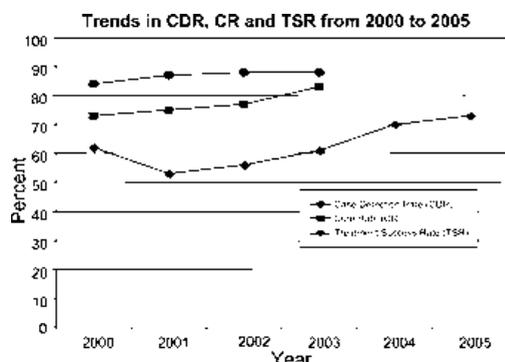
Conclusion: GOC and personal commitment by Vice-Minister Wang Longde proved decisive in accelerating TB control efforts to reach the 2005 TB targets in China.

Implementing DOTS: the role of the Barangay health workers in the Philippines

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Background: Since it was piloted in 1996, the Philippines Department of Health has implemented DOTS, nationwide coverage achieved by 2003. After 10 years implementation, steady increase in case detection (CDR), treatment success rates (TSR) reaching 73% CDR by 2005 and TSR of 88% by 2003. One of the key factors that contributed in DOTS implementation was the utilization of Barangay Health Workers, served as links of TB symptomatics and patients to the local health centers, trained on skills to provide awareness of TB in the community, address common activities in TB control: health education and counselling, identification TB symptomatics; as treatment partners, supervised giving drugs, do default tracing, advocates good health in the community.

Methods: Review on processes which the BHWs were engaged in delivering DOTS. Analyzed roles of BHWs, before and after DOTS implementation. Comparison of the trends on case detection and treatment success. Likewise, reviewed support provided by local government units, identified challenges, best practices done by the BHWs. Key partners are essential for capacity building, technical resource and for mentoring the BHWs.



Results: Almost 50 000 BHWs are distributed in 1500 municipalities and 115 cities. NTP in collaboration with Local Government Units (LGUs) have involved BHWs through health related activities. The

LGUs provide incentives to BHWs in form of honoraria. The BHWs contributed to increasing CDR by conducting health education, referring symptomatics. Also assist local health centers ensuring case holding of TB patients, thus resulting to treatment success and cure.

Conclusion: Epidemiologically, accomplishment versus targets of >70% CDR and >85% TSR of the country is contributed by many factors. This achievement reflects unified effort made by the national government, health workers, local government units, private sector and the community health volunteers.

MOBILE STAFF, MOBILE PATIENTS, MOBILE TREATMENT

TB and immigration in Turkey

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For twenty years, Turkey has received huge numbers of asylum seekers and refugees, transit, irregular labor, and regular migrants. Africans, Indians, Roma, Philipinos, Russians, Afghanis, and people from the Middle East pour in, with official data showing two thirds as entering legally and one third, illegally. Turkey maintains the geographical reservations of the 1951 Geneva Convention, and non-European asylum seekers are not recognized. Services available in countries recognizing migrant and refugee rights are unavailable in Turkey; rather, such people are ghettoized, overcrowded, without legal employment, without health care, subject to periodic arrest, and continuously at peril. Istanbul Tuberculosis and Aids Program (ITAP) surveyed Istanbul's migrant, refugee and asylum-seeking communities and, in August 2005, created the first community-based tuberculosis and HIV/AIDS program. Together with Istanbul Anti-TB Association, program goals are to:

- raise TB and HIV/AIDS awareness in the target population
- encourage at-risk people to attend local clinics and get free testing without fear of reprisal, regardless of economic or legal status
- insure continuous treatment
- reduce the stigma of infection.

ITAP will share program findings, show how current legislation affects health care access and how ITAP mobilizes community strengths to create a viable model of community health service.

Upgrading the skills of laboratory personnel in low-income, high-burden countries

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Migrants represent nearly 3% of the world's population. Mobile people frequently have difficulty maintaining their health and these people are more vulnerable to infectious diseases due to poor socioeconomic conditions or limited access to healthcare. A significant proportion of migrants are travelling from developing countries with high incidence of infectious diseases to developed and low-incidence countries increasing the risk of spreading diseases such as tuberculosis (TB) in the host countries. Policies for screening migrants for active tuberculosis differ between different host countries. Host countries such as the United States, United Kingdom, Australia or Canada rely on initial chest X-ray screening of migrants followed by either AFB microscopy alone or AFB microscopy and culture to exclude TB prior to migration. As microscopy alone is not as sensitive as culture in diagnosing active TB, prevalent cases may be missed. In settings where microscopy alone is used as the screening tool, prevalent cases may subsequently be reported as incident cases upon arrival to the host country. Contributing to the decreased sensitivity of AFB microscopy performed in developing countries is the lack of quality assured microscopy, inadequate trained staff or poor quality sample collection. Building laboratory capacity to perform reliable quality assured TB bacteriology including culture will contribute to reducing the incidence of TB in persons migrating to low prevalence countries.

Human rights and governance for TB patients in Sudan

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Aim: With an annual risk of infection of 1.8%, Sudan shoulders 8% of the TB burden in EMRO. Despite the successes made, critical issues such stigma, discrimination, poverty and marginalization have denied patients access to treatment and perpetuated human rights violations.

Methods: Reviews of documents and publications from relevant national and international bodies, as well references cited in papers and reports. Key informants interviews.

Findings: Since 1995 NTP is implementing the DOTS Strategy. DOTS all over were achieved by the end of the year 2002. No specialized unit at the MoH for legalization. Most health legislation are old. Although Sudan has ratified to international treaties, it was not uncommon to find disrespect, violation, or failure to

implement policies and strategies: revoke or suspension of legislation, implementation of legislation irreconcilable with international legal obligations, denial of access to health services, failure to enforce laws, misallocation of resources. The National Stop TB Board and the Patients Association were instrumental in enhancing the rights of patients and community to participate in decision-making processes and social mobilization. Plans were put to raise standards of care with mutually accountable responsibilities and respected rights.

Conclusion: Government (NTP) and civil society should combine efforts. NTP: ensuring that the principle of non-discrimination is legally enforced; set up mechanisms to monitor health-related human rights; engage civil society in the process of formulation of laws and the creation of an enabling environment; engage the patients to articulate their interests exercise their rights, collaborate with the legal sector to ensure that criminal laws and protective laws are revised to cover patients and other vulnerable groups. Civil society should: build strong leadership at all levels, empowering vulnerable groups, increasing access to resources, information and education, free legal aid services.

MYCOBACTERIUM BOVIS: CONTRIBUTION TO TUBERCULOSIS IN HUMANS

Mycobacterium bovis infections in humans in Tanzania

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A molecular epidemiological study to determine the zoonotic importance of bovine tuberculosis was also carried out in Tanzania. Specimens from human cases of tuberculosis as well as from slaughtered cattle were collected from regions with a high proportion of extrapulmonary tuberculosis. In order to determine the similarity of strains from the two sources, molecular typing techniques, namely RFLP and spoligotyping, were used to determine the genetic profile of the strains involved. The results of pTBN12 typing of *M. bovis* from cattle and man has shown a rather heterogeneous population of this species spread all over Tanzania. IS986 RFLP revealed that strains have 1–13 copies of IS986. This study has once more highlighted a need for synergy of veterinary and medical policies in the control of tuberculosis in Tanzania and probably in other developing countries. Furthermore a human case-control study was conducted in northern Tanzania, comparing risk factors and prevalence of cattle interdermal test positives of cases with age- and

sex-matched controls. *M. bovis* was confirmed in seven of 65 (10.8%) human cervical adenitis cases, of which only one came from a household owning infected cattle. *M. bovis* in human patients was associated with families in which a confirmed diagnosis of tuberculosis had previously been made ($P < 0.001$) and with households far (>100 m) from neighbours ($P = 0.003$).

Tuberculosis as a zoonotic disease in north-west Italy

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Tuberculosis is the leading cause of death associated with infectious diseases in the world. *M. bovis* causes TB in a wide variety of mammalian species and in particular bovine TB has been faced as a public health issue since 19th century. Nowadays molecular analysis applied to strain characterization led to reveal in a large background of *M. tuberculosis* infection, some cases of *M. bovis* disease, still persisting especially in those people living in close contact with infected cattle (veterinarians, farmers, butchers, etc). As in Italy epidemiological data on *M. bovis* TB in man are not available, the study aimed to give a contribution to knowledge about *M. bovis* infection and transmission to man, in order to better understand the role of *M. bovis* as zoonotic agent in an area, Piedmont region, where cattle breeding represent an important economical resource and TB eradication is not yet completed. The investigation was conducted between 2001 and 2005: 426 strains isolated from TB patients were submitted to genotyping analysis and among them 9 *M. bovis* strains were detected (2.1%). In 7 cases anamnestic investigations led to establish a relationship with bovine TB and in 4 cases out of them the origin of infection could be traced back to cattle TB outbreaks, as these patients were cattle breeders. By the aid of genotyping analysis (RFLP, Spoligotyping, VNTR, MIRU, QUBs) *M. bovis* strains isolated from breeders were compared to the respective ones isolated from their herd. Transmission of *M. bovis* infection could be clearly explained by the evidence of genetic identity of human strains and their respective bovine ones, in each of these 4 cases. Moreover, the case reports collected in this study seem to state that, in some particular occasions, *M. bovis* infection may source both from animal and man as well. In conclusion, these evidences confirm that *M. bovis* infection still represent a real public health problem, often underestimated.

An update of *M. bovis* infection in humans in the USA

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Although the extent of tuberculosis (TB) in the United States (US) caused by *Mycobacterium bovis* is unknown, several recent local analyses of surveillance data and case series have been described. In publications from San Diego and New York, the percentage of TB due to *M. bovis* was 6.6% and 1%, respectively. A small series of cases occurring in children in Maryland has also been reported. The majority of cases in these reports occurred in persons of Hispanic ethnicity, usually either adults born in Mexico or Central America or children born in the US. Other similarities include a high proportion of extrapulmonary disease and HIV-associated disease in adults. The common risk factor for *M. bovis* appears to be ingestion of unpasteurized fresh cheese, often consumed in or imported from Mexico. To assess the contribution of *M. bovis* to human TB in the US as a whole, the US Centers for Disease Control and Prevention, Division of Tuberculosis Elimination (CDC DTBE) is examining national genotyping data. Preliminary analysis of spoligotyping patterns of more than 15 000 isolates collected from throughout the country shows that about 1.8% are *M. bovis*. *M. bovis* was isolated from specimens collected over a wide geographic distribution (36 US states), and the percentage of isolates that were *M. bovis* varied, with some states having nearly 4% of isolates identified as *M. bovis*. By continuing to examine the genotyping database, CDC DTBE will be able to track trends in *M. bovis* cases over time. In addition, CDC DTBE plans to link isolates to case report records so the epidemiology of *M. bovis* in the US can be analyzed. This should help to improve US prevention and control efforts.

M. bovis infection in humans in South and Central America

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According to information collected from 10 National Reference Laboratories in the region, the frequency of cases due to *Mycobacterium bovis* would range between nil (0 isolates in ≥ 20 000) and 1.5%. Most of these cases are from Argentina, where comparison of data from 1980 to 2005 suggests a decreasing incidence. In 1988, in Santa Fe, 6.6% of pulmonary TB cases were due to *M. bovis*. In 1982, in Buenos Aires, 8% of childhood extra-pulmonary TB cases were caused by *M. bovis*. Between 1977 and 2005, in Coni Institute (Santa Fe) from nearly 150 000 samples and 4700 cultures(+) obtained, 2.2% were *M. bovis* (1.5% in 2005). In Buenos Aires City (Muñiz Hospital), per-

centages of *M. bovis* cases in 1981–91 were respectively for HIV(–) and HIV(+) patients, 0.95 and 0.8%. In 2000–2004, these amounted respectively to 0.26 and 0.7%. A total of 16 000 patients were included. Then, bovine TB rates seem to remain stable among HIV (+) while decreasing among HIV(–). No correlation between *M. bovis* and multidrug resistance was observed. In the period 1969–2004, an average of 10 million carcasses were submitted annually to veterinary inspection in Argentina. During this time, the percentage condemned for TB decreased from 6.7% to 1.2%. Nearly 5000 farms holding 1.5 million dairy cattle have been officially declared free of infection. Milk pasteurization and abattoir veterinary control have improved throughout the region. These measures effectively protect man from infection by the oral route. Yet, where TB in cattle persists, slaughterhouse and rural workers remain at risk of aerosol-borne disease. Only active campaigns of bovine TB eradication can effectively reduce the human risk of infection.

ISSUES ON ACCESS TO ART IN LOW-INCOME COUNTRIES

Can provision of ART be equitable when the (whole) health system is inequitable?

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Aim: To report on the outcomes of health systems and equity analysis of ART provision in east and southern Africa, focusing on examples from Malawi.

Methods: In 2003, EQUINET conducted studies in four countries on selected issues relating to health sector responses to HIV and AIDS, and drew issues arising in ART scale up for the manner in which this addresses health systems and equity concerns. Policy principles for equitable and sustainable ART roll out were elaborated from regional consultations, and indicators from routine health information were identified for monitoring these principles. Working with key stakeholders in Malawi, REACH Trust conducted detailed equity analysis of ART scale up using this framework. This analysis provides an example of equity analysis and identifies both promising practices and barriers to equity and health systems strengthening.

Findings and discussion: Evidence suggests positive options for addressing equity, including staffing, pay levels and working conditions of health personnel and linking community outreach and primary healthy

care services. Providing free treatment at point of care on a 'first-come, first-served' system is practical but may favour urban, higher educated non-poor people unless treatment is linked to Prevention of Mother to Child Transmission (PMTCT) through maternal health services, and decentralised to community and economic support to promote uptake and adherence in vulnerable groups. Decision making over programme design needs to involve communities in decisions to enhance equity in patient selection. Community health workers have critical in many interventions such as immunisation that promote health. Developing their role in improving treatment access could strengthen PHC.

Human resource: a critical factor for the success of ART scale up in resource-limited settings

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Developing countries worldwide are facing critical shortages of health care workers (HCWs) which threatens the success of scale-up interventions for HIV/AIDS. This crisis is particularly acute in sub-Saharan Africa which has the highest burden of disease (24%) and the lowest number of health care workers (3%). Globally 36 of the 57 countries with critical shortage of health care workers are within sub-Saharan Africa region. Causes include: years of underinvestment in health, economic reforms, migration to other countries and the private sector, poor working conditions, HCW attrition due to illness/death and new and continuing disease epidemics including HIV, TB and malaria. The case of Zambia is presented as representative of a high disease burden country with a critical HCW shortage. In the past two years the Zambian Ministry of Health and partners have initiated ART in 64 000 people in the public sector which is operating with 50% of the required number of HCW. Numbers of patients on ART and enrolled into HIV care are expected to grow dramatically in the next 2–5 years. The challenge is to add new chronic ART and HIV care services to existing workloads while maintaining quality of care and without causing demoralization and burn out. This paper discusses various approaches that have been taken in Zambia to address this problem and include novel approaches to patient care systems, HCW training, task shifting and delegation, and mobilization of community resources.

The state of health systems in low-income countries and access to ART: what is the way forward?

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In low-income countries, pre-transitional morbidity patterns resulted in a strong emphasis on primary

health care, and tensions on health financing have undermined the development of sound secondary services. Poor performance of health systems is aggravated by an inefficient use of resources and weak stewardship capacity. Constraints on the health workforce are the single greatest challenge to improving service delivery in many low-income countries today. The size of the workforce is related to training, enrolment, and a rate of attrition itself affected by migration and by AIDS. Its performance depends much on wage levels and work environment. Access to ART is examined from the point of view of challenges posed by ART programmes to medical technologies and systems, organisation of care, human resources, finances, and policy and institutional capacity. Successful experiences are examined in view of peer reviewed and grey literature.

ADDRESSING THE HUMAN RESOURCE CRISIS IN THE TB LABORATORY

Staffing problems, their causes and solutions for laboratories in sub-Saharan Africa

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This paper was written after a desk review of literature, key informant interviews and personal experience by the author. WHO estimates a worldwide health worker shortage of 4 250 000 disproportionately distributed between developed and developing world. Sub Saharan Africa faces the greatest challenge with 11% of world population; it has 24% of global burden of disease, but has 3% of world health workers. Rural areas have greater shortage than urban areas and public institutions have fewer workers than private sector. There is a general brain drain as wealthy nations actively recruit to cover their own shortages. In-country factors include inadequate salaries, late pay checks, lack of professional development, lack of representation at head offices, lack of protective equipment and gear, enormous work loads with little or no supervision, lack of reagents or equipment needed to perform their tasks. Laboratories receive less priority in funding. The result is widespread use of 'empiricism without laboratory support for diagnosing disease'. Few training schools for laboratory workers in the region. The solutions include; more direct investment in training of laboratory staff, covering the gap in remunerations between physicians and laboratory staff, investing in laboratory infrastructure, safety equipment and gear, encourage women to be laboratory workers, bilateral international agencies should change their policies and start funding salaries for health workers as part of bilateral support. Develop-

ment of career incentives to encourage service in rural and disadvantaged areas, and some simple health care tasks now assigned to highly skilled personnel delegated to less skilled workers able to deliver them competently. Laboratory health workers be represented at head office so they can advocate for laboratory services.

Do we need managers and microbiologists to head a TB programme's laboratory network?

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Control of tuberculosis (TB) is usually dedicated to a special division of health called the National TB Programme (NTP). The NTP ensures that the Global targets of 70% case detection and 85% cure rates as well as the Millennium Development Goals are achieved by mainly implementing the DOTS strategy. Access to good quality laboratory services is key to achieving these goals. A laboratory network usually integrated in other health care services provides TB diagnostic as well as drug sensitivity services. A fully functional network should be united by common objectives, guidelines, programming, supervision and evaluation. Within this huge network, there are personnel, diagnostic units, equipment, supplies, finances and technical aspects to manage. There is need to organise external quality assessment on the National Reference Laboratory (NRL)—culture and susceptibility testing as well as the microscopy network. The network closely works with the other parts of the NTP in addition to cooperate, private, health units and administrative sectors. The network therefore demands a high level command of laboratory technical skills to enable proper conceptualisation, planning, implementation, monitoring, evaluation and communication of its activities. Although by nature of training, microbiologists' curriculum usually does not cover these issues, a microbiologist is fairly well equipped with basic knowledge of microbiology, epidemiology and biostatistics to quickly learn and adapt to these demands. In my experience, due to these demands one microbiologist heading the NRL should concentrate on the above mentioned administrative duties whereas his deputy would address more technical issues of the NRL activities. Thus, additional, appropriate managerial skills to handle the numerous non technical aspects of the network must be acquired by the microbiologist.

Overview of laboratory training resources and methods

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The laboratory network has been called the weakest link in TB control and insufficient qualified, well-

trained staff is a major barrier to high quality microscopy and increasing availability of culture/DST. A long term strategy is to raise the qualifications of laboratory technologists and develop programs to increase graduate-level directors of laboratories and networks. An immediate need is to develop training tools and assure access to materials that assist countries improve microscopy, increase culture/DST, implement new technologies, and improve quality. Laboratory training is a country responsibility. Therefore, web-based information/distribution, instructional design, and distance based learning are effective international strategies that provide access for all countries to materials that strengthen capabilities without requiring external consultation and training. Current trend are to promote one international training product with multiple cosponsors and consensus to avoid duplication. Traditional workshops are still necessary to train experts and leaders, but may not be effective without follow-up implementation support in the laboratory. Currently tools include: train-the-trainer manual for AFB microscopy (JATA, IUATLD); AFB microscopy 'workshop in a box' (in press-WHO, IUATLD, CDC, APHL, JATA, USAID). Training for culture/DST is in process (WHO) and training tools are needed for fluorescent microscopy, laboratory management, and EQA. Basic training in quality management systems (CDC) is also necessary for all existing and new diagnostics. Training materials require commitment, support, customization, and implementation plans. A last requirement for success is to develop laboratory leaders and recognize strong laboratory network are necessary to accomplish the ambitious goals of the StopTB partnership.

Lessons learned in implementing culture laboratories

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Culture examination is surely a useful tool to obtain living bacilli for further steps of TB laboratory works. Recently, demand for introduction of culture examination to the TB laboratory is getting increasing due to support 'DOTS-Plus' activities and to increase case detection in the areas of a high burden of TB associated with HIV infection. However according to our observation on the quality of culture examination in most resource limited countries where we are supporting, it does not reach to the sufficient level indicating low recovery rate and high contamination rate. One of the factors to be a possible cause is attributed to inadequate laboratory infrastructure with insufficient necessary laboratory facilities, shortage of manpower and non-standardized skills. TB examinations such as AFB smear microscopy, culture examination, identification test or drug susceptibility test are not independent laboratory works of each other. TB

examinations require different levels of technical proficiency and physical facility requirements. Therefore, accumulation of technical experience is extremely needed as technical capacity advances from smear, culture and to susceptibility test. It is strongly recommended that technology transfer of TB examinations should be made stepwise with utmost prudence.

EARLY RESULTS FROM CLINICAL TRIALS OF NEW TUBERCULOSIS VACCINES

Results from a randomised controlled trial comparing intradermal and percutaneous administration

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Aims: To compare the TB rate, the adverse event rate and the all cause- and TB-specific mortality rates during the first 2 years of life between infants given Tokyo 172 BCG at birth via the percutaneous route or via the intradermal route.

Design: Phase 4 randomised controlled equivalence trial.

Methods: 11 677 infants were enrolled between March 2001 and August 2004 and vaccinated with BCG within 24 hours of birth. Randomisation was by week of birth. Follow up was primarily passive and for a minimum of 2 years after vaccination. Follow up will end in July 2006. Surveillance systems were set up to detect and investigate all adverse reactions, deaths, admissions to hospital and cases of TB exposure and/or disease occurring in the cohort. Suspected cases were verified in a dedicated facility through tuberculin skin testing, chest radiography and expert clinical and radiological review, HIV serology, and culture of two gastric aspirate and two induced sputum specimens for MTB, with molecular testing to exclude disease caused by nontuberculous mycobacteria or *M. bovis* BCG.

Results: We will present the primary efficacy analysis of the trial, using the two-year cumulative incidence of new cases of TB disease as the primary endpoint, as well as the secondary analyses relating to the cumulative incidence of adverse events including TB specific and all cause mortality.

Conclusions: Conclusions pertaining to current and future BCG vaccination programs will be drawn.

BCG and Ad35 vector

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Aeras Global TB Vaccine Foundation is developing a prime boost strategy for infants as a new vaccination regimen to prevent TB and a booster regimen for adolescents that have presumably already been vaccinated with BCG. The strategy consists of giving the current BCG or replacing BCG with an improved recombinant BCG in newborns followed at 14 and 24 weeks with either a recombinant protein in adjuvant or viral vectored TB vaccines. In adolescents the booster would consist of two doses of the viral vectored vaccine or two doses of the recombinant protein in adjuvant. The first rBCG to go into humans is rBCG30 which over-expresses Ag85B, and provides better protection in Guinea pig challenges compared to its parent Tice strain. rBCG30 was shown safe in 30 BCG naïve volunteers. Immunogenicity in 10 individuals demonstrated increased Ag85B specific CD4+ & CD8+ INF γ + T cells. Crucell/Aeras402 is a non-replicating Adeno35 vector expressing Ag85A, Ag85B and TB 10.4. Less than 1% of individuals in Africa have significant antibodies capable of interfering with AD35 replication. A regimen of BCG boosted with Aeras 402 induced high levels of antigen specific increased protection in the Guinea pig challenge model. In animals a regimen of Aeras 402 induces high levels of antigen specific CD4+ and CD8+ T cells in mice and better protection than BCG alone in long term Guinea Pig challenge studies. It is scheduled for human clinical trials in July–August.

TB subunit vaccines based on fusion proteins: Hyvac4

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Large resources have been invested in the identification of candidate molecules for the inclusion into a new generation of TB sub-unit vaccines. With the complete genome of *M. tuberculosis* available, antigen discovery has taken a leap forward which has resulted in the identification of a large number of antigens within the last 6–8 years several of them with potential in TB vaccines. The next phase of this work has now started—putting the most relevant molecules back together as fusion molecules and cocktails. This requires careful monitoring of aspects as immunodominance, recognition in different populations as well as the influence of different adjuvants and delivery systems. It also requires some very difficult decisions on the preferred use of some of the antigens such as ESAT-6 that has been demonstrated both to

have a valuable vaccine and diagnostic potential. The presentation will review the available data on the Hyvac4 construct based on the ESAT family member TB10.4. This vaccine has been developed not to conflict with ESAT6 based diagnosis and to provide an optimal booster for BCG. The presentation will summarize some of the available preclinical data for priming and for boosting BCG and the status of this vaccine on its way to clinical trials.

BCG escaping the endosome

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A novel vaccine against tuberculosis is urgently needed.¹ We have constructed a novel rBCG vaccine which expresses listeriolysin and is deficient in urease C (rBCG Δ ureC:Hly).² It induces more potent protection against the laboratory strain, *M. tuberculosis* H37Rv and a clinical isolate of the Beijing/W family. The crosstalk between *M. tuberculosis* and the host defense system involves T lymphocytes, macrophages and dendritic cells (DC) as critical partners.^{2–4} The rBCG Δ ureC:Hly vaccine induces improved protection through two putative pathways which are not mutually exclusive. First, it allows egression of antigens into the cytosol. Second, perforation of the phagolysosomal membrane allows egression of host enzymes, such as cathepsin D which can induce apoptosis in infected host cells. Apoptosis paves the pathway for crosspriming which allows better stimulation of T cell populations involved in anti-mycobacterial immunity. The rBCG Δ ureC:Hly vaccine has been licensed to Vakzine Projekt Management and GMP production has been started for clinical trials. Currently, with the support of the Bill and Melinda Gates Foundation, a biosignature is being defined allows distinction between infection/protection and infection/disease in tuberculosis and thus can speed-up efficacy testing of tuberculosis vaccines in clinical trials.

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MVA-85a

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BCG is administered at birth throughout the developing world and confers reliable protection against dis-

seminated disease. Recombinant pox-viruses, particularly modified vaccinia Ankara (MVA) are powerful boosting agents, which boost both CD4+ and CD8+ T cells. Antigen 85A is a leading candidate antigen for inclusion in a new TB vaccine. Boosting BCG with a recombinant MVA expressing antigen 85A (MVA85A) induces greater protection against aerosol challenge than either vaccine alone in mice, guinea pigs and non-human primates. MVA85A was the first new TB vaccine to enter clinical trials and is currently in clinical trials in the UK and Africa. When used alone in BCG naïve subjects, it boosts pre-existing immunity induced by environmental mycobacteria and induces high levels of antigen specific T cells. When administered to subjects previously vaccinated with BCG, significantly higher levels of antigen specific T cells are seen. Importantly, this vaccine is as safe and as immunogenic when administered to subjects who are latently infected with M.TB, as it is in BCG primed subjects. Results from clinical trials in both the Gambia and South Africa show that this vaccine is also safe and highly immunogenic in these TB endemic populations. We will review the clinical development of this promising vaccine and present a detailed immunological analysis of the vaccine induced responses. In addition, results from the ongoing study in HIV-infected subjects will be presented.

CONTACT INVESTIGATION IN THE HOUSEHOLDS OF ACTIVE TUBERCULOSIS PATIENTS: YIELD IN NEW CASES OF TB AND IMPLICATIONS FOR EVALUATION AND MANAGEMENT OF EXPOSED CHILDREN

Yield for detecting new active cases of TB in the household and impact on TB incidence of a contact investigation project in Brazil

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Objectives: To compare the impact of routine DOTS versus Enhanced DOTS (DOTS-A) on TB incidence and to measure the prevalence of active and latent TB in household contacts of TB patients from DOTS-A communities in Rio de Janeiro (RJ) city.

Methods: Prospective, community-randomized trial. Eight urban neighborhoods in central RJ were randomized to DOTS vs. DOTS-A. In DOTS communities, TB index cases were asked to have their contacts come to the clinic for evaluation to rule out active TB. In the DOTS-A communities, contact tracing and

evaluation was more aggressive and included home visits, clinical evaluation, chest X-ray, tuberculin skin test (TST), and sputum exam. Household contacts in the DOTS-A communities diagnosed with TB infection (TST ≥ 5 mm) received directly observed or self-administered preventive therapy.

Results: From November 2000 to December 2004, 960 and 1003 household contacts were enumerated from 311 and 337 TB pulmonary cases from DOTS-A and DOTS communities, respectively. Among 701 (73%) contacts from DOTS-A communities that were assessed, 26 (4%) TB cases were detected. Among 583 contacts with a complete TST, 429 (75%) had induration ≥ 5 mm. Between the year preceding the intervention and the final year of the study, TB incidence increased 6.5% in DOTS communities and decreased 9% in DOTS-A communities. At the end of the study, the DOTS-A communities had an incidence rate that was 15% lower than the DOTS communities ($P = 0.04$).

Conclusion: DOTS-A identified a high prevalence of TB infection and disease in households of active TB cases. Intensive contact evaluation and preventive therapy may be an important strategy for reducing the incidence of TB in a high incidence community.

Management of child contacts of drug-resistant TB patients: results of a survey of DOTS-Plus projects in Asia, Africa, South America and Eastern Europe

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Introduction: International policy on treating pediatric contacts of multidrug-resistant tuberculosis (MDR-TB) for latent TB infection (LTBI) do not currently exist due to a lack of evidence about best practices. We sought to assess current practices for managing pediatric contacts of MDR-TB worldwide.

Methods: We surveyed all countries with DOTS-plus programs and countries where $>3\%$ of new TB patients have MDR-TB according to the WHO Third Global Drug Resistance Report. The survey assessed policies and practices of screening and treating pediatric contacts of MDR-TB for LTBI.

Results: Of 26 countries surveyed, 1 declined to participate, 15 responded, and results from 10 others are pending. Of the 15 who responded, all routinely screen pediatric contacts of MDR-TB using various methods. When treating LTBI is indicated, 5 (33%) countries do not routinely treat, 6 (40%) treat with isoniazid alone, and 4 (27%) treat with other combinations based on drug susceptibility testing of the source case. Two countries report using fluoroquinolones routinely.

Conclusions: Few countries treat pediatric contacts of MDR-TB with regimens likely to effectively treat

multidrug-resistant LTBI. Evidence and expert opinion about best practices for treating pediatric contacts of MDR-TB is needed in order to implement effective contact management.

Role of new T-cell based diagnostic tests to evaluate children exposed to active TB

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Pediatric tuberculosis (TB) represents a major cause of childhood morbidity and mortality worldwide. Prompt, accurate identification of infants and young children with *Mycobacterium tuberculosis* infection is an important priority as they are at higher risk of progression to disease and suffer from more severe disease than older children and adults. Diagnosis of latent tuberculosis infection (LTBI) has traditionally relied on the tuberculosis skin test (TST). Recent development of interferon gamma secreting assays (IGRAs) now offer new ways to diagnosis LTBI. Studies utilizing these tests for diagnosis of *M. tuberculosis* infection in children will be reviewed and results of our study of child household contacts using a whole blood IFN- γ assay will be presented. In this study, whole blood IFN- γ production in response to *M. tuberculosis* culture filtrate was measured in household contacts of culture positive adult pulmonary tuberculosis cases enrolled in a prospective cohort study conducted in Kampala, Uganda. Young household contacts demonstrated robust IFN- γ responses comparable to adults, which positively correlated with TST results and defined epidemiologic risk factors for infection. IGRAs represent a promising prospect for improved diagnostics for young children and warrant further study. Further studies should address increasing feasibility and appropriate application in resource poor countries where TB is a leading cause of childhood morbidity and mortality.

Contact investigation policies and practices for children exposed to active tuberculosis in El Salvador: experiences from the field

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Setting: El Salvador is a small Central American country, of 20 000 km² and a 320 inhabitants/km² population density and a all form tuberculosis rate of 26/100 000 inhabitants.

Methods: Documental revisions of all the records of treatment of 100% of Acid Fast Bacilli smear positive TB cases nationwide at the national cases registry office were carried out.

Results: During 2005 there were 1059 smear-positive patients and there were 4900 contacts registered, of which 4551 were investigated (93.0%). 317 (7%) were all TB forms. Sixty eight (21.5%) were smear positive; where as 220 (68.8%) were smear negative tuberculosis and 17 (5.4%) were extra-pulmonary TB. The most used diagnostic procedures were: chest X ray suggestive of TB in 249 (79.2%); On the other hand 301 (6.7) were PPD positive >5 mm; Only 2.4% of smear-positive patients had one or mere BCG vaccine scars; while 22.6% with positive sputum had to PPD >5 mm.

Conclusion: Seven per cent of investigated contacts were (all forms) TB cases, which make 17.3% of El Salvador total cases and only 1.5% of these investigated contacts were smear-positive. The main diagnostic criteria come from the clinical standpoint, chest X ray, PPD and sputum smear, in that order.

PATIENT AND PROVIDER EDUCATION: SUCCESSFUL MODELS AND LESSONS LEARNED

Peer educators to promote tuberculosis case finding in prisons in Thailand

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Background: To find TB cases more actively, a peer educator strategy is developed. The peer educators refer to key prisoners who are officially appointed by prison authorities to assist prison staff for such activities inside prisons.

Objective: To describe characteristics of the peer educator strategy, to identify problems encountered, and to develop lessons learned.

The peer educator strategy: Prison nurses trained the peer educators by focusing on knowledge of transmission, prevention, treatment and care, and assessment of personal risk. In addition to case-finding, the peer educators also provide health education for fellow prisoners.

Preliminary results: Each prison trained about 30 peer educators. Overall, the peer educators identify

100 TB suspect per month per 4000 prisoners. About 10% of TB suspects are diagnosed as smear-negative TB and 3% as smear-positive TB. Problems encountered included that support from prison staff was inadequate. Another major problem was related to lower number of TB suspects than expected. Several lessons can be learned from early phase of implementation. These include that there is a need for intensive health education for prison staff to promote the TB control procedures. Peer educations should be informal group leaders rather than formal key prisoners.

Conclusions: Peer educators can be used for TB case-finding in prisoners. Other staff in prisons should be provided TB information. The most effective educators may be from group leaders of the unofficial hierarchy because these leaders have gained the respect of other group members.

Innovative training methods: MDR-TB training centre in Latvia

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Multidrug-resistant tuberculosis (MDR-TB) is increasing public health threat in the world. To implement appropriate MDR-TB treatment and management program additional education is crucial. WHO CC, Latvia have implemented training programs based on international guidelines and 10 years experience of DOTS Plus program in Latvia and four other pilot projects: Peru, Estonia, Philippines and Tomsk. The aim of the training is to build the capacity of TB programs by developing human resources with improved skills, abilities and knowledge for ongoing high priority needs and implementation of new guidelines. This presentation will describe:

- WHO CC developed TB/MDR-TB training programs; TB/MDR-TB treatment and management; TB infection control; TB/MDR-TB laboratory diagnostics; TB/MDR-TB nursing care; clinical aspects on TB-HIV; TB in children; training of trainers in DOTS/DOTS Plus programs; TB/MDR-TB patient education;
- Training methods based on adults learning principles which are with emphasis on improving knowledge in hot topics, gaining skills in working with TB/MDR-TB cases, developing managerial skills, practicing in case studies, receiving feedback on work performance, getting opportunity to observe experience, gaining ability to integrate theory with practice;
- Learning by pre/post test and assessment of draft plan for local needs and reaction evaluation by questionnaire.

To meet country needs and job descriptions training is provided for program managers, clinicians, laboratory staff, nurses and nurse assistants.

TB-HIV train-the-trainer surveillance training in Botswana

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Introduction: The World Health Organization (WHO) recommends that countries conduct HIV surveillance among TB patients. To ensure district and facility-level health care workers have the knowledge and skills to conduct TB-HIV surveillance, a training of trainers (TOT) curriculum was developed using the Teachback Methodology.

Description: The Teachback Methodology integrates the development of training skills with the learning of course content. In July 2005, two pilot TB-HIV surveillance TOT courses were delivered in Botswana to district-level TB and HIV coordinators using the Teachback Methodology. Seventy-two course participants increased their knowledge of TB-HIV surveillance and gained the skills to teach the course to facility-level staff. Course content included TB-HIV epidemiology, routine HIV testing policy and techniques, recording and reporting, and the use of TB-HIV data. Participants also developed skills for facilitating a lecture, a group discussion, and role-play. Participants also created action plans to deliver trainings in their own districts with assistance from the Botswana National TB Programme and CDC staff.

Lessons learned: Course evaluations indicated that the Teachback Methodology is effective for teaching content and building training skills. Currently, 21 of the 24 districts in Botswana have trained facility-level staff on TB-HIV surveillance using the curriculum from the TOT course.

Conclusions: Teachback can be an effective methodology for building the capacity of trainers and implementing courses on TB-HIV surveillance across a national TB programme. The methodology can be applied to other existing curricula to develop a TOT course.

Uganda: improving TB case detection and increasing the uptake of HIV testing in Kampala, Uganda

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Uganda one of the world's high burden countries with tuberculosis, has an estimated annual risk of infection of 3% equivalent to 150–165 new smear-positive TB cases per 100 000 population per year, or 300–330 total TB cases per 100 000 per year. The country detected 52% of the expected new smear positive cases, of whom 67.6% were successfully treated. Integration of TB and HIV increases the burden of both diseases. Non standardized integrated TB-HIV activities

have been implemented. Findings indicate knowledge gaps among health care workers resulting in poor implementation. Mulago Hospital has responded to the prevailing demand through a program funded by PEPFAR. Integrated TB-HIV program is providing routine HIV testing, routine TB screening and a specialized clinic for TB-HIV co infected patients is in progress. Nurses have trained in HIV counselling and testing and TB screening. This approach has not only improved on case detection and health outcomes of TB-HIV positive persons, but has also improved on the knowledge base and skills of the health care providers resulting in minimizing the loss of highly skilled Ugandans.

Implication: Target population for training nurses was small compared to the demand. There is need for more support to train nurses who have demonstrated positive attitudes towards care thus improvement of case detection. Similar approach should be replicated to other health care facilities countrywide to realise the global case detection and treatment success target of 70% and 85% respectively.

Volunteers involvement in educating TB patients and families: example from an urban TB control programme

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Background: The burden of TB is high in urban areas in Nepal, where many patients fail to complete treatment. Because of resource constraints, the Nepal NTP has been unable to make provision for tracing patients who interrupt treatment.

Setting: Lalitpur sub-metropolitan city, population 200 000, where DOTS was started in 1998 together with a public private mix (PPM) project.

Objective: To develop volunteer Late Patient Tracers (LPTs) to support the DOTS programme.

Methods: 30 volunteers were identified and provided with two days training. They were involved in address verification of patients, home visits, educating patients and families, visiting private practitioners (PPs) and delivering feedback. LPTs were coordinated by a local NGO.

Findings: More than 90% of LPTs continued in this role for at least 5 years. Their input contributed to the Municipality achieving 90% treatment success with less than 1% default: 20% referrals came from the private sector. Few TB patients needed tracing because volunteers and staff were actively involved in educating patients and families. Participation of local volunteers in awareness campaigns helped in timely identification and investigation of TB suspects. LPT involvement contributed to strengthening the PPM, encouraging PPs to establish wider PPM networks and trust.

Lessons learned: In the face of limited resources, volunteers are a potential human resource in TB control. Identification of LPTs by the municipality rather than the NTP means volunteers are responsible to local communities. Volunteer LPTs can be sustained at little cost: monthly meetings, regular interactions and tokens of gratitude can motivate volunteers to continue. It is important to have a committed coordinator. Self-motivated volunteers can create 'volunteer networks' in DOTS and strengthen PPM.

VARIOUS TYPES OF TOBACCO USE

Kretek

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There are 215 billion cigarettes consumed every year in Indonesia, which put Indonesia as the 5th highest cigarette-consuming country in the world. About 60% of Indonesian males and less than 5% of females are smokers. That means more than 60 million Indonesians are smokers. Indonesian Global Youth Tobacco Survey (GYTS) 2006 showed that 12.6% of 13–14 years students are smokers, and 2006 National Global Health Professional Survey (GHPS) among medical students showed that the prevalence of current smoker are 9.3%. More than 80% cigarettes in Indonesia are in the form of kretek. Aside from tobacco, the kretek also contains two ingredients, clove and 'sauces', a mixture of hundreds different flavors. One single brand of kretek may also include over 30 different varieties of tobacco. Kreteks were so named from the keretek-keretek sound of cloves burning and exploding. Initially a home industry, hand rolled kreteks were commercially produced in 1906. Their popularity soared further after the mechanization of the industry in the 1970s. Data from 130 TB patients in Persahabatan Hospital Jakarta (2006) showed that 52.3% of them are smokers. Among them, 88.31% smoke kretek, 5.19% smoke ordinary cigarettes and 6.49% smoke kretek as well as ordinary cigarettes. Another data from 180 TB patients treated at Indonesian Anti TB Association ('PPTI') Jakarta clinic showed that 40.55% are smokers which 93.15% smoke kretek (36% smoke so-called 'mild' form) and 6.84% smoke kretek as well as ordinary cigarette. A case control study as an extended analysis of Indonesian National Health survey was done to find the odds ratio of TB and smoking in Indonesia. There are also several small scale surveys regarding the impact of kretek in lung health, i.e., lung cancer as well as tuberculosis, which will also be presented.

Potential reduced exposure products (PREPs)

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PREPs are intended for those among the $\pm 50\%$ chronic smokers unable or unwilling to quit, who seek an alternative way to reduce tobacco related harm. Major health consequences of cigars, cigarillos and pipe persist in spite of the reduced lung hazard in primary non-inhaling smokers. Ventilated filter cigarettes (ultralight, extralight) are not associated with reduced health risks: most chronic smokers compensate the smoke dilution by increasing the smoke volume inhaled and occluding the ventholes of the filter. To reduce the tobacco related harm of cigarettes, filter ventilation should be banned, toxins and carcinogens yields reduced, and their measurements in smoking machines adapted to the smoking pattern after compensation. A decreased nitrosamine yield is claimed in several types of manufactured cigarettes (Omni, Vector, Star). 'Advance lights' seems to produce less CO than conventional cigarettes. New types of cigarettes with modified combustion but producing nicotine aim to reduce the toxins and carcinogens developed during tobacco burning. Eclipse® produces nevertheless much CO and other smoke constituents. Accord® does not increase CO but is less satisfying to the smoker who sometimes uses conventional cigarettes concurrently. Oral forms of tobacco (Ariva: lozenges of compressed powdered tobacco; snuff including Swedish snus) deliver tobacco products without any inhaled or environmental smoke. The number of known carcinogens is lower in tobacco (15) than in tobacco smoke (60) but there are variations in their carcinogen content. Indefinite use of pharmaceutical nicotine suppresses carcinogenicity but is not appealing to smokers, and results are still lacking. How far new tobacco products allow an effective harm reduction must still be demonstrated. Their content including additives is usually not disclosed by tobacconists. No biomarkers were demonstrated to be predictive of tobacco disease.

Transcultural tobacco: key issues

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Smokeless tobacco is much less harmful to health than smoking. It is already known that types of smokeless (transcultural) tobacco commonly used in Asia contain high levels of toxins and carcinogens and cause considerable health risks. The aim of this presentation is to highlight that smokeless (transcultural) tobacco products, available in the EU, vary greatly in concentrations of nicotine, toxic metals and carcinogens and remain unregulated and widely available. However, some smokeless tobacco products, known as oral snuff, are currently illegal in many parts of the EU. There is convincing evidence that the use of oral

snuff in Sweden, known as snus, can reduce the risk of people starting smoking. There is growing evidence that the use of snus in Sweden can help smokers to give up smoking. The current regulatory regime in the EU means that we leave the most dangerous form of nicotine use—cigarette smoking—the least regulated, while certain forms of smokeless tobacco are illegal and medicinal nicotine, the safest form of use, is heavily regulated. It is therefore strongly advocated that toxin standards should be introduced and that ban on oral snuff within the EU can be lifted if regulatory controls can be introduced to prevent marketing of the products to prevent an increase demand for them.

SYMPOSIA: FRIDAY 3 NOVEMBER 2006

EVALUATION OF THE INTEGRATION OF TB-HIV ACTIVITIES AT THE COMMUNITY LEVEL: THE IMPACT ON HUMAN RESOURCES

Role of the community in implementing joint TB-HIV interventions: an example from a rural district in Malawi

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Setting: Thyolo district, rural Malawi.

Objectives: To describe a) the experience of initiating community involvement in HIV/AIDS and tuberculosis (TB) activities and b) some of the different activities and outcomes of community involvement.

Methods: Community members were actively involved in planning and implementation. Data from January 2003 to December 2004 were analysed.

Results: Forty-one per cent of a total of 52 510 HIV tests which identified 15 556 HIV-positive individuals were conducted by lay-community counsellors. A community network of 465 volunteers, 1362 family caregivers and 9 nurses provided care and support to 5106 HIV-positive individuals including 2006 (39%) in World Health Organization stages III and IV. A total of 1634 individuals were placed on ART, of whom 895 (55%) were living in areas with community involvement. For all patients placed on ART with and without community support, those who were alive and continuing ART were respectively 856 (96%) and 560 (76%, $P < 0.001$); death was 31 (3.5%) and 115 (15.5%, $P < 0.001$); loss to follow-up was 1 (0.1%) and 39 (5.2%, $P < 0.001$) and stopped ART was 7 (0.8%) and 25 (3.3%, $P < 0.001$). The relative risks {with 95%CI} for alive and on ART (1.26 {1.21–1.32}), death (0.22 {0.15–0.33}), loss to follow-up (0.02 {0–0.12}) and stopped ART (0.23 {0.08–0.54}) were all significantly better in those offered community support ($P < 0.001$). A total of 2714 TB patients, 60% of whom were HIV-positive, also received community support.

Conclusions: In resource-poor, high HIV-prevalence countries, communities can play an important contributory role in reducing the burden of HIV/AIDS and TB, mitigating its impact and in improving treatment outcomes.

Integration of TB and HIV therapy for coinfecting patients by strengthening TB DOTS infrastructure and utilizing community and family supports

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Introduction: The province of Kwazulu-Natal, in South Africa has experienced a dual TB and HIV epidemic with a TB incidence of over 1000 per 100 000 people per annum and an antenatal HIV prevalence of over 36% per cent. Over 70% of new TB patients are HIV-positive. Even with successful TB treatment, the annual case fatality rate among HIV-TB coinfecting patients remains up to 40%. Introduction of antiretroviral therapy (ART) by integrating with existing TB DOTS infrastructure could be an effective, safe and efficient strategy to increase ART access and improve TB and HIV outcomes in resource-poor settings. This discussion outlines the experience of a local district hospital based in a resource poor setting in rural Kwazulu-Natal, South Africa. This facility has 1200 patients on the National ARV therapy rollout program and 700 patients on TB therapy at one time. The TB DOTS infrastructure has been strengthened by improved transport and community communication, the formation of a community network of 37 area supervisors, 320 volunteer Home Based Carers and 200 DOT supporters all supervised by four hospital-based field teams. Routinely 'treatment buddies' (usually family members) accompany patients during the pre-treatment preparation sessions. An observational treatment study among 100 HIV-TB co-infected patients followed up for 12 months will be completed in August 2006. Co-infected patients are treated with once-daily ART regimen concurrently with TB therapy by home-based DOTs. The study end points include HIV and TB outcomes, drug toxicity, hospitalizations, mortality, CD4 and viral load change, and ART resistance.

Conclusions: This integrated strategy utilizing community and family support may be effective for initiating ART in other rural resource-poor settings where TB DOTS infrastructures already exist. TB DOTS programs provide a logical infrastructure to introduce ART into rural resource-poor settings. Integration of TB and HIV treatment has resulted in increased access to ART, and favorable therapeutic outcomes for both HIV and TB.

HIV counseling/testing and impact of ART on reducing mortality during TB treatment

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Background: Both TB and HIV are high prevalent diseases in Thailand. TB is the most common OI in PHA and 20% of TB cases infected with HIV. Thai

NTP has implemented DOTS strategy for TB control since 1998 and around 80 000 TB cases were annually registered. National Access to anti-retroviral therapy for PHA (NAPHA) program started in the year 2002 and currently around 80 000 AIDS cases are treated with HAART. High mortality (44%), however, is detected among TB-HIV co-disease patients. One of the most important causes is inadequate knowledge of health staff in each program. Collaboration from both sides in TB-HIV integrated activities is another problem.

Method and results: We conducted training of TB-HIV integrated activities for staff from both clinics. The objective is to incorporate their TB-HIV knowledge especially to understand the importance of HIV counseling and testing among TB patients. We found that TB clinic staff can provide counseling for HIV testing for TB patients properly, timely and conveniently. In 2005, 89% (1908/2235) of TB patients received counseling for HIV testing and 81% (1537/1908) accepted HIV testing. 103 TB patients knew their HIV positive status before blood test. 21% (350/1640) of TB cases have HIV co infection. 98% (546/559) of PHA received TB screening and 9% (49/546) of them were diagnosed TB. TB-HIV co-disease patients received CD4 cell count exam and ART would be given regarding their CD4 status. Mortality rate of smear positive TB-HIV patients decrease from 44% to 23%. However, human resource developments are not only training in the classroom but also to include continuous supervision, monitoring, and evaluation as a key part of on the job training.

Conclusion: Counseling/testing for TB patients is the first important step that leads to other treatment and care activities that can decrease mortality of TB-HIV co-disease patients.

The 'accompagnateur' model for community-based interventions for pediatric TB-HIV coinfection in Rwanda

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Issue: Good program models for the diagnosis and treatment of tuberculosis in HIV-positive pediatric patients in resource-poor areas are lacking.

Description: Over a period of 12 months, a new HIV and TB treatment program in rural Rwanda diagnosed 304 children ages 1 to 15 with HIV. Of 116 children started on ART (antiretroviral therapy), 34 (29%) were first initiated on TB treatment. Thirty-two of the HIV-positive children received TB treatment but had not yet started ART. The only available TB diagnostic methods were history, physical exam, chest X-ray, and sputum exam. Active case-finding of both HIV and TB were employed. Diagnosis was aided by the Rwandan national TB program's pediatric TB scoring system. All children on either TB treat-

ment or ART received daily DOT (directly observed therapy) by a trained community health worker, or accompagnateur. Accompagnateurs received a monthly stipend for daily medication administration, and for acting as the patient's liaison with health centers, including accompaniment to monthly clinic visits.

Results: A substantial number of HIV-positive children were identified with active TB. The accompagnateur model resulted in no patients lost to follow-up and high medication adherence. Outcomes for HIV-positive children treated for TB have showed clinical improvement, with no treatment failures or deaths to date.

Conclusion: Using program protocols, and a low threshold for TB diagnosis in HIV-positive children, has led to the ability to identify TB cases despite few diagnostic tools. DOT for both TB and HIV therapy, using the accompagnateur model, have led to excellent clinical outcomes. The cost of accompagnateur stipends is justified by avoiding the price of treatment failure. Daily DOT using community health workers may be a necessary component of successful pediatric HIV and TB treatment in resource-poor settings.

Evaluation of access to and uptake of HIV testing of TB patients in urban Sao Paulo, Brazil

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Introduction: São Paulo State discover each year about 21 000 TB cases. Among them there are about 3000 coinfecting with HIV. In 1994–1995 a HIV seroprevalence survey was carried out in 895 TB patients from ambulatory health services finding 10.3% of HIV-positive. In 1995 and 1996 the same survey was carried out in 4 long term hospitals for TB patients and the results showed seroprevalence of 11.8% (270 TB patients) and 13.5% (348). At that time the percentage in pregnant women (400) was of 0.75%. Therefore it was recommended that all TB patients should be offered an HIV test, as this is one of the highest risk factor known to get TB. In 1998 a resolution about it was published in the State official newspaper. It was the only state in the country at that time, to put it into practice.

Methodology: To evaluate these activities was utilized the TB notification system (Epi TB) since the HIV test information is one of the variables of the registration form.

Results: The evaluation of the HIV testing at the TB diagnosis moment in the period 1998–2004, showed an increment of 23.3% in offering the test. In 2004 the HIV seroprevalence in TB patients was of 12.4% among new cases and 23.2% in retreatments. Although the percentage of the test realization was increasing there wasn't an increase in the positivity of HIV, so the 12.4% must be near the real figure.

Conclusions: In São Paulo State, the recommenda-

tion of offering HIV test to TB patients has been followed and with these found percentage it's an activity that must be maintained and implemented, not only for the opportunity to offer treatment with HAART for these patients but also because the need to interrupt the virus transmission.

FIDELIS: INNOVATIVE ACTIVITIES TO STRENGTHEN HUMAN RESOURCES FOR TUBERCULOSIS CONTROL

FIDELIS and human resource development activities: an overview

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Background: FIDELIS is a \$27 million USD initiative funded by the Canadian International Development Agency (CIDA) and managed by the International Union Against Tuberculosis and Lung Disease (The Union). The main goal of the FIDELIS initiative is to increase case finding for new smear positive tuberculosis cases through, cost-effective, locally developed and innovative activities.

Methods: A survey was conducted in June and July of 2006 to determine the nature and extent of human resource development activities in all 28 projects that had completed their phase I implementation at the time of the survey. Information was obtained on training activities, recruitment of new staff, enhanced supervision, utilization of incentives and 'other' human resource development activities. The cadre of worker targeted was tracked, as well as the relative importance of the specific activities within the overall project.

Results: Most of the respondents reported a wide range of human resource development activities. The target of these activities included front line health providers, laboratory workers, community workers and various private providers. The reported human resource development activities were frequently the major focus of the FIDELIS project. In China alone, 130 000 health workers were trained through FIDELIS projects.

Discussion: Though the focus of the FIDELIS initiative was case finding enhancement, this goal was frequently obtained through activities which directly or indirectly supported human resource development.

FIDELIS in China: training 130 000 health workers to increase tuberculosis case detection

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Setting: FIDELIS projects implemented in 10 provinces, China.

Objective: Training health personnel at various levels by implementing FIDELIS projects to increase case detection.

Methods: Training activities as key interventions were integrated into work plan of FIDELIS projects. Training methods consisted of training course and training on the spots. The aim of training must be clear linkages to FIDELIS projects supervision and on the job training to maintain high quality implementation. The majority of health personnel trained were working at existing health facilities. Trained manpower has to be competent for their responsibilities. First of all, adopted training trainer at provincial level as a key persons and then a training courses were conducted layer upon layer at various levels.

Results: During October 2003 to October 2005, there were 10 FIDELIS projects implemented for 1 year in 10 provinces with population of 218.1 million, and consisting of 444 counties. There were total of 118 554 health personnel trained, including 190 province health professionals, 3879 prefecture and county health professionals, 99 448 township and village health workers, and 12 997 schoolteachers trained respectively. FIDELIS project rapidly implemented as wider health personnel trained and mobilized into action to find the suspects of tuberculosis. During one-year project 94 231 new smear positive cases detected that showed a marked increase over previous year when 56 762 cases detected.

Conclusions: Training and mobilizing health personnel at existing general health facilities are very important intervention to increase case detection and got twice the results with half the effort.

Developing district level laboratory supervision (DLS) arrangements in FIDELIS supported districts

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Background: Pakistan ranks sixth among TB high burden countries. Since 2005, when countrywide coverage of DOTS was achieved, the programme priority has been to improve the quality of DOTS implementation. The National TB Control Programme has strengthened the national and provincial/regional level reference laboratory arrangements. However, district level arrangements for AFB quality control still remain a challenge.

Development: Three options for supervising the district laboratory network have been developed and being piloted in four FIDELIS-IV supported districts. These DLS options include: a microscopist from district hospital laboratory, a senior malaria microscopist, and a senior paramedic (with no background in

microscopy). Through a series of workgroup consultations, participated by representative of NTP Pakistan and experts from ASD and FIEDLIS district coordinators a draft DLS guidelines were developed. These guidelines include technical and operational details on the working of DLS including external quality assurance and tools to be used for performing various laboratory monitoring tasks in more structured fashion.

Implementation: Each DLS was provided training on core laboratory component and on operationalising the DLS guidelines and logistic support for regular visits to the laboratory staff at the health facilities to provide onsite technical support. The operationalisation of DLS guidelines was carried out by: 1) supervising the laboratory arrangements and staff practices, 2) replenishing the laboratory supplies, and 3) performing external quality assurance.

Results: The experience of developing the DLS system including guidelines and arrangements will be systematically reviewed and documented for sharing in the symposium during the Union Conference. The early implementation experience with the three selected DLS options are currently being evaluated (through COMDIS support) in which the preliminary finding of the qualitative review of three DLS options (analysis still in-process) indicates the importance of previous laboratory background, adequate mobility and supervision support, and management arrangements for making the DLS work effective. The final results of the qualitative review as well as preliminary findings of the ongoing evaluation, of DLS options in four districts, will be shared in the poster presentation during the Union Conference.

Future: Preliminary experience indicates that district level supervision of laboratory network is feasible and potentially replicable. The ongoing systematic research and development would help in further developing these arrangements.

Strengthening the role of community health workers: FIDELIS-supported activities in Bangladesh

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Background: BRAC strengthened its community based DOTS services with the support of FIDELIS and the national TB control programme, covering 8.3 million urban and 27.6 million rural population between 2004 and 2006.

Objective: To develop a model to increase case detection and maintain high cure rates by involving community health volunteers, community leaders, and the corporate and private sectors.

Methods: BRAC developed a comprehensive human resource plan including recruitment and training of community health volunteers known as 'Shastho Shebika'. They identify TB suspects and ensure DOT. Community leaders, and public and private sector health workers were also mobilized. Additional staff was recruited and training was given. Community level awareness campaign was enhanced through cable TV network, popular theatre shows and school children. Performance review meetings with Shastho Shebikas and workers were held monthly and quarterly respectively.

Result: In the project area, 11 225 community health volunteers are trained and involved in DOTS. Of these, 3539 health volunteers were trained by Fidelis project. Under Fidelis support, 1011 government field workers, 68 laboratory technicians, 66 medical officers, 290 private medical practitioners, 1288 village doctors, 1064 cured patients, 179 factory worker leaders were orientated and sensitized. 14 workshops in medical colleges and 7 workshops for factory owners were conducted. Additional 116 staff was recruited to accomplish and supervise the activities. In one-year project period case detection rate was increased from 30 to 51 per 100 000 and 9 to 47 per 100 000 population in rural and urban areas respectively. The average treatment success rate was 93%.

Conclusion: Human resources at community and service point levels, capacity development of existing and newly recruited public and private sector health care providers, and involvement of community are crucial to expand DOTS and maintain high quality of services.

Utilising incentives in FIDELIS projects to improve performance

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Background: China is one the high TB burden countries in the world. Nearly 80% TB patients are living in rural area in China. China is a developing country and the economic development is uneven in different area. Rural area is much poorer and the income of the residents in rural area is very low. The health service system is functioning in the rural area but its development largely depends on its income. Fidelis project has made great contribution to the TB control in China mainly because it motivates the health care provider at township and village levels to play an active role in case detection and treatment.

Methods: 1) To motivate the health care providers by the incentive mechanisms:

- 1.1 Clinical doctors in hospitals should refer the detected TB suspects or patients to TB dispensary
- 1.2 The village doctors actively collect sputum specimen at patient's home and send the specimen to township hospital for smearing and microscopy.

- 1.3 To encourage lab technician to do more smear microscopy with high quality
- 1.4 To encourage more TB suspects go to seek health service in TB dispensary, transportation fee is provided to those patients arriving TB dispensary.
- 2) To improve patient's compliance with treatment and increase the cure rate: the doctor is responsible for DOT and keeping record on the treatment card. If the job is performed well, by the end of the treatment, doctor will get incentive.

Results: The implementation of incentive mechanism promotes the progress in case-detection. With the effort in past few years, Fidelis since Oct. 2003 and among them the projects in 9 provinces and prefectures have completed the phase I. The results showed that in the previous year before the project, 37 494 new smear positive TB cases were detected, compared with the number of 94 231 in the project year, it increased 43 707 cases (217%).

Discussion: All health care workers in China have their salary. However, the salary is only related with whether they are working or not. It does not reflect the quality and quantity of their work. Thus, the incentive mechanism implemented in fidelis project that is directly related with the quality and quantity of the work greatly promotes the enthusiasm of the health care providers and the efficiency and effectiveness.

THE ROLE OF THE LABORATORY IN ACHIEVING THE MILLENNIUM DEVELOPMENT GOALS

Global urgency in capacity building of TB diagnostic services

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Bacteriology is one of the fundamental aspect of national tuberculosis control programmes (NTP) and a key component of the DOTS strategy. However, TB laboratory services are often neglected components of these programmes. In addition to improving sputum smear microscopy there is a need to introduce culture and drug susceptibility testing to improve diagnosis and identify MDR-TB. An unprecedented lack of human resources at national and international level jeopardizes the laboratory component of TB control. The factors contributing to this problem are the generalized human resource crisis in high-TB burden and high-TB endemic countries, poor moral and motivation of laboratory staff related to low salaries and poor working conditions, no career structure or career progression, retirement of many international laboratory experts. The scarcity of human resources is aggravated by poor education of staff and inadequate

management of human resources. To correct the trend there is a need to urgently address:

- inadequate competence of existing staff
- imbalance in human resources for TB laboratory work (numbers, distribution, skills)
- improve pre-service training
- increase number of qualified international experts to support countries

Management of MDR-TB: can we do it without laboratory support?

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Latvia has one of the highest rates of MDR-TB in the world. In 1996 MDR-TB was reported in 14% of newly diagnosed and in 54% of previously treated patients.

Aim: To describe the level of laboratory support for DOTS-Plus program. Three levels laboratory network provides diagnostic services in Latvia (smears, cultures, methods of *Mycobacterium tuberculosis* strains identification and drug susceptibility testing [DST]). The National Reference Laboratory of Latvia only is performing DST to I and II line antituberculosis drugs. BACTEC-MGIT system is used for rapid MDR-TB case detection. Laboratory is quality assured by supranational reference laboratory at the Swedish Institute for Infectious Disease Control (100% agreement for isoniazid and rifampin and greater than 90% for other anti-tuberculosis drugs including 95% to ofloxacin). The *rpoB* gene mutation line probe assay INNO-LiPA Rif.TB is studied to use for more rapid diagnosis of MDR-TB.

Results: All DST results are reporting to the TB registry weekly and MDR-TB patients switched to treatment with second line drugs. Registered MDR-TB cases have declined by 51% since 1997. Among 605 patient who initiated MDR-TB therapy from 2000–2002, 115 (19%) had extreme drug resistance (XDR), MDR-TB plus resistance to 3 second line drugs. Analysis of culture conversion time for cohort 2000 showed that 75% of those who started treatment positive converted and half of them converted within 12 weeks. Treatment success was achieved in 66% and more, 60% of cases with XDR achieved good outcome. Rapid MDR TB diagnostic methods can decrease time to MDR-TB diagnosis to 3–4 days.

Conclusion: Bacteriology laboratory is a central part of MDR TB program in high level MDR TB setting. The high quality laboratory can guide clinicians to establish the most appropriate treatment and achieve good treatment results. Proper use of rapid diagnostic methods contributes to early diagnosis and treatment, improves infection control.

Laboratory technical assistance for high-burden countries: experience from China

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China has a strong commitment to stop TB. Despite the high-burden, there has been a gradual buildup of laboratory capacity in both central and peripheral TB laboratories in the past years. Because of the vast population, drug resistance surveys (DRS) are performed on a province-by-province approach whereby new provinces are added on to previous ones. In the actual DRS where sampling was done and clusters are selected, training and human resource capacity building were essential components that remain critical to the success of DRS. Through these surveys, reliable drug resistance data have been obtained which give an accurate picture of the drug resistance situation, assess DOTS program, and help identify hotspots of multidrug-resistant TB (MDR-TB). Once the MDR-TB situation has been further delineated, it is possible to assess the requirements for and setting up of DOTS-plus program. AFB smear microscopy external quality assessment (EQA) was first introduced as a pilot project. A national expert committee was set up and EQA manual was subsequently produced. This facilitated training of provincial and prefectural laboratory staff responsible for the main work of EQA. Difficulties encountered include the adverse effects of healthcare reforms that take away routine laboratory work from the provinces, inadequate laboratory setup, and deterioration of equipment and supplies. Consistent technical assistance is necessary, as rapid turnover of laboratory staff perpetually drain on human resources.

HUMAN RESOURCE DEVELOPMENT PLANS: SUCCESSES AND LESSONS LEARNED

From training courses to plans for HRD for comprehensive TB control

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Human resource development (HRD) for comprehensive TB control should be seen within the context of overall development of Human Resources for Health (HRH). HRD is one of the key issues in overall health system development. The quality of service delivery, including interventions for comprehensive TB control, depends to a large extent upon the performance of personnel, enabled by the availability of sufficient equipment, drugs and other facilities. The performance of personnel depends on various factors such as motivation, training, supervision, salaries and working

conditions, all of which require carefully formulated and implemented HRH policies. Any changes in the organization or in approaches of the health system have an impact on the performance of health personnel working in the sector, in either private or public facilities. In scaling up of health programmes and interventions including interventions for comprehensive TB control, the lack of HRH often represent a major constraint. HRD has for many years been synonymous with organizing training courses. However the strength and sustainability of National Tuberculosis Control Programmes (NTPs) depend on timely, adequate and ongoing training and deployment of personnel to ensure that the desired quality of service provision is reached and maintained. To manage this two types of plans are needed for HRD for comprehensive TB control. The first is a country specific strategic plan for HRD that provides overall guidance to NTPs in planning and implementing strategies to ensure achieving the goal of an adequate and competent workforce for comprehensive TB control. The second is an annual implementation plan that includes short term objectives and activities needed to progress towards and adequate and competent workforce for comprehensive TB control. Plan long, act short and update often should be the guiding principle for planning and management of HRD which must adopt long, medium and short term goals and objectives.

National planning and implementation of HRD for TB control in Thailand

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Objectives: To describe short term plan and implementation, to define problems regarding planning and implementing the plans, and to identify lessons learned.

HRD plans and implementation: In 2003, HRD short term plan had to propose HRD activities to the Task Force of NTP, define task, focal point, roles and responsibilities. In 2004–2005, HRD plans were implemented. Key activities referred to: 1) revise existing training materials; 2) organise a meeting workshop for 45 nursing school instructors in order to discuss the way to integrate TB control to nursing curricula and post grad course; 3) host training workshops for 80 nursing schools; 4) organised a workshop for developing a module on supervision, monitoring and evaluation; 5) conducted a training workshop on HRD for regional officers, prisons and Bangkok Metropolitan Administration; and 6) design HRD information system. Problems regarding planning and implementing the plans included that 1) curricula and module for different staff categories are not available; 2) inadequate collaboration and precise mechanism on HRD activities; 3) inadequate systematic recording, monitoring and evaluation on HRD tasks lead to poor HRD database; 4) limited staff capacity at cen-

tral, regional and provincial level; and 5) weakening of supervision activities at all levels. A number of lessons to be learned from early years of HRD experience from Thailand were identified. These included that major concepts of HRD are abstract causing misunderstanding and then pay less attention; training materials should be specifically tailored and there is lack of HRD experts.

Conclusions: HRD is not just training. Key concepts should be further communicated to shift focus from organizing training courses to managing human resource for TB control. HRD is one of the important strategies for TB control. There are urgent needs to develop systematic monitoring and evaluation among TB staff after training.

HRD planning for TB control: HRD in the TB strategic plan

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Setting: The National Leprosy and Tuberculosis control programme, Ministry of Health, Kenya.

Background: Kenya is among the 22 high TB disease burden countries. As in the rest of Sub-Saharan Africa the TB disease burden in Kenya is driven by the concurrent HIV epidemic. Recent data accruing from a revised case recording and reporting tool that captures HIV information in addition to the traditional TB data suggests that the HIV prevalence in TB patients in Kenya is about 60%. The increasing TB disease burden has occurred without any significant inputs for strengthening the health care system thereby severely straining the ability of the TB control programme to cope with the demand. This scenario may be responsible for static or declining TB case detection. The NLTP has, in the last one year taken steps to remedy this situation, strengthen the health care system including the improving the human resource base required for the coordination and delivery of an effective TB service.

Human Resource Development Plan of the Kenyan NLTP: In 2005 the NLTP undertook an assessment of the human resource capacity for TB-HIV control in Kenya. This assessment revealed that there was not only inadequate number of staff at all levels of the health care system but also staff morale was very low as a result of work load, poor work conditions, inadequate technical support, poor remuneration and a lack of clear promotional pathways following in service training. The recommendations from this assessment included the regular assessment of work load, team building workshops and surveys of staff motivating or demotivating factors. These recommendations have been incorporated into the HRD plan of the NLTP and are included in the 2006–2010 strategic plans. The potential benefit of including HRD

plans into the NTP's strategic plan and the challenges of implementing these plans will be discussed.

RECENT ADVANCES IN TB DRUG DEVELOPMENT

Update on TMC207

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TMC207 (R207910), a diarylquinoline, is the first in a new class of anti-tuberculosis (TB) drugs, an inhibitor of mycobacterial ATP synthase. It is a promising agent to improve treatment of both drug-sensitive and multidrug-resistant TB. It has potent late bactericidal properties in the established murine TB model. First-in-human dosing occurred in February 2004. Six (6) phase one trials have been conducted in healthy volunteers ($n = 173$, TMC207 $n = 144$) and one phase IIa 7-day extended early bactericidal activity (eEBA) trial in patients with pulmonary TB ($n = 75$, TMC207 $n = 45$). The pharmacokinetic and pharmacodynamic properties of TMC207 are characterized by extensive and rapid tissue distribution and a long half-life, and it has the possibility for less-than-daily dosing. In the recently completed eEBA trial 3 different doses of TMC207 were evaluated (25 mg, 100 mg, and 400 mg). A statistically significant decline in serial colony-forming units/ml sputum (expressed as daily log₁₀ fall) was observed at day 7 for the highest dose of TMC207 administered. TMC207 was detectable in sputum from all but one subject (in the highest dose group) on Day 1 (i.e. after administration of the first dose of TMC207) and sputum concentrations continued to increase in the higher dose groups up to Day 7, suggesting a progressive and dose-dependent distribution of TMC207 into lung secretions that may provide insight into the bactericidal results observed in this trial. The maximum exposure to TMC207 in clinical trials to date has been 400 mg daily for 15 days. No serious adverse events attributed to TMC207 have been reported in the 189 subjects to whom it has been administered. Additionally, no clinically relevant abnormalities of biomarkers have been observed, including target organ biomarkers identified in nonclinical safety studies. Future trials are planned to evaluate the efficacy, safety and tolerability of TMC207 beyond 7 days of therapy.

COPD IN LOW-INCOME COUNTRIES

COPD management in Nigeria: current challenges and future

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Chronic obstructive pulmonary disease (COPD) is a major health problem globally. It is estimated that by 2020 it will be the fourth commonest cause of death and the third most important disability-producing illness in the world. Studies in Nigeria have shown that COPD is associated with a high level of morbidity and mortality. In spite of the global consciousness of the morbidity and mortality of COPD, the strategy for its management and prevention has been focused mainly on western countries with little or no attention given to the problem in Africa. Nigeria is the most populous country in Africa. It is assumed that one in every four black persons in the world is a Nigerian. The barriers and constraints encountered in the management of COPD Nigeria will be discussed.

Highlights will include:

- Presentation of a survey of chest physicians and their knowledge and approach to COPD management.
- The importance of indoor pollution especially the use of wood smoke as major aetiological factor for the risk of COPD in Nigeria.
- The obstacles encountered in the use of Global Initiative on COPD (GOLD) guidelines in the management of COPD in Nigeria.

The Union has been championing the fight against tuberculosis and other lung diseases globally. The burden of management of COPD in a resource limited country is high. Focus should be on halting the development and progression of the disease. This symposium will help characterize COPD in Nigeria. This hopefully will serve as a model for future strategy to management of COPD in Africa.

Risk factors other than smoking

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With the decrease in the classic diseases (in particular the pneumoconioses) induced by exposure to mineral dusts in the late 20th century, largely due to industrial hygiene controls, COPD has emerged among the most prevalent occupational respiratory disorders in industrialized (usually high income) countries, and increasingly in industrializing (usually low income) countries. In the 1984 US Surgeon-General's report on COPD, active cigarette smoking was listed as the only established environmental risk factor for airflow obstruction during adulthood. Occupation, air pollution (indoor included), passive exposure to tobacco smoke

and socioeconomic status were listed as putative. Wood smoke was implicated in rural populations, also in low income countries. Since then, the evidence implicating all these risk factors has been greatly strengthened. A 2003 American Thoracic Society Statement on the Occupational Contribution to the Burden of Airway Disease¹ noted that cigarette smoke, a complex mixture of particles and gases, is analogous to mixed inhalation exposures in work places. Estimates of Population Attributable Risk % from occupational exposures ranged from 4–8% in 3 areas in China, from 9–20% in 5 areas in Spain, and 55–56% in New Zealand. Though methodological differences may have contributed to these between site differences, the Statement considered 15% a reasonable estimate of the occupational contribution to the population burden of COPD. Similarly, indoor air pollution, passive exposure to tobacco smoke, and socioeconomic status are now considered established risk factors for COPD. Occupation as well as all these risk factors have a place in the clinical, public health and research agendas of both low and high income countries.

1 American Thoracic Society Statement. Occupational Contribution to the Burden of Airway Disease. *Am J Respir Crit Care Med* 2003; 167; 787–797.

Global approach to the management of COPD: the COPD guidelines and beyond

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Chronic diseases (CD) are often defined as problems of ageing communities mainly caused by tobacco use, unhealthy diets, and physical inactivity. However, 80% of deaths caused by CD were in low and middle-income countries, in 2005. According to WHO, COPD will be the 5th cause of disability and the 3rd cause of mortality by 2020, all over the world. COPD is a leading but under-recognised cause of morbidity and mortality worldwide. As regards the global burden of COPD, Chapman et al reported that the prevalence of COPD in the general population is estimated to increase with age, reaching about 10% amongst those aged >40 yrs. Some of the variations of prevalence of COPD all over the world, attributed to differences in risk exposure or population characteristics, may be influenced by the methods and definitions used to measure disease. A review by Halbert et al analyzed on thirty-two studies about COPD prevalence rates, representing 17 countries and 8 WHO-classified regions. The overall COPD prevalence rates ranged from <1 to >18% and tended to vary with the method used to estimate the prevalence rate. The most used diagnostic criterion for COPD is that reported in the GOLD guidelines; but recent studies showed that the GOLD (FEV₁/FVC <70%) criterion can overestimate

the prevalence of COPD in older patients, because it doesn't take into account the natural decline of FEV₁/FVC with age. Thus, the ATS/ERS Task Force on standardization of lung function tests suggested to use a cut-off value of the FEV₁/VC ratio at the 5th percentile of the normal distribution. The use of 5th percentile does not lead to an overestimation of the ventilatory defect in older people. The most important intervention able to modify the natural history of COPD (since the early stage) is smoking cessation. A global approach to the management of a CD as COPD is related to the awareness that all sectors of the Society must contribute in reducing health risk factors and promoting quality of life.

HEALTH PROFESSIONAL ACTIVITIES FOR TOBACCO CONTROL

Helping patients stop smoking

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Smoking cessation is considered to be a medical activity and a cost-effective preventive intervention. Therefore, it is accepted that health professionals have to actively address the problem of smoking with their patients. But for helping their patients efficiently, health professionals have to fulfil several prerequisites:

- 1 Knowledge about health effects of active and passive smoking, including new and unexpected ones (e.g. the effect on the risk of tuberculosis!)
- 2 Self abstinence. This seems obvious, but is far from being the norm in many countries, where male and female health professionals are regular smokers
- 3 Training. Trained health professionals are more successful in their intervention than untrained. Therefore, smoking prevention programmes should include training sessions
- 4 Timely interventions and use of opportunities to address the problem with patients. The benefits from cessation are not the same for healthy and sick smokers and the arguments used are different.
- 5 Correct prescription of the available drugs for sustaining the cessation attempts, taking into account the local conditions, their availability and the economical problems
- 6 Follow-up of the smokers willing to make a cessation attempt increases the success rate
- 7 Management of the problems which may arise during cessation (e.g. weight gain) and prevention of relapse.

Interventions for smoking cessation are frequently regarded by health professionals as unrewarding, as the increase in success rate is low. Considering the frequency of the problem and the large numbers of smokers a health professional may meet, the global impact on the population is large and cost-effective.

The force of physicians against tobacco

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In addition to their clinical responsibilities to support tobacco reduction among their patients, doctors play a crucial role in developing anti-smoking social norms and in establishing public policies that are effective at reducing tobacco use. Individual physicians, physicians' organizations and physicians within other health agencies can and do provide the necessary community leadership and political activism that lead to social and political change. The widespread ratification of the Framework Convention on Tobacco Control creates the potential for accelerated improvements in tobacco control policy and an opportunity for physicians to help this potential be realized. Ways to expand physician engagement and to meet the challenge of supporting physician efforts in various regions and settings are discussed.

REVISED GUIDELINES FOR SCALING UP ART IN RESOURCE-LIMITED SETTINGS AND THEIR IMPLICATIONS FOR HUMAN RESOURCE DEVELOPMENT IN COLLABORATIVE TB-HIV PROGRAMMES

Key changes in the 2005/2006 revision of the guidelines 'Scaling up antiretroviral therapy in resource-limited settings': treatment guidelines for a public health approach and their evidence base

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Tuberculosis (TB) is an important entry point into HIV care and a common opportunistic infection among persons already diagnosed with HIV, particularly in resource-limited settings. HIV-infected persons with TB will often require ART and WHO recommends all patients with extrapulmonary TB (stage 4) and all those with pulmonary TB (stage 3)—unless CD4 count is above 350—receive ART. ART is highly beneficial, reducing both case fatality rates and the incidence of TB and recurrent TB. Antiretroviral therapy in individuals undergoing treatment for tuberculosis merits special consideration because co-management of HIV and TB is complicated by drug interactions between rifampicin and both the NNRTI and PI classes; by immune reconstitution inflammatory syndrome (IRIS); and by pill burden, overlapping toxicities and by adherence issues. Active TB can be present when ART needs to be initiated or can present in patients taking first- or second-line therapy. The treatment of active TB remains a priority for patient care. Collaboration between TB

and HIV programmes is essential for the delivery of an integrated package of HIV and TB services.

Implications of the revised guidelines for collaborative TB-HIV activities at the country level

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Introduction: Uganda has an estimated number of 2 million people who have been infected with human immunodeficiency virus (HIV) and over 1 million have died since the onset of the AIDS epidemic. To-date, HIV prevalence in the age group 15–49 is 6.4%, while about 100 000 people get HIV infection yearly. Those living with HIV are approximately 1 million and those with AIDS who need treatment are 156 000. Burden of tuberculosis has made Uganda one of the world's 22 high burden countries with TB. Annual risk of infection is 3%, equivalent to 150 165 new smear-positive TB cases per 100 000 population per year or 300–330 total TB cases per 100 000 per year. Burden of TB-HIV co-infection is increasing the burden of both diseases. It is well established that HIV is the biggest risk factor for the development of active TB among individuals infected with *M. tuberculosis*. At the moment 50% of TB patients are also co-infected with HIV and TB remains a leading cause of morbidity and mortality for people living with HIV/AIDS (PLHAs). Control of TB is through directly observed therapy with emphasis on the community based model while HIV control is through information, education and communication, condom use promotion, safe blood for transfusion, VCT, PMTCT and management of STIs and infection control under universal precaution. Collaborative TB-HIV activities have not been standardized and depend largely on the knowledge of an individual health worker or counselor. Most health workers lacked knowledge on TB-HIV collaboration activities which results in poor implementation of TB-HIV collaboration activities at country level.

Implication of the revised guidelines for collaborative TB-HIV activities at country level: The revised guidelines aim at provision of services using the public health approach which means reaching people at the lowest health facilities at health centre III. These serve the population of 20 000 people who will need human resource capacity to be built through training which at the moment is not met. We need to improve infrastructure in terms of space for various equipment to accommodate various activities for patients. The current infrastructure was built many years ago when health needs had not increased. Equipment of facilities at lower level will include binocular microscope, CD4 counters and biochemistry analyzers. Logistics and supply chain management will have to be improved to ensure no stock out of commodities such as drugs, ARVs, TB drugs, OIs, testing kits, reagents.

Conclusion: If all the required ingredients are put in place for universal access to ART, this will give a good avenue to scale up TB-HIV collaboration up to much lower level of service delivery.

Implications of the revised guidelines for HRD for collaborative TB-HIV activities at the country level: a perspective from Africa

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Malawi still faces an increasing burden of tuberculosis, fuelled by the AIDS epidemic. Between 1985 and 2002 TB case notifications increased from 5000 to 26 000, the majority of TB cases occurring in people during their reproductive years (15–49 years). The rate of HIV among TB patients in Malawi is 77%. Increased HIV infection rate has led to an increase in smear-negative pulmonary TB (PTB) cases, which are difficult to diagnose, consequently resulting to an increase in TB deaths and recurrence. Malawi's TB case detection rate is estimated to be 42% and it has proved impossible to achieve WHO's target to detect 70% of the cases by 2005. The current trend of TB indicates that there is need to find alternative approaches to manage the two epidemics. This will be necessary if the millennium development goal to halt and begin to reverse HIV and other major diseases such as tuberculosis by 2015 is to be achieved. Malawi has scaled up its ART services, but currently out of the 70% cases co-infected by TB and HIV only 13% are on ARV treatment. Human resource development is vital to achieve global targets for these epidemics. Since 2002 the NTP Malawi in its human resource development activities has embarked on capacity building down to the peripheral level on both TB and HIV with support from the TBCTA/USAID Malawi mission. In 2005, about 600 health surveillance assistants were trained using the WHO peripheral health facility modules on TB and HIV management besides the other trainings for central unit, regional and district staff. With the human resource crisis in the Malawi health sector, utilisation of peripheral health staff such as the health surveillance assistants has greatly contributed to success in the Malawi TB DOTS programme. Further collaboration between the TB and HIV programmes at this levels will be very useful in ensuring an increase in access to ARVs by HIV positive TB patients and also follow-up of patients on TB treatment and ART.

MOBILISING HUMAN RESOURCES TO ADDRESS TB CONTROL IN BIG CITIES

Hospital involvement in TB control in Asia

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Objectives: To investigate tuberculosis services provided in public and private hospitals in big cities.

Methods: The International Union Against Tuberculosis and Lung Disease coordinated a survey in Bangkok, Cairo, Dhaka, Jakarta, Karachi, Kathmandu, and Manila. Union staff prepared a questionnaire for the survey. The survey was carried out by visiting hospitals and face-to-face interviews.

Results: The number of hospitals included in the survey ranged from 52 in Bangkok to 106 in Jakarta. The proportion of private hospitals with the National Tuberculosis Program (NTP) manual ranged from 8% in Jakarta to 89% in Bangkok. Private hospitals rarely functioned as a basic management unit (BMU) of NTP except in Bangkok. Chest radiograph has been heavily used for tuberculosis suspects in most hospitals. Tuberculosis treatment was not always provided free of charge in BMU hospitals. The proportion of BMU hospitals with a successful treatment rate of less than 70% was highest in Bangkok, followed by Jakarta and Karachi. In Jakarta and Karachi, a high proportion of BMU hospitals did not have any patient tracing system. The proportion of not-BMU hospitals that never refer/report tuberculosis patients to NTP ranged from 0% in Cairo to 100% in Jakarta. Not-BMU hospitals did not routinely use standard regimen of the NTP, especially in Jakarta, Karachi and Manila. Most not-BMU hospitals charged for tuberculosis treatment. Patient tracing mechanism in not-BMU hospitals providing a completed course of treatment was generally lacking. Outcome of treatment in not-BMU hospitals was not known.

TB control in slum areas in Dhaka, Bangladesh

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Until the end of 2002, public non-DOTS tuberculosis control services in Dhaka municipality were provided by two chest clinics and one hospital only. Detection of new smear-positive patients was below 30% and treatment success about 60%, with over 30% defaulters and transfers out. In order to establish and gradually increase accessibility of the urban poor to DOTS services, the National Tuberculosis Control Programme (NTP) concluded partnerships with two local non-governmental organizations (NGO's) that coordinated the primary health care services delivered by 15 NGO's working in slum areas. AFB microscopy was expanded to 28 clinics and treatment to all 94

clinics of these NGO's. The number of smear-positive patients diagnosed increased with 30% and 45% during the first and second year of decentralization and treatment success to 79% and 84%. Major constraints for TB control among urban slum dwellers include unsuitable clinic hours for its work force, consisting mainly of factory workers and daily laborers and unstable populations. Measures to establish and expand DOTS services at work places have been taken and observation of treatment by community members and through local pharmacies will be piloted. Studies have indicated that the majority of TB patients in urban areas, including slum populations, attend a private qualified or un-qualified health provider. NTP management, in collaboration with its partners has recently developed guidelines for public-private and public-public collaboration. Initiatives to establish linkages between public, private and NGO health care services will be presented and discussed.

What do people living in slums want from the TB service provision and what are tools to find it out?

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Introduction: Quality of care issues in the delivery of tuberculosis (TB) services have emerged as critical for TB programmes. The National TB programs for Kenya, Malawi and Uganda in collaboration with Regional Centre for Quality of Health Care, KNCV, KIT and NIVEL undertook a study to determine Quality of care as seen Through the Eyes of the TB patient (QUOTE-TB) and use the data to develop a tool. This paper describes what people who live in peri-urban areas including slums want from the TB service provision and the tool that was developed in 2005, whose validation is underway.

Study goal: The goal of this study was to identify perceptions of TB patients on quality of TB services in order to develop a tool to measure client quality of care ratings.

Methods: Twelve (12) focus group discussions and 15 in-depth interviews with patients and providers from Kenya and Uganda urban settings, including slums were conducted.

Results: Nine important quality of care dimensions for TB patients were established: good patient-provider interaction and counseling; information, availability, accessibility of TB services; payment for TB

services; physical infrastructure; TB-HIV relationship; support from TB services and professional competence and procedures of TB health care providers. **Conclusion:** The findings indicate that the developed QUOTE-TB tool will be suited to describe and diagnose client demands and also holds the prospect for becoming an important analytic tool to assess the service providers' ability to provide quality TB care in slums.

How can we improve the management of tuberculosis patients in large African cities?

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The management of tuberculosis in big cities in Africa, and particularly in the capital cities, is a huge challenge and a constant preoccupation for National Tuberculosis Programmes (NTPs). Demographic growth in the urban areas of Africa is high and another characteristic of urbanisation in Africa is the concentration of the population in the capital. Capital cities also play an important role in the detection of tuberculosis on national level. On the treatment level, the cure rates obtained are poor, lower than the 85% recommended by the WHO. Rates of loss to follow-up and transferrals are often very high in some of the capital cities in Africa. Despite an increase in the number of tuberculosis centres, these are not distributed evenly among the different health structures. The process of decentralisation has not always led to lessening of the burden on the traditional tuberculosis clinics in Abidjan (Côte d'Ivoire) and Yaoundé (Cameroon), for example, and they continue to treat excessive numbers of tuberculosis patients. Given the above situation, which can only negatively impact on the performance of the NTPs, solutions must be found to improve the management of TB cases in the African capitals. This improvement must necessarily involve the creation of new diagnostic and treatment centres (CDTs) to bring the treatment clinics closer to their patients and a functioning referral system from the large diagnostic centres towards the other CDTs to bring the treatment clinics closer to their patients and a functioning referral system where patients who are referred are registered according to their initial status at the time of diagnosis as new cases and not as transfers.

Options for closing gaps in TB control in complex urban settings: towards multidisciplinary management

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With a demographic shift away from rural areas towards cities, and pressures arising from crowding and social disruption, it has been widely documented that in general TB has a higher incidence in urban than in

rural areas. Amongst the most prominent issues in urban TB are overcrowded living conditions, access of the poor to services, marginalised populations, prison populations, multiple service providers and treatment adherence. Given high urban HIV rates, TB-HIV collaborative activities are of particular importance. Other issues have different dynamics in urban than in rural environments, such as treatment barriers, health seeking behaviour, and community involvement. The policy environment can be characterised as more complex, with more players. A conceptual model will be presented, whereby a better 'fit' between 'service delivery', 'needs', 'demands' is expected to give more satisfactory outcomes in terms of case detection and treatment outcome. The model will be underlined with examples about innovative initiatives that bridge existing gaps. It will then be discussed which disciplines would be desirable to complement current management mechanisms of urban TB control programmes, and what tasks could be attributed. Examples will be given of current programmes in several urban settings. Various management models to widen the scope of urban TB control activities will be outlined in a plea to intensify work towards multidisciplinary approaches of TB control in urban settings.

Are we offering basic TB services in the big cities?

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Contrary to the situation in the rural areas, the number of TB patients in big cities is very high in a limited space, due to the population density, the high level of transmission due to overcrowding, the attractiveness of the services in the big cities, and the lack of services outside the cities. Big cities are also characterised by a high density of health services and a variety of stakeholders. In many big cities, there have always been one or two TB centres, hospitals or outpatient facilities, dealing with TB. The attraction of these centres remains very strong, and we have failed to decentralise services to other parts of the city. The goal should be:

- one microscopy centre per 100 000 to 300 000 population, usually established in the basic management unit (BMU);
- one BMU managing 100–500 TB patients per year;
- under the control of the BMU, one treatment unit should take care of 20–150 patients per year.

How can we to meet these goals?

- implication of authorities other than the NTP to plan and support the involvement of the other health facilities;
- identification of the health structure that should host the BMUs and the treatment units;
- implementation of tuberculosis services in these BMUs and treatment units;

- referral system organised and evaluated from the main TB centre (s) to the BMUs.

The main problem today, in many cities, remains to offer these basic decentralised TB services; energy should be concentrated first on this topic. Examples of the TB control situation in different cities will be given during the presentation, with examples of successes, bottle necks and solutions.

NTP MANAGERS' PERSPECTIVES ON BUILDING LABORATORY CAPACITY: CAN WE PROVIDE MYCOBACTERIAL CULTURE FOR ALL?

Building laboratory capacity, National TB Programme Managers' perspectives: Germany—can we provide mycobacterial cultures for all?

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In Germany 6057 cases have been detected in 2005, giving an incidence of 7.3 per 100 000 population. In contrast to a decrease of new cases the number of drug-resistant and even multidrug-resistant (MDR) cases is increasing (any resistance: 11.1% [2001]; 13.9% [2004], MDR: 2.0% [2002]; 2.5% [2004]). This is one of the reasons for performing microscopy and culture for all specimens from suspected TB patients to get culture material for drug susceptibility testing (DST). In Germany the gold standard for culture techniques is the use of liquid and solid media, to get the results more rapid and with higher sensitivity. Also for DST liquid media has been used. Microscopy and culture has been done by approx. 180 laboratories, DST and differentiation by approx. 60. Nearly all laboratories are quality controlled by an external QC program. From the perspectives of a good TB control program it is absolutely necessary to perform culture for all specimens and to do DST mainly for all new cases to treat patients in a proper way, to interrupt transmission, and to hospitalize patients infected with a resistant strain immediately in special rooms. What we need in future is not only culture techniques but methods to detect a resistant strain in a shorter period of time.

Building laboratory capacity, National TB Programme Managers' perspectives: Egypt

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The first priority of an NTP is case detection and cure by reliable diagnosis and effective treatment. As case finding relies heavily on laboratory diagnosis, it is im-

portant to provide TB smear microscopy services that are accessible to the entire population yet maintain an acceptable level of technical proficiency. To accomplish this objective, a network of laboratories with competency in acid fast sputum smear microscopy, supported by larger regional laboratories and overseen by a National Tuberculosis Reference Laboratory, is required.

The laboratory network in Egypt is organized according to three levels: peripheral laboratories (157) located at district chest units and capable of doing DSM, intermediate laboratories (18) located in big chest hospitals and capable of doing cultures, and the National Tuberculosis Reference Laboratory denoted by WHO as a Supranational laboratory for the EMRO region depending on the results of proficiency testing of DST in the last 2 years.

Many activities have been performed to increase the laboratory network capacity in Egypt:

- a separate budget for laboratory network allocated for equipment supplies
- training courses and supervision
- coordination between the NRL and NTP
- updating of National Laboratory guidelines to include all standardized procedures
- 59 new diagnostic centres chosen so that the catchment area for one laboratory is 250 000
- increased capability of culture laboratories
- application of a system for internal quality control of direct smear microscopy and culture
- external quality assessment for direct smear microscopy, with a plan for EQA based on WHO guidelines.

Building laboratory capacity, National TB Programme Managers' perspectives: The Philippines

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Background: The National TB Program adopted DOTS strategy in 1996. Strategy prioritized sputum microscopy. However, facilities for mycobacterial culture are limited. NTP is considering increasing culture facilities under the National TB Reference Laboratory (NTRL) improving diagnostic capacity.

Methods: Review of existing policies on mycobacterial culture, accessibility to culture facility in the private and public sector and capacity of public laboratories to do culture in supporting DOTS program. The development of long term plan on mycobacterial culture is envisioned.

Results: Quality laboratories for mycobacterial culture in the Philippines are limited. Foundation of the Makati Medical Center, a private hospital doing mycobacterial culture through the GLC approved DOTS Plus pilot project. National TB Reference Laboratory and 4 regional laboratories equipped for culture only

utilized in supporting Drug Resistance Surveillance (DRS). The existing culture policy is to improve sputum microscopy findings. However the majority of smear-negative patients do not undergo culture but chest X ray, the next accessible procedure. Stepwise approach in development of wider population access mycobacterial culture from quality facilities. Initial implementation entails improvement existing laboratories and generation financial operations. Quality assurance must be parallel with expansion culture facilities. Sustainability is an issue.

Conclusion: Building laboratory culture capacity is a huge undertaking. Needs commitment of national government, local governments, other stakeholders to be effective, sustainable. Thus provide better bacteriologic evidences, improve access for patients suspected to be multidrug-resistant (MDR-TB).

Building laboratory capacity, National TB Programme Managers' perspectives: Hong Kong

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Hong Kong has an intermediate burden of tuberculosis (TB). TB is a notifiable disease and patients are seen in both public and private sectors. Public hospitals/clinics diagnose and treat most of the patients. The bacteriology sections of clinical laboratories are responsible for sputum smear microscopy for acid-fast bacilli (AFB), and primary cultures for mycobacteria. Positive AFB cultures are referred to a central TB reference laboratory for mycobacterial identification and anti-TB drug susceptibility testing. The central laboratory also serves all TB suspects/patients that are seen and treated in the TB and Chest Service clinics. When cases are detected by this central laboratory to be culture positive, this is automatically reported back to the TB registry and facilitates contact tracing. This is an important supplement to regular physician reporting. Because smears are done at peripheral laboratories, an external quality assessment system has been set up whereby panels of unknown AFB slides are sent to participating laboratories, and feedback given after checking results. Educational workshops are organized for participating laboratories to enhance performance. This centralized laboratory service has the advantage of pooling together and efficient use of scarce resources, intensify the experiences of laboratory personnel, and provide opportunities for adequate training of new staff. The network of TB laboratories has to be maintained by this centralized service if there were to be sustained program effort in TB control.

PATIENT PERSPECTIVES IN TB CONTROL AND CARE

Total quality management of TB care from a provider and client perspective

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Background: High quality health care services are at the core of the global effort to control tuberculosis (TB). Total Quality Management (TQM) states that quality must involve everyone and all activities. TQM demands conformance to standards and maintains that quality can and must be managed. It also places emphasis on meeting customer (client) requirements. This study undertook to improve TB control services, taking cognizance of the existing quality of services and provider/client perspectives of quality.

Design: An interventional, descriptive and exploratory study was conducted in Kenya, Malawi and Uganda, focusing on: provider performance; client experiences, opinions and perceptions; provider and stakeholder beliefs on client perceptions of the quality of services provided.

Methods: The Performance Improvement Approach (PIA) was used to establish provider performance, while the patient and provider perspectives of quality were derived from 54 focus group discussions and 84 in-depth interviews.

Results: Important dimensions of quality: interpersonal relationships and counseling; procedures and competence of providers; availability and accessibility of free services; infrastructure; patient support; TB-HIV/AIDS relationship. PIA found that standards of TB care did not adequately address interpersonal-relationships, infrastructure, or patient support beyond case management. Information and counseling were inadequate, particularly for TB-HIV/AIDS.

Conclusion: Quality is a function of proper performance according to set standards that are effective and evidence based. Prevailing standards of care do not fully incorporate client concerns and there is a need to consider both the provider and client perspectives of quality when standards are being developed.

Using patient's perspectives in improving performance of providers (PIA/QUOTE tool for assessment)

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Quality of TB services is often compromised by poor geographical or economic, and by poorly functioning NTPs, characterized by poor attitude of health workers, stigmatizing behavior (HIV/AIDS) and long waiting times. The Stop TB Strategy addresses quality of care for TB patients, based on quality DOTS, and features empowerment of patients and communities and Human Resource Development (HRD). As part of HRD, the RCQHC Kampala has developed the staff Performance Improvement Approach (PIA). Its patient exit interview has been standardized through the QUOTE tool, developed by RCQHC, KNCV Tuberculosis Foundation, KIT and NIVEL. The QUOTE tool (Quality Of care as seen Through the Eyes of the patient) is a qualitative and quantitative instrument to measure quality of care from the patient perspective. The tool measures structure quality (availability, accessibility, continuity, costs, accommodation) and process quality (attitude, information, autonomy, professional competence). It is disease and setting (culture) specific. It establishes the dimensions important to TB patients, and measures ongoing the performance of staff and TB programs. The Quality Impact Score, based on importance AND performance, quantifies where most can be gained through interventions. This easy quantification makes the tool suitable for monitoring and evaluating performance of staff and health care systems through the eyes of the patients, in communities and in health facilities, and through aggregation, of a district or the country. Importance dimensions established in East Africa included provider interaction/counseling, information, availability of services and treatment, accessibility, payments, physical infrastructure, support, TB-HIV relationship, and professional competence.

Patient empowerment: the role of peer work

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Empowering and involving TB patients is increasingly becoming a source of interest for policy makers, managers and health care providers involved in TB control. It is clearly interconnected with other TB priorities, such as the problem of equitable access to TB services for the vulnerable and poor population, the interaction between TB and HIV and, among others, the human rights issue. Empowering patients requires a change of attitudes among health staff. Through

structured peer work, our experience is that patients supporting each other become able to demand participation in the treatment of their disease. Inviting patients to discuss and develop information material concerning a variety of aspects of having TB may become a tool for empowering patients. Patients organizing themselves is another way of patient empowerment that may also be termed peer work. LHL supports a variety of local and international organisations. Experiences from the focal point person in the Stop TB secretariat (Mr. Ted Torfoss, an LHL employee), has resulted in a set of recommendations for the way forward. LHL has a long experience with peer work among heart and lung patients in Norway. These experiences are now being transferred into our international co-operation in TB control.

The effect of stigma on access to and use of TB services

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This presentation aims to trace the impact of stigma on diagnosis and treatment pathways for TB patients by reviewing current TB and stigma literature and by drawing on qualitative research carried out in urban and rural Zambia in 2002. To date, research (largely qualitative) has shown how TB stigma feeds denial of TB and of TB diagnosis and/or leads people with TB to hide their diagnosis. Stigma is of significance in delayed health-seeking amongst TB patients; shopping around for treatment elsewhere (from private clinics or traditional healers); interrupting treatment; and refusing directly observed therapy. There is documented evidence of TB patient, TB patient households and families, and health workers working with TB facing discrimination (in many forms) as a direct result of TB, and some indications of the adverse impact of TB related stigma on psychological well being. In addition, women's added vulnerability to TB related stigma has been captured by research in Asia, demonstrating that women have more negative feelings at diagnosis and that TB can threaten marriage prospects, instigate divorce and incite fears about sterility. In a high HIV prevalence setting, as demonstrated by the Zambian material, TB stigma becomes even more heightened with TB symptoms and diagnosis used as a marker for HIV status, and with HIV stigma compounding TB stigma for TB patients (whether co-infected or not). TB stigma therefore impedes treatment seeking, disclosure, care and outcome for TB patients, and can make having TB a dehumanizing experience, especially in high HIV prevalence settings. The presentation will end by making suggestions for how TB stigma could be addressed effectively, and by

identifying current research gaps in our understanding of TB stigma.

TB human resource development and the needs of specific populations

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Background: Recently more interest is shown into patients' perspectives on quality of TB care. In a literature review it became clear that there has been limited interest and studies into patients' experiences, neither on stigma nor on specific vulnerable groups targeted by TB services. In this paper we link the needs of these specific populations to quality of TB care and HRD.

Poor and vulnerable: WHO (2005) defines the poor and vulnerable groups with barriers to TB services as people in absolute economic poverty, people disadvantaged by gender-related factors, marginalized ethnic groups, people in remote locations and the urban poor. Suggested strategies for NTPs were to formulate for each of these groups specific strategies based on problem analysis. This seems a step in the right direction, albeit insufficient. QUOTE studies showed that stratification is also required for age and ethnicity. Strategies aiming at the poor and vulnerable are only working if service providers show the right attitudes and motivation to work (Dieleman 2003). More attention has to be paid to improvement of staff performance by addressing providers' attitudes to and knowledge about these groups. In the field of TB very few projects have been undertaken to reduce stigma (Heijnders and Van Brakel 2005), although it seems an important barrier in case detection, case finding and case holding.

Conclusion: NTP programs should ensure that services remain responsive to the needs of the poor and vulnerable in line with the recent WHO publication (2005). However, there should be an overall gender sensitive package that not only addresses the needs of the vulnerable and poor, but also aims to improve performance of health providers.

TB CURRICULA IN NURSING, MEDICAL AND ALLIED HEALTH SCHOOLS: EDUCATING FOR TB CONTROL

Development and implementation of the TB Curriculum Coordinating Centre

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Background: In 2003, the United States National Institutes of Health funded a 5-year project to improve

knowledge of tuberculosis in students in health professions schools. The National Tuberculosis Curriculum Consortium (NTCC), which was originally designated the Tuberculosis Curriculum Coordinating Centre, was established to achieve this goal. The NTCC includes over 40 faculty in 25 schools representing eight disciplines (medicine, baccalaureate and advanced practice nursing, pharmacy, respiratory therapy, physician assisting, clinical laboratory sciences, and public health).

Accomplishments: The NTCC has developed competencies and learner objectives for each discipline to allow us to work effectively with educators to develop products that use active-learning strategies to enhance curricula. In 2005, we completed a base-line survey of 1480 students in NTCC schools to determine their TB knowledge, attitudes, and confidence in caring for patients with latent tuberculosis infection (LTBI) and/or active tuberculosis (TB). The NTCC is producing many products that include computerized cases, resource banks (multimedia, clinical case descriptions, and questions/answers/teaching points), standardized patient cases, games, and lectures.

Future plans: Additional products will be developed throughout the project. The student TB survey will be repeated during 2007 in NTCC schools to determine whether NTCC-developed products have had an impact on student knowledge, attitudes, and confidence in caring for LTBI/TB patients. The NTCC is also working with many professional organizations that accredit academic programs, certify and/or license health professionals for entry into practice, and provide life-long learning, to help us reach the 3–4 million students and practicing health professionals in the U.S. to insure adequate attention is paid to the topic of tuberculosis. The NTCC-developed products are available free-of-charge via the website (<http://ntcc.ucsd.edu>).

Undergraduate education of TB in medical schools and TB control in Turkey

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Turkey is a country with a population of 74 million and 5000 USD per capita GDP. Tuberculosis incidence was 24/100 000 in 2004 and the budget for National Tuberculosis Programme (NTP) is more than 50 million USD. Although Turkish NTP includes some DOTS components, the systematic DOTS implementation is in pilot phase yet. Bacteriological diagnosis and treatment success in TB patients are low and default and MDR-TB rate are high. There are 45 medical schools in Turkey (2004). With respect to curriculum, 36.8% of students are trained under sequential education strategy, while integrated or semi-integrated form is employed for the remaining 63.2%. Only 4.9% of students are trained with full problem-based methods. Only in a few medical schools, TB is

a part of Public Health Education and TB education has no close relationship with NTP. A study done in ten medical faculties, which has 37.5% of all medical students in Turkey, showed that prior subjects of NTP does not hold an important place among examination questions about TB. In a study conducted in a medical school, interns interpreted 40.4% of AFB positive smears as false-negative and 25.9% of negative smears as false-positive. Studies, which have been done recently in Turkey, showed that physicians-related delays in diagnosis and treatment of tuberculosis are important and also physicians' knowledge in standard treatment regimes recommended by NTP is not sufficient. In conclusion, physicians have a key role in appropriate TB control, medical schools should provide every medical graduate with the knowledge, skills and attitudes essential to the management of TB in the patient and in the community as a whole. In Turkey, which is in the transition to DOTS strategy, undergraduate TB education should be updated according to the priorities of NTP.

Team building for TB education in nursing schools in Thailand

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Background: It is recognized that some skills of providing nursing care for TB patients are achieved through pre-graduation. However, current educational system may not be designed to promote TB education adequately. Innovations are required to reduce these gaps.

Objective: To present baseline assessment of TB education in nursing schools and to describe model for teaching TB in these schools through team building.

TB education in nursing schools: About 80 nursing schools reported that TB education was taught for undergraduate students. Throughout 4 years of education, time spending for TB education ranged from 5 minutes to 5 hours. TB content included cause, signs, symptoms, treatment, and prevention. To promote TB education systematically, the committee of TB education in nursing schools is formed to develop a TB manual for nursing students. Faculty members from all nursing schools also attended a 2-day training course. After the training, they serve as a contact person among other faculty members within and between institutions.

Conclusions: There was a wide variation of teaching TB among nursing schools in Thailand. Faculty members want the TB manual which content is specifically tailored for undergraduate students and is consistent with the NTP. The committee members and trained faculty members are resourceful to link academic institutions with the NTP.

Including TB programme management in medical school curricula: experiences from the WHO European Region

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Training in TB management is the key to successful DOTS implementation in the WHO European Region. However, in many countries this is not part of routine postgraduate medical training, which is usually clinically oriented, with limited attention given to TB programme management, and not always in line with international recommendations. Two possible ways of integrating TB management with postgraduate training were observed in Russia. The first involves adapting the standardized 5-day WHO training course on TB management at the district level to the Russian context and approval by the national authorities as thematic training for district TB doctors. Extending the course to 72 hours with a distance-learning component allows official requirements to be met. Secondly, medical schools can modify a "flexible" part of the national curriculum for certified TB specialists on their own initiative and include DOTS principles. Since 1997 the faculty of the Northern State Medical University (NSMU) Chair of Phthysiology has been involved in DOTS training and supervision in Russia. The NSMU curriculum for TB specialists includes 144 training hours and covers various aspects of TB epidemiology, infection control and TB prevention, DOTS and DOTS-Plus strategy, TB-HIV, principles of TB treatment and diagnostics. Training methodology is based on adult learning techniques. National funding ensures the sustainability of DOTS training. Since 1997 all graduates and postgraduates of NSMU have been trained in the DOTS strategy, including about 500 TB doctors from Arkhangelsk and other regions in postgraduate training courses. To ensure the sustainability of international efforts to improve TB control in the Region, medical schools and postgraduate institutions must be involved, so that each certified training course on phthysiology includes TB programme management as a universal national training standard.

Allied health education in the Philippines

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The 1997 Philippine National Prevalence Survey revealed that more than 50% of all symptomatic TB sufferers do not seek medical care and about 25% resort to self-medication. This finding places the allied

health professionals, particularly the nurses, pharmacists and medical technologists, at the forefront of the fight against tuberculosis. The objectives of this project were to appraise the existing TB curriculum in the medical technology, nursing and pharmacy schools; identify competencies that need to be developed; develop teaching-learning resources and get the commitment of key stakeholders in the incorporation of DOTS in their respective curricula. Appraisal was done by survey, focus group discussions and TB-DOTS center visits. The development of teaching modules was done in close coordination with representatives from various stakeholders, local and international experts. The final teaching modules were presented and discussed in a seminar attended by various stakeholders followed by a signing of the commitment resolution to the TB DOTS project. Less than 20% of allied health schools had TB educators. The study also showed that there was a lack of knowledge on DOTs, consequently, this treatment strategy was not emphasized. The teaching modules emphasized the epidemiology, transmission, pathogenesis, proper sputum collection and examination, DOTs strategy and various roles of the nurse, pharmacist and medical technologist at different levels of care. The allied health group proudly endorsed the teaching modules. By improving and building on the capacities of future nurses, pharmacists and medical technologists, sustainable mechanisms can be promoted in coordination with physicians and other stakeholders to adequately prevent and control TB using the DOTS strategy.

INDOOR AIR POLLUTION

Indoor air pollution asthma and COPD

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A large part of human life is spent indoors and knowledge of the role of the indoor environment for respiratory health is increasing. Passive smoking, building dampness and indoor allergen levels are the environmental factors that have been most studied in developed countries whereas data on the health related effects of solid fuels (biomass and coal) used for household cooking and space heating is emerging from developing countries. In children, prenatal exposure to passive smoking is associated with impaired lung function and increased risk of developing asthma, while postnatal exposure mainly acts as a triggering factor for respiratory symptoms and asthma attacks. In adults passive smoking is associated with respiratory symptoms, asthma, impairment of lung function and increased bronchial responsiveness. Literature reviews show that 'dampness' in buildings increases the risk

of health effects such as cough, wheeze, and asthma (odds ratio 1.4–2.2). Although this indicates a true association between 'dampness' and health effects the literature is not conclusive with regard to which agents in indoor air due to 'dampness' are responsible for the health effects. The association between COPD and indoor air pollution has been less studied, but several recent studies show that the use of fossil fuels for cooking is a major risk factor for COPD in women in developing countries. In conclusion measures to improve indoor air quality are important for respiratory health in both developed and developing countries.

Indoor air pollution in Sweden and China

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Recent studies indicate an increase of asthma, allergies and respiratory illness in China, particularly in the more wealthy parts. Outdoor air pollution of particles, SO₂, and NO₂ is a major problem, with some recent improvements. Indoor coal combustion can still be a major indoor source of particle pollution in the countryside. Chemical emissions from new building materials is another well recognised problem, with formaldehyde levels exceeding the WHO guidelines. There is less information on other indoor chemicals, or building dampness, moulds, bacteria, or radon. We have reviewed the scientific literature on indoor air pollution in China, and compared with data from similar indoor environments in Sweden. Moreover, we have studied the school environment and home environment in Shanghai, and Taiyuan, in Shanxi province. House dust mite allergens were found in high levels (>2000 ng/g dust) in dwellings in Shanghai, and some homes contained cat allergen. About 10% of the homes had high levels of formaldehyde (>100 µg/m³), while indoor radon concentration was low (6–55 Bq/m³). In Shanghai junior high schools, NO₂ was relatively high, both indoors (33–85 µg/m³), and outdoors (45–80 µg/m³). Increased indoor NO₂ was associated with respiratory symptoms in the pupils. Moreover, respiratory symptoms and airway infections were associated with microbial exposure in the classrooms. The data suggested a protective effect of muramic acid in the classrooms, and some types of endotoxin. Similar results were found in another school study from Taiyuan, in north China. Moreover, cat and dog allergens were common in classroom air in Taiyuan. In conclusion, there is little information on respiratory effects on the indoor environment in China, but recently some epidemiological studies on respiratory effects of the indoor environment in China has been published internationally. In urban schools, outdoor air pollution limits window opening, resulting in increased indoor air pollution.

Health impact assessment of the introduction of improved stoves in Mexico

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Introduction: One out of three households in Mexico still cooks with wood fuel (25 million people). The average wood fuel consumption is 2.1 kg/cap/day or 4.6 ton/hh/yr. LPG complements rather than substituting wood fuel in rural households tends toward multiple-fuel use. This project is part of a standard monitoring packages for household energy and health. The objective is to assess the impact of the implementation of improved stoves on the health (upper respiratory diseases) of women and children in highlands Michoacan.

Methods: A total of 612 households in six communities were selected and randomized to receive an improved stove (Patsari Model) early on (intervention group) or after 18 months (control group). The inclusion criteria were: usage of open fire stoves and having a child under three years. They were followed up for a period of 10 months with monthly home visits from a trained crew. In these visits we gathered information on respiratory signs and symptoms (with a 15 day recall questionnaire). We adjusted Poisson regression models to obtain the relative risk associated with the non-use of the improved stove compared with its regular use.

Results: At baseline, 71% of the household had a non cement floor; 91% the kitchen wall was made of wood and 90% had one window in the kitchen or none; 74% of the women collected wood in the forest and the others bought it; 32% of the women reported spending more than 3 hours collecting wood; 33% reported eye itch, and 37% back pain. A total of 29% of the children were reported to be sick, 27% with some respiratory symptoms. After adjusting for different variables we found that women not using the 'Patsari stove' had a RR of 1.16 (95%CI 1.06–1.28) for cough, 1.14 (95%CI 1.04–1.25) for phlegm and 1.54 (95%CI 1.18–2.03) for watery eyes compared with those using the improved stove. For children the RR was 1.07 (95%CI 1.01–1.15) for cough and 1.03 (95%CI 0.96–1.14) for nasal congestion after adjusting for different variables.

Conclusion: The use of these improved stove models significantly reduces the risk for upper respiratory signs and symptoms in this population chronically exposed to wood smoke.

Indoor air pollution in South Korea

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Overview: Concern about possible health effects of indoor air pollution is increasing in Korea with respect to asthma, allergies, and non-specific symptoms of eyes, upper airways and facial skin. Indoor pollution is one of the greatest current problems for public health in Korea. This paper introduces the guidelines and standards of IAQ, and studies about IAQ and building-related health effects in Korea.

Indoor Air Quality Management in Korea: The Indoor Air Quality Management Act of 2003, which substituted for the Underground Air Quality Management Act (1996), has been gradually expanded and currently enforces restrictions on 17 kinds of facilities and 8 pollutants. Additionally, the Ministry of Environment in Korea imposed restrictions on the use of construction materials of high pollution discharge and obligation of IAQ monitoring in newly built apartments.

Studies about IAQ and health effects in Korea: 'Making healthy home' project (1999–2001) reported that environmental factors affecting aldehydes level were indoor smoking, ventilation, carpet, bed and new furniture, painting for renovation and indoor humidity. And it also reported the formaldehyde levels were weakly correlated with the SBS scores for 280 households in 35 dwellings. Median levels of formaldehyde and TVOCs measured before move-in were 209 $\mu\text{g}/\text{m}^3$ and 2090 $\mu\text{g}/\text{m}^3$, respectively, in 800 newly built apartments (2004–2005). Several studies reported formaldehyde levels were 200–630 $\mu\text{g}/\text{m}^3$ for dwellings built less than 1 year before and 5–360 $\mu\text{g}/\text{m}^3$ for older houses. Nationwide surveys on IAQ were also conducted to various public facilities in order to establish appropriate management strategies.

Conclusions: Although the various studies on IAQ are actively performed in Korea recently, there are still many research gaps. Based upon review of the current scientific data, programs can be designed to reflect current science and research priorities better, and to fill the important gaps in current knowledge in Korea.

Synergism in behavioural and technological intervention in alleviating IAP in China: a World Bank demonstration project

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Half of the world's population relies on biomass fuels (wood, charcoal, crop residues and dung) and coal as their primary sources of domestic energy. Exposure to high levels of indoor air pollution (IAP) leads to acute respiratory infections and other ailments and is a major cause of mortality and morbidity in rural areas worldwide. Indeed, IAP accounts for 3.7% of deaths and

3% of disability-adjusted life years (DALYs) lost in low and middle income countries. In China, where 17 per cent of the population still lives on less than \$1 a day, virtually all rural households use biomass and/or coal for heating and cooking purposes. Indoor air pollution, therefore, constitutes a major health hazard in China, but at the same time provides an equally important opportunity to design and field test community-based solutions to mitigating its health, social, environmental and economic impact. In 2002, the World Bank, in cooperation with the Ministry of Health and the Centers for Disease Control in China, initiated a project to test affordable household energy interventions (improved stoves, better ventilation, health education and behavioral changes) designed to substantially reduce indoor air pollution and exposure to it. The project took stock of international experience in the field of mitigating indoor air pollution and lessons learned from the programs implemented in China over the past two decades. Entitled Sustainable and Efficient Energy Use to Alleviate Indoor Air Pollution in Poor Rural Areas of China, the project was designed to tailor interventions to local conditions in a socially and culturally acceptable and economically feasible and sustainable manner. The project is now completed, and a final technical report by the Chinese team is now available. A more policy geared report, authored by the World Bank team and focusing on intersectoral policy and programmatic implications of the intervention results is under preparation. The purpose of this symposium is to present the findings of the World Bank-funded study to a broader audience of researchers and representatives of international organizations, and provide a forum for discussion of policy and programmatic implications of the demonstration project. More specifically, the following questions will guide the presentation and discussions:

- 1 Has the project design been able to combine various hard and soft interventions to address key development issues in a multi-sectoral way?
- 2 What were the roles of educational, socioeconomic and cultural factors in affecting end-users' behavior?
- 3 How did the results differ by type of intervention used (behavioral interventions vs. a combination of technological and behavioral interventions), and were there any synergism in combining those?
- 4 What are the challenges in scaling up and mainstreaming such multi-sectoral interventions to reduce IAP and its impact on health, environment and access to energy?
- 5 How is the prospect of future interventions determined by the household's ability to pay? What are the recommendations in terms of subsidy mechanisms?
- 6 What are the suggestions for designing future indoor air pollution interventions on the technical front (locally acceptable technology, ownership, sustainability etc)?

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ASTHMA DRUG FACILITY

Is the ADF also for COPD patients?

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Morbidity and mortality due to COPD is rising worldwide. This rise is likely to be most dramatic in African and other developing countries over the next two decades due to the projected increase in the prevalence of smoking. There is an urgency for actions to fight against smoking. In addition, the management of COPD must be organised through a programme for lung health promotion. This management will increase patients' quality of life, reduce disease exacerbations and hospitalisations as well as health costs. The implementation of such management could be done by adapting the programme recommended by the Global Initiative for Chronic Obstructive Lung Disease (GOLD) with further specific needs: equipment of first referral level health district centres with spirometers, organisation of these centres to enable long-term management of patients and availability of adequate and affordable treatment. The drugs chosen by the Asthma Drug Facility (ADF), bronchodilators and inhaled steroids, are also the essential drugs for the management of COPD. As in GOLD, these two types of drug could be used in a stepwise approach, with some adaptations for developing countries. Even with such adaptation, the main obstacle remains the high price of inhaled steroids, which will be procured through the ADF at a lower cost. The ADF, which was created to provide affordable essential quality drugs for asthma management, could also be a mechanism for drug provision to allow the implementation of COPD management in developing countries.

The rising epidemic of asthma in developing countries

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Between the 1950s and the 1990s, asthma prevalence in Western countries was doubling approximately every 15 years and this finding was very consistent in all studies. Since this time there has been more variation and studies in children have shown both increases and decreases. Nevertheless the prevalence of atopy among adults is continuing to rise and is likely to affect increasingly older people who are likely to have more complex disease. Poorer countries have had a lower prevalence of asthma, particularly in the rural

areas. With increasing urbanisation and increasingly Westernised lifestyles it is likely that a similar epidemic will follow. This is particularly likely as the prevalence of sensitisation to allergen is already very high in some of these populations. There are still relatively few studies from which to draw definitive conclusions and the evidence is so far mixed, but increases in prevalence are now well documented from several areas. There is evidence that the increases are happening at least as fast in the rural areas and are not confined to towns and cities. As the causes for this increase are not known it is difficult to give advice on primary prevention, but secondary prevention is going to be costly in terms of protecting an increasingly atopic population. This will involve specific protection from allergen in the home, the workplace and the diet as well as more general health measures. Inefficient management of asthma will also be very expensive. In the Union's recent GASP study, only 18% of those receiving "adequate" doses of inhaled corticosteroids lost work every week. In contrast 57% of those who were at least two steps below the recommended dose had lost work at least once a week. After adjusting for age, sex and severity a meta-analysis of results from the different centres estimated the odds ratio for losing at least 2 days usual activities in the previous month as 2.96 (95% confidence interval 1.09–8.03) if patients were prescribed inadequate inhaled corticosteroids.

Human resource development

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Access to affordable medications has been shown to be the most important barrier to effective treatment of persistent asthma, particularly among the poor. The Asthma Drug Facility has been designed to address this barrier. Behavioral factors both in terms of patient and provider adherence to standard case management are important in maximizing the benefits of improved access to medications. Built into the plan for the Asthma Drug Facility are two components that are designed to enhance adherence to standard case management for persistent asthma. The first is standardized tools for recording and reporting. Knowledge is crucial to action for health and knowledge can only be created through collection of valid information. Critical evaluation of the information collected empowers the user to guide modifications to improve the quality of care. A second component of the Asthma Drug Facility for enhancing adherence to standard case management is a formal system of technical assistance to the clients of the Asthma Drug Facility. Within each of the contracts for provision of medications from the Facility is a plan for periodic and systematic technical assistance from specially trained experts who will guide the use of the medications and

supervise the standard case management. These experts will undergo a standard training and use standard tools to monitor and supervise the use of the medications obtained through the Facility.

INTERFERON-GAMMA ASSAYS IN THE DIAGNOSIS OF TUBERCULOSIS: UNRESOLVED ISSUES AND APPLICABILITY IN HIGH-BURDEN COUNTRIES

Specific antigens and assays for latent tuberculosis

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One of the most important challenges in global tuberculosis control is the diagnosis and treatment of latent tuberculosis infection. The currently used method for detection of latent tuberculosis infection, the tuberculin skin test, has low specificity. The identification of antigens specific for *Mycobacterium tuberculosis* to replace purified protein derivative has therefore been a major international research priority. We have performed a rigorous assessment of the diagnostic potential of antigens that are lacking from the *M. bovis* bacille Calmette-Guérin vaccine strains, as well as from most non-tuberculous mycobacteria. We have identified three antigens with a major diagnostic potential: ESAT6, CFP10 and TB7.7. These antigens can be used for tests such as the QuantiFERON Gold test that measure the production of interferon- γ from sensitized T lymphocytes, thereby signalling ongoing infection. In the EU, US and Japan, where these tests have entered the market, the value of this approach in contact tracing has rapidly become apparent. I will suggest that such tests can be modified to identify the individuals among the latently-infected, at most risk of developing active contagious TB. Targeted treatment of this part of the population offers the possibility of preventing TB before it becomes infectious, which would greatly contribute to the eventual control of this global epidemic.

What do we know about the performance of IFN- γ assays in the diagnosis of active and latent tuberculosis?

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The tuberculin skin test (TST) has been the golden standard for detection of infection with *M. tuberculosis* ever since it was introduced by Robert Koch in 1889. The main drawback with the clinical use of the TST is the lack of specificity due to cross reactivity

with proteins present in other non-tuberculous mycobacteria (NTM). Identification and characterization of three *M. tuberculosis* specific antigens, ESAT-6 and CFP-10, and TB 7.7, has led to the development of a whole new generation of highly specific diagnostic tests. These tests are based on the measurement of interferon- γ (IFN- γ) produced in vitro by T-cells recognizing antigens contained within the RD1 region of the mycobacterial genome, a region, which is absent from *M. bovis* BCG, *M. avium* and most other NTM. The development of these IFN- γ -based assays into commercially available tests is a major step forward in the diagnosis of infection with *M. tuberculosis* and may provide us with a unique opportunity to re-evaluate the epidemiology of TB. In the past few years an increasing number of clinical studies in TB low endemic countries have shown higher specificity than TST, mainly explained by no cross reactivity in prior BCG-vaccinated individuals, better correlation with exposure to *M. tuberculosis* than TST, and high sensitivity comparable to or better than the TST. In TB high endemic countries, similar trends are found but the data are still limited. An overview of the current knowledge of the performance of the IFN- γ tests for the diagnosis of MT infection in high and low endemic countries and in specific groups such as immunocompromised individuals and in children will be provided.

What is the applicability of IFN- γ assays in high-burden developing countries?

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Detection and treatment of latent tuberculosis infection (LTBI) is an important component of TB control efforts in low incidence settings. Until recently, the tuberculin skin test (TST) was the only tool available to detect LTBI. A major breakthrough in recent years has been the development of interferon-gamma release assays (IGRAs). In less than a decade, two commercial tests have been developed and licensed in many countries. Current evidence, based on several studies, suggests IGRAs have higher specificity than the TST, better correlation with surrogate markers of exposure to *M. tuberculosis* in low incidence settings, and less cross-reactivity due to BCG vaccination compared to TST. Because of their high specificity and logistical convenience, IGRAs might replace the century-old TST in selected low incidence, high income settings in the next few years. At this time, the role for IGRAs in low income, high burden settings is rather limited. Simplification of the available test formats and reduction of costs might enhance applicability in such settings, particularly in selected subgroups such as HIV-infected individuals, children, and other high risk groups (e.g., household contacts). Until such time,

the tuberculin skin test will continue to be a useful, simple, low-cost tool in developing countries where BCG vaccination is given in infancy (and, therefore, has limited impact on TST results). In high burden countries, IGRAs may serve as useful research tools, especially in epidemiologic studies. They may assist researchers to revisit and revise some of the risk and rate estimates traditionally used in TB epidemiology.

Research agenda for latent TB diagnostics for developing countries and applicability to NTPs

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During the last several years, the body of literature supporting the use of interferon-gamma release assays (IGRAs) for the diagnosis of latent tuberculosis infection (LTBI) has rapidly expanded. However, a number of questions about their use remain to be answered. These include unexplained discordance between tuberculin skin test and IGRA results, ill-defined correlation between bacterial burden and T-cell responses, unknown predictive value of IGRAs for the development of active tuberculosis, insufficient data on test performance in high-risk populations such as children and individuals with HIV infection, inadequate information on IGRA performance in serial testing, lack of evidence on the utility of IGRAs in epidemiologic studies, and questions about the feasibility, applicability, cost effectiveness, and potential utility of these assays in high-incidence and resource-limited settings. To address these knowledge gaps, FIND and WHO co-organized a meeting on behalf of the Stop TB Working Group on New Diagnostics in Geneva in March 2006. The outcome of the meeting was the development of a comprehensive research agenda grouped by seven topics: 1) biologic issues and assay development; 2) test performance in high-risk populations and poorly studied groups; 3) risk prediction and modeling; 4) reproducibility and serial testing; 5) T-cell responses during treatment and role in treatment monitoring; 6) epidemiologic and field applications; and 7) health systems, operational and economic research. To advance this agenda, FIND will partner with CREATE to evaluate the QuantiFERON-Gold assay in prospective studies of LTBI in large cohorts of adult contacts of tuberculosis cases and HIV-infected patients.

THE CHALLENGE OF TB LABORATORY DIAGNOSIS IN THE HIV-INFECTED

Does bleach concentration of sputum improve the sensitivity of smear-microscopy in HIV-positive patients?

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Tuberculosis diagnosis in Africa and other poor-settings regions relies on sputum microscopy. Although its specificity high, major concern includes low sensitivity and delayed diagnosis of smear negative disease. The accuracy of microscopy is reduced by HIV, because HIV-related tuberculosis is more usually smear-negative and so, assessments of diagnostic approaches with existing methods and continuing research into new diagnostics tools are necessary. In autopsy studies up to 50% of HIV-related tuberculosis deaths go undiagnosed; these findings indicate the diagnostic challenge. One of the major and old initiatives to increase microscopy sensitivity is the digestion and concentration of sputum with bleach. Does this method improve the sensitivity of smear microscopy in HIV-positive patients? I'll answer yes: in a sample size 1000 sputum specimen, incremental yield in positive results is ~10% in Cameroon. But, since there are discrepancies in the different reported results, it remains necessary to organize well-guided multi-centre operational research to clarify questions on the feasibility in the field, the real extent of the sensitivity improvement and a consensus on the best procedure.

Options and practical implications for fluorescence microscopy in low-income countries

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The recent meta-analytic review (Steingart KR et al, *Lancet Inf Dis* 2006, accepted for publication) comparing fluorescence (FM) and conventional light microscopy (CM) yielded following results. FM was ~10% more sensitive than CM (median 11%, range -9% to +35%); specificity was ~ comparable (median 0%, range -2% to +1%). FM reduced the workload by speedier reading. Corresponding SROC and AUC will be shown. FM is more sensitive than CM specifically in low AFB number specimens (Ba F, Rieder H, *IJTLD* 1999; 3: 1101). Possibility to implement FM in the periphery of low income countries is questionable for many reasons, though new FM devices using other (e.g., LED) than quartz-halogen bulbs look promising. Enhancing TB diagnostic techniques, particularly for TB driven by HIV, is important (e.g., Dowdy DE et al, *AIDS* 2006, 20:751), but enhance other factors, such as to increase TB suspects finding & examina-

tion also (e.g., Bumburidi E et al, *MMWR* 2006; 55: 11). Presently, to bring FM below the intermediate level of a NTP laboratory network would be an error: there are no sufficient human resources, nor data on stability of FM reagents under conditions of the HBCs, nor internationally accepted EQA schemes for FM. Huge amount of operational research is needed in the next future before any decision can appear realistic enough to implement it, even at the intermediate level and on a large scale.

Improving the sensitivity and efficiency of AFB microscopy should start by improving the testing strategy

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AFB-microscopy is being criticised because of perceived low sensitivity, particularly in HIV-positive patients, as well as tediousness. For the last reason, it has been suggested to drop the third smear examination, having an incremental yield of only a few percent in most reports. However, studies have shown that with multiple examinations sensitivity of smear approaches that of culture, so that these trends are contradictory. The solution may lie in the collection strategy. The spot-morning-spot strategy is based on older Indian trials in a highly centralised setting, where many patients presented with high bacillary load resulting in little difference between spot and morning specimens, which is generally not true. Since then microscopy networks have been decentralised so that convenience for the patient is less problematic, and also HIV results in more paucibacillary sputa, while overload in laboratories causes only first (poor spot) specimen to be (properly) examined. But studies from Uganda and Zimbabwe have shown that repeated, good microscopy can detect almost all cases detectable by culture, also in HIV-positives. All this suggests that more sensitive as well as efficient microscopy may be reached by an improved collection strategy. It should target mainly or exclusively morning specimens, and series might be restricted to two sputa, repeated at intervals of 1-2 weeks.

Integrated laboratory quality assurance for TB and HIV

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There are global efforts to integrate TB-HIV treatment and care requiring quality laboratory testing both to detect TB in the HIV-infected and determine HIV status in TB cases. Often these are separate laboratories, but as countries move to patient-centered care there are increasing efforts to co-locate testing

services. For TB clinics this often involves implementing rapid HIV tests. As countries integrate services at the peripheral level, and often the intermediate and national levels, this provides opportunities to implement combined quality management systems to improve the accuracy and credibility of HIV and TB testing. Recent international guidelines and training packages emphasize EQA and quality systems for both AFB microscopy and HIV rapid tests. Both guidelines emphasize onsite evaluation/supervisor visits with standard checklists, panel testing, and offer statistically-based sampling methods for retesting of slides/samples for efficient and accurate monitoring of performance. Implementing TB and HIV guidelines separately, however, requires sufficient resources for two monitoring systems. There is a lack of resources for separate TB and HIV supervisory visits. If supervisors are trained to review both testing services, similar to external assessments in high and middle resource countries, this would increase laboratories receiving at least one supervisory visit. Integrating intermediate and national levels promotes shared systems, expertise, and advocacy for EQA. Integrating supervisory visits limits the extent of evaluation for each test, but currently countries with significant TB-HIV problems have no effective monitoring or visitation for either test. Simplicity, practicality, and shared resources should be priorities for integrating of testing and quality assurance for HIV, TB and other tests at the peripheral level.

Diagnosing latent tuberculosis in the HIV-infected in high TB prevalence settings

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The management of tuberculosis amongst those living with HIV/AIDS is of paramount importance. This presentation will review the rationale for diagnosing and treating of latent tuberculosis infection versus traditional TB control measures in high prevalence settings. The challenge of diagnosing latent tuberculosis in the HIV-infected using the tuberculin skin test will be reviewed and compared to the evidence behind new blood tests for detecting LTBI. The potential role of the new blood tests will be discussed in light of their clinical performance and applicability to high TB prevalence settings.

Clinical and X-ray diagnosis of smear-negative pulmonary tuberculosis in low-income countries: the current evidence

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Background: Sputum microscopy is only positive in 50–60% of patients with pulmonary TB. In the absence of other readily available cost-effective investigations, diagnosis of smear-negative pulmonary TB

relies on clinical and radiological findings. However, a significant proportion of what is considered 'smear-negative TB' is likely to be smear-positive.

Clinical diagnosis: HIV patients are likely to have smear-negative TB with atypical presentations (e.g., dry cough, no haemoptysis). Recent evidence implies that the diagnostic sensitivity is likely to increase if patients are screened at an earlier stage with cough more than 2 weeks.

Radiological diagnosis: Smear-negative TB patients with HIV are also likely (75%) to have atypical chest X-ray findings. However, in low-HIV settings where X-rays are more typical, use of specific radiological criteria improves diagnosis.

Antibiotic trial: In diagnosing smear negative TB, an antibiotic trial is widely recommended before X-ray. In our hospital-based study in Pakistan, two-thirds of patients suspected of TB did not return for a visit after the antibiotic trial. Moreover, 6.8% of those who did return, and showed improvement, were later diagnosed with TB. There is some evidence that a repeat smear at this stage can improve diagnostic sensitivity. Studies in high-HIV settings reported even better temporary improvement rates (8%–9%) after antibiotic trial among TB patients. A trial of anti-tuberculosis drugs is generally not recommended. However in a recent study use of expanded case definitions and objective criteria to assess improvement after anti-tuberculosis therapy has shown to improve diagnosis.

Diagnostic algorithms: Numerous clinical scoring systems have been developed but require further validation. We welcome recent efforts in the WHO to revise their generic diagnostic algorithm in an HIV setting. However, these guidelines need to be adapted by taking local context and patient pathways into consideration.

THE ROLE OF COMMUNITY ADVOCACY IN IMPROVING TB-HIV PROGRAMMES AND POLICIES

Armenian National AIDS Foundation experience

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Aim: In 2005 the Armenian National AIDS Foundation (ANAF) launched a project to develop a multi-stakeholder response to TB-HIV coinfection in Armenia.

Methods: Targeting institutions like the Country Coordination Commission on HIV/AIDS, TB and Malaria (CCM), medical institutions, NGOs/affected communities, ANAF advocated for better communication/information exchange between TB and HIV National Programmes that would ultimately lead to more joint TB-HIV programmes. Project activities included orga-

nizing awareness-raising workshops; disseminating treatment literacy materials among policymakers and affected communities; organizing roundtables to initiate dialogue among representatives from HIV and TB Programmes, CCM, medical institutions and local NGOs representing the interest of affected communities.

Results: ANAF in collaboration local NGOs advocated for a resolution to form a CCM working group responsible for coordination between HIV/AIDS and TB Programmes. The resolution was unanimously supported and adopted at the workshop for CCM members. The workshop for NGO representatives resulted in increased cooperation and communication among organizations combating TB-HIV. The workshop for physicians succeeded in providing recommendations to enhance comprehensive services to people coinfecting with TB-HIV. The recommendation of the roundtable discussions among different sector representatives supported the need to mutually integrate the issues of TB-HIV into the TB and HIV/AIDS National Programmes.

Conclusion: When given appropriate support and information, key stakeholders demonstrate a commitment to address TB-HIV collaboratively. Moving this commitment into action will require the continued engagement of TB-HIV advocates, including communities most affected by TB and HIV.

AVE de Mexico experience

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Background: Latin American countries report TB rates of 10% to 20% in people living with HIV. In recognizing this, in 2005 Mexican TB and HIV organizations collaborated to increase the knowledge of TB-HIV and to include TB coinfection in their advocacy programs.

Aim: Forming a multi-sectoral TB-HIV National Committee to increase awareness and advocacy.

Methods: In 2005 Mexican National AIDS and TB programs joined with civil society NGOs to organize a TB-HIV satellite session during an AIDS treatment conference, sensitizing regional and Mexican networks, policy makers, and PLHA activists. Participants shared experiences, discussed advocacy strategies, identified gaps, needs, and challenges. A follow up process was established to elaborate advocacy strategies in regional and national levels to strengthen the collaboration between different actors. A bimonthly electronic bulletin was established as a monitoring, evaluation and communication tool. Human rights framework, legal issues and informational gaps were discussed to develop a regional and national TB-HIV advocacy strategy. A Mexican committee involving policy makers, PLWHA, and civil society representatives was formed to empower and improve members' skills by sharing lessons learnt. This committee is conducting training

and skills building courses for health workers and also providing other technical assistance to ensure success of advocacy strategies.

Recommendations: National TB-HIV collaborative efforts including AIDS and TB NGOs including AVE de Mexico and models of how to partner and combine advocacy and capacity building among agencies and governments are needed to improve the efficiency of TB-HIV advocacy.

Union 'Georgian Plus Group' experience

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Background: TB-HIV is considered one of the major challenges of controlling TB in Georgia as well as the South Caucasus countries—Armenia and Azerbaijan; yet, there are no coordinated services or programs between national TB and HIV programs. Across all three countries, the population most at risk for TB and HIV coinfection is injecting drug users.

Aim: Since 2004 the Georgian Plus Group (GPG) has been leading TB-HIV advocacy activities to accelerate and implement joint TB-HIV policy guidelines in Georgia and the South Caucasus.

Methods: People affected by TB-HIV are deprived of proper care and support where budgets are inadequate and public health infrastructures are poor. GPG developed a community-led advocacy plan to raise awareness about TB-HIV among people living with HIV and those at risk for TB. By raising public knowledge about TB-HIV through the dissemination of treatment literacy information, more people are able to identify symptoms and seek medical attention. At the policy level, GPG joined activist from Armenia and Azerbaijan to develop a unified regional strategy on TB-HIV. This joint strategy laid the grounds for coordination of TB and HIV programs at the national and regional level.

Recommendations: Empowering and mobilizing affected communities, and developing regional strategies to address TB-HIV will greatly advance global efforts to fight the TB-HIV co-epidemic.

The TASO experience

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Background: In the last ten years there has been an alarming increase in TB cases in Eastern and sub-Saharan regions of Africa as a result of the HIV/AIDS epidemic.

Aim: In Uganda the AIDS NGOs such as TASO and networks like NAFOPHANU have contributed to TB-HIV advocacy.

Methods: Working with the Ministry of Health and the NTP, community activist have conducted advocacy activities at the policy level and took part in a com-

mittee to develop a national TB-HIV policy. Through the organization of workshops, drama groups, and production and dissemination of treatment literacy material, community awareness of TB-HIV increased dramatically, leading to action plans, involvement of affected communities and advocacy agendas for the improvement of collaborative TB-HIV programs and services. AIDS NGOs and networks provided the platform from which activists have addressed challenges such as TB drug stock outs, developing TB-HIV policy, conducting community outreach to sensitize district health officials on TB-HIV, as well as providing communities at risk treatment literacy.

Recommendations: There is marked enthusiasm within PLWHA networks to learn and become part of a large TB mobilization effort. Because of community involvement in planning and developing policies, there is now more vigor among TB and HIV programs to integrate services at treatment centers and improve case detection for both HIV and TB. Strong HIV NGOs and PLWHA advocacy networks can be utilized to advocate for important TB issues and implement strategies.

Stop TB Partnership experience

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Aim: The Stop TB Partnership is a global consortium aiming to reverse rising rates and ultimately halt TB around the world. Since 2005, TB-HIV community activists have been working with the Partnership internally as well as externally to make TB a high priority on the global political agenda.

Methods: Engaging affected communities leads to better policy making at the global level. In 2005, community advocacy contributed to the development of expanded WHO TB control strategies, which included empowerment of communities affected by TB. Community representatives developed the Patients Charter, advocated for the Global Plan TB-HIV goals to be in line with UNAIDS targets, and for the development of community involvement guidelines to further relations between the NTP and civil society. Nationally community activist leveraged support from the Stop TB Partnership to increase their involvement in TB control activities. The Stop TB Partnership has agreed to send community endorsement letters to the NTP and other government officials, encouraging collaboration with civil society partners. As a result, the involvement of community representatives in NTP activities has allowed for recognition of community issues and reconsideration of national TB priorities.

Recommendations: The support of global institutions is critical to increasing community engagement at the national level. To achieve short-term and long-term success, community activist must participate in national TB coordinating bodies and global Stop TB working groups. Community representatives must

bridge the gap between affected communities and the NTP to ensure community concerns are addressed and capacities are built.

HUMAN RESOURCE MANAGEMENT ISSUES IN HIGH-BURDEN COUNTRIES

Addressing the health workforce crisis

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The changes to the health development landscape, resulting in the formulation of the MDGs and the success of advocacy campaigns in recent years, generated new opportunities and challenges for National TB control programmes (NTPs).

NTPs can now access resources through new health initiatives and partnerships but in many high-burden countries they have to balance the extra demands posed by additional resources, new initiatives, new health interventions and multiple donor imposed targets, on already strained inadequate health infrastructures, amid political and economic uncertainties, an insufficient, underdeveloped, underpaid and over-worked health workforce and the devastating effects of the HIV pandemic.

The main human resource (HR) issues constraining effective TB control are insufficient quantity, quality and distribution of staff. These problems are not specific to TB control and require action at national or health sector-wide levels.

Addressing the health workforce crisis require supporting countries to develop comprehensive Human Resources Development Strategies including clear progress in policies addressing financial ceilings for ensuring adequate remuneration and increase recruitment and retention; generating staff friendly HR policies to improve recruitment and retention of staff; reviewing educational policies and curricula to improve staff competency, capacity, career development opportunities and accountability; strengthening HR planning covering needs assessment, forecasting, intelligence, skills mix, distribution, continuous professional development, contribution to health systems strengthening, partnership working, policies and budgets to ensure adequate remuneration and support of the healthcare workforce.

Governments, donors and national and international partners have a responsibility to address the brain drain and to support countries addressing their health workforce crisis.

Attracting and retaining staff for TB work in developing countries: the role NGOs and bilaterals can play

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Generally a mix of public and non-government partners coexists for TB control work in developing countries. Effective TB control work in a country requires a range of expertise and human inputs at various hierarchical levels. However, inadequate human resource planning and development policies and arrangements pose a challenge for attracting and retaining staff for TB work. A complex of structural and procedural issues directly or indirectly affects the practices and the commitment of staff in most of the developing countries. There is no simple solution to this complex problem. Multi-dimensional approach to analyzing the situation, identifying workable short-term and long-term strategies, developing and implementing interventions, and informing the policies and arrangements accordingly may provide the basis for slow but continued progress. The NGOs and bilateral agencies can play an important role in making the working environment friendlier for the staff. The human resource management areas where specific inputs can help include: a) developing a well defined career structure, b) developing monetary and non-monetary incentives, c) developing context-sensitive training and supervision arrangements, d) encouraging dissemination of 'good practices' within the country and the region.

Attracting and retaining staff for TB work in developing countries: the role governments can play

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India is the highest TB burden in the country and contributes nearly one-fifth of the global TB incident cases. The national TB programme covers the entire country of 1114 million population in 35 states and 632 districts/reporting units. The Revised National TB programme (RNTCP) in the country is based on the internationally recommended DOTS strategy, and has treated over 5.7 million patients since the inception of the programme, and has initiated nearly 1.3 million TB cases on treatment in 2005 alone. The programme has consistently achieved 85% treatment success rate and the case detection rate in 2005 was 66%. RNTCP/TB control activities in high burden countries—are human resource intensive—and the biggest challenge especially in settings of weak and variable health systems in a vast country like India. The challenges in implementation of RNTCP through the general health system include addressing issues related to human resource gap; mal-distribution of human resource—across the district/state; availability

of qualified personnel (Training); rapid turn over of staff due to frequent transfers or appointment policies and attitude of work force. The strategy adopted by the programme and the role government can play is to ensure political and administrative commitment at all level; provision of contractual staff for filling up human resource gap; standardized modular training; clearly defined job responsibilities of each level of general and contractual staff; Supportive supervision; regular review and monitoring of vacant positions; development of partnerships—community volunteers/PPs/NGOs/etc; encouraging community participation through IEC/ACSM and looking at HRD as a management issue—work distribution/satisfaction/growth/pay scale etc. Motivated trained staffs are the need of the hour and supportive supervision at all levels the solution.

The effects of HIV on the workforce in developing countries

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The human immunodeficiency virus (HIV) epidemic has compounded the human resources crisis in developing countries by affecting the workforce in public and private sectors. These countries by definition have limited resources to generate sufficient economic and social development, HIV is eroding these resources. The scale of the human capacity crisis and impact of HIV on workforce in developing countries can be broadly categorised into two main ways. First, through direct effect due to the fact that the epidemic is concentrated in the working age population (15–49 years) and second, due social economic consequence resulting in reduction in labour supply and earnings, loss of valuable skills and experience, and decline in productivity and enterprise profits. Studies on the impact of HIV on the workforce in a number of countries in Sub-Saharan Africa shows that key sectors such as education and health have seriously been affected. A World Bank study in Zimbabwe and Zambia showed that 9.4% of teachers employed in 1999, could die of AIDS-related illnesses over the next decade. Another study in Botswana found that up to 41% of health workers could be infected with HIV. It is clear that without significant efforts to address the effect of HIV in the work-force, very few of the global development targets, including the Millennium Development Goals, can be met. Human resource management is a neglected issue for many governments including TB programmes in developing countries. Addressing human resource management issues will strengthen human resources for better health.

SUSCEPTIBILITY TESTING AGAINST SECOND-LINE ANTI-TUBERCULOSIS DRUGS FOR SURVEILLANCE AND MDR-TB TREATMENT

Global strategy to cope with MDR-TB

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World Health Organization (WHO) estimates that in 2004, 424 000 multidrug-resistant TB (MDR-TB) cases occurred worldwide (95%CI 376 000–620 000) with 62% of the estimated global burden concentrated in China, India and the Russian Federation. The DOTS component of the new Stop TB Strategy is and will be instrumental to prevent further creation of MDR-TB. However, there are humanitarian and public health reasons to address MDR-TB. Strong evidence indicates that MDR-TB management under programmatic conditions is feasible and cost effective in resource-limited settings. Thus, MDR-TB is also a component of the new Stop TB Strategy. To implement this strategy and achieve the TB-related Millennium Development Goals a Global Plan to Stop TB 2006–2015 has been developed, aiming at treating 778 000 MDR-TB cases by 2015. The Green Light Committee mechanism has become instrumental in enabling access to high-quality second-line anti-TB drugs at reduced prices, drawing on the new WHO Guidelines for the programmatic management of drug-resistant TB, and the significant funding of the Global Fund to Fight AIDS, TB and Malaria. Scale up diagnosis and treatment of MDR-TB and reaching the targets set up by the Global Plan will require sustained funding to the GLC and the GFATM, and the development of new diagnostics, to shorten the time of diagnosis, and the development of new and more effective drugs, to shorten the treatment period.

Second-line drug susceptibility testing: current practices and calibration to improve clinical relevance

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The WHO organized a project to improve the quality of second-line anti-tuberculosis drug susceptibility testing (SLDST) procedures in the context of clinical relevance of test results in order to make it useful for MDR-TB treatment as well as drug resistance surveillance. The project was carried out in the Massachusetts State Laboratory Institute, Boston, USA and the Public Health Laboratory Centre, Hong Kong SAR, China to determine clinically relevant criteria of resistance for SLDST in the different test systems using clinical isolates of *Mycobacterium tuberculosis* from Peru, Hong Kong, Korea, Philippines, and Latvia. In-

terim results showed the critical concentrations (CC) at which probable resistant *M. tuberculosis* isolates (PR) could be best distinguished from probable susceptible isolates (PS), equal to a range of minimal inhibitory concentrations (MIC) for susceptibility testing against capreomycin (CPM), kanamycin (KM), and ofloxacin (OFX) and lower than MIC in case of cycloserine (CS), para-aminosalicylic acid (PAS), and ethionamide (ETH). Except for CS, high level resistance was encountered in 26% (OFX) to 52% (KM) of PR strains in L-J medium and 18% to 54% in 7H10 medium. The best discrimination between PS and PR at proposed CC was observed with KM, CPM, and ETH, showing 61% to 75% in differences of cumulative susceptibility, but ETH misclassified 5% of PS strains. PAS and OFX were apparently less reliable because PAS was misclassified in a considerable number of PS and PR strains while for OFX, some PR strains. CS susceptibility tests misclassified approximately 30% of PS strains at CC and 85% of PR strains at MIC, thus DST of this drug is not recommendable.

Second-line drug susceptibility testing in agar and broth based medium

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Objectives:

- To compare robustness and reproducibility of agar plate proportions (APP), BACTEC methods for second-line drug susceptibility testing (SLDST) of *M. tuberculosis* isolates.
- To establish critical concentrations (CC) for 6 second line anti TB drugs (SLD).

Materials and methods: Second line drugs (SLD) used: capreomycin (CP), kanamycin (KM), ofloxacin (OF), PAS, cycloserine (CS), ethionamide (ET). APP and BACTEC testing was performed in the Massachusetts State Laboratory Institute, Boston, USA; LJ testing was done in the Public Health Laboratory Center, Hong Kong SAR, China. A set of 272 well characterized *M. tuberculosis* isolates obtained from patients with known clinical history was used in all testing. Isolates probably sensitive (PS) to SLD were obtained from patients who did not have a history of treatment with these drugs. Isolates from the patients that have been previously treated with SLD were considered probably resistant (PR).

Results:

- It was anticipated that ideally PS and PR isolates were supposed to have well separated MIC points which would allow to establish clinically relevant CC. Such separation was observed in case of KM an OF better than in case of other drugs. Splitting PR isolates into two groups with short vs. prolonged time of exposure to SLD improved the MIC separation, especially, when PS data were compared to PR 'long exposure' group.

- To study a correlation between CC determined by APP and BACTEC methods, MIC point data were assigned to one of the three groups: low, medium or high. Good correlation between APP and BACTEC methods was observed for CP, OF and CS, less for KM, PAS and ET.

Second-line drug susceptibility testing in Löwenstein-Jensen medium

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Aim: To study the minimum inhibition concentration (MIC) distribution and determine the critical concentrations of second-line drugs against *Mycobacterium tuberculosis* (TB) in Löwenstein-Jensen (LJ) medium.

Design: Probable susceptible (PS) and probable resistant (PR) strains of TB were collected from five international collaborating laboratories. These strains were identified and tested against kanamycin (KM), capreomycin (CM), cycloserine (CS), ethionamide (ETH), ofloxacin (OFX) and para-aminosalicylic acid (PAS) in LJ medium. Drug susceptibility tests (DST) against isoniazid and rifampicin were also performed to determine the multidrug-resistant (MDR) status of the tested strains.

Results: There were 135 MDR strains found where 132 were PR strains. Bimodal MIC distributions were observed in all tested drugs except CS. For KM, CM and OFX, discrete bimodal distributions were found while there appeared to be more strains with intermediate MICs for ETH and PAS. For drugs that showed bimodal distribution, the high MIC modes were predominantly contributed by PR strains. Based on the differentiation ability between PS and PR strains, tentative critical concentrations of the tested drugs were suggested which can be used in clinical setting to best discriminate between these two groups of strains.

Conclusion: Second-line DST using LJ media can produce bimodal MIC distributions for most second-line anti-tuberculosis drugs, and optimised for use in clinical testing.

Second-line drug susceptibility tests for MDR-TB treatment in India

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The global plan to stop TB has envisaged to treat 800 000 MDR-TB cases from 2006 to 2015. The actual numbers of MDR-TB cases requiring treatment in India are expected to be huge. To scale up the proportion of the estimated incidence of MDR TB patients receiving appropriate treatment as approved by GLC, India need to establish a sufficient number of

quality assured intermediate reference level laboratories for the diagnosis and monitoring of treatment response of MDR-TB cases. At present, the MDR-TB burden among new cases is known in only less than 10% of the population. Two large scale state level drug resistance surveys, which are underway in the western part of India, will provide shortly the true magnitude of MDR-TB cases from new as well cases with an history of previous treatment in a population of over 160 million. At present, only one of the three National Reference Laboratories (NRLs) in India, the Tuberculosis Research Centre (TRC), Chennai is able to perform DST to all second line anti-TB drugs, including newer quinolones. TRC has also published definitions of resistance to ofloxacin, gatifloxacin and moxifloxacin in both agar and egg based solid media as well as liquid culture system. To meet above challenges, India has formed national and state level DOTS-Plus Committees and guidelines, protocols for accreditation of the intermediate reference laboratories (IRL), a mycobacteriology module, technical specifications for equipment and consumables for IRLs and IRL human resources. DST for second-line drugs is being established in the remaining two NRLs. And in the remaining 22 IRLs in a phased manner over the coming 3–4 years. The need of the hour is to detect MDR-TB by employing any one of the cost-effective, faster, less demanding newer methods.

SYMPOSIUM IN HONOUR OF FORMER KNCV CHAIR, JAAP BROEKMANS

Policy development

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In May 1991, the 44th World Health Assembly (WHA) set out global targets for TB control for the year 2000—detection of 70% of the infectious cases and cure at least 85% of them—and urged member states to control TB through the DOTS strategy. The global efforts towards TB control were further intensified in 1993 when WHO declared TB a global emergency. The International Union against Tuberculosis and Lung Diseases and the KNCV TB Foundation which supported national programmes, training courses and technical materials, played an important role in implementing the strategy. In 1997, it became apparent that countries were still far from the year 2000 targets. WHO convened an ad hoc committee in London, UK, in 1998, which identified the constraints and solutions needed to accelerate TB control in 22 high burden countries. Jaap Broekmans was a member of the committee. He was also chair of the WHO Technical and Research advisory committee (1997–1998). Following these events, chair of KNCV was involved

in almost all global events with policy implications. Founding member of the Global Partnership to Stop TB in 1998, co-organizer of the Ministerial Conference on Tuberculosis and Sustainable Development (Amsterdam, March 2000), member of the Technical Advisory group of WHO Western Pacific Region, chair of the WHO Strategic and Technical Advisory Group (2001-2004), member of the committee that defined an expanded DOTS framework in 2002, chair of the TB group in the Millennium Development Project, chair of the 2d ad-hoc Committee on the TB epidemic (Montreux, 2003). This work has increased political commitment, visibility of TB globally, strengthened DOTS expansion and its financing, has laid out the foundations of the new Stop TB strategy and prepared the shift of TB control target from 70/85 to impact targets of MDGs.

TB Control Programme implementation in Peru, 1990–2005

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Background: In the 1980s, the tuberculosis (TB) control in Peru was faced with serious organizational, structural and logistical issues: inadequate strategies resulting in high incidence rates, insufficient search for suspected cases and therefore a low treatment coverage (less than 50% of all cases diagnosed); the cure rate was less than 60%. Since the second half of 1990s, TB became a priority in the health agenda.

Objective: To demonstrate the impact of DOTS implementation in Peru in the past 15 years.

Results: In Peru, there was an improved tuberculosis TB case detection and cure rates, resulting in an accelerate decline the incidence of TB. The number of case reports increased between 1990 and 1992 as an outcome of improved case detection. Although diagnostic efforts have continued to increase since 1993, the incidence of new pulmonary TB cases (from 161.1 to 67.1 per 100 000 population) has declined, with a national rate of decline -6.8% per year (range, 0.8% – 13.1%). When comparing the 2005 indicators with the 1990; we concluded: there has been an increase in the suspected cases examinees from 31% to 98.7% and DOTS coverage from 25% to 100% at the health services. In 2004 increase the treatment success rate from 76.8% to 89.6%; a decrease in the defaulters from 12.1% to 4.2%, and a decline of the death rate from 4.1% to 2.1%.

Conclusions: The main factors to reduce the TB problem are: political support, regular and free supply of diagnosis and treatment cases, sensitive and qualify health personnel. They have to be continuously trained; strategic articulation and coordination within the different health institutions and community actions with the active participation of the af-

ected people. Fighting against TB is to contribute to the fight against poverty; even with improved control programs, it is a slow process. The sustainability of TB control actions must be guaranteed, by means of a stronger NTP for several decades, to achieve the final objective: to eliminate TB as a public health issue. Through institutional polices and social long term undertaking is required.

NTP implementation: responding to challenges

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Background: The TB Programme was launched in 1977 by act of Parliament in combination with leprosy control. It is being implemented in close collaboration with partners including the KNCV Tuberculosis Foundation, WHO and the Union. DOTS strategy achieved national coverage by 1987. Treatment success over the years is high—about 80% despite the HIV epidemic. Case detection has increased more than 4 fold to 180/100 000 or 55% of WHO estimates.

Objective: To improve case detection and treatment outcome in Tanzania in line with STOP TB strategy.

Results: Number of diagnostic centres has increased at district level above the recommended 1 per 100 000 population. Over 80% of frontline health providers have been trained in TB case management. Since July 2005, TB-HIV activities are being implemented with 8000 TB patients screened for HIV with 50% co-infection rate. The programme is piloting patient centred care to improve case notification and treatment adherence. Treatment regimen has been changed from 8 to 6 months using 4-fixed dose combination drugs with RH in the continuation phase. Electronic TB register is now being used to compliment the manual register. The diagnostic algorithm for smear negative TB patients is being revised in line with WHO recommendations.

Conclusions: Implementation of the STOP TB strategy will enable the country to meet the global TB control targets and the Millennium Development Goals despite the high prevalence of HIV infection in the general population.

Operational research

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Over the past 20 years, the KNCV Tuberculosis Foundation under the leadership of Jaap Broekmans has contributed to epidemiological and operational research in various ways. It supported Dr Styblo, who developed tuberculosis control programs in high burden countries. These served as the model for the WHO

global tuberculosis control strategy. The importance of case finding and treatment were illustrated with data on the TB epidemiology in The Netherlands. Tuberculin surveys in various countries provided convincing evidence on TB trends as well as more controversial estimates of TB incidence. Dr Styblo was research Director of the TSRU, which continues to meet annually to exchange research results internationally. Over the past decade, the KNCV program expanded to include studies on TB transmission using molecular epidemiological tools, and it put an increasing emphasis on the importance of impact assessment, and the impact of HIV and MDR-TB. In the presentation recent research results in these areas will be presented.

CONTRIBUTION OF MOLECULAR BIOLOGICAL METHODS TO TB CONTROL IN HIGH-BURDEN COUNTRIES

Pro-NAT for direct detection of TB

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Our failure to control the tuberculosis epidemic is, in part, due to inadequate case detection. Current diagnostic algorithms are unsatisfactory, particularly in parts of the world with a high prevalence of HIV infection where the effectiveness of chest radiography and smear microscopy is much reduced. Rapid detection is highly desirable, both for the individual patient and to reduce opportunities for transmission. Current diagnostic tests for TB are either insensitive or slow. Nucleic acid amplification technologies are rapid and specific. They are widely used for diagnosis of other infectious diseases but their application to tuberculosis has so far been limited. Although not as sensitive as culture they offer rapid diagnosis and, if required, rapid detection of drug resistance. In studies in sub-Saharan Africa they have been shown to be more sensitive than microscopy for diagnosis of pulmonary disease. They require only a single sputum specimen and do not need viable bacilli which facilitates specimen transport and avoids the need for sophisticated and expensive microbiological safety facilities. In the absence of alternative rapid tests it is time to reassess the role of nucleic amplification technology. As the patents on PCR and the other technologies expire the market for diagnostic kits is likely to become more competitive. The generic nature of the technology enables molecular laboratories to provide a broad spectrum of diagnostic services enabling economies of scale. The emergence of 'specialist' laboratories will also facilitate quality assurance. Reluctance to invest in the new technology has already been largely overcome in HIV/AIDS treatment programmes where tests

for assessing viral load are widely available. Direct detection of TB by nucleic acid amplification tests is the most accurate rapid diagnostic method currently available. It is time to embrace the new technology and apply it where it is most needed in the struggle against tuberculosis.

Relevance of identification of mycobacterial isolates

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With the introduction of culture techniques for mycobacterial diagnostics in high-incidence countries, moreover when using liquid culture systems, the isolation of non-tuberculous mycobacteria (NTM) also has to be taken into account. So far, there are only few data available on isolation of NTM in those settings, however, the presence of, e.g., *M. kansasii*, *M. avium* complex, *M. scrofulaceum* or *M. lentiflavum* have already been shown. Furthermore, due to the knowledge derived from investigations in developed countries that HIV-infected patients are susceptible to NTM infections, the presence of NTM in HIV-patients in high-incidence countries should at least be considered. Beside the possibility of infection with NTM, environmental species also may be isolated, which can easily be estimated as non pathogenic by species identification. Most important, in case susceptibility testing the isolates have to be confirmed as *M. tuberculosis* before onset of the test. Usually, NTM are resistant to some or all of the regular drugs, leading to false resistant results. Nowadays rapid molecular techniques are available that can easily be included in routine clinical laboratories. Mainly DNA strip hybridisation assays have been shown to give reliable results within hours for identification of the most important mycobacterial species from solid and from liquid media.

Molecular detection of drug resistance in *M. tuberculosis*

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Drug resistance in *Mycobacterium tuberculosis* was recognised rapidly after the introduction of chemotherapy. The 3rd global report on 'Anti-tuberculosis drug resistance in the world' documented the presence of drug-resistant tuberculosis (TB) in most settings surveyed and the presence of multidrug-resistant (MDR) TB in all regions of the world. It has been shown that a favourable response is achieved more often if treatment is adjusted according to the results of susceptibility testing to first line drugs. Outbreak evaluations have shown that late recognition of drug resistance can contribute considerably to the mortal-

ity and spread of MDR-TB, particularly among immunocompromised patients. As traditional *in vitro* drug susceptibility testing requires pure growth of *M. tuberculosis*, results have only been available several weeks after the initial diagnosis in general. For the most potent first line drugs, molecular methods have proven useful in several ways. Applied on cultures growing mycobacteria, it has enabled laboratories to render detected drug resistance in *M. tuberculosis* probable by excluding the mixture with the most common other mycobacterial species. Furthermore, drug resistance detected by traditional drug susceptibility testing can easily be verified and possible cross-resistance to other drugs may be identified rapidly. Applied on sputum smear positive primary specimens, molecular testing can provide detection of mutations conferring drug resistance to the most important first line drugs within 2 days. However, in many countries badly affected by MDR-TB, resources are limited and consideration need to focus on costs compared to benefits and indications for the analyses.

Use of fingerprinting results for NTPs

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Studies on DNA fingerprints of *M. tuberculosis*, using restriction fragment length polymorphism (RFLP) have taken place since the early nineties, mainly in low incidence countries, but also in medium and high incidence countries. These studies have taught important lessons about the epidemiology of TB, such as the contribution of reinfection and the occurrence of multiple strains. Since recurrent TB episodes can now be separated into relapse and re-infection, studies on acquired drug resistance have become much more precise. DNA fingerprinting has been used to quantify transmission within households, and transmission from smear-negative source cases. Moreover, they allow an assessment of the transmission of drug-resistant strains. Further DNA fingerprint assisted in identification of laboratory cross contamination, and complications of BCG vaccination. The population structure of *M. tuberculosis* is the basis for virulence and vaccine studies. Future DNA fingerprint studies may identify subgroups in which active case finding is needed, and to evaluate treatment outcomes. Strain diversity, and virulence of strains such as the Beijing strain, may affect BCG vaccination and TB medication. A new method, mycobacterial interspersed repetitive unit-variable number tandem repeat analysis (MIRU/VNTR) can give much faster DNA fingerprint results. This will lead to new applications of the DNA fingerprinting, that will also be discussed. The focus will be on relevance for NTPs.

SUCCESSFUL MODELS OF WORKING WITH THE MEDIA ON TB

Engaging significant others

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All cases of TB disease are curable and become rapidly non-infectious. The main problem in treatment of TB patients is to make sure they take their medication properly. We are always very effective in blaming our patients for non-compliance but physician and policymaker non-adherence to good TB practices is increasingly responsible for most ongoing problems in TB control. With the recognition of the danger of multidrug-resistant tuberculosis (MDR-TB), an increased level of awareness, often bordering on hysteria, has occurred. MDR-TB occurs for one of two reasons: 1) patients are not treated properly by their physicians and/or 2) patients do not take their medication properly. With the increasing recognition of problems in the private sector delivering proper TB care globally, increasing attention to this deficiency are being noted, including the new International Standards for Tuberculosis Care (ISTC). We are recognizing new strategies in developing new TB drugs, new TB diagnostics, and a new TB vaccine. However, there is no way the global epidemic will turn around until all the basic tenants of TB control are met and adhered to:

- Think tuberculosis!
- Early case finding and treatment
- Optimal contact follow-up
- Optimal use of appropriate treatment of latent infection where indicated
- Development of new tools

In an era when health sector reform is rapidly becoming the operative modality in delivering health care, these tenants become more important. Finally, the most important aspect of continuing this downward trend of TB cases is political will to ensure proper attention, care and resources globally. All of these aspects can be promoted with a knowledgeable and concerned local media. If journalists have background and know the correct questions to ask, they can go a long way to effect proper change.

Overview of communication and advocacy: role of the media

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Using the media strategically is a pre-requisite to succeeding in global TB control. There is a very direct and causal relationship between the level of media attention that a disease like TB gets and the amount of funding donors provide to that disease. As more

articles about TB come out, more funding will be directed towards TB control programs. Likewise, the media sets the political agenda. To increase political will for TB programs, say in developing countries, it is essential to use the media. When planning media events, it is crucial to think strategically. To maximize the exposure and the affect of media campaigns, use the following tools:

- Reframe the conversation—policy debates can get stale and uninteresting. Inject new angles and themes into your messages to media interested.
- Tell human interest stories—people in general, and the media in particular, tire easily of numbers, stats and acronyms. The story of one family affected by TB can be much more effective than talking about the two million people who die each year.
- Seize the news cycle—improve your chances for getting coverage by placing your story within the context of a larger existing story. Be aware of upcoming events and structure your message to ‘piggy-back’ on them.
- Make your case with hard evidence—to build your image as a trustworthy source of information, both with the general public and the media, make sure your facts are solid.
- Cultivate unusual allies—the media is always looking for what is different, new, or interesting. You can also reach new audiences and change people’s minds by partnering with somebody unexpected.

Seeds of change: working with the media on TB in the Russian Federation

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Introduction: Urged by an inadequate public response to the TB epidemic in Russia, WHO and the National Union of Journalists (NUJ) has been continuously scaling up media involvement through media events, contests and workshops for Russian journalists. **Objectives:** To raise awareness and commitment about TB among policy stakeholders, health care providers, communities and population through responsible quality reporting of TB issues in national and international media outlets.

Methods: Programme and partnering agencies run annual advocacy campaigns, including World TB Day with press conferences, regular interviews with national and international journalists, contests and workshops for journalists that strengthen media network and partnerships.

Results: Regular contests and workshops for journalists create a favourable environment for increased media coverage and raise awareness about TB among target audiences. Around 200 entries from 45 regions of the country were submitted for the contest by jour-

nalists, with some of them demonstrating continuous commitment to reporting TB. Consistent work with the media expands the media network and improves the quality of reporting. Press events in conjunction with annual World TB Day campaigns help establish direct and informal contacts with the media and increase coverage of TB issues.

Conclusion: Contests and workshops for journalists have been a useful advocacy tool and provide an opportunity to raise awareness about TB among national media and to increase commitment to reporting about TB. New approaches and framework for partnerships with the media are needed to ensure a growing pool of knowledgeable journalists at the country and regional level to act as advocates for effective TB control towards reaching MDGs.

Scaling up media response to the TB epidemic in Nigeria

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Background: Nigeria ranks fourth among the high TB burden countries. TB is a leading cause of death among PLWH. Though TB has been a major public health challenge for decades, it remains grossly underreported in the media. HIV/AIDS, on the other hand, is widely reported. The media is a powerful, yet underutilized avenue for awareness creation, sensitization and public mobilization.

Methodology: Through newspaper reviews, and focused group discussions JAAIDS assessed factors responsible for media’s apathy towards TB issues in Nigeria.

Findings: Major media reports were event driven and centered on World TB Day. Factors responsible for poor media reporting include erroneous belief that TB is not a major health issue; lack of knowledge about key issues in TB; unwillingness of TB programme implementers to discuss with the media.

Conclusions: Roundtables, workshops convened by JAAIDS have provided platforms to equip the media with skills to report TB issues more frequently. However, the media needs to be brought on as key partners in TB control efforts to achieve long-term impact.

Using media fellowships to increase coverage of tuberculosis: experiences from the Panos Foundation

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The Panos STOP TB media fellowship project attempts to address obstacles journalists face in covering issues around TB. The project awarded fellowships to two print journalists each from Bangladesh, Pakistan, Indonesia, the Philippines, Haiti, Zambia,

Malawi and Ethiopia and three print journalists from India in 2005. Additionally, fellowships were awarded to four photojournalists from Africa and Asia. As part of the fellowships procedure selected fellows were trained in regional workshops on issues around TB and how to produce stories that could be disseminated in the mainstream media. Emphasis was put on helping journalists understand the linkages between TB and other equally important issues like poverty, gender and urbanisation. The print journalists have written features on TB and TB-HIV issues in their countries, disseminated in their national newspapers. In addition, Panos together with other partners co-organized a journalist's symposium on TB at the ICASA meeting in Nigeria in December 2005 and a workshop for Eastern Africa journalists in Nairobi, Kenya, to expose them on key TB issues prior to the launch of the Stop TB Global Plan 2006–2015 in January 2006. Panos is also in the process of developing a guideline for journalists on reporting on TB. The guideline will contain some of the well-researched features from the fellowships. Fellows have provided very positive feedback. All journalists have welcomed this move of providing information on technical issues as well as discussions on possible story ideas. Panos now proposes to expand the project to broadcast media in 18 countries in Asia, Africa, Eastern Europe and the Caribbean. Also, a global movement of journalists reporting on TB issues is expanding each year through the project.

Case studies of effective global media advocacy on TB

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In the period 2004–2006, the global Stop TB Partnership orchestrated a number of initiatives to boost media coverage of TB, with the objective of strengthening political commitment and mobilizing resources to combat the epidemic. These initiatives integrated the efforts of the Stop TB Partnership Secretariat, WHO, advocacy partners and regional/national TB actors and generated unprecedented coverage of TB issues, in particular by global television networks such as the BBC, CNN and others. The author was head of advocacy and communication for the Stop TB Partnership Secretariat during this period. He will present several case studies of successful media promotion and the collaborative methodologies and techniques that were employed to create effective news stories. The case studies will highlight the need to link media promotion with political advocacy in order to achieve the strategic objective of building political commitment and mobilizing resources. The case studies will include World TB Day 2005, the declaration of a regional TB emergency in Africa, and the launch of the Global Plan to Stop TB 2006–2015.

PROVIDER-INITIATED HIV COUNSELLING AND TESTING IN TB CLINICAL SETTINGS: LINK TO HIV CLINICAL CARE

Provider-initiated HIV counselling and testing in TB clinical settings: a paradigm shift

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Due to the substantial price reduction of antiretroviral (ARV) therapy, funding of multiple global HIV/AIDS initiatives, and the United Nations General Assembly call for universal access to HIV treatment for all who need it by 2010, ARV therapy for HIV/AIDS is becoming widely available in resource-limited settings. This has stimulated the demand for widespread HIV counseling and testing to identify infected persons eligible for treatment and prevention. Routine provider-initiated diagnostic HIV testing and counseling in TB clinics (DTC) is a targeted approach to identify HIV-infected persons eligible for ARV, especially in sub-Saharan Africa, where up to 80% of TB patients are co-infected with HIV. Implementing DTC requires commitment, co-ordination, and policy development by National TB and AIDS Control Programs, training of staff on counseling and rapid testing, procurement of test kits, development of laboratory procedures, and supervision and monitoring. To date, approximately 50% of TB patients in Botswana, Rwanda, Kenya, and Malawi know their HIV status, but overall in sub-Saharan Africa less than 10% of TB patients know their status. Barriers to DTC in TB clinics include 1) legislative restrictions on who can counsel and who can test; 2) limited space; 3) concerns regarding confidentiality; 4) concerns regarding dual stigma; 5) stock-outs of HIV test kits; and 6) lack of human resources to provide ongoing training and supervision. Access of TB patients testing HIV-positive to HIV care is limited due to a variety of factors, including limited availability of HIV services, difficulties in obtaining care at multiple sites, difficulties tracking patients moving from one program to another, and transportation costs. Some countries are providing cotrimoxazole and a few, ARV, within the TB clinics.

Scale-up of HIV diagnostic counselling and testing in TB clinics: Kenya

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A Nairobi project has shown that TB suspects with alternative diagnoses have higher HIV rates (70%) than those with TB (62%). With goal of achieving universal diagnostic HIV counseling and testing (DCT) for TB patients, Kenya plans to scale-up coverage from 41% (2005) to >80% (2010). Kenya has 1600

TB treatment clinics, 619 TB diagnostic laboratories and 287 ART clinics in 8 Provinces and 74 Districts. To achieve above goal, Kenya has issued HIV testing guidelines that are being widely used. National and Provincial TB-HIV Committees have been formed to coordinate TB-HIV services. Similar committees are being formed at district level. Other activities: training, allocation of responsibilities and operational materials, support for infrastructure and logistics. New TB-HIV monitoring tools are being used and evaluated. From 66 districts, 23 003 TB patients were registered the last quarter of 2005. Out of these, 9507 (41.3%) were tested for HIV and 5277 (55.5%) tested positive. 1259 staff were trained in 2005 and more training is planned. Challenges include: integrating TB-HIV services from separate delivery systems, inadequate manpower and infrastructure, sub-optimal disbursement of complementary funding, de-stigmatization of the TB-HIV link, and settling modalities for expanding DCT to TB suspects in public health facilities. To settle this issue, an appropriate targeted evaluation is planned.

HIV counseling and testing in TB clinics—DR Congo: empowering TB health care workers on the front line

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Background: In 2004, more than 700 000 people living with HIV/AIDS suffered from TB. In many countries, there is a lack of experience in and capacity for the management of HIV co-infected TB patients, and limited knowledge of how community and health service providers can work together to improve access to care and treatment.

Aim: This presentation will convey lessons learned from a technical assistance program in Kinshasa, Democratic Republic of Congo (DRC) and address critical issues regarding health services and contextual issues surrounding the expansion of access to care and treatment for HIV co-infected TB patients, as well as key factors that facilitate sustainability of collaborative TB-HIV activities at the level of the TB clinics.

Results: Following dissemination of the results of a pilot project to stakeholders, a new policy on DRC diagnostic HIV counseling and testing for TB patients was formulated. Roles of health care workers and National TB and HIV Programs were defined. Training materials on collaborative TB-HIV activities were developed, field tested and revised. HIV testing and counseling, cotrimoxazole prophylaxis during and after TB treatment, referral for care, and support groups for co-infected patients were initiated in 14 TB

clinics with a total annual case load of 5000 patients. Extensive supervision, quality control, and monitoring and evaluation of activities were performed.

Conclusion: Involving key decision makers in operational research accelerates the process of translating research into practice. Integrating new collaborative TB-HIV activities into routine care demands targeted training of health care workers, extensive supervision at the initial phase and continued monitoring and evaluation. Forging links with community services and anti-retroviral treatment clinics are essential but challenging in resource-poor settings.

Implementation of voluntary counseling and testing of TB patients in Thailand: a field approach

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Background: WHO recommends that HIV testing and counseling be offered to all TB patients in setting where the HIV prevalence among TB patients is 5% or higher. Thailand is 17th on WHO's list of 22 high TB burden countries and has more than 600 000 persons currently living with HIV/AIDS. HIV prevalence among TB patients is around 10%.

Description: We started implementing a project of offering HIV Voluntary Counseling & Testing (VCT) and care to TB patients since February 2003 at all 25 hospitals in Ubon-ratchathani, a province in Northeastern Thailand. Since February 2005, the project has been expanded to six additional provinces covering a total population of 6.7 million. The project was not started with a typical model, i.e., from standard training to formal implementation but rather learning-by-doing approach. We have performed a regular Plan-Do-Check-Act (PDCA) cycle. The results are shown in Table 1. We found out that the important parts of the project are not only training courses but also continuous activities of supervision, monitoring and evaluation.

Table 1 Summary of performance of TB-HIV project; ODPC #7

Provinces	Period	Total TB	HIV testing	Total TB-HIV	CD4 tested	ART
1 (Ubon)	1 Feb.– Sep 2003	1539	501 (32.6%)	201 (13%)	101 (50%)	39 (19.4%)
7	1 Feb.– Sep 2005	5849	3951 (67.6%)	673 (11.5%)	384 (57%)	206 (30.6%)

Note:

1. The ratios of 2005 would be increased when we update the data. The reason is many TB cases may be tested later.

2. The ratios are calculated as follows:

HIV testing = No. of TB cases who are tested for HIV/No. of total TB with HIV+ = No. of total TB-HIV cases/No. of total TB

CD4 tested = No. of TB-HIV cases tested for CD4/No. of total TB-HIV

ART = No. of TB-HIV cases who get ART/No. of total TB-HIV

Lessons learned: TB-HIV integrated activities can be implemented as a public health intervention. Particular attention should be focused on the learning process of field staff. As a result of this project, Thailand has set its targets for TB-HIV integrated activities as in Table 2.

Table 2 Thailand national target for TB-HIV joint activities

Indicators	2005	2006	2007	2008	2009	2010
% of HIV testing among TB patients	–*	75	80	85	90	>90
% of TB screening among PHA	75	80	85	90	>90	>90
% of TB-HIV co-disease get access to HIV/AIDS care	100	100	100	100	100	100

* We don't set a target for percentage of HIV testing during the first year of the national TB-HIV joint activities. We, however, set a target that 100% of TB patients should undergo HIV counseling by the end of 2005.

Acknowledgement: We would like to express our sincere thanks to: 1) Thailand MOPH US-CDC Collaboration for its support to the implementation in Ubon-Ratchatani and 2) GFATM for its support to the expansion phase to other six provinces.

HIV counseling and testing of children: special considerations

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An estimated 2.3 million children under 15 years of age are living with HIV/AIDS. Almost 90% of these children live in sub-Saharan Africa (SSA). More than half die before the age of 5 years. Little is known about HIV prevalence among pediatric tuberculosis (TB) patients, but in SSA co-morbidity is considered to be substantial, and diagnostic HIV testing and counselling of pediatric TB patients is crucial for getting children into HIV care and treatment. Special considerations for implementing routine diagnostic HIV testing and counselling in children include: 1) diagnosis of HIV in children under 18 months of age requires PCR laboratory capacity, which is not widely available; 2) giving HIV test results to children requires consideration of the child's developmental age and is often a process that occurs over several interactions between health care providers and the family; 3) parents or guardians must consent for medical interventions, or refuse routine HIV testing, for children; and 4) if young children test HIV positive their mothers are also likely to be HIV-infected and need to be tested. These and other challenges in pediatric HIV testing and counselling will be discussed.

ABSTRACT PRESENTATIONS THURSDAY 2 NOVEMBER 2006

THEMATIC SLIDE PRESENTATIONS

NEW APPROACHES TO DIAGNOSIS, TREATMENT AND INFORMATION MANAGEMENT

TS-61233-02 *Mycobacteria* attacked with a Trojan trick

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Aim: A major step forward in TB control would be a therapy which is more powerful and of shorter duration. Targeted drug delivery may prove an important tool. We developed a drug delivery-based therapy: the TROIAN (Targeted Reduction Of Infectious Agents Numbers) therapy.

Experimental design: As drug delivery tool we have prepared Stealth® liposomes. For liposomal encapsulation Amikacin (AMK) as an important second-line agent in MDR-TB treatment was chosen. Our *in vitro* studies revealed a rapid and high mycobacterial killing capacity of AMK. In our first therapy studies *Mycobacterium avium* complex (MAC) was used. Chronic

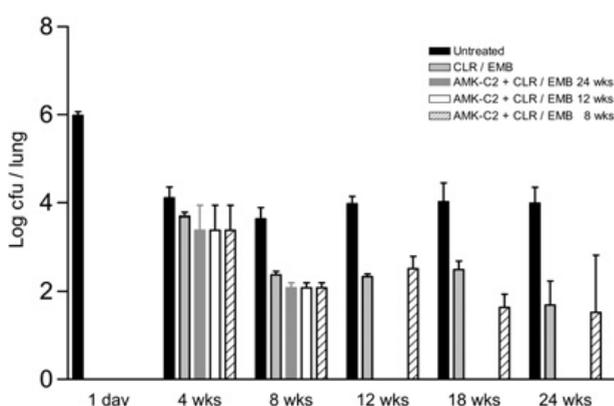


Figure Efficacy of TROIAN therapy (AMK-C2) during the first 3 wks added to conventional therapy (CLR/EMB) for 24 wks or 12 wks or 8 wks.

disseminated MAC infection (lungs, spleen, liver, inguinal and mesenteric lymph nodes) over a 24 wks period was established in mice.

Results: Following conventional therapy with clarithromycin (CLR) and ethambutol (EMB) during 24 wks daily for 6 days a week, MAC numbers in infected organs substantially decreased, however were not eliminated after 24 wks (Figure). Addition of TROIAN therapy (AMK-C2) during the first 3 wks of treatment twice-weekly resulted in rapid decrease and complete elimination of MAC within 12 wks without relapse. As a result total treatment duration could be reduced to 12 wks.

Conclusion: The TROIAN therapy opens new ways for treatment of TB, and is now investigated in our mouse model of pulmonary TB. We focus on different routes of administration and further simplification of the treatment approach.

TS-61103-02 *Mycobacterium tuberculosis* genotype and drug resistance in children with culture-confirmed tuberculosis

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Aim: To describe *Mycobacterium tuberculosis* genotype diversity in children with culture-confirmed tuberculosis and assess the relation between genotype and drug resistance.

Methods: Prospective study conducted from March 2003 through August 2005 at Tygerberg Children's Hospital, Western Cape Province, South Africa. All children (<13 years) diagnosed with culture-confirmed tuberculosis were included. Drug susceptibility testing (DST) and genotype analysis, using spoligotyping, was done.

Results: Culture-confirmed tuberculosis was diagnosed in 399 children. DST was available in 389 (97.5%); 48 had isoniazid resistance of whom 20 had multi-drug resistance. Genotyping was done in 387 (97.0%); 130 (32.6%) were strain Family 29 (Beijing), 25 (6.2%) Family 28, 65 (16.3%) Family 11, 25 (6.3%) low copy number, 12 (3.0%) Haarlem, 29 (7.3%) low-frequency families (frequency <10) and 101 (25.3%) were unclassifiable strains. Children infected with Beijing or Haarlem strains comprised a bigger proportion of the drug-resistant group compared to the drug-susceptible group (21/48 vs. 105/341; relative risk 1.42, 95% confidence interval 1.0–2.0, and 4/48 vs. 8/341, RR 3.5, 95% CI 1.1–11.4, respectively)

Conclusion: The dominance of the Beijing strain family amongst this child cohort may indicate its emer-

gence in the Western Cape. Drug resistance was more prevalent amongst the Beijing and Haarlem family strains.

TS-61131-02 The role of QuantiFERON TB-Gold in screening for tuberculosis in a low prevalence country

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In Norway the incidence of tuberculosis (TB) is low, and 80% of the cases are due to reactivation of latent infection. Screening for TB infection, followed by preventive treatment, is therefore recommended in national guidelines. Due to the well known limitations of the tuberculin skin test (TST), we have evaluated the performance of the specific blood test QuantiFERON TB-Gold (QFT) in comparison with TST in different target groups for TB screening. The objective of the studies is to improve routine screening for TB infection in order to target preventive treatment more efficiently. The studies include asylum seekers on arrival in Norway and schoolchildren with a positive Mantoux test ($>6\text{mm}$) in a school based screening program prior to BCG vaccination.

Preliminary results show that among 643 asylum seekers tested, 29% (186) have a positive QFT-test. In this group there is a linear correlation between the size of the TST induration and the proportion of QFT positive tests. Routine screening among schoolchildren (45 000 students tested) has identified 358 TST positives of which 297 have been QFT-tested so far. Among these there were only 7% (21) QFT positives.

The preliminary results of these studies confirm the higher specificity of QFT compared to TST. The results will be used to better target future screening and identify the role of QFT in a national TB control programme.

TS-61320-02 Evaluation of microscopic observation drug susceptibility assay (MODS) for detection of multidrug-resistant TB

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Aim: To prospectively evaluate MODS in the concurrent detection of *M. tuberculosis* and its susceptibility to isoniazid and rifampin (two drugs defining multidrug-resistant tuberculosis, MDR-TB) directly from sputum sample.

Methods: A total of 262 smear positive sputum specimens were processed according to conventional culture system. For MODS testing, 100 μl of decontami-

nated samples were inoculated into 24-well plate containing 1ml of MB 7H9 broth with and without appropriate drugs. After 3 days of incubation, growth was daily examined using inverted light microscope for characteristic cord formation by *M. tuberculosis*. Both agar and egg based methods of proportion (MOP) and BACTEC-MGIT were used as references tests.

Results: MODS detected 96.9% of the 262 smear positive sputum culture while 94.3% of these were positive on Löwenstein-Jensen medium. From the 247 cultures, the sensitivity, specificity and accuracy of MODS for detecting MDR-TB are 92.0, 99.5 and 99.8% respectively using MOP as a reference (concordance, 98.8% and kappa value, 0.932). Furthermore, 58 isolates were tested using BACTEC-MGIT. MODS has a sensitivity, specificity and accuracy of 95.0, 100.0, and 98.3% respectively when compared with this method (concordance, 98.3% and kappa value, 0.961). Results of MODS were obtained in a median time of 9 days.

Conclusion: MODS is an optimal alternative method to identify MDR-TB in a timely and affordable way in resource limited settings.

TS-61739-02 Bacteriological conversion of cultures in patients receiving standardized treatment for MDR-TB

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Justification: In Peru, there are several groups of patients who receive standardized treatment for multidrug-resistant tuberculosis (MDR-TB) if they do not have susceptibility testing: those patients who fail treatment schemes (2HREZ/4H₂R₂) and (2HREZS/1HREZ/5HRE), or patients contacts of documented MDR-TB cases, or patients with active TB after two previous treatments.

Objectives: To report the frequency of negative monthly cultures of patients receiving standardized treatment and to estimate differences in frequency based on previous treatment exposure.

Method: Information of 887 patients enrolled in standardized treatment for MDR-TB between March and September 2005 was analyzed from the National TB Program database. Of this group, 387 had received 2HREZ/4H₂R₂, 192 received two courses of treatment and 52 received more than two courses of treatment previously.

Results: See the Table showing % of (-) cultures by month of treatment. In the second and fourth months of treatment respectively, more than 83% and 93% of all groups had negative cultures.

Antecedent	N	1	2	3	4	5	6
Resistant to at least H+R	71	12.5	87.8	85.0	97.1	97.0	96.3
01 previous treatment	387	54.1	83.3	90.5	93.0	93.8	96.4
02 previous treatments	192	53.2	84.7	92.3	94.0	93.7	95.1
>02 previous treatments	52	45.5	90.0	94.4	93.7	94.4	100

Conclusions: The achieved frequency of negative culture is similar to that of susceptible TB cases. Patients receiving the standardized treatment scheme have negative cultures in short time. This rapid response may diminish the probability of clinical deterioration and of dissemination of the bacilli in the community.

TS-61683-02 Epidemiology and TB treatment outcomes of HIV-infected TB patients in An Giang Province, Viet Nam

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Background: TB is the most common cause of mortality in HIV-infected patients. We examined factors associated with poor TB treatment outcomes in HIV-infected TB patients in An Giang, a province in southern Vietnam, to better describe the epidemiology and to inform program improvement.

Methods: We abstracted data retrospectively from TB records of all HIV-infected TB patients diagnosed from 2001–2004. Poor treatment outcome was defined as death, treatment failure or treatment interruption.

Results: From 2001–2004, An Giang identified 638 HIV-infected TB patients, of whom 502 (79%) were male and 476 (74%) were aged 25–44 years. The most common self-reported HIV risk factor was sex with a commercial sex worker in 221 (35%). TB was classified as smear-positive in 531 (83%), smear-negative in 30 (5%), and extra-pulmonary in 77 (12%). During TB treatment, 167 (26%) patients died. In multivariable analysis, the only factor associated with good treatment outcome was cotrimoxazole preventive therapy (CPT), adjusting for demographics, type of TB, and occurrence of TB treatment side effects. Of 453 patients who received CPT, 116 (26%) had poor TB treatment outcome compared with 33 (72%) of 46 patients who did not receive CPT (adjusted odds ratio 0.4; 95% confidence interval 0.3–0.5).

Conclusions: In Viet Nam, HIV-infected TB patients have high mortality. These results support WHO recommendations to prescribe CPT to HIV-infected TB patients in order to improve their TB treatment outcomes.

TS-61718-02 Extensively drug-resistant TB as cause of death in TB-HIV coinfecting patients in rural South Africa

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Background: In rural KwaZulu Natal, South Africa, where TB-HIV coinfection rate is >80%, antiretroviral therapy has reduced mortality. However, 67% of remaining deaths are due to multidrug-resistant (MDR) TB. We sought to determine the extent of MDR-TB among patients (pts) in this district.

Methods: Surveillance with sputum culture and drug susceptibility testing initiated for pts with known or suspected TB in a rural South African hospital. Spoligotyping performed on isolates resistant to all tested TB drugs (isoniazid, rifampin, ethambutol, streptomycin, ciprofloxacin, kanamycin).

Results: Sputum from 559 pts from 2/2005 to 1/2006 revealed 197 (35%) pts culture positive for TB. Of these, 118 (60%) had MDR-TB and 59 (30%) had resistance to all first and second line drugs tested (meeting criteria for XDR-TB). Spoligotyping revealed 89% of XDR-TB pts infected with a single TB strain. 55 of 59 (93%) XDR-TB pts have died. Median survival after sputum collection 25 days (range: 11–136). All pts with known HIV status ($n = 43$) were HIV-positive. Only 34% of pts were previously treated for TB and 56% previously hospitalized.

Conclusions: Increased surveillance in rural South Africa has revealed markedly greater MDR-TB prevalence than previously recognized, with evidence of recent transmission of XDR-TB in HIV coinfecting pts. The convergence of the TB-HIV epidemic with MDR and XDR-TB in resource poor settings is a deadly threat to gains in survival achieved by TB DOTS and ARV therapy.

TS-61717-02 Implementing and evaluating a laboratory information system to optimize the treatment of tuberculosis patients

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Background: Treatment for multidrug-resistant tuberculosis in Peru is often delayed by over three months

after initial presentation. These potentially dangerous delays occur because of time required by the bacteriology tests and the cumbersome procedures for data collection and communication of results.

Objective: To develop and assess the feasibility and effectiveness of a web-based laboratory information system in reducing treatment delays, errors, and costs.

Methods: Partners In Health has developed a web-based medical record system (PIH-EMR) to support the treatment of TB, with data on 9678 patients to date. We have further developed a laboratory information system, 'e-Chasqui' to connect the national and regional laboratories to local health centers and specialists to reduce delay times and facilitate communication and analysis. e-Chasqui incorporates tools to improve data quality, notify health centers of new results and alert physicians about at-risk patients. In this first stage, we report on the implementation and feasibility of this system.

Results: e-Chasqui has been deployed in 12 health centers in two districts in Peru. Since its implementation in November, 2005, 6613 smear, 7062 culture and 1105 drug sensitivity test results have been entered. Since February, 2006 all health centers have viewed 100% of their results online. This experience demonstrates the feasibility of implementing a web-based laboratory information system in a low resource urban setting.

POSTER DISCUSSION SESSIONS

CLINICAL TRIALS AND TB BASIC SCIENCE

PC-61082-02 Possible markers for tissue tropism in *M. tuberculosis*

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Several host-related risk factors for extrapulmonary tuberculosis (TB) have been reported. Bacterial genome variations may also influence tropism of *Mycobacterium tuberculosis*. The aim of this study was to identify possible markers for tropism and virulence factors in isolates of *M. tuberculosis*. Comparative genome hybridization and epidemiologic data were integrated to investigate the relationship between genomic insertions and deletions and the clinical manifestations of disease. Complete genome interrogation, by use of microarray analysis, was performed on characterized isolates from cases with skeletal and pulmonary TB.

Twelve sequences encoding proteins or hypothetical proteins were absent only from the genomes of the pulmonary isolates. These included an archipelago of genes (rv2271-2277c) for 7 hypothetical proteins be-

lieved to encode for transmembrane and metabolic proteins. Isolates with wild type plcD were observed in pulmonary and clustered isolates. The locus plcABC were missing only from the initial isolate of an ongoing outbreak. This indicated that these sequences were deleted after transmission from an unknown common index case or during the progression of disease in the index patient. The current study suggests that genetic variations may affect tropism in *M. tuberculosis*. Individual and collections of genes encoding hypothetical and known proteins are presented as candidate markers for tropism in *M. tuberculosis*.

PC-61263-02 Minimum inhibitory concentration of isoniazid to BCG Tokyo strain

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Introduction: Bacillus Calmette Guerin (BCG) vaccines are basically safe attenuated live bacteria. However, BCG systemic infection may occur frequently when it is administered to immuno-compromised host like congenital diseases or human immunodeficiency virus infection. Additionally, some drug resistant BCG strains are reported. Isoniazid (INH) is one of the most powerful anti TB drugs, and the World Health Organization considers its use during the treatment of BCG infection. Then, it will be important to evaluate drug susceptibility of BCG strains to assure its safety.

Objective: To confirm the minimum inhibitory concentration (MIC) of INH to currently used BCG Tokyo 172 preparations.

Methods: Five lots of lyophilized BCG products and the seed lot were used in this study. MICs were measured as described in the Clinical and Laboratory Standards Institute and some previous reports. Bacterial suspensions were inoculated onto the agar medium containing 0.03, 0.06, 0.125, 0.5, 1.0, and 2.0 µg/ml of INH. After colony growth was observed, MICs were measured as the lowest concentration of INH that inhibited more than 99% of the bacterial population.

Results: The MICs to INH were 0.06 to 0.125 µg/ml against BCG preparations tested.

Conclusion: The data may indicate the safety of BCG Tokyo 172 substrain even in case of systemic dissemination, if it is treated appropriately. Our data will be useful for appropriate treatment in case of pathological complication of BCG Tokyo 172 substrain.

PC-61730-02 Characterization of spontaneous, in vitro-selected ethambutol-resistant mutants of *Mycobacterium tuberculosis*

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Aim: To explore the association of mutations in the *embB* gene and ethambutol resistance to clarify conflicting reports in the literature.

Method: Independent, spontaneous, ethambutol-resistant mutants from *M. tuberculosis* laboratory strain H37Rv and a pan-susceptible clinical isolate Beijing F2 were generated by plating 50 cultures of each strain derived from a single low density inoculum on medium containing 5 µg/ml ethambutol.

Results: Ethambutol-resistant mutants were recovered from 45 of the H37Rv cultures and 43 of the Beijing F2 cultures. Sequencing the region encoding amino acids 194-367 of the *embB* gene revealed that 47% (21/45) of the H37Rv and 86% (37/43) of the Beijing F2 mutants had mutations in this region of the *embB* gene. No mutations were found in the *embB* amino acid region 870-1040 for either strain.

Conclusion: The investigation of *embB* gene mutations and ethambutol resistance is complicated by the fact that ethambutol-resistant clinical isolates are often resistant to more than one drug and most often multidrug-resistant. The generation and in-depth study of spontaneous ethambutol-resistant mutants will aid in clarifying the association of *embB* mutations and ethambutol resistance.

PC-61600-02 Tuberculin-specific CD4 TH1 responses induces immune restoration syndrome in TB-HIV co-infected patients

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Background: We tested the hypothesis that an acute exacerbation of mycobacteria-specific-Th1-response, after HIV-infection HAART-control, causes immune restoration syndrome (IRS) in TB-HIV-co-infected-patients.

Methods: 24 untreated HIV-TB-co-infected patients were included when initiating antimycobacterial therapy and sequentially evaluated during HAART and at time of IRS. IRS was defined according to classical diagnostic criteria. Patients were declared IRS- if no IRS occurred within 3 months after HAART-initiation. Mycobacteria-specific (tuberculin/PPD, ESAT-6, CFP10 and others) Th1-IFN-γ-producing-cells were quantified by ELISpot and ICS.

Results: Eleven patients (46%) experienced IRS (IRS+). PPD-specific Th1 IFN-γ-producing CD4 cells increased sharply during IRS but not CMV-specific responses tested as control. Those PPD-specific cells represented up to 35% of CD4 cells (ICS) and all expressed HLA-DR. Only 4 IRS+ patients had ESAT-6- (one CFP10-) responses at time of IRS.

Conclusion: Immune restoration concomitant to CD4-T-cell exposure to some mycobacterial antigens (excluded ESAT-6 and CFP10) appears to cause IRS in HIV-TB-co-infected patients. This key event provides new evidence valuable for the diagnosis and treatment of IRS.

PC-61177-02 Time to signal in MGIT 960 for determining the early bactericidal activity of anti-tuberculosis agents

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Introduction: The early bactericidal activity (EBA) of antituberculosis agents is usually measured by the fall in colony forming units (CFU) of *M. tuberculosis* (MTB) grown from serial sputum dilutions on agar plates. The prolongation of time to signal (TTS) in a semiautomatic broth culture system (Bactec MGIT 960) inoculated with a neat sputum specimen is potentially a less expensive, faster and technically simpler means of quantitating MTB in sputum.

Method: Both TTS and CFU were collected from 331 sputum samples during a 7-day EBA study of isoniazid 300mg (INH), rifampicin 600mg (RMP) and an investigational drug (TMC207) in doses of 25mg, 100mg and 400mg in 38 patients with newly diagnosed, sputum smear-positive pulmonary tuberculosis.

Results: Fewer TTS than CFU samples were lost for analysis due to contamination or technical problems (11% vs. 5%, $P < 0.01$). TTS and CFU were strongly correlated ($r = 0.808$, $P < 0.001$). Significant correlations and similar percentage changes from baseline were found for all groups. Both methods ranked the groups identically. Relative to CFU, the EBA measured with TTS was higher for TMC, similar for RMP and lower for INH.

Conclusion: TTS in MGIT 960 looks a promising alternative to CFU counts for the determination of the viable bacterial load in sputum in EBA studies. More comparative studies with CFU and TTS are needed to validate TTS and to investigate the significance of the relationship between CFU and TTS.

PC-61285-02 Revisiting the pharmacokinetics and pharmacodynamics of rifapentine using the murine model

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Aim: To determine whether increased exposure to rifamycins enhances antituberculosis activity in the murine model of tuberculosis.

Design: Pharmacokinetic studies were conducted to compare rifamycin exposure after twice-weekly (2/7) rifapentine (P) dosing vs. daily (5/7) rifampin (R) dosing. The activities of P (2/7)-based regimens were then compared to R (5/7)-based therapy with isoniazid (H), and pyrazinamide (Z).

Methods: The primary pharmacodynamic parameters were calculated after dosing with R10 mg/kg (5/7) or P15 mg/kg (2/7). Balb/c mice were aerosol infected with *M. tuberculosis* and treated with 2 months of RHZ (5/7) or 2 weeks of RHZ (5/7) followed by 6 weeks of PHZ (2/7), with P administered at 10, 15 and 20 mg/kg. Relapse rates were also determined for mice treated with daily therapy and the predominantly P15 (2/7)-based regimen.

Results: The free drug weekly AUC/MIC and weekly time above MIC were 31% and 110% higher for P15 (2/7) vs. R10 (5/7). After 2 months of treatment the lung CFU counts for RHZ (5/7), P10HZ, P15HZ and P20HZ (2/7) were 2.56, 3.06, 2.37 and 1.68, respectively. After 4 months of therapy, 9/12 and 0/12 mice relapsed for RH (5/7) and P15H (2/7), respectively; 2/12 and 0/12 relapsed after 5 months. After 6 months rates were uniformly 0/12 for both treatment groups.

Conclusion: By virtue of the enhanced rifamycin exposure twice-weekly P15-containing regimens are more active than standard daily therapy and warrant clinical evaluation.

PC-61395-02 Characteristics of people living with HIV-1 screened for isoniazid preventive therapy, Botswana

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Background: IPT prevents tuberculosis (TB) among PLWH in highly TB-endemic countries. National programs can implement IPT more effectively with knowledge of characteristics of PLWH seeking therapy.

Methods: PLWH referred from local clinics and voluntary counseling and testing centers were screened

for a 2,000-person clinical trial of continuous IPT according to Botswana's National IPT Program guidelines. First-round exclusion criteria included acute illness, recent TB treatment, liver disease, or Karnofsky score <60. Second-round (trial-related) exclusion criteria included abnormal chest radiographs (CXR), elevated hepatic enzymes, significant neutropenia, or anemia.

Results: Between 11/04–03/06, 3842 persons underwent first-round screening (65% female; median age 33 years) of whom 1101 (29%) were excluded—48% due to acute illnesses. Of first-round screenees, 2516 (65%) completed second-round screening. Of second-round screenees, 562 (22%) were excluded of whom 52% had abnormal CXRs and 25% had neutropenia. Of first-round screenees, 1771 (46%) were started IPT. Among enrollees, 75% had tuberculin skin tests with <5 mm induration, median CD4 count was 308 cells/mm³ and 21% were receiving antiretroviral drugs.

Conclusions: Many PLWH seeking IPT had advanced HIV disease, and/or were ineligible due to illness or abnormal CXRs. As IPT candidates have new HIV diagnoses, these results suggest targeting healthy persons for HIV-testing and healthier PLWH for IPT.

PC-61998-02 Infection control and occupational diseases of medical personnel in the Tomsk Oblast TB Hospital

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Objective: To document the rates of TB among medical personnel working in the Tomsk Oblast TB hospital and evaluate administrative and preventive measures of infection control implemented during the last years.

Methods: Retrospective notification data on TB and other occupational respiratory diseases among medical personnel for the period of 1980–2005 have been analyzed.

Results: Within the period of 1980–2005 occupational diseases were notified in altogether 72 medical workers in the hospital: 37 persons (51%) contracted pulmonary TB, 32 persons (45%) extra-pulmonary TB. Respiratory diseases other than TB (bronchial asthma, medicament allergy) were diagnosed in 3 medical workers (4%). 53% of the personnel were nurses and laboratory staff, 19% were TB doctors and 28% belonged to other professions. 6 medical workers had MDR-TB. One nurse died, she had diabetes as concomitant disease. During the 1980s TB was detected in 1–2 medical workers annually. During the 1990s the notification rate increased, showing a maximum of 14 cases among medical workers in 1994. Within the last 4 years the rate decreased, only few TB cases

were notified. In 2005 no case of TB was identified among the medical personnel of the hospital.

Conclusions: Comprehensive measures of infection control comprising administrative and environmental control as well as individual protection have been implemented over the last year in the Tomsk Oblast tuberculosis hospital.

PC-61280-02 Reassessing dose-response relationships of anti-tuberculosis drugs

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Rationale: Greater understanding of dose-response relationships of existing drugs may inform their clinical usage and/or development of new drugs. We determined dose parameters of in vitro activity, minimum inhibitory concentration [MIC], minimum bactericidal concentration [MBC] and lowest concentration with maximum bactericidal effect [EmaxC] for isoniazid (H), rifampicin (R), pyrazinamide (Z), moxifloxacin (M), and PA-824 (Pa) against Mtb. The dose parameters of activity in the mouse model were also determined: minimum effective dose [MED], minimum bactericidal dose [MBC] and maximally effective dose [EmaxD].

Methods: Using Mtb H37Rv, MIC, MBC, and EmaxC were determined in 7H9 broth inoculated with 5log CFU. MED, MBD, and EmaxD were determined in BalbC mice after aerosol with 3.7log CFU. Quantitative CFU counts were performed on 7H10 or 7H11 agar. **Results:** For H, R, Z, M and Pa, MICs were 0.03, 0.25, 50.0 (at pH 5.5), 0.25, and 0.25 µg/ml, respectively; MBCs were 0.06, 0.5, 800 (at pH 5.5), 0.5, and 2 µg/ml, respectively; EmaxCs were 1, 4, >3200, 1, and 8 µg/ml, respectively. For H, MED, MBD, and EmaxD were 3.12, 6.25, and 100 mg/kg, respectively; for M, MED, MBD, and EmaxD were 25, 50 and >100 mg/kg, respectively; for Pa, MED, MBD, and EmaxD were 12.5, 100 mg/kg, and >200 mg, respectively; For R and Z, studies are still in progress.

Conclusion: For strongly bactericidal drugs H, R and M, MBC & MBD are 2x MIC & MED; For Z, MBC is 16x MIC; For Pa, MBC & MBD are 8x MIC & MED.

PC-61354-02 Evaluation of the investigational new drug PA-824 and its potential role in combination chemotherapy of TB

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Background: Because PA-824 (Pa) has potent activity against drug-induced persisters in mice, we tested

whether combinations of Pa with rifampin-isoniazid-pyrazinamide (RHZ) would improve the regimen's potency in the murine model of TB.

Methods: Eighteen days after aerosol infection, with lung CFU counts of 8.2 logs, mice received daily RHZ for 2 mo., then RH for 4 mo. or the same regimen with Pa (100 mg/kg) either added or substituted for R, H or Z. Lung CFU counts were performed at 2, 4 and 6 mo. of treatment. After 6 mo. treatment, additional mice went untreated for 3 mo. to determine relapse rates.

Results: Addition of Pa to RHZ had no effect on CFU counts. Substitution of Pa for R or Z was detrimental. Substitution of Pa for H however, resulted in an additional 1.3 log CFU reduction at 2 mo. After 4 mo., all mice receiving 2RPaZ+2RPa were culture-negative, while all mice in other groups were culture-positive. Ultimately, 0 of 46 (0%), 1 of 19 (5.3%) and 2 of 19 (10.5%) mice relapsed after receiving 2RHZ+4RH, 2RHZPa+4RHPa, and 2RPaZ+4RPa, respectively.

Conclusions: Despite its substantial activity against persisters when given alone, addition of Pa did not improve the potency of RHZ. While replacement of H with Pa led to a more rapid fall in CFU and faster culture conversion, the proportion of mice relapsing after treatment was no different than with RHZ. The potential of an RPaZ-based regimen to shorten the duration of therapy therefore warrants further study.

PC-61330-02 Increasing TB case detection in females through sputum submission instructions: an RCT in Pakistan

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Background: In several settings, female TB suspects test smear-positive less frequently than males. Submission of poor quality sputum specimens by females may be one reason for the gender difference.

Methods: 1604 male and 1494 female TB suspects at the Federal TB centre in Rawalpindi, Pakistan were enrolled onto a single-blinded randomised controlled trial to evaluate the impact of sputum submission instructions on case detection. Patients in the intervention arm received instructions prior to specimen submission and patients in the control arm submitted specimens without specific guidance, according to prevailing practice.

Results: Among females, instructions resulted in a 63% increase in smear-positive case detection, from 7.8% in the control arm to 12.7% in the intervention arm ($P = 0.002$). There was a decrease in spot sample saliva submission ($P = 0.003$) and an increase in females returning with an early morning sample ($P = 0.02$). There was no significant impact of instructions on males.

Conclusions: In this setting, lower female smear-

positivity was largely a function of poor quality specimen submission, and was increased substantially through the provision of brief instructions. Sputum submission guidance could be a cost-effective intervention to improve smear-positive case detection and reduce the gender disparity in smear-positivity rates in low-income countries.

PC-61951-02 Upper room ultraviolet light and negative air ionization both prevent airborne tuberculosis transmission

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Rationale: Institutional TB transmission is an important problem necessitating studies of environmental control measures.

Objectives: To evaluate upper room ultraviolet germicidal irradiation (UV) and negative air ionization for preventing airborne TB transmission.

Setting: A guinea pig facility sampling the air from a TB ward in Lima, Peru.

Methods: Exhaust air from the TB ward was passed through three enclosures each housing 144 guinea pigs. On alternate days, ward air was passed over 'control animals' and 'ionizer animals' (ionizers located within that animal enclosure). On the other days, UV lights were turned on in the ward and ward air passed over 'UV animals'. All guinea pigs had monthly tuberculin skin tests and positive reactors underwent autopsy and organ culture for TB.

Results: After 300 days there were 55 tuberculin-positives in the control animals, 26 in ionizer animals, and 15 in UV animals ($P < 0.001$) (Figure). Kaplan-

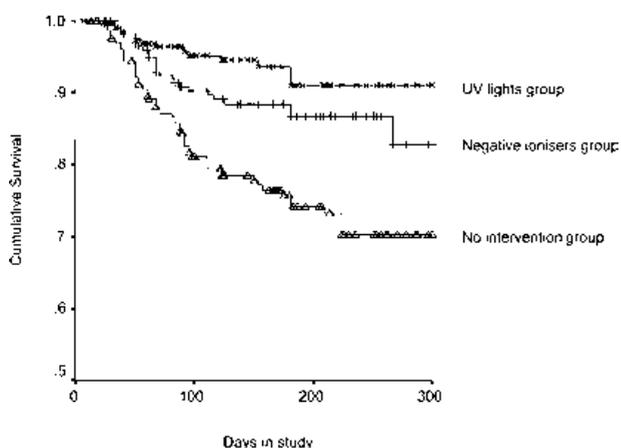


Figure Kaplan-Meier survival based on PPD skin test conversions.

Meier analysis of skin test data demonstrated that TB transmission was reduced by both ionizers (log rank 10.6; $P = 0.001$) and UV lights (log rank 23.4; $P < 0.0001$). Autopsy and culture results lag behind skin tests and currently provide borderline confirmatory evidence that UV is protective (log rank 3.6; $P = 0.057$) in this ongoing experiment.

Conclusion: Despite Lima's high humidity, upper room UV lights and negative air ionizers both prevented the majority of airborne TB transmission and these interventions should be considered in high-risk clinical settings.

EPIDEMIOLOGY AND LUNG HEALTH

PC-61554-02 Air pollution in Tehran, Iran: relationship between air pollution and cardiorespiratory diseases

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The purpose of this research was to investigate the effects of air pollution on cardiorespiratory health. The study was pursued by assessing the relationship between the levels of air pollutants and emergency visits for asthma and cardiovascular diseases in Tehran, Iran. Two research questions were investigated in this study. These research questions were as follows: Which criteria elements of toxic air pollution are associated most strongly with the level of hospital admissions for cardiorespiratory conditions? What proportion of the variation in hospital admissions for cardio respiratory admissions is explained by variations in levels of air pollution? Hypotheses were tested in relation to each of the research questions. The hypotheses were as follows: The correlation coefficients between a) particulate matter and hospital admissions for cardio respiratory problems and b) carbon monoxide and hospital admissions for cardio respiratory problems is greater than 70% ($r < 0.70$). Variations in the combined level of five criteria elements of toxic air pollution (excluding lead) explain >65% of the variations in hospital admissions for cardiorespiratory problems. Both hypotheses were supported. The major finding of the study was that variations in the five criteria elements of toxic air substances tested explain 68.7% of the variations in hospital admissions for cardiorespiratory problems.

PC-61213-02 Asthma patient management by physicians: a national survey performed among physicians and interns of Togo

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Background: Although it is a chronic inflammatory airway disease, asthma is still badly cared for. No study has been performed to assess asthma management by physicians and interns in Togo.

Objective: To evaluate physicians' and interns' attitudes to asthma management in Togo.

Methods: Transversal inquiry through anonymous questionnaire conducted through March 2005 among 159 physicians and interns caring for asthma patients in Togo. Data were upon the initial complementary analysis of asthma, prescription habits during and between acute periods of asthma, knowledge about the technical procedures of inhalation of sprays, use of the peak-flow meter and prescription for sport. Data analysis was performed using Epi Info software version 3.3.2.

Results: Participation rate was 78%. The peak flow meter is not known to physicians and is prescribed in 14.5%. Chest X-ray (97.5%) and hemogram (91.2%) were the most frequently prescribed analyses. During acute periods of asthma, β 2 agonists (spray and drips) are prescribed, commonly associated with corticosteroids. Between acute periods, sprays of β 2 agonists are prescribed with corticosteroids (spray and tablets). Dry powders are not known. Sport is often recommended in 39.3% and refused by physicians in 27.1%.

Conclusion: Asthma patients are not correctly managed in Togo. It is necessary to have a national asthma management guide for training.

PC-61824-02 The Asthma Program of Rio de Janeiro City: a hard beginning

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Introduction: Brazil ranks 8th worldwide in prevalent cases of asthma in children. Asthma remains as the 3rd most frequent cause of hospital admission, which represents an average annual cost of US\$76 380 116. To face this problem, from the year 2000 the Health Department of Rio de Janeiro City began implementing a structured program for controlling asthma, based on training the public health staff and categorizing the care according to the level of severity.

Objective: To improve the care to patients as standardized by the Brazilian Asthma Guideline, provid-

ing free medication in order to reduce the morbid-mortality associated with the disease.

Methods: 1) Establish a standardized routine for care, by defining the treatment regimens used; the means of achieving environment control and education for patients. 2) Develop and implement a system of registering the clinical attendance, in order to monitor the indicators of impact. 3) Develop a structured training program focusing on the clinical staff and nurses through five courses given along the year. Each course lasts 12 hours and is able to qualify 15 health workers.

Results: Five courses were accomplished and 106 health workers received training.

Conclusion: The plan has a potential to improve care to targeted patients but we have many challenges: insufficient number of public basic health units, the adherence of the Emergency Room teams to this plan and the organization of the Health Family Program.

PC-61279-02 Smoking and tuberculosis among silicotic patients in Hong Kong

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Background: Most silicotic patients are smokers and their high risk of tuberculosis allows easier exploration of the relationship between smoking and tuberculosis.

Method: 431 silicotic patients without previous history of tuberculosis were tuberculin tested with 1 unit of PPD-RT23 from 1995 to 2002, and followed up prospectively till the end of 2004. Baseline background and disease characteristics were analysed with respect to positive tuberculin reaction (≥ 10 mm) and development of disease by univariate and then multivariate analysis.

Results: Smoking, alcohol use, and body mass index were independent predictors of positive tuberculin reaction at baseline in multiple logistic regression analysis (all $P < 0.05$), but total cigarette pack-years did not demonstrate any significant effect. The annual incidences of tuberculosis were 1683, 2296 and 4392 for never, ex- and current smokers respectively. On COX proportional hazard analysis, current smokers have significantly higher risk of tuberculosis than those not currently smoking (adjusted hazard ratio 1.84, 95%CI 1.07–3.16) after controlling for age, alcohol use, tuberculin status, treatment for latent TB infection, and other relevant background/disease factors. A significant dose-response relationship was also observed with the number of cigarettes currently smoked.

Conclusion: Smoking increases the risk of both tuberculosis infection and subsequent disease development among silicotic patients.

PC-61324-02 Comparaison du tabagisme chez les jeunes scolarisés en milieux urbain et rural à Sousse, Tunisie

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Objectif : Comparer l'habitude tabagique chez les jeunes scolarisés en milieux urbain et rural au Sahel tunisien.

Méthodes : Une étude épidémiologique transversale a été menée dans la région de Sousse, ayant inclus 1569 élèves en milieu urbain et 793 en milieu rural suite à un échantillonnage en grappe à deux degrés. Les données concernant l'habitude tabagique ont été collectées à travers un questionnaire anonyme et auto administré.

Résultats : L'âge des jeunes variait de 13 à 17 ans avec un âge moyen de 15,11 ± 1,7 ans en milieu urbain et de 14,51 ± 1,56 ans en milieu rural. La prévalence globale du tabagisme était significativement plus élevée en milieu urbain qu'en milieu rural (7,6% vs. 4% ; $P < 0,0001$). L'étude de cette prévalence en fonction du sexe montre une prédominance masculine aussi bien en milieu urbain (14,7% vs 1,1% ; $P < 0,0001$) qu'en milieu rural (7,3% vs 1,2% ; $P < 0,0001$).

Conclusion : Les jeunes scolarisés, surtout ceux du milieu urbain, devraient constituer la cible des différentes interventions destinées à arrêter le tabac. Les services de médecine scolaire pourront représenter la plaque tournante d'un éventuel programme de lutte anti tabac.

PC-61062-02 Increased case detection of TB through intensive referral of TB suspects by village doctors to a TB dispensary

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Objective: To explore the new approach to increase case detection of pulmonary tuberculosis (TB).

Methods: 30 counties whose case rates were lower than the average in Hubei province in 2003 are involved in this project. TB suspects are inquired and referred by village doctors trained to county dispensary or designated township health center or general hospital for free sputum examination services. TB staff pursues TB patients and suspects notified by general hospital via phone call, letter and so on if they are lost during the transfer. Monthly reports are collected and checked regularly. χ^2 test is applied to analyze the quantitative data by SAS 8.1.

Results: From Nov. 2004 to Oct. 2005, 12 091 new smear (+) TB cases are detected in 30 counties. The new smear (+) registration rate increases from 36.2/100 000 to 49.6/100 000 ($\chi^2 = 101.7$, $P < 0.0001$) and the case detection rate under DOTS reaches 85.5%.

Among 43 464 TB suspects registered, 15 363 (35.3%) suspects are referred by village doctor, and 28 101 (64.7%) suspects consult at TB dispensary by themselves ($\chi^2 = 136.5$, $P < 0.0001$). The smear (+) rates in TB dispensary, general hospital, and township health center are 48.4%, 9.0% and 26.1% respectively ($\chi^2 = 142.0$, $P < 0.0001$). The tracing rate is 70.9%, and the arrival rate is only 33.1%.

Conclusion: It may obviously improve the case detection to intensively refer TB suspects by village doctors to TB dispensary. However, the technicians at sputum examination centers must be trained regularly.

PC-61340-02 Anti-tuberculosis multidrug resistance surveillance in the WHO European Region: the situation in 2004

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TB surveillance data from European countries (2000–2004) were used to describe drug resistance to both isoniazid and rifampicin (multidrug resistance, MDR) among TB cases reported with drug-susceptibility test results. In 2004, 35 of 52 countries (67%) submitted countrywide resistance data to Euro-TB: 25 from the European Union and West (EUW, excluding Baltic states), 5 from the Balkans, and 5 from the Former Soviet Union (FSU). Only 23 countries had nationally representative data (44%), reporting in total 877 cases. Of these, 604 (69%) were reported by the Baltic states, 194 (22%) by EUW and 79 (9%) by Balkan countries. In the EUW, MDR-TB prevalence was much higher (15.5%) in cases originating from the FSU than in cases from other countries (Asia 1.6%, Africa 1.5% and EUW 0.6%). MDR-TB was lower in previously untreated cases (primary MDR-TB) than among cases previously treated (acquired MDR-TB) in the Baltic States (11.2% vs. 44.0% respectively), in the Balkans (1.2% vs. 8.6%) and in EUW countries (1.1% vs. 6.6%). Between 2000 and 2004, primary MDR-TB increased significantly in Austria (from 0.4% to 3.1%), while in Israel it decreased (14.2% to 4.4%). Our analysis underlines the importance of timely surveillance of MDR-TB across the European continent and calls for a more active prevention of the emergence and transmission of drug-resistant strains, particularly in countries of the FSU.

PC-61535-02 Place de la mortalité respiratoire en Algérie

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L'Algérie a amorcé depuis la fin des années 80 une transition épidémiologique marquée par l'importance

du poids des maladies non transmissibles dans la charge de morbidité. Le projet TAHINA a pour but d'étudier les effets et les impacts de la transition épidémiologique dans les pays du Maghreb dans le but de proposer des stratégies de santé adaptées au contexte de la transition. L'analyse porte sur un total de 13.358 décès survenus durant l'année 2002. Les résultats montrent : 56% des décès touchent le sexe masculin et 44% le sexe féminin. Les décès sont plus fréquents dans les tranches d'âge 70 ans et 0-4 ans avec 38,7% et 23,7%. Parmi les affections transmissibles, 10,4% sont représentés par les infections des voies respiratoires, dominés par les bronchiolites aiguës et les pneumopathies. Parmi les décès par tuberculose, 38,3% sont des séquelles de tuberculose et 35,3% sont des tuberculoses d'autres organes. Dans les décès par affections non transmissibles, les décès par maladies respiratoires représentent 7,6% et sont dominés l'asthme avec 33% et les BPCO 21%. Les décès par tumeurs malignes montrent que Trachée/bronches/poumon représentent 12,3%. Ces premiers éléments seront utilisés pour déterminer la charge globale de morbidité et affineront les stratégies d'intervention.

PC-61676-02 Private DOTS clinic and comprehensive care, support and treatment

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Indonesia is the fourth most populated country in the world; contributes the third biggest number of Tuberculosis (TB) cases after India and China. The DOTS strategy started in 1995. Indonesian Association Against Tuberculosis (PPTI), established in 1968, adopted DOTS strategy in 1997, partnership with the government and Japan Anti-Tuberculosis Association (JATA), 2 private clinics in Jakarta belongs to PPTI started DOTS implementation in 1998. Both clinics contributed the province coverage of 20.3%; 19.1% and 19.3% in 2001, 2002 and 2003 consecutively

One of the clinics who had 700 new smear positive cases coverage annually with 3-4 times of smear negative cases, reach more than 90% cure rate with less than 3% discrepancy. From a small study in the period of 1998-1999, among the death, 15.4% were drugs user, also many smear negative patients with unclear chest X-ray were suspected to be AIDS, but not until 2004 when Voluntary Counseling and Testing (VCT) put in place, Human Immune Deficiency Virus (HIV) infected patients could be diagnosed.

In the period of September 2004 to February 2005; 37.7% patients were at high risk group, from those, 97.7% got VCT and 243 (23.1%) had HIV positive test result that make 8.7% identified as HIV positive

from the total TB patients. 72% were Injecting Drug Users (IDU) as risk factor followed by 22.2% sex.

Conclusion: DOTS clinic and VCT clinic should be under one roof.

PC-61794-02 New incidence of TB in Egypt

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Egypt has an intermediate incidence of tuberculosis, for evaluating the magnitude of the tuberculosis problem and its trend in Egypt three tuberculin surveys had been conducted, the first survey was in 1951 and with 350/100 000 incidence of population. The second in 1982 and the incidence was 70/100 000 of population and the last survey in 1997 and the incidence was 32/100 000 of population. But in February 2003 Egypt chosen by World Health Organization WHO/EMRO as one of 4 counties to attend a Surveillance exercise in Damascus-Syria for preparation of Cairo workshop in which 14 intermediate incidence countries were invited for measuring the new incidence of the TB through mathematic ways away from the high cost tuberculin survey. In March 2003, through the international workshop, Egypt estimated new incidence of TB as 28/100 000 population by three methods:

—Calculating the incidence from pulmonary deaths and case fatality rate.

—Estimation of incidence using projection of ARI.

—Styblo Estimation.

Since 2003 till now the TB incidence in Egypt is calculated annually based on these mathematical ways, and it was 24/100 000 population in 2005

PC-61811-02 Méthodologie de validation du St George Respiratory Questionnaire : étude comparative

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En se basant sur les études de validation du St George Respiratory Questionnaire dans différentes langues, l'objectif de ce travail était de faire le point sur les différences méthodologiques notées lors de ces études. Au cours du processus de traduction contre traduction, ces différences concernaient principalement les traducteurs dont le nombre et le profil différaient d'une étude à l'autre, et l'étape de l'adaptation conceptuelle qui ne respectait pas les mêmes normes. Les divergences notées lors de l'étape quantitative sont représentées essentiellement par le nombre de sujet nécessaire qui allait de 40 (version égyptienne) jusqu'à 318 patients (version espagnole). Ces validations se sont faites sur des patients atteints de pathologies res-

piratoires différentes (Bronchopneumopathie chronique obstructive, asthme, . . .). Les critères statistiques recherchés différaient également : certaines vérifiaient la fiabilité et une seule facette de la validité alors que d'autres évaluaient toutes les propriétés psychométriques. Les Gold standards et les examens complémentaires administrés n'étaient pas les mêmes dans chaque étude. De plus, des différences concernant la terminologie utilisée ont été également relevées. Malgré ces différences, toutes les versions étaient considérées selon leurs auteurs comme valides et fiables. Ceci souligne l'intérêt de développer des méthodes standardisées de validation de telles échelles sans lesquelles l'outil en question ne peut être valide.

PC-61837-02 Tuberculosis mortality rate change from death certificates review: Taiwan experience

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Background: In Taiwan, tuberculosis mortality rate is frequently to be criticized as overestimated due to some bias from death certificate coder.

Aim: To clarify the real mortality rate of tuberculosis in Taiwan.

Design: Case review study.

Method: We screened all the death certificates in 2004 which are regarded tuberculosis as the cause of death. In order to look into the quality and improving accuracy, standardized review protocol was introduced. Death certificates with logistic mistakes, sorting errors, etc. were selected for rechecking.

Result: The death number of tuberculosis change from 1277 (2002) and 1309 (2003) persons to 975 persons (2004). The mortality rate change from 5.68/100 000 persons and 5.80/100 000 persons (2002 and 2003) to 4.23/100 000 persons (2004).

Conclusion: Death certificates reviewing process can be a significant factor for improving TB mortality rate accuracy.

TREATMENT AND DRUG RESISTANCE IN TB

PC-61102-02 Early TB deaths: a distinct entity?

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Aim: To study patient characteristics in tuberculosis (TB) mortality.

Design: Prospective case series.

Methods: All case records of patients with TB diagnosed and treated at the Singapore General Hospital

between September 2005 and February 2006 were reviewed. All deaths as of March 2006 were analyzed. Patient deaths were divided into 2 groups—those who died from TB and those who died from other causes.

Results: 167 patients were found to have *Mycobacterium tuberculosis* complex. 118/167 (71%) had pulmonary TB, of whom 57/118 (48%) were smear positive for acid-fast bacilli. There were a total of 18 deaths, 10 from TB and 8 with TB—overall mortality 10.8%. Of the 10 patients who died from TB, 80% had pulmonary TB of whom 62.5% were smear positive, 90% had multilobar disease, and 60% had cavitary disease on chest radiograph. The median time from commencement of appropriate treatment to death was 9.5 days. Of the 8 patients who died with TB, 4 died from cancer, 2 died from ischaemic heart disease, 1 died from intracranial haemorrhage, and 1 died from gram-negative bacteraemia. Other patient characteristics are shown in the Table.

	Overall deaths (n = 18)	Deaths from TB (n = 10)	Deaths with TB (n = 8)
Age, years	74.6 ± 12.1	75.6 ± 12.1	73.3 ± 12.8
Pansensitive <i>Mycobacterium tuberculosis</i>	16 (89%)	9 (90%)	7 (87.5%)
Isolated resistance to isoniazid	1 (5.5%)	1 (10%)	0 (0%)
Isolated resistance to streptomycin	1 (5.5%)	0 (0%)	1 (12.5%)
Total pulmonary TB	13 (72%)	8 (80%)	5 (63%)
Smear-positive pulmonary TB	7/13 (54%)	5/8 (62.5%)	2/5 (40%)
Chest radiograph characteristics:			
Multilobar	10 (56%)	9 (90%)	1 (13%)
Cavity present	7 (39%)	6 (60%)	1 (13%)
Time between starting treatment and death, days	17 (1–87)	9.5 (1–42)	43 (9–87)

Conclusions: TB remains the leading cause of death worldwide from a single infectious organism. From our data, we are able to describe 2 distinct populations of patients—early and late death. In the patients who died from TB, most had severe disease and died early. We postulate that there is a distinct entity of early TB deaths.

PC-61128-02 Is the Mantoux skin test reaction suppressed with anti-TNF therapy?

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Background: Anti-tumor necrosis factor (TNF) agents are used to treat arthritis and Crohn's disease. TB reactivation has been reported in patients on this therapy.

Objective: Does a baseline Mantoux reaction ≥ 10 mm persist in patients receiving anti-TNF therapy.

Design: This was a retrospective study of Mantoux positive patients referred to TB clinic.

Methods: Patients who received three or more months of anti-TNF therapy and were currently on treatment were eligible. The baseline Mantoux reaction was retrieved from records of patients who had a skin test reaction ≥ 10 mm before therapy was started. Those who consented were given a repeat Mantoux skin test.

Results: 14 patients consented: 9 arthritis and 5 Crohn's; 9 women and 5 men. The mean age was 50.9 (43–65) years. Seven patients took etanercept and seven took infliximab. Mean duration of therapy was 22.2 (SD 15.2) months. The mean baseline Mantoux reaction was 15.6 (SD 5.7) mm. The mean repeat Mantoux reaction was 4.1 (SD 4.3) mm. This difference was significant ($P < 0.001$). The skin test reaction decreased to < 10 mm in 78.6% (11/14) of patients and < 5 mm in 57% (8/14).

Conclusions: The Mantoux reaction decreased a mean of 11.5 mm, from ≥ 10 mm to < 10 mm in 78%, from ≥ 5 mm to < 5 mm in 57% patients. This needs to be considered when interpreting the skin test in patients taking anti-TNF therapy.

PC-61679-02 Association between treatment interruptions and treatment default in new tuberculosis patients in Russia

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Objective: To determine the frequency of treatment interruptions and to evaluate the association between the period of interruption and default outcome in TB patients in Russia.

Methods: A retrospective case-control study of 1528 new pulmonary TB patients registered in 2nd–3rd quarters of 2003.

Results: Data from 84 patients with default and 1444 with treatment success were analyzed. During the intensive phase, defaulted patients had a significantly higher number of mean total days of inconsecutive interruptions (12.5 vs. 4.3 days, $P < 0.001$) and a higher total number of interruptions (2.6 vs. 1.1, respectively, $P = 0.001$), compared to patients with successful outcome. During the continuation phase, mean total days of inconsecutive interruptions (7.7 vs. 8.0 days, $P = 0.90$) and total numbers of interruptions (1.7 vs. 2.0, respectively, $P = 0.42$) did not differ significantly in patients with treatment success vs. default. Treatment interruptions in the intensive phase for ≥ 1 inconsecutive days were significantly

associated with default: 63.1% defaulted patients interrupted their treatment for ≥ 1 inconsecutive days, compared to 35.7% patients with treatment success (OR = 3.07, 95% CI 1.95–4.85).

Conclusion: The study shows that treatment defaults are associated with treatment interruptions. Treatment interruptions are common in TB patients in Russia. Interventions for improving treatment adherence are necessary.

PC-61687-02 Factors influencing follow-up smear results of pulmonary tuberculosis patients under the national program

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Objective: To identify factors associated with the results of serial follow-up sputum smear microscopy of the smear positive pulmonary tuberculosis (TB) cases.

Design: A retrospective cohort analysis. We reviewed demographic, radiological, and bacteriological data of TB patients registered as smear positive new or relapsed cases at the health centers in 2004.

Results: The positive rates were 12.3%, 3.9% and 2.8% in 3651 new cases and 10.6%, 6.7% and 4.2% in 1061 relapsed cases at the early 3rd, 5th and 6th month respectively. In a multivariate logistic regression analysis, positive smears at the 3rd month treatment were associated with higher grades of initial smear results (odds ratio [OR]; 2.07, 95% confidence interval [CI]; 1.77–2.42), treatment with non-standard regimen (OR; 1.87, 95% CI 1.24–2.81), presence of cavitory lesion (s) (OR; 1.56, 95% CI 1.20–2.04), male (OR; 1.72, 95% CI 1.26–2.33) and old age (OR; 1.33, 95% CI 1.02–1.73) in new cases. In relapsed cases, drug resistance (OR; 3.34, 9% CI; 1.71–6.51) and higher grades of initial smear results (OR; 2.17, 9% CI; 1.67–2.81) were significantly associated with the results by multivariate analysis. 'Cavitory lesion in chest X-ray' was only significant in univariate analysis. Sex and age group were not significant.

Conclusion: Follow-up smear at the 3rd month treatment was closely associated with bacillary counts of diagnostic smears and afterward with treatment outcomes.

PC-61770-02 Isoniazid therapy for latent tuberculosis in persons living with HIV/AIDS in western Kenya

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Background: A critical component of HIV/AIDS care is the prevention of tuberculosis. Treatment of LTBI with isoniazid (INH) is thus increasingly available as part of programs throughout the developing world. Evaluation of the outcomes of such programs is essential to determine the impact of this care as well as optimal program design.

Objectives: To evaluate the programmatic use of LTBI treatment in an HIV care program in western Kenya.

Design: Cross sectional cohort analysis of data collected from PLWAs receiving INH.

Setting: Twelve HIV clinics in western Kenya.

Main outcome measures: Adherence, development of hepatitis and peripheral neuropathy.

Results: The total number of registered adult PLWAs at AMPATH as of February 2005 was 19 202, of whom 8385 (44%) were prescribed INH. The median age of LTBI patients is 36.3 years, 71% of whom are female. Self reported adherence to therapy revealed that 91% took INH on all days prescribed. 46 patients developed hepatitis as defined by symptoms in association with transaminase elevations, 36 of whom were on concomitant antiretrovirals. 941 patients developed peripheral neuropathy, 777 of whom were on concomitant antiretrovirals.

Conclusion: Administration of INH therapy is feasible within the context of an established care program. Rates of side effects appear low, suggesting tolerability, even when used with concomitant antiretrovirals. Self reported rates of adherence was good.

PC-61112-02 Predictors of treatment interruption among tuberculosis patients in Central Asian countries and Russia

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Aim: Tuberculosis (TB) treatment interruption (TI) leads to lower treatment effectiveness and drug resistance. Characteristics of TB patients that are predictive of TI may help focus interventions to increase successful TB treatment.

Methods: We applied univariate and logistic regression analysis to routine electronic TB surveillance and case management records from Kazakhstan (Kz), Kyrgyzstan (Kr), and five regional TB hospitals in central

Russia (Ru), analyzed separately. Records of TB treatment from 47 740 patients in KZ in years 2000–2001 and from 5690 patients in KR in 2002–2003 were analyzed. Russian data from 1993–2002 contained 17 300 in-patient records. We excluded patients if they were under 18 years of age, ‘transferred in’ or ‘transferred out,’ or died during treatment.

Results: Country-specific logistic models found the same predictors, often with similar strength of association: prison history (Kz: Odds ratio [OR] = 1.8, 95% confidence interval 1.6–2.1, Ru: OR = 1.7 95%CI 1.2–2.6), unemployment (Kz: OR = 2.0, 95%CI 1.8–2.2, Ru: 1.9, 95%CI 1.–2.3), concomitant diseases (Ru: OR = 0.8, 95%CI 0.7–0.9, Kz: OR = 0.8, 95%CI 0.7, 0.9), 20–50 year age group (Kr: OR = 1.3, 95%CI 1.2–1.5, Ru: 1.5, 95%CI 1.3–1.7), male (Kz: OR = 2.0, 95%CI 1.8–2.2, Ru: OR = 2.1, 95%CI 1.7–2.6). Alcohol abuse was a stronger indicator in Ru than in Kz (OR = 3.1, 95%CI 2.3–4.2 vs. OR = 1.8, 95%CI 1.5–2.1 respectively).

Conclusions: The results of this study can help target interventions for improvement of TB control in former USSR countries.

PC-61755-02 Comparing drug consumption against quantities ordered and prediction using an information system

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Background: The programming of purchases of multi-drug-resistant tuberculosis medications is crucial to receive the lowest price and avoid stock outs. Currently an estimation method based on approximations of past consumption data is used to place orders for the Global Fund.

Objective: To compare the actual medication consumption for individualized treatment in the First Phase (Sept. 2003–Nov. 2005) of the Global Fund against the order placed and a prediction obtained from the clinical information system PIH-EMR.

Methods: Medication consumption data was obtained from the Socios en Salud (SES) warehouse for 58 patients who had finished their treatment. Only medications that were fully supplied by the SES were included in this analysis. SES clinical personnel performed the medication prediction using the PIH-EMR, and placed the order using the existing estimation method.

Results: The PIH-EMR had a mean of predicted/actual use of 99%. The current estimation method had a mean

of predicted/actual use of 145%. The PIH-EMR's underestimation of capreomycin is due to increased consumption from previous years related to a large purchase of that medication and a shortage of kanamycin. **Conclusions:** The PIH-EMR estimation tool is dynamic and takes into account the epidemiological changes in the population to be treated and the full length of the patients' treatment. The PIH-EMR estimation tool is simple to use and can provide a more accurate estimate of future medication consumption.

	Actual consump.	Order placed	Predicted/ actual	PIH-EMR prediction	Predicted/ actual
N	58	58		58	
Cycloserine (250 mg)	78 774	108 576	138%	85 445	108%
Ciprofloxacin (500 mg)	74 728	97 718	131%	88 211	118%
Ethionamide (250 mg)	76 519	76 003	99%	72 494	95%
Moxifloxacin (400 mg)	3 450	7 238	210%	3 734	108%
Capreomycin (1 g)	8 726	12 667	145%	5 798	66%
Average			145%		99%

PC-61843-02 Effectiveness of the WHO standard treatment regimens in patients with isoniazid-resistant tuberculosis

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Objective: To evaluate the effectiveness of short-course chemotherapy regimens based on isoniazid (INH) and rifampin (RIF) in patients with known resistance to INH.

Methods: 2300 patients newly diagnosed with pulmonary TB between 1997 and 2003 in TB Programs in Tomsk, Russia were enrolled. The primary outcome of interest was culture conversion measured on the 5–6 month after treatment initiation. Patients were classified into two groups: Group 1 (2009) demonstrated pan-susceptible strains and Group 2 (291) demonstrated resistance to INH. Patients were also stratified by initial smear status within both groups. Both groups received the same treatment regimens, consisting of INH, RIF, PZA and EMB/S under DOT as per WHO recommendations.

Results: In smear-positive Group 1 patients compared with smear-positive Group 2 patients, 5–6 month culture conversion was significantly higher: 97.2% vs. 80.1% (OR = 8.7; 95%CI 4.29–17.83, $P < 0.05$). This result was not significant when smear-negative Group 1 and Group 2 patients were compared: 97.2% vs. 93.3% (OR = 2.54; 95%CI 0.85–7.24, $P = 0.11$). **Conclusion:** Burden of mycobacterial excretion as represented by an initial positive smear may impact

treatment outcomes among patients with INH resistant strains of TB. Further study needs to evaluate impact of 2nd line drugs on treatment of patients with known resistance to INH.

PC-61134-02 Multiple-dose pharmacokinetics of efavirenz with and without the use of rifampicin

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Objective: To evaluate EFV pharmacokinetics after multiple-dose administration of 800 mg/daily in HIV-positive patients with tuberculosis (TB) treated with rifampicin (RMP).

Methods: We carried out a prospective, comparative study to define efavirenz (EFV) pharmacokinetics in 16 cases and 13 controls. Cases were HIV-TB co-infected adults assuming RFM 600 mg once daily and EFV at the dose of 800 mg once daily. Patients on EFV without RFM at the standard dose of 600 mg were taken as controls. EFV levels in plasma were assayed by HPLC and pharmacokinetic parameters were determined by non-compartmental methods.

Results: Among cases, 81% were males, mean age was 37 years, mean weight 64 kg, mean CD4 cell count and log HIV RNA copies were 160 cells/mm³ and 5.2 log copies/ μ l, respectively. Cases had a significantly higher Cl/F/kg if compared with controls (0.269 ± 0.12 vs. 0.167 ± 0.05 L/h/kg, $P < 0.01$). Otherwise, dose-dependent pharmacokinetic parameters of EFV were similar between cases and controls. Interindividual variability was consistently higher among TB cases compared to controls for all considered parameters.

Comments: A dose of 800 mg of EFV in association with RFM produces EFV plasma levels similar to the standard dose in patients not taking RFM. Therapeutic drug monitoring may be recommended for patients on combination therapy with RFM.

PC-61304-02 Case detection and predictors for incident tuberculosis in persons attending an HIV clinic in western Kenya

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Setting: Patients attending a large HIV clinic in Kisumu, and not on antiretroviral treatment. TB case finding was based on clinical suspicion.

Method: Routinely collected data were analyzed to describe detection of TB upon enrolment, TB incidence during follow up, and patient characteristics and clinical indicators present at enrolment that predict incident tuberculosis.

Results: Among 2753 patients, 2.2% were identified with active TB between clinic enrolment and first follow-up visit. After the first follow-up visit TB incidence was 5.8/100 person years (95% confidence interval (CI) 4.6–7.4). In multivariate analysis, risk factors associated with incident TB during the first 5 months after enrolment were: report of ≥ 2 symptoms from fever, night sweats and/or weight loss during the month prior to enrolment (HR 2.5, 95% CI 1.2–5.3), Karnofsky performance score below 100% (HR 5.8, 95% CI 1.3–26.4 for a 90% score, and HR 7.0, 95% CI 1.6–30.1 if $\leq 80\%$). A previous TB episode increased TB incidence throughout follow-up (HR 5.2, 95% CI 1.2–21.7). The WHO stage of HIV disease at enrolment was not an independent predictor for incident TB.

Conclusion: The predictors for incident TB within 5 months of enrolment combined with a low proportion of patients identified with active TB upon enrolment compared to other studies, suggest incomplete and delayed detection of active TB at enrolment. Routinely applied TB diagnostic algorithms and more sensitive diagnostic tests are recommended.

PC-61705-02 MDR-TB emerges as principal cause of death in TB-HIV patients on therapy in rural KwaZulu Natal, South Africa

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Introduction: More than 2/3 of all TB cases in KwaZulu Natal South Africa are coinfecting with HIV, with a case fatality rate of 40%. Strengthening TB DOTS programs and integration with antiretroviral therapy (ARV) for co-infected patients may improve outcomes for both diseases.

Methods: Observational study of patients (pts) with active TB and HIV in rural resource-poor KwaZulu Natal. Patients receive standard TB therapy and once-daily ARV (ddI+3TC+EFV) concurrently by home-based DOT. Pts are followed for 12 months for TB and HIV outcomes.

Results: 115 TB-HIV patients enrolled (58 women); mean age 32 years, mean CD4 107 cells/mm³. Of 85 pts currently reaching 12 months, mean weight gain was 5.9 kg, CD4 increase 196 cells/mm³, and 87% have

undetectable HIV viral loads. 69 (81%) pts successfully completed initial TB treatment, 4 (5%) defaulted, 2 (2%) are alive on 2nd line therapy for MDR-TB and 10 (9%) died on therapy; 6 of 10 deaths had suspected ($n = 2$) or confirmed ($n = 4$) MDR-TB. Six of 69 pts (9%) relapsed with MDR-TB after TB treatment completion; 4 of 6 (67%) have died. All-cause mortality was 12%/pt-year; MDR-TB-attributable mortality 8%/pt-year.

Conclusions: Integration of TB and HIV therapy improves mortality and TB and HIV outcomes among coinfecting patients. MDR-TB has emerged as the principal cause of death in this group. Greater efforts to identify, treat and prevent transmission of MDR-TB are necessary to further reduce mortality in TB-HIV coinfecting patients.

PC-61963-02 Magnitude of tuberculin reactions: the risk of disseminated tuberculosis in an HIV-infected cohort in Tanzania

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Background: Data are not available on the relationship between the magnitude of a positive tuberculin skin test (TST) reaction and the subsequent risk of disseminated tuberculosis.

Objective: To investigate TST reactivity as a predictor of subsequent pulmonary and disseminated tuberculosis in HIV-infected patients. Secondly, characteristics associated with a positive TST were assessed. **Methods:** HIV-infected patients eligible for a tuberculosis vaccine trial in Tanzania (CD4 > 200, BCG scar) had a TST at enrollment and received 6 months of isoniazid for TST reactions >5 mm. Subjects were followed for the development of pulmonary or disseminated tuberculosis.

Results: Of 1944 patients, 637 (33%) had a positive TST (>5 mm induration). Higher CD4 counts (500 mm³ vs. 457 mm³, 95% CI 21–65) and male sex (RR = 1.43, AR = 12.9%) were associated with TST positivity. Patients with a positive TST were significantly more likely to develop tuberculosis, with the risk increasing with TST induration size (RR of disseminated tuberculosis 18.8 for TST ≥ 15 mm; RR of pulmonary tuberculosis 5.8 for TST ≥ 20 mm.)

Conclusion: Among HIV-infected patients with CD4 counts ≥ 200 the risk of disseminated and pulmonary tuberculosis both increase with increasing magnitude of the TST reaction. This risk persists even when treatment for latent tuberculosis infection is administered.

TB EPIDEMIOLOGY AND CONTROL

PC-61151-02 Evaluating the impact of the 2nd global plan: the 1st year of the Thailand TB Active Surveillance Network

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Background: WHO's 2nd Global Plan to Stop TB advises high-burden TB countries to expand case-finding in the private sector and enhance HIV and multidrug-resistant TB (MDR-TB) services. Two years before this plan was released, we developed the Thailand TB Active Surveillance Network (TBNNet) to evaluate these strategies.

Methods: In 10/2004, we began contacting public and private healthcare facilities monthly to record data about persons diagnosed with TB, assist with patient care, provide HIV counseling and testing, and obtain sputum for culture and susceptibility testing. TBNNet's catchment area includes 3.6 million persons in 4 provinces.

Results: From 10/04–9/05, TBNNet ascertained 5724 TB cases (159/100 000), including 2258 new, smear-positive cases (63/100 000). Compared with routine surveillance from these sites in 2003, active surveillance increased reporting of all TB cases by 17% and of new, smear-positive cases by 10%. Private facilities diagnosed 662 (12%) of all TB cases. Of 4828 with unknown HIV infection status, 3847 (80%) received counseling; 3292 (86%) of these agreed to testing. Of all TB cases, 1360 (24%) were known to be HIV-infected. Mycobacterial culture was performed in 2473 (54%) and MDR-TB diagnosed in 51 (1%) of 4543 pulmonary TB cases; 32 (63%) MDR-TB cases were previously treated for TB.

Conclusions: In Thailand, piloting of the new WHO strategy increased case finding, collaboration with the private sector, HIV services for TB patients, and MDR-TB diagnosis.

PC-61248-02 Analysis of the consultation status of tuberculosis suspects in 30 counties in Hubei

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Objective: To analysis the consultation status of Tuberculosis suspects in different conditions.

Methods: Tuberculosis suspects were recommended to county TB dispensaries by trained village-doctors in 30 FIDELIS Counties from Nov. 2004 to Oct. 2005.

Result: The total consultation rate, recommendation consultation rate and self-consultation rates were 180/100 000, 60/100 000 and 120/100 000, respectively; In 2003, the total consulting rate, recommendation consultation rate and self-consultation rate were 140/100 000, 20/100 000 and 120/100 000, respectively. There were significant difference on total consultation rate and recommendation consultation rate before and after FIDELIS project ($\chi^2 = 3636.7$, $P < 0.01$; $\chi^2 = 476.2$, $P < 0.01$), but no significant difference on self-consultation rate ($\chi^2 = 2.1$, $P > 0.05$). The recommendation consultation rate in poverty counties was significantly higher than in non-poverty counties (90 and 60/100 000, respectively, $\chi^2 = 314.9$, $P < 0.01$). The recommendation consultation rate in mountainous counties was significantly higher than in plain and hill counties (100, 50 and 60/100 000, respectively; $\chi^2 = 588.1$, $P < 0.01$).

Conclusion: It is effective to increase the rates of consultation rate and case-finding rate by recommending TB suspected to TB dispensaries by village doctors in poverty and mountainous areas where the medical services was lacked.

PC-61298-02 Annual risk of TB infection (ARTI) in Mumbai slum communities far exceeds countrywide estimates in India

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Background: In 2003, a national survey conducted by the Government of India found an ARTI ranging from 1.1%–2.9%. This study determines the ARTI for children (5–9 years of age) living in a Mumbai slum community and participating in an NGO program.

Methodology: Eligible children were examined for evidence of a BCG scar and received tuberculin testing using 5 TU PPD, by standard Mantoux technique. Reactions were read after 48–72 hours. The ARTI was calculated using: $1-(1-\text{Prevalence})^{1/\text{Mean Age}}$. Ethics approval was attained from the Queen's University Health Sciences and Affiliated Teaching Hospitals Research Ethics Board.

Results: Of 512 eligible children, 446 (87%) were skin tested and 408 (80%) returned for interpretation. The average age of those tested was 7.0 years. 252 (52%) eligible children had evidence of BCG vaccination. The estimated prevalence of TB infection was 49.5% [95%CI ± 4.85] using a 10 mm cutoff (ARTI = 9.4%) and 40.4% [95%CI ± 4.76] using a 15 mm cutoff (ARTI = 7.1%). The presence of a BCG scar did not influence the estimated prevalence or ARTI.

Conclusion: The study indicates a high estimated

prevalence of latent TB infection and ARTI, far beyond other analyses. Inadequate human resources in part contribute to the problem. NGOs should bridge this gap by serving as a conduit between the private and public sectors, include TB screening as part of other services provided, and use outreach initiatives as a platform for awareness raising and advocacy.

	Sample size (N° read)	10 mm induration estimated prevalence % (95%CI)	10 mm induration ARTI (%)	15 mm induration estimated prevalence % (95%CI)	15 mm induration ARTI (%)
Total	408	49.5 (±4.85)	9.4	40.4 (±4.76)	7.1
BCG scar +	215	48.8 (±6.68)	9.1	40.9 (±6.57)	7.2
Males	199	45.3 (±6.92)	8.3	35.9 (±6.67)	6.2
Females	202	50.0 (±6.90)	9.3	42.1 (±6.81)	7.4

PC-61774-02 Contact survey of children under the age of 5 years living with pulmonary TB in the same household

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Objective: To examine the prevalence of tuberculosis infection and disease in children under 5 years in household contact with pulmonary TB in Cambodia. **Methods:** 161 children in contact with smear-positive and 60 children in contact with smear-negative underwent clinical examination, TST, QuantiFERON® TB-2G (QFT) and chest X-ray, at least 2 months after the index case started TB treatment.

Results: 40 (25%) children living with smear-positive TB and 8 (13%) children living with smear-negative TB were TST-positive with 10-mm threshold. 30 (19%) contacts of smear-positive and 3 (5%) contacts of smear-negative were QFT-positive, respectively. 14 (9%) children with TST-positive living with smear-positive had active tuberculosis such as lymphatic or pulmonary TB. One child in close contact with smear-negative TB was diagnosed as hilar lymph node TB.

Conclusion: Universal INH prophylaxis for childhood contacts of smear-positive TB needs careful discussion even in high burden countries. In resource-limited settings like Cambodia, where TST is usually not available and chest X-ray service is poor, strengthening childhood contact investigation is one of challenging problems under NTP.

PC-61785-02 A three-year follow-up of TB infection and disease in pediatric household contacts of smear-positive PTB

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Objective: To determine the incidence of TB infection and disease in pediatric household contacts of smear positive pulmonary tuberculosis three years after initial evaluation.

Methods: A cohort study among 128 pediatric household contacts of 86 smear positive adults with PTB was done. The children were classified as either having disease, infection, or non-infection during the initial evaluation in January 2002–December 2003. The previously non-infected children underwent a repeat tuberculin skin test in January 2006. If it was positive they had a chest X-ray taken; if PTB was found, they had a sputum examination. The previously infected children underwent a repeat chest X-ray and subsequent sputum examination if there was evidence of PTB.

Results: On initial evaluation, the prevalence of TB disease among the pediatric contacts was 3%, infection was 57.8%. The age of more than 5 years was associated with an increased risk for infection (OR = 4.3, 95%CI = 1.8–10.1). 52% (*n* = 65) of the original study population came for reevaluation. An additional 12.5% was found to be infected resulting to a cumulative incidence of 77%. None of these children were found to have the disease on follow up.

Conclusion: Contact screening is of great value for detecting infection and disease among the pediatric household contacts of adults with smear positive PTB. Follow up of such cases contribute significantly to the detection of more cases of tuberculosis infection in this group of patients.

PC-61802-02 First national tuberculin survey in Nepal

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Objective: To assess the prevalence of tuberculosis infection in primary school children in Nepal (class 1 to 3).

Methods: In 33 districts, selected by probability proportional to population size sampling, within 4 geographical zones (mountains, hills, terai and Kathmandu Valley) schools are selected by random sampling. The total sample size will be 15 000 primary school children in class 1 to 3. All schools will be visited by one of the two trained field teams. At least one week before the survey the school is visited by a member of

the field team to plan the survey and request permission from the school and the parents. At the first day of the survey the teams will test the children using 2 TU in 0.1 ml PPD RT23/Tween 80. The test will be read 72 hours after administration. Data entry will be done using Epi Info 6.04d. All data will be double entered and checked. After data validation the Annual Risk of Tuberculosis Infection (ARTI) will be assessed using cut off levels that were used in previous surveys and the mirror method.

Results: By April around 4000 children in 7 districts have been tested.

Conclusion: This first national tuberculin survey is underway in Nepal; preliminary results may be available in October.

PC-61868-02 Impact of task force actions for tuberculosis control in high-burden cities in the State of Sao Paulo, Brazil

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Introduction: Task force (TF) is the operational ensemble created by Brazilian Department of Health (DH), State Secretaries of Health (SSH) and Municipal Secretaries of Health to increase actions for tuberculosis (TB) control according to National Tuberculosis Control Program (NTCP) under management of each government level and the support from partner and sponsor institutions. Task force consultants are the pooling of professionals—DH professionals that work with the purpose to carry out goals of NTCP in high burden cities with TB under institutional responsibility of DH.

Method: Comparison of data of TB Laboratory Information (LAB-TB) from respiratory suspects attended (RSA) between 1st quarter 2005 and 1st quarter 2006 from 12/73 high burden cities with TB at State of Sao Paulo which was done a workshop to cause sensibility and also a training for all health care workers from basic health care (BHC) for TB control in the second quarter of 2005.

Results: TF accomplishment in the training for all health care workers from BHC has been demonstrated to cause sensibility in the active seeking of TB cases as demonstrated in the Table, considering RSA. Thus, that success brought increase on information system. Therefore, with the binomial TF-Epidemiological Surveillance Center, the 73 cities with high burden of TB at State of Sao Paulo closed 90% of data information at National Information System (SINAN).

Table Twelve cities at Sao Paulo State with high burden of TB cases trained by task force for active seeking for TB cases during 1st quarter 2005 and results until 1st quarter 2006, Brazil

N ^o	High burden cities with TB cases	1st quarter 2005		2nd quarter 2005		3rd quarter 2005		4th quarter 2005		1st quarter 2006	
		RSA	Cases								
1	Carapicuíba	1051	53	1042	40	636	53	1306	16	1073	64
2	Diadema	370	16	976	11	409	17	312	19	207	9
3	Ferraz de Vasconcelos	181	5	206	11	278	16	283	16	2	1
4	Itapevi	266	24	323	34	245	37	245	18	144	2
5	Itapeçerica da Serra	194	20	206	8	407	9	488	7	206	37
6	Itaquaquecetuba	234	7	184	5	153	3	147	11	158	10
7	Mogi das Cruzes	110	9	186	9	189	21	138	25	34	7
8	Santo Andre	508	33	658	37	504	149	438	33	403	46
9	Sao Bernardo Campo	269	28	339	26	298	22	263	40	235	41
10	Sao Caetano do Sul	12	3	25	8	21	8	8	1	34	7
11	Suzano	128	11	301	19	224	12	186	10	193	22
12	Tauboá da Serra	420	38	410	17	365	20	658	21	77	10

RSA = respiratory suspect attended; TB = tuberculosis.

Source: Laboratory Information System on Tuberculosis at Sao Paulo State, Brazil-AB-TB. Apr 2006.

PC-61346-02 Impact of HIV infection on the epidemiology of tuberculosis in Uruguay, 1994–2004

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Background: Since 1980 a declining incidence of tuberculosis (TB) cases has been observed in Uruguay. However, for the last decade, the reduction in TB incidence has stalled, hovering around 20 cases/100 000. One of the likely causes for this phenomenon is an increased contribution of patients positive for HIV infection to the incidence of TB.

Methods: We conducted a retrospective cohort study of all TB patients registered from 1994–2004. We sought to analyze how HIV infection has impacted TB epidemiology in Uruguay during this period. TB patients are routinely tested for HIV, over 83% during this period.

Results: A steadily increasing contribution of HIV-positive patients to the incidence of TB was observed throughout the study period. On average, 10% of the TB patients were HIV-positive (lowest: 4% (1994), highest: 14% (2002)). The treatment success rates were significantly lower in TB patients who were HIV-positive (57%) vs. those HIV-negative (92%). Conversely, deaths rates were significantly higher in HIV-positive (37%) vs. those HIV-negative (6%). No differences were observed between HIV-positive and HIV-negative TB patients with respect to drug-resistant TB (OR 0.77, 95%CI 0.32–1.73).

Conclusions: HIV among TB patients in Uruguay is a barrier to successful control of TB infection, and is

associated with high death rates. Collaborative TB-HIV activities must be implemented urgently in Uruguay to alleviate the impact of this dual epidemic.

PC-61331-02 High risk of tuberculosis among health care workers in the Murmansk Region, Russia

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Introduction: Health care workers (HCWs) are an invaluable resource in tuberculosis (TB) control. High rates of TB among HCWs compromise efforts to maintain this resource. Infection control measures have been neglected in many areas of Eastern Europe. Identifying HCWs at high risk helps to direct protective measures where most needed.

Aim: To compare risk of TB among HCWs and the permanent adult population in a region with high rates of multidrug-resistant (MDR) TB.

Methods: The number of TB cases was obtained from the Murmansk Regional Tuberculosis Dispensary (MRTBD) and population counts from the MRTBD, Regional Health Administration and the Territorial Authority of the Federal State Statistic Service of Murmansk Region.

Results: During 1999–2004, there were 15 new TB cases (13 female) among HCWs employed in the MRTBD. The unadjusted annual incidence was 1101/100 000 in the MRTBD and 52/100 000 in the adult permanent population. Among females, incidence (1070/100 000) was 37 times higher among staff than among general population (RR 37). Ratio changed little adjusting for age and sex using indirect standardization (SIR 39,18). In the entire Murmansk region, TB incidence was twice as high among female HCWs than among general female population.

Conclusions: HCWs working in facilities where TB patients are treated were at increased risk for tuberculosis which suggests health care-associated TB. High MDR-TB rates make improvements in infection control all the more imperative.

PC-61416-02 Tuberculosis outbreaks in the United States; 2002–2005

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Background: Despite low tuberculosis (TB) rates in the United States (4.8/100 000 in 2005), TB transmission, including outbreaks, continues to occur. At the request of local TB programs, the Division of Tuberculosis Elimination (DTBE) provides epidemiologic assistance for outbreak investigations.

Methods: We queried DTBE's outbreak data repository for investigations conducted in the United States during 2002–2005. We summarized investigations by population type and factors contributing to the outbreak.

Results: DTBE conducted 26 outbreak investigations. Of these, 7 (27%) involved foreign-born, 6 (23%) homeless persons, and 4 (15%) drug-users. 4 (15%) of these outbreaks involved African Americans, 2 (8%) Native Americans, and 2 (8%) health-care workers. 3 (11%) were in immunocompromised persons, including 2 in HIV co-infected persons (percentages not mutually exclusive). Factors contributing to these outbreaks included delayed diagnosis, incomplete contact investigations, failure of contacts to adhere to treatment for latent TB infection, and failure to detect TB transmission earlier.

Conclusions: In the United States, the majority of outbreaks occur in high-risk populations. Controlling TB transmission in these populations is challenging and often requires additional resources. Targeted efforts, including screening, treatment of latent TB infection, and universal genotyping, should be focused on high-risk populations for early detection and prevention of transmission.

PC-61686-02 Intense *Mycobacterium tuberculosis* transmission within one county of a low-incidence state: Indiana, 1999–2005

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Background: Indiana has been a low-incidence state (<3.5 TB cases/100 000 population) since 1995. However, in October 2005, surveillance and genotyping data suggested prolonged, ongoing transmission of a single strain of *M. tuberculosis* within one Indiana county. We investigated to determine the magnitude of and identify factors contributing to transmission.

Methods: We reviewed national TB genotyping data and patient records, interviewed patients, and conducted contact investigations.

Results: The outbreak strain represented 0.3% (35/11 842) of all isolates submitted to the National Genotyping Program but was associated with 23 (79%) of 29 cases reported during 1999–2005 by the county. In 12 (55%) of 22 outbreak-related pulmonary TB cases, >60 days elapsed from symptom onset to diagnosis. The county had no dedicated staff consistently providing directly observed therapy or conducting contact investigations. Incomplete contact investigations of smear-positive, pulmonary TB cases reported (1999–2005) failed to identify at least 3 close contacts subsequently diagnosed with TB in 2005. At least 4 patients did not adhere to TB therapy.

Conclusions: This investigation demonstrated failure to interrupt transmission of a single *M. tuberculosis* strain over a 7-year period. A major challenge in the context of low incidence is maintaining an infrastructure to ensure timely diagnosis of TB, identification and treatment of exposed contacts, and completion of TB therapy.

POSTER DISPLAY SESSIONS

CLINICAL TUBERCULOSIS-1

PS-61011-02 Hepatotoxicity of rifampin plus pyrazinamide for LTBI treatment compared to active TB

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Objectives: To compare the hepatotoxicity of a 2-month regimen of rifampin plus pyrazinamide (2RZ) administered to treat LTBI with the same combination as part of therapy for active TB.

Methods: From Feb 2001 to Feb 2003, a multicenter, randomised, and comparative study of a 2RZ regimen vs. a 6-month regimen of isoniazid in HIV-seronegative contacts was carried-out in Spain. The cohort of contacts assigned to 2RZ arm was compared with HIV-seronegative TB patients diagnosed in 2 of the participating centres during the same period. These received RZ for at least two months, and were regularly monitored for liver function test (LFT). Patients with baseline LFT values >3 times the upper normal limit and liver cirrhosis were excluded. The outcome variable was the development of hepatotoxicity grade >3 (WHO-ART criteria) or the occurrence of hepatitis. Multivariate analysis was used to adjust for age, gender, nationality and basal LFT.

Results: Patients were more likely to be older, and to have a non-Spanish background, an underlying disease, a significant alcohol intake and more LFT abnormalities at baseline. Hepatotoxicity was observed in 14/133 (10.5%) contacts vs. 9/180 (5%) patients (OR 1.3, 95%CI 0.5–3.1, $P = 0.6$). The multivariate analysis showed an adjusted OR for hepatotoxicity in contacts vs. patients of 1.78 (95%CI 0.68–4.76 $P = 0.22$).

Conclusion: Hepatotoxicity due to RZ may not be significantly different in contacts and patients with similar degree of LFT monitoring.

PS-61027-02 Delay in TB diagnosis and its influence on lung lesion, treatment outcome and relapse in Ninh Thuan Province

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A cross-sectional study on 2002 new pulmonary TB patients was carried out in Ninh Thuan province, in Vietnam to determine the factors associated with delay in TB diagnosis and to investigate its influence on degree of lung lesion in chest X-ray. All those patients had been followed for 68 months (1998–2004) to define the association between delay and treatment outcome and percentage of relapse.

Results: 84.7% of patients got delay with the average time was 68.6 days. In which, 79.2% of patients were responsible for delaying at the first time visit to health care. Especially, 39.6% of patients got long delay (>8 weeks). The health care services outside NTP network increased percentage of delay from 79.2% to 82.2% and increased percentage of long delay 10.4% more. Distance from home to district health center ($P = 0.04$), patients' knowledge about TB ($P = 0.004$), and private sector ($P = 0.0017$) significantly influenced on delay. There was no association between delay and demographic and economic characteristics. There was a significant difference of percentage of lung lesion in both lungs from long delay group and short delay group (from 4 to 8 weeks) and non-delay group ($P = 0.009$). The delay did not significantly associated with treatment outcome and percentage of relapse; however, the longer delay patients got the higher percentage of relapse they had.

Recommendation: To strengthen communication about TB in the community and to implement private-public mix DOTS in Ninh Thuan province.

PS-61044-02 Analysis of cases of death from pulmonary tuberculosis in a specialised clinic

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The aim of this investigation—to study data about deads from pulmonary tuberculosis in the clinic of the Institute of Phthysiology and Pulmonology during 1995–2004 ys. There were 151 case of death (46.18% from all lethal outcomes in this clinic). Autopsy was performed in 72.85% of deads. 55.0% were men under 60 years old. Mean age of deads was 47.08 years in men and 38.92 in women. The time-average of residing in clinic was 71.05 days. During the first month of treating died 28.26%. In 80.13% the cause of death was tuberculosis (fibrouse-cavernouse was more often than other forms, $P < 0.05$). In 78.85% of

complications, that caused death were (pleural complication, caseous pneumonia, lung edema, spontaneous pneumothorax), and in 21.15% complications were not associated with tuberculosis (more often—cardiac infarction, cancer intoxication, cranial edema, bleeding). The 2/3 of deads had several complications (from 2 to 5) which were direct causes of death. Tuberculosis even in cases, were it not primary disease, that caused patient's death, was as disease that promotes to lethal outcomes.

PS-61045-02 Lethal outcomes among patients with pulmonary tuberculosis during treatment

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Comparative analysis of lethal outcomes in patients with pulmonary tuberculosis hospitalized to Institute of Phthysiology and Pulmonology named by F G. Yanovsky AMS of Ukraine.

Study parameters	1991–1994 (before epidemic)	1995–2004 (during epidemic)
Number who died from TB	79	151
% of all deceased	46.18 ± 4.06	33.91 ± 5.33*
Mean age of deceased		
Men	45.30 ± 1.74	47.08 ± 1.59
Women	53.31 ± 4.71	38.92 ± 3.10*
Number of days in hospital	63.15 ± 15.01	71.05 ± 7.61
Died during the first month of treating (%)	25.41 ± 4.90	28.26 ± 3.66
Autopsy performed	70.89 ± 6.07	72.85 ± 4.24
Causes of death (%)		
TB (including TB intoxication and fibrous-cavernous TB)	78.48 ± 5.22	80.13 ± 3.63
Other diseases (including cardiac infarction and oncopathology)	24.05 49.37 21.52 ± 9.96	33.77 52.32 19.87 ± 7.29
Divergence in clinic and pathomorphology diagnosis (including concomitant pathology revealed during autopsy, hypo and hyper diagnostic of the forms of TB)	13.25 7.59 52.94	40.00
	28.57 ± 11.30	58.18 ± 6.17*

* $P < 0.05$.

More often divergence in diagnosis: imperfection of diagnostic and treatment during previous treatment, short time of treatment in clinic, renunciation of timely checkup and hospitalization of patients using alcohol, drugs, and in returned from prisons.

PS-61047-02 Bioavailability of rifampicin: does technology matter?

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Background: The problem of poor /variable bioavailability of rifampicin which is shown in particular

when the drugs are present in anti-tubercular FDC products is a matter of serious concern. There is potential failure of therapy in patients with an active disease, which leads to increasing drug resistance to ATD. The enhanced decomposition of RMP in presence of INH in stomach after ingestion is indicated to be the key factor behind this problem. To overcome this problem FDCs with IDDT (innovative drug delivery technology) where release of RMP is in stomach and INH is in small intestine, are being used now a days. A clinical study of 420 patients was done to evaluate efficacy of IDDT FDC v/s conventional FDC. **Method:** All fresh cases of pulmonary tuberculosis were included in the study. There symptoms, chest X-ray, haemogram, sputum smear for AFB, myco bacterial culture and sensitivity was done periodically. All the patients were given ATT (IDDT FDC and conventional FDC) as per WHO guidelines on randomized basis for 6/7 months. There were equal number of patients in both the groups.

Results: Patients with IDDT- FDCs shows early symptomatic relief and radiological improvement. There is early bacteriological conversion in IDDT FDC group as compare to conventional FDC (95% of pt shows smear neg. at the end of intensive phase)

Conclusion: As per WHO guidelines to treat tuberculosis use of FDC is must. FDC with IDDT (release of INH is modified). shows superiority over conventional FDCs.

PS-61049-02 Female genital tuberculosis simulating advanced ovarian malignancy: a disease not to be forgotten

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Despite the increasing number of TB cases among HIV-seropositive persons, female genital TB is very rare. However, each case still remains a serious medical problem. If not recognized and treated properly, it may lead to an unfavorable disease outcome and even the patient's death. A 23-year-old HIV-seronegative woman with a two-month duration amenorrhea as her chief complaint, underwent surgery due to lower abdominal mass simulating a left ovary advanced malignant tumor, strongly suggested by ultrasound examinations. During sampling, we found a mass of round, necrotising nodules, up to 3 mm, diffuse on uterus, ovarian and tubarial surfaces, in cervical and endometrial mucosa, and even in myometrium and fat omental tissue. All reproductive organs were regular sized. No tumor mass was found on the left ovary surface. Microscopically, the tissue samples from all reproductive organs and omentum contained numerous tuberculous caseating granulomas. *Mycobacteria* were confirmed by identification of acid-fast bacilli by

Ziehl-Neelsen method. Tuberculin skin test PPD3 was +12mm. Owing to anti-tuberculosis treatment, as for life, final disease outcome was favorable.

Conclusion: Clinicians should always consider TB as a differential diagnosis when encountering clinical presentations of an ovarian tumor and ascites. TB should be especially suspected if recent *M. tuberculosis* infection occurred, in women belonging to any of risk groups either HIV infected or not.

PS-61063-02 Role of Mw vaccine in management of hydropneumothorax as an adjuvant to anti-tuberculosis treatment with intercostal tube drainage

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Introduction: Hydropneumothorax is a common complication of PTB (pulmonary tuberculosis) in India and is managed by ATT+ICTD. Removal of ICTD takes 3 months at this center and is often complicated by secondary infections which increase the stay of ICD.

Aim: Primary objective: To see whether the addition of Mw vaccine to ATT+ICTD can decrease the time taken for removal of ICTD in comparison to ATT+ICTD given alone. Secondary objective: 1) Time taken for sputum conversion. 2) Mean weight gain over time.

Material and methods: This was a randomized, double blind, placebo-controlled, comparative clinical trial. CAT I patients (smear+ve and smear-ve) received RHZE (2 months) + RH (4 months). CAT II patients (smear+ve and smear-ve) received SHREZ (2 months) + HREZ (1 month) + HER (5 months). Mw was administered intradermally 0.2 ml on day 0 followed by 0.1 ml on days 15, 30, 60, 120, 180 till end of ATT therapy. Light's criteria was used to detect the presence of exudates.

Results: Mw arm had faster removal of ICTD with 72% removal within 22 days compared to 37.5% in conventional ATT+ICTD. $t = -3.32$ sdev = 23.6 degrees of freedom = 32. The probability of this result, assuming the null hypothesis, is 0.002. Group A Mean = 15.1 days, Group B Mean = 42 days.

Conclusion: Our data demonstrate that the addition of Mw to ATT+ICTD will reduce the time taken for removal of ICTD and will produce faster sputum conversion and greater increment in weight vs standard care.

PS-61067-02 Association between genetic markers and arising cheesy pneumonia in patients with tuberculosis of the lungs

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Our purpose was to study an association between genetic markers and cheesy pneumonia in patients with tuberculosis of the lungs. Twenty-six patients with pulmonary tuberculosis in which specific process manifested as cheesy pneumonia were examined. There were 14 males ($53.8 \pm 9.7\%$) and 12 females ($46.2 \pm 9.7\%$). They were aged 31.4 ± 1.9 . Infiltrative tuberculosis of the lungs was diagnosed in 6 patients. Fibrous-cavernous and disseminated occurred to be in 10 (40 ± 9.7) respectively. As carriage of genetic markers phenotype of haptoglobin by D. G. Davis in modification of N. P. Osina (1989), GINK inactivation type by L. P. Grebennik (1966), activity of erythrocyte's enzyme glucoso-6-phosphate dehydrogenase (G-6-PhDH) by G. Glori (Asatiani VS, 1965) were determined.

It was established that infavourable combination of genetic markers (homozygous phenotype of haptoglobin, a weak type of GINK inactivation, decreased activity of enzyme G-6-PhDH) was revealed in 16 ($61.5 \pm 9.5\%$) patients, relatively infavourable combination of genetic markers (combination of 2 infavourable and 1 favourable marker)—in 10 ($38.5 \pm 9.5\%$) patients.

Leucocytes' intoxication index (LII) before treatment of patients with carriage of infavourable combination of genetic markers was 3.42 ± 0.32 ($N -0.6 \pm 1.2$), in relatively infavourable combination -2.88 ± 0.33 . LII in process of treatment of patients with infavourable combination of genetic markers was reducing till 2.9 ± 0.32 , in relatively infavourable one -2.4 ± 0.25 .

PS-61068-02 Stabilization of the epidemiological situation of tuberculosis in Uzbekistan

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Prevention of tuberculosis is a priority direction of health. Over 19 thousands of tuberculosis patients were diagnosed in Uzbekistan every year, that accounts for 39.5% from a total number of diagnosed patients. There are 11 478 (57.7%) males and 8398 (42.3%) females. Despite of measures made epidemiologic situation of tuberculosis in Uzbekistan aggravated and a level of morbidity achieved in 2002 up to 79.0/100 000 population. Lethality from tuberculosis was increasing up to 12.5/100 000 population. Taking into consideration an infavourable situation with tuberculosis in Uzbekistan since 1998 WHO recommended to begin a financial support from a number

of charitable organizations that gave a possibility to improve sufficiently an earlier diagnosis and treatment of patients in all the regions of Republic. Introduction of strategy DOTS positively affected a morbidity and mortality levels from tuberculosis. Within 5 years since 2001–2005 morbidity was reducing 4.7%, lethality—17.9%. Thus, a successful implementation of strategy DOTS decreased mortality of tuberculosis that is an important factor in restoration of population of Republic.

PS-61086-02 Isolation of non-tuberculous mycobacteria in children investigated for pulmonary tuberculosis

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Aim: To evaluate the frequency and significance of non-tuberculous mycobacteria (NTM) isolates among children investigated for pulmonary tuberculosis (PTB) in a rural South African community.

Methods: Children were investigated as part of a tuberculosis vaccine surveillance program (2001–2005). Clinical features of children with NTM were compared to those with culture-proven *M. tuberculosis*. Data were analysed by Mann-Whitney and Fisher's Exact tests.

Results: Mycobacterial culture demonstrated 114 NTM isolates from 109 of 1732 children investigated [crude yield 6% (95%CI 5–7)]. Comparative yield of positive NTM culture from gastric lavage was 40% (95%CI 31–50), compared to 67% (95%CI 58–76) from induced sputum. No children were HIV-infected. *M. tuberculosis* was isolated in 187 children [crude yield 11% (95%CI 9–12)]. Ninety-five per cent of children with NTM isolates were symptomatic. Children with NTM isolates were older ($P < 0.0001$), more likely to have constitutional symptoms ($P = 0.001$), such as fever ($P = 0.003$), and loss of weight or failure to gain weight ($P = 0.04$), but less likely to have a strongly positive tuberculin skin test ($P < 0.0001$).

Conclusion: Mycobacterial culture yielded NTM in 6% of children investigated for PTB, with the greatest yield from induced sputum. Children with NTM were more likely to have constitutional symptoms, and demonstrated less reaction to tuberculin, than those with *M. tuberculosis*.

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PS-61147-02 Pulmonectomy of large and huge cavities

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Pulmonectomy was made at the large and huge cavities on 43 patients (women—22) in age 20–45 years. Patients suffer from tuberculosis 2–4 years. Cavities in diameter of 6–8 sm with cirrhosis pulmonary tissue to promoted full anatomy-functional insufficiency of lung. Micobacteria tuberculosis in sputum are found out at 40 patients (93.0%), from them resistant forms—at 17 (42.5%). Before operation within 2–3 months the intensive chemotherapy carried out on background of pneumoperitoneum and general tonic treatments. After operation bronchial fistula and pleural empyema have developed at 5 patients (11.6%), pulmonary-heart insufficiency has come—at 6 (14.0%). The nearest good effect after pulmonectomy achieve at 30 patients (69.7%), unsatisfactory results at 3 (7.0%). Have died at 10 patients (23.3%) of pulmonary-heart insufficiency (6), progressing of tuberculosis, bronchial fistula and pleural empyema (4). Clinical cure across 2–10 years after pulmonectomy is establish at 30 patients (90.9%) from 33 surveyed. Has died 3 patients (9.1%) of progressing tuberculosis in the only lung and pleural empyema on the side of operation.

Conclusion: The large and huge cavities, the expressed morphological changes in pulmonary tissue served reason of inefficiency of therapeutic treatment. Pulmonectomy is the basic and highly effective method of treatment and a unique opportunity of treatment of 90.9% of heavy patients.

PS-61148-02 Repeated operations of bronchial fistulas after pulmonectomy

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Repeated operations at bronchial fistulas after pulmonectomy at fibre-cavernous tuberculosis lung was made on 103 patients (72 men, 31 women) aged 14–50 years. Bronchial fistulas in 2–3 weeks after operation have developed at 72 patients, in 1–3 months—at 31, from them on the right—55, left—78. In the only lung the limited cavity is diagnosed for 5 patients, tuberculoma—1, infiltrate—2, focal dissemination—22. *Mycobacterium tuberculosis* in sputum are found out at 18 patients (17.5%), in pleural contents—37 (35.9%). Preoperative preparation was carried out 1.5–3 months and included antitubercular chemotherapy, non-specific antibiotics, general tonic treatment. The pleural cavity at 43 patients was sanitation by puncture method, at 32—drainage, at 28—thoracotomy and tamponade. Transpleural reamputation of stump the main bronchial tube was made at 61 patients, transsternal-pericardial occlusion—11,

thoracomyoplasty—at 31. Good effect achieved at 76 patients (73.8%), satisfactory—6 (5.8%), unsatisfactory—1 (1.1%). Has died 20 patients (19.3%) from intrapleural bleeding, pneumonia of the only lung, progressing pleural empyema and pulmonary-heart insufficiency.

Conclusion: Repeated operations at bronchial fistulas after pneumonectomy, despite of traumatic and high surgical risk, are the basic and effective method of treatment and allows to improve 73.8% of patients with heavy bronchopleural pathology.

PS-61164-02 Using modeling to understand the impact of smoking on population-level tuberculosis outcomes

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Objective: In India, TB kills more smokers than all types of cancer combined. There is substantial evidence linking smoking and TB; in countries where TB is prevalent, smokers are more susceptible to and are spreading (and dying of) an infectious disease. My objectives are to: investigate the mechanisms by which smoking affects TB risk, estimate the extent of the impact of smoking on TB outcomes, and determine whether smoking is a factor that should be considered in the development of TB-control policy.

Methods: A dynamic systems model was developed to represent the key aspects of TB transmission and disease development. The introduction of smoking is based on a review of the impact of smoking on lung function and immune response. The size of the impact of smoking is constrained by meta-analysis of the literature on the association between smoking and TB.

Results: In populations with 29% smoking prevalence (the average for developing countries), 56% of all incident TB is attributable to smoking. Smoking is responsible for 75% of TB cases among ever-smokers. The negative effects of smoking extend to never-smokers as well, as smoking increases the likelihood of becoming infected with TB due to the larger number of TB cases overall. 38% of TB cases among never-smokers are attributable to smoking.

Conclusions: In addition to a slew of other health benefits, policies that address smoking behavior (both initiation and cessation) would also have a significant impact on TB.

PS-61176-02 The impact of TB sequelae on the evolution and severity of COPD: early or late complication of TB?

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The aim of this prospective, clinical study on consecutive patients, treated from January 2005 to January 2006, on intensive respiratory care unit was to investigate the influence of TB sequelae on the evolution and severity of COPD. The study was enrolled 425 pts (319 males, 106 females) average age 66.21y. The X-ray examination recorded TB sequelae in 130 pts—30.6% (87m, 43 f) average age 61.54y (41–79). The interval between the sustained TB and the occurrence of COPD was on average 7y (range 2–19y). The analysis of severity radiological findings according Snider score showed: massive in 71 pts (54.7%), moderate in 27 pts (29.7%) and minor in 32 pts (24.6%). Among 71 pts with massive radiological findings 59 pts—80% had global respiratory failure, and 12pts—20% partial. All this pts had statistically shorter interval—5y ($P < 0.001$) between sustained TB and the occurrence of COPD, than pts with moderate and minor radiological extensivity of TB—13y. It was not found the statistically significant difference between the parameters of lung function and the occurrence of COPD among the patients with moderate and minor radiological findings of TB. Among the patients with massive TB sequelae were statistically more smokers than among the pts with moderate and minor sequelae.

Conclusion: The results of our study suggests that massive TB sequelae, male sex and smoking habit are important reason for occurrence and statistically significant faster evolution of severe COPD.

PS-61276-02 Aspiration of lymph nodes increases the specificity of an algorithm to detect lymph-node tuberculosis in Ethiopia

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In Ethiopia the proportion of extra-pulmonary TB among all TB is more than one third, the majority being Lymphnode Tuberculosis (LNTB). This study evaluates the national LNTB algorithm.

Methods: 150 patients with enlarged lymphnodes were enrolled. Fine Needle Aspiration (FNA) and excision biopsy were examined, ZN stained and cultured.

Results: Of 150 patients, 117 (78%) were confirmed

LNTB. PCR identified *M. tuberculosis* in all culture-positive specimens (100% sensitivity, 83% specificity). Of all patients 21% were HIV-positive, vs. 24% of 117 culture proven patients. ZN staining of the 117 FNA and biopsy specimens detected AFB in 32% and 27% respectively. FNA cytology (FNAC) and histopathology detected 88 (75%) and 105 (97%) of the 117 culture proven LNTB patients respectively. Macroscopic caseation was found in 68% of nodes and 67% of aspirates. Caseation was associated with LNTB ($P = 0.002$). The association between HIV and urban residence ($P = 0.002$), and female gender ($P = 0.006$) in proven LNTB patients was significant. Combination of macroscopic examination, cytology and ZN-staining of FNAs detected 96% of proven LNTB.

Conclusion: The specificity of this algorithm for LNTB in field conditions was 78% and may contribute to unnecessary TB treatment. *M. bovis* does not appear to be the underlying cause of lymphnode enlargement. Adding macro- and microscopic and examination of FNA to the current algorithm will increase its specificity.

TB-HIV

PS-61091-02 HIV-associated TB complicated with opportunistic infections

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Aims: To investigate structure of HIV-TB cases, complicated with opportunistic infections, their mortality rates, clinical forms and clinical properties.

Design: 96 patients with TB-HIV, observed in Moscow during the 2-year period, were included in the study. They were assessed using standard clinical, X-ray, functional and laboratory tests.

Results: For the group investigated further clinical forms of opportunistic infections were revealed: CMV infection (16,7%), pneumocystic pneumonia (14,6%), candidosis of gullet, trachea and bronchi (3,1%), recurrent fungal mucous lesions (36,5%), HIV-associated encephalopathy (1%).

Conclusions: The main clinical features of HIV-associated infections in cases of TB-HIV illness were established. Data obtained suggest need for further, more deep studies for diagnose and therapy improvement in patient group.

PS-61124-02 HIV-associated tuberculosis in Ukrainian children

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The peculiarity of TB epidemic in Ukraine today is combined epidemic of TB and HIV. Common quantity of TB-HIV-ill and died children is not known. Registration of new cases is conducted from 2004 year. The aim of investigation was to study epidemic situation and some clinical peculiarities of TB-HIV in children.

Results: The number of children with first revealed HIV, AIDS and died from AIDS in Ukraine was 2516, 143 and 36 accordingly in 2005 year. The common number of children with HIV, AIDS and died was revealed from 1987 to 2005 years and have compounded 10 994, 447 and 186. In 2004 year 22 new cases of TB-HIV were revealed in children, in 2005—20. In 2005 year incidence of children with TB-HIV was 0.3/100 000 in child populations of conforming age, juveniles—0.1, children under 1 year—0.5, from 1 to 4 years old—0.7, from 5 to 9—0.2, from 10 to 14—0.04. Clinical analysis of 19 cases of TB-HIV in children revealed 5 children with primary TB-complex, 5—with TB of intrathoracic lymph nodes, 9—disseminated pulmonary TB. In 4 children apart from pulmonary lesion a generalized process with entrainment of intestine, mesenterial lymph nodes, and peritoneum and other organs was revealed.

Conclusion: Official statistics do not reflect a real situation on TB-HIV in children of Ukraine. The most cases of TB-HIV was revealed from 1 to 4 years old (55%). All children were born from HIV-infected mothers and juveniles used injected narcotics.

PS-61161-02 Reliability of chest radiograph readings from TB screening among people living with HIV/AIDS (PLHA)

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Background: Actively finding and treating TB in PLHA may reduce TB transmission and mortality. CXR screening is one approach recommended for finding TB. We evaluated the reliability of CXR readings for TB from a screening program in An Giang, Viet Nam. **Methods:** An expert radiologist reviewed screening CXRs performed on PLHA by the An Giang Preven-

tive Medicine Center (PMC) from 2001–2004. We compared PMC readings to the expert reading to determine inter-rater reliability (kappa statistic). PMC and expert readings were categorized as 'TB' or 'not TB'; the expert reading was considered the referent.

Results: From 1/2001–12/2004, 884 screening CXRs were read by the PMC: 666 (75%) were read as normal or as abnormal, but not TB; 193 (22%) were read as TB; and 25 (3%) had no result documented. For the 752 films available for review, agreement between the expert and PMC reading was 81% (kappa = 0.50). There were 113 (15%) false negative CXRs, i.e., classified as normal by the PMC, but read as TB by the expert. False negatives were more common in CXRs with a hilar mass or lymphadenopathy, an infiltrate in >1 lung zone, and upper lobe fibrosis or nodule, but none of these comparisons were statistically significant.

Conclusions: CXR readings by a provincial program screening for TB among PLHA demonstrated good agreement with expert radiologist readings. In order to improve CXR screening, programs may want to train healthcare workers in interpreting the upper lobe and hilar region.

PS-61290-02 Aspects cliniques, thérapeutiques et évolutifs de la co-infection TB-VIH au PPH/MI CHU Tokoin Lomé, Togo

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Objectif : Analyser les aspects cliniques, thérapeutiques, et évolutifs chez les patients infectés par le VIH et la tuberculose

Patients et méthode: Les patients co-infectés ($n = 135$) de la tuberculose et l'infection par le VIH ont été identifiés au service des Maladies infectieuses et de Pneumologie de janvier 2004 à février 2005. Les cas ont été rétrospectivement observés sur étude des dossiers médicaux.

Résultats: Chez les 135 patients 94,1% souffraient d'une immunodépression sévère avec un taux de CD4 < 200/ml et bénéficiaient d'une association thérapeutique (antituberculeux et antirétroviraux). L'âge moyen des patients a été 36 ans avec un sex-ratio de 1,04. Cent onze (82,2%) étaient atteints de la tuberculose pulmonaire et 24 patients d'adénite tuberculose. Les effets secondaires principaux ont été l'anémie, éruption mucocutanée, neuropathies périphériques, vertiges, signalées jusqu'à la deuxième visite. La létalité a été 6,5% chez les patients atteints d'immunodépression sévère et un décès avec un taux de CD4 > 200 sans traitement antirétroviral.

PS-61328-02 Diagnostics of tuberculous pleuritis in HIV-infected patients by the QuantiFERON TB-GOLD® assay

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Objective: To diagnose tuberculous pleuritis (TBP) in HIV positive (+) patients.

Methods: 24 HIV+ (CD4 count 7–328, median 89) and 5 HIV negative patients (median CD4 count 457) with chest X-ray findings and clinical symptoms consistent with TBP were studied. TB culture was performed on pleural fluid (PF). Whole blood and suspension of PF mononuclear cells were analysed by the QuantiFERON TB GOLD In-tube assay® (QFN). The IFN- γ levels were quantified by ELISA and calculated by the QFN analysis software.

Results: In TB culture positive HIV+ patients 5/11 had positive QFN in blood (median CD4 176) and 3/11 in PF (median CD4 75). In TB culture negative HIV+ patients, 5/13 had positive QFN in blood (median CD4 105) and 6/13 in PF (median CD4 89). The majority of the remaining patients had either inconclusive QFN results in PF because of high background signals (median CD4 120) or in blood because of low mitogen response (median CD4 57). In the HIV negative patients 4/5 were TB culture negative, but with positive QFN both in blood and PF, whereas 1 documented malignancy was negative in both compartments.

Conclusion: The QFN assay seems to be useful in diagnosing TBP when TB culture is negative for HIV negative patients or for HIV+ patients with a CD4 count above 100. The seemingly limited use of the test for patients with very low CD4 counts and for patients with high levels of unspecific immune activation in the PF needs to be further studied.

PS-61426-02 Prevalence and clinical presentation of Nigerian patients with tuberculosis and HIV

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Aim: To determine the prevalence of HIV among TB patients and assess the impact of HIV co-infections in the presentation of TB.

Methods: Patients with cough for more than 3 weeks duration attending selected hospitals in Abuja, Nigeria were interviewed during 2003 and 2004 using structured questionnaires. After clinical examination, sputum samples were examined by smear microscopy and

one sample was cultured on BACTEC-MGIT-960. Blood samples were tested for HIV.

Findings: 1321 patients were screened. Of these, 1186 (90%) samples were cultured and 731 (62%) were culture-positive. 353 (48%) culture positive patients were smear-positive. 546 (55%) of the 1002 patients tested were HIV positive. HIV infection was 53% (329/625) for culture-positive and 58% (217/377) for culture-negative patients. Anorexia (AOR = 2.2, 95%CI = 1.6–3.1), anaemia (AOR = 3.0, 95%CI = 2.1–4.4), hypoalbuminaemia (AOR = 2.3, 95%CI = 1.6–3.5) and a high ESR (AOR = 9.5, 95%CI = 2.8–32.4) were independently associated with an increased risk of co-infection. On X-Rays, co-infected patients were less likely to have cavitations and had less extensive lung involvement.

Interpretation: The prevalence of HIV among patients with TB was high and smear microscopy only identifies about 50% of the patients with culture proven TB. HIV further undermines the performance of smear microscopy. Anorexia, anaemia, hypoalbuminaemia and a raised ESR are independent markers associated with HIV co-infection.

PS-61444-02 Epidemiological situation of HIV-associated TB in Georgia

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Introduction: HIV is one of the most powerful factors promoting development of Tuberculosis. It increases susceptibility to TB and is the main cause of the disease. Prevalence of TB among HIV infected individuals depends on the epidemiological situation in the region. According to the data of 2004, the number of new and registered cases of TB was correspondingly 88 and 137/100.000 population. These figures indicate to the severity of the epidemiological situation. **Aim:** Proceeding from all above mentioned, the goal of a given work is to study the prevalence of TB infection among HIV/AIDS patients.

Methods: The research is based on the study of TB prevalence among 766 HIV/AIDS patients registered at the National Centre of Infections Diseases, AIDS and Clinical Immunology in 1989–2004;

Results: TB was diagnosed in 159 (20%) of these individuals; 58 (38%) of them had active form of TB, the rest 95 (62%) latent. 22 from those 58 patients with active TB received intensive course of anti-TB chemotherapy in hospital. 45.5%—previously treated patients.

According to the localization of pathologic process pulmonary TB was diagnosed in 81.8% of cases and extra-pulmonary TB in 18.2%.

Conclusion: Results show low indicators of HIV associated TB prevalence in Georgia. Taking into account slow but stable increase of HIV/AIDS new cases

and complicated, but manageable epidemiological situation with regards to TB, increasing of the cases of HIV associated TB can be expected.

PS-61487-02 Characterization of extra-pulmonary tuberculosis among HIV-infected patients in a tertiary care center in India

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Background: Extrapulmonary tuberculosis (EPTB) is one of the most common opportunistic infections among HIV-infected individuals in India.

Aim: To characterize EPTB based on site affected.

Methods: A retrospective chart review of 188 HIV-infected patients diagnosed with EPTB between August 2004 and December 2005 was performed at YRG CARE, Chennai, India. EPTB was defined as tuberculosis (TB) involving any part of the body besides the lung. EPTB was categorized based on the sites involved.

Results: The cohort comprised 145 men and the mean age was 34 years. The median CD4 at the time of diagnosis was 177 (IQR: 69, 287) cell/ μ l. Of these, 141 (75%) presented with EPTB only while 47 (25%) were diagnosed as having both EPTB and pulmonary TB. Abdominal TB (median absolute CD4 114 (57–192)) was the most common form observed (45.7%) followed by lymph node TB (43.71%) and pleural effusion (7.28%). The most common symptoms of abdominal TB included fever (81.93%), cough (66.27%), weight loss (40.96%), and abdominal pain (34.94%). Of those with abdominal TB, ultrasound demonstrated retroperitoneal lymph nodes in 82% of them.

Conclusion: Abdominal TB was the most common presentation of EPTB in this cohort. Usage of low cost diagnostic tools like abdominal ultrasound should be encouraged. With EPTB more likely at low CD4 counts, HAART needs to be initiated at the appropriate time in developing countries to prevent these complications.

PS-61626-02 Clinical course of 44 HIV-TB co-infected children from Kinshasa, Democratic Republic of Congo

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Background: HIV-TB co-infection is a major cause of morbidity and mortality in children.

Methods: Retrospective study of 44 HIV positive children diagnosed with pulmonary tuberculosis in 2005. PPD, anthropometric, clinical, and immunological status were collected closest to the start and end of TB treatment.

Results: Median age was 7 years (range: 1 to 16), CD4% 8.5 (1 to 34) and CD4 absolute count 290 cells/mm³ (5 to 2547). One in three (32%) had a history of TB treatment. 21/44 were referred for HIV care while on TB treatment and 8/44 were receiving HIV care (no ART) when diagnosed with TB. 15/44 were diagnosed with TB on average 4.5 (1 to 12) months after ART initiation, in some possibly reflecting immune reconstitution inflammatory syndrome (IRIS) in others undiagnosed, subclinical TB at time of ARV initiation. PPD test was done in 20 (45%) children, and positive in 60%. 34/44 children received concomitantly nevirapine (NVP) and rifampin (RMP). Median CD4% increased to 21.5 (6 to 28, $P < 0.01$) and CD4 absolute count to 506 cells/mm³ (68 to 2220, $P = 0.01$). Weight increased 2 kilo on average ($P < 0.01$). One child died during TB treatment of cryptococcal meningitis.

Conclusion: Even though some children developed TB as possible IRIS after ART initiation, and despite the concomitant use of NVP and RMP, we demonstrated that treatment of co-infected children in resource poor settings is feasible and results in good clinical and immunological outcomes.

PS-61638-02 Client management in counteraction to TB-HIV co-infection in TB services

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Aim: High morbidity of TB and spread of HIV among injecting drug users (IDUs) in Kazakhstan poses a real threat of co-infection development. *AIDS Foundation East-West—AFEW* with support of the Dutch Ministry of Foreign Affairs supports the development of HIV-TB collaborative activities at the base of the TB dispensary in Turksib district of Almaty. In the 180 beds capacity more than 50% of patients are IDUs and ex-inmates. During the last 3 years 14 people died with the diagnosis TB-HIV.

Design: The TB dispensary provides HIV prevention and Harm reduction services such as VCT, needle exchange, patient's education through outreach and IEC materials.

Methods: Within a social bureau, in dispensary trained client managers establish a medico-social referral network of services for patients. The effectiveness of the referral and continuum of care system is monitored through a Client Management Data Base.

Results: The social bureaus model at the basis of TB services attended by HIV highly vulnerable groups

facilitates the development of comprehensive health, social and juridical care plan.

Conclusion: HIV Client management integrated with VCT and development of referral network system provides an effective comprehensive mechanism for HIV prevention, care and support and it should be used by TB services to restrain co-infection.

PS-61678-02 Prise en charge de la coinfection TB-VIH : expérience du CNHPP de Cotonou dans le cadre du projet IHC

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Objectifs : 1) Etudier la faisabilité du counseling et du dépistage systématiques du VIH chez les tuberculeux ; 2) Etudier la prise en charge du VIH en début du traitement antituberculeux ; 3) Analyser les résultats à la fin du 2ème mois du traitement de la TB.

Méthode : Etude prospective réalisée d'octobre à décembre 2005 au CNHPP. Les paramètres étudiés sont: sérologie VIH, sexe, âge, taux de refus du test VIH, numération des CD4, bacilloscopie.

Résultats : 216 tuberculeux ont bénéficié du counseling et ont été inclus dans l'étude, parmi lesquels: 181 nouveaux cas de TPM+, 25 cas de TPM+ (retraitement), 2 cas de TPM- et 8 cas de TEP. 191 patients testés au VIH (88,4% de taux d'acceptation); 25 cas de refus (11,6%); 30 séropositifs (soit 15,7%) dont 26 nouveaux cas (86,7%) et 4 anciennes PVVIH (13,3%). Parmi les séropositifs, on compte 23 nouveaux cas TPM+, 6 cas TPM+ en retraitement, et 1 cas de TEP. 73,3% des coinfectés ont un âge compris entre 20 et 45 ans; 60% ont les CD4 < 200 cel/ml. En phase intensive du traitement antituberculeux, 13,3% étaient sous ARV, et au premier contrôle des BAAR: 24 patients négatifs (82,7%), 2 positifs (6,9%) et 3 décès (10,3%), tandis que chez les séronégatifs: 136 négatifs (84,5%), 24 positifs (14,9%) avec 1 décès (0,6%).

Conclusion : Le test du VIH proposé doit être systématique dans le protocole de prise en charge de la tuberculose (prise en charge précoce de la coinfection). Le traitement de la tuberculose reste bon (VIH+ ou VIH-).

PS-61690-02 Cluster of TB in drug dependent in HIV-positive patients, Dominican Republic, 2005

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Introduction: The study includes 17 patients' drug dependence and HIV positive who had been admitted

into therapeutic communities. These communities presented factors de risk for development TB who stacking.

Objectives: To identify risk factors for this communities for development TB.

Methods: This is an investigation realized in one Hogar Crea Dominicano, Santo Domingo West. All the patients were interview, smear studied and culture for *M. tuberculosis*, this trial were sent to the National Laboratory of Respiratory Disease. For analyses was used the Epiinfo application. This patients in the moment of the investigation were are in therapy anti retroviral.

Results: Identify 4 (23%) cases of TB, all was male. The first case go to the hogar 4 months before, the 3 cases contaminated. 2 (50%) cases were smears positive and 4 (100%) were culture positive. The means of age in patiens of comunities is 30 year and range is 17 to 56. he entire patient with diagnosis of TB administration to therapy anti-TB y all patients without TB were introducing to Therapy preventive with Isoniacida.

Conclusion: Is very important to identify condition bacteriology initial for TB before ingresses in this hogares for drug dependence and speciatly with patient VIH positive.

PS-61712-02 Yield of a chest radiography screening program for tuberculosis in HIV-infected persons, An Giang Province, Vietnam

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Background: TB is a leading cause of death in people living with HIV/AIDS (PLHA). Actively finding and treating TB in PLHA may reduce TB transmission and lower mortality. An Giang province has been screening PLHA for TB using annual chest radiographs (CXR) since 1999. We evaluated yield and coverage in this program, and risk factors for TB in PLHA screened.

Methods: We reviewed records for PLHA who had a screening CXR from 1/2001–12/2004. We classified CXRs as ‘TB CXR’ or ‘Not TB CXR’ based on local TB program interpretation of the CXR at the time it was performed. Because persons could have multiple CXRs during the study period, we restricted analysis to one CXR per person per year. To assess yield, we analyzed CXRs performed; to assess other factors, we analyzed persons receiving a CXR.

Results: Of 876 screening CXRs performed during 1/2001–12/2004, 191 (22%) were classified as a ‘TB CXR’; the yield of a ‘TB CXR’ ranged from 18–25% per year, and did not change significantly over time ($P = 0.78$). An increasing proportion of PLHA received a screening CXR in each year of the program (21% in 2001, 48% in 2002, 41% in 2003, 61% in 2004; $P < 0.001$). Compared to PLHA with a ‘Not TB CXR’, PLHA with a ‘TB CXR’ were more likely to be age 24–64, male, and previously treated for TB ($P < 0.01$ for each comparison).

Conclusions: In An Giang, a large proportion of PLHA are screened for TB annually. Although the best TB screening method is not known, annual CXR may be one high-yield approach.

PS-61742-02 Smear microscopy, chest radiography, clinical judgment: important elements for TB diagnosis in the HIV patient

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Background: Diagnosing tuberculosis (TB) in resource poor settings with high HIV prevalence continues to be a challenge.

Description: In our centers in rural Rwanda, we have adopted aggressive TB screening measures for patients with HIV. Patients are questioned regarding TB symptoms, undergo chest radiography before starting anti-retrovirals (ARVs) and have sputum smears if symptomatic. Initially neither quality smears nor radiography were available. Early on, microscopes were purchased and smear microscopy was quality assured. Patients had to be transported one hour for chest radiography.

Outcomes: From 6/1/05 through 2/28/06, at one rural center, we started 362 adult HIV+ patients on ARVs. Of those, 93 (26%) were diagnosed with TB. Of this number 12 (13%) were smear positive, 63 (68%) smear negative, and 18 (19%) smear not done or not documented. The high percentage of smear-negative patients likely reflects the combination of smear microscopy being of poor quality initially and a low threshold to start treatment based on clinical judgment. Most commonly, patients who were smear negative or smear not done were started on treatment because of abnormal chest radiography or convincing clinical symptoms.

Recommendations: Tuberculosis was common among HIV positive patients in our center. Access to quality assured smear microscopy and chest radiography combined with astute clinical judgment is essential to timely detection and treatment of TB in people with HIV.

PS-61922-02 Cohort of MDR-TB-HIV treatment in Peru

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Background: Peru has 3.0% of primary MDR-TB and 1.8% of notified prevalence of HIV among TB patients (2005y). The cohort of treatment among new TB-HIV patients has an efficiency level of 48.3% (2004y). All TB-HIV has free access to drug susceptibility testing (DST) at the moment of diagnosis.

Objectives: Determine the outcome of MDR-TB-HIV patients with standardized/WHO regimen (4KCxEtZ,E/14CxEtZE) and individualized regimen (according to the DST).

Materials and methods: Comparative retrospective cohorts study under operational conditions (standardized discharge condition of WHO/IUATLD). Cases were consecutively admitted from 1997 to 2003. Only cases with known discharge condition were included. Statcalc/Epinfo 2000 was used. Database: MDR-TB Unit/National TB Strategy/Peruvian Ministry of Health. **Results:** 73 patients were registered at standardized regimen and 23 at individualized regimen (20 and 12 cases without discharge condition were excluded, respectively). The Table summarizes the results:

Regimen	N°	Cured	Failure	Death	Abandon	Transfer
Standardized	56	6	10	36	4	0
%	100	10.7	17.9	64.3	7.1	0.0
Individualized	11	3	0	7	1	0
%	100	27.3	0.0	63.6	9.1	0.0

OR Failure = indef; $P = 0.001$

OR Die = 1.03 (IC95%0.22-4.63); $P = 1.000$

OR Abandon = 0.77 (IC95%0.07-20.0); $P = 1.000$

Conclusion: There was a statistical significance difference at the failure risk between standardized and individualized regimen. It is necessary to consider early DST and individualized treatments.

PS-61942-02 Impact of tuberculosis on the natural history of HIV infection in South African children

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Background: Tuberculosis is recognized as the most common opportunistic infection in HIV infected persons in Africa. However the impact of tuberculosis on

the natural history of HIV in children has not been well characterized.

Aim: To investigate the impact of TB on morbidity and mortality in HIV infected children.

Methods: Multi-centre prospective cohort study of HIV infected children who developed tuberculosis. Socio-demographic, clinical and laboratory data were collected at enrollment. Subsequent morbidity and mortality data were recorded.

Results: 239 HIV infected children, with a median age of 16 months, who developed TB were enrolled by the end of Apr 2005. Follow-up was for 24 months after completion of TB therapy. Sixty eight children (28%) subsequently died with 36 (53%) of the deaths occurring within 3 months of commencement of TB therapy. At diagnosis of TB almost half of the children were characterized as having significant immune suppression, i.e., CD4% count <15% and 113 children were subsequently admitted to hospital for respiratory, gastrointestinal and multi-system disorders. Risk factors for morbidity and mortality will be presented.

Conclusion: Tuberculosis has a significant negative impact on morbidity and mortality in HIV infected children. The role of primary preventative TB therapy and HAART in reducing the adverse consequences of TB in HIV infected children requires urgent investigation.

Funding: BMS Secure the Future

PS-61957-02 Prevalence of MDR-TB with drug susceptibility testing in HIV patients

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Background: In Peru TB has been the AIDS indicative disease in 28% of these cases. The number of MDR-TB patients whom MDR-TB regimen was required represented 1.5% of morbidity.

Objectives: Determine the prevalence of MDR-TB between patients admitted to a MDR-TB regimen.

Material and methods: It was a comparative transversal study. Database was obtained from MDR-TB Unit at Peruvian Ministry of Health. Cases were admitted since 2001 to 2005. All cases registered with standardized and individualized treatment and DST were included. Statcalc of Epinfo 2002 was used.

Results: 47 patients were registered at individualized treatment and 113 at standardized treatment since 2001 to 2005. Of all of these 160 patient, 72 had access to a DST (44.7% total) and the point of prevalence of MDR-TB in HIV patients was 26.1%. The Table summarizes the results.

Conclusion: The prevalence of MDR-TB in HIV patients was 26.1%. It is urgent to use DST in new TB-HIV patients to determine the real prevalence.

Regimen	2001 n (%)	2002 n (%)	2003 n (%)	2004 n (%)	2005 n (%)	Total n (%)
Individualized	8 (28.6)	3 (9)	10 (50)	16 (45.7)	10 (22.2)	47 (29.2)
Standardized	20 (71.4)	30 (91)	10 (50)	19 (54.3)	34 (75.6)	113 (70.2)
Empirical	— (—)	— (—)	— (—)	— (—)	1 (2.2)	1 (0.6)
Total	28	33	20	35	45	161 (100)
With DST	12 (42.9)	10 (30)	13 (65)	20 (57)	17 (39)	72 (44.7)
MDR DST	9 (75)	7 (70)	9 (69)	9 (45)	8 (47)	42 (58.3)

PS-62005-02 Proposition de dépistage systématique de l'infection VIH aux malades tuberculeux au CNHPP de Cotonou

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Objectifs : Evaluer le taux d'acceptation de la proposition systématique du dépistage du VIH auprès des patients enquêtés, dégager les contraintes de cette approche, et formuler des recommandations pour son utilisation.

Méthodes : C'est une étude prospective menée au CNHPP de Cotonou de janvier à mai 2005; tous les cas de TB ont bénéficié d'un counselling au cours duquel la proposition du dépistage est faite. En cas d'acceptation, la sérologie VIH est faite sur un premier prélèvement sanguin. Un deuxième prélèvement est fait chez les tuberculeux infectés au VIH, après le counselling post test, pour la numération des CD4.

Résultats : 67% des 256 malades enregistrés ont accepté le dépistage du VIH. Les 33% des patients qui n'ont pas accepté le dépistage justifient leur refus par le désir de demander l'avis de leur partenaire (44%), la peur de gérer une éventuelle séropositivité au VIH (38%), et le refus de connaître leur statut sérologique (13,1%). Les contraintes enregistrées sont liées surtout à la disponibilité et la formation du personnel sur le counselling et l'actualisation de ses connaissances sur le VIH/SIDA. La séroprévalence qui est de 32% chez l'ensemble de tous les malades tuberculeux est significativement plus élevée dans les formes extra pulmonaires de TB que dans les formes pulmonaires (77% vs. 25%). Des 60% des malades qui ont eu une numération des CD4, 56,7% sont dans un état d'immuno-dépression avancée avec moins de 200 CD4.

PS-62033-02 Co-infection TB-VIH aux Cliniques Universitaires de Kinshasa

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Contexte : La prévalence de la co-infection TB-VIH est inconnue à Kinshasa.

Objectif : Evaluer cette prévalence en milieu hospitalier à Kinshasa et la prise en charge thérapeutique.

Schéma : Etude rétrospective de 2000 à 2004 des don-

nées récoltées sur les fiches des patients tuberculeux hospitalisés, les registres de dépistage VIH et les registres de traitement aux Cliniques Universitaires de Kinshasa.

Résultats : 176 patients enrôlés (85 hommes et 91 femmes) avec un âge moyen de 40 ans. La suspicion clinique d'infection à VIH/SIDA a intervenue chez 72 (40,9%) patients. Le dépistage anti-VIH avec deux tests dont un ELISA n'est réalisé que chez 36 (20,5%) patients ; tous étaient séropositifs. 13 patients ont pu accéder au typage lymphocytaire et aux ARV.

Conclusion : La co-infection est une réalité à Kinshasa. Le dépistage du VIH et l'accès aux ARV sont encore insuffisants. Des efforts doivent être entrepris dans les activités de collaboration TB-VIH.

PS-62058-02 Involving society in the fight against stigma and discrimination among people with TB and HIV/AIDS

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Problem: In most of the African countries, stigma is still a big challenge facing the people with TB while living with HIV/AIDS. This has led to many People with TB or HIV/AIDS fail to disclose their TB or HIV sero status to their family and community members, which in turn lead to more spread of HIV.

Methodology: Women Fighting AIDS in Tanzania (WOFATA) in collaboration with People Affected and Infected by HIV/AIDS AIDS in Tanzania (PAIHAT) and the Movement of Girls and Young Women against Serious Problems in Tanzania (MGYWOSEPT), several times exchanging views of the real situation from the community, in different ways like through e-Mails and seminars. These was including informations from People with TB and HIV/AIDS etc as the way of fight against stigma on TB and AIDS.

Outcome: The community members made a way forward that reporting of the TB and HIV/AIDS issues in the mass media etc by using the smooth language that does not discourage people with TB and HIV/AIDS, taking that the messege will rich many people easily. This is an inspiration to those who are not yet open, and a good number is expected to come out. They came out with new inspiration to put into action, to reduce and finally bring stigma to an end.

Recommendations: This is just a few days activities concerning TB and HIV/AIDS organized by just three organizations, and it had a remarkable impact to the Tanzanian community. This means that if more organizations and networks, religions, and government collaborate well for such activities, the changes will occur soon. I call upon all TB and HIV/AIDS stake holders to collaborate to organize different activities helping to fight stigma, which will help to increase

activism against TB and HIV/AIDS. At the end, I believe that TB and AIDS will no longer be a national calamity as it is now.

DRUG RESISTANCE/MDR-TB MANAGEMENT-1

PS-61087-02 A prospective cohort of patients with tuberculosis attending a referral treatment centre in Kampala, Uganda

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Aim: To describe the overall study population and determine the outcome of patients admitted to the Mulago Hospital tuberculosis (TB) ward.

Design: Since July 2003, we enrolled all consenting patients admitted to the TB ward. Subjects were evaluated at baseline, monthly during TB treatment and quarterly thereafter for at least 2 years or, during sick visits. Drug susceptibility testing was routinely performed.

Results: As of August 19, 2005, we screened 578 subjects and enrolled 423 (73%). Data is available on 301 subjects. The median time of follow-up is 8 months. To date, 107 (25%) subjects have died and 2 (0.5%) have been lost to follow-up. When compared to their corresponding control group, unadjusted mortality rates are highest in subjects with multidrug-resistant TB (RR 2.7; $\chi^2 P = 0.001$), HIV positive (RR 2.4; $P < 0.0001$), new TB (RR 2.3; $P < 0.0001$) and isoniazid monoresistance (RR 1.7; $P = 0.05$).

Conclusions: Study enrolment and follow-up rates in this cohort are excellent. The mortality rate is high, particularly among drug-resistant TB and HIV positive subjects. There is an urgent need to further study multidrug-resistant TB (MDR-TB) and develop effective treatment programs in this setting.

PS-61088-02 Resistance to anti-tuberculosis drugs in patients attending Mulago Hospital, Kampala

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Aim: To determine the prevalence of drug resistant tuberculosis in patients attending a referral TB centre in Kampala, Uganda.

Design: *M. tuberculosis* isolates from 394 patients attending the TB clinic at Old Mulago Hospital were tested for susceptibility to isoniazid, rifampicin, ethambutol, pyrazinamide, streptomycin and ofloxacin using the BACTEC 460 liquid culture system. Further testing was undertaken on a subset of those isolates found resistant to first line anti-tuberculosis drugs. Susceptibility to capreomycin, ethionamide, kanamycin and para-aminosalicylic acid was assessed using the agar proportion method.

Results: Of 394 patients screened 107 (27.2%) were new cases and 287 (72.8%) were re-treatment cases. Resistance ranged from 0–9.1% in new cases and 0–22.5% in re-treatment cases. The highest levels of resistance were to isoniazid, all isolates tested against ofloxacin were found susceptible. MDR-TB (resistance to at least isoniazid and rifampicin) was observed in 4.5% of new cases and 11.5% of re-treatment cases. Of the 26 MDR isolates tested with second-line drugs 10 (38%) were resistant to ethionamide, and all were susceptible to capreomycin, kanamycin and para-aminosalicylic acid.

Conclusions: Resistance to anti-tuberculosis drugs is a serious problem in this population. Further study is urgently needed to determine the national prevalence of drug resistant tuberculosis in Uganda.

PS-61140-02 Evidence of presence of less active meso (R,S)-ethambutol HCl in bulk drug samples and anti-tuberculosis formulations

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Aim: To investigate the presence of 16-times therapeutically less active meso (R,S)-ethambutol HCl in various APIs and commercial anti-TB products containing ethambutol HCl.

Methods: A novel DSC (differential scanning calorimetry) method for simultaneous quantitation of two diastereomeric forms (S,S and R,S) of ethambutol HCl was developed and validated. 35 formulations and 5 bulk drug samples of ethambutol HCl available in Indian market were screened.

Results: 1 out of 5 bulk drug samples and 12 out of 35 anti-TB formulations (comprising of single drug formulations of ethambutol HCl, two-, three- and four-drug FDCs containing ethambutol HCl along with isoniazid, rifampicin and/or pyrazinamide) were found to have therapeutically less active meso (R,S) form of ethambutol HCl. Percentage of the meso (R,S) form ranged between 11.61 to 100%. Overall, about 30% of the marketed anti-TB products (including samples from a DOTS centre, where the extent of presence of meso form was ~97%) were found to contain less therapeutically active meso (R,S) form.

Conclusion: Presence of meso (R,S) form of ethambutol HCl in APIs and anti-TB formulations is a serious issue due to its low therapeutic index.

PS-61168-02 Drug susceptibility patterns for anti-tuberculosis drugs in Category IV patients in Santo Domingo, DR, 2000–2005

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Introduction: Reported initial MDR-TB in Dominican Republic is 6.6%. To design adequate treatment regimens for suspect or MDR patients (Category IV) we need to know their drug susceptibility patterns to first line drugs and history of antituberculosis treatments.

Aim: To establish drug susceptibility patterns to anti-tuberculosis drugs in Category IV patients to design treatment regimens.

Method: An interviewed was applied with clinical history formulary containing information related to their illness, use of antituberculosis drugs and bacteriology results to patients reported as suspect or MDR and file revisions. The obtained data was process and analyzed.

Results: Of 69 reported patients, 50 (72%) were evaluated; 56% male; 83% were between 15–44 years old; 46 (92%) patients had confirmed MDR-TB. 8 (16%) were failure to Category I, 22 (44%) failure to Category II and 20 (40%) others (WHO calcification) with history of use of second line drugs. 76% (35) of

confirmed MDR-TB were resistant to at least three of the first line drugs and 37% were resistant to isoniazid, rifampin, ethambutol and streptomycin.

Conclusion: The standardized SLD regimen recommended for Dominican Republic PNCT (KmZCxEtCs/CxEtCs) can be used to treat 60% of the evaluated patients.

PS-61283-02 Drug resistance among patients with one or more risk factors for MDR-TB in a health district of Lima, Peru

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Rationale: Identification of risk factors for multi-drug-resistant tuberculosis (MDR-TB) is crucial for implementing rational criteria for performing drug susceptibility testing (DST). In 2005, the Peruvian National Tuberculosis Program established national criteria for soliciting DST.

Objective: To estimate the proportion of drug resistance among MDR-TB risk factor groups in a health district in Lima, Peru.

Methods: This is a descriptive study in which 351 patients with established risk factors for MDR-TB were identified in the 32 health establishments of Lima Ciudad from 1/2005 to 12/2005. Risk factors were confirmed through patient chart review and consultation with treating physicians. DST was performed, either by conventional or BACTEC methods.

Results: 351 patients were identified with one or more risk factors, according to national norms, with a median of 1 risk factor per patient. The most frequent risk factor was multiple previous TB treatments (14.5%), followed by suspected Category I treatment failure (13.0%), contact with confirmed MDR-TB (12.5%) and diabetes (10%). In these risk groups, 46.1%, 65.8%, 57.5% and 41.2% had MDR, respectively.

Conclusions: Among patients with one or more risk factors, the proportion with MDR-TB varies by risk factor. Operational assessment of these results could inform further norms on DST testing.

PS-61390-02 Ambulatory treatment of MDR-TB patients in Tomsk, Russia

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Objective: Assess treatment effectiveness of multiple drug-resistant tuberculosis (MDR-TB) in ambulatory settings.

Drug susceptibility patterns	MDR patients N	%
Resistant to		
RHES	17	37
RHE	5	11
RHS	13	28
RH	11	24

Materials and methods: We analyzed outcomes of 84 MDR-TB patients (22 women and 62 men aged from 19 to 68) who completed treatment in ambulatory settings between January 2000 to September 2004. DOT was provided in several places. In TB dispensary DOT was organized in day care department, medical treatment room, through home visiting service; in general health net settings; in Red Cross department; in a social center for homeless people; in a clinic of 'Tomsk Anti-AIDS' charity foundation. Incentives were provided during the entire treatment (food packages, hygiene sets, transportation vouchers).

Results: An average duration of treatment of this group of patients was 19 months, including 8 months of the intensive phase. The regimen included not less than 6 TB drugs taken 2 times a day. Treatment outcomes were determined based on the WHO recommendations. 61 (72.6%) patients cured, 6 (7.1%)—failed, 14 (16.7%)—defaulted, 2 (2.4%)—died of other disease, 1 (1.2%)—transferred out.

Conclusion: The majority of MDR-TB patients can be cured within ambulatory conditions using adequate DOT regimens and social support.

PS-61531-02 Programmatic risk factors for the acquisition of multidrug resistance in a TB treatment cohort in Tomsk, Russia

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Context: Tuberculosis control in the Russian Federation is threatened by the rising incidence of multidrug resistance.

Aim: To analyze programmatic risk factors for the acquisition of multidrug resistance in a tuberculosis treatment cohort in Russia.

Design and setting: Retrospective cohort study conducted in Tomsk, Siberia between January 1, 2001 and December 31, 2001.

Patients: Consecutively enrolled, newly detected, culture positive adult tuberculosis patients initiating therapy in a DOTS program.

Main outcome measures: Acquisition of multidrug resistance during the course of therapy.

Results: Non-adherence was not associated with the development of multidrug resistance (Adjusted OR 0.84; 95%CI 0.14–5.02). Patients who began treatment in the hospital setting, or who were later hospitalized during their treatment course, had a substan-

tially higher risk of developing multidrug-resistant tuberculosis than those who were treated as outpatients (Adjusted ORs: 12.7; 95%CI 2.3–70.2 and 9.6; 95%CI 1.3–68.7, respectively). None of the other risk factors assessed were significantly associated with the development of multidrug resistance.

Conclusions: In this cohort of Russian tuberculosis patients, most acquisition of multidrug-resistant tuberculosis occurred among patients who had been hospitalized in the course of their therapy, raising the possibility that these patients were re-infected with a drug-resistant strain.

PS-61534-02 Non-adherence, default, and acquisition of multidrug resistance in a TB treatment program in Tomsk, Russia

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Background: Tuberculosis (TB) control in the Russian Federation is threatened by non-adherence to therapy, which is thought to contribute to the incidence of multidrug-resistant tuberculosis (MDR-TB).

Methods: We conducted a retrospective cohort study to determine risk factors associated with non-adherence, default, and the acquisition of MDR-TB during the course of therapy in a cohort of patients in Tomsk, Siberia. We enrolled all newly detected, smear- and/or culture-positive adult TB patients initiating therapy in a DOTS program in 2001.

Results: Among all risk factors examined, substance abuse was found to be strongly associated with non-adherence (Adjusted Odds Ratio (AOR): 4.7; 95%CI 1.9–11.6) and default (AOR 11.9; 95%CI 2.8–50.6). Although non-adherence was associated with poor treatment outcome (AOR 2.4; 95%CI 1.1–5.5), it was not associated with the acquisition of MDR-TB during the course of therapy (AOR 0.8; 95%CI 0.1–5.2). Other factors that are believed to contribute to non-adherence and default, such as previous imprisonment and unemployment, were significantly related to poor treatment outcome in univariate analyses but the association became non-significant after adjusting for substance abuse.

Conclusions: Substance abuse was a strong predictor of non-adherence and default among a cohort of TB patients in Tomsk, Siberia. Such TB programs might benefit from incorporating interventions aimed at diagnoses and treatment of substance abuse.

PS-61543-02 Evaluation of drug susceptibility testing requests under program conditions in Lima, Peru

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Rationale: In 2005, the Peruvian National Tuberculosis Program approved new norms on the management of multidrug-resistant tuberculosis (MDR-TB), including criteria for drug susceptibility testing (DST), according to risk factors for drug resistance.

Objective: To evaluate whether DST requests met the appropriate criteria in one health district of Lima, Peru.

Methods: This is a descriptive study of 764 patients referred for DST from 32 health establishments in a health district in Lima, Peru throughout 2005. During this period, health workers were trained on criteria for requesting DST and posters with DST criteria were distributed throughout health centers.

Results: The indications for DST were reviewed in a total of 764 patients, among whom 52.4% (400/764) had at least one criteria for DST testing per national norms. The remaining 47.6% did not meet any criterion. The proportion of MDR identified among those with criteria for DST testing according to national norms vs. those without criteria was 40.8% vs. 3.8%.

Conclusions: Half of DST requests in a Lima health district in 2005 lacked appropriate criteria for DST, despite training on national norms. One possible explanation is the high rate of rotating health personnel at the local level, which minimizes the impact of training efforts. The low percentage of MDR strains among those without approved DST indications suggests that universal DST in this setting may be less appropriate than DST for high risk groups.

PS-61569-02 Clinical outcome of treatment among MDR patients in Armenia

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In Armenia MDR-TB was reported in 17.14% of patients with newly diagnosed TB and in 46.9% of those with a previous history of treatment. From September 2005 to March 2006 17 MDR-TB patients (men—15, women—2) previously received empirical treatment, continued the treatment with second line drugs, after individually tailored regimens, based on results of second line drug susceptibility test (in vitro) performed in the supranational laboratory. Body mass index less than 18.5 was revealed in 17.6% of all cases, the median age was 39 years. Most patients were

unemployed. Patients hadn't a history of heavy alcohol usage, 18% had a history of imprisonment. 16% of all cases reported previous contact with MDR-TB patients. Lung cavitations were present on chest radiography in all patients, and less than 12% received adjuvant surgical management. Resistance to second line drugs was the most common against kanamycin and prothionamide. Resistance to 2–4 drugs was in 12% patients, 5–6 drugs—41.7% and to 8 drugs—35%. 70% of cases had adverse effects associated with treatment. The most common side effects were nausea, vomiting and abdominal pain. 15 patients (excluding a defaulter and one died) who were cultures positive converted to culture negative after 3–5 months was 6%. X-ray scanning revealed positive tendency. Currently patients continue treatment with 5–6 preparations. Funding for this project was provided by MSF-France.

PS-61586-02 Early treatment outcomes for a multidrug-resistant tuberculosis patient cohort in Almaty, Kazakhstan

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Introduction: There is a growing number of MDR-TB patients registered in Almaty. Second line drugs (SLDs) were introduced in 1999, one year after introduction of the DOTS strategy. We present a preliminary assessment of an empiric standard treatment strategy where sensitivities to SLDs are unknown.

Methods: A cohort of 25 sputum smear and culture positive (SS+, C+) MDR-TB cases was enrolled for treatment during the first half of 2005. All patients were prescribed the regimen 6CaEtOfiCsZ/18EtOfiCs. The basic principle followed was to have at least 4 new (never used) drugs, including an injectable. All patients received the standard regimen except for three patients who received E instead of Z, and one patient treated without Cs due to severe side effects. All patients were hospitalized in a specialized MDR-TB department during the intensive phase (IP) and received treatment under strict observation. Monthly SSM and culture was performed to monitor treatment effectiveness in the IP. Two consecutive SS– and C– results were considered as conversion.

Results: Sputum smear and culture conversion rates were 80% and 84%, respectively, at the end of intensive phase. The majority of patients became SS– and C– (18 and 17) during the first two months of treatment.

Conclusion: The standard treatment regimen used demonstrates good interim treatment outcomes for

this cohort. Final treatment outcomes will depend on the success of DOT during the continuation phase.

PS-61618-02 Effectiveness and DOTS-Plus treatment outcomes in patients with adverse effects on second-line drugs

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Study the frequency and heaviness of adverse responses on treatment outcomes in patients with MDR-TB. 327 MDR-TB patients divided in two groups were analyzed. Group I included 132 patients who took capreomycin (CAP), cycloserine (CYC) (produced by EllyLilli, USA), prothionamide (PTH), pyrazinamide (PZA) (Sanavita, Germany), zanocyn (Ranbaxi, India). Group II was constituted of 197 patients who received CAP, CYC, ofloxacin and PZA (Adjanta Pharma, India), and PTH (Lupin, Ltd, India). Patients in both groups. In Group I, heavy and irremovable adverse responses occurred in 29 (22.0% \pm 3.6) cases, while in Group II in 83 (42.1% \pm 3.5). Interruption of CAP was needed in Group I in 2.3% \pm 1.3, in Group II in 3.0% \pm 1.2, CYC in 13.6% \pm 2.0 and in 26.4% \pm 3.1, PTH in 4.5% \pm 1.8 and 19.3% \pm 2.8, Oflox. in 5.3% \pm 1.9 and in 17.9% \pm 4.7 respectively. In Group I, 96.8% \pm 2.2 with removable adverse responses and 75.9% \pm 8.1 patients with heavy adverse responses were cured, while in Group II 82.3% \pm 4.3 and 71.1% \pm 5.0 relatively. Compared with Group I patients among Group II patients treatment interruptions increased by 1.2–1.3 times, and the unfavorable outcomes by 1.2–1.3 times due to the bad tolerance of the second-line drugs. In Group I bacteria emission continued in 3.2% \pm 2.2 of patients with removable adverse responses and in 20.7% \pm 7.7 of patients with heavy adverse responses, in Group II in 11.4% \pm 4.9 of patients respectively. Frequency and heaviness of adverse responses significantly influence on treatment outcomes which depend, in turn, on the quality of the second-line drugs and their pharmaceutical companies.

PS-61622-02 Primary *M. tuberculosis* resistance to second-line drugs and its impact on outcomes of DOTS-Plus regimen

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Investigate the prevalence of *M. tuberculosis* (MT) primary resistance to anti-TB drugs of the second line (ATDSL) among patients with MDR-TB treated under DOTS-Plus regimen at the National TB Center. Results of drug sensitivity testing (DST) to ATDSL were analyzed before treatment in 194 patients aged from

18 to 67 years. Chronic MDR-TB cases were notified in 85 (43.8%), relapses and treatment failure in 81 (41.8%), MDR-TB newly diagnosed in 28 (14.4%). DST was carried out by method of absolute concentrations. In 40 (20.6%) sensitivity to all ATDSL was kept. MT resistance to one of ATDSL was found in 62 (31.9%) cases, to two drugs in 48 (24.7%), to three in 26 (13.4%) and four or more in 19 (9.8%). The more frequent resistance was revealed to Et, that constituted 146 (72.3%) of cases. High level of MT primary resistance was to Cap in 61 (31.4%). Resistance to Oflox was revealed in 44 (22.7%), to Cyc in 29 (14.9%) and to Amikacin in 30 (15.5%) of patients. Treatment was designed as a standardized DOTS-Plus regimen (4-8CapOfCycEtZ/14-16OfCycEt). At present 53 (27.3%) patients completed their treatment course. Out of them 27 (50.9%) were cured, failure occurred in 15 (28.3%). Defaulted 3 (5.2%), died—8 (13.8%) from disease progressing. Of 23 cases with outcomes 'treatment failure' and 'died' 17 (73.9%) had the resistance to two ATDSL or more. Thus, among patients with MDR-TB high level of primary MT resistance was identified to ATDSL, especially to Et (72.3%) and Cap (31.4%).

CLINICAL RESEARCH, TREATMENT AND CARE: OTHER—1

PS-61238-02 Community acquired pneumonia: speed indices of ventilation pulmonary function and bronchial resistance

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Aim: To compare indices of air flow rate with bronchial resistance of community acquired pneumonia (CAP) patients.

Methods: CAP patients underwent spirometry and body plethysmography with the help of 'Masterlab Pro' apparatus produced by E Jaeger Company (Germany); we also determined bronchial resistance (Raw) and the structure of total lung capacity. We examined 40 CAP patients in the course of disease acuity (2–3 days of hospitalisation) at the age of 16–56 (the average age was 32.1 \pm 2.0 years), 33 males and 7 females. **Results:** 15 out of 40 patients were registered to have obstructive disorders of ventilation pulmonary function. FEV₁ fluctuations were between 75.6 and 95.4% of due values (on average 88.67 \pm 2.78%). The changes of forced expiratory flows at the level of 25, 50, and 75% of FVC testified to a blockade at the level of bronchi of different size within I-II degrees. Here, the average value of Raw was within the range of due values: 0.22 \pm 0.02 kPa·s/l, i.e. 74.53 \pm 4.5%

of due values (the average value of due Raw is 0.29 ± 0.005 kPa-s/l).

Conclusion: Obstructive disorders of pulmonary ventilation during CAP acuity were not the manifestation of bronchial permeability disorder, because no simultaneous increase of bronchial resistance in these cases was registered. The above mentioned testified to the fact that the speed indices of ventilation pulmonary function of this category of patients were affected by extra-pulmonary factors.

PS-61295-02 Pneumocystosis in a non-HIV-infected patient

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Pneumocystis jirovecii pneumonia (PJP) remains among the most frequent opportunistic infections in HIV-infected patients. It may however occur in HIV-infected patients with different kinds of immunodepression (organ transplantation, cancer . . .)

We report a case of a 64-year-old male heavy smoker with known bronchiectasis and recurrent bronchial infections. During the last exacerbation, he presented with fever, persistent cough, general alteration and a left pleural (PL) effusion which remained of unknown etiology despite all different investigations (PL fluid study, PL biopsy, fiberoptic and thoracoscopy). During evolution, he developed unilateral interstitial and microcystic opacities of the right lung. Induced sputum and bronchoalveolar lavage fluid examen showed the presence of Gomori Grocott + PJP cysts. HIV serology for HIV1 and HIV2 was negative and lymphocyte populations and sub populations were normal. No contamination nor immunodeficiency risk factors were noticed, despite several oriented investigations (corticosteroids, chemotherapy, neoplasia, dysglobulinemia, lupus erythematosus, etc. . . .). Clinical and radiological outcome was favorable with Bactrim. This leads to conclude that PJP infection could be seen in non evident immunocompromised subjects and should not be eliminated in such cases.

PS-61071-02 Forced expiratory oral pressure

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Objectives: To explain the gender and sport variation in lung function (FVC, FEV₁ and PEFR) by the forced expiratory oral pressure (FEOP).

Design and settings: A cross-sectional study was performed in September 2005 in Wad Medani City in Central Sudan on 63 adult healthy subjects of similar ages and heights (21 athletic males, 21 non athletic

males and 21 non athletic females). The subjects were examined for pulmonary function using the micro-plus spitometer, then the FEOP was measured using a modified sphygmomanometer connected to a mouth piece instead of the cuff. Mean lung function values were compared in the three groups using the *t*-test and correlated to FEOPs.

Results: As shown in the attached Table entitled lung function and FEOPs in athletic males and non athletic males and females, mean FVC, FEV₁, PEFR and FEOP were significantly lower in non athletic females compared to non athletic males, but the same variables were higher in athletic males compared to non athletic males ($P < 0.01$).

Variable	Athletic males	Non athletic males	Non athletic females
FVC Mean	4.30	3.57	2.49
Litres SD	0.45	0.27	0.23
FEV ₁ Mean	3.80	3.31	2.29
Litres SD	0.37	0.24	0.21
PEFR Mean	648.62	432.86	372.86
L/min SD	94.80	46.86	34.30
FEOP Mean	124.23	100.48	63.57
mmHg SD	24.90	15.24	12.96

Conclusion: Lung function values (FVC, FEV₁ and PEFR) and FEOP were higher in adult males compared to adult females while they were lower in non athletic males compared to athletics. Because of the direct correlation between lung function values and the FEOP, FEOP could explain gender and sport variation in lung function as indicator of the strength of respiratory muscles.

PS-61316-02 Impact de la formation des médecins dans une intervention de santé

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Une recherche opérationnelle comportant une étude de base et d'évaluation de l'impact de la formation des médecins généralistes dans la prise en charge des maladies respiratoires a été réalisée en 2004. Cette étude avait pour but d'évaluer avant et après intervention :

- la place des maladies respiratoires dans la demande de soins
- la qualité des procédures de diagnostic
- les modèles et le cout des prescriptions

La formation a concerné 77 sites répartis dans 10 départements. Le groupe de coordination de l'étude a élaboré un guide technique décrivant les procédures à appliquer. La méthode de formation est fondée sur l'auto apprentissage à partir de résolution de problèmes et de jeux de rôles. Cette méthode devait permettre de sélectionner les éléments du diagnostic, d'adopter une attitude pragmatique concernant la prescription, la demande d'examen complémentaires, de décrire

les modalités de référence, et de remplir les supports d'information.

L'impact de cette enquête a permis:

- de rationaliser la prescription des antibiotiques dans les IRA.
- d'améliorer la qualité du diagnostic de la tuberculose
- d'améliorer les conditions de diagnostic et de prise en charge des maladies respiratoires chroniques.

PS-61075-02 Nail clippers in the left main bronchus of an adult

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Tracheobronchial foreign body aspirations are infrequently seen in adults. The aim of this paper is to report one adult patient with a relatively large foreign body aspiration. A 20-year old man, who had been treated for upper respiratory tract infection and bronchitis, applied to our clinic with mild cough at times and wheezing for one month. A chest X-ray showed the presence of nail clippers in the left main bronchus. Confirmation of the diagnosis was done by computed tomography. We saw nail clippers in the left main bronchus by flexible bronchoscopy and recorded video picture. The patient had no psychiatric disease, but he occasionally experienced epileptic seizures. The patient did not remember the exact time of aspiration but when questioned in detail, it is likely that the clippers were aspirated during a mild epileptic attack that occurred just before he went to bed 2 months previously. The nail clippers were successfully removed via flexible fiberoptic bronchoscopy. This case reviews and discusses therapy of foreign body aspirations; to our knowledge this is the first such case in the literature.

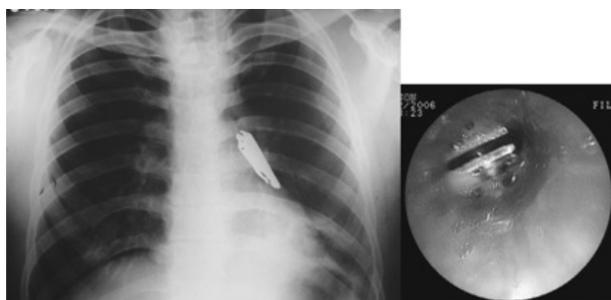


Figure Chest X-ray and fiberoptic bronchoscopy.

PS-61141-02 Influence of commonly used excipients on the stability of first-line anti-tuberculosis agents: I. Individual drugs

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Aim: To determine the influence of 25 commonly used pharmaceutical excipients (selected from Physician Desk Reference and Physician Gen Rx) on the physical and chemical stability of individual first-line anti-tuberculosis drugs, viz., rifampicin, isoniazid, pyrazinamide and ethambutol HCl.

Methods: The studies were done under accelerated stability test conditions of 40°C and 75% relative humidity in open glass vials. Samples were drawn after 1 and 3 months and observed visually for physical changes. Chemical changes were determined by HPLC.

Results: Isoniazid was most affected overall, as lot of excipients showed physical and chemical interactions with it. On the other hand, excipients interacted in a differential manner with rifampicin, while most of the excipients were compatible to ethambutol HCl. Pyrazinamide proved to be stable and non-interactive with any of the excipients. Based on the observations, the investigated excipients could be classified as stabilizing, intermediate and destabilizing towards the four drugs.

Conclusion: The results indicate that stability of the single-drug anti-TB formulations, especially those containing isoniazid, rifampicin or ethambutol HCl, can be improved significantly by cautious use of the excipients.

PS-61142-02 Influence of commonly used excipients on the stability of anti-tuberculosis agents: II. Combination of 2, 3 and 4 drugs

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Design: To study the influence of commonly used excipients on the physical and chemical stability of two-, three- and four-drug combinations of first-line anti-tuberculosis drugs, viz., rifampicin, isoniazid, pyrazinamide and ethambutol HCl.

Methods: Mixtures of drugs and excipients were prepared at a ratio normally present in tablets formulations. These were exposed to accelerated stability test conditions of 40°C and 75% relative humidity. Samples were drawn after 1 and 3 months and visually observed for physical changes. Chemical changes were determined by HPLC.

Results: The most detrimental effect of excipients was observed in three- and four-drug combinations con-

taining rifampicin, isoniazid and ethambutol HCl, and rifampicin, isoniazid, pyrazinamide and ethambutol HCl. On the other hand, differential interactions were observed with combinations of isoniazid and ethambutol HCl, rifampicin and isoniazid, and rifampicin, isoniazid and pyrazinamide. Pyrazinamide was least affected whether present in two-, three- or even four-drug combinations. In contrast, all the other drugs (rifampicin, isoniazid and ethambutol HCl) degraded to differential extents in different combinations. Based on the observations, the tested excipients were classified into stabilizing, intermediate and destabilizing categories.

Conclusions: Physico-chemical stability of anti-TB FDCs may be improved by cautious use of excipients.

PS-61145-02 Evaluation of 239 patients with bronchiectasis who had surgical therapy

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Bronchiectasis is the abnormal and permanent enlargement of subsegmental airways. It was aimed to evaluate 239 patients with 241 surgical interventions for bronchiectasis in our clinic between January 1993 and December 2005. Out of all patients 12 were female and 227 were male and mean age was 23.97 (14–71). The most common complaints were sputum expectoration and cough and 52% of patients had history of recurrent pulmonary infections for a long time. Left lung of 8 patients and right lung of one patient were entirely bronchiectatic (destroyed lung). In other 230 patients, 97 of bronchiectatic lesions were in the right lung and 188 were in the left lung. In two patients there was bilateral bronchiectasis. These 241 operations were done with thoracotomy in 235 interventions and with VATS in 6 interventions. Two patients with bilateral bronchiectasis were operated in different sessions. Right middle lobectomy in 5 patients and wedge resection in one patient were performed with VATS. Eight left pneumonectomies, 1 right pneumonectomy, 1 right upper bilobectomy, 6 right lower bilobectomies, 175 lobectomies, 22 lingulectomies, 26 segmentectomies and 47 wedge resections were performed with thoracotomy. When medical treatment is inadequate for prevention of symptoms or in case of massive hemoptysis, surgical treatment leads to acceptable mortality and morbidity levels.

PS-61225-02 Blastomycosis in a non-endemic area

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Blastomycosis is an endemic mycotic infection in some countries (0.6 cases/100 000 a year in USA). It is exceptional in Tunisia. Blastomycosis could either be asymptomatic, inducing insidious disease protective cellular immunisation, or symptomatic with pulmonary or extra-pulmonary localisations (bone-skin). Our study aims to discuss through a case with pulmonary localisation diagnosis and treatment features of blastomycosis and its possible occurrence in non endemic areas like Tunisia.

A 45-year-old farmer presented with cough, hemoptysis, rachialgia and lower left limb pain. Chest X ray showed a right lung upper opacity with necrotic aspect on CT. Bone scintigraphy revealed multiple vertebral and right femoral hyperfixation. Tuberculosis and immunodeficiency were eliminated. On fiberoscopy the right upper lobar bronchus was infiltrated. Pathological exam of bronchial biopsy surprisingly showed granulomatous mononuclear and giant cells, with spheric cytoplasmic PAS and Grocott positive thick double walled inclusions, with a unique exuberance with large implantation. Confirmation was made by typical blastomyces dermatitidis micella growth from bronchial aspiration fluid and biopsies. Itraconazole was indicated and evolution was favorable. Blastomycosis is inexistent in Tunisia. Only 3 cases have been previously described within 20 years. could mimic other insidious diseases, resulting in diagnostic delay. It could be evoked in case of exposure to earth moisture with suitable clinical features. Lung cancer, however, should never be ignored.

PS-61294-02 Revealing complications of pulmonary hydatid cyst

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Pulmonary hydatid cyst (PHC) management needs early diagnosis when the cyst is intact, allowing conservative surgery, whereas complicated cysts can result in lung resection. Complications following rupture of a PHC need to be recognised in order to avoid complications.

We report complicated PHC radioclinical aspects that can help in early diagnosis in 50 cases of PHC. 21 were simple PHC and 29 (58%) complicated PHC.

Revealing symptoms were mostly those of bronchial rupture of the cyst (22 cases, 75%). P presented with abscess like infection of the cyst (10 cases, 30%) and pneumonia in 4 cases. In 3 cases, hemoptysis with large opacities evoked cancer. Fibroscopy (F) showed a hydatid membrane occluding the bronchus in 5 cases. Cyst rupture in the pleural space was inaugural in 6 patients (25%), with 5 empyema and one pyo-pneumothorax. In one case, pulmonary embolism symptoms were inaugural due to the rupture of the cyst in the pulmonary artery. Chest X rays (CXR) suggest PHC (13 cases: 45%). CT, showing low dense opacities and a trapped hydatid membrane, is most helpful. A liver localisation is suggestive (25%).

Surgery is more risky in complicated than in simple cysts (20% vs 5%). Early diagnosis of PHC before cyst rupture is essential. However, some complications can have a more benign outcome, with no surgery necessary (7 cases). Spontaneous cure of the cyst occurred following bronchial emptying of the cyst content (3), chest drainage for a pleural cyst rupture (3) and bronchoscopic extraction of hydatid membrane in one case.

PS-61297-02 Mucosal associated lymphoid tissue (MALT) lymphoma of the lung: a case report

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We report a 58-year-old patient who presented with cough and bilateral alveolar shadows on chest X rays. Bronchial fibroscopy was normal. On biology, there was an increased gamma globulinemia. Right transbronchial and left transthoracic biopsies showed lymphomatous malignant cell proliferation with diffuse lymphoplasmocytic infiltrate and rare tumoral epithelial ilots. On immunohistochemistry staining, cells were positive in particular to B CD20 and CD79a. No extra-thoracic localisation nor extension to other mucosal sites were found. Considering low malignancy and controversy about therapeutic attitudes which vary from chemotherapy to abstention, the patient was put on corticosteroids. After a 2 years survey, gastric localisation occurred.

Lung born primitive lymphoma are third in frequency among all organ primitive lymphoma (12%). Age of onset is 50–60 years. Clinical symptoms are not specific, 50% being asymptomatic. MALT lung lymphoma are bilateral in 60–77% on CT with possible regional lymph nodes. Diagnosis is often incidental. Pathology shows interstitial and peribronchiolar B cell proliferation with follicular hyperplasia. According to REAL and WHO classification, low malignancy B phenotype is most frequent: 58–60%. M monoclonal

gammopathy with normal $\beta 2$ microglobulin is present in 20–60%. Pathogenesis is based on chronic infections or auto immune antigen stimulation. Therapeutic options vary from surgery to chemotherapy and even abstention. The prognosis remains favourable. 5-year survival is >80%.

PS-61351-02 Bronchogenic cyst simulating emphysematous bulla

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Bronchogenic cyst are embryogenic congenital malformations which are incidentally detected. They are foregut derived developmental abnormalities. Usually mediastinal, they could in 1/3 of cases be parenchymal where they simulate other different diseases and cause differential diagnosis problems. We report a case of a smoker 52 years aged patient who presented with recurrent bronchorrhea, 2 lung abscess episodes and recent hemoptysis and fever. Chest X rays showed a giant hydroaeric cavity of the left lobe lower. CT performed after antibiotherapy revealed a large regular walled cystic cavity of the left lower lobe with a small hydroaeric content. Surgery was indicated and a lingulectomy performed. Pathology of the resected cyst showed a fibromuscular walled cystic mass containing ciliated cells and cartilage ilots, all consistent with a parenchymal bronchogenic cyst. A literature review is performed.

PS-61353-02 Bactériologie et sévérité des exacerbations des broncho-pneumopathies chroniques obstructives

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Notre objectif est de déterminer les particularités bactériologiques, spirométriques, et évolutives de l'exacerbation des BPCO et leur relation avec la sévérité de la maladie. L'étude concerne 50 patients suivis pour BPCO sur 8 ans de 1998 à 2005 hospitalisés lors des exacerbations. L'âge moyen est de 69 ans. 50% ont un trouble obstructive sévère (stade III de GOLD), 24% sont stade II b, 12% stade II a et 14% stade I. 36% étaient sous oxygène à domicile. 24 patients ont eu une seule exacerbation, 16 en ont eu 2, 10 ont eu plus de 3 exacerbations, allant jusqu'à 6. Sur un total de 86 ECBC pratiqués lors des 96 exacerbations, 50 sont positifs (58%), 32 polymorphes, 4 négatifs.

Les 50 ECBC positifs concernent 32 patients. 5 patients ont eu le même germe dans des exacerbations différentes. 13 patients ont eu plusieurs G sur des ECBC différents, 14 patients ont un seul ECBC demandé, qui a été positif. Les différents G isolés sont : *Haemophilus influenzae* : 22 cas (44%), *Pseudomonas aeruginosa* : 22%, *Streptococcus pneumoniae* : 14%, *Branhamella catharralis* : 6%, *Klebsiella pneumoniae* : 4%, *Providencia stuartii* : 4%, et autres Gram—2%. L'hospitalisation est plus longue pour les stade III que pour les autres stades (25 vs. 15 jours). L'évolution sous antibiotiques est favorable : 88%, avec transfert en réanimation : 8% (2 malades stade III et 2 stade II), et mortalité de 4% (2 malades stade III). Les BPCO stade III font des exacerbations sévères avec des germes virulents. Le délai entre les exacerbations est corrélié à la sévérité de la maladie, la nature du germe et l'antibiotique.

TB IN HIGH-BURDEN COUNTRIES—1

PS-61013-02 Prevalence of HIV infection among TB patients in Somalia

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Objective: To determine HIV prevalence among TB patients in Somalia in 2005.

Methods: A cross-sectional sero-prevalence study in which a minimum sample size of 250 in each randomly selected TB center (Hargeisa, Mogadishu, Bossaso) was used on assumption of 95% confidence level assuming prevalence of 5% among TB patients.

Results: A total of 716 blood samples were collected from newly smear positive TB patients during first quarter 2005 from Hargeisa, Mogadishu and Bosasso TB centers, all samples have been tested for HIV. The overall prevalence of HIV among TB patients is 4.5% in the three TB centers in Somalia. Among the TB patients the HIV prevalence increases with age until about the age group 35–39 years. It is highest among age group 35–39 years (6.8%). There is no significant association between sex and HIV among TB patient and also there is no significant zonal difference.

Conclusion: The TB centers must be used to provide treatment to the dual infection of TB and HIV using DOTS and ART.

PS-61083-02 Identifying peculiarities of TB among patients infected with HIV by data from electronic database in Kazakhstan

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Kazakhstan is a country of Central Asia Region (CAR) with high burden of TB. But since 2003 TB incidence decrease is observed. To fight TB Protocols of WHO on DOTS adapted to the needs and opportunities of the country with monitoring of electronic Register of TB patients were implemented. Number of certain factors impeding the situation improvement was determined, such as revealing TB forms advanced with abundant bacilli emission, resistant TB forms development. For the last time detection of double infection TB and AIDS should be marked. Countries of CAR are yet in the earliest stage of HIV/AIDS epidemic. However, reason to be worried seriously is the fact that the associated TB and HIV infections are found out among patients with active TB forms which are men and urban inhabitants and adult persons the most frequently, but there are the separate cases among adolescents and children. Significant percentage of patients with TB and HIV associated constitutes the jobless, ex-prisoners, drugs abusers. Lung location of TB process was marked in 96.7%, in 57.1% of them with destruction and in 66.3% with TB bacilli excretion. Expanded TB process was present in the highest percentage of cases (71.8%). In structure of clinical forms infiltrative pulmonary TB was prevalent (74.8%). Thus, presence of HIV infection in TB patients aggravates the disease course and need in the joint activities emerges to fight these infections.

PS-61220-02 HIV seroprevalence among TB patients in Donetsk Oblast, Ukraine

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Objectives: After the Russian Federation Ukraine is the country of the former USSR experiencing the greatest epidemics of tuberculosis (TB) and HIV. No official complete data exists but the rates of TB-HIV co-infection seem to be rising. This study was conducted to assess the prevalence of HIV in the TB population in the civilian and penitentiary sectors, compare the findings with the data collected by the routine HIV surveillance system and explore the risk factors for TB-HIV co-infection.

Methods: A cross-sectional survey was undertaken of 424 new patients with TB (338 civilians, 86 pris-

oners) during a 3 month period in 2005 in Donetsk Oblast, Ukraine.

Results: The prevalence of HIV among TB patients was 15.4% (11.7–19.7, here and elsewhere ranges are 95% confidence limits) and 18.6% (11.0–28.4) in the civilian and penitentiary sectors, respectively. The risk factors associated with HIV infection were intravenous drug use and history of imprisonment.

Discussion: The results of the first ever HIV surveillance among TB patients conducted in Ukraine following international standards are quite astonishing showing a prevalence of HIV in the civilian TB population almost two times higher than the WHO estimate for 2004 (8.3%) and two percentage points higher than the official data reported during the same period by the routine HIV surveillance system (13.3%, 10.8–16.1). These findings call for urgent measures to control the spreading of HIV among TB patients in the country.

PS-61258-02 Community involvement in cluster sampling for a tuberculosis prevalence survey in Western Kenya

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Background: A tuberculosis prevalence survey in rural Western Kenya. Lack of understanding of sampling concepts may raise suspicion in the community about selection criteria and adversely affect study participation.

Aim: 1) Increase the communities' understanding and acceptance of the cluster selection. 2) Random sampling of clusters to obtain a sample of 20 000 persons over 14 years old.

Method/results: The study area has a population of 134 000 and 217 villages. Using available demographic and GIS maps, the area was divided in 105 clusters with a mean population of 1279 (range 752–1792). A mean of two (range 1–4) contiguous villages formed each cluster. Ten administrative leaders of the area participated in the cluster sample selection. Basic information on sampling principles, aim and design of the survey were presented, as well as maps and tables identifying the composite villages that formed the clusters. The leaders were divided in groups and inserted labels with sequential numbers 1–105 into table tennis balls. The balls were placed in a box and drawn by the leaders to form the sample clusters, which were then identified on a map and table. This process created a randomly ordered list of clusters to be used in the prevalence survey.

Discussion: The leaders were pleased with the transparent process and able to explain the procedure to community members. The sampling design is both logically and statistically efficient.

PS-61270-02 From symptoms to treatment: delay among smear-positive pulmonary TB patients in Sabah, Malaysia

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Tuberculosis is a major health problem in the state of Sabah, East Malaysia; where the case notification rate exceeds 100 cases/100 000 population. Reducing delays in diagnosis and treatment will limit the duration of infectiousness and thus reduce transmission in the community. A cross-sectional study is being conducted to determine the factors that affects the duration of the time period from the onset of symptoms to the start of treatment. It involves all adult smear positive pulmonary TB patients in a population of about a million over a period from October 2005 to March 2006. The domains of interest include socio-demographic status, difficulty in accessing services including travel time, perception of health services, knowledge, practices, attitudes and TB symptoms. The median age of participants was 36 years (range 18–80 years) and 36% were female. Cough was the most common TB symptom, being present in 93% of respondents. The median delay from onset of symptoms to start of TB treatment was 4 weeks (interquartile ranges: 4 weeks, range 1–156 weeks).

PS-61273-02 Molecular epidemiology of *Mycobacterium tuberculosis* in Dar Es Salaam, Tanzania

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Tanzania, located in east Africa, has a high tuberculosis burden despite long lasting efforts from tuberculosis control programs. To improve the understanding of the diversity of *Mycobacterium tuberculosis* in Tanzania, isolates from pulmonary cases in Dar es Salaam were assessed using spoligotyping. The strains were isolated in consecutive patients during October and November 2005, and shipped to Norway for PCR amplification and spoligotyping. The preliminary results from this ongoing study include those of 147 strains. Among the analyzed strains, 76 different spoligotypes were found. A total of 89 isolates were part of one of 18 identified clusters (61%). An overall diversity of 52% was inferred from the spoligotypes and the clustered isolates will be analyzed further. A high proportion (37%) of the strains was found to be members of, or closely related to the Central Asia (CAS) lineage. The Latin American Mediterranean (LAM)

family was also found to be widespread (22%), and the East African Indian (EAI) lineage constituted 10%. Low levels of other common lineages such as Haarlem, X, T and Beijing were found. The epidemic appears to be an established one, with little influence of newly-imported strains.

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PS-61321-02 Tuberculosis deaths in a rural area in Bangladesh, 1988–2003

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Introduction: Bangladesh ranks fifth among high burden tuberculosis (TB) countries. However, data on TB mortality from Bangladesh is sparse.

Objectives: To present data on TB mortality from Matlab, a rural area of Bangladesh during the period 1988–2003.

Methods: Data were obtained from Matlab, Bangladesh where the ICDDR,B has been maintaining a Health and Demographic Surveillance System (HDSS) in a population of about 200 000 since 1966. DOTS services were introduced by National Tuberculosis Control Programme in 1998 and BRAC health volunteers were involved in social mobilization and treatment supervision since 2001. As part of HDSS, all deaths were recorded and causes of deaths were ascertained using verbal autopsy methodology and causes assigned according to WHO ICD codes. All death records were reviewed retrospectively for the period 1988–2003 to determine deaths due to TB.

Results: During the period, there were 639 TB deaths; 473 (74%) among males and 166 (26%) among females. Most of the deaths (75.6%) were among persons aged ≥ 45 years followed by 21.6% among 15–44 years and 2.8% in <15 years old. TB deaths comprised of 3.6% of all deaths among persons ≥ 15 years. The age-standardized TB mortality rates varied between years and ranged from 19.15 to 46.05/100 000 population among males and 2.19 to 23.72 among females.

Conclusions: The high burden of tuberculosis deaths among adults in rural Bangladesh warrants further strengthening of TB control programme.

PS-61350-02 Tuberculosis as primary cause of death among AIDS cases in Rio de Janeiro City, Brazil

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Background: AIDS-related mortality decreased in Rio de Janeiro City (RJC) since the introduction of HAART (1997), and has been stable since 2000. We investigated the role of Tuberculosis (TB) as the primary cause of death among HIV+ subjects in RJC, in order to assess the magnitude of the co-infection.

Methods: Review of Mortality Information System, according to ICD-10, with death certificates coded in Chapter I—B20 to B24. Data of ARV use came from ARV drug database.

Results: Between 1996 and 2004, TB was the primary cause of death in 9.1% of AIDS related deaths, while PCP accounted for 4.6%. ‘Other’ infectious diseases accounted for 53.7% (B20, excluded B20.0), although it is not clear by the death certificate if TB cases were misclassified as other entities 32.1% of TB related deaths were on HAART (median: 18 months) vs. 25.2% of those who died from PCP (median: 20 months). Patients that died from TB were less educated (58.2% vs. 53.0%; $P = 0.04$) and more likely to be non-white (56.7% vs. 50.6%; $P = 0.07$) than patients with other causes.

Conclusions: Analysis of primary cause of death among AIDS cases using a secondary database showed that TB is the leading cause of AIDS related death and is responsible for twice as many deaths as PCP. The burden of TB may be an underestimate due to potential misclassification among causes of death labeled ‘other’.

PS-61352-02 A controlled trial of door-to-door tuberculosis active case finding in a Brazilian favela

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Design: A pair matched, cluster randomized trial of a door to door symptom screen and spot sputum collection vs. home delivery of an informational pamphlet in a large Brazilian favela (slum).

Aim: To compare TB case notification rates in the two study arms.

Methods: 14 administrative zones in the favela Rocinha were pair-matched based on estimated TB case notification rates in 2003. One zone of each pair was randomly allocated to receive a door to door symptom screen and sputum collection from all symp-

tomatic individuals. The other zone of each pair concurrently received pamphlets. Detailed interviews are performed following TB diagnosis to measure symptom duration and reason for seeking care.

Results: The study is ongoing. Preliminary results show an estimated 20 925 houses are involved in the intervention to date; 9611 in the door to door arm, and 11 314 in the pamphlet arm, representing an estimated 56 754 residents. 132 cases were identified in the study arms (case detection rate 233/100 000). Of the 132 cases, 71 were from the pamphlet arm of the study; 61 from the intervention arm. Of the 61 cases found in the intervention arm, 11 (18%) were new, AFB positive pulmonary cases identified at the home. Of 82 TB cases so far interviewed, 23 (28%) said they sought care for symptoms because a community health agent came to the door, and 9 (11%) came because they received a pamphlet.

Conclusion: Door to door case finding appears effective at detecting prevalent cases and influencing care seeking.

PS-61376-02 Analysis of TB case registration and treatment outcome in non-poor and poor counties in Guangxi, 2002–2005

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Objective: To know the situation of case register and treatment outcome of TB in Guangxi after implementing World Bank Loan TB Project.

Method: Analyze the quarter report forms of Guangxi from 2002 to 2005. Result Total 44 357 sputum smear positive TB patients were registered, among them 32 235 were new cases. The register rates of sputum smear positive TB patients in non-poverty and poverty counties were increased from 8.96 and 31.54/100 000 in 2000 to 35.42 and 41.01/100 000 in 2005 respectively. The register rates of new sputum smear positive TB patients were also increased from 5.43 and 13.63/100 000 to 29.44 and 32.25/100 000 respectively. The cure rates of sputum smear positive TB patients in non-poverty and poverty counties were increased from 56.81% and 67.39% in 2002 to 86.24% and 84.74% in 2004 respectively. The cure rates of new sputum smear positive TB patients in non-poverty and poverty counties were increased from 67.19% and 74.55% in 2002 to 89.38% and 88.61% in 2004 respectively. The default rates of sputum smear positive TB patients in non-poverty and poverty counties were decreased from 8.61% and 14.34% in 2002 to 1.51% and 1.66% in 2004. The default rates of new sputum smear positive TB patients in non-poverty and poverty counties were decreased from 7.05% and 11.82% in 2002 to 1.16% and 1.40% in 2004 respectively.

Conclusion: After implementing DOTS strategy in Guangxi, whether it is non-poverty or poverty county, the TB control effect is developed significantly.

PS-61377-02 MDR-TB patient types in a private-public mix DOTS unit

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Background and setting: The Makati Medical Center DOTS Clinic, a privately initiated PPMD unit since 1999 provides programmatic multidrug-resistant TB (MDR-TB) management in Manila, Philippines. This country has a large sector of private practicing physicians especially in Metro Manila where the PPMD unit is located. DOTS was initiated in the public sector in 1996 and had reached 90% coverage in year 2000. Structured involvement of the private sector in DOTS has been a focus since 2003 through the establishment of PPMD units in strategic areas of the country.

Objective and methods: To describe the types of MDR-TB patients seen in this PPMD unit from 1999 to 2005. Patients' charts were reviewed to gather this information.

Results: During 1999 to 2003, only 13% (24/182) of our MDR-TB patients were DOTS referrals. However, from 2004 to 2005, 32% (94/294) of our MDR-TB patients were DOTS referrals, mostly from failures of Category II.

MDR-TB patient type	1999 (n = 6) n (%)	2000 (n = 14) n (%)	2001 (n = 85) n (%)	2002 (n = 56) n (%)	2003 (n = 21) n (%)	2004 (n = 99) n (%)	2005 (n = 195) n (%)
New (previously untreated)	0	0	4 (5)	1 (2)	0	3 (3)	6 (3)
Non-DOTS referrals	5 (83)	12 (86)	71 (84)	46 (82)	19 (90)	68 (69)	123 (63)
DOTS referrals	1 (17)	2 (14)	10 (12)	9 (16)	2 (10)	28 (28)	66 (34)
Relapse	0	0	0	2 (4)	0	5 (5)	11 (6)
Return after default	0	0	2 (2)	4 (7)	0	2 (2)	7 (4)
After Category I failure	0	0	2 (2)	2 (4)	0	4 (4)	4 (2)
After Category II failure	1 (17)	2 (14)	6 (7)	1 (2)	2 (10)	17 (17)	44 (23)

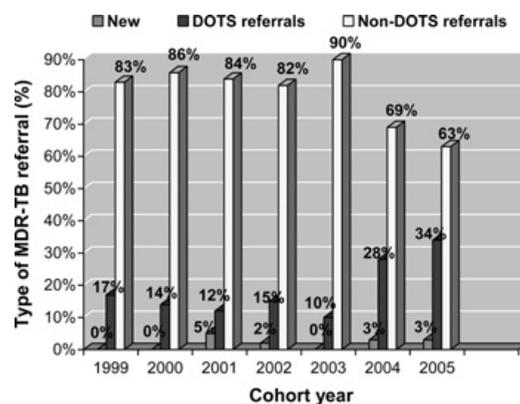


Figure Type of MDR-TB referrals to a PPMD Unit providing programmatic MDR-TB management.

Conclusion: Our data indicate that either there is more awareness among the DOTS implementing units to refer their unsuccessful DOTS patients to our PPMD unit or more private physicians are availing of DOTS services through PPMD units or public health centers. It is anticipated that over time, DOTS referrals will predominate the MDR-TB referrals to this unit.

PS-61409-02 Sex and age distribution of category 2 failure TB patients in Bangladesh

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Aim: To assess the distribution of age and sex among category 2 failure patients in Bangladesh.

Design: All failure cases are usually treated in Bangladesh in Chest Disease Clinic as they have specialist doctors. All CDCs were requested to send category 2 failure patients (smear positive at the end of 5 months of cat. 2 treatment) to National Institute of Disease of Chest and Hospital (NIDCH), Dhaka. From July to December 2005, 63 patients were referred at NIDCH. Thorough history was taken from each patients during each encounter. AFB microscopy was done at NIDCH and culture were done at Antwerp, Belgium.

Results: 63 patients came to NIDCH during the period with AFB smear positive result at the end of 5 month of cat 2 treatment. 79% were male and 21% were female. Most of the patients 88% (55) came from urban area. History of previous TB treatment could not be taken as patients could not provide the information. 51% were less than 30 years of age, and 76% were less than 50 years of age.

Conclusion: Proportion of active aged male and reporting of cat 2 failures from urban area is high indicating a need for improvement in NTP performances in urban area. Though it might be due to easy accessibility of information and different health care seeking pattern.

PS-61418-02 Patient and health care provider delays in the diagnosis and treatment of tuberculosis patients in Vietnam

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Background: Treatment delay is an important indicator of access to tuberculosis diagnosis and treatment. Analysis of patient delay (i.e. time interval between onset of symptoms and first consultation of a health care provider) and health care delay (i.e. time interval between first consultation and start of treatment) may inform policies to improve access.

Methods: During one quarter in 2002, all consecutively registered patients in 70 randomly selected districts in Vietnam were interviewed about duration of cough and health care consultation.

Results: Median (interquartile range) delay was 4 weeks (3–8) for total, 3 (1–4) weeks for patient and 1 (0–3) week for health care delay. Patients with long total delay (>12 weeks, 15%) accounted for 49% of the total delay. Independent risk factors ($P < 0.05$) for long total delay were middle age, remote setting, residence in the northern or central area, and initial visit to the private sector. For long patient delay (>6 weeks) this was female sex, belonging to an ethnic minority, and living at >5 km distance from a health facility or in the northern area. For long health care delay (>6 weeks) this was urban setting, residence in the central area and initial visit to a communal health post, TB hospital or the private sector.

Conclusion: Analysis of patient and treatment delays indicate target groups and areas for patient education and strengthening of the referral system, in particular between the private sector and the NTP.

PS-61449-02 Mapping potential 'hot spots' of TB transmission within an endemic community

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Background: The majority of TB transmission in endemic areas occurs outside the household. Methods for identifying potential 'hot spots' of TB transmission within communities are poorly developed.

Objectives: To conduct a rapid appraisal of gathering places, and to rate the potential contribution of these gathering places to TB transmission, within a TB endemic community, by applying established transmission principles.

Methods: The study was conducted in eight communities across the Western Cape Province of South Africa; a TB endemic area with TB incidence rates in excess of 500/100 000. Fieldwork combined participatory tools and observational methods using transect walks, informal conversations, daily time charts, structured observations, free-listing with community leaders and GPS (Global Positioning System) plotting. Gathering places were identified during fieldwork and mapped using a Geographical Information System (GIS). The transmission risk was rated by evaluating the following indicators: size of the gathering place, ventilation, UV-light exposure, number of people, proximity and duration of contact, and frequency of interaction.

Results: Various gathering places, their potential transmission risk (colour-coded) and their distribution within a community are visually illustrated using GIS maps.
Conclusion: Combining qualitative and quantitative research, together with modern GIS technology, may identify novel intervention targets for TB control.

TB IN SPECIAL POPULATIONS AND INSTITUTIONS (MIGRANTS, HOSPITALS, PRISONS)–1

PS-61110-02 Risk factors for tuberculosis outbreaks in the Netherlands

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Background: Tuberculosis (TB) cases that belong to a cluster of the same *Mycobacterium tuberculosis* DNA fingerprint are assumed to be consequence of recent transmission. Targeting interventions to fast growing clusters may be an efficient way of interrupting transmission in outbreaks.

Objective: To assess predictors for large growing clusters compared to clusters that remain small within a period of 2 years.

Design and method: Out of the 10 567 culture confirmed TB patients diagnosed between 1993 and 2004, 4783 (45%) had unique fingerprints while 5784 were part of a cluster. Of the clustered cases 673 were in a small (2 to 4 cases within the first 2 years) and 83 in a large cluster (more than 4 cases within the first 2 years).

Results: Independent risk factors for being a case within the first 2 years of a large cluster were non-Dutch nationality (OR = 6.38, 95%CI 1.38–29.55), concurrent pulmonary and extra-pulmonary tuberculosis (OR = 2.99, 95%CI 1.24–7.22), more than 5 years residence in the Netherlands (OR = 3.75, 95%CI 1.80–7.81), history of exposure to an infectious TB patient (OR = 4.42, 95%CI 1.50–13.02) and urban residence (OR = 2.43, 95%CI 1.20–4.89).

Conclusion: TB cases with the above mentioned risk factors have increased the risk of being part of a tuberculosis outbreak and may need intensified contact investigation.

PS-61171-02 Estimation of prevalence of tuberculosis infection among Indian health care workers: comparison of convention

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Objectives: To estimate the prevalence of latent tuberculosis infection (LTBI) among healthcare workers (HCWs), using the tuberculin skin test (TST), and the QuantiFERON-TB Gold In Tube (QFT-G), using conventional and model-based approaches.

Methods: 719 Indian HCWs underwent TST (1 TU PPD-RT23) and QFT-G, a whole-blood interferon- γ assay. Prevalence of LTBI was estimated using TST alone (using cut-points and mirror-image method), and using QFT-G alone (using various cut-points). In addition, mixture model analyses were performed using the TST data, and latent class model analyses (LCA) were performed using one or both test results. All models were estimated using a Bayesian approach. The LCA took into account prior information on the sensitivity and specificity of both tests.

Results: As shown in the Table, estimates of prevalence varied widely, depending on the method used. Based on TST alone, both model-based results gave similar estimates of the prevalence of around 35%. When results from both tests were combined using LCA, the estimated prevalence was 45.4%.

Method used to estimate prevalence	Estimated prevalence	95% confidence or credibility interval
TST		
5 mm cut-point	60.7%	57.1–64.2%
10 mm cut-point	41.4%	37.7–44.9%
14 mm cut-point, corrected for loss of sensitivity	33.8%	30.3–37.3%
Mirror image, corrected for loss of sensitivity	40.4%	36.8–44.1%
QFT-G		
0.20 IU/mL cut-point	44.6%	41.0–48.3%
0.35 IU/mL, manufacturer's cut-point	40.1%	36.6–43.7%
0.70 IU/mL cut-point	34.3%	30.8–37.8%
Mixture model of TST (assuming Weibull distributions for both infected and cross-reacting subgroups)	36.5%	28.5–47.0%
LCA		
Prior information on TST alone	35.6%	21.4–45.8%
Prior information on QFT-G alone	47.7%	41.6–54.6%
Prior information on both tests	45.4%	39.5–51.1%

Conclusions: In the absence of a gold standard for LTBI, estimation of prevalence of TB infection relies

on arbitrary, cut-point-based analyses of TST. The availability of more specific interferon- γ assays such as QFT-G, and the development of Bayesian model-based techniques that combine multiple test results and account for prior information, offer a more sophisticated approach to the estimation of LTBI prevalence.

PS-61282-02 Tuberculosis: epidemiological aspects in Complexo de Manguinhos, an urban slum in Rio de Janeiro, Brazil, 2000

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We report tuberculosis (TB) epidemiological aspects in patients living in slum area of Complexo de Manguinhos, (CM, 43.347 inh), RJ, Brazil, and attended in Centro Escola Germano Silval Faria/ENSP/FIOCRUZ where is established the Tuberculosis Control Program unit (TCP). January 2000 to December 2002, a retrospective study of medical record of all patients were done. The overall number of cases notified were 290 and 75.8% were new cases. The TB new cases incidence rate was 157, 205 and 145/100 000 across the study years, respectively. The year of 2001 showed the highest rate for TB incidence and TB/human immunodeficiency virus association infection. Thus may be related to the TCP reorganization in 2001. Female cases slightly increased in the study period. Neglected treatment and mortality still high (19.3% and 11%), however the accuracy of TB diagnoses increased. The present date show that improvement of the quality of the local health service can improve detection, however the TB situation is far to be controlled. It is important to ensure better integration of social, educational and health activities, including intensifying the Family Health Program and direct observed therapy.

PS-61284-02 *Mycobacterium tuberculosis* drug resistance in slum areas, Rio de Janeiro, Brazil

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Setting: Twelve urban slum area (Complexo de Manguinhos), Rio de Janeiro, Brazil.

Objective: To estimate the TB drug resistance.

Method: From Oct/2000 to Dec/2002 three weeks coughers pulmonary TB suspects attended at the Community Health Center had their respiratory samples

for acid-fast bacilli stain (AFB), culturing and drug susceptibility testing for isoniazide (INH), rifampin (RIF), streptomycin (SM), ethionamide (ETH) and ethambutol (EMB).

Results: A total of 263 three weeks coughers had sputum culture performed and 75 were sputum culture confirmed, of which 14 (18.6%) were AFB negative smear. Drug susceptibility were finding in isolates from 59 patients (78.7%) and only 4 (6.8%) were previously treated (PT). Resistance to any drug was found in isolates from 16 patients (21.4%), of which half (8 patients) were new cases (NC) and the remainder previously treated. The largest slum (CHP2) concentrated 37.5% (3/8) of all resistant NC. MDR-TB were associated to PT resistant cases (8%, 6/75), but SM resistance predominated among NC.

Conclusion: This study is the first in the area showing drug resistance higher than national rate. This observation indicates that more effective Tuberculosis Control Program intervention need to be done in Complexo de Manguinhos.

PS-61288-02 Comparison of an interferon- γ assay and the tuberculin skin test in multiple high-risk populations

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Recently developed in vitro tests of cellular immune response address limitations of the tuberculin skin test (TST). We estimated the prevalence of *M. tuberculosis* infection using TST and the QuantiFERON®-TB Gold In-Tube test by Cellestis Inc (QFT-GIT) to determine agreement between these tests in four high-risk populations in the US ($n = 1166$ with results available for both tests). We enrolled homeless persons in Seattle, WA ($n = 156$), new refugees ($n = 432$) and HIV+ persons ($n = 340$) in Dekalb County, GA, and alcohol and substance abusers (ASA) in North Carolina ($n = 238$). The tests performed differently in each population; for new refugees, 42.8% TST+, 28.7% QFT-GIT+ (McNemar's $P < 0.01$; $\kappa = 0.19$); for HIV+ persons, 2.7% TST+, 6.2% QFT-GIT+ (McNemar's $P < 0.05$; $\kappa = 0.03$); for homeless persons, 20.5% TST+, 18.6% QFT-GIT+ (McNemar's $P = 0.55$; $\kappa = 0.49$); and for ASA, 0.0% TST+, 0.08% QFT-GIT+ (McNemar's $P = 0.16$; κ undefined). 2.5% of all QFT-GIT results were indeterminate; 6.5% were indeterminate among HIV+ persons. The results are encouraging because QFT-GIT found fewer positives

among refugees for whom the TST may have poor specificity and more positives among HIV+ persons and ASA for whom the TST may have poor sensitivity.

PS-61292-02 MDR *M. tuberculosis* in high-risk groups of Delhi: preliminary results from an on-going cross-sectional study

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Objectives: To determine the prevalence of multi-drug-resistant *Mycobacterium tuberculosis* (MDR-TB) among injection drug users (IDU), HIV infected persons, and those at high risk for TB disease at a non-governmental health organization in Delhi. Secondary analysis examined the specificity and sensitivity of smear compared to culture diagnosis in a community directly observed therapy (DOTS) setting.

Methods: Participants aged 18 years or older who presented to DOTS and community clinics were recruited from three Delhi clinics. Consenting participants provided three sputum samples which were tested by the All India Institute of Medical Sciences for Acid Fast Bacilli smear, Bactec MGIT culture and sensitivity to anti-TB medications.

Results: Of the 168 participants who provided sputum to date, 87% were male, median age was 30 years, and 38% were HIV positive. Over 31% of participants tested culture positive for TB; of which 29% were AFB positive. Participants who were HIV positive compared to those without HIV infection were more likely to have TB disease ($\chi^2 = 9.13$, $P < 0.01$). To date, 16% of culture isolates tested positive for MDR. Data collection and drug sensitivity tests are on going to determine risk factors associated with MDR-TB.

Conclusions: As consistently shown elsewhere, those with HIV infection are more likely to have TB disease. The need for TB cultures and drug sensitivity testing is needed in this high-risk group.

PS-61303-02 Tuberculosis among health care workers in a hospital department

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Tuberculosis (TB) is an occupational disease in health care workers (HCW) and its transmission in health care facilities is an important concern. Some hospital departments are at higher risk of infection.

Aim: To review TB cases in HCW from an Otorhinolaryngology department in a short working period and determine their features.

Methods: TB screening among HCW was conducted after a suspected exposure and clinical and microbiological data from HCW with TB were collected.

Results: From 73 HCW who underwent TB screening, TB diagnosis was established in 9 (8 female; median age: 30 years; 1 doctor, 6 nurses, 2 nursing auxiliary). Pulmonary TB was found in 8 HCW and extra-pulmonary TB in 1. Microbiologic diagnosis was made in 7 cases by the following methods: polymerase chain reaction (PCR) and culture exam (BACTEC MGIT 960 Automated System), in sputum, $n = 2$; PCR and culture exam, in bronchoalveolar lavage (BAL), $n = 3$; BAL culture exam, $n = 1$; histological exam of pleural tissue, $n = 1$. In 4 cases, *Mycobacterium tuberculosis* (Mt) genomic DNA was extracted from cultures and molecular typing was made by Mycobacterial Interspersed Repetitive Unit (MIRU). All cases had identical MIRU types, which allowed to identify epidemiological link.

Conclusion: Nosocomial TB is prominent and an effort is needed to implement successful infection control measures in health care facilities as well as an effective TB screening program among HCW. MIRU typing of Mt facilitates clusters identification.

PS-61317-02 Predictors of tuberculosis as AIDS-defining disease

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Background: Tuberculosis (TB) as AIDS defining disease is the most frequent disease in developing countries and in some developed countries. The aim of this study is to analyse the characteristics of AIDS-TB cases in Barcelona.

Methods: Cross-sectional study, including cases from the Barcelona AIDS register diagnosed from 1994 to 2005. Global characteristics of AIDS-TB cases were compared with those of AIDS-non TB cases. Adjusted odd ratio (OR) and 95% confidence interval (CI) were calculated through logistic regression analysis.

Results: Among the 3550 patients included, 32.6% (1166) of patients were diagnosed with TB as AIDS defining disease. The associated factors with TB as AIDS defining disease at the multivariate level were: sex (OR [male]: 1.28; CI: 1.06–1.56), age (OR [<45 years old]: 1.31 (1.04–1.66), district of residence (OR [district I]: 1.80 (1.50–2.15), transmission pattern (OR [injecting drug users]: 1.79 (1.50–2.14), CD4+ (OR [<200 cel/mm³]: 0.35 (0.28–0.43), prison history (OR 2.55 (2.08–3.12), and origin region (OR [Spain]: 1, North America and Western Europe: 0.84 (0.46–1.53), Latin America and Caribbean: 1.42 (0.96–2.11), Middle East and North Africa: 1.44 (0.75–2.74),

Sub-Saharan Africa: 2.53 (1.29–4.93), rest Europe and Asia: 1.24 (0.50–3.12).

Conclusions: TB is also the most frequent AIDS defining disease in our city; specially in IDUs, prisoners and some migrants.

PS-61361-02 Characteristics of tuberculosis in immigrant and Italian patients hospitalised in Brescia, Italy

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Objective: Evaluation of impact of tuberculosis (TB) on the overall hospitalisations at the Department of Infectious Diseases (DID) of Spedali Civili Hospital of Brescia (Italy), clinical and epidemiological characteristics of TB in the study population and in comparison between IM and IT patients.

Methods: Retrospective study based on charts review of all TB cases diagnosed at the DID from January 2000 to December 2004.

Results: 392 cases were hospitalised. The trend was in increase: from 58 (2.2%) cases in 2000 to 94 (3.9%) cases in 2004, especially in IM and HIV-negative patients. The main characteristics of the study population are shown in the Table.

Discussion: TB represents an important cause of hospitalisation, especially in IM. The impact of the HIV-TB coinfection is proven limited both in IM and Italians. The drug resistance profile does not seem alarming: isoniazid and rifampicine resistance results almost inexistent. The higher number of tuberculin skin test positive in IM at the moment of admission to hospital suggests that the major pathogenetic mechanism of TB development is that of reactivation of latent tubercular infection. The management of patients during hospitalisation does not differ between IM and IT concerning diagnostic criteria, duration of hospitalisation and rate of notification. A lot still has to be done regarding the time lapse from onset of disease and diagnosis, especially in the case of infectiousness.

Parameters	Italian patients (It) (n = 93)	Immigrant patients (Im) (n = 299)	P
Sex (It/Im = 93/299)			
Male	45 (48%)	202 (68%)	0.001
Female	48 (52%)	97 (32%)	
Age (years) (It/Im = 93/299) mean (range)	58.27 (0.9–91.9)	31.40 (0.5–82.1)	0.001
Localization (It/Im = 93/299)			
Pulmonary	49 (52%)	127 (42%)	0.204
Extra-pulmonary	9 (31%)	5 (35%)	
Generalised	15 (16%)	66 (22%)	
Infectiousness (It/Im = 48/150)	41/48 (85%)	115/150 (76%)	0.137
Excavation (It/Im = 63/188)	27 (42%)	64 (34%)	0.134
Radiological features (It/Im = 63/187)			
Typical	62 (98%)	176 (94%)	0.359
Atypical	1 (2%)	8 (4%)	
Negative	0	3 (2%)	
Tuberculin skin test positive (It/Im = 51/173)	29 (56%)	141 (81%)	0.000
HIV+ status (It/Im = 90/289)	3 (3%)	9 (3%)	0.572
Rate of notification (It/Im = 93/299)	89 (95%)	281 (93%)	0.369
Type of diagnosis (It/Im = 93/299)			
Microbiological	56 (60%)	13 (71%)	0.220
Clinical-radiological	10 (10%)	19 (6%)	
Histological	9 (9%)	23 (7%)	
Ex-juvantibus	18 (19%)	44 (14%)	
Resistance to at least one drug (It/Im = 50/171)	9 (18%)	21 (12%)	0.208
Resistance to only one drug (It/Im = 49/171)			
Rifampicin	2 (4%)	2 (1%)	0.125
Isoniazid	3 (6%)	12 (7%)	0.561
Multidrug resistance (MDR) (It/Im = 50/171)	1 (2%)	1 (0.6%)	0.39
Hospitalisation (days) (It/Im = 85/261)	Mean = 23	Mean = 20	0.054
Delay in diagnosis (months) (It/Im = 89/287)			
Mean	3.08	2.29	0.072
Range	0.17–30.27	0.13–20.07	
Job (It/Im = 90/282)			
Employed	59 (65%)	120 (43%)	0.000
Unemployed	31 (35%)	162 (57%)	
Education (It/Im = 89/282)			
Illiterate	0	0	0.000
Secondary school	75 (84%)	275 (98%)	
Degree	14 (16%)	7 (2%)	

PS-61415-02 Tuberculosis incidents in health care workers in hospitals, England and Wales, 2005

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Introduction: A national tuberculosis incident and outbreak surveillance system (TBIOS) encompasses incidents from a variety of settings, including health care.

Aim: To describe the frequency, distribution and characteristics of tuberculosis incidents in health care workers in hospitals in England and Wales in 2005, and to evaluate the current surveillance system.

Methods: A retrospective survey of incidents involving tuberculosis in health care workers in hospitals in

2005. Questionnaires were sent to relevant local and regional contacts responsible for tuberculosis incidents. **Results:** TBIOS identified 63 incidents in health care workers in 2005 (an increase from 52 in 2004). Reports varied by region, with the highest number from London and the South East (16 from both). The health care worker was known to be sputum smear positive in 25 cases (40%), and 14 were known to be foreign born. Further results following completion of the questionnaire survey will be presented.

Conclusions: Reports of incidents of tuberculosis in health care workers in hospitals are increasing, which may reflect changes in reporting or a true increase in events. Routine collection of more detailed information on characteristics and outcomes of such incidents can provide an evidence base for their public health management.

PS-61451-02 DNA fingerprint analysis of *M. tuberculosis* isolated from TB patients of health centers in a province of Korea

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The IS6110 DNA fingerprint is a very useful tool to investigate tuberculosis transmission. This study aimed to find epidemiological situation within a province, which surrounds metropolitan city, Seoul, with frequent movement of population as well as high density of population due to rapid industrialization and a great expansion of household. The 681 *Mycobacterium tuberculosis* isolates from patients registered at health centers of Gyeonggi Province from May to December in 2004 were subjected to IS6110 DNA fingerprinting. The number of IS6110 copies of 681 isolates showed diverse fingerprint patterns from 0 to 21. The most prevalent copy number was 10 from 120 isolates (17.6%). One hundred and eighty strains (26.4%) were included in fifty clusters, of which two clusters were identified as household transmissions. The cluster rate by gender was 28.4% (135) in male and 22.1% (41) in female. Cluster distribution by ages was 57.1% (~60 years), 28.1 (20–29), 27.0% (50–59), 24.6% (40–41), 24.5% (20–29), and 22.2% (30–39) in order, indicating the highest cluster frequency in age group of 60–70 years (95% CI RR 1.072 ~1.988). The 33 (4.8%) were K (Korean) strain and 128 (18.8%) isolates belonged to K family. The K strains have been isolated only from Koreans. The proportion (4.8%) of K strains in this study was much higher than that (2.9%) of the previous nationwide prevalence survey (1995). This study showed characteristics to be helpful in the formulation of national TB control program.

PS-61454-02 Drug-resistant tuberculosis in six hospitals of Rio de Janeiro, Brazil: preliminary result

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Objective: To evaluate the occurrence of drug resistant and multidrug-resistant (MDR) tuberculosis (TB) among *Mycobacterium tuberculosis* (MTB) strains isolated from six hospitals and to analyze the association of resistance with investigated variables.

Methods: Prospective, descriptive study. During a period of one year all MTB strains isolated from patients of six hospitals (two reference centers for TB and four general hospitals) were analyzed. Patients enrolled were supposed to answer a questionnaire which contained clinical, social, demographic and epidemiological data. Bivariate analysis of preliminary data was done.

Results: Until March 2006, four hospitals had already finished data collection. Among 378 strains included in this analyze, 278 (73.5%) were from patients with newly diagnosed TB. From this population we found 18 (6.7%) with isoniazid (H) resistance; 5 (1.8%) with rifampin (R) resistance and 8 (2.8%) with both H/R resistance (MDR). Among patients with previous TB (100), 18 (18%) had H resistant strains; 14 (14%) R resistant strains and 12 (12%) were MDR. In bivariate analyze drug resistant cases were significantly associated with previous admission in hospitals ($P \leq 0.003$) and previous TB ($P \leq 0.0008$). MDR cases were significantly associated with previous TB ($P \leq 0.0003$).

Conclusion: High occurrence of resistant and MDR strains in hospitals display the importance to consider TB control programs based in these settings, mainly in high burden TB regions.

PS-61496-02 Contributions of a mobile digital X-ray unit in actively detecting TB amongst high risk groups in London

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Background: Tuberculosis (TB) in high-risk hard to reach groups such as prisoners, the homeless and problem drug users contributes to the occurrence of disease in London. An active case finding intervention using a mobile digital X-Ray unit (MXU) was targeted at these groups to identify cases of active pulmonary

TB. We present data from a preliminary evaluation of the first 6 months.

Methods: Effectiveness was measured in terms of the total number of users screened, the proportion of individuals identified with infectious TB and those with asymptomatic early stage disease. The number of TB referrals lost to follow up was determined.

Results: A total of 7426 people were screened. Fifty seven referrals were made for possible TB, of which 15 new active cases were diagnosed of these 2 were lost to follow up. Sixteen suspected TB cases were lost prior to confirmation of diagnosis. Prisoners and the homeless were found to account for the majority of cases.

Conclusion: A MXU can contribute towards identifying cases of TB that were not previously known to health services thus potentially curbing onward transmission. This preliminary evaluation demonstrates the importance of actively engaging local services in reducing loss to follow up in these high risk groups.

PS-61502-02 Occupational-attributable tuberculosis infection in Peruvian medical students: prevalence and risk factors

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Aim: To define occupational-attributable risk for *M. tuberculosis* infection as determined by QuantiFERON ESAT-6 (QFN) in medical students in a high-burden TB setting.

Design: Cross-sectional study.

Methods: 658 medical and 92 engineering students in Lima, Peru completed questionnaires under supervision and provided blood for QFN in the tube assay. Medical students also underwent 5TU PPD TST.

Results: Known occupational TB exposure was reported by 88% and 28% of clinical and preclinical medical students; 30%, 35% and 10% of clinical, preclinical and engineering students reported non-university exposure. 7 medical students had received TB treatment; 30% of clinical students had taken anti-TB prophylaxis. 41% of clinical and 18% of pre-clinical students were PPD positive. QFN positivity was more common in clinical students (14%) than pre-clinical (7%, OR 2.28 [1.32–3.92]) or engineering (8%) students; no significant difference was noted between pre-clinical and engineering students. 40% of medical students reported never using respiratory masks in wards or the ER. Degree of reported mask use in any setting, however analysed, did not protect against QFN-positivity.

Conclusion: Clinical medical students in Lima are at

greatly increased risk of occupationally acquired tuberculosis infection and disease, against which current personal respiratory protection measures (with infrequently worn, old, inappropriate and ill-fitting masks) offer no detectable protection.

PS-61529-02 Higher rate of extra-pulmonary TB in South Asians than in other foreign-born: United States, 1993–2004

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Background: Tuberculosis (TB) trends in the US are usually described in two broad categories, US-born and foreign-born, which may mask differences in TB epidemiology among different immigrant groups.

Methods: TB cases in the US from 1993–2004 were divided into South Asian-born (Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka), and other foreign-born. Multivariate logistic regression was used to determine associations between predictor variables for the two groups.

Results: 7624 South Asian-born (SA) TB patients and 85 171 other foreign-born (Other FB) TB patients were reported in the US Extrapulmonary TB disease (EPTB) occurred in 40.8% of SA TB patients, compared with 20.3% in Other FB patients. Risk factors most commonly associated with EPTB were rarely reported among SA TB patients (HIV infection 1.1%; age <5 years 0.7%). When adjusted for other risk factors, SA TB patients were more likely to have EPTB (OR 1.7, CI 1.6–1.9), and to be HIV-uninfected (OR 5.8, CI 4.7–7.3), and less likely to be <5 years old (OR 0.2, CI 0.1–0.3) than other foreign-born patients.

Conclusion: Despite the absence of traditional risk factors for extra-pulmonary disease, South Asian TB patients in the US have a much higher proportion of extra-pulmonary TB compared with Other FB TB patients. Higher rates of extra-pulmonary TB disease present special diagnostic challenges. A high level of suspicion is important to detect and treat TB early in South Asian immigrants.

PS-61540-02 Pulmonary tuberculosis among health personnel in Peru in 2004

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Rationale: Pulmonary tuberculosis (PTB) is one of the principle public health challenges in Peru, with incidence rates among the highest in Latin America. This

problem is also reflected in health establishments by high rates of TB transmission among health workers. **Methods:** This is a descriptive study, drawing data from the National Institute of Health Mycobacteriology Laboratory. All drug susceptibility testing (DST) requests and test results for patients with confirmed PTB who worked or studied within health establishments in Peru from January–December 2004 were reviewed.

Results: Sputum samples and DST requests from 65 health workers or health sciences students with confirmed PTB were received by the NIH Laboratory during the study period. 63.3% corresponded to men; the most frequent age group was of those 20–29 years of age (59.3%). 90.8% were health workers, while 9.2% were students. 65.1% worked in hospitals, while 19% worked in health centers. A majority (62%) lacked data on profession, but among those with data, 52.6% were physicians. 79.5% had no previous treatment, while 20.5% were previously treated. 60.7% for whom DST was obtained were infected with pan-susceptible strains, while 12.5% were multidrug-resistant.

Conclusions: In health workers whose DST results were confirmed by the NIH in 2004, we found a predominance of PTB among young male hospital workers with a high level of MDR-TB in comparison to other surveillance studies in Peru.

PS-62030-02 Workplace tuberculosis program in Kenya

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Kenya is among the 22 countries that have the highest burden of TB in the world. Over the last decade, there has been a more than ten-fold increase in TB cases. 50 to 60% of the TB patients are HIV positive. Various studies have shown that most of the industrial labor force lives in the slums. About 70% of the urban population lives in the 70 Kenyan slums. With the poor living and housing conditions like overcrowding, poor sanitation, lack of water and high illiteracy, a very high proportion of this population is either infected or affected by HIV and TB. This situation poses threat to the fellow workers in the workplace settings. In an effort to thwart the public health problem of workplace TB, KAPTLTD introduced the workplace respiratory health program to improve lung health in the workforce.

Objectives: To train the health professionals (physicians, nurses, paramedical staff) on epidemiology, diagnosis, transmission, prevention and treatment of TB and MDR-TB; Train the workers representatives and peer educators to be DOTS facilitators to ensure treatment adherence; Create positive awareness among the employees and employers to prevent stigma and urge them to identify symptoms and seek treatment early; and to advocate for acceptance of

tuberculosis infected people at the workplace. The program also builds the capacity of the corporate clinics in these industries thus enabling them to diagnose and manage TB according to the NLTP guidelines. 10 industries in Nairobi city are taking part in the workplace program. Through this program, we have been able to reach patients who are among employees and their families and communities surrounding these industries. In the long run, we hope that the productivity of the companies will rise owing to reduced absenteeism, deaths and limited staff turnover through early case detection, early and effective treatment. Transmission to other workers, family members and the general community will also be significantly reduced.

EPIDEMIOLOGY: ACUTE RESPIRATORY DISEASE/AIR POLLUTION AND OCCUPATIONAL LUNG DISEASE/ ASTHMA/TOBACCO

PS-61173-02 Follow-up observation of SARS patients for three years

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To explore outcome of SARS patients complicated by pulmonary fibrosis and follow up the occurrence of the complication on chest and coax arthrosis films in convalescent cases.

Materials: A 3-year imaging follow-up observation on 34 cases with diagnosis of SARS confirmed, contents of follow-up observation consisted of frontal and lateral chest X-ray plates, frontal X-ray plates of pelvis and CT scanning.

Results: 18 revealed fibrotic changes of various extent in the lungs while staying in hospital. 12 out of 15 severe cases showed fibrotic changes of various extents in the lungs during staying in hospital. 6 out of 19 ordinary cases were complicated by pulmonary fibrosis. After discharging from the hospital, 9 cases had existence of fibrosis in their lungs. After 1 month, 4 cases showed presence of shadows of fibrotic cords in both lungs of different calibers; comparing with the past plates, all showed improvement through absorption. After 3 months, 2 cases were discovered scanty amount of shadows of fibrotic streaks in their lungs, while the rest 2 cases had their pathologic foci completely absorbed. After 3 years, 1 case was discovered to show shadows of fibrotic.

Conclusion: Pulmonary fibrosis is a commonly seen complication in SARS patients; it is more apt to occur in severe SARS cases than those common SARS cases. Patients of old age and those severe SARS cases complicated by pulmonary fibrosis showed a higher sever-

ity marked by slower absorptive process and requiring longer time.

PS-61230-02 Risk factors associated with snoring in urban Delhi, India

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Aim: To study the risk factors associated with snoring in urban population of Delhi.

Methods: 32 municipal wards were selected by cluster sampling method. One polling station from each ward was selected by simple random method. Households were selected randomly from each polling station. The field investigators made house-to-house visits and administered a validated questionnaire with 15 questions on sleep disorder symptoms to those over 18 years. Each subject has to choose one of five possible alternatives for each question: 1) 'never', 2) 'less than once a week', 3) 'once or twice a week', 4) 'three to five nights/days a week', or 5) 'almost everyday/night'. The responders were classified as having snoring if they had loud snoring (scores 4 or 5). Use of anti-diabetic and anti-hypertensive medications was obtained.

Results: A total of 7975 subjects from urban Delhi were studied. There were 4050 (51%) males and 3925 (49%) females. The age ranged from 18 to 103 years. A history of snoring was present in 378 (4.7%) of 7975 subjects. Of these, 6.1% were males and 3.3% were females. Multiple logistic regression modeling demonstrated that male sex (Odds Ratio (OR) 2.518, 95% Confidence Interval (CI) 1.988–3.189), advancing age, body mass index (OR 3.302, 95%CI 1.483–7.354) and diabetes mellitus (OR 1.798, 95%CI 1.351–2.393) were associated with snoring.

Conclusion: The risk factors associated with snoring were male sex, advancing age, body mass index and diabetes mellitus.

Snoring	Male	Female	Total
Present	248 (6.1%)	130 (3.3%)	378 (4.7%)
Absent	3802 (93.9%)	3795 (96.7%)	7597 (95.3%)
Total	4050	3925	7975

PS-61245-02 Pneumothorax : épidémiologie et prise en charge au CHU Tokoin de Lomé, Togo

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Le pneumothorax est un accident grave. Quelle que soit son abondance, il impose une enquête étiologique minutieuse.

Objectif : Dresser le profil épidémiologique, clinique, thérapeutique, et évolutif des pneumothorax au Togo.

Patients et méthodes : Etude rétrospective de 57 dossiers de pneumothorax hospitalisés de janvier 1994 à décembre 2004.

Résultats : Les pneumothorax ont constitué 1,4% des hospitalisations du service. Age moyen : 40,35 ans (extrêmes 15 et 78 ans) : Sex-ratio (H/F) : 2,56. Les travailleurs de bas niveau économique, les tabagiques (49,1%), et les personnes vivant avec le VIH (56%) ont été les plus représentés. Douleur thoracique (94,7%), dyspnée (87,7%), toux (75,4%) ont été les plaintes les plus retrouvées. L'hémithorax droit a été le plus atteint (57,9%) avec une prédominance des pneumothorax totaux (56,1%). Les images associées (91,2%) ont été souvent homolatérales (75%). Les PSI ont prédominé (49,1%). La tuberculose (29,8%) a été la cause infectieuse la plus fréquente. Le traitement a été basé sur l'exsufflation à l'aiguille (80,7%), le drainage (14%), les antituberculeux (29,8%), les antibiotiques non spécifiques (96,4%) auxquels ont été associées la kinésithérapie (28%), la corticothérapie (71,9%). Durée moyenne d'hospitalisation : 27,6 jours. Evolution favorable : 80,7% et défavorable : 12,2%. Vu la fréquence de la tuberculose dans les étiologies infectieuses et la forte mortalité hospitalière, insistons sur la prévention tuberculeuse, tabagique et du VIH.

PS-61539-02 Stratégie de prise en charge des BPCO : enquête de faisabilité

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Dans les pays du Maghreb, la BPCO reste inconnue du grand public et souvent méconnue des médecins et autres professionnels de santé. Ceci est un obstacle majeur à sa prise en charge efficace. Toute stratégie de prévention doit reposer sur la connaissance de l'ampleur du problème dans chacun des pays du Maghreb. Il existe un vrai besoin de réaliser une étude épidémiologique afin de connaître la prévalence de la BPCO, et de décrire ses principaux facteurs déterminants. Dans ce cadre, une pré enquête a été réalisée sur une population qui s'est déroulée en 2005 au niveau d'une commune de 10 000 habitants. L'objectif est d'apprécier la faisabilité du questionnaire et les difficultés pratiques prévisionnelles. Utilisation d'un questionnaire standardisé et validé inspiré du questionnaire respiratoire de l'ATS DLD—78. Mesures spirométriques réalisées à l'aide d'un dispositif portable (PIKO6), soumises à un étalonnage et un contrôle de qualité. Le patient doit réaliser 3 mesures spirométriques puis subir un test de réversibilité incluant également 3 mesures spirométriques après bronchodilatation. Au total 170 patients ont été étudiés montrant :

Age moyen 47,65 ans (25 ans à 87 ans)

Sexe : sexe ratio 2,33

Prévalence BPCO : 14,7%

Les résultats démontrent la faisabilité de l'étude proprement dite.

PS-61921-02 Prevalence and factors associated with asthma among a group of Iraqi people

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Aim: Measuring the prevalence of asthma among the study group and their families, and associated factors.

Methods: 1578 students in the college of medicine, Al-Nahrain University in Baghdad and their families were included in the study.

Results: The mean age was 30.56 ± 13.66 years, with a median of 23 years, ranging from 1.5–90 years. The prevalence of asthma was 8.1%. There was a significant difference between males and females (10% vs. 6.1%, respectively) ($P = 0.005$). The highest prevalence of asthma: for males (28.9%) was noticed among those ≤ 10 years old, for females (15.2%) was also noticed among those who were ≤ 10 years. Factors found to be associated with higher prevalence were smoking, family history of asthma, food allergy, drug intake, passive smoking and manual cleaning of carpet ($P < 0.05$). While presence of house garden, pets or other animals, occupation were found not to be associated ($P > 0.05$).

Conclusion: The prevalence of asthma (8.1%) in our sample is a little bit higher than some other countries.

PS-61955-02 Quelles attitudes du patient face à son asthme en pays pauvre?

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Introduction : Le patient asthmatique doit être autonome dans la prise en charge de son affection. Le but de notre étude est d'évaluer l'attitude des patients asthmatique face à leur maladie.

Patients et méthodes : Nous avons mené une enquête par questionnaires auto administré auprès de 127 patients asthmatiques, nouvellement diagnostiqués au CHU Sanou Sourô. Ont été recherchés entre autres, les circonstances de recours au soins, l'utilisation des traitements antiasthmatiques.

Résultats : Le taux de réponse était de 92%. Tous les patients n'ont recours au personnel de santé qu'en cas de crise. Aucun ne disposait d'un traitement de fond de la maladie. La chronicité de l'affection n'est reconvenue que par 27,3% des patients. D'autres traitements (incantations, décoctions diverses) étaient utilisés par 42,7% des patients.

Discussion : Notre travail a montré que dans le contexte de pauvreté, le niveau d'auto prise en charge des patients asthmatiques est bas. Il est à craindre que l'asthme ne devienne une grande source d'invalidité et un frein au développement.

Conclusion : La création d'écoles de l'asthme est impérative.

PS-61984-02 Does mycobacterial infection prevent the development of atopy in childhood? A systematic review

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Background: The epidemiologic relation between mycobacterial infection and the prevalence of atopic disease in humans is still unclear. This contrasts with studies in murine models in which a clear suppression of atopic symptoms was observed after exposure to mycobacteria.

Aim: A systematic overview and meta-analysis of the published literature.

Methods: EMBASE and MEDLINE databases were searched for papers published in the English literature (1966–2005) on the relationship between mycobacterial infection and atopic disease. Original studies involving the pediatric population were included.

Results: Of a total of 1201 hits, 23 studies (19 cross-sectional, 3 case-control, 1 prospective cohort) met the inclusion criteria. Only a minority of studies (10) observed an association between mycobacterial infection and the prevalence of atopic disease outcome. In the meta-analysis only studies containing complete data on infection with mycobacteria and atopic disease outcome variables were included. Only cross sectional studies, showed statistically significant negative correlation (OR 0.63; 95% CI 0.51–0.79).

Limitations: There was a high level of heterogeneity (I^2) observed between studies.

Conclusions: Only a minority of studies in the literature shows any evidence of an association between mycobacterial infection and atopic disease.

PS-62031-02 Price, availability and affordability of asthma medicines: results from 30 country surveys

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Design: Cross-sectional observational multi-country study.

Methods: In 30 countries data were collected, on

generic and originator beclometasone (50 mcg/dose) and salbutamol (0.1 mg/dose) inhalers (200 doses) from 20+ facilities in public and private sector, using the WHO/HAI standardized methodology. Prices were adjusted to international reference prices (IRP).

Results: The prices paid by patients in the public sector in median values for both medicines ranged from 0.73 to 1.21 times the IRP. In the private sector, both medicines as originator cost three times the IRP, generic medicines once the IRP. Median availability of beclometasone in both public and private sector did not exceed 14%. Salbutamol was not available in the public sector, in the private sector median availability is 64% and 74% for originator and generic respectively. Affordability of both medicines was poor: for generic and originator respectively beclometasone 'cost' 1.4 and 3.3, salbutamol 0.7 and 1.2 days wages for the lowest paid government worker.

Conclusion: The availability of both medicines in the public sector is poor. The private sector shows better availability but fairly high prices. Most of the surveyed countries are developing or transitional, and affordability of the inhalers is poor. Initiatives such as the Asthma Drug Facility will be needed to guarantee universal access.

PS-61031-02 The report of first smoking cessation clinic, Tehran, Iran, 2005

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Introduction: Tobacco use is the leading cause of preventable death worldwide. 5 million people die from tobacco each year, the half of these deaths usually occur in developing countries. If current trends continue, it is estimated that it will be responsible for 10 million deaths by the year 2020, the majority of which 7 million will occur in low-income countries.

Material and method: Smoking Cessation Clinic, as a research project, was established for the first time in Iran by NRITLD in 1998. The quitting educational courses consist of 7 sessions of 90 minutes run by General Practitioners. In implementation of smoking cessation programs, the following are being employed: Providing education on smoking hazards and quitting methods, behavioral therapies, group discussion, nicotine replacement therapy. Among the ex-smokers, some are randomly selected for confirmation of CO expiratory smokerlyzer Test.

Results: Of 2502 (1935 male, 567 female) smokers registered on 1st March 2005, 646 (491 male, 155 female) were not able to completed the educational courses for different reasons and of the remaining 1856 (1444 male, 412 female), 1661 (1310 male, 351 female) have quitted successfully (88%) and others smoked cigarette in lower rate. Among those, 23.4% had a relapse into smoking a month after abstinence and the percentages in the 3rd and 6th months were

40.7% and 47.2%, respectively. One year after quitting, the rate of relapse was 52.4%.

PS-61032-02 Smoking rates and related diseases among members of the Iranian National Medical Association: 2005

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Background: Medical society potentially could have great influence on tobacco control and prevention. Performed studies in most countries showed that there is a relation between physicians' smoking rate and general population smoking rates. In Iran we have not had a similar study and we decided to perform this project at the national level.

Material and method: This study evaluated the smoking behavior and its related disease among the all members of Iranian NMA who are 80 000. It is a descriptive cross-sectional study by a questionnaire based on WHO which was matched with IUATLD questionnaire. The project has been carried out in autumn 2003 by sending the questionnaires through the NMA journals for the members.

Results: 3270 returned questionnaires show that 13.1% of NMA members are smokers. Among NMA members, 19.6% of male and 5.5% of female are smokers. According to the job, 16.6% of general physicians, 12.5% of dentists, 12.5% of pharmacologists, 10.6% of specialist, 1.4% of midwives, 18.2% of nurses and 4.7% of other professions are smokers. The most common age of starting smoking is 18 years (31%). Among whole population, 39.6% have diseases which is respectively 37.2%, 46.4% and 45% in non smokers, ex-smokers and smokers. 28.2% of smokers who smoke less than 10 cigarettes a day and 44.6% of smokers who smoke more than 20 cigarettes a day have diseases.

PS-61315-02 Le tabagisme chez les enseignants de la ville de Sousse, Tunisie

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Objectif : Evaluer les habitudes tabagiques des enseignants de la ville de Sousse (Tunisie), ainsi que leurs connaissances sur les méfaits du tabac.

Méthodes : Une étude transversale a été réalisée en 2004 sur un échantillon représentatif des enseignants de la ville de Sousse. Un questionnaire anonyme et auto administré a été utilisé pour recueillir les informations sur les connaissances et les habitudes tabagiques de nos enseignants.

Résultats : Le taux de réponse à cette étude était de 92,4% (739/800). L'âge moyen de la population étu-

diée était de $45,3 \pm 8,1$ ans avec un sexe ratio (féminin/masculin) de 1,8. La prévalence de l'habitude tabagique était de 31% avec une prédominance masculine (82,8% des fumeurs étaient des hommes). La cigarette était le mode de consommation de tabac la plus fréquente (91%). Parmi les différentes composantes de la fumée du tabac, seule la nicotine était identifiée par la majorité des enseignants, alors que le CO n'était cité que par 5,3% d'entre eux. Globalement, les connaissances de nos enseignants en matière de tabagisme comportaient de grandes lacunes avec plus de 79% d'entre eux étaient mal informés à ce sujet.

Conclusion : A fin d'être efficace dans les différents programmes de lutte anti-tabac en milieu scolaire, il est impératif d'associer les enseignants dans les différentes actions en tenant compte de leurs connaissances et habitudes tabagiques.

PS-61700-02 Tabagisme chez les étudiants en formation paramédicale du Togo

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Objectifs : Evaluer la prévalence, les connaissances et les attitudes tabagiques des étudiants.

Méthode : Il s'agissait d'une enquête transversale descriptive réalisée de mars à juin 2005 à l'aide d'un auto questionnaire anonyme inspiré du questionnaire de l'OMS pour les agents de santé.

Résultats : Le taux de participation était de 75,6%. 30,1% des avait déjà fumé ou tenté de fumer, 2,2% étaient fumeurs. Une proportion de 12,35% des enquêtés avaient des parents et 43,22% des amis fumeurs. Trois enquêtés sur 4 (76,2%) trouvait le tabac nocif pour la santé, 34,5% et 49,4% ignoraient le lien entre respectivement le cancer des bronches et de la vessie et le tabac. Les fumeurs de la 1ère année privilégiaient la survenue de symptômes pour arrêter de fumer alors que leurs homologues des 2ème et 3ème années envisageaient arrêter de fumer avant l'apparitions des symptômes. Au cours de leur future carrière, seul 10% des enquêtés pensaient mettre en garde les patients fumeurs présentant des signes liés au tabagisme sur les méfaits du tabagisme. 96% des enquêtés était pour une interdiction absolue de fumer dans les hôpitaux et les lieux publics.

Conclusion : Les données de cette étude montre la nécessité d'améliorer les connaissances des étudiants sur le tabagisme de permettre à ces futurs soignants de contribuer efficacement à la lutte contre le tabagisme au Togo.

PS-61756-02 Tabagisme et transition épidémiologique au Maroc

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L'Organisation Mondiale de la Santé attribue au tabagisme près de 4,9 millions de décès par an, ce chiffre devrait passer à 8.4 millions d'ici 2020. On estime que 70% de ces décès se produiront dans les pays en développement où les tendances vont vers un accroissement de la prévalence du tabagisme chez les adolescents. Au Maroc, pays en transition épidémiologique, les conséquences du tabagisme sont alarmantes. Aux maladies infectieuses en voie d'être contrôlées viennent s'ajouter des maladies chroniques considérées jusqu'ici comme l'apanage des pays industrialisés. Pour apporter une réponse adaptée à ce fléau, le ministère de la santé avait menée une enquête nationale en 2000. Ses résultats ont montré que la prévalence du tabagisme chez les personnes âgées de plus de 20 ans était de 13,8% (31% des hommes et 1% des femmes). Pour les moins de 20 ans, les chiffres étaient plus inquiétants avec une proportion des fumeurs en milieu scolaire de 21% (4,5% des filles) et augmentant avec le grade scolaire. La majorité des fumeurs marocains sont pauvres. Ainsi, en 1999, les ménages avaient dépensé autant d'argent pour le tabac que pour l'éducation. Malgré les profits colossaux du commerce du tabac (5,66 milliards de dirhams en 1996 au Maroc), le coût de ses conséquences sociales pèsent lourdement sur l'économie (au moins 200 milliards de \$ US par an dans le monde). Cette situation exige une mobilisation de tous les moyens éducationnels et législatifs pour lutter contre ce fléau.

PS-61076-02 Strategy to reduce/control TB by training TB health professionals to address cessation with their patients

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Every health professional working with TB patients need to be trained in dealing with the tobacco habits of their patients. As a first step the health professional has to ask the patient whether they practice the tobacco habit—smoking/chewing since the use of tobacco has been demonstrated to increase the incidence of TB. Since behavioral changes require that the patient be informed, be motivated, given skill and help build enabling environments, the training would include all these elements. Education will be based on the needs and problems of the patient and a technique of evolving such education would be imparted. Since education alone will not achieve a behavioral change, a strategy of motivating the patient will be an intrinsic part of the training. Tactics of motivating patients require a deep understanding of the patient in addition

to understanding how he could stay interested. Even when he is educated and motivated, he may not have the skill to stay away from or give up the use of tobacco. Skill building will be imparted which will include skills of communication, negotiation, refusal and self-confidence and decision making power. Even when all these are in place, the objective is not achieved unless the enabling environments are created at the family, workplace and community level. This strategy is workable as it has been pretested and modified.

TB EDUCATION AND TRAINING

PS-61119-02 User evaluation among MDR-TB inpatients in Arkhangelsk and needs assessment of IEC materials and methods

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Method: Questionnaire among 127 inpatients with multidrug resistant tuberculosis. The questionnaire assessed the patients needs for freetime activities, psychological adaptation. Current IEC materials and training methods were evaluated in addition to social data and behaviour patterns associated with risk of developing TB disease. The respondents were asked what they would like to know and learn more about tuberculosis and treatment and what themes had been poorly addressed: To learn more about management of adverse drugs reactions, secondly themes of TB and MDR-TB and social issues of housing, social security and rights. Hospital rules and regulations and use of alcohol under TB treatment were listed as least interesting. The majority preferred to obtain information through talks with their doctor, secondly through peer groups with other TB patients. Leaflets, TB school/lectures and posters were least preferred. Feed back on the analysis of the questionnaire has been given to the respondents.

Conclusion: Questionnaire as user evaluation method has documented the need of revising the IEC materials and needs to change IEC methods being used in the TB control programme. The method has facilitated inclusion of the users and participation of the patients in revising IEC material.

PS-61137-02 Knowledge and attitudes about tuberculosis among pre-university and university students in China

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Setting: Schools in urban Jinzhou city, China.

Objective: To study knowledge and attitudes towards TB, related behaviours, and sources of TB information among pre-university and university students.

Method: Cross-sectional study using self-administrated questionnaire. 5 schools were selected from 11 schools in the study area. In each school, two or three classes were selected.

Results: 505 individuals aged 16–34 years were interviewed. Most respondents (61.29%) were girls. The study showed that although 98.6% had heard of TB, the level of knowledge was poor, with the mean scores of only 3.44 (range 0–10). This was significantly associated with age and level of education. The majority (67.6%) believed TB was curable. More than half of respondents knew about mode of transmission (76.0%) and that coughing is a common symptom (59.8%). But 81.9% did not know about TB treatment policy and free TB drugs supply. 53.5% of the students did not know how TB diagnosis is done. Television (74.1%) and friends/relatives (45.9%) were the two major sources of information about TB. 66.1% of the respondents said that they worried about catching TB. This was significantly associated with age and the level of knowledge.

Conclusion: Students had limited knowledge about TB. Even though schools serve as an important place for education, students in the schools with crowding may be a risk group for spread of TB. There may be a need for health education in the schools.

PS-61175-02 Lessons from a training and supervision program of community health workers in a Rio de Janeiro Favela

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Introduction: Rocinha, the largest favela (slum) in Rio de Janeiro, has high rates of poverty, violence, drug trafficking and TB (incidence 618/100 000). From June 2003–2005 the TB Control Program implemented a successful DOTS strategy utilizing 40 CHWs from Rocinha to supervise TB treatment.

Objective: To share lessons learned about training and supervision of CHWs and recommendations for future programs.

Methods: Structured group sessions and focus groups with CHWs, nurses and trainers conducted over a 2 year period, ongoing summaries and feedback to program managers.

Results: CHWs identified the most helpful training components—communication skills, TB information, home visits with nurses, reading materials. Strengths included group interactions, lectures with handouts, and trainers. Initial concerns: fear of contracting TB, rejection by patients and first home visits. After one year, CHWs felt valued, happy with patients' treatment success, but overwhelmed by violence. Specific TB-HIV topics, psychological support, and job performance feedback were identified as ongoing training needs.

Conclusions/recommendations: Selection process of CHWs, nurses and trainers, comprehensive initial training, ongoing training and supervision, support, evaluation and outcome feedback are crucial for success.

PS-61396-02 Knowledge of tuberculosis patients about the disease and treatment in rural health centres, Bangladesh

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Introduction: Checklists are used to find out the knowledge level of TB patients about the disease and treatment in Bangladesh.

Aim: To determine patient's general knowledge of tuberculosis and the treatment of the disease.

Methods: A descriptive cross sectional study conducted from June 2005 to August 2005 at Upazilla Health Complexes (UHC), Bangladesh. Information was collected from TB patients using checklists. Analysis of knowledge of 345 TB patients was done.

Results: When correct answers to three out of four questions asked were regarded as good knowledge and correct answers to two out of four questions asked were regarded as satisfactory knowledge. 62% patients have good knowledge about tuberculosis and treatment while 36% patients have satisfactory knowledge. Only 1% patients have poor knowledge about the disease they are suffering from. The most important source of information about TB was health worker. Health education and counseling is very much important for quality TB service.

Conclusion: The study identified factors associated with the knowledge level of TB patients that could assist in designing health education intervention strategies.

PS-61406-02 Training in AFB microscopy in Bangladesh

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Training on AFB microscopy in NTP Bangladesh aim to improve capacity of laboratory technologists of government and NGO facilities. The duration of the course is six days. Main contents are : 1) basic knowledge on TB and TB control program; 2) NTP targets and strategies; 3) smear preparation; 4) staining; 5) reading; 6) recording and reporting; 7) laboratory safety; 8) quality control. 50% time of the training are allocated for practical session. NTP Bangladesh has its own operational manual for TB laboratory in Bangla language, in line with WHO/IUATLD strategies. In 2005, 46 Batch training courses were done, total participants were 550. 46 (71%) of 64 districts were covered. Special institutions such as Armed Forces and some private hospitals were also included. 60% (330) were GoB staff and rest (220) were NGO staff. NTP has two training venue in Dhaka. Facilitators are laboratory technologists and medical doctors. A pretest and post test was taken to measure immediate impact of training. Aftercare is made through supervision visits and refresher courses. Human resource development strategy in laboratory training is very much needed.

PS-61428-02 Knowledge, attitude, and practices regarding TB among health professionals and TB patients in Kyrgyzstan

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Background: A KAP survey was conducted in Kyrgyzstan to determine information needs of health care workers and TB patients.

Methods: Questionnaires were developed and field tested to obtain information through personal interviews. The survey was carried out by the volunteers previously trained at a three-day workshop.

Results: 30 out of 50 family doctors (60%) did not prescribe initial aspecific therapy for sputum smear negative TB suspects. Of 50 TB specialists only 34 (68%) asked for sputum smear examination in patients with symptoms of pulmonary TB. Only 16% of 50 family nurses explained to patients that TB treatment was free of charge. And only 8% of TB facility nurses provided a TB patient with information about the importance of regular sputum analysis. Of 50 TB patients, 28% visited the doctor 2 or more months after TB symptoms had appeared. And 31% of respondents answered that relatives and acquaintances started to avoid having contact, after knowing about the diagnosis.

Conclusion: The survey showed that professionals and TB patients have a low knowledge of TB and its proper management. As part of a National Communication Strategy training curricula and IEC materials will be developed to improve knowledge, skills and attitudes towards TB.

PS-61460-02 The work based learning module on interagency working in tuberculosis

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Aim: To develop a work-based learning module on inter-sectoral working in tuberculosis.

Background: Tuberculosis continues to pose a significant public health risk to disadvantaged groups and London now accounts for 44% of cases nationally. The concentration of the disease in marginalised groups presents new challenges to tuberculosis control with implications for the training and educational needs of health and social care providers. The Chief Medical Officer's TB Action plan (2004) suggested best practice models should incorporate teams with an appropriate skill mix, working across boundaries and with strong links with the community. Moreover, the role of the voluntary sector in tackling health inequalities is increasingly gaining significance (DoH, 2003). Life-long learning and development are key to delivering patient centred care in the National Health Service modernisation agenda (DoH, 2001). Although there is evidence of inter-agency working to tackle tuberculosis in London, initiatives are often under-resourced and unsustainable unless embedded within wider policy and strategic frameworks, including education and training. Drawing on literature searches and a stakeholder analysis this paper describes work in progress on the development of a course designed to 'tool-up' care providers with skills to develop services to meet the needs of disadvantaged communities.

Conclusion: Can inter-professional education and practice result in improved health gain?

PS-61499-02 Agir sur les croyances liées à la co-infection TB-VIH pour mieux contrôler la tuberculose en RDC

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Depuis 2005, des messages sur la tuberculose intégrant des informations sur la co-infection TB-VIH sont vulgarisés dans la communauté. Le but poursuivi est d'amener les individus et les familles touchés par la tuberculose à se faire tester pour le VIH et ceux qui sont atteints de VIH à suivre correctement le traitement antituberculeux. L'enquête conjointe menée dans

la ville de Kinshasa par deux organismes spécialisés utilisant la méthode de sondage, donne le résultat suivant : 26% des familles enquêtées acceptent que leur malade tuberculeux passe un test VIH. Par ailleurs, 23% acceptent un examen de crachat pour la tuberculose en cas d'infection confirmée au VIH. Ainsi, plus de 70% de familles n'admettent pas l'idée de l'association TB-VIH, à cause de leurs croyances populaires concernant la tuberculose et le SIDA.

Conclusion : Les croyances qui empêchent l'adoption des comportements favorables à la lutte contre la co-infection TB-VIH dans la communauté sont combattues par les acteurs de terrain en Mobilisation sociale à juste titre parce qu'elles rendent difficile le contrôle de la tuberculose en République Démocratique du Congo.

PS-61504-02 Elargissement de l'appropriation communautaire de la lutte antituberculeuse en RDC

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Avant l'année 2000, la lutte antituberculeuse était l'apanage des milieux médicaux, des malades et de leurs familles. Depuis que les messages sont vulgarisés dans la communauté par l'approche de la participation communautaire, l'appropriation de la lutte s'est élargie. Le constat est que les milieux encore hostiles aux messages contre la tuberculose se sont ouverts, comprenant que le but poursuivi est d'amener les individus et les familles touchés par la tuberculose à se faire dépister le plus tôt possible, conformément aux objectifs du Programme National de lutte contre la Tuberculose. Ainsi, les médias publics et privés, audiovisuels et écrits qui considéraient les messages de promotion de la santé comme faisant partie du marketing se sont impliqués dans la lutte par un matraquage sans précédent. Les milieux religieux, toutes confessions confondues, ont adopté une attitude positive. Les chefs coutumiers ont aussi montré leur intérêt dans ce processus, ainsi que les étudiants. En conclusion, l'appropriation communautaire de la lutte n'est pas impossible quand le message est bien intégré à la base et perçu comme l'affaire de tous.

PS-61614-02 Drug management training in CAR DOTS programs

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Background: Tajikistan, Uzbekistan and Turkmenistan all received GDF drug grants in 2003–2006. These grants for DOTS represent the first time in several years that full supplies of drugs have been available for the TB program in these countries. GDF drug

grants do not last forever. To assure proper procurement, storage, dispensing, distribution and reporting training in drug management has been required. Trainings are essential not only for using the grant drugs effectively but also for preparing the day when the grants are no longer available.

Objective: To develop a training program in drug management.

Methods: Design a system, produce a training manual, develop training materials, field test and revise training activities, train trainers and roll out to national coverage.

Results: All three countries have developed programs to teach correct product selection, quantification and cost estimation, procurement, distribution and use of DOTS drugs. Cutting across these topics is a logistics management information system.

Conclusion: The investment required for drug management programs are substantial and easy to underestimate. The experiences of Tajikistan, Uzbekistan and Turkmenistan provide examples of what is required for long term drug management programs in support of DOTS.

PS-61631-02 Quality of life in patients with tuberculosis

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Objectives: 1) Qualitative validation of a questionnaire designed to identify aspects of quality of life (QL) that are affected by TB. 2) Identification of the main aspects of QL perceived as problems by patients undergoing TB.

Methods: Active TB-outpatients of the Hospital of Clinics of the State University of Campinas-Brazil, were invited to gather a focus group in the same day of a regular appointment. Those who agreed signed a written declaration of acceptance. Two focus groups were carried out with six patients each. Open-ended questions adapted from the HAT-QoL, instrument designed for HIV were used for the dynamic process, oriented by a facilitator and two observers. The session was audio-recorded and the researchers after several readings of the whole centered on the identification of the relevant topics in each dimension.

Results: The mean age was 35 years old. The following aspects were identified as the most evident: limitation of physical and social activities, worries about health and with financial questions of daily living and perception of social prejudice. Drugs adverse effects were not perceived as problems. It was a surprise that at the end of the session patients pointed the importance of a space for dialogue, similar to the focus group.

Conclusions: The adapted instrument revealed suitable to discuss QL in patients with TB. The study pointed a significant impact on QL and that its anal-

ysis might promote changes in the routines of the biomedical model of assistance

PS-61633-02 Adherence to tuberculosis treatment: training for a differentiated boarding

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Objectives: 1) To verify modifications in the attendance of TB patients with the introduction of the strategy 'consultation of the first week'; 2) to promote discussions about aspects related to the use of medicines and adherence.

Methods: The training is permanently carried out during the routine attendance at the Tisiology Clinic at State University of Campinas-Brazil. Medical students, nurses and nursing attendants participate in it. The boarding is initiated the first time the patient comes when aspects related to the education on the use of medicines and the serious risks of non-compliance are discussed. In the next week, during the 'consultation of the first week' these orientations are strengthened and adverse reactions to medicines are investigated.

Results: Better patient adherence (from 12% to 1% of dropout) was verified in the initial two months of treatment. Concern with the nurse post-consultation was demonstrated by medical students. Related to health professionals, there was better treatment handling and more integration with the other services for the DOTS accomplishment. It was relevant for monitoring adverse reactions also to consider the evaluation made by patients of how much these reactions were interfering with their daily life.

Conclusions: Patients with risk of low adherence could be identified early. Training in services involving assistance professionals and medical students narrowed the contribution for better TB treatment.

PS-61682-02 Capacity building for DOTS and DOTS-Plus in Peru: training manuals and course

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Introduction: As part of the PARTNERS TB Control Program, a series of 9 printed training manuals with accompanying slide presentations were developed for a week-long interactive training course for health care workers (HCWs) on management of TB and MDR-TB.

Methods: A systematic health education process was used. The need for basic training in TB, as well as MDR-TB, for HCWs was identified through a formal needs assessment. Existing material was reviewed and adapted. Materials were field tested with HCWs dur-

ing a pilot course in Lima, and revised based on field test results and feedback from expert panel review.

Results: A comprehensive week-long training course was developed along with a series of 9 reference manuals and accompanying slide presentations. Seventeen HCWs were trained in the initial test. One-thousand copies of the manuals will be printed and distributed throughout Peru. Additional courses are planned.

Conclusions: Extensive formative evaluation provided valuable feedback, enhanced the usefulness of the materials, and increased acceptability among the target audience. In developing effective training materials, it is essential to follow a systematic approach that identifies needs and gaps, includes the target audience in the development process, enables collaboration, and provides a structure for monitoring and evaluation.

PS-61936-02 Tuberculosis KAP study among health care workers and tuberculous patients in Iraq

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Aim: To evaluate knowledge, attitudes, and practice of TB patients and health care workers (HCW).

Method: A random sample of 500 patients and 500 HCWs was interviewed using pre-tested structured questionnaires.

Results: The optimum knowledge about TB was 64.4% of patients while 54.8% reported –ve attitudes and practice towards TB, reflecting a high degree of stigma. While 95.5% of HCWs reported optimum knowledge. HCWs knowledge was significantly associated with age and job duration. By contrast, HCWs' practice towards TB suspects was not satisfactory: only 38.2% responded correctly. The two most important source of patient information about TB were their physicians and Television. Education, training and supervision of NTP showed good impact on the knowledge of TB among both patients and HCWs.

Conclusion: Knowledge is not the only determinant of health seeking behavior and compliance to treatment but mainly the attitudes and practice towards the disease, and the high level of stigma proved to be the main barrier hindering proper and timely health seeking behavior. Poor adherence of the HCW to national tuberculosis control (NTP) guidelines regarding tuberculosis suspects, highlighted a major cause of low case detection in this community. These results call for the need to organize an awareness programme to de-stigmatize the disease and for regular training of the HCW on the NTP guidelines.

PS-61975-02 Realization of training courses for improvement of tuberculosis surveillance system in Uzbekistan

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DOTS strategy implemented in Uzbekistan by 2005. The process was accompanied by improvement of the tuberculosis (TB) statistics by implementation of TB electronic surveillance and case management system (TB ESCM) and by modification of recording and reporting (R&R) TB forms to meet the requirements of traditional and DOTS oriented statistical systems. It has been conducted from 2005 by Republic DOTS Center (RDOTSC) based on technical and financial support of the US CDC Center Asia Region office (CDC/CAR), USAID and financial support of GFATM. Effective realization of modified R&R and TB ESCM include the requirements of qualified filling and timely processing of them on all levels starting with districts. That demands corresponding training courses. In 2005–2006 RDOTSC conducted 10 seminars on modified R&R forms. There were 183 TB specialists from Tashkent city and 9 Uzbek oblasts. The structure of interactive seminars included the lectures and the seminars on bases of TB and national R&R forms. Pre-testing showed the lower level of participants' knowledge (50%, on average), which improved after training courses (84%, on average). The courses promoted the improvement of quality of filling R&R forms and effective working of TB statistical system, including TB ESCM.

PS-62040-02 Distinctive benefits of experience-based approaches by former TB patients in DOTS: lessons from Zambia

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An operational research study to document benefits from using FTB as voluntary treatment supporters compared to non-FTB in 4 districts of the Copperbelt, Zambia. 42 treatment supporters (18 FTB) were interviewed in focus group sessions, while 5 from each category were interviewed in-depth to fully document differentials in the quality of service offered. Unstructured observations and randomly interview with patients were also carried out. Most treatment supporters who are FTB provided comparatively better help to clients seeking TB treatment than those who are non-FTB. FTB relied a lot more on their own lived experiences and skills acquired during and after illness

episodes. FTB who were also co-infected with HIV and were on ARVs seemed to benefit additionally as they planned to cope with both therapies and life-long treatment. FTB are important, informed care providers in the TB treatment process and stand comparatively better treatment supporters. Non-FTB are equally important but comparatively less influential in initiating and sustaining the treatment process adherence. A summation of lived experiences, skills and working knowledge on TB and/or HIV helped to facilitate incremental adherence to treatment and favourable cure rates accordingly to WHO targets.

PS-62042-02 Traditional healers as DOT providers in Zambia

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Ten traditional healers (TH) are enrolled in a pilot project as TB treatment supporters and DOT providers in Zambia. A local NGO, CHEP, facilitates the project in cooperation with local health authorities and the TH organization. THs are selected by their organization and CHEP, based on interest and on beliefs that TB should be treated with modern medicines. They are trained to recognize TB, and on DOT provision. When a patient comes to them with signs of TB, the TH accompanies him to health facility to be tested. If positive, the TH is registered as DOT-provider. The Results show that all THs are successful in getting their patients to complete treatment. This model builds on acknowledging the role of TH in the community by being the provider of choice for the patient, and focuses on common goal to help cure patients. Selection of only progressive TH who believed in talking drugs for TB and HIV/AIDS is important, as is cooperation with TH organization, and attitude of trainers to cooperate with TH and not challenge their role. The model is contrasted with experiences from Tanzania and Malawi where training of TH by MOH did not result in cooperation and change.

PS-62045-02 'See me not only my disease': identifying barriers to good communication between TB patients and health work

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Method: Social anthropological method of participatory observation among 22 asylum seekers with TB disease through 9 months in 2002–2003. In 2002–2004 a total of 104 TB patients were treated at the

site of the field work, health office for asylum seekers at a transit asylum camp in Oslo, Norway. Several constraints for good communication were identified through interactional study following TB patients through diagnosis and treatment and daily activities. Language barriers: ex. In isolation at hospital: use of translators only when doctors had messages to the patient. Doctors language was reported to be too difficult to understand: When my doctor said that the TB test result was positive I first went so happy. You know, positive usually means something good'.

Conclusion: Patients report that they feel comfortable and are in control of the situation when health personnel ask questions and give answers acknowledging the patients needs for care. Biomedical language is often too difficult to understand and create a barrier to good communication. Health workers fail to understand that they represent a professional culture communicating with a biomedical cognitive model often not taking into account the illness perspective—patients subjective experience of the disease or folk explanatory models of tuberculosis.

PS-62049-02 The process of using communication tools to bridge the gap between former TB patients/DOT providers and health workers

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One day communication courses were held separately with 30 former TB patients (FTBs) and 20 health workers (HWs) in Temeke, with the objective to create awareness and learn skills to listen better to patients, and to ask questions to understand patients' concerns. Both groups also conducted an MSC evaluation exercise to identify most significant changes as a result of their involvement with COMDOT.

After selecting one story in each group of 5, this story was told to the large group. FTBs told their stories, and HWs were asked to respond. The HWs exhibited increasing appreciation for the FTBs stories and results, and expressed surprise at what they heard. When HWs told their stories, it became clear to the FTBs that their assistance was appreciated, and that they play a very important role in COMDOT. This was acknowledged by the HWs.

HWs and FTBs then cooperated to develop information leaflets, based on the questions the FTBs had collected from their patients in the field. The communication in the groups were very good, and FTBs commented that they had now lost their fear for the HWs and would more easily be able to contact them.

This communication model can be used to encourage better cooperation between HWs and FTBs.

DOTS EXPANSION-1

PS-61255-02 Barriers in seeking health care among TB suspects: an institution-based cross-sectional study

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Introduction: Evidence suggests under reporting of TB suspects (TS) especially among the females.

Objectives: To assess the pattern of health seeking behavior and barriers in seeking health care among identified TS with gender differentials.

Methodology: STC conducted an institution based cross sectional study among 998 identified TB suspects of ages ≥ 15 years in two TB diagnostic centers in Dhaka during July–September 2005 using pre-tested questionnaire.

Results: Overall male:female ratio was 57:43, more females in the age group 15–19 years and beyond that more males. 68% of the TSs was from urban area, majority being of low socioeconomic status. 17% of the TSs did not seek any advice before for symptoms, there was no significant sex difference. Causes were lack of awareness or ignorance 52%, want of money 32% and lack of time 15%. Who sought advice, 42% visited paraprofessionals or irrelevant sources, 38% visited qualified private sources and 16.5% visited government sources. No significant gender difference was found. Significantly more males had to loose wages and more females had to take an accompanying person for visiting the center. 7.5% of the TB suspects faced some form of social stigma.

Conclusion: Lack of awareness or ignorance, poverty and social stigma are still prevailing as barriers in seeking health care among TB suspects and override gender differences.

PS-61060-02 DOTS expansion in the provinces financed by the Global Fund in the Dominican Republic

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Introduction: Dominican Republic is one of 10 countries in America with the highest rate of TB and controlling this disease is a major priority for authorities. In September 2004, the Project financed by the Global Fund initiates in order to strengthen DOTS using technical and financial support in 18 of the countries provinces in which 71% (1 701 882 hab.) of the total population had free access to DOTS.

Objectives: To evaluate the DOTS expansion in the provinces supported by the Global Fund.

Methods: The information system at the PNCT provided data in order to analyze information submitted before and alter the execution of the Global Fund Project in the 18 intervention provinces.

Results: By the end of 2005, 81% (402) of all health establishments applied DOTS, increasing the number of people covered by it up to 86%. Treatment success increased from 78.4% (2003) to 82% (2004), detection rate also increased from 440 examined/100 000 hab (2003) to 623 examined/100 000 hab (2005) and the case detection percentage increased from 54% (2003) to 78% (2005).

Conclusion: Global Fund Project has contributed with technical and financial support in order to expand DOTS in the 18 intervention provinces.

	Country data 2003	GF intervention provinces data 2003	Country data 2005	GF intervention provinces data 2005
People covered by DOTS	72%	71%	80%	86%
Treatment success	80%	78.4%	82% (2004)	82% (2004)
Detection rate	530 examined/ 100 000 hab.	440 examined/ 100 000 hab.	577 examined/ 100 000 hab.	623 examined/ 100 000 hab.
Case detection	71%	54%	81%	78%

PS-61108-02 Compliance monitors for optimal use of scarce human resources

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A scarcity of human resources inhibits widespread effective TB control. DOT has improved TB treatment, but requires intensive use of human resources and imposes a heavy burden on many patients. These problems have contributed to inadequate political support. The 60–65% of patients who are sufficiently reliable to be successfully treated with self-supervised therapy (SST) represent an untapped resource for reducing the problems. Electronic compliance monitors with built in inexpensive displays to show the adherence record in any setting without computers or PDAs, could identify reliable patients who could be successfully treated with SST. If further developed and mass-produced in a low wage country, the estimated cost of a reusable device would be <\$10.00. Compliance monitors would be most valuable in the continuation phase of treatment if lack of resources makes DOT impossible. Both clinics and community workers could supervise SST with compliance monitors. Pharmacists using compliance monitors could oversee SST for private patients. Health departments could supervise family DOT using these devices. Compliance monitors that keep the adherence record from the beginning of therapy would help in managing mobile patients. The human resources saved not giving DOT to

all patients could be used to retrieve defaulters and manage less adherent patients with counseling, extensions in treatment duration, and DOT when necessary, leading to expanded effective TB treatment services.

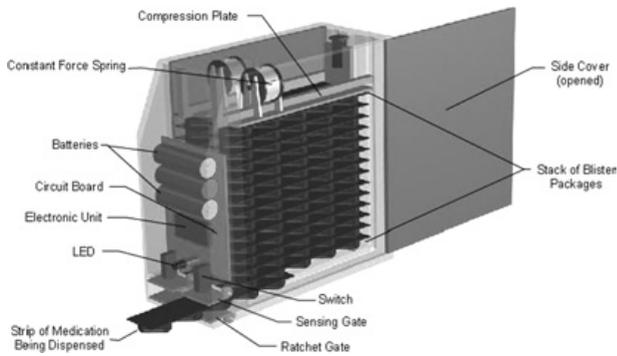


Figure Stack monitor for strips of packaged medication. The device determines when strips of blister packages are removed from either of two stacks of strips. As a strip of blister packages is removed from the bottom of a stack, it forces two gates to open. One gate acts as a ratchet to prevent the strip from being re-inserted into the monitor. The other activates a switch which senses removal of the strip. Traces on a circuit board connect each of two switches (one for each of two stacks of strips) to an electronic unit which records medication removal. Compression plates assure that each strip will be in a position to be dispensed.

PS-61133-02 Data management training as a support for RNTCP implementation

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RNTCP in India generates quarterly reports to monitor programme performance. In Orissa, India, data management at peripheral level is weak, especially concerning compilation, analysis, interpretation and evidence based decision making. The data flow has potential flows of transcription and compilation at each level.

A data management course was organized, consisting of 3 theoretical modules of 1 week duration each, and 2 inter modular fieldworks. The underlying hypothesis being: training in applied epidemiology and statistics of medical officers involved in RNTCP management increases their skills and attitude for problem detection and analysis, improves the quality of routine data and problem solving skills. Participants were District TB Officers and medical officers working in the PHC services. The total duration was 4 months. The teaching approach focused on skills' acquisition and understanding of data. Routine RNTCP problems were taken up for intermodular field work.

The course gave the participants a good sense of understanding field data to identify and solve problems in RNTCP implementation; furthermore the training helped them to convert data into information for decision making.

An assessment carried out 4 months after the course revealed that the alumni spend now much more time on data verification and analysis. The data management course improved also the program management. Regular refreshment courses should be organised.

PS-61135-02 SWOT analysis as a tool for RNTCP strengthening at district level

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In the State of Orissa, India, RNTCP was started in 1997; the coverage was gradually to cover the whole State by 2004. Till 2002, Orissa figured in the target zone of successful case detection and case holding, but the extension of the program brought a decline in detection and case holding indicators.

To explore the causes a SWOT analysis was carried out in 2005 in all 30 districts. The principal objectives were to analyse the strengths and weaknesses of RNTCP in each district, to brainstorm about eventual remedial measures to be taken at district level and to motivate all staff responsible for TB control in the district to tackle the main weakness through appropriate action. In each district these SWOT analyses reunited the key personnel responsible for TB control at district or subdistrict level.

In most districts the SWOT analysis resulted in an increased involvement of the CDMO (Chief District Medical Officer), of the peripheral TB workers and the NGOs in TB control and promoted thus a better coordination of all staff.

Such a SWOT analysis is a very effective instrument for program monitoring by those involved in the implementation. It should not remain a one-time exercise, but be repeated at regular intervals, and the impact of the action (s) taken at district level jointly monitored by all involved in TB control.

PS-61144-02 National study on the reasons for delays in treatment of tuberculosis in Cambodia

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Setting: Urban, rural, and remote areas with 30% of the total country's population.

Objectives: To measure delays in seeking treatment of tuberculosis, and to identify the factors associated with these delays.

Design: Information on personal characteristics, health seeking behavior and delays to treatment of TB was

collected from the consecutively registered smear-positive pulmonary TB patients, from 10th October to 9th December 2005. Analysis of rates was used to investigate factors associated with delays.

Results: Among 1004 patients, median total delay to treatment was 109 days, with system delay contributing a greater proportion than patients' delay. Total delay was longer among patients in remote areas (303 days) than those in urban (98 days) and rural areas (101 days). Factors associated with total delay were older age and longer distance to DOTS facilities ($P < 0.05$). Factors associated with patients' delay were male sex, longer distance to DOTS facilities, higher travel cost, not heard of tuberculosis, and higher number in family ($P < 0.05$). Factors associated with system delay were older age and being poor or very poor ($P < 0.05$).

Conclusion: Total delay was very long among patients who live in remote areas. Innovative approaches to improve accessibility to DOTS should be taken.

PS-61193-02 Expansion of urban DOTS in Bangladesh: an experience through operational research

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Introduction: Operational Research guides NTPs to formulate policies and guidelines for expansion of urban DOTS.

Objectives: To discuss a successful Operational Research (OR) in expansion and implementation of DOTS by identifying critical elements.

Methods: DOTS implementation in urban areas of Bangladesh through Participatory Action Research (PAR) usually consisted of two parties of actors and researcher. Plan of action prepared by both parties and revised quarterly. Bi-annual meetings/workshops accelerated to identify crucial elements and strategies developed to solve those critiques.

Results: During 2005, the number of microscopy centers increased to 67 in all urban cities compared to 5 in Chest Disease Clinics in 2001. The participation of NTP-NGOs increased case detection to 58.66% (2005) compared to 51.94% (2004). The number of new smear positive patients diagnosed during 2005 was 7113 as compared to 5804 in 2004. DOTS were expanded among private practitioners through Participatory Action Research. Results of implementation of DOTS in urban cities of Bangladesh by different providers will be presented and discussed.

Conclusion: TB Control in big cities is complicated. Operational Research only could solve issues. This consists of implementation team (Public-Private/NGOs), technically supervisory team and research team.

PS-61196-02 Profile of TB training of different service providers under the National TB Control Program in Bangladesh

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Introduction: NTP is primarily responsible for training. It plans all aspects of training and work with government and non-governmental entities to determine training content, develop materials, identify Government and NGO health staff to be trained, ensure training course implementation and follow up for new hires and maintenance training.

Aim: To establish uniform HRD-TB Control.

Methods: Plans for different category of staff, training need identification, implementation of training and follow up.

Results: Different course curriculum prepared by NTP for government and NGOs since 1998. A total of 1519 doctors trained on TB management during 1998–2005. Detailed course plan will be presented. TB microscopy network is a vital. A total of 1040 laboratory technicians trained at the central level till the end of 2005. Two day mid level course for paramedics and one-day field courses provided to the DOT providers. Several orientation courses are in progress for other sector involvement like Private Public Mix, general practitioners, medical students.

On job supervision facilitates to follow up the training assessment, capacity building and competencies at all levels.

Conclusion: HRD-TB Control is the major challenges to reach MDG. Training working group, proper planning and support of NTP partners could solve these issues.

PS-61201-02 Tuberculosis control in metropolitan cities of Bangladesh

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Introduction: More than half of the TB patients in Bangladesh first seek treatment in the private for-profit sector, including high proportions among the poor. However, the treatment outcomes in the private sector are generally poor; increasing the burden on TB patients and promoting multidrug-resistant.

Objectives: Development and functioning urban DOTS in metropolitan cities of Bangladesh.

Methods: DOTS implementation and expansion in metropolitan cities through involvement of government dispensaries, city corporation dispensaries, NGO general health services, PPM initiatives, academic institutes and in prisons.

Results: Establishment of microscopy and DOT cen-

ters in all 4 metropolitan cities: Dhaka—121 (41 microscopy); Chittagong—61 (11 microscopy); Khulna—22 (8 microscopy) and Rajshahi—7 (7 microscopy). During 2005 7113 (58.66%) new smear positive patients were diagnosed compared to 5804 (51.94%) in 2004 in all metropolitan cities. Treatment success rate increased to 84.51% in 2004 compared to 75.32% in 2003. During 2002–2005 DOTS was expanded to academic institutes, prison and garment industries and PPM was initiated.

Conclusion: TB Control in big cities is complex. In addition to the public sector, public-public and public-private partnership should be established in order to increase DOTS coverage and case detection.

PS-61205-02 TB services in general hospitals of Dhaka Metropolitan City, Bangladesh: an analysis

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Introduction: TB is often neglected or not properly managed in general hospitals of big cities. The management of TB is a complex in tertiary level.

Objective: To analyze practices of general hospitals in management of TB.

Methods: Lists of general hospitals both public and private without specialized TB services prepared. Questionnaire developed and field tested. Data collected.

Results: Analysis of general hospitals comprising of out and in patients facilities shows a considerable number of TB suspects are not taken into care for its diagnosis. Out of 324 registered hospitals 28 (8.6%) of the general hospitals has facilities to deliver out patients services to over 1000 patients per month. Out of these 8 (2.4%) has NTP manual, 30 (9.25%) has facilities for sputum test, 55 (16.9%) has facilities for radiological examination. 8 (2.4%) of these hospitals provide diagnosis and complete treatment and 22 (6.7%) provide diagnosis and initiation of treatment. 13 (4.0%) of the hospitals willing to participate in DOTS.

Conclusion: NTP should take more attention in metropolitan area to increase case detection and expand TB services to all people. Strategies to be in built in involving general hospitals for TB care.

PS-61229-02 Towards controlling the world's severest TB epidemic: progress in Namibia

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Background: Namibia with 824 295 km² area had a population of 1 830 330 in 2001; growth rate of 2.6%,

and 2.2 people/km². NTCP started in 1991. TB care is integrated in the Primary Health Care services of all 34 health districts. TB treatment is free. Smear microscopy is done in 36 laboratories and culture is done at the Reference Laboratory, Windhoek.

Aim: To demonstrate the need to revisit criteria of high-burden countries.

TB indicators:

- 1 CNR of all types of TB and new smear-positive PTB was 748 and 252 respectively in 2004.
- 2 CDR was 88% in 2004. HIV sero positivity is estimated at 61%.
- 3 The treatment success rate was 70% in 2004 cohort.

Achievements:

- NTCP review done in 2000 recommended development of 5 year plans and introduction of FDCs
- Strategic plans (MTP-1) was launched in March 2005
- Secured funding from USAID, Norwegian TB association, and Global Fund.
- Revised national guidelines launched in March 2006.
- Started replacement of single drugs with FDC anti-tuberculosis drugs in April 2006.
- KNCV is providing technical assistance
- Training of health workers.

Conclusions: Namibia, a country not classified as a high burden for TB could only develop TB strategic plans and attract funding after TA was offered by KNCV. Many other needy countries especially in SADC region of Africa are similarly disadvantaged.

Recommendation: Avail TA to all countries with CNR of 250 and above.

PS-61254-02 Community based TB care in Omaheke Region, Namibia

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Background: TB treatment outcome rates in Omaheke one of Namibia's administrative regions were 3% case detection, 51.4% defaulter and 28% cure in 1998.

Objectives: To determine factors associated with community-based TB care, implement this strategy, determine its contribution to TB treatment outcomes improvement, establish patients' experiences and opinions.

Methods: Factors associated with community-based TB care were identified through a descriptive study design. Similarly, patients' experiences and opinions were established. Prospective cohort design enabled followed up of 332 PTB patients; 308 exposed and 24 unexposed to the strategy.

Results: TB is gender neutral with equitable access to TB care; 73% of treatment supervisors were family

members; DOT actually happened in 91.3% with 95.5% adherence. Cure rate was 90% and 66.7% in exposed and unexposed groups respectively ($\chi^2 = 11.78$; $P < 0.05$; $RR = 1.35$; $P = 0.05$). Defaulter rate was 0% and 1 in 8 from exposed and unexposed groups respectively including 0% treatment failure. More female patients than male were cured ($\chi^2 = 8.64$; $P < 0.05$).

Conclusions: Taking treatment at home was more convenient and satisfying for patients than walking to the clinic everyday while ill. Decentralising TB care beyond health facilities into the community improved TB treatment outcomes in Omaheke and should be replicated to all regions in Namibia.

PS-61267-02 TB control in Khomas Region of Namibia

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Khomas region hosts the capital city of Namibia; Windhoek with a population of 300 000 and a CNR of 1102 All types of TB in 2005. TB burden is attributed to HIV epidemic; at 19.7% in 2005 in ANC attendees, migration to the city and the poverty complex. The region has a 120 bed TB hospital, 2 health centers and 8 clinics. There are 4 TB coordinators. Implementation of program activities is guided by the Medium Term Plan 1 (2004–2009) for TB. The main challenge is lack of human resources in the entire health sector.

Khomas region has responded to the problem by strengthening community involvement with the help of Penduka TB project. DOTS was implemented through mobile dot-points. Densely populated areas were prioritized for mobile points manned by community volunteers trained on TB control, management and their roles and responsibilities clearly stated to them. The Penduka TB project started with three mobile points in the Hakahana, Wanaheda and Okuryangava areas. There were 30 patients in DOTS point taking tablets and food. They are also trained on handcraft skills. Today 2006 the Mobile-DOTS services have expanded to eight points with 30 patients in a point, providing certificates of acknowledgement to patients who are cured. Those who successful finish their hand grafts also receive a financial incentive. Treatment success has improved from 55% in 2001 to 66% in 2005.

PS-61314-02 Expanding quality DOTS in Afghanistan: escalating the battle against TB

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Introduction: Afghanistan is rapidly expanding DOTS coverage in a country whose health infra-structure was largely destroyed by 23 years of war.

Objective: To describe the process of rapid expansion of quality DOTS in a complex, post-conflict environment.

Methods: Key international partners are working with the NTP of Afghanistan to rapidly expand DOTS within the Basic Package of Health Services, including WHO, JICA, and USAID. REACH provided technical assistance to help the MOPH develop pilot DOTS using CHWs; to review policies and develop technical guidelines; to establish national QA programs for TB labs; and to implement a national IEC/BCC strategy for TB based on formative research on stigma reduction and assistance with material production.

Results: The number of REACH facilities providing DOTS increased 423% and the number of patients treated for TB increased 310% from 2004 to 2005. The NTP reported an increase of 200% in DOTS facilities and a 35% increase in TB patients treated in the same time period.

Conclusion: Using a comprehensive approach, both the NTP and REACH have shown that rapid expansion of DOTS is possible in a complex environment.

PS-61323-02 Results of DOTS implementation in Kosova for the 5-year period 2001–2005

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Objective: To determine the results of the 5 year period DOTS implementation in Kosova.

Methods: TB reports of years 2001–2005 were used and analyzed different indicators.

Results: Number of TB cases decreased from 1674 (74/100 000) in 2001 to 1102 cases (52/100 000) in 2005. This decrease for the period of 5 years (2001–2005) presents 26% decrease of case notification with median annual decrease of 5%. Number of SS+ cases (sputum smear positive cases) decreased from 461 (2001) to 232 (2005). Bacteriological confirmation of cases among pulmonary cases was 41.8% (2001). Proportion of pulmonary/extra-pulmonary cases during the 5 year period was 80% pulmonary and 20% extra-pulmonary. Percentage of relapses among positive pulmonary cases was 18.6% (2001) and decreased to 15% (2005). The age-group distribution though 5 years (2001–2005) was very similar, with the most cases in the age group 15–34 years. 'Treatment success' among new positive pulmonary cases in 2002

was 90%, 2003 89% and 2004 93%. 'Treatment success' for relapses was 80%, 77% and 76% for the same period.

Conclusion: With successful implementation of the DOTS strategy in Kosova the number of TB cases decreased during 5 year period 2001–2005. Decrease of the bacteriological confirmation of pulmonary cases from 41% to 31% can be explained with the difficulties performing smear examination. Many TB patients were not bacteriologically examined.

PS-61356-02 Ten years experience of the TB Control Programme in the southern region of Ethiopia

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Settings: TB Control Programme, Southern Region, Ethiopia.

Objective: To assess the impact of the implementation of the DOTS programme on TB case-finding and treat outcome.

Design: Records of TB patients registered since the introduction of DOTS in 1995 to 2004 in the Region. TB patients were diagnosed, registered and treated following the WHO recommendations. Case-notification and treatment outcome reports were compiled quarterly. This survey was based on the data collected and retained at the regional level.

Results: 135 692 TB cases were registered from 1995 to 2004. Of these, 47% were smear-positive, 25% smear-negative and 28% extra-pulmonary TB. In 2004, 94% of the health institutions in the region were covered by DOTS. Between 1995 and 2004, case-notification increased from 45 to 143/105 population and case-detection rate from 22% to 45%. Treatment success rate increased from 53% to 85%, default and failure rate decreased from 26% to 6% and from 7% to 1% respectively.

Discussion: There was a steady increase in case-notification and treatment success rate with the decentralisation and expansion of DOTS. Although 94% coverage was achieved after ten years, the stepwise scale-up was important in securing resources and dealing with challenges that emerge during expansion. 85% treatment success rate was achieved in 2004; however with the current low case-detection rate (45%), the 70% WHO-target seems unachievable in the absence of intensified case-finding mechanisms.

Table Trends of TB case notification and detection rates in the Southern Region, 1995 to 2004

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003
Population (million)	10.4	10.5	10.8	11.1	12.1	12.5	12.9	13.3	13.7
All forms of TB	4 648	6 197	9 725	10 004	15 167	17 067	17 858	17 246	18 464
Smear-positive PTB case	2 247	2 678	3 862	4 050	5 695	7 456	8 192	8 386	8 880
Notification rate/105 (all) cases	45	59	90	90	125	136	138	130	135
Notification rate/105 (SM+ve)	22	25	36	37	47	60	63	63	65
Case detection rate (all) (%)	18	22	33	31	42	43	43	38	38
Case detection rate (SM+ve) (%)	22	24	32	31	37	45	45	43	42
Treatment success rate	NA	294 (53%)	1062 (52%)	636 (77%)	1517 (70%)	2285 (77%)	4381 (79%)	6157 (82%)	6987 (82%)
Defaulter rate	NA	89	525	100	311	368	538	507	534
	NA (16%)	(26%)	(12%)	(14%)	(12%)	(10%)	(7%)	(6%)	

PS-61374-02 Myanmar National Tuberculosis Programme moving towards Millennium Development Goals

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Introduction: Myanmar ranks 21 among 22 TB high-burden countries. The Ministry of Health approved the Five Year Strategic Plan (2006–2010) in line with the Global Plan To Stop TB 2006–2015. August 2005, the Global Fund to Fight AIDS, TB and Malaria abruptly announced its termination in Myanmar, leaving a huge funding gap.

Objective: To measure progress towards Millennium Development Goals.

Methods: Cohort analysis based on township WHO quarterly reports and Annual TB Evaluation Meeting. **Findings:** Political commitment towards the STOP TB Strategy is high and the STOP TB Partnership well coordinated. Case detection increased from 70% (2004) to 83% (2005) while treatment success stabilizes at 81%. The Global Drug Facility awarded NTP with a 2nd 3 year grant (till 2008), human resource development was strengthened and TB-HIV and PPM DOTS activities were expanded. Innovative case management strategies were implemented in selected townships and community DOTS strengthened. A TB prevalence survey is underway and a 2nd Drug Resistance Survey is planned.

Conclusion: NTP Myanmar is moving towards MDGs. The GFATM termination might reverse the success of the NTP, especially with HIV and MDR-TB rising. Urgent resource mobilization is necessary to sustain the excellent efforts by the STOP TB Partnership in Myanmar.

PS-61389-02 Quality control of DOTS implementation in the National TB Control Programme, Bangladesh

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Introduction: In Bangladesh, tuberculosis care services are delivered through the Upazilla Health Complexes (UHC) in the rural areas. Checklists are used to supervise the quality of DOTS and sputum microscopy for national TB control programme.

Aim: To monitor the implementation status of national TB control program, Bangladesh.

Methods: A descriptive cross sectional study conducted from June 2005 to August 2005 at Upazilla Health Complexes (UHC), Bangladesh. Information was collected from TB register, laboratory register and treatment card using checklists. Analysis of TB services in 345 UHCs (out of 640) was done.

Results: 99% of UHCs have regular supply of drugs and laboratory consumables. NTP manuals and laboratory manuals were available in 96% of UHCs. 91% maintained TB register and treatment cards completely. 91% preserve the microscope according to guidelines, 96% disposed waste properly and 98% submitted quarterly report correctly. 62% of the patients had good knowledge about tuberculosis.

Conclusion: Analysis of results indicates that the quality of DOTS implementation is satisfactory.

POLICY AND PROGRAMME IMPLEMENTATION: OTHER-1

PS-61003-02 Case management discussions in an internal consilium

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Background and setting: The Public-Private Mix DOTS (PPMD) clinic at Makati Medical Center, Philippines has been managing multidrug-resistant tuberculosis (MDR-TB) since 1999. In 2005, an Internal Consilium (IC) composed of clinicians and program coordinators was formed initiating a standardized approach to MDR-TB management utilizing consensus decisions based on WHO guidelines for drug-resistant TB and program conditions, vis-à-vis patients' clinical history and treatment course.

Objective: To describe the reasons for discussion of MDR-TB suspects and cases in the IC.

Design: A retrospective review of IC forms from September to December 2005.

Results: The IC met 14 times, 3 to 4 times monthly,

and conducted 195 case discussions for 160 patients. A third (34.9%) of the case management discussions were for enrolment. More than half (57.9%) were for management during treatment before outcome eligibility, addressing a) need to change to a more appropriate drug, within groups or classes considering cost or availability, or dose change (24.1%), b) shift to the continuation phase (15.9%), c) uncontrolled adverse drug reactions (13.3%) and d) changing drug susceptibility (4.6%). Fourteen (7.2%) were for treatment outcome determination.

Conclusion: For a complicated intervention like MDR-TB management, a strategy like the IC is necessary as a case management tool. It provides a standardized approach in consensus management decisions.

Month	For enrolment	Change to more appropriate drug or dose	Shift to continuation phase	Uncontrolled ADR	Change in DST pattern	For determination of treatment outcome	Total
September 2005	10	5	9	6	2	2	34
October 2005	29	3	10	2	1	0	45
November 2005	13	38	8	6	4	1	70
December 2005	16	1	4	12	2	11	46
Total	68 (34.9%)	47 (24.1%)	31 (15.9%)	26 (13.3%)	9 (4.6%)	14 (7.2%)	195 (100.0%)

PS-61004-02 Poverty and the disease burden of TB in rural China

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Objective: To investigate the economic effects and disease burden of TB illness in rural China.

Setting: During 2002–2004 we studied 160 new pulmonary TB cases and 320 age-matched and sex-matched controls living in neighbouring houses in 4 rural counties of Henan Province, China.

Design: Cases and controls were interviewed 1–3 months after patients were diagnosed; we conducted follow-up interviews of patients 10–12 months later to assess economic effects and DOTS completion. We used matched multivariate logistic regression to compare cases and controls for economic status using household incomes, assets, and relative wealth within the village. We then studied treatment costs, income losses, coping strategies and DOTS completion.

Results: Poverty is strongly associated with TB incidence even after controlling for smoking and other risk factors. Excluding income losses, direct treatment costs (medical and non-medical) accounted for

55% of average household income and most TB cases fell into heavy debt. DOTS completion rates were high. When DOTS was incomplete or not done, mortality was high.

Conclusions: Poverty is both a cause and devastating outcome of TB in China. This warrants government intervention to alleviate income loss and debts due to TB.

PS-61012-02 Impact of six days of tuberculosis management training on Somali doctors' knowledge and practice of tuberculosis

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Objective: To assess the impact of training on knowledge of medical practitioners in diagnosis and management of tuberculosis in Somalia.

Methods: A cross-sectional intervention study. In which the doctors were interviewed a questionnaire concerning their knowledge of TB before and after training.

Results: Among 120 doctors involved in training, 108 were interviewed. 70 doctors (64%) had treated TB patients during the prior 12 months, but only six had notified the case to the National TB Program. 71 (66%) of all the doctors knew the most important symptoms of tuberculosis, and 64 (60%) doctors indicated sputum smear microscopy as the most important diagnostic test. Only eight doctors prescribed the correct regimen, and only 10 advocated direct observation of drug taking. After 6 days training on management of tuberculosis using WHO modules 103 (96%) of all doctors knew the most important symptoms of tuberculosis, and 105 (98%) doctors indicated sputum smear microscopy as the most important diagnostic test. 95 (88%) doctors prescribe correct regimen and advocating direct observation of drug taking. Suboptimal knowledge of TB diagnosis was more common among general practitioners.

Conclusion: Few doctors follow the guidelines of the National TB Program (NTP) in Somalia leading to inadequate management of TB patients.

PS-61089-02 Internal consilium: a standardised approach for MDR-TB management

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Background and setting: The Public-Private Mix DOTS (PPMD) clinic at the Makati Medical Center, Philippines has been managing multidrug-resistant tuberculosis (MDR-TB) since 1999. In 2005, an Internal Consilium (IC) was formed initiating a stan-

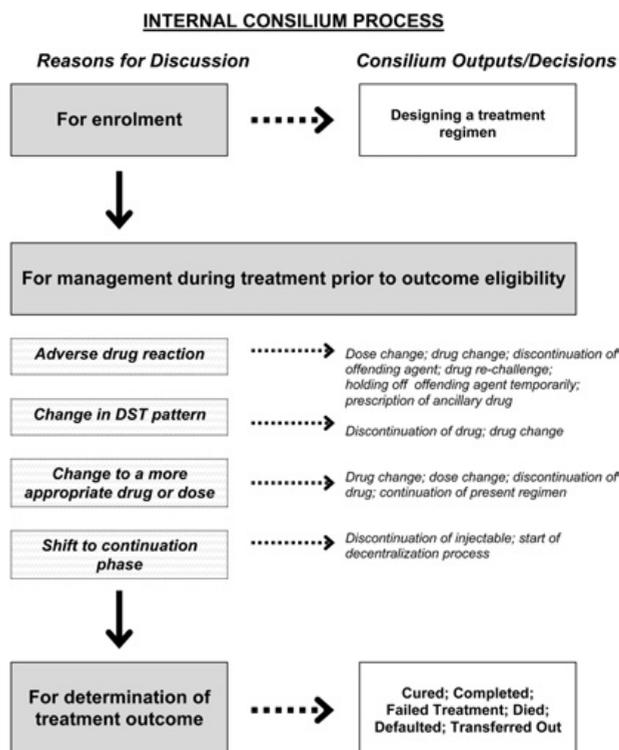
dardized approach to MDR-TB management utilizing consensus decisions based on WHO guidelines for drug-resistant TB and program conditions, vis-à-vis patients' clinical history and treatment course. Clinicians and program coordinators comprise the IC and meet once weekly.

Objective: To describe the IC process as a case management tool for MDR-TB care providers.

Design: A retrospective review of IC forms from September to December 2005.

Results: The IC process involves discussion of MDR-TB suspects and cases for the following reasons: a) patient enrolment to design MDR-TB treatment regimens; b) management during treatment prior to outcome eligibility to address 1) adverse drug reactions, 2) changing drug susceptibility, 3) need for a more appropriate drug or dose considering cost or availability, and 4) shift to continuation phase; and c) treatment outcome determination.

Conclusions: The IC is a strategic venue for training MDR-TB care providers in regimen design, ADR management and treatment outcome determination and in developing policies for MDR-TB management. It is a good model to replicate in regions where MDR-TB management will expand in the country.



Figure

PS-61136-02 15 years of NTP in China: knowledge and attitudes towards TB

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Background: TB cases in China are detected through passive case-finding where symptomatic suspects are expected to seek help at health facilities. Therefore, knowledge about TB plays a critical role.

Setting: Study was conducted in health facilities, schools and resident communities in urban China

Objective: To assess knowledge of and attitudes towards TB, and factors affecting access to TB care and treatment compliance.

Method: Cross-sectional study using semi-structured questionnaire. Data was collected among general population (GPo), general patients (GP), TB patients (TBP) and students from July to September 2005. A knowledge score of 0–10 was calculated based on the responses.

Results: 1150 individuals aged 16–88 years were interviewed. Overall knowledge score for GPo (3.77 ± 1.50) was higher than GP (3.44 ± 1.64) and students (3.44 ± 1.39). Age was significantly associated with knowledge among GPo ($P = 0.023$). Most respondents (73.6%) believed TB was curable. More than half of respondents knew about mode of transmission. Over 70.3% did not know about free TB drugs supply and treatment policy. The reason for delay in seeking care and non-adherence to treatment among TBP were poverty (44.9%) and lack of knowledge about TB (27.9%). There were misconceptions about transmission routes and TBP were stigmatized.

Conclusion: The study showed that knowledge about TB in GPo is limited. TB related health education is urgently required to improve the efficiency of passive case finding.

PS-61166-02 Translation of research results into policy and practice in tuberculosis

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The EMRO/TDR small grants scheme (SGS) for operational research in tropical and other communicable diseases introduced tuberculosis in its research agenda in 2000. In 2005, the first call for evidence was issued in order to collect evidence about the translation of research results into policy and practice of the national tuberculosis control programmes (NTPs).

Methods: The principal investigators of the SGS supported projects were requested to fill a proposal form including information on the means of communicating research results to policy makers, evidence of implementation of research-derived recommendations by the NTPs and their impact on disease control.

Results: A total of 10 proposals were submitted: 5 from Pakistan, 2 from Egypt, and one from each of the following countries: Afghanistan, Somalia, Iran, and Yemen. Examples of collected evidence were: implementing different tested PPM models in the countries; issuing ministerial decrees; increasing health facilities in areas not covered by TB health services; strengthening reporting of private laboratories to the NTPs; strengthening defaulter tracing mechanism; and developing an electronic system to strengthen surveillance.

Conclusion: These results indicate that research-derived recommendations were successful in influencing policy and practice of the NTPs. A high level of awareness of the supported researchers in using research results to improve disease control is also reported.

PS-61200-02 Analysis of strengthening supervision, monitoring and quality assurance DOTS in Bangladesh by NTP partner

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Introduction: Supervision, monitoring and quality care are important perspective to improve referral of suspects, diagnosis and treatment.

Objective: To determine pros and cons and strengthen supervision, monitoring and quality care on DOTS.

Method: 6 regional supervisors nominated to work in 6 pilots each covering 1 sub-district implementing DOTS.

Results: A 3-day regional supervisory workshops held in 4 batches during last quarter 2005 covering all supervisors from NTP and Partner NGOs. Slide presentation, participatory discussion, brain storming, case study, group work and group presentation were the salient features. The sessions as evaluated by the supervisors were supervision and monitoring (50%), quality care (30%), group work (10%), all of session (10%). The supervisors selected for pilot areas are performing intensive supervision using NTP check list and other tools. This will reflect challenges and constraints in supervision, monitoring and quality care on DOTS in turn NTP can formulate policies on recommendations further improving status in quality DOTS.

Conclusion: The assessment results need dissemination among DOTS service providers for both NGO and public sector that will help to build quality assurance system on competitive basis among partners.

PS-61207-02 Partnership a unique example in implementation of DOTS in BangladeshE Hossain,¹ V Begum,¹ S Sultana,² K Hyder,² M Becc.²¹National TB Control Program, DGHS, Leprosy Institute an, Dhaka, ²National TB Control Program, World Health Organization, Dhaka, Bangladesh. Fax: (+88) 2 9884656. e-mail: ntpban@cyberbangla.com

Introduction: TB is a major public health problem in Bangladesh. About 300 000 new cases cropping up every year and 70 000 die due to this single disease. Young males are predominant in the society. GoB establishes unique partnership with NGOs in implementation of DOTS through existing facilities.

Objectives: To sustain successful partnership in DOTS in Bangladesh.

Methods: Through Memorandum of Understanding NGOs are linked with NTP Bangladesh adopting its policies and strategies.

Results: Governments effort to improve health service delivery especially for the poor. Through collaboration with NGOs increased case detection to 61% (2005) and treatment success rate to 89% (2004). Partners' operational plan in implementing strategies of NTP will be presented and the collaboration undertaken are the lessons for other countries.

Conclusion: There is increased trend of the Government collaboration with NGOs in implementing TB program in Bangladesh. Government-NGO collaboration is an effective way of improving access and quality of TB and other health care services.

PS-61210-02 Current status of human resources in TB control, Shaanxi Province, PR China

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Background: Shaanxi Provincial TB Control Program was developed and carried out in 2002, to cover 36.70 million population in 107 counties in all the province under DOTS strategy.

Objective: To evaluate the need for whether human resources meet increasing expansion of DOTS strategy since carrying out the program for 5 years.

Methods: To collect data on human resources at all levels for statistic analysis.

Results: There're 416 full-time professionals in TB control, 157 part-time professionals. Of full-time professionals, doctors count for 163, 15 nurses, 56 statisticians, 71 lab technicians, 40 radiographers, 57 druggists and 14 other staffs in the province, with 32 persons at provincial level, 56 at city level (averagely 5.6 persons each city) and 328 at county level (3.1 persons each county).

Conclusions: Human resources are the basis to carry out TB control program, or a good TB control program will not be carried out because of lack of staff.

In the province, human resources after the implementation of the program have been more improved compared with that before the program, but not met standards of the national TB control program (i.e. 10-15 persons each city and 5-8 persons each county) and the need for increasing expansion of DOTS.

PS-61214-02 Evaluation de la tenue du dossier médical de pleurésie en pneumo-physiologie : audit clinique de 302 dossiersA Hounkpati,¹ N A Ngwanou,¹ A A Balogou,² O Tidjani.¹¹Service de Pneumophysologie et Maladies Infectieuses, Lomé, Togo, Togo; ²Service de neurologie, Lomé, Togo, Togo. Fax: (+228) 221 59 69. e-mail: hfredo@yahoo.fr

But : Apprécier la qualité de la tenue du dossier médical de pleurésie au PPH/MI pour contribuer à son amélioration.

Méthodes : Audit clinique de 302 dossiers médicaux de pleurésie archivés au PPH/MI de janvier 2000 à avril 2005.

Analyse des données : Epi Info 3.3.2.

Résultats : Dossiers non retrouvés : 1,3%. Identification du dossier : <15% (numéro du dossier et le responsable du service). Identification du patient : 95%. Données d'admission précisée >94%. Histoire de la maladie : signes d'imprégnation tuberculeuse : 20,5%. Durée du traitement antérieur : 14,2%. Respectivement, antécédents pulmonaires et mode de vie précisés : 61,3% et 31,4% des cas. Données d'état général précisées >77% sauf poids (9,6%) et taille (1,3%). Données de l'examen pleuro-pulmonaire précisés >51%, sauf inspection (42,7%). Résumé de l'observation médicale précisé : 89%. Hypothèse diagnostique précisée : 92%. Radiographie pulmonaire et examen biologique du liquide pleural demandés dans 98% et 97% des cas mais les résultats parvenus dans 99% et 53 à 89%. Diagnostic retenu précisé dans 82%. Eléments du diagnostic précisés : 67%.

Eléments du traitement précisés : 98,7% (traitement global), 5% (durée du traitement), et 5,3% (effets secondaires). Eléments de surveillance et évolution retrouvés <55% des cas. Eléments de sortie précisés <31%. Eléments de prise en charge bien agrafés dans le dossier : 8,3%. Respect du plan d'observation : 51%. Salle des archives mal tenue. Dossiers rangés ni par année ni par numéro d'ordre. Nécessité de vulgariser l'audit clinique.

PS-61234-02 Political commitment in the implantation and sustainability of DOTS in Sao Paulo, Brazil, 2005

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This study aimed to analyze political commitment (PC) in the implantation and sustainability of the DOTS strategy in 36 priority cities to control TB in the State of São Paulo. We assume the premise that PC is fundamental to make possible the transference of responsibilities for the implantation and sustainability of DOTS. The study population consisted of 22 Tuberculosis Control Program (TCP) coordinators. Data were collected through semistructured interviews and analyzed through thematic content analysis. The PC theme was based on the unit of meaning 'transference of responsibility for management (planning, monitoring, training, health team supervision) and technical (Supervised Treatment—ST, Search for Respiratory Symptomatics—SRS) TCP activities'. Results showed that only technical activities were decentralized to Peripheral Health System Units, due to the availability of resources, lack of health team preparation, complexity of control actions and technical-management training of coordinators. Hence, the municipal health system should guarantee a minimal structure (financial/human/material resources; technical, management and political preparation of TB responsible) with a view to the actual transference of DOTS activities.

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PS-61271-02 The Global Fund and tuberculosis in Nicaragua: making links between global policies and local experiences

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Purpose: To assess and analyze local stakeholders' experiences with Global Fund to Fight AIDS, Tuberculosis and Malaria (GF) policies relevant to tuberculosis (TB) in Nicaragua.

Design: Using an ethnomethodological approach, the research explored stakeholders' perceptions of the impact of the GF on TB control, health systems and health rights. Data collection involved contextual analysis, participant observation, in-depth interviews and focus groups in two GF-prioritized states.

Results: Preliminary analysis of findings shows various internal and external challenges in communication/procedural and disbursement/execution aspects

of the GF grant. In TB control, private sector participation, case detection and abandonment are thought to have improved as a result of the GF project, though sustainability beyond GF is a key concern. In health systems, there are concerns around absorptive capacity, sustainability, and efficacy in the use of funds; norms and standards required by the GF are neither always considered familiar nor feasible; and evaluation indicators may be inappropriate. Focus on human resource development via the GF, however, is considered a strength. Participation and stigma, two facets of health rights, are perceived to have improved through the GF grant.

Conclusion: To respond to country needs, GF should give more attention to the value of experiences of those working within the confines of procedural processes that are less flexible than they appear.

PS-61278-02 A review of the management challenges faced by National TB Control Programme directors in sub-saharan Africa

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The review will define both the operational and strategic management challenges faced by NTCP managers from three African countries in sub saharan Africa that impact on the successful implementation of TB control programmes. The review will include the following consistent elements for each country and provide both an individual commentary and synthesis of common best practice and management barriers to successful implementation.

Specifically the review will look at the following:

- The position of the NTP manager in the National Department of Health hierarchy
- Access to key policy and decision makers
- The level of non TB management training offered in the last three years and by which organisations
- The range of staff offered in support teams within the National TB Control Programme (NTCP) and
- The range of management skills that are available both within the NTCP and accessible to it through the National Department of Health.

The data will be elicited by both questionnaire and structured interviews with individual NTCP managers. It will be presented in an aggregated format but specific points of best practice will be identified for each country.

PS-61310-02 TB control incentives and enablers in China

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Background: By the end of 2005, China has already reached three intermediate targets for TB control. In

the progress of achieving targets, nationally, in China, a variety of Incentive and Enablers (I&E) schemes are in use for TB control, targeting patients, providers and communities.

Objectives: To summary and update the national evidence and experience on the use of I&E in TB control.

Methods: Evidence-based reviews were conducted to summary the experience.

Results: Over the past decade or so, China has introduced innovations that employ money or other material incentives to affect the behavior of health care providers and patients or some communities.

The main actions included: 1) Giving case reporting subsidy, referral fee, case management fee, free training or subsidy for sputum smear examination for health provider. 2) Providing transportation support to attend TB clinics, providing free diagnosis for TB suspects and free drug for TB patients. 3) Involving the community leaders in the of TB control and giving incentives to them.

Conclusion: This paper just summary the evidence of (I&E) has been carried out in China. But more research need to do for exploring how these innovations are working, and how they are affecting (or could affect) the broader health system.

TB DIAGNOSTICS: CULTURE AND RAPID DETECTION METHODS

PS-61096-02 Specificity of a T-cell-based assay in patients with tuberculosis or *Mycobacterium avium* complex disease

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Background: The utility of the tuberculin skin test for detecting latent tuberculosis is limited by its inability to distinguish between infection with *Mycobacterium tuberculosis* and non-tuberculous mycobacteria. Newer interferon gamma (IFN- γ) assays using *M. tuberculosis*-specific antigens ESAT-6 and CFP-10 should have a higher specificity for tuberculosis but have not been tested in patients with pulmonary disease due to non-tuberculous mycobacteria.

Objective: To test the specificity of a T-cell-based IFN- γ assay in patients with tuberculosis or pulmonary disease due to *M. avium* complex (MAC).

Methods: Ten patients with culture-confirmed pulmonary disease due to MAC, four patients with culture-confirmed tuberculosis and two healthy controls were interviewed and tested with the T-SPOT.TB Test®. Medical charts were reviewed.

Results: The four patients with tuberculosis had reactive T-SPOT.TB results and the 10 patients with MAC disease and the two healthy controls had non-

reactive results. The sensitivity and specificity of the T-SPOT.TB Test for tuberculosis was 100%.

Conclusion: A T-cell-based assay for tuberculosis has excellent specificity for distinguishing tuberculosis disease from MAC pulmonary disease in patients and can be used to distinguish tuberculosis infection from MAC infection in healthy persons.

PS-61172-02 Longitudinal changes in T cell interferon-gamma responses during anti-tuberculosis treatment

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Objectives: 1) To evaluate the sensitivity of the QuantiFERON-TB Gold® In Tube (QFT) assay in patients with newly diagnosed smear or culture-confirmed tuberculosis, and 2) to determine changes in interferon- γ responses in individuals before and after standard anti-tuberculosis treatment.

Methods: We recruited 80 patients with smear or culture-positive TB (median age 39 years, 73% male, 23% cavitory disease) at a rural hospital in India. The QFT assay was used to measure interferon- γ responses to ESAT-6, CFP-10, and TB7.7 peptides at three time-points: at baseline [$n = 80$], after 2 months of intensive treatment [$n = 47$], and at treatment completion [$n = 39$]. Due to deaths and losses to follow-up, not all subjects underwent all QFT tests. The cut-point for QFT positivity was IFN- $\gamma \geq 0.35$ IU/mL.

Results: At baseline, 74% of 80 patients were positive by QFT. At the second time-point, 81% of 47 subjects were QFT-positive. At treatment completion, 79% of 39 subjects were QFT-positive. Although the median interferon- γ levels decreased during treatment (Table), the positivity rate remained mostly unchanged during therapy.

Time point	N (smear+ cases)	Sensitivity of QFT-G In Tube	Median Interferon- γ levels (IU/mL)
0 (baseline)	80	74%	2.7
2 months (after intensive phase)	47	81%	1.9
6 months (at treatment completion)	39	79%	1.8

Conclusions: Among TB patients with mostly moderate to advanced disease, QFT-G had a sensitivity of 74% at diagnosis. There was no significant decline in sensitivity during the course of treatment. Further research is needed to understand the kinetics of T-cell responses during TB treatment, and explore the correlation between bacterial burden and interferon- γ responses.

PS-61261-02 VOC analysis of *M. tuberculosis*

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Aim: There is an urgent need for low-cost rapid diagnostic tests to replace smear microscopy which is a time consuming and labour intensive method of screening suspected TB patients. Detection of characteristic volatile organic compounds (VOC) in the headspace of clinical samples may provide an alternative mode of diagnosis. However, the development of a robust diagnostic test will require defined vapour analysis to enable calibration and standardisation of the technology. This presentation will describe the application of zNose technology and present data on the identification of *M. tuberculosis*. Preliminary work with clinical specimens and breath will also be presented.

Method: The zNose (Electronic Sensor Technology, USA) incorporates capillary Gas Chromatography with a temperature regulated surface acoustic wave (SAW) sensor. A portable version is available that has been shown to be robust in field applications. When coupled with a novel remote sampling 'pre-concentrating' device (Slickstick) highly sensitive trace vapour analysis may be undertaken.

Results: Using the zNose and Slickstick compounds in the headspace of cultures of *M. tuberculosis* were detected that were not present in the headspace from environmental mycobacteria. Sampling and analysis takes just a few minutes. Using the Slickstick samples can be stored and transported at ambient temperature. Reagent costs are less than US\$1 per specimen. Work is continuing towards the development of a diagnostic test.

PS-61425-02 7H9 broth is an ideal tuberculosis culture medium for resource-limited countries

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Growth detection of *M. tuberculosis* (MTBC) is still indispensable since culture is more sensitive than microscopy and conventional drug susceptibility tests require viable organisms. The introduction and routine application of commercially available broth-based culture systems might not be applicable or affordable for laboratories in resource-limited countries. Therefore, a prospective study was organized to evaluate the performance of the inexpensive, home made 7H9 broth for the recovery rate and time to detection of MTBC and to compare the results with those of the MGIT 960, BACTEC 460TB and Lowenstein-Jensen (LJ) media. The 7H9 tubes were weekly centrifuged, an aliquot stained, and considered positive when cord formation was detected. A total of 106 MTBC iso-

lates were recovered from 136 clinical specimens from known TB patients. The rates of recovery of MTBC were 99% with 7H9, 85.6% with both the MGIT 960 and the BACTEC 460TB, and 70.5% with the LJ. The mean time to detection of MTBC in smear-positive specimens was 8.8 (4–18) days for 7H9, 9.4 (2–24) for MGIT 960, 8.3 (2–19) for BACTEC 460TB, and 21.3 (14–35) for LJ, and in smear-negative specimens, it was 14.0 (4–42) days for 7H9, 14.2 (6–18) for MGIT 960, 16.3 (2–53) for BACTEC 460TB, and 26.0 (14–35) for LJ. In conclusion, the 7H9 broth can be considered a viable alternative to shorten the TAT for growth detection while increasing the yield of MTBC compared to LJ, BACTEC 460, and MGIT 960 in resource-limited countries.

PS-61541-02 Diagnosis of pulmonary TB and MDR-TB in smear-negative or paucibacillary samples from patients using BACTEC

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Rationale: Pediatric patients and HIV-positive patients with suspected pulmonary tuberculosis (PTB) are difficult to diagnose. They suffer excess morbidity and mortality from late diagnosis or failure to identify multidrug-resistance (MDR)

Objective: To evaluate the utility of rapid culture and drug susceptibility testing (DST) using BACTEC on smear-negative samples from pediatric and HIV-positive patients.

Methods: This is a descriptive study of pediatric patients with suspected or confirmed MDR exposure and HIV-positive patients from 102 health establishments in two health districts throughout 2005. All patients were clinically suspected or confirmed to have PTB. Smear-negative sputum samples were processed for culture and DST using BACTEC 460.

Results: 43 HIV-positive patients were referred for DST: of these, 21 were smear-negative, and in 19 cases, no data were available on smear status. 36 pediatric patients were tested: 7 were smear-negative and in 29 cases, no data were available on smear status. Among all 28 smear-negative samples, 11 (39.3%) were culture-positive. 3 (7.0%) of the 43 HIV-positive patients and 5 (13.9%) of the 36 pediatric patients were confirmed to have MDR.

Conclusions: The use of rapid, sensitive methods for culture and DST offers important utility in diagnosing PTB and MDR-TB in high-risk groups such as pediatric and HIV-positive patients.

PS-61673-02 Monitoring of RD1 selected peptide response and QF-TB during prophylaxis in individuals exposed to TB

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Background: We set up a new potential immune assay for diagnosing tuberculosis (TB) and monitoring therapy, able to discriminate between active TB and latent infection. This test measures IFN-gamma in response to peptides selected from RD1 proteins. The objectives of the present study were: 1) to evaluate the response to this assay in contacts of active pulmonary TB patients; 2) to compare our test with QuantiFERON TB-Gold assay (QFT-G); 3) to monitor these responses during anti-TB prophylactic therapy (INH).

Methods: 204 contacts were tested by RD1 selected peptides Whole Blood ELISA and QFT-G at the time of TB diagnosis of the index case.

Results: 116 were tuberculin skin test (TST) positive and 32 of them started INH. Among these 32, 20 (63%) responded to RD1 selected peptides and 24 (75%) to QT-B-G. Fourteen subjects under INH therapy, with a positive response to both assays, were studied after 1 and 6 months of treatment. A dramatic decrease (66%) of RD1 selected peptides response was observed after one month of prophylaxis, vs. a lower reduction (27%) observed with QT-B-G. After completion of therapy a significant decline (>85%) by both assays was found.

Conclusions: Our assay based on RD1 selected peptides may offer an accurate approach for monitoring *M. tuberculosis* replication after exposure. This assay may be a potential tool for an earlier evaluation of the effect of prophylaxis in contacts of TB patients.

PS-61775-02 Comparison of TST and T-SPOT TB among TB exposed health care workers in Norway

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Substantial resources are utilized to follow up personnel after unprotected exposure to patients with sputum-smear positive pulmonary tuberculosis (TB) in Norwegian health institutions. The individuals defined as super-infected by the tuberculin skin Test (TST) are currently followed up with consultations at the pulmonary department and annual chest X-rays for three

years. Due to the low specificity of the TST, a large proportion of the group defined as super-infected after exposure are probably false positives, which leads to incorrect treatment, waste of resources, and unnecessary anxiety. Oxford Immunotech has developed the specific T-spot TB test based on the ESAT-6 and CFP10 antigens which are absent in BCG and most of the environmental mycobacteria. By collaboration with three Norwegian hospitals, we have so far included 122 exposed health care workers in a study where they were tested with both TST and T-spot TB. Twenty individuals came out as super-infected with TST, while only one of these had a positive T-spot TB test. The preliminary results of this study indicate that the risk among health care workers for being infected by unprotected TB exposure in a hospital setting is low. Hence, the utilization of *M. tuberculosis*-specific blood tests, like T spot TB, can prevent incorrect treatment and save major resources as the number of personnel needed to be followed up will be substantially reduced.

PS-61862-02 Towards development of new point of patient care tuberculosis diagnostics

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Setting: Most cases of TB occur in countries where resources for health care are scarce and national health programs struggle to find cost-effective ways of reducing transmission. The HIV pandemic has led to an increased diagnostic challenge as the sensitivity of smear microscopy is reduced further in TB-HIV co-infected individuals who commonly have smear-negative pulmonary and extra-pulmonary disease. Therefore there is an urgent need for new diagnostic tools.

Aim: To develop new cost effective point of care TB diagnostics.

Design: Based on an earlier developed ELISA technique to measure arabinomannan antigen secretion in urine (Scand J Infect Dis 33: 279–284, 2001; Scand J Infect 34: 167–171, 2002) we have now developed a simpler dip-stick urine test and evaluated it in 35 culture verified Estonian TB patients and 15 healthy Swedish controls.

Results: 77% of the TB patients were correctly identified by the dip-stick test and all controls were negative.

Conclusions: Although promising—further increase in sensitivity is needed and current work on this and a new immuno-chromatographic method will be presented.

Acknowledgments: This work was partially supported by Foundation for new innovative diagnostics (FIND). We want to thank Annika Krüüner for the Estonian samples.

PS-61899-02 Induced sputum is a simple means of combining interferon- γ assays with microbiology in diagnosing active TB

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Introduction: The clinical utility of blood-based interferon-gamma (IFN- γ) secretion assays in active TB is unclear. We have focussed on lung fluids as this allows integration of immunology with standard microbiology. Here we describe the adaptation of a method developed for bronchoalveolar lavage (BAL) to induced sputum samples.

Methods: Nebulised 3% saline was inhaled for 20 minutes. Sputum was mucolysed and then divided. After overnight incubation with PPD, the IFN- γ -secreting CD4 lymphocytes were measured.

Results: 35 TB patients, 10 HIV co-infected, have undergone pre-treatment sputum induction. 22/35 had pulmonary TB, with 19/22 AFB smear negative. 2/35 had miliary TB. 2/35 had mediastinal lymph gland and 2/35 pleural TB without parenchymal involvement. 7/35 had solely extra-thoracic disease. Using flow cytometry, the median CD4+IFN- γ + frequency response to PPD was 3.96% (range: 0–23.79%). 33/35 had detectable responses, with 32/35 >0.5% and 29/35 >1%. In 8 BCG-vaccinated healthy HIV negative controls, CD4+IFN- γ + frequencies were all <0.5%.

Conclusion: We have shown that a simple lung-orientated approach to TB immuno-diagnosis allows rapid microbiological and immunological investigation to be performed on a single sputum sample regardless of HIV status and site of disease.

PS-61913-02 Evaluation of a nucleic acid amplification test among adult respiratory symptomatics in Lima, Peru

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Background: PCR and other nucleic acid amplification tests (NAAT) have become valuable diagnostic tools compared to culture for pulmonary tuberculosis (PTB) and other mycobacterial diseases in industrialized countries. Performance of a novel method, termed loop-mediated isothermal amplification (LAMP), was evaluated among respiratory symptomatic adults.

Methods: A cross-sectional study was designed to evaluate the performance of LAMP in diagnosing PTB compared to the Lowenstein-Jensen culture (LJ) in the north area of Lima, Peru. PTB suspects presenting to 8 peripheral health centers were enrolled from Feb-

ruary to April 2006. Smear microscopy, LJ culture and LAMP assay were performed for all specimens.

Results: A total of 135 patients were enrolled. We present here preliminary data of the first 57 patients. 42% (24/57) were culture positive, 83.3% (20/24) were smear positive and 8.3% (2/24) were smear negative. LAMP sensitivity, specificity, PPV and NPV are shown in the Table below:

	LJ culture +	LJ culture -
Lamp +	23	0
Lamp -	1	31
Total	24	31
Sensitivity	95.83%	
Specificity	100.00%	
Positive predictive value (PPV)	100.00%	
Negative predictive value (NPP)	96.87%	

Conclusions: LAMP has a high sensitivity and specificity, achieving a good performance among respiratory symptomatic adults. Further studies are needed to validate these results.

PS-61931-02 Humoral response to MT-10.3 (Rv3019c) antigen combined with two other *Mycobacterium tuberculosis* antigens

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Background: Primary care clinics in Rio de Janeiro, Brazil, do not provide facilities for induced sputum technique and, consequently, patients who do not present sputum have their diagnosis based on symptoms and chest X ray findings. TB serodiagnosis could help.

Objective: To determine the humoral response to 38kDa, 16kDa and MT-10.3 antigens combined and separately.

Methods: Enzyme-linked immunosorbent assay was used. Specific antibodies were measured in the sera from 65, clinically or bacteriologically diagnosed cases and 81 cases of other pulmonary diseases, in a primary care clinic (CMS Heitor Beltrão), in Rio de Janeiro, 2003–2004.

Results: Anti-IgG antibodies against MT-10.3, 38kDa, and 16kDa antigens were detected in 63%, 64.6%, and 60%, respectively. When the three antigens were combined, sensitivity was 41.5% and specificity was 83%.

Conclusion: Up to now, the humoral response to MT-10.3, in the serum of this TB endemic population was not known. The response to MT-10.3 antigen performed marginally well and similarly to the other already tested antigens. However, when the three were combined, despite of a loss in sensitivity there was an increase in specificity.

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PS-62004-02 Evaluation of a lateral flow immunochromatographic system for the diagnosis of active pulmonary tuberculosis

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Setting: To control TB, a timely diagnosis is one of the strategies implemented by public health programs that lead to a timely treatment and control of the disease. The improvement of TB diagnostic methods has been extremely slow.

Objective: To evaluate a rapid immunochromatographic diagnostic system.

Methods: 144 subjects were included in the study, 72 had active pulmonary tuberculosis and 72 had the infection. The patients answered a questionnaire and underwent the rapid test.

Results: The test detected 57 of the active TB patients and, only 1 healthy contact got a positive result. These results represented a sensitivity of 79% specificity of 98.6%. The positive predictive value was 98%. Sequential use of the diagnostic systems in respiratory symptomatic patients bacilloscopy and diagnostic strip. These results represented a sensitivity of 83% specificity of 98%.

Conclusion: Based on these results, this test can be used as a support for the existing methods in the timely detection of active TB cases in locations where a bacilloscopy is unavailable, or when it is impossible to obtain a culture or bacilloscopy sample due to the patient's condition. It also increases the positive detection rate in developing countries

TB IN LOW-BURDEN COUNTRIES

PS-61033-02 Deaths associated with mycobacterial infection in Lanarkshire, Scotland

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Introduction: NHS Lanarkshire provides TB services for approximately 560 000 people with around 30 TB notifications per annum.

Aim: We aimed to improve practice through audit of mycobacterial associated deaths.

Method: Deaths with ICD-10 codes A15–A19, B90 ('TB') and A31 ('atypical') as underlying and non-underlying cause of death were identified for the period January 2000–September 2005. General practice notes, and all atypical laboratory isolates were reviewed. Isolates reflect episodes of disease, and overestimate total cases.

Results: There were 57 deaths, with notes available for 33. 'TB' was coded as the underlying cause of death in 26 cases, of which 7 (27%) were subsequently

identified as due to atypical mycobacteria (4 *malmoense*, 1 *kansasii*, 1 *avium*, 1 *abscessus*). Of the 28 cases with 'TB' as the non-underlying cause of death 10 cases (36%) were due to atypical mycobacteria (5 *malmoense*, 3 *avium*, 1 *kansasii*, 1 failed to grow). 3 cases were coded with 'atypical' as the non-underlying cause of death (*malmoense*, *intracellulare* and *xenopi*). Over this period there was a total of 83 atypical isolates (including 26 *malmoense*, 15 *avium/lavium* complex, 8 *kansasii*).

Conclusion: Audit revealed an unexpectedly high number of *malmoense* associated deaths, prompting renewed interest in the local management of atypical mycobacterial infection.

PS-61059-02 The persistent link between tuberculosis and poverty illustrates the inability to improve health inequalities

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Aim: To compare health inequalities today with the recent past.

Background: A previous study showed that tuberculosis (TB) rates across Liverpool are related to poverty (BMJ 1993; 307: 759–761). With a commitment to reduce health inequalities, cities with the lowest life expectancy should show improvement in patterns of a curable disease like tuberculosis.

Design: An ecological study of geographic patterns of TB and respiratory disease.

Methods: TB notifications, mortality and hospital data (1996–2005) were analysed against ward-level measures of deprivation.

Results: TB rates in 1996–2000 and 2001–2005 had virtually exactly the same correlation with deprivation as observed in 1985–1991. There were almost no TB cases in the most affluent areas; 2/100 000 in moderately deprived areas; and over four times this rate in the most deprived wards. Other respiratory diseases and mortality from conditions related to smoking show the same geographical pattern across Liverpool and are also likely to have not changed from historic distributions.

Conclusion: The persistent pattern of tuberculosis across the city of Liverpool illustrates that health inequalities, inextricably linked with poverty, have not reduced in the last 20 years. Perhaps the ban on smoking in public places will help to reduce some inequalities in respiratory diseases but tuberculosis control policies do not appear to be improving its distribution across the city of Liverpool.

PS-61126-02 Epidemiology of childhood tuberculosis in Ukraine

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The rise of TB incidence in Ukraine was begun from 1990 year and epidemic was registered in 1995 officially. The aim of investigation was to study the main indexes of childhood TB in our country.

Results: Incidence of children over the period of epidemic (10 year) increased on 50% (from 6.3/100 000 in 1995 to 9.3 in 2004). Incidence of juveniles in 2004 year was 31.4/100 000 and 33.5 in 2005. Incidence among children in 2005 year was conduct: under 1 year—4.0/100 000; from 1 to 4 years—9.8; from 5 to 9 years—7.8; from 10 to 14 years—9.9. In the structure of first revealed childhood TB: pulmonary TB (PTB)—30%; extra-pulmonary TB (EPTB)—70% (68% of them—EPTB of respiratory organs (most cases are TB of intrathoracic lymph nodes) and 32%—EPTB other organs (35.3% of them—TB of bone-joint system). In 2005-year number of children with serious illness forms such as miliary TB, TB meningitis had increased. Children contingents with latent tuberculosis infection, which were register by the phthisiologist grew by 200% over 10 years and made up 202 375 or 2792/100 000 ($P < 0.01$) at the end of 2004. Number of children and juveniles who lived in family contacts with TB in 2004 year was more than 40 000. **Conclusion:** Epidemic of TB in Ukraine is progressing. The most incidence of TB is among children of 1–4 years, 10–14 years and juveniles. Structure of TB forms becomes severe. Number of children and juveniles with latent TB infection is increased.

PS-61158-02 DNA-subtyping of *M. tuberculosis* in TB patients in Denmark, 1992–2004

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Aim: Nationwide analysis of IS6110-RFLP cluster frequency and new RFLP patterns in 1992–2004 in TB patients born in Denmark (DK).

Methods: The laboratory database of RFLP examinations was revised. The annual cluster frequency was calculated with a window of observation widening from 1 to 13 years. Annual new RFLP patterns introduced after 1992 were counted.

Results: The revised database contains 4648 TB cases, 1788 among persons born in DK. Clustering within a calendar-year increased from approximately 30% to 50% from 1992 to 2003 solely due to Danish RFLP cluster 2. Clustering increased with time-window from average 43% to 68% with 10 years observation. In 2002–2004 new RFLP patterns were seen in approximately 35% of TB patients born in DK.

Conclusion: Recent transmission of MT infection is the major reason for TB in patients born in DK. Latent MT infections acquired before 1992 is a diminishing source of TB, but can continue for many years. Routine DNA-subtyping of *M. tuberculosis* can provide essential information about TB epidemiology in a TB low incidence country.

PS-61289-02 Smear-negative pulmonary tuberculosis: peculiarities of its frequency in Cuba, 1992–2002

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Background: Notification of smear and culture-negative pulmonary tuberculosis (TB) was reintroduced in the national TB control program since 1994. Diagnosis of smear-negative TB cases is a challenge for good patient management and public health statistics. **Objective:** To describe TBp sputum smear microscopy negative (SSM–) distribution and trend in Cuba in 1992–2002.

Methods: Data on TB cases from ambulatory centres and hospitals registered by the TB control program were analysed. The incidence rates for the 1992–1994 and 1994–2002 periods were estimated along with the percentage of variation.

Results: As an average there was 86.8% of pulmonary TB cases out of the total TB cases, among which there were 30.5% SSM (–). Extra pulmonary TB accounted for 13.2% out of the total TB cases. In 1994, there was an incidence rates increase of 24.7% from 1993, and 53% from 1992. Since 1994 to 2002, a 48.3% (6% yearly) reduction was observed.

Conclusions: A major increase number and rates of TB cases notified in the 1992–1994 period was observed, and there was a sustained decline from 1995 to 2002, which was probably associated to more efficient control measures.

PS-61329-02 Tuberculosis in foreign-born persons, England and Wales, 2001–2003

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Objectives: To describe the demographic and clinical characteristics of tuberculosis (TB) in foreign-born persons in England and Wales, including comparison with UK-born cases, to inform appropriate public health action and health service provision.

Methods: A descriptive analysis of TB cases reported

to the Enhanced TB Surveillance system during 2001–2003.

Results: 67% of TB cases occurred in the foreign-born. The TB rate was 88/100 000 in the foreign-born population compared to 4/100 000 in the UK-born. The highest TB rate occurred in persons who had entered the UK less than two years prior to diagnosis. Nearly half of foreign-born cases had, however, been resident in the UK for 5 years or more. The majority of foreign-born cases originated from South Asia (48%) and Sub Saharan Africa (35%). The demographic characteristics, in particular the age structure and ethnic group composition of foreign-born cases were very different to the UK-born. Foreign-born persons were less likely to have pulmonary TB compared to the UK-born, but were slightly more likely to have isoniazid resistant TB.

Conclusions: The majority of TB cases in England and Wales now occur in the foreign-born population. Health service provision for TB therefore needs to take the characteristics and needs of this population group into account. Furthermore, awareness of the risk of TB is required, not only in persons who have recently arrived, but also among those who have been resident for many years.

PS-61335-02 Determinants of death among tuberculosis cases in the European Union, 2003

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We used case-based individual data to study the determinants of death amongst TB cases reported to EuroTB by 17 European Union (EU) countries in 2003 (Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Germany, Hungary, Ireland, Latvia, Lithuania, Malta, Netherlands, Portugal, Slovakia, Slovenia and Sweden). Countries reported outcomes for all 26 172 cases notified in 2003 (8% with outcome unknown), of which 2282 died (9%, country range: 0%–11%). The risk of death increased for cases >34 years (Odds ratio [OR] = 7.8, 95%CL 6.5–9.4), of male sex (OR = 1.3, 95%CL 1.1–1.4), with pulmonary disease (OR = 1.7, 95%CL 1.5–1.9), having had previous TB treatment (OR = 1.6, 95%CL 1.4–1.8) and from the EU (OR = 3.0, 95%CL 2.6–3.5). Logistic regression was used to identify variables associated with death among 11 746 culture-positive cases with complete data for age, sex, origin, past treatment history, site of disease, and drug resistance. Death (965 cases, 8%) was associated with older age (referenced to age <15y: age 55–74y: OR = 5.7, 95%CL 2.1–15.6; age >74 y: OR = 12.8, 95%CL 4.7–34.9), male sex (OR = 1.5, 95%CL 1.3–1.7) and resistance to isoniazid and rifampicin (OR = 2.9, 95%CL 2.3–3.7). Deaths were less likely in cases from FSU (referenced to EU: OR = 0.6; 95%CL 0.4–

0.9). In the EU, tuberculosis patients who are elderly, male and multidrug-resistant should be considered at increased risk of dying while on treatment.

PS-61336-02 Tuberculosis mortality rates in the World Health Organization European Region, 2000–2003

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We analysed TB mortality data of European countries on the WHO Mortality Database for 2000–2003 and compared mortality rates with TB notifications reported to the EuroTB network. Nationwide TB mortality data with 80%–100% completeness were available for 24/29 countries in the European Union and West (EUW), 5/8 from the Balkans, and 9/15 from the former Soviet Union (FSU, including Estonia, Latvia and Lithuania). TB accounted for 0.0–0.3% of all deaths in EUW countries, 0.3–0.9% in the Balkans, and 0.5–2.6% in FSU. Overall TB mortality rate in 2003 (or latest year) was 0.9/100 000 population in the EUW (country range: 0.2–2.4), 7.2 in the Balkans (3.5–10.5) and 19.8 in the FSU (6.6–24.2). Rates peaked in the 45–64 year age-group in FSU countries and Romania, but increased progressively by age elsewhere. TB mortality rates correlated with notification rates for 113 country-year observations (linear $R^2 = 0.78$; $\beta = +0.13$), with Romania and Ukraine being extreme outliers (low and high mortality respectively). A steady decrease in TB mortality rates over 3–4 consecutive years exceeding 5% annually was observed in Czech Republic, Estonia, Hungary, Latvia and Poland, while rates increased in Belarus and Slovakia. TB mortality rates show an incremental West to East gradient in the European Region, mirroring the trend in TB notification rates for most countries.

PS-61387-02 Tuberculosis incidence in Nepal: a trend analysis during 1996–2003

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Tuberculosis (TB) is a major public health problem, affecting about 45% of total population in Nepal. DOTS has been successful, however, still 5000–7000 deaths annually due to TB. The increasing trends of HIV infection has been a threat to TB control in Nepal. **Objectives:** To describe trends of TB epidemiology in Nepal.

Methods: A descriptive study was conducted using TB surveillance data during 1996–2003 under the NTP.

Results: The overall reported TB incidence rate is decreasing from 136 to 129/100 000 during 1999–2003,

where as overall decreasing trend of TB incidence is 0.81/100 000 per year given by an equation $IR_t = 137 - 0.810 \times \text{year}$. However, the above reported incidence in comparison with the expected incidence during this period shows that TB continues to be a public health problem in Nepal (t -test, $P < 0.025$). There had been steadily increasing pulmonary positive TB incidence rate among male than female. A high incidence rate was reported in flat ecological zones followed by hilly and mountainous with ratio equal to 3.1:2.07:1.0.

Conclusion: The study finds that TB is a major public health problem in Nepal, though the reported incidence is decreasing per year. The successful implementation of DOTS throughout the country has had impact to reduce burden of TB epidemiologically in Nepal. However, the resources should be allocated according to the burden of TB, considering person, place, and time.

PS-61597-02 Epidemiology of strains of *M. tuberculosis* in New South Wales, Australia

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Over 80% of cases of TB arise in migrants to Australia, making this an excellent venue to describe the epidemiological and clinical characteristics associated with diverse strains of *M. tuberculosis*. Isolates from 775 cases of TB arising in New South Wales between 2003 and mid-2005 were spoligotyped. Clinical and epidemiological data for 638 of these were ascertained by linkage with the state TB register. Two thirds were pulmonary cases and 88% were born outside Australia. A total of 260 spoligotypes were identified of which 415 (65%) were clustered into 37 shared types. The most common spoligotypes (strains) were Beijing (24%) and East African-Indian (13%). T, Central Asian, Haarlem, Latin American and Mediterranean, and X strains each represented <10%. The only strong epidemiological predictor of strain type was country of birth. The extent of transmission (measured as the presence of any contacts with active disease or positive TST), proportion of smear positive cases, and prevalence of drug resistance did not differ among the strains. The lack of epidemiological and clinical differences between strains may indicate that previously observed differences were attributable to regional epidemiological factors rather than differences in the virulence of strains. However, this does not exclude the possibility that, in situations where TB control is poor or in highly susceptible populations, Beijing strain would show an advantage over other strains, as previously reported.

PS-61611-02 Predictors of mortality within one year of tuberculosis diagnosis in England and Wales, 2001–2002

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Aim: To ascertain the proportion of deaths among tuberculosis (TB) cases due to tuberculosis and the risk factors associated with mortality from tuberculosis.

Methods: Data from the national Enhanced tuberculosis database for the years 2001 and 2002 were combined and linked to the national HIV/AIDS database to ascertain HIV status. Information on reported mortality within 12 months of TB diagnosis was analysed. Cases where TB was reported to have contributed to death were compared with TB cases not dead by univariate and multivariable logistic regression. The effect of age, sex, disease site, ethnicity, multidrug resistance (MDR) TB and HIV status were examined.

Results: 866 deaths (6.6%) were identified among 13 175 TB cases. TB was reported as contributing to death for 310 cases. Table 1 compares mortality, demographic and disease categories of TB cases. Multivariable analysis revealed older age (>65 years), MDR-TB and HIV positive status as independent risk factors for mortality. For extra-pulmonary disease, miliary and meningitis TB were also significantly associated with mortality.

Mortality category	No. of cases	Median age	Prop. male	Prop. UK born	Prop. pulm.	Prop. MDR	Prop. prev. TB	Prop. HIV+
All deaths	866	71	63%	60%	77%	1.1%	16%	6.0%
TB contributed to death	310	70	62%	60%	80%	2.1%	17%	8.7%
TB incidental to death	177	72	66%	54%	77%	0.0%	13%	7.9%
Unknown cause of death	379	73	63%	62%	74%	0.5%	15%	2.9%
All cases not dead	12 309	35	54%	32%	59%	0.7%	9%	4.5%

Conclusion: This study has identified recognised factors as predictors of mortality for TB cases in a low incidence country. In the era of Highly Active Anti Retroviral Treatment (HAART) HIV remains an independent predictor for mortality among TB cases. Future aims include a mortality audit of the data set with national death registrations to further investigate these findings.

PS-61698-02 Efficient PTB case detection through cough screening of family members during home visits

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Background: Passive detection of PTB in patients with cough >2 weeks performs poorly in low incidence settings.

Aim: To evaluate the efficiency of active, risk factor based cough screening coincidental with home visits.

Methods: Passive PTB detection in Las Tunas province, Cuba, is based on sputum smear examination and culture in patients attending with cough >2 weeks. A target is set of examining yearly 1% of the population. End 2003 we introduced, in 4 health areas, active screening of family members for cough >2 weeks during fortuitous home visits. End 2004 we restricted this screening to risk groups and relaxed the target. We monitored numbers of people with respiratory symptoms investigated, sputum smear/culture positivity rates and PTB cases detected.

Results: The yearly number of people with respiratory symptoms investigated decreased slightly from 1821 to 1621, and in 2005 42% of them were identified through active screening. Smear/culture positivity rates increased from 6/1000 to 27/1000 and the total yearly number of PTB cases detected from 11 to 35.

Conclusions: Coincidental active screening for cough in family members during home visits is more effective and efficient than passive PTB detection in patients spontaneously presenting with cough. It should complement the latter strategy in low incidence settings.

PS-61908-02 Miliare tuberculose au CHU Antananarivo

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La miliare tuberculose est rare et grave traduisant la dissémination hématogène des BK. Nous en présentons les caractéristiques épidémiocliniques et évolutives. Etude rétrospective, transversale, au CHU Antananarivo USRF de Pneumologie, janvier 2004 à décembre 2005, de miliare tuberculose avec radiographie pulmonaire : analyse épidémiologique, clinique et évolutive avec logiciel Epi info, test χ^2 . 23 cas retenus, dont 13 femmes (56,6%). La miliare tuberculose représentait 4,50% des tuberculoses : âge moyen des patients 38,26 ans, classe socioéconomique moyenne prédominante, contag tuberculeux 21,7%, fièvre fréquente, toux constante avec hémoptysie 21,7%, douleur thoracique 39,1% et dyspnée 82,6%. L'examen pul-

monaire était normal dans 30,4% ; crachats BAAR positifs 52,2%. La radiographie présentait des opacités micronodulaires 82,6%, lésions confluentes 69,6%, excavations 34,8%. Il existe une relation significative entre positivité bascilloscopie et confluence des lésions radiologiques ($P = 0,001$), positivité des crachats et existence des excavations ($P = 0,001$). 13,4% étaient décédés par insuffisance respiratoire. La miliare TB se rencontre chez les sujets dont les conditions sociofamiliales sont difficiles, et atteint souvent les femmes.

PS-62012-02 Risk models to predict risk of drug resistance and poor adherence among tuberculosis patients

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Background: Poor treatment adherence is internationally recognised as a major barrier to control and as the main risk factor for drug resistance. This study aimed to develop risk models to predict risk of drug resistance and poor adherence among tuberculosis patients.

Methods: Data were obtained on all tuberculosis patients in London on 1st July 2003. Multiple logistic regression models based on backward elimination with robust standard errors were used. The models performance were assessed using internal validation based on bootstrapping, and discriminatory and predictive abilities were assessed using the ROC area and the Miller method.

Results: Data were complete for 97% (1941/1995) of patients. Homelessness and previous tuberculosis were important predictors of MDR-TB. Migrant status, Black Caribbean ethnicity, prison and drug use predicted isoniazid resistance. Gender, ethnicity, prison, drug use, homelessness and mental health problem were important predictors for poor adherence. The models exhibited good predictive ability for all the outcomes and discriminated reasonably well between high and low risk patients (ROC > 0.7) for all outcomes except adherence (ROC = 0.65).

Conclusions: This is a novel attempt to develop risk models for predicting important outcomes in TB patients. These models are simple to use and provide a useful tool to target patients requiring increased support and rapid drug resistance testing.

ABSTRACT PRESENTATIONS FRIDAY 3 NOVEMBER 2006

THEMATIC SLIDE PRESENTATIONS

CHALLENGES IN TB PROGRAMMES AND POLICY IMPLEMENTATION

TS-61152-03 Liquid culture adds speed and sensitivity to solid culture in Bangkok: the Thailand TB Active Surveillance Network

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Background: WHO's 2nd Global Plan to Stop TB advises countries to develop capacity to diagnose TB using sputum culture. In developed countries, sputum is cultured on both liquid and solid media. The benefits of using liquid culture, which is expensive and technically demanding, are not well documented in high-burden TB countries.

Methods: In 2004, we began collecting at least one sputum specimen from patients diagnosed with pulmonary TB in all 17 public TB clinics in Bangkok. Specimens were inoculated onto liquid (Mycobacteria Growth Indicator Tube [MGIT]) and solid (Lowenstein-Jensen [LJ]) media. Biochemical tests identified isolates as *Mycobacterium tuberculosis* (MTB) or non-tuberculous mycobacteria (NTM).

Results: From 10/2004–1/2006, we cultured 2078 specimens; 1038 (50%) were culture-positive by MGIT compared with 733 (35%) by LJ ($P < 0.01$). For the 824 smear-positive specimens, the yield was 84% for MGIT vs. 71% for LJ ($P < 0.01$); mean time to detection was 10 days for MGIT vs. 26 days for LJ ($P < 0.01$). For the 1254 smear-negative specimens, the yield was 28% for MGIT vs. 12% for LJ ($P < 0.01$); median time to detection was 17 days for MGIT vs. 35 days for LJ ($P < 0.01$). Of the 1038 isolates recovered on MGIT, 890 (86%) were MTB and 148 (14%) NTM. Of the 733 isolates recovered on LJ, 720 (98%) were MTB and 13 (1%) NTM.

Conclusions: In a high-burden TB country, liquid culture adds speed and sensitivity compared with solid culture. Further research into cost-effectiveness is needed.

TS-61165-03 Clinical audit and changes in the availability of sputum microscopy results in patients with suspected TB

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Background: In the absence of more rapid and accurate tests, diagnosis of pulmonary tuberculosis still relies primarily on sputum smear microscopy.

Methods: We used clinical audit as a quality improvement tool to improve TB diagnosis in eight health centres in Peru and Bolivia each. The audit cycle included standards setting and measuring clinical performance against these. We estimated the proportion of patients with suspected TB who had the sputum microscopy results available at follow up in Peru and Bolivia over two 6-month periods pre-and-post intervention.

Results: In Peru only 31% (95%CI 27–35) of patients presenting with suspected TB had sputum microscopy results reported in case notes before the intervention. In Bolivia 30% (95%CI 25–35) had at least two sputum microscopy examinations. These percentages improved by 7% (95%CI 1–12, $P < 0.05$) and 23% (95%CI 15–30, $P < 0.05$) over a period of 18 months in Peru and Bolivia respectively.

Conclusions: Despite WHO's recommendation to perform sputum microscopy in all TB suspects, only one-third to a half of such patients have the results of this investigation available. This is a potential serious impediment to case detection in TB. Clinical audit had only a limited impact. We recommend further investigations to ascertain organisational and structural constraints in the uptake and use of microscopy services.

TS-61051-03 To establish incentive mechanisms as the main approach to increase case detection in Shanxi, China

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Background: FIDELIS project is implemented in 50 counties (27 out of 50 are poverty counties) with the population of 16.02 million in Shanxi.

Objective: To increase case detection while maintaining high cure rate mainly through establishing incentive mechanism in Shanxi.

Methods: 50 counties are selected in Shanxi and a pack of incentive mechanism were conducted to increase case detection, mainly consisting of offering transportation fee for TB patients and giving township and village doctors and village leaders incentive fee for transferring smear positive patients to TB dis-

pensary. Other activities including training and IEC were conducted.

Results: The target from Nov. 2004 to Oct. 2005 was 5699 and 7736 new smear positive TB cases were detected which was 136% of the target and 1.52 fold of the same period in the baseline year, and among them 6124 (79.2%) were with limited access to health service, which was 126% of project target goal. The conversion rate at the end of 2nd month and the cure rate were both 96%.

Conclusion: The incentive mechanism has greatly increased the case detection rate in project area while maintaining high level of cure rate, Which proved practical and successful in project area.

TS-61199-03 DOTS implementation at work places in Bangladesh

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Introduction: The garment industry one of the major industries in Bangladesh, employing almost 2 million people, over 80% is females between the ages of 18–45 years. Implementation of DOTS addresses one of the health needs of a large vulnerable group.

Objective: Include the garment industry in the DOTS program to improve health of its employees.

Method: In 2001 DOTS was implemented in Young-one garment factory in Chittagong Export Processing Zone, which employs over 24 000 employees. Staffs were trained by NTP, provides drugs and laboratory supplies. It was expanded to Dhaka Export Processing Zone having 50 000 employees in 2004 and to the rest of the Chittagong Export Processing Zone covering over 100 000 employees same year. The factories (Para) medical staff identifies TB suspects, carry out smear microscopy and deliver treatment under DOT.

Results: During the first 2 years on average 126 smear positive cases per 100 000 employees were diagnosed. This is over three times the case detection among females of the same age group in general population. Detail results will be presented.

Conclusion: The extent of TB problem, as well as the large group of concerned employees has urged the garment industry to extend DOTS to other parts of the country.

TS-61653-03 Tuberculosis in Rio de Janeiro prisons: epidemiological and sociological specificities of prison units

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Background: In Rio de Janeiro prisons, a tuberculosis (TB) hyperendemic setting, prison units are heterogeneous in terms of TB incidence (2004 range: 688–8185/100 000) and sociology (inmates are allocated into units according to their declared belonging to the ‘faction’ which influences the social organisation of their community of origin and of the unit they will be incarcerated).

Aim: To assess the unit’s profiles in order to improve the TB control program.

Design: Cross sectional chest X-ray survey and recording of socio-demographic data in 3 units (A, B, C) for adults males ($n = 3014$).

Methods: TB diagnosis among inmates with X-ray abnormalities by sputum smear and culture or, if bacteriological results were negative, by response to TB treatment. Face to face standardized interviews.

Results: Prevalences were lower ($P < 0.001$) in unit A (4.6%, $n = 1052$) than in units B (6.3%, $n = 590$) and C (8.6%, $n = 1372$). Compared with unit A, inmates from units B and C originated more often from underprivileged communities (favelas) (respectively 25.6%, 49.0% and 61.4%, $P < 0.001$) and had been more often under TB treatment (5.8%, 12.3% and 10.6%, $P < 0.0001$). In unit A, inmates belonged to a ‘faction’ different from those in units B and C, with a different social structure.

Conclusion: Significant specificities according to unit were observed. They should be taken into account to improve the TB program (including health messages, prisoner’s participation . . .).

TS-61637-03 Expansion of diagnostic counselling and testing in tuberculosis clinics, Nyanza Province, Kenya

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Background: Since 2000, tuberculosis (TB) notification rates have almost doubled in Nyanza Province, from 233/100 000 (2000) to 427/100 000 (2005), likely related to HIV. Provider-driven HIV testing among TB patients (diagnostic testing and counselling–DTC), is being promoted as the standard of care in Kenya.

Methods: After one year of DTC implementation at Nyanza Provincial General Hospital, we scaled up DTC services province-wide. Provincial and District Health Management Teams were sensitized to TB-HIV collaborative activities from March–December 2005, with 239 service providers trained on DTC using approved HIV rapid test kits. HIV-positive TB patients were offered cotrimoxazole prophylaxis (CPT) and referred for HIV care services.

Results: By 12/2005, DTC was initiated in 125 (47%) of 265 TB treatment sites. In 2005, 20 998 TB patients were registered and 6478 (32%) were tested. Of these, 4565 (70%) were HIV-positive, 4065 (89%) initiated CPT and 684 (15%) started antiretroviral treatment (ARVs).

Recommendations: Implementation of DTC for TB patients is feasible within the existing TB clinic infrastructure and with existing human resources. Because of high co-infection rates, rapid scale-up of HIV testing in TB clinics is a priority intervention to ensure access to CPT, ARVs and other HIV/AIDS services. In 2006, we plan to cover all TB treatment centres in Nyanza and expand DTC to include TB suspects.

TS-61707-03 Staff awareness and routine services for patients with TB and HIV at TB clinics in Rwanda, 2005

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Background: In 2005, Rwanda adopted a national TB-HIV policy of routine HIV testing of all patients with TB, and provision of HIV care and treatment for patients with both TB and HIV. In September 2005, we conducted a baseline evaluation of TB clinic staffs' awareness of the relationship between TB and HIV.

Methods: Staff at a geographically representative sample of 23 TB clinics were interviewed regarding their knowledge of the relationship between TB and HIV, their practice of offering HIV counseling and testing (HIVCT) and provision of HIV related care and treatment.

Results: Of 40 staff interviewed, 14 (35%) knew that TB is the most common cause of death among people with HIV and 26 (65%) knew that HIV is a risk factor for TB. When asked about offering HIV testing to patients with TB, 11 (28%) reported offering testing to all patients, 16 (40%) offered to between 99%–50%, and 6 (15%) to <50% of patients. Staff reported the following barriers to offering HIVCT; not enough trained staff (43%), not enough space (33%),

and patient concern about the stigma of HIVCT (25%). Asked about services routinely provided, 26 (65%) staff reported offering cotrimoxazole preventive therapy, 36 (90%) provided HIV prevention counseling, and 26 (65%) offered condoms.

Conclusions: Implementation of the TB-HIV policy will require additional staff training on the relationship between TB and HIV, skills for routine HIVCT, and guidelines for caring for patients with TB and HIV.

TS-61748-03 Early successes and challenges of a national policy on collaborative TB-HIV activities in Rwanda

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Background: Tuberculosis (TB) is the leading cause of mortality for people living with HIV/AIDS (PLHA). In October 2005, Rwanda adopted a new policy on collaborative TB-HIV activities to improve care of people with both diseases.

Methods: A TB-HIV integration group was established and operational protocols developed for 1) routine HIV counseling and testing (RCT) for all TB patients, and HIV care for patients with TB and HIV; 2) screening PLHA for TB and ensuring treatment for active TB disease. Program data were reviewed from facilities involved in early implementation.

Results: From 10/05 to 12/05, 409/524 (78%) of registered TB patients at 38 health facilities underwent RCT and 155/409 (38%) were HIV-infected. Of these, 105/155 (68%) received cotrimoxazole (CTX) preventive therapy and 48/155 (31%) started on antiretrovirals (ARV). Of 614 registered PLHA, 346 (56%) were screened for TB, 30/346 (9%) had active TB and 27 (90%) began TB treatment. Program challenges included: need to harmonize national policies regarding HIV-testing; need to modify the procurement system for HIV test kits, CTX, and ARV; inconsistent use of new recording and reporting tools.

Conclusion: Implementation of the national policy to integrate TB and HIV services has begun to improve access to care and treatment in this high risk population. Coordination, planning and monitoring and evaluation between TB and HIV programs and partners must be a priority as collaborative activities scale up.

POSTER DISCUSSION SESSIONS

TB CONTROL IN SPECIAL POPULATIONS

PC-61202-03 DOTS implementation in prisons of Bangladesh

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Introduction: TB is huge problem in prisons of Bangladesh. There are 5–8 times more prisoners staying in the prisons at a time exceeding the normal capacity. TB easily transmitted among the prisoners. There are risks among inmates; staff and families are obvious considering diffusion to the general population.

Objective: To establish DOTS corner in all prisons.

Methods: Prisons identified, staff trained, drugs and logistics supplied by NTP linked with respective area NTP-Partners for case management.

Results: Service providers of major prisons of the country trained on DOTS during 2nd quarter of 2003. DOTS implemented in prisons of 2 big cities since last quarter of the same year. During the first 2 years on average 126 smear positive cases per 100 000 prisoners were diagnosed. This is over three times the case detection among prisoners in general population. Presently the rate is same for the expanded prisons. Detail results will be presented.

Conclusion: Majority of the suspects are diagnosed by Chest Disease Clinics of respective prisons, follow up and referral linkages need to be strengthened.

PC-61235-03 CDC immigration requirements: technical instructions for tuberculosis screening and treatment, 2006

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Background: The screening for tuberculosis among persons overseas applying for US immigration status is described in the 1991 Technical Instructions, which rely on chest radiograph (CXR) findings and sputum smears among applicants ≥ 15 years of age to prevent applicants with smear-positive tuberculosis from traveling to the United States. This system does not detect persons with smear-negative, culture-positive tuberculosis and does not fully screen applicants < 15 years of age.

Methods: Through consultation with tuberculosis experts and scientific evidence, the Technical Instructions

were revised to include screening of children and mycobacterial culture.

Results: The draft 2006 Technical Instructions changes include screening for all applicants ≥ 6 months of age. Tuberculin skin testing will be an adjunctive tool for screening in children. Applicants with CXR suggestive of tuberculosis will submit three sputum specimens for AFB smear microscopy, mycobacterial culture, and drug susceptibility testing (DST). Prior to traveling, applicants with smear- or culture-positive tuberculosis will need to complete therapy that relies on DST results. Changes will be monitored to evaluate Technical Instruction effectiveness.

Conclusions: Implementation of the revised 2006 Technical Instructions should increase detection of tuberculosis, decrease importation of tuberculosis, and help prevent the development of drug resistance overseas among persons applying for US immigration status.

PC-61236-03 La contribution des écoles de médecine à la prise en charge de la tuberculose et des maladies respiratoires

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L'orientation de l'enseignement médical vers des programmes de santé ont rendu nécessaires la formulation d'objectifs d'apprentissage et l'adaptation de méthodes pédagogiques en pneumo-phtisiologie. Cette orientation a d'abord concerné la tuberculose puis les maladies respiratoires. Les stratégies pédagogiques ou méthodes d'apprentissage reposent sur un enseignement de type modulaire intégré dans lequel les données biomédicales et de sciences fondamentales sont intégrées à l'enseignement clinique. Cet apprentissage doit permettre d'enseigner comment diagnostiquer et traiter la tuberculose chez un individu, comment prévenir la maladie dans la communauté et participer de surveillance du programme de lutte contre la tuberculose. L'enseignement des maladies respiratoires s'est inspiré du modèle utilisé pour la tuberculose en s'appuyant sur les programmes et actions de santé existants (programme IRA, consensus sur l'asthme, recommandations sur les BPCO). Les objectifs éducatifs comportent des objectifs cognitifs et des objectifs comportementaux. Ce type d'enseignement fait appel à différentes méthodes: cours magistraux par groupes d'étudiants, séances de résolution de problèmes, exercices de simulation ou jeux de rôles. Cette stratégie éducative répond à la volonté d'intégrer la prise en charge globale des maladies respiratoires chez l'individu et dans la communauté.

PC-61378-03 Analysis of effect of tuberculosis control in Guangxi border areas from 2002 to 2005

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Objective: To evaluate effect of tuberculosis control in Guangxi border areas after implementing World Bank Loan Tuberculosis Control Project.

Method: Cases register and cure outcome of pulmonary tuberculosis are the basis of evaluation.

Result: The proportion of initial sputum smear positive tuberculosis patient is increasing and the proportion of re-treatment patients is decreasing from 2002 to 2005, the proportion is from 3.8:6.2 to 7.9:2.1. The register rates of new sputum smear positive TB patients and sputum smear positive TB patients in Guangxi border areas were increased from 9.06 and 24.07/100 000 in 2000 to 30.38 and 42.41/100 000 in 2005 respectively. The cure rates of new sputum smear positive TB patients and sputum smear positive TB patients in Guangxi border areas were increased from 71.88% and 60.00% in 2002 to 85.13% and 80.57% in 2004 respectively.

Conclusion: After the government's commitment and implementing World Bank Loan TB Control Project and modern tuberculosis control strategy (DOTS), the TB control effect is developed significantly in Guangxi border areas.

PC-61398-03 Complex approach to anti-tuberculosis care in Tomsk Oblast Prison, Russia

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A problem of wide spread of social diseases including tuberculosis requires searching for new approaches of treatment and prevention. As a result, learning experience of prevention, detection and treatment of tuberculosis in the penitentiary system of Tomsk can be of interest. Since 1998 the International TB Control Programs using WHO methods have been implemented in the penitentiary system based on the integration with civilian TB services. This resulted in stabilization followed by decrease of TB incidence (1996—7171.0; 1998—3898; 2002—2810; 2003—2133.9; 2004—2050; 2005—2106.9 per 100 000 inmates), increase of treatment efficacy in new TB patients, and decline of TB mortality. Since 2000, MDR-TB treatment under the DOTS-Plus Project started in the prison TB hospital. Between September 2000 and December 2005, 298 MDR-TB patients were enrolled in the Program. Treatment outcomes of MDR-TB patients show high effec-

tiveness of the employed methods. Since 2004 financial support of TB activities is provided by the Global Fund resulting in further improvement of TB treatment in the penitentiary system.

PC-61559-03 Treatment outcome among Bhutanese refugees with sputum smear-positive tuberculosis in south-eastern Nepal

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Setting: Bhutanese refugee camps in south-eastern Nepal where treatment was daily supervised throughout.

Objectives: To evaluate the treatment outcome of the tuberculosis cases recruited in refugee camps, and to determine the frequency of conversion of sputum smears by direct microscopy.

Design: Retrospective review of four-monthly reporting forms of case finding, sputum conversion, and result of treatment from July 1999 to July 2004.

Results: Of 631 patients with smear-positive tuberculosis who were notified in the programme, 609 (96.5%) had completed treatment and were bacteriologically cured after 8 months, 2% had died, 1% had defaulted, and 0.5% had failed the treatment. Sputum conversion after the 2-month intensive phase was 94%.

Conclusion: The findings of our study revealed that the highest the cure rates and lowest the bacteriological failure rates can be achieved through DOTS strategy in the refugee settings if there is close coordination and collaboration between the local health agencies and the NTP of the host country.

PC-61578-03 Study of establishing pilots at township level for screening tuberculosis suspects to improve positive case detection

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Aim: To explore the feasibility of establishing pilots at township level in Guizhou province.

Methods: The trial group was composed of 50 pilots at township level. The microscopes and laboratory materials of pilots for suspecting the tuberculosis were provided by FIDELIS project. The pilots were in charge of detection the smear positive patients through sputum smear examination. The control group was made of 50 general hospitals from townships with similar basic conditions. The groups were in charge of transferring the suspects to the counties level. The county level should reconfirm the smear positive patients through sputum smear examination.

Result: The registration rate of smear positive cases of the trial group and the control group were respectively 22.3/100 000, 22.6/100 000 ($\chi^2 = 3.84$, $P < 0.05$), the registration rate of new smear positive cases of the trial group and the control group were respectively 16.8/100 000, 14.3/100 000 ($\chi^2 = 3.84$, $P < 0.05$).

Conclusion: It was no significant difference in positive cases detection between the trial group and the control group. It is feasible to establish pilots at township level for screening TB suspects to improve the positive cases detection.

PC-61596-03 Coverage and yield of entry and follow-up screening for tuberculosis among immigrants

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Objective: To determine coverage and yield of tuberculosis screening of immigrants.

Method: Screening results were collected in a central database. Patients diagnosed 0–5 months after entry screening were considered to be prevalent cases. Patients diagnosed during the follow-up period were considered to be incident cases.

Results: The coverage of the four screening rounds was 60, 45, 35 and 33%. The yield of the entry screening was 111/100 000 screened persons, and of the four follow-up screenings 55/100 000 screened persons. Prevalence at entry was 133/100 000 persons screened. The incidence during the follow-up period was 99/100 000 person years follow-up. The yield of follow-up screening was highest in the immigrants with abnormalities on the CXR at entry (519/100 000). The incidence among this group was 891/100.00 pyrs f/up. Among immigrants with a normal CXR at entry, no cases were detected through screening when coming from countries with an estimated incidence <100/100 000. Among immigrants from countries with an incidence between 100–200/100 000 and >200/100 000 the yield of follow-up screening was respectively 48 and 110/100 000 persons screened.

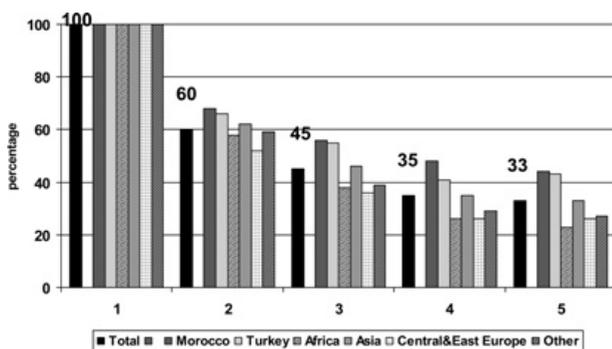


Figure Coverage per screening round in 27 104 immigrants screened at entry.

Estimated incidence in country of origin	Yield of entry screening per 100 000 screened	Prevalence 0–5 months after entry screening per 100 000 screened		Yield of follow-up screening per 100 000 screened immigrants with normal CXR on entry		Incidence during follow-up 6–29 months after entry screening per 100 000 pyrs f/up immigrants with normal CXR on entry		
		95%CI	95%CI	95%CI	95%CI	95%CI	95%CI	
<100/100 000	49	16–114	59	22–128	0	—	6	0–34
100–200/100 000	104	52–185	141	79–233	48	19–99	93	52–153
>200/100 000	302	165–507	324	181–534	110	40–239	220	123–363
Total	111	71–150	133	89–176	42	24–70	76	50–103

Conclusions: Entry screening seems justified. Follow-up screening for immigrants from countries with a lower incidence may be abolished. Further study is needed to determine the need of follow-up screening and the optimal length of the follow-up period among immigrants from countries with an intermediate or high incidence.

PC-61662-03 Empowerment human resources against tuberculosis in North Sumatra: a FIDELIS initiative

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Background: North Sumatra communities influenced with 4 major ethnics: batak, melayu, java, minang. Topographic area dominated with lowland and coastal. Most of them were farmer, fisherman, labourer in factory and other sectors who had low income. Since 2004, several diagnostic centers were developed including capacity building for clinical health staffs (CHS) and volunteers to cover 6.5 million people in seven districts with an estimated 10 353 new smear positive cases in 2004 but only found 54% of case detection (below the 70% global target).

Method: To obtain high quality of TB care, CHS were trained based on National TB Program curriculum and volunteer through class training: communication skill (30%), TB basic science-epidemiology (25%), health promotion (15%), collecting sputum and case holding (30%). CHS and volunteer regular meetings were facilitated to share individual experiences.

Result: Seven additional diagnostic centers, 7 doctors, 14 nurses, 7 laboratory technicians, 29 smear preparers, 440 volunteers were found. CHS and volunteers conducted quarterly meeting for learning process. Between July 2004 to June 2005, 5322 cases detected or 54% increase than previous year.

Conclusion: Strengthening human resources was significant to increase tuberculosis case detection. It will gain long-term community awareness, CHS professionalism and sustainability.

PC-61665-03 Representations and practices of guards towards tuberculosis: implications for TB control in prison

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In Rio de Janeiro prisons, members of the prison 'community' (inmates, guards . . .) are little involved in the tuberculosis (TB) control which is mostly vertical, prescriptive and implemented by health workers.

Aims: Explore the guards' representations concerning TB in order to develop actions aimed at improving their practices towards TB control.

Methods: In the context of a research-action program on health in prisons, face to face interviews and group discussions in 3 prisons and 2 penitentiary hospitals.

Results: Whereas guards considered that the HIV risk can be controlled by the segregation of the prison-space and the separation 'us' (guards)/'them' (inmates), the TB risk, due to airborne transmission, hampers attempts of role fixation and menace the defensive categorisations which reaffirm identities. Measures mentioned by guards were mostly defensive: identify TB cases, keep away from inmates, withhold breath when in the cells . . . After discussing, guards began to perceive these strategies as useless and based on pre-concepts. Further, they tended to develop a more participative attitude concerning inmates access to TB programs for their own and inmates' benefit.

Conclusion: The guards' insufficient knowledge, defensive attitudes and practices may constitute barriers to inmate's access to TB programs, and generate additional tensions between guards and inmates. To induce changes, there is a need for actions taking into account symbolic systems.

PC-61946-03 The challenges of tuberculosis control in Nigerian prisons: a situation analysis of the north-east zone of Nigeria

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The north-east geopolitical zone of Nigeria comprises of 6 states with an estimated total population of about 18 million people. There are 48 main prisons in the zone with a total inmate population of about 120 000. One of the strategies for TB control in Nigeria is provision of DOTS services in prisons, accordingly state TB control programmes had to establish linkages with the Prison health services. The level of implementa-

tion of the strategy varies among states since the DOTS strategy was introduced in Nigeria in 1993.

This paper examines the TB control situation of 12 prisons in 6 states of the north-east zone, namely Adamawa, Bauchi, Borno, Gombe, Taraba and Yobe. The study analyses the access to TB microscopy services, effective treatment and follow up, treatment outcome and TB-HIV care and support. The paper also examines the contribution of Prisons DOTS services to the overall TB control services in the various states and the zone. Preliminary results of analysis indicate that State TB control programmes established collaboration with only about 20% of prisons in their states which mainly in the state capitals, and less than 10% of Prison health service staff are trained in DOTS service delivery according to national guidelines. The results also show that an average 45% of TB suspects that are inmates have sputum smear positive result. This has revealed the need to accelerate action to involve the Prison health services in the state TB control programmes.

PC-62016-03 TB in health workers in SP State, Brazil

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Objective: To analyse how do health-care workers with TB are diagnosed and treated.

Method: Surveillance system databank was analysed.

Results: From 1999 to 2004, a total 1244 health-care workers were notified as new TB cases in São Paulo State: 111 nurses, 174 physicians, 725 nursery technicians, nurse aid personnel and health agents, 33 RX technicians, 58 lab personnel and 143 others. From the 873 new pulmonary cases, 493 were smear-positive, 242 negative and the other 138 did not perform smear examinations. Culture was done only for 173 cases. Susceptibility tests were reported in very few cases, but 6 of them were MDR. HIV testing was done in 848 cases, 156 of which were positive. From the 1244 new cases, 90 (7.2%) defaulted and 41 died. In the group that abandoned treatment, 16 were physicians and 2 nurses. In 2004, when DOT coverage was over 30% in SP State, only 48 from the 412 TB health workers were treated under supervised treatment.

Conclusion: Health workers, a known high-risk group for TB, are frequently diagnosed and treated for TB in an inadequate way. Although it is recommended that smear examinations, culture and susceptibility tests have to be done for every health worker with pulmonary TB, they are often not done, as well as HIV tests. As other TB patients, abandoning treatment is frequent, and DOT should be done for them. Surveillance must be improved to investigate possible institutional transmission.

TB ADVOCACY AND COMMUNITY INVOLVEMENT

PC-61265-03 TB illness experience from patient, community and provider perspectives in Manila, Philippines

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Methods: We examined how patients experience TB and their treatment, how non-affected urban poor residents perceive TB patients, why TB carries stigma, and the patient-provider relationship. The following was done in Manila, Philippines: interviews with 319 TB patients; 3 focus group discussions with non-affected urban poor residents; and administration of questionnaires to 104 public health centre personnel. **Results:** Many patients reported emotional and social distress, e.g., sadness, loss of self-esteem and feeling ostracised. Many patients separated eating utensils, slept apart from others, and reduced sexual activities, consumption of tobacco and alcohol. Non-affected urban poor residents were reluctant to approach TB patients, based on fear of infection, but also supportive. They explained the TB patients' embarrassment and social withdrawal as the result of their fear of infecting others. Identified problems in the interaction between health centre personnel and patients included providers giving inaccurate or incomplete information about TB and treatment and a tendency to blame patients: 49% of 35 community health volunteers and 27% of 48 nurses and midwives felt patients drop out of treatment due to them being lazy or fed up. Some patients (16%) perceived the competence of the personnel and their explanations to be unsatisfactory. **Conclusion:** Providers' good relational skills and accurate health education may reduce the TB illness burden and make DOTS attractive.

PC-61007-03 Management of tuberculosis by general practitioners of Vadodara City, India

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Background: The majority of the TB patients who go to TB clinics have typically been under care of general practitioners (GPs) at one stage or another. GPs in our study were not given orientation training in Revised National Tuberculosis Control Programme (RNTCP) before conducting the study. The purpose was to know and understand how tuberculosis is being managed currently vis a vis RNTCP guidelines and than make suggestion.

Methods: Present study, is a cross-sectional study conducted in Vadodara city in 2003. There are three Tuberculosis Unit (TU) and ten Designated Microscopic Centre (DMC) in Vadodara city. Random selection of three DMC-areas, one representing each TU was done. Total GPs holding MBBS degree in above three DMC areas are 112 (From the list of GP Association, Vadodara city). 45 GPs of these, who agreed voluntarily to participate, were selected from above list. Pre-tested semi-structured proformae were canvassed to these 45 respondents.

Results: After clinical suspicion of tuberculosis, 100% of GPs confirmed diagnosis on the bases of X-ray, only 57.77% requested for sputum examination. 42.22% of GPs, who treated the patient, did so with their own regimens which did not confirm to RNTCP guidelines. 48.88% of GPs didn't explain about safe disposal of sputum.

Conclusion: Majority of GPs didn't manage patients of TB as per RNTCP guidelines. GPs did as per their own knowledge and treatment preferences. The training component of GPs in RNTCP needs strengthening.

PC-61617-03 Treatment support group practice in DOTS districts of Tajikistan

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Background: DOTS Program is operating in Tajikistan since July 2002. In 2005 Treatment Support Groups (TSG) consisting of patronage PHC nurses were established in three DOTS districts: Kulyab, Vosse and Rudaki.

Objective: To prove the efficacy of a TSG service to ensure uninterrupted treatment of TB patients.

Target groups:

- 64 patronage PHC nurses
- 571 TB patients on continuation treatment phase.

Methods:

- Training and material support by Project HOPE in DOTS strategy
- Interpersonal Communication Counseling methods for Patronage Nurses to ensure treatment control for current TB patients, and conduct IEC activities with patients and their family members.

Results: In the 2nd quarter of 2005, 571 patients were in the continuation phase of treatment, of which 44 often interrupt their treatment, causing default. By the end of the 3rd quarter of 2005, 41 of them restarted and successfully completed treatment. 2 patients failed treatment and started retreatment with Regimen II. Among the 41 patients, 4 were alcoholic, and one suffered from mental illness. Success in these cases was credited to intensive work with the patients' family members. One patient refused to continue treatment. **Conclusion:** The establishment of TSGs is an effective mechanism ensuring uninterrupted treatment of

TB patients as a model of greater integration of TB treatment support into PHC health systems.

PC-61652-03 Intensified IEC and increased service access improve TB control in hard-to-reach area: experience from Nepal

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About 45% of total population is infected with TB in Nepal. DOTS implemented in 1996 and expanded throughout the country by 2001. However, difficult geographical settings, conflict, TB HIV co-infection and MDR-TB present a challenge in TB control, which is further difficult in hard to reach areas.

Setting: A pilot study in a mountain district of Nepal where DOTS was implemented and expansion was in progress. The objective was to increase total number of TB symptomatic, case notification and treatment success rate in district.

Method: Community initiated social awareness campaigns held among different groups and interventions made to increase service access by establishing service outlets for microscopy along with a courier mechanism to transport sputum slides from non microscopic centres.

Results: Intensified social mobilization and IEC activities increased number of symptomatic cases to health facilities. Moreover, expanded service outlets and established courier system increased overall service access and helped in early notification of TB cases. Involvement of local community helped to strengthen local commitment in TB control as a result TB awareness campaigns were continue through community initiatives. The overall interventions made TB service accessible to general population which lead to better case notification and treatment outcome and slide courier system reduced patients visit to health facility as a result social and financial burden was less to TB patients.

PC-61716-03 KAP study as a basis for a public awareness campaign on TB in Moldova

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Objective: To identify the level of TB awareness among the population of Moldova in order to design a public awareness campaign on TB.

Method: The survey was conducted by specially trained operators. They distributed written questionnaires among 1194 respondents aged 18 years or older living in the cities and villages of 12 districts of Moldova. This sample is representative for the adult population of Moldova with a maximal error of +3%.

Results: The symptoms of tuberculosis were generally known to the survey respondents. Almost half of the respondents named coughing as the main symptom when prompted for an answer. Over 70% of respondents recognized familiar symptoms of tuberculosis when a list of symptoms was read. 88% of respondents knew that tuberculosis is a contagious disease and 62% knew it is transmitted through air and coughing. At the same time only 59% believed that TB is curable. Poor awareness of the possibility to treat TB free of charge leads to the stigmatization of TB patients and late medical consultations.

Conclusion: KAP study should precede a public awareness campaign on TB. In Moldova this survey demonstrated that such campaign should include the information about TB symptoms and the ways to cure TB. In order to encourage citizens to seek treatment, the campaign must emphasize that tuberculosis is curable if effective treatment is instituted without delay and that the diagnosis and treatment of TB are provided free of charge.

PC-61849-03 Tobacco information in a group of teenagers

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Information about health consequences of smoking can reach teenagers from different sources. To evaluate general and school information about cigarette smoke a confidential questionnaire was given to 1770 school students, of both sexes, with ages between 11 and 21 years (median 15 yrs), from 4 different schools. Concerning general sources of information most of them ($n = 1639$) considered that they were well informed about smoking, but when they were specifically asked about tobacco related diseases, lung cancer was mentioned in 25.6% of cases, other cancers in 25.4% and general cardiac and respiratory diseases in 6.7%. Most ($n = 515$, 85.4%) said that they had already been told by their parents about smoking risks, and 1059 (59.8%) had discussed this matter with their friends. Concerning school information, 1745 students (98.6%), answered the questionnaire. Most of them ($n = 952$, 53.8%) denied the existence of information placards within the school area, but the answers showed important differences between schools (school A—10.3%, school B—60.5%, school C—45.4% and school D—49.5%); 1063 students (60.3%) answered that health effects of smoking had already been mentioned in some classes, mainly civic formation and biology. In conclusion, parents and friends are frequent sources of general information about smoking but they are not enough for a good perception about tobacco-related damage to health in this group of young people; stronger school information seems to be needed.

PC-61445-03 Health care utilization of chronic coughers in urban areas of Bangladesh

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Introduction: Tuberculosis (TB) remains a public health challenge in Bangladesh with about 140 000 sputum positive new cases annually. Case detection under DOTS to a large extent depends on care seeking of chronic coughers, which is less investigated in urban areas of Bangladesh where DOTS coverage has been extended recently.

Objectives: To describe health care utilization of chronic coughers in urban areas of Bangladesh.

Methods: A survey was conducted in two areas of Dhaka City Corporation, the capital of Bangladesh. Adults ≥ 15 years were screened for presence of cough for >21 days by household visits. These chronic coughers were interviewed by a structured questionnaire.

Results: A total of 60 382 adults were surveyed during 2005 in Dhaka city. The prevalence of chronic cough was 1.9% (1138), more in male (2.3%) than in female (1.6%). Among the chronic coughers 1046 were interviewed. At the time of interview, 648 (62%) sought care from at least one provider. Majority of them, 66.5% consulted with non-graduate private practitioners (PP) and pharmacists, 17% with graduate PPs and 16% went to DOTS centres. In more than 90% of the cases the chronic coughers were provided with a prescription of drugs. Only one patient was referred to DOTS centre.

Conclusion: Chronic coughers are more likely to seek care from non-graduate PPs and pharmacists. Strategies are needed to involve them in TB case detection.

PC-61721-03 Distinctive benefits of experience-based approaches by ex-TB patients in DOTS: lessons from Zambia

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Objectives: To conduct an in-depth TB operational research study to document the catalogue of incremental benefits arising from the use of former TB patients as treatment supporters in comparison to non-former TB patients in 4 Copperbelt towns of Zambia.

Methodology: 42 treatment supporters (24 non-former TB patients) and 18 former TB patients were interviewed in focus group sessions in separate sessions while 5 from each category were interviewed in-depth to fully document differentials in the quality of services offered. Unstructured observations were also documented during periodic field visits and patients were

randomly interviewed for qualitative information regarding how they classified the variety and quality of various services offered by treatment supporters.

Findings: Most treatment supporters who are also EX-TB patients provided comparatively better help to clients seeking TB treatment than those who are non-former TB patients. Former TB patients relied a lot more on their own lived experiences and skills acquired during and after illness episodes. By learning to live with TB, the treatment supporters who are former patients were distinctively share their 'journeys of living with illness' and provided examples of surviving from a fatal disease but living on.

Conclusion: While being a former patient and its resulting experiences helped enhance treatment adherence for new patients, results also show its dependant on the orientation of EX TB patients.

PC-61772-03 Social mobilization through NGO communities alliance support DOTS/TAES in the Dominican Republic

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Introduction: In the Dominican Republic 80% of the population is covered by DOTS/TAES, cured patients is 74.4%, 11% abandon and only 27% of respiratory symptomatic are detected. On July 2005, Social Mobilization (SM) was introduced.

Design: SM implemented in 12 provinces under TB National Control Program (PNCT) and Provincial Health Direction (DPS) coordination in six Health Region through nine NGOs (IDDI, MUDE, BRA DOMINICANA, ONE RESPE, FUNDASUR, MOSCTHA, INDAJOVEN, FUDECO and CACS) alliance. Technical/financial support was provided by USAID/FHI/Proyecto CONECTA and the evaluation process by International TB Coalition (KNVC, USAID, PAHO/OMS and The Union).

Methods: Educational training in advocacy/orientation link community/TB services, emotional and nutritional support, follow up the DOTS/TAES, TB contacts, coinfection TB-HIV/AIDS, stigma and discrimination and social leadership network.

Result: NGO intervention: 145 communities, 80 bateyes, 203 community stance, 20 818 people, 31 766 material/education distributed, 220 health providers and 1443 community volunteers trained, 881 respiratory symptomatic detected and 22% general population receiving SM.

Conclusion: Social mobilization is an essential tool to support the DOTS/TAES and should be offered in all country. The experience accumulated in this process will help to create a set of recommendations to be used and linked with the revision of The National TB policy.

PC-61867-03 Empowering TB patients as support group to patients under treatment in government hospital in the Philippines

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Background: In 2005, government hospital served as satellite DOTS Plus treatment center. DOTS Plus clinic had enrolled 60 multidrug-resistant TB patients (MDR-TB), with 2 nurses delivering DOT. Ratio of 1 nurse to 30 patients (1:30). Government hospital staff is scarce due to limited resources, thus hindered delivery health services. Few Patients voluntarily assisted nurses caring TB patients. Recognizing importance of patients participation in TB control, study aims to determine patients feasibility and effectiveness as support group in delivering health services.

Methods: Prospective Study in organizing MDR-TB as support group in DOTS clinic was conducted. Selection criteria: 1) volunteer as treatment partner; 2) potential leaders, 3) TB advocates. Monthly social meetings, oriented patients as treatment partner, focus group discussion were implemented. Patients plan to generate fund for livelihood activities making life worthy while on treatment.

Results: Four MDR-TB patients voluntarily served as treatment partners. Aside acting treatment partner, served as advocate on patient's treatment compliance, sharing experiences, including spiritual and moral support. Patients have contributed funds to support livelihood projects.

Conclusions: TB patients as support group is feasible in high TB burden country. People living with disease must be at the center of all TB awareness, prevention, care and treatment programs, which is essential community mobilization in TB control efforts.

PC-62061-03 Forum of TB NGOs: building a collective response for controlling tuberculosis in Brazil

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Problem: Up to a recent moment and in all levels of government, the Brazilian Control Policy of TB had failed to recognize the important contribution paid by the social environmental control in this matter. Government officials and the communities affected by tuberculosis have come closer at this moment. Nevertheless, their role is still underestimated leading to a minimal participation.

Objective: To enhance the interaction amongst the governmental and non-governmental players restraining both the advance and the worsening of the disease in Brazil through communication and social mobilization.

Methodology: The community is being empowered via assembly attendance, trainings and discussions.

Results: The Forum released its first community information campaign about TB in 2006 (Building a collective response for controlling tuberculosis), which included posters, folders, postcards, comic books, a web site linked to a popular major online newspaper and also a 30-second video clip broadcasted on open TV.

Conclusions: We understand that social control strengthening as well as political, technical and financial investments in the social mobilization area are strategic and play an important role in controlling TB.

PC-61477-03 Health professionals: fighting TB stigma

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Background: The re-emergence of TB is accompanied by the stigmatizing of TB patients, resulting in negative economic, social and medical consequences. Health professionals are key in implementing strategies to reduce TB stigma.

Objectives: To understand the context of TB stigma and identify methods needed to reduce TB stigma.

Methods: Surveys were distributed electronically to 400 nurse instructors in universities worldwide to collect expert views on main causes, forms and consequences of TB stigma. The survey was a questionnaire of 20 qualitative questions exploring nursing instructors' attitudes towards stigma.

Results: The main cause of stigma was fear of contracting TB (58%), followed by association with poverty (40%) and lack of knowledge (34%). Frequent stigma forms were minimizing contact (40%), verbal discrimination (29%) and refusal to care (23%). Consequences of stigma were reduced quality (56%) and amount (25%) of care and limited access to health services (18%). The most effective intervention to combat stigma was education (90%), followed by community involvement (29%) and resource provision (27%).

Conclusions: Survey findings influenced the development of strategies to minimize TB stigma, and have been integrated into a toolkit developed by the International Council of Nurses for health professionals around the world. The toolkit 'TB and Stigma: A Double Burden' with key interventions to fight TB stigma will be presented at this session.

DOTS: THE ONGOING CHALLENGES

PC-61154-03 Progress in TB control in India, 2005–2006

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Background: With almost 1.8 million new cases annually, India has the highest TB burden in the world. **Recent progress:** The Revised National TB Control Programme (RNTCP) expanded from 947 million (January 2005) to nation-wide coverage of 1111 million population (March 24, 2006). In 2005, 1 293 083 cases were initiated on treatment, with 506 193 new smear positive cases registered—a case detection of 66%. Despite rapid expansion, treatment success remains high at 86% (2004 cohort)—hence achieving the global target for treatment outcome. By end of 2005, >10 000 private practitioners, >2000 NGOs, 100 corporate sector units and over 200 medical colleges were involved in RNTCP. Collaborative activities between RNTCP and the HIV/AIDS programme, are ongoing in 14 states of India. From July to December 2005 in the 6 high HIV seroprevalent states, as a result of intensified case finding activities, over 11 000 clients at voluntary counseling and testing centres were identified as TB suspects and investigated at RNTCP service points, with 3034 being diagnosed as TB cases. During 2005, the updated RNTCP protocol for external quality assessment of smear microscopy services was rolled out and is now implemented in 6 states fully and partially in the remaining states. State-representative drug resistance surveillance surveys commenced in the states of Gujarat (55 million population) and Maharashtra (105 million population) in August and November 2005 respectively.

PC-61156-03 Development of a network for culture and drug susceptibility testing: the Thailand TB Active Surveillance Network

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Background: WHO's 2nd Global Plan recommends that countries increase capacity for TB culture and drug susceptibility testing (DST). In Thailand, several laboratories can perform TB culture, but few do so routinely.

Methods: We established a network of laboratories capable of culturing TB on liquid and solid media in 3 provinces and increased existing capacity for culture and DST at the National TB Reference Laboratory Center (NTRLC) and the Bangkok municipal laboratory. We hired and trained staff, purchased equipment and supplies, provided on-site monitoring, and implemented an internet-based data management system. We conducted an external performance evaluation of NTRLC in 2005.

Results: We trained 16 persons in culture and DST. Across the 5 laboratories, the total number of cultures performed increased from 5000 in 2002 to nearly 10 000 in 2005. The number of isolates undergoing DST increased from 560 in 2003 to 3569 in 2005. Contamination rates ranged from 10% to 15% for all 5 sites. In 2002, all sites relied on facsimile or mail to exchange data with NTRLC; in 2005, all sites began using a secure, internet-based server for this purpose. Grades on the external performance evaluation were between the 70th and 80th percentiles.

Conclusions: We successfully established a network for TB culture and DST in a high-burden TB country. Further efforts are needed to reduce contamination, improve performance, and evaluate whether expanding laboratory capacity improves TB control.

PC-61159-03 Clinical audit as a tool to improve the quality of care for patients with suspected tuberculosis

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Background: Clinical audit is an intervention designed to improve the quality of clinical care. Although well established in high income countries, there is little research evidence for its effectiveness in resource poor settings.

Methods: We recruited 26 health centres in total in Cuba, Peru and Bolivia. We introduced clinical audit of the diagnostic care for patients attending with suspected TB. Standards were based on the WHO and TB program guidelines relating to the appropriate use of microscopy, culture and radiological investigations. We completed at least two audit cycles over two years. Improvement was determined by comparing performance between two six-month periods pre- and post-intervention.

Results: We found a significant improvement in nine out of 13 standards in Cuba, two out of six in Bolivia and one out of five standards in Peru. Barriers to quality improvement included conflicting objectives for clinicians and TB programs, poor co-ordination within

the health system and patients' perception of illness and health services.

Conclusions: Clinical audit may drive improvements in the quality of clinical care in resource poor settings. It is likely to be more effective if integrated within local TB programs. We recommend developing and evaluating an integrated model of quality improvement including clinical audit.

PC-61195-03 Analysis of AFB microscopy to determine quality of diagnosis: an essential for DOTS in Bangladesh

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Introduction: In Bangladesh direct sputum microscopy remains the most cost effective tool for diagnosis of tuberculosis and for monitoring progress of treatment. External Quality Assurance Centers (EQA) established.

Aim: Analysis of EQA Laboratories.

Methods: 22 External Quality Assurance Laboratories established in all the regions of the country supervise peripheral laboratories; reports received quarterly.

Results: 635 microscopy centers are functioning for AFB microscopy and all are covered by EQA centers. 82% reports are received by NTP on EQA. During 2005, 19 620 slides were reexamined (2345 positives, 180 scanty and 17 095 negatives) as per policy of NTP at EQA centers mostly situated in District Chest Disease Clinic (first reader) and Chest Disease Clinic, Shaymoli, Dhaka (act as second reader). Among the slides 1.2% had False Positive (High False Positive 0.9% and Scanty False Positive 0.4%); 0.8% had False Negative (High False Negative 0.5% and Scanty False Negative 0.3%) and Quantification Error was 3.6%. 1 (0.2%) microscopy center had more than 1 High False Positive and 51 (8.0%) microscopy centers had more than 1 High False Negative.

Conclusion: Analysis of results indicates performances in all laboratory services of NTP that ensures high quality diagnosis and follow up.

PC-61211-03 Analysis on effectiveness of implementing WB/DFID TB Control Project, Shaanxi Province, P R China

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Background: WB/DFID TB Control Project was carried out in 107 counties in the province (covering 36.70 million population).

Objective: To extend the DOTS strategy, to reach 100% of DOTS coverage rate, 70% of detection rate of patients with new smear positive TB and 85% or more of cure rate by 2005.

Methods: To include government commitment, establishing TB control facilities, supplementing necessary equipments and staffs, setting up TB special clinic, X-ray room and sputum testing room, and developing extensive IEC, providing free diagnosis, free anti-TB drugs, technical assistance as well as village doctors to carry out DOT.

Results: Since carried out the program in 2002, TB control facilities reached were all established in 2004, with 4.3 full- or part-time staffs each county and with 100% of DOTS coverage rate. During 2002–2005, a cumulative total of 37 475 patients with smear positive TB were detected under the project, of which 25 130 cases were patients new smear positive. In 2005, detection rate of patients with new smear positive TB reached 70% with 88.1% of cure rate.

Conclusions: The implementation of the program resulted in establishing a continuable development system for TB control, and reaching the targets on schedule in 2005.

PC-61357-03 Anti-tuberculosis treatment outcomes in patients with previous treatment in a third level center, Mexico

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Purpose: To determine treatment outcomes at INER in TBP patients previously treated.

Methods: Patients admitted at INER from 1994 to 2001. It was analyzed outcome according to the number of previous treatments; the first INER treatment and MDR-TB. Treatment was given at primary care facilities and supervised by INER.

Results: Of 146: 56, 54 and 36 with one, two and three or more previous treatments. Cure 68.2%, 40.4% and 68.8% ($P = 0.009$); MDR-TB rate was 64.4%, 86.3% and 94.4% ($P = 0.0004$). Patients with or without previous failure before to INER admission, shown an association with first INER treatment failure [RM = 2.4 (95%CI 0.9–6.4) $P = 0.04$]. Patients with and without failure to first INER treatment had rate cure of 16.1% vs. 72.5% ($P < 0.0001$) while than the failure rate was of 67.7% vs. 7.7% ($P < 0.0001$) for the first and second groups, respectively. In 81.2% (108/133) had I and R resistance. With and without MDR-TB the cure rate was 51.1% vs. 72.7% ($P = 0.07$). The cure rate in patients with mono-, multi- and poly-resistance was of 71.4%, 44.9% and 30.8% ($P = 0.03$).

Conclusions: Results shown high cure rates among patients with previous treatment but not in patients with previous failure, which is a MDR predictor.

PC-61397-03 Impact of EQA system in Bangladesh

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Aim: To assess the impact of quality control system in AFB microcopy in NTP Bangladesh.

Setting: 11 EQA centers started at the end of 2004 in Bangladesh. 339 peripheral centers were covered by these centers.

Methodology: Analysis of database of quarterly EQA reporting format introduced by the program. The format was filled from EQA laboratories by EQA laboratory technicians and analyzed centrally.

Result: In 1st quarter total 5260 were rechecked (647 positive, 45 scanty and 4568 negative). In 2nd quarter total 5913 slides were rechecked (760 positive, 52 scanty and 5101 negative). In 3rd quarter 6080 slides were rechecked (707 positive, 45 scanty and 5328 negative). High false positive slides were found in 1st quarter 0.7%, in 2nd quarter 0.5% and in 3rd quarter 1.2%. High false negative slides were found in 1st quarter 1.4%, in 2nd quarter 1.7% and in 3rd quarter 1.3%.

Conclusion: We have found the zigzag pattern in major errors in 1st 3 quarters. It may be due to initial stage of EQA system. Rapid turn over or transfer of the laboratory technologists is also a barrier for EQA system. Feed back system should be more strengthened.

PC-61399-03 Chest radiograph abnormalities among screened asymptomatic HIV-1-infected adults, Botswana

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Background: IPT is recommended for PLWH in tuberculosis (TB)-endemic settings. Based upon previous findings, the Botswana IPT Program guidelines recommend that asymptomatic PLWH receive IPT without a screening CXR. We sought to validate this recommendation among patients enrolled in a 2-site clinical trial integrated with the national Program.

Methods: PLWH referred from counseling and testing centers and local clinics were screened for symptoms using a standardized questionnaire. If asymptomatic they underwent chest radiography and other tests. Individuals with abnormal CXRs were later evaluated for pulmonary TB.

Results: Between 11/04–3/06, 1804 asymptomatic PLWH underwent CXR screening. Abnormal CXRs potentially compatible with TB were found in 200

(11%). Abnormalities were: 50% infiltrates, 26% hilar adenopathy, 7% pleural abnormalities, 2% cavities. Detailed evaluations for TB were conducted in 72/200 (36%), 0–13 months after the initial screening. Twelve (17%) had TB. Of the 200 individuals with abnormal baseline CXRs, 35 initiated or completed a 6 month course of IPT. One of these 35 had cavitary disease, subsequently developed TB and received anti-tuberculosis therapy. None of the remaining 34 (97%) developed TB after a median of 8 months of observation.

Conclusions: Abnormal CXRs were common among asymptomatic PLWH seeking IPT. A significant portion of these individuals developed TB. Evaluation of additional study participants will help to inform IPT policy.

PC-61493-03 Strengthening informal health providers to increase access to TB services in poor settings

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Objective: To explore the impact of Extending Services to Communities (ESC) on early care seeking and TB case finding through training storekeepers, volunteers and community health committees on referral system and health promotion on TB issues.

Design: The study was implemented in two poor peri-urban areas, Area 24 and Kauma in Lilongwe, Malawi. Capacity building of informal providers took place in 2004. The impact was measured using quantitative and qualitative methods. Chronic cough and TB registers were audited before (2003) and after (2005) the intervention from January to December. In depth interviews with patients referred were conducted.

Findings: Chronic cough cases increased by 100% (27 in 2003 to 54 in 2005) in Kauma and by 20% (89 in 2003 to 107 in 2005) in Area 24. The number of TB patients increased by 91% (12 in 2003 to 23 in 2005) in Kauma and 28% (67 in 2003 to 86 patients) in Area 24. Findings from qualitative research indicated that the referral letters from the informal providers enabled patients to have quick diagnosis.

Conclusion: The study has demonstrated that strengthening the informal health providers has potential to increase utilization of TB services by people living in poor settings in countries with human resource as a major constraint.

PC-61749-03 Risk factors for tuberculosis treatment default, Republic of South Africa, 2002

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Background: In 2002, 215 120 people were registered with tuberculosis (TB) in South Africa; 13–17% were estimated to have defaulted from TB treatment.

Methods: We conducted a national retrospective case control study to identify factors associated with treatment default using TB program data from 2002 and a standardized patient questionnaire. Cases were a sample of registered TB patients that defaulted from treatment. Controls were those who began therapy and were cured, completed or failed treatment. We analyzed preliminary data from 6 provinces.

Results: We interviewed 180 cases and 729 controls. Of these, 537 (59%) were male; the median age was 34 years (range 18–82 years). Compared to controls, cases were more likely to be male (OR 1.5, 95%CI 1.1–2.2), have a documented history of previous treatment default (OR 7.3, 95%CI 4.0–13.5) and have extrapulmonary TB (OR 2.1 95%CI 1.1–3.7). Cases were more likely than controls to self-report being non-adherent to TB treatment in the past (OR 4.25, 95%CI 2.3–7.7), missing treatment because of employment (OR 10.6, 95%CI 5.6–20.0) or health care worker poor attitude (OR 3.5, 95%CI 1.8–6.8) and that treatment did not make them feel better (OR 8.8, 95%CI 4.9–16.0).

Conclusion: Risk factors for treatment default included social and economic characteristics such as previous default, conflicts with employment, poor patient-provider interaction, and a patient perception that their treatment was not working.

PC-61850-03 Lesson learnt from GLRA-initiated PPM projects in Nigeria

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Introduction: GLRA initiated 2 PPM pilot projects in Onitsha and Aba in Southeast Nigeria in 2004 and 2005. Private-for-profit hospitals were involved.

Methods: There were 11 and 15 private-for-profit hospitals that participated in the PPM projects in Greater Onitsha, Anambra State and Aba, Abia State, respectively. Assessment of the facilities was done through survey and visits. Dialogues with stakeholders were done to build trusting relationship with MDs. Selection of the hospitals were based on crite-

ria. Tasks were discussed and formal agreements were reached. Orientation, training and mentoring of staff were done as the hospitals were integrated into the DOTS and Lab networks of NTBLCP. Logistics like free drugs, microscope, reagents, R & R materials were provided. The TBLS were provided transport money to supervise and monitor the PPM hospitals but no additional salary was paid.

Results: After more than a year, 80% of the participants expressed willingness to continue. The PPM resulted to 12% increase in CDR and comparably good treatment outcomes. The TBL supervisors play crucial role in sustaining and ensuring the success of the project.

Summary: Trusting and friendly relationship between NTBLCP and private MDs through dialogues and constant communication is very important in the acceptance of PPM initiatives. There should be transparency, commitment and accountability. Supervision with emphasis on support instead of fault-finding should be in placed.

PC-61879-03 Risk factors for default in MDR-TB patients at the MMC DOTS Clinic, Philippines

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Background: MDR-TB management is a complex strategy of at least 18 months of supervised treatment. Defaults diminish the success of MDR-TB management leading to the generation of extensively drug-resistant TB (XDR-TB).

Objective: To examine risk factors for default in MDR-TB patients.

Materials and methods: Case-control study of risk for default associated with patient's age, gender, number of previous treatment, time between evaluation and initiation of treatment, and monthly income. Cases are MDR-TB patients who abandon treatment for at least 2 months, and controls are MDR-TB patients who complete their regimen and are either cured or failed treatment.

Results: Fifty-three (25.1%) of 211 MDR-TB patients treated from April 1999 to February 2006 at MMC DOTS clinic defaulted treatment (Table). Only >6 months–1 year lag between evaluation and initiation of treatment was a significant risk factor for default (OR = 3.1, 95%CI 1.5–6.7). Although unemployment and monthly income of <PhP 18 000 suggested an increased risk of default compared to monthly income of >PhP 18 000, these failed to reach statistical significance. The study, however, did not include data on patient education and perception about his illness which may have affected default.

Table Risk factors for treatment default in MDR-TB patients

Characteristic	Default No./ Studied (%)	Univariate Odds Ratio (95%CI)
Time from evaluation to enrollment		
>1 year	8/25 (32)	2.2 (0.8–6.3)
6 months–1 year*	22/55 (40)	3.1 (1.5–6.7)
<6 months	23/131 (17.5)	1.0
Monthly income		
No monthly income	32/124 (26)	2.1 (0.4–20.1)
<18 000	18/69 (26)	2.1 (0.4–20.1)
>18 000	2/14 (14)	1.0
Age group, years		
≥55	10/30 (33.3)	1.5 (0.4–6.8)
45–54	7/28 (25)	1.0 (0.2–4.8)
35–44	16/63 (25)	1.0 (0.3–4.2)
25–34	15/70 (21)	0.8 (0.2–3.4)
<25	9/24 (37)	1.0
Sex		
Male	35/134 (26.1)	1.2 (0.6–2.4)
Female	18/77 (23.4)	1.0
Previous treatment		
>3	11/40 (27)	1.14 (0.3–3.1)
3	17/67 (25)	1.0 (0.3–3.1)
2	17/62 (27)	0.9 (0.3–2.7)
1 or less	8/32 (25)	1.0
Residence		
Outside Metro Manila	9/42 (21)	0.8 (0.2–2.8)
Metro Manila excluding Makati	37/142 (26)	1.0 (0.4–2.8)
Makati	7/27 (26)	1.0

Conclusion: A rapid MDR-TB diagnosis allowing early initiation of treatment would improve treatment adherence.

TB DIAGNOSTICS

PC-61450-03 Improve direct microscopy by overnight bleach sedimentation: a simple tool for peripheral health centres

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Background: Direct microscopy is the only available test to diagnose tuberculosis (TB) in peripheral health centres in low-income countries. We compared the detection of smear-positive patients before and after overnight bleach sedimentation in peripheral health centre.

Method: Prospective controlled study in Mathare clinic (Nairobi, Kenya) between February and December 2005. Three sputa were collected over 2 days from suspected patient (>2 weeks cough). Hot Ziehl-Neelsen staining was performed the same day on fresh speci-

men and the following day on sediment resulting from overnight sputum sedimentation with equal volume of 3.5% bleach. Two smear-positive case definitions were used: 2 and 1 smear-positive result (≥ 10 AFB/100 fields). McNemar's test was used to compare positivity rates.

Results: We included 644 patients. Case detection increased after bleach sedimentation from 16.9% (105/621) to 19.5% (121/621) using 2 smear-positive definition ($P = 0.02$) and from 18.6% (120/644) to 21.4% (138/644) using 1 smear-positive definition ($P < 0.001$). Regardless of definition, bleach method resulted in 15% increase of new detected patients. Using 1 smear-positive definition, more TB patients were detected after bleach sedimentation of the 2 first specimens (20.7%, 133/644) compared to standard microscopy of 3 specimens (18.6%, 120/644) ($P = 0.01$).

Discussion: Overnight bleach sedimentation is an effective, affordable, simple method to improve TB diagnosis in peripheral health centres.

PC-61857-03 The use of sputum cytology on Ziehl-Neelsen stained smears to improve pulmonary TB diagnosis

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Introduction: Sputum quality is of central importance for the diagnosis of pulmonary TB. Current macroscopic methods have limited ability to differentiate sputum from mucus, and degraded sputum from saliva. The leucocyte:epithelial cell ratio method has primary value for culture, and can give misleading results particularly for degraded sputum samples.

Objective: To develop a simple, comprehensive and reproducible cytology-based sputum classification system for Ziehl-Neelsen stained smears.

Method: Stained smears were categorized using $\times 10$ microscopy into sputum and not-sputum. Sputum was defined by the presence of leucocytes and/or necrotic material and/or fibrils and/or atypical cells. Smear size was categorized at $\times 100$ microscopy into < 20 , 20–100 or > 100 fields of true sputum. Sputum quality and smear size was correlated with AFB detection. Practicality was assessed by field trials.

Results: Analysis of data from 3 MSF programs showed a 98% correlation (95%CI 95.4–99.1, $n = 250$) between AFB detection and sputum quality defined by cytology and smear size. Surveys in representative MSF-supported programs indicate that 60%–70% of sputum samples are of poor quality, as defined by this methodology.

Conclusion: The methodology is simple, rapid and practical in field conditions. The classification system is more robust than microscopic systems solely dependent on the presence of polymorph leucocytes. It provides significant program management information.

PC-61912-03 Improved sensitivity of AFB microscopy using small membrane filters

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Introduction: There is an urgent need for simple tests to rapidly diagnose tuberculosis (TB) with greater sensitivity. Membrane filters (MFs) of 25 mm diameter have been shown to increase the sensitivity of sputum microscopy for acid-fast bacilli (AFB). We hypothesized that using small 13 mm MFs would further improve the sensitivity of microscopy for AFB.

Methods: Sputa specimens from patients with presumed TB were divided evenly. After removing an aliquot for culture, one half was used for the traditional auramine stain method after centrifugation and the other for the small membrane filter (SMF) method using both the auramine and Kinyoun stain methods. The specimen was treated with sodium hypochlorite, ethanol and detergent. White and black MFs were loaded into 13 mm filter holders. After filtration, the MF were removed, placed on glass slides and warmed gently, then stained in the usual methods.

Results: We report results from the first 61 subjects, 26 of whom have complete culture and microscopy data. The sensitivity using centrifugates was 85% (22/26) and the sensitivity of the SMF method was 96% (25/26). The median smear grades on the SMFs were higher than the centrifugates with borderline significance (Wilcoxon; $P = 0.06$).

Conclusions: These preliminary data suggest that this simple SMF method increases the sensitivity of sputum microscopy for diagnosing pulmonary TB. Additional data are needed to confirm this and to evaluate specificity.

PC-61538-03 Improved diagnosis of tuberculous pleuritis by immunohistochemistry with anti-MPT64 polyclonal antibody

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Aim: The aim of this study was to evaluate the usefulness of immunohistochemistry for the secreted mycobacterial antigen MPT64, specific for *Mycobacterium tuberculosis* complex organisms in the diagnosis of tuberculosis in formalin fixed pleural tissue biopsies.

Methods: A total of 37 pleural tissue samples were obtained. Twenty five of these were from patients with clinical features and histological features suggestive of tuberculosis and responded to anti-tuberculosis

treatment, while 12 cases were malignant and other diagnosis.

Immunohistochemistry was performed using the envision peroxidase-anti peroxidase indirect method (DAKO). Polymerase chain reaction (PCR) of IS6110 was performed.

Results: Only 2/26 TB cases were AFB positive and there was no granuloma in these 2 cases. Three of 26 TB cases had typical caseous granuloma and MPT64 was positive in all the 3. Twenty two TB cases had either granuloma without necrosis or no granuloma at all, MPT64 was positive in 14/22 TB cases. MPT64 was negative in all the 12 non TB cases. PCR was positive in 15/25 TB cases. Overall sensitivity of MPT64 was 68% (17/25) and specificity of 100% (12/12).

Conclusion: MPT64 was able to diagnose TB pleuritis in 14 out of 20 TB cases with atypical feature thus it improves the diagnosis in cases without typical histological features of TB pleuritis.

PC-61601-03 Estimating sensitivity and specificity of tests for latent TB without a standard reference test

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Aim: We evaluated diagnostic accuracy of interferon-gamma assays for latent tuberculosis infection (LTBI) by using latent class analysis, a method that is recommended when a gold standard is not available.

Methods: We studied 115 health care workers. TST and the following in vitro tests were performed: home made RD1 proteins ELISPOT, T SPOT-TB and Quantiferon-TB Gold.

Results: Among the 115 participants, positivity was found in 53% by TST, in 35% by home made ELISPOT, in 37% by T SPOT-TB and in 25% by Quantiferon. Sensitivity/specificity (95% confidence intervals) estimated by a latent class model were: TST 98% (95–100)/64% (53–74); home made ELISPOT 92% (85–100)/87% (80–94); T SPOT TB 94% (87–100)/85% (77–93); Quantiferon 79% (65/94)/97% (92–99). Differences in diagnostic accuracy were statistically significant. In a model in which BCG status was entered, TST sensitivity and specificity were 98% and 69% among non-vaccinated individuals and 99% and 54% among those BCG vaccinated.

Conclusions: When used among health care workers, in vitro assays may provide a significantly increase of specificity for LTBI, even among non vaccinated individuals, at the cost of some sensitivity. ELISPOT based tests may significantly differ from the ELISA based test.

PC-61915-03 Additional yield of sputum culture for diagnosis of pulmonary TB in high and low incidence settings

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Background: In view of the low sensitivity of microscopic sputum-examination, culture is recently being promoted for supplementary diagnosis of pulmonary TB.

Aim: To quantify the additional number of pulmonary TB-cases diagnosed by sputum culturing among passively detected TB-suspects (subjects coughing ≥ 21 days).

Methods: Between end 2002 and begin 2005, sputum samples from passively detected TB-suspects, submitted for microscopic examination, were systematically cultured under otherwise routine program conditions in 2 high (Bolivia and Peru) and 1 low-incidence settings (Cuba).

Results: Of all confirmed pulmonary TB-patients (either by microscopic exam or by culture), the proportion of patients diagnosed by culture alone was 27.7% ($n = 33/119$) in Peru, 25.7% ($n = 35/136$) in Bolivia and 12.0% ($n = 12/100$) in Cuba.

Conclusions: The additional yield of culture for diagnosis of pulmonary TB was variable but satisfactory. However, under routine conditions (outside research-setup), the additional yield will probably be less. Furthermore, waiting-times for obtaining culture-results remain long (minimum 4 weeks) and logistical problems (collection and sending of samples, communication of the results, finding back the patient, quality-control of culture-labs, etc.) are sometimes very hard to solve. Finally, repeat and reliable smear examinations might detect a non trivial fraction of smear-negative culture-positive subjects before the culture-results become available.

PC-61995-03 Diagnostic indicators of tuberculosis in patients self-presenting with chronic cough in Harare, Zimbabwe

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Objective: To develop a scoring system for diagnosis of TB.

Methods: Research records of 544 primary care pa-

tients, systematically recruited and investigated for chronic cough, were randomly split into 'trainer' and 'test' datasets.

Results: In the trainer dataset the diagnostic accuracy of 2 concentrated sputum smears (read with fluorescence), antibiotic response and chest radiography (area under curve [AUC] 93.5%) was significantly improved by adding symptoms (weight loss) and culture (AUC 95.6%, $P = 0.009$) but not b) third initial smear or c) culture alone or d) Day 7 smears (AUC respectively, 93.9%, 95.3% and 94.1%). Other variables with uni- but not multivariate significance were HIV status, night sweats and haemoglobin. Scores based on multivariate coefficients were allocated to a final model as: Day 1 and 7 smears (each of first 2 positives = 3), chest radiograph (abnormal = 1), antibiotic response (none = 3; partial = 2), weight loss (any = 4), with scores of >8 indicating TB. Sensitivity and specificity in the test dataset were 90.2% and 87.0% for all TB patients, and 91.1% and 87.5%, respectively, for TB patients whose first 2 smears were negative.

Conclusion: A basic set of two sensitive smears, antibiotic response and chest radiograph was highly discriminating. A scoring system including symptoms and day 7 smears provided reasonable diagnosis of smear-negative TB. Replicating this approach elsewhere in Africa may contribute to algorithm development.

PC-61402-03 Rapid detection of PZA resistance in *Mycobacterium tuberculosis* using nicotinamide

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Pyrazinamide (PZA) is an important first-line anti-tuberculosis drug, but testing *M. tuberculosis* isolates for PZA resistance is difficult because PZA is not active under normal culture conditions near neutral pH, but only in acid medium. This condition makes in vitro drug susceptibility testing more difficult since *M. tuberculosis* grows poorly in acid medium. At acid pH PZA is converted to its active form, pyrazinoic acid, by pyrazinamidase and mutations in the *pncA* gene encoding for this enzyme are the main cause of resistance to the drug. At neutral pH, pyrazinamidase also converts nicotinamide to nicotinic acid, which has activity against *M. tuberculosis*. In this study nicotinamide was evaluated as a surrogate for detecting PZA resistance in a 96-well format with the redox indicator resazurin (REMA), and compared to results obtained by the BACTEC 460-TB system and the Wayne method for detecting pyrazinamidase activity. PZA resistant strains were also subjected to DNA sequencing to detect mutations in the *pncA* gene. The REMA nicotinamide assay demonstrated a sensitivity of 100% and a specificity of 98% for detecting resis-

tance to PZA; a cut-off value of 250 µg/ml was defined to detect resistance. The REMA plate using nicotina-mide to detect PZA resistance is a rapid and inexpensive method that could be performed in limited-resource countries.

PC-61423-03 Première enquête nationale sur la résistance primaire aux antituberculeux à Madagascar, 2005–2006

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A Madagascar, environ 13 000 nouveaux cas de tuberculose pulmonaire à microscopie positive (TPM+) sont dépistés annuellement. La dernière enquête sur la résistance, effectuée à Antananarivo, a montré un taux de multirésistance primaire de 0,1%. Cette enquête nationale sur la résistance a commencé en octobre 2005, et durera un an. L'échantillonnage en grappe de type PEV s'est fait sur 205 centres de diagnostic et de traitement : 35 grappes de 30 patients ont été retenues, soit 1050 nouveaux cas TPM+ à inclure de manière consécutive, pour l'étude de la résistance primaire. La résistance secondaire sera évaluée sur les patients TPM+ déjà traités, inclus au cours de la même période. Les tests de résistance à la streptomycine, la rifampicine, l'isoniazide, et l'éthambutol sont réalisés sur milieu LJ, suivant la méthode des proportions. Entre octobre 2005 et mars 2006, 813 patients nouveaux cas et 69 patients déjà traités ont été inclus. Les cultures et antibiogrammes sont en cours. Nous présenterons les résultats intermédiaires de cette enquête à la prochaine Conférence de l'Union.

PC-61511-03 Prevalence of tuberculosis drug resistance in Rwanda

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Background: One of the principal objectives of tuberculosis control is to minimize the emergence of drug resistance. A national drug sensitivity survey was carried out in Rwanda to determine the prevalence of drug resistance in sputum smear positive cases.

Methods: Sputum of newly registered and re-treatment smear positive cases was collected during Nov. 2004 to Feb. 2005 through 100% sampling of health districts. Subsequently drug susceptibility testing of *Mycobacterium tuberculosis* samples isolated from the cultures was carried out.

Results: During the 4 month inclusion period 701 sputum smear positive patients were registered. Of these, 616 (87.87%) were new and 85 (12.13%) re-treatment cases. Resistance to H was observed in 38 (6.17%) of new and 9 (10.59%) of re-treatment cases. 24 (3.9%) of new and 9 (10.59%) of re-treatment cases were resistant to R. MDR was present in 24 (3.9%) of new cases and in 8 (9.41%) of re-treatment cases, for these 8 in combination with E and S resistance.

Conclusions: The level of multidrug resistance among new cases and re-treatment cases in Rwanda is high. Disorganization of the health system and migration of the population during the 1994 war, use of treatment regimens with only 2 times weekly drug treatment during the continuation phase until 2002 and poor success rates (58% in 2002, 67% in 2003, 76% in 2004) with a high number of patients transferred out and lost to follow up are the main reasons for this emergence of MDR-TB.

PC-61710-03 Structure of *M. tuberculosis* among new TB cases in Tomsk Oblast, Russia

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In 1998–2000, 977 new TB cases detected in Tomsk Prison, of them: culture+ cases 401 (41% of all). Among all culture+ new TB cases *M. tuberculosis* strains were identified in 252 (62.8%) using RFLP, of them: 210 patients developed TB in prison, and 42 detected in the pre-detention center (SIZO) coming from civil sector. Among all new TB cases, 73% were presented by three strain families only: W, KY, AI. We identified similarity of the prevalent *M. tuberculosis* strains both in prison and civilian sector, including prevalence of KY strain, which had not been identified in Russia before, but in Tomsk they are common in both sectors 11.9%. Additionally, we identified similarity in DST structure among the same cases: in prison/civilian sector correspondently pan-susceptible

Table Major families of *M. tuberculosis* strains isolated among all new TB cases

Families	Total %	In prison %	In civil community %
W148	21.5	21	23.8
W200	8.3	8.5	7.1
W221	4.4	4.8	2.4
Other W	18.2	19	14.3
AI	8.7	7.1	16.7
KY	11.9	11.9	11.9
KQ	2	1	7.1
OO1	5.2	5.2	4.8
LL	4.4	4.8	2.4
Small clusters	15.5	16.6	9.5

40.5%/38.1%; mono- or polyresistant 25.2%/26.2%; MDR 35.7%/35.7%.

Conclusions: A complete identity of TB epidemiological situations was determined in prison and civilian sector which is the evidence of the lack of chronic TB focus in Tomsk prison; the main obstacle to the prompt improvement of TB epidemiological situation is a high rate of MDR strain prevalence among new TB cases, primarily W148 (21.5%), KY (11.9%); higher prevalence of small clusters in prison is conditioned by inmates coming from other regions of Russia.

POSTER DISPLAY SESSIONS

BACTERIOLOGY/IMMUNOLOGY

PS-61019-03 Analysis of mutations in multidrug-resistant *M. tuberculosis* strains isolated in Kyrgyzstan

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Aim: To characterize the *rpoB*, *katG*, *inhA* and *ahpC* gene mutations in rifampicin (RIF) and isoniazid (INH) resistant of TB strains isolated from tuberculosis patients in Kyrgyzstan.

Materials: A total 278 specimens were analyzed for mutations of *rpoB*, *katG*, *inhA* and *ahpC* gene by biological microchip assay.

Results: 129 samples (46%) were found to be wild type *M. tuberculosis* strains (RIF and INH susceptible), while 149 (54%) samples contained mutations associated with RIF and INH resistance. Among (149) drug resistant strains, the single primary drug resistance to RIF was 7 (4.7%) and INH was 48 (32.3%). Multidrug resistance to RIF+INH was found in 94 (63%) cases. In *rpoB* gene the most common point mutations were in codon 531 (60%), 526 (19%), 516 (5.5%) and 511 (6.8%). Point mutation Ser531Leu was at the highest frequency (59%). Resistance to INH found in 142 strains. Prevalence of mutation was found in *katG* gene—91%, *inhA* gene—7% and *ahpC* gene—2%. In the *katG* gene 5 different mutations were detected: Ser315Thr—94%, Ser315Asn—3%, Ser315Arg—1%, Ser315Gly—1% and Ile335Val—1%. In the *inhA* region the only found mutation was *inhA* T15 (7%).

Conclusion: Though we conclude that in Kyrgyz Republic it is a high prevalence of multidrug resistance—63%. The main cause of RIF-resistance of *M. tuberculosis* is the Ser531Leu mutation of *rpoB* gene, and Ser315Thr mutation of *katG* gene is the main cause of INH resistance.

PS-61111-03 Drug susceptibility of *M. tuberculosis*: comparison of conventional tests with HPLC mycolic acid analysis

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The standard drug susceptibility tests of *M. tuberculosis* based on number of colony forming units (CFU) or CO₂ secretion/O₂ consumption need of long time growth of bacilli and are not enough precise so new more accurate and rapid methods are searched. One of them is based on quantitative analysis of mycolic acids with using a high pressure liquid chromatography (HPLC) technique. The linear relationship between logarithm of CFU/ml and total area under the mycolic acids (TAMA) chromatographic peaks in HPLC analysis was documented. Recently the possibility of application method in drug susceptibility tests was discussed. The aim of study was to compare the drug resistance of *M. tuberculosis* isolates evaluated according TAMA method to the conventional tests: culture on solid Loewenstein-Jensen medium, and fluorescence detection of O₂ consumption (MGIT system). The results of TAMA tests were expressed as MAI (mycolic acid index) = TAMA of 5-day culture with drug/TAMA of 5-day control culture. The results of the drug susceptibility of 30 clinical isolates evaluated by MAI were compatible with the both standard methods. The advantages of the TAMA method are the direct examination of the mycobacterial cell wall compounds, the possibility of the numerical expression of the resistance degree, verification of bacilli speciation at the same analysis and comparatively quick procedure—within 6 to 7 days.

PS-61291-03 Detecting genetic polymorphism of *Mycobacterium tuberculosis* using whole-genome microarray analysis

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Background: Recent advances in functional and comparative genomics have improved our understanding of genetic diversity among the *Mycobacterium tuberculosis* complex.

Objective: To investigate the genetic polymorphism of *M. tuberculosis* using whole-genome microarray analysis.

Materials and methods: Amplified fragments of 15 *M. tuberculosis* strains (from two different geographical origins) and the reference strain H37Rv were produced by random amplification of polymorphic DNA (RAPD) using three different primers. The RAPD products were labeled with fluorescent dyes (Cy3 and Cy5) and hybridized to a TB DNA microarray representing

nearly all open reading frames (ORFs) of H37Rv. The final results were analyzed using bioinformatic tools. **Results:** Some genetic variability was found among the 16 *M. tuberculosis* strains. The majority of the highly polymorphic DNA sequences were observed in ORFs representing non-essential genes of the bacterium. **Conclusions:** The future use of comparative genomics based on DNA microarray technology should prove a powerful tool for understanding phenotypic variability among *M. tuberculosis* isolates of similar genetic composition. It is also a promising approach to provide important insights into evolution, virulence and pathogenesis of *M. tuberculosis*.

PS-61344-03 Spoligotyping of *Mycobacterium tuberculosis* recovered from Cambodian children with tuberculosis

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Background: Little is known about the genetic diversity of *Mycobacterium tuberculosis* in Cambodia. From an epidemiological perspective, *M. tuberculosis* isolates recovered from children with tuberculosis (TB) represent strains that were circulating in the population in the recent past. Therefore, the characterisation of *M. tuberculosis* isolates recovered from children allows indirect monitoring of the genetic diversity of *M. tuberculosis* strains circulating in Cambodia.

Methods: Mycobacteria recovered from children with clinical TB were identified to the species level by means of the Genotype MTBC assay (Hain Life Science GmbH, Nehren, Germany). Spacer oligonucleotide typing (spoligotyping) was done with a spoligotyping kit (Isogen Life Science, Ijsselheim, NL). Data were compiled, and shared-types (ST) were identified using data published in SpolDB4.

Results: From January 2004 to September 2005 the cultures from 60 patients (male/female ratio, 1.03; median age, 11.0 years [range, 0–15.0 years]) yielded *M. tuberculosis*; 44 (73.3%) of these patient isolates were clustered. A total of 52 patient isolates were assigned to 16 STs; the spoligotypes of 8 isolates were not listed in SpolDB4. STs of the East-African-Indian (EAI) lineage predominated and were found in 36 (60%) isolates. Eight (13.3%) isolates were ST 1.

Conclusions: Our data suggest that in Cambodia during the last decade STs of the EAI lineage were predominant. Interestingly, the rate of ST 1 was lower than in neighbouring countries.

PS-61520-03 Laboratory identification of optimal growth conditions for clinical isolates of *Mycobacterium bovis* BCG

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Aims: *M. bovis* BCG is routinely given at birth to infants in high-burden TB settings regardless of HIV exposure. BCG disease is a well-recognized clinical entity in HIV-infected infants, reflecting the need for improved laboratory surveillance. We conducted a comparative study to investigate optimal growth conditions for BCG.

Methods: We compared Danish strain BCG clinical isolates in specialized growth vs. routine media; 2 rapid growers, 10 slow growers and 1 reference strain (1331). Existing Lowenstein-Jensen (LJ) colonies were diluted in saline, stearate (BACTEC), Tween 80 and nutrient broth, and inoculated into MGIT 960. Time to culture-positivity (TTP) was noted before secondary inoculation onto duplicate LJ, Pyruvate LJ and Middlebrooks (7H9)

Results: Mean TTPs: saline and Tween 80 MGIT (4 days), stearate and nutrient broth (3 days) Confluent growth on subculture was observed for LJ and Middlebrooks (10 days); faint growth in pyruvate LJ (4 weeks).

Conclusions: Contrary to existing laboratory guidelines, BCG grew well on LJ and Middlebrooks, but performed poorly in pyruvate. We recommend using nutrient broth and LJ, or MGIT-enhanced methods, depending on resources.

PS-61562-03 The most important nontuberculous mycobacteria isolated in Brazil

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We analysed data obtained for 1092 cultures with suspected mycobacterial disease, isolated from 1996 to 2005, sent by the majority of public-health laboratories from all five regions of Brazil to the National Reference Laboratory (NRL). All the cultures were identified according to classical biochemical and cultural methods, and some subsets also by genetic probe (ACCUPROBE, Gen-Probe), PCR-restriction enzyme pattern analysis of the *hsp65* gene (PRA) and mycolic acid pattern by high-performance liquid chromatography (HPLC). The *M. avium-intracellulare* complex (37%) was most prominent, followed by *M. fortuitum* (15%), and *M. kansasii* and *M. abscessus* (13% each). Pulmonary infection was the most frequent,

representing 70 to 80% of all patients analysed for the entire country. Other potentially pathogenic species were found, such as *M. peregrinum*, *M. terrae*, *M. szulgai*, *M. malmoense*, *M. xenopi* and even *M. scrofulaceum* involved in pulmonary infections. Other pathogenic species described abroad and not previously identified by NRL despite targeted investigation *M. genavense* and *M. haemophilum*, were recently reported in Brazil. Despite the reduction in disseminated NTM infections afforded by antiretroviral therapy we suppose that *M. avium-intracellulare*, *M. fortuitum* and *M. abscessus* remain important pathogens in pulmonary disease of HIV patients.

PS-61564-03 Pulmonary infections caused by rapidly growing mycobacteria in Brazil

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The widespread presence of *Mycobacterium fortuitum*, *M. abscessus* and *M. chelonae* in the environment has been well known for many years. These rapidly growing mycobacteria (RGM) are an increasingly important group of human pathogens, and can cause infection of skin or soft tissues following trauma. *M. abscessus* and *M. fortuitum* are also involved in pulmonary diseases in patients with predisposing conditions. These RGM have changed in name and status recently, and *M. abscessus* was added to this group after studies on DNA hybridization by Kusunoki et al 1992. Using traditional biochemical and cultural methods for species identification, and PCR-restriction enzyme pattern analysis from hsp65 gen (PRA) we studied 1092 cultures sent to identification between 1996 and 2005 from the majority of public-health laboratories throughout Brazil. We found that 315 (28% of total mycobacteria identified) were in the RGM group. *M. abscessus* was the second in the total of pulmonary infections in Brazil. HIV-positive status was observed in 2.7% of total strains of RGM. Some regional differences appeared, mainly in northeast region of the country where the number of RGM exceeded *M. avium-intracellulare* complex in pulmonary cases.

PS-61565-03 Virulence gene analysis of the Beijing family genotypes of *Mycobacterium tuberculosis* strains

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Background: Beijing family genotypes of *Mycobacterium tuberculosis* strains have successfully disseminated globally. This investigation focused on the identification of factors contributed to the selective advantages of these strains to enhance their virulence and pathogenicity. Mutations in genes, *fbpA*, *fbpB* and *pimB*,

involved in cell wall biosynthesis were analyzed. A total of 67 representative Beijing family genotypes and 104 non-Beijing strains were studied. Polymerase chain reactions of gene products were sequenced on ABI 3700 DNA analyzer (Applied Biosystems).

Results: Overall, 67 (100%) Beijing family strains had mutation at codon 107 (GGT>GGC) of *pimB* gene, whereas the other 13 major non-Beijing genotypes strains were also elicited the same mutation. Twenty-four (38.5%) and 37 (55.2%) of Beijing family genotypes strains, in two distinct clades of RFLP patterns, displayed unique mutations at codon 156 (AGG>ATG) of *fbpA* and codon 238 (CCC>CCA) of *fbpB* genes, respectively. No mutations were observed in all 104 non-Beijing genotype strains.

Conclusion: Mutations in genes involved in the cell wall synthesis might have contributed to the virulence of *M. tuberculosis*. In this study, the polymorphisms of *fbpA*, *fbpB* and *pimB* were first characterized and found unique to Beijing family. The influence of the polymorphisms in functions of these genes should be further investigated.

PS-61579-03 Association of mutations in *katG*, *rpoB*, *rpsL* and 16SrRNA genes of MDR-TB strains with spoligotypes

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Most MDR *M. tuberculosis* strains from Russia belong to either the Beijing or LAM spoligotype families. The objective of this study was to investigate possible associations between genotype and the frequencies of mutations that confer drug resistance in a population which has two large families of circulating strains. Spoligotyping, IS6110-RFLP typing, and sequencing of the *katG* and *rpoB* genes were performed for 217 MDR *M. tuberculosis* patient isolates. The *rpsL* and *rrs* genes were also sequenced in selected streptomycin-resistant strains. Of the 217 strains, 99 (46%) belonged to the LAM family, 92 (42%) to the Beijing family, 21 (10%) to the Haarlem family, and 4 (2%) to the T family. There was one unique spoligotype. Mutations in the *katG* gene were identified in 207 (95%) strains predominantly in codon 315. Mutations in the *rpoB* gene were identified in 200 (92%) strains; 75% of LAM strains carried a mutation in codon 516, whereas 71% of Beijing strains carried a mutation in codon 531. In the 33 strains resistant to 50 µg/ml streptomycin studied, the 43AGG *rpsL* mutation was found in 27% of Haarlem, 75% of Beijing and 0% of LAM isolates; and *rrs* mutations were found in 17% of Beijing and 100% of LAM isolates. There appears to be a correlation between genotype and specific mutations conferring resistance to rifampin or streptomycin in

the Beijing and LAM families. The implications of this correlation remain to be explored.

The study was done in the framework of #63 BTEP project.

PS-61783-03 A single-nucleotide polymorphism in the narGHJI operon in *M. tuberculosis* complex strains from Guinea-Bissau

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Background: A single-nucleotide polymorphism (SNP), -215C-to-T, within the nitrate reductase (*narGHJI*) operon promoter was recently described in *Mycobacterium tuberculosis* complex isolates. This mutation was reported to be responsible for the differential nitrate reductase (NO₃) activity of *M. tuberculosis* (-215T) versus *M. bovis* (-215C).

Aim: To investigate the occurrence of the SNP within the *narGHJI* operon in *M. tuberculosis* complex isolates from Guinea-Bissau and to compare these findings with earlier published data on phenotypic expression of NO₃ in these isolates.

Methods: The isolates were characterized by PCR-RFLP using the previously published primers LC66 and LC67. The PCR products obtained were digested using the restriction endonuclease Sau3AI.

Results: For all DNA isolates analysed a single PCR product was observed. The PCR fragments had a size of approx. 155 bp. The following digestion with Sau3AI, specifically cutting at the GATC sequence, produced two bands (≈90 bp and ≈70 bp) in strains harbouring this SNP. For the strains lacking the restriction site cleavage was not successful resulting in a single uncut band of approx. 155 bp.

Conclusions: Most isolates had this SNP (-215C), irrespective of phenotype, indicating that this mutation cannot be the only explanation for differences in *M. tuberculosis* versus *M. bovis* phenotype.

PS-62029-03 Rapid identification of mycobacteria: Casuistry *Mycobacterium lentiflavum* in the Czech Republic

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Introduction: One of the adverse effects of globalization is the increasing incidence of tuberculosis and mycobacterioses; this in time may unfavorably influence and change the so far continuing low incidence of TB in the Czech Republic (CZ).

Objective: Evaluation of the new GenoType Mycobacterium assay for identification of mycobacterial species (Hain Lifescience, Nehren, Germany).

Materials and methods: A total 580 mycobacteria strains were isolated from solid and liquid media. The

CM for identification of 13 different mycobacteria including *M. tuberculosis* complex a new AS of 16 species. Differentiation of the *M. tuberculosis* complex usany GenoType MTC. GenoType tests only 7 hrs, conventional methods 3–6 weeks.

Results: CM panel of 394: *M. tuberculosis* complex 71, *M. avium* 54, *M. gordonae* 4 and following. AS panel of 84: *M. species* 61, *M. lentiflavum* 7, *M. kansasii* 6 and following. MTBC panel of 97: *M. tuberculosis* 76, *M. bovis* ssp. BCG 15 and following.

In patient 30yrs old with history of lymph node tuberculosis (TB) was diagnosed mycobacteriosis of paranasal sinuses. Repeat nasal swabs 7× were culture positive and *M. lentiflavum* was identified.

Conclusion: All assays are useful in routine diagnostics identification of mycobacteria is more rapid with high sensitivity and specificity.

PS-61065-03 A whole blood IFN-γ assay for detection of latent and active tuberculosis infection in Bulgarian HIV/AIDS patients

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Aim: To evaluate QuantiFERON-TB Gold test for the diagnosis of latent and active *M. tuberculosis* infection in therapy-free HIV/AIDS patients.

Methods: 47 HIV/AIDS patients and 10 HIV-negative healthy control subjects were studied. All subjects were BCG vaccinated. Of the 47 HIV/AIDS patients, 14 (29.79%) were with culture-confirmed Tuberculosis and 33 suspicious for TB. T-cell responses to ESAT-6 and CFP-10 were measured by QuantiFERON-TB Gold (Cellestis, Ltd) on whole blood samples. All patients were therapy free.

Results: Of the 47 HIV/AIDS patients, 4 (8.51%) gave an indeterminate result due to very low mitogen responses in positive controls. Of the 14 patients with confirmed TB, 12 (85.71%) were positive in QFT-G. Of the 33 TB suspects, with negative microbiology, 15 (45.45%) were QFT-G positive. Control subjects were negative in response to ESAT-6 and CFP-10.

Conclusions: The QFT-Gold test is a very useful complementary tool for the diagnosis both of latent and active *Mycobacterium tuberculosis* infection in immunocompromised patients, especially in those with microscopy- and culture-negative results.

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PS-61260-03 Immunity of children borne by women with tuberculosis

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Immunity of 77 children (Group I) born healthy and 58 children (Group II) born by women with tuberculosis was studied. There were investigated CD3, CD4, CD8, IgG, IgM, IgA, C3, C4 and phagocytosis of leukocytes in umbilical cord blood of neonates (during birth) and, further, in the peripheral blood of infants (5–7 days after birth, then 3, 6 and 12 months and 3 years later). Impact of HLA DR2 phenotype carrying by mothers on BCG vaccination course in infants was investigated. During 3 years analysis of disease development was done in both Groups. Among infants of Group II compared with Group I there were observed slowing down the synthesis of their own IgG, the lowest level was marked in age of 3 and 6 months, the reliable decrease of CD3, CD4 in age of 5–7 days and 1 year; and during all terms of observation phagocytosis and C3 were decreased. Since birth till 3 years' age diseases spectrum was great among infants of Group II compared with Group I, namely 53.4% vs. 10.4% and, especially, incidence of ARI (25.8% vs. 10.1%) and pneumonia (10.3% vs. 2.8%). HLA DR2 phenotype carrying by mothers significantly influenced on BCG vaccination and scar formation among infants of both Groups.

PS-61431-03 Clinical and immunological aspects of pulmonary TB progressing

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Target of investigation: study CD3, CD4, CD8, CD16, CD19, CD25; cytokine level (IFN- γ , IL-1 β , IL-2) and antituberculosis antibodies in newly detected patients with infiltrative pulmonary TB with progressive disease course and those with favorable course just at hospitalization and 2–3 months later. In both groups patients had the moderate decrease of CD4, CD16, CD19, index of ratio CD4/CD8, IL-2 synthesis suppression and high level of IFN- γ , IL-1 β . Levels of CD3, CD8, CD25 was virtually normal. Titer of antituberculosis antibodies in ELISA was higher negative control by some times. At the dynamic analysis of all clinical and immunological data it was determined that at progressing pulmonary TB CD19 level sharply decreases, and cells killers decrease by 1.9 times, titer of antituberculosis antibodies did by 3.2 times, level IL-2 by 3.2 times and IFN- γ by 1.2 times. Likely it is linked with cells migration into lungs, autoimmune component development, progressing the lung tissue destruction. Thus, these indicators could be useful for detection of risk group on pulmonary TB progressing.

PS-61438-03 Direct comparison of the apoptosis gene expression in bronchoalveolar lavage cells and peripheral blood cells

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Apoptosis plays an important role in tuberculosis but there has been little analysis of the molecular components involved. In this study, we assessed expression of a series of apoptosis markers: fas, fasL, TNF- α , TNF-RI, TNF-RII, caspase-8, FLIP, bcl-2, bfl-1 and bax. We compared mRNA levels in peripheral blood and bronchoalveolar lavage (BAL) from patients with active pulmonary TB and healthy controls. Infection with *M. tuberculosis* increased expression of caspase-8 ($P = 0.004$) and decreased bcl-2 ($P = 0.007$) in blood. Furthermore of the fall in blood bcl-2 mRNA expression correlated with X-ray score and hence disease status ($r^2 = 0.53$, $P = 0.007$). Following completion of anti-TB treatment, blood bcl-2 mRNA expression increased ($P = 0.004$) to the same levels as controls. In sharp contrast, at the site of infection (BAL), bcl-2 expression was increased in TB patients ($P = 0.049$) and FLIP mRNA expression was elevated in severely ill patients with X-ray score above 15 when compared with patients with X-ray score below 15 ($P = 0.002$). Taken together, tuberculosis induces an apoptosis initiator and suppresses an anti-apoptosis factor in blood hence increasing the potential for blood cells to undergo apoptosis, whereas tuberculosis increases anti-apoptotic factors in the lungs hence inhibiting apoptosis of BAL cells. Our study provides very valuable data as there has been no other study showing direct comparison of apoptosis gene expression between BAL and peripheral blood in human TB.

PS-61847-03 Tissue immune responses of antigen-specific V γ 2V δ 2 T cells in tuberculosis

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Tissue immune responses of antigen-specific $\gamma\delta$ T cells during infection remain poorly characterized. Here, macaque animal models were employed to examine the tissue-associated responses of phosphoantigen-specific V γ 2V δ 2 T cells during *M. tuberculosis* infections. Four monkeys were challenged with *M. tuberculosis* by aerosol and assessed for V γ 2V δ 2 T-cell responses in lymphocytes isolated from various organs collected at the time they developed fatal tuberculosis. While increases in numbers of V γ 2V δ 2 T cells were seen in bronchial lymph nodes and spleen but not other lymphoid organs, the increases were even more striking in nonlymphoid organs such as the lung, kidney, liver and intestinal mucosae. The tissue-associated increases in the number of V γ 2V δ 2 T cells appeared to be independent upon the extent of *M. tuberculosis* burdens or lesions. However, the increased

numbers of V γ 2V δ 2 T cells in the nonlymphoid tissues coincided with up-regulated expression of various immune genes especially those of chemokines/chemokine receptors. Interestingly, despite their increases to the up to 53% of CD3 T cells in nonlymphoid organs, there was no expansion of V γ 2V δ 2 T cells in the blood circulation after pulmonary *M. tuberculosis* infection. This was contrasted to the expansion of circulating V γ 2V δ 2 T cells seen after intravenous mycobacterial infections. Taken together, the findings suggest that multiple microbial and host factors regulate antigen-specific V γ 2V δ 2 T-cell responses during *M. tuberculosis* infection.

PS-61223-03 The Beijing genotype is more common in extra-pulmonary than in pulmonary isolates in children with tuberculosis

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Aim: There is limited clinical evidence regarding *Mycobacterium tuberculosis* strain-related differences in the host-pathogen interaction. We investigate 1) the distribution of *M. tuberculosis* strain families in samples from children with culture-confirmed tuberculosis (TB) and 2) the association between genotype and disease site.

Methods: We conducted a prospective study from March 2003–August 2005 at Tygerberg Children's Hospital, Western Cape Province, South Africa. All children (<13 years) with culture-confirmed TB were included. Genotyping of isolates was done using standardized spoligotyping; TB was classified as pulmonary or extrapulmonary based on culture site.

Results: We genotyped mycobacterial isolates from 392 children (median age 2 years, range 1–12 years), from 293 (74.7%) with pulmonary and 99 (25.3%) with extrapulmonary disease. The dominant genotype was the Beijing family, in 129 patients (32.9%), followed by Family 11 in 65 (16.6%) and F28 in 25 (6.4%) patients. The Beijing genotype was significantly more prevalent in children with extrapulmonary compared with pulmonary TB (42.4% vs. 58.6%; OR = 1.413; 95%CI 1.059–1.885) but was not associated with age, gender or HIV status.

Conclusions: We demonstrate an association between the Beijing genotype and extrapulmonary disease in children. Further studies investigating the role of mycobacterial virulence and the host immune response are important.

VACCINES, CLINICAL TRIALS AND TB TREATMENT

PS-61208-03 Immunological studies DNA-vaccine encoded antigen ESAT6

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TB remains one of the leading cause of death due to infections. At present the only available vaccine against TB is BCG, which has been demonstrated to have variable efficacy. There is therefore a need for development of improved vaccine strategies to supplement BCG. Recently, ESAT6 encoded by RD1 of *M. tuberculosis* have been suggested as promising vaccine candidate. The ESAT6 is a dominant target for cell-mediated immunity in the early phase of TB in patients as well as in animal models. Evaluation of ESAT6 in DNA-vaccine with polysaccharide conjugate could be a novel approach for the development of vaccine. With this aim, in the present study, pcDNA3.1mycHis(-)/lacZ/ESAT6 encoded ESAT6, with spermidine-polyglucan conjugate was evaluated in mouse model of immunization. The ESAT6 in experimental construction showed high stimulation index and IFN- γ levels suggesting the induction of Th1 response. We have assessed toxicity of our experimental construction and showed it not toxic. We have showed that polysaccharide matrix efficiently protect nucleic acids from degradation by nucleases in vitro. The results obtained indicated that the experimental construction can induce specific T-cell responses and be valuable vehicle for DNA-vaccine against TB.

PS-61911-03 Phase one trial of modified vaccinia Ankara 85A tuberculosis vaccine in adults in a high TB prevalence setting

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Background: The new TB vaccine, modified vaccinia virus Ankara expressing antigen 85A (MVA85A) has previously been shown to be both safe and highly immunogenic in *Mycobacterium tuberculosis* uninfected adults in the United Kingdom and in The Gambia. This paper will present results of the first trial of the vaccine in a high TB prevalence setting. TB incidence rates in adults at the trial site are in the region of 1000/100 000 per year.

Aims and objectives: To demonstrate the safety and immunogenicity of MVA85A in healthy HIV uninfected, *M. tuberculosis* uninfected adults.

Methods: Starting in August 2005, 24 healthy adult

volunteers from the town of Worcester, Western Cape, South Africa, are being recruited into a phase one trial of the vaccine. Volunteers are screened for HIV and *M. tuberculosis* infection and uninfected subjects are vaccinated intradermally with a single dose of 5×10^7 pfu MVA85A. Follow-up is for safety and immunogenicity and is for one year following vaccination.

Results: At the time of abstract submission, 18 participants have been recruited and vaccinated. Most participants report mild to moderate constitutional flu-like symptoms for 1–2 days post vaccination but no severe vaccine reactions or other serious adverse events have been reported or detected. Follow up to day 84 post vaccination shows that the vaccine is also highly immunogenic in this population. In this paper, we intend to present and discuss our safety and immunogenicity results up to day 180.

PS-61040-03 Results of survey of TB-HIV action in provinces and districts from 3rd to 4th quarter, 2004

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According to the MOH of Vietnam, from 2001 to 2003, there have been 47 519 person affected HIV all over Vietnam, and some had changed into AIDS. An important and necessary task is to take HIV test over TB patients in order to find out the HIV positive from them and to make TB test to HIV patients so that AFB (+) among them can be discovered. These actions were held for years, in some district, especially in some main provinces of MOH. In order to evaluate and make remarks on the testing actions in TB-HIV diagnosis in these provinces, NTP will hold surveillance TB-HIV test action in local areas.

Methods: Direct surveillance to the provinces and districts; Decide to use what technique in HIV diagnoses in provincial and district labs.

Results: From 3rd quarter 2004 to 4th quarter 2005, there have been 30 Provincial Labs being surveyed. We have achieved some results on the TB patients having HIV (+), and gain some advantages and disadvantages from the process.

PS-61130-03 Comparison of the Capilia TB, BDProbeTecET CTB assay for rapid detection of MTBC in MGIT

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The immunochromatographic test, Capilia and BD-Probe™ Tec ET CTB assays were prospectively performed for detecting *Mycobacterium tuberculosis* complex in MGIT liquid medium. A total of 560 res-

piratory specimens were evaluated. The BACTEC MGIT 960 liquid culture system and standard niacin biochemistry method were used as reference methods. Out of the 560 clinical isolates, 140 specimens showed culture positive signals in the BACTEC 960 system. A total of 103 specimens were identified as MTBC by biochemistry methods. A total of 100 specimens were positive with the Capilia test, and 103 specimens were positive with the BDprobe™ Tec ET. A total of 37 clinical isolates were differentiated into 13 NTM using standard biochemistry methods. After a discrepancy survey, the sensitivity for serpentine cord smear, BDprobe™ Tec ET and capilia TB were 99%, 99%, 97.1% and 100% and the specificities were 89.2%, 97.3%, 100%, respectively. The agreement between BDprobe™ Tec ET and capilia TB assay was 97.86% and Kappa = 0.946 (95% CI 0.886–1.006). The strength of agreement is very good. Capilia TB assay could be used to replace the labor-intensive BD-probe™ Tec ET CTB test in MGIT. One more day of culture is necessary to eliminate the false negative rate, and the cultural smear morphology from MGIT could be used to have presumptive MTBC results. The Capilia TB test should be combined with serpentine cord morphology in smears to prevent false negatives and MTBC spread.

	Serpentine cord in CSM	BDProbeTec™ ET CTB test	Capilia TB assay	Serpentine cord + Capilia TB assay
Sensitivity	99%	99%	97.1%	100%
Specificity	89.2%	97.3%	100%	89.2%
Positive predictive value	96.2%	99%	100%	96.3%
Negative predictive value	97.1%	97.3%	92.5%	100%
Likelihood ratio (LR)	9.16	36.64	∞	9.25
Agreement with niacin	96.43%	98.58%	97.86%	97.14%
Kappa (95% CI)	0.906 (0.825 to 0.987)	0.963 (0.913 to 1.014)	0.946 (0.886 to 1.006)	0.924 (0.850 to 0.997)

PS-61436-03 Immunotherapy with RUTI will allow short-course chemotherapy against latent tuberculosis infection

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Treatment of latent tuberculosis infection (LTBI) requires a long period of chemotherapy (9 months), which makes treatment-compliance extremely difficult. Latent bacilli (LB) are able to survive in the necrotic granulomas and the outermost layer of foamy

macrophages (FM) that represent an important immunosuppressive barrier. The presence of FM explains how LB can escape into the alveolar spaces where re grow easily. RUTI is made of detoxified, fragmented *Mycobacterium tuberculosis* cells, delivered in liposomes, and is used after a short period of chemotherapy (1 month). The rationale of this therapy is first to kill active growing bacilli, eliminate the outermost layer of FM and reduce local inflammatory responses so as to avoid the predictable Koch phenomenon caused by *M. tuberculosis* antigens when given therapeutically. After chemotherapy, RUTI is inoculated to reduce the probability of regrowth of the remaining LB. RUTI has demonstrated its efficacy in controlling LTBI in experimental models of mice, guinea-pigs and goats after a short period of chemotherapy; these experiments showed the induction of a Th1/Th2/Th3, polyantigenic response with no local or systemic toxicity. Local accumulation of specific CD8 T IFN- γ + cells and a strong humoral response are characteristic features of RUTI that explain its protective properties. These initial positive results are sufficiently encouraging to merit a Phase I clinical trial, due to be launched in fall 2006.

PS-61530-03 Clinical effect of ethionamide resistance on multidrug-resistant tuberculosis treatment

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Ethionamide (ETH) is being used for the treatment of multidrug-resistant tuberculosis (MDR-TB) cases. We aimed to look for ETH resistance rate and its clinical effects such as sputum conversion time in MDR-TB cases. We evaluated 50 patients, whose strains were resistant to at least isoniazid and rifampicin, in three tuberculosis centers in İstanbul. While indirect agar proportion and BACTEC method has been applied. In order to determine ETH sensitivity both methods were used. With BACTEC method, ETH resistance was found 22%. The 11 patients of 3 (27.7%) newly, 8 (72.7%) old TB cases. 3 of 18 new patients (16.6%), and in 8 of 25 old (25%). While mean sputum conversion time was 56.04 days in all patients, in ETH resistant group it was significantly longer than non resistant group (75.18 vs. 50.03 days). When other factors affecting conversion time were evaluated, radiologically advanced disease and age seemed to have moderate effect on delaying the sputum conversion time provided that ETH resistance is not taken into account. The clinical effect of this result was the significantly delayed sputum conversion time. We concluded that ETH resistance should be considered in MDR-TB patients.

PS-61594-03 Early bactericidal activity, tolerability, and pharmacokinetics of the investigational diarylquinoline TMC207

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Background: TMC207 (also known as R207910) is a novel antituberculous agent specifically directed against mycobacterial ATP-synthase. TMC207 has shown high in vitro activity against *M. tuberculosis* including strains resistant to all first line agents and fluoroquinolones.

Method: Seventy-five subjects with treatment-naïve sputum-smear positive pulmonary tuberculosis were randomised to receive once daily TMC207 25 mg, TMC207 100 mg, TMC207 400 mg, rifampicin (RMP) 600 mg, or isoniazid (INH) 300 mg for 7 days.

Results: The 2-day and 7-day early bactericidal activity (EBA) expressed as daily log₁₀ fall in colony forming units (CFU) per ml sputum were -0.01 and 0.01 for TMC207 25 mg, 0.10 and 0.04 for TMC207 100 mg, 0.02 and 0.11 for TMC207 400 mg, 0.44 and 0.24 for RMP, and 0.28 and 0.27 for INH. Significant activity of TMC207 400 mg and TMC207 100 mg was observed only from day 4 and day 6, respectively. The daily CFU drop observed with TMC207 400 mg from day 4 onwards looked similar to the CFU drop with INH and RMP from day 1 onwards. A pharmacokinetic (PK) analysis of TMC207 indicated steady-state conditions after 5 days of administration. TMC207 was well tolerated.

Conclusions: TMC207 showed a significant and dose-related but delayed EBA in sputum. The late onset of action may be partly explained by its mechanism of action and its PK properties. The EBA of TMC207 should be further studied in combination with other antituberculous agents over a longer period of time.

PS-61620-03 The effect of multi-vitamin/mineral supplementation on mortality during treatment of pulmonary TB: a randomised trial

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To assess effects of multi-vitamin/mineral (MVM) and zinc (ZN) supplementation during TB treatment on mortality. Patients diagnosed with sputum positive pulmonary TB in Mwanza, Tanzania, were randomised,

using a 2×2 factorial design, to ZN (45 mg) and MVM (vitamins A, B, C, D, E, and selenium and copper) or placebo. Survival status was ascertained at the end of the 8 months TB treatment. Of 499 TB patients, 213 (43%) had HIV. The mean weight gain at 7 months was 6.88 kg (6.36; 7.41). ZN and MVM combined, but neither alone (interaction, $P = 0.03$), increased weight gain by 2.37 kg (0.91; 3.83), irrespective of HIV status. Survival status at 8 months was determined for 422 (84.6%), of which 52 (12.3%) had died. Among 52 deaths, there were no effects of MVM (RR 0.73, 0.43; 1.23) and ZN (RR 0.76, 0.46; 1.28). Among HIV co-infected patients, marginally significant effects of both MVM (RR 0.60, 0.34; 1.05) and ZN (RR 0.63, 0.37; 1.08) were seen, and MVM and ZN combined reduced mortality (RR 0.29; 95% 18CI: 0.10, 0.80, interaction ratio 0.52). Supplementation with MVM, including zinc during treatment of pulmonary TB may reduce mortality in those co-infected with HIV. A randomised trial of effect of the combined intervention used in this study should be conducted in a different setting to confirm the finding.

PS-61725-03 Can short-course chemotherapy work for cases reported as MDR-TB by a laboratory?

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Turkey is performing drug sensitivity tests (DST) for *Mycobacterium tuberculosis* but without a laboratory quality control (QC) system that covers all testing institutions, including teaching hospitals. DST for four major anti-tuberculosis drugs has been conducted for many years throughout the country without QC programs, the results of these tests may determine case management in some settings. Our setting is a teaching hospital ward managing more than 500 TB cases a year. WHO recommendations, in 2003, are used for case management decisions regardless of individual DST results, even in culture-positive cases. We use short-course chemotherapy (SCC) with direct observation therapy in the initial phase and, in the continuation phase, self-administration with monthly check-ups. In 2004, 530 TB patients were treated in our clinic and discharged with monthly checks. Thirty-nine (10.3%) of the 390 culture-positive cases had multi-drug resistance patterns. Of those reported as MDR-TB, we found that 29 cases (74.35%) were cured with SCC, 2 cases defaulted and 8 cases failed. Seven out of 8 patients with category II MDR patterns were cured with second-line treatment. Use of DST obtained in the absence of QC is questionable for case management decisions in our setting as it may lead to harmful and unnecessary use of second-line drugs. We concluded that

a QC program for MDR-TB resistant management is urgently required in our country.

	Cure	Default	Failure	Death	Total
CAT I	18	1	0	0	19
CAT II	11	1	8	0	20

PS-61744-03 Diagnostic and therapeutic problems in young and elderly patients with pulmonary tuberculosis

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To identify differences in the clinical, radiologic, and microbiologic features of pulmonary tuberculosis (TB) were compared between 102 patients aged 65 years old or more and 167 patients younger than 65 years old, who were followed and treated in Regional Center of Pulmonology in Bydgoszcz between 2002 and 2004. The mean ages were 44.6 ± 5.3 and 69.6 ± 6.3 years, respectively. Hemoptysis and a febrile sense were more frequent in the young, whereas weakness, dyspnea, anorexia, and mental change were more frequent in the elderly. Elderly patients showed higher frequencies of cardiovascular and chronic lung diseases and chest radiography showed a significantly higher frequency of mid or lower lung involvement by TB lesions. In the elderly lesions were frequently misdiagnosed as pneumonia or cancer showed a higher frequency of adverse drug reactions, a higher tuberculin negative rate and higher TB-related mortality. The common radiographic findings were infiltration, cavity, cavity and infiltration. Sputum acid-fast bacilli positivity was higher in younger. There were no differences according to disappearance of bacilli in smears and culture. According to treatment results, the rates of discontinuation of therapy, In conclusion this study showed that young and elderly pulmonary TB patients have similar microbiologic features; however, the elderly showed higher frequencies of atypical clinical and radiologic presentations, adverse drug reactions, and higher TB-related mortality

PS-61809-03 Development of clinical picture of lung tuberculosis combined with peripheral lymph node tuberculosis

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Aim: To study features of clinical picture development of lung tuberculosis (LTB) that occurs with peripheral lymphatic nodes tuberculosis (PLNTB).

Materials: 38 patients suffering from LTB and PLNTB have been examined. They mainly complained on af-

ected peripheral lymphatic nodes: increased size (64%), pains (58%), presence of fistula (11%). LTB is often has been revealed only after patients concerning increase of and pains in lymphatic nodes. Diagnosis of PLNTB of 24 patients has been confirmed by histological method. There is prevailing number of women as well patients aged 21–40 (58%) among them. Duration of the illness was from 2 months to 10 years since it was often supposed presence of tumoral process or a nonspecific inflammation that was not confirmed. The combination of affected several groups of lymphatic nodes was observed in 50% of cases. Blood test has revealed the anemia at 34% of cases, stab neutrophile shift to the left at 34%, lymphopenia at 26%, eosinophilia at 21%, leukocytosis at 24%, accelerated ESR 76%. Tuberculin skin tests Mantu with 2TU of patients has showed a high degree of a specific allergy.

Conclusions: Currently LTB combined with PLNTB is quite often diagnosed among young people. It is necessary to notice prevalence of complaints on affected PLNTB.

PS-61830-03 Bilateral axillary tuberculous adenopathy: a case report

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The axillar localization of TBC adenopathy is rare and is results of an infection with unusal entrance or lymphohematogen widespread. The origin of the bacterial widespread is often unkown because TBC is omitted as etiologic agent. This is the presentation of a case-tuberculosis of the lymph nodes with axillar localisation, associated with tibial bone TBC in an immunocompetent patient. In the last 2 years, this patient was twice submitted to surgical interventions (valvular substitution of aorticand mitral valves); he presented an adhesive pericarditis and minimal pleural left colection, not completely cured with nonspecific antibiotherapy. The histological diagnosis was TBC of axillary bilateral lymph nodes, the bacteriological examination of pus from biopsy was positive for *Mycobacterium tuberculosis*. In this case the origin of the bacterialwidespread could be the active granulomas from pericardium or/and the mediastinallymph nodes.

PS-61858-03 Les effets secondaires du traitement antituberculeux combiné

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La chimiothérapie antituberculeuse sous forme d'associations en proportions fixes, ne permet pas d'adapter individuellement la posologie.

But : Analyser la fréquence des effets secondaires du traitement antituberculeux, au cours des combinaisons RHZE ou RHZ.

Matériel et méthode : Il s'agit d'une étude rétrospective, qui porte sur 291 patients atteints de tuberculose, chez ces patients les médicaments sont administrés sous la forme d'associations en proportions fixes.

Résultats : Le nombre de patients ayant présenté des effets secondaires est de 70 soit 24,05% dont 6,86% ont des effets secondaires majeurs : 3,43% sont dus à une hypersensibilité cutanée avec urticaire et prurit, et 3,43% sont dus à un ictère.

Conclusion : Les présentations combinées des médicaments antituberculeux ne provoqueraient pas plus d'effets secondaires majeurs que les formes non combinées malgré un dosage des antituberculeux qui n'est pas toujours adapté au poids de chaque malade mais les effets mineurs restent élevés.

PS-61954-03 Incidence et présentations cliniques de la tuberculose de reconstitution immunitaire au CHU Sanou Sourô Bobo

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Introduction : La tuberculose peut se rencontrer dans le contexte de traitement anti rétrovirale efficace.

But : Etudier l'incidence et la présentation clinique de cette affection dans notre contexte de double endémicité tuberculeuse et VIH avec accès aux anti viraux.

Patients et méthodes : Il s'agit d'une étude descriptive qui s'est déroulée au CHU Sanou Souro. Nous avons suivi 203—patients âgés de plus de 15 ans, sous anti rétroviraux, de janvier à décembre 2005. Le diagnostic de tuberculose a été posé selon le programme tuberculose. L'efficacité du traitement anti rétrovirale a été évaluée cliniquement et par numération lymphocytaire CD4.

Résultats : L'incidence de la tuberculose de 0.11 patient-année. Les localisations de la TB étaient : pulmonaire bacillifère (12 cas), disséminée (6 cas), ganglionnaire médiastinale (5 cas). Le délai moyen de diagnostic était de 50 jours après le début du traitement anti rétroviral.

Discussion : L'incidence de la tuberculose est élevée même en cas d'efficacité du traitement antiviral. La présentation clinique est la traduction de la reconstitution de l'immunité.

Conclusion : Dans un contexte de double endémicité tuberculeuse et VIH, la mise sous antirétroviraux devra être précoce, après avoir éliminé une tuberculose.

PS-61992-03 Some features of pulmonary tuberculosis in Tomsk Oblast, Russia

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Objective: To investigate the main features of pulmonary tuberculosis at present in Tomsk Oblast of the Russian Federation.

Methods of investigation: Clinical, X-ray, laboratory, microbiological and bacteriological methods.

Results: The number of sensitive tuberculosis decreased among new cases (from 74% in 1997 to 64.6% in 2005) and among the relapses (from 64.4% to 30.3% in 2005) with parallel growing numbers of patients with resistant forms of TB. The following features are predominantly observed in resistant pulmonary TB cases in comparison with sensitive or negative patients: TB Contacts with TB in the anamnesis, severe forms in the beginning of the disease with intoxication syndrome and thoracic symptoms: notification of the disease after visiting doctors with diagnosis of a destructive process in lungs, detection of intensive bacteria extraction and tracheal and bronchial inflammation; prison history, long episodes of alcohol abuse.

Conclusions: Resistant forms of pulmonary TB in comparison with sensitive forms and TB without sputum extraction are more significant and dangerous forms of this social disease.

PS-61994-03 'Unfavorable background' in phthisiology: what is this?

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Objective: To investigate factors reducing efficiency of surgery interventions in TB surgery.

Methods of investigations: Clinical, X-ray, laboratory, functional, microbiological, bacteriological methods and fibrobronchoscopy.

Results: Results of surgery interventions of 545 patients with pulmonary TB during implementation of DOTS (1995–2005) and DOTS Plus (2000–2005) were analyzed. Polyresistant and MDR-TB together with other factors (bacteria exposure, remaining of chest symptoms and intoxication syndrome, infiltrative changes around cavern and tuberculome, active TB of large bronchia or disseminative non-specific endo-bronchitis, concomitant diseases, adverse effects of TB drugs and reduction in homeostasis results often reflect the formation of a common 'unfavorable background' resulted in growth of numbers of earlier postoperative complications and in reactivation of the disease, reducing results in operation.

Conclusions: Algorithms of common actions of TB surgery and TB doctors should help to prevent or remove 'unfavorable backgrounds' and change it into 'favorable ones'.

LABORATORY DIAGNOSTICS FOR TB**PS-61104-03 Induced sputum for lung tuberculosis investigation**

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Method: We carry out a study with 85 patients in 2004, to investigate tuberculosis by means of induced sputum and it was carried out with a manual nebulizador in 85 patients in 2005 with an electric nebulizador. The study consists on putting 10 ml of saline solution inside the nebulizador as much in the manual as in the electrician to apply it to the patient and to obtain a sputum sample. The purpose was to verify that the two methods work well and to teach to the patient as using them.

Results:

First group 2004			Second group 2005		
Total participants: 85			Total participants: 85		
Women 39, 46%			Women 41, 48%		
Men 46, 54%			Men 44, 52%		
Ages:	15–30	18, 21%	Ages:	15–30	8, 9%
	31–45	15, 18%		31–45	15, 18%
	46–60	22, 26%		46–60	25, 29%
	61–75	15, 18%		61–75	18, 21%
	76–92	14, 16%		76–95	19, 22%
Tolerance: excellent			Tolerance: excellent		
Any secondary effect			Any secondary effect		
Results of the first group			Results of the second group		
spot-am-spot			spot-am-spot		
(3 samples)	positive	negative	(3 samples)	positive	negative
positive	11 (12%)	1 (1%)	positive	12 (14%)	0 (—)
negative	1 (1%)	72 (85%)	negative	0 (—)	73 (86%)
total	12 (13%)	73 (86%)	total	12 (14%)	73 (86%)

PS-61116-03 Evaluation of microcolony method and phage assay for rapid detection of *Mycobacterium tuberculosis* complex

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Early and rapid diagnosis of tuberculosis is necessary for both treatment and control of the disease. This study was aimed to evaluate two microcolony observation techniques; based on liquid media and on solid media as well as a mycobacteriophage assay for their effectiveness in a diagnosis of pulmonary TB by comparing with standard culture (BACTEC460 and LJ medium). Middlebrook 7H9 (M7H9) broth based microcolony observation detected 57/61 positives cultures ($n = 200$) sensitivity 93.4%, specificity 87.1%. While M7H11 agar detected 57/62 positive cultures

($n = 198$) sensitivity 92%, specificity 89.7%. Mycobacteriophage assay detected 98/139 (68.5%) positives. Time to positivity was 48 h in mycobacteriophage assay versus 7 days by M7H9 broth and M7H11 agar. The cost in comparison with culture (Bactec460 and LJ) was 33% and 48% of microcolony methods and mycobacteriophage method respectively. Microcolony methods were rapid and cost effective as compared to the standard cultures. Mycobacteriophage assay despite its lower sensitivity had a short turn around time, and may thus be recommended as a screening test in countries with low prevalence of tuberculosis.

PS-61179-03 Clinical and imaging characteristics of AIDS complicated with disseminated *Penicillium marneffei* infection

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Objective: To investigate the clinical and imaging characteristics of AIDS complicated with disseminated *Penicillium marneffei* (PM) infection.

Method: A retrospective analysis of related materials of 12 cases with AIDS complicated with disseminated PM bacterial infection with diagnoses confirmed: clinically, composed of 7 men and 5 women with their age ranging from 26~53 and a medium age of 30.5.

Results: 1) Diagnoses of all the 12 cases were confirmed by peripheral blood culture; 12 cases had swollen lymph nodes, 8 cases had skin rashes; 8 cases had enlarged liver; 9 cases had enlargement of spleen while 8 cases had anemia. 2) Imaging manifestation: 7 cases showed bilateral pulmonary disseminated miliary nodular shadows or lattice shadows; 1 case showed enlarged hilar lymph node and 2 cases showed patchy shadow with pleuritis. Another case showed on CT presence of sub-pleural arc line shadow at the posterior part of the right lower lung.

Conclusion: Patients suffering from low immunity AIDS (CD4T lymphocytes <50/UL) are easily complicated by disseminated PM infection with main manifestations of damages of multiple organs with occurrence of such symptoms as fever; enlargement of liver; spleen and lymph nodes as well as specific skin maculopapular rashes. Imaging characteristics in the lungs were revealed as miliary nodular shadows as well as lattice-like shadows.

PS-61403-03 Improved sample storage for T-SPOT.TB

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Reports suggest that the sensitivity of the ELISPOT assay is dependent on sample handling time. With the long-term storage of blood not supported, the present

study investigated sample handling and storage for T-SPOT.TB. T-SPOT.TB is an in vitro enzyme-linked immunosorbent assay that detects activated T cells by capturing and visualising interferon- γ after T cell contact with specific *M. tuberculosis* antigenic peptides. Samples were processed following storage under a variety of conditions and assessed via T-SPOT.TB and flow cytometric analysis. Work was initially performed to try to understand the limitations within the current procedure and to explore what could be done to improve this. The effect of anticoagulant was unimportant as was the addition of co-stimulatory molecules e.g. CD3/CD28. It has been shown that storage at 2–8°C and below has a detrimental effect on the lymphocyte layer following Ficoll separation, when stored as whole blood or the PBMC fraction. Further to this an increase in contaminating cells such as granulocytes were apparent following storage for up to 24 hours. Recent feasibility investigations have shown that the addition of an equal volume of growth medium to a blood sample, can allow successful storage and Ficoll extraction of the PBMC layer following 24 hours at 18–22°C. An improved sample storage method is considered commercially important as samples may be taken at a site significantly remote from the processing laboratory.

PS-61420-03 Evaluation of the TB-Biochip™ for rapid detection of rifampin resistance in *Mycobacterium tuberculosis*

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The TB-Biochip™ oligonucleotide microarray system is a rapid system to detect mutations associated with rifampin (RIF) resistance in mycobacteria. After optimizing the system with 29 laboratory-generated rifampin-resistant mutants of *Mycobacterium tuberculosis*, we evaluated the performance of this test using 75 clinical isolates of *Mycobacterium tuberculosis*. Compared to conventional drug susceptibility testing results for RIF resistance, the TB-Biochip™ system displayed a sensitivity of 80%, specificity of 100%, positive predictive value (PPV) of 100% and negative predictive value (NPV) of 85%. Four of the seven observed discrepancies were attributed to rare and new mutations not represented in the microarray while 3 of the strains with discrepant results did not carry mutations in the RIF resistance-determining region. The results of this study confirm the utility of the system for rapid detection of RIF resistance and suggest approaches to increasing sensitivity.

PS-61724-03 Identification of *Mycobacterium tuberculosis* complex directly from smear-positive samples using HPLC

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Rapid identification of *Mycobacterium tuberculosis* is constantly a goal in public health; cost is often deterrent to PCR assays that give rapid results. An investigation on the use of HPLC as an alternative to a commercially available *M. tuberculosis* PCR assay (Amplicor MTB-Roche) for the detection of *M. tuberculosis* complex directly from 3–4+ smear positive samples (10^6 and 10^7 CFU/mL respectively) was performed. Respiratory samples were spiked with known concentrations of *M. tuberculosis* H37RV. The resulting sediments were analyzed using the Agilent Technology 1100 Series HPLC with MIDI Sherlock Identification System and the Amplicor MTB Roche PCR system. Sensitivity and specificity were compared between the two systems. The data indicate 100% agreement between the two systems when bacteria concentration was at 10^7 CFU/mL. When the concentration was at 10^6 CFU/mL, the sensitivity between HPLC and PCR was 85.7% and 100%, respectively, and specificity remained the same. The cost savings per test was significant. Cost per identification on HPLC was less than \$20.00 per sample compared to \$175.00 per sample using PCR. In addition, HPLC takes 4 hours and PCR takes 6 hours to final identification.

This study provides encouraging data supporting the use of HPLC as a cost effective, rapid and reliable method of detection and identification of *M. tuberculosis* complex directly from 3–4+ AFB smear positive respiratory sample.

PS-61974-03 Establishing external quality assessment on sputum smear microscopy in Lusaka, Zambia

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Background: There are about 80% of TB patients co-infected with HIV in Zambia. It is a known fact that early detection of TB by microscopy in a community can prevent HIV infected people from becoming exposed to TB. The HIV/AIDS and TB control project has been establishing EQA on sputum smear microscopy, maintaining a quality microscopy in Lusaka province since the third quarter 2003.

Method: Blinded rechecking was adopted based on the international EQA guidelines (2002). Selected slides are evaluated based on 6 assessment points (specimen quality, staining, cleanliness, thickness, size, evenness)

of smear preparation and smear reading (Errors). The 22 diagnostic centers in Lusaka were divided into 2 groups.

Findings: Comparing 2 groups, greater improvements were observed in Group 1 than Group 2. In Group 1 both Major/Minor errors have been reduced to 0% since the fourth quarter 2004. Proportion of Major/Minor errors decreased through 2 years from 5.6%/3.7% to 0%/0% in group 1 and from 4.9%/3.3% to 0.8%/0.4% in group 2.

Conclusion: Detailed assessments of smear preparation and monthly supervisory visits at the initial stage are effective in maintaining a high standard smear microscopy.

PS-61224-03 Analyse des déterminants de la qualité de la microscopie au sein des laboratoires des centres de santé, Dakar

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Dans le but d'améliorer la qualité de la microscopie dans le cadre du dépistage et du suivi des patients atteints de tuberculose pulmonaire, une étude des déterminants de la qualité de la microscopie a été réalisée dans les laboratoires des centres de santé de Dakar, Sénégal. Il s'agit d'une étude épidémiologique de type transversal qui s'est déroulée durant la période du 19 avril au 05 mai 2004. Elle a consisté en une série d'observations, d'entretiens, de revue des registres de laboratoire et à une relecture et recoloration, au niveau du Laboratoire National de Référence du Programme National de lutte contre la Tuberculose (LNR), de 50 lames collectées au hasard dans les centres de santé de Dakar. Il ressort de cette étude qu'il n'y avait pas de lien statistiquement significatif entre les facteurs de risque d'erreurs tels que la surcharge du travail, le mauvais état du microscope, le manque de compétence et les erreurs observées dans certains laboratoires. Par contre l'aspect des frottis, l'épaisseur des frottis et la présence de cristaux pouvait altérer la qualité de la microscopie ($P < 0.005$). Par ailleurs on a noté une bonne concordance des résultats de ces laboratoires avec ceux du LNR (test Kappa = 0,981, $P < 0,0001$). Ainsi, nous recommandons:

- un renforcement des compétences régulier des laborantins
- et une mise en place d'un système de contrôle de la qualité de la microscopie, interne au niveau des laboratoires périphériques et externe par le LNR du PNT.

PS-61226-03 Quality assessment of smear microscopy for acid-fast bacilli in the District of Gujarat

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Setting: 12 Peripheral Laboratories in Gujrat that have been involved in EQA program of AFB smear microscopy.

Objective: To evaluate the results from a 1-year pilot program involving blinded rechecking of randomly selected AFB smears from all peripheral TB laboratories in Gujrat and determine its feasibility for future implementation.

Design: District Laboratory Supervisor performed quarterly statistical sampling of AFB smears and collected slides during laboratory technicians' intra district meetings. AFB smears were rechecked at the district EQA center and discrepancies were results resolved at Reference Laboratory.

Results: The proportion of good quality specimens was considered acceptable but proportion of adequate thick and size was relatively low. Staining quality was considered good. The average agreement in readings throughout the district was 96%. Nevertheless, the false-positive rate was considered significant (6%), and false negative rate was 2%. The overall sensitivity was 88% and specificity was 99%.

Conclusion: The technical quality and agreement in the laboratory network were satisfactory. Nevertheless, improvements need to be made in the smear preparation.

PS-61256-03 Quality assessment of sputum microscopy in private laboratories in Nepal

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Introduction: Realizing the role of private sector in diagnosis and treatment of tuberculosis, SAARC TB and HIV/AIDS Centre (STC) has conducted this study.

Objective: To assess the quality of sputum microscopy in private laboratories in Nepal.

Methods: From the available list with prior consent, 10 private laboratories were randomly selected for this study. In November 2006 the laboratory personnel from the selected laboratories were oriented at the Centre and a prepared panel of 10 slides was handed to them. After examining the slides, nine laboratories sent back reports and slides to SAARC Reference Laboratory, where reports were analyzed. The WHO and IUATLD guidelines and reporting criteria were followed for slide preparation and reporting respectively.

Results: None of the nine private laboratories reported error of any type except one with a quantitative error.

Conclusion: The performance of all the participated private laboratories was excellent.

PS-61262-03 Third round external proficiency testing of smear microscopy in National TB Reference Laboratories in SAARC

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Introduction: SAARC TB Reference Laboratory has started quality assessment of sputum microscopy in the SAARC Region through External proficiency Testing. The result of third round External Proficiency Testing is highlighted here.

Objective: To assess the quality of sputum microscopy in National TB Reference Laboratories (NTRLs) in the SAARC region.

Methods: In June 2005 panels of 10 slides were prepared and sent to nine NTRLs in the SAARC region. After examining the slides by the NTRLs, reports and slides were sent back to SAARC Reference Laboratory, where the reports were analyzed. The WHO and IUATLD guidelines and reporting criteria were followed for slide preparation and reporting respectively. Courier service was used for slide transportation.

Results: Out of nine NTRLs one laboratory reported one Quantitative Error and none of the NTRL reported any major error.

Conclusion: The participating laboratories demonstrated excellent performances.

PS-61439-03 Biocidal effect of bleach on *Mycobacterium tuberculosis* in smear microscopy: a safety measure approach

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Background: Although treatment of sputum using bleach has shown increased sensitivity in smear microscopy, safety aspects when using sodium hypochlorite (NaOCl) have not been addressed.

Aim: To determine the biocidal effect of NaOCl on *Mycobacterium tuberculosis* (MTB) in direct sputum smear microscopy for diagnosis of tuberculosis (TB) as a safety measure approach.

Method: A total of 156 smear and culture positive pooled sputum specimens were assessed for the viability of MTB after treatment with NaOCl. Each specimen was divided into seven equal portions. One portion was directly cultured. Each of the three portions was treated with 3.5% NaOCl and the other three with 5% NaOCl. Specimens were then cultured immediately, at 1, 3, 15 and 24 hours intervals.

Findings: A total of 21 (13.5%) specimens showed growth after treatment with NaOCl. Of these, 8 (5.1%) showed growth immediately upon treatment with 3.5% NaOCl, at 15 and 24 hours. Thirteen (8.3%) showed growth after treatment with 5% NaOCl between 0 and 3 hours but no growth after 15 hours.

Conclusion: Use of 5% NaOCl and appropriate time of exposure should be recommended as a safety measure in smear microscopy for diagnosis of TB.

PS-61447-03 Combination of bleach and fluorescent microscopy enhances diagnosis of sputum smear-negative tuberculosis

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Background: Fluorescent microscopy (FM) is more sensitive than Ziehl-Neelsen (ZN). However, its sensitivity is less than culture.

Objective: To establish whether sodium hypochlorite (NaOCl) enhances diagnosis of smear negative TB when used with FM.

Methods: Two hundred and five smear negative sputum specimens above 10 ml from new TB suspects were processed for FM. Direct smears were examined using FM method. Sputum was divided into five equal portions after homogenization. One portion was processed for culture. Two portions were treated each with 3.5% NaOCl and the other two each with 5% NaOCl. One portion of each concentration was centrifuged and the other sedimented overnight. Smears were prepared from the deposits of the four portions and examined by FM method.

Results: Forty five (21.9%) specimens were culture positive. FM sensitivity was 28.9% and 22.2% after centrifugation and sedimentation with 3.5% NaOCl, respectively. FM sensitivity was 24.4% and 17.8%, after centrifugation and sedimentation with 5% NaOCl, respectively. Differences between sedimentation and centrifugation using both concentrations were significant ($P = 0.05$; $P = 0.0014$), respectively.

Conclusion: NaOCl enhances diagnosis of FM smear negative TB. It is recommended for use in laboratories with high TB workload.

PS-61462-03 Improved diagnosis of Ziehl-Neelsen smear-negative tuberculosis using sodium hypochlorite sedimentation method

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Background: Bacteriological diagnosis of tuberculosis (TB) is largely dependent on Ziehl-Neelsen (ZN) microscopy. This method has a low sensitivity. Concentration of sputum with sodium hypochlorite (NaOCl) followed by sedimentation increases the sensitivity of direct smear microscopy.

Objective: To establish whether NaOCl sedimentation method specifically improves diagnosis of smear negative TB.

Methods: Two hundred and thirty two direct ZN smear negative sputum specimens from new TB suspects were processed for microscopy. Direct smears were processed using Ziehl Neelsen (ZN) staining method. Sputum specimens were divided into three equal portions after homogenization. One portion was processed for culture. The other two portions were each treated with 3.5% and 5% NaOCl, respectively. The specimens were left overnight at room temperature. Smears were prepared from the deposit and examined using ZN method.

Results: Sixty eight (29.3%) of the 232 specimens were culture positive. ZN sensitivity was 27.1% after sedimentation with 3.5% NaOCl and 10% after sedimentation with 5% NaOCl. There was a significant difference between using 3.5% and 5% NaOCl ($P = 0.001$).

Conclusion: Overnight sedimentation using 3.5% NaOCl, significantly improves diagnosis of smear negative TB. This technique has potential of improving overburdened TB diagnostic services especially in settings with high burden of dual TB-HIV infection.

PS-61623-03 Health care providers' attitude towards the DOTS strategy in Tajikistan

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Background: In July–August, 2005 in 14 Rayons of Tajikistan a KAP Survey on TB has been conducted among health care providers including both PHC and TB doctors and nurses.

Objective: Examine PHC and TB health providers' attitude regarding the use of microscopy as a diagnostic tool

Study groups:

- 42 TB doctors and 130 PHC doctors
- 28 TB nurses and 142 PHC nurses.

Methods:

- The Tajik Medical Center for Statistics (TMCS) used a Table of Random Numbers (TRN) methodology, and 342 medical workers were selected throughout the selected areas from a total of 3349.
- Data entry, aggregation and analysis were completed by the TMCS and Project HOPE.

Results: The survey asked respondents to indicate the first action taken to initiate diagnosis. Of TB specialists and PHC physicians 83% and 68% direct patients to 'sputum collection', 9.5% and 18.5% send patients directly to X-ray examination. Both groups of physicians indicated that microscopy is 'convenient and not expensive' (64.3% and 46.9%) and 'helps to diagnose promptly' (28.6% and 43.1%).

Conclusion: The study showed that most health providers have a positive attitude to the priority use of microscopy in DOTS strategy. The results will be used in TB Communication Strategy and development of information materials for both PHC and TB health providers.

PS-61625-03 Bronchoalveolar lavage and following analyses of sputum for diagnosis of pulmonary MDR-TB

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Develop and improve the ways to enhance the diagnostics of *M. tuberculosis* excretion from patients with MDR-TB using the BAL and repeated sputum investigation. *M. tuberculosis* was isolated in 91 (57.6%) out of 158 patients with MDR-TB at the clinical and X-ray signs of activity or disease progression when 3 times' sputum bacterioscopy (Bs) after hospitalization done, and in 141 (89.2%) cases by culture 2–3 months later. To prove the disease activity if negative results of Bs investigation of the sputum collected under observation obtained, fibrobronchoscopy (FBC) with BAL was implemented in 67 patients. Bs investigation of BAL allowed to identify *M. tuberculosis* in 38 (56.7%) patients, while through cultural method growth was obtained in 49 (73.1%). Along with, 67 patients were collected the sputum immediately after FBS with BAL and all sputum in next day. Necessity to repeat the investigation of sputum just after FBS is explained by the fact that after BAL bronchi drainage restores and as a rule, quantity of pathologic secret from lung destruction area increases. Likelihood of *M. tuberculosis* identification increases. *M. tuberculosis* was isolated through Bs in sputum after BAL in 27 (40.2%) patients, by culturing growth of agent was obtained in 24 (35.8%). Thus, if continuing massive bacteria excretion in patients with MDR-TB is absent, FBS and BAL with following sputum samples investigation allow to identify MDR strains in 97.0%

of these category of patients and, therefore, choose the adequate chemotherapy regimen.

PS-61845-03 Cavitory disease, quantitative sputum bacillary load and time to positive culture in pulmonary tuberculosis

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Presence of cavity, 2-month sputum acid fast bacilli (AFB) smear positivity and 2 or 3 month culture positivity are associated with an increased risk for relapse of pulmonary tuberculosis (PTBc). In order to evaluate the relationship between sputum bacillary burden and presence of cavities in patients with PTBc, the sputum colony forming units (CFUs) and time to detection of *Mycobacterium tuberculosis* in BACTEC cultures were analysed of patients (pts) with initial episodes of PTBc in a large metropolitan area in Espírito Santo state (Brazil). The 153 patients with a diagnosis of PTBc (at least 11 colonies of *M. tuberculosis* isolated of sputum) were divided in the cavitory (97) and non-cavitory (56) groups based on the presence or absence of cavity >1 cm diameter in postero-anterior chest X-ray, respectively. Taking into account the chest X-ray, moderately advanced and far advanced diseases comprised 70% of the patient population (133/153). Cavitory pts had CFU counts significantly higher ($P < 0.05$) than that in non cavitory pts (5.1 log vs. 3.6 log CFU/mL) and a shorter BACTEC DTP (3.8 days vs. 8.8 days). Within extension disease category, higher CFU counts were associated ($P < 0.05$) with cavitory group. The bacillary load in both groups increased according to the progression of disease in chest X-ray. These results clearly support the relation between higher bacillary load and presence of cavity in chest X-ray.

CLINICAL TUBERCULOSIS-2

PS-61287-03 Tuberculin skin test as a diagnostic tool for tuberculosis: yes or no

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Background: Tuberculin skin test (PPD) is widely and successfully used in epidemiologic surveys. Its use as a diagnostic tool for tuberculosis (TB) in adults is doubtful. A positive test only shows that the person has at

some time been infected with *Mycobacterium tuberculosis*. (spontaneously or deliberately—by vaccination) and tells us nothing about the activity of TB. On the other hand, the negative test doesn't exclude active disease (prostration and intoxication lead to decreased immune responses).

Objective: To evaluate the significance of PPD test in diagnosis of active TB in adults.

Methods: We investigated the group of 120 pulmonary patients (30 with active TB, 30 with inactive TB, 30 with sarcoidosis and 30 with other lung diseases) treated at the Tuberculosis Clinic of our Institute during last 3 month. We analyzed the positivity of the test and the size of induration according to the diagnose and to the age of the patients.

Results: Among 30 patients with active TB 14 patients (42%) had positive PPD test (induration >6 mm) comparing to 11 patients (33%) with inactive TB, 4 patients (12%) with sarcoidosis, and 10 patients (30%) with other lung diseases. The size of induration was significantly bigger in active TB patients with positive PPD test (average size 12.28 mm) comparing to non-TB patients—average size <10 mm ($P < 0.05$), as well as in active TB patients younger than 40 years of age comparing to the older ones ($P < 0.05$).

PS-61296-03 Pulmonary tuberculosis and deep vein thrombosis

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Pulmonary tuberculosis (PTB) has been reported as a risk factor for deep vein thrombosis (DVT). The study concerned 16 cases of PTB 44-yr mean aged patients (P) with DVT seen among 1000 TB P within 10 years. PTB lesions were bilateral and extensive in 67%. Phlebitis occurred within 16 days (2–46). Sputum conversion was delayed: 68 days vs. 16 in control TB P with a prolonged hospitalisation (PH): 44 days vs. 23. Under anti-tuberculosis and heparin treatment, evolution was favorable with repermeabilisation of the veinous network in 81%. In one case thrombolysis was performed for pulmonary emboly (PE). Etiologic investigations showed elevated platelet counts above 500 000 (525 000–825 000) in 69% with anaemia in 94% with haemoglobin below 10 g/dl in 69%, a G6PD deficit in one case and coagulation (C) proteins deficiency in 2 cases. Antithrombine III activity was only performed in 8 cases. In one case, anti phospholipid antibodies were positive and one case had elevated plasma fibrinogen. PTB and DVT association is not rare (1.6%–3.4%). Because of shared symptoms, DVT diagnosis could be delayed with PE risk. This association is hard managing due to interference between anti TB and

anti C drugs resulting in delayed TB improvement, difficult anticoagulant level adjustment, hemoptysis risk and PH. No specific etiology is evident, but TB inflammation mediators especially TNF α could be involved in DVT occurrence. TB inpatients should be at close survey to detect early DVT symptoms.

PS-61307-03 Risk of treatment failure in TB patients with sputum AFB positive after 2 months of short-course therapy

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Short course chemotherapy regimen containing rifampicin is very effective in management of tuberculosis. High cure rates are possible. Sputum microscopy is done periodically to monitor response to treatment. Small fraction of TB patients does not respond to treatment (treatment failure). Is sputum result at end of 2 months i.e. Intensive Phase (IP) an indicator?

Setting: Anantapur district in Andhra Pradesh, India has a population of 3.7 million. Rifampicin containing intermittent short course regimen (DOTS) has been implemented in the district since 2001. IP is extended for one month if sputum is positive for AFB at the end of IP. A TB patient is declared as treatment failure if he/she is sputum positive for AFB at fifth month of treatment.

Design: Retrospective study with data from TB register on New Sputum Positive (NSP) TB patients registered in 2002.

Results: Follow up sputum microscopy was done for 95.3% of 2399 NSP TB patients. It was observed that 10% were positive for AFB at end of IP. Treatment failure observed in positives at end of IP (13.8%) was three times that of negatives at end of IP ($P < 0.00001$). Treatment failure was 35% among those positive at end of extended IP.

Conclusion: Sputum positivity at end of IP indicates risk of treatment failure.

PS-61347-03 Yield of investigation of children with a tuberculosis contact in a high prevalence region

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Objective: To compare the yield of investigation for TB amongst children identified by a passive TB surveillance programme, with the sentinel event either a TB contact, or symptoms compatible with TB disease.

Methods: Children were identified by a passive surveillance programme as part of a BCG vaccine trial in a rural South African community. Surveillance notification dockets were perused for the sentinel TB contact and symptom data, which led to admission to a Case Verification ward for active investigation, including a tuberculin skin test, chest radiograph, and paired induced sputum and gastric lavage specimens. Data are *n* (%) with 95% confidence intervals (CI).

Results: Surveillance of 11 682 children identified 1820 children for investigation. Notification docket data were available in 1147 children (63%), in whom the sentinel event was TB contact only (Group A) in 483 (42%), symptoms only (Group B) in 459 (40%), and both contacts and symptoms (Group C) in 201 (18%). Amongst children referred for investigation, there was no significant difference in the proportion diagnosed with definite, probable or possible TB between Group A (40.2%, 95% CI 35.8–44.7), Group B (34.6%, 95% CI 30.3–39.2) and Group C (39.3%, 95% CI 32.5–46.4).

Conclusion: In this community, all children with a TB contact should be investigated actively for TB, even in the absence of sentinel symptoms. This has similar implications for the future design and conduct of any phase 3 trials of new TB vaccines.

PS-61373-03 Survey and analysis of reasons for stopping treatment and side-effects of anti-tuberculosis drugs in Guangxi

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Objective: Survey the reasons of halt treatment and the main symptoms and rate of side-effect because of taking free anti-tuberculosis medicine to treat tuberculosis in Guangxi to put forward relevant disposal measures.

Method: Retrospective survey and analysis has been done for 20 464 new and 6593 retreatment sputum smear positive patients who received free anti-tuberculosis medicine treatment to know the reason and rate of halt treatment and side-effect rate from 2004 to first half year of 2005.

Result: The rates of halt treatment because of different reasons for new and retreatment sputum smear positive patients were 9.47% and 17.57% respectively, and the first reason for halt treatment was side-effect and the rates of halt treatment for new and retreatment patients were similar, it was about 29%. 6756 patients were come forth different degree and symptom side-effect out of 27 057 sputum smear positive patients, the rate of side-effect was 24.97%, and 892 patients were halted treatment because of side-effect and the halt treatment rate was 11.45%.

Conclusion: The main reason of halt treatment for sputum smear positive patients was side-effect in

Guangxi. We should be pay more attention to it and take effective measures to reduce the rate of halt treatment because of side-effect and insure successful accomplishment of anti-tuberculosis treatment.

PS-61393-03 Atypical mycobacterial lymphadenopathy in children: clinical and immunological profile

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Objective: To describe the clinical presentation and immunological profile of children with AML.

Methods: All children who received medical assistance in our clinics for AML were enrolled. The diagnostic criteria for AML were either a positive mycobacterial culture for non-MTB mycobacteria or a histological finding of granulomatous lymphadenopathy in a child without epidemiological/clinical criteria for tuberculosis (TB). Tuberculin skin testing (TST), lymphocyte cell count and neutrophil respiratory burst (NRB) were analyzed.

Results: From July 2002 to February 2006, 20 children had a diagnosis of AML. Patients were predominantly female (70%) and Italian (95%), with a median age of 2.9 years (range 1–8). Lymphadenitis sites were mainly cervical (55%) and submandibular (25%). Parotid gland involvement was present in 6 children (30%). Culture for mycobacteria was positive in 72% (13/18): 12 isolates of *M. avium* and 1 of *M. malmoense*. TST was positive in 40% of children. Mean CD4+ (40.6%), CD8+ (23.2%) and NK (9.2%) cell percentages were into the normal range for age, but B lymphocyte mean percentage (21.2%) was higher. NRB as assessed by dihydrorhodamine-1,2,3 oxidation was normal for all patients tested. All children underwent both surgery and antimycobacterial treatment with complete disease resolution.

Conclusion: AML in children without immunological deficiency is associated with a good outcome when treated with both surgery and chemotherapy.

PS-61433-03 Disturbance of main functions of reproductive system among women with pulmonary tuberculosis

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For the last time increase in number of women suffered from pulmonary tuberculosis is marked.

Target: To study the menstrual and reproductive functions of women with pulmonary tuberculosis.

Methods: 96 women in the age of 18 to 46 years were

examined. Infiltrative form was prevalent among them: 45 (46.9%), 37 (38.5%) women suffered from fibrocavernous pulmonary tuberculosis, while 14 (14.6%) did from focal form of pulmonary tuberculosis.

Results: Disturbances in the menstrual function since TB disease development were observed in 76 (79.2%) of patients. The secondary oligomenorrhea was marked in 43 (44.8%), the secondary amenorrhea in 10 (10.4%), primary dismenorrhea in 13 (13.5%), menometrorrhagia in 10 (10.4%) out of them. Among 76 (79.2%) women being married in 16 (21%) cases (the primary infertility was notified in 9 (11.8%), the secondary infertility in 7 (9.2%). Twenty persons had no sex. After treatment the restoration of the menstrual function was found out in 72.1% of women with oligomenorrhea, in 60% with amenorrhea and in 50% with menometrorrhagia. Tuberculosis process leads to decrease the fertility. Infertility was revealed in 21% of women with TB. Heavier is the tuberculosis process, higher is the frequency of menstrual function disturbance. Longer is the tuberculosis process higher is the frequency of amenorrhea. Early diagnostics and adequate treatment of women suffered from pulmonary tuberculosis are necessary to keep their fertility function.

PS-61480-03 Role of gastric washing with and without previous nebulization for diagnosis of childhood tuberculosis

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Introduction: Tuberculosis (TB) is known as one of the most important mortality causes in the world. It is estimated that in developing countries approximately 1 300 000 cases and 450 000 deaths for TB occurs annually in the age group below 15 years.

Objective: To compare the diagnostic values of the methods of gastric washing without previous nebulization and with ultrasonic nebulizer for TB diagnosis in the childhood.

Methods: This is an open randomized clinical trial. The group 1 (42 children) had gastric washing in the way usually recommended, and the group 2 (37 children) had a nebulization, with saline solution of 3%, 30 minutes before the sputum collection. The study subjects suspected of pulmonary TB were recruited from the TB clinics in Grande Vitória-ES, Brazil.

Results: We analyzed 80 tuberculosis cases. Group one 09 of 43 (21%) were culture positive compare to 16 of 37 (43%) positive in group two (RR 2.04: 95%CI 1.04–4.11).

Conclusion: These results confirm our opinion that a nebulization can improve the sensitivity of mycobacterial cultures, but also indicate that diagnosis of childhood tuberculosis requires other approaches.

PS-61542-03 Foreign material in the respiratory zone and pulmonary vascular malformation diagnosed as TB

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Introduction: Is difficult to diagnose infantile TB due to the similarity of its clinical and radiographic manifestations with other pathologies. The hemoptysis is not synonymous of infantile TB. Therapeutic Essays are used, and other possibilities of diagnosis are ruled out.

Objective: To present two clinical cases with hemoptysis, diagnosed and wrongly treated as TB.

Methodology: Revision of clinical history of two patients with antecedents of hemoptysis, diagnosed and treated as TB at health facilities of low complexity, due to the persistence of the sintomatology after the treatment was complete, both patients were referred to Hospital General Plaza de la Salud, Dominican Republic. **Results:** Male, 13 years old, hemoptysis, recurrent right basal opacity with one year of evolution, diagnosed and treated as TB. Fibrobronchoscopy and extraction of vegetal foreign material on right basal bronchium with clinical and radiological resolution.

Male, 8 years old, hemoptysis, bilateral and hyperlucid images, diagnosed as TB and treated for 1 year. Angiography establishes a diagnosis of vascular malformation and through embolization the hemoptysis is corrected.

Conclusion: In children with presumed diagnosis of TB, other diagnosis must be establish before administering 'therapeutic essay'.

PS-61557-03 Treatment outcomes of DOTS options in Ulaanbaatar, Mongolia

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Design: We have concluded that cure rate (CR) is connected with the socio-economic condition of TB patients.

Objective: To introduce into health service of Mongolia (HSM) new DOTS options for TB treatment involving MATA volunteers and to analyze the outcomes.

Method: In 2003 NTP designed three options of DOTS:

Option I—ambulatory DOTS—patients received free standard TB treatment (STT: 2HRZE/4RH) in the outpatient clinics;

Option II—home DOTS—DOTS-trained volunteers (DTV) visit at home TB patients and offered free STT;

Option III—free lunch DOTS—every day a free lunch was offered to TB patients and DTV have given to the patients STT after the meal.

This scheme was supported by the Project from the GFATM. We have analyzed in this study treatment outcomes of three DOTS options utilized in the Capital City of Mongolia—Ulaanbaatar (UB) in 2003–2004. **Results:** 1016 new smear positive pulmonary TB were diagnosed in UB in 2003–2004. Of them 529 (52.1%) have been treated with the Option I, 372 (36.6%) with the Option II and 115 (11.3%) with the Option III. CR was 74.1%, 87.1% and 90.4%, death rate—3.4%, 2.4% and 1.7%, treatment failure—4.7%, 3.5% and 1.7%, default rate—8.9%, 1.3% and 2.6%, and transfer rate—4.5%, 0.0% and 0.7% respectively for Options I, II and III.

Conclusion: Free lunch DOTS is the most successful TB treatment option in the current conditions of UB, Mongolia and home DOTS offers the least default and transfer rates.

PS-61572-03 Tuberculosis risk factors in children

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Various risk factors of TB development have been studied in 120 children treated in children's department of the Republic TB dispensary of the Armenia. The risk factors fall into three groups: 1. medico-biological; 2. epidemiological; 3. social. The defects of vaccination (76.7%), the presence of relatives taken ill with TB (54.2%), and puberty age (42.5%) are the most important for the first group, while contact (56.7%) including the contact in the family (47.5%) is significant for the second one. Bad social conditions (39.2%) including those connected with unemployment of parents (18.3%), migration (8.3%) played the main role among the factors of the third group. 20.8% make incomplete families and 7.5% have many children. Malnutrition has been mentioned in 18.3%. The combination of some aggravating factors has been noted in a group of children. The simultaneous influence of 3 factors has been observed more often (25.8%) and the absence of all the above mentioned factors has been mentioned in 3 cases (2.5%). There is a direct correlation between the multifactor risk factors and the severity of TB course. Thus, the carried out analysis has revealed a significant role of various risk factor in TB development in children.

PS-61595-03 Human *Mycobacterium bovis* cases in Taiwan

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Background: *Mycobacterium bovis* is the causative agent of tuberculosis (TB) in humans and animals. The epidemiology of *M. bovis* TB is very complex. The prevalence of *M. bovis* in Taiwan remains unknown due to difficulties in differentiation. In this molecular epidemiological study, spoligotyping and VNTR-MIRU were applied for genotyping. Additional patient and demographic data were also analyzed.

Results: From July 2004 to November 2005, 15 TB patients were diagnosed with *M. bovis* infection. Their average age was 62.2. Two (13.3%, 2/15) and thirteen (86.7%, 13/15) were extrapulmonary and pulmonary TB cases, respectively. Three (20%, 3/15) and twelve (80%, 12/15) cases were female and male, respectively. The majority (73%, 11/15) of the cases were identified in Eastern Taiwan. Only one spoligotype was observed in all 14 *M. bovis* strains identified. Two VNTR-MIRU profiles, 523232324253322 (92.9%, 13/14) and 523222324253322 (7.1%, 1/14), were revealed. No apparent animal contracts and other epidemiological linkage were found in most cases.

Conclusion: There was a major *M. bovis* clone accounted for human *M. bovis*-associated TB cases in Taiwan. The prevalence of the disease in Eastern Taiwan has to be monitored in the future.

PS-61624-03 Some aspects of TB case relapses in Kazakhstan

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Aim: To study TB relapse cases for detection and treatment outcomes improvement.

Methods: Retrospective analysis of case records of relapses in the Northern region of Almaty oblast over 2004.

Results: In 2004, 85 relapses were registered, 53 (62.4%) cured before DOTS implementation in Kazakhstan; 32 (37.6%) occurred after DOTS treatment completion. Among the latter 23 (71.9%) were men and 9 (28.1%) were women. Compared to the gender distribution among registered new S+ cases in the same period 144 (55.9%) men and 128 (49.8%) women, among relapses men had a 1.3 times greater risk to relapse. The majority of patients (75%) were 25–44 years old (17 men and 7 women). Relapses occurred in 22 (68.8%) within the 1st year. Among relapses the lower effectiveness of treatment is marked. Cure rate for new cases was 80.9%, for relapses—65.1%. (not statistically significant). Relapses have a three times greater risk of dying than new S+ cases ($1.08 < RR < 9.24$).

Conclusion: Most often relapses occurred in the 1st year after completion of treatment; the reasons for that will be further investigated. Patients with relapses have the higher death risk in comparison with new cases.

PS-61632-03 The effect of allergy skin test positivity on radiological dissemination in soldiers with tuberculosis

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Aim: To measure the effect of allergy skin test (AST) positivity on radiology and cavitation.

Methods: This study was performed in a military hospital referred to tuberculosis (TB) in the year of 2005 in Istanbul, Turkey. Smear and/or culture positive 83 patients with pulmonary TB enrolled to the study. In the beginning, AST and radiological evaluation were done in all patients. Radiological dissemination was scored to mild, moderate and severe by splitting the whole lung area to 3 equal parts. Cavitation was defined as present-absent. χ^2 test was used for statistical analyze.

Results: All patients were men. Mean age was 22.0 ± 3.9 . 31 of 83 patients had positive AST (37.3%) and, 52 patients (62.7%). The patients in AST positive group showed mild (74.2%) and moderate (25.8%) radiological dissemination. There was no severe classification in this group. The distributions of patients in AST negative group as percentage were 69.2, 25.0, and 5.8, respectively. Cavity was present in 70.9% of AST positive patients. This percentage was 80.7 in other group. There was no statistical difference between two groups in terms of radiological dissemination and having cavity ($P = 0.394$ and 0.418 , respectively).

Conclusion: We established that AST positivity had no effect on radiological dissemination and cavitation in soldier patients diagnosed with pulmonary TB.

PS-61646-03 Detection of candidiasis injuries in patients with pulmonary tuberculosis

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To diagnose the candidiasis injuries we examined 168 patients with pulmonary TB including those newly detected, with relapses and treatment failure. At their hospitalization and during treatment course all the patients were investigated by bacteriological methods using feces smear from fauces and vagina to isolate *C. albicans*. It was revealed that before antituberculosis chemotherapy *C. albicans* was isolated from different

materials in 62 (36.9%) patients. During following months of chemotherapy number of those patients was doubled to 114 (67.8%). At this, the most frequently *C. albicans* were identified among patients with MDR-TB treated with anti-TB-drugs of the second line, i.e. in 51.3%. Patients of Category II constitute 25.5%, newly detected ones did 23.2%. In 21 (27.6%) cases systemic candidiasis was diagnosed. Criteria of its identification was more than 500 CFU in the cultures in two or three organs (fauces, lungs, intestine, vagina). Thus, against background of anti-TB chemotherapy number of candidiasis injuries increases and it means that is necessary to administrate antifungal drugs as a preventive measure.

PATIENT TREATMENT ADHERENCE/ MANAGEMENT-1

PS-61129-03 Health worker commitment to patient compliance is crucial for adherence to anti-tuberculosis medication in Guyana

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Background: In Guyana the use of DOTS for the treatment of TB is being scaled up in four of the most populous regions of the country; nonetheless, issues with adherence still exist in both the DOTS and non-DOTS patient population. Recently the Public Health Strengthening in Guyana project in collaboration with the Georgetown Chest Clinic and the Guyana Ministry of Health undertook a study to determine the factors that affect adherence to anti-TB medication.

Methods: A case control design was used. Patients who consecutively missed two or more months of treatment were selected from clinic records from four chest clinics in different regions of Guyana and twice the number of compliant patients were randomly selected as controls. Patients were interviewed in their home or the clinic using structured questionnaires.

Results: Patients that were not on the DOTS program ($n = 30$) were more likely to default from their treatment regimen compared with those on DOTS ($n = 37$) (OR = 3.17, 95%CI 1.10–9.17); however, patients that began on DOTS, but for several reasons excluding default were discontinued from the program ($n = 10$) were much more likely to default from the program when compared with patients who remained until the end of treatment (OR = 8.46, 95%CI 1.77–40.36).

Conclusion: The findings indicate that not only is an adequate DOTS program essential to compliance, but

it is also imperative to have commitment to patient care and compliance from health workers.

PS-61132-03 Side effects in underweight TB patients treated with a first-line anti-tuberculosis drug regimen

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International guidelines recommend use of standardised anti-TB drug regimen in 2 to 4 weight bands for adult TB patients. India's RNTCP has a unique dosage, where patients weighing 30–60 kg receive one dosage, from a standard patient-wise box, and dosages are adjusted for patients weighing >60 kg or <30 kg. A prospective study was conducted to assess the extra burden of side effects on low weight patients. 3392 patients were followed-up till cure, treatment completion, or attrition due to defaulting, death or end of the study. The incidence of major side effects was low, but was significantly associated with body weight, being 3.2% in patients <35 kg, 2.4% in 35–47 kg, and 1.5% in >48 kg. Multivariate analysis showed significant association with body weight and treatment category. The main major side effects were streptomycin related. A linear weight trend was observed in the etiological fractions of defaulting and death, but neither of these associations was significant. About 40% developed 'minor' side effects, mostly occurring at the beginning of treatment.

Conclusion: Giving a standardised unique dosage to patients >35 kg weight is supported by the findings of this study. RNTCP needs to consider adjusting dosage of streptomycin for patients weighing 30–35 kg and reinforcing counselling of patients for minor side effects.

PS-61181-03 Pharmacy-based directly observed treatment in Istanbul, Turkey

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Directly observed treatment (DOT), which is recommended by WHO for tuberculosis, is still on pilot stage in Turkey. In this study, we present the results of treatment using DOT in tuberculosis patients between January 2004 and September 2005 in some dispensaries in Istanbul. We used DOT in 5 dispensaries in 2004 and 6 dispensaries in 2005, especially in pharmacies. There were 2104 total and 979 smear-positive regis-

tered TB patients in these dispensaries in this period. In the period of the first 2–3 months, the percentage of total patients who were treated under DOT was 42.2% (889/2104) and this rate was 49.7% (487/979) in smear-positive patients. DOT were used on pharmacies in 396 (44.5%) patients, 114 (12.8%) in dispensaries, 62 (7%) in primary health centers, 52 (5.9%) in private health centers, 199 (22.3%) by any family members and 66 (7.4%) by other persons or institutes. Smear conversion rate at the end of the initial treatment was 94.9% in smear positive patients who were treated under DOT. In the patients who were treated under DOT in initial phase and whose treatments were completed, treatment success rate was 90% (476/528), failure was 1.5% (8/528) and the default rate was 4.5% (24/528). There were 452 patients who were treated under DOT on whole treatment duration in this period. Treatment success rate was 92% (417/452) in these patients. As these preliminary results show, pharmacies can play an important role for DOT program in big cities like Istanbul.

PS-61281-03 Improving TB and MDR-TB treatment outcomes through the use of incentives in Tomsk Oblast, Russia

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Background: Tomsk oblast implemented the DOTS strategy in 1994 and introduced DOTS-Plus for treating MDR-TB in 2000. Beginning in 1997, food packages were introduced to improve treatment adherence of patients with susceptible TB and then in 2002 to MDR-TB patients.

Aim: To assess the impact of monthly food packages on TB and MDR-TB treatment outcomes.

Methods: Incentives were provided for 33 new TB patients on DOTS regimen in one rural area in Tomsk oblast during the continuation phase in 2002. The number of missed doses and outcomes of treatment were retrospectively compared to another 53 new TB patients, who received the same treatment but without any incentives. Further, a retrospective comparison was made between 66 MDR-TB patients who received monthly food baskets for 6 months or more with other 220 MDR-TB patients.

Results: Although cure rate was comparable among TB patients receiving food packages vs. the comparison group (90.9% vs. 90.6%), the proportion of people who did not miss any doses was 84.8% vs. 66.0% in the control group. For the MDR-TB patients, the cure rate was 84.8% in the exposed group, and 59.5% in the comparison group. Also, the proportion of MDR-

TB patients who missed more than 2 months of doses was 31.8% among those receiving food compared with 44.1% in the comparison group.

Conclusion: These results indicate that monthly food packages improved adherence to treatment and also was associated with improved treatment outcomes among MDR-TB patients.

PS-61312-03 TB control programme in the penitentiary system of Georgia: seven years' treatment outcomes (1998–2004)

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Setting: MOJ with ICRC support has been implementing DOTS since 1998 in the Penitentiary System of Georgia (PSG).

Objectives: To report on DOTS treatment outcomes in patients with Pulmonary Tuberculosis (PTB) in the PSG during the period of 1998–2004.

Methods: Combination of Passive, Entry and Mass screenings were introduced for identification of PTB suspect cases by Clinical Questionnaire and BMI. Diagnosis was confirmed bacteriologically and all SS+ cases received DOTS.

Results: DOTS successful Treatment rate has increased from 39.8% in 1998 to 53.4% in 2004. Treatment Failure rate has decreased from 19.2% in 1998 to 12.8% in 2004. Default rate has increased from 5.4% in 1998 to 10% in 2004, which is a specific condition to the prison system. Transfer out rate decreased from 30.9% in 1998 to 18.1% in 2004.

Conclusions: However the program has succeeded in improving the Treatment rate; this is still below the WHO target. Increased efforts need to focus on improving the Default and Failure rates, and also follow-up of TB Transfer out (released) prisoners. This in turn contributes to an overall compromised final treatment outcome result.

PS-61363-03 Case-control study of failures of category I treatment, Lima and Callao, Peru 2001–2003

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Background: In 2001, 54% of all TB failures in Peru were from Lima City and Callao; this proportion increased to 86% by 2003.

Methods: We performed a case-control study to identify risk factors for Category I (CAT1) treatment failure. Cases were defined as new pulmonary TB (NPTB)

patients who failed CAT1 and who initiated a retreatment regimen; controls were NPTB patients who cured CAT1 treatment during 2001–2003.

Results: Data on 125 cases y 125 controls were abstracted from TB registers in Lima City/Callao. Preliminary analysis revealed that cases were 8 times more likely to have had a history of contact with reported drug-resistant TB (OR 8.5; 95% confidence interval [95%CI] 2.3–48.8), and 2 times more likely to have been diagnosed with a sputum smear of 2+/3+ (OR 2.3; 95%CI 1.1–4.3). Cases were 18 times more likely not to have converted their sputum smear after two months of treatment (OR 18.4; 95%CI 6.9–61.1).

Discussion: Treatment failure should be suspected in those with a history of contact with TB, arrive severely ill, or do not convert their sputum smear by two months. Patient and provider education, and drug susceptibility testing of at-risk patients may help to ensure proper and timely TB case management.

PS-61382-03 Analysis of causes and outcomes of irregular treatment of 333 pulmonary tuberculosis patients

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Objective: To find out the causes and outcomes of irregular treatment of pulmonary tuberculosis cases, and to discuss the methods to improve the compliance and increased cure rate.

Methods: To analysis 333 cases of irregular treatment of pulmonary tuberculosis registered during 2001 to 2003 in Shanghai.

Result: The male cases of irregular treatment of pulmonary tuberculosis are more than that of underwent regular treatment cases ($\chi^2 = 12.5, P = 0.001$). The percentage of underwent irregular treatment increased with the ageing. The causes of irregular treatment mainly are adverse effects of drug and non-cooperation. The cure rate of cases with combinative diseases (64.3%) or other causes (26.7%) was much lower than that of cases with adverse effects of drug. The cure rate of bacteriological positive of new cases is 84.7%. The cure rate of bacteriological positive of re-treatment is 80.6% ($\chi^2 = 0.077, P < 0.05$).

Conclusion: We can reduce pulmonary tuberculosis cases underwent irregular treatment by enhancing case management, correctly treatment adverse effects of anti-tuberculosis drugs as a result increased cure rate of pulmonary tuberculosis cases is predicabile.

Table Age and sex distribution of 333 irregular treatment cases

Age (years) (1)	Male TB cases of irregular treatment (2)	Female TB cases of irregular treatment (3)	Rate (2)/(3)	Male TB cases of same period (4)	Female TB cases of same period (5)	Rate (4)/(5)
0-	8	2	4.0	323	288	1.1
20-	21	7	3.0	1 119	716	1.6
30-	30	8	7.5	1 098	557	2.0
40-	52	10	5.2	2 426	848	2.9
50-	43	11	3.9	1 530	482	3.2
60-	45	7	6.4	1 588	473	3.4
70-	79	10	7.9	2 925	761	3.8
Total	278	55	5.1	11 009	4 125	2.7

PS-61476-03 Risk factors for anti-tuberculosis treatment default in national district and Santo Domingo, Dominican Republic, 2005

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Introduction: In terms of operational indicators, an examination of new cases from the year 2000 showed that successful treatment was recorded in 70.5% with an 14% defaulted treatment. In previously treated patients, 27% defaulted treatment

Objectives: To identify risk factors for treatment default in patients who were treated for TB in the National District, Dominican Republic, in 2005.

Methods: This is a case-control evaluation to compare factors between patients that default treatment and those that successfully complete anti-TB treatment in the National District and Province of Santo Domingo. It was sampled 46 cases (treatment abandonment) and 114 controls (cure treatment), of 47 services of health. The aim of this study it was to predict factors to abandonment of TB treatment. For analyses was used the Epiinfo application.

Results: The predict factors to abandonment were be masculine (OR = 2.8, $P < 0.005$), No family structured (OR = 2.1), used alcohol (OR = 2.9, $P < 0.005$), used drugs (OR = 11.6, $P < 0.0005$), Used tobacco (OR = 5.1, $P < 0.005$), No conversion of smears (OR = 1.26), migration (OR = 2.53)

Conclusion: This information is very important for to implementer politics of intervention in the patients that complain with this profiles (probable default).

PS-61484-03 TB treatment under various forms of DOT: does it matter in terms of sputum conversion and treatment outcome?

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Background: DOT is often not uniformly implemented and it is not clear how important strict implementation of DOT is to achieve cure.

Methods: Thrice-weekly anti-TB therapy was randomly assigned to 10 of the 20 public health centres of Taguig, Philippines. The TB patients of the other 10 health centres received daily therapy. Sputum and culture tests were performed at 2 or 3 months of treatment. Sputum conversion and treatment outcome were compared between patients with various modes of treatment supervision and also between patients under thrice-weekly and patients under daily therapy.

Results: Whatever the mode of treatment supervision (fully facility-based DOT, less strict forms of supervision, e.g., family DOT, or self-administered treatment) approximately 20% were still sputum smear- or culture-positive at 2 or 3 months of treatment. The rate of adverse treatment outcome (failure or relapse) was similar whatever the mode of treatment supervision. More patients under thrice-weekly therapy than patients under daily therapy were still sputum smear- or culture-positive at 2 or 3 months of treatment (25% vs. 16%; $P = 0.01$). But the rate of adverse treatment outcome (failure or relapse) was similar (5.9% vs. 4.6%).

Conclusion: The mode of supervision does not influence sputum conversion rate nor treatment outcome. Thrice-weekly therapy is inferior to daily therapy in terms of sputum smear conversion rate but probably not in terms of adverse treatment outcome.

	Sputum still positive at 2 or 3 months	Adverse treatment outcome (relapse or failure)
a Mode of treatment intake		
Patients under thrice-weekly therapy	25% (89/374)	5.9% (28/472)
Patients under daily therapy	16% (46/289)	4.6% (17/371)
	$P = 0.01$	$P = 0.4$
b Mode of treatment supervision		
Patients with health facility based DOT	22% (49/227)	5.1% (32/630)
Patients with other forms of DOT (e.g., family DOT)	20% (58/290)	
Patients on self-administered treatment	19% (28/146)	
	$P > 0.5$	$P = 0.5$

PS-61494-03 Community response to TB: empowering communities in TB management

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Background: Bwafwano HBC was established in 1996 as a community response to the increase in number of TB-HIV/AIDS patients. Since inception, Bwafwano has moved from just providing care and support to patients to involving communities in effective TB treatment adherence, management and prevention.

Objective: To strengthen the capacity of communities in the management and prevention of TB. The programme includes the following trainings:

- Staff Orientation in TB management
- TB Treatment support
- Prevention of multiple drug resistance
- DOTS adherence support
- Defaulter tracing
- TB management and prevention
- ART Adherence support
- Nutrition support

Results: The results of the program include:

- Less defaulter cases recorded
- 100% treatment compliance. There are currently 115 TB patients on treatment
- 100% treatment completion rate
- Increased community involvement in TB management and prevention
- Reduced number of bed ridden patients
- Reduced mortality rate

Conclusion: Strengthening of human resource at community level increases the success of combating TB. Bwafwano not only targets community volunteers but also primary care givers in effective TB adherence support management and prevention.

PS-61537-03 Pilot of 'referral for TB treatment' mechanism in India, 2005

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Background: People migrate seeking health care, often to higher level facilities. Linking TB patients diagnosed at such facilities back to their local DOTS services is a challenge.

Objective: To pilot a 'referral for treatment' mechanism for TB patients diagnosed at medical colleges under the Indian Revised National TB Control Programme (RNTCP) in the states of Gujarat and Rajasthan.

Method: Referral for treatment forms and registers were provided to the medical colleges, and staff trained in their use. Triplicate forms were sent—1 with the patient, 2 via the post to respective District TB Office

and peripheral health institute where DOTS treatment was to be initiated. The forms had pre-paid postage to enable receiving units to provide feedback on referred patients to the referring units.

Results: During January to April 2005, 578 patients were referred in Gujarat, and during February–April 2005, 3358 patients in Rajasthan. Feedback was received on 74% (425/578) and 41% (1190/3358) of referrals in Gujarat and Rajasthan respectively. Feedback decreased for patients referred outside of the district where the respective medical college was situated.

Conclusion: 3936 diagnosed TB patients were referred for start of treatment to their nearest DOTS centres. Monitoring of the feedback and training of involved staff, especially within the receiving districts, is needed to increase feedback rates to the referring units.

PS-61548-03 Evaluation of treatment of TB patients using the new criteria of discharge

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Introduction: We shortened the hospitalization periods of TB patients, using the new criteria including sputum smear negative conversion instead of sputum culture negative conversion.

Aims: To evaluate the results of treatment of TB patients after introducing the new criteria of discharge.

Subjects: 95 TB patients with smear-positive were enrolled in our hospital from July 2005 to January 2006. They underwent WHO short-course chemotherapy with pyrazinamide, were discharged after confirming sputum smear-negative conversion and were followed up by public health nurses after their discharge.

Methods: We checked the hospitalization periods by referring to their medical records, and evaluated their treatment outcomes.

Results: The average hospitalization period with the new criteria was 68.2 days, which were shorter than those with the previous criteria by 1 month. The results of treatment were as follows: 85 patients (89%) were cured, 5 (5%) completed, 2 (2%) died and 3 (3%) defaulted or transferred out. Those with the previous criteria were as follows: 77% were cured, 13% completed, 3% died and 6% defaulted or transferred out. There were no changes in the results of treatment after introducing the new criteria of discharge.

Conclusion: We were able to shorten the hospitalization period and had a good outcome of TB treatment by using the new criteria of discharge.

PS-61552-03 DOTS for pulmonary tuberculosis with 9 months of INH and RMP in a largely rural aboriginal population

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Background: For existing resources in the Great Canadian Plains, the most suitable regimen to implement DOTS for tuberculosis was INH and RMP daily for one month followed by 8 months twice weekly.

Objective: To review patient outcome of this 9 month regimen for pulmonary tuberculosis in field conditions.

Methods: All records of patients with culture positive pulmonary TB from January 1, 1996 to December 31, 2005 who completed DOTS were reviewed. Patients with previous treatment, HIV infection, drug resistance, or death during treatment were excluded. Outcome parameters were completion of treatment, treatment failure, relapse within 24 months, and stopping medications because of side effects.

Results: 193 patients were available for review. 57% were smear positive and 26% had cavities. 90% were Canadian-born Aboriginal, 6% Canadian-born non-aboriginal, and 4% foreign born. 60% were male and 40% female. The mean age was 33 (0.4–87) years. One patient failed treatment. 98% completed treatment with a median compliance of 92%. One patient relapsed (0.5%), 2 (1.0%) stopped medications due to side effects and none developed drug resistance.

Conclusion: DOTS with 9 months of INH and RMP is an economical, effective, and acceptable regimen for pulmonary tuberculosis.

DRUG RESISTANCE/ MDR-TB MANAGEMENT-2

PS-61627-03 Analysis of drug susceptibility results among new cases with failure outcome

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Aim: To study the frequency of drug resistance among 'failed' outcomes of new S+ cases in Almaty oblast.

Methods: Retrospective analysis of DST results of new TB cases with failed outcomes in 2004.

Results: In 2004, 257 new S+ cases were registered and treated with category I regimen. At the end of treatment 45 (17.5%) were categorized as failed outcome.

DST was done at the end of intensive phase of treatment for 44 patients, when they failed to convert and remained smear positive. Culture was negative in two patients. Of 42 patients any resistance was found in 38 patients, while 4 patients were sensitive to all tested drugs (S, H, R and E). Monoresistance was detected

in 6 cases (14.2%), 3 strains were resistant to E and 3 to S. 14 cases (33.4%) were MDR and 18 (42.8%) polyresistant. Among polyresistant strains 10 (23.8%) were resistant to two drugs (SH) and 8 (19%) to three drugs (SHE).

Conclusion: More than one out of six new S+ cases identified failed Category I. Of those one third was MDR-TB. This indicates that DST should be done to all S+ cases before the start of treatment to enable timely correction of treatment regimens.

PS-61639-03 Preliminary results of a pilot program to treat multidrug-resistant tuberculosis in Kampala, Uganda

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Background: There is growing evidence tuberculosis drug resistance is increasing in Sub-Saharan Africa (SSA). In July 2003, we began a pilot treatment program for multidrug-resistant tuberculosis (MDR-TB) at Mulago TB Hospital in Kampala, Uganda.

Methods: We enrolled all consenting subjects admitted to the TB hospital or presenting with re-treatment TB. Subjects were evaluated at baseline and during follow-up visits. The initial evaluation included drug susceptibility testing (DST) to the 5 first-line drugs and ofloxacin. Subjects found to be MDR had further DST to a panel of second line drugs. We began our pilot MDR treatment program in May 2005.

Results: As of March 2006, we have enrolled 484 subjects. Of the 46 subjects with MDR-TB we have identified, information is available on 27 (59%); 6 (22%) of these are receiving tailored MDR treatment. The median follow-up time for the 27 patients is 4.7 months (range 0.5–27.1). Before MDR treatment began, 12 (44%) patients died in 15.3 person years of follow-up (ppy), giving a mortality rate of 0.78 ppy (95% CI 0.44–1.37). Of the 6 MDR treated subjects, 5 (83%) have smear/culture converted by month 4, all tolerated treatment well and none have died after 7.5 months (5–10).

Conclusions: We have successfully initiated a pilot MDR treatment program in Kampala, Uganda. Our preliminary results shown promising treatment outcomes.

PS-61657-03 Résistance initiale aux antibiotiques des mycobactéries du «complexe tuberculosis» à Lomé

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Objectifs : 1) Déterminer les taux de résistance primaire aux antibiotiques de première intention (rifampicine, isoniazide, éthambutol et streptomycine). 2) Evaluer l'impact de l'infection à VIH sur cette résistance.

Matériel et méthodes : Etude prospective réalisée chez 268 patients tuberculeux nouveaux cas Les mycobactéries ont été isolées sur milieux Ogawa. L'antibiogramme a été réalisé par la méthode de proportion sur milieu Lowenstein-Jensen. Une sérologie VIH a été réalisée chez tous les patients.

Résultats : La répartition des 268 souches en fonction des espèces était : *Mycobacterium tuberculosis* 78%, *M. africanum*, 11%, *M. bovis* 11%. Les pourcentages de résistance suivants ont été observés : rifampicine = 1%, isoniazide = 10%, éthambutol = 2% et streptomycine = 14%. Le pourcentage de MDR = 0,5%. Soixante neuf (69) patients étaient infectés par le VIH (25,7%) mais il n'y avait pas de corrélation entre l'infection à VIH et la résistance aux antibiotiques.

Conclusion : Les antibiotiques de première intention pour le traitement de la tuberculose ont un bas niveau de résistance. Leur utilisation rationnelle peut nous permettre d'atteindre l'objectif de l'OMS qui est de guérir 85% des malades dépistés.

PS-61704-03 Results of DOTS-Plus project in Orel Oblast, Russia

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Setting: DOTS project in Orel Oblast started in 1999. DOTS-Plus project started in November 2002.

Objective: To analyze preliminary treatment results of 200 MDR-TB patients approved by Green Light Committee for treatment in the DOTS-Plus project in Orel Oblast.

Design: Data collection forms for MDR-TB patients registered in 2002–2005.

Results: 200 MDR-TB cases included 56 (28%) new and 144 (72%) re-treatment cases. Out of them 84 (42%) had treatment success, while 25 (12.5%) defaulted, 22 (11%) failed, 6 (3%) transferred-out and 18 (9%) died. Culture conversion was observed in 139 (69.5%) cases. Remained on treatment 43 (21.5%). High default rate was mainly related to alcohol abuse. Adverse reactions were observed in 176 (86%) cases; 57 (28.5%) didn't need chemotherapy modification,

106 (53%) required dosage decrease or temporary withdrawal of suspected drug; 13 (6.5) required withdrawal of suspected drugs. 2 (1%) cases stopped treatment due to side-effects.

Conclusion: Preliminary results of the project are satisfactory. Orel Oblast has applied to Green Light Committee for DOTS-Plus continuation. Treatment results could be improved through decreasing the number of defaulters by strengthening the management of MDR-TB patients with alcohol abuse.

PS-61754-03 Outcomes of MDR-TB diagnosis and treatment using a standardized regimen during a 5-year period in Brazil

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Introduction: National MDR-TB surveillance program was established in 2000 by Ministry of Health after therapeutic regimen was validated. MDR-TB treatment consists of a minimum eighteenth-month course of ofloxacin, ethambutol, terizidon, ampicillin, clofazimine and/or pyrazinamide.

Methods: Used a database created in 2000. Data base contains information on patient epidemiology, bacteriology, radiography, HIV status, cure, failure, abandon and death rates.

Results: Of 2305 notified MDR cases (March 06), 95% are acquired resistance. 939 (40.7%) are from Rio de Janeiro state, reflecting its historical trends of TB. Age median is 39 years, with 67.4% male, 55.3% non-white and 82.0% with less than 8 years of schooling. Almost 20% were household or institutional contacts of other MDR-TB cases. Radiology shows bilateral cavitory disease in 64% of cases. HIV serology performed on all patients shows co-infection prevalence of 8.0%. Cure rate among those completing 18 months treatment was 65.2%. Death, failure and abandon rates were 22.2%, 12.2% and 7.7% respectively.

Conclusion: Additional interventions in local TB programs, such as early detection and DOTS implementation are needed to avoid the emergence of MDR cases as well as to improve these outcomes.

PS-61789-03 MDR-TB transmission quantified in a state-of-the-art airborne infection research facility in South Africa

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Background: Studies on MDR-TB transmission and infection control interventions are hampered by the inability to culture tubercle bacilli from room air, and current understanding of MDR-TB aerobiology relies on extrapolation of research results of almost 50 years ago. To address this knowledge gap, a state-of-the-art Airborne Infection Research Facility was recently established in SA, with the aim to quantify MDR-TB transmission, determine predictors of infectiousness, investigate infectiousness during therapy, and assess the efficacy of infection control interventions.

Methods: Air from patient wards is conveyed to animal exposure chambers where guinea pigs serve as quantitative air samplers for MDR-TB transmission. Flexible, automated electronic systems for ventilation, heating/cooling and humidity enable study of transmission under variable conditions. In the first experiment, eligible MDR-TB patients ($n = 28$) were rotated according to clinical and laboratory criteria for infectiousness. Guinea pigs ($n = 360$) were tuberculin skin tested once a month (duration 4 months) and those with skin indurations were autopsied for evidence of MDR-TB.

Results: 80% of guinea pigs showed evidence of infection on skin testing and histopathological evidence of disease. Patient and animal isolates are currently being matched on genotype.

Conclusions: MDR-TB is highly transmissible. Efficacy of conventional and novel infection control interventions will be studied in future experiments.

PS-61807-03 Named patient drug box system for standardized regimen of second-line drugs: Nepal DOTS-Plus program

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Introduction: The National Tuberculosis Programme started a Green-Light Committee (GLC) supported standardised 5 drug regimen DOTS-Plus pilot, September 2005. For simplicity, a 4 month supply named patient box system was introduced with 4 types of boxes: 24 months of ethionamide, cycloserine, pyrazinamide, ofloxacin with pyridoxine prophylaxis provided in six boxes of two weight categories (Box A

>50 kg or Box B); during the 8 months intensive phase, Kanamycin (150 doses) with ranitidine are provided in two 4 month supply boxes Box K1 (100 doses), Box K2 (50 doses).

Method: Staff training on standardised drug ordering forms at clinic and district level was provided. GLC sanctioned drugs are obtained 6 monthly. Ten steps for ordering the national second line drug supply guidelines were developed.

Results: On patient enrolment, clinics get 2 Boxes A or B, Box K1 and K2 providing a patient 8 months treatment (4 months local buffer stock). Additional 4 boxes are provided with routine four monthly DOTS drug supplies. This 'pull' system integrates DOTS PLUS drug supplies avoiding stock-outs.

Conclusion: The Named Patient Drug Box system is practical for the health workers managing the standardised DOTS-Plus pilot, with no drug stock-outs to date.

PS-61808-03 Initial smear conversion and DST results on NTP standardized DOTS-Plus pilot cohort at 4 months of treatment

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The NTP started a Green-Light Committee supported Standardised 5 Drug Regimen DOTS-Plus pilot in September 2005. Preliminary results are presented.

Design: Standardised treatment (kanamycin, ethionamide, cycloserine, pyrazinamide, ofloxacin) is offered for Category 2 failures and other culture demonstrated multidrug resistance. Free daily treatment including prophylactic side effect drugs ranitidine and pyridoxin are given by DOTS health workers. Monthly medical reviews include smear and culture testing, and blood monitoring for potassium and creatinine.

Methods: Cohort analysis of all patients registered (Nepali) monthly, as shown in the DOTS-Plus register of Central region.

Results: Of 76 patients registered, 74 had positive sputum at recruitment (the 2 others had recent culture evidence of MDR-TB). 2 early deaths (3%) occurred at 2 and 11 days of treatment. No patients defaulted, have been withdrawn, or had medication altered for side effects. At 2 months of treatment 45% (22/49) were smear negative, at 3 months 63% (19/30), and at 4 months 90% (9/10) with smear conversion at 4 months of 70% (7/10). No patients had medication altered for side effects.

Conclusions: This regimen with prophylactic side-effect treatment shows encouraging initial compliance and treatment results.

PS-61844-03 Pretreatment drug susceptibility testing can be a good but not the absolute indicator of tuberculosis treatment

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Design: A retrospective analysis of pulmonary tuberculosis (TB) patients in respect of in vitro susceptibility to isoniazid, rifampicin, streptomycin and ethambutol and response to treatment was undertaken.

Results: *M. tuberculosis* from sputum specimen of 245/274 (89%) specimens were isolated. Five specimens (2%) grew contaminants and 26 (9%) did not yield any growth. Drug susceptibility for 205 isolates was undertaken. One hundred and sixty one of 205 (78.5%) were susceptible to all four drugs. Seventy nine percent of the patients (127/161) were cured and 3.1% (5/161) failed to respond to the treatment. Combined resistance to isoniazid and rifampicin (MDR) was shown by 11/205 (5.3%) isolates. Cure was observed in 6/11 (55%), patients infected with MDR, where as 45% (5/11) patients have shown treatment failure.

Conclusion: Treatment guided by in vitro susceptibility tests is presumed to lead to cure. This presumption is not absolute. This study shows that clinical response to anti TB treatment is independent of in vitro susceptibility in small number of cases.

PS-61960-03 Comparative cohorts of treatment of MDR-TB: standardised WHO vs. individualised regimen in Peru

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Background: Peru has an increased prevalence of primary MDR-TB rate: 2.5% (1996) and 3.0% (1999). Since 1996 it has used individualized (Indiv) regimen (according to DST, 18–24 months) and since 1998 until 2004 standardized (Stand) WHO regimen (4KmCxEtZE/14CxEtZE), both under DOT. Until 2001 only patients who consecutively failed to the DOTS WHO regimen I (2RHZE/4(RH)2), then the WHO regimen II (1RHZE/5(RHE)2) and then the WHO standardized regimen for MDR-TB (4EZKmCxEt/14EZCxEt) and survived, acceded to the individualized regimens. Since 2001 the indications of Indiv regimen were expanded.

Objective: To determine the outcome of cohorts of treatment of both MDR regimens in the period 1997–2003, under outcome definitions of WHO/IUATLD.

Material/methods: Retrospective national cohort of treatment of MDR-TB patients consecutively enrolled in operational conditions under DOT. All patients with known egress condition were included and strat-

ified according to specific conditions. Source: MDR-TB Unit/National TB Strategy/Peru.

Results: Cases under Stand: 4177, Indiv: 1778, Stand (resistant to RH): 1973, Indiv (resistant to RH): 951, Stand (resist RHZE): 371, Indiv (resist RHZE): 314, Stand (resist RHZE+others): 55, Indiv (resistant RHZE+others): 267. Table summarize the results:

Cohort	Reg.	Number	Cured	Failed	Dead	Default	Trans.	OR failure	P value
1999–2003	Stan.	2419	47.0	34.0	16.1	27.2	0.0		
	Ind.	608	66.6	1.9	19.2	12.1	0.0		
RH resistant	Stan.	1592	39.1	31	10.4	19.3	0.0	21.06	0.000
	Ind.	396	66.9	2.5	17.6	12.8	0.0		
RHZE resistant	Stan.	300	28.0	40.3	13.6	18.0	0.0	32.77	0.000
	Ind.	139	65.4	2.8	17.2	14.3	0.0		
RHZE and other resistance	Stan.	42	7.1	59.5	14.2	19.0	0.0	160.42	0.000
	Ind.	121	63.6	3.3	17.3	15.7	0.0		

Reg. = Regimen; Trans. = Transfer; Stan. = Standardized; Ind. = Individualized.

Conclusions: There are statistical significant differences between both cohorts. The individualized regimen in developing countries is better than the standardized one, even in operational conditions.

PS-62001-03 Anti-tuberculosis drug resistance surveillance in Kenya, 2002

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Setting: Thirty-nine clusters from all the nine administrative provinces in Kenya.

Objective: To determine the prevalence of drug resistance both in newly diagnosed and previously treated smear positive patients with pulmonary tuberculosis and possible risk factors associated with resistance.

Design: Cross-sectional study.

Methods: Consecutive sputum samples from eligible patients with smear positive were analysed for culture, identification tests and drug susceptibility test (DST) to isoniazid (INH), rifampicin (RIF), streptomycin (SM), and ethambutol (EMB) using standard methods and in accordance with WHO guidelines.

Results: Of the 1255 patients, whose specimens were culture positive, 1022 (81.4%) had a DST and identification test results. Of these, 75 (7.3%) patients had a resistant strain (total resistance) to one or more drugs, 64 (6.3%) or 85.3% of total resistance were resistant to INH of which 42 (56.0%) were mono-resistant. Eight (0.8%) had a Multi-Drug Resistant (MDR) strain, while 11 (1.1%) had a resistant strain to EMB. High concordance between our laboratory and the WHO-based Supranational Reference Laboratory in the UK, on both sensitive and resistant strains has been maintained.

Conclusion: Emergence of MDR-TB, high proportion of initial INH mono resistance and entry of EMB resistance are cause for concern to the NLTP.

PS-62038-03 Résultats préliminaires d'un traitement standardisé pour la prise en charge des cas de TB-MR à Kinshasa

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Contexte : L'étude s'est déroulée 1er janvier 2004 au 30 Septembre 2005 dans la ville de Kinshasa, capitale de la République Démocratique du Congo. Au LNR, et aux deux grands hôpitaux (Cliniques Universitaires et Hôpital Général). Cette cherchait à établir des bases pour un projet DOTS-Plus.

Objectifs : Mettre les patients atteints de TB-MR sous un schéma thérapeutique comprenant ofloxacine (O), prothionamide (P), pyrazinamide (Z) et ethambutol (E) pendant 12 mois (mi-parcours), avec la kanamycine (K) durant les 3 premiers mois (3KOPEZ/21OPEZ). Evaluer la conversion bactériologique et ressortir les effets secondaires rencontrés.

Schema : Les frottis, les cultures sur milieu de Löwenstein-Jensen et test de sensibilité sur les expectorations étaient réalisés lorsqu'un patient était suspecté. Et trimestriellement pour le suivi sous traitement. Les effets secondaires ont été notés au cours du traitement. Les fonctions rénales et hépatiques ont été évaluées.

Résultats : - La cohorte était de 37 patients avec une moyenne d'âge de 34.6 (\pm 10.96) ans.

— Trente trois patients (89.2%) ont des germes résistants aux 4 antituberculeux essentiels à la fois et 75.7% ont une charge bacillaire importante.

— Le taux de négativation au 3ème mois était de 91.4% et le taux de conversion au 6ème mois de 88.2%.

— Les issues provisoires au 12ème mois sont : 5.4% de décès, 5.4% d'abandons, 78.4% en évolution favorable et 18.8% assimilés à des échecs bactériologiques.

— Les effets secondaires sont d'abord digestifs. La néphrotoxicité (5.7%) et l'hépatotoxicité (2.8%) sont rares.

Conclusion : Les résultats de cet essai sont prometteurs pour la mise en place d'un projet DOTS-Plus en République Démocratique du Congo. Les effets secondaires n'ont pas constitué un obstacle pour la prise en charge de ces patients.

TB IN HIGH-BURDEN COUNTRIES—2

PS-61419-03 How can we reduce patient's delay?

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Setting: Netrakona, a district of Bangladesh having 2 156 810 inhabitants, TB control programme implemented by Damien Foundation.

Objective: To determine the factors that are influencing the patient's delay.

Method: All the patients registered for anti TB treatment were interviewed for duration of illness; this was noted in the TB treatment card at the time of registration. Data from all patients registered in 2005 were collected and analyzed.

Result: 1391 patients were registered in 2005. The mean duration of illness was found 10.76 weeks. Delay to treatment is little shorter in male than in female patients (10.72 vs. 10.96 weeks). Mean duration varied with the distance of patient's residence from the microscopy centre and source of referral, and with age. For the patients residing <5 km, 5–10 km and >10 km, the mean delays were 7.76 weeks, 11.24 weeks and 12.08 weeks respectively. As for source of referral 10.08 weeks, 8.8 weeks and 11.72 weeks when referred by Village Doctors, Cured TB patients and graduate doctors respectively. Patient delay also increases in the older age group.

Conclusion: The mean duration of patient's delay is reduced when services are available close to their residence and referred by former cured patients.

PS-61424-03 Beijing genotype is associated with multidrug resistance and young age in rural Vietnam

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Background: Association of *M. tuberculosis* Beijing genotype with multidrug resistance has been shown in several studies, but most are from congregate settings where Beijing genotype and multidrug resistance may co-occur as a result of common risk factors. We assessed this association in a population-based study in rural Vietnam.

Methods: Sputum specimens and interview data were collected of all diagnosed smear-positive pulmonary tuberculosis patients in 3 adjacent rural districts during the period 2003–2004. Specimens were cultured and tested for drug susceptibility and spoligotype.

Results: Complete data were available for 995 of 1462 registered patients (68%). Beijing genotype was identified in 334 (34%), and multidrug resistance in 25 of 894 new (2.8%) and in 15 of 101 (15%) previously treated patients. Multidrug resistance was independently associated with Beijing genotype among new (adjusted odds ratio (aOR): 7.2, 95%CI 2.6–21.0) but not among previously treated patients (aOR 3.1, 95%CI 0.61–13.5). The prevalence of Beijing genotype was independently associated with age <25 years (2.0, 1.4–6.1) and previous treatment (1.9, 1–2–2.9). **Conclusion:** Beijing genotype is strongly associated with multidrug resistance among new smear-positive patients, and appears to be spreading in the population, in this rural, non-congregate setting. This suggests that biological phenomena rather than common risk factors underlie these associations.

PS-61478-03 No change in annual risk of tuberculosis infection in Cape Town despite the introduction of DOTS in 1996

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Background: Despite the introduction of the DOTS strategy in 1996, SA was still in 8th position among the high tuberculosis burden countries in 2003.

Objective: To measure the Annual Risk of Tuberculosis Infection (ARTI) before and after the introduction of DOTS in two urban communities in Cape Town and to compare it with National TB Program indicators.

Methods: In 1998 and 2005, tuberculin skin test (TST) surveys were done to determine the prevalence of tuberculosis infection in 6–9 year old children from all primary schools. The ARTI was calculated from the prevalence of tuberculosis infection and the average age.

Results: 2067 children participated in the survey in 1998 and 1954 children in 2005. The average ARTI for the total area was 3.7% (3.4–4.0%) in the early survey and it remained unchanged in the later survey at 3.9% (3.6–4.3%). The notification rate for total TB increased from 649 per 100 000 in 1998 to 777 per 100 000 in 2002. The average successful treatment rate for the period 1998–2002 was 75% for new smear-positive TB and 58% for smear-positive re-treatment patients.

Conclusions: There was no decrease in the annual risk of tuberculosis infection despite the introduction of DOTS in 1996. This may be explained by the low successful treatment rates, not reaching the WHO criteria of 85%.

PS-61482-03 Determining the tuberculosis burden in Eritrea: a new approach for a tuberculosis prevalence survey

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In Eritrea, the case detection rate of smear positive tuberculosis was 18% in 2003. To evaluate whether this estimate is correct the Ministry of Health performed a national tuberculosis prevalence survey using a new methodological approach. Forty clusters were selected and in each cluster approximately 875 individuals were interviewed. Three field teams collected information about name, sex and age of all individuals and information about cough and its duration, and smoking of individuals ≥ 15 years. All individuals ≥ 15 years were requested to provide a spot and morning sputum sample. The samples were examined by fluorescence microscopy. Samples found positive were confirmed by Ziehl Neelsen microscopy. All positive and 5% of negative samples were re-examined by the National Health Laboratory. In total 38 032 individuals were included in the survey and 19 197 were aged 15 years or more. Fifteen smear positive individuals were identified providing a prevalence of new smear positive tuberculosis of 90/100 000 (95%CI 35–145/100 000) in individuals ≥ 15 years of age. As 44% of the Eritrean population is <15 years of age the overall prevalence can be estimated at 50/100 000. The prevalence estimate from the survey is considerably lower than the WHO estimate of 239/100 000. The new methodology for TB prevalence surveys that was used is feasible in the field, however the methodology needs to be validated in other countries and it needs to be compared to other methods.

PS-61490-03 Supervised treatment of tuberculosis in Paraíba: a challenge for primary health care, Brazil, 2006

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The actions in primary attention level to the health are fundamental for the prevention and control of the tuberculosis. This study aimed to analyze the perception of the professionals who work in the Health Family Program (HFP) and by the state and city coordinators of the Tuberculosis Control Program (TCP) about the DOTS in priority Paraíba cities that had cure percentage over 85% in the period between 1994 and 2004. The data were obtained through 11 inter-

views semi-structured and analyzed from the technique of analysis of the content, identifying the fragilities and potentialities in the practice of the supervised treatment (ST). It was observed that the interviewees were unanimous to point as fragility, the long time of treatment and the distance to go to the health service compromise the therapeutic adhesion. It was also added the fact that the lab net is not sufficient damaging the control actions. The potentialities, refer to the decentralization of the ST for the HFP is put as possibility to change the tuberculosis epidemiologic indicators, and that the Community agent is detached as an excellent allied, able to contribute to the therapeutic success.

Acknowledgments: padct III milênio/TB Research network—REDE-TB n. 62.0055/01-4.

PS-61495-03 Impact of supervised treatment in tuberculosis control in cities of Paraíba State, Brazil, 1999–2004

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In the period from 1999 to 2004, six cities in Paraíba State, Brazil, priority for the National Program of Control of the Tuberculosis (NPCT) introduced the DOTS for tuberculosis control. The objective of this study was to analyze the rates of cure and deaths in the period from 1999 to 2004 in the priority cities. The data were collected based on the registers of the Black Book A, the sample was composed by 1943 cases of patients with positive bacilloscopy, of both sexes, aged over 15 and treated with the Supervised Treatment (ST) in the period described previously. The analyzed data, through the descriptive statistic, reveal that the sick people treated through the (ST), the ones related with death and abandon, were respectively 2.2%, 2.7. The index of cure was above 90%. These results show the efficiency of the ST in the control of the TB, once studies show that, in the same period, indicators obtained with the treatment self-administered were: 4.4% deaths, 8.1% abandon and 75.7% cure.

Acknowledgments: padct III milênio/TB Research network—REDE-TB n. 62.0055/01-4.

PS-61498-03 Political commitment to the DOTS strategy and TB control in priority cities in Paraíba State, Brazil

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This study analyzed the component political commitment in the implementation of the strategy DOTS in priority cities of Paraíba-Brazil, for the National Program of Control of the Tuberculosis (NPCT). Seven control of the tuberculosis program coordinators took part of the study. The data were collected through interview semi-structured and black book. The results show the involvement of professionals with the expansion of DOTS, was articulated to amplification of Family Health Program (FHP) and by the political commitment of state level PCT (sensitivity of municipal managers). Among the fragilities were described political lack of continuity of the job of manager and coordinator and the centralization of the lab rear-guard, that compromises control actions of the tuberculosis. The sources of DOTS show that in 5 from 6 Paraíba cities the percentage of cure exceeded 90%. In João Pessoa, capital of the state, there were happened. The rate of cure increased from 44% to 61% in 2003. It was concluded that DOTS associated to reorganization of services of basic at, above all with expansion of PSF contributed for alterations in indicators regarding to tuberculosis in priority cities of Paraíba.

Acknowledgments: padct III milênio/TB Research network—REDE-TB n. 62.0055/01-4.

PS-61501-03 Prevalence of latent TB infection, radiological TB disease and silicosis among gold miners in South Africa

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Aim: To determine the prevalence of latent TB infection (LTBI) in gold miners in South Africa using the tuberculin skin test (TST), and investigate factors for a positive TST.

Methods: Gold mine employees randomly recruited in two age strata (<30, 30+ years), as a proxy for intensity of TB exposure, underwent a questionnaire, TST and review of occupational screening radiograph. HIV status was classified as negative (HIV-N) by self-report,

confirmed in medical records, and positive (HIV-P) by self-report or positive result in medical records. LTBI was defined as TST ≥ 10 mm.

Results: There were 57 participants (93% male, median age 27 y) in the <30y stratum and 159 participants (99% male, median age 42 y) in the 30+y stratum. Prevalence of LTBI was 59.7%, higher in underground than surface workers (63% vs. 13% respectively; $P < 0.001$). HIV-P participants were more likely to have zero TST response compared to HIV-N or -unknown participants (50%, 13.1%, 15.1%, respectively, $P < 0.001$). In participants with TST > 0 , there was little difference between size of response by HIV status (ANOVA $P = 0.7$). Mean (SD) widths for HIV-P, HIV-N and unknowns were 11.6 mm (3.1), 12.4 mm (2.9), and 12.1 mm (3.2) respectively. Prevalence of LTBI did not vary by age, sex, residence, previous TB, TB contact, BCG status, or silicosis.

Conclusions: The prevalence of LTBI was high. HIV-P individuals were more likely to have a negative TST but positive responses were similar size to HIV-N or status unknowns.

PS-61518-03 Genotyping of *M. tuberculosis* clinical isolates in Pakistan: description of phylogenetically prevalent clades

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Background: Despite a high TB burden in Pakistan, genotyping information is scarce. In this study therefore we investigated prevalence of *Mycobacterium tuberculosis* genotypes locally.

Method: 926 clinical isolates (2003 to 2005) selected through stratified random sampling from across the country were typed using Spoligotyping and Mycobacterial Interspersed Repetitive Units (MIRU). Proportion method was used for antimicrobial sensitivity testing and Inno-Lipa line probe assay to identify *rpoB* gene mutations in 33 rifampicin resistance isolates.

Results: Within the 926 isolates 59 clusters (721/926) and 205 unique spoligotypes were identified. Predominant spoligotypes included Central Asian Strain1 (CAS1) 44% ($n = 411$), Beijing 3% ($n = 25$). 72 CAS1 strains were sub-categorized via VNTR-MIRU into 4 clusters of 2 strains each and 64 unique strains. 54% ($n = 503$) of the strains showed resistance to one or more first line agents (isoniazid 50% and rifampicin 45%) with 43% ($n = 397$) MDR. Beijing strains were significantly associated with MDR ($P = 0.047$). Line probe assay detected resistance in 29/33 (88%) isolates with mutations in codons 531 ($n = 19$) 58%, 516 ($n = 4$) 12%, 526 ($n = 3$) 9% other codons 9%.

Conclusion: This report, representing the largest genotyping data on *M. tuberculosis* isolates from Pakistan to date, suggests CAS1 as a predominant clade. Beijing strains, although less prevalent, showed significant association with MDR.

PS-61526-03 Reasons for TB training in health professionals working with HIV: coinfection evaluation from 1998 to 2005 in Sao Paulo, Brazil

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In S. Paulo, 20 285 tuberculosis cases were found out in 2004. About 3000 (15%) of them were HIV positive, at the moment of the tuberculosis diagnosis. Among the retreatments cases the HIV positive percentage were higher (23%). In the last 8 years this proportion has been more or less constant. The majority (70%) of coinfecting cases are concentrated in 12 cities (of 645 total cities). The highest rate is among men of 20 to 49 years of age. As usual pulmonary cases are more frequent in spite of the extrapulmonary proportion be higher than in HIV negative. An increase of almost twice can be observed in this proportion in the studied period, due mostly to more severe forms (meningitis and disseminated). The new cases cure rate is lower (58%) and deaths rate in the coorte higher (23%) than in the HIV negative (78% and 7%). The proportion of cases in DOT is always lower than in HIV negative cases. So the health professionals who work with HIV need to be better skilled in DOT, to increase the number of the patients under the strategy and to improve cure rate. There is also a need to invest on latent tuberculosis treatment trying to decrease the coinfection trend.

PS-61528-03 Tuberculosis and HIV coinfection in the Dominican Republic

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Background: Human Immunodeficiency virus (HIV) has played a key role in tuberculosis (TB), modifying its prevalence and clinical presentation.

Objectives: This study describes the prevalence of HIV among TB patients attending health facilities in the Dominican Republic (DR) as well as sociodemographic and clinical factors of patients coinfecting with TB and HIV.

Methods: A cross sectional study was conducted in August 2004–August 2005 in Santo Domingo, the capital of the DR, and 8 other provinces of the country. All consenting patients from 15 to 55 years of age with pulmonary or extra-pulmonary TB were included in the study ($n = 549$). After TB was diagnosed, study participants were tested for HIV-1 antibodies following WHO HIV rapid test recommendations.

Results: Overall HIV prevalence was 8.6%. Higher HIV prevalence was observed in tourist and poor areas of the country. There were no differences by gender, type of TB or TB treatment categories. TB patients who were single, however, were more likely than those who were married or in a common law marriage, to present an HIV positive result ($P < 0.05$). TB-HIV co-infection, moreover, peaked in the 30–34 year old adults ($P < 0.05$).

Conclusions: Health initiatives are urgently needed to promote disease prevention and control the incidence of HIV-related TB in areas of high HIV prevalence, especially among young adults.

NIH/Fogarty AITRP, Miami (D43TW00017)

PS-61561-03 Analysing and forecasting the trend of incidence of smear-positive tuberculosis in Gansu Province

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Objective: To analyze and forecast the trend of incidence of smear positive TB in Gansu.

Methods: Establishing a predictive Grey Model (GM).

Results: According to the data of communicable disease submitted in the recent years, we established GM (1.1) to forecast, and analyze the trend of the incidence of smear positive TB. The result was satisfied compared with true dates of smear positive TB from 1998 to 2003, the accurate rate was 97%. Precision of the mathematical model was excellent. It is important to learn the TB prevalence in Gansu and make related polices of prevention. About 80% TB patients live in rural area where the medical service is poor. The miss-reporting is still existing It is accounted by specialist: The rate of miss-reporting in 2004, 2005, 2006 would be 10%. Thus, the data of TB cases will be changed to 11 848, 11 669, 11 958.

Conclusion: The TB cases in Gansu were increasing from 1998 to 2003.

COMMUNITY PARTICIPATION IN LUNG HEALTH

PS-61157-03 Introduction of 'Most significant change stories' approach to monitor patient empowerment processes

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Method: 27 former TB patients being DOT providers participating in community sensitization campaigns in Temeke Municipality and PASADA were asked to write stories of the most significant change since they joined the TB project. Most Significant Change stories is a participatory approach, for evaluation or monitoring of change, to record experiences and assess project impact. Participants are involved in deciding sorts of change to be recorded and analysing the data. Stories go through a transparent selection process to reduce large number of stories to smaller amount of significant and shared value among the participants. This is a method where the participants by selecting stories all the way up, avoid the bias that researcher select stories to confirm hypothesis of change and project impact.

Former TB patients chose most significant stories of change around themes:

- Change from scepticism to acceptance of the disease.
- That TB patients are recognised by health workers and the society as somebody who knows.
- Relationship between former patient and society has changed, to acceptance.
- Acceptance of being HIV positive and TB patient, accept the disease and be open.

Conclusion: The most significant project impact of involving former TB patients is increased social acceptance and improved relationship with healthworkers.

PS-61203-03 Raising community awareness of HIV/AIDS through peer education in Bangladesh: an experience of NGO-BRAC

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Introduction: HIV/AIDS is likely to become a challenging and threatening problem in health sector. Bangladesh has experienced major trend towards urbanization characterized by a higher incidence of violence, alarming high rate of divorce and destitution, and a greater prevalence of drug use.

Objective: To address individuals' behaviors that place them at risk of contracting HIV/AIDS and sexually transmitted infection (STI) by educating community

adolescents and secondary school girls and boys and targeting activities for high-risk population.

Methods: Cross sectional review of reports.

Results: To date 38% of all brothels based commercial sex workers in the Program's area have enrolled in a BRAC Village Organization. A total of 765 192 individuals participated in the community meetings. Community volunteers communicated with 241 773 community members. Theater show on HIV was staged successfully at 28 upazillas (sub-districts). A total of 63 826 boys and 69 742 girls attended school meetings (formal and non-formal) about HIV/AIDS. BRAC distributed 1 115 995 condoms through the brothel based community health workers.

Conclusion: NGOs in Bangladesh has capacity to mobilize society, empower women with knowledge on HIV/AIDS.

PS-61345-03 A qualitative study to identify barriers to community participation in a TB prevalence survey in western Kenya

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Setting: Preparation for a TB prevalence survey targeting 20 000 participants in rural Western Kenya.

Methods: To evaluate the communities' views on TB, assess perceptions of a TB prevalence survey, and identify barriers to participation and best ways to inform families and return results, 11 focus group discussions were conducted with randomly selected males, females, community health volunteers, and household interviewers.

Results: Preliminary analysis of the focus group data revealed that TB was considered an important problem in the communities. A study to provide TB examinations in the villages was believed to reduce the spread of TB. People reported that they would participate if prior information was given, tests were free and close to their homes, and treatment available. People fear giving blood for research, but sputum was felt to be acceptable. Awareness of X-ray radiation side effects was low, but a shield to protect reproductive organs was considered acceptable. Door-to-door information followed by appointment days was believed to promote participation. Barriers included fear that sputum tests and X-rays reveal diseases like HIV, and concerns about confidentiality.

Conclusion: The community appears positive towards the survey. Concerns about the study and beliefs on TB were captured and can be addressed during mobilization and enrolment.

PS-61585-03 An effective example of public-private mix in a slum of Kolkata

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Introduction: Effective urban coverage is major problem in TB Control Programs in India. Unlike Rural areas, absence of basic health care infrastructure and lack of community feelings among the slum dwellers create problem in case detection, drug compliance and cure. The efforts of an NGO, working in the slums of Kolkata covering a population of 500 thousands, involved private practitioners, informal leaders, local youths resulted remarkable improvement in the program.

Objective: To involve different stakeholders of the community to increase case detection and cure rate. To develop a sustainable inbuilt infrastructure within the community.

Methods:

- 1 Different stakeholders were identified, sensitized and followup system was developed.
- 2 Community based operational partners (CBOP) were identified and involved.
- 3 Linkage between local government—the service provider and CBOPs were developed.

Results: Effective community participation resulted a steady increase of case detection both in total cases and new sputum smear positive cases was seen from 2001–2005. The cure rate also increased and stabilised throughout these period.

Conclusion: The experience of this public private mix is being replicated to a number of poor functioning treatment units in urban and rural areas of West Bengal.

PS-61593-03 Issue de traitement des 6.892 patients TB bacillaire en 2004 à Kinshasa

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Problématique :

- 1 incidence TB : 10^e pays au monde et 4^e en Afrique
- 2 RAI : 5%
- 3 Kinshasa : i) Promiscuité ; ii) pauvreté accrue ; iii) incidence TBC 2004 : 11.995 cas ; iv) couverture TBC par le réseau Catholique 2004 : 6.892 patients, soit 57% de Kinshasa ; v) Ressources humaines : émigration élevée.

Objectif : Mesurer la prise en charge.

Méthodes et activités : Supervision et analyse documentaire

Stratégies : 1) Application du DOTS ; 2) Parrainage par un proche du malade ; 3) Accompagnement par expérience (un ancien tuberculeux guéri de bon témoignage).

Résultats :

Cohorte	Total n	Guéri n (%)	Traite. terminé n (%)	Décédés n (%)	Echec n (%)	Abandon n (%)	Trans. n (%)
NC	5.870	5.142 (88)	187 (3)	308 (5.2)	91 (1.5)	137 (2)	5 (0.1)
R.T	93	5 (soit 5)	54 (58)	10 (11)	4 (4)	12 (13)	8 (9)
Echec	95	47 (49.4)	3 (3)	11 (12)	25 (26.3)	2 (2)	7 (7.3)
Rechute	834	619 (74.2)	19 (2.2)	78 (9.3)	34 (4)	25 (2.9)	59 (7)

Traite. = Traitement; Trans. = Transféré.

Conclusion : Objectif atteint + 85% Guéris, réduire taux d'abandon et echec, TBC demeure problème de santé publique, ressources humaines = émigration élevée, conscientiser le communauté et motiver RH.

PS-61644-03 Community-based management of tuberculosis in Siaya and Bondo Districts, Kenya

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Background: The HIV-fuelled tuberculosis epidemic is outstripping the ability of health services to cope in Kenya. With increased TB caseload and limited health workers, community involvement is critical. A community approach to TB management can expand DOTS coverage at the village level. This strategy has been implemented in two districts in Nyanza province in Western Kenya.

Method: A four day training curriculum was developed for the community health workers (CHWs). Using predefined selection criteria, including willingness to do voluntary work, ability to read and write, local residence, CHWs, referred to as 'TB-Ambassadors' were identified, trained and assigned to a village(s). Recording and reporting tools (referral chits, CHWs diaries to record client encounters, and monthly reporting forms) were developed, and follow-up training planned.

Results: In 2004, a total of 826 TB-Ambassadors were trained in 24 sessions. One day follow-up trainings were held in 2005, and 680/826 (82%) of the TB-Ambassadors attended. The TB ambassadors identified 4429 TB suspects and 4285 (97%) of these were referred to health facilities; 756 defaulters were traced.

Conclusions: TB-Ambassadors are willing to sustain their activities, as shown by a low drop out rate (17%), are able to use the tools, and critically complement the work of the health sector in TB control. Training more TB-Ambassadors will increase DOTS coverage. An impact evaluation of the strategy is planned.

PS-61668-03 Health care seeking behavior of TB patients in Jogjakarta

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There is a concern that individuals with TB symptoms in Indonesia had not been attending appropriate care providers but private practitioners not practicing DOTS, other alternative therapists, and traditional healers. This behaviour may be related to lack of education and information, awareness, access to health care providers, and family and community support.

Objective: The aim of this study is to explore health care seeking behavior of TB patients in Jogjakarta province.

Method: This was a qualitative study conducted in Jogjakarta city and Kulon Progo district. The study population consisted of TB patients, patients' family and community. Data were collected through in-depth interviews and FGDs.

Results: Most TB patients took over a month to reach a DOTS facility after first symptoms appeared and consulting a number of providers beforehand. Private physicians are the first choice provider of TB patients, particularly in urban population. Factors that influence care seeking behaviour include income and advise from household members or friends. Stigma does persist particularly between spouses. Communities in Jogjakarta and Kulon Progo have already some degree of knowledge but still incomplete and many mistakes.

PS-61856-03 TB in urban slums: approach to strengthen and empower community for effective implementation of DOTS

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Introduction: Exploring Human Resources of the Community is very essential in successful implementation of DOTS and address issues related to DOTS coverage, poverty, hygiene and sanitation—not tackled effectively by the routine programme.

Objective: To develop methodology so as to strengthen and empower community for effective implementation of DOTS in urban slums.

Methodology:

1 TB NGO working in a Urban slum of Mumbai identified Volunteers to form 7 Self Help Groups (SHGs) each consisting of 12 individuals from the community and 1 Social worker from NGO to facilitate.

- 2 Basic Training on TB and DOTS, Sanitation and hygiene, Income Generation activities, IEC was imparted to Volunteers.
- 3 Each SHG Volunteer was asked to render his free available time for community development activities and was entrusted with responsibility of 30 houses initially.

Result: Within 1 year the SHG group contributed to successful DOTS provision, community awareness, sanitation and hygiene issues and Income generation activities. Their involvement resulted into increased New case detection, enhanced treatment completion, reduction in defaulters and stigma.

Conclusion: Community has strong will to participate in all major health programmes provided they are efficiently contacted, motivated and trained—this will go a long way towards achieving millennium development goals and impart programme ownership to the key population.

PS-61875-03 Maximizing human resource base in poor rural settings

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Migori is a rural district in Nyanza, Kenya, with a population of 615 000, whose main occupation is fishing and farming. The population annual growth rate is at 1.7%, which is below national figures. HIV prevalence is high with 30% of VCT clients and 20% of pregnant mothers being HIV positive. There is an increasing TB burden in the community from mere 200 cases in 1990 to 3000 cases in 2005. This is attributed to improved community health seeking behavior, proper recording by NLTP, and HIV co-infection. In 2005 alone, over 80% of all the TB patients were HIV positive. To address the situation, the district medical team held consultative meetings to identify strategic interventions. Human resource was identified as one of the weaknesses and was addressed through on job training of all hospital staff. Interdepartmental referral forms were introduced to ensure that every patient had the opportunity to be tested for HIV and tuberculosis and put on appropriate therapy. The district also received an additional nurse to help in coordination of the TB-HIV activities. This approach has helped increase the suspicion index among health workers and communities and thus contributed to increased case detection, and can be applied to other rural districts with high TB-HIV burden.

PS-61900-03 Séminaire dialogue : stratégie d'impliquer la famille dans la prévention de prise en charge intégrée de la TB-VIH

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Objectifs : Améliorer les connaissances, attitudes et aptitudes des membres des familles et proches des personnes vivant avec le VIH/SIDA dans la prévention et prise en charge intégrée TB-VIH SIDA. Accompagner les familles dans le suivi de traitement des personnes co-infectées TB-VIH.

Methodes : Organisation d'une réunion en faveur de 20 a 20 membres des familles ou proches des PVV. Mise à la disposition lors de la rencontre des informations relatives à la prévention et prise en charge intégrée TB-VIH. Référence des PVV auprès des CDT et des tuberculeux auprès des CCDV, ONG de prise en charge ou CTA.

Résultats : 12 seances des seminaires dialogues tenues en faveur de plus/moins 232 membres des familles et/ou proches des PVV dans 6 antennes de Kinshasa. 125 tuberculeux se sont depistés dans les familles des participants à ces rencontres, dont 59 positifs et 66 négatifs. 32 de ces tuberculeux ont pu bénéficier du traitement intégré TB-VIH par référence auprès des CTA partenaires et centres de sante. Accompagnement effectif des proches et parents des PVV co-infectés dû à l'amélioration de leurs connaissances, attitudes et aptitudes.

Conclusion : La participation des parents et/ou proches des PVV aux seminaires dialogues a permis de découvrir d'autres malades dans la familles suite aux informations partagées avec l'équipe sociale. La famille est et doit rester le centre de l'impulsion de la prevention et prise en charge integree de la co-infection TB-VIH SIDA.

PS-61910-03 One community's perceptions of the relationship of TB and HIV/AIDS

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Background: Expansion of DOTS brings TB care to larger numbers of patients globally; a limitation of DOTS is an inability to address delays to diagnosis. Causes of diagnostic delay are many; both provider and patient issues contribute. As TB and HIV become increasingly intertwined, barriers associated with each disease do so as well. We hypothesize that HIV/AIDS associated stigma is a significant barrier to the accessibility of TB care in a high burden TB-HIV area.

Methods: A cross sectional survey of attitudes and perception towards TB and HIV/AIDS was administered at a local bus stand in Eldoret, Kenya over a 3 week period (151 participants).

Results: Questions were asked in yes/no format or graded on a four-point likert scale (options: strongly agree, somewhat agree, somewhat disagree, strongly disagree).

Discussion: In this high TB-HIV incidence setting, many myths were acknowledged by community members. However, factual knowledge of each disease was more prevalent than expected. Further behavioral evaluation is critical to future TB-HIV programs designed to improve access to care.

	Has heard statement	Agree or somewhat agree
'TB is associated with HIV'	94%	50.3%
'Someone who has TB has HIV'	90.1%	7.3%
'You can only get TB if you have HIV'	68.2%	1.3%
'It is easier for a person infected with TB to become HIV+'	34.7%	11.9%
'If a person who has TB and HIV gives you TB, you can also catch HIV from that person too'	15.2%	7.3%
'TB is the same as HIV'	24.5%	0.8%

PS-61935-03 Le rôle des tradipraticiens dans les activités de détection des cas suspects de tuberculose au Burkina Faso

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Au Burkina Faso, le Programme d'Appui au Monde Associatif et Communautaire, en collaboration avec le Programme National de Lutte contre la Tuberculose, a mis en place un projet pilote 2005–2009 de référence des cas suspects de tuberculose par les associations de tradipraticiens. L'objectif est de contribuer à l'augmentation du taux de détection des TPM+. La stratégie d'intervention a consisté à sélectionner, en partenariat avec les districts sanitaires, 15 associations de tradipraticiens afin qu'elles mènent des activités de références vers 15 Centres de Diagnostic et de Traitement de la Tuberculose (CDT) du Burkina. La première étape de mise en oeuvre du projet a été d'organiser des sessions de formation des tradipraticiens dans chaque district sanitaire par le médecin chef et le responsable du CDT. Des cartes de référence et de contre référence ont ensuite été mises à la disposition des associations afin qu'elles mènent les activités. Ce projet pilote permet d'établir un lien entre médecine traditionnelle et médecine moderne ainsi que de mettre en place un dispositif de dépistage précoce de la tuberculose en impliquant les tradipraticiens qui sont le premier recours au soin de la population burkinabé.

PS-61962-03 Tuberculosis control among the Roma in Romania: a community approach

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Purpose: Doctors of the World–USA (DOW) implemented a 2-year project to strengthen the implementation of the DOTS strategy in Roma communities. Romania has the largest Roma population in Europe; a population with greater poverty and long-term experience of human rights abuses.

Methods/results: The project created networks of stakeholders committed to improving Roma health and TB outcomes. Following a survey revealing poor TB knowledge in Roma, DOW trained forty Roma community members as Peer Health Educators (PHEs) to provide community based education on TB, identify potential cases, and encourage defaulters to complete therapy. PHEs carried out 480 education sessions, reaching 13 000 people in three months. Through PHE education sessions, 607 Roma community members with symptoms were tested for TB; 49 were positive. Over 450 contacts were identified and tested. PHEs provided DOT for 28 patients and provided treatment completion support for 69 people. The PHEs liaised between the health system and Roma community members to improve Roma access to TB care.

Conclusions: TB treatment for marginalized populations, if provided at the community level, can have greater involvement of community members and is a low-cost, high-yield strategy to strengthen TB control programs in a community with high TB rates. Involving members of marginalized communities in TB programs is an effective way to advancing NTP goals.

PS-62063-03 Accompagnement des PVV par leurs proches à domicile

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Description : Dans le cadre de la prise en charge médicale de PVV à domicile, nous avons promu le concept de «suivie sociale» pour mieux cerner les besoins de l'observance du traitement et y apporter des réponses adéquates (juillet à mars 2006).

Objectif : Evaluer lors d'un entretien personnalisé post counselling de la mise sous traitement les difficultés rencontrées par les PVV. Effectuer une enquête sociale auprès des PVV afin d'apprécier leur situation familiale et apporter une orientation en faveur de l'observance du traitement.

Activités réalisées et résultats obtenus : Méthodologie : organisation des entretiens avec des personnes vivant avec le VIH référées et nouvellement mises sous ARV :
1 Réalisation d'enquête socio-familiale pour les PVV ayant des indications du traitement ARV.

2 Recherche d'ONG de prise en charge pour des supports matériel et financier de PVV.

3 Recherche d'un accompagnateur familial pour l'observance du traitement.

Résultats : 105 PVV ont eu un entretien au service de soin à domicile. Les besoins recensés sont repartis ainsi :

- Plus de 50% de PVV entretenue sont sans emploi ou exerce une activité peu rentable et habite dans la famille.
- Toutes les PVV sont sous le traitement ARV.
- Plus de 50% de PVV qui habite en famille a un enfant moins de 18 ans.
- 80% de PVV avec accompagnement sont des enfants moins de 18 ans et observent bien leur traitement sous ARV.
- 20% des PVV avec accompagnement extérieur de la famille n'ont pas bien observé leur traitement.
- 100 PVV ont reçu un appui moral et financier de leur famille par l'ONG de prise en charge psychosociale.

Leçons apprises et étape future :

- Comprendre l'environnement et rechercher les solutions favorisant l'intégration dans la continuité du traitement.
- Bien expliquer les effets secondaires pour une bonne adhérence aux traitements.
- Les enfants suivent bien leur parent et les accompagnateurs dans leur traitement parce qu'ils ont un intérêt particulier.

DOTS EXPANSION-2

PS-61391-03 Quality of AFB microscopy in Bangladesh

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Aim: To assess the quality of AFB microscopy reading of microscopy centers of NTP Bangladesh.

Setting: National Tuberculosis Control Program Bangladesh introduced External Quality Assurance system by blinded rechecking of samples of smears in 2003.

Methodology: Analysis of quarterly EQA reporting format. The format was filled at EQA laboratories.

Results: The 22 EQA centers in the country cover all 635 peripheral laboratories. 5 of them for 3 years, 11 EQA centers for 1 year and 6 for less than 1 year. 18 (82%) EQA centers submitted quarterly report to NTP. Total 19 620 slides were checked during 3 quarters of 2005. Among the slides 2345 (12%) were positive, 180 (1%) were scanty and 17095 (87%) were negative. 31 (0.9%) slides were found false positive, 131 (0.8%) were found false negative and quantification error was found in 92 (3.4%) slides. Among the false positive

slides 22 (71%) were high false positive and 9 (29%) were scanty false positive. Among the false negative 79 (60%) were high false negative and 52 (40%) were scanty false negative. 1 microscopy center was found with more than 1 high false positive slide and 51 (8%) centers were found with more than 1 high false negative slide.

Conclusion: EQA is well established in Bangladesh. Continuing EQA system and regular supportive feedback is expected to enhance quality improvement of AFB microscopy.

PS-61392-03 Unfavorable outcome on 6-month regimen is less than that on 8-month regimen for smear-positive tuberculosis

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Background: NTP in Cambodia piloted 6-month regimen with RH in the continuation phase in 4 districts in 2004, 1 year prior to nationwide implementation.

Methods: We compared unfavorable outcome (sum of death, default, failure and transfer-out) on 8-month regimen in 2002–2003—(1st period) with that on 6-month regimen in 2004—1st Quarter 2005 (2nd period) at 4 pilot districts: 2 district as high HIV epidemic areas with more than 25% HIV-positive and other 2 as low HIV epidemic areas with less than 7% HIV-positive according to 2005 survey among TB patients.

Results: Unfavorable outcome among smear positive TB in the 1st period and the 2nd period was 15.2% and 10.7%, respectively in high HIV epidemic areas, while that was 7.0% and 4.5%, respectively in low HIV epidemic areas. That reduction in unfavorable outcome was mainly due to improvement in death and defaulter rate on 6-month regimen. However, such improvement in unfavorable outcome among smear-negative and extra pulmonary TB was not observed in either high or low HIV epidemic areas.

Conclusion: The 6-month regimen with RH in the continuation phase takes advantage in reducing unfavorable outcome among smear-positive TB. More detailed study including effects of ART for TB-HIV on treatment outcome should be necessary.

PS-61401-03 Assessment of first controller for AFB microscopy in Bangladesh

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Aim: To assess reading and evaluation capabilities of 1st controller of AFB microscopists in Bangladesh.

Setting: 1st controller plays an important role to improve quality of AFB microscopy. In Bangladesh, there are 22 EQA centers to serve as 1st controller. Laboratory technologists of 11 EQA centers were assessed during March 2006.

Methodology: 10 slides were assessed by senior technologists and laboratory consultant who act as 2nd controller. Then these 10 slides were provided to 11 participants to read and evaluate the slides. Six points were fixed to evaluate the slides, they are—specimen quality, staining, size, thickness, cleanness and evenness. The results of participants were assessed with standard result (result of 2nd controller).

Results: The mean of correct reading is 9.6 (95%CI 9.1–10.2, SE 0.24). 80% did exact same as standard. In case of smear evaluation six points were addressed. The mean of acceptable comment on smear quality is 8.5 (95%CI 7.7–9.4, SE 0.36), on smear thickness is 7.3 (95%CI 5.2–9.4, SE 0.94), on smear size is 7 (95%CI 5.7–8.3, SE 0.59), on evenness is 7 (95%CI 6–8.2, SE 0.5), on cleanness is 8.2 (95%CI 6.7–9.7, SE 0.7). The mean of agreement of staining quality is 6.5 (95%CI 5.1–7.9, SE 0.6).

Conclusion: Reading and evaluation capability of 1st controller of 11 centers are high-quality. This kind of assessment may increase confidence of NTP as well as laboratory technologists themselves.

PS-61474-03 Expansion of the DOTS strategy for tuberculosis control in the Dominican Republic

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Introduction: The Dominican Republic is included among 10 countries of the Americas as a TB high-burden country; TB control is a priority for the authorities. In 2000, 9% of the population was covered by DOTS; in 2002 the expansion began, with a cure rate of 60% and 48% of expected cases being detected. In 2003 66% (791) and 2005 77% (933) of the health establishments were applying DOTS, with an 80% population coverage.

Objectives: To measure the progress achieved in DOTS expansion.

Methods: Analyzed information was given by the System of Information of the PNCT comparing the information before and after initiating DOTS expansion.

Results: 80% of the population at the end of 2005 was covered by the DOTS strategy; symptomatic respiratory cases identified increased from 27 856 (2002) to 60 028 (2005), the percentage examined from 67% (2002) to 88% (2005), and 81% of expected cases were detected. The cure rate of new cases increased from 60% (2002) to 82.3% in 2004.

Conclusion: With the expansion of DOTS we expect to reach in 2005 the WHO goals of treating 85% of new cases and detecting 70% of expected cases.

PS-61497-03 DOTS implementation in Brazil: historical and regional particularities, 2005

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As of 1998, the implementation of DOTS takes place in Brazil as a strategy for TB control.

Objective: To analyze the implementation of DOTS in different Brazilian regions in 2005.

Methodology: The project was carried out in Brazil, in the states of São Paulo-SP and Paraíba-PB and in four state capitals in 2005 using qualitative and quantitative approaches. The data were collected from secondary sources (SINAN and EPI-TB) and through semi-structured interviews with Tuberculosis Control Program (TCP) coordinators from priority cities. The data were analyzed by descriptive statistics and content analysis thematic modality.

Results: The coverage of Supervised Treatment (ST) for the states are: SP (60.5%) and PB (62.5%). Strengthen in local health system: In SP state there was an effective TB laboratory network: 64% of the cities deliver sputum exam results within 24 hours, and have integrated DOTS to their local primary health system.

The barriers are: In the state of PB, insufficient laboratory network; in Rio de Janeiro, urban violence; in Porto Alegre resistance to ST; and, in Recife the difficulty to implement the ST in the Family Health Programs (FHP).

Conclusions: There are general constraints: a low commitment of the management with TB, discontinuity of TB coordinators, and a lack of preparation by the FHP team in terms of the ST implementation. Challenges: autonomy/power for making decisions in the TCP management and performing combined planning of the local strategies.

PS-61519-03 Review of strategic direction of the National TB Control Program of Bangladesh in line with MDGs

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Introduction: NTP conducted a 3 days workshop during March 2005 to develop the strategic directions for 2006–2010. Participants were from NTP and different NGO partners. Based on strengths, weaknesses, opportunities and threats (SWOT) analysis of individual organizations and identification of challenges NTP developed the strategic plan. The strategic plan was finalized and endorsed by the partners in the review workshop held on March 29 and 30, 2006.

Objectives: To review and finalize strategic plan prepared in 2005.

Methods: A total of 36 participants from 10 different organizations attended the workshop. Participants were divided into 3 groups and worked on 3 different objectives and 8 service delivery areas (SDAs), as identified in the 1st workshop.

Results: A comprehensive strategic plan was developed. Major activities and sub-activities were identified against each of the SDAs. Further, existing gaps were identified and complemented. Activities will be presented in detail.

PS-61524-03 DOTS strategy in FONAP: impact on tuberculosis control in the province of Azua

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Introduction: The province of Azua is a city of the South Region with a high percentage of poor people and was a priority for TB, because incidence TB rates were about 40–60 per 100 000 population. For the year 1999, 15% of the population was covered by DOTS, with a cure rate of 40% and 10% of expected cases detected. In 2000 expansion began, and in 2003, 100% of the health establishments were applying DOTS, with 100% population coverage.

Objectives: To measure progress achieved in DOTS expansion in the province of Azua.

Methods: Analyzed information was given by the System of Information of the Azua comparing the information before and after initiating DOTS expansion.

Results: 100% of the population of Azua at the end of 2003 was covered by the DOTS strategy; symptomatic identified respiratory cases increased from 674 (2000) to 2059 (2005), the number examined from 33% (2000) to 96% (2005), with 90% of expected cases detected. The treatment cure rate for new cases increased from 60% (2001) to 92% in 2004.

Conclusion: DOTS expansion in Azua is attributed to the implementation of the strategy in the first level health services with recourse to the Project Fondo United Attention Primary (FONAP). The expansion of quality DOTS is very important.

PS-61582-03 RNTCP DOTS in slums of New Delhi: a special strategy

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Introduction: Approximately 50% of total populations reside in slums of Delhi. Most are poverty stricken daily wagers. Incidence of TB high in slums. Default rate comparatively high since treatment is escaped for daily wages. Health Services not substantial matching the timings and distantly located. GLRA started DOTS services through DOT Volunteers in slums during 2005. **Objective:** To assess the efficacy of combined approach of slum DOT volunteers supplemented by appropriate IEC intervention.

Method: 13 slums of New Delhi identified. One slum volunteer identified from each slum. Cured patients were preferred as DOT Volunteers. DOT volunteers trained in Govt. recognized Training Centers and subsequently equipped with drugs and logistics and TB patients allotted from nearest microscopy centers. IEC using Interpersonal communication, street play, Printed material adopted.

Results: During last quarter 2005, total of 188 patients allotted to 13 centres. Default rate was reduced to 2.6%. Sputum conversion rate improved to 93%. Treatment adherence improved when supplemented with IEC using locally acceptable methods.

Conclusion: Flexible timing DOT service (including early morning and late evening DOT) from within the slum through trained slum volunteers combined with locally acceptable awareness methods has potential to improve TB treatment outcome among difficult population in urban slums.

PS-61588-03 Linking with civil society organisations to improve TB service delivery in peri-urban Lilongwe, Malawi

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Aim: To make TB care easily accessible to the poor by involving community-based organisations in service delivery in Area 56 of urban Lilongwe.

Project design: The intervention was designed through participatory approaches with community-based or-

organisations and policy makers at national and district level. A local sputum specimen collection centre was established. The community-based organisations are involved in conducting health promotion, raising TB awareness, identifying and referring chronic coughers to the sputum collection centre.

Results: Before the intervention an average of 56 TB patients/year were diagnosed in the area. In the first eight months of intervention, 83 patients were diagnosed. Preliminary findings from qualitative data indicate that the new referral system resulted in early case detection and treatment initiation. Collaborative working and community engagement has enhanced awareness of TB and need for early treatment seeking. Ongoing multi-method process evaluation will shed further insights on the strengths, weaknesses and replicability of this approach.

Conclusion: By linking with civil society organisations, intervention utilise resources that are easily available. Participatory approach creates community ownership and sustainability of intervention. The intervention has demonstrated that strengthening informal community-based organisations lead to high service utilisation, increased and early case detection.

PS-61605-03 Regional approach to LMIS development: experience from three countries in Central Asia

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Background: A logistics management information system (LMIS) is essential for maintaining a continuous drug supply for DOTS programs. LMIS provides continuous reports on drugs dispensed to patients, balances and stock losses and adjustments. In Central Asia Tajikistan, Uzbekistan and Turkmenistan have all adopted the LMIS design and implementation as priorities.

Objective: To use an LMIS design first implemented in another region of the former Soviet Union (Armenia) in CAR countries.

Methods:

- Using a common 'template' to start the design process; and
- Adapting to each country different needs.

Results: Lessons learned are:

- Each country made its own adaptations to the template.
- Formation of MOH working groups on drug management was essential for obtaining stakeholder input and building support.
- Developing and implementing national training strategies proved to be a major challenge.

Conclusion: The LMIS design first implemented in Armenia was efficiently used as a common 'template' in Tajikistan, Uzbekistan and Turkmenistan. Other regions and countries can benefit by considering the processes followed in three CAR countries.

PS-61733-03 DOTS implementation in TB programme, Carapicuíba City, Brazil

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Introduction: Tuberculosis (TB) remains a public health burden. Carapicuíba TB Programme was launched in 1998. The city introduced a TB Control Project in July, 2004 using the WHO-recommended, DOTS in response on the long stagnation in TB incidence and cure rates with assistance from USAID.

Aim: To present the incomes before and after DOTS implementation.

Methods: This is a descriptive research by 2 cohorts: cohort 1 (12 months before DOTS and self-drug-administration) and cohort 2 (12 months after DOTS).

Description of DOTS implementation: An extensive training programme was put into place. Time 0 was set as the calendar date when each general health services started the project. All public services started active TB case-finding for all with cough for longer than 3 weeks was done. Smear positive patients were referred and started the short course therapy (180 doses). The treatment was free and every dose of the regimen was observed (week days). Patients who did not come for their treatment were followed up at home. Incentives of food and transportation tokens were provided. Celebration of accomplishments with parties and certificates were also common.

Results and discussion: The Global target of cure was achieved by DOTS (Table 1). The benefits of DOTS expansion for the individual patient and for society were obvious, as many of the patients were cured, deaths averted, and drug resistance will be reduced.

Outcome	Cohort 01	Cohort 02
Completed treatment	138 (79.8%)	160 (85.6%)
Defaulted	23 (13.3)	11 (5.9%)
Death due to TB	3 (1.7%)	2 (1.1%)
Death due to not TB	1 (0.6%)	10 (5.3%)
Transferred	6 (3.5%)	0 (0.0%)
Diagnosis changed	2 (1.2)	4 (2.1%)
Total	173 (100.0)	187 (100.0)

$P = 0.0015.$

PS-61737-03 Effects of change in health care system on tuberculosis care

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Having more than one institution responsible for the management of TB patients leads to poorer cohort analysis, patient follow up. Until February 2005, our hospital operated a 'unique system', whereby it was required to manage patients to the end of their treatment once they had been registered with us. All TB patients in our care were obligated to attend our clinic

for monthly observation to obtain drugs and to extend their sick leave. In February 2005, our hospital administration was transferred from the Social Security Administration (SSK) to the Ministry of Health. Since then, our hospital has not been required to perform outpatient follow up, we moved to a 'dual system'. A study compared the diagnosis and management results of category I patients from the first 6 months of 2004, when our hospital was under SSK control, with the same period in 2005, included 5 months under the Health Ministry. From February 2005, patient follow-up has been conducted by a TB association, though our clinic also remains available for patients if they so wish. Before transfer, the cure and unknown outcomes rates were 88.69% was 10.43%, respectively. In the first 6 months of 2005 (which includes 5 months under new administration), the cure rate decreased to 56.64%, while the unknown outcome rate rose to 39.86%. Liaising between institutions resulted in a decrease in cure rates and an increase in unknown outcome rates. Unique system is important cohort analysis and patient follow up.

	Cure	Unknown outcomes	Failure	Death
Unique system	115 102 (88.69%)	12 (10.43%)	1 (0.86%)	2 (0.5%)
Dual system	143 81 (56.6%)	58 (40.55%)	1 (0.69%)	3 (2.09%)

PS-61740-03 Directly observed treatment strategy in Niğde province, Turkey

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Niğde is located in Central Turkey; has a population of 348 081; 64% is living in rural areas according to General Population Count in 2000. Directly observed treatment (DOT), started in 2003 and is executed successfully. This study will present tuberculosis control in Niğde province with 2004 data. In tuberculosis dispensary (TB-D), 2004 registered cases were 54; male patients were 37 (69%), new cases were 46 (85%), and extra-pulmonary cases were 20. With microscopic examination in the TB-D, 74% (25/34) of pulmonary TB cases were smear positive, microscopy were not done for 4 cases. DOT were given to all cases. Mostly by primary health centers (52%) with TB-D coordination; 11% by TB-D, 35% by family members and 2% by different personnel. Treatment outcomes evaluated; there were 92% (23/25) cure in smear positives; for all TB cases, there were 94% treatment success, 2% death and 4% transferred out. One TB case was detected with 114 contact investigations. Preventive therapy were given to 70 cases, 67 were contacts and 60 (86%) completed. With DOTS strat-

egy, our TB-D, had a higher cure rate than WHO target 85%. In addition to this, with contact investigation and preventive therapy practices, it has a comprehensive TB control service.

PS-61741-03 Directly observed treatment in Sakarya province and problems

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Sakarya Central Tuberculosis Dispensary serves approximately 500 000 people. We had seen irregular drug intakes, defaulters and relapse cases in the previous years. In April 2004 we started directly observed treatment (DOT). First we began DOT to relapse and problematic cases. In a short time we began DOT to all patients. With the help of primary health centers, we take the drugs to the most appropriate places for patients to swallow. Monthly controls are done in the dispensary. Our TB cases in 2004 were 154; 124 (80.5%) pulmonary, 108 (70.1%) male, 30 (19.5%) were 'old' cases and five of them were MDR-TB. Among pulmonary cases 102 (82,3%) were smear positive. Cure in smear positive cases were 60.8%, treatment success in all cases were 86%. DOT was used in 70 (45.4%) cases. Nine TB patients were detected from 390 contact investigations and 60 of the 67 preventive therapy completed. Some of our problems are, sharing patient data and laboratory results with other dispensaries and hospitals, patients' confusion about DOT when they go to other cities without DOT, lack of incentives and enablers, wrong treatment regimens started elsewhere. We are trying to solve problems with the patients with good communication. Applying DOT for all cases we are sure that they take their drugs and day after day we think we are carrying out a better tuberculosis control.

PS-61750-03 Reasons for tuberculosis treatment default, Republic of South Africa, 2002

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Background: In 2002, the reported tuberculosis (TB) rate in South Africa was 457/100 000, with 13–17% of patients reported to have defaulted from treatment. **Methods:** We conducted a national retrospective study to identify why patients defaulted from TB treatment. Patients who defaulted from treatment in 2002 were selected from eight provincial TB program registers by multi-stage sampling. Data were collected from

program records and patient interviews. We analyzed preliminary data from 6 provinces.

Results: Of the 764 defaulters initially sampled, 180 (24%) were located and consented to be interviewed, 154 (20%) were reported to have died, 113 (15%) were incorrectly classified as defaulters, and 317 (41%) could not be located or refused to participate. Among the 180 defaulters, 121 (67%) were male, the median age was 31 years (range 18–78 years), and 100 (56%) were employed. Reported reasons for defaulting included feeling better (27%), having no time for treatment (13%), taking pills for too long (12%), and a fear of losing one's job (12%). When asked about specific factors which influenced stopping treatment, 117 (65%) said that not having enough food to eat, and 66 (37%) said that not knowing enough about TB, influenced their decision.

Conclusion: In South Africa, mortality among defaulting patients is high. Interventions to strengthen the TB program to reduce the default rate and address patients' economic and social concerns are urgently needed.

PS-61761-03 Applying a management and organizational sustainability tool for TB control to strengthen the Dominican Republic's NTP

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Introduction: Dominican Republic is classified as a high-burden TB country in LAC by WHO/PAHO. Since 2001, DOTS coverage has increased in health services through case detection and improved efficiency of TB treatment; however the detection rate and treatment success rate are still below WHO targets. Factors hindering DOTS expansion are: lack of human resources and management capacity.

Objective: To adapt and pilot a process for improving the management of a NTP.

Methods: The USAID-funded RPM Pus Program, in partnership with Dominican's NTP, Global Fund and PAHO, have been working to strengthen managerial capabilities at the national and provincial level. MOST, a structured, participatory process that allows organizations to assess their management performance while developing and implementing a concrete plan, was adapted for use with NTPs. Facilitated by MSH, a MOST/TB workshop, attended by participants working at different levels of Dominican's NTP, was used to aid management development.

Results: Using MOST/TB, Dominican's NTP developed a baseline assessment of their management capacity, a set of performance improvement target indicators, and an action plan. Using the time table agreed

upon during the workshop, the action plan is now underway.

Conclusion: MOST/TB is appropriate for addressing management capacity issues challenging many NTPs.

PS-61762-03 Implementation of TB patient incentive program in Romania

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Overview: Treatment non-adherence remains a common challenge for controlling tuberculosis. In response, programs have implemented a range of initiatives, including incentives and enablers (I&E) schemes. Doctors of the World–USA (DOW), along with the Romanian Red Cross (RRC), managed an incentive program from 2004–2006 in Romania in Bucharest, Ilfov and Constanta.

Objectives: The primary objective was to establish incentive distribution for patients during the continuation phase.

Methods: Incentives were offered universally following an enrollment plan developed by the partners and the NTP. The maximum value of the incentives was 60 RON per month (US\$20). Monthly patient lists were compiled by the dispensary physicians at 12 sites. 109 RRC volunteers were recruited to distribute the vouchers: redeemable for food.

Results: There were 15 839 distributions to 4193 beneficiaries. The total incentives provided totaled US \$313 000. In addition, 14 250 pieces of educational materials were distributed as a form of education. On average, adherence compliance, as defined as attending scheduled visits and DOT sessions from 39.2% in Feb. 2005 to 89.9% in Feb. 2006. Treatment completion improvement has not been calculated by the NTP. **Discussion:** This project demonstrates that an incentive distribution in the form of vouchers motivates some patients and can increase TB adherence. Resources to support a universal program, however, will require a considerable investment and may not be sustained.

DOTS: PUBLIC-PRIVATE MIX-1

PS-61038-03 Private-public mix in Lebanon

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Health care system in Lebanon: Mainly private. Diagnosis of TB patients is made in 70–90% by the private sector. Treatment of all TB cases takes place in the NTP, as a public sector. Cure success rate 92%. Detection rate 72%.

Survey: A total of 152 private physicians of different medical specialties were interviewed on TB control subjects. Pediatricians and pneumologists represent each 1/3 of the group. Family medicine, infectious diseases and general medicine doctors represent the other 1/3 group. About 46% of all respondents had diagnosed at least one TB case in the previous 12 months. 74% of practitioners would attempt to manage a TB case themselves. Cough is the most common symptoms mentioned in 60%. Sputum analysis is recommended (75%) for diagnosis and follow-up of pulmonary tuberculosis. For close contact, 95.5% recommend chest X-rays. The treatment regimen adopted in Lebanon is fully implemented by those who had diagnosed at least one TB case in the previous year. 70% declared having full confidence in the national TB program. Interest in obtaining additional TB training is approved by 57% of those interviewed.

Recommendations: Continue and maintain a good relationships and coordination with all physicians. Prepare new meeting with practitioners who are involved in the TB control.

PS-61058-03 Comparative study of hospital-based DOTS and community-based DOTS in relation to treatment outcome

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Aim: To compare the treatment outcome of two health facility of DOTS, a hospital based public-private mix DOTS (St. Paul Hospital, Iloilo City PPM-DOTS) and a community based DOTS (LaPaz, Iloilo City) in relation to treatment outcome.

Methods: This is a 2 year descriptive study design of 2 health facility, a hospital based PPM-DOTS and a community based DOTS from April 2003 to April 2005 in relation to treatment (tx) outcome. Subjects were identified from the National TB Control Program (NTP) Registry Logbook.

Results: Five hundred fifty (550) were included in the study, 190 subjects were from St. Paul Hospital (SPH) and 360 subjects were from LaPaz Health Station. SPH had a 67% cured rate, 25.7% tx completed, 2.6% died, 2.6% failure rate, and 2.1% trans out, while LaPaz Health Station had a 59.4% cured rate, 38.9% tx completed, 1.1% died, no failure rate, and 0.6% trans out. Both health facility had no defaulter and both has a significant tx outcome, although SPH has a higher tx outcome, no significant difference was noted as exemplified by the *P* value of 0.000 for SPH and 0.009 for LaPaz Health Station.

Conclusion: It is concluded that both health facility has a significant tx outcome. DOTS strategy ensures tx compliance and complementation of both public and private sector will yield a better treatment outcome. Males (71.6%) are affected more than females

(28.4%). The majority of the afflicted ranges from 21 to 60 years old.

Table 1 Frequency distribution of subjects according to their characteristics in both health stations

Characteristics	Frequency	Percentage
Sex		
Male	394	71.6
Female	156	28.4
Total (<i>n</i> = 550)	550	100.0
Age, years		
≤20	44	8.0
21–40	207	37.6
41–60	244	44.4
≥61	55	10.0
Total (<i>n</i> = 550)	550	100.0
Health facility		
SPH	190	34.5
LaPaz	360	65.5
Total (<i>n</i> = 550)	550	100.0
Treatment outcome		
SPH		
Cured	127	67.0
Tx completed	49	25.7
Died	5	2.6
Default	0	0
Failure	5	2.6
Trans out	4	2.1
Total (<i>n</i> = 190)	190	100.0
LaPaz		
Cured	214	59.4
Tx completed	140	38.9
Died	4	1.1
Default	0	0
Failure	0	0
Trans out	2	0.6
Total (<i>n</i> = 360)	360	100.0

PS-61073-03 Lessons learned from public-private mix (PPM) DOTS in Cambodia

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Objectives: To describe the implementation process, lessons learned and recommendations for PPM DOTS scaling-up in Cambodia.

Background: Based on private sector study results done by NTP/URC and funded by USAID, under the direction of NTP, public-private mix (PPM) partnership strategy was developed and approved by MOH. It has been implemented by NTP supported by URC in Battambang province, Cambodia.

Methods: MOH/NTP and URC/USAID have developed a comprehensive approach to strengthen public and private sectors to improve quality of TB DOTS services. Training of private providers on identification of TB suspects, ability to provide good screening services to TB suspects and refer them to TB DOTS network services and strengthen management capacity of the PHD and the OD and referral linkages, are some key activities presently being implemented.

Results: After implementation of the project for six months 181 TB suspect clients have been referred by the private providers, 91 were received at TBDOTS public network services and all of them had smear examinations. A total of 35 TB patients were diagnosed. Of them, 20 were sputum positive, 6 pulmonary TB smear negative and 9 extra pulmonary cases.

Conclusions: PPM reduces TB diagnostic delay and increases case detection rate. Strong support from NTP and collaboration among key partners sped up the implementation process. The involvement of private doctors in treatment is recommended in order to catch all TB suspect and TB clients.

PS-61125-03 Role of GRECALTES in strengthening the RNTCP through public-private mix and community involvement

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Introduction: GRECALTES is a NGO in the metropolis of Kolkata covering a population of 15 million, sponsored by German Leprosy and Tuberculosis Relief Association. The role of GRECALTES is very noteworthy in case detection and treatment efficiency through Public Private Mix.

Objective: To strengthen case detection and DOTs expansion through Public Private Mix and Community Involvement for better lung health.

Method: 1) GRECALTES took its initiative to establish DOTs center and Microscopy Center in two renowned Government Hospitals of Kolkata, B. R. Singh Railway Hospital and Sambhu Nath Pandit State General Hospital. Both the Microscopy Center and DOTs center are being run by GRECALTES under the supervision of Kolkata Municipal Corporation. 2) Need based information, education and communication to mobilize human resources for better lung health.

Results: Performance of Microscopy Centers of two hospitals. Result of Outdoor of Sambhu Nath Pandit State General Hospital for the year 2004 and 2005. All cases are put in DOTs. See Table.

Conclusion: NGO involvement in RNTCP DOTs program is raising the effectiveness of TB control program by strengthening the human resources for better lung health.

Quarter	TB suspects examined for diagnosis		TB suspects found positive	
	2004	2005	2004	2005
1st Qtr	69	176	12	28
2nd Qtr	111	180	21	22
3rd Qtr	141	199	37	26
4th Qtr	133	192	25	18
Total out-patients	454	747	95	138
Total in-patients	155	331	51	10

PS-61153-03 Improving TB outcomes in Phuket through DOTS, public-private mix: the Thailand TB Active Surveillance Network

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Background: WHO's 2nd Global Plan to Stop TB advises countries to strengthen public sector TB control, while partnering with the private sector. Few successful models have been reported.

Method: In Phuket, Thailand, we negotiated agreements with all 3 public and 3 private hospitals to collect standardized data about all persons diagnosed with TB. In public facilities, we encouraged directly observed therapy (DOT).

Results: From 10/04–9/05, we identified 512 new TB cases, 106 (21%) from the private sector, for a TB case rate of 181/100 000, 15% greater than the previous year's estimate in which only public sector cases were reported. In the public sector, we increased the proportion of patients receiving DOT from 44% in the previous year to 85% ($P < 0.01$). For new, smear-positive cases, the sputum conversion rate increased from 82% to 84% and treatment success rate from 68% to 70%, but the changes were not statistically significant. In the private sector, in which only 2 (2%) patients received DOT, the sputum conversion rate was 55% and treatment success rate 41%. Public sector patients were more likely than private sector patients to have sputum conversion (Odds Ratio [OR] 7.3; 95% confidence interval [CI] 3.2–16.3) and treatment success (OR 3.3; 95% CI 1.3–8.3).

Conclusions: Collaboration between public and private sectors increased case finding and allowed comparison of program outcomes. Efforts are needed to improve treatment outcomes in Phuket, particularly in the private sector.

PS-61197-03 Tuberculosis control in mega cities: Dhaka, Bangladesh

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Introduction: TB expansion in big cities is complex. Considerable number of private health sector provides services which continue to form the largest burden of disease. Private providers often to be the first and only contact for over 60% of patients with TB. Their role is particularly important since detection and cure remain the major interventions for reducing disease transmission.

Objectives: Implement initiatives and expand DOTs.

Methods: Analysis of operational research to implement and expand DOTS. DOTS implementation and expansion in Dhaka city through involvement of NGO general health services, PPM initiatives, academic institutes and in prisons.

Results: During 2002–2005 the number of microscopy centers increased from 2 to 41 and the number of DOT facilities from 2 to 80. During 2002 94% of the patients were reported by 2 Chest Disease Clinics, during 2005 59% were reported through NGO network. Case detection increased from 28% in 2002 to 60.66% 2005. During 2002–2005 DOTS was expanded to prison, academic institutes, private hospitals and PPM was initiated. Results will be presented.

Conclusion: Involvement of public-public, public-private in TB control is essential in big cities.

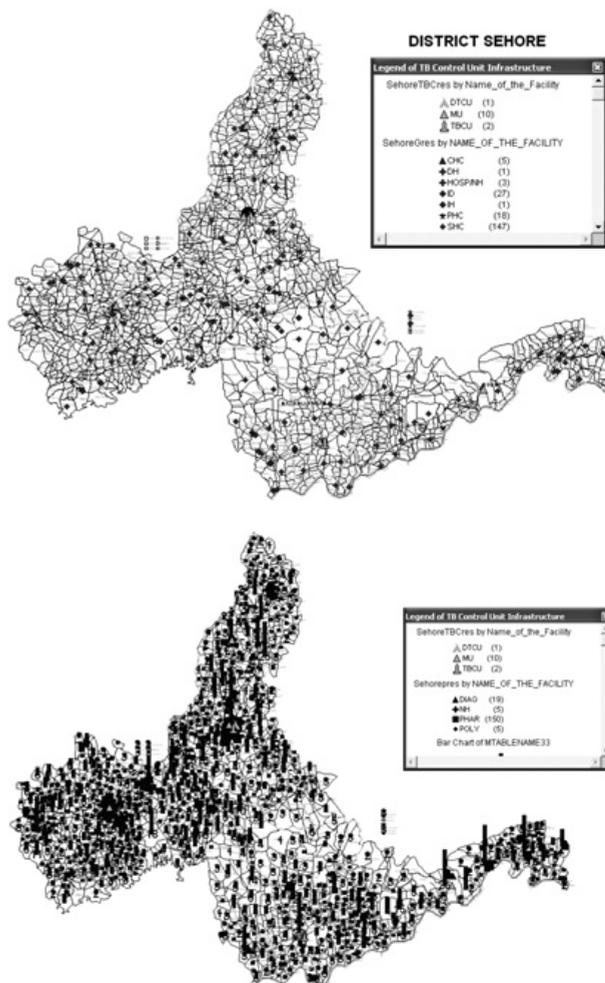
PS-61209-03 A geographic information system in Madhya Pradesh, India: mapping DOTS and the public private mix

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The development of a computerized Geographic Information System (GIS) in Madhya Pradesh, India, mapping the following is described:

- 1 Location of DOTS program infrastructure and the performance of each facility
- 2 Public and private health infrastructure in each village
- 3 Village-wise—socio-demographic data, vital statistics, health program indicators

Madhya Pradesh, a province in Central India has a population of 60.4 million people. It covers a land area of 308 000 km². 73% of the population is rural. Information for all 56 000 villages in 48 districts has been mapped onto the GIS. A cross sectional survey across the province was done to collect data on (b). Secondary data was sourced for (a) and (c) from the Department of Health. The outputs are presented in the attached figures. The mapping of private and public health care provision in the province provides an empirical data base of the large heterogeneous private sector (80% of health care in India is by the private sector). This is a first step towards establishing public private partnerships for TB control. Visualization of DOT program units and their performance, in the context of the surrounding health infrastructure provides a) the opportunity to build partnerships; b) reporting linkages; c) view TB specific indicators against the backdrop of socio-demographic and vital statistics of the villages in the catchment area.



PS-61299-03 Introducing a PPM-DOTS model in Phnom Penh, Cambodia

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Background: Because 75% of TB suspects in Cambodia first seek care in the private sector, the NTP and its partners—CENAT, JICA, PATH, the Pharmacists Association of Cambodia (PAC), and the Phnom Penh Municipal Health Department—piloted Phase 1 of a program using private providers to increase TB case detection.

Objectives: To increase TB case detection and strengthen public-private partnerships in TB control.

Design: A pilot was implemented in 129 private pharmacies and 67 private clinics in two operational districts (ODs) of Phnom Penh between July 2005 and February 2006. Activities included establishing a TB PPM working group; developing standardized referral forms; developing training and IEC materials, training 351 private sector providers and conducting monthly monitoring and data collection visits.

Results: From July 2005 to February 2006, 454 TB suspects were identified and referred to public DOTS facilities. Among them, 228 (50.2%) presented for evaluation. Of those, 172 (75.4%) submitted sputum for examination and 12 (7.0%) were diagnosed as smear-positive pulmonary TB, 10 (5.8%) as smear-negative pulmonary TB, and 4 (2.3%) as extra-pulmonary TB. **Conclusion:** In pilot sites, private providers contributed to increased numbers of suspects presenting to public health facilities for evaluation and to cases detected. With improvements in the referral process to decrease those lost to follow-up, the private sector in Cambodia can become an important partner.

PS-61379-03 Analysis of referral TB patients reported by non-TB dispensaries from 2004 to 2005, Guangxi

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Objective: Evaluate the cooperation and correspondence situation between Tuberculosis (TB) dispensaries and other general medical and healthy organizations in 2004 and 2005.

Method: Analyze and compare the rates of referral, tracing, total patients appeared, who were reported by general medical and healthy organizations through internet and traced by tuberculosis dispensaries, and their influence to case-detection.

Result: The rate of referral patients appeared who were reported by general medical and healthy organizations through Internet increased from 38.36% in 2004 to 42.72% in 2005. The gap between Guangxi and the average of China decreased from 4.42% to 1.04%. The rate of patients appeared traced by TB dispensaries increased from 40.65% in 2004 to 49.64% in 2005. The gap between Guangxi and the average of China decreased from 9% to more than 2.34%. The rate of total patients appeared increased from 50.89% in 2004 to 63.47% in 2005. The gap between Guangxi and the average of China decreased from 7.92% to much at one. The case-detection rates of new sputum smear positive increased from 68% in 2004 to 81% in 2005.

Conclusion: After implementing integrated intervention measures, and criterion of case register, report, referral and track, the case-detection rate of Guangxi increased significantly. But the cooperation between general medical and healthy organizations should be strengthened further.

PS-61400-03 Strengthening human resources to increase performance of urban TB control in Bangladesh

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Introduction: National Tuberculosis Program has expanded DOTS in 6 City Corporations of Bangladesh in 2004.

Objectives: To increase accessibility of DOTS services and increase performance in urban areas.

Methods: DOTS services are provided with other health services in NGO health centres. TB focal persons were deployed to coordinate the activities. As staff turn-over is very high in most urban health facilities, training of new staff and refresher training of existing staff are conducted regularly. Advocacy workshops were conducted for professional institutes, and private practitioners. Community awareness campaigns were conducted in slums and under-served areas. Flexible and patient friendly mechanisms were adopted for better treatment adherence by engaging community health volunteers for DOT provision. The referral system was strengthened and coordination meetings have been conducted regularly.

Results: During 2005 a total of 7913 new smear positive, 1171 relapse, 5320 smear negative pulmonary, and 2907 extra-pulmonary TB cases were diagnosed. The case detection rate for new smear positive increased from 55% in 2004 to 60% in 2005. Sputum conversion rate has increased from 86% to 89%. The treatment success rate was 78% in 2004.

Conclusion: Strengthening human resources along with advocacy and increased community awareness activities can improve performance of urban TB control. Treatment success needs improvement.

PS-61452-03 Public-private partnership: a need in TB control, New Delhi: a comprehensive study

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Objective: To assess the quality of TB services provided by private practitioners (PPs) in Northwest Delhi slums.

Method: 120 PPs interviewed. 50% were qualified and 50% were Quacks.

Result: 103 PPs out of 120 (86%) treat chest symptomatic for average of 2 months symptomatically with cough syrups/antibiotics, then refer if no relief to patient.

25 PPs out of 103 (24%) had TB patients under treatment at the time of interview. None followed supervised DOTS.

6 PPs out of above 25 (24%) does absentee follow up only once. Rest 76% does not follow absentee retrieval.

All PPs (25) treating TB patient educate patient on regularity/duration of treatment. None counsels on follow up investigation, chemoprophylaxis, drug side effects, sputum disposal and contact screening.

5 PPs out of 25 (20% appx) treating TB rely on sputum examination for diagnosis, rest 80% prefers CXR.

5 out of 103 PPs (4.8%) treating chest symptomatic—not aware of Govt TB control program

Conclusion: Most PPs in slums are barrier to early detection increase average lag time in reporting to Standard DOTS. National TB guidelines not practiced due to lack of awareness. So, PPs needs to be involved as stakeholder under public-private mix

PS-61489-03 Cost and cost-effectiveness of intensified public-public and public-private mix DOTS in Bangalore

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Objective: To assess the cost-effectiveness of intensified Public-Public and Public-Private Mix DOTS (PPM-DOTS).

Setting: Bangalore, India. Intensified PPM-DOTS scale-up which initially focused on medical colleges, and subsequently then targeted a wide range of providers.

Methods: Costs and cost-effectiveness before and after PPM-DOTS implementation were compared. Costs from diagnosis onwards were analysed in year 2005 prices from a societal perspective (i.e. public sector, private provider and patients/attendant costs were considered). Effectiveness was measured as the number of cases successfully treated.

Findings: With intensified PPM, total costs and the number of cases treated under DOTS increased while the average societal cost per patient treated fell from US\$123 to US\$87. The provider cost (i.e. public sector and private provider costs) per patient treated fell from US\$87 to US\$63 (and to US\$56 for the public sector specifically), mainly because of the relatively low start-up costs for implementing PPM. The societal cost per patient successfully treated was US\$108 before PPM and US\$79 afterwards.

Conclusion: There is a strong economic case for PPM intensification and scale-up in Bangalore and similar settings in India.

PS-61513-03 Defects of private practitioners in TB management

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A study was conducted on 63 private medical and chest specialists of Dhaka city in 2003 to judge their knowledge, attitudes, practice and behavior on TB management through a WHO questionnaire for implementation on a Public-Private-Partnership Pilot Project. The study shows that there is no uniformity amongst them in diagnosis and treatment. The system of recording, reporting and follow-up is almost absent. They did not follow National guidelines. The physicians used nineteen different types of tests for diagnosis. The treatment regimen is also not uniform. Fifty-nine physicians prescribe HRZE for initial intensive phase as followed by NTP but treatment regimen in the continuation phase and duration of treatment are quite variable. For treatment success most of them examine their patients only in the last month. The situation in other developing countries may be the same. The observations suggest that involvement of private practitioners into TB control activities in urban areas are crucial for introduction of uniform TB management system in the developing countries. This will help NTP to increase case detection rate and decrease occurrence of MDR-TB. This can only be efficiently done by an independent organization otherwise the control of TB will remain as a dream.

POLICY AND PROGRAMME IMPLEMENTATION: OTHER-2

PS-61636-03 Development of national tuberculosis communication strategies in Central Asia

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Background: Building on strong relationships with National Tuberculosis Programs in the CAR, the Project HOPE Consortium developed National TB Communication Strategies (NCS) to encourage greater coordination among key stakeholder agencies and to build capacity of key policy and implementing actors through a program of technical assistance, training, and hands-on learning.

Objective: To use communication, advocacy and social mobilization to support and enhance the existing components of the DOTS program for maximum impact on national tuberculosis indicators

Method:

- KAP study among health providers and TB patients to prepare an analysis of the different target groups for TB communication.

- Formation of a multi-sectoral IEC Thematic Working Group for Tuberculosis
- Implementation of a 3 day workshop to initiate the design of NCS
- Evaluation of existing TB IEC materials to determine appropriateness of the messages in regards to target groups.

Results: NCS were developed to guide and coordinate integrated, comprehensive communication activities addressing prioritized audiences for tuberculosis prevention and control. The TWGs will continue to meet to coordinate and monitor activities. The NCS will act as a living document, to be adapted in response to new research and circumstances.

Conclusion: A strategic approach to designing and implementing IEC/BCC activities, can contribute greatly to reaching the overall goals of the National TB Program.

PS-61693-03 Advocacy for TB in Russia as a tool to strengthen commitment and mobilize the community

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Introduction: Due to complex TB situation with high incidence, MDR and growing TB-HIV rates, Russia needs active involvement of informed society to ensure high profile of TB on the national agenda. WHO TB Control Programme undertakes continuous efforts to strengthen advocacy and communications capacities in Russia.

Objective: To mobilize broad strata of society and generate stronger political commitment in Russia

Results: Through such effective mechanisms as High-Level Working Group (HLWG) and TB Interagency Coordination Committee (TB-ICC) the staggering progress was made in raising awareness and gradual changing national policy, strengthening commitment and mobilizing resources. Effective co-operation with governmental structures and non-governmental organizations was established. Partnering agencies run annual advocacy campaigns, including World TB Day with press conferences, contests and workshops for media, poster competitions for children and forums for TB patients that allow strengthening media and societal partnership. This together with all stakeholders mobilized through Global Fund to Fight AIDS, TB and Malaria and World Bank projects ensure an enabling environment for sustainable growth of advocacy countrywide.

Conclusion: Continuous efforts need to be undertaken to broaden a coalition of stakeholders to foster political will and mobilize resources on a sustainable basis. This will ensure irreversible progress towards a Russia free of TB.

PS-61332-03 TB case finding in two Oblasts of Uzbekistan

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Introduction: Uzbekistan is in the process of revising its TB control policy. Currently DOTS and the old Soviet system exist in parallel. To inform the process of developing a new policy, a study on case finding was conducted in two Oblasts.

Subject of study: Active case finding is still routine in Uzbekistan but doubts exist about its reported effectiveness. Risk groups targeted are very broad and include an estimated 50% of the population, as a result coverage is incomplete. A random sample of 85 pulmonary TB patients was interviewed and had its records reviewed. The main study question was: 'By what method have these patients been diagnosed with TB'; as a result of mass screening, or because they had sought healthcare at their own initiative. Information on risk factors for TB was also collected.

Results: Of 85 patients interviewed, 11 (13%, CI 7–22%) indicated that they had been diagnosed through active case finding. The remaining 74 patients had all been diagnosed with TB while seeking care for symptoms at their own initiative. Most common risk factors found in the study were 'concomitant other disease' (COPD 10 cases, Diabetes 5 cases, Peptic Ulcer 3 cases) and 'contact of a TB patient' (8 cases). Out of 26 patients with these risk factors, only 2 had been identified through active case finding.

Conclusion: The screening policy needs revision. TB screening needs to be restricted to a small number of well defined target groups, which need to be covered completely.

PS-61343-03 Improved treatment adherence through community-based DOTS-Plus

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Background: A clinic-based DOTS-Plus for the management of multidrug-resistant TB (MDR-TB) patients in Makati, Philippines has been approved in 2000 by the Green Light Committee (GLC).

Objective: To determine the impact on treatment adherence and outcome of MDR-TB patients on community-based care.

Materials and methods: This is a descriptive study of initiating a community-based TB care program among MDR-TB patients seen at the Makati Medical Center (MMC) DOTS Clinic from September 2003 to December 2005.

Results: After appropriate coordination with the Na-

tional Tuberculosis Program (NTP), local government health units implementing DOTS, faith-based organizations and non-government organizations (NGOs) providing community-based health services, a series of training courses for various health care workers was undertaken. Seventy-two of 359 MDR-TB patients enrolled from June 2001 to September 2005 were endorsed to community treatment partners (CTPs). Monthly visits and weekly phone calls were done by a supervisor. A significant increase in cure rate and significant decline in default rate among patients endorsed to CTPs were observed.

Conclusion: Community-based implementation of DOTS-Plus is feasible in Metro Manila, Philippines. Continued close monitoring is essential in assuring that DOTS-Plus services are properly implemented by CTPs. A significant improvement in treatment adherence among MDR-TB patients underscored the benefit of community-based DOTS-Plus.

Outcome	Community-based* (n = 32) (40 ongoing treatment)	Facility-based* (n = 172) (115 ongoing treatment)	All patients (n = 205) (154 ongoing treatment)
Cured	27 (84.4)*	93 (53.8)†	120 (58.5)
Failed	2 (6.3)	8 (4.6)	10 (4.9)
Defaulted	2 (6.3)‡	43 (24.8)‡	45 (21.9)
Died	1 (3.1)	28 (16.1)	29 (14.1)

* Overall $\chi^2 P = 0.03$.

† $P = 0.01$.

‡ $P = 0.01$.

PS-61385-03 Analysis of human resources in TB control in Zhejiang

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Objective: To understand the human resource situations about TB Control in Zhejiang.

Methods: The latest data, obtained by questionnaire, were analyzed after classification by dynamic series and χ^2 test.

Results: Among all the professionals in city and county level, 24.6% has bachelor degree and above, 41.3 of them qualify lower degrees. The professional title of the professionals studied distributed mainly in junior and middle level. According to the NTP in China, 90.9% CDC have less than 10 positions. 35.7% county CDC lack of professionals in diagnosis and treatment. 58.3% lack of lab professionals, 76.2% lack of monitoring professionals. 77.4% lack of professionals for patient management. 73.9% of all the professionals can master their skills efficiently with 12.5 of them know basic English.

Conclusion: The staff in the CDC in Zhejiang have satisfying skills, which is a index of the CIDA/WHO training program. However, this still can not meet the needs. A construction of professional team needs to

be strengthened, stimulating mechanism needs to be perfected to encourage the professionals. Build up the system in countryside, recruit and train volunteers to relieve the tension of human resources.

PS-61404-03 Initial defaulting in adults and children: quantifying the gap and identifying reasons for it

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Background: Initial default rates of 8–18% have been documented, but reasons for initial defaulting are unknown.

Objective: To assess the proportion of individuals diagnosed with bacteriologically confirmed TB who did not start treatment and to detect reasons for initial defaulting.

Methods: A retrospective descriptive study was done using data from centralized laboratory registers (2nd quarter 2005) and Electronic TB treatment registers (ETR) (2nd and 3rd quarters 2005). The number of people with bacteriologically confirmed TB, who were not recorded in the ETR (initial defaulters) were recorded in 10 clinics in the Western Cape, South Africa. Initial defaulters were interviewed on reasons for initial defaulting.

Results: There were 4477 samples from 2835 TB suspects of whom 262 were TB cases. Of these, 52 (20%) could not be traced in the ETR of the same clinic. Twenty-four of these started treatment at another clinic and 28 (11%) were true initial defaulters. Reasons for initial default included death, moving to other areas without starting treatment, untraceable and denial of diagnosis.

Conclusions: A large proportion of initial defaulters were found. TB patients should be encouraged to take responsibility for their health by being tested for TB and to return to the clinic for results.

PS-61446-03 Tuberculosis in Recife-PE, Brazil: results of treatment and case detection, 1995–2003

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Recife, capital of the State of Pernambuco, in the Brazilian Northeast, is one of the fifteen priority cities in the fight against tuberculosis.

Objective: To analyze tuberculosis treatment results (cure and abandonment) and case detection between

1995 and 2003—using secondary sources (National Disease Notification System—SINAN and LAB-TB—database on laboratory results of tuberculosis cases).

Results: Cure rates increased (52% to 77.7%) between 1995 and 1999 and then decreased to 64.7% in 2003. Abandonment levels in the study period ranged from 12.5% to 18.3%. The number of cases detected between 1995 and 2001 decreased from 101% to 93.9% and, between 2002 and 2003, increased from 106% to 128.5%. Treatment results can be explained by the absence of supervision/monitoring of actions; high number of cases from neighboring cities and reduced political support from local management. The high percentage of detected cases can be related to a late diagnosis of cases that were not discovered earlier. The implantation of the DOTS strategy needs to be expanded through efficient supervision, follow-up and assessment mechanisms.

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PS-61455-03 DOTS strategy: survey of Brazilian scientific production, 1998–2005

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Aim: To survey scientific production about the DOTS strategy (political commitment, case detection, supervised treatment, case notification and laboratory support).

Method: We selected articles and abstracts about operational research related to the DOTS strategy in Brazil, published in Portuguese, using the electronic databases LILACS and SCIELO. We established inclusion and exclusion criteria to select the bibliography and elaborated a data collection instrument. Data were stored in an EXCEL database. The following descriptors were used: tuberculose, tuberculosis, directly observed therapy, terapia diretamente observada, terapia por observación (indexed), DOTS and supervised treatment (not indexed).

Results: We found 11 abstracts from LILACS, 9 (81.8%) of which were from journal articles and 2 (18.2%) from dissertations. Six full journal articles were found in SCIELO, 5 (83.3%) of which discussed supervised treatment and 1 (16.7%) registration and information system.

Conclusion: We found a small number of scientific articles and dissertations about DOTS in Brazil, which show that only one of the strategy's components, that is, supervised treatment, is privileged. A broader understanding of the strategy is needed.

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PS-61463-03 Gender and tuberculosis in five health districts of West Africa

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Settings: The magnitude of tuberculosis (TB) may not reflect enough gender differences. To assess gender differences and reasons concerning the TB care, a survey involved 4 West African countries in 2003.

Methods: Quantitative data from 2000 to 2002 were extracted from TB patients files in the health districts (HD) of Kita (Mali), Dosso (Niger), Comé (Benin), Ziniaré and Kaya (Burkina Faso). The organisational and behavioural information came from 60 TB women interviewed (15/HD) and a focus group discussion involving 8 women health care providers (2/HD).

Results: We do not observe any significant gender difference concerning cure rate, death rate and the regularity to treatment. The under detection (1 woman for 2 men) and the level of the stigma induced by TB gave gender differences. The main factors influencing the care seeking behaviour among women were the low access to the household resources in general and the high stigma felt by TB patients. 89% of the interviewed women asked the information to prevent TB and a better access to household resources.

Conclusions: As far as TB and gender are concerned, the case detection only puts women at the disadvantage. Nevertheless, an holistic approach is imperative to improve the situation.

PS-61465-03 Treatment adherence and defaulter status in TB treatment BRAC supported area

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Introduction: BRAC has been implementing community based TB programme in rural and urban areas of Bangladesh. The main aim is to involve community health volunteers to ensure treatment adherence. They ensure DOT, follow up sputum examination and defaulter tracing. If the patient fails to take drugs, health volunteers visit the home, identify the causes and ensure treatment

Objective: To identify the defaulter status in TB treatment by urban and rural settings to improve the treatment outcomes.

Methods: Treatment outcome of all patients registered in 2004 both in rural urban areas was analyzed using cohort analysis method. Data was taken from the programme MIS and compared for urban and rural areas by different types of cases.

Result: Of the total cases (50 252), 930 were defaulted (1.85%). Of them, 1575 (3.1%) from urban and 48 677 (96.9%) was from rural area. The defaulter rate in urban and rural areas was 2.73% and 1.82% respectively. The defaulter rates were 1.64%, 4.31% and 2.51% for new smear positive, retreatment cases and smear negatives respectively.

Conclusion: Along with community health volunteer approach, public private approach could be explored for further improvement of treatment adherence in special area such as urban and retreatment cases.

PS-61466-03 The situation of TB control (advances and difficulties) in the implantation of DOTS in Porto Alegre, RS, Brazil

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The city of Porto Alegre has a population of 1 394 000 inhabitants. In 2003, tuberculosis incidence corresponded to 120.72/100 000, with an default rate of 18%. This study aims to identify difficulties and advances in the implantation of the DOTS strategy in this priority city, using semistructured interviews with key persons in the fight against TB in the place. In the 1990's, a change in the epidemiological situation occurred as a result of TB-HIV co-infection, destructuring of the basic network, worsening of socioeconomic conditions and of the prison situation. Barriers to DOTS implantation were: resistance to the incorporation of DOTS by TCP (Tuberculosis Control Program) professionals coordinators, due to the belief that the results of self-administered treatment could improve again; and lack of human resources to work in the TCP. With respect to advances, we identified the commitment of social organizations in the city, which are carrying out DOTS, to follow street dwellers registered in their programs in 2005.

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PS-61473-03 Organizational aspects of respiratory symptomatic search for tuberculosis control, São Paulo State, Brazil, 2005

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This study aimed to analyze the Respiratory Symptomatic Search (RSS) as a detection strategy of Tuber-

culosis cases. The study population consisted of 22 coordinators of TB Control Programs from priority cities to control TB for controlling this disease in São Paulo State. Data were collected through semi-structured interviews and analyzed through thematic content analysis. The theme was 'Organizational Aspects of the Respiratory Symptomatic Search'. Results showed that the RSS is carried out at Basic Health Units in 59% of the cities and in Family Health Programs in 23%. This results demonstrates that this activity is accompanying the decentralization process the health sector has been going through in Brazil. In most cities, the RSS is performed as a routine activity in health services. However, often, this routine is only directed at these services' spontaneous demand. In some cities, this activity is still the responsibility of one single health professional or linked up with medical appointments, instead of a responsibility for all professionals. Moreover, in 64% of the cities, sputum smear results are available after 24 hours at most. This stands out due to the strong organization of the laboratory network and strengthens the RSS.

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PS-61486-03 The DOTS Strategy for tuberculosis control in Sao José do Rio Preto-SP, Brazil, 2000–2005

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This study aimed to describe the experience of implanting the DOTS strategy for Tuberculosis control in São José do Rio Preto-SP. Descriptive study using secondary information sources, by means of a specific instrument with questions. The percentage relations between new pulmonary TB cases presenting positive sputum smears and abandonment, cure, death and detection rates from 1998 to 2003 indicate a decrease in abandonment and case detection levels, as well as a rise in cure and death rates. As from 2005, there has been an increase in political commitment to the implantation of the DOTS strategy through the hiring of health agents, specific training for professionals and the start of the decentralization of Supervised Treatment to Basic Health Units and Family Health Teams. The rise in TB deaths may be related to three factors: predominant age range over 50 years old; TB-HIV coinfection and associated diseases. When reconsidered at a macro management level, Tuberculosis control issues require a progressive improvement in the

population's living conditions and the adoption of intersectorial health promotion and surveillance measures, as taken by the municipal government during this period, which are capable of influencing conditioning factors in articulation and allied with the DOTS strategy.

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PS-61505-03 Implantation of DOTS for tuberculosis control in the State of Sao Paulo, Brazil, 1998–2005

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Objective: To analyze the implantation of DOTS in the priority cities in the state of São Paulo (SP) in 2005.

Methods: Qualitative study that conducted semi-structured interviews on 22 coordinators of the TB Program. The technique used was content analysis. To observe the technical and political dimension of DOTS, it was analysed: Political Commitment; Supervised Treatment (ST) and the Respiratory Symptomatic Search (RSS).

Results: DOTS was analyzed according to the type of activity, treatment location, and the occurrence of centralization/decentralization. The management activities are centralized and performed at the Reference Units in 15 (68.2%) cities, and at the Periphery Units in 8 (27.2%) cities. The ST and the RSS are decentralized to the Basic Health Units (BHU), respectively, in 15 (68.2%) and 13 (59%) cities. As to ST location, 18 (81%) cities performed treatment at the health services, and 3 (14%) at the patient's home. Thirteen (59%) adopted the universal ST criteria, and 7 (32%) according to the availability of resources. The laboratory network delivers bacilloscopy exams results within 24 hours, in average, in 14 (67%) cities.

Conclusion: SP has advanced in the decentralization of ST and RSS to the BHU, in the agility of bacilloscopy results, and the constraints are the political discontinuity of the coordination, the turnover of human resources, not assigning TB as a priority in the agenda and the lack of financial resources, such as specific TB funds.

PS-61567-03 Peruvian National TB Programme during 1990–2000: a policy analysis

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Aim: A policy study was done, analyzing successful experiences on health at LAC and the Caribbean.

Methods: In-depth interviews and comprehensive review of secondary sources of information was done. The main axes analysed were: Governance, Economic and Financial issues, and Health Impact.

Results: Political decision allowed sustainable policies. The governmental period and adequate election of the NTP Director, with technical and managerial skills favored its implementation and success. NTP Director stimulate co-participation of national and international social actors needed 'to begin and maintained' a quality improvement process. All published technical-normative documents favored his leadership. Training strategies seek standardized processes on promotion and health management. Together with periodic activities stimulated the creation of 'a group identity', 'empowered the regional and authorities', helped to disseminate health results, therefore improving self-esteem. The political decision also allowed its inclusion on the political arena as one of the elements of the 'National Plan against Poverty' favoring higher budgets and international collaboration. Finally, all the former conditions allowed improvement on TB control indicators.

Conclusion: Political will, leadership with technical skills and the creation of 'group identity' allowed Peruvian NTP to become one of the most successful in the world.

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TB CONTROL IN SPECIAL POPULATIONS AND INSTITUTIONS

PS-61150-03 Challenges encountered in following up VCT clients at Chipata Health Centre: lessons learnt

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Issues: A sexual behaviour study designed to assess whether VCT clients change their sexual behaviour after accessing VCT demonstrated a wider problem for research and TB control. Follow-up is difficult in high density unplanned urban areas in Lusaka, Zambia.

Description: The study started in June 2004 recruiting a cohort of 811 clients accessing VCT services at Chipata Health Centre using a structured questionnaire. Cohort clients were asked for permission to be followed up after 6 months of initially accessing VCT, to see if there is any sexual behaviour change in the 6 months period. Strategies used for followed included the church, name by which client was known in community, land mark to their house, zones of community. 324 clients were re-interviewed. The study finished in August 2005.

Lessons learnt: 324 (40%) were followed up; 256 (32%) houses could not be traced; 153 (19%) moved; 18 (2%) refused to be re-interviewed; 43 (5%) died; 17(2%) did not reply.

Recommendations: Unplanned settlements and urban drift are a challenge to research and TB control. The health planners and implementers must collaborate with the housing authorities in easier ways to locate houses in unplanned settlements.

PS-61308-03 Introducing a model project of TB control in elderly people in Cambodia

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Background: National TB prevalence survey 2002 showed that TB smear (+) in elderly (55 year olds or over) was higher than any other age group (3.2 times), but elder registered for treatment in NTP was less than other groups (2.5 times) in 2004.

Objective: To be a role model in TB case detection, diagnosis and treatment in elderly people.

Design: CATA/JATA Model-Project implemented TB control in elderly through existing system in two health centers with 46 546 population since April 2005. Intensive education, community participation, social support, active detection, additional mean to diagnose smear-negative, and DOT approach were conducted.

Results: Comparison between before (2004) and after project start (2005): TB notification rate among all cases increased from 221 in 2004 to 430 per 100 000 in 2005 and TB notification rate among elderly increased from 54 in 2004 to 200 per 100 000 in 2005. Moreover, successful rate was significantly high (>90%).

Discussion: This model project was effective to increase TB detection rate, especially TB detection rate among elderly. Early detection of TB in Elderly can eventually protect the children as in Cambodian culture elderly stay at home and take care of the children. Thus national tuberculosis control programme should extend this model to other DOTS facilities in Cambodia.

PS-61311-03 Role of medical commission in proper enrolment of SS- PTB patients in DOTS

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Introduction: MOJ and NTP with the support of ICRC are implementing DOTS in Georgian prisons.

Aim: To estimate the role of the joint NTP/MOJ/ICRC medical commission (MC) for controlling the enrolment of sputum smear negative (ss-) Pulmonary TB (PTB) cases in DOTS.

Methods: Data of sputum smear investigation, chest X-ray and clinical symptoms of prisoners, suspect of PTB, were presented to MC.

Results: In 2003, 388 PTB cases were diagnosed, among them ss+ were 207 (53.35%) and ss- 181 cases (46.65%). In 2004—out of 320 PTB cases 211 (65.9%) were ss+ and 109 (34.1%) ss- cases. In 2005—out of 355 PTB cases 283 (79.7%) were ss+ and 72 (20.3%) ss- cases. In 2005 MC revised 288 ss- cases suspected of PTB. Diagnose was verified only in 65 prisoners (22.6%). In 90 prisoners (31.2%) PTB was not verified, 28 patients (9.7%) administered antibiotic therapy to clarify diagnose, 105 (36.5%) prisoners needed additional instrumental investigations.

Conclusion: The trend is decrease of part of ss- PTB received DOTS (from 46.6% to 20.3%). Well functioning MC help in determining of PTB diagnose (especially ss- cases) and avoid unnecessary treatment.

PS-61360-03 Formulating an efficient tuberculosis screening strategy for Canada's First Nations and Inuit population

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Background: Tuberculosis (TB) is responsible for severe morbidity and mortality in Canadian FNI communities. Despite significant drops in TB rates in FNI population, they still remain significantly above the average for Canada. Newborns are being vaccinated with Bacille Calmette-Guerin (BCG). However, due to concerns about side-effects, BCG is being withdrawn. Alternative TB containment strategy is required to protect FNI communities and reduce TB prevalence to the average for Canada. The strategy intended to replace BCG vaccinations consists of pre-school and school yearly screening of FNI children followed by prophylaxis treatment of infected individuals. The goal of this paper is to find the most effective way to implement pre-school screening.

Method: We use MatLab to model all possible screening strategies consisting of one to six rounds of screening of all children between years one to six as well as at age 11 of life for each cohort. The number of cases and costs were estimated in order to identify the optimal strategy for a given time period and resources available.

Results: Optimal strategies in each set were identified, and the effects of uncertainty in key parameters were evaluated. Cost-Benefit analysis was performed in order to determine the cost-effective strategy.

Conclusions: Optimal strategies in each set were identified according to epidemiological and cost parameters.

PS-61532-03 Treating tuberculosis away from the place of residence: risks and challenges

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São Paulo State has an extended net of health services and laboratories that, in thesis, are able to diagnose and treat TB. In spite of this, many of the TB patients seek care outside their residence cities, probably due to the idea that great cities can offer more qualified care. In 1998, of 17 204 new TB cases that were notified, 15 801 (91.8%) were treated in the city where they live. Cure rate was 68.8% for TB cases that treated TB at their own city and only 48.0% for those treated elsewhere. In 2004, of 16 176 new cases, 14 896 (92.0%) were treated at the same city, with a cure rate of 77.1%, while for the other 1252 patients cure rate was 58.0%. Default rate fell down from 15.3% to 8.9% in the same city-treated group, and from 14.2% to 9.6% in this period. Although cure rate has increased for both groups, the patients treated at the city where they live had a greater improvement. Poorer results for the other group may be due to many reasons: gravity of the cases, difficulties in accessibility to health services able to solve patient's needs, indirect costs to the patients, health personnel attitudes with 'foreign' people, and so on. Therefore, these cases have to be seen with special attention.

PS-61555-03 DOTS in prisons: experience of Bangladesh

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Introduction: Prisoners' load is 6 to 8 times higher than the capacity of two large prisons of the country. Security and administrative formalities together with the issue of continuing treatment after release from the prisons made it challenging to implement DOTS in prisons.

Objective: To implement DOTS services in prisons of Bangladesh.

Methods: Medical staff of prisons were oriented on DOTS. Either TB services were incorporated in their own health services or one NGO was assigned for each of the prisons to implement DOTS. Monthly sputum collection sessions for symptomatic patients are conducted. Microscopy is done in the nearest microscopy centre. DOT is provided by the prison staff. Released prisoners are referred to the nearest DOTS centre of their residence for continuation of treatment.

Results: A total of 478 TB patients registered during 2005 in 15 prisons. Among them 344 were new smear positive, 21 were relapse, 89 were smear negative and 24 were extra-pulmonary patients. Sputum conver-

sion rate is 74%, and treatment success rate is 67% in 2004. A significant portion of patients (23% and 33% respectively for sputum conversion and treatment success) transferred out.

Conclusion: TB prevalence at prisons is alarming. Overcrowding at most of the prisons contributes to high transmission of TB. Access to treatment outcome of released prisoners is still a challenge for the program.

PS-61650-03 High prevalence of pulmonary tuberculosis at entry into Rio de Janeiro State prisons, Brazil

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Aim: To measure the prevalence of active tuberculosis (TB) and TB infection at entry in Rio de Janeiro State (RJ) prisons, a highly endemic setting (2005 incidence rate: 3532/100 000, 35 times that of the state population).

Design: Active TB detection by chest X-ray screening among 997 male inmates entering RJ prisons from police remand centers.

Methods: Diagnosis of active TB among subjects with X-ray abnormalities by sputum microscopic examination and culture or, if bacteriological results were negative, by response to TB treatment. Diagnosis of TB infection based on PPD test (recorded positive if induration >10 mm).

Results: The study population was young (median age, 24 yrs), often (47.0%) lived in poorest sections of RJ city, had been previously in jail (59.3%) and had a past history of TB (7.0%). The prevalence of active TB was 3.0% (30/997) and that of TB infection 52.9%. Among TB cases, 63.3% (19/30) were bacteriologically proven, 53.3% (16/30) had extensive lesions (bilateral lesions or cavities) and 46.7% (14/30) did not declare coughing >3 weeks, with no difference between smear-positive and negative TB.

Conclusion: These results 1/call for a systematic screening at entry in prison—if feasible based on X-ray, given the low sensitivity of the symptom 'cough >3 weeks'—as a complement to TB control programs; 2/ demonstrate the urgent need for improving detention conditions and medical assistance in police remands.

PS-61667-03 Implementation of DOTS in the prisons of Togo

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The necessity of an organized system for the screening and the treatment of tuberculosis cases in the Togo prisons justified this new approach. In order to facilitate the access to the care of the prisoners, an interministerial National committee composed of the ministries of health, the territorial administration, of democracy and human right and the ministry of justice or their representatives has been created. This committee with the support of the TB program assigned to install at the level of every prison, a local tuberculosis committee composed of the representatives of these ministries. Then the members of these local committees have been formed on the strategy and the role of each of them. The nurse of the jail and the medical team of the district take care of the medical aspects. Every prisoner suspected of tuberculosis is admitted for medical examination and sputum specimen collected for microscopy. The TB patients are isolated in a room arranged to this effect for some weeks for a better follow-up and receive a nutritional support before joining the other prisoners. The treatment is supervised. The results of this strategy are to be evaluated in the next few years.

PS-61745-03 Active case finding of tuberculosis in a poor peri-urban community in Kampala, Uganda

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Background: Under-detection of smear positive tuberculosis (TB) continues to impede effective TB control due to the transmission that occurs in communities before cases are diagnosed. The Ugandan TB Program employs DOTS, a passive strategy that screens for TB in patients who present at clinics. Under this strategy, approximately half of the infectious TB cases remain undetected by the health care system. We examined the feasibility of community Active Case Finding as a supplement to current TB case detection methods in a setting of high disease burden.

Methods: In a cross-sectional door-to-door survey conducted in Kisenyi slum in Kampala, 930 adults were screened for cough in June to August 2005. Three specimens were collected from people who reported cough lasting 2 weeks or more for acid-fast bacilli (AFB) examination. Two positive smear results led to a TB diagnosis and precipitated referral to the public health system for treatment.

Results: Of the 930 people, 189 (20%, 95%CI 19.9–20.2) had a cough for ≥ 2 weeks. Of the coughers, 33 were positive for AFB (18.0%, 95%CI 17.6–18.4) and were not yet in care. Smear positivity was associated with age and duration of cough. Only nine of the coughers were on anti-TB treatment.

Conclusion: This simple screening method suggests that Active Case Finding in communities such as Kisenyi is feasible and may prove useful in improving TB detection in Uganda but its cost-effectiveness needs to be evaluated.

PS-61786-03 National Tuberculosis Control Program, Egypt 2005

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Egypt has an intermediate incidence of tuberculosis. The estimated incidence rate of all TB cases is 24 per 100 000 population, Every year about 20 000 people are estimated to develop TB in the country, 83% of the cases occur in the productive age groups (between 15 and 54 years). TB therefore is an important public health problem. NTP started implementing DOTS in 1996, and achieved the Regional Targets of DOTS all over in 2000. Case detection rate is 63%, and a treatment success rate is 88%. In order to accomplish the global targets the NTP made efforts involve other health care providers in DOTS (DOTS comprehensiveness) progress is made through establishment about 80 new diagnostic centers in all governorates, 68 new Health Insurance Organization (HIO) specialized TB centers, training of the health staff of the private sector, prisons, universities, NGOs etc . . . in diagnosis, treatment, recording and reporting. The NTP also made efforts to improve quality of DOTS activities by internal & external quality assurance of the Laboratories activities, Electronic Nominal Recording-Reporting system. DOTS-Plus activities also started by establishment of specialized Multidrug-resistant (MDR) diagnosis and treating center for 75 MDR patients in 2006.

PS-61959-03 Satisfaction of the clientele: tool of management in a hospital of reference for tuberculosis in Rio De Janeiro

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Introduction: The Hospital Estadual Santa Maria (HESM), reference for the treatment of Tuberculose (TB), TB MDR and co-infection TB-HIV/AIDS, is responsible for the internment of patients of all the state of Rio De Janeiro and possess currently 77 stream beds.

Objective: To evaluate the degree of satisfaction of the patients of the HESM.

Methods: Elaboration and application of a questionnaire to evaluate the satisfaction of the patients of the HESM, ahead of the characteristics of the services, the concept of quality of the given service and satisfaction of the customer.

Results: From a preliminary sampling the nursing service was evaluated initially. The analysis of the data indicated that, for being the responsible team for the direct assistance to the patient, its performance more was focused and analyzed of more rigorous form. The evaluation of the item 'orientation to leave the hospital' was considered 'bad' for more than 50% of those interviewed ones.

Conclusion: For if dealing with patients who need a specialized accompaniment of long duration, it is necessary the accomplishment of permanent evaluations and training in together service to the professionals of the hospital. It must be implanted projects to improve the functional quality and technique of the hospital. Amongst these projects the implantation of one Program of Quality in the HESM.

ABSTRACT PRESENTATIONS SATURDAY 4 NOVEMBER 2006

THEMATIC SLIDE PRESENTATIONS

TB IN HIGH-BURDEN COUNTRIES: EPIDEMIOLOGY AND SOCIAL ISSUES

TS-61253-04 Tuberculosis treatment failure and death among patients classified as transferred out in Vietnam

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Preliminary results: Final results presented in October 2006.

Objective: To assess the proportion misclassified failures and deaths among new smear-positive pulmonary tuberculosis patients with reported transferred out in northern Vietnam.

Methods: A cohort of patients with reported transferred out in 32 randomly selected district tuberculosis units were followed up after 1 to 3 years after start of treatment for survival, the history of re-treatment and bacteriologically confirmed tuberculosis. Sputum smear examination and culture and interview for recent treatment history were collected of included patients.

Results: 85 patients were included. No information was available of 32 (38%) and 19 (22%) had died, of whom 8 during the 8 months after start of treatment. Sputum smear results were available for 34 (40%). The median interval between start of treatment and follow-up was 25 months. Tuberculosis was recorded in 9 (26%), including 6 (18%) with positive sputum smears, 2 (6%) with negative smears but positive culture and 2 (6%) who had started tuberculosis re-treatment.

Conclusion: Reported tuberculosis treatment transfer out included 29% actual treatment failures and 11% actual deaths during treatment duration. In northern Vietnam in 2003 the failure rate (0.4%) and the death rate (2.7%) were underestimated with 0.3% and 0.5% due to classified transferred patients (3.0%).

TS-61720-04 Characteristics of patient delay for new tuberculosis cases in Uzbekistan

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Aims: Tuberculosis (TB) patient's delay (PD) reflects public awareness and accessibility of primary health care and could significantly influence effectiveness of passive TB case-finding and disease' course. PD defined factors were studied.

Methods: We examined Kazakhstan national TB surveillance from 2005 (16 370 new TB cases). PD was defined as months from onset of TB symptoms to first visit to any physician. Degree of PD (DPD1) was calculated as proportion of new TB cases with PD >1 month. Logistic multivariate regression was used to confirm results.

Results: The proportions of patients with PD >1, 2 and 3 months were as following: 47.5%, 16.7%; and 5.9%, respectively. DPD1 was higher in unemployed (48.9%) than in employed patients (38.2%), $P < 0.01$; DPD1 was highest among disabled (49.7%) and retired (53.6%). DPD1 was higher in rural population (OR = 1.6, 95%CI 1.5–1.8) and extra-respiratory TB cases (OR = 2.6, 95%CI 2.9–2.3), and was less in extra-pulmonary respiratory TB (OR = 0.4, 95%CI 0.35–0.43). PD >1 month provided double increase of the probabilities of severe TB forms (OR = 2.3, 95%CI 2.1–2.5) as well as the smear positive TB (OR = 2.2, 95%CI 2.0–2.4).

Conclusion: To improve passive TB case-finding, the sanitary education has to be improved especially among rural population, retired and disabled. Information about consequences of delay in seeking medical care and about the main symptoms of extra-respiratory TB should be included in the printings for population.

TS-61612-04 Developing a feasible ACF strategy for prison TB program in Azerbaijan

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Background: The Ministry of Justice (MOJ) of Azerbaijan tries to develop a feasible and effective Case Finding Strategy in prisons with the support of the International Committee of the Red Cross (ICRC).

Methods: Prisoners were screened for active TB using 2 methods: Mass Miniature Radiography (MMR) method and Questionnaire method. At least 3 sputum sam-

ples were collected from all TB suspects identified by MMR or Questionnaire.

Results: From May 2005 to March 2006, the total prison population of 8 colonies (46% of total colony population) underwent both screening procedures. Among 545 MMR suspects 64 sputum smear positive (SS+) TB cases were diagnosed. Respectively, among 1157 questionnaire suspects 60 SS+ TB cases were identified. In order to compare both screening methods, the sputum smear microscopy examination was taken as the 'golden standard' to confirm diagnosis. Preliminary results show that sensitivity, 73.6%, and specificity, 90.1%, of MMR method are higher than for the questionnaire method, 69% and 75% respectively. Positive Predictive Values (PPV) and Negative Predictive Values (NPV) also differ for both methods: MMR: PPV = 11.73%, NPV = 99.5%, questionnaire PPV = 5.18% NPV = 99.3%

Conclusion: MMR method has higher sensitivity, specificity, PPV and NPV compared to the Questionnaire method. However, in developing feasible ACF strategy a cost-effective analysis should be carried out and the capacities of prison health services should be taken into consideration.

TS-61370-04 Effects of tobacco smoking and indoor air pollution on tuberculosis risk: a meta-analysis

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Background: Smoking, passive exposure to tobacco smoke and indoor air pollution (IAP) have been implicated as risk factors for TB infection, progression and death.

Objective: To perform a systematic review and meta-analysis of published studies on the effects of tobacco smoking and IAP on tuberculosis risk.

Method: We conducted a systematic review of observational studies that quantitatively reported effect estimates of tobacco smoking or indoor air pollution on latent TB infection, clinical TB disease or TB mortality.

Results: Of 57 potentially relevant articles, 42 studies on tobacco smoking (No. of participants = 667 722) and 5 on indoor air pollution (No. of participants = 263 670) were included in the analysis. Although effect estimates for both exposures and for each outcome (infection, clinical disease and death) were found to be heterogeneous with statistical significance, we found that, on average, current and former smokers had higher risks of infection, disease and death from tuberculosis compared with never smokers. Effect es-

timates varied with the type of study, the type of control selection and the variables that were controlled for in the analysis. Studies that selected population based controls tended to report higher risks while those that adjusted for alcohol reported lower ones.

Conclusion: The evidence is consistent with a strong link between tobacco smoking, IAP and tuberculosis risk, even after adjusting for the confounding effect of alcohol.

TS-61475-04 Association of passive smoking and tuberculosis infection in children

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Background: We showed previously that active smoking was associated with tuberculosis infection in adults. The association between passive smoking and tuberculosis infection is not well documented.

Objective: To examine the association between household tobacco smoke and tuberculosis infection in children.

Design and methods: A community survey was carried out in 15% of addresses in a low-income community in South Africa. All children (<15) residing on these addresses were included in the study. Children underwent a tuberculin skin testing (TST). Information on smoking behaviour was obtained from all adult household members using a questionnaire. Univariate and multivariate analyses were performed, and odds ratios (OR) were adjusted for the presence of a TB contact in the household, average income of the adults living in the household and the age of the child.

Results: Of 1344 children, 1170 (87%) were exposed to tobacco smoke in the household and 432 (32%) children had a TST ≥ 10 mm. Passive smoking was significantly associated with tuberculosis infection in children in the unadjusted analyses (OR 1.89, 95%CI 1.24–2.86) but not in the adjusted analyses (OR 1.35, 95%CI 0.86–2.12).

Conclusion: It is of great concern that 87% of children are exposed to household tobacco smoke because passive smoking might be associated with an increased risk of tuberculosis infection.

TS-61178-04 Conflict, migration and TB treatment in Nepal

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Internal conflict has occurred in Nepal for the last 12 years, claiming more than 12 000 lives. People have been forced to leave their homes, resulting in increased migration. Tuberculosis (TB) has become an urgent concern for these populations affected by conflict and migration. Poverty, powerlessness and social instability affect the spread of TB and its treatment. This paper aims to identify problems of TB and its treatment completion among migrants in Nepal.

Methods: Qualitative interviews and FGDs were conducted among migrant TB patients and health service providers. The grounded theory approach was used in data collection and analysis.

Findings: Forced migration appears to be a critical factor in TB control. Ongoing conflict destroys health, education, transportation, and communications infrastructure, separates families, alters gender roles, creates psychological as well as physical suffering, and restricts people's lives. These factors have affected continuation of TB treatment. Moreover, social, cultural and economic constraints, reduced information, poor physical access to TB services, and discrimination have further fuelled non-completion of TB treatment and the spread of TB.

Conclusion: Ongoing conflict and increasing migration is a challenge in TB control especially in urban areas. For better access to TB services and successful completion of TB treatment among migrants, effective strategies need to be developed: appropriate interventions are vital.

TS-61117-04 Utilisation des TIC pour la formation médicale sur la tuberculose : l'expérience acquise dans le projet EMPHIS

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But : Rendre accessible à l'ensemble des médecins et des étudiants en médecine, un enseignement validé sur la tuberculose et la lutte antituberculeuse à l'échelle nationale

Cadre : Expérimentation de l'EAD de médecins en exercice dans 8 sites pilotes répartis sur le territoire algérien

Méthode : Rédaction de modules de formation par un collectif d'enseignants, numérisation des modules, production de CD Roms et installation sur site web dédié à l'EAD. Elaboration d'un logiciel pour l'enregistrement des cas de tuberculose et de leur suivi. L'enseigne-

ment à distance s'est déroulé sur une période de trois mois, entrecoupée de 4 présentiels.

Résultats :

- Amélioration des connaissances des apprenants sur la lutte contre la tuberculose
- Satisfaction des apprenants pour la méthode utilisée
- Amélioration de la qualité des informations recueillies pour la surveillance épidémiologique

TS-61167-04 Effective human resource development (HRD) for TB and leprosy control in Ethiopia

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Objective: Implementation of a HRD plan to improve the performance of tuberculosis and leprosy (TBL) health workers at all levels of the TBL Programme.

Design: Baseline assessment of human resources for TBL services, task analysis, training methodology, followed by development of a training package for Training of Trainers, general health workers of various categories, implementation and monitoring.

Results: An inventory of TBL human resource capacity was made, three Training of Trainers courses were conducted and training of general health workers was supported. Retention of new trainers was as high as 86% after one year. General health staffs trained, however, were less than 50% of the target. Monitoring of activities covered 54% of the regions, in which 34% of new trainers were supervised. The overall cost of implementing the HRD plan was \$100 000 over 2 years.

Conclusions: The trainers' performance was high in terms of knowledge and skill transfer but fell short in capacity to implement the training plan. Constraints in course organization, budget, and availability of designated HRD focal staff were the main determinants in failure to achieve all planned activities. Policies facilitating staff retention and motivation have not been addressed and significant experience from elsewhere is urgently needed. Periodic assessment of the HRD plan outputs and corresponding corrective measures are recommended.

POSTER DISCUSSION SESSIONS

HUMAN RESOURCE DEVELOPMENT AND TB

PC-61174-04 L'enseignement de la tuberculose vu par la communauté médicale d'Oran

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Objectif : Les auteurs analysent l'intégration du programme national de lutte antituberculeuse au niveau des facultés de médecine, vue par la communauté médicale de la ville d'Oran (Algérie).

Méthodes : Un questionnaire de six items a été adressé à une population tirée au sort faite d'enseignants, d'étudiants en médecine et médecins généralistes du centre hospitalo-universitaire et les cinq secteurs sanitaires de la ville d'Oran par le biais d'enquêteurs. L'analyse est faite par le logiciel Epi-info.

Résultats : Sur les 300 questionnaires envoyés nous avons reçu 200 réponses. 69% accordent de l'intérêt à la tuberculose : 85% médecins généralistes, 81% enseignants et 70% étudiants. Autour de 60% ne sont pas au courant du programme national de lutte antituberculeuse dont 86% étudiants, 53% enseignants et 45% médecins généralistes. Plus de 80% classent l'Algérie pays à haute prévalence, 89% enseignants, 84% étudiants et 74% médecins généralistes. 79% sont pour l'amélioration de l'enseignement de la tuberculose et le partenariat école de médecine-Programme national de lutte antituberculeuse dont 90% étudiants, 87% enseignants et 88% médecins généralistes.

Conclusion : Intérêt de l'applicabilité du partenariat Ecole de médecine-Programme national de lutte antituberculeuse et de l'optimisation de l'enseignement de la tuberculose dans notre pays pour un meilleur contrôle de cette vieille campagne de l'humanité.

PC-61583-04 Assessment of knowledge and skills about TB among senior medical students in Sudan: the influence of traditional medical faculties

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A descriptive cross-sectional study was carried out in one of the oldest traditional medical faculties in Sudan, aiming at assessing the knowledge and skills of the senior medical students on TB. Only 223 out of 3000 (78%) responded to the questionnaire to knowledge and skills that are supposed to be well grasped from the curriculum in epidemiology, clinico-pathological features, diagnosis and management. Only 35% of the students came across 5–10 TB cases dur-

ing their study period of 6 years. 1.3% has never seen a case of TB. Only 57% of the students answered correctly, that sputum microscopy by demonstration of AFB is the best to confirm diagnoses of TB. 7% of the students have never attended any session on chest X-ray. 20% have never seen tuberculin test done. 76% have never done Z N stain during their clinical practice. 25% have never seen AFP under microscopy. 8% of the students were not confident in diagnosing and managing a case of TB and only 26% of the students have not heard about DOTS. Based on the results, the existing methods of teaching and curriculum on TB are inadequate to develop knowledge and skills among medical students. Focused structured problem based curriculum and core competency assessment are highly needed.

PC-61645-04 Training of the specialists: necessary condition of drug resistance survey implementation in Donetsk Oblast

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Objective: In spite of the fact that in 2004 the pilot project on DOTS implementation in Donetsk oblast was completed, sputum smear negativation and cure rate do not reach WHO standard and failure rate remains on high level. To clarify the reason of such situation in Donetsk oblast decision was made to conduct drug-resistance survey (DRS). Trainings for the local specialists were carried out before DRS implementation.

Methods: Trainings were carried out according to special program, which contained three lectures, in-depth study of the 'Protocol of DRS system implementation' and practical lessons conducted separately for phthisiatricians and lab technicians. Role games, situation tasks, preliminary and final testing were also used.

Results: 3 two-day trainings for 26–27 specialists each were conducted, in total 59 tuberculosis specialists and 21 lab technicians were trained. Phthisiatricians received main information on inclusion and exclusion criteria, lab technicians were informed on methods of bacteriological investigations in framework of DRS.

Conclusions: Testing of the participants showed that 94.08% of all phthisiatricians and 95.24% of lab technicians have learnt well the proposed information. This ensures the successful performance of DRS.

PC-61692-04 Building the capacity of TB trainers in Russia with the teachback training of trainers methodology

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Introduction: The World Health Organization (WHO) and the Russian Ministry of Health incorporated the Directly Observed Therapy (DOTS) strategy into Russia's TB control program. For the TB program to be successful, many health care workers need to be trained in this strategy. To meet this need competent trainers must be developed to provide TB training throughout Russia.

Methods: A training of trainers (TOT) course was developed based on the Teachback Methodology, a unique methodology that integrates learning training skills with course content. Course participants included 28 individuals from Russia with expertise in TB, but not necessarily in training. In the course, participants increased their knowledge in the DOTS strategy and gained the training skills necessary to teach the course to others.

Results: Course evaluations indicated that the Teachback Methodology is effective in building the training skills of TB health workers. Many of the participants have begun training health care workers. Additional trainings and TOTs are planned based on participant actions plans.

Conclusions: Teachback methodology is an effective training methodology for building the training capacity within technical areas such as TB. It is also a flexible methodology that can be integrated into an existing curriculum to create a TOT.

PC-61792-04 Impact des ateliers pédagogiques OMS sur la lutte contre la tuberculose en Afrique

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De 1998 à 2004, neuf ateliers pédagogiques ont été organisés par la Région Afrique de l'OMS, sur l'enseignement de la tuberculose dans les écoles de médecine. Ils regroupaient des enseignants universitaires et les responsables des programmes nationaux antituberculeux de 25 pays. L'innovation pédagogique proposée a eu un impact dans les pays qui avaient engagé une réflexion sur le rôle des écoles de médecine, ainsi qu'une réforme du contenu et des méthodes d'enseignement. L'impact de l'amélioration de la formation initiale des médecins dépend de la capacité des services de santé à reconnaître et à employer, dans des condi-

tions de travail satisfaisantes, les personnels médicaux formés.

PC-61746-04 Human resource development for DOTS expansion in Brazil, January 2004 to December 2005

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Introduction: At the world level, Brazil stands 15th among the 22 countries responsible for 80% of all tuberculosis cases in the world. Although the implementation of DOTS strategy began in 1997 in pilot areas, DOTS coverage has advanced slowly in the last decade.

Objectives: 2004–2007 Action Plan Brazil for TB control the goal is to implement the DOTS strategy in all 315 priority municipalities which account for 70% of country incidence. To reach this goal the PNT puts a special emphasis to the training of human resources in order to spread knowledges on the control of the tuberculosis with the objective to develop, monitoring and to evaluate the actions and activities for the expansion of DOTS strategy in Brazil.

Method: The training of the professionals of public healths for TB was strengthened in the 26 Federated Units and the Federal District by means of the application of the strategy formation of trainers/multipliers and with the partners for TB control in Brazil as IUATLD, USAID and PAHO/WHO.

Results: 1.153 multipliers trained in the period of 2 years in the whole Brazil: 82 (7.11%) multipliers at the Federal level and 1.071 (92.89%) multipliers at the State level. These multipliers qualified another 46.495 professionals in the respective health units.

Conclusion: Increase of 31.04% of the qualified health professionals for tuberculosis in the period. This increase of the qualified human resources in TB allowed in very direct form the increase of DOTS national coverage.

PC-61804-04 Training for treatment and management of multidrug-resistant tuberculosis

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Background: The first WHO CC for Research and Training in Management of MDR-TB has been established in Latvia, to train specialist for countries with high burden of TB/MDR-TB, to unable development and implementation of MDR-TB control strategies in

WHO European Region. WHO CC provides consultation and technical assistance to the countries projects. **Objectives:** To assess the importance of training for MDR-TB management.

Methods: Two week courses were conducted. Training quality and its impact on development and implementation of MDR-TB control strategies in the Region is assessed using post training evaluation and follows up questionnaire. Site visits to the MDR-TB projects were conducted.

Results: In 2001–2006, 346 participants from 12 Europe and 16 from other WHO region countries were trained. Training provided for MDR-TB consultants—18, program managers—47, laboratory specialist—28, clinicians—253. In trainees represented countries and regions projects for MDR-TB treatment and management: under development—6; approved by GCL—4; implemented—14.

Conclusion: Since the Human Resource Development is crucial part towards the implementation of the new Stop TB Strategy, the training of specialist on MDR-TB management conducted in WHO CC, Latvia is of great importance for the establishment of quality assured DOTS plus in the European Region.

PC-61825-04 Strengthening human resources for DOTS expansion: BRAC experience in Bangladesh

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Introduction: BRAC initiated a pilot community based TB control project in 1984 and extended to 83 million of 140 million population in Bangladesh with the support of national TB programme.

Objectives: Involve community to ensure equitable quality TB control services.

Methods: Community health volunteers were selected from every village and trained on TB. They identified TB suspects and ensured DOT. In addition, Community leaders, students, and public and private sector health workers were also mobilized. Additional staff was recruited and trained to perform and supervise the activities. Performance review meetings with community health volunteers and workers were held monthly and quarterly respectively.

Results: Currently over 50 000 community health volunteers are involved in DOTS expansion. Between July 2004 and December 2005, 39 480 cured patients, 21 836 village doctors, 18 248 opinion leaders and 1379 private practitioners were also oriented. In 2005, 72 547 patients were diagnosed in BRAC supported areas. Of them, 56 049 were new sputum positive cases. Case detection rate was 68% and treatment success rate of new smear positive patients diagnosed in 2004 was 91%.

Conclusion: Adequate trained human resources at community and health facility levels are essential to enhance DOTS expansion and sustain it to reach the WHO and MDG goals.

PC-61886-04 Harnessing human resources through public-private partnerships

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Kenya ranks twelfth on the list of countries with the highest tuberculosis burden in the world. Other lung diseases of public health importance in Kenya include asthma and tobacco-related diseases. The National Tuberculosis Program (NLTP) is the institution dealing with tuberculosis in Kenya and there are no special programs for other lung diseases. The Kenya Association for the Prevention of Tuberculosis and Lung Diseases (KAPTLD) supports public and private sectors efforts by initiating systems to streamline management of tuberculosis among PHPs and later linking the PHPs to the national reporting grid. To regulate the management of asthma in Kenya, KAPTLD through the lung health experts in pharmaceutical industries development of asthma guidelines for the Ministry of Health and continues to conduct medical education forums to capacity build health workers. Our learning institutions lung health program aims at lowering cigarette consumption and gives medical students a glimpse of the real respiratory health situation. This will create a generation of health workers who do not engage in activities endangering lung health, and at the same time, well versed on management of lung diseases. A workplace lung program has been established in Nairobi to address lung health issues through industrial setting. This paper highlights Kenyan experience and the challenges in harnessing the private sector potential to strengthen human resources for better lung health.

PC-61896-04 Human resources—catalyst or constraint: study of TB control and HR gap in DOTS in Madhya Pradesh, India

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Background: Non-realization of the actual human resources potential is acting as a major constraint to the effective implementation of DOTS in Madhya Pradesh State of India. With a population of 63 million, this State has 48 districts, 142 TB units, 714 designated microscopy centres and 10 456 DOTS centres.

Methodology: Quantitative and Qualitative HR barrier analysis was conducted. The former was through secondary data pertaining to the funds, functions and

functionaries. The latter through an open ended questionnaire involving the under-trainees and focussed upon motivation levels, skills, training, manpower distribution and relevant knowledge.

Result: With 100% coverage under Revised National TB Control Program, contractual staff is 456 (73.5%) out of 620 sanctioned in Madhya Pradesh. 94 DMC were nonfunctional due to lack of lab-technicians, 48 DMC managed by MPW. Districts performing below average were 22 (45.83%) in case detection rate, 24 (50%) in cure rate and 19 (39.48%) in sputum conversion. Over 11 000 health workers received training but with considerable gaps resulting into inadequate knowledge, low morale and under-performance.

Conclusion: Improvements in the existing systems through sensitization of both the targets and implementers are sought after. The real remedy lies in creating such an enabling environment that nurtures the existing capacity while boosting innovations and aims at unleashing the latent human potential on a sustainable basis.

PC-61928-04 Cough monitors: who are they and what do they do?

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Background: We designed an active case finding FIDELIS project in Eldoret, Kenya. The backbone of the program consisted of Cough Monitors (CMs) hired from local communities to perform cough screening/sputum collection in that community.

Methods: Hiring was performed through adverts. Only an ability to read and write English was required. Training consisted of 2 day seminar. A general job description was supplied, but CMs were encouraged to develop community sensitization/mobilization strategies through their own initiative.

Results: 42 CMs were employed; 100% were unemployed prior to the project. 18 held degrees: 13 lab technologists, 2 nurses, 1 counselor, 2 university graduates. Following training, CMs worked in teams of 2–4. Strategies included: bicycles for mobility, contact with traditional government, public speaking campaigns, identification of congregate settings, door to door outreach, non-traditional contact tracing of active cases, flier campaigns. CMs screened 17, 243 patients in 15 months, finding 1660 sm+ patients (198% increase in case finding), and raising completion of therapy in the area to 89%. At 21 months, 10 CMs used the experience to move into other jobs, 12 were laid off and 20 remain with the project.

Discussion: Community health workers are key to DOTS expansion. In many countries, significant numbers of trained personnel are unemployed. Successful utilization of human resources leads to both the expansion of DOTS and the healthcare job pool.

PC-61948-04 Evaluation of qualification of multipliers for the laboratory diagnosis and SIL-TB in Brazil

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Introduction: To enable professionals from the PNT to carry through a bacteriological diagnosis is an essential strategy to expand DOTS to the primary attention.

Goal: To create human resources as multipliers for the laboratory net on TB aiming the continuous education of professionals.

Methodology: The course for multipliers occurred in São Paulo and was administered by technicians from the Brazilian Ministry of Health for the multipliers of 26 states and the Federal District. The programmatic contents with duration of 40 hours using software vídeo and self explaining manuals (TELELAB). We use a questionnaire to evaluate the courses.

Results: 53 enabled professionals from the laboratory net of state level positively responded (96%) to the evaluation results and 91% of the component of SIL-TB. 93.5% of the professionals agreed with the transposition of the findings to the laboratorial routine and 95% of the participants informed an increase in their knowledge.

Conclusion: Since it is a course aiming the formation of multipliers the PNT in the period of October 2004 to December 2005 has graduated 1120 professionals in the entire Brazilian territory for the diagnosis of TB demonstrating an increase in the accomplishment of the Acid Fast Bacilli (AFB) microscopy of 22% and an increase on the control of quality of 75% in 350 priority cities for the expansion of the DOTS strategy.

TB TREATMENT AND DIAGNOSIS

PC-61365-04 Outcomes of treatment of positive pulmonary tuberculosis cases during the 1980s and 1990s in Brazil

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Aim: To compare the outcomes of treatment using 2RHZ/4RH in new cases of pulmonary tuberculosis in Brazil confirmed by direct smear or culture during the decades 1981–1990 and 1991–2000.

Methods: 102 046 cases of TB+ve notified during the 1980s and 230 189 TB+ve cases notified during the 1990s were analyzed.

Results: The rates of outcomes of treatment for the 85 239 cases seen during the first decade were: treatment success = 79.8%; default = 12.9%; death = 3.3%; transferency = 1.6%; others = 2.4%. During the 1990s: treatment success = 75.1%; default = 13.6%; death = 4.4%; transferency = 6.2%; others = 0.7%. If those for whom we had limited information about the outcome of treatment were included, the overall results for 1980–1990/1991–2000 would be: treatment success = 66.6%/60.7%; default = 10.8%/11.0%; death = 2.7%/3.6%; transferency = 1.4%/5.0%; others = 2.0%/0.5%.

Conclusions: The reduction in the rate of successful outcomes for treatment from 79.8% in 1980–1990 to 75.1% in the period 1991–2000 is due to an increase in the default, death and transference rates. These events coincide with the AIDS epidemic and with the implementation of a new informatized system for the notification of diseases (SINAN), which has been causing operational difficulties, during the last years of the 1990s.

PC-61407-04 Anti-tuberculosis drug resistance patterns among category 2 failure TB patients in Bangladesh

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Aim: To determine the pattern of anti-tuberculosis drug resistance among category 2 failure TB patients in Bangladesh.

Design: All failure cases are usually treated in CDCs (Chest Disease Clinic) as they have specialist doctors. All CDCs were requested to send category 2 failure patients to National Institute of Disease of Chest and Hospital, Dhaka. From July to December 2005, 63 patients were referred from different areas of Bangladesh. Sputum was collected and AFB microscopy was done. Sputum with Cetyl Pyridinium Chloride was sent to supra national reference laboratory at Antwerp, Belgium where susceptibility testing with 4 first line drugs and 4 second line drugs was done.

Result: Of the 63 samples 1 was contaminated, 2 had leaked and 1 had not been completed. Among 59, 16 (27%) were culture negative and 42 (71%) were culture positive, 1 (2%) had growth of *M. intracellulare*. Among 42 positive culture, 36 (86%) had resistance to isoniazid, 36 (86%) to rifampicin and 83% (35) to both (MDR). Of all MDR-TB cases 46% are also resistant to any of the 2nd line drugs. Among MDR 23% are resistant to ofloxacin, 29% to ethionamide

and 11% to PAS. No resistance was found to kanamycin (some are resistant to more than one 2nd line drugs).

Conclusion: MDR occurs in a high proportion of category 2 failure TB cases indicating a need for improvement in NTP performance.

PC-61472-04 Anti-tuberculosis drug resistance trends over the last 10 years in the Republic of Moldova

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Aim: Analyze the trends of TB drug resistance over the last 10 years.

Design: Analysis of 9453 cards of sensitivity tests performed in the National TB Reference Laboratory and three Regional Reference Laboratories during 1995–2004.

Results: During 1995–2001 the TB resistance has been increased. Any primary resistance increased from 11.4% to 31.6%, primary MDR from 0.5% to 6.3% and acquired MDR increased from 4% to 32.2%. The frequent and prolonged shortages of anti-TB drugs, inadequate prescription and often breaks in drugs intake contributed to the increase. DOTS started to be implemented in Moldova from 2002. During next 2 years the prevalence of any primary resistance and primary MDR slightly decreased and become 20.5% and 6.0% respectively. In 2004 the primary MDR rate increased again achieving 9.9%, any primary resistance—24.9% and acquired MDR resistance—38.6%. This phenomena is explained by a great number of old MDR patients without proper treatment and contributes to an increase number of relapses and new resistance cases. This also contributes to low rate of treatment success which was 62% from new SSM+ cases and 41% from re-treatments in 2004.

Conclusions: TB resistance is an increasing problem during last 10 years in Moldova. High prevalence of resistance in 2004 is explained by a great number of old MDR patients without proper treatment in previous years. The increase number of resistant cases influences the results of routine therapy.

PC-61521-04 Clinical and behavioral profile for tuberculosis patients coinfecting with HIV in the Dominican Republic

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Objectives: To evaluate sociodemographic and clinical factors in relationship to HIV-TB coinfection.

Methods: A cross sectional study was conducted in 2004–2005, in Santo Domingo, the capital, and 8 other provinces of the Dominican Republic. All consenting patients from 15 to 55 years of age with pulmonary or extra-pulmonary TB were included ($n = 549$). After TB was diagnosed, patients were tested for HIV-1 antibodies following WHO HIV guidelines. Odds ratios were determined and logistic regression was used, with α at 0.05.

Results: HIV positive results were significantly associated with candidiasis (OR = 7), dermatitis (OR = 3), chronic diarrhea (OR = 4) and lymphadenopathy (OR = 4). An HIV result was also more likely to be observed in TB patients who had sexual relationships with persons having STI (OR = 4) or reported to be jailed (OR = 6). Age (30–34 years) and history of blood transfusion (past 20 years) were also associated with HIV ($P < 0.05$). Age ($P = 0.01$), chronic diarrhea ($P = 0.04$), candidiasis ($P = 0.004$), past blood transfusion ($P = 0.004$) and history of sexual relationships with persons reported to be jailed ($P = 0.04$) continued to be significant in the final logistic regression models.

Conclusions: These findings highlight the need for HIV testing in TB patients, especially young Dominican adults, exhibiting specific clinical (chronic diarrhea, candidiasis, blood transfusion in the past) and behavioral (sex with persons reported to be jailed) factors.

PC-61810-04 Nepal national MDR-TB survey data analysed for time from previous treatment to relapse

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Design: Data generated by the randomised National MDR-TB survey includes patients recollection of time since last treatment. This was analysed for Cat 2 patients on an excell spread sheet.

Methods: The time period since last treatment was categorised as within one year, between 1–2 years and more than 2 years ago.

Results: Data were available for 58% (99/171) of CAT 2 patients. Among these 55% (54/99) had relapsed within the last 12 months, 10% (10/99) between one and 2 years, and the remaining (35/99) 35% had received their last treatment over 2 years ago. Of those treated within the last year 56% (30/54) claimed to have been cured at the time, only 15% (2/13) of those who were treated within 9 months. This rose to 60% (6/10) and 71% (25/35) in patients treated 1–2 yr and over 2 year ago respectively. 31% (31/99) of CAT2 comes from patients treated over a year ago who report being cured by previous treatment.

Conclusions: Data routinely collected as part of MDR-TB surveys can throw additional light on the previous treatment history of the re-treatment population.

PC-61920-04 Susceptibility of multidrug-resistant *M. tuberculosis* to second-line drugs in Peru, 2005

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Aim: To know the resistance the *M. tuberculosis* to second line drugs in patients multidrug-resistant TB (MDR-TB) previously treated.

Methods: Observational study, that included (+) cultures of *M. tuberculosis* of patients of several cities country-wide and referred to the National Mycobacteriology Laboratory. The DST was made by the agar proportion method. The evaluated drugs were those employed in the country for the treatment failure: ethionamide (ETH), kanamycin (KM), para aminosalicylic acid (PAS), ciprofloxacin (CIP) and cycloserine (CS).

Results: Were included 714 MDR-TB patients previously treated (45.4% failures, 39.2% relapses and 15.4% abandonment). The average age was 33.6 ± 14.1 years and 467 (65.4%) were males. The cases came from Lima City (21.0%), North Lima (17.0%), East Lima (13.2%), South Lima (12.0%), Callao (8.7%) and other cities country-wide (28.2%). 542 (75.9%) were susceptible to all drugs evaluated. The DST was: ETH 126 (17.7%), KM 51 (7.1%), PAS 15 (2.1%) and CIP 11 (1.5%), with no resistant isolates to CS. The distribution of DST according to the number of drugs was: one drug in 143 cases (20.0%), two drugs 27 (3.8%) and three drugs 2 (0.3%). No isolate was found resistant to more than three drugs.

Conclusions: The high rates of resistance to second line show a reduced availability of effective drugs for patients with clinical failure. Therefore it must be emphasized the importance of reporting resistance for patient to defined a new treatment scheme.

PC-61266-04 Determination of drug susceptibility and DNA fingerprint patterns of isolates of *M. tuberculosis* from Rwanda

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Background: The global distribution of drug resistant tuberculosis reflects the quality of tuberculosis control worldwide and it continues to be a major public health-problem.

Objective: To determine the rate of initial drug resistance and transmission patterns of *M. tuberculosis* in four district of Rwanda.

Methods: Susceptibility testing of *M. tuberculosis* isolates to first line drugs from previously treated and re-treated pulmonary tuberculosis patients was tested using the proportion method and radiometric BACTEC 460 system. All serial MDR isolates were subjected to spoligotyping and MIRU-VNTR typing.

Results: Primary *M. tuberculosis* isolates from 644 patients were analyzed. Isolates of 500 (79.8%) patients were susceptible to all first-line anti-tuberculosis drugs. The prevalence of primary mono and poly-resistance was lower (isoniazid 0.2%, streptomycin 2.3%, ethambutol 1.0%, isoniazid + streptomycin 0.6%, isoniazid + ethambutol + streptomycin 0.2%). The primary and acquired MDR rates were 7% and 25.5% respectively. DNA fingerprinting showed a single strain in cultures from 47 of the 69 patients with MDR-TB. Reinfection was suspected in 4 cases (18.2%), reactivation in 17 cases (77.3%), and probable mixed infection in one case (4.5%) as shown by presence of double alleles at two MIRU-VNTR loci.

PC-61525-04 Acquired MDR-TB among cases who were initially drug-susceptible, United States, 1993–2002

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Objective: To characterize cases of acquired MDR-TB discovered on final drug susceptibility testing (DST). **Method:** Analyzed cases from the US national TB surveillance system for follow up DST results from 1993 through 2002.

Results: Over the 10-year period, 12 229 TB patients had final DST test results after their initial DST. Of these, 249 (2%) additional cases of MDR-TB were

found on the final DST results, after they had tested partially resistant (isoniazid (INH) $n = 120$, 48%, rifampin (RIF) $n = 24$, 10%) or fully susceptible to INH and RIF ($n = 105$, 42%) on initial DST. The acquired MDR-TB represents 9.2% of all MDR-TB from any DST result. The greatest number of acquired MDR-TB cases ($n = 55$) occurred in 1993. Since 1997, 10 to 21 cases occurred each year (.07% to .17% of those tested). The odds of having a previous history of TB (odds ratio (OR) 1.9, 95%CI 1.2–2.9), cavitary TB (OR 2.4, 95%CI 1.0–6.6), smear positive TB (OR 3.0, 95%CI 2.2–4.2), not completing treatment (OR 2.2, 95%CI 1.2–4.0), dying during treatment (OR 4.0, 95%CI 3.1–5.3), and failing to convert sputum results within 60 days of starting treatment (OR 9.5, 95%CI 5.8–15.7) were greater for patients with acquired MDR-TB than for those with susceptible TB.

Conclusion: Acquired MDR-TB results from late diagnosis and poor treatment of TB. Presence of acquired MDR-TB cases on final DST results may indicate that local TB programs need careful evaluation and capacity building.

PC-61606-04 The tuberculosis treatment outcome monitoring system in Piedmont Region, Italy, in 2001–2004

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Introduction: According to the European framework for tuberculosis (TB) control and elimination in countries with a low incidence TB surveillance and treatment outcome monitoring are prerequisites to implementing the policy package aiming at the elimination phase of tuberculosis. Public Health authorities of Piedmont Region of Italy (resident population 4 214 677 people in 2001) implemented the treatment outcome monitoring system (TOMS) since year 2000. We report the main findings observed during the period 2001–04.

Design: Treating physicians report to the TOMS selected information on pulmonary TB cases. Outcome information are then evaluated by cohort analysis according to international recommendations.

Results: Overall 1326 pulmonary TB cases were reported to the TOMS, 1068 (80%) were new cases, proportions did not significantly changed over time. The treatment successes were <60%. The age-adjusted factors significantly increasing the risk of unsuccessful outcome (i.e. failure, default and transfer out) were homelessness (OR 7.0, 95%CI 3.0–16.2), immigrant status (OR 1.7, 95%CI 1.3–2.4) and male gender (OR 1.7, 95%CI 1.3–2.2).

Conclusion: Our data indicate that the proportion of treatment success in Piedmont region is smaller than

the purposed 90% threshold and that specific social sectors of the community are at a greater risk of unsuccessful outcome. The findings are relevant to target the local TB control programme activities.

PC-61257-04 Pulmonary TB prevalence in prisoners from pre-trial institutions and penitentiary institutions in Georgia

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Setting: MOJ with ICRC support is implementing DOTS across the entire Penitentiary System of Georgia. **Objectives:** To compare the 2005 prevalence of PTB in Pre-trial Institutions (PTI) and Penitentiary Institutions (PI) following Mass Screening (MS).

Methods: MS of all prisoners (6852) was conducted by Clinical Questionnaire and BMI in 3 PTI (pop. 3491) and in 5 PI (pop. 3361) by trained health staff.

Results: 93.2% (no. 3253) of prisoners were screened in PTI. Out of 703 PTB suspects (20.1% of total), 10 were SS+ (0.29% out of total and 1.42% out of PTB suspects). Prison average length of stay was 6.8 months and BMI—24.0. 97.5% (no. 3278) of prisoners were screened in PI. Out of 803 PTB suspects (23.9% of total), 29 were SS+ (0.86% out of total and 3.61% out of PTB suspects). Prison average length of stay was 20.7 months and BMI—22.3. The estimated prevalence of PTB among the PTI population was 286/100 000 and 863/100 000 among the PI population.

Conclusions: The risk of PTB is significantly higher among the PI population when compared with the PTI population. RR = 2.88 <1.40 <OR < 5.90>, P = 0.002. Contributing factors to the increased risk include: poor living conditions with limited access to adequate health care and malnutrition (PI BMI of 22.3 vs. PTI BMI of 24.0). Role of increased permanence in confined areas of a healthy population in contact with SS+ PTB cases needs to be investigated.

PC-61364-04 Comparison of tuberculin skin test with Quantiferon-TB Gold in detection of latent TB in hospital workers

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Quantiferon-TB Gold (QTG) detects δ -IFN in response to specific *Mycobacterium tuberculosis* antigens. Our aim is to measure latent TB (LTB) prevalence in a reference TB hospital in Istanbul using tuberculin skin test (TST) and QTG and compare them with respect to risk factors, age, sex, BCG, job definition and

duration. In Aug. 2005 we analyzed 78 (33 F, 45 M) hospital workers (28% doctors, 10% nurses, 15% lab technicians, 47% cleaning people) aged 18–60 (mean age 30.5 + 8.57). Job, job duration, history of TB, contact out of the hospital, BCG, TST and QTG levels were recorded. χ^2 and logistic regression analysis were used for statistics. TST and QTG levels did not differ with respect to job ($P > 0.05$), QTG levels of TST (+) workers were significantly higher than people with (-) TST ($P < 0.01$). TST was affected by the number of BCG ($P < 0.01$) but QTG was not. The longer workers worked, the higher their QTG levels ($P < 0.05$) were. QTG sensitivity was 56.14%, specificity 90.48%, positive predictive value 94.12%, negative predictive value 43.18% with 65.38% accuracy. TST endurance and QTG positivity are closely related. With TST ≥ 10 mm, QTG positivity is 91.2%. QTG(+) cases have worked for 1–5 years whereas QTG(-) cases less than 1 year. We report LTB prevalence at our hospital as 43% which seemed higher among nurses and cleaning persons. TST and QTG correlated well but age, sex and BCG vaccination did not affect QTG positivity. We recommend QTG in screening at hospitals as an alternative to TST.

TB-HIV LINKAGES AND DIAGNOSTIC CHALLENGES

PC-61264-04 Integrating TB-HIV services in secondary health facilities in Nigeria: lessons learnt from the GHAIN Project

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Issue: TB remains the commonest cause of mortality amongst HIV infected Nigerians. However the HIV Comprehensive Care and DOT scale-up programs in the country have occurred in parallel and have insufficient linkage to each other. There is therefore an urgent need to integrate TB and HIV services in Nigeria. **Description:** The GHAIN Project identified 8 secondary health facilities for HIV Comprehensive Care Services in the first phase of a scale-up process. Two of the sites—Mainland General Hospital, Lagos and Infectious Disease Hospital Kano, were TB referral centers and were the pilot sites for implementing joint TB and HIV services in Nigeria. These activities include: Active screening of HIV positive patients for TB; Screening of TB patients for HIV and referral of dually infected patients to both DOTS and HIV Care Services.

Lessons learnt: After 6 months of TB-HIV integration, 1941 (99%) of 1960 TB patients seen had been counseled and tested for HIV, 367 (18.9%) were HIV

sero-positive. 570 HIV positive individuals who had TB symptoms (30% of all HIV positive patients) were screened for TB and 201 (35%) were confirmed to have active TB. All the patients received therapy for TB and HIV according to the National guidelines.

Recommendations: HIV care activities should be implemented where possible at existing DOT sites to maximize the management of both TB and HIV. Health care workers at the sites should be trained on TB, HIV and TB-HIV co-infection.

PC-61598-04 Role of motivated health workers in improving TB patients' access to ART: case of Thyolo District in Malawi

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Background and aim: Emerging evidence from Thyolo showed that a significant number of patients, including TB patients, eligible for ART chose not to initiate ART. The aim was to explore barriers and enablers to accessing and adhering to free ART.

Methodology: The study utilised a qualitative approach complemented by analysis of routine ART register data. Data was collected at Thyolo District Hospital, peripheral health centres and the general community in Thyolo district, from March to June, 2005.

Results: Most TB patients were HIV positive. Transport costs and lack of food were reported as major barriers. Major enablers were positive health worker attitudes and decentralization of TB and ART services. Positive health worker attitudes were mainly due to motivation in terms of remuneration and availability of tools of trade for example, drugs (facilitated by MSF Belgium). Home Based Care (HBC) volunteers and Health Surveillance Assistants (HSAs) supported by MSF played an important role in improving access and adherence to treatment.

Conclusion: Motivating overloaded health workers, in terms of remuneration and tools of trade results to positive health worker attitudes which enhances uptake of health services by the poor. HBC volunteers and HSAs must be considered when addressing the health worker crisis.

PC-61688-04 Evaluation of HIV-related services at TB clinics in Guyana, 2005

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Background: Guyana national policy recommends counseling and testing all tuberculosis (TB) patients for HIV and referring the co-infected to HIV services. National TB clinics also provide co-trimoxazole preventive therapy (CPT) to co-infected patients. We evaluated HIV-related counseling and testing, referrals and CPT procedures to determine whether these recommendations were being followed.

Methods: We collected data from TB registers and patient charts for patients diagnosed and treated for TB disease from July 1, 2005 through December 31, 2005 at all national TB clinics.

Results: We reviewed 194 patients' records. Sixty-six (34%) knew their HIV status prior to TB diagnosis and were not tested, 50 of whom reported being HIV-infected. Of the 128 patients with unknown HIV status prior to TB diagnosis 95 (74%) were offered HIV counseling and testing and 85 (89%) of these 95 were tested. Eleven (13%) of the 85 tested were HIV-infected. Overall, HIV status was established for 151 patients, with 61 (40%) being HIV-infected. Referral rates for HIV care varied by patients' enrollment in HIV programs before TB diagnosis and by each TB clinics' ability to provide HIV care. Fifty-one (84%) patients were receiving HIV care and 38 (62%) were receiving CPT.
Conclusion: Though many TB patients receive HIV-related services, further improving and standardizing TB clinics' awareness, provision, and documentation of these services are critical to ensure co-infected patients' health.

PC-61722-04 Collaboration in establishing a TB-HIV pilot project, Addis Ababa, Ethiopia, 2005

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Introduction: Persons infected with HIV are at increased risk for developing TB and should be screened for TB and evaluated for isoniazid preventive therapy (IPT). The objective of this collaboration was to es-

tablish a TB screening pilot project and an IPT program in a hospital-based voluntary counseling and testing (VCT) clinic in Addis Ababa.

Methods: CDC collaborated with the following Ethiopian agencies to implement the project: the Ministry of Health (MOH), the Regional Health Bureau, a reference laboratory, the project hospital, and a local teaching hospital. All patients newly diagnosed with HIV at the VCT clinic were eligible for TB screening, including symptom review, physical examination, chest radiograph, and microscopy and culture of sputum specimens.

Results: Beginning in March 2004, staff from all agencies collaborated to provide technical advice and develop operational procedures for the project. CDC and MOH collaborated with the hospitals and reference laboratory to provide training to research assistants and monitor implementation of the project. Of the first 94 HIV-infected patients screened, 12 were diagnosed with TB and referred for treatment. IPT is now routinely offered to HIV-infected patients at this clinic for whom TB is excluded.

Conclusions: Collaboration between TB and HIV/AIDS programs is essential for providing comprehensive care for co-infected patients, and can result in greater patient access to health services and better use of scarce resources.

PC-61758-04 Outcomes of isoniazid preventive therapy among HIV-positive persons, Battambang Province, Cambodia

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Objectives: To assess the feasibility of implementation and outcomes of isoniazid preventive therapy (IPT) for HIV-positive persons.

Design: All HIV-positive persons referred from Voluntary Confidential Counseling and Testing centers are screened for active TB using a symptoms/signs questionnaire, sputum smear-microscopy and culture examination, and chest X-ray. Those with active TB are placed on anti-TB treatment. Those without active TB are counseled for IPT and screened for IPT eligibility. Those enrolled receive a one-month supply of isoniazid and are scheduled for once monthly visits for 9 months. Outcomes are assessed upon IPT completion and every 6 months for 3 years post-IPT.

Results: During September '03–February '06, 1869 HIV-positive persons were screened for TB; 372 (19.9%) cases were identified and treated. Of the remaining 1497 persons, 115 (7.7%) were clinically eligible for IPT, of which 101 (87.8%) were enrolled

and treated. Outcome was available for 56 enrolled patients; the rest were receiving IPT. Among these 56, 47 (83.9%) completed a full course, five (8.9%) defaulted, two (3.6%) developed active TB, one (1.8%) died, and one (1.8%) was transferred out. The two active cases had a normal CXR and no symptoms, but the culture was positive for MTB at 2 months.
Conclusions: TB screening is essential before IPT can be considered. Completion of therapy in Cambodia was high with few complications. However, strategies to increase IPT uptake are needed.

PC-61765-04 What tasks are performed by TB nurses? Activity sampling study of health care workers in Kinshasa, DRC

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Objectives: Many fear that integration of HIV activities into TB care will strain already overburdened health care workers (HCW). This study assessed activities performed by TB clinic HCW prior to implementation of collaborative TB-HIV activities.

Methods: HCWs' activities in 11 of 92 TB clinics in Kinshasa were observed and coded at 3-minute intervals using an activity sampling technique developed by Family Health International. Each TB nurse was observed for a 2-week period. Some TB nurses identified themselves as both TB nurse and head nurse, lab technician, or administrator.

Results: On average 24.4% of the HCWs' time was spent on TB activities: 10.9% (0–26.8%) on TB patient care and 13.5% (1.8–49.9%) on TB tasks without patient contact. The large variations could in part be explained by provider type, number of TB nurses at each center, and TB clinic caseload. Non-TB related activities took up 75.6% of TB nurses time: 37.7% (0–69.9%) for care of patients with health issues other than TB, and 37.9% (11.0–91.4%) on non-patient, non-TB-related work. Of the latter, 24.4% was spent waiting for patients, and 61.9% on non-productive activities (snacking/lunch, reading a magazine, talking to family or friends).

Discussion: HCW employed in TB clinics integrated within primary care clinics performed predominantly non-TB related activities. Integrating HIV activities into routine TB care may demand re-organization of tasks between HCW rather than adding more TB nurses.

PC-61780-04 Tuberculosis screening among people living with HIV/AIDS in Thailand

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Background: TB is a common opportunistic infection among People Living with HIV/AIDS (PLWHA). Method of screening TB among PLWHA is necessary.
Purpose: This study aimed to assess prevalence of TB disease among PLWHA.

Method: A total of 8019 PLWHA from 483 districts of 813 districts in Thailand was enrolled. They were new diagnostic HIV infection. They were screened by the use of five questions: cough more than 2 weeks; history of TB treatment; history of being housed in a prison; history of IDU; and having a TB case in household. PLWHA who had at least one of these five items were further examined by sputum examination and chest X-ray.

Results: From 1 June to 30 September 2005, 7266 (91%) access IEC for TB and they were screened by the five questions. Percentage of PLWHA having at least one of the five items was 41%. About 17% (1354) were diagnosed as TB.

Conclusion: Prevalence of TB among PLWHA at the VCT centers was high. VCT centers can offer TB screening for PLWHA and refer those to TB clinics for diagnosis and treatment.

PC-61274-04 Efficiency of serial smear examinations in excluding sputum smear-positive tuberculosis

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Background: This study determined the number of slides required to identify one additional case of sputum smear-positive tuberculosis from the third smear. The study hypothesis was: not more than 100 and 75 slides respectively in Mongolia and Zimbabwe need to be examined to find one additional case of tuberculosis with a third serial diagnostic sputum smear examination.

Methods: This was a retrospective, record-based study. Data were abstracted from tuberculosis laboratory registers from all 31 laboratories in Mongolia and 23 randomly selected laboratories in Zimbabwe using a uniform EpiData collection instrument.

Results: A total of 52 909 records of examinees were available. In Mongolia, of the 15 103 suspects, 1717 (11.4%) were positive. Of these, 0.7% were positive for the first time on the third smear examination. In

Zimbabwe there were 25 693 suspects, of which 3452 (13.4%) were positive and 4.5% were positive only on the third smear examination. The expected number of slides required to detect one additional case on the third examination was 1153.3 for Mongolia and 132.6 for Zimbabwe.

Conclusions: The requirement of routine examination of three serial smears before declaring a suspect as a 'non-case' (of sputum smear-positive tuberculosis) will need to be reviewed in both Mongolia and Zimbabwe.

PC-61563-04 External quality assessment of sputum smear microscopy in Taiwan

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Background: To ensure adequate laboratory services, the Center for Disease Control (CDC) Taiwan initiated an external quality assessment (EQA) of sputum smear microscopy program in 2005. Nine CDC contracted mycobacteriology laboratories collected slides from their routine work for rechecking by the National Reference Laboratory of Mycobacteriology. A sampling strategy based on the lot quality assurance system was applied to choose slides for evaluating the quality of smear prepared and the accuracy of reading.

Results: A total of 1017 slides were evaluated for smear quality. Of these 1017 slides, 637 (62.6%) had proper smear size, 492 (48.4%) proper thickness and 884 (86.9%) proper staining. Rechecking of 981 readable slides revealed that 25 (2.5%) had major errors and 29 (3.0%) minor errors. Of the 9 laboratories evaluated, one had one high false positive and 8 had at least one high false negative result.

Conclusion: A routine smear EQA program has to be included in the National Tuberculosis Program. Supervision visits to find out the causes of errors followed by corrective actions are crucial to assure the quality of the sputum smear microscopy.

PC-61616-04 External quality assessment of smear microscopy in Central Asian Republics

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Aim: To analyze methods of External Quality Assessment for smear microscopy in the CAR region.

Method and material: Analysis of data collected during regional laboratory assessment conducted by Project HOPE in five CAR countries and quarterly monitoring reports.

EQA methods for smear microscopy: Rechecking 10% of negative and 100% positive slides in Kazakhstan and Turkmenistan; on site evaluation in Uzbekistan and Kyrgyzstan; blinded rechecking in Tajikistan and partly in Uzbekistan.

Results: In Kazakhstan in 2005 disagreement was detected in 4 (0.05%) slides, out of 7978 rechecked. Case detection of smear positive cases among suspects decreased from 4.9% to 3.9%. In Tajikistan, 8 (21%) out of 38 laboratories did not meet required standards of quality. During the third quarter of 2005, 10 088 smears were done, 577 slides rechecked and 32 (5.5%) major errors found.

Conclusion:

- 1 Rechecking 10% of negative and 100% of positive slides does not contribute to quality improvement of smear microscopy service.
- 2 Implemented properly, blinded rechecking method provides reliable information on lab performance. Development of practical instructions will facilitate wider implementation in the region

PC-61806-04 The Epi-Lab experience in building the capacity of Sudan NTP staff: a case study

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A major hindrance to equity and sustainability of public health services in Sudan is the competence of its health workforce. The competence to guide critical evaluation of public health services in order to improve performance is strikingly lacking both nationally and regionally. The skills and experience needed to guide programme development are learned skills and can be transferred to local institutions and experts to scale up the activities required to address the major challenges encountered in reducing avoidable suffering and death and in empowering communities to lead their economic development. The Epi-Lab was established as a first step to realize this vision. Since its establishment in 1997 the Epi-lab has been engaged in building the capacity of its staff and that of the Sudan NTP. This was done through many PhD, masters degree programmes both locally and overseas, also by way of participation in national, regional and international courses and conferences. As a result the Epi-lab has been a leader in Sudan in founding and scaling up effective and accountable public health services in the country. Extending the Sudan NTP from its pilot projects in 1995 to country-wide implementation in 2002, the Programme has provided high quality care for almost one quarter of a million tuberculosis patients by 2004. The Programme has documented a steady rise in case finding activities,

population coverage and successful treatment of these patients in scientific publications.

PC-61972-04 Comparative study on the proficiency of medical and non-medical technologists on quality sputum microscopy

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The role of peripheral sputum microscopy centers in providing good quality procedures, accurate and reliable results should be maintained and evaluated for effective TB control.

Method: A comparative experimental study in double blind design was done from October–December 2005, to compare and evaluate proficiency on quality sputum microscopy of 36 medical technologists and 24 non-medical technologists in Region 12, Philippines. A 25 points proficiency test was given for knowledge level; 10 unknown slides for reading; 5 slides for smearing staining.

Results: At 95% confidence level, .05 degrees freedom, the study showed: 1) no significant difference in quality slide preparation; 2) significance difference in slide reading; t statistics 2.65 vs. t critical 0.005; 3) significant difference in knowledge level: t statistics –3.00 vs. t critical 0.009.

Discussion: Both medical and non-medical technologists produced good slides irrespective of age, gender, civil status, workload, training hours and years of service. The medical technologists however were more knowledgeable, and more accurate and reliable in identifying TB bacilli. The study, being the first, described the microscopists' current involvement; and the results are now used for future plans and prospects in quality assured peripheral laboratory.

ASSESSING AND ADMINISTERING QUALITY CARE IN LUNG DISEASES

PC-61127-04 How pulmonary tuberculosis influences the quality of life of the patients

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WHO recommends determining of QL, as individual correlation of the state own in the life of society with the task of the given individual, with his plans, possibilities and the degree of common disarrangement.

Aims: To study the QL of patients with the first revealed pulmonary tuberculosis.

Methods: QL was estimated by the questionnaire QL-100 CARTFUL (WHOQOL-100). It contains 100 questions incorporated in 6 scales, each in its turn

combines from 3 to 8 regions, 4 questions in each. Every question is used in the treatment of marks of one of the scales: physical, psychological functioning, level of independence, social interrelations, environment and spiritual life.

Results: In research the data on 142 patients with first revealed TB aged from 18 to 55 years were included. The obtained results showed the reliable decline of the QL indexes as a whole in all spheres ($P < 0.001$), except for the level of independence. Patients with pulmonary TB estimate quality of the life in most parameters as middle. None of the parameters notes polar estimations (very bad or very good). The general estimation of QL in patients with the first revealed TB turned out on the average by 1.5 times below QL in healthy persons.

Conclusions: The decline of the QL indexes in patients with the first revealed pulmonary TB sets up a serious problem in the life of a patient and determines the necessity of program development of social-psychological rehabilitation on the early stages of management.

PC-62046-04 Nursing training model to assess *M. tuberculosis* infection level in institutionalised populations in Brazil

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Introduction: The tuberculosis (TB) is a world-wide distributed endemic disease, but it occurs predominantly in the underdeveloped countries. It is more frequent in urban areas, in the poverty clusters where if it propagates more intensely. Its risk factors include undernutrition, low immunity and large crowding household. Risk Environment for the transmission of the *M. tuberculosis* are the general hospitals, the psychiatric hospitals, the shelters, the arrests, the asylums and the houses of rest.

Objective: To evaluate the model of nursing training in the actions of the National Program of Control of Tuberculosis (PNCT) praised for institutionalized populations, with emphasis in the determination of the level of the *M. tuberculosis* infection.

Methodology: We conducted an observational survey study design with prospective data collection. Five nurses were trained in the application and reading of the tuberculin skin test (TST). TST was done in 395 patient and employers of a Psiquiatric Institute located in the west zone of the Rio de Janeiro city. The training nurses had participated of TST open readings and TST double-blind readings with the reference nurse and it was expected that they would have to reach at least 80% of agreement with the reference reader. Beyond these procedures, the nurses had been enabled in the identification of symptomatic respiratory (SR).

Results: The correlation graphs of the readings results of each training nurse and the reference reader indicate a good level of agreement. The combined reading results of the training nurses indicated 90.2% of agreement. The individual results had varied from 88% to 93%.

Conclusions: This model of TST training is indicated to the professionals who work with institutionalized populations. It is essential to include this kind of training in the activities of tuberculosis surveillance of these special groups.

PC-62059-04 Tuberculosis infection in African nursing students: tuberculin skin test compared to ELISPOT conversion rates

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Objective: To investigate the rate of new infection with *M. tuberculosis* in student nurses in Harare, as indicated by the tuberculin skin test (TST) and enzyme-linked immunospot (ELISPOT) assay.

Design: Cohort study of TST and ELISPOT (ESAT-6 and CFP-10) conversion. 213 student nurses (144 two-step TST-ve ELISPOT-ve; 54 TST+ve ELISPOT-ve; 15 two-step TST-ve ELISPOT+ve) were retested 6, 12 and 18 months into training.

Results: The conversion rate for ELISPOT (27.6 per 100 PYFU, 95%CI 21.8 to 35.0) was 8.4 per 100 PYFU (95%CI -0.4 to 17.1) higher than for TST (>10 mm increase: 19.3 per 100 PYFU; 95%CI 14.2 to 26.2), with poor individual concordance. Only 28 of 69 (41%) ELISPOT conversions were accompanied by TST conversion. 22 (79%) of 28 TST conversions to >15 mm and 6 (46%) of 13 TST conversions to 10 to 15 mm were accompanied by ELISPOT conversion. Students rotated through specialities at a high rate, limiting power to correlate conversions with exposure.

Conclusions: High rates of *M. tuberculosis* infection, indicated by either TST or ELISPOT conversion, occurred in this cohort, but with poor concordance between the two tests. ELISPOT has previously been demonstrated to have high sensitivity and specificity for recent *M. tuberculosis* infection in non-endemic settings. If also true in this setting, then this implies that true *M. tuberculosis* infection rates were markedly underestimated by TST conversions, but that TST conversions to >15 mm have good specificity.

PC-61028-04 Aetiology study of acute severe pneumonia in Malawian children

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Background: Mortality is high (10–15%) in infants and children admitted with severe pneumonia in Malawi yet knowledge of the causes is limited. Haemophilus influenzae is likely to be less common since Hib conjugate vaccine was introduced routinely in 2001 but there is evidence from the region to suggest that non-typhoidal Salmonella (NTS) and tuberculosis (TB) may be common and unlikely to respond to currently recommended antibiotics.

Aim: To investigate aetiology of severe pneumonia in Malawian infants and children.

Methods: Children of 2 months and older who fit the WHO criteria for severe or very severe pneumonia are being enrolled following informed consent and investigations included oxygen saturation; CXR; blood culture; lung aspirate for culture; nasopharyngeal aspirate or induced sputum for Pneumocystis, viruses and *Mycobacterium tuberculosis* microscopy and culture; HIV test (if agreed on separate consent). First-line antibiotics are penicillin and gentamycin.

Results: Study still in progress. For the first 200 children enrolled from 2 months to 14 years, case-fatality rate has been 12%. HIV prevalence of those tested is 55%. The common bacteria isolated are NTS (10), pneumococcus (9), staph aureus (4) and Hib (3). In addition, there have been 11 cases of PcP and 5 cases of TB.

Conclusions: The common finding of NTS in Malawian children with severe pneumonia has implications for appropriate recommended first-line antibiotics.

PC-61043-04 Asthma control test: a new tool to assess asthma control

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Background: A variety of methods have been used to assess the level of asthma control. Asthma control test (ACT), a relatively new tool and, is based on five simple questions that are answered by the patient in an out patient setting. Each question has a score of 0 to 5. A score of 25 is considered as 'total control', between 20–24 'well control' and <20 as 'poor control'.

Objective: To assess the level of asthma control in patients attending a university hospital chest clinic.

Method: Asthmatics, as labeled by their physician, and who were >12 yrs of age, attending the chest clinic were included.

Result: One hundred and fifty patients were included.

Sixty eight (45%) were male and 82 (55%) female. Of these patients only 10 (7.0%) patients had an ACT score of 25. Forty seven (31.0%) had a score between 20–24 and 93 (62%) patients had a score <20. Fifty seven (61%) patients with 'poorly controlled' asthma were females.

Conclusions: As assessed by this particular tool, over 60% of patients visiting the chest clinic have poorly controlled asthma. ACT is a relatively new tool in our population and further studies are needed to validate this study.

PC-61272-04 Management of asthma adhered to GINA 2002 in the university hospital at Hochiminh City, Vietnam

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Asthma is a chronic airway inflammation. The Global Initiative for Asthma Management (GINA), which launched in 1993, with the latest publication in the year of 2002, is applied worldwide. We conducted this study to investigate the management of asthma adhered to GINA in The University hospital at Ho Chi Minh city, Vietnam.

Method: This was a cross-sectional, described study of 1646 outpatients in The University hospital at Ho Chi Minh city, from 1/2001 to 4/2004.

Results: The results showed that up to 55.2% of asthmatic patients have not been diagnosed as asthma, only 13.8% of patients used inhaled corticosteroids. There were 86.6% of asthma patients is of step 4 for severity. There were 84.2% of typical form of asthma, 7.8% as dyspnea variant of asthma, and 6.9% as cough variant of asthma. There were up to 58.5% of patients dropped of after 1st or 2nd visit. The results of treatment showed that after 2–4 weeks up to 93.9% of patients have had no clinical signs, the spirometric parameters improved with statistical significance, only 7.9% of patients suffered from the adverse effects of the asthmatic drugs.

Conclusion: The management of asthma adhered to GINA were effective both on clinical and spirometric aspects. But the rate of non compliance was still high.

PC-61094-04 Health-related quality of life in sarcoidosis: test of new instrument

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Background: The first specific Sarcoidosis Health Questionnaire was developed in 2003 in USA. It was validated and has shown to be acceptable in terms of reproducibility, reliability, and high correlation with the other stated QL instruments.

Aims: To test the previously validated SHQ Russian Version in patients with sarcoidosis.

Design: 32 patients with proven sarcoidosis (systemic and local) were included in the study. All patients filled the SHQ and special CRF.

OR: Results: Mostly patients were females (22). HRQL of males (Total Score: 5.24 ± 0.49) was higher than in females (Total Score: 4.39 ± 0.81), $P = 0.016$. The overall index of HRQL in sarcoidosis patients (Total Score in SHQ) did not differ between systemic and local forms of disease (number of organs affected by sarcoidosis did not analysed). Activity of sarcoidosis did not affect on Total Score (4.77 ± 0.76 in high-active disease and 4.23 ± 1.42 in case of low activity, $P = 0.386$).

Conclusion: There are significant differences in HRQL in sarcoidosis patients between groups of different sex, but now such differences in terms of activity and severity of the disease. Further investigations in the field of HRQL in sarcoidosis are needed.

PC-61113-04 Direct comparison of interferon-gamma tests in immigrant contacts of smear-positive tuberculosis patients

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Background: Recent latent tuberculosis infection (LTBI) is difficult to diagnose in immigrants from high endemic countries because the only available test method, the tuberculin skin test (TST), has a low positive predictive value (PPV). Recently interferon-gamma (IFN- γ) tests have become available that measure cellular responses to specific *M. tuberculosis* antigens which might not have this disadvantage.

Aim: To determine the predictive value of TST and two different IFN- γ tests combined with epidemiological characteristics for developing active TB in immigrants who are close contacts of smear positive TB patients.

Methods: In this prospective cohort study immigrants above 15 years, who are a close contact of an infectious TB patient are included. Those with a TST induration of ≥ 5 mm are also tested with both QuantiFERON TB Gold in tube and T-SPOT.TB and followed up for 2 years to evaluate the development of tuberculosis.

Preliminary results: 53% of 118 contacts with a positive TST, were positive by the QuantiFERON TB Gold in tube assay, compared with 63% by the T-SPOT.TB assay. No contacts have developed tuberculosis during follow-up yet.

Discussion: It is unclear whether differences between the IFN- γ assays show a higher sensitivity or a lower specificity of T-SPOT.TB. Preliminary results on the

comparison between TST and both IFN- γ test as well as their predictive value for development of TB will be presented.

PC-61149-04 Development, implementation and preliminary study of a PDA-based bacteriology collection system

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Rationale: Monthly bacteriology tests, collected from health establishments across Lima, Peru, are an integral part of a tuberculosis treatment. Currently, each establishment must be visited to collect this information by hand, process it and type it into an electronic medical record system (PIH-EMR).

Objective: Evaluate the effect of a personal digital assistant (PDA)-based electronic collection system on the delays, errors and resources required to collect smear and culture results.

Methods: A PDA-based system was developed to collect, verify and upload bacteriology data into the PIH-EMR. After an initial implementation period, a pilot study was performed. A baseline assessment of over 1200 bacteriologies was completed in two health districts. The electronic system was implemented in one while the control site continued the paper-based system.

Results: The PDA system had a processing time of 6.2 days, significantly lower than both baseline and control measurements of 54.8 and 64.4 days, respectively (both $P < 0.0001$). It reduced the frequency of data discrepancies from 10.1% to 2.8% ($P < 0.0001$), and received positive feedback from users. Finally, the system's cost per user would be recuperated in 3 months by increased efficiency.

Conclusions: This system shows promise in reducing delays, errors and resources in collecting bacteriology results from many health establishments and could be used in tuberculosis programs where care is spread out.

PC-61649-04 Pilot on adverse reactions to first-line anti-tuberculosis drugs under DOTS-based program

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Introduction: International survey on frequency of adverse reactions (ARs) to TB drugs is conducted in Kyrgyzstan in cooperation with The Union. The pilot was conducted in January–March 2006 in Bishkek.

Objectives: Identify how often ARs cause serious interruption of treatment

Methods: A field tested questionnaire was used as a tool; it measured the discontinuation of TB medication for at least 7 days.

Results: The questionnaire was completed by all 843 patients; 12 (1.4%) cases of ARs that caused interruption were identified, 9 related to 4FDCs and 3 to single drugs. ARs were of 5 types: rash—4 (R suspected); vomiting/nausea—1 (H); collapse—1 (H, R, E); abdominal pain—1, jaundice—1 (not identified for both). In 4 other cases suspected drugs were not indicated. All ARs were in the intensive phase and most of them (78%) in the second month of treatment. Interruptions lasted 7–16 days. 4FDC was canceled in 9 cases, 1 patient needed extra hospitalization. All patients continued mono-TB drug treatment, treatment regimen was changed in 1. The frequency of ARs was 7 per 1000 patients.

Conclusion: The questionnaire is useful for collecting information on AR. The pilot survey illustrated not high rate of observed ARs. The survey can be conducted in routine NTP.

PC-61979-04 Assessment of health-related quality of life in chronic obstructive pulmonary disease patients in Ife, Nigeria

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Background: Health related quality of life (HRQL) often encapsulates a patient's whole life experience especially in the activities of daily life. There is a paucity of work on the use of this outcome marker and the St George's Respiratory Questionnaire (SGRQ) among COPD patients in Nigeria hence this study.

Method: Patients with stable COPD according to the ATS criteria were recruited consecutively from the outpatient clinic of the Obafemi Awolowo University Hospital, Ile-Ife, Nigeria. They all underwent lung function test, 6-MWT and dyspnoea ratings with VAS and Borg scales. The HRQL was assessed using the SGRQ.

Results: This is a preliminary result of an ongoing study. Eighteen patients of mean (SD) age 69 (10), mean (SD) FEV₁ 0.74 (0.39) l and mean (SD) FVC 1.42 (0.50) l have been included. FEV₁, FVC and dyspnoea ratings were correlated with dimensions of the SGRQ. Correlations were found between the pre-bronchodilator FEV₁ and the 'activity' component of the SGRQ ($r = -0.485$, $P = 0.041$). None existed with the 'symptom', 'impact' or 'total' scores and none was found between the post bronchodilator lung function parameters and the SGRQ. Strong correlation was however found between the SGRQ 'Activity', 'Impact', 'Total' scores and VAS ($r = 0.687$, $P = 0.002$), Borg ($r = 0.668$, $P = 0.002$) at the end of exercise.

Conclusion: This study shows that the SGRQ can be a very useful tool in assessing HRQL in COPD patients in Nigeria and serve as a basis for both research and clinical assessment.

PC-62055-04 TB case registration within 3 days of notification and analysis of data at regular interval improved the case management of patients

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TB case registration within 3 days of notification and analysis of data at regular interval improved the case management of patients at the Area Health Office Keningau, Sabah, Malaysia.

Objective: To strengthen the treatment outcomes (cohort) for all PTB of the infectious type and the registration of cases at the districts level.

Setting: All cases, 2002 onwards of documented PTB of the infectious type and all forms of TB treated by government clinics in the districts of Keningau, Tenom, Pensiangan and Tambunan, where the Area Health Office Keningau as the center of control.

Methods: PTB is defined with the lesion in the lung parenchyma and PTB smear negative microscopy were defined with at least three smear microscopy done and the chest X-Ray reading consistent with Tuberculosis characteristics. All cases of TB treated by government clinic and recorded in Tuberculosis Information System (TBIS) were reviewed. Secondary data entry for treatment outcome analysis were performed to all registered patient with TBIS. Quality Control Circle (QCC) were applied in the project implementation.

Results: MyTB an on line registration and analysis were created as one of the management tool. Another tool using Brain storming, Meeting, Refer (BMR) approach were implemented. All the 23 districts implemented the two tools in management that will improve in the case management. The cure rate of 85% and the PTB of infectious types proportion has improved to more than 65%.

Conclusion: QCC has assisted in the creation of two management tools which has strengthened the case management of TB in Keningau Area Health Unit and the State of Sabah.

POSTER DISPLAY SESSIONS

DRUG SUSCEPTIBILITY TESTING FOR TB

PS-61021-04 Nitrate reductase assay: an alternative method for tuberculosis drug resistance detection

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Background: Tuberculosis (TB) is one of the most important health problems around the world. The emergence of *Mycobacterium tuberculosis* multidrug resistant strains has hindered tuberculosis control. For this reason the rapid diagnosis of TB drug resistance is a priority to avoid dissemination of resistant strains. The aim of this research was to evaluate the performance of the Nitrate Reductase Assay (NRA) for detection of resistance to the first line antituberculous drugs.

Methods: The NRA was used as an alternative for resistance detection to the first-line antituberculous drugs isoniazid, rifampicin, ethambutol and streptomycin. Three hundred and twenty *Mycobacterium tuberculosis* strains were studied and the results were compared with the Proportion Method.

Results: The average time to obtain results was 10 days. The sensitivity of the NRA was 91.7%, 96.5%, 88.0% and 93.9% for isoniazid, streptomycin, ethambutol and rifampicin, respectively and the specificity was higher than 99.1% for all drugs. The overall agreement between the NRA and the PM was 98.8%.

Conclusion: The NRA constitutes a useful tool for TB drug resistance detection in low-resource countries with limited laboratory facilities due to its low cost, ease of performance and lack of requirement for sophisticated equipment.

PS-61022-04 Drug-resistant tuberculosis in Cuba: results of the three global projects

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Background: The spread of multidrug-resistant tuberculosis (MDR-TB) in the world remains a major public health problem. Surveillance of anti-tuberculosis drug resistance is therefore as essential tool for monitoring the effectiveness of TB control program and, through policy development, for improving national and global TB control. The objective of this research was to determine the prevalence of anti-TB drug resistance in Cuba during the execution of the three global projects.

Methods: Drug-resistance was determined using the proportion method in 1528 *Mycobacterium tuberculosis* strains to first line anti-TB drugs.

Results: Resistance in new cases was 8.3%, 4.6% and 5.0%; MDR was 0.7%, 0% and 0.3% in the first (1997), second (2000) and third (2004) global projects respectively. In new cases, none showed resistance to the four drugs. There were among previously treated cases statistically significant decreases in the prevalence of resistance to at least one drug when comparing the results obtained in the three global projects.

Conclusions: The contributed data through Cuba demonstrated that our country is relatively free of MDR strains, recognizing it to world level the good National Control Program and the possibility of TB elimination in Cuba.

PS-61095-04 Comparison of three rapid methods for screening sputum specimens for rifampicin-resistant tuberculosis

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Aim: To compare three new technologies for the direct detection of rifampicin-resistant tuberculosis in smear positive sputum samples in Kampala, Uganda.

Design: Sputum specimens from smear-positive suspected MDR-TB cases were tested for rifampicin sensitivity by a phenotypic method (BACTEC 460, Becton Dickinson), a molecular test (Inno-LiPA, Innogenetics) or a bacteriophage test (D29, in-house). Results were compared to those obtained from indirect testing (BACTEC) of the corresponding specimens. Turn around times and cost analysis were assessed for each technique.

Results: Results showed high correlation between the traditional method and direct testing with BACTEC 460. The Inno-LiPA and bacteriophage tests were less reliable, particularly from specimens with low bacillary loads. The most rapid test, the Inno-LiPA, could be performed in eight hours, although actual 'turn around time' averaged 48 hours, similar to the bacteriophage test. Direct BACTEC results ranged from 4–20 days with a mean of 8. Costs were dependent on batching, but generally the bacteriophage was less expensive than direct BACTEC, while the LiPA test was considerably more expensive. All methods were good predictors for MDR in this population.

Conclusions: All three tests offer advantages over conventional methods for detecting rifampicin resistance. Further research is planned using direct rifampicin

testing as part of an improved patient management strategy for retreatment cases.

PS-61118-04 Assessment of primary resistance in multidrug-resistant TB

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Objective: To study MDR-TB isolates to identify primary and secondary resistance at microbiology laboratory Aga Khan University Karachi Pakistan.

Material and methods: All samples positive for *Mycobacterium tuberculosis* received January–September 2004 were reviewed for drug resistance pattern as well as for history of previous antituberculous drugs exposure.

Results: Out of 216 *M. tuberculosis* cultures 138 (64%) showed resistance to one or more agents. Multi-drug resistance (MDR) was observed in 102 (47%) isolates. Of 138 drug resistant isolates; primary resistance to any one or more agent was noted in 31 (39%) and secondary (acquired) resistance in 107 (79%) isolates. On analysis of the 102 MDR-TB strains 8 (10%) showed primary resistance while 94 (69%) showed secondary resistance.

Conclusion: In this population MDR-TB was mainly associated with previous anti-tuberculous treatment. However, primary MDR was also observed and reflecting dissemination of MDR cases within the community.

PS-61183-04 Drug resistance in pulmonary tuberculosis in Istanbul, 2004

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In the present study, we investigated prevalence of drug resistance in TB patients who were diagnosed in Istanbul, 2004. 1865 (1419 male, 446 female) TB patients who have drug resistance test in laboratory of Istanbul Anti Tuberculosis Association and who are registered in a dispensary and/or live in Istanbul, were enrolled the study. Drug sensitivity test was performed on Lowenstein Jensen media. The concentration of drugs: Isoniazid 0.2 mg/ml, streptomycin 5 mg/ml, Rifampicin 40 mg/ml, ethambutol 2 mg/ml. There were 1614 (1203 male, 411 female) new TB cases, 251 (216 male, 35 female) previously treated TB patients. In new TB cases, of the 1356 patients have not got any drug resistance (84%), of the 258 patients have got at least one drug resistance. In new TB cases, the frequency of drug resistance: isoniazid 170 (10.5%),

streptomycin 154 (9.5%), ethambutol 51 (3.2%) and rifampicin 85 (5.3%). In 251 previously treated patients there were 86 (34.3%) who have got at least one drug resistance. The frequencies of drug resistance were 69 (27.5%), 48 (19.1%), 27 (10.8%) and 51 (20.3%) respectively. Multidrug resistance was found in 70 (4.3%) of the new cases and in 43 (17.1%) of previously treated patients. When we compare our results with the study of 1999,¹ the prevalence of resistance was similar and it was still high.

1 Kilicaslan Z, et al. Drug resistance in pulmonary tuberculosis in Istanbul. *Eur J Clin Microbiol Infect Dis* 2002; 21: 763–764.

PS-61459-04 In vitro activity of linezolid and moxifloxacin against multidrug-resistant *Mycobacterium tuberculosis*

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Tuberculosis caused by multidrug-resistant *Mycobacterium tuberculosis* strains (MDR-TB) is considered an emergent health problem frequently associated to HIV positive patients. Currently used antituberculosis treatments often fail and others drugs different from those included in the standard chemotherapy must be used. Minimal inhibitory concentration (MIC) of linezolid (LZ) and moxifloxacin (MOX) were determined by a colorimetric microplate-based method using 3-(4,4-Dimethylthiazolyl)-2,5 Diphenyl Tetrazolium Bromide (M-MTT). MIC₅₀ and MIC₉₀ for each drug were also determined. The tested drugs range concentrations ($\mu\text{g/ml}$) were: LZ, 2.00 to 0.06 and MOX 1.00 to 0.03. The assay was carried out on 35 MDR-TB isolated in Argentina during 2005. MIC₅₀ and MIC₉₀ for LZ were 0.25 and 0.50 $\mu\text{g/ml}$ respectively, while for MOX these figures were 0.06 and 0.25 $\mu\text{g/ml}$. Results of MICs by M-MTT were obtained in an average of 8 days and they were compared to those obtained by the agar proportion method (PM) containing 2.0 $\mu\text{g/ml}$ of LZ and 1.0 $\mu\text{g/ml}$ of MOX. Full agreement between results obtained by both methods was observed. The microplate system could be used as a simple, rapid and low cost technology to explore susceptibility of MDR-TB strains to several potential antituberculosis drugs as MOX and LZ.

PS-61703-04 Evaluation of a screening test for rapid detection of MDR-TB and the cost of its utilization in a group of patients

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MDR-TB is increasing worldwide, it is necessary an early detection to give a rapid an effective treatment and decrease morbidity, mortality and transmission of MDR strains to the community.

Aims: Evaluate a screening test for detection of resistance to INH and rifampin and to compare cost of its utilization in a population with high risk of MDR-TB.

Methods: 100 patients with pulmonary TB, AFB smear positive and risk factors for MDR-TB were studied. All specimens were decontaminated AFB smear and culturing in LJ and MGIT were performed, sputum were directly inoculated in screening media TLA/INH/RIF (Thin layer with 7H11 agar in a four quadrant dish, growth control quadrant, 7H11 plus PNB, 7H11 plus INH and 7H11 plus rifampin), DST were done using proportion method. Cost of care and time to render a result were calculated for four algorithms comparing standard methods, MGIT and TLA/INH/RIF.

Results: Average days for resistance detection using the screening test were 12 days for INH and RIF, for indirect proportion method were 46 days. The screening test showed 100% of agreement compared to the proportion method. Using TLA/INH/RIF for MDR-TB detection decreased the cost of care.

Conclusion: TLA/INH/RIF for MDR-TB give rapid detection reducing the cost related to detection of these patients.

PS-61891-04 Accuracy of a phage assay for detection of rifampicin resistance in smear-positive patients in Lima, Peru

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Background: FASTPlaque-Response™ (BIOTEC) with NOA Antimicrobial Supplement (BIOTEC) is a diagnostic kit that uses phage amplification technology to determine rifampicin resistance in strains of *Mycobacterium tuberculosis*. The test is performed directly on sputum specimens and results are available within 2 days. The antimicrobial supplement is intended to decrease the number of invalid results due to microbial contamination that was seen in earlier studies.

Methods: A study was designed to evaluate the accuracy of the FASTPlaque test in detecting rifampicin resistance. Indirect testing for rifampicin resistance by

the proportion method on Lowenstein-Jensen (LJ) medium was used as the gold standard. Patients from the north area of Lima, Peru, with smear positive pulmonary TB were recruited for the study. We report here the preliminary results on the first 151 patients tested.

Results: Resistance to rifampicin was detected in 10%, 79% were susceptible, 1% were contaminated, and 10% were indeterminate. Sensitivity and specificity of the *FASTPlaque-Response*TM test were 94% and 100%, with a positive predictive value of 100% and a negative predictive value of 99%.

Conclusions: *FASTPlaque-Response*TM with NOA Antimicrobial Supplement is a fast and accurate method for diagnosing rifampicin resistance among smear positive patients. The NOA Antimicrobial Supplement greatly reduced the rate of contamination.

PS-61934-04 Evaluation of the results of drug susceptibility testing for second-line anti-tuberculosis drugs

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Aim: The purpose of the study was to diagnose the susceptibility of MDR strains to several concentrations of 1st-line and 2nd-line anti-TB drugs.

Material and methods: 24 patients were examined. The following 1st-line anti-TB drugs were used: INH (0.1 µg/ml, 0.2 µg/ml, 1 µg/ml, 5 µg/ml), RMP (20 µg/ml, 40 µg/ml, 50 µg/ml), SM (4 µg/ml, 10 µg/ml, 25 µg/ml), EMB (2 µg/ml, 3 µg/ml, 5 µg/ml). Furthermore, the following 2nd line anti-TB drugs were used: Rifapentine 9 µg/ml, PZA 200 µg/ml, Amikacin 5 µg/ml, Ofloxacin (5, 10, 25 µg/ml), PAS (0.5, 1, 10 µg/ml), Rifabutin (10, 30, 50 µg/ml), Pefloxacin 2 µg/ml, Cycloserin 30 µg/ml, Ethionamide (10, 20, 30 µg/ml), Nicotinamide (10, 20, 30 µg/ml), Capreomycine 10 µg/ml, Kanamycin (10, 20, 30 µg/ml), Pyruvate 0.2%. The susceptibility testing both for the 1st and 2nd line anti-TB drugs was developed on L-J medium using the above concentrations.

Results: In a total of the 24 strains the following results for the 1st-line anti-TB drug susceptibility testing are:

RMP 20 µg/ml: 0%, 40 µg/ml: 0%, 50 µg/ml: 62.5%
INH 0.1 µg/ml: 25%, 0.2 µg/ml: 25%, 1 µg/ml: 62.5%,
5 µg/ml: 75%

SM 4 µg/ml, 10 µg/ml, 25 µg/ml: 62.5%

EMB 2 µg/ml: 62.5%, 3 µg/ml: 62.5%, 5 µg/ml: 87.5%

In a total of the 24 strains the following results for the 2nd-line anti-TB drug susceptibility testing are (Table 1):

Drug	Concen.	Number of strains suscept.	Suscept. %	Drug	Concen.	Number of strains suscept.	Suscept. %
Rifapentine	9 µg/ml	15	62.5	Cycloserin	30 µg/ml	24	100
Pyrazinamide	200 µg/ml	12	50	Ethionamide	10 µg/ml	0	0
Amikacin	5 µg/ml	12	50	Ethionamide	20 µg/ml	6	25
Ofloxacin	5 µg/ml	21	87.5	Ethionamide	30 µg/ml	9	37.5
Ofloxacin	10 µg/ml	21	87.5	Nicotinamide	10 µg/ml	0	0
Ofloxacin	25 µg/ml	24	100	Nicotinamide	20 µg/ml	0	0
PAS	0.5 µg/ml	24	100	Nicotinamide	30 µg/ml	0	0
PAS	10 µg/ml	24	100	Capreomycine	10 µg/ml	6	25
Rifabutin	10 µg/ml	15	62.5	Kanamycin	10 µg/ml	21	87.5
Rifabutin	50 µg/ml	21	87.5	Kanamycin	30 µg/ml	24	100
Pefloxacin	2 µg/ml	6	25	Pyruvate	0.2%	6	25

Concen. = Concentration; Suscept. = Susceptible/Susceptibility.

Conclusion:

- 1 The testing of higher concentrations of first-line anti-TB drugs is essential.
- 2 The highest susceptibility is found to PAS, Ofloxacin, Cycloserin and Kanamycin, while the highest resistance is found to Nicotinamide.

PS-61988-04 Three years experience with panel test for anti-tuberculosis drug susceptibility testing

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Introduction: External quality assessment (EQA) of anti-tuberculosis drug susceptibility testing (AST) is expanding to assure its accuracy. We had experiences in implementing EQA of DST for consecutive 3 years.

Objective: To assess the participating laboratories for the performance of AST

Methods: Identical culture panels consisting of 20 *M. tuberculosis* strains containing both drug resistant and susceptible cultures were sent to the participating laboratories and tested to isoniazid (INH), rifampicin (RIF), streptomycin (STR) and ethambutol (EMB). The sensitivity, specificity, efficiency, and reproducibility were calculated to assess their performance.

Results: Twenty-three private laboratories attended the first round. Forty-nine laboratories including hospital facilities attended the second, and it was expanded to 64 laboratories in the third round. The overall sensitivity and specificity to INH and RIF exceeded 95% in all three rounds. The efficiency of STR and EMB could not exceed 90% in the first round, however they improved in the following two rounds. A few laboratories with poor performance detected through panel testing. The poor performance has been corrected through the on-site evaluation based on the panel testing results.

Conclusion: The repeated panel testing has shown a positive effect to the accuracy of AST. It is also useful to standardise DST procedures.

CLINICAL TUBERCULOSIS-3

PS-61663-04 Causes of treatment failure among new pulmonary TB patients

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Setting: TB Control Programme in Vladimir Oblast implemented in line with WHO recommendations.

Objective: To analyze causes of treatment failure among new pulmonary TB cases.

Design: Retrospective analysis of data from new pulmonary TB cases registered in 2003 ($n = 50$) and 2004 ($n = 46$) and declared as treatment failure according to WHO definitions.

Results: We identified the following causes of treatment failure:

- Drug resistance of *M. tuberculosis* to H and/or R was diagnosed in 26 (52.0%) cases in 2003 and in 36 cases in 2004 (78.2%). MDR was diagnosed in 15 new cases (30%) in 2003 and in 30 (65%) in 2004.
- Considerable delay in seeking medical care was declared in 14 cases (28.0%) in 2003 and in 3 cases (6.5%) in 2004.
- Treatment interruptions caused treatment failures in 6 cases (12%) in 2003 and in 3 cases (6.5%) in 2004.

Conclusion: Major causes of treatment failure were drug resistance, treatment delay and interruptions. Implementation of DOTS-Plus, rapid DST techniques, active case finding among risk groups for TB, improving treatment adherence are needed to improve the overall effectiveness of anti-TB treatment.

PS-61669-04 Assessment of a diagnostic work-up for smear-negative pulmonary tuberculosis in Cochabamba, Bolivia

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Background: Smear-negative pulmonary tuberculosis is increasingly a challenge for TB-programs. It is not well documented how such patients are dealt with under routine conditions.

Aim: To assess the implementation of a recommended diagnostic flow-chart for smear-negative pulmonary TB under routine operational conditions in health-centres in Cochabamba, Bolivia.

Methods: From end 2002 till begin 2005, TB-suspects prospectively passed through a diagnostic work-up for smear-negative PTB (see Figure 1) under routine

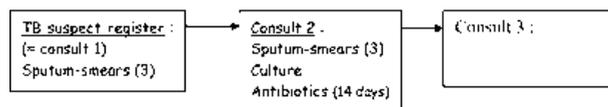


Figure 1 The recommended diagnostic flow chart.

operational conditions. For all TB-suspects registered in 8 health-centres, subsequent diagnostic steps were retrieved from the patient-files. The diagnostic work-up was compared to the recommended flow-chart.

Results: In Figure 2, the number of subjects in each diagnostic step can be seen. Of the 868 TB-suspects, only 370 (43%) had sputum-smears realised. It is not known how many suspects keep coughing but do not re-consult. Of the 245 who attended a 2° consult with cough, only for 41 (17%) the differential diagnosis of TB was maintained. Of those 41, only for 6 (15%) a second set of sputum-smears and culture was requested.

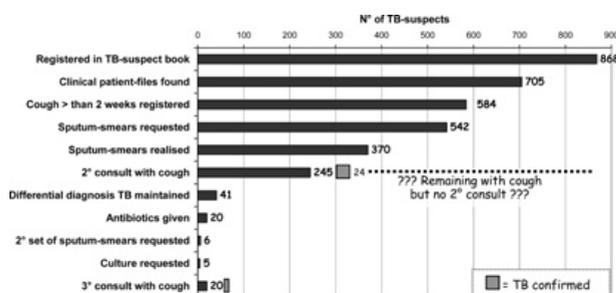


Figure 2 Diagnostic work-up for pulmonary TB suspects under operational conditions in 8 health centres in Cochabamba, Bolivia, 2002-2005.

Conclusions: Under operational conditions, the work-up of potential TB-suspects deviates substantially from the recommended flow-chart. Besides those mentioned lost opportunities which can and should be overcome, the use of antibiotics (and the possible use of chest X-ray) is probably more difficult to fully implement.

PS-61681-04 Do we need to extend treatment of relapsed pulmonary tuberculosis patients?

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Setting: New or relapsed smear positive pulmonary tuberculosis (TB) patients treated at the public health centers under the national TB program (NTP) in Korea.

Objective: To determine the treatment (Tx) period of relapsed pulmonary TB patients.

Background: The Tx regimen and period of relapsed patients are different with new patients according to the World Health Organization guidelines. But there is a controversy surrounding the Tx period for relapsed patients. Korean NTP guidelines recommend

6 months regimen (2HRZE/4HRE) for new (N6) and relapsed patients (R6), or allow extending maintenance phase 3 months more for relapsed patients (R9). Some new patients were treated for 9 months (N9) even NTP does not recommended.

Design: Retrospective cohort analysis. The relapse rate of 18 months after completion of Tx was analyzed according to the Tx period of the patients cured during 2001 to 2003. Smear positive relapsed patients were screened by the surveillance system (KTBS).

Results: Relapse rate was 2.90% (168/5622) in N6, 2.27% (24/1032) in N9, 6.43% (16/233) in R6, and 3.12% (34/1055) in R9. By multivariate analysis, relapse rate of R6 was higher than R9 (Relative risk [RR] 2.12, $P = 0.0106$). It was also higher in male (RR 1.93, $P < 0.0001$) than female. It was not different between N6 (RR 1.06, $P = 0.7526$) and R9 or between age group.

Conclusion: For achieving similar relapse rate with new patients, the maintenance phase of relapsed patients need to extend three months more.

PS-61781-04 Retrospective evaluation of 120 cases with tuberculous exudative pleurisy

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Tuberculous exudative pleurisy (TEP) is the most common form of extrapulmonary tuberculosis in our country. In this study, we evaluated 120 patients with TEP of 895 patients with various forms of tuberculosis, who are examination and treatment in Diagnostic department of Research Institute of Phthisiology and Pulmonology, between 2002–2005 years. Fifty six of cases 56 (46.7%) was women, 64 (53.3%) was male and mean age of cases 42.51 ± 15.48 years. Fourteen cases (11.7%) had a history of tuberculosis, while 35 (29.2%) had a history of contact. The prominent symptoms were pain in chest (93.6%), sweating (86.1%) and cough (79.9%). Tuberculin skin test was positive in 89 (74.2%) patients who are applied this test. Diagnosis was established by examination of pleural fluid in 93 (77.5%), by clinical and radiological in 27 (22.5%) patients in this study. All patients were treated by antituberculous drugs (HRZE/S) for 9–12 months.

PS-61788-04 Ultrasonographic signs of patients with lung and nephrotuberculosis

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Aim: To evaluate the effect of ultrasound scanning of patients with tuberculosis of the lung and various forms of nephrotuberculosis—NT.

Material and methods: We studied the results the ultrasound scanning of 344 patients with various forms of

NT. On the soundgraphy the various forms of NT characterized by focally and multiple traits. There was depending of depth of pathomorphological change.

Results: We found the growth proportion kidneys at 41.8% case of various forms of NT. The diminution proportion kidneys found at 19.5%, the bumpy of contours kidneys at 75.9%, the deformation of calyces-pelvis systems at 79.1%, the petrification at 50.3%, the cavitation with bumpy, enlargement in walls and different forms—at 51.2% cases. We observed to organization one cavity by 70 (39.8%), more then one—by 106 (60.2%) patients with NT. The cavities with purulent contents as hypo- or anechogen formation of cavities in parenchyma of the kidneys were at 62.5% cases, cavities with fibrous calcification as hyper-echogen formation of cavities—at 54.5% cases.

Conclusion: The ultrasoundgraphic the kidneys are the high-informative of methods: the precision at 78.5% and the specific at 89.7% cases.

PS-61881-04 Tuberculosis and diabetes mellitus in Belgrade

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In 2005, we registered 471 patients with tuberculosis (TB) of which 36 (7.6%) had diabetes as well. We analysed a group of patients with both tuberculosis and diabetes to examine the influence of diabetes on the characteristics and course of tuberculosis. Out of 36 patients 25 (69%) were males, average age 59 (23–77) and 11 (31%) females, average age 63 (26–77). Extra-pulmonary tuberculosis was found in 3 (8%) patients. There were 30 (83%) new cases and 6 (17%) relapses. Cavitory lesions were found in 18 (55%). Pulmonary TB cases were smear-positive by microscope in 22 (66%) patients and culture positive in 28 (84%). Sputum conversion was achieved in 15 of 22 (68%) patients after 2 months. Treatment was successful in all patients, except for one who died. Though tuberculosis in diabetics has a severe clinical form and sputum conversion rate is slow, treatment is successful.

PS-61907-04 Patients with tuberculosis in a rural Ugandan hospital: presentation and outcome

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Aim: To study the patients (pts) with tuberculosis (TB) hospitalized in St Francis Hospital, Buluba to assess their presentation and outcome at the end of their stay.

Method: Prospective study of the pts admitted consecutively during the period June 02–March 05.

Results: There were 680 pts. The median age was 31 (range 2–75). 364 (53.5%) were male. 102 (15%) and 211 (31%) pts had moderate or severe malnutrition, respectively. There were 565 (83%) new pts, 61 (9%) defaulters and 34 (5%) relapses. 595 (87.5%) had pulmonary and 136 (20%) extra-pulmonary TB. Among 102 pts tested for HIV 68 (67%) were positive; another 46 (8%) were suspected to be infected on clinical grounds. Among 470 pts with new pulmonary TB 395 (84%) were smear+. In this group, among 249 pts tested after 2 months of treatment 90 (36%) were smear+; among 59 tested at 3 months 27 (46%) were still smear+. 54 pts (8%) suffered an adverse reaction from treatment: due to pyrazinamide in 28 (51%). The median stay was 60 days (range: 1–99). At the end of hospitalization 592 (87%) pts were transferred, 34 (5%) had defaulted and 54 (8%) had died.

Conclusions: TB is a significant health problem in this rural area. The very limited resources of our pts causes their late presentation which together with the HIV co-infection contribute to its severity. These factors must be considered in order to effectively control TB in Uganda.

PS-61947-04 Lung function and associated diseases in patients with tuberculosis sequellae

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Aim: To investigate lung function (LF) in patients with pulmonary and pleural tuberculosis (TB) sequellae with special regard to associated diseases. The study group consisted of 194 Pts with inactive TB, 138 (71.1%) men and 56 (28.9%) women, average age of 49.3 ± 13.2 years. They all underwent spirometry with flow-volume curve registered.

Results: We found impairment of LF in 46 (23.70%) of Pts, and two thirds among them had mixed type of disturbance. The LF impairment was more frequent in patients with previously active bilateral TB lesions, and in those with pleural disease when compared to Pts with other clinical forms ($P < 0.01$). However, previous persistence of cavernous changes was not statistically important in LF impairment ($P > 0.05$). Analysis of LF with special regard to associated diseases or conditions showed significantly lower values in those with alcoholism, repeated infections of the lower airways, pneumonia, and COPD ($P < 0.01$).

Conclusion: The impairment of LF in our patients depended on the proportion of lung tissue affected by active TB and not on the level of lung tissue destruction; among associated diseases, COPD was the most contributing one.

PS-62053-04 Risk factors that contribute to treatment relapses in patients with AFB smear (+) tuberculosis in El Salvador, 2001–2003

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Objective: To identify the risk factors that contributed to treatment relapses among patients with TB Pulmonary AFB smear (+), were treated in the different health services in El Salvador during years 2001–2003.

Design: Analytic case-control.

Results: All characteristics demographics examined were not risk factors of relapses because presented a $P > 0.05$. 14 cases and 5 controls were smears negatives after 2 months of beginning their treatments and 69 cases and 79 controls doing before 2 months, OR = 3.21 (95%CI = 1.0–10.8; $P < 0.05$). 37 cases and 2 controls has presented an irregular treatment and 46 cases and 82 controls doing a regular form. OR = 33 (95%CI = 7.3–207; $P < 0.05$).

Recommendations: It is recommend looking the smears's negative after 2 months, this patient presented 3 twice more the probability to have a relapse than the patients was negative 2 months before.

—You will have to give continuity to the patients to assistant at his treatment of irregular form (less 3 twice a week) presented a probability of 33 twice more than assisted a regular form.

—It is recommend take others factors like: 'the social factor' that it can to help to relapses; the demographics factor that studied did not present statistic meaning.

PS-61731-04 Clinical presentation and diagnostic features of childhood tuberculosis: 25 years of experience in Peru

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Background: Childhood tuberculosis (TB) is an important threat in developing countries, yet under-reporting of cases and diagnostic challenges continue to hinder childhood TB control.

Setting: Pediatric referral center in Lima, Peru, a country with a TB prevalence of 216 per 100 000 in 2004. **Methods:** A retrospective medical record review of 2802 children hospitalized with a diagnosis of TB between 1973 and 1997.

Results: The median age was 8 years, 27% were under 5 years old and 67% were male. Sixty-one per cent had known TB contacts, 24% were malnourished, and 15% lived in overcrowded conditions. Evidence

of prior BCG vaccination was noted in 80%. Median duration of illness prior to diagnosis was 2 months. Most common symptoms included cough (74%), fever (66%), anorexia (64%), and weight loss (55%). Thirteen per cent presented with intrathoracic adenopathy alone, 61% with pulmonary TB (PTB), and 40% with extrapulmonary TB (EPTB). The most common sites of EPTB were meningitis (12%), lymphadenitis (11%), and pleural effusion (11%); 12% had evidence of miliary disease. A positive tuberculin skin test (>10 mm) was noted in 75%. Microbiologic confirmation was achieved in 48% of specimens collected. Eight per cent of the children died.

Conclusion: Most children with pulmonary disease presented with symptoms of active PTB, similar to adults. EPTB was common, particularly more severe forms of disease. The yield for mycobacterial smear and culture was higher than expected.

PS-61751-04 Nutritional status, HIV and tuberculosis prevalence among contact children of index TB cases in Uganda

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Objective: We determined nutritional status, HIV and tuberculosis (TB) prevalence among contact children of index TB cases in Kampala, Uganda.

Methods: A cross-sectional analysis of 595 contact children aged <18 years to index TB patients was performed as part of the ongoing Kawempe community healthy study. Nutritional status was assessed by anthropometric, hemoglobin, and bioelectric impedance analysis (BIA) methods.

Results: Among 135 children <5 years, 6 (4%) were found to have active TB disease; 9 (7%) had HIV infection and one (0.7%) had HIV-TB co-infection. Whereas of 372 children aged 5 to 18 years, 12 (3%) had HIV infection and one (0.3%) had HIV-TB co-infection. Among 145 non-HIV-TB infected and 6 TB diseased children <5 years of age, weight was 12.5 ± 3.1 and $8.8 \text{ kg} \pm 0.99$ ($P = 0.038$), body fat was 4.3 ± 1.8 and $1.8 \text{ kg} \pm 0.8$ ($P = 0.0009$), and hemoglobin was 11.4 ± 1.4 and $8.9 \text{ mg/dl} \pm 2.3$ ($P < 0.001$) respectively. No significant difference regarding height between children <5 years of age with TB disease and non-HIV-TB infected children. No difference between HIV infected and non-HIV-TB infected children regarding anthropometric, hemoglobin, and BIA parameters irrespective of age.

Conclusions: Tuberculosis was associated with body fat loss, lower weight, and hemoglobin among TB

contact children <5 years of age and there was an appreciable prevalence of TB disease and HIV infection in this population.

PS-62056-04 Overdiagnosis of tuberculosis in non-specific respiratory diseases in children

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Background: The diagnosis is thus largely based on the clinical features of chronic cough, weight loss, with a history of close contact with an infectious adult TB patient. This condition make the phenomenon of overdiagnosis tuberculosis of non-specific respiratory diseases in children, results in unnecessary and prolonged treatment with antituberculosis drugs, which are often hepatotoxic. To overcome the pitfalls in the diagnosis of non-specific respiratory diseases in children has described, in detail characteristic, the reasons for overdiagnosis and the nature of mistakes.

Aims: To describe overdiagnosis of tuberculosis in non-specific respiratory diseases in children under 5 years
Methods: The retrospective study was performed by reviewing medical records of 450 children in outpatient clinic of Children Allergy Center, Jakarta, Indonesia, from 2004 to 2005,

Results: 32 (14%) of 226 children with main symptoms chronic and recurrent cough and diagnosed tuberculosis, 16 (50%) was diagnosed just based on parenchymal infiltrate of chest X-rays, 13 (38%) was diagnosed by parenchymal infiltrate of chest X-rays and negative Mantoux test. There was 12 (38%) children treated with antituberculosis for 1 years, 4 (16%) for 1 years and 2 (10%) treated by INH for 2 years. Most common etiology of nonspecific respiratory diseases included allergy and asthma.

Conclusions: The diagnosis of tuberculosis in children can be difficult because children under the age of 5 years usually cannot cough up enough sputum to be sent for laboratory investigations to confirm the infection of tuberculosis. There was many overdiagnosis tuberculosis in children with recurrent or chronic cough caused by allergy and asthma.

PS-62057-04 Overdiagnosis of tuberculosis in children with failure to thrive

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Background: In Indonesia over 550 000 people develop TB and many will continue to die each year from TB. The diagnosis is thus largely based on the clinical features of cough, weight loss, with a history of close contact with an infectious adult TB patient. This condition result the phenomenon of overdiagnosis of tuberculosis in children with failure to thrive, results in unnecessary and prolonged treatment with antituberculosis drugs. To overcome the pitfalls in the

diagnosis of failure to thrive in children has described, in detail characteristic, the reasons for overdiagnosis and the nature of mistakes.

Aims: To describe overdiagnosis of tuberculosis in children under 5 years with symptoms failure to thrive and picky eaters.

Methods: The retrospective study was performed by reviewing medical records of 226 children in outpatient clinic of Picky Eaters Clinic Jakarta Indonesia, from June 2005 to December 2005.

Results: 42 (22%) of 226 children with main symptoms failure to thrive and anorexia diagnosed tuberculosis, 14 (33%) was diagnosed just based on parenchymal infiltrate of chest X-rays, 22 (52%) was diagnosed by parenchymal infiltrate of chest X-rays and negative Mantoux test. There was 21 (50%) children treated with antituberculosis for 1 year, 11 (26%) for 1 year and 4 (10%) for 2 years. Most common etiology of failure to thrive and anorexia included and celiac disease, food intolerance and metabolic disorders.

Conclusions: The diagnosis of tuberculosis in children can be difficult because children under the age of 5 years usually cannot cough up enough sputum to be sent for laboratory investigations to confirm the infection of tuberculosis. There was many overdiagnosis in children with symptoms failure to thrive and anorexia.

PATIENT TREATMENT ADHERENCE/ MANAGEMENT-2

PS-61602-04 Treatment outcomes of TB patients in ambulatory conditions

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Background: DOTS has been implemented in Tajikistan since 2002 in two pilots. Dushanbe, the capital was one of the first pilots with a population of 625 500. According to MOH Prikaz, 70% of TB patients should receive intensive phase treatment in hospitals.

Objective: Comparison of treatment outcome of new S+ patients either treated ambulatory throughout, or receiving the intensive phase in hospital.

Materials: Reporting and Recording documents of the Dushanbe TB Center and Millennium Development Goals report.

Methods: All new S+ cases registered in 2004 in Dushanbe were analyzed.

Results: In 2004, in total 227 S+ cases were registered in Dushanbe. 88 Patients (38.8%) received ambulatory treatment throughout; of them 78 (88.6%) were cured. A total of 139 patients (61.2%) were hospitalized for the intensive phase of treatment; of them 117 (84.2%) were cured. There is no statistical difference.

Conclusion: In the setting of Dushanbe city it is possible to treat patients ambulatory throughout and obtain the same cure rates as patients who are hospitalized for the intensive phase. Ambulatory treatment is cheaper for the health system and probably more acceptable for the patient.

PS-61607-04 Direct observation of TB treatment: filling the gaps

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Background: While Tajik guidelines do not directly prohibit participation of community volunteers in DOT, the current system exclusively relies on medical workers. In practice, treatment often goes unobserved either because of shortages of medical personnel or country's mountainous terrain.

Objective: Examine TB and PHC doctors and nurses practices on direct observation.

Methods: TB KAP survey of health care providers, patients, and population was conducted in 14 rayons of Tajikistan in 2005. 342 medical workers (42 TB and 130 PHC doctors, 170 nurses; from a total of 3349) were randomly selected.

Results: Majority of TB doctors (65%), PHC doctors (55%), and nurses (70%) answered that TB drugs self-administration should never be allowed. However, TB doctors, PHC doctors, and nurses justify self-administration if a patient lives far away (21/10/6%), if a patient relocates (14/8/6%), on weekends (12/11/8%), if illness is non-severe (14/12/7%), and when a patient is trustworthy (5/15/6%). Multiply answers were possible.

Conclusion: Medical workers admit the possibility of TB drugs self-administration in some situations that are frequent in Tajikistan. While the importance of DOT should be stressed, in some cases a mechanism of administering drugs that would rely on additional support might be required. Involvement of community volunteers could provide this additional support and should be developed.

PS-61672-04 Risk factors for TB relapse among patients previously treated with success according to DOTS protocol

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Setting: DOTS program in Vladimir Oblast, Russia.

Objective: To analyze risk factors for TB relapse among patients with previous successful treatment.

Method: A retrospective study of relapses among new TB cases of 2001.

Results: 47 TB relapses were registered between 2002 and 2005 among 748 new TB patients of 2001. 27.7% relapses were declared during the first year after treatment. 69.2% of them had interruptions and 15.4% had inadequate period of treatment. 30.8% were homeless and 15.4% contacted with SS+ TB patients after treatment completion. 34% relapses were registered during the second year after treatment completion. 62.5% of them interrupted treatment and 18.6% had inadequate regimen when treated. 50% remained homeless after treatment completion. 23.4% relapses were registered during the third year after treatment. 27.3% of them interrupted treatment. 45.5% were socially vulnerable, while 9.1% contacted with SS+ TB patients after treatment completion. 14.9% relapses were notified during the fourth year after treatment. 45.5% had treatment interruptions. 28.5% contacted with SS+ TB patients after treatment. 57.1% belonged to socially vulnerable group.

Conclusion: Major risk factors for TB relapses were treatment interruptions and homelessness. Improving treatment adherence and quality of care for the homeless can decrease the risk for TB relapse.

PS-61685-04 Social support and treatment success in new pulmonary TB cases

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Objective: To evaluate the association between social support and treatment success in new pulmonary TB cases.

Methods: A retrospective case-control study of 1657 new pulmonary TB cases registered in 2nd–3rd Quarters of 2003.

Results: Overall treatment success rate was 80.0%, failure—7.2%, default—4.6%. Patients with treatment success ($n = 1444$) received social support more often, compared to those with treatment default or failure ($n = 213$): 56.7% vs. 18.8% ($P < 0.001$). In multivariate analysis, the impact of social support on treatment success was modified by employment status: social support contributed to a threefold increase of the odds of success among the unemployed (OR = 3.31, 95%CI 1.58–6.94), two-fold for the employed patients (OR = 2.05, 95%CI 1.19–3.52) (referent group employed without social support). Independent risk factors decreased the probability of treatment success and included: unemployment for patients without social support (OR = 0.33; 95%CI 0.21–0.51), alcohol abuse (OR = 0.43; 95%CI 0.29–0.63) and positive AFB smear upon presentation (OR = 0.34; 95%CI 0.23–0.52).

Conclusion: Our study demonstrated that social support for TB patients had the positive impact on treat-

ment success in new pulmonary TB patients, primarily among the unemployed. Social support for patients from the risk groups should start immediately on treatment initiation.

PS-61699-04 Characteristics and long-term follow-up of patients defaulting from MDR-TB treatment in Lima, Peru

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Aims: 1) To identify characteristics associated with default from an individualized multidrug-resistant tuberculosis (MDR-TB) regimen in a DOTS-Plus program in Lima, Peru; 2) To ascertain the current vital status of patients who defaulted.

Methods: A retrospective chart review was conducted for patients with confirmed MDR-TB who initiated therapy between August 1, 1996 and July 31, 2002. Data were collected for clinical, social and demographic characteristics. Follow-up household visits were conducted to determine vital status. Multivariable logistic regression was used to identify factors associated with default.

Results: 64 (9.6%) of 668 patients defaulted from therapy. The median time to default was 395 days. A history of substance abuse was strongly associated with failure to complete treatment (OR 6.26, 95%CI 2.79–14.05]. Later year of enrollment (OR 1.68, 95%CI 1.03–2.76]) and health district were also significantly associated with default. For 39 (60.9%) default cases, the patient or a family member was located a median of 32 months after default. Of these, 22 patients (56.4%) had died prior to the visit. Median survival after default for those for whom the date of death was known ($n = 14$) was 393 days.

Conclusion: Patients defaulting from MDR-TB therapy had a high death rate. Interventions tailored to high-risk populations, including those suffering from substance abuse, could improve individual outcomes and curtail the risk of secondary transmission of MDR-TB.

PS-61734-04 Self-report of prisoners post-release: why completion of care doesn't happen

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Prisoners are a focus for TB control efforts, and treatment completion after release has been poor. We

examined status and reasons subjects provided for behaviors after release.

Methods: At the end of a randomized trial in San Francisco, California, we interviewed subjects after the primary endpoint (link to TB clinic) had occurred. This descriptive analysis compared health and intent in jail to post-release measures.

Results: Of 230, those who had lost support from partner, family, or friends were half as likely to have continued at TB clinic (Odds Ratio .5, 95% confidence interval .2–.9), controlling for drug and alcohol problems and factors significant in the original randomized trial (study group and <5 years immigration status). Those who did not go to clinic were more likely to cite drug and alcohol and being too busy as primary reasons; those who went to clinic were more likely to cite concern about TB and support from others as primary reasons. Transportation, waiting period and clinic hours were major barriers for those who went.

Conclusions: The disruption of incarceration alters social status; information gathered while incarcerated may not reflect realities after release. Further, system characteristics may be as important as individual characteristics in adherence. Attention must be paid to post-release issues facing persons after incarceration for this population to achieve completion of care.

PS-61777-04 Providing patient-centred TB treatment: what it involves

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The concept of Patient centred treatment is gaining currency, including as an integral component of the new Global TB strategy. A definition of what this entails is however lacking. Within the Tanzanian National TB Leprosy Programme, patient centred treatment is defined as empowering patients to choose where their daily drug intake is supervised and by whom. The concept was developed and operationalized based on the input from 343 patients on treatment, 92 health workers, 72 cured patients and 8 defaulters. The study combined a quantitative and qualitative approach, using semi-structured interviews. The narrative was recorded, translated and analyzed using quantitative software. The views were coherent across respondents and clearly highlights the fact that one supervision model does not fit all as patients need to meet multiple and often conflicting commitments. 80% of respondents considered being given a choice to be good/very good. More than half would opt for home-based DOT motivated by pragmatic considerations such as distance, rest, poor health and lack of fare.

The National TB Leprosy programme has introduced fixed dose combination tablets in 3 pilot districts using patient centred treatment. The implementation is being closely monitored to provide the proof of principle of whether Patient Centred Treatment can meet the targets for TB control.

PS-61795-04 Longer delays in tuberculosis diagnosis among women in National Tuberculosis Centre, Nepal

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Setting: Study conducted in National Tuberculosis Centre (NTC) where more than 10 000 tuberculosis (TB) suspects are examined every year.

Objectives: To describe and compare health seeking behavior between men and women and to measure delays in TB diagnosis.

Design: A cross-section analysis was made of patient interviews. Standard questionnaire were administered to 176 (58 women, 118 men) pulmonary TB patients diagnosed at NTC clinic between April and May 2005. **Result:** Mean total delay to TB diagnosis was 6.96 months. Women were found to have a significantly longer delay (mean 9.97 months for women, 5.48 months for men, $P = 0.021$). Women visited more health care providers than men (2.33 and 1.10 providers, respectively, $P < 0.001$). Of 58 women patients, 32.6% delayed seeking care due to lack of money and 27.6% delayed to their lack of awareness about DOTS services.

Conclusion: Public awareness about chest symptoms and the availability of free diagnosis services should be increased. Public private partnership should be enhanced for effective referrals between private and public providers.

PS-61848-04 Treatment default among urban tuberculosis patients, Thailand

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Tuberculosis (TB) treatment default, missing medical appointments for two consecutive months or more, is a serious problem for individuals but also societies and health care systems. Most research focuses only on patient factors without considering health care system factors effects on treatment default. The study purpose was to examine the influence of process of care on treatment default. Structured interviews and medical chart reviews were conducted in 160 TB pa-

tients receiving care at a tertiary hospital in Thailand. The samples included 54 patients with treatment default and 106 patients with treatment completion. Hierarchical logistic regression was used to examine relationships among the variables. After adjusting for patient factors, having severe medication side effect (OR = 4.7) and travel time to clinic (OR = 4.5) increased treatment default. The patient factor of being paid on a daily basis was also significantly associated with treatment default (OR = 5.1). Evidence indicates that some process of care factors influence treatment default. Findings can be applied to practice levels to maintain patients until treatment completion.

PS-61852-04 Forecasting three years drug supply for a large MDR-TB treatment program in Peru

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Background: Timely procurement of medications for treating MDR-TB is crucial to treating patients in a safe and cost effective way.

Objective: To develop a system for forecasting drug requirements up to a year in advance and evaluate this with the actual medications prescribed.

Methods: Using a web-based medical record system developed for the MDR-TB program in Peru (PIH-EMR), we prospectively collected data on initial and updated drug regimens for 2560 patients treated. Drug requirements for 11 second line drugs were predicted by first calculating the proportion of patients on each drug and the mean drug doses on the day of estimate. Then total patient days in treatment were estimated from (1) the last 90 day recruitment rate of new patients and (2) the expected time in treatment for each patient modeled with a Kaplan-Meier survival curve. Future drug requirements for each year were forecast only with data available on January 1st that year. Results were compared with total drugs subsequently prescribed for all patients that year.

Results: For each of the 11 second line drugs, a predicted/prescribed value was calculated. The average of these values is shown in the Table. Standard deviation can be reduced by combining drugs such as injectables and quinolones into groups.

Year	Doses (millions)	Predicted/prescribed	Standard deviation
2002	2.6	117%	23%
2003	3.7	95%	6%
2004	3.4	98%	31%

Conclusions: Results were within the warehouse buffer stock limits. Forecasts can be further improved by incorporating planned changes in drug prescribing.

PS-62026-04 Etude de la variation du poids des tuberculeux en traitement en 2004 au Togo

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Introduction: Le poids est un indicateur facile à utiliser. Il est utilisé comme argument clinique dans le diagnostic de plusieurs maladies.

Objectif: Nous avons voulu étudier la variation du poids entre les mois zéro et deux, les mois deux et cinq et les mois cinq et huit du traitement.

Méthode: Nous avons fait une étude rétrospective basée sur les dossiers des malades de 2004 de toute l'étendue du territoire togolais.

Résultats: Dans 43,37% des cas la variable n'a pas été enregistrée. Entre les mois 0 et 2 la variation moyenne était de 2884 (3574) kg ; elle était 2611 (3315) kg entre les mois 2 et 5 et 1505 (3055) kg entre les mois 5 et 8. La variation entre les mois 0 et 8 est de 7035 (4831) kg.

PS-62048-04 Defects of private practitioners in TB management

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A study was conducted among 63 private medical and chest specialists of Dhaka city in 2003 to judge their knowledge, attitudes, practice and behaviour on TB management through a WHO questionnaire for implementation of a Public-Private-Partnership Pilot Project. The study shows that there is no uniformity amongst them in diagnosis and treatment. The system of recording, reporting and follow-up is almost absent. They did not follow national guidelines. The physicians used 19 different types of tests for diagnosis. The treatment regimen is also not uniform. Fifty-nine physicians prescribe HRZE for initial intensive phase as followed by NTP, but treatment regimen in the continuation phase and duration of treatment are quite variable. For treatment success most of them examine their patients only in the last month. The situation in other developing countries may be the same. The observations suggest that involvement of private practitioners into TB control activities in urban areas are crucial for introduction of uniform TB management system in the developing countries. This will help NTP to increase case detection rate and decrease occurrence of MDR-TB. This can only be efficiently done by an independent organization, otherwise the control of TB will remain a dream.

PS-62054-04 Active tuberculosis case finding and isoniazid preventive therapy in primary care clinics in South Africa

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Aim: To assess the yield of active tuberculosis (TB) case finding and adherence to isoniazid preventive therapy (IPT) in South African primary care clinics.

Design: Prospective cohort study.

Methods: South Africa participated in the WHO-sponsored ProTEST Initiative by establishing TB-HIV Pilot Districts from 1999 to 2002 in rural KwaZulu-Natal (Ugu), rural Limpopo (Bohlabela) and peri-urban Western Cape (Central). Voluntary counselling and rapid HIV testing (VCT) was offered in morning health talks at primary care clinics and clinicians offered VCT to patients attending antenatal, TB or sexually transmitted infection services. HIV-positive clients had a symptom screen for TB and symptomatics were investigated for TB. HIV-positive clients with no symptoms of TB or history of TB in the last 2 years and who were willing to come for monthly clinic visits were started on IPT 300 mg daily for 6 months.

Results: Of 4110 clients screened, TB was diagnosed in 353 (8.6%). The yield of case finding varied between sites: 5.3% (111/2111) in Ugu, 2.9% (11/376) in Bohlabela and 14.2% (231/1623) in Central. Overall adherence to 6 months of IPT was 30.2% (465/1539): 18.2% (192/1054) in Ugu, 47.1% in Bohlabela and 58.8% in Central.

Conclusions: Screening HIV-positive clients for TB increases TB case detection. Adherence to IPT is variable and interventions to improve adherence should be assessed.

PS-62065-04 Status of the revised WHO TB recording and reporting forms

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Background: The generic WHO tuberculosis (TB) recording and reporting (R&R) forms, an essential component of the DOTS strategy, are under revision to capture elements which are now part of the Stop TB Strategy and to ensure standardization in data collection. There is a need to receive feedback from countries regarding changes they have already made in their R&R forms before finalizing the generic forms.

Methods: Questionnaires were sent to all national

TB control programmes to assess the extent of the revisions they have already made and whether they use an electronic TB R&R system. The questionnaire also covered the feasibility and applicability of the WHO forms under revision. Follow up by e-mail and phone was conducted. The variables evaluated included: TB-HIV and laboratory activities; diagnostic algorithms; smear not done; TB register and quarterly reports on case registration; and treatment outcome. Information was also sought on drug presentations, repackaging of open kits, laboratory supplies, management of human resources, involvement of all health providers (public-private mix), civil society and community support in TB care as well as childhood TB case notification.

Results: The results of these questionnaires and of current field testing undertaken by countries contributed to the final revision of the TB R&R forms to be ultimately recommended by WHO as a generic system for national adaptation and implementation.

PS-61326-04 Social support of TB patients in the Arkhangelsk region

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Method: Comparative analysis.

We have collected and analysed data on treatment outcomes among the cohort of patients in the category of 'new case', registered on the territory of the Arkhangelsk Region in 2000–2004, civil sector, and default rates in the above mentioned cohort. In 2000 the default rate in this cohort was 15.5%. By 2004 we witnessed a decline up to 7.6%. These figures among new smear-positive cases were 14.5% and 8.2% respectively. These falling rates resulted from the fact that since 2000 we have started implementing major principles of social support for the patients. Our outpatients receive social support (food parcels) on condition that they attend regularly and take their drugs daily. We have worked out principles of social support and psychological adaptation of the patients. We consider it necessary to provide reimbursement of travelling costs for all patients and distribution of hot meals for those without permanent place of living. Treatment of MDR-TB patients presents a serious problem for us, because our experience shows that 18–24% of them default both during hospitalization and on the ambulatory treatment. There is also a group of patients among non-MDR who default during hospitalization. To decrease default rates we try to organize free time of the in-patients (TV, board games, literature). We also plan to implement occupational therapy and group sessions with a psychologist.

CLINICAL RESEARCH, TREATMENT AND CARE: OTHER-2

PS-61491-04 Schwannomes thoraciques : à propos de 2 cas

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Le schwannome (SCH) bénin (B) ou neurinome est une tumeur (T) nerveuse à prolifération (P) lente. Il s'agit de T encapsulée constituée de P de cellules de schwann. Il se voit à tout âge avec un pic entre 20 et 50 ans. Sa localisation thoracique (TH) est rare : 8.5% des cas. Nous rapportons 2 cas nouveaux de SCH TH. Il s'agit de 2 patients (PT) de sexe masculin âgés de 58 et 76 ans et tabagiques. Le 1er avait une dyspnée exagérée par le décubitus. La RX TH a montré un élargissement du médiastin supérieur et la TDM thoracique a montré une masse de l'angle costovertebral droit (D) évoquant une T neurogène. La fibroscopie bronchique était normale. Le malade a été opéré. L'examen anatomopathologique (AN) a conclu à un SCH bénin partiellement kystisé. Le 2ème PT avait une tuméfaction latéro-sternale D en regard du 4ème espace intercostal. La RX TH de profil a montré la présence d'une opacité biconvexe située au niveau du 1/3 antéro-inférieur du sternum. La TDM TH a montré une masse pariétale (PR) latérosternale D. Le PT a été opéré. L'examen AN a conclu à un SCH B. Il s'agit de 2 SCH TH, un PR antérieur, ce qui est exceptionnel et l'autre médiastinal, qui est le plus fréquent. La reconnaissance d'un SCH est importante vu la dégénérescence possible, l'hémorragie intratumorale, ou la compression. Dans 10%, le SCH s'étend au canal médullaire et peut se compliquer en pré ou per opératoire. Le diagnostic avec le cancer ou la tuberculose pseudotumorale est redressé par la TDM ou l'IRM.

PS-61573-04 Effectiveness of transbronchial needle aspiration in diagnosing and staging of bronchogenic carcinoma

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Objective: To evaluate the diagnostic effectiveness of transbronchial needle aspiration for lung cancer and mediastinal metastase.

Methods: 146 patients: 107 pts with bronchogenic carcinoma and 39 pts without lung cancer as control group were included. All of pts were underwent bronchoscopy and TNA was done by material: needle: NA - 1C, 21G (SW - 121), and method of Wang K.P. The TBNA was performed on the visible endoscopically

lesion (central lesion) and on carina in all pts. Mediastinal lymph node and site for puncture was chosen base on CT scanning and nomenclature of lymph node of Wang KP 1995.

Results: Our obtained data show that in diagnosing central bronchogenic carcinoma, TBNA had Sensitivity (Se): 77.6%, Specificity (Sp): 97.4%, Positive predictive value (PPV): 98.8%, Accuracy (AC): 82.9%. Morphologically typing of cytology analyses obtained by TBNA was completely agree with post operation in 56%. In evaluating metastatic mediastinal lymph node, TBNA had Se: 43.8%, Sp: 100%, PPV: 100%. Complication of TBNA consist of mild bleeding at site of puncture: 5.45%, fever after procedure: 2.25%.

Conclusion: TBNA was safe and useful technique diagnosing and typing of bronchogenic carcinoma.

PS-61660-04 Incidence of cancer in tuberculosis patients responding poorly to treatment in Delhi

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During the period 1996 to 2005, 177 patients who were initially diagnosed as having pulmonary tuberculosis and were being treated for it showed poor response. The poor response was adjudged on the basis of progression on follow up imaging studies and/or persistence of symptoms. These patients were subjected to a computed tomography (CT) guided fine needle aspiration cytology (FNAC) from the lung lesion. 97/177 (54.8%) patients were diagnosed to have lung cancer on the basis of cytology. These patients were taken off the anti tuberculosis treatment (ATT) and were subjected to management for cancer as appropriate. Whenever there is poor response to ATT, apart from multi drug resistance (MDR) there is a fair chance that these patients may be suffering from malignancy and the diagnosis should be established on cytology so that this subgroup of patients suffering from malignancy are subjected to appropriate form of treatment for cancer.

PS-61736-04 Effectiveness of etiological diagnosis for inpatients with community-acquired pneumonia

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Most patients with community-acquired pneumonia (CAP) are initially treated with empirical antibiotic therapy, according to local most frequent agents and resistance patterns. The aim of this study was to determine diagnostic yield of blood and sputum cultures

and if these findings influenced clinical outcome. We assessed blood and sputum cultures results of 333 patients with CAP (51.4% male; mean age 72.8 ± 16.4 years), admitted to a Medicine ward from January to December 2003. In-hospital mortality was 17.7%. Only 203 patients (61%) did blood cultures, being positive in 25 (12.3%). *St. aureus*, *St. pneumoniae* and *St. epidermidis* were the most common isolates (5, 4 and 4 cases, respectively). Positive blood cultures were not associated with death ($P = 0.705$). Sputum samples were obtained in 150 patients (45%), but only 20 (13.3%) were good-quality samples. Etiologic pathogens were found in 9 patients (6.0%), with *St. aureus* isolated in 3. As for blood cultures, positive sputum cultures were not associated with death ($P = 0.642$). Empirical antibiotic therapy was modified in 88 patients (26.4%) for different reasons: clinical worsening ($n = 28$); fever ($n = 25$); coverage of isolated pathogen ($n = 16$) and other reason ($n = 19$). Antibiotic therapy change was associated with death ($P = 0.024$).

Conclusions: A small number of blood and even smaller proportion of sputum cultures were positive. Only empirical antibiotic therapy change was independently associated with death.

PS-61873-04 Tumeur neuroectodermique thoracique : à propos de quatre cas

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La tumeur à cellules rondes de type PNET, est une tumeur thoracique neuroectodermique primitive. Elle est rare et sa localisation est profonde surtout les régions paravertébrales et costales. Quatre cas ont été hospitalisés et diagnostiqués à la clinique Matiben entre 2000 et 2006. Le diagnostic de ces tumeurs n'est pas aisé :

- D'une part l'accès difficile nécessitant souvent le recours à la ponction-biopsie scannoguidée
- De l'autre part l'étude histologique n'est concluante qu'après un immunomarquage

Le recours à un service hospitalier spécialisé dès la suspicion diagnostic et la qualité de la prise en charge initiale conditionnent le pronostic. Le traitement repose sur une polychimiothérapie. La chirurgie et la radiothérapie sont à discuter. Finalement, le pronostic de ce type de tumeurs bien qu'en amélioration reste sévère justifie la poursuite d'essais thérapeutiques multicentriques.

PS-61950-04 Clinical, radiographic and therapeutic features of sarcoidosis in menopausal women

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The aim of this work is to investigate if there is any difference in clinical manifestation, radiographic finding, lung function, and therapeutic approach in menopausal women with sarcoidosis and those with normal menstrual cycles. Study group (77 women with sarcoidosis, average age 43.7 ys) consisted of: 42 women with normal menstrual circle (Group 1), and 35 menopausal women, either spontaneous or after total hysterectomy (Group 2).

Results: We found the first radiographic stage, and acute sarcoidosis more frequently in Pts' group 1: 66.7% vs. 34.2% ($P < 0.05$), and 57.2% vs. 17.1% ($P < 0.01$), respectively. Disturbance of lung ventilation was registered in 50.8% Pts, and decrease of DCO and/or DVA in 63.6% of them but without significant difference ($P > 0.05$). We found extra pulmonary sarcoidosis more frequently in Pts' group 2 ($P < 0.01$) as well as hypercalciuria ($P < 0.05$). We also found significant difference in therapeutic approach between two groups with methotrexate more frequently applied in menopausal women group ($P < 0.01$).

Conclusion: Differences in clinical, radiographic and laboratory findings in menopausal women with sarcoidosis require different therapeutic approach and may influence prognosis of the disease.

PS-61978-04 Asthma control activities in Niterói, Rio de Janeiro, Brazil

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During 2005, the Health Secretary of Niterói, a municipality of Rio de Janeiro, implemented an asthma program in its health system. In the previous year, asthma was responsible for 1.3% of all hospitalizations, at a cost of US\$34 800. The standardized asthma control measures are being developed in some ambulatory health units selected according to their regional localization. The main objectives of the program include: to decrease asthma morbidity and mortality; to reduce both the number of hospitalizations and emergency consultations, as well as the cost and absenteeism rate. During 2005, 200 patients were registered at the Asthma Campaign; 38% had severe asthma and 34% mild or intermittent asthma. Severe asthma was more frequent among the age group 50–69 (47%) while mild asthma was more frequent among those

younger than 15 years old. 35% were below 15 years of age and the same proportion was older than 49.

PS-62032-04 Impact of patient centredness approach for tuberculosis control on every stage of the tuberculosis case detection process in Burkina Faso

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Impact of patient centredness approach for tuberculosis control (PCA/TB) on every stage of the tuberculosis case detection process in Burkina Faso.

Aim: To assess the efficacy of the PCA/TB on every stage of the tuberculosis case detection process.

Methods: The PCA/TB consisted in a package of activities defined through a consensual way by different actors of tuberculosis care. These activities were implemented in three districts during two years. Results of detection, at every stage of the process have been measured and compared before and after intervention, and between intervention and control districts.

Results: The percentage of chronic coughers among the consultants for cough increased from 1.4% to 2.9% in the intervention districts and from 0.8% to 0.9% in the control districts. The percentage of chronic coughers referred to the laboratory among the chronic coughers increased from 72% to 83.9% in the intervention districts and from 55.9% to 57.8% in the control districts. The percentage of patients registered at the laboratory among the referred chronic coughers decreased from 72.1% to 53.1% in the intervention districts and from 64.5% to 32.7% in the control districts.

Conclusions: The PCA/TB has a positive impact on the process of tuberculosis detection in health centres, by increasing suspect's identification and reference of these suspects to the laboratory. It makes the access to the laboratory less difficult. However this study reveals a global decrease in laboratory accessibility. Thorough studies are needed to identify the reasons of such limited laboratory accessibility.

PS-62037-04 Gender and tuberculosis: case detection and treatment processes in Burkina Faso

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Aim: To analyse the gender differentials during tuberculosis case detection and treatment processes.

Methods: Retrospective study using three types of data sources: annual reports of the utilisation of curative health care services for 2001–2004, curative health care and tuberculosis registers for 1995–2004.

Results: Female/Male ratio was 1.18 in curative health care users. Among the curative health care users, the proportion of tuberculosis suspects referred to the laboratory was lower in women (73.1%) than in men (81.9%), $P < 0.001$. Among the suspects submitted to sputum examination, the proportion of smear-positive cases was lower in women (16.2%) than in men (27.6%), $P = 0.030$. Treatment success rate was higher in women than in men (67.4% and 60.8%), while defaulting rate was lower in women than in men (9.9% and 13.9%).

Conclusions: The utilisation of curative health care services is not different between women and men. In curative health care services reference of tuberculosis suspects to the laboratory and results of laboratory sputum examination are stages of detection process where gender differentials occur with advantage for men. Treatment outcomes are better in women, due to better compliance of women.

PS-62044-04 Tuberculosis control in large cities: a comparison of case detection and treatment outcome patterns in Burkina

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Aim: To analyse tuberculosis case detection and treatment outcome in the two largest cities of Burkina Faso, in comparison with other setting of TB control.

Methods: Retrospective study based on TB registers from the exhaustive 80 detection and treatment centres in Burkina Faso. Data of every registered patient was entered under Epi info software and then analysed under SPSS for Windows. Cities of Ouagadougou (the capital) and Bobo Dioulasso are designed as large cities. Adjusted relative risks of treatment success (RR) with 95% confidence interval (95%CI) were derived from logistic regression model.

Results: The total notified TB cases was 19 933 including 16 981 (85.2%) smear-positive TB. Among smear-positive TB 15 470 (91.5%) cases were new cases. The new cases of smear-positive TB were registered for 41.3% in large cities and for 58.7% in other setting. The overall case detection (cases per 100 000 inhabitants) was 13.6. It was higher in largest cities (34.8) than in other setting (9.5). The age and sex adjusted RR (95%CI) for treatment success in other setting was 1.09 (1.01–1.17), as compared to largest cities.

Conclusions: 41.3% of new cases of smear-positive TB are registered in large cities in Burkina Faso. The TB case detection is definitely better in large cities, but not the treatment outcome.

PS-62047-04 Realization and conversion rates of sputum smear examination for control of smear-positive follow-up patients

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Aim: To determine the realization and conversion rates of sputum smear examination for control of smear-positive follow-up patients.

Methods: Retrospective study based on TB registers from the exhaustive 80 detection and treatment centres (DTC) in Burkina Faso. Data of every registered patient was entered under Epi info software and then analysed under SPSS for Windows. The realization rate was the number of smear-positive patients for whom a control sputum smear examination has been made at two months of treatment divided by the number of registered smear-positive (except those who were died or transferred before two months). The conversion rate was the number of negative results divided by the number of smear-positive patients for whom a control sputum smear examination has been made at two months of treatment.

Results: The realization rate was 75.6%. It increased from 62.6% in 1996 to 70.1% in 2003. The conversion rate was 82.8% (increasing from 81.1% in 1995 to 86.8% in 1997, and then regularly decreasing to 78.9 in 2003).

Conclusions: The realization rate can be considered as insufficient. The conversion rate was satisfying but it is worriedly decreasing since 1997. We must try to know if this is due to patients characteristics such as associated diseases (HIV, malnutrition), or to drug itself (effective administration of drug even under DOT, insufficient dosage, resistances).

PS-62051-04 Characteristics and mortality of 4049 extra-pulmonary tuberculosis cases notified in Burkina Faso from 1994 to 2004

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Aim: To describe characteristics and analyse mortality of extra-pulmonary tuberculosis (TB).

Methods: Retrospective study based on TB registers from the exhaustive 80 detection and treatment centres (DTC) in Burkina Faso. Data of every registered patient was entered under Epi info software and then analysed under SPSS for Windows. Adjusted relative risks of death (RR) with 95% confidence interval (95%CI) were derived from logistic regression model.

Results: Among all TB cases, extra-pulmonary TB proportion was 16.9% (increasing from 14.4% in 1996

to 19.7% in 2001, and then decreasing to 14.8% in 2004). TB sites was pleural (33.8%), osseous (22.4), lymph node (18.0%), peritoneal (9.9%), other sites (9.0%) and multiple sites (2.4%). The death rate of extra-pulmonary TB (13.6%) was lower than smear-negative TB (24.9%) and smear-positive TB (13.9%). The adjusted RR (95%CI) of death was 0.48 (0.33–0.69), 1.29 (0.94–1.77), 1.90 (1.33–2.71), 1.27 (0.86–1.87) and 2.07 (1.10–3.90) for osseous, lymph node, peritoneal, other sites and multiple sites TB respectively, as compared to pleural site. The risk of death did not significantly evolve between 1995 and 2003.

Conclusions: Extra-pulmonary overall frequency or mortality did not change importantly over ten years under routine programme condition in Burkina Faso. More attention should be given to extra-pulmonary TB, especially to multiple site, peritoneal and lymph node TB, which present highest risk of death.

TB IN HIGH-BURDEN COUNTRIES–3

PS-61647-04 The challenges of conducting a TB-HIV prevalence study in a resource limited setting

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Aim: To highlight the challenges of conducting a prevalence survey in resource limited settings.

Methods:

- 1 Obtaining consent from Provincial and district health authorities and from neighbourhood health committees.
- 2 Four Southern African communities, three urban one rural.
- 3 Census data was used to enumerate households in selected communities.
- 4 Cluster sampling techniques were used to randomly sample households with the aim of recruiting 5000 adults.
- 5 Sputa collected from asymptomatic adults was sent for culture.
- 6 Individuals with positive sputa were revisited for second and third confirmatory samples.

Challenges:

- 1 Obtaining consent from local leaders.
- 2 Lack of detailed maps with proper enumeration areas and addresses.
- 3 Acceptability of results as participants were asymptomatic healthy adults.
- 4 Issues of satanism associated to sputum collection.
- 5 Ethical issues regarding individual participation.

Lessons learnt:

- 1 Local leaders and their communities were willing to work with the researchers and believed that the survey provided a service to their communities.
- 2 GPS was successfully used to identify houses.
- 3 Individuals with positive sputa sometimes only accepted results after developing symptoms.
- 4 Rumours of satanism faded as the study progressed. Study revealed it is possible to do prevalence surveys in resource limited settings.

PS-61719-04 Culture-based diagnosis of pulmonary TB in a setting with high TB and HIV prevalence

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Background: The diagnosis of PTB was evaluated in Guguletu, Cape Town.

Methods: From 2002 to 2004, cultures were done at diagnosis in addition to routine smears on a cohort of TB suspects ≥ 14 years of age.

Results: There were 4807 suspect episodes (SE) in 4045 individuals. 98% and 78% of SE had at least 1 and 2 smears done respectively while 87% had at least 1 culture. 8% of SE had at least 2 positive smears and 17% one, while 27% had at least one positive culture. A study on laboratory contamination using artificial sputum revealed 1% false positive cultures (95%CI 0–2.4%). The Table indicates smear (sm) and culture (cult) results (at least one positive result) and percentage put on treatment. Comparing 2 positive smears with at least one positive culture, smears had a sensitivity of 54% and specificity of 99%. 1097 (23%) of 4807 SE were placed on treatment. 17% of SE with at least 1 positive smear and 31% with at least 1 positive culture were not placed on treatment.

Result	Sm+ Cult+	Sm+ Cult-	Sm- Cult+	Sm- Cult-	Sm+ No cult	No Sm Cult+	Total
Number of SE	680	31	607	3374	86	29	4807
Number of SE put on treatment (%)	586 (86%)	15 (48%)	300 (49%)	122 (3%)	58 (67%)	16 (55%)	1097
% of total put on treatment	54%	1%	28%	11%	5%	1%	

Discussion: Smear-based diagnosis detects only half of culture-positive TB cases in Guguletu, and half of these patients did not receive treatment for active TB.

PS-61766-04 Tuberculosis as a late complication of HIV infection in Banteay Meanchey, Cambodia

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Background: Cambodia has the highest reported HIV prevalence (1.9%) and tuberculosis (TB) case rate (508/100 000) in Asia. We examined prevalence of TB and relationship to CD4+ T-cell count (CD4) in patients treated at one AIDS clinic in Banteay Meanchey Province.

Methods: We analyzed data on all patients enrolled at the clinic from December 2004 through March 2006 for whom a baseline CD4 was recorded. Patients were screened for TB using clinical exam, chest radiograph, and sputum smears; TB diagnosis was based on national protocol.

Results: Among a total of 639 patients 630 had a baseline CD4 recorded at the time of enrollment of whom 122 (19.4%) were receiving TB treatment. Median CD4 among those receiving TB treatment was 55 cells/ μmL (range 5–635) compared with 152 among those not receiving TB treatment ($P < 0.01$). TB screening of the remaining 508 patients identified 89 (17.5%) with TB. Median CD4 of patients with TB diagnosed by screening was 55 (range 2–846) compared with 189 (range 2–1161) among those with TB not diagnosed ($P < 0.01$). Among screened patients, 28 of 81 (34.6%) with CD4 ≤ 25 had TB diagnosed compared with 60 of 427 (14.0%) with CD4 > 25 ($P < 0.01$).

Conclusion: In contrast to sub-Saharan Africa, where HIV-infected patients develop TB across a wide range of immune deficiency, TB in Cambodian HIV-infected patients occurs predominantly in those with advanced disease. Screening identified many TB cases with highest yield among persons with low CD4 counts.

PS-61771-04 Environmental contamination with *M. tuberculosis* in a provincial TB hospital

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Aim: To identify risks of occupational exposure to *M. tuberculosis* in a provincial TB hospital by using molecular methods to detect dead and/or live bacteria in the environment in an around the hospital.

Design: 140 samples from air, waste water system before and after disinfection, nasal swabs from staff and surfaces in rooms where patients and staff would have touched them.

Methods: Air sampling used a new gelatin membrane filtration system to concentrate bacteria in the air, other samples collected using swabs. *M. tuberculosis* were detected in the samples by PCR; positive samples were screened for 16S rRNA by RT-PCR and ELISA hybridisation, as an indicator of live bacteria in the sample. These results were compared with detection by conventional methods such as microscopy and growth on Lowenstein-Jensen medium, and MGIT system.

Results: TB bacilli were found in 32/140 samples, including 8/42 air samples from examination and X-ray rooms and laboratory, 11/27 surfaces touched by patients, 11/67 nasal swabs from staff. Of these 32 positive samples, 8 contained live bacilli by RT-PCR/ELISA. These included 1 nasal swab from a nurse, 2 from surfaces in ward, and 4 from laboratory environment and 1 from X-ray room.

Conclusion: The environment in this provincial TB hospital show a risk for staff and visitors for exposure to live bacilli. Safer practices need to be introduced to minimise this risk.

This study was supported by Medical Committee Netherlands-Vietnam.

PS-61784-04 Comparison of QuantiFERON with TST for child household contacts under the age of 5 years

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Background: QuantiFERON® TB-2G (QFT), a whole blood interferon gamma assay, has recently been developed and used to detect tuberculosis infection among adult contacts, but little is known about assessing it for children less than 5 years old.

Methods: We compared positivity of QFT with that of TST defined as 10-mm cutoff point in 219 children under 5 years old in close contact with pulmonary tuberculosis with sputum smear-positive or negative.

Results: Of 219 children including 197 (90%) children with scar of BCG vaccinated in neonatal period, 48 (22%) and 33 (15%) children had positive TST and QFT, respectively. Agreement between QFT and TST was high (kappa coefficient = 72%,) with concordant results in 161 (91%) of 177 children excluding 22 indeterminate and 20 doubtful-positive QFT. Positive rates in both QFT and TST were increased according to smear positivity. However, positive rate of children aged under 36 months in TST was significantly lower than that of children aged 36 or over ($P < 0.05$), although positive rate in QFT is similar between both.

Conclusion: QFT is comparable with TST in its ability of detecting tuberculosis infection among child contacts under 5 years of age. Further study on discordance between QFT and TST should be required.

PS-61805-04 Use of routine national data to note effect of switch to fixed-dose combination drugs in Nepal

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Aim: Nepal NTP switched its drug regimen in 2003 to include HR and HE fixed dose combinations in the national Regimen. This study looks at routinely collected data at national level to measure impact.

Design: Annual Smear Conversion and Treatment Outcome of New S+ve cases before and after introduction of the fixed dose combinations was analysed.

Methods: The data generated by the NTC for the annual reports were tabulated against introduction period of fixed dose regimen.

Results: Both smear conversion (83% in 2001/2 increased to 86% in 2004/5) and Treatment cure ratios (84% of 2001/2 cohort to 86% in 2002/3 cohort) increased. However these trends were already increasing prior to the introduction of the fixed dose drugs. The increases can also be attributed to a decrease in the proportion of defaulters and people with no results. The proportion of failures (1%) and deaths (5%) remained static during this period.

Conclusions: During the time that the NTC switched to fixed dose combinations, outcome indicators improved. The upward trend preceded the introduction of fixed dose combination. Using routine data it was difficult to attribute improvements to fixed dose drugs.

PS-61823-04 Survey on drug sensitivity for AFB-positive sputum patients

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Background: Tuberculosis has been a problem in Afghanistan for a long time. Patients with respiratory infection initially consult private physician and many of them are neither diagnosed accurately nor treated effectively. NTP conduct a survey for national planning purposes in TB control in Afghanistan. Survey on Drug sensitivity is performing in 200 new sputum smear positive patients from eight different provinces of Afghanistan.

Objective: To determine drug resistance present among those recently diagnosed sputum smear positive tuberculosis.

Method: Total 25 National Tuberculosis Control centers selected from 8 provinces which have the high

number of TB patients within the province. A questionnaire and agreement papers for patients are made. Inclusion criteria are age 18 years or greater and newly-diagnosed tuberculosis cases who have not yet initiated treatment. For drug sensitivity testing the LG media is using. Ten tubes (Direct control, Dilution control, PNB, INH, R, Z, E, S and T) are prepared for sensitivity test from one sample. Tubes are kept in 35–37 Celsius. The deadline for result reading is 8 weeks. **Result:** Still we haven't achieved the result of all samples b. Among 72 samples which the results of drug sensitivity are going to be ready by end of April 2006.

PS-61854-04 Prediction model of bacillary disease among smear-negative PTB cases in a high TB, low HIV prevalence country

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Background: To reduce transmission, treatment of smear-positive pulmonary TB (PTB) is the highest priority of National TB Programs. However, molecular epidemiologic studies show that 18% of new cases are transmitted from smear-negative individuals, making early treatment of these patients imperative.

Objective: To evaluate a predictor model for bacillary PTB in sputum smear-negative PTB suspects.

Materials and methods: Case-control study of risk factors for bacillary PTB in sputum smear-negative PTB suspects. Cases are patients with sputum smear-negative, culture-confirmed PTB and controls are sputum culture-negative patients with symptoms and/or radiographic findings consistent with PTB. Risk ratios of the demographic and clinical features in 416 sputum smear-negative patients seen consecutively between January 2004 to December 2005 were evaluated.

Results: 128 (31%) patients had culture-confirmed PTB. On multivariate analysis, duration of symptoms for more than 14 days (OR = 3.3, 95%CI = 1.1–10.5), CXR finding of lesions in 1 or more lung zones (OR = 6.8, 95%CI = 3.4–13.6) and male gender (OR = 1.7, 95%CI = 1.03–2.7) were independently predictive of bacillary PTB (Table). A threshold cumulative score of 6 was most discriminatory for culture-confirmed PTB (sensitivity = 72.4% specificity = 69.3%) based on a receiver operator characteristics (ROC) curve (Figure).

Conclusion: The culture-positivity predictor model is an objective tool in deciding whether to treat sputum smear-negative PTB suspects.

Table Univariate and multivariate analysis of predictive factors for culture-positive PTB in sputum smear-negative TB suspects

Factors	Univariate OR (95%CI)	Multivariate OR (95%CI)	Score
Gender			
Male	1.8 (1.1–2.8)	1.7 (1.03–2.7)	1
Duration of symptoms			
≥14	3.3 (1.3–10)	3.3 (1.1–10.5)	3
Number of lung zones			
≥2	14 (5.9–34)	15.1 (6.6–34.0)	6
1	6.7 (3.2–14.1)	6.8 (3.4–13.6)	4
Malnutrition			
BMI ≤17	1.9 (1.2–3.1)	1.6 (0.9–2.7)	0

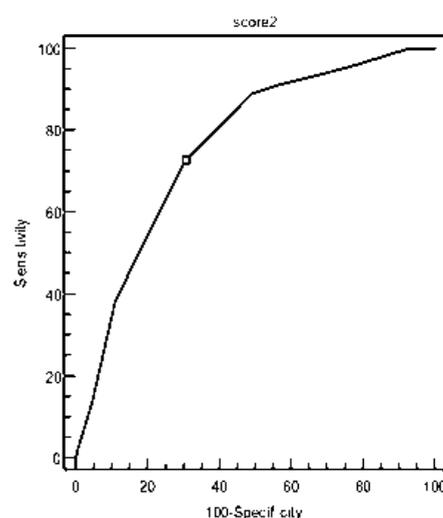


Figure Culture-confirmed PTB prediction model: ROC curve in the derivation cohort.

PS-61860-04 Clinical forms of childhood tuberculosis in Brazil

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Background: Brazil is amongst the 22 TB high-burden countries with an estimated TB case-rate of 20.7/100 000 children as it has been informed recently. Up to now, comparable and complete data on the clinical forms of TB among children are scarcely available in this country.

Objective: To review available nationally published studies on the prevalence of childhood clinical forms, pulmonary and extra-pulmonary, of tuberculosis (EPTB).

Methods: A review was performed considering Brazilian published studies from 1990 to 2001, retrieved at LILACS and MEDLINE. Selected key words were: childhood, tuberculosis, diagnosis, epidemiology and TB clinical forms. The review focused on children <15 years old, the standard WHO category for TB in

children. Only studies providing data from TB notification surveillance were reviewed.

Results: Thirteen studies were initially selected but all except three fulfilled the inclusion criteria. The per cent of TB clinical forms is given below (Table).

Year Author	State	Pulmonary TB <i>n</i> (%)	EPTB <i>n</i> (%)	Notification origin
1990–2001 Franco, R	Bahia	159/275 (57.8)	67/275 (24.3)	Outpatients
1993 Oliveira, HMV	Rio de Janeiro	380/560 (68)	160/560 (32)	Out+inpatients
1996 Nascimento, LF	Sao Paulo	178/188 (94.7)	10/188 (5.3)	Not informed

Conclusion: TB pulmonary forms were more prevalent in three studies performed in Brazil. Countries reporting EPTB as a measure of case detection among children could underestimate cases of pulmonary TB as demonstrated through this review.

PS-61889-04 The main causes responsible for tuberculosis relapses: a retrospective analyse of 100 cases

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The aim of the present study was to identify the main factors involved in tuberculosis (TB) relapses. The authors performed a retrospective study on 100 patients admitted in the Cluj-Napoca Pneumology Hospital between Jan. 2002–Dec. 2004. The results showed that TB relapses affect especially: males (78%), active people, with a peak between 41–50 years (29%) and people from urban areas (52%). The social status of patients was: 44% workers, 35% unemployed and 17% retired. Other causes involved in the onset of the relapses were: the unfit living conditions (47%), smoking (69%) and chronic alcoholism (55%). 33% cases presented other concomitant diseases: 15% other lung diseases, 10% ulcerous disease, 3% diabetes mellitus, 2% acute viral hepatitis, 2% mental disorders and 1 case with lung cancer. At admittance, the sputum smear examination was positive in 68% cases. Drug resistance was detected in 13% patients (3% MDR). 33 patients received individual anti-TB treatment. In 79% the relapses occurred in the first 5 years. The non-compliance to the tuberculous therapy was very high: 62% patients, especially among men (81%). The treatment outcome revealed: 20% cured, 24% completed treatment, 30% failures, 19% defaulters, 4% lost, 3% deaths. Only a correct application of DOTS together with the improvement of the socio-economic status will allow us to obtain good therapeutic effects among patients with TB relapses.

PS-61890-04 Evaluation of epidemiological situation and TB control in Kazakhstan

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The main benefit of DOTS strategy in Kazakhstan (1998) was the free treatment for each TB patient and an integration of TB Program into Public Health System, because of it was achieved decline of TB mortality in two times. At the same time the level of TB incidence (154.3 per 100 000) and TB mortality (20.6 per 100 000) TB in Kazakhstan is the highest among a population of the Central Asia republics.

Target: Evaluation of epidemiological situation and TB control in Kazakhstan before and after the DOTS strategy implementation by the main epidemiological indicators.

Methods: Analysis of epidemiological indicators: 'incidence/mortality' to show the heaviness of epidemiological situation on TB and 'prevalence/incidence' to evaluate the effectiveness of TB Program before (1992–1998) and after (1998–2004) DOTS strategy implementation.

Results: The lowest proportion 'incidence/mortality' (1995–1997—2.6; 2.4; 2.4 respectively) and the highest proportion 'prevalence/incidence' (4.4 and 3.7 respectively) determined before DOTS implementation. The highest proportion 'incidence/mortality' (1999–2004—4.6 and 7.5 respectively) and the lowest proportion 'prevalence/incidence' (2.3 and 2.7 respectively) was determined after of DOTS implementing. Thus, there is necessary the supplementary criteria, as the proportion 'incidence/mortality' and 'prevalence/mortality' for evaluating the epidemiological situation and effectiveness of TB Program.

PS-61904-04 Drug resistance among smear-positive pulmonary tuberculosis patients in a high prevalence area in Lima, Peru

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Background: Peru has one of the highest rates of drug-resistant tuberculosis (TB) in Latin-America. Several studies have shown that the prevalence of multidrug-resistance tuberculosis (MDR-TB) is 50% in previously-treated (PTP) patients and 3.5% in newly diagnosed patients (NP). The objective of this study was to assess the pattern of drug resistance in a TB high prevalence area.

Methods: A retrospective analysis of the sensitivity pattern of strains isolated from pulmonary TB patients was conducted. Smear-positive cases were recruited during a phase III trial that evaluated four new diagnostic tests for MDR-TB. Smear microscopy,

Löwenstein-Jensen culture, drug susceptibility (proportion method) and HIV testing results were reviewed. **Results:** 850 cases were included; 797 were non previously treated and 53 were previously treated cases (relapses and failure to standard regimen one). Resistance to any of the four TB first-line drugs was found in 14.9% (119/797) NP and in 13.2% (7/53) of PTP subjects ($P > 0.05$). MDR was observed among 5.8% (46/797) of NP and 54.7% (29/53) of PTP ($P < 0.0001$). Rifampicin resistance was strongly associated with isoniazide resistance (OR 84, $P < 0.001$) and with MDR-TB ($P < 0.001$). Prevalence of HIV infection was 0.4% (3/850).

	Previously treated patients <i>n</i> (%)	New patients <i>n</i> (%)
Sensitive to four drugs	14 (26.4)	587 (73.7)
Any resistance	39 (73.6)	210 (26.3)
Any resistance to		
Isoniazid (H)	33 (62.3)	103 (12.9)
Streptomycin (S)	29 (54.7)	174 (21.8)
Ethambutol (E)	12 (22.6)	28 (3.5)
Rifampicin (R)	30 (56.6)	54 (6.8)
MDR		
HR	5 (9.4)	7 (0.9)
HRE	2 (3.8)	3 (0.4)
HRS	13 (24.5)	21 (2.6)
HRSE	9 (17.0)	15 (1.9)
Non-MDR but at least resistant to H and S	29 (54.7)	46 (5.8)

Conclusion: Levels of drug resistance, specially MDR among PTP were high in this setting. Strong correlation between rifampicin and isoniazide resistance was observed.

PS-61958-04 Antituberculosis drug resistance in Guarulhos, Brazil, 2005

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Guarulhos has the second biggest population of the State of São Paulo, with 1 300 000 inhabitants. Lately, about 550 cases of tuberculosis have been registered per year, with low cure rates (68%) and low DOTS coverage (12% in 2003), reason why it is considered a tuberculosis priority city by the State TCP program. In 2005, an active case finding of respiratory symptoms has been conducted in Guarulhos. SSs and cultures were performed for 2865 patients, with the discovery of and 207 SS+ and 139 cultures (yielding 136 positive *M. tuberculosis* specimens), with the following susceptibility test profile:

Primary monoresistance: 10% (INH = 2.4%; RMP = 0%; SM = 5.6%; PZA = 0%)

Any primary resistance: 12.1% (INH = 6.5%; RMP = 4.0%; SM = 6.5%; PZA = 3.2%)

Primary MDR: 4% (INH+RMP = 0.8%;

INH+RMP+PZA = 2.4%; and

INH+RMP+PZA+SM = 0.8%)

Acquired monoresistance: 25% (INH = 8.3%;

RMP = 0%; SM = 16.7%; PZA = 0%)

Any acquired resistance: 41.7% (INH = 25.0%;

RMP = 16.7%; SM = 25.0%; PZA = 0%)

Acquired MDR: 16.7% (INH+RMP = 8.3%;

INH+RMP+SM = 8.3%)

Resistance rates higher than the country as a whole and the State were observed in Guarulhos, mainly relative to acquired resistance, which is an issue of deep concern. Active case finding, case monitoring and implementation of DOTS in the area for all patients are urgent and highly necessary measures to improve the performance of tuberculosis control program.

PS-61966-04 Factors associated with death during standardized re-treatment for multidrug-resistant TB in Peru, 1997–2001

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Background: Since 1997, the standardized re-treatment scheme for MDR-TB was implemented in Peru, with a duration of 18 months, with application of Kanamycin, Ciprofloxacin, Ethionamide, Pyrazinamide, and Ethambutol. Between 1997–2001, 1442 patients have completed therapy from which deaths 205 (14.3%).

Methods: This is a descriptive, retrospective study. Included in the study were the cases that received standardized re-treatment between 1997–2001. Excluded were the cases in which treatment was modified. A review of medical charts and database of the cases that completed standardized re-treatment, data related with associated factors to death in an individualized registry. Epi Info was utilized for the analysis. **Results:** From the cases that death standardized re-treatment, 61% had two or more previous treatments, 18.2% were contacts to deaths cases in, 17.5% had extensive injury lung, 15.5% late diagnosis, 14% had infection HIV/AIDS, and 9% of the cases denutrition were observed.

Conclusion: Death of Standardize Re-treatment is an important problem in Perú. Two or more previous treatments, Contacts to deaths cases, extensive injury lung, late diagnosis and infection HIV/AIDS, are associated factors to death.

PS-61977-04 Second anti-tuberculosis drug resistance survey in Brazil

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Introduction: Multidrug-resistant tuberculosis (MDR-TB, resistance to at least isoniazid and rifampin) is a major threat to TB control. The first national MDR-TB survey in Brazil conducted in 1994 demonstrated low levels of primary MDR (1.5%). In 2005, we initiated a second national survey, including HIV testing of TB patients.

Objectives: To determine the prevalence of first-line anti-TB drug resistance, to assess MDR-TB trends, and to estimate the prevalence of HIV infection among TB patients.

Methods: The survey was designed according to WHO recommendations. Sampling was nationwide and proportional to the population size. New patients are defined as those receiving <1 month of TB treatment; re-treatment cases are those previously treated \geq 1 month. Patients with smear or culture-positive pulmonary TB are included; acceptance of HIV testing is not required. Data analysis will be stratified by new versus re-treatment and by HIV status.

Results: 7201 new and 2779 re-treatment patients from 566 diagnostic centers have been selected to participate. Patient enrolment began in August 2005. Data entry and analysis are underway.

Conclusion: Results of this survey will be critical to evaluate the burden of MDR-TB and HIV-positive TB patients in Brazil, and the effectiveness of current TB control, including current treatment guidelines.

TB IN SPECIAL POPULATIONS AND INSTITUTIONS (MIGRANTS, HOSPITALS, PRISONS)–2**PS-61560-04 *Mycobacterium abscessus* pseudonococomial outbreak in a respiratory care center**

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Background: Nontuberculous mycobacteria (NTM) infection among elderly patients with underline dis-

ease in Respiratory Care Center (RCC) has been increasingly suspected and notified in Taiwan. As soon as a RCC-patient was transferred to another hospital and was confirmed as a tuberculosis (TB) case, a nosocomial outbreak caused by mycobacteria was suspected after contact investigation at a general hospital in Central Taiwan. Molecular techniques, PCR-RFLP and RAPD-PCR, were used for identification and subtyping of patients' isolates. Medical charts of patients were reviewed.

Results: The bacteriologic results of 33 patients hospitalized in RCC indicated that 27 patients have positive culture for NTM and 1 for *Mycobacterium tuberculosis*, respectively. The rapid-growing *Mycobacterium abscessus* (*M. abscessus*) identified by PCR-RFLP is the main (89.3%, 25/28) causative infectious clone; the 2 others were unidentified mycobacterial species. Twenty-two paired clinical *M. abscessus* isolates were compared by RAPD-PCR. A total of 6 unique RAPD-PCR patterns including 3 clusters were obtained.

Conclusion: Epidemiological and laboratory investigation did not recognize any possibility of TB transmission, common source of environmental reservoir of NTM and person-to-person NTM transmission.

PS-61568-04 Comparison of the incidence of TB in migrants selected for post-migration follow-up and in other migrants

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Migrants to Australia who have radiological evidence of past tuberculosis (TB) are required to sign a TB health undertaking (TBU) prior to migration. In order to assess of the efficiency of this selection process, we compared the incidence of TB in the first two years after arrival among migrants on TBUs with the incidence over the same period in migrants who were not on TBUs, overall and for selected countries of origin. A database of all migrants on TBUs arriving in New South Wales between 1992 and 2004 was linked to the state-wide TB register for the same period. Available records were reviewed to confirm or refute the diagnosis. The TB register includes data on country of origin and date of arrival. Department of Immigration figures were used for the total number of migrants. The annual incidence rate (/100 000) over the first two years was 177 in TBU migrants and 43 in other migrants. For specific countries of origin, rates were higher in TBU migrants than non-TBU migrants from India (364 vs. 144, respectively), Vietnam (326 vs. 218), China (120 vs. 35) and SAR Hong Kong (178 vs. 22) but not the Philippines (84 vs. 173). This rate in TBU migrants was also higher than the WHO

reported incidence rate in their country of origin for migrants from India (187), Vietnam (189) and SAR Hong Kong (114), but not China (113) and Philipines (314). For most countries, the TBU selection process does identify a cohort of migrants at higher risk of subsequent reactivation of TB.

PS-61584-04 Radiographic predictors of subsequent tuberculosis among migrants selected for TB follow-up

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Radiographic classifications have been used to identify cases of TB in population screening. We have evaluated one of these (1) and another, new classification for the purpose of predicting subsequent TB. A case control study was conducted nested within a cohort of 7256 migrants to Australia who were followed up on TB undertakings. The average time at risk (ie from chest X-ray to end of follow-up) was 9.6 years. Cases were those who had a confirmed diagnosis of TB during follow-up ($n = 60$). A random sample of 107 controls was selected. Initial chest X-rays were read, independently and blinded to case vs. control status, by two readers. Agreement was quantified as weighted kappa (κ_w). Disagreements were resolved by consensus. Sensitivity and specificity for subsequent TB were estimated. There was moderate agreement between readers for both the Graham and the new classifications (κ_w 0.67 and 0.60, respectively). Apical fibrosis, parenchymal infiltrate, and/or lesions $>2\text{cm}^2$ in size were strong predictors of subsequent TB but the presence of calcified granulomas alone was not a significant predictor. In the new classification, the presence of abnormalities consistent with previous TB disease or parenchymal infiltrate vs. other abnormalities or normal findings had a sensitivity of 66% for subsequent pulmonary TB and a specificity of 82%. Radiographic screening can be helpful in identifying individuals at increased risk of subsequent TB.

1 Graham S et al. IJTL 2002; 6: 137–142.

PS-61609-04 Tuberculosis drug resistance in prisons of the Republic of Azerbaijan

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The International Committee of the Red Cross (ICRC) and the Ministry of Justice (MOJ) has been collaborating successfully in bringing tuberculosis (TB) under control in the penitentiary system of Azerbaijan since 1995.

Objective: To determine the nature and extent of drug-resistant TB in smear and/or culture-positive patients/prisoners.

Methods: In 2005, Drug Susceptibility Testing (DST) was performed for all cases at enrolment to TB treatment at the prison TB hospital. Subcultures of each isolated strain were shipped to the SRNL of Borstel (Germany) for External Quality Assessment (EQA) on DST.

Results: 316 DST results are available for 466 sputum smear or culture-positive patients (68%). The DST results show that 49.5% of new and 64.4% of previously treated smear-positive TB patients are infected with strains resistant to any first-line anti-TB drugs, most frequently Isoniazid (32% and 61% respectively) and Streptomycin (55% and 71%, respectively). Of 184 new patients, 41.8% have pan-susceptible TB, 27.2% mono-resistance, 10.9% MDR-TB and 20.1% have Poly-drug resistance TB (PDR TB). Among 132 previously treated patients, these proportions are 27.3%, 3.0%, 40.2% and 21.2%, respectively.

Conclusion: High levels of the MDR and PDR TB urge a swift start of a pilot DOTS-Plus project submitted and approved by GLC and GFTAM, strengthening of DOT and infection control measures are also required to prevent the further development and transmission of MDR and PDR TB.

PS-61726-04 Epidemiology of tuberculosis and multidrug-resistant tuberculosis in a refugee camp: Thailand, 2005

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Background: In January 2005, reports of tuberculosis (TB) and multidrug-resistant TB (MDR-TB) cases among Hmong refugees living in a camp in Thailand and refugees who had arrived in the United States, prompted an investigation to describe the epidemiology of TB among camp residents.

Methods: Camp residents underwent a standard evaluation for TB disease and latent infection. Patients were interviewed and living quarters were mapped with global positioning system (GPS) technology. *M. tuberculosis* isolates were genotyped.

Results: During March 2004–January 2005, 272 cases were diagnosed among 15 707 Hmong refugees. Three (18%) of the 17 culture-confirmed MDR-TB patients were treated previously for TB. Nine (53%) reported at least weekly contact with another MDR-TB patient, and 7 were linked through a social network cen-

tered around a patient with sputum smear-positive MDR-TB. GPS mapping revealed widespread distribution of cases. Of 49 isolates genotyped, 26 (53%) belonged to 1 of 7 clusters ranging in size from 2 to 11. 1625 (29%) of 5640 camp residents had a positive skin test result. Housemates of smear-positive patients were 1.6 times (95%CL = 1.4–1.9) as likely to have a positive TST result.

Conclusions: MDR-TB was the result of both primary and secondary (acquired) drug resistance. Recent transmission of TB and MDR-TB was suggested by genotyping, social links between patients, and elevated rates of positive TST results among housemates of sputum smear-positive patients.

PS-61763-04 Tuberculosis in prisons: major risk in women and HIV-positives in S. Paulo, Brasil

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The S. Paulo State prisons population is about 140 000 distributed in 144 prisons units. The tuberculosis program coordination has been working together with the penitentiary system since 1996. The tuberculosis cases have been increasing (521 in 2000 and 1153 in 2005) probably because the improvement of active case finding. Men are 96% of this population and 93% of the TB cases. However the women estimated incidence rate value is double of men. The high prevalence of coinfection needs urgent measures. In 2004 the new tuberculosis cases among HIV positive were 18.7% and 30% for retreatments, these percentage of HIV cases are higher than the ones found in the majority of population. The treatment results show a considerable improvement. In 2000 the cure, abandon, transfer and death rates were respectively: 55.2%; 18.8%; 15.8%; 9% and in 2004, 71.1%; 7%; 11% and 4.9%. So it is necessary to change the percentage of transferences monitoring these cases closer. As there has been an increase in the number of tuberculosis cases and high prevalence of HIV, it is also time try to do latent tuberculosis treatment.

PS-61840-04 Active screening for tuberculosis in a vulnerable group: Roma population in a Belgrade municipality

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Introduction: Generally, Roma population (about 50 000 living in Belgrade) is considered a high-risk group for acquiring TB. We performed active screening for TB in one Belgrade municipality—Cukarica.

Methods: Adult subjects underwent chest radiography. Subject in whom abnormalities were found, un-

derwent further investigation. Children up to 14 yr of age were tuberculin tested and their BCG scar estimated. Subjects showed positive results were clinically and radiography examined.

Results: We had 407 registered adults out of which 167 (41%) presented and had chest X-ray done in our Institute. In 8 subjects, abnormalities possibly due to TB were found on chest X-ray, but the results of sputum smear and culture turned out negative. Of 224 registered children, 202 were studied; 22 were excluded from the study due to various reasons. The results of tuberculin test were as follows: 161 negative and 16 positive. Four children were BCG vaccinated; 11 underwent chest radiography. No case of TB was confirmed.

Conclusion: Our investigation found no case of tuberculosis either in adults or children in studied population. The obtained results were in correlation with the results characteristic for general population.

PS-61863-04 Tuberculin skin test of nurses working in Greek hospitals

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Occupational transmission of *Mycobacterium tuberculosis* has been recognized as a risk to Health Care Personnel. Aim of this study was to estimate how many nurses had positive TST results in 3 General Hospitals in Attica-Greece. Participants in this research were nurses who worked at Internal Medicine wards and treated patients with Tuberculosis (TB). Participants were asked about contact with patients with TB and use of respiratory protection. Mantoux skin testing was performed. Of the 127 nurses (mean age = 41.5 years) who work at the above mentioned wards only 62 (40%) accepted to perform TST, 5 already knew to have positive results and thus were not included in the study. 38 of them had TST results = 0 mm, 11 had negative results of 5–9 mm, 12 had TST conversions with reaction sizes of 10–14 mm and 1 had TST conversion with reaction of >15 mm. 87% of the participants worked at the same wards for more than 15 years and used to perform protection measures (93%). Among them only 21% had positive TST. It is concluded that low incidence of transmission of *Mycobacterium tuberculosis* was noted at the population probably due to the protection measures they used to perform.

PS-61901-04 Active tuberculosis among schoolchildren with positive tuberculin skin tests and their household contacts in Syria

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A prospective cohort 205 school children recording +ve tuberculin skin test (TST), were investigated as well as their contacts for latent and active TB infection. All participants <15 year old were subjected to TST. Chest radiograph for children with +ve TST and all adults. Three sputum specimens for acid fast bacilli were performed for adults.

Aim: To determine the incidence of active TB among this cohort and their household contacts, determining the prevalence of latent TB infection (LTBI) and identifying the risk factors for active TB among these contacts.

Results: 191 remained TST +ve in 2002. Depending on chest X ray finding and clinical examination, nine children were diagnosed as active TB cases. The incidence was 4.39%. 146 TB cases diagnosed among 834 contacts recording a prevalence of 14.3%. Of these, 144 were new cases, the cumulative incidence among contacts was 17.4%. Risk factors: age ≥ 15 years; smoking; low BMI; diabetes; and closeness of contact with the index cases. Of 398 household <15 years of age, 133 (33.4%) had +ve TST. Only, 8 had +ve chest X-ray. +ve past history of TB was recorded in 34 of the 1039 studied population (3.27%). These may explain the LTBI in surveyed schoolchildren and could be the main source of infection for the new 144 cases detected in 2002, therefore 77.18% of new TB is attributed to the household contacts.

Conclusion: These results indicate the need to strengthen therapy of latent TB infection in recently infected contacts of a case of TB.

PS-61916-04 Tuberculosis in the prisons of Ankara in 2005

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Because tuberculosis (TB) risk is high in prisons all prisoners of Ankara except those in Polatli Prison were screened for TB in 2005 with microfilm. In 15 prisons 92% (2014/2196) of prisoners and 39% (494/1276) personnel were screened. Cases with suspected X-rays were examined in dispensary. In Ankara F-Type No 2 and Open Prisons, one smear positive and one smear negative pulmonary-TB cases were detected with screening; two smear and culture positive pulmonary-TB cases were under treatment in Open Prison during screening. TB point prevalence was 198 in 100 000 for all prisoners. No TB cases were detected by per-

sonnel screening. During 2005, other than these 4 cases, 9 TB patients were followed up in Ankara Closed Prison who were sent from different cities for hospitalization. Seven of the 14 cases detected in prisons of Ankara during 2003, 2004, 2005 were found by screening. Screening coverage rate for target prisoner population increased during these years (86%, 89%, 92% respectively). Education meetings with prison managers may have a role in this increase. This study shows that prisoners are a risk group for TB and yearly screening need to be carried on. For the success of screening, cooperation and education should be strengthened.

PS-61929-04 Drug-resistant tuberculosis in prisoners of Lurigancho Penitentiary, Lima, Perú, 2003–2004

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Introduction: In Peru, the incidence of TB in prison is 1725 cases per 100 000. In Lurigancho Penitentiary (Lima) resided 7800 prisoners, under conditions of overcrowding.

Aim: To know the resistance the *M. tuberculosis* to anti-tuberculosis drugs in prisoners of The Lurigancho Penitentiary, during 2003–2004 years.

Methods: Observational study that included to patient diagnosed as pulmonary TB smear-positive. Using the National Laboratory Network of Tuberculosis the cultures was processed by the Ogawa method, and referred to the National Mycobacteriology Laboratory. DST for isoniazid (INH), rifampin (RFP), ethambutol (EMB) and streptomycin (SM) was performed using the proportions method; pyrazinamide (PZA) testing employed the Wayne method.

Results: Were included 244 prisoners, all males. The average age was 28.9 ± 8.3 years. 178 (72.9%) previously untreated cases (NT) and 66 (26.1%) previously treatment cases (AT). Also, 18/195 (9.2%) were HIV (+), 44.4% had more than an entrance at the prison, and the time of average permanency in prison was of 28.9 ± 31.5 months. The primary resistance (RP) was 25.2% and the multidrug resistance (MDR) primary was 4.5%; and the acquired resistance (RA) was of 33.3% and the acquired MDR was 4.6%.

Conclusions: A high prevalence of resistance and multidrug resistance to antituberculosis drugs was found in prisoners of principal penitentiary from Lima. Therefore it must be necessary to implement strategies for this population in risk.

PS-61956-04 Tuberculosis in homeless patients in the State of São Paulo, Brazil, 2000–2005

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The homeless is a hard population to work with, presenting an explosive social and epidemiological risk of developing severe illnesses: tuberculosis, AIDS, MDR-TB.

Objective: To analyze epidemiological aspects of tuberculosis in the homeless.

From the total tuberculosis (TB) cumulative notifications registered in the 2000–2005, 980 were homeless people, 963 (95.5%) from São Paulo City (SPC) and the remaining 44 (4.5%) from other metropolitan areas. Yearly variation was from 112 to 189: The most frequent form was pulmonary (93.10%); 60% were SS+, re-treatment were 26.2%, twice the State percentage (13%) and 90.6% were male. HIV+ patients were 15.5% (during the study period, tests more than doubled, from 31.2% to 67.6%). 695 (70.90%) patients required hospitalization, suggesting TB advanced forms and delayed diagnosis. A 99 days hospital stay also demonstrated high treatment costs. Co-morbidities were also frequent: 81.2% of patients had associated diseases, mostly alcoholism (48.5%) and AIDS (14.8%), Diabetes and Mental Illness (3.2% each), to mention a few. Treatment outcomes were highly disappointing, with cure and mortality rates of 31% and 18%.

Conclusions: The State TB Control Program is likely to fail due to the high tuberculosis incidence, mortality and HIV-TB co-infection rates, case severity, low cure rates anticipates the risk of MDR outbreak in the homeless population, if actions are not taken to improve this explosive situation.

PS-61961-04 Participation of the health services in tuberculosis control in big cities: Sao Paulo State, Brazil

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Introduction: The Tuberculosis control in the big cities is more difficult due to existence of the many health care facilities carry out diagnosis and treatment. Several health care facilities not are involved directly with the activities of the TB Control Program (case-finding and DOTS).

Objective: To describe the main health facilities involved in diagnosis and treatment in the 2 high burden cities in Sao Paulo State identifying what is their contribution to diagnosis and treatment success.

Method: Design—descriptive study. Study population—All new cases notified in 2004, in Santos City (432 cases) and Sao Paulo City (6310 cases), municipi-

palities about 39% of the TB burden in Sao Paulo State.

Results: The degree of participation the hospitals services in TB diagnosis was high, with 59% in Sao Paulo and 50% in Santos. There were problems in referral system between hospitals and ambulatory services, with 25% of cases lost in both municipalities. In the hospitals services the rate of treatment success were under ambulatory services, Sao Paulo 61% (ambulatory services 79%) and Santos 64% (ambulatory services 80%).

Conclusion: The implementation of PPM approaches (one of the six components of the Strategy STOP-TB) in high burden municipalities is an ideal opportunity to improvement the case-detection and treatment success to reach the Millennium Development Goals.

PS-61999-04 Nursing and community rates of *Mycobacterium tuberculosis* infection in students in Harare, Zimbabwe

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To estimate nosocomial and community risks of *M. tuberculosis* infection in Harare students.

Design: Cohort study of tuberculin skin tests (TST) conversion. 159 nursing and 195 polytechnic students TST-negative (<9 mm) on two-step testing at the start of their studies were retested at 6, 12 and 18 months into training.

Results: The TST conversion (≥ 10 mm increase) rate was 19.3 (95%CI 14.2 to 26.2) per 100 person-years in nursing and 6.0 (95%CI 3.5 to 10.4) per 100 person-years (PYFU) in polytechnic students. The rate difference was 13.2 (95%CI 6.5–20.0) per 100 PYFU. Using more stringent definitions of a conversion (≥ 10 mm increase to ≥ 15 mm), likely to increase specificity but decrease sensitivity, conversion rates were 12.5 and 2.8 per 100 PYFU in nursing and polytechnic students respectively (rate difference 9.7 per 100 PYFU; 95%CI 4.5–14.8). Nursing students nursed 20 868 tuberculosis inpatients during 315 person-years training.

Conclusions: Both groups had high TST conversion rates, but student nurses had significantly higher rates and also reported intense exposure to inpatients with TB. Preventing institutional transmission of *M. tuberculosis* is increasingly difficult in high HIV prevalence settings. Better prevention, surveillance, and management of institutional *M. tuberculosis* transmission are essential components of the international response to the severe HIV epidemic and health worker crisis in Southern Africa.

PS-62035-04 Multidrug-resistant tuberculosis in health care workers, Cape Town, South Africa

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Tuberculosis (TB) remains a major health threat in South Africa and is accompanied by the problem of multidrug-resistant tuberculosis (MDR-TB). This is further exacerbated by a rapidly growing Human immunodeficiency virus (HIV) epidemic with the proportion of TB patients co-infected with HIV increasing. Transmission of *M. tuberculosis* (and more seriously MDR-TB) is a recognized risk to health care workers (HCWs). Between September 1989 and November 2005, 32 HCW's with MDR-TB were identified in the Cape Metropole. 15 of these HCW's originated from academic hospitals, 3 each from secondary hospitals, TB and health care facilities. 2 each from the prison and ambulance services, and one each from a psychiatric hospital, pharmacy, private clinic and social services. Their ages ranged from 24 to 54 years (median 36). 25 were female. Of twenty-seven HCW's who underwent HIV testing—three were positive. 17 HCW's successfully completed a course of MDR-TB treatment. All except 1 remained disease free. This patient was subsequently reinfected with a susceptible strain. 8 HCW's are currently on treatment, 5 of these have converted, and one can't produce sputum. 7 have died of MDR-TB. Patients who have MDR-TB are infectious for prolonged periods, increasing the risk for nosocomial and/or occupational transmission of *M. tuberculosis* and protection policies need to be urgently addressed.

PS-62036-04 TB transmission in a penitentiary facility in Cameroon

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The New Bell Central Prison, the sole penitentiary facility for Douala, the economic capital city of Cameroon, houses approximately 2800 prisoners. Living and sanitary conditions in the 25 cells are extremely deplorable. During a study where 2474 inmates were screened for pulmonary tuberculosis, 87 cases of active TB were detected, yielding an incidence of 3517 cases per 100 000 inmates, while in the country the prevalence is 227 cases per 100 000 inhabitants. Of the 25 cells 18 had at least 2 cases of contagious tuberculosis. The aim of this study is to analyse molecular characteristics of strains isolated from these patients in order to compare the genotypes observed with those of the general population, and evaluate a

likely transmission. Spoligotyping has been performed on 42 isolates from prisoners living in 14 different prison cells: five cells with 2 isolates, five with 3, one with 4, two with 6 and one cell with a single isolate. Spoligotyping showed five clusters including 36 isolates: two clusters with 12 isolates (Clusters 1 and 2), one with 8 isolates (Cluster 3), and two clusters with 2 isolates (Clusters 4 and 5). The 6 remaining isolates showed unique spoligotypes. Comparison with a data base of published patterns (Sola et al. 2001) showed that strains from Cluster 3 belong to the Cameroon family with the spoligotype 61 (Niobe-Eyangoh et al. 2003) and Clusters 1 (spoligotype 50) and 2 (spoligotype 53) showed a great similarity of patterns with only a difference of spacer 31. MIRU-VNTR typing is being performing for a better characterization of clustered strains and evaluating transmission into the prison. Results will be discussed.

PS-62064-04 Mobile DOTS centre reaching the unreached: a novel experience

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There is a big problem of shelterless/homeless persons who migrate to Delhi to earn their livelihood. One segment of such shelterless population was identified in Chandini Chowk area, where about 2000 persons sleep on the footpath (pavement dwellers). They usually do not have access to any health facility. For providing TB care services at their doorsteps, a Mobile DOTS Centre was started by DTBA on July 22, 2002. Another NGO is working in this area for treatment of various ailments of these pavement dwellers. It refers all respiratory cases to Mobile DOTS Centre which functions at the footpath. Our Team is in position at 7.00 A.M. The patients are examined and their sputum samples collected. The patients diagnosed as TB are given treatment as laid down in DOTS strategy.

Progress of this project is as follows:

No. of patients examined	10 162
Patients diagnosed TB by sputum examination	380
Patients diagnosed by clinical and histopathological examination	51
Patients completed treatment	51

FIDELIS—THREE YEARS OF INNOVATIVE APPROACHES TO TUBERCULOSIS CASE FINDING

PS-61218-04 Evaluation of the effect of the FIDELIS Tuberculosis Control Project

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Background: FIDELIS phase I covered 3 prefectures with 18 million population from Oct. 2003–Sep. 2004. The main strategy was strengthening TB referral.

Objective: To analyze and evaluate the effect of the project.

Methods: Data were abstracted from notification and treatment outcome forms in project area and NTP routine reports in non-project area. The notification of NS+TB in project and non-project area in project and baseline; proportion of NS+TB in project and non-project area in project and baseline; proportion of NS+TB in project area among the total in Hunan; treatment outcome of NS+TB were analyzed.

Results: The notification of NS+TB increased from 28/100 000 to 59/100 000 (111%) in project area and 25/100 000 to 30/100 000 (20%) in non-project area from baseline to project year. The proportion of NS+TB was changed from 29.2% to 42.6% in project area and 71.8% to 57.4% in non-project area from baseline to project year. With 27% of the total population in Hunan, project area detected 42.6% NS+TB of the total in Hunan. Cure rate and treatment success rate of NS+TB were 88.2% and 93.0% in project area.

Conclusion: FIDELIS phase I substantially increased case-finding in Hunan. The project developed feasible interventions which would be expanded in Hunan even in China.

PS-61591-04 The role of smear microscopy center at township level

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Background: The smear microscopy centers (SMC) were established in township hospitals in four prefectures, namely Hengyang, Yueyang, Chengzhou, Yongzhou, in phase II FIDELIS project in Hunan province, China.

Objectives: To assess the role of SMC at township level in case-finding

Methods: The data of new smear positive (NS+) TB detected in baseline (Jun. 04–Feb. 05) and in the project

period (Jun. 05–Feb. 06) in the 4 prefectures (intervention) with SMC and the province (excluding the 4 prefectures) (control) were collected. The comparison of case notification of NS+ TB between the intervention area and control area and between baseline and project period were conducted.

Results: In the intervention area, the number of NS+TB was increased from 7187 to 15 553 which was 2.16 folds compared with the baseline. While in the control area, the number of NS+ TB was increased slightly from 15 090 to 15 709 which was 1.04 folds over the baseline. The incremental trend in the intervention area was much more significant than that of the control area.

Conclusion: The establishment of SMC played a very important role in increase case-finding. The experience should be summarized and expanded to the other prefectures in Hunan.

PS-61635-04 Developing high quality TB care in Madagascar through FIDELIS

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Background: In Madagascar approximately 20 000 tuberculosis cases are notified annually, but the cure rate remains low (72%). More than 80% of Madagascar's 17 million inhabitants live in rural areas, which can often be inaccessible during the rainy season.

Objective: The main objective of this FIDELIS project was to strengthen tuberculosis care through decentralization of services and strengthening of human resources.

Methods: The main activity was to decentralize services by establishing 1000 additional treatment centers (TC) (500 would also be involved in slide preparation). For new centers, health workers and paramedical staff would be trained. Also, community volunteers would be recruited to support TB patients. These volunteers would also receive incentives.

Results: During the 12 months of project activities, the following human resources strengthening activities were completed: 1) 695 doctors trained in TB management; 2) 200 paramedical staff trained in slide preparation; 3) 387 volunteers oriented in identification of tuberculosis suspects; 4) Incentives provided to volunteers; 5) the number of new smear positive cases detected during the project period increased compared with the previous year.

Conclusion: Decentralisation of TB services requires strengthening of human resources. Increased case detection observed during the FIDELIS may be due, in part, to these human resources strengthening efforts.

PS-61405-04 Impact of standard referral mechanism on case notification in FIDELIS Project Area

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Background: Fourteen prefectures (11 newly expanded) covered by FIDELIS phase II in Hunan province, China.

Objectives: To develop and implement standard referral mechanism and to evaluate its impact on case notifications.

Methods: An intervention package, including administrative interventions, differential training for health care providers, practical ascertainment tools, establishing the sputum examination sites at township hospitals, supervision, and a financial incentive mechanism were developed and implemented. The referral mechanism was evaluated through data collected during a 9-month baseline (Jun. 2004–Feb. 2005) and equally long project period (Jun. 2005–Feb. 2006).

Results: 24 069 NS+ TB patients were notified in the 14 prefectures in project period, an 8.04% increase over the baseline (22 277). The incremental trend was more substantial in the 11 newly expanded prefectures where the number of notified NS+ TB patients was increased from 14 766 to 17 368 with a 17.54% increase over the baseline. The risk ratio of case notification of NS+ TB in 11 prefectures in project period to the baseline was 1.18 ($P < 0.05$). The case notification of NS+ TB in Hunan was 48.7/100 000 in project period, 32.4% higher than the national figure in 2005.

Conclusion: The increase in case notification was significantly associated with the implementation of standard referral mechanism which should be expanded to other provinces adapting the local setting.

PS-61581-04 Economic and geographic factor analysis for cases with limited access to health services in Hubei FIDELIS area

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Object: To analyze economic and geographic factors, which affect the limit access rate of new smear positive cases, and bring up relevant interventions to reduce the limit access rate of new smear positive cases.

Method: To make chi-square test with GDP per capita, service semidiameter of TB dispensary, landform characteristics (plain, mountain, hill) in the 36 counties and the limit access rate of new smear positive cases obtained by questionnaire survey in 36 counties of Hubei FIDELIS project during Oct. 2003–Sep. 2004.

Result: No difference of limit access rate between different GDP pre capita groups ($\chi^2 = 1, P > 0.2$); there is difference of limit access rate between three service semidiameter of TB dispensary groups ($\chi^2 = 8.236, P < 0.002$); there is difference of limit access rate between landform characteristics groups ($\chi^2 = 8.800, P < 0.001$); the limit access rate is higher in mountain area than in hill area ($\chi^2 = 6.085, P < 0.05$), the limit access rate is higher in mountain area than in plain area ($\chi^2 = 4.5, P < 0.05$).

Conclusion: More funds should be invested to the counties with larger geographic area and mountainous area to facilitate patients receiving health service and reduce the limit access rate of new smear positive cases. Geographic area and mountainous area should be the priority consideration as criteria for project support with economy and population in the next place.

PS-61608-04 Evaluation of the effect of the implementation of the FIDELIS project in Guizhou Province, China

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Setting: 88 counties in Guizhou Province of China, from Nov. 2004 to Oct. 2005.

Objective: To evaluate the effectiveness of implementation of FIDELIS project in Guizhou province.

Method: Using description study to review the monthly report data and correlative data from Nov. 2004 to Oct. 2005 and compared the results with those the year before FIDELIS project implemented.

Result: During one year project implementation, 12 478 new sputum smear positive pulmonary tuberculosis cases were found, increased 3073 cases compared with the corresponding period the same term in the last year. The registration rate of new smear-positive TB case were 32/100 000 and 24/100 000 respectively. χ^2 showed there was significant difference between these two rates ($P < 0.05$). Cure rate of the new smear positive patients in the project year was 82.7% and 81.3% respectively. χ^2 test showed there was significant difference ($P < 0.05$). Case detection rate of the project year and the year before project year were 86.9% (12 178/14 015) and 72.9% (10 231/14 041), respectively. χ^2 test showed there was significant difference ($P < 0.05$). Suspect TB patients were traced in the project year and the trace rate was 71.4% (14 504/20 296), the arrival rate of traced patients was 33.7% (4891/14 504).

Conclusion: The implementation of FIDELIS project in Guizhou province make achievement on increasing TB cases finding and improving cure rate of patients.

PS-61041-04 Implementing priority TB health promotion activities in Hebei and Shandong Provinces, China

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Background: Hebei FIDELIS project phase II is implemented in 88 counties with the population of 41.2 million in Hebei and Shandong.

Objective: To increase case detection through implementing priority TB health promotion (HP) activities.

Methods: Based on experience of Hebei FIDELIS project phase I, the survey on the sources of patients' TB information and demands of the general public, a pack of priority TB HP activities are conducted to inform the general public the knowledge and policy of TB, including wall painting, mass media, government notice, recreational activities and TB-club in 88 counties.

Results: The target from Nov. 2005 to Feb. 2006 is 5132 and 5494 new smear positive TB cases were detected which is 107% of the target and 1.6 fold of the same period in the baseline year, and among them 4464 (81.3%) are with limited access to health service.

Conclusion: The priority TB HP activities have greatly increased the case-detection and played an important role in the sustainable development of TB control. The activities are reduced while the case-detection rate is still maintained at a high level, which prove the priority HP activities are cost-effective.

PS-62009-04 BRAC community-based TB control program in Afghanistan and community based TB DOTS

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BRAC Afghanistan initiated a pilot community based TB control project in early 2004 in 2 districts in Parwan province and Balkh Province. The purposes were; to make TB diagnosis and treatment services available and accessible to the community and to encourage community participation in the care of TB patients. According to the MoPH policy, TB control program must be integrated with Basic Package of Health Service. So a MoU was signed between Government of Afghanistan, WHO and BRAC Afghanistan in 2005. At present BRAC TB program is operational in 30 district. Following the MoU, BRAC planned to extend the program in additional 3 districts together with other health components. In this regard all medical equipments had been supplied to all CHCs and district hospitals. Community Health Workers play a significant role in this program. The CHWs identify the Tuberculosis suspected cases, referring them for sputum examination, provide directly observe therapy

and follow up the patient during continuation phase. In the beginning of the program, medical officers, pharmacists, CHW supervisors, CHWs were trained according to the National TB guideline with support of NTP. Laboratory technicians were trained at the National TB institute. Drugs and reagents are supplied by the Government and WHO to BRAC Afghanistan. BRAC is providing other necessary costs for implementation of the program. In the year 2006 BRAC has received Fidelis support to expand the TB control activities.

PS-61074-04 Strengthening the health system through FIDELIS project: Tanzania experience

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Background: The one year FIDELIS projects were implemented in 27 out of 121 districts of Tanzania. The population covered was over 11 million. The challenge was to expand DOTS services and involving the community members to support the few existing health providers in tuberculosis services.

Methods: The project aimed at increasing case detection through three strategies, namely strengthening of public health facilities, strengthening public-private mix and introduction of community-based DOTS (CB-DOTS). In this project, the first two strategies were implemented in all 27 and CB-DOTS in 18 districts according to needs and comparative advantages. In all strategies, patients were free to choose place of DOT.

Major interventions were:

- Training
- Sensitization
- Recruitment of CB-DOT supporters
- Hiring of laboratory technicians
- Enhancement of supervision

Results:

- A total of 674 and 147 health care providers were trained on CB-DOTS and fixing smears respectively
- 19 laboratory technicians were recruited
- Over 5750 local leaders and influential people were sensitized on CB-DOTS
- Over 1300 DOT supporters were recruited in the 18 districts
- Project supported extra two days of supervisory visits every months to each site
- In the project area case finding increased by 1329 NSP to 7471 NSP cases compared to the previous year

Conclusion: The project has increased NSP notification and strengthened health care system in the 27 project districts.

PS-61232-04 Developing district level laboratory supervision arrangements in FIDELIS supported districts

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The NTP has strengthened the national and provincial reference laboratory as a priority programme components, since achieving 100% DOTS coverage in 2005. However, district level arrangements for AFB quality control still remain a challenge.

Methods: Three options of DLS from varied background have been piloted for supervising the district laboratory network in four FIDELIS-IV supported districts. Each DLS was provided laboratory training, logistic support and continued supervision for there providing 'onsite technical support' to the laboratory staff at health facilities. The support comprised: a) supervising laboratory arrangements/staff practices, b) replenishing supplies c) external AFB quality assurance. The early implementation experiences with the selected DLS options are currently being reviewed for further refinement. The selected and refined DLS options would be implemented and further evaluated in four districts in next three quarters.

Results: The experience indicates feasibility of DLS for AFB quality control. DLS previous laboratory background, adequate mobility and supervision support, and management arrangements are of great importance for effective working. The final results would be shared in the forthcoming Union Conference.

Conclusion: The district level supervision of laboratory network is feasible and potentially replicable. The ongoing systematic research and development would help in further developing these arrangements.

PS-61246-04 The uses of AWTS as a parameter to monitor the FIDELIS Project in China

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Background: The FIDELIS has been supporting China since 2003. To date there are 14 FIDELIS projects, covered 32% of the population. In the past, to detect 70% of S+ cases and to cure at least 85% of them by 2005 setting by WHO was widely accepted TB control target. However, easy to be detected cases are likely those easy to access health care. Therefore. Focus on population with limited access to health care (LA) remains a valuable and desired principle of the FIDELIS initiative; ensured by a weighting system (AWTS—Additional weighted treatment success).

Methods: There is a standard application package with close linkage between kindicators. Newly registered S+ cases were assessed for LA status according to a questionnaire and scoring system. Contractors

submitted a monthly report using a specifically designed reporting file. Case finding target was delegated to each month with an automatically calculation of cumulative.

Results: 10 phase I projects detected 94 231 new S+ cases, which was 66% increase compared with previous year. 79.6% of them were those with LA. Cure rate for the cases with LA and Non-LA was 89.2% and 90.8% ($P > 0.05$). Case notification in FIDELIS areas was approximately 70–80%, but 37–50% in the non-FIDELIS areas. Total AWTS was 29 460.

Conclusions: Advantages of using AWTS are continuing tracking the project on real and focusing on the poor. The effective parameter is not only suitable in FIDELIS initiative but also suitable to national TB control programme.

PS-61443-04 BRAC experience in expansion of FIDELIS project in rural areas of Bangladesh

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Introduction: BRAC started fidelis project in rural areas of 5 districts of Bangladesh in April 2004. After successful completion, in November 2005 the project period was extended to total 73 upazilas of 10 districts covering 27.6 million population.

Objectives: To increase case detection of new smear positive TB patients and to ensure more than 90% cure rate.

Methods: School students, private practitioners, pharmacists, village doctors, cured TB patients and community leaders were oriented on TB. They refer TB suspects for examination. DOT is ensured mainly by trained CHVs. Decentralized sputum collection centers are organized in remote villages to increase the accessibility. Messages on TB disseminated through cable television and TB campaign were undertaken through popular theater.

Results: Till March 2006, a total of 54 908 suspects were examined and 8638 new sputum positive patients were diagnosed in five months against the annual target of 17 940 (65/100 000). Among them, 89% were from limited access areas. Sputum conversion rate of new sputum positive cases were 95%.

Conclusions: A strenuous effort through awareness campaign and social mobilization activities are found to be effective. However, the quality of diagnostic and treatment services is essential to reach the target.

PS-61629-04 Strengthening DOTS by enhancing the capacity of government health facilities and community mobilization

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Goal of this one-year FIDELIS project was to increase tuberculosis case detection and treatment outcomes by strengthening government's TB-DOTS programme in eight districts of Sindh and Balochistan provinces of Pakistan, targeting 5.7 million people. Project methodology involved: capacity-building of managers and various cadres of health care providers; on-site technical and material support; and community mobilization. Results showed that compared to 828 new smear positive cases in the year prior to project; a total of 2890 new cases were identified, 85% of which were hard to access. Sputum conversion was more than 90%, and treatment success was 88%. Case detection in Sindh has increased from 18% to 70% and in Balochistan from 16% to 86%. Sputum conversion increased from 80% to 97% in Balochistan, and from 83% to 91% in Sindh. Total successfully treated cases in Balochistan were 667, with an Additional Weighted Treatment Success (AWTS) of 475, with cost per AWTS being \$179.0. In Sindh there were 2223 cases with an AWTS of 1231 and a cost of \$82.67; variations in population densities of the two provinces accounted for this. These results, even in hard to access cases, were mainly due to well trained, adequately equipped and supportively supervised health staff.

PS-61967-04 Active case finding through the use of cough monitors: a FIDELIS sponsored program in Eldoret, Kenya

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Background: FIDELIS projects focus on local initiatives for DOTS expansion. In western Kenya, barriers to DOTS expansion included poor diagnostic service, a registration fee for TB suspects to enable access for 'free' TB care, and a lack of adherence to institutional screening procedures.

Methods: Laboratory services were strengthened through intensified retraining, the development of a QA/QC program, and laboratory infrastructure improvements (new microscope, lab renovations). Lay community health workers, entitled 'cough monitors,' were trained and placed in their own local communities to facilitate direct sputum screening of suspects in the field. A wide variety of sensitization campaigns were also tested and carried out by the program.

Results: In 15 months, over 17 000 individuals were evaluated with sputum for cough. 1666 (9.8%) smear

positive cases were identified and registered resulting in a 189% increase in case-finding from the previous year. A successful completion of therapy rate of 89% was achieved through improved adherence monitoring defaulter tracing by cough monitors in the field. Although not a formal part of the FIDELIS project, universal opt-out for HIV testing was also established in TB treatment clinics with linkage to an established HIV care program.

Discussion: Active case finding by cough monitors in a high burden setting was an effective strategy for successful DOTS expansion in Eldoret, Kenya.

PS-61056-04 Analysis of the tracing failure reasons of the TB patients reported by an internet-based reporting system

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Aim: To investigate the main reasons which pulmonary TB patients and suspects failed to attend to the TB dispensary after tracing.

Design: The pulmonary TB patients and suspects reported by the internet-based reporting system who failed to attend the TB dispensary after tracing by county TB staff, township and village doctors between Jan.-July 2005 are investigated. The research was supported by FIDELIS project

Methods: The questionnaire of the tracing failure reasons had been done for the pulmonary TB patients and suspects failed to attend to the TB dispensary after tracing. All the data was processed by SPSS12.0.

Results: 1278 cases were analyzed. Outgoing 168 (13.2%), refusing return 164 (12.8%), financial problem 161 (12.6%), cases not found 128 (10.0%), be in hospital 118 (9.2%), transportation inconvenient 114 (8.9%), busyness 81 (6.3%).

Conclusions: According the main reasons, so we should strengthen health promotion of tuberculosis to enhance the patients' responsibility to their family and society; health administration department should strengthen to intervene the reporting system; all the items should be filled in detail by medical institutes; government should increase the finance input to help the poverty patients. The results have been used for improving the tracing system in the NTP of China.

PS-61099-04 The impact of FIDELIS project on TB control in Xianyang, China

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Objective: To improve the patients' access to health care service by establishing smear microscopy center in township hospitals.

Methods: The smear microscopy centers were established in township hospitals. Comprehensive interventions were carried out, including training, health promotion, quality control and technical monitoring and supervision.

Results: Before FIDELIS project, the case detection and cure rate in project area were 9% and 1% lower than the non-project area, while after the implementation of the project, the rates were 171% and 3% higher than the non-project area. Thirty-two township smear microscopy centers and 32 TB clinics were established and 32 TB doctors and 64 lab technicians were trained. The capacity of TB staff in county TB dispensary was strengthened in terms of the number (increased from 4 to 5 staff) and the qualification of the staff (the proportion of bachelor holders was 5.2% higher than it was in non-project area, while before FIDELIS project, it was actually 0.1% lower than the non-project area).

Conclusion: FIDELIS project strengthened human resource capacity building through the establishment of township smear microscope. Patients' access to health care service was improved and the case-detection rate of infectious TB was increased.

PS-61799-04 Impact of management courses on TB control among Sudan police forces and prisoners: a case study

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The importance of management skills is one of the lessons that I learned from my experience as coordinator of TB control among Police forces and Prisoners. In Sudan the Police force has health system which is separate from that of Federal Ministry of Health which presented a challenge to Sudan NTP as cases treated in these health facilities were not reported. Therefore the Epi-lab with the NTP implemented the FIDELIS funded project of involving the Police and Army in the combat against TB. However the project didn't reach its targets of case detection and treatment outcome, despite the huge effort that was invested to ensure its success. Lack of profound managerial skills of the team was identified as a possible cause. The Epi-lab director recommended my enrollment in The Union management course as the coordinator among police and prisoners. In the International course on Management, finance and logistics of TB control, I came to realize my shortcomings and areas where I could have performed better together with my strength points. By the end of the course I draw an action plan to address the challenges in TB control among police forces and prisoner utilizing my new acquired management skills and knowledge. These skills proved to be fundamental in the successful achievement of my proposed objectives and were reflected positively in the

overall performance of our team. It helped us in gaining the recognition and appreciation of our supervisors and colleagues likewise.

PS-61100-04 What could we do after FIDELIS phase II?

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Background: Five large FIDELIS projects in China will complete their phase II by October 2006.

Objective: To explore the mechanism for sustainable development and to identify the research direction for the next step.

Methods: After the implementation of different interventions in FIDELIS phase I in Hebei, Hunan, Gansu, Hubei and Anhui, the case detection rate has exceeded 70% in the project area and the cure rate is maintained at the level of 90% or above. Since June and November 2005, FIDELIS phase II was launched in these provinces. Phase II covers more area and optimizes the interventions based on the experiences of phase I.

Results: With the implementation of FIDELIS phase II, it is estimated that the case detection rate has achieved more than 80% and the cure rate maintains at 90% or above so far.

Conclusion: The optimized interventions achieve satisfactory results which are not only cost-effective but also provide evidence for the sustainable development of TB control. In order to maintain the high case detection rate and cure rate, the priority interventions should be continuously implemented and meanwhile relevant operational research should be considered according to the local setting.

PS-61121-04 Implementation of incentive mechanisms in Shanxi, China

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Background: FIDELIS project has been implemented in 50 counties with 16.02 million population in Shanxi.

Objectives: To increase case detection while maintaining high cure rate mainly through establishing incentive mechanism.

Methods: 50 counties in Shanxi are selected to mainly provide incentives for three activities: transport fee for poverty patients to TB dispensary for their diagnosis; incentive for township doctor, village doctor and village leader for referring patients; incentive to village doctor for directly observe treatment (DOT).

Result: From Nov. 24 to Oct. 2005, the expenditure

of incentives was 69 054 USD, which is 27.6% of the total fund amount. 21 348 poor patients got transportation fee, 5337 doctors were provided incentives for referring patients and 3962 village doctors got the incentives for DOT. The number of new smear positive TB cases in the FIDELIS counties is 7736, which is 136% of the target and 1.52 fold of the same period in the baseline year, The conversion rate at the end of the 2nd month and the cure rate in the FIDELIS counties are both 96%.

Conclusion: The incentives implemented in the project are cost-effective tools to increase the case-detection while maintain high cure rate in project area.

PS-61309-04 Pilot of evaluating TB incentives and enabler in the FIDELIS Shanxi project in China

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Background: A FIDELIS project was implemented in 50 counties of Shanxi province from Nov 2004 to Oct 2005. The project aimed to increase case detection through financial incentive.

Objectives: To survey and evaluate the implementation of the incentive.

Methods: Self-administered questionnaires were distributed to five groups of project stakeholders including county TB staff, village doctors, village leaders, TB patients and TB suspects. Clustered group sampling was employed. Topics of the questionnaires covered: If the incentives are distributed to the right persons; Opinions on the manner of incentive; Patient reactions to the incentives; Sustainability of the incentive.

Results: Total 377 interviewee finished the questionnaires, 39 for county TB staff, 79 for village doctor and leader, 259 for TB patients and suspects. More than 40% TB suspects and patients and 50% village doctor and leaders got the incentives according to the requirements; More than 95% interviewee thought that the incentive is favorable. But more than 50% showed worry about the sustaining.

Conclusion: The incentive played an important role in TB control in project areas. Further research should be done to evaluate the effectiveness of the incentive to see if the incentive is replicable to other provinces and countries.

PS-61453-04 Delay in tuberculosis treatment in a selected rural area of Bangladesh

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Introduction: Early diagnosis of tuberculosis lowers the risk of transmission and disease progression. At present DOTS covers 99% of the country but still

there are many barriers to seek treatment and get standardized care. BRAC strengthened DOTS services in 5 rural districts in Bangladesh with the support of FIDELIS and the NTP in 2004.

Objectives: To determine the total delay, patient delay and health system delay to initiate treatment in rural area.

Methods: In the FIDELIS project area 'limited access form' was used to assess the accessibility status. These interview records of 4908 new smear positive patients diagnosed from April, 2004 to February, 2005 were analyzed.

Results: Median total treatment delay, patient delay and health system delay was 12, 4 and 8 weeks respectively. 89.6% patients started treatment after an excessive delay of 8 weeks. Median health system delay was longer than patient's delay. Large number of patient visited traditional healers or equivalent providers.

Conclusions: Sensitization of different services providers including traditional healers and private practitioners on TB need to be strengthened along with community awareness to detect patients at early stage.

PS-61469-04 Delay in treatment of smear-positive pulmonary tuberculosis in selected urban and peri-urban areas of Bangladesh

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Introduction: Delay in TB treatment may worsen the diseases and increase risk of death and transmission. Many cases remain undiagnosed due to lack of services facilities and awareness on TB. In October 2004, BRAC strengthened and expanded DOTS services in urban and peri urban areas of 5 cities in Bangladesh with the support of FIDELIS and national TB program.

Objectives: To determine length of delay between 1) onset of symptoms and patient's first visit to any health provider (patients delay) and 2) health provider visit and treatment initiation (health system delay).

Methods: 2372 new smear positive patients were diagnosed between October 2004 and September 2005 were interviewed during treatment initiation and 'limited access' forms were filled up. Data collected through these forms was analyzed.

Results: Median treatment delay to initiate treatment was 10 weeks. 80% patients started treatment after an excessive delay of 8 weeks. Health system delay (6 weeks) was longer than patient's delay (4 weeks). There was no significant difference in treatment delay between male and female.

Conclusions: Since traditional healers and private practitioners play an important role in the primary medical care, their involvement in the national TB control programme need to be increased through sensitizing them.

PS-61571-04 Analysis of the effect of the FIDELIS TB control project in Guizhou Province

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Aim: To evaluate the implementation and effect of one year FIDELIS TB control project in rural areas of Guizhou Province.

Method: The project support to increase the smear positive detection by checking the epidemic surveillance system to find the patients who fail to arrive in the TB dispensary and following up the patients, PPM-DOTS (Public and Public Mix-DOTS) and establishing 50 pilots at township level for screening the suspects.

Result: 16 173 smear positive cases of pulmonary tuberculosis were detected during the phase I project, there were 12 478 new cases among the smear positive. The registration rate of smear positive and new smear positive was increased 19.4%, 33.3% respectively compared with the previous year.

Conclusion: To improve the case detection rate of smear positive and new smear positive by implementation FIDELIS TB control project. To achieve the 'high detection' aim that 70% new smear positive patients have been detected by the end of 2005 in Guizhou province. In a word, to provide us with many new methods and precious experience for detection smear positive patients during implement FIDELIS project and improve TB control level in Guizhou Province.

PS-61747-04 The utility of FIDELIS case detection and additional weighted treatment success flow chart and its expansion

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Background: FIDELIS designed a FIDELIS case detection and additional weighted treatment success flow chart (Chart). The Chart using '(A) Population in the project area' and '(B) WHO estimated new smear+ TB incidence rate' to obtain '(C) WHO estimated number of new smear+ TB cases (=A*B)', which was compared with '(D) Number of new smear+ cases of the most recent annual report' to disclose '(E) Number of undetected new smear+ cases in the project area(C-D)'. The Chart then asks for '(F) Expected number of new smear+ case to be detected during the project' and '(G) Number of additional new smear+ cases to be detected during the project (F-D)'. People with limited access to health care are required to calculate the 'Number of additional weighted treatment success expected'.

Methods: As the Chart was designed by using Microsoft Excel spreadsheet and proper equations were written for relevant cells, users can fill in different fig-

ures in relevant cells and automatically obtain different pictures.

Conclusions: The Chart is useful in planning the budget and target for FIDELIS project and in comparing different FIDELIS projects. With proper modification, similar flow chart can be developed to design other activities of national tuberculosis programs.

HUMAN RESOURCE DEVELOPMENT AND TB

PS-61101-04 Volunteers filling the resource gap in TB control: example from an urban TB control programme in Nepal

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The TB burden is high in urban areas where government lacks the resources and infrastructure to provide basic health services. In this context, involvement of volunteers in urban TB control is vital.

Setting: Lalitpur sub-metropolitan city, population 200 000. DOTS was started in 1998 along with a public private mix (PPM) project.

Objective: To develop Late Patient Tracers (LPT) in DOTS, to strengthen the PPM.

Methods: 30 LPTs were identified and provided with two days training. They were involved in address verification of patients, home visits, visiting private practitioners (PPs) and delivering feedback.

Findings: Above 90% LPTs continued in this role. Their contribution has helped to achieve 90% treatment success with less than 1% default, and 20% referrals from private sector. Few TB patients needed tracing because volunteers and staff were actively involved in educating patients and families. Awareness campaigns helped in timely identification of TB suspects. LPT involvement contributed to strengthening the PPM, encouraging PPs to establish wider PPM networks.

Lesson learned: In the face of limited resources, volunteers are a potential human resource in TB control. Identification of LPTs by the municipality and DOTS centres has made volunteers responsible to local communities. Moreover, monthly meetings, regular interactions and tokens of gratitude can motivate volunteers to continue. Self motivated volunteers can create 'volunteer networks' in DOTS and strengthen PPM.

PS-61163-04 Strengthening human capacity in China at the district level: adapting a TB case management deskguide

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Objectives: Translating and adapting a generic English TB case management deskguide and training modules, for their usability at the county level in China. Evaluating the effectiveness of using the materials through prospective operational research. Providing an adaptation process that can be used for other international generic guidelines.

Methods: Two provinces were chosen representing poor and rich parts of China. The materials was first piloted in one county for readability. Then in each province, we chose one prefecture (with 2–5 million population) as the intervention site and another comparable prefecture as the control site. The intervention prefectures used our materials for routine refresher training, while the control ones used national guideline.

Results: The deskguide and training modules have been successfully incorporated in the one-day refresher training sessions. Interviews from officials, TB health workers and patients demonstrated that 1) the materials fit in the needs of TB management at the county level; 2) effects of using them in refresher trainings are better than using routine national guides; and 3) the easy usability of the deskguide contributes to a better TB control performance. Routine statistical reports show that more counties in the intervention prefectures have achieved the target of 85% cure rate.

Conclusion: The adaptation process with embedded research illustrates a good example for using other generic international messages.

PS-61239-04 Human resource strengthening through training can be challenging in a poor resource setting

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Strengthening of human resource through training is an important component of a successful External Quality Assessment (EQA) for Acid Fast Bacilli (AFB) smear microscopy program. In Zambia, the tuberculosis reference laboratory for TB (CDL) began the implementation of an EQA program in October 2003 and quickly identified the need to adequately train laboratory network personnel in standard TB smear microscopy which still is the tool of diagnosis and monitoring of TB treatment in Zambia. An initial needs analysis was from data obtained from onsite evaluation of the

eight provincial three central and one specialised laboratories and individual performance assessment of personnel through panel testing. The analysis revealed a great variation in the performing of TB smear microscopy. A curriculum based on the IUATLD/WHO training materials and with guidance from CDC was thus developed. A training program was designed to have all personnel in these laboratories trained in a phased manner in line with the EQA implementation program, which is being carried out in a phased approach. As the trainings began we started to encounter problems such as frequent staff turnovers or critical staff shortages. The purpose of this is to share the challenges the Zambia reference laboratory has experienced in training personnel in the laboratory network in the past three years and how some problems encountered due to the country being resource constrained have been or will be overcome.

PS-61313-04 Current situation of human resources in tuberculosis prevention and control in Hunan Province, China

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Setting: 14 prefectures and 130 counties with a population of 66,98 million in Hunan, China

Objective: To identify the current situation of human resource.

Methods: A self-administered questionnaire was used to collect data of TB control staff from level by level in 2005.

Results: Total 863 medical workers engaged in TB control in Hunan, 486 (56.3%) male and 377 (43.7%) female with a median age of 37 years (range 19–59). Mean of the staff at city and county level was 5.3 ± 2.2 and 5.9 ± 1.5 , respectively. Members newly recruited were 11 and 128 and quit job were 7 and 98 at the city and county respectively. 68.6% of the staff in city level was graduated from medical schools while 72.3% in county got their medical education from specialized secondary schools. Only 16.6% of the staff has got senior professional rank in city while 68.8% with junior rank in county. Median work years of TB control in city staff and county staff were 5 (1–21 years) and 4 (1–12 years), respectively. Members in city get one or more training yearly while staff in county be trained every 2 or more years.

Conclusion: Lack of the adequately trained and qualified staff in TB prevention and control in Hunan. Measures including encouraging existing staff on-job training or adult education, introducing qualified staff into TB dispensary, and implementing a feasible incentive mechanism should be taken.

PS-61367-04 Difficultés d'exercice de la profession médicale en Afrique : cas des médecins des hôpitaux de référence, Togo

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Dans l'exercice de la profession médicale, il existe entre pays industrialisés (PI) et pays pauvres très endettés (PPTE), une dichotomie responsable de l'exode des médecins des PPTE vers les PI.

Objectif : Décrire les conditions de vie et de travail des médecins hospitaliers de Lomé

Population et méthodes : Enquête prospective transversale et analytique auprès de 107 médecins des CHU Tokoin et campus grâce à un questionnaire anonyme du 1^{er} au 30 septembre 2005. Les données ont été analysées sur Epi Info 3.3.2.

Résultats : Taux de participation : 78,5%. Nous avons recensé 69% de contractuels, 24% de fonctionnaires et 7% de bénévoles. Age moyen = 32,75 ans (extrêmes = 24 et 54 ans). Sex-ratio (H/F) : 7,4. Mariés 57%. Célibataires 43%. Seulement 12% des enquêtés sont propriétaires de maison. Respectivement 26 et 27% des enquêtés avaient un téléphone fixe et des sanitaires personnels. Salaire mensuel moyen : 184 euros (extrêmes 45,7 et 381 euros) pour 49 heures de travail et 37 consultations par semaine. Les ristournes sont évaluées à 7,6 euros/mois.

Conclusion : Les conditions de vie et de travail des praticiens hospitaliers togolais sont dérisoires. Le praticien hospitalier togolais est au bas de l'échelle dans l'espace UEMOA en matière de rémunération malgré un PIB/habitant plus élevé que celui de la plupart de ces pays.

PS-61375-04 Strengthening human resources for TB control, National Tuberculosis Programme, Myanmar

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Introduction : Myanmar ranks 21 among 22 TB high-burden countries. The 2004 external NTP review Mission urgently recommended to strengthen human resources to cope with TB and emerging TB-HIV and MDR-TB threats.

Objective : To measure progress towards human resource development.

Methods : Quarterly NTP and GFATM activity reports.

Findings : Following start of GFATM TB project in 2005, 21 Master Trainers on TB control management were trained by 2 international facilitators, training modules were revised and 322 Township Medical Of-

ficers and TB coordinators were (re)trained in 9 States and Divisions. 20 Master Trainers, 400 private practitioners and 21 private laboratories were trained on PPM DOTS. NTP developed a comprehensive draft Human Resource Development Plan with national and international partners. New training methodology include interactive sessions, standardized slide sets, pre and posttesting, course evaluation and follow-up assessment. Development of TB-HIV materials is underway. The curriculum of the Diploma in Chest Medicine and TB is currently being revised in line with the STOP TB Strategy. Professionals from (para) medical Universities were advocated in DOTS and MDR-TB management. Multiplier courses will take place until GFATM terminates 21.8.2006.

Conclusion : NTP Myanmar has made considerable progress in human resource development. Urgent resources need to be found to support the TB control response in Myanmar.

PS-61413-04 Volunteers: an essential human resource in TB control

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Volunteers are a vital part of the human resource needed to tackle TB. Many NGOs and Governments rely on volunteers within formal TB control programmes, for example, identifying TB suspects, spreading information about symptoms and how to seek diagnosis and treatment, and implementing DOTS. There are also informal volunteers, who are not associated with organisations, but are supporting family members, neighbours and friends throughout the period of illness and treatment. Examining volunteering in the wider context there are those who are managing organisations, raising funds, and advocating on behalf of TB in all parts of the world both developing and developed. This session will examine all aspects of volunteering, an aspect of human resources often overlooked. It will look at examples of the varied work carried out by volunteers and consider new ways of working.

PS-61471-04 Delivery of tuberculosis services by female community health volunteers in hard-to-access areas of Nepal

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Background : Limited resources, weak health services and difficult geographical settings present challenges to providing accessible TB services in the hill districts of Nepal. The situation is further complicated by on-

going conflict. To meet these challenges it is necessary to provide a broad range of TB service delivery options.

Method: In ten hill districts Female Community Health Volunteers (FCHVs) were trained as treatment supervisors. A qualitative study was performed to better understand TB services provided by these FCHVs. Data was collected using in-depth interviews, key informant interviews and group discussions and analysed by identifying and describing themes.

Findings: FCHVs supervised TB treatment locally: most of them were accessible and acceptable to many patients. Large numbers of FCHVs were trained but few acted as treatment supervisor. However, their involvement increased affordable access to TB services for patients, especially those who were poor and vulnerable. FCHVs established good relationships with patients, community and service providers, helping successful completion of treatment. However, FCHVs are being used by other programmes and work pressure is increasing, presenting a challenge to continued volunteering.

Conclusion: Delivery of TB services through trained community volunteers increases access to services. FCHVs provide a resource for TB services where patient access is poor.

PS-61621-04 TB advocacy among people living with HIV/AIDS: experience of Moldova

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Objective: To increase TB awareness among PLWHA and to encourage them to test for TB.

Method: A 3-days training for a selected group of outreach workers and volunteers was organized by AIHA-Moldova in collaboration with the network of non-governmental organizations working with drug users and PLWHA. The agenda of the training and informational materials were elaborated by AIHA-Moldova specialists with the consideration of suggestions received during consultations with these organizations. A group of special trained TB specialists and psychologists carried out the training.

Results: Trained peer educators disseminated the information they received during the training among more than 500 beneficiaries of their programs. Only in the first month after the training they helped to test for TB 34 drug users and PLWHA and members of their families.

Conclusion: Peer education is one of the best ways to inform about TB such a vulnerable group as PLWHA. Trainings on TB for outreach workers and volunteers from PLWHA community are very important and should include information about TB symptoms, possibilities for free of charge consultations and treatment and teaching of psychological aspects of communication with PLWHA community members.

PS-61675-04 TB behavioral and social science resources website

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Introduction: TB behavioral and social science (TB BSS) research is important in the fight against preventing and controlling tuberculosis.

Objective: The aim of this activity was to create a website to serve as a central repository of TB BSS resources and materials, as well as to promote TB BSS research.

Methods: A steering committee of social scientists was convened to guide the development, design, and the content of the website. Usability testing was conducted to refine the design of the website.

Results: Based on guidance from the steering committee, as well as a usability testing, the website includes: descriptions of TB BSS research projects; study tools and instruments, a listserv for researchers to participate in ongoing communication, as well as other resources.

Conclusions: The TB Behavioral and Social Science website is a central repository for TB BSS materials. The website facilitates sharing TB BSS resources, serves as a forum for communicating about TB BSS resources, and serves as a means to increase the visibility of TB BSS. Extensive formative evaluation provided valuable feedback to enhance the usefulness and acceptability of the website among the target audience.

PS-61677-04 Distance education: constructing an alternative for the qualification of professionals in tuberculosis

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Introduction: The proposal of the course in the modality of Distance Education comes to the meeting of the most recent educational program of the Ministry of the Education of Brazil that places this modality as strategical for the development of the human resources. It is important to stand out the contribution that the Distance Education can bring in magnifying of offers of vacant, making possible the permanent education to the professionals. Being the serious tuberculosis problem of public health, to spread out the knowledge on the illness is a necessity that has in the Distance Education an instrument for its accomplishment.

Objectives: To carry through a course of qualification in the actions of control of the tuberculosis for health professionals, in the modality Long Distance Education.

Methods: Elaboration of content programmer for professionals of health and the area of education, based

on the lines of direction of the health department for the tuberculosis program.

Results: Accomplishment of a long-distance course in tuberculosis for qualification of professionals of health.

Conclusions: In a country of continental dimensions as Brazil, the Long Distance Education is an alternative to fortify the development of the human resources in health and to improve the indicators of tuberculosis.

PS-61711-04 Permanent education in health as a strategy for tuberculosis control in a District of Rio de Janeiro

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Introduction: In 2004, the Brazilian Ministry of Health created the National Policy on Permanent Education in Health (PEH), as a strategy of the Unified Health System (SUS) for formation and development of the human resources (HR) and the consolidation of Sanitary Reform. The PEH is based in horizontal cooperation among the managers, professionals, educational institutions, social control and students. Qualifications of the HR in health must lean toward the needs of people, the health sector itself, and the social control as well.

Objectives: Implement the PEH in the activities involved in the control of tuberculosis (TB), in a district of Rio de Janeiro, Brazil.

Methods: Monthly meeting to analyze and discuss the control of TB.

Results: Collective construction of a project based on the PEH to develop actions for the control of TB.

Conclusions: The PEH is an innovative strategy, since it requires dialogue among the actors who carry different views. Be committed with actions that will result in changes in the health practice that will lead to the improvement of the indicators. This is the greatest challenge of this policy.

PS-62003-04 Workplace tuberculosis program in Kenya

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Kenya is among the 22 countries that have the highest burden of tuberculosis in the world. Various studies have shown that most of the industrial labor force lives in slums where with poor living and housing conditions like overcrowding, poor sanitation, lack of water and high illiteracy, a very high proportion of

this population is either infected or affected by HIV and tuberculosis. This poses a threat to fellow workers at the workplace. In an effort to thwart the public health problem of workplace tuberculosis, KAPTLD introduced the workplace Tuberculosis program whose objectives are: To train health professionals on epidemiology, diagnosis, transmission, prevention and treatment of TB and MDR-TB; Train workers representatives and peer educators to be DOTS facilitators; Create awareness among the employees and employers to identify symptoms and seek treatment early; and to advocate for acceptance of tuberculosis infected people at the workplace. To date, ten industries in Nairobi city are taking part in the workplace program. Through this program, we have been able to reach patients who are among employees and their families. The long term goal is to reduce absenteeism, deaths and high staff turnover through early case detection and early and effective treatment thereby reducing transmission to other workers, family members and the general community. This leads to many people in the community being cured, the cycle of transmission broken and fewer people infected.

DOTS EXPANSION-3

PS-61769-04 Strengthening surveillance system of DOTS strategy in Punjab: an experimental study

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An experimental study was conducted in six DOTS implementing districts of Punjab (a province of Pakistan). An electronic reporting system was introduced to get timely, correct and reliable reports from these districts. Six districts were kept as external control and data from these districts was also collected and compared to experimental districts. All available reports were collected and analyzed. A questionnaire was distributed to all the DTCs before providing them trainings and introduction of electronic reporting system. Post launching questionnaire was also distributed to compare.

Objectives: To strengthen TB DOTS surveillance system in Punjab Pakistan. The other objectives included testing acceptability of computer at district level, testing the impact of electronic reporting system at district level in terms of reducing errors and delays in report submission and evaluating the impact of electronic reporting system at district level.

Results: It was found that availability of reports, quality of reports, error free reports and timely submission of reports was possible with this system. This system also enhanced the knowledge of health care providers regarding program indicators.

Conclusion and recommendations: It is user friendly and easily accepted system at districts level. This system can be introduced in all districts of Pakistan if necessary training and hardware (computer) is provided.

PS-61778-04 Evaluating effect of increased collaboration with health insurance organization on TB case notification

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Background: TB is an important public health problem in Egypt with a case detection rate of 58% in 2004. Although the Health Insurance Organization (HIO) provides health care to about 50% of the population it only shares 9% of TB case detection.

Objective: To study effect on HIO case notification of training doctors of HIO polyclinics that are supposed to refer patients to the special HIO TB centers, and by introduction of a suspect register.

Methods: Four study governorates were compared with 4 control governorates. In the 4 study governorates 425 doctors of HIO received a 1-day training on TB. A suspect register was distributed to all polyclinics in the 4 study governorates.

Results: About two thirds of the polyclinics submitted at least one suspect register sheet for a 6 month period. 870 suspects were entered in these suspect registers. Out of 857 suspects with a diagnosis, 103 had smear positive PTB (12%), 47 smear negative TB (5%), and 53 EPTB (6%).

Recommendations: Regular supervisory visits to HIO polyclinics needed to check inclusion of all suspects. Expansion of training for physicians in polyclinics of HIO to include all governorates in Egypt.

PS-61833-04 Multifocal tuberculosis pulmonary, lymph nodes, cerebral: a case report

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Background: Tuberculosis remains predominantly a disease of the marginalized and poor people as our patient.

Case report: The present work presents a case of young male, admitted to our hospital because of deteriorated clinical general status with the suspicion of an acute miliary tuberculosis. During the hospitalization occurs right laterocervical lymphadenopathy (histological examination noncaseous granuloma), right pleural effusion, and clinical symptoms which suggest a cerebral damage confirmed by CT scan and RMN (four fronto-temporo-parietal masses most probably cerebral tuberculosis). The diagnosis of tuberculosis was established initially on epidemiological, clinical, biological, radiological aspects subsequently confirmed

by immunological methods (an ELISA test for anti-mycobacterium antibodies was positive) and a good response to antituberculosis treatment.

Conclusion: We present the difficulties of the diagnosis and therapy in multifocal tuberculosis.

PS-61865-04 Building capacity and implementing quality assurance in laboratory through a new technical and management tool

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Background: National Quality Assurance Lab (INCQS) and Projeto MSH in Brazil created a new tool by incorporating into MOST (Management and Organizational Sustainability Tool) the general requirements and international standards organization (ISO) requirements for implementing quality assurance systems in drug testing/clinical laboratories.

Methods: Traditional approach to build capacity on quality standards always separated managerial and technical requirements. By promoting technical exchanges between operational and management areas and a critical integrated vision of the process of quality management, the tool creates a positive environment for implementing a step by step change process by creating integrated teams, precise indicators, common guidelines, transparent references for evaluation, and motivating staff by helping them to better understand and incorporate the critical concepts of quality systems.

Results: This participatory tool was successfully applied at the INCQS accredited according to the ISO/IEC 17025 norm in 2004. The tool is currently being used to move the national TB Helio Fraga Reference Laboratory and regional state laboratories toward accreditation.

Conclusion: Depending on the laboratory's level of complexity, the tool can be applied with a restricted number of components to focus on basic quality assurance. In its comprehensive version, it can serve as a reference guide for gradual improvements leading to full accreditation.

PS-61878-04 Strengthening two-way referral system in hospital-based TB program in government hospital in the Philippines

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Background: A 200-bed government hospital started TB-DOTS clinic in 2000. But referral of TB patients

from the hospital to public health centers (PHCs) was unsystematic with unknown outcome.

Aims: To determine the feasibility and effectiveness of systematizing two-way referral system between hospital and public health centers.

Method: In 2004, Prospective Study on two-way referral system for TB patients between hospital and PHCs was conducted. Strategies 1) designated permanent hospital DOTS physician and nurse, 2) oriented hospital physician, 3) recorded patients in TB registry and referral logbook, 4) utilized hospital referral transfer forms, 5) regularly coordinate with PHCs. Determining outcome of referral through returned acknowledgements receipts, text messages, phone calls received from PHCs documented and analyzed.

Results: Of 282 TB cases at hospital's OPD, 100 (35%) enrolled at DOTS clinic, 34 (56%) of 61 accepted by PHCs, 23 (8%) work-up as drug resistant, 25 (9%) for surveillance, 73 (26%) lost. While 109 admitted and discharged TB cases, 69 (63%) enrolled at DOTS clinic, 19 (68%) of 28 accepted by PHCs, 1 (0.9%) work-up as drug resistant, 6 (6%) for surveillance, 5 (5%) lost. Acceptance rate by PHCs from hospital was 60%.

Conclusions: Systematic two-way referral system between hospital and PHCs is feasible, and its outcome could be determined. Hospital as one largest provider TB services, must establish effective referral system for continuity of TB treatment.

PS-61880-04 Reaching the poorest of the poor through lady health workers

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The integration with the PHC will, in addition provide the necessary work force of LHWs, (approximately 90 000) and Lady Health Supervisors (LHS) (approximately 40,00) to cater to the large population of Pakistan. It is envisioned that LHWs will aid in suspect identification, sputum collection, case referral, supervision of medicine intake by patient (DOT), and improvement in case holding to prevent the high number of defaulting patients. Likewise, the induction of LHS into the TB Control activities will ensure that the LHWs are satisfactorily carrying out the TB work and enhancing their capacity and achieving maximum participation of LHWs will further improve the DOTS implementation. Another important tier that will be available for TB activities with this integration is the District Coordinator of PHC system. Presently, the District Coordinator of the PHC is the main person who is responsible for the effective and smooth functioning of the LHS and their LHW, having a car, therefore, s/he's mobile and able to carry out the activities of monitoring and supervision easily and timely.

The induction of these District Coordinators with the TB activities will ensure that the TB work is also properly carried out and monitored at the district level and one person will be accountable for all primary health care activities.

PS-61884-04 TB situation in Oshikoto region of northern Namibia

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Introduction: This is an abstract from the regional annual report of 2004/2005 financial year.

TB results: Total TB cases have increased from 7.7% (1622 cases) in 2004 to 9.0% (1624 cases) in 2005 and death cases decreased from 296 to 268 the same period. Treatment Success Rate for new cases has decreased from 78.4% in 2003 cohort analysis report to 70.2% in 2004 report. TB defaulter rate for new cases has increased from 11.3% in 2003 cohort report to 16.2% in 2004 cohort report.

Activities conducted:

- Situation analysis on high TB defaulter rate in the region
- Supervisory support visits and training
- Quarterly Regional Meetings for TB control program
- Performance Improvement Approach for TB program
- Commemoration of National Events
- Visiting of TB treatment Units by District TB Coordinators
- Introduction of Fixed Dose Combined TB Tablets and CB DOTS

Conclusion: Successful implementation of the TB program in Namibia has been hampered by lack of human, material and financial resources. This has been rectified through the Global Fund Round 2 and 5. The target is 85% cure rate by 2007.

PS-61888-04 Public-public mix DOTS in the advance implementation sites in the Philippines

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Background: The 1997 National Prevalence Survey (NPS) showed 20% TB symptomatics consulted hospital; 24.5% health center; 12.1% cases treated in government hospitals. Hence, Department of Health (DOH) issued guidelines in 1997, revised in 2004 defined hospitals should implement NTP DOTS strategy. Guidelines on efficient referrals between public hospital and public health facility were developed to strengthen, systematize two-way referral system, ensuring continuum treatment; contribute increase CDR. **Methods:** Last quarter 2005, P2PMD guidelines were implemented in two provinces, 1 city with populations

2.6 M. Criteria a) coordinators willingness, b) committed local government units (LGU); c) area representation. Hospital has two options: 1) Establish DOTS clinic service provision; 2) Establish DOTS referring unit, mainly referrals. Coordinator's clear functions, systematic patients flow, hospital transfer forms were implemented. Proportion referred cases accepted by health centers; CDR monitored.

Results: Two retained hospitals, 7 devolved hospitals are involved. Three of 9 (33%) established DOTS clinic, 6 (66%) DOTS referring unit. Systematic patients flow. Feedback returned referral slip, telephone, text messages, supervisors visit documented. Acceptance rate 30–85%; CDR 10–15%.

Conclusions: P2PMD guidelines are feasible in retained and devolved public health facilities. However, more efforts be exerted to strengthen effective referral system, ensure continuum TB treatment.

PS-61924-04 Tuberculosis control provincial coordinator system is being initiated in Turkey

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We want to present the educations for tuberculosis control provincial coordinators (TC-PCs). Aim of this training was to improve TB-D's and increase their activities with a provincial TB control vision. In eight periods, 69 TC-PCs, 26 deputy health managers, 63 infectious disease branch managers were trained. TC-PC's practical education period was one week while it was on day for others. According to the questionnaire during the educations, 64 TC-PCs were practitioners, two chest disease, two internal medicine and one other branch specialists. Coordinators' mean age was 40.6 (25–60), mean working duration in TB-D was 8.8 (0–27) years; 43% had participated in a TB training. Microscopic results were available in 54 (78%) TB-Ds. Directly observed treatment (DOT) was given to all cases in 4 and to some cases in 23 TB-Ds. Participants' view in the questionnaire revealed that, this education was helpful for TB-D activities, official relations and many points about tuberculosis and patients. After these trainings, depending on the communications with coordinators we had an impression that, bacteriological studies increased, DOTs started, educational meetings in the field held, new recording system initiated and coordinators are involved with tuberculosis more than before. TC-PCs have an important role in the provincial TB control activities. We think practical education in the dispensary had an important impact. There should be a continuous and regular education in TB control.

PS-61968-04 Initial treatment for tuberculosis

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Objective: Initial treatment for Tuberculosis in AIDS in Bolivia.

Material and methods: After following 110 HIV seropositives persons, that were diagnosticated during the period of 2004 and 2005 in INLASA. Of the 110 persons with HIV, of whom 25 (22.7%) were asymptomatic persons and 85 (77.3%) showed sings and symptoms of AIDS, 32 (37.6%) had gastrointestinal complaints, 26 (30.5%) pulmonary sings, 18 (21.1%) constitutional sings and 9 (10.5%) CNS sings and symptoms. We regarded 14 HIV positives in critical clinical conditions, lost of weight, cough and anorexia. The sputum smear test was performed and sputum samples were took for culture but chest radiographs weren't execute, for the high prevalence of TB in Bolivia. And, for the critical clinical conditions of the patients, they initiated anti-BK treatment. Used clinical parameters to evaluate the ameliorate of the patients like fever and gain of weight. After 2 months, blood samples were taken for CD4 cells and viral load.

Results: Of 14 AIDS patients, 2 died and 1 abandoned the treatment. The rest of the patients completed the treatment for TB and continue the ARV treatment the sputum smear was negative and the cultures were positive in 8 (57%) patients and 6 (43%) were negative. The critical clinical conditions in AIDS patients with pulmonary symptoms, sputum smear negative must be considered the starting point for antituberculosis treatment immediately, until we have the culture of BK, CD4 and viral load.

PS-61993-04 Basic conditions for efficient complex treatment of MDR tuberculosis

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Objective: To determine the basic conditions for efficient complex treatment of patients with SHDR TB.

Methods of investigations: Clinical, X-ray, laboratory, microbiological and bacteriological methods.

Results: Since 2000 more than 600 MDR patients were under complex treatment, including 55 patients with surgery interventions. This treatment is very expensive; some basic, organizational and methodological measures should be taken: organization of adequate laboratory services (formation of multilevel laboratory services with a high detection of MDR-TB; modern technical equipment for the diagnostic process and re-equipment of small laboratories including primary

health care facilities; establishing the reference laboratory; centralization of bacteriological investigations for MDR detection; introduction of registration and report system; permanent monitoring of positive and sensitive patients of Tomsk Oblast; permanent supply of first and second line drugs, organization of drug storage and distribution; organization of specialized wards, personnel training, modern technologies for conservative and surgery treatment of patients.

Conclusions: The problem of MDR-TB has many components that are to be solved step by step.

PS-61996-04 Involving medical colleges and tertiary care hospitals in DOTS

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An intervention study was designed to involve tertiary care hospitals in DOTS. Two Teaching Hospitals of Peshawar the Capital City of NWFP Province of Pakistan were selected for intervention. The Chest specialist and Medical officers of Department of Pulmonology were invited in a consultative meeting and case for implementation of DOTS were presented. The Departments agreed to participate in the intervention and with consensus it was decided that both the hospital will provide DOTS Services according to NTP approved Protocols to a well defined catchment's population in the geographical Vicinity of Hospital. Those Patients who are not from the catchments population referred with a note to Primary Health Care Center after Diagnosis and from the list of health facilities provided by the Provincial TB Control Program, a copy of reference note send to the District TB Coordinator and one kept for the record of Hospital. Provincial TB Control Program provided the Microscope, Reagents, Drugs and Reporting and Reporting Tools. The training was provided to the Doctors, Lab Technicians and DOTS facilitator working in the Chest units of two Hospitals. 656 patients presented with cough more than three weeks 1350 smear examinations performed during last quarter of 2005. 40 cases were registered with 13 as sputum smear positive from the catchments population while 42 sputum smear positive patients were from areas other than the defined catchments area and referred to PHC with a reference note for treatment and DOT.

PS-61997-04 Indications for resection lung surgery by resistant forms of tuberculosis

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Objective: To determine indications for resection lung surgery in resistant forms of tuberculosis.

Methods of investigations: Clinical, X-ray, laboratory, functional, microbiological, bacteriological methods.

Results: 1) life indications (lung bleeding, pneumothorax, unilateral caseous pulmonary infiltration with haemoptysis; 2) direct indications (decomposed lungs under MDR, cavernous TB, especially located in the lower lung segments, fibrocavernous TB with destruction of 1 or 2 pulmonary lobes, kaseomas, tuberculoma under destruction with periodic bacterial excretion or intoxication syndrom, bronchoadenitis, and local bronchiectasis, TB with local empyema, abscesses, bronchiectasis; 3) relative indications (wish of a patient to keep a job, to recover more quickly, to provide a complex recovering).

Conclusions: Vital, direct and relative indications for resection lung surgery by resistant forms of tuberculosis are determined.

PS-62034-04 Facteur de risque de transmission de la tuberculose à Kinshasa

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Contexte: La République Démocratique du Congo (RDC) est 12^{ème} parmi les pays à forte prévalence de la tuberculose.

Objectif : Aider le PNT dans la gestion sur terrain du DOTS.

Schéma: Questionnaire auprès des cas contacts des malades atteints d'une TBP à frottis positif dans 2 zones de santé. L'étude a investigué sur le statut socioéconomique et sur le volet des connaissances et information sur la tuberculose.

Résultats : Sur 150 patients interrogés (hommes : 90 (60%) et femmes 60 (40%)) :

69,4% vivent à plus de 4 personnes dans une chambre à coucher.

49,4% ont une seule fenêtre par maison.

99,3% ont déjà entendu parlé de la tuberculose dont 50% dans la rue.

26,7% ignorent les signes cliniques de la tuberculose.

28% ne savent pas se protéger contre la tuberculose.

82% ignorent la relation TB-VIH.

40% ignorent l'existence d'un programme national.

Conclusion : Cette enquête sur la connaissance et attitudes pratiques sur la tuberculose montre l'impact négatif de la précarité et de l'ignorance sur les efforts du PNT/RDC.

PS-62039-04 Impact of DOTS on results of treatment in new smear-positive cases

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Background: Starting from the year 2001, with support of the ACIDI-ACP, Ecuador, strengthens its Pro-

gram of Control of TB, in three Counties, Azuay, Guayas and Pichincha, having as antecedent the recommendation that made the OPS/OMS in its evaluation to the program in the year 1999, in which indicated the strategy DOTS is implemented, to exist subregistro of notifications, high% of abandonment to the treatment, with a rate of incidence that duplicated the one that was reported by the country. In Guayas, it is fulfilled the invigoration, qualifying all their personnel of the 32 areas of health, (204 operative units), in combined form the provincial team of the PCT and the ACP, are carried out the delivery of the whole logistical material for the program and laboratory, also the manual of norms of the modernized PCT. The support of the ACP culminates in March of the year 2004, the Provincial Team assumes the responsibility of maintaining the continuity of the actions, being observed the detection increment and cured of new cases BK+, and the decrease of the treatment abandonments that are reflected in the studies of cohort of the years 2003 and 2004.

Results:

	2003	2004
Evaluated	1441 CN BK+	1483 CN BK+
Cured	79%	81%
Abandonments	9%	7.4%

Conclusions: The sustainability, technical consultancy, trainings, supervisions and evaluations trimestrales that are executed, have achieved these results that come closer to those required by the OPS which are to detect to 70%, to cure to 85% of the cases and decrease <5% the treatment abandonments.

PS-62067-04 DOTS expansion: overview of policy transfer analysis in Zambia

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Background: Zambia's DOTS expansion will depend on its policy processes, learning and communication. Understanding how non-technical issues facilitate or hinder expansion should reveal process-related lessons.

Methods: The Zambia component of a four-country policy transfer study (Malawi-Zambia, Brazil-Mexico) involved document analysis and semi-structured interviews with eighty-three informants from Ministry of Health, relevant professions at national, provincial and district level of the NTP, general health services, NGOs, communities and patients.

Key findings: DOTS has achieved wide acceptance, although perceptions about meaning differ between actors and levels. Key for expansion was: learning

from piloting and negative health sector reform lessons; gaining credibility for NTP; national coalition lobbying for governmental commitment; TB focal persons at all levels of NTP; DOTS made integral to decentralisation. Challenges are: financial and human resource constraints; motivation of personnel-training allowances culture created disincentives for on-the-job learning; consolidating management and information use in changing health sector. Community volunteers fulfil valuable communication roles, but often lack resources and supervision. NGOs provide resources and innovation, but sustainability needs addressing. Collaborative relationships and policy coherence between service providers is crucial.

Conclusion: Decision-making processes, information systems, training, supervision and advocacy must reach, involve and motivate all providing TB care.

PS-62068-04 DOTS expansion: overview of policy transfer analysis in Malawi and Zambia, Mexico and Brazil

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Background: A four-country (Malawi-Zambia, Brazil-Mexico) comparative policy transfer study analysed how the DOTS strategy moved between global, national and sub-national levels.

Methods: A heuristic model of health policy transfer, adapted from political science and diffusion of innovation methodologies, guided qualitative document analysis and key informant interviews. One researcher and advisor per country and two internationally-based researchers undertook fieldwork and analysis.

Key findings: Expansion depended on: policy packaging; innovation; partnership-building; communication mechanisms; political, social, institutional and professional commitment. Country strategies differed according to TB policy history; relationship with international funding and technical entities; stage in health sector reform; configuration of health service providers, among others. NGOs and communities played larger role in Africa. DOTS was generally associated with facilitating decentralisation, although perceptions of its meaning differed over time, between levels and countries. Fundamental was achieving a mixture of directive approaches ensuring accountability and impetus for change with approaches that inspired voluntary motivations for adoption and provoked ownership and adaptation of DOTS.

Conclusion: Policy transfer analysis reveals valuable lessons about policy-making, adapting and learning processes, interfaces between actors, motivation for policy change and contextual factors affecting policy expansion. Scaling-up relies on application of such lessons and methods in programme development and research.

DOTS: PUBLIC-PRIVATE MIX-2**PS-61514-04 TB control in workplaces of Bangladesh**M H Khan,¹ M B Bleumink,¹ A B M T Islam,¹ V Begum.²¹World Health Organization, Dhaka, ²National TB Control Program, Dhaka, Bangladesh. Fax: (+88) 02 9884656. e-mail: mohiuddin_khn@yahoo.com

Introduction: Overcrowded environment is very common in most workplaces. Workers most often hide their illness, due to the fear of losing their job and being isolated by co-workers. Bangladesh introduced DOTS services in 12 workplaces.

Objective: To operate a patient friendly DOTS program for workplaces and eventually a nation-wide scaling up.

Methods: Initially medical and laboratory staff were trained on TB Control Management and sputum microscopy. TB services were integrated in the general health systems of the workplaces, where feasible. Out reach sputum collection centres were arranged where sputum microscopy facilities were not available. Advocacy workshops for trade union leaders, supervisors and workers were conducted to increase awareness for TB suspects identification, referrals and DOTS. DOT was provided by supervisors, health staff or co-workers.

Results: Out of 640 TB patients registered during 2005 in 12 workplaces 376 were new smear positive, 22 were relapse, 148 were smear negative and 94 were extra-pulmonary. Sputum conversion rate is 95% among new smear positive patients registered between October 2004 to September 2005 and treatment success rate is 95% among patients registered in 2004.

Conclusion: Results are very promising. The Public Private Mix approach for DOTS in workplaces should be scaled-up to cover the entire country within next few years.

PS-61515-04 Sharing findings of laboratory supervision in urban areas of BangladeshM H Khan,¹ A B M T Islam,¹ M B Bleumink,¹ V Begum,² M N Uddin,¹ S A Hassan,³ Q M E Hossain.⁴ ¹World Health Organization, Dhaka, ²National TB Control Program, Dhaka, Bangladesh; ³Bacteriology Department, Kanazawa University, Kanazawa, Japan; ⁴Directorate General of Health Services, Dhaka, Bangladesh. Fax: (+88) 02 9884656. e-mail: mohiuddin_khn@yahoo.com

Introduction: NGOs health centres are doing sputum microscopy in most of the urban areas of Bangladesh. Supervision and monitoring is part and parcel to maintain the quality of TB program.

Objective: To assess the status of laboratory performance in urban areas and to give on-site technical assistance for improvement

Results: A total of 8247 TB suspects had their sputum examined between July and September 2005 in

39 laboratories of 4 City Corporation areas of Bangladesh. Total 24 296 smears were examined. The average smear positivity rate was 13%. A total of 1091 TB patients were detected. 2983 patients had sputum follow up examinations; with 6% positivity rate. Supervision indicators have shown in the Table.

Indicators	Yes/Good/Present/ Sufficient (% of labs)
Laboratory manual in place	88
Stock of reagents	90
Size of smear	84
Thickness of smear	89
Color of bacilli	89
Preservation of microscope	81
EQA in place	77
Stock of slides	82
Stock of sputum pots	81

Conclusion: Smear positivity rates are found within the range of national range of 10%–15%. Performance indicators show that there is room for improvements. All laboratories should be brought under EQA network.

PS-61553-04 DOTS in medical academic institutions and hospitals of BangladeshM H Khan,¹ V Begum,² A B M T Islam,¹ M B Bleumink,¹ Q M E Hossain.³ ¹World Health Organization, Dhaka, ²National TB Control Program, Dhaka, ³Directorate General of Health Services, Dhaka, Bangladesh. Fax: (+88) 02 9884656. e-mail: mohiuddin_khn@yahoo.com

Introduction: It was difficult to include Medical institutions in DOTS services. National TB Control Program (NTP) extended its TB services in most of the medical academic institutions during 2004–2005.

Objective: To include all medical academic institutions, and other secondary and tertiary level hospitals in DOTS coverage.

Methods: Initially Medical Officers and Laboratory Technicians of hospitals were oriented on DOTS. NGOs were given responsibility to open DOTS corner in collaboration with the hospital authority. Advocacy workshops were conducted. TB suspects both from indoors and outdoors are referred to DOTS corner for sputum microscopy. After diagnosis patients residing in close proximity are registered in the DOTS corners, or they are referred to a nearest centre of their residence for registration. Seriously ill indoor patients receive initial treatment through attending nurses and during discharge they are referred to their convenient nearest centre.

Results: Out of 3051 TB patients registered during 2005 in 21 hospitals 1476 were new smear positive, 421 cases were relapse, 650 were smear negative and 504 were extra-pulmonary. Sputum conversion rate is 82%, and treatment success rate is 76% in 2004.

Conclusion: A good number of cases could be retrieved from DOTS corner and through their success-

ful referrals. Side by side impact of engaging clinical professionals in DOTS could be enormous.

PS-61556-04 Impact of intensified TB control activities in Khulna City Corporation, Bangladesh

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Introduction: NTP started implementation of Urban DOTS with different partners in Khulna City Corporation since 2002. No single administrator is responsible for whole of the health related activities in urban areas, which made it difficult to boost up performances.

Objectives: To develop a successful model for urban TB control, to increase and sustain case detection rate to at least 70% and treatment success rate 85% to achieve Millennium Development Goals.

Methods: Different areas of the City Corporation were allocated to 4 NGOs under MoU to deliver DOTS. Health personnel were trained and re-trained periodically. A planning workshop was conducted with partners to develop work plan, evaluate performance and learn from each other's experience. After 6 months, work plans of implementing NGOs were reviewed based on the challenges and probable solution were planned in the review workshop held in December 2005.

Results: Results are shown in the Table. Work plans will be presented in detail.

	2003	2004	2005
Case detection rate	34%	47%	50%
Sputum conversion rate	83%	85%	83%
Treatment success rate	83%	87%	

Conclusion: For increasing accountability single administrator should be given responsibility in Khulna. Periodic workshops should be continued to review work plan based on challenges faced at local level.

PS-61558-04 A quality assessment of TB control in urban areas of Bangladesh

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Introduction: National TB Control Program (NTP) is implementing DOTS activities through 224 DOT centres in 6 metropolitan cities of Bangladesh. The case detection rate is gradually increasing. Side by side steps are taken to maintain quality of TB Care.

Objective: To assess scopes for improvement to maintain quality of TB services in urban areas and to give on-site technical support.

Methods: The supervision checklist of NTP was used to carry out the supervision. Supervisors interviewed some patients, checked records, necessary stocks, quality of technical aspects of sputum microscopy, cross-checked reports with records, and provided recommendations based on the findings.

Result: A total of 145 centres were covered. After interviewing of patients it was found that 37% of patients had good, 60% satisfactory and 3% had poor knowledge on TB. NTP manual was found in place in 89% of centres. Treatment card was found complete in 69% centres. Only 56% centres kept complete information of patients. While cross-checking records and last quarter reports, it was found that 83% centres submitted correct reports. 88% of centres had sufficient stock of drugs and 53% centres had sufficient stock of sputum pot.

Conclusion: To strengthen quality of TB services improvement of recording and reporting, counseling of TB suspects and patients, and training of staff are essential.

PS-61723-04 India business alliance to Stop TB: an innovative partnership in TB control

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Aim: To determine the impact of the India Business Alliance and outline the success factors of an innovative public-private partnership in TB Control

Background: In response to the increasing threat of the TB epidemic on businesses, the India Business Alliance to Stop TB was developed by the Global Health Initiative of the World Economic Forum—the first such an alliance of businesses worldwide. Seven premier Indian companies joined hands with national government, industry confederation, Stop TB Partnership and WHO, for collective action against TB by implementing disease control programs in workplaces and communities. The GHI coordinates and facilitates the partnerships as the Alliance scales up programmes to cover five million employees, dependants and community members. As more companies join in, it uses public and private resources to raise TB awareness, increase case detection and meet treatment rate targets.

Methods: Prospective cohort study using qualitative and quantitative indicators of population coverage, case detection rates, treatment rates and treatment outcomes. A retrospective study (from existing reports) is also being analysed to study the effectiveness of the Alliance's programmes.

Conclusion: The India Business Alliance can serve as a model for similar initiatives where businesses are affected by TB. Opportunities for replication in South East Asia are under evaluation.

PS-61767-04 DOTS in the workplace initiative in Davao Region, Philippines

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This study aims to assess the contribution of the DOTS in the Workplace Initiative to the TB Control Program of Davao Region, Philippines in CY 2005 and Q12006. Four industrial companies participated in this study. Tools used in the assessment were reports, meetings, records review, on-site observation and interviews with program implementers. The companies are in various stages of program implementation utilizing the Public Referral Model with the integration of the five DOTS elements. In CY 2005, 44 TB symptomatics (from the company with advanced program implementation) were referred to the Rural Health/PPMD Units for sputum microscopy and or TB Diagnostic Committee evaluation. Two (2) were identified smear positive and 24 were evaluated smear negative active PTB cases thus were treated; declared cured and treatment completed respectively. In Q12006, 8 smear positive TB cases have been detected from 3 companies and are on going treatment. Best practices include a MOA between the companies, Local Government Units and Department of Health, DOTS trainings, program review, and TB education activities. In conclusion, the DOTS in the Workplace Program ensures proper management of TB cases, with the workplace staff as advocates of the TB Control Program in Davao Region hence recommended for strengthening and scaling up.

PS-61773-04 TB diagnostic committee: a tool for quality diagnosis and judicious management of smear-negative PTB cases

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This study aims to assess the role of the TB Diagnostic Committee (TBDC) in the diagnosis and treatment of smear negative PTB cases in Davao Region, Philippines for CY 2004–2005. Seven TBDCs were the subjects of the study. Tools used in the assessment were records review and interviews with program implementers and TBDC members. The TBDC members composition included a radiologist, clinician, and provincial/city NTP medical and nurse coordinators. Meetings were done either weekly or twice a month in the city and provinces respectively with presentation and deliberation of patients' clinical data and X-ray

films. Consensus on diagnosis and treatment were made. The Out-Patient TB Benefit Package from the Social Insurance has been the source of financial sustainability. TBDC data showed that only 48% (253/523) and 65% (798/1233) of the smear negative but X-ray positive TB suspects evaluated in CY 2004 and 2005 respectively were diagnosed as active TB cases and were treated; while 49% (256/523) and 30% (367/1233) were inactive TB cases and 3% (14/523) and 5% (68/1233) as other lung diseases with appropriate interventions given. In conclusion, the TB Diagnostic Committee has improved the quality of diagnosis of the smear negative PTB cases in Davao Region and afforded them judicious management hence recommended to be strengthened and maintained.

PS-61836-04 Economic analysis of health care seeking behaviour by TB patients in Bangalore, India

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Setting: Bangalore, India.

Objectives: To determine the economic costs incurred by patients prior to treatment under DOTS.

Methods: All adult TB patients (>14 years old) enrolled on DOTS during the second quarter of 2005 ($n = 1050$) were interviewed using a standardized questionnaire.

Findings: Fifty per cent of patients belonged to the lowest socio-economic group (defined according to a standard of living index), with 38% and 12% respectively in the medium and highest groups. The average economic cost incurred by patients was US\$147 (95% CI US\$ 133–161); diagnostic tests and lost wages were the two most important cost items. The average cost was highest when the first contact was with a private practitioner. Costs represented 75% of annual household income for those in the lowest socio-economic group and 49% for those in the highest socio-economic group. Many patients (41%) in the lowest socio-economic group borrowed money.

Conclusion: People suffering from TB also are also burdened with high economic costs prior to starting TB treatment under DOTS with the poorest patients worst hit. In addition to free drugs and sputum microscopy, there should be efforts to reduce the cost incurred by patients prior to treatment under DOTS.

PS-61846-04 Successful PPM DOTS scale-up in India: assessment of contribution of different health care providers

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Setting: In 2003, the Revised National Tuberculosis Control programme in India scaled up and intensified PPM in 14 districts targeting a wide range of providers; state government public health, national government departments, medical colleges, corporate sector, private sector and non-governmental organisations.

Objective: To assess the contribution of different categories of health care providers to case detection and cure.

Methods: Analysis of the quarterly reports of 14 intensified PPM districts from the 4th quarter 2004 to the 4th quarter 2005.

Results: The case detection in the PPM sites ranged from 61% to 85%. The public health sector contributed the majority of cases. The contributions of medical colleges, private sector and NGOs in new smear positive TB case detection were 17%, 6% and 7%. In 22.5% of all patients ($n = 87\,624$), treatment supervision was provided respectively by the medical colleges, private sector and NGOs. The cure rates of the 4th quarter 2004 cohort ($n = 5356$) were 85%, 89% and 87% respectively (overall 86%).

Conclusion: Involvement of other sectors of health care especially the medical colleges, private sector and the NGOs have contributed significantly to the case detection and treatment supervision while maintaining high cure rates. PPM DOTS is now a national strategy.

PS-61851-04 Health seeking behaviour and delay in diagnosis of TB

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Setting: Bangalore, India.

Objectives: To determine health-care seeking behaviour and diagnostic delays within a large-scale Public-Private Mix (PPM) initiative.

Design: All adult TB patients (>14 years old, $n = 1050$) enrolled on DOTS treatment during the second quarter of 2005 in Bangalore were interviewed using a standardized questionnaire.

Results: The median total diagnostic delay was 53 days, with median patient and health system delays of 7 and 32 days respectively. Patient delays were longer for patients in the lower socio-economic group (de-

finied according to a standard of living index). On average, 3 providers were consulted before starting TB treatment under DOTS. The first health care contact was a private provider for 72%, 76%, and 78% of patients from the low, medium and high socioeconomic groups respectively. Health system delays were longer when a private practitioner was the first provider visited.

Conclusion: Health system delays are still relatively long within the PPM initiative in Bangalore. RNTCP has to appropriately address this issue of diagnostic delay.

PS-61859-04 Retrospective analysis on participation of private medical practitioners in an urban TB control programme

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Revised National Tuberculosis Programme (RNTCP) was started in an urban district of Hyderabad. HYLEP of LEPRA Society a Non-Governmental Organisation was allotted 5 designated Microscopy centres to enhance the reach of TB control services to 590 949 people.

Aim: To assess Participation of PMPs in urban RNTCP. **Methods:** Data of TB control activities in HYLEP for 4 years was reviewed to assess involvement PMPs in an urban setting. A rapid assessment in the project area was conducted to map out the availability PMPs. PMPs were sensitised about RNTCP inviting interested PMPs to refer persons with TB symptoms for sputum examination. Some PMPs were used as DOTS providers where ever feasible.

Results: Till end of December 2005, 2197 patients with TB were detected and treated in the DMCs. 224 PMPs agreed to participate in the programme. 802 TB sputum positive patients were referred by PMPs and 153 of them have even extended their services to provide DOTS for their patients. The highest cure rates beyond 90% could be achieved in Hyderabad.

Conclusion: By intensive health education 28% of existing private practitioners could be trained in RNTCP. 37% of total patients were referred by PMPs, who could otherwise have been missed.

PS-61870-04 Developing a viable model for public-private mix for interaction in a mega city of Pakistan

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Keeping in view the quality service provision to the TB patients and establishment of a viable model of private-public partnership, two studies were conducted in Pakistan. The first study was, a descriptive cross sectional survey conducted in 2003 in two major cities of Pakistan. In this study out of 884 private medical practitioners in two cities, a sample of 245 was interviewed using a semi structured study tool. It concluded that on the whole the private medical practitioners were not following National TB control guidelines in Pakistan in diagnosing, treating and conducting follow up of pulmonary TB patients. The second was an intervention study designed in the light of findings of the previous study. The aim was to develop a viable model for public private mix (PPM) to involve the private practitioners in the DOTS delivery system. Total 60 private practitioners from the slot of 100 involved in the previous KAP study were selected.

PS-61872-04 Training private practitioners to strengthen TB control in Jogjakarta and Bali provinces, Indonesia

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Background: Around 60% of tuberculosis patients in Indonesia prefer to consult private practitioners (PP) for their illness and may receive sub-standard care. We developed and carried out a training programme to strengthen the role of PPs in tuberculosis control.

Method: We carried out a survey to evaluate the training programme one year after it had been implemented in Jogjakarta and Bali provinces. Data was collected through structured interview carried out by trained research assistants. The questionnaire was developed based on a literature review and expert consultation.

Results: 85.9% PPs reported that the training content was adequate. 85.9% reported that the training was useful for their daily work. 71.9% of private physicians claimed that the training had changed the way they manage TB patients. 81.9% claimed that the training had motivated them to actively communicate with the local public health centre to coordinate TB case management and 85.5% reported that they had been motivated specifically to report to the local health centre if they see a TB suspect.

Conclusions: The training model had been successful in facilitating PPs to improve case management of TB patients.

TB-HIV PROGRAMME LINKAGES

PS-61081-04 Successes and challenges of upscaling TB-HIV collaborative services: PATH's experience in Tanzania

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Introduction: In collaboration with National Tuberculosis and Leprosy Programme (NTLP), National AIDS Control Programme (NACP), and Association of Private Health Care Facilities in Tanzania (APHFTA), Programme for Appropriate Technology in Health (PATH) is spearheading a coordinated up-scaling of TB-HIV integrated activities through the public and private health care sectors in 10 districts in Tanzania.

Objectives: To strengthen human resources capacity at national and district levels; introduce and scale-up TB-HIV activities in 10 districts in the first year; and stimulate community awareness of TB and TB-HIV, mobilizing them to reduce stigma and promoting HIV testing and care seeking.

Successes: A Public/Private Collaboration Officer, district and Zonal TB-HIV coordinators are recruited and seconded to APHFTA, district, and regional levels respectively. PATH is developing a national TB-HIV Manual, patient referral directories, and IEC strategy. TB-HIV Coordinators will collect baseline data and train health facility staff on TB-HIV services. A focal person in NTLP has greatly improved coordination.

Challenges: Delays in securing funding; recruitment process; coordination problems; and scarcity of candidates with TB-HIV experience.

Lessons learnt: National ownership of Project, early set up of routine coordination mechanisms, identification of NTLP TB-HIV focal person and careful introduction of new cadres (TB-HIV coordinators) to districts are crucial.

PS-61222-04 The impact of provider initiated HIV counselling and testing in a TB treatment facility, Durban, South Africa

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Introduction: Provider initiated HIV testing of TB patients is an efficient way of identifying individuals who are co infected with TB and HIV. We describe our experiences in establishing and implementing a provider initiated service linked to a TB primary care service.

Methods: An HIV treatment facility offering HIV-CT and HAART was established next to the Prince Cyril Zulu Communicable Disease Centre (PCZCDC), which provides treatment for ambulant TB patients. HIV infection was based on 2 rapid tests.

Results: Data regarding number and gender distribution of patients accessing HIV-CT services, refusal and HIV infection rates (Table), and strategies used between January 2004 and December 2005 are presented. The median age of patients is 33 years (range 18–52). Strategies implemented to enhance the provision of VCT are illustrated in the Figure. One of the key strategies was the introduction of counseling and testing for all patients as opposed to a client initiated service.

	2004	2005	<i>n</i>
Total number referred	409	975	1384
Total number tested	218	843	1061
HIV infected	131	525	656
Status known	10	8	18
% infected	34	55	1079
% refused testing	47	21	323

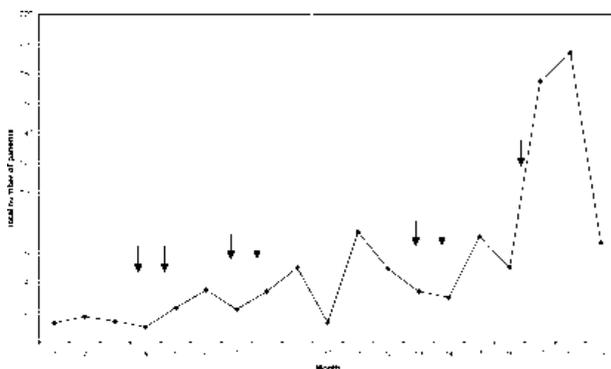


Figure Impact of strategies implemented on total number of patients over time.

Conclusion: Integration of HIV counseling and testing services into TB treatment facilities is a challenge which can be successfully addressed if a flexible approach is adopted. This is reflected in the increasing number of patients accessing care and the decreasing refusal rates. The reasons for refusal are being explored.

PS-61293-04 Challenges of introducing TB DOT services in HIV care centers: lessons learnt from the GHAIN Project

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Issue: TB remains the commonest cause of mortality amongst HIV infected Nigerians. However the HIV Comprehensive Care and DOT scale-up programs in the country have occurred in parallel.

Description: The Global HIV/AIDS Initiative Nigeria Project identified 8 secondary health facilities for HIV Comprehensive Care Services. All but one of the sites—General Hospital, Calabar had an existing TB pro-

gram. Patients from this site were hitherto referred to the Infectious Disease Hospital for TB services with attendant patient loss to follow-up. Attempts were therefore made to open a TB DOTS facility at the General Hospital, Calabar.

Lessons learnt: Contrary to the situation in the other HIV Care Centers with existing DOT services, a year after commencing HIV comprehensive services at the General Hospital, the TB DOTS service is yet to take off. This is due to the strong resistance of the Health Care Workers in the Hospital to the opening of a TB DOTS service in the hospital as a result of the following: Strong TB related stigma amongst Health care Workers, Myths and misconceptions about TB and Belief that TB services are not meant to co-exist with other health services. The problem was addressed by educating the health care workers on TB and TB-HIV and advocacy to the state government.

Recommendations: Before attempting to introduce TB DOTS to an HIV Comprehensive Care site, concerted efforts should be made to address the problem of TB-related stigma, fuelled by myths and misconceptions.

PS-61318-04 Nurse training in antiretroviral treatment improves lung health care in the South African public health system

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The introduction of antiretroviral treatment (ART) into the South African public health sector has raised enormous challenges, including the urgent requirement for the adequate in-service training of available health professionals to deliver ART. In South African provinces such as the Free State, a lack of human resource capacity, especially the dearth of doctors, has meant that ART implementation is largely reliant on nurses. PALS Plus, a nurse-training programme previously focusing exclusively on lung health, has therefore incorporated the management of HIV and AIDS, including ART, into its training programme. Findings of qualitative research designed to evaluate PALS Plus suggest that nurse uptake of the training, not only with regard to ART specific components, but also with regard to lung health, has been significantly greater than uptake of the original PALS model of training in lung health, which did not include HIV/AIDS or ART. Findings suggest that this can partly be attributed to nurse enthusiasm for the ART roll-out, which has re-inspired commitment to the provision of comprehensive primary health care in the public sector.

PS-61485-04 Joint TB-HIV/AIDS programme: the experience of Omaheke region of Namibia

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Background: 80% of Omaheke population is rural, 89% of the population walk more than one hour to reach a health facility. The Gini coefficient of income inequality is 0.7, highest in Namibia.

Programme objectives: To improve control and management of TB/STD/HIV/AIDS.

Methods: Application of theories and models for community education; social mobilisation; introduction of community based response strategies and training of health workers.

Results: Community ownership of the TB/STD/HIV/AIDS control activities; stigma reduction; widespread of TB-HIV/AIDS services to the poorest and most vulnerable; quality of life improved as 91% TB cases got cured; MDR-TB reduced from 13 cases in 2001 to 1 in 2004; 80% of STD cases were correctly managed; eligible AIDS patients started on antiretroviral therapy and loss of life due to TB-HIV/AIDS reduced.

Conclusion: The community is will to participate in TB-HIV/AIDS control. Their participation favourably influences and increases their responsibility, initiative and decision making in health increasing self-reliance and self-determination. Community structures such as Clinic Health Committees, when established and given appropriate skills and knowledge on TB-HIV/AIDS, empowered by provision of decision-making opportunities, can adequately lead TB-HIV/AIDS control at community level; provide a forum for voiceless, powerless and marginalised communities to become creative design.

PS-61536-04 Le réseautage, un levier pour la réduction de la propagation du VIH/SIDA en milieux des jeunes en RD Congo

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Contexte : Les jeunes de 0–24 ans représentent 65% de la population (53.8 millions). La prévalence du VIH chez les jeunes congolais est 3,8%, alors qu'au niveau de la population générale, il est de 4,5%.

Description : Pour riposter, les jeunes ont organisé en mai 2005, un Forum National intitulé « Jeunes et HIVAIDS » qui, a rassemblé plus 210 jeunes et adultes venus de toutes les provinces du pays. Cette activité est un exemple d'un grand partenariat entre les adultes et les jeunes, tant à son élaboration qu'à son évaluation. Elle a permis aux jeunes de faire le point sur leur situation, de partager des expériences, de jeter les bases d'un cadre stratégique national de prévention

du VIH en milieu jeune, et de formuler un certain nombre de recommandations.

Leçons apprises : Un comité d'initiatives et de suivi de recommandations issues du forum a été mis en place. Ce comité a pris part à beaucoup d'activités conjointes et organisé en décembre 2005, l'assemblée générale de mise en place du Réseau. Donc, les jeunes, lorsqu'ils sont responsabilisés et soutenus par les adultes, peuvent résoudre leurs propres problèmes. Ils ont besoin de confiance et de respect.

Recommandations : Pour 2006, le Réseau vise à renforcer les capacités des organisations de jeunes dans la gestion d'initiatives et de responsabilités liées à une meilleure santé, en particulier la prévention de l'infection à VIH, le développement harmonieux et la participation des jeunes aux décisions les concernant.

PS-61590-04 Multidisciplinary teamwork in academic model for prevention and treatment of HIV/AIDS (AMPATH)

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Introduction: AMPATH (Academic Model for Prevention and treatment of HIV/AIDS) is jointly run by Moi teaching and referral hospital (MTRH), Moi University-Faculty of Health Science and US collaborators—Indiana University.

Genesis of AMPATH: Ampath is a comprehensive HIV care programme which was initiated in November 2001 with only 3 staff with a pilot target of 70 patients to be enrolled. This has expanded with 14 satellites centres within western kenya established and operational with a total of 21 290 patients with MTRH enrolling 7786 patients.

Results: Cohort analysis of the total patients enrolled at MTRH in the last 6-months showed an increase of 2365 patients with 559 patients on IPT, 452 on active TB treatment. DTC indicated a total of 732 TB patients were counselled and 680 (93%) undergoing HIV test. 294 (41%) were positive, 391 (53%) negative, 49 (7%) declined.

Providers: Ampath complex has 4 modules and each module has 2 physicians, 3 clinical officers, 3 nurses, 1 nutritionist and 2 outreach workers. All have undergone comprehensive TB and HIV training(s), access to incentives with increased workload and all except physicians cover 48 h in a week with co-infected patient attending the module clinic and referred to TB-HIV clinic for registration, update of registers and counselling on contact tracing on smear positive clients.

Recommendation:

- Strengthened trainings for providers.
- Create incentive as motivation
- Call for dedication for all in the entire system.

PS-61664-04 Evaluation of newly developed training materials to promote integration of HIV activities in TB clinics

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Background: HIV counseling and testing, HIV prevention, and care and support for HIV co-infected TB patients are needed to reduce the HIV burden among TB patients and should be integrated into routine TB care in countries with high HIV prevalence. Training materials were necessary to build the capacity of TB health care workers (HCW) for these tasks.

Methods: Existing DRC training materials for voluntary counseling and testing, prevention of mother-to-child transmission of HIV, and management of opportunistic infections were reviewed and adapted to develop performance-based training materials for collaborative TB-HIV activities. Training materials were evaluated based on pre- and post training assessments of 65 HCW from 14 TB clinics.

Results: Mean test results increased from 72% pre- to 87% post-training. Post-training, HCW demonstrated adequate knowledge of HIV transmission routes, natural history of HIV, HIV counseling and testing principles, link between TB and HIV, meaning of CD4 counts, co-trimoxazole preventive therapy, management of opportunistic infections and the importance of confidentiality. Effective occupational post-exposure prophylaxis (PEP) remained poorly understood.

Conclusions: Training provided HCW with key knowledge to integrate HIV activities in TB clinics. Including newly updated modules with antiretroviral treatment and improved PEP training will be validated through monitoring and evaluation of TB-HIV activities.

PS-61760-04 Reducing the HIV burden among TB patients in Kinshasa: are the Global Plan to Stop TB targets within reach?

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Setting: Kinshasa, Democratic Republic of Congo.

Objectives: To conduct a baseline assessment of HIV activities in TB clinics before the start of Global Fund supported TB-HIV activities.

Methods: All 92 TB clinics were surveyed in March–May 2005.

Results: The majority of health centers had at least

one health care worker (HCW) trained in HIV counseling (71%) and testing (60%). Fifty-three (57%) clinics offered counseling and testing to TB patients, 30% routinely to all patients, others using selective criteria. While most offered on-site counseling (94%) and testing (81%), not all 53 clinics had a HCW trained in counseling or access to a counseling room. Some (26%) clinics charged patients for HIV testing. Management of HIV co-infection consisted of cotrimoxazole prophylaxis in 49% of clinics, nutritional support in 28%, psychosocial support in 13%, and antiretroviral treatment in 17%.

Conclusions: In 2005, HIV activities existed in 56% of TB clinics in Kinshasa. Shortcomings in human resources, infrastructure and quality of services were revealed. Prioritizing the strengthening of activities in clinics already implementing HIV activities, may make it possible to achieve the 2006 targets of the Global Plan to Stop TB in Kinshasa, given effective collaboration between National TB and HIV programs, and adequate mobilization of resources.

PS-61791-04 Implementation of HIV counseling and testing for TB patients in Thailand

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Background: Thailand is classified as a generalized HIV epidemic. NTP Thailand has implemented a policy targeting that 100% of TB patients are offered HIV counseling and at least 75% of those accept HIV testing since June 2005.

Purpose: To assess the implementation of HIV counseling and testing policy in terms of 1) percentage of districts adhering the policy; 2) percentage of TB patients being offered HIV counseling; and 3) percentage of those being offered accepting HIV testing.

Method: 12 825 TB patients who were registered for TB treatment during 1 June–30 September 2005 were included into this evaluation. The data were retrieved from 4-month reports of TB-HIV activities (TB-HIV 01) which TB staff at district level submitted these reports to the National level.

Results: Of the total 813 districts, 483 (59.4%) districts submitted the TB-HIV 01 report to the National level. Among 12 825 TB patients from these districts, 9569 (75%) were offered HIV counseling (a range between 43.7% and 100%). Of those being offered counseling, 69.8% (6676/9569) accepted HIV testing (a range between 48.9% and 98.5%). Prevalence of HIV infection among TB patients was 14% (1802/12 825).

Conclusion: Implementation of the new policy was slow. Close monitoring at facilities where the new policy was not in place or the targets were not achieved is needed.

PS-61822-04 Feasibility of engaging TB Leprosy Supervisors (TBLS) to carry out TB-HIV collaborative activities in Nigeria

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In Nigeria a TBLS is assigned in each LGA to manage and coordinate NTBLCP activities. GLRA is one of the IPs supporting the NTBLCP providing technical and financial support to 14 states in the country. In 2004, GLRA entered into a partnership with FHI/GHAIN funded by PEPFAR to implement comprehensive HIV/AIDS care in Nigeria. GLRA provides technical leadership in strengthening and expanding the quality of TB services in the target States. With this new development, the role of the TBLS in the GHAIN sites has to expand to make way to TB-HIV collaboration.

Objective: To determine the feasibility of expanding the role of TBLS to include TB-HIV tasks in 19 GLRA-supported GHAIN sites.

Methods: There were 12 TBLS designated to cover 19 facilities in 12 LGAs in 3 GHAIN States. Orientation, training and mentoring were done to prepare them to the new roles especially on GHAIN M & E system. Logistics were provided but no additional salary was paid. They became part M & E networks and collaborating bodies. They in turn were also supervised.

Results: After a year of engaging the 14 TBLS in the new TB-HIV collaborative activities under GHAIN, all of them expressed willingness and interest to continue. They have been successfully integrated into the GHAIN system although added role increased work.

Summary: It is feasible to expand the role of TBLS which originally covers only TB and leprosy works in the LGA to include TB-HIV collaborative activities at no added cost and manpower.

PS-61905-04 Quality improvements in TB-HIV care in South Africa

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Aims: Within South Africa TB-HIV co-infection is recognized as a major problem. This paper aims to describe the development of creative quality improvement strategies to address TB-HIV as a single entity.

Methods: The Quality Assurance Project (QAP), within the University Research Co.LLC, provides technical assistance to expand care and support initiatives for HIV and AIDS programs, by:

- Integration of services/cross-referrals between HIV and TB centers and awareness of TB-HIV.
- Compliance with guidelines to improve understanding/ongoing mentoring, support and evaluation.

- Improvements in the continuum of care by provision of appropriate prophylaxis for TB-HIV co-infected patients.
- Early and appropriate referral for anti-retroviral therapy for all HIV infected patients.

Results: Within a 6-month period, the number of TB patients referred and tested for HIV tripled from 729 to 2158, with improvements in the provision of opportunistic infection prophylaxis to TB-HIV patients from 382 to 3073 patients. Compliance with national guidelines for TB-HIV has improved along with knowledge/skills regarding screening, referral and follow-up.

Conclusion: It is essential that models of care focusing on content and process of care are developed to integrate TB and HIV activities. Increased awareness of the disease coupled with ongoing evaluation is pivotal for improvements in the continuum of care for TB-HIV co-infected patients.

PS-61926-04 Role of people living with HIV/AIDS in TB-HIV collaborative activities in Gombe State of Nigeria

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The north-east sub region has a mean HIV prevalence rate of 5.8, which is above the national average of 5%. Gombe State is situated in the region and has a seroprevalence of 6.8%. TB case notification has increased by 100% over 2 years in the states with sputum smear positives constituting about 60%. Initial TB-HIV co-infection rate for Gombe State was estimated to be 30%. The Gombe State TB Control Programme commenced implementation of TB-HIV collaborative activities in January 2005 through collaboration between a voluntary counselling and testing (VCT) unit and the DOTS clinic in the State Specialist Hospital. The support group of the network of people living with HIV/AIDS in Nigeria (NEPHWAN) provided psychosocial support for the commencement and motivation of TB patients to be counselled and tested. Currently 1009 clients had VCT at the State Hospital, of which 960 (52%) were males and 916 (48%) were females. The proportion of TB patients among all VCT clients increased from 2% in the first three months to 26% at the end of March 2006. Of the 215 TB patients so far tested, 135 (63%) are positive for HIV. Of the 135 TB patients co-infected with HIV, 102 (76%) were sputum smear negative. This paper examines the step by step approach in establishing the TB-HIV collaborative activities in Gombe State, the role of PLWHAs in the process, the TB-HIV patient follow up and main challenges towards addressing the TB-HIV problem in Gombe and Nigeria.

PS-61945-04 Improving access to HIV counseling and testing services by TB patients at Mangochi District Hospital, Malawi

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Background: There is a high prevalence of HIV (77%—2000 study) in TB patients in Malawi. However, at Mangochi Hospital only 4% of TB patients were being counseled and tested early in 2005.

Method: The District Management Team initiated a problem solving approach involving clinicians and HIV counselors to explore factors contributing to low uptake of Counseling and Testing (CT) by TB patients admitted to the TB ward.

Results: Several factors were identified:

- Patients refusing to go for CT once they saw an improvement after TB treatment initiation
- Fear of taking an HIV test itself because HIV has no cure
- Fear of rejection by family members or service providers
- Misconception people have that once one has TB; it means he/she has AIDS.
- Lack of initiating the CT process by clinicians
- Poor referral system between the TB ward and the CT site

Solutions: The problem solving process led to the following actions:

- All TB patients are offered routine CT
- Referral forms were introduced to facilitate referral of TB patients to the CT site
- Health education on the benefits of CT targeting TB patients and their guardians was initiated.
- Provision of HIV CT at the TB ward
- Helping clinicians to understand the importance of sending all TB patients for CT

Conclusion: The problem solving approach helped increase the HIV test uptake rate from an initial 4% early in 2005 to 88% by December 2005. This is an effective approach at operational level.

POLICY AND PROGRAMME IMPLEMENTATION: OTHER-3

PS-61587-04 Has anti-tuberculosis drug management been improved after the switch to a 6-month treatment regimen?

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Setting: Eighty-seven public health facilities with TB service and 27 private pharmacies in 11 provinces.

Objectives: To assess the improvement in TBDM practices, by comparing with the results of the previ-

ous assessment survey conducted (2003–2004) and to measure a change in TB drug availability in private pharmacies.

Design: Documents and treatment record reviews, inventory checks and structured interviews.

Results: The improvement in the prescribing practices for TB drugs was not marked: 91% of TB patients received correct TB drugs in correct dosages (previous survey: 89%). Seventy-one per cent of TB staff and TB patients, and 58% of community TB supporters interviewed had correct knowledge about TB treatment. The proportion for TB patients was lower than that of the previous survey (92%). The improvement in the stock control of drug storekeepers for TB drugs was not marked: The stock records for all types of TB drugs corresponded exactly to the physical counts in 15% of the storerooms surveyed (previous survey: 10%). In average, 1.2 types of TB drugs were available per pharmacy (previous survey: 4.0).

Conclusions: An indicator-based TBDM assessment survey can measure the current situation and quality of DOTS, identify any weaknesses or changes in practice from the norm, and serve for training of TB service providers and storekeepers. The same indicators can be used periodically to compare with original survey data to measure extent of improvements in TBDM practices.

PS-61592-04 Delay in tuberculosis diagnosis and treatment in Myanmar

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Objectives: The study aims to determine the patient's delay, health provider's delay and total delay for tuberculosis diagnostic and treatment and treatment seeking pattern of new sputum smear positive pulmonary tuberculosis patients in Myanmar.

Design: A cross sectional study was conducted in 6 randomly selected townships in Yangon, Mandalay divisions and Shan state in collaboration with National Tuberculosis Programme (NTP), Myanmar and Japan International Cooperation Agency (JICA) in 2005. Structured interview was used.

Results: A total of 345 new smear positive TB patients were interviewed. The median total delay from the onset of symptoms to the commencement of anti-TB treatment was 8 weeks (Interquartile range 4–13 weeks). Median total delay was longer in rural than in urban area (9.5 weeks vs. 6 weeks, $P < 0.0001$). Health provider's delay was significantly longer in those who sought the first treatment at private practitioners' clinics (PPs) than other health care providers.

Initial treatment seeking at PPs significantly shortened the patient's delay for TB diagnosis and treatment.

Conclusion: The knowledge on the treatment seeking pattern of the TB patients can improve the delay for TB diagnosis and treatment. Strengthening the early referral from PPs are particularly needed to be emphasized for the better TB control in Myanmar.

PS-61654-04 Financial resources for TB control in priority countries of Latin America

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Background: The success of the Global Plan to Stop TB rests on the ability of mobilizing the political will and financial resources. In order to effectively do this task, countries should prepare their strategic plans analyzing the available resources, and accordingly intend the resource mobilization.

Objective: To describe the current funding for TB control in the priority countries of the Americas Region, with focus on the allotted national and governmental resources.

Methodology: Financial data were collected from the 2005 WHO questionnaire, completed by the NTPs. Priority countries for TB control in the Americas were included in the study (refer to Table). Calculations of national (all resources) and government TB budget per patient and per capita were done, to establish comparisons among countries. Relation with the GNI per capita was explored by linear correlation. Currency: USD.

Results: The mean of the national budget per capita is 0.23, SD 0.15; and of the government budget is 0.06 SD 0.04. The mean national budget per patient is 354.3 SD 196 and governmental one is 121.6 SD 89. External contribution (loans and grants) ranks from 98 to 17% of the national budget, 51% for the group. The main results by country are in the Table.

Country	National TB budget per capita (USD)	National TB budget per patient (USD)	Government TB budget per capita (USD)	Government TB budget per patient (USD)
Bolivia	0.33	295.3	0.04	34.3
Brazil	0.12	246.3	0.10	204.9
Dominican Republic	0.33	627.4	0.05	91.2
Ecuador	0.07	147.0	0.08	163.4
Guyana	0.23	280.9	0.15	182.4
Haiti	0.33	189.9	0.01	3.44
Honduras	0.29	624.62	0.07	155.39
Mexico	0.08	545.11	0.04	280.2
Nicaragua	0.04	85.6	0.01	29.28
Peru	0.49	411.5	0.09	71.9

Conclusions: 1) In these countries, there are enormous differences in the budget for TB control per patient, not related with GNI. 2) High proportion of national budgets comes from external resources.

PS-61671-04 Active search for 'unknown cases' of TB in Carapicuíba City, Brazil

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Introduction: Carapicuíba city has a high prevalence of infection and active tuberculosis (TB); since the unknown smear-positive cases are the ones largely responsible for propagating infection, this feature naturally is one of the ways of reduction TB.

Objective: How important is an active search for unknown cases who have cough for more than 3 weeks and right after investigating then bacteriologically.

Method: Cross Section study of Case-finding (active search) in all of public clinics had made in the city, 2005. All health public personnel had being trained how to search symptomatic persons the year before. Every kind of patients and their escorts were asked about cough (at least 3 weeks) when they drop by the public health service and a sample of their sputum are collected and investigated.

Results and discussion: Almost 50 per cent of the population was active searched (183 375); 2127 reported having cough (more than 1%), and after bacteriological investigation, more than 4% was sputum-smear-positive (91 cases). According the National Tuberculosis Program (NTP), all cities have to do an active search and find at least 1% of population with TB suggestive symptoms. If our TB Program maintains its efforts according NTP, it'll be able to diagnosis twice or more unknown cases and treat then with standard antimicrobial drugs.

Conclusion: We tried to show that an active search can easily identify TB cases by bacteriological exams and after treat then.

PS-61674-04 Policy analysis of MDR-TB and TB-AIDS co-infection in Peru, 1990–2000

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Aim: Despite being one of the most successful in the world, as part of global initiative to analyse successful experiences on health at Latin American countries and the Caribbean, a policy study was done.

Methods: In-depth interviews to key informants (Directors, health providers, patients, among others) were done. Also a comprehensive review of secondary sources of information, including manual, national and local documents, articles, was done. The main dimensions or axes analysed were: Governance, Economic and Financial issues, and Health Impact.

Results: Peruvian experience evidenced that the political will allowed health policies implementation, and sustainability. Weaknesses of the NTP were on the lack of pro-active attitudes and decisions towards MDR-TB and TB-AIDS co-infection, debilitating the

group work and leadership. Poor results on MDR-TB and TB-AIDS were found.

Conclusions: During the 1990s, the NTP had a poor pro-active managerial strategy against MDR-TB and the TB-AIDS association. Moreover after the 90's, the new government didn't have the political will to continue TB control efforts; therefore all the gains achieved are weakened.

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PS-61701-04 Tomsk Oblast coordination committee experience as efficient model of CCM

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TB projects develop successfully in Tomsk based on interagency integration between TB services: 1994 DOTS/2000 DOTS-Plus, with participation of Russian Red Cross and NGOs: MERLIN; PHRI, USA; PIH, USA. The TOCC was created to coordinate activities of separated departments and NGOs. Central TB Drug Fund supervises the use of medications. In 2003 Tomsk received a grant of GFATM to develop a TB program Tomsk Comprehensive Strategy to Contain and Control TB (2004–2009). The budget is \$10.7 million (year II budget \$6.3 million). Start Program: 1 Dec. 2004. Total number of MDR-TB patients to be enrolled in Program—950, of them: 630 in civilian sector; 320 in prison. As of 1.12.2005, 315 patients enrolled (215 in civilian sector and 100-in prison). Money allocation (year I): 2-line drugs—33%; inflection control—17%; laboratory equipment—16%; patient motivation—9%. MDR-TB patients receive inpatient and outpatient therapy under DOT. X-ray, laboratory monitoring, timely management of side effects are performed. Improvement of treatment compliance 100% of patients receive food packages in Red Cross for \$1.25 a day; in 2005 out of 800 patients treated under DOTS only 2 patients defaulted. Since 2000 total number of MDR-TB patients enrolled in DOTS-Plus is 1013. In 2005 a proportion of cured TB patients and TB deaths is 7.3:1 (RF–2.5:1). Program success depends on the TOCC that provided internal monitoring and unified management of collaboration between NGOs.

PS-61787-04 Proficiency testing program for drug susceptibility testing of *Mycobacterium tuberculosis* in Serbia in 2004

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Out of 43 laboratories which performed culture for mycobacteria in Serbia, drug susceptibility testing (DST) of *M. tuberculosis* was done in 9 laboratories. The National Reference Laboratory (NRL) with the Supranational Reference Laboratory from Borstel (Germany) introduced external quality assessment for DST in 2001 and it has been continuously performed over the last five years. In order to determine the accuracy of DST in 5 local laboratories, NRL carried out quality assurance program in 2004. Batch of 20 strains was tested for susceptibility to isoniazid (INH), rifampicin (RMP), ethambutol (EMB), and streptomycin (SM). The efficiency, sensitivity and specificity of DST were compared. At least 90% agreement with NRL for both INH and RMP has been achieved in 3 out of 5 tested laboratories. In two laboratories efficiency levels of 95% for INH and RMP and at least 90% for SM and EMB were reached. The technical failures in the DST procedure in some of the local laboratories have been revealed, and corrective measures have already been undertaken. All DST laboratories are now supplied with pure substance of antimycobacterial drugs of good quality. Additional training for staff was organized. The number of laboratories performing DST should be reduced from 9 to 4 according to the annual number of performed analyses and results of proficiency testing.

PS-61798-04 Electronic nominal registration system: Egypt experience

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Background: Two pilot governorates were selected to implement ENRS in 2004, after success, it was essential to expand.

Methods: The first stage of expansion was in 4 governorates in 2005, after distribution of 90 computers, the second phase has been started its path in two directions, vertical in all chest units of Ministry of Health and horizontal with the other partners e.g. Health Insurance Organization and prison. Full coverage is expected by end of 2006. The implementation included the whole package of ENRS (TB, Lab and suspect registers). ENRS files were modified, Arabic comments for titles plus drop lists in both languages were introduced and (If) condition were used. Three days of training on Excel, basic epidemiology and data management was conducted. Data collected in each

chest unit have been subjected to data cleaning at local, governorate and central level. Data flow timetable has been provided monthly on 5th, 7th and 10th of each month respectively. Close supervision and continuous communication is provided for follow up. **Results:** This implementation proves feasibility of ENRS and leads to strengthening surveillance system in terms of completeness, accuracy and timeliness in addition to improvement of staff skills in data analysis and computer using.

PS-61818-04 Pre EQA implementation baseline survey of tuberculosis laboratory network in 41 districts

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Aim: The long-term goal of NTP for an optimal external Quality assurance is to have a country wide Programme for blinded rechecking of slides at regular interval. Blinded rechecking was piloted in one district in 2005 and this year EQA sputum smear microscopy will be implemented in 41 district covering 48.4 M population and 316 diagnostic centers. Before implementation baseline survey will be conducted to analyze quality of laboratory services and to identify gaps.

Method: Standardized checklist and on site evaluation and blinded rechecking.

Results: Base line survey is ongoing and will be completed by June 2006. Results of baseline survey would be presented including Programme quality indicators including smear positive CDR, proportion of smear positive cases in all new PTB cases, and proportion of Sputum smear negative cases in laboratory registered as smear negative PTB cases. Conditions of microscopes, stains and laboratory supplies, workload, storage and retrieval of slides. Laboratory indicators including Positivity rate in diagnostic and follow-up smears, proportion of low positive smears and isolated smear positive in positive cases and results of blinded rechecking.

Conclusion: Measurable baseline indicators obtained to study impact of EQA implementation.

PS-61869-04 L'impact de charge de travail sur la qualité des examens Ziehl dans les centres de santé de la RD Congo

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Objectif : Evaluer l'impact de la charge de travail sur la qualité des examens ziehl réalisés dans les centres de santé en RDCongo.

Matériel et méthode : Les lames de frottis des crachats colorés au Ziehl à chaud provenant de trois groupes des CSDT classés suivant la charge travail des laborantins (gpe1 : charge faible, gpe2 : charge moyenne et gpe3 : charge élevée).

Traitement des échantillons : Les lames récoltés sont recolorées et relues par deux techniciens de labo : la première lecture aveugle et l'autre contre lecture des lames discordantes. Les résultats non discordants de la première relecture et le résultat du deuxième lecture obtenu sur les lames discordantes sanctionnent la fin du contrôle de qualité.

Résultats : Au total 907 lames de ziehl recolorées et relues:le groupe2 présente 98% de concordance positive, 97% de concordance négative, 2% de résultats faux positifs, 3% de faux négatifs, sensibilité de 96,2% et 98% de spécificité et le coefficient Kappa évalué à 0,68, tandis que le groupe1 présente 79% de concordance positive, 92% de concordance négative, 21% de résultats faux positifs, 8% de faux négatifs, sensibilité de 86,3% et 87,3% de spécificité et le coefficient Kappa évalué à 0,45.

Conclusion : Les résultats des CSDT du gpe2 sont meilleurs que les deux autres gpes : à charge élevée et à charge faible.

PS-61874-04 Partnership development experience of National TB Control Program, Pakistan

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NTP Pakistan over the years has emerged as one of the largest partnership forums in the form of an Inter-Agency Coordination Committee (IACC), CCM and Supervisory Committee. The Partnership forums comprises of donor organizations, Inter Governmental organizations, NGO, for Profit Corporations and individual Partners. Pakistan was amongst the first to constitute IACC committee with largest number of partners. The composition and Process of IACC enabled NTP to mobilize additional Social, Financial, Technical and Political resources. The IACC, established to harmonize the process of DOTS implementation, stop duplication and prioritize critical activities while delineating the role of each partner.

The Partnerships development Process includes:

- 1 Identifying the priority areas in the light of evidence based Program needs
- 2 Participatory Policy development for the key strategic areas.
- 3 Identification of intended and interested Partners for key strategic areas
- 4 Deciding the Scale and Scope of Partnership to avoid duplication and ensuring synergy
- 5 The Partnership spans from Policy formulation to Service delivery and community participation includ-

ing all components of Program service delivery areas. The commitment evident by rapid expansion of the DOTS strategy to 127 districts of the country covering over 70% of the population have been reviewed and appreciated by a number of international agencies including WHO, USAID, CIDA, GFATM.

PS-61897-04 Review of electronic district register database and reporting system implementation for Afghanistan

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Afghanistan currently lacks adequate infrastructure to support electronic reporting systems at the patient level, but the National Tuberculosis Control Program is implementing a novel database, which captures key register data at the provincial level. As this system is implemented nationally, our intention is to show that by more efficiently completing existing reporting requirements, decreasing delays in report submission, improving data quality and supervision, and expanding analytical capabilities at the regional and national level, we can demonstrate improved outcomes on key indicators and show evidence of faster identification and resolution of management problems. As functionality is developed to provide additional reporting and data analysis at the provincial level, integrate drug ordering and usage monitoring functionality, and integrate data with other health care data systems currently in development, we expect that similar benefits to be accrued in those areas. As tuberculosis supervisors are familiarized with basic concepts of data analysis and management, ratio and trend analysis will be an increasingly significant factor in planning and monitoring at all levels of supervision. We intend to provide examples presented at national review meetings that demonstrate newly available knowledge for better decision-making, and how such knowledge has impacted management.

PS-61909-04 Gender disparities in TB control in Zambia

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Background: Global data show that more men than women are diagnosed with tuberculosis and reasons for this are not clear. TB is the third cause of morbidity and mortality combined in women of reproductive age in developing countries and leads to more deaths in women than maternal mortality. In Zambia, there is lack of evidence of gender disparities in tuberculo-

sis control programme, although some studies suggest that gender disparities do exist. Until 2002, TB data in Zambia was not disaggregated by sex, and this meant that gender analyses could not be done. **Main objective:** To describe gender disparities in TB control in Zambia.

Specific objective: To describe gender differences in TB notifications. To describe gender differences in treatment outcomes.

Methods: Review of 2004 TB notifications and 2003 cohort. Data analysis using Stata version 9.0.

Results: More males than females notified. Males more than women to be smear pos and females smear negative and ETB. More males likely to have smear conversion than women.

Conclusion: Gender disparities in TB control program exist Zambia. In order to understand why these disparities occur, and for the national TB programme to address them, there is need for more research using quantitative analytic and qualitative methods.

PS-61932-04 L'implication des communautés du Burkina Faso dans la lutte contre la tuberculose

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Introduction : Au Burkina Faso, le Programme d'Appui au Monde Associatif et Communautaire, en collaboration avec le Programme National de Lutte contre la Tuberculose, a mis en place un volet communautaire de lutte contre la tuberculose 2005-2009.

Objectif : Contribuer à l'augmentation du taux de détection des TPM+ et du taux de succès au traitement.

Méthode : La stratégie a consisté à mobiliser les associations à travers deux composantes : la sensibilisation et la prise en charge communautaire. 170 associations ont mené des activités d'Information, d'Education et de Communication en partenariat avec l'ensemble des districts sanitaires et 17 associations ont tenu des permanences au sein des Centres de Diagnostic et de Traitement (CDT) afin de réaliser des visites à domicile et des recherches d'absents au traitement.

Résultats : Au quatrième trimestre 2005, 4620 animations ont touché 283 200 personnes, 809 cas suspects ont été référés vers les CDT dont 71 dépistés positifs. 356 malades ont été pris en charge par les associations à travers 524 visites à domicile.

Conclusion : Ce projet qui mobilise la communauté en amont et en aval des activités des structures sanitaires permet un dépistage précoce et une prise en charge globale du malade tuberculeux.

PS-62017-04 TB data analysis management with MyTB and BMR improved case management at Keningau Health District

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Objective: To strengthened the treatment outcomes (Cohort) for all PTB of the infectious type and the registration of cases at the districts level.

Setting: All cases, 2002 onwards of documented TB, the infectious type and all forms treated by government clinics in the districts of Keningau, Tenom, Pengsiangan and Tambunan, where the Area Health Office Keningau as the center of control.

Methods: PTB is defined with the lesion in the lung parenchyma and PTB smear negative microscopy were defined with at least three smear microscopy done and the chest X-Ray reading consistent with Tuberculosis characteristics. All cases of TB treated by government clinic and recorded in Tuberculosis Information System (TBIS) were reviewed. Secondary data entry for treatment outcome analysis were performed to all registered patient with TBIS. Quality Control Circle (QCC) were applied in the project implementation.

Results: MyTB an on line registration, storage and analysis of data were created as one of the management tool. Another tool using Brain storming, Meeting, Refer (BMR) approach were implemented. All the 23 districts implemented the two tools in management that will improve in the case management. The cure rate of 85% and the PTB of infectious types proportion has improved to more then 65%.

Conclusion: QCC has assisted in the creation of two management tools which has strengthened the case management of TB in Keningau Area Health Unit and the State of Sabah.

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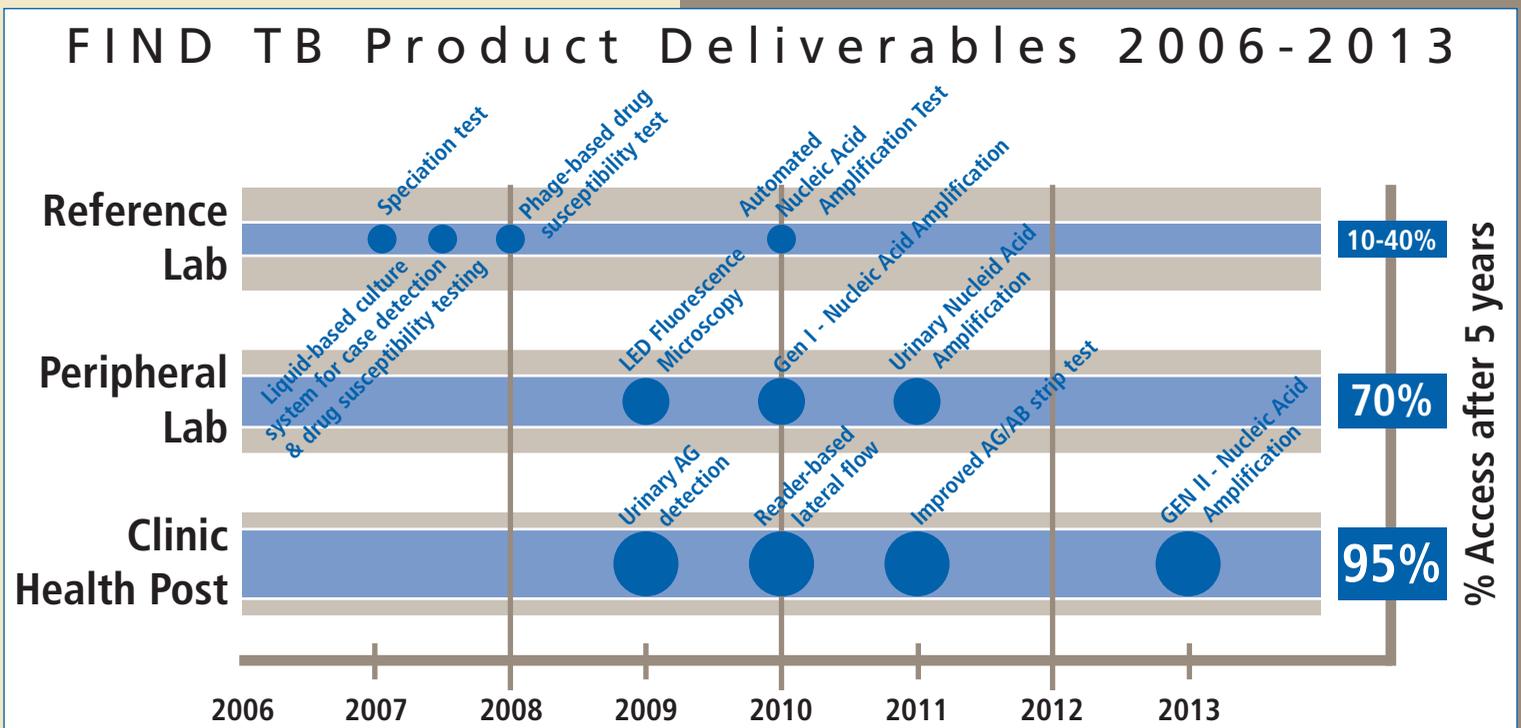
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FIND works through public private partnerships to develop simple, accurate and affordable diagnostics to fight poverty-related diseases at all levels of the health system



- The most commonly used TB diagnostic is sputum microscopy, a 100+ year old technology
- It is 40-60% sensitive, at best, and falls as low as 20% for HIV co-infection
- It can take as much as six weeks to get results from sputum culture
- Delay in results causes serious setbacks for treatment as well as patient fall out

The FIND TB product development pipeline



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- Improvement of Diagnosis & Treatment of Tuberculosis
- Offering innovative solutions
- Supplying high-quality products & services

Meeting International GMP requirements & a listed qualified manufacturer for the supply of Anti-TB drugs to GDF



Fixed Dose Combination tablet of Anti TB drugs as mentioned in the Essential Drugs List of WHO



Stop TB Patient Kit for the treatment of Cat I & III and Cat II patients



Stop TB Diagnostic kits for the diagnosis of Tuberculosis based on the Ziehl-Neelsen staining method



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