

Continuity of TB services during the COVID-19 pandemic in China

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Dear Editor,

The emergence and spread of the novel coronavirus SARS-CoV-2 and the resulting COVID-19 pandemic threatens the accessibility of healthcare services.^{1,2} TB diagnosis depends on individuals with symptoms having access to diagnostic facilities, and treatment requires daily adherence to an antibiotic regimen. Many studies have voiced concerns about the potential of COVID-19 to undermine recent gains in TB control.^{3,4} China has faced the dual burden of TB and COVID-19 since the initial outbreak in December 2019,^{5,6} and used aggressive public health interventions to mitigate the spread of COVID-19 (including the lockdown of cities). Although these measures have thus far succeeded in limiting the local spread and health effects of COVID-19,⁷ it is less clear how these efforts may affect TB services, as well as the interactions between TB and COVID-19.⁸ We developed a hospital-based survey to better characterise these impacts on TB care and describe how personnel working in TB programmes have developed creative strategies to maintain continuity of TB care in China.

Thirteen TB hospitals from 13 provinces in different parts of China (including Wuhan City) participated in this questionnaire. These provinces accounted for over 50% ($n = 414,673$) of incident TB cases in 2018, and 91.8% (76,088) of COVID-19 cases (until 30 April 2020) in China. Within the 13 provinces, each participating hospital is among the three largest in the province by TB case volume. We compared specific metrics of TB services in three phases: the pre-pandemic phase (2019), the emergency response phase (January–March 2020), and the mitigation phase (April 2020). We also conducted a pilot study in one hospital prior to scale-up. We collected information focused on changes in the following two aspects of TB diagnosis and care during the outbreak:

Detection of TB

Compared with the same period in 2019, the number of TB patients diagnosed significantly decreased during the pandemic (Table). In the emergency response phase, 11 hospitals reported a median decrease of 25% in the proportion of notified TB cases. During the mitigation phase, 10 hospitals had smaller numbers of TB diagnoses than in April 2019; however, the gap was

decreased (median reduction of 15%) compared with the decreases observed in the emergency response phase.

Availability of hospital-based TB services

In the emergency response phase, nine hospitals were designated as COVID-19 hospitals and moved at least a proportion (median 75.7%, range 21.1–100.0) of designated TB beds to COVID-19 care. Twelve hospitals reassigned professional TB staff for COVID-19 service (28.5%, range 3.0–100.0). Among the nine hospitals that continued inpatient services for TB, five (38.5%) set stricter indications for hospitalisation. Ten hospitals set restrictions for the number of outpatient visits. These measures significantly decreased the supply of TB services. Compared to the same period in the previous year (January–March 2019), the number of outpatient visits and the number of hospital admissions were reduced by respectively 34% (6–99%) and 30% (11–100%) reductions during the emergency response phase (Table).

In the mitigation phase, the proportion of TB medical resources redeployed for COVID-19 gradually decreased. Five hospitals still converted some TB beds for COVID-19, but at a decreased median proportion of 43.6% (range 5.0–53.3) compared to 75.5% during the emergency response phase. Twelve hospitals continued to reassign professional TB staff for COVID-19, but this proportion decreased from 28% to 10% (Table). Compared with the same period in April 2019, the decline narrowed for the number of outpatient visits and the number of patients admitted to each TB hospital (Table), indicating the gradual restoration of TB medical services.

In order to maintain continuity of essential services for people affected by TB during the COVID-19 pandemic, TB hospitals in China made a number of modifications to existing hospital-based TB services.

Treatment and patient support

Across the 13 TB hospitals, anti-TB treatment regimens were adapted to minimise the number of hospital visits and hospitalisations to ensure the continuity of anti-TB treatment. First, distribution of longer-term prescriptions was used. Nine hospitals provided 2–3 months of medications, and four hospitals provided 1 month of medications for TB patients during the emergency phase compared to 1–2 weeks of medications prior to the pandemic. Second, 11 hospitals converted from injectable treatment regimens to oral regimens for patients with multidrug-resistant TB to reduce the frequency of hospital visits and avoid exposure.

In our survey, all hospitals reported a sharp increase in demand for counselling and mental health assistance among TB patients. In response, TB hospitals have adopted multiple interventions, including patient-friendly, web-based educational material for both TB and COVID-19; and dissemination of paper educational materials on both TB and COVID-19. All hospitals used digital medical technologies such as instant messaging and/or telephone calls to follow-up patients and provide consultation. Eleven hospitals provided drug delivery services for TB patients.

Infection prevention and control

Consistent with WHO guidelines,⁹ hospitals have strengthened infection control measures as follows: 1) all TB patients are screened for COVID-19 using an appropriate triage system. TB patients screening negative for COVID-19 are sent directly to TB services, while those screening positive are separated within a COVID-19 investigation area. 2) All patients and visitors are required to wear a surgical mask when at the hospital. 3) All hospitals have strengthened environmental disinfection and ventilation systems. 4) Eleven hospitals use upper-room germicidal ultraviolet systems in the consulting rooms and wards for disinfection. 5) All of the participating hospitals reduced the use of bronchoscopy for TB patients by a median of 67% (range 24–100) during the emergency response phase and by 27.5% (range 6–90) in the mitigation phase (Table).

The observed decrease in TB case detection at the hospitals surveyed raises concerns for TB control efforts. Given the slow secular decline in TB incidence in China,¹⁰ the dramatic decline in TB diagnoses during the pandemic is most likely the result of changes in care-seeking and access attributable to COVID-19. There were clearly documented limitations in available TB services caused by the response to COVID-19 and other movement restrictions that likely led to further barriers for probable TB patients to access diagnosis and care. Based on our findings, we suggest that national and local TB programmes commit to interventions that maintain the continuity of essential services for TB patients. China and many other high TB burden countries remain reliant on in-person and community-based DOTS for TB treatment. Modifications to current in-person TB services towards more innovative patient-centred approaches may improve patients' adherence to their treatment during this and any future crises. Digital health technologies and virtual healthcare should be further explored so that patients can remotely access medical consultation.^{11,12}

Our survey revealed that COVID-19 led to a significant disruption in TB diagnosis and care at major hospitals throughout China. We urgently call for additional investment directed toward improving the availability of diagnostics and therapeutics such that equitable access to care can be maintained during times of crisis.

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Table. Impact of COVID-19 on TB services in 13 TB hospitals in China

Category	Pre-pandemic phase %	Pandemic phase %	Recovery phase %
TB medical services			
Change in number of TB beds ^{*†}	100	Decreased: Median: 75.7; Range: -100 ~ -21	Decreased Median: -43.6; Range: -53.3 ~ -5.0
Change in number of professional TB staff ^{*†}	100	Decreased Median: -28.5; Range: -100 ~ -3	Decreased Median: -10; Range: -38 ~ 0
Number of hospitals setting strict indications for hospitalisation	0	38.5	23.1
Number of hospitals setting restrictions on maximum outpatient visits	23.1	30.8	23.1
Change in number of outpatient visits [†]	100	Decreased Median: -34, Range: -99 ~ -6	Decreased Median: -20; Range: -90 ~ -2
Change in number of inpatient admissions [†]	100	Decreased Median: -30; Range: -100 ~ -11	Decreased Median: -18; Range: -95 ~ 0
Detection of TB patients			
Change in number of TB patients detected [†]	100	Decreased Median: -25; Range: -100 ~ +11	Decreased Median: -15; Range: -90 ~ +15

* TB beds and professional TB staff were redeployed for COVID-19.

† Compared with the same period of 2019: Pre-pandemic phase = the same period of 2019, Emergency phase = January-March 2020, Recovery phase = April 2020.