The Union
International Union Against Tuberculosis and Lung Disease
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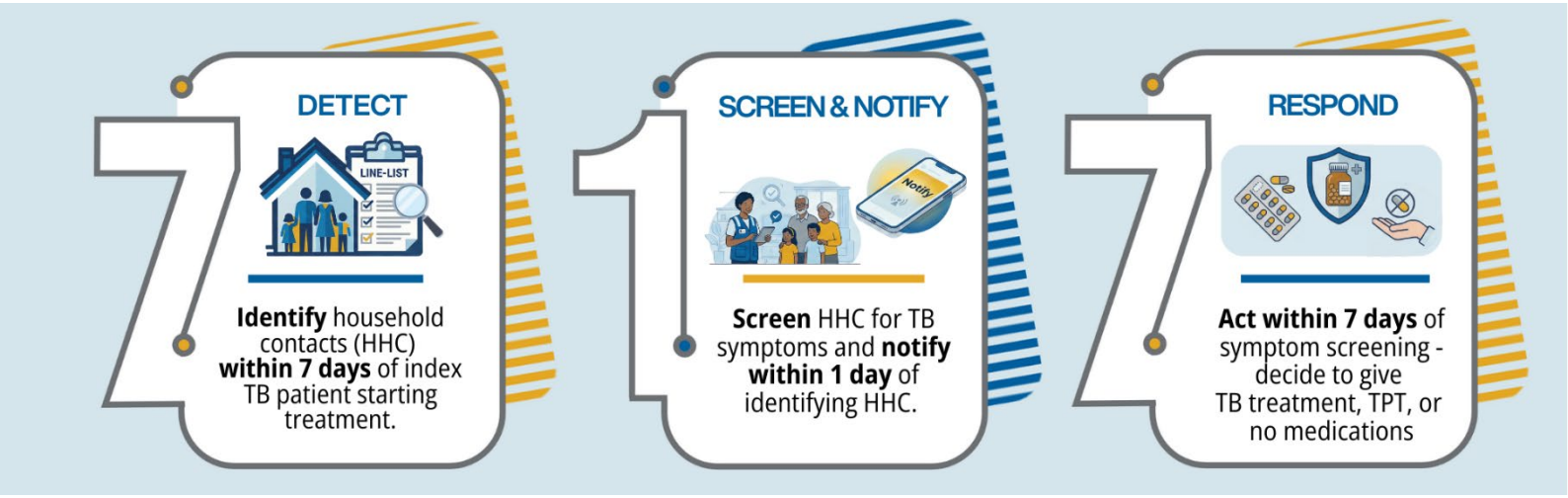
CLOSING THE GAP IN TB PREVENTION

Using the 7-1-7 Timeliness Metric to Improve the Speed and Coverage of Household Contact Management



THE PROBLEM

The global targets aim to end TB by 2035 with a 95% reduction in tuberculosis (TB) deaths and 90% reduction in TB incidence compared with 2015. Three pillars of the international guidance underpin this ambitious aim, with Pillar 1 (focused on integrated, patient-centred care and prevention) being at the heart of the action. Embedded in Pillar 1 is TB preventive treatment (TPT) of persons at high risk of the disease.[1]

Household contacts of patients with pulmonary TB are at particularly high risk of TB. Therefore, systematic screening of household contacts for TB is recommended followed by initiation of TPT in eligible contacts after active TB has been ruled out. This intervention can significantly reduce the risk of developing active TB.

At the time of adopting the 7-1-7 timeliness metrics, global implementation and uptake of TPT in household contacts was poor. In 2018, world leaders at the United Nations High-Level Meeting (UNHLM), pledged to provide TPT to at least 24 million household contacts by 2022, but, only 4.2 million (17.5% of the target) received it.[1] Despite this poor progress, the UNHLM in 2023 upheld the commitment to provide TPT to 30 million household contacts between 2023 and 2027. Uptake has not only been low but often delayed - recent studies reported that TPT initiation could take two months or longer after the index TB patient was diagnosed. [2,3,4] Although coverage has improved, gaps remain: in 2024, an estimated 3.5 million household contacts - around one in four - received TPT.[5]

A POTENTIAL SOLUTION

To improve timeliness of household contact screening and TPT initiation, The Centre for Operational Research (COR) at The Union took inspiration from a new global timeliness metric of 7-1-7, implemented to improve early detection and

[1] Implementing the end TB strategy: the essentials, 2022 update. Geneva: World Health Organization; 2022. Licence: CC BY-NC-SA 3.0 IGO.
[2] Kaswasa K, et al. Effect of patient-delivered household contact tracing and prevention for tuberculosis: a household cluster-randomised trial in Malawi. PLoS One 2022; 17: e0269219
[3] Kadyrov M, et al. Contact tracing and tuberculosis preventive therapy for household child contacts of pulmonary tuberculosis patients in the Kyrgyz Republic: how well are we doing? Trop Med Infect Dis 2023; 8: 332.
[4] Mahajan P, et al. Test and treat model for tuberculosis preventive treatment among household contacts of pulmonary tuberculosis patients in selected districts of Maharashtra: a mixed-methods study on care cascade, timeliness, and early implementation challenges. TropicalMed 2024; 9:7.
[5] World Health organization. Global Tuberculosis Report 2025. WHO, Geneva.

rapid control of health threats arising from infectious disease outbreaks and pandemics. 7-1-7 is defined as follows: detection of an outbreak within 7 days of emergence; notification of the outbreak to public health authorities within 1 day of detection; and completion of early response actions within 7 days of notification.[6]

The COR adapted this as follows:

- **First '7'** - detection (line-listing) of household contacts within 7 days of index pulmonary TB patient being initiated on TB treatment;
- **Next '1'** - household contacts have symptom screening outcomes ascertained and notified to the National TB Programme within the next 1 day;
- **Second '7'** - eligible household contacts complete early response actions (start TB treatment or TPT or make a no-treatment decision) within 7 days of symptom screening (Table 1).

Table 1: Adapting 7-1-7 to household contact management

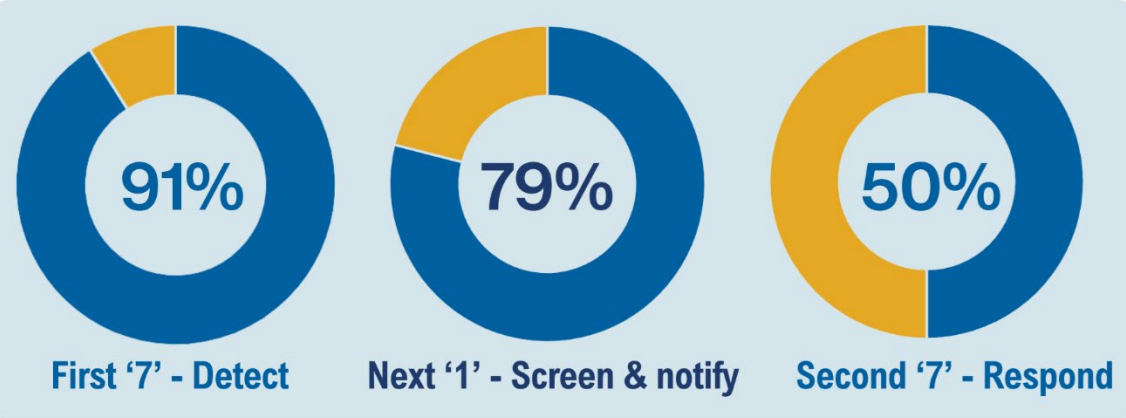
Timeliness metrics	Outbreak preparedness	Household contact management
First '7'	Detect outbreak within 7 days of emergence	Household contacts of index TB patient line-listed (detected) within 7 days of index patient starting TB treatment
Next '1'	Notify outbreak to public health authorities within 1 day of detection	Line-listed household contacts complete symptom screening with notification to National TB Programme within 1 day of detection
Second '7'	Complete early response actions within 7 days of notification	Household contacts complete early response actions: start TB treatment, start TB preventive therapy or decision made by healthcare workers or household contacts to receive no drugs within 7 days of symptom screening

IMPLEMENTATION OF 7-1-7 FOR HOUSEHOLD CONTACT SCREENING AND TPT

The COR collaborated with partners over a 9 month period between November 2022 and August 2023 to assess the feasibility and usefulness of the 7-1-7 metric in four specific contexts: the private sector through TB Nanbans (meaning "friends" in Tamil), in Chennai, India; the public sector through TB survivors in Chhattisgarh, Bihar and Odisha states, India; tertiary health facilities through dedicated project staff, Sindh province, Pakistan; and through healthcare workers within the National TB Programme, Kiambu county, Kenya.[7,8,9,10] Standardized methodology and data capture and validation procedures were used across all the sites. Where data were available, TPT uptake under 7-1-7 was compared with historical controls 3 months before the 7-1-7 metric was implemented.

[6] Frieden TR, et al. 7-1-7: an organising principle, target, and accountability metric to make the world safer from pandemics. Lancet 2021; 398: 638-640.
[7] Thekkur P, et al. Using timeliness metrics for household contact tracing and TB preventive therapy in the private sector, India. Int J Tuber Lung Dis 2024; 28: 122-139.
[8] Jamil B, et al. Feasibility, enablers and challenges of using timeliness metrics for household contact tracing and TB preventive therapy in Pakistan. PLoS One 2023; 18: e0295580.
[9] Nair D, et al. Timeliness metrics for screening and preventing TB in household contacts of pulmonary TB patients in Kenya. IJTLD Open 2024; 1: 41-49.
[10] Nair D, et al. Implementing timeliness metrics for household contact tracing and TB preventive therapy through TB champions in the public sector, India: an explanatory mixed-methods study. BMJ Open 2025; 15: e097935.

Chart 1: Implementing 7-1-7 metrics for household contact screening and management in India, Pakistan and Kenya



KEY FINDINGS

1. Achieving 7-1-7 targets

Combined findings from the four sites are shown in Chart 1 above. Altogether, there were 1,816 index pulmonary TB patients who started TB treatment and 5,166 household contacts line-listed.[11] The First 7 was the component most easily achieved at 91%. Overall achievement of the next 1 was 79%, the key challenge being meeting household contacts (adults and children) for face-to-face screening within one day. Children and adult household contacts were frequently away at school or at work respectively, requiring repeat home visits or scheduling facility-based assessments on alternative days. Achievement of the Second 7 was the most difficult with only 50% of eligible household contacts getting evaluated for a decision on TPT, TB treatment or no-treatment.

Three key barriers were identified:

1 Patient and community barriers

- Reluctance of household contacts to attend health clinics for assessment due to travel costs and loss of daily earnings
- Fear and stigma associated with TB
- Unwillingness to take medication while asymptomatic

2 Healthcare worker barriers

- Hesitance of health care workers to provide TPT due to lack of clear guidelines
- Fear of adverse drug reactions and/or development of drug resistance

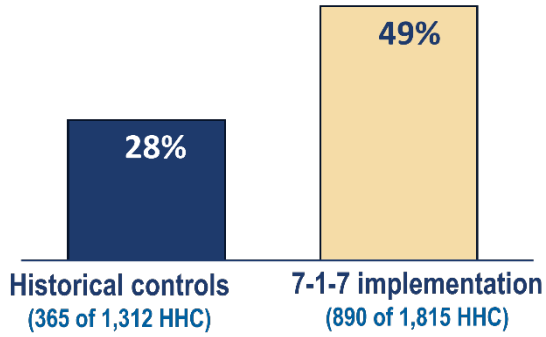
3 Health system barriers

- Stock-outs of TPT drugs

2. Uptake of TPT under 7-1-7

Combined findings from the four sites are shown in Chart 2. Where historical data on the TPT cascade were available, 49% of household contacts initiated TPT at any time after screening during 7-1-7 compared with 28% in the pre-implementation period.[11]

Chart 2: TB preventive therapy uptake at any time after screening: 7-1-7 and historical controls



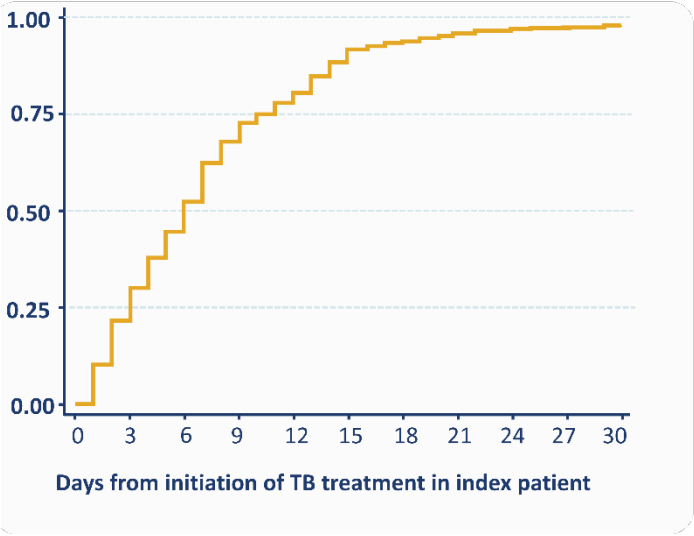
**Data on historical controls (3-months prior to 7-1-7) in three of the four sites: Chennai, India; Sindh province, Pakistan; Kiambu County, Kenya*

[11] Harries AD, et al. Applying "timeliness" to the screening and prevention of TB in household contacts of pulmonary TB patients. Int J Tuberc Lung Dis 2024; 1: 59-62.

3. Time to initiate TPT under 7-1-7

Altogether, a total of 1,635 household contacts initiated TPT. The median time to TPT initiation was 6 days (interquartile range: 3-10); Figure 1. In terms of cumulative initiations, 69% of household contacts initiated TPT within 7 days and 98% within 30 days.[12]

Figure 1: Time to initiation of TB preventive therapy for household contacts



4. Usefulness of 7-1-7 and endorsement by WHO

Implementing staff found 7-1-7 innovative, motivating and led to better performance.[3-7] Field staff suggested that a 3-5-7 timeliness metric might be more appropriate to implement (3 days to line-list household contacts, 5 days to symptom screen and 7 days to complete early response actions). Extrapolating from the data collected from all four studies, 76% of household contacts could have been line-listed by index patients within 3 days compared with 91% using 7 days, although front-line staff believed performance would have been better if the 3-day target had been set from the beginning. Completing the symptom screening outcome component improved from 79% in 1 day to 88% in 5 days. It was believed that increasing the Second 7 to more days would not solve the health service challenges mentioned in earlier sections. The 2024 WHO Operational Handbook on TB Prevention cites 7-1-7 as a valuable way to rapidly implement household contact screening and includes supporting case studies and a figure showing cumulative time to TPT uptake.[13]

CONCLUSION

- Prevention of TB is better than cure. Many people who complete TB treatment continue to suffer from substantial disability and have a three-fold higher risk of death in the follow-up period compared with those who have never had TB.
- The 7-1-7 timeliness metric brings structure and urgency to household contact management and TPT initiation and should be monitored by National TB Programmes.
- Whether 7-1-7 is the optimal metric (or if alternatives such as 3-5-7 are more feasible) needs further assessment under operational research conditions.

WANT TO LEARN MORE?

Contact The Union's Centre for Operational Research by emailing cor@theunion.org
Learn more about The 7-1-7 Alliance: www.717alliance.org

[12] Harries AD, et al. TB preventive therapy: uptake and time to initiation during implementation of "7-1-7". IJTLD Open 2024; 1: 189-191.
[13] World Health Organization. WHO Operational Handbook on Tuberculosis: TB Preventive Therapy. 2024. WHO, Geneva.

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