

Tuberculosis

The Problem

Tuberculosis (TB) is a major global health challenge, and in 2016 India accounted for over a quarter of estimated TB incidence and over a fifth of estimated TB mortality worldwide, the highest burden of any country (WHO, 2017). Prime Minister Modi recently set the goal of ending tuberculosis by 2025, five years earlier than the world committed in the Sustainable Development Goals.

While most cases of TB are curable with a 6-month regimen, the emergence of multi-drug-resistant (MDR) TB is a cause of increasing concern. Management of drug-resistant TB is significantly more costly and protracted than treatment of drug-sensitive TB: as a result, although MDR-TB accounts for an estimated 4% of TB burden in India, it accounts for almost half of programmatic spending in India (Revised National Tuberculosis Control Programme (RNTCP), 2016)

India's recent National Strategic Plan (NSP) for TB elimination, launched in 2017, sets out renewed ambition for TB control. The two interventions discussed here (private sector engagement and case-finding) form a critical part of the NSP.

Solutions

Interventions	BCR	Benefit (INR crores)	Cost (INR crores)
Private sector engagement	179.4	54541	304.00
Private sector engagement + active case finding in urban slums	117.2	81959	699.22

Total costs and benefits from 2018 to 2049 in 2018 crore rupees discounted at 5%

The full paper by **Nimalan Arinaminpathy**, senior lecturer in Mathematical Epidemiology at the Department of Infectious Disease Epidemiology, School of Public Health, Imperial College London is available on www.rajasthanpriorities.com/health-infectious-diseases.

Private Sector Engagement

The Problem

In India, the private healthcare sector is large, fragmented and unregulated: there is strong evidence of a poor standard of TB care in this sector. First, the use of inaccurate diagnostic tests delay the diagnosis of TB, permitting ongoing transmission. Second, a general lack of treatment support by the private sector means that many TB patients do not complete the standard TB regimen.

The Solution

This intervention calls for creation of a 'Public Private Support Agency' PPSA (piloted in Mumbai & Patna),

supported by public funds and overseen by the National TB programme, that has responsibility for engaging with private providers and facilitating diagnosis and treatment. A PPSA aims to sensitize and engage with private providers, offering subsidies for high-quality TB diagnostic tests; free TB treatment; support mechanisms to help TB patients complete their treatment regimens; and support to the providers for notifying TB. The purpose is not to 'divert' the patient to the public sector, but rather to facilitate high-quality TB care amongst the providers that they are already visiting.

Patients diagnosed with TB are linked to a call centre, which tracks their treatment progress and offers

adherence support, offering free drugs. Patients diagnosed with drug-resistant TB are referred to the public sector, for second-line treatment.

It is assumed that the intervention starts in 2018 and would be scaled up in a linear way to have approached 75% of private providers across the state by 2020. It is also assumed that 2/3 of providers actually take up the diagnostic tests available to them, as well as linking their patients to adherence support mechanisms.

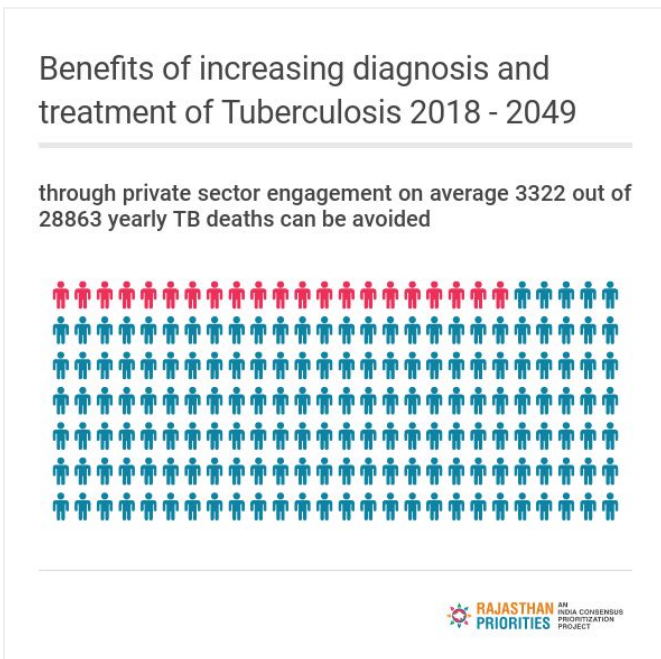
Costs

Costs include the cost of engaging private providers; provider training; subsidies for TB diagnostics; TB treatment counselling; free TB drugs; and the call centre support mechanism.

Further costs to the patients are assumed to include time (50% of wages) and the travel cost for each visit to a provider. Additionally, patient costs of TB care in the private sector, incorporating consultation fees, diagnosis costs, and out-of-pocket expenditure on TB drugs, have been included. For patients initiating second-line treatment, costs are included of a week’s hospitalization, valued at 100% of a patient’s wages.

Benefits

Benefits include the lives saved by this intervention as well as the reduction in person-years of active TB disease.



An intervention that succeeds in engaging half of private healthcare providers in Rajasthan will avert

3,322 deaths per year on average, or 11.5% of deaths compared to the baseline and would avert 10,678 TB cases per year (an 11.9% reduction compared to baseline). The intervention would cost on average Rs. 15.2 crores per year (undiscounted) between now and 2050. Overall, the benefit-cost ratio (BCR) is 179.4 (with a 5% discount rate). Moreover, the intervention has a strong impact on MDR-TB, owing to the use of rapid molecular tests in the private sector to facilitate early diagnosis.

Private Sector Engagement combined with case finding

The Solution

Current TB services rely largely on 'passive' systems - that is, waiting for symptomatic patients to present for care. This intervention concentrates on case-finding in risk groups, as described in the NSP for TB elimination (RNTCP, 2017b).

A focus on urban slums is due to the fact that these account for 10% of India’s population, yet 25% of India’s TB burden (consistent with slums having three-times the TB prevalence as the rest of the population). The intervention seeks sustained screening of the entire state’s slum population three-times a year, consistent with India’s National Strategic Plan.

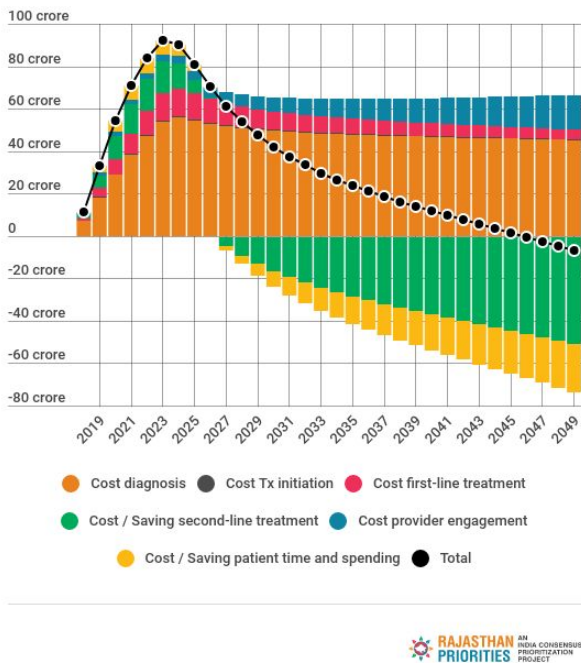
Under this intervention mobile diagnostic units are sent to urban slums to screen for TB, using X-rays and symptoms suggestive of TB. Possible TB cases are diagnosed using accurate, rapid molecular tests for TB. If positive, they are referred to the public sector for treatment. Case-finding is implemented in combination with private sector engagement.

Costs

Costs include the costs of running and staffing the mobile diagnostic unit, as well as the use of rapid molecular tests – together with X-ray - to diagnose TB. Also included is the cost of private sector engagement (costs of treatment for those diagnosed with TB, including both first- and second-line treatment). Additionally, costs to the patients have also been factored in. Benefits include averted TB deaths and averted TB Disability Adjusted Life Year (DALYs).

Costs of increasing diagnosis and treatment of Tuberculosis 2018 - 2049

through private sector engagement and active case finding in urban slums



The main cost component is for diagnosing more people, which leads to costs for treatment. However,

earlier diagnosis and treatment will lead to 30% fewer patient needing the longer and costlier second-line treatment. By the end of the period the yearly savings in second-line treatment offset the yearly program costs. Around 20% of total costs are devoted to engage and support the private sector.

Benefits

Benefits include averted TB deaths and averted TB Disability Adjusted Life Year (DALY).

It is estimated that this intervention will have a mean annual cost of Rs. 41.6 crores. It is assumed that it costs USD \$2,000 per person diagnosed in the slums, covering the use of mobile diagnostic units, staff time in counselling and testing patients, and the use of rapid molecular diagnostic tests. Further it is assumed that the intervention will detect 2/3 of prevalent cases in this setting in each round of case-finding.

A 'combined intervention' scenario, where private sector engagement is combined with case-finding to screen urban slums three times a year, will avert 4,976 deaths per year, averting an average of 16,253 TB cases per year corresponding respectively to reductions of 17.2% and 18.2% compared to baseline at an average cost of Rs. 41.6 crores per year (undiscounted). The BCR is 117.2 (with a 5% discount rate).