

Rollout strategy is key to battling India's TB epidemic, researchers find

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A new study led by Johns Hopkins Bloomberg School of Public Health researchers suggests that getting patients in India quickly evaluated by the right doctors can be just as effective at curbing tuberculosis (TB) as a new, highly accurate screening test.

While ideally all suspected TB cases would be evaluated with the new test, it is primarily being used only on the highest-risk populations and only in public health clinics, partly because of its cost and the complexity of the nation's <u>health care</u> system. This slows diagnosis of a disease that must be caught early, the researchers say.

A report on the research, conducted in conjunction with researchers at McGill University and others, is published July 15 in the journal *PLOS Medicine*.

Approximately 8.6 million people worldwide develop active TB each year, and 1.4 million die from it. Twenty-five percent of all diagnosed TB patients are in India alone. Although treatment for TB is freely available and highly effective, TB continues to kill hundreds of thousands of people every year in India, and vast numbers of cases go undetected. Public TB clinics are better equipped to quickly diagnose and begin treatment for the disease, but patients are often reluctant to utilize them. The researchers say that for better TB tests to make a major difference they must be made available to the private <u>health care</u> <u>providers</u> where patients first seek care.



"Most people in India with underlying TB initially seek care for cough from the private health care sector," notes the study's lead author Henrik Salje, PhD, a postdoctoral fellow in the School's Department of Epidemiology. "Private providers often use the wrong tests for TB, and without getting the right diagnosis, patients move between providers with long diagnostic delays."

Often, patients with symptoms start with convenient and more trusted private sector physicians and informal health care providers, but ultimately public sector physicians diagnose and treat more than half of the TB cases in India. They have long used sputum smear microscopy, which may miss up to half of all active cases.

The new test for TB, Xpert MTB/RIF, can diagnose TB in 90 minutes, capture 70 percent of cases missed by microscopy and can also determine if the strain is resistant to rifampin, the most important anti-TB drug. India has begun rolling out this new technology, but since Xpert MTB/RIF is much more expensive than traditional tests, it is currently being implemented mainly in public clinics to test HIV-positive patients who may also have TB or those at high risk of having multidrug-resistant tuberculosis (MDR-TB).

For their study, the researchers explored the impact of six different rollout strategies by developing a mathematical model of TB transmission, care-seeking and diagnostic and treatment practices in India. They found that providing access to Xpert for 20 percent of all individuals seeking care for TB symptoms could reduce new TB cases by 14.1 percent over 5 years, while the "high-risk-only," public-sector strategy currently being implemented might only reduce TB cases by 0.2 percent. However, achieving this result required substantially more resources and appropriate TB treatment. The authors also found that simply improving the referral network of informal providers to the public sector – without any new testing at all – could have as much of an



effect on TB as scaling up the new Xpert test.

"The impact of better TB diagnosis depends not only on the accuracy of the test, but also on the behavior of both <u>patients</u> and providers, good access to validated new tools, and quality TB treatment following diagnosis," says the study's senior author David W. Dowdy, MD, PhD, an assistant professor in the Department of Epidemiology. "To achieve maximum impact of novel diagnostics, India should engage the private sector, improve quality of care across all sectors, and dramatically increase the resources used to fight TB."

More information: Salje H, Andrews JR, Deo S, Satyanarayana S, Sun AY, et al. (2014) The Importance of Implementation Strategy in Scaling Up Xpert MTB/RIF for Diagnosis of Tuberculosis in the Indian Health-Care System: A Transmission Model. *PLoS Med* 11(7): e1001674. doi:10.1371/journal.pmed.1001674 . www.plosmedicine.org/article/info %3Adoi%2F10.1371%2Fjournal.pmed.1001674

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