



## INDIA: Can TB patients help successfully identify others for testing?

Tuberculosis, commonly known as TB, is an infectious bacterial disease spread through the air that can lead to death when left untreated. The disease killed some 1.6 million people in 2017, according to the World Health Organization, making it one of the top ten causes of death worldwide and one of the leading causes of deaths from infectious disease. TB is treatable and patients are usually cured with a standard six-month course of medications. Treatment often is free of charge, but many cases of TB aren't diagnosed or treated properly, particularly in low-income countries. Improving the detection of TB is crucial to ensure that infected individuals receive proper treatment and to prevent them from infecting others.

In India, where estimates suggest that 40 percent of TB cases aren't reported to health officials, researchers supported by the World Bank's Strategic Impact Evaluation Fund worked with clinics run by a local non-governmental organization to test the impacts of different approaches for bringing in new patients for TB screening. Current TB patients were asked to participate in either direct outreach to potential TB patients or to provide information to health workers who could contact them instead; some were also offered different financial incentives for referring potential TB patients for screening. TB patients themselves might have better information than health workers about who was at risk of TB, because others in their social networks

might share the same risk factors for the disease. Offering financial incentives doubled the number of referrals made by existing patients and increased the number of patients screened and new TB cases detected. Current patients turned out to be more effective than health workers in bringing in new patients for TB testing, especially when they were offered financial incentives to compensate them for the effort of peer outreach. The research team is currently working with the Delhi State TB department to test the program in public health centers in the city.



## Context

Tuberculosis is a major public health problem in India. The country accounts for over a quarter of TB cases in the world, and each year almost 3 million people in India develop the disease. The disease is highly debilitating and when left untreated can be fatal. In 2016, [more than 400,000 people](#) in India died from TB, making the country the number one in the world in terms of TB deaths.

In India, the vast majority of TB treatment is delivered through the public health system, which works together with non-governmental organizations to increase access to care. Treatment is administered in centers that follow the World Health Organization's Directly Observed Treatment Short-course (DOTS), which requires that a health worker observe

the patient taking the medication to ensure compliance. The drugs in these centers are provided by the government in partnership with the World Health Organization. Treatment is free for patients.

Despite this set-up, the disease presents a major challenge for health officials. People infected with TB are disproportionately from vulnerable and marginalized populations. They're often unaware of TB symptoms or lack information about the availability and effectiveness of treatment. Social stigma may be an additional barrier to obtaining information about screening. Many people who have symptoms of TB are never tested, making it impossible for them to obtain proper treatment and making it easier for the disease to spread.

## Evaluation

To conduct the study, the research team partnered with [Operation ASHA](#), an Indian non-governmental organization that operates about 200 TB treatment centers. The organization works in conjunction with India's Revised National Tuberculosis Control Programme, the country's national initiative to combat the disease. Like other non-governmental organizations, Operation ASHA doesn't administer tests for TB – that's done at government testing centers – but those who test positive can be enrolled in one of Operation ASHA's centers and be treated free of charge. Operation ASHA does, however, offer screening for potential patients and will refer those with symptoms of TB to government testing centers.

In 10 cities across four states in India, researchers randomized 122 Operation ASHA treatment centers into a control group or one of nine treatment groups to test the impact of various combinations of incentives and outreach strategies. In the control group, the standard care continued – health workers were tasked with routine outreach and screening for household members of newly diagnosed patients.

The treatment centers were randomly assigned to one of three types of incentives: “encouragement,” in which current patients were asked to refer people they thought might be infected with TB for the good of their communities but were not offered a financial reward; “unconditional incentives,” in which current patients were offered Rs. 150 (about US\$3 or roughly the median daily income in India) for each new person they encouraged to come to Operation ASHA for TB screening, irrespective of the test result; and “conditional incentives,”

in which current patients received Rs. 100 for each new person screened, with an extra Rs. 150 if the person tested positive for TB.

Within each different incentive group, centers were also randomly assigned to one of three outreach strategies. In the peer-to-peer outreach group, existing patients were asked to directly approach people they knew who had TB symptoms and encourage them to come to Operation ASHA to discuss testing. In the “identified contact tracing” outreach group, existing patients were asked to provide contact details of people who might benefit from testing, so that health workers could reach out to their contacts, using their names as references. In “anonymous contact tracing” group, existing patients were similarly asked to nominate contacts for visits by health workers, but under the condition that the health workers wouldn't reveal the identity of the referrer.

In all three outreach strategies, referral cards that contained unique ID numbers and information about the testing and treatment process were used to keep track of the connections between new patients coming in for screening and the current patients who referred them. In the peer outreach arms, these cards were given to current patients to distribute to their contacts directly, and in the two contact tracing arms, the cards were handed out by health workers.

A total of 3,176 current TB patients in treatment at these centers took part in the evaluation. The intervention was implemented by South Asia office of the Abdul Latif Jameel Poverty Action Lab in five waves between January 2016 and October 2017.

## Findings

**Encouraging existing TB patients to directly reach out to people they thought might have TB proved highly effective in bringing in people for screening...**

On average, direct outreach by current patients resulted in twice as many new TB symptomatic people getting screened as outreach by health workers. It turned out that peers were more effective than trained and paid health workers at convincing potential TB patients to get screened and tested, even when health workers were approaching people named by current patients. Preserving the referring patient's anonymity didn't result in better screening or testing rates, nor did it increase the number of positive cases detected through Operation ASHA clinics.

**...and relative to encouragement alone, cash incentives doubled the number of referrals made by current patients and was more effective when combined with peer outreach.**

Existing patients who were offered cash incentives to refer potential cases of TB - whether by contacting them directly or working through a health worker - were significantly more likely to refer potential cases of TB than existing patients who weren't offered any financial incentives to refer people for screening. But the most successful strategy was direct outreach by peers combined with financial incentives. When current patients asked to reach out to their peers were offered cash incentives, one new suspected case of TB was screened for every six existing patients, and one new TB symptomatic was tested for every seven current patients. Using peer outreach without financial incentives didn't give any advantage over the control group.

There was no evidence that current patients tried to take advantage of the incentives and get a financial reward by referring people who didn't actually have symptoms of TB. There was no difference in the likelihood that a person referred for screening would test positive for TB when the person who made the referral received a "bonus" for identifying someone who actually tested positive for TB, compared to when the person making the referral received a fixed payment even if the new referral did not have symptoms of the disease.

**Overall, using existing patients to find new patients led to a higher detection rate than what's normally reported by testing centers.**

Of the 222 new suspected TB cases screened at Operation ASHA centers through this pilot referral program, 176 had symptoms consistent with TB and were sent for testing at government testing centers. Among the 129 who ultimately got tested, 36 of them turned out to have active TB. This 28 percent infection rate among those tested was more than double the 12 percent average TB-positive rate reported by government clinics.

**In the study, current patients also were more able to reach individuals with fewer social contacts than health workers.**

The new TB symptomatic people reached through peer outreach were more likely to be socially marginalized - as measured by lower literacy rates and less social interactions outside of their household in the previous 24 hours - than those reached by health workers.





**Although it required greater expenditure, offering financial incentives to current TB patients proved more cost-effective for TB detection.**

The research team calculated the cost-effectiveness of the different outreach strategies and incentive structures. The researchers took into account the incentive payments, the printing of referral cards, the costs associated with health workers explaining the scheme to current patients, and the additional Rs. 900 (about US\$25) paid monthly to each health worker for the extra efforts locating people for screening in the contact tracing arms.

Offering existing patients an unconditional payment for every person they referred was the most cost-effective of the incentive strategies. It cost US\$ 183 per TB case detected, while conditional incentives cost US\$ 253 per TB case detected. Pure “encouragement” alone – when patients

were asked to identify potential TB patients but were not given any financial incentive – turned out to be the least cost-effective, at \$410 per TB case detected, because fewer new potential patients were referred.

**The cost-effectiveness of peer outreach was even higher.**

The cost of identifying a new TB patient through direct outreach by existing patients was US\$ 114, whereas finding active TB cases by using paid health workers cost between US\$ 302-\$402. The research team compared the costs of adding outreach and incentive strategies to existing TB treatment programs but did not measure the costs of program management or the time or transportation costs borne by patients, which may have differed by outreach strategy.

HEALTH

**Conclusion**

This field experiment in India demonstrated that referrals from current TB patients can be effective in identifying new TB cases and less expensive than relying on traditional contact tracing strategies that employ health workers to reach out to affected individuals.

Existing TB patients not only identified individuals who were potentially infected, but they were also effective in convincing them getting them to get screened and tested.

Most TB patients in India are treated in the public health system. Having demonstrated that current TB patients are capable of identifying others in need of treatment and convincing them to get tested, and that they respond to incentives to participate in outreach efforts, the researchers are now working on a pilot project with the public health authorities in Delhi to scale up and further refine peer referral strategies in the public sector.

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