

Researchers show a better way for curbing TB where the disease is rampant

November 28 2012, by Adam Gorlick



Russian prisoners with tuberculosis take their medicine. The problem of prisoners and ex-convicts transmitting diseases is especially bad in the countries of the former Soviet Union, where TB rates are among the world's highest.

Credit: Reuters

(Medical Xpress)—Those who live and die behind prison walls don't usually get much public attention. Incarceration is, after all, meant to remove criminals from society. But contagious and potentially deadly diseases can't be locked and left in a penitentiary, especially when infected inmates are eventually released.

The problem of prisoners and ex-convicts transmitting diseases to the [general population](#) is especially bad in the countries of the former Soviet Union, where rates of tuberculosis and drug-[resistant strains](#) of TB are among the world's highest.

But Stanford University researchers have identified solutions that could help curb tuberculosis in Russia, Latvia, Tajikistan and the 12 other countries in the region. Led by Jeremy Goldhaber-Fiebert, an assistant professor of medicine at the School of Medicine, the team has shown that a genetic TB and drug-resistance [screening tool](#) called GeneXpert is more cost-effective and better at reducing the spread of the disease than other methods currently recommended by the [World Health Organization](#). Their findings were published online Nov. 27 in [PLoS Medicine](#).

"Tuberculosis doesn't stop at any border or any locked gate," said Goldhaber-Fiebert, a faculty member at Stanford Health Policy, a research center at the university's Freeman Spogli Institute for International Studies.

"Drug-resistant TB is rampant in prisons," he said. "When infected prisoners get out, they are thought to drive the TB epidemic in the general population. We are looking to find better ways to deal with that."

About 400,000 cases of TB were diagnosed last year in the 15 former Soviet Union states—40 times the number reported in the United States. Nearly 80,000 of the sick had drug-resistant TB. According to several studies, the prevalence of TB among the region's prisoners is 10 times greater than that of the general population.

The WHO suggests three ways to screen for TB in prisons: relying on inmates to report symptoms, actively interviewing prisoners about their health and administering chest X-rays. The organization doesn't recommend one method over another, and currently, prisoners in the former Soviet Union are screened annually with miniature chest X-rays.

While X-rays can show whether a lung looks healthy, they don't always catch TB. And when they do, they cannot differentiate between a TB

that can be cured with standard medications and its drug-resistant cousins that require more expensive and extensive treatments.

That's where GeneXpert has an upper hand.

Since it was introduced in 2005, the diagnostic has been hailed as a potentially powerful tool that can help to cut TB and drug-resistance rates by more accurately diagnosing people and getting them treated. With just a small sample of mucous analyzed by a machine, the GeneXpert system can instantly detect TB and its drug-resistant genetic mutations, well-suited to mass screening within the prison systems of the former Soviet Union.

But the GeneXpert test is more expensive than alternative screening methods. And while it promises to be more effective, its impact on total costs had not been quantified in the former Soviet Union region until Goldhaber-Fiebert and his colleagues began their work nearly three years ago.

By developing computer models of the former Soviet Union's prison populations, the team predicted that using GeneXpert can cut the prevalence of TB among inmates by about 20 percent within four years—provided the screening is combined with standard regimens of drug treatment for infected patients and for those with drug-resistant TB.

"For this to make sense, you need to have the right drugs to cure those individuals you identify," Goldhaber-Fiebert said.

The additional cost of screening with GeneXpert averages to \$71 per prisoner compared to the next best alternative approach, he said.

When compared to the decreases in illness and increases in survival, and factoring the financial and societal costs of TB in the broader

population, the method makes good economic sense, he said.

"There is a large, direct value to using this technology for screening in prison settings, and there are potentially substantial secondary benefits to the general population of the former Soviet Union and to the world," Goldhaber-Fiebert said.

Douglas K. Owens, a professor of medicine who is one of the paper's co-authors and director of Stanford Health Policy, said the findings could give governments and medical experts the evidence they need to change the way they tackle TB.

"This is the kind of work we hope will inform policymaking about TB control," Owens said. "We've shown there's a more effective approach for trying to catch TB in prisons, and that means a better chance for preventing the disease from spreading."

More information: www.plosmedicine.org/article/info%3Adoi%2F10.1371%2Fjournal.pmed.1001348

Provided by Stanford University Medical Center

Citation: Researchers show a better way for curbing TB where the disease is rampant (2012, November 28) retrieved 20 March 2024 from <https://medicalxpress.com/news/2012-11-curbing-tb-disease-rampant.html>

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