

Learning from the XDR-TB Experience: Policy Priorities Going Forward

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Careful examination of government and public responses to the recent case of Extensively Drug-Resistant Tuberculosis (XDR-TB) is critical. However, in the course of this assessment, there has been so much focus on border control issues that the broader public health implications of this case and the associated events might be missed. Specifically, this case raises important questions about the nation's ability to detect and respond not only to tuberculosis (TB) outbreaks, but also to other major outbreaks of serious infectious diseases, whether they are the result of a natural epidemic or a bioterrorist attack.

The Global TB Epidemic Will Increasingly Affect the U.S.

One third of the human race, or approximately 2 billion people, is currently infected with active or latent TB. Each year, there are as many as 8.8 million cases of active TB and 2 million deaths.¹ As many as 500,000 people may have multidrug-resistant TB (MDR-TB), which is resistant to both first-line therapies (INH and rifampin).¹⁻³ An uncertain percentage of MDR-TB infections, estimated to be 2% to 19% in various studies, meet the definition of XDR-TB,¹⁻³ which is currently defined as TB that is resistant to both first-line drugs, the best second line medications—the fluoroquinolones (i.e., ciprofloxacin, ofloxacin, and levofloxacin), and at least one of three injectable drugs (i.e., amikacin, kanamycin, or capreomycin).⁴

The fact that one person with XDR-TB flew on several commercial flights should not be as alarming as the fact that millions of contagious TB patients are intermixing with and potentially exposing uninfected people every day throughout the world. There can be little doubt that many TB patients (including those with MDR-TB and XDR-TB) have traveled many times locally by public transportation and over longer distances by airplane.

The global experience with HIV, SARS, West Nile virus, and many other contagious diseases is evidence that infectious diseases are widespread in the world and will find their way to the U.S. The U.S. could and should do a great deal to alleviate the burden and suffering caused by TB in other countries. But at the very least, the U.S. has a vital self-interest in working to control major infectious diseases elsewhere in the world so that they do not increasingly affect the U.S. population.

Rapid Diagnosis—Not Currently Available for Most Contagious Infectious Diseases—Is Essential to Both Treatment and Control

According to news reports,⁵ the patient recently diagnosed with XDR-TB was first suspected of having TB in January 2007 on the basis of an incidental finding on a chest x-ray. It appears that he had an appropriate routine and methodical work-up that resulted in a diagnosis of XDR-TB 5 months later. This long path to diagnosis is a direct result of the current state of TB diagnostics.

Necessary investments in research and development (R&D) have not been made because diagnostic tests are not profitable, so private industry has not been interested in them, and, for the most part, neither the U.S. nor other governments have recognized R&D for medical diagnostic testing as being their responsibility. In this particular case, a rapid diagnosis of XDR-TB could have avoided the entire incident. In countless other cases, a rapid diagnosis could be the difference between life and death for patients and is essential to curbing disease spread. The same is true for many other naturally occurring contagious diseases and for some bioweapons.

Governments Must Invest in Antimicrobial Drug Development

Considering the enormous global morbidity and mortality associated with TB, and given the sharp rise in MDR-TB and XDR-TB, relatively little money has been invested in pharmacological research for new therapeutics. In 2005, the U.S. government spent \$79 million on R&D for new TB medications; that year, \$189 million was spent globally on this work.⁶ First-line therapies for TB have not changed in 30 years. New and better therapies for TB are needed, and market forces alone will not solve this problem, given that it is a disease that disproportionately

affects people who are impoverished and those from developing countries. There are few options available to treat MDR-TB and XDR-TB: existing options are difficult to administer to patients and are associated with more adverse reactions than the first- and second-line treatments.

Given the potential impact that TB and other major infectious diseases (both those that are naturally caused and those that could follow a biological attack) could have, the country needs:

- A strong commitment by government to invest in rapid diagnostic tests;
- Medicines and vaccines for these diseases;
- Effective public-private partnerships with the pharmaceutical and biotech industries—the only organizations capable of making these critical products; and
- A public interested in sustained funding for these issues.

How the Country Treats People with Contagious Diseases Is Critical

The patient has said he decided to fly home from Europe against the direction of public health authorities because he was frightened that he would be confined to an Italian hospital, that he would never get home, and that he would never get well. This refrain is common in the history of epidemics. When people become so frightened by the possible government reaction or by the possible public reaction to their illness, they avoid medical attention and sometimes disappear. This has been documented in past U.S. smallpox outbreaks,⁷ in the HIV/AIDS epidemic, and in the 2003 SARS outbreak in Beijing and Hong Kong.

If infected individuals are made into public scapegoats, it may increase the likelihood that in the future, people with highly contagious diseases will be reluctant to seek proper medical attention. It is in society's great interest to avoid doing anything that makes it so frightening to get diagnosed and/or treated for infectious diseases that people decide not to seek diagnosis and care. Addressing this critical issue is not only a matter of common decency—it is also a matter of collective enlightened self-interest.

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