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Supporting a Comprehensive International Approach to Global Tuberculosis Eradication Is the Right Thing to Do

In recent years, we have seen several dramatic examples of localized infectious disease outbreaks spreading regionally or globally and requiring concerted international public health containment responses.

The 2014–2016 Ebola outbreak led to immense suffering and more than 11,000 deaths in West Africa and created widespread concern about the potential of spread to other regions, including the United States. Coordination and financial support from international partners, including the United States CDC, enabled West African governments and health officials to use sound public health practices to stem the epidemic and prevent widespread transmission in the United States and a number of other countries (1). Earlier, the world came together to fight polio, one of the most feared diseases of the 20th century. Jonas Salk, who created the first polio vaccine, did not patent it, asking, "Would you patent the sun?" (2). From the distribution of the polio vaccine to current efforts to eradicate the virus, the struggle against polio has become an example of how a collective global effort can save lives and reduce suffering. Now, the coronavirus disease (COVID-19) pandemic is causing enormous disruption of health systems and the global economy, highlighting again the importance of infectious disease surveillance and the ability to respond collectively and effectively. The message from these examples—and many others—is clear: effective control of many public health threats requires local, national, and international cooperation and investment.

One challenge that has languished in the last half century is the eradication of tuberculosis (3, 4). Although there has been a reliable cure for the disease since the early 1950s and a robust epidemic control strategy since the late 1950s, tuberculosis has persisted globally and continues to kill more than 4,000 people every day. This is because until recently, low- and middle-income countries have not been supported to deploy the epidemic control strategies that have been so successful in high-income settings (5). The largest omissions have been in the areas of early identification of tuberculosis (active case finding using highly sensitive tests and contact investigation) (6, 7), treatment of active disease (prompt initiation of effective medical regimens), infection control, identification of exposed contacts, and treatment of tuberculosis infection (8, 9). These are not so much knowledge gaps as they are a lack of political will and funding (10).

In this issue of the *Journal*, Menzies and colleagues (pp. 1567–1575) use a modeling approach to estimate the benefit to the United States of a comprehensive global tuberculosis eradication strategy (11). Such an approach, which is reflected in the global End Tuberculosis Strategy—and was affirmed by the Secretary of Health and Human Resources at the United Nations High Level Meeting on Tuberculosis in 2018—is widely seen as the only way to reduce tuberculosis incidence globally by 90% by 2035 (1, 12). Menzies and colleagues show that if the United States directs funding toward an effective epidemic control strategy globally—or even simply focuses on the five countries from which the greatest number of non–U.S.-born tuberculosis cases arise in the United States—two significant positive outcomes would result. First, death and suffering would be reduced both in the United States and globally. Second, there would be direct health-system savings in the United States (between eight and 32 billion dollars between 2020 and 2035). Their argument is both morally and fiscally compelling (13).

The rationale for investing in local tuberculosis control by supporting public health systems outside the United States is straightforward (14). Because the majority of new tuberculosis cases and infections in the United States are detected in people born abroad (15), ensuring that other countries can build tuberculosis prevention and control programs based on sound medical science is of critical importance to tuberculosis eradication at home. Menzies and colleagues add to previous analyses by using global tuberculosis epidemiology and a sophisticated model to demonstrate the merits of a shared epidemic control strategy for stopping the epidemic. By highlighting dramatic differences

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in the projected financial and human toll of a global strategy versus the continuation of the status quo, Menzies and colleagues demonstrate the true costs to the United States of failing to invest in a global tuberculosis control strategy.

This thoughtful and detailed analysis by Menzies and colleagues shows that investing in a comprehensive approach to tuberculosis control in high-burden settings—both directly and through global partners—makes sense for our nation. As the United States congress rethinks the nation's global strategy for combating tuberculosis (the End Tuberculosis Now Act), there is an opportunity to redefine our approach to global tuberculosis eradication. Menzies and colleagues have given us a strong push in the right direction. Their conclusions are difficult to refute and should be immediately adopted by advocates, policy makers, and funding agencies. ■

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PHorecasting Heritable Pulmonary Arterial Hypertension: Are We Nearly There Yet?

For individuals with a family history of pulmonary arterial hypertension (PAH), especially for those who know they have inherited the familial mutation, it must feel like they are waiting for the other shoe to drop, and yet it is by no means inevitable that they will develop the disease. Mutations in the *BMPR2* (bone morphogenetic protein receptor 2) gene are the most common cause of heritable PAH, and here we know that the penetrance—the proportion of mutation carriers who actually develop the disease—averages 27% (1). Even for females, for whom the penetrance is about three times higher than in males, more than half of mutation carriers will remain asymptomatic throughout their lifetime. So, what triggers the development of PAH in some individuals, and can we predict when and to whom this will occur?

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