# TB risk should not depend on where we are born

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In many high-income countries, even a small number of tuberculosis (TB) diagnoses can generate headlines and prompt a rapid public health response. Recent situations in U.S. cities such as Seattle and San Francisco illustrate this, where media coverage has focused on the number of children being tested after TB disease was identified in a school.

In sub-Saharan Africa, these situations are viewed through a different lens. While some regions experience relatively low levels of TB disease, others face substantial challenges. Several countries in East and Southern Africa—including Ethiopia, Kenya, Uganda, Nigeria, and South Africa—remain among the high TB-burden settings globally, with significant variation in drug-resistant TB across and within countries.

In many of these settings, sustained transmission places continuous demands on health systems, requiring responses focused on large-scale, ongoing disease control rather than isolated events. An estimated 10.7 million people globally fell ill with TB in 2024, and the disease killed 1.23 million, more than any other infectious disease. It is the leading killer of people living with HIV, and a major cause of deaths related to drug resistance. TB is a known risk in many parts of the world, yet in the U.S. it is relatively rare and is often perceived by the public as a disease of the past.

Our risk of exposure should not depend on something as haphazard as where we are born.

This is the imperative that informs my work as a scientist endeavouring to develop a vaccine for TB. We want to bring locations with a high burden of either drug-resistant or drug-sensitive TB to a point resembling that of San Francisco or Seattle—where the disease is so rare that even a small number of diagnoses is an exceptional event.

TB is often described as a disease strongly associated with poverty. Transmission is facilitated in settings with poor ventilation and close contact, such as underground mines, crowded workplaces, and densely populated urban settlements. Undernutrition—commonly linked to poverty—weakens immune defenses and increases the risk of developing TB disease. The illness can also place a heavy financial burden on households when the primary wage earner becomes sick, further compounding economic hardship and vulnerability.

Ethiopia is a high TB-burden country, and I witnessed the impact of the disease firsthand while living in the community and through my work as a physician and researcher there. I saw how TB affects families and communities, and it struck me deeply as the disease devastated many lives around me. This perspective has motivated me throughout my career. The only current TB vaccine, the BCG vaccine, is an important but imperfect hundred-year-old tool. A review of studies on BCG concluded that while it provides protection to young children from severe forms of TB, it provides limited protection against pulmonary TB in adolescents or adults.

Adolescents and adults bear the greatest burden of pulmonary TB and are the primary drivers of transmission. Preventing TB in these age groups could therefore help protect people of all ages. Widespread use of an effective TB vaccine could also contribute to reducing drug-resistant TB. By lowering the incidence of TB disease, it would reduce the need for antibiotic treatment—a critical step in curbing antimicrobial resistance. The World Health Organization estimates that over a 25-year time span, a vaccine with 50% efficacy for protecting adolescents and adults could save 8.5 million lives, prevent 76 million new TB cases and save $41.5 billion for TB affected households.

A new vaccine, if able to deliver on this goal, could be game changing. But it will only have an impact if it is used by the people who would benefit most from it. The experience of the measles vaccine illustrates this point well. Introduced more than 60 years ago, its success has depended on sustained efforts to ensure widespread use. Today, measles outbreaks still make headlines, but they are small compared with the devastating epidemics seen before vaccination. Over the past 25 years alone, measles vaccination is estimated to have prevented about 59 million deaths.

The TB vaccine candidate that we at the Gates Medical Research Institute are evaluating is among several candidates currently in late phase clinical trials. There has never been a time when the TB vaccine pipeline has shown such promise, bringing us closer than ever to improving the prospects for communities most affected by this disease. If one of these vaccine candidates proves to be effective, it will be essential for governments, global health organizations, and communities to work together to ensure that it reaches those who would benefit most. Broad and equitable access will be critical to reducing the global burden of TB and moving closer to the goal of a world free of TB.

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