

CDC's Role in **Global
Tuberculosis
Control**



National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention
Division of Tuberculosis Elimination



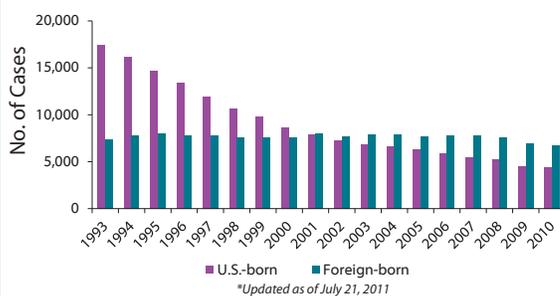
TB in the United States: A Global Perspective

Tuberculosis (TB) is a challenging disease to diagnose, treat, and control globally and in the United States. TB is spread through the air from one person to another. TB bacteria are released into the air when a person with TB disease of the lungs or throat coughs, sneezes, speaks, or sings. People nearby may breathe in these bacteria and become infected.

Globally, TB is one of the most common infectious diseases and the leading cause of death among people living with HIV (PLHIV). In 2010, a total of 8.8 million people become sick with TB disease, most of whom (82%) live in one of the 22 high burden countries for TB. While significant progress has been made toward the elimination of TB in the United States, this disease remains an urgent public health problem in many other parts of the world.

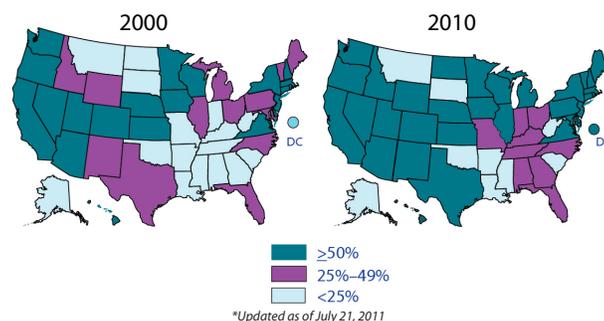
TB in the United States reflects the global reality. Latest surveillance data show the annual TB incidence rate among the U.S.-born was 1.6 per 100,000 compared to 18.1 in foreign-born individuals. In 2010, 60% of all TB cases and 88% of drug-resistant TB cases¹ in the United States occurred among people born in other countries. More than 75% of these individuals were born in just 15 countries. Many of CDC's global TB control activities are focused in these high-burden and origin countries. Investing in TB control in high-burden settings reduces TB cases in the United States, costs less than screening at U.S. entry points, and saves funds that would be spent treating TB disease in the U.S.

Number of TB Cases in U.S.-born vs. Foreign-born Persons United States, 1993–2010*



While the number of TB cases among U.S.-born have fallen steadily since 1993, they have stayed the same among the foreign-born

Percentage of TB Cases Among Foreign-born Persons, United States*



Since 1999, the proportion of TB cases among foreign-born individuals has risen in nearly every state. More than half of all TB cases in 31 states were among foreign-born individuals in 2009.

Strong national TB programs, such as we have in the United States, strive to reduce the opportunity for TB transmission particularly during travel, immigration, work, or study abroad; however, these remain routes of transmission internationally. CDC collaborates with other U.S. Government (USG) agencies, presenting a unified front in working with other governments, multilateral organizations, and NGOs to implement The Global Plan to Stop TB, advancing new diagnostic, treatment, and programmatic strategies to fight TB worldwide.

¹Drug-resistant TB is defined as TB that is resistant to any of the first-line drugs commonly used to treat TB. Please see the CDC website for more information about drug-resistant TB:

<http://www.cdc.gov/tb/topic/drtb>

CDC Partners in Global TB Control

Many USG agencies support international health programs. In supporting international TB control programs, USG agencies play complementary roles to reduce duplication and leverage each agency's strengths. USG agencies are actively engaged in implementing international TB control plans, including support of the Global Plan to Stop TB, which seeks to halve TB prevalence and mortality by 2015. USG agencies support this plan by assisting high-burden countries to expand basic TB control programs, invest in research and development initiatives, and build programs with a focus on reducing TB/HIV co-morbidity, preventing and treating multidrug-resistant TB, and reaching vulnerable populations.

Examples of other USG agencies' work to control TB globally include:

- The National Institutes of Health's (NIH) biomedical and clinical research and development for vaccines, diagnostic technologies, and better TB treatments;
- The U.S. Agency for International Development's (USAID) material support to country programs and partners to scale-up effective strategies; and
- The Office of the Global AIDS Coordinator's (OGAC) coordination of global TB and HIV efforts.

CDC's Role in the Effort to Control TB Globally

CDC plays an important role in finding the most effective ways to implement new tools and approaches in resource-limited and high-burden settings through clinical and operations research, technical assistance, program and policy design, demonstration projects, and program monitoring and evaluation. CDC focuses on supporting innovative approaches to screening, diagnosing, case-finding, and curing TB to stop the spread of disease and prevent development of drug resistance.

CDC is particularly interested in finding new ways to prevent TB among people who are most vulnerable, including those co-infected with HIV, women, children, and those who are incarcerated, homeless, or experiencing substance or alcohol abuse. CDC also helps national TB programs and communities develop and improve policies and strategies for conducting surveillance, upgrading laboratory systems, and training new researchers and outreach and health care workers. CDC looks for ways to provide effective TB control in resource-limited and high-burden settings by helping refine policies and build partnerships. Lessons learned through overseas research are also used to inform U.S. domestic programs and policies.



An outreach worker from CDC's collaboration in Botswana educates clients about TB. (Photo Credit: Mavis Bengtsson, BOTUSA).

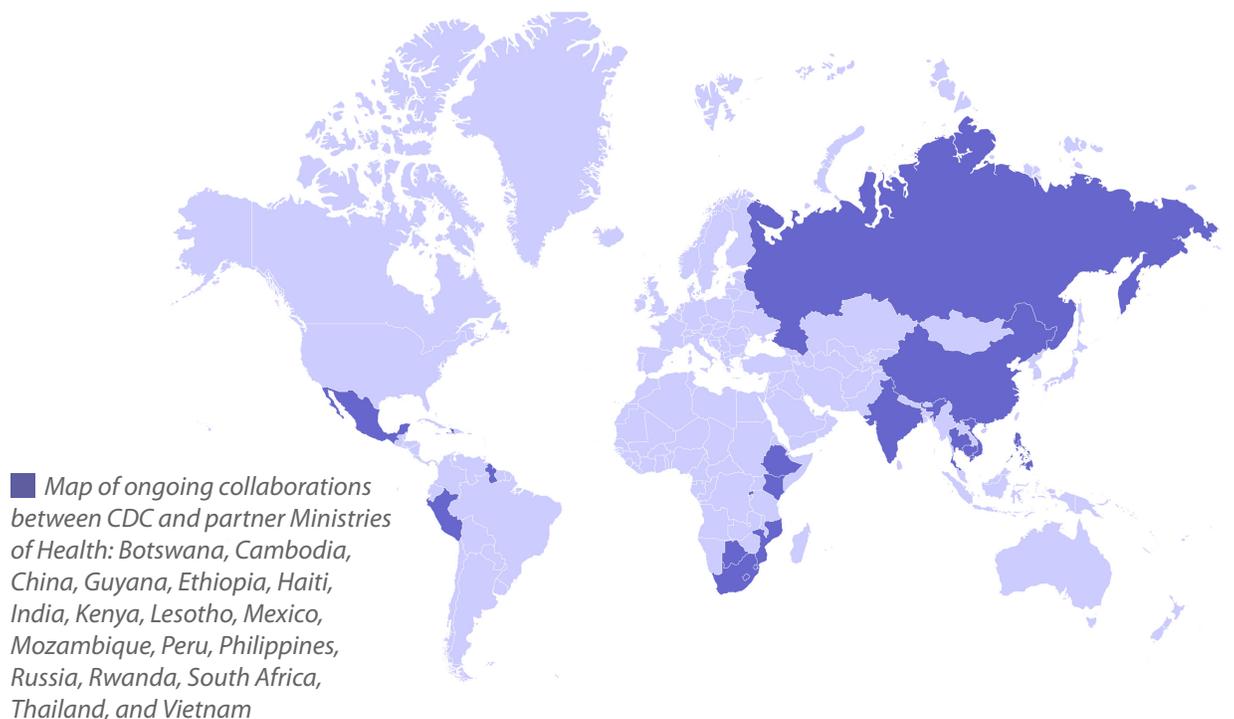
CDC's Division of Tuberculosis Elimination's (DTBE) Global TB Priorities

DTBE, along with other CDC programs and USG agencies, collaborates with national TB programs and international partners to control TB worldwide. DTBE's international priorities include:

- Strengthening national TB programs in WHO-designated high-burden TB and multidrug-resistant TB (MDR TB)² countries and countries that contribute to the TB burden in the United States;
- Implementing the President's Emergency Plan for AIDS Relief (PEPFAR) goals by reducing the impact of HIV and TB prevalence and mortality;
- Improving and expanding the diagnosis, treatment, and prevention of drug-resistant TB internationally and among the foreign-born in the United States;
- Strengthening TB laboratory systems to achieve high-quality lab performance;
- Improving infection control (IC) practices to prevent TB transmission and provide a safer environment in congregate settings; and
- Supporting programmatically relevant research on the diagnosis, management, and prevention of TB infection and disease through the TB Trials Consortium.

DTBE's Select Accomplishments in Global TB control

DTBE has worked in nearly every region of the world, providing technical assistance and participating in research collaborations to improve TB control. Significant programmatic and research collaborations are ongoing in Botswana, Cambodia, China, India, Kenya, Mexico, Russia, South Africa, Thailand, and Vietnam.



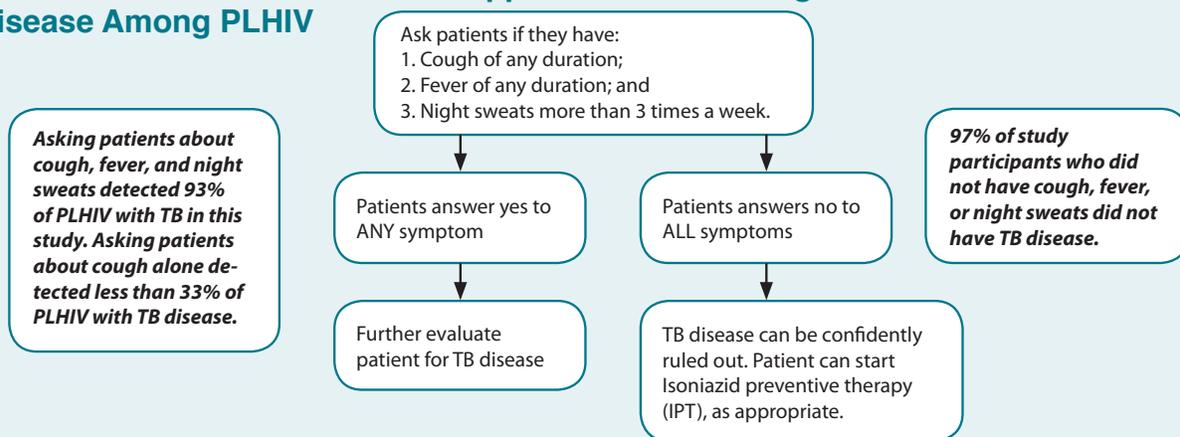
²Multidrug-resistant TB (MDR TB) is defined as TB that is resistant to at least two of the best anti-TB drugs, isoniazid and rifampicin. These drugs are considered first-line drugs and are used to treat all persons with susceptible TB disease. For more information about MDR TB:

<http://www.cdc.gov/tb/publications/factsheets/drtb/MDRTB.pdf>

Improving Diagnosis of TB in People Living with HIV (PLHIV): An Evidence-Based Screening and Diagnostic Approach

DTBE led a cross-sectional study (Improving Diagnosis of TB in HIV-Infected Persons: The ID-TB/HIV Study), enrolling more than 2,000 PLHIV from eight anti-retroviral (ARV) clinics in Cambodia, Thailand, and Vietnam to determine the best method for screening and diagnosing TB in PLHIV. The study found that using previously recommended screening approaches failed to detect more than two-thirds of patients with TB disease. However, screening PLHIV for TB using a combination of three symptoms detected almost all cases (93%) among this population. The presence of one or more symptom (cough, fever, or night sweats) is a positive symptoms screen, whereas absence of all symptoms is a negative symptom screen. Patients with a positive symptom screen need further evaluation to accurately diagnose TB disease. Patients with a negative symptom screen have TB disease reliably ruled-out (97% without TB had no symptoms), allowing isoniazid preventive therapy (IPT) to be started more quickly. In follow up to this study, DTBE and WHO collaborated on a meta-analysis which led to a change in WHO's international guidelines for screening for TB among PLHIV.

Figure 1: The Best Evidence-Based Approach to Screening for TB Disease Among PLHIV



Prevention of TB Disease in PLHIV: Evaluating the Impact of Isoniazid Preventive Therapy (IPT)

The Isoniazid Prevention Therapy Trial (IPTT), conducted in Botswana from 2004 to 2011, was designed to determine whether 36 months of isoniazid treatment was more effective in preventing TB disease among PLHIV than the routinely prescribed six month treatment. The main finding was that while IPT was highly effective (>90% reduction) in reducing TB in people with a positive tuberculin skin test, 36 months of IPT further reduced the risk of developing TB disease by 76% compared with six months of IPT for these people. CDC Botswana has worked closely with the National TB and HIV Programs, including providing cost effectiveness analysis to modify the National IPT Program based on these findings. The trial continues to monitor incident TB in those who received IPT. This study informed a change in WHO guidelines, now suggesting that PLHIV with a positive skin test should receive 36 months of IPT.



Raising awareness at a rally. Globally, TB is the leading cause of death among people living with HIV. (Photo Credit: Alex Miranda, UNAIDS)

Preserving Effective TB Treatment for Second Line Drugs for Treatment of Drug-Resistant TB

In collaboration with the Ministry of Health (MOH) and local partners in nine countries, DTBE spearheaded the Preserving Effective TB Treatment Study (PETTS). PETTS has informed the new framework for WHO and international partners that support countries in achieving universal access to the diagnosis, treatment, and care of MDR TB. PETTS, a large multi-year, multi-country study compared programs approved by the Green Light Committee (GLC) to programs that were not GLC approved; this was done to determine the incidence and consequences of acquired resistance to second-line drugs (SLD)³ among MDR TB patients. Preliminary results suggest that acquired resistance to these drugs was lower in GLC approved programs. GLC approved projects also demonstrated higher cure rates, lower mortality, and lower treatment failure rates when compared with non-GLC approved projects.



*Training laboratorians on infection control procedures
(Photo credit: Garry Blackwelder, CDC)*

³Second-line drugs (SLD) are used to treat MDR TB, but are more costly, less effective and have more side effects than first-line drugs used to treat susceptible TB. MDR TB plus resistance to certain second-line drugs is considered extensively drug-resistant (XDR TB). For more information: <http://www.cdc.gov/tb/publications/factsheets/treatment.htm>.

Improving Cross-Border Collaborations

DTBE continues to collaborate closely with the Pan-American Health Organization (PAHO) to develop policies and guidelines regarding national TB control in Latin American countries, while working with the Mexico National TB Program and U.S.-Mexico Border States to define challenges to TB control and improve continuity of care for persons who cross the U.S.-Mexico border following a TB diagnosis. DTBE is also working with CDC's Division of Global Migration and Quarantine (DGMQ) to implement and evaluate technical instructions for overseas TB screening of immigrants and refugees, and provide advice on considerations for commercial travel restrictions.

Additional Resources

Information about CDC's TB programs and activities:

- Tuberculosis (TB) <http://www.cdc.gov/tb/>
- Drug-Resistant Tuberculosis (DR TB) <http://www.cdc.gov/tb/topic/drtb/>
- BOTUSA (Botswana-USA Partnership) <http://www.cdc.gov/botusa/>
- Global HIV/AIDS <http://www.cdc.gov/globalaids/>
- Tuberculosis Trials Consortium (TBTC): <http://www.cdc.gov/tb/topic/research/tbtc/default.htm>
- TB Education and Training Resources Website: www.findtbresources.org
- TB-Related News Items: www.cdcnpin.org/lyris/ui/listservs.aspx#journal

Information about TB programs and activities at other USG agencies:

- USAID Tuberculosis http://www.usaid.gov/our_work/global_health/id/tuberculosis/
- NIAID Tuberculosis <http://www.niaid.nih.gov/topics/tuberculosis/Pages/Default.aspx>

Information about World Health Organization programs and activities:

- Stop TB Department www.who.int/tb/en/

Photos appearing on the cover:

- Health care worker reading TST. (Photo Credit: Sean Toney, CDC)
- AFB Staining in a clinic laboratory, Bangladesh. (Photo Credit: Wanda Walton, CDC)
- TB DOTS Delivery Unit, Namibia. (Photo Credit: Sundari Mase, CDC)



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