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CLOSING THE GAP IN TUBERCULOSIS RESEARCH AND DEVELOPMENT FUNDING: ACTIONS FOR U.S. CONGRESS

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RECOMMENDED ACTIONS

- Increase U.S. government investment in tuberculosis (TB) research and development (R&D) from $313.5 million to at least $444.5 million in FY2020
- Support robust funding for agencies involved in TB R&D, including:
  - » U.S. National Institute of Allergy and Infectious Diseases (NIAID)
  - » Institutes and Centers at the U.S. National Institutes of Health (NIH)
  - » U.S. Department of Defense (DoD)
  - » U.S. Agency for International Development (USAID)
  - » U.S. Centers for Disease Control and Prevention (CDC)
- Direct U.S government agencies involved in TB research through appropriations report language to apply increased levels of funding to TB research and to coordinate across agency TB research strategies and activities

TB IS A PUBLIC HEALTH AND ECONOMIC THREAT

TB is the number one global infectious disease killer, killing 1.6 million people in 2017.[1] TB is curable when promptly diagnosed and treated. However, children are especially vulnerable because there is a lack of appropriate pediatric diagnostic and treatment options for TB. A quarter of the world's population—including 13 million Americans[2]—has latent TB infection, which could develop into active, infectious TB disease. There are no accurate tests to determine who is most at risk of becoming ill with active TB.

Drug-resistant TB, which sickens over half a million people around the world each year, is more difficult and expensive to diagnose and treat, requiring up to two years of treatment with devastating side effects. Only 10 percent of patients with drug-resistant TB globally received treatment and were cured, resulting in ongoing risk for outbreaks of drug-resistant TB.

In 2013, the CDC declared drug-resistant TB a serious threat to U.S. public health.[3] Although TB rates in the United States are currently low,[4,5] an epidemic could have a devastating human and financial toll: direct treatment costs average $164,000 per patient for multidrug-resistant TB (MDR-TB) and $526,000 per patient for extensively drug-resistant TB (XDR-TB).[6] Loss of productivity and death add additional societal impact. In an epidemic, costs would quickly escalate, and the government would be responsible for the public health response. State and local health departments can end up paying 80–100% of the cost of care for patients with drug-resistant TB, straining most public health budgets.[7] In the 1990s, New York City spent over $1 billion to control outbreaks of MDR-TB.[8] As long as drug-resistant TB remains a global threat, the United States must play a leading role in eliminating TB around the world.

GLOBAL TB FACTS, 2017

- 10 million people fell ill with TB, including 1 million children
- 1.6 million people with TB died, including 300,000 people with both TB and HIV/AIDS
- 4 million people with TB were not diagnosed, treated, or monitored
- Over half a million people developed drug-resistant TB, and only 10% were cured

U.S. TB FACTS, 2017

- 9,105 people fell ill with TB, with patients in all states
- 515 people with TB died
- 123 patients had MDR-TB, with total treatment cost of $20.2 million
- Two patients had XDR-TB, with total treatment cost of $1.1 million
- 13 million people had latent TB infection

WHY SHOULD THE U.S. SUPPORT INCREASED TB R&D?

The good news is that the global fight against TB is beginning to gather momentum, as demonstrated by a heightened level of awareness and political will from governments at the United Nations High-Level Meeting on TB in September 2018. Now is the time to seize on the momentum and finally turn the corner on this deadly disease through a robustly funded science agenda. TB R&D is essential to combating TB in the United States and around the world. Scientific advances led to the development of a rapid test for diagnosing TB—and for determining resistance to one of the most important drugs to treat it—and approval of two new, safer, and more effective medications for drug-resistant TB in 2012 and 2014, the first new treatments for drug-resistant TB in 40 years. To eliminate TB as a global health threat, continued innovation is needed to develop more effective medications with fewer side effects, faster diagnostics that can accurately pinpoint resistance to many TB drugs, and effective vaccines for preventing TB transmission and disease. Better tools for public health to prevent and combat TB can significantly drive down societal, economic, and healthcare costs associated with TB outbreaks in the United States, with better patient and community outcomes.

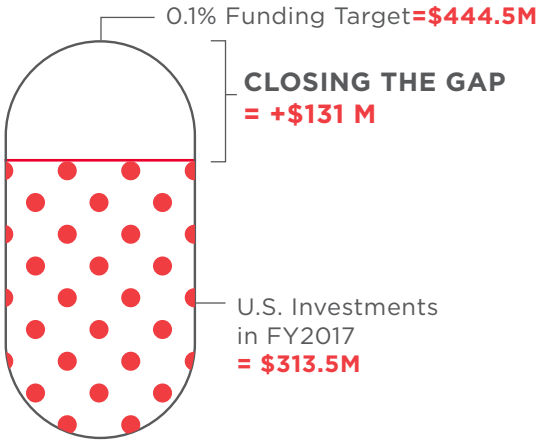
In addition, investing in TB R&D supports U.S. priorities for HIV/AIDS, antimicrobial resistance (AMR), and global health security. First, TB is a leading killer of people living with HIV. To fully benefit from U.S. investments in the global fight against HIV/AIDS through the President's Emergency Plan for AIDS Relief (PEPFAR), it is critical that people with both HIV and TB be promptly diagnosed and treated for both infections and that research be conducted to ensure that TB medicines are effective in individuals who are also taking antiretroviral HIV medicines. Second, drug-resistant TB is the leading cause of deaths from AMR, which was declared to be a significant threat to global public health by the United States and the World Health Organization (WHO) in 2015.[9] To address AMR, the United States released National Action Plans to Combat Antibiotic-Resistant Bacteria and MDR-TB in 2015.[10,11] Finally, the Global Health Security Agenda (GHSA), an ongoing U.S. priority and global collaborative to build global capacity to withstand infectious disease outbreaks, recognizes AMR as one of its priorities.[12] Combating TB is central to addressing HIV/AIDS, AMR, and global health security, and any strategy to upend the rising threat of TB must include funding science to create the next generation of public health tools.

WHAT CAN THE U.S. GOVERNMENT DO TO CLOSE THE TB R&D FUNDING GAP?

The U.S. government has long been a leader in TB medical research and product development, strongly supported by a history of bipartisan congressional commitment. In 2017, the U.S. government invested $313.5 million of the total global investment of $772 million in TB R&D.[13] But much more is needed to ensure the development of life-saving TB medicines, vaccines, and diagnostics. Although global funding for TB R&D reached a new high in 2017, it still fell far short of the $2 billion in annual R&D spending required to end the global TB epidemic by 2030.[14]

At the 2018 UN High-Level Meeting on TB, the U.S. and all other member states committed to mobilizing "sufficient and sustainable financing with the aim of increasing overall global investments to US$2 billion, in order to close the estimated US$1.3 billion gap in funding annually for tuberculosis research, ensuring that all countries contribute appropriately to research and development."[15] Treatment Action Group has developed a proposal, endorsed by other TB stakeholders, that urges all governments to contribute to TB R&D based on each country's "fair share" of demonstrated research capacity, as measured by their annual spending on R&D overall.[16] If all countries devote at least 0.1% of their annual R&D spending to TB research, they will close the funding gap and position the world to end this deadly epidemic.

FIGURE 1: CLOSING THE GAP – U.S. GOVERNMENT INVESTMENT IN TB R&D



For the United States, this means increasing annual investment in TB research from $313.5 million in FY2017 to at least $444.5 million, a difference of $131 million (see Figure 1). This relatively small amount will yield big dividends. By committing to greater investment in TB R&D, the United States will demonstrate its global leadership in TB, encourage other governments to contribute their fair share to TB research investments, catalyze investment amplification, and strengthen U.S. priorities in HIV/AIDS, AMR, and global health security. Additionally, about 89% of U.S. government investments in global health R&D are spent in the U.S., creating jobs for American researchers, supporting American companies, and leveraging additional investments from the private sector.[17]

WHERE CAN TB RESEARCH APPROPRIATIONS BE DIRECTED?

Current TB research funding is distributed among several U.S. government agencies that play critical roles along the R&D continuum from basic and clinical research to product development and approval (Table 1). The $131 million in additional funding could be appropriated to these agencies and applied to priority areas of research including basic sciences, diagnostics, treatments, vaccines, operational research, research infrastructure, and pediatric research.

Each agency contributes in a unique way to the development of new tools for combating TB. The majority of annual TB research funding (66%) is invested by NIAID at the NIH. Although NIAID funds research across priorities, it is a clear leader in funding basic science that is not funded by the private sector. NIAID released an ambitious five-year strategic TB research plan in September 2018 and is poised to channel increased funding into enhanced research outcomes. New scientific technologies, developed from research on other diseases, can be applied to improve our understanding of TB disease. Other NIH institutes and centers invest 13% of U.S. government TB research investments within their areas of expertise. For example, the Eunice Kennedy Shriver National Institute of Child Health and Human Development partners with NIAID on pediatric TB research.

TABLE 1: TB R&D TARGETS BY AGENCY			
Agency	FY2017 ($M)	0.1% Target ($M)	Difference ($M)
NIH/NIAID	206.6	293.4	86.8
NIH/Other IC	41.5	57.8	16.3
USAID	34	48.9	14.9
CDC	18.3	26.7	8.4
DoD MRDP	6.1	8.9	2.8
NSF	3.4	4.4	1.0
PEPFAR	1.6	2.2	0.6
VA	1.2	1.8	0.6
FDA	1	1.3	0.3
Total	**$313.5**	**$444.5**	**+$131**

Funding from USAID (11%) and the CDC (6%) supports the conduct of clinical trials, operational research, and implementation research – especially in TB-endemic areas. The DoD, through its Medical Research and Development Program (MRDP), funds research (2%) for drugs, vaccines, and diagnostics that would benefit troops and families living in TB-endemic areas. Other agencies currently contribute minimally to TB research but are in a position to expand TB research activities. The Biomedical Advanced Research and Development Authority (BARDA) supports the conduct of advanced clinical trials and catalyzes the development of medical products against a broad array of public health threats, including AMR. BARDA could direct additional funding to TB R&D, as drug-resistant TB has been prioritized by the U.S. government as an AMR threat.

By committing to at least $444.5 million annually to funding for TB R&D, the United States will demonstrate global leadership in closing the TB R&D gap, encourage other governments to contribute their fair share toward TB research, contribute to the U.S. economy, and strengthen U.S. priorities in HIV/AIDS, AMR, and global health security.

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