USAID
FROM THE AMERICAN PEOPLE

COMMITTED TO ENDING TB

TUBERCULOSIS REPORT TO CONGRESS

FEBRUARY 2018

FY 2016

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On the Cover: Training in Zimbabwe on childhood TB (Photo by Phoebe Nzombe)

ACRONYMS AND ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
ART	Antiretroviral Therapy
CDC	Centers for Disease Control and Prevention
CI	Contact Investigation
CY	Calendar Year
DOT	Directly Observed Treatment
DOTS	Directly Observed Treatment, Short Course
DR-TB	Drug-Resistant Tuberculosis
FAST	Finding, Actively Separating, and Treating Tuberculosis
FDA	U.S. Food and Drug Administration
FY	Fiscal Year
GDF	Global Drug Facility
GHP	Global Health Programs
GLI	Global Laboratory Initiative
Global Fund	Global Fund to Fight AIDS, Tuberculosis, and Malaria
HHS	U.S. Department of Health and Human Services
HIV	Human Immunodeficiency Virus
IC	Infection Control
IPT	Isoniazid Preventive Therapy
LTBI	Latent Tuberculosis Infection
MDR-TB	Multidrug-Resistant Tuberculosis
National Action Plan	National Action Plan for Combating Multidrug-Resistant Tuberculosis
NIAID	National Institute of Allergy and Infectious Diseases
NIH	National Institutes of Health
NTP	National Tuberculosis Program
PEPFAR	President's Emergency Plan for AIDS Relief
PMDT	Programmatic Management of Drug-Resistant Tuberculosis
PViMS	Pharmacovigilance Monitoring System
RR	Rifampicin-Resistant
SDG	Sustainable Development Goal
STREAM	Standardized Treatment Regimen of Anti-Tuberculosis Drugs for Patients with Multidrug-Resistant Tuberculosis
TB	Tuberculosis
USAID	U.S. Agency for International Development
WGS	Whole Genome Sequencing
WHO	World Health Organization
XDR-TB	Extensively Drug-Resistant Tuberculosis
Xpert	Xpert® MTB/RIF

EXECUTIVE SUMMARY

The U.S. Agency for International Development (USAID) submits this report to Congress pursuant to P.L. 110-293, the Tom Lantos and Henry J. Hyde U.S. Global Leadership Against HIV/AIDS, Tuberculosis, and Malaria Authorization Act of 2008, Section 302(g).

In Fiscal Year (FY) 2016, USAID, the lead U.S. Government Agency for international tuberculosis (TB) programming, supported high-quality screening, diagnosis, and treatment services for millions of people affected by TB, multidrug-resistant tuberculosis (MDR-TB), and extensively drug-resistant tuberculosis (XDR-TB). U.S. Government FY 2016 investments of $242 million in bilateral TB funds were focused in 23 countries – those with high burdens of TB, MDR-TB, and TB/HIV co-infection. Working in collaboration with each country's Ministry of Health, USAID achieved the following results: 3.9 million TB cases detected; 88-percent treatment success; and 77,000 drug-resistant TB (DR-TB) patients started on appropriate treatment. USAID's FY 2016 activities contributed to an estimated 53 million lives[1] saved from 2000-2016.

USAID is the world's largest bilateral donor for TB and works in partnership with national TB programs (NTPs); the Global Fund to Fight AIDS, Tuberculosis, and Malaria (Global Fund); the World Health Organization (WHO); the Stop TB Partnership; technical-assistance organizations; and civil society. Our goal is to reach and cure all individuals with TB, and prevent the transmission of the disease through a patient-centered approach aimed at alleviating suffering and saving lives. USAID also leads the international effort to implement the U.S. Government's Global TB Strategy (2015-2019),[2] and the Agency's comprehensive approach includes support for all of the pillars of the Strategy, including:

- Improving access to high-quality patient-centered TB, DR-TB and TB/HIV services;
- Preventing TB transmission and disease progression;
- Strengthening TB service delivery platforms; and
- Accelerating research and innovation.

In addition to USAID's bilateral programming in 23 countries, the Agency supports an additional 31 countries through targeted technical assistance and support for Global Fund grants. In FY 2016, USAID continued to focus on identifying individuals with TB earlier and putting them on effective treatment to prevent further transmission and cure them through strengthened partnerships with all health care providers. The Agency also supported countries in expanding diagnosis and treatment capacity for MDR-TB, to improve the availability and quality of services.

USAID also works closely with other U.S. Government Departments and Agencies on efforts to combat MDR-TB. The five-year National Action Plan for Combating MDR-TB (National Action Plan)[3] was launched in December 2015, with three overall goals:

1) Strengthen domestic capacity to combat MDR-TB;

2) Improve international capacity and collaboration to combat MDR-TB; and

3) Accelerate basic and applied research and development to combat MDR-TB.

USAID, the Centers for Disease Control and Prevention (CDC), and the National Institute of Allergy and Infectious Disease (NIAID) within the National Institutes of Health (NIH), both within the U.S. Department of Health and Human Services (HHS), are implementing the National Action Plan in 10 countries.[4] As part of the Plan, USAID will continue to lead the U.S. Government's

1 World Health Organization 2017 Global Report, http://www.who.int/tb/publications/global_report
2 United States Government Global Tuberculosis Strategy, https://www.usaid.gov/sites/default/files/documents/1864/Reach-Cure-Prevent-2015-2019-TBStrategy.pdf
3 National Action Plan for Combating Multidrug-Resistant Tuberculosis, https://www.usaid.gov/what-we-do/global-health/tuberculosis/resources/news-and-updates/national-action-plan-combating-mdr
4 Burma, China, India, Indonesia, Kazakhstan, Nigeria, Pakistan, Philippines, South Africa, and Ukraine

A state-of-the-art GeneXpert machine installed with support from a Global Fund grant now allows medical staff at Pollsmoor Prison, South Africa, to test inmates identified as likely to have been exposed to TB. Diagnosis is now available in a matter of hours rather than weeks. This means those who have TB can be fast-tracked onto treatment and separated from other inmates, to prevent further spread of the disease. Photo by John Rae / The Global Fund

international efforts to combat MDR-TB as a public health emergency (Goal 2).

USAID, HHS/CDC, and HHS/NIH/NIAID work together to achieve the Plan's objectives. The U.S. Government released its results under the National Action Plan for Calendar Year (CY) 2016 on World TB Day 2017, highlighing the achievements made under each goal. While the interagency successfully achieved all Year One goals, additional milestones are ambitious and will require a more intensified effort to attain.

USAID continues to leverage American innovation and leadership in the effort to combat TB. Partnering with Johnson and Johnson, the Agency is addressing the growing threat of MDR-TB through a donation program for the drug SIRTURO® (bedaquiline) and support for strengthened MDR-TB services in high-burden countries.

USAID is also partnering with diagnostic companies such as Cepheid, a maker of diagnostic platforms, to expand access to rapid quality testing.

USAID's investment in TB saves lives and contributes to the U.S. Government's broader effort to end extreme poverty and promote resilient, democratic societies while advancing American security and prosperity. In step with the WHO's End TB Strategy,[5] the Agency is committed to a multi-sectoral approach. Beyond Ministries of Health, USAID also engages Ministries of Labor to reach manufacturers and garment workers, Ministries of Education to reach school-aged children, correctional agencies to reach prisoners, and the corporate sector to reach pharmaceutical and diagnostic companies. USAID uses research and innovation to develop the most effective approaches for identifying and supporting all those with TB at the earliest possible point.

5 World Health Organization End TB Strategy, http://www.who.int/tb/strategy/

GLOBAL CONTEXT

TB is a curable disease, yet it remains the leading infectious disease killer worldwide; it takes the lives of more than 4,600 people each day. The WHO 2017 Global TB Report[6] reiterates the progress made since 2000 and the importance of accelerating efforts to reduce incidence and mortality in the context of the Sustainable Development Goals (SDGs). The ambitious goal of ending TB by 2030 requires continued action and additional investments on the part of global TB stakeholders.

The U.S. Government is a leader in global TB control, having driven and funded interventions and technologies that have resulted in an estimated 53 million lives saved from 2000 - 2016.[7] Despite recent progress in reducing the incidence of and mortality from TB, millions still suffer and die each year as a result of delayed diagnosis, weak health systems, and the ongoing challenges of DR-TB and TB/HIV co-infection. In CY 2016, the most recent year for which data are available, an estimated 10.4 million people became ill[8] with TB, and 1.7 million died.[9] Finding individuals with TB and supporting them to get effective TB treatment early in their illness is critical to interrupting transmission, yet remains a major challenge. In 2016, just over 60 percent of new and relapse cases were detected and notified to NTPs, which left many "missing" cases without access to high quality services. Of those TB cases detected and started on treatment, more than 40 percent were diagnosed only by their symptoms and never received a laboratory confirmation of their diagnosis.[10]

The emergence and transmission of drug-resistant strains of TB, which are more difficult to diagnose and treat, threatens all the progress made so far. In CY 2016, an estimated 600,000 people developed a form of TB that is resistant to the most effective first-line antibiotic, rifampicin. MDR-TB has become a global problem and a challenge for NTPs in every region. Only one in five individuals with DR-TB starts treatment, and just over half of those on treatment are cured. Another major challenge is the ongoing TB/HIV epidemic, concentrated in sub-Saharan Africa. Globally, 10 percent of all TB patients with known HIV status are HIV-positive. Additionally, TB is the leading cause of death among people who are living with HIV/AIDS.

The economic and social consequences of TB diagnosis and treatment of individuals, families and communities are devastating. TB has a tremendous negative impact on development, and exacerbates poverty. A WHO systematic review concluded that, on average, TB patients and their households lose 50 percent of their annual incomes from missed work and the costs of seeking care for the illness, even where TB services are provided free-of-charge.[11] In working with partners to face the challenge, USAID is saving lives and contributing to the broader development goals of ending extreme poverty and building a healthy, resilient, and productive workforce.

6 World Health Organization 2017 Global Report, http://www.who.int/tb/publications/global_report
7 World Health Organization 2017 Global Report, http://www.who.int/tb/publications/global_report
8 World Health Organization 2017 Global Report, http://www.who.int/tb/publications/global_report
9 World Health Organization 2017 Global Report, http://www.who.int/tb/publications/global_report
10 World Health Organization 2017 Global Report, http://www.who.int/tb/publications/global_report
11 National TB Patient cost survey to monitor progress toward the target to eliminate catastrophic costs and help design social protection and Universal Health Coverage, http://www.who.int/tb/areas-of-work/tb-hiv/garciai_patient_cost_survey_rationale_and_method.pdf

USAID'S GLOBAL TUBERCULOSIS PROGRAM:

SAVING LIVES AND AIMING TO END THE TB EPIDEMIC

USAID shares a vision of a world free of TB, and works to achieve this goal through the U.S. Government's Global TB Strategy, as well as the WHO End TB Strategy. The Agency is working with partners around the world to reach every person with TB, cure those in need of treatment, and prevent the spread of disease and new infections.

MEASURING SUCCESS

In implementing the Global TB Strategy and the National Action Plan, USAID follows an ambitious results framework:

U.S. GOVERNMENT TB STRATEGY

IMPACT	**A World Free of TB**			
LONG-TERM OUTCOMES	Reduce TB incidence rate by 90% by 2035 Reduce TB mortality rate by 95% by 2035			
MEDIUM-TERM OUTCOMES	During 2015-2019 • Reduce TB incidence rate by 25% • Maintain treatment success rates > 90% • Successfully treat at least 13 million patients • Initiate treatment for 360,000 DR-TB patients • Provide ART for 100% of TB/HIV patients			MDR-TB NAP target to initiate additional 200,000 DR patients on treatment
OBJECTIVES	Improve access to high-quality TB services	Prevention of transmission and disease progression	Strengthen TB service delivery platforms	Accelerated research

USAID will contribute significantly to the WHO END TB Strategy[12] by achieving the outcomes and objectives outlined above.

USAID'S FOCUS ON RESULTS

USAID leads the U.S. Government's global TB efforts, by working through implementing partners to provide bilateral assistance in 23 countries with high burdens of TB, TB/HIV, and DR-TB – and where the Agency is able to work closely with Ministries of Health to ensure sustainable results. USAID's implementation approach focuses on ensuring access to high-quality TB services and efforts to improve the detection of all those with TB. These efforts consist of interventions at all levels of the health system, including laboratory networks, community-based screening, the introduction of new TB drugs and regimens, and policy changes.

By improving the capacity of NTPs to make high-quality TB services available, USAID achieves results

12 World Health Organization End TB Strategy, http://www.who.int/tb/strategy/

in the countries with greatest need, and among the most vulnerable populations. In FY 2016, the Agency supported training for more than 46,000 health workers to increase staffing capacity within NTPs. USAID also leverages the U.S. Government's investment in the Global Fund by providing technical assistance to support the implementation of Global Fund TB grants. In FY 2016, USAID provided this support to a total of 54 countries, including the 23 countries with bilateral funds. USAID plays a critical coordination role in each country, by working closely with Ministries of Health, the Global Fund Secretariat, other U.S. Government Department and Agencies, and technical assistance partners.

USAID also continued to make significant progress in FY 2016 towards reaching the targets set forth in the U.S. Government's Global TB Strategy and the National Action Plan. On average, TB incidence in the 23 countries with bilateral funding has decreased 20 percent since 2000, while TB mortality fell by 39 percent during that time. USAID countries increased TB case-notifications by five percent, more than the three-percent increase globally. For example, Afghanistan reported an increase of 17 percent in FY 2016, due in part to USAID's innovative urban case-finding approach. Similarly, case-notifications increased 23 percent last year in Mozambique through expanded screening in community-based programs. Overall, USAID is on track to meet the 2019 treatment targets described in the U.S. Government Global TB Strategy, successfully treating more than 5.8 million people with TB and starting 147,000 individuals with DR-TB on second-line therapy. Also, among those with TB/HIV co-infection, 88 percent began antiretroviral therapy (ART).

FY 2016 ACHIEVEMENTS FOR COUNTRIES THAT RECEIVE BILATERAL SUPPORT FOR TB FROM USAID

23	Countries with bilateral programs
54	Countries that received technical assistance[13]
3,900,000	TB cases detected
5 percent	Increase in case-notifications
88 percent	Treatment success rate[14]
77,000	Individuals with DR-TB started on appropriate treatment[15]
23,000,000	Xpert cartridges procured under concessional pricing (cumulative)
56	Countries accessed the Bedaquiline Donation Program (cumulative)
46,000	Health workers trained
18	Countries completed drug-resistance surveys (cumulative)
14	Countries completed TB prevalence surveys (cumulative)
5	Research studies supported focused on new treatment regimens

13 USAID provided technical assistance in all 23 countries that operate bilateral programs, as well as in an additional 31 countries.
14 The TB treatment-success rate for FY 2016 is affected by increases in TB notification by private-sector providers in India in 2015 that were unaccounted for in the country's analysis of treatment outcomes in 2016. Using the data provided to the WHO with these additional notified cases, the treatment success rate for India is 72 percent. For this report, the actual number of TB patients for whom treatment outcomes were reported in India helped determine the overall treatment-success rate in USAID TB priority countries, which yields a result of 88 percent. In subsequent years, all notified patients in the treatment cohort for all priority countries will contribute to the overall treatment success rate.
15 Since 2014, USAID has calculated the total number of DR-TB patients who initiated second-line treatment by adding together three values reported to the WHO on an annual basis: Number of confirmed rifampicin-resistant (RR)/MDR-TB patients who started treatment (individuals with a laboratory test result to indicate either RR or MDR-TB), Number of unconfirmed RR/MDR-TB patients who started treatment (individuals without laboratory test result, but clinical diagnosis of RR or MDR-TB) and the number of confirmed XDR-TB patients who started treatment (patients with a laboratory test results to indicate XDR-TB). Currently there is variation among NTPs on how they report confirmed XDR-TB cases: as either separate from or included in the overall count of RR/MDR-TB cases. To address the situation, we will work with NTPs and the WHO to ensure the most-accurate reporting on this indicator in coming years.

A couple in Zimbabwe were all smiles after showing no signs of TB during a targeted screening for active TB. (Photo by Paidamoyo Magaya)

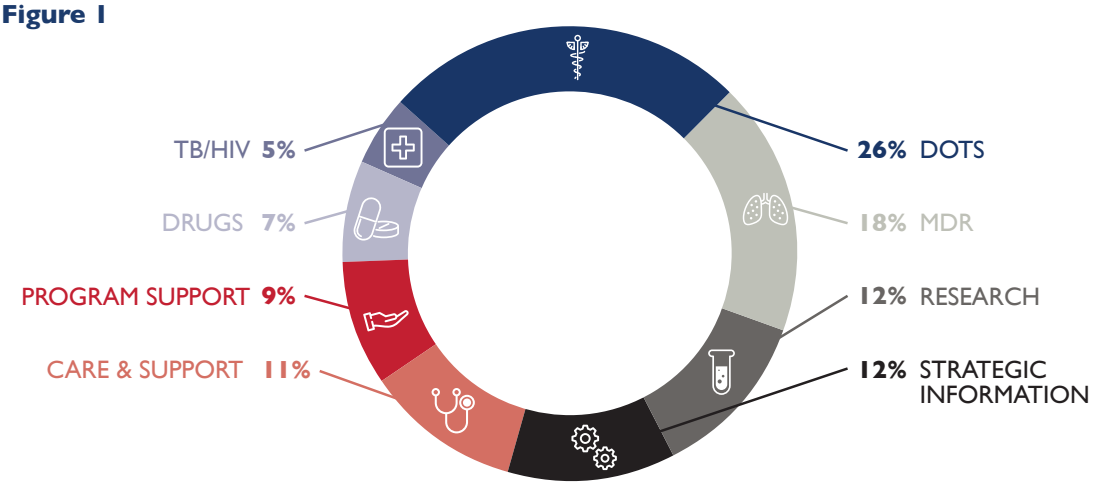
During FY 2016, USAID continued to focus its global TB program on four key technical areas vital to addressing the global TB epidemic:

- Improving access to high-quality, patient-centered TB, DR-TB and TB/HIV services;
- Preventing TB transmission and disease progression;
- Strengthening TB service delivery platforms; and
- Accelerating research and innovation.

A total of $242 million, appropriated through USAID's Global Health Programs (GHP) and Economic Support Fund accounts, supported the FY 2016 TB programming as follows:

- The diagnosis, treatment, care, and support of patients with TB, MDR-TB, and TB/HIV (67 percent);
- TB-related research (12 percent);
- Governance, finance, and strategic information (12 percent); and
- Program support (nine percent).

Figure 1



IMPROVING ACCESS TO HIGH-QUALITY, PATIENT-CENTERED SERVICES FOR TB, DR-TB, AND TB/HIV CO-INFECTION

With USAID funding, countries with high burdens of TB are expanding access to high-quality TB services, including the diagnosis, treatment, care, and prevention of TB and MDR-TB. In FY 2016, bilateral USAID TB financing helped detect and initiate on treatment more than 3.9 million TB cases in 23 countries. In the same timeframe, 88 percent of these people completed treatment successfully.

USAID continues to work with country partners to expand access to TB services by improving enabling environments, strengthening diagnostic networks, and supporting patient-centered TB care.

ENABLING ENVIRONMENTS

People who are suffering from TB face many challenges in accessing services – including cost, distance, stigma, and discrimination. In FY 2016, USAID worked with country partners to create positive, enabling environments; support efforts to increase the availability and affordability of TB services in both the public and private sectors; and combat TB-related stigma and discrimination, particularly in areas that serve high-risk populations.

Buddy "BEAT TB" Launch at Brooklyn Chest Hospital in Cape Town, South Africa (Photo by USAID)

BUDDY BEAT TB

USAID supports the efforts of the **South African** Government to reduce TB infections, encourage the use of health services, and improve TB adherence to TB treatment. "Buddy Beat TB" is a USAID initiative created to provide much-needed support to children with TB hospitalized for treatment. Children often become scared when their routines are disrupted and they are separated from their families. A friendly TB-fighting mascot, Buddy, educates pediatric patients to encourage them to take TB treatment, and ease their anxiety during hospital stays.

With Buddy, children can express their worries and feelings in safe and comfortable spaces. They also learn about their health, with an emphasis on the importance of completing treatment so they can be cured and become healthy again. Also, each child gets a small stuffed version of Buddy, which they can use to continue role-playing the process of treatment and care, and feel supported in the process.

Co-created by USAID, the Western Cape Department of Health (through Brewelskloof Hospital), and the Gauteng Department of Health (through Sizwe Tropical Diseases Hospital), Buddy joins a list of other local characters and performers who entertain young people with serious conditions in hospitals and hospices, by using fun as a therapeutic tool.

The Buddy initiative is being piloted in several hospitals with pediatric-TB wings: Sizwe Hospital (Gauteng Province,) King Dinuzulu Hospital (KwaZulu-Natal Province), and Brewelskloof and Brooklyn Chest hospitals (both in Western Cape Province). Once tested and refined, the intervention approach will be rolled out to all hospitals that treat pediatric patients in South Africa.

Burma is making progress mobilizing the community to support individuals with MDR-TB. USAID funded development of a network of community volunteers integrated into the health care system to support individuals on MDR-TB treatment. With USAID financing, Burma achieved an 87-percent MDR-TB treatment-success rate, significantly higher than the global average of 54 percent.

PATIENT-CENTERED CARE

Prevention practices, diagnostic processes, and treatment regimens for TB are highly effective when correctly followed. Unfortunately, strict adherence to treatment for TB and MDR-TB is extremely challenging for most people, especially those who are living in poverty, as these regimens are long, difficult, expensive, and toxic. To improve TB outcomes, USAID works with NTPs to develop and implement patient-centered TB services. As defined by the U.S. Institute of Medicine, patient-centered care is "respectful and responsive to individual patient preferences, needs, and values, and [ensures] that patient values guide all clinical decisions."[16]

Through an in-depth assessment and program improvements, the number of MDR-TB patients who stopped treatment in the four USAID-supported regions of **Ukraine** fell to two percent, significantly lower than the national average. The Ukrainian NTP, in consultation with USAID, developed region-specific action plans that scale-up the program improvements to other regions by increasing efforts to provide medical, social, and psychological support.

In an innovative approach to locating patients in **South Africa**, USAID uses the mobile health application *ConnecTB* to pinpoint, or "geo-map," patient locations. The Agency trains community-based workers to use *ConnecTB* and equips them with mobile devices. Each patient on the list can be found by location, type of TB, gender, and age through the *ConnecTB* application, uploaded in real time. As *ConnecTB* captures the geo-locations of TB patients, an interactive map also identifies high-burden TB clusters — geographical areas where many patients are living in close proximity — to inform targeted interventions. Identifying, screening, and testing the close contacts of TB patients in such areas can assist in finding undetected TB cases earlier, which can save many lives.

DIAGNOSTIC NETWORKS

Health providers miss an estimated one out of every three people who are suffering from TB. Many never receive the proper diagnosis or treatment, while others get a diagnosis but never register for treatment or report to the NTP. Many die from TB, and many others endure a long and difficult illness. Each person with active TB who is not on treatment infects an average of 10-15 people each year. Reaching these "missing" TB cases is vital from both a humanitarian and a public health perspective. To address this problem, USAID supports the development of comprehensive diagnostic networks that include the full screening, diagnosis, care, and treatment cascade.

The overwhelming majority of "missing" TB cases occurs in 10 countries: Indonesia, India, Nigeria, Pakistan, Bangladesh, South Africa, Democratic Republic of the Congo, People's Republic of China, Tanzania, and Mozambique. In FY 2016, USAID reduced the number of "missing" TB cases by 10 percent overall in these priority countries. USAID works with the Global Laboratory Initiative (GLI), NTPs, and national TB reference laboratories to build the capacity of country-specific diagnostic networks that use global policies and best practices. In addition, new evidence gained in USAID countries continues to inform and improve global policies and practices.

Countries in sub-Saharan Africa face significant challenges in establishing and implementing high-quality TB diagnostic networks, given relatively weak infrastructures and health systems that are slow to adopt newer TB-testing technologies. USAID was instrumental in developing and leading the GLI in Africa to address this regional challenge. The group focuses on finding regional-specific solutions to improve case detection within the constraints of

16 Crossing the Quality Chasm: A New Health System for the 21st Century, http://www.nationalacademies.org/hmd/~/media/Files/Report%20Files/2001/Crossing-the-Quality-Chasm/Quality%20Chasm%202001%20%20report%20brief.pdf

existing health and laboratory systems.

In **Tanzania**, USAID is funding the use of motorcycles for transporting sputum[17] samples from lower-level health facilities to Xpert sites in four priority Districts. Through these efforts, Xpert technology identified 10 percent more of the "missed" cases than conventional diagnostic methods.

In FY 2016, a system to transport specimens by temperature-controlled vehicles financed by USAID became operational in **Ethiopia**. The introduction of cold-chain sputum-transportation systems in Amhara, Oromia, and Addis Ababa has improved significantly the average sputum delivery time — reducing it from five to seven days to one to two days within just a few months. It has also resulted in improvements in the integrity of specimens and timely specimen-processing by culture labs, as well as a decrease in culture contamination caused by the poor storage of specimens and delivery delays.

17 Sputum is a combination of mucus and other liquids expelled from the lungs during coughing.

SOCIAL SUPPORT IN BANGLADESH

Mohammed Rasel left his village to work in a Dhaka garment factory two years after his father died. Mohammed was proud of being able to support his family, but he fell ill. After an initial misdiagnosis, doctors confirmed Mohammed had TB, and he received six months of appropriate treatment. Although he successfully completed his regimen, the disease later returned in a form resistant to first-line drugs. Mohammed spent seven months in the MDR-TB ward of the local chest-disease hospital. The treatment was free to Mohammed, but his family struggled to afford necessities such as food while he was unable to work.

To ease such financial burdens on patients during treatment, and to increase the chance of success, USAID supports the **Bangladesh** NTP in providing "social support" to TB patients. The most visible part of this support is an $18-per-month subsidy, sent via mobile money to the patient's phone. As an incentive to provide regular services, the patient's Directly Observed Treatment (DOT) provider is also eligible to receive a subsidy.

Following treatment, Mohammed was back home and feeling strong. He received daily visits from his DOT provider, and found work as a salesman in a clothing and fabric shop. With the help of his DOT provider, Mohammed also explained the disease and treatment to his co-workers, who accepted him without reservation.

Mohammed said of the program, "Really it would not be possible for my family to maintain the treatment procedure without the support."

Rasel at his new place of work after successful treatment (Photo by Challenge TB)

Close to 210,000 Bangladeshis received a diagnosis of TB in 2015; nearly 900 of them had MDR-TB. USAID provides technical assistance and capacity-building to the NTP and focuses its activities in two of the country's eight Divisions, providing support to the Bangladeshi garment factories where TB can more easily spread because of close working conditions and poor ventilation. USAID is supporting NTP projects to organize TB clinics near clothing factories to reach workers with TB education and screening programs. The project also emphasizes to supervisors that, consistent with national law, people with TB should not lose their jobs while being treated for the disease.

PREVENTING THE TRANSMISSION OF TB AND PROGRESSION OF THE DISEASE

USAID is working with country partners to prevent both the transmission of TB among individuals and its progression from latent infection to active TB disease which is critical to stopping the global epidemic. As those with latent TB infection (LTBI) are not contagious, and active TB patients on effective therapy quickly become non-infectious, screening and early treatment are key to stopping the spread of TB. The under-detection and under-diagnosis of TB and MDR-TB significantly hinder global efforts to limit the transmission of TB.

The best way to prevent the transmission of TB and the progression of the disease is through early detection and treatment. While people with LTBI are not ill and cannot transmit TB, they are at risk of developing active TB disease, which is symptomatic and transmissible. Since an estimated two billion people in the world have LTBI, the global health security risk is significant. Individuals, who are malnourished, live in crowded conditions, or whose immune systems are compromised by medical conditions such as HIV infection and diabetes, are at the highest risk of developing active TB.

People with active TB who do not receive appropriate diagnosis and treatment pose serious threats to close contacts, such as family, friends, and colleagues. Those who have LTBI contribute to the global TB epidemic as the infection can progress to disease, especially in the subset with weakened immune systems or other vulnerable conditions.

USAID is working to address this by improving screening and diagnosis of high-risk individuals who might have undetected and untreated TB, or inadequately treated MDR-TB, as part of the U.S. Government's strategy for TB prevention efforts:

- Education and targeted screening of high-risk individuals and groups;
- Rapid diagnosis and treatment of TB and MDR-TB patients;
- Infection control measures in high risk settings such as clinics and prisons; and
- The identification and management of LTBI.

In **Afghanistan**, USAID is funding the NTP and front-line health care staff to conduct TB contact investigation (CI)[18] in urban Directly Observed Treatment Short-Course (DOTS) sites in Kabul and other four Provinces. The USAID-financed program identified 3,739 household members as contacts, all of whom received screening for TB. Sixteen percent of household contacts were found to be presumptive for TB and nine percent received a diagnosis with TB and began treatment; almost 17 percent of the family members were children under the age of five who received isoniazid preventive therapy (IPT) because they were direct contacts of a TB case.

Indonesia is among several high burden countries shifting toward a decentralized health system, which can make finding and tracking TB cases more difficult. USAID developed the first comprehensive District-specific approach, introduced and rolled out in 16 Districts in six Provinces over the past year, to cover a significant proportion of the estimated TB in the country. The approach engages national, Provincial, and District-level stakeholders to plan strategically for implementation that addresses the needs of each District's specific environment. The new approach has facilitated planning, forged District stewardship, and mobilized local resources for comprehensive District TB-control plans, with a focus on capacity-building and sustainability. USAID estimates this District-based approach will contribute to a 17-percent increase in case detection over the next three years. Furthermore, the approach is standardized and systematic, and additional Districts can replicate it in Indonesia, and other countries that are moving toward decentralization can adapt this approach.

18 CI is a series of interventions that systematically and actively trace and screen people who have had close contact with patients with infectious TB; these close contacts are at high risk for infection.

A healthy child under 5 who received IPT during contact investigation, Cambodia (Photo by Ngo Menghak)

USAID funded the creation of the "FAST" strategy for Finding, Actively Separating, and Treating TB as a focused approach to TB infection-control in health care facilities. Time to diagnosis is often lengthy in many countries, as it begins at the point a presumptive TB case presents to a health care worker, and runs through the time when the diagnostic test result is provided to the patient. The time to diagnosis can be quite lengthy depending on the type and location and of the facility where the presumptive TB case presents. Not all facilities are fully equipped with appropriate diagnostic equipment, and the nearest laboratory can be quite a distance away, which leads to delays in diagnosis that span several days to several weeks.

In **Nigeria**, USAID implemented the FAST strategy in 15 facilities located in three of the highest-burden States, which led to a reduction in the time to diagnosis. The frequency of diagnoses that spanned less than two days increased from 19 to 85 percent in Lagos State, from 48 to 80 percent in Benue State, and from 50 to 67 percent in Akwa Ibom State.

STRENGTHENING SERVICE DELIVERY PLATFORMS FOR TB

In the countries where USAID is working, national or private health systems and facilities typically provide TB services. Many countries with high burdens of TB, MDR-TB, and TB-HIV co-infection have relatively weak health systems, which reduces their ability to provide high-quality TB services, and contributes to the development and spread of MDR-TB. USAID funds the implementation of national TB strategic plans and programs, and works to build capacity at all levels of the TB service-delivery system.

In **Uzbekistan**, USAID programming is improving the use of evidence-based practices among care providers at the community and facility levels. As one measurement of the quality of TB care within a facility, USAID developed a standardized testing tool used before and after the introduction of a quality-improvement intervention.

Health providers' average score on the test rose from 38 percent on pre-test, to 81 percent on post-test. The average score of non-health providers improved from 54 percent on pre-test to 92 percent on post-test. Increased awareness and use of quality TB and MDR-TB practices will result in better care and health outcomes.

The **Philippines** is one of a few countries in the world that has introduced new anti-TB medicines and novel regimens to shorten the duration of treatment, improve patients' adherence, and increase treatment-success rates. To monitor patient safety, and to ensure and evaluate the proper management of adverse drug reactions, a pharmacovigilance system is needed. USAID financed the Philippine Food and Drug Administration and the NTP to adopt a web-based Pharmacovigilance Monitoring System (PViMS) to simplify the collection and analysis of data from patients who are receiving new anti-TB drugs and regimens. As a result, treatment is now safer and better-quality, which should result in improved treatment-success rates, and reduce the number of debilitating side effects.

An MDR-TB with a pre-XDR-TB patient, Indonesia (Photo by Trishanty Rondonuwu)

WORKING WITH THE CORPORATE SECTOR

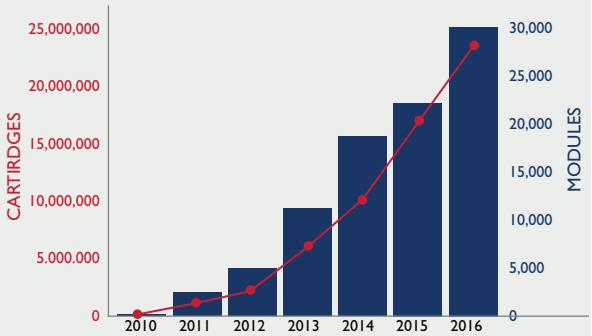
USAID is forging partnerships with the corporate sector to speed the roll-out of new technologies, including the introduction and scale-up of new drugs and regimens, new diagnostics, and new treatment approaches.

For the first time in decades, two new drugs are available for TB treatment, and USAID is using its platform to partner with manufacturers to improve access to these drugs for those most in need. Through a public-private partnership with Johnson & Johnson, USAID is deploying a four-year, $30 million donation of the drug SIRTURO® (bedaquiline) to address the growing threat of MDR-TB. To maximize the use of bedaquiline to treat MDR-TB, USAID has established a system through which all countries eligible for Global Fund grants can request both the drug and technical assistance. As a result, 56 countries have used bedaquiline in combination with existing second-line drugs. This provides new hope for MDR-TB patients who have limited treatment options, particularly those who experience debilitating side effects, such as hearing loss. USAID also has joined with Otsuka Pharmaceutical to help improve access to a second new TB drug, delamanid. USAID has included both of these drugs in its USAID-supported stockpile to ensure eligible countries have access to the drugs.

In addition, USAID has worked with other U.S. Government Departments, Agencies, and partners to support improved access to Xpert, a diagnostic platform developed by American manufacturer Cepheid. The results have been game-changing in the diagnosis of MDR-TB. Over the past five years, the number of testing kits available worldwide has increased ten-fold, the technology is now available in as many as 130 countries, and negotiations to establish concessional prices has resulted in a savings of $100 million (See Figure 2).

Overall, the U.S. Government is playing a pivotal role in developing mechanisms that have improved TB diagnostic networks around the world — from efforts to develop specimen-transportation systems, negotiate concessional global pricing for Xpert cartridges, and support the rapid scale-up of new technology.

Figure 2
Cumulative number of GeneXpert instrument modules and Xpert MTB/RIF cartridges procured under concessional pricing



As of 31 December 2016, a total of 6,659 GeneXpert instrumemts (comprising 29,865 modules) and 23,140,350 Xpert MTB/RIF cartridges had been procured in the public sector in 130 of the 145 countries eligible for concessional pricing. *Data: Cepheid*

ENGAGING THE PRIVATE HEALTH SECTOR

USAID partners to increase the engagement of communities and the private sector in the development and delivery of TB services. Overall, the private health sector is an important component of health services as patients often seek health care services from individual or institution-based private health-care providers. In FY 2016, the USAID-funded Private Health-Sector project in **Ethiopia** established a new public-private platform within the Federal Ministry of Health to improve the provision of TB care. Through USAID technical support, facility standards were finalized and health facility inspectors trained, and a learning community for private health businesses was created. Also, an additional 35 private health facilities were engaged as DOTS providers. Across all private DOTS facilities enlisted to date, more than 9,000 individuals received a diagnosis of TB and referral for treatment, and private facilities retained and treated 1,517 TB cases.

MANAGEMENT OF DRUG AND COMMODITIES

For TB programs to succeed, patients must have reliable access to affordable, quality-assured, and effective TB medicines and diagnostic commodities. USAID helps countries with high TB burdens forecast their need for TB drugs and commodities and strengthen their procurement and distribution systems.

USAID continues to be a major supporter of the Global Drug Facility (GDF). As the largest supplier of TB medicines and diagnostics, GDF helps ensure the availability of stable, affordable supplies of quality-assured first-line and second-line TB drugs.

USAID also supports the manufacturers of TB drugs to ensure products are internationally quality-assured. USAID ensures the global supply of TB medicines by improving the market for medicines with limited manufacturers. As a result of this work and the Agency's support of the GDF, the cost of MDR-TB treatment regimens has declined nearly 50 percent since 2012, while the price of some second-line drugs has fallen by 70 percent. Through these efforts, USAID is able to reach more patients, and provide much-needed technical assistance to NTPs and projects.

Essential to patient adherence, as well as proper treatment, are an uninterrupted drug supply and drug-management system. In **Ethiopia**, USAID worked in collaboration with the Tigray Regional Health Office and the National Pharmaceuticals Fund and Supplies Agency to develop forecasting and procurement systems for second–line drugs. This system helps to prevent stock-outs between the MDR-TB treatment initiating centers and relevant stakeholders. Such interventions have helped avoid potential critical shortages of second-line drugs in regional DR-TB treatment initiation centers in Ethiopia.

MONITORING AND EVALUATION

USAID provides global technical leadership and country-level support to improve the collection, analysis, and use of TB data to inform policies and programs. Timely, accurate, and complete data are required for NTPs to make strategic decisions about the prioritization of services. For example, effective planning and intervention strategies require data on the optimal placement of new diagnosis tools, drugs, and regimens. USAID provides technical assistance to help high-burden countries, including Bangladesh, Kenya, and the Philippines, implement TB-prevalence surveys and analyze the results. India also completed a drug-resistance survey after several years of specimen-collection, testing, and data analysis. In Mozambique, South Africa, and Vietnam, planning and pilot activities are underway to launch surveys in the coming year. Through these activities, USAID is funding research studies to improve overall reporting for TB programs. Additionally, in FY 2016, USAID supported a series of data-analysis training workshops aimed at improving the use of sub-national data for TB programming.

BEDAQUILINE DONATION PROGRAM

The Bedaquiline Donation Program is an innovative public-private partnership between USAID and Janssen Therapeutics of Johnson & Johnson.

The donation of the bedaquiline, combined with technical support provided by USAID, will enable patients in nearly 100 countries to have access to this life-saving medication for MDR-TB.

Bedaquiline arrives for an XDR-TB patient for whom it is the last hope, Karabalta MDR-TB hospital, Kyrgyzstan. (Photo by Nurgulia Kulbekova)

ACCELERATING RESEARCH AND INNOVATION

USAID has a long history of supporting late-stage research studies that have informed new policies and innovations. In FY 2016, USAID's support for TB research concentrated on three priority areas: improving the treatment of drug-sensitive and MDR-TB; preventing the development and ongoing transmission of TB; and building capacity to conduct operational research from improvements in the performance of TB programs and the management of TB/HIV.

IMPROVING THE TREATMENT OF DRUG-SENSITIVE AND MDR-TB

An individual with MDR-TB faces two years of treatment; requires nearly daily visits to a health provider; receives 250 injections; and takes 15,000 pills. Based on the assumptions that shorter treatment with well-tolerated drugs will lead to increased treatment adherence, improved treatment outcomes, and eventually reduced transmission, USAID is funding clinical trials to determine the efficacy and safety of shorter regimens for the treatment of MDR-TB. The "Standardized Treatment Regimen of Anti-Tuberculosis Drugs for Patients with

MDR-TB," (STREAM) study is a clinical trial to confirm the efficacy and safety of shorter TB-treatment regimens. Final patient follow-up was scheduled for December 2017, and trial results will be available in early 2018.

A second phase of the STREAM study now underway aims to evaluate the efficacy and safety of a shorter treatment regimen that contains the TB drug bedaquiline, newly-approved by the Food and Drug Administration (FDA). USAID is also financing the evaluation of several combination-treatment regimens that aim to shorten TB treatment and offer additional options for patients with XDR-TB — those who show additional resistance to injectables and/or fluoroquinolones. For example, the Nix-TB study is evaluating the combination of pretomanid, bedaquiline, and linezolid for the treatment of MDR-TB in patients with XDR-TB. Early results show that 74 percent of patients were culture-negative after eight weeks of treatment.

Beyond investments in clinical studies, USAID is also financing community-engagement activities around clinical-trial sites. Engaging communities is an important element for the successful implementation of research activities, and the translation of research findings into policies and practices. USAID funds community engagement activities for both the STREAM and Nix-TB studies.

PREVENTING THE DEVELOPMENT AND ONGOING TRANSMISSION OF TB

An estimated one-third of the world's population has LTBI; these individuals are at risk for developing active TB disease at some point in the future. Immunocompromised individuals like those living with HIV are at a particularly high risk of developing TB disease from a latent infection. Modeling studies have demonstrated that treating individuals with LTBI is a strategy that could lead to a rapid decline in TB incidence. New developments suggest that the treatment of LTBI with a simplified, once-per-week combination (termed 3HP, since it lasts for three months) of rifapentine (P) and isoniazid (H) for 12 weeks is as effective as the conventional six-to nine-month daily isoniazid regimen. USAID is funding a study in South Africa, Ethiopia, and Mozambique to compare the effectiveness of a single course of 3HP to two annual rounds of 3HP, with the aim of showing sustained reduction in the incidence of TB in HIV-infected individuals. Enrollment is ongoing.

In 2016, USAID also led the design and development of protocols for TB-transmission studies in Kyrgyzstan and Moldova. Using advanced innovative technology such as Whole Genome Sequencing (WGS), the studies will assess the transmission of TB in hospital and community settings and evaluate the effectiveness of infection measures for prevention and control. Mapping transmission "hot spots" will help identify areas of high transmission and speed the design of appropriate response interventions. The research will also support the development of national capacities in employing genotyping methods and incorporating them into routine program operations.

BUILD CAPACITY TO CONDUCT OPERATIONAL RESEARCH FOR IMPROVING THE PERFORMANCE OF TB PROGRAMS AND THE MANAGEMENT OF TB-HIV CO-INFECTION

In conjunction with the Peruvian Ministry of Health's NTPs, USAID funded an operational research training course in Peru, and another course with the Department of Medical Research in the Ministry of Health in Burma. These courses aimed to support health professionals who are working to conduct independent operational research, and to aid them in translating findings into improved policy and practice. USAID also financed the National Research Advisory Committee in Ethiopia to develop a country national TB-research plan.

A community health worker and specimen fixer, travels by motorbike from his home to remote villages hours away to find, test, and treat those suffering from tuberculosis. Here he suggests these women get tested and guides them through the process, Tanzania. (Photo by Nichole Sobecki)

CONCLUSION

As the leading bilateral donor for TB, USAID is committed to accelerating progress toward ending the disease. The Agency continues to mobilize increased commitments and funding from high-burden countries and other donors in support of this goal. In 2018, a United Nations High-Level Meeting on TB will provide another opportunity to support these objectives. It is critical we continue to maximize existing resources and leverage additional sources to build self-reliant TB responses.

Because of the mode of TB transmission and the dynamics of the drug-resistance epidemic, the disease is an emerging health-security risk. The U.S. Government's investments of $242 million in FY 2016 bilateral funds were focused primarily in 23 countries – those with high burdens of TB, MDR-TB, and TB/HIV co-infection. Working in collaboration with each country's Ministry of Health, USAID achieved the following results in FY 2016: 3.9 million TB cases detected; 88 percent treatment success; and 77,000 drug-resistant (DR) TB patients started on appropriate treatment. USAID's FY 2016 activities contributed to an estimated 53 million lives[19] saved from 2000-2016.

The Agency has been successfully implementing the U.S. Government's Global TB Strategy and looks forward to continuing to build upon these achievements. Among USAID's top priorities are a continued emphasis on building a strong evidence-base, and an ongoing commitment to supporting innovations in research and policy development.

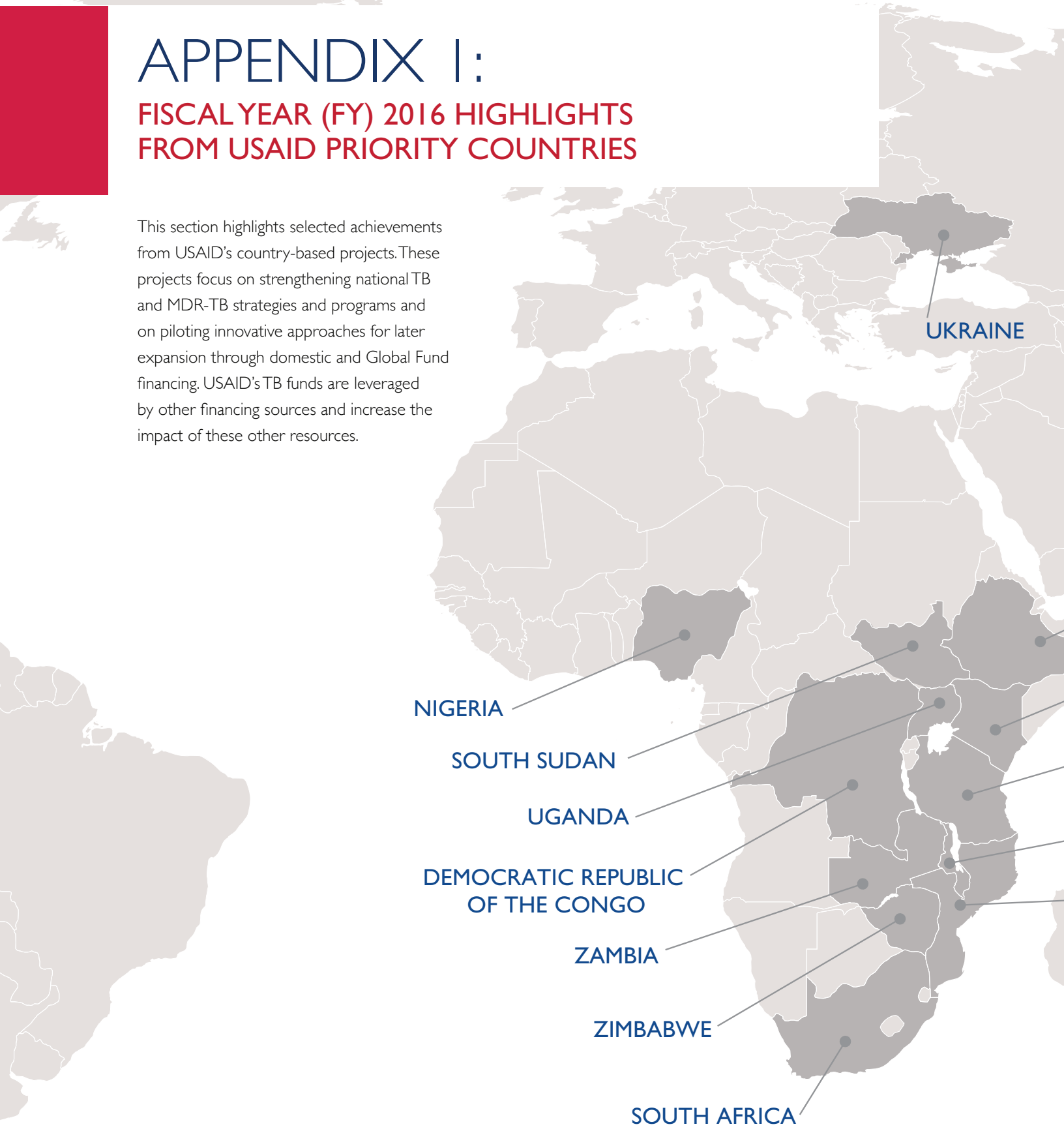
Administrator Mark Green, confirmed by the U.S. Senate in August 2017, sees controlling TB as an important milestone on countries' journey to self-reliance, and will be seeking opportunities to raise private capital to match USAID's investments.

19 World Health Organization 2017 Global Report, http://www.who.int/tb/publications/global_report

APPENDIX 1:

FISCAL YEAR (FY) 2016 HIGHLIGHTS FROM USAID PRIORITY COUNTRIES

This section highlights selected achievements from USAID's country-based projects. These projects focus on strengthening national TB and MDR-TB strategies and programs and on piloting innovative approaches for later expansion through domestic and Global Fund financing. USAID's TB funds are leveraged by other financing sources and increase the impact of these other resources.




KYRGYZ REPUBLIC
UZBEKISTAN
TAJIKISTAN
AFGHANISTAN
INDIA
BANGLADESH
BURMA
CAMBODIA
PHILIPPINES
ETHIOPIA
INDONESIA
KENYA
TANZANIA
MALAWI
MOZAMBIQUE

AFGHANISTAN

In FY 2016, USAID's partners maintained implementation of DOTS in the densely populated cities of Kabul, Mazar, Herat, Jalalabad, and Kandahar. During the reporting period, USAID helped the NTP expand DOTS to 10 additional public and private health facilities; by the end of June 2016, 166 urban DOTS health facilities were operating in Afghanistan. USAID trained 159 health workers, including nurses, doctors, and laboratory technicians, to follow standard operating procedures for finding and treating TB cases, including laboratory assessment and the repair and maintenance of microscopes. The expansion in services led to a 17-percent increase in case-notification.

BANGLADESH

USAID's installment of GxAlert[20] at eight out of a total of 39 Xpert sites has contributed to a seven-percent increase in case-notifications this year; national roll out to all sites is underway. The Agency also continued to provide maintenance funding for Xpert machines, to ensure all of them remain functional to provide rapid and accurate diagnosis of DR-TB.

BURMA

USAID financed Burma's NTP to develop and launch its TB National Strategic Plan (2016-2020). At the ceremony to introduce the Plan, the Minister of Health noted Burma's high-level commitment for the prevention and care of TB cases, and stressed mandatory notification of TB diagnoses and the role of research. Nationwide TV channels broadcast the event, which increased public awareness and media participation in activities to prevent, diagnose, and treat the disease.

CAMBODIA

To ensure the completeness and accuracy of recording and reporting of TB data at health centers, USAID implemented an internal data-quality-improvement process, which used a standard checklist to evaluate TB data records. Cambodian NTP District TB supervisors and USAID staff visited 65 health centers in four Districts, and observed progress compared to previous quarters. One such improvement was the completeness of chest X-ray results for smear-negative TB patients, which showed an increase from 24 to 77 percent.

DEMOCRATIC REPUBLIC OF CONGO (DRC)

USAID has focused its support in the DRC on finding cases of TB and MDR-TB. Activities implemented in the eight USAID-supported Provinces resulted in an increase in the number of TB and DR-TB cases detected through active case-finding and a sputum-transportation system. The Agency activities also focused on improving the treatment enrollment of MDR-TB patients through the implementation of the short-course regimen and the appropriate use of new drugs. These interventions resulted in a 10-percent increase in notifications.

ETHIOPIA

In late August 2016, Ethiopia introduced two new drugs, bedaquiline and delamanid, for the treatment of patients with pre-XDR-TB and XDR-TB. Two treatment-initiating centers (Bishoftu and ALERT hospitals) implemented the initial phase, with a plan for further expansion in the near future. USAID funded the development of a national implementation plan, guidelines, and training materials; procured treatment-monitoring equipment (e.g., audiometers) and nutritional support for patients; and conducted clinical review meetings and training sessions for both clinical and culture requirements. During the reporting period, 10 patients started treatment with the new anti-TB drugs, and have been doing well.

20 GxAlert was designed for NTPs and other relevant stakeholders to set up various alerts to capitalize on the data received from Xpert systems via SMS text message, email, or link to an online dashboard.

INDIA

During the reporting period, nearly 25,000 presumptive pediatric TB and DR-TB patients underwent testing in Chennai, Delhi, Hyderabad, and Kolkata. Of the total tested, seven percent received a diagnosis of TB through the use of Xpert, 162 of whom had had DR-TB. In addition, more than half of the children were diagnosed by successfully testing non-sputum specimens with Xpert. For 95 percent of the patients enrolled, specimens were transported and tested, and results reported to providers within 24 hours of collection. The Agency is exploring how further investments in TB could leverage financing from the private sector and philanthropists.

INDONESIA

USAID supported Indonesia in its efforts to adequately place, install, train, and troubleshoot additional Xpert machines, which brought the total reach from 41 to 82 sites across 33 Provinces. This increase is the beginning of a shift to a more-appropriate use of Xpert, to allow for the screening and diagnosis of a larger number of MDR-TB cases. In addition, the Agency assisted two regional laboratories in obtaining certification to determine if patients' strains of TB are susceptible to second-line drugs, which bring the total number of certified labs in Indonesia to seven.

KENYA

USAID funded the National Tuberculosis, Leprosy, and Lung Disease Program to develop a national hub for TB ECHO, a novel and innovative knowledge-transfer solution. TB ECHO is a video-conferencing platform that enables clinicians in peripheral health facilities to gain expertise from experts in national and regional centers. Since the treatment of MDR-TB is very complicated, this provides additional support to clinicians and allows patients to undergo their treatment closer to home. TB ECHO has reached more than 100 County Tuberculosis and Leprosy Coordinators, as well as Sub-County tuberculosis and leprosy coordinators, and national program staff. The platform has also been used for laboratory quality improvement, and its use has saved time and money.

KYRGYZ REPUBLIC

USAID funded the Government of the Kyrgyz Republic to develop and implement an action plan to improve TB care is provided. This resulted in a significant restructuring of the Kyrgyz TB hospital network to provide quality services efficiently, expand outpatient treatment, and optimize laboratory services. As a result, the number of TB beds in hospitals is expected to decrease 40 percent by 2020, and an additional 20 percent by 2026, which will translate to a 10-percent annual reduction in unnecessary hospitalizations and an estimated cost savings of $2.3 million. In addition, USAID support helped ensure that 100 percent of the country's diagnosed MDR-TB patients began treatment. Finally, the Kyrgyz Republic was one of the first nations to adopt the WHO's recommendations on new drugs and shorter treatment regimen, which 156 patients initiated through USAID support in FY 2016.

MALAWI

USAID's multi-sectoral approach to TB in Malawi involved working with the Ministry of Internal Affairs to provide quality TB services to prisoners through an initiative that trained 90 prison staff from six prisons. As a follow up, the NTP and USAID conducted TB-IC assessments, and prepared TB-IC plans. USAID supported mass screenings at three of these prisons, and screened a total of 3,007 prisoners and 27 prison staff. In total, 37 percent of the prisoners, and 44 percent of the prison staff, tested positive for TB.

MOZAMBIQUE

Of all the USAID-supported countries, Mozambique had the largest increase in case-notifications last year: 23 percent. The Agency funded the NTP to implement the Xpert testing algorithm in all USAID-supported Districts. Building on this successful work, supervisory visits showed that local health professionals were familiar with how to use Xpert. USAID saw an increase in the demand for Xpert testing; the Sofala Province alone saw a 43-percent increase in Xpert testing compared to the previous quarter. The Agency is also financing the roll out of GxAlert, which makes results available to clinicians by text message and helps ensure the early treatment of confirmed cases.

NIGERIA

While Nigeria has struggled with a low case-notification rate over the past several years, USAID's activities contributed to a 12-percent increase in notifications in FY 2016. The Agency supported the scale-up of key case-detection activities, including the tracing and investigation of patients' contacts, the transport of sputum, and implementation of a system to retrieve laboratory-results in 12 States. A total of 9,860 sputum samples were transported; of the 98 percent tested, 11 percent were positive, including five percent found to have drug-resistant strains. Strengthening diagnostic networks including sputum transport and results retrieval is a critical element of ending the TB epidemic.

PHILIPPINES

In the Philippines, USAID focused its investments on identifying more people with the disease and helping them access treatment. Since 2012, USAID has worked to detect more TB cases accurately by engaging more than 370 private hospitals, 4,000 private pharmacies, and 200 prisons, as well as employees in different workplaces, indigenous peoples, and religious leaders. Using intensified case-finding, USAID funded screenings for 8,000 jail inmates and 2,000 orphans and malnourished children, and delivered TB-outreach services to 8,000 indigenous people in 2016. As a result of these efforts, USAID contributed to a 20-percent increase in case-notifications.

SOUTH AFRICA

USAID funded innovative interventions to address childhood TB in South Africa, such as creating TB advocates in schools as a sustainable method of identifying TB in communities. Programming reached 83,396 children, 85 percent of whom were screened for TB. Seven percent of tests were presumptive, and two percent of those were given a diagnosis of TB and started on TB treatment. The program also helped at-risk family members; 11 percent were diagnosed with TB and started treatment. In addition, the program has identified six high-burden DR-TB Districts in which to implement the DR-TB model of care to improve patients' adherence to treatment.

SOUTH SUDAN

Despite the difficult environment in South Sudan, USAID funded the country in increasing TB case-notifications by 12 percent in FY 2016 and expanding overall lab capacity. Over the past year, USAID increased its focus on contact-investigation and the use of Xpert, as well as emphasized case-finding and TB services among displaced populations. More than 20 percent of the household contacts of South Sudan's 1,654 index cases' household contacts underwent screening, 17 percent were tested, and eight percent of these were bacteriologically-confirmed to have TB. Through increased focus on the transportation of specimens and the use of Xpert, such testing increased by 27 percent, which resulted in an increase in the notification of both drug-susceptible and DR-TB. New activities to target TB services among displaced persons resulted in 449 new cases diagnosed among this hard-to-reach population.

TAJIKISTAN

With USAID funding, the NTP reached 35,403 vulnerable people, such as prisoners, former prisoners, and migrants. Of those, 82 TB cases were notified, which translates to an incidence rate of more than three times the national average. In pilot areas, 717 women were found to have TB, 100 percent of whom were started on treatment. Patient-centered services provided at the facility and community levels resulted in outpatient management of 47 percent of drug-susceptible and 62 percent of MDR-TB cases. In addition, 102 pre-XDR and XDR patients began on shorter or new-drug regimens in three pilot areas. Finally, 885 TB patients and their families benefited from social and economic support provided by local governments.

TANZANIA

USAID continues to provide funding for the decentralization of programmatic management of drug-resistant TB (PMDT) services. In FY 2016, an additional 12 sites throughout the country initiate DR-TB patients on treatment, which brought the total to 20 sites. In just one quarter of FY 2016, half of the 38 patients initiated on MDR-TB treatment received care from decentralized sites. At these locations, experienced clinicians and nurses mentor health care workers and Regional and District coordinators once a patient is identified. Cohort reviews are also regionalized to accommodate decentralization. The CY 2016 data show a six-percent increase in TB case notification, which can be attributed to active case-finding efforts, the expansion of Xpert, the roll-out of pediatric TB training, the implementation of quality-improvement initiatives, and an increase in private-sector involvement.

UGANDA

USAID implemented an Urban DOTS model that supported a comprehensive spectrum of TB-control interventions, including efforts to strengthen providers' skills, use community linkage facilitators, and apply continuous quality-improvement approaches. USAID increased the capacity of the National TB and Leprosy Program to increase quality-improvement campaigns and overall coordination of partners.

UKRAINE

USAID initiated a pilot to provide comprehensive DR-TB care and support that incorporated physiological and educational sessions, enhanced nutritional support, patient-centered DOT, and legal support. Lessons learned from the pilot will influence the scale-up of comprehensive support to all regions in the country, with financial assistance both from the Government of Ukraine and the Global Fund.

UZBEKISTAN

USAID made significant strides in improving access to quality TB services, with a focus on prioritized, vulnerable population groups. The program continued to implement a three-pronged approach: 1) strengthening and expanding the patient-centered approach; 2) increasing the outpatient treatment of patients with TB and MDR-TB; and, 3) improving laboratory services, such as advanced methods of TB diagnosis. Community-level referrals contributed to improved detection of TB cases; multi-disciplinary teams referred 8,336 individuals from vulnerable and high-risk groups for TB evaluation, 91 percent of whom were tested. The coverage of vulnerable groups, particularly among the migrant population, increased more than ten-fold, with a case-detection rate of 10 times the national average. In addition, 1,612 TB cases were notified among women, 99 percent of whom enrolled in treatment. Through supportive supervision, counseling, the monitoring of TB services, and follow-up, the program provided high-quality treatment for the disease.

ZAMBIA

Xpert now performs the initial testing of all presumptive TB cases in Zambia, and the number of functional Xpert machines has risen from 55 to 104. Of the total available, 87 are located in public health institutions, six in correctional facilities, and 11 in military institutions. The use of Xpert for the diagnosis of presumptive TB individuals will contribute to a reduction of DR-TB in the long term as patients can receive the correct treatment from the beginning.

ZIMBABWE

In Zimbabwe, USAID funded the development of the National Strategic Plan for TB Control. Strategic interventions included the universal use of Xpert as the initial diagnostic test for all presumptive cases of TB. In addition, the Agency's partners emphasized patient-centered care that safeguards rights and promotes social protection, with a goal of minimizing catastrophic costs related to TB.