INNOVATING & ADAPTING TO END TB

TUBERCULOSIS REPORT TO CONGRESS





U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT REPORT TO CONGRESS ON FISCAL YEAR (FY) 2022 TUBERCULOSIS PROGRAMMING WITH FY 2021 FUNDS

INNOVATING & ADAPTING TO END TB

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(d), which amended P.L. 87-195, the Foreign Assistance Act of 1961, to add Section 104B(g).

INNOVATING & ADAPTING TO END TB

Nearly 30 years after the World Health Organization (WHO) declared tuberculosis (TB) a public health emergency, the disease remains one of the world's leading infectious disease killers—claiming more lives each year than HIV and malaria combined. Until the emergence of COVID-19, the bacterium that causes TB was described as "the most destructive pathogen on the planet." Despite being preventable, treatable, and curable, this ancient disease persists, resurges, and continues to take a global toll—particularly among the most vulnerable and poorest populations.

Across the world, millions of people—mainly in low-and middle-income countries—continue to suffer and die from TB each year due to a range of factors including lack of access to TB services; financial constraints; stigma and discrimination; high-risk co-morbidities (see health risk factors table below); socioeconomic determinants including poor living conditions and changing climate; and the slow development of new diagnostics, drugs, and vaccines. In 2020, the onset of the COVID-19 pandemic had a devastating impact on the global TB response, compounding these factors and resulting in even further suffering and death from TB.

While in 2021, there were initial signs of recovery from COVID-19's impact, global TB cases and deaths still increased, with an estimated 10.6 million people falling ill with TB, and almost 1.6 million people dying. Global case notifications improved slightly, with 61 percent of estimated incident cases reported to National TB Programs (NTPs) and started

on treatment. This was around a five percent increase from 2020, but still a decline from 2019 levels.²

Despite an increase in the availability of rapid molecular tests, many TB cases are not appropriately diagnosed. Only 63 percent of the estimated pulmonary TB cases reported in 2021 were bacteriologically confirmed, and only 38 percent of notified cases were tested with WHO-recommended rapid molecular tests.³

Drug-resistant TB (DR-TB), which causes one-third of all deaths due to antimicrobial resistance (AMR),⁴ remains a global public health challenge in that it is more deadly, and more difficult and expensive to diagnose and treat. DR-TB, which includes multidrug-resistant TB (MDR-TB) and extensively drug-resistant TB (XDR-TB)⁵ are TB variants that are resistant to at least rifampicin. In 2021, 450,000 people developed these deadlier, drug-resistant forms of TB.⁶ Of those with DR-TB, 154,405 people (34 percent) started on treatment in 2021.

HEALTH RISK FACTORS THAT CONTRIBUTE THE MOST TO DEVELOPING ACTIVE TB DISEASE⁷

Health Risk Factor	Number of TB Cases Attributed to Risk Factor in 2021
Undernutrition	2.2 million
HIV infection	860,000
Alcohol use disorders	740,000
Smoking	630,000
Diabetes	370,000

- 1 The Economist
- 2 Global Tuberculosis Report 2022, World Health Organization
- 3 Global Tuberculosis Report 2022, World Health Organization
- 4 World Health Organization
- 5 MDR-TB is resistant to both isoniazid (the second-most vital drug) and rifampicin, and XDR-TB is resistant to both rifampicin and isoniazid, and other drugs used to treat MDR-TB.
- 6 ibid.
- 7 World Health Organization

Despite the development of newer, shorter, and less toxic regimens, the treatment success rate for DR-TB remains around 60 percent as new regimens continue to scale up globally. Lack of access to drug-susceptibility tests, porous linkages to treatment, and high loss to follow-up all contribute to poor DR-TB treatment outcomes.

TB impacts the poorest and most vulnerable populations and drives individuals, families, and communities into further poverty. Currently, individuals with TB have to pay almost 30 percent of TB health care costs out-of-pocket. On average, individuals

with TB and their households lose 50 percent of their annual income as they suffer from, and get treatment for, the disease—even where TB services are provided free-of-charge.⁸ Without urgent action, it is projected that TB will kill an estimated 6.6 million additional people through 2030, translating to a global economic loss of \$1 trillion.⁹ Conversely, the <u>Global Plan to End TB 2023-2030</u> estimates a total of \$250 billion is needed to end TB by 2030 with an impressive return on investment of \$40 per one dollar invested.

World Health Organization
Stop TR Global Plan to END TR



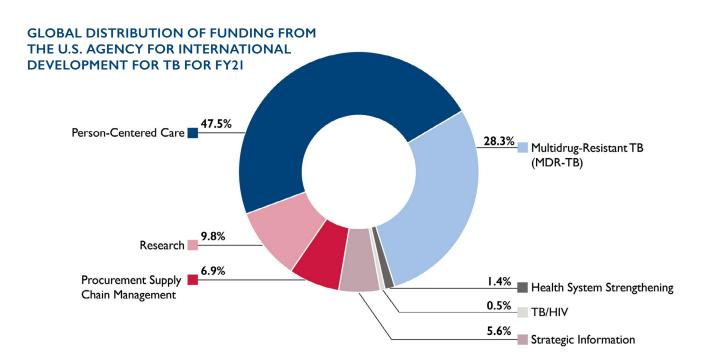
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USAID'S GLOBAL TB PROGRAM

With continued support from Congress, the U.S. Agency for International Development (USAID) leads the U.S. Government's (USG) global TB efforts, working with agencies and partners worldwide on the shared goals of reaching every person with the disease, curing those in need of treatment, and preventing the spread of new infections and the progression to active TB disease.

USAID provides bilateral assistance in 24 countries with high burdens of TB, in cooperation with their Ministries of Health. In addition, by leveraging the USG's contribution to the Global Fund to Fight AIDS, Tuberculosis and Malaria (Global Fund), USAID supports the successful implementation of TB grants and provides targeted technical assistance to an additional

31 countries. In addition, USAID also supports WHO, the Stop TB Partnership, local and civil society partners, and others to achieve the Global Plan to End TB 2023-2030, The End TB Strategy and the United Nations High-Level Meeting on TB (UNHLM) targets.



Congress appropriated \$319 million in resources for TB activities in FY 2021 through USAID's Global Health Programs (GHP) account.¹⁰ This includes programming through bilateral assistance to high-burden countries, regional platforms, and global mechanisms.

In each country, USAID plays an essential coordination role by working closely with a wide range of multi-sectoral TB stakeholders to create a strong, sustainable network of

 $10\ \ The\ Global\ Distribution\ of\ Funding\ chart\ was\ produced\ using\ final\ approved\ Agency\ funding\ levels.$

partners to work towards achieving the country's National TB Strategic Plan (NSP). These stakeholders include Ministries of Health, the Global Fund Secretariat and Principal Recipients, other U.S. Government departments and agencies, WHO, the Stop TB Partnership, civil society, local non-government organizations, faith-based organizations, communities, and the private sector.

OUR APPROACH: THE GLOBAL ACCELERATOR TO END TB

USAID's Global Accelerator to End TB (the Accelerator) was launched in 2018 at the United Nations High-Level Meeting (UNHLM) on TB, which established the ambitious targets of diagnosing and enrolling 40 million people on TB treatment (to include 1.5 million people with DR-TB and 3.5 million children) and 30 million people on TB preventive therapy by 2022. The Accelerator was designed to increase commitment from, and build the capacity of, governments, civil society, and the private sector to accelerate affected countries' progress in reaching the global targets. It focuses on countries with high burdens of TB where the Agency can align with local communities and partners to deliver results by:



INCREASING COMMITMENT

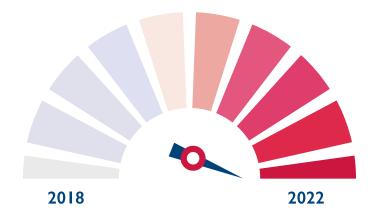
USAID Missions are leveraging additional TB resources and strategic support to reach the UNHLM targets through **partnership statements** with Ministries of Health in 2I countries. To support implementation, USAID develops **annual country roadmaps** with National TB Programs and other major stakeholders.





BUILDING CAPACITY

To further build a sustainable TB response, USAID has made direct awards to over 40 **local organizations** in 2I countries, including faith-based groups and new partners. These organizations implement on-theground solutions to improve TB services; address discrimination, gender disparities, and equity within the TB response; and accelerate the transition to local accountability and ownership. USAID has also embedded 66 TB **advisors** in NTPs to build their technical expertise.



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A LOCAL APPROACH IMPROVES CASE NOTIFICATIONS IN UGANDA



The remote Karamoja region in northeastern Uganda carries the country's highest TB burden, at a devastating 315 cases per 100,000

people (compared to the national estimate of 154 cases per 100,000). A third of the TB cases reported in the region are children below age 15—significantly higher than the national average of 12 percent. Traditionally, the Karamojong people live communally in enclosed homesteads known as Manyatta, which have multiple households of about 20 or more individuals sharing the same space. These crowded and poorly ventilated settlements increase the risk of TB transmission.

To address these challenges, USAID's local partner trained community members

(known as community-owned resource persons or CORPS) in TB education, mobilizing communities for TB screening, collecting sputum samples, making referrals, providing adherence counseling, and ensuring follow-up for those who miss appointments.

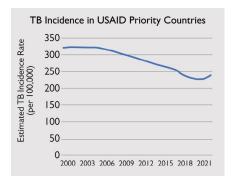
This initiative drove a 52 percent increase in the number of TB cases identified in the region in 2021, compared to 2019. While COVID-19 initially caused Uganda's case notifications to drop by eight percent from 2019 to 2020, efforts like these have contributed to the country's recovery. In 2021, Uganda's case notifications increased by 23 percent from 2020, representing a 14 percent increase from pre-pandemic notifications in 2019.

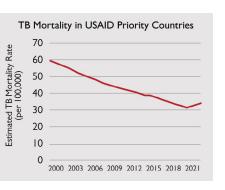


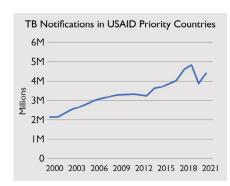
RESULTS: REGAINING LOST PROGRESS

Overall since 2000, in USAID's TB priority countries, TB incidence decreased by 25 percent, TB mortality decreased by 41 percent, and TB notifications increased by 106 percent.

In 2020, the COVID-19 pandemic took a catastrophic toll on the global TB response. In USAID's TB priority countries, there was a 20 percent decline in case notifications, as compared to 2019, and TB deaths increased for the first time in a decade. While there was a 15 percent increase in case notifications in 2021, the TB incidence, mortality, and case notifications rates did not rebound to 2019 levels in 2021. The 2021 case notification number still remains nine percent below 2019 levels, while mortality is 11 percent and incidence is five percent below 2019 levels.¹²







USAID PRIORITY COUNTRY RESULTS: 2019–2021

2019	2020	2021
4.8 million TB cases detected	3.8 million TB cases detected	4.4 million TB cases detected
5% increase in case notifications (compared to 2018)	20% decrease in case notifications (compared to 2019)	15% increase in case notifications (compared to 2020)
109,000 individuals with DR-TB started on treatment	82,000 individuals with DR-TB started on treatment	94,000 individuals with DR-TB started on treatment
57,000 health workers trained	33,180 health workers trained ¹³	163,538 health workers trained ¹⁴
88% treatment success rate	89% treatment success rate	89% treatment success rate
6 research studies	6 research studies	7 research studies

¹¹ For consistency, aggregate USAID 2021 data in this report represent data from 23 USAID priority countries without inclusion of Pakistan (except for aggregate funding data). Pakistan historic data is included in the country profile section of the report as a baseline and the country data will be included in the aggregate data set in next year's report.

¹² Global Tuberculosis Report 2022, World Health Organization

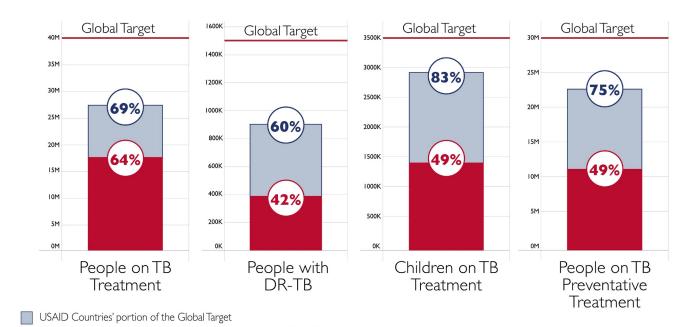
¹³ Based on provisional data from USAID Missions. Existing health workforce shortages and capacity issues were exacerbated by the COVID-19 pandemic. Prior constraints included the limited number of qualified health care workers at the primary health care level with often large workloads. During the pandemic, under-resourced TB personnel were re-purposed and deployed in response to COVID-19, due to having applicable skills and experience.

¹⁴ Data as reported to USAID. Three countries (Burma, Indonesia, Uzbekistan) reported less than 12 months, so the number for the year was projected only for those three countries. Most countries focused on health worker training to adapt to COVID-19's impact.

PROGRESS TOWARDS

THE UNHLM TARGETS

USAID priority TB countries make up significant portions of the global UNHLM TB targets. Due to COVID-19's impact, current data, both globally and for USAID's TB priority countries, show that the world will not achieve the UNHLM targets by 2022, with one reporting year remaining.





RESTORING TB SERVICES IN BANDLADESH



In Bangladesh, there was a 21 percent decline in TB case notifications in 2020, as compared to 2019. Given the challenges Bangladesh faced due to

COVID-19, USAID swiftly pivoted and developed a range of interventions to help identify and treat more people with TB through a recovery plan.

Efforts included simultaneously testing for TB and COVID-19; screening for TB within large industries; training informal healthcare providers; addressing health worker staff shortages; and extending laboratory hours to facilitate more testing. Along with community-based active case finding efforts, USAID implemented facility-based active case finding in health care facilities, including diabetes

centers across the country, since diabetics are at high risk for TB. USAID also engaged the private sector in finding cases through pharmacies and private providers and scaled up training on and usage of the Janao application, which allows private practitioners to directly notify TB cases to the National TB Program.

These initiatives, among others, enabled Bangladesh's TB program to successfully restore TB diagnosis and care services, despite the ongoing impacts of the pandemic.

Case notifications increased by 33 percent in 2021, as compared to 2020—a five percent increase from before the pandemic, in 2019.



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NEW REGIMENS IMPROVE DR-TB TREATMENT

To improve DR-TB treatment success rates, USAID has supported the development and global scale up of all-oral treatment regimens, which increased in USAID's TB priority countries by 33 percent from 2020 to 2021. These regimens enable people to complete treatment from home instead of traveling to health facilities for hard-to-tolerate daily injectables.



In the Philippines, USAID supported the Department of Health in rolling out and scaling up all-oral regimens by conducting virtual trainings across the country's 200 DR-TB health facilities, widely disseminating guidelines and job aids to health workers, and hosting virtual meetings to address concerns. Via digital adherence monitoring, those with DR-TB were able to self-administer treatment, offering more flexible community and home-based care options and improving the country's treatment success rate. In 2021, 91 percent¹⁵ of those with MDR-TB were on all-oral regimens (a 29 percent increase from 2020), achieving an 84 percent treatment success rate.



ADAPTATIONS AND INNOVATIONS

To mitigate the pandemic's impact, USAID adapted programming and implemented innovations that not only addressed COVID-related service gaps, but drove forward progress in combating TB. In countries initially most impacted by TB case notification declines, USAID supported urgent recovery efforts that focused on increasing access to and improving the quality of TB services. Innovations like digital treatment adherence tools, digital surveillance apps, remote health care worker trainings, multi-month dispensing, and the switch to all-oral treatment regimens were implemented and scaled up by necessity during the pandemic. Their introduction, however, introduced new ways to reach, prevent, and cure individuals with TB. USAID continues to roll out these innovations across TB priority countries to improve TB service delivery.

USAID continues to support new tools and initiatives to combat TB. One of these initiatives is the introducing New Tools Project (iNTP), a collaboration between USAID and the Stop TB Partnership to help countries reach the UNHLM targets by introducing new methods to detect TB and DR-TB. Through this, the project introduced Truenat™—a portable, rapid molecular device test that provides results in less than an hour—as an initial diagnostic test for all individuals being evaluated for TB in peripheral health facilities and through active case finding activities. Recommended by WHO in 2020 as the first near point-of-care rapid molecular test for TB and DR-TB, Truenat instrument systems have built-in batteries allowing for eight hours of use, can be used in temperatures up to 104 degrees Fahrenheit, and have built-in connectivity functionalities—enabling them to be used in sites that previously had no access to a molecular diagnostic. The iNTP project has installed Truenat instruments in the Democratic Republic of Congo, Nigeria, the Philippines, and Zimbabwe, with plans to expand to an additional five countries in 2022. To date, over 35,000 tests have been conducted with these instruments, yielding 3,300 people newly diagnosed with TB.

USAID's research efforts also aim to improve TB diagnosis and treatment outcomes. Currently, USAID is supporting the piloting and expansion of stool-based TB testing on the GeneXpert platform to improve TB diagnosis for children. To improve DR-TB treatment outcomes, USAID continues to study the efficacy and safety of various short-course combinations of new TB medicines, such as bedaquiline (BDQ), delamanid, pretomanid,

and linezolid. The recently completed BEAT TB study in India reported an 84 percent favorable outcome in individuals with pre-XDR and XDR-TB who were treated with a six-to-nine month regimen of BDQ, delamanid, linezolid, and clofazimine. ¹⁶ Through the newly awarded Supporting, Mobilizing, and Accelerating Research for Tuberculosis Elimination (SMART4TB) project, USAID will engage public and private sector research and academic institutions to build research capacity in high TB burden countries. SMART4TB will support studies that evaluate novel approaches, interventions, and tools to combat TB—including diagnostic tests, new treatment drugs and regimens, socioeconomic and health system challenges, methods to interrupt TB transmission, and TB vaccine readiness and delivery.

While adapting programming to better combat the changing landscape of TB, USAID also continues to utilize TB platforms to build countries' capacities to respond to COVID-19 and other airborne infectious diseases. The international community relied on TB infrastructure and expertise to respond to COVID-19, and USAID continues to support bi-directional testing for both diseases, joint contact investigations and increased community screenings, and expanding infection prevention and control, among other measures. However, increased investment and commitment from countries, partners, and other donors is needed to drive forward progress in recovering lost gains in TB-and expand TB interventions and technology to address other airborne pandemics.

¹⁵ Source: USAID TB Success Story, September 2022.

¹⁶ A detailed description of USAID's research studies and clinical trials are outlined in the Combating Multidrug-Resistant Tuberculosis, Year Five of the National Action Plan Report

EFFECTIVELY IMPLEMENTING INFECTION PREVENTION AND CONTROL

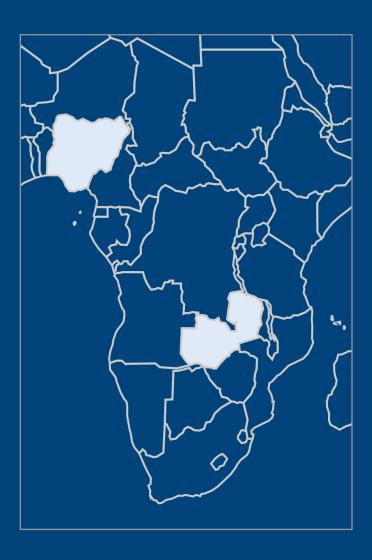
As TB is an airborne disease, Infection Prevention and Control (IPC) measures are key in reducing TB transmission. To drive IPC policy operationalization and evidence-based expansion, USAID actively supports the End TB Transmission Initiative (ETTi), which scales up IPC implementation through research, education, and training. Critically, ETTi has and continues to assist the Stop TB Partnership and Global Drug Facility (GDF) to add specifications for infection prevention and control commodities to the laboratory catalog such as surgical masks, filtering facepiece respirators, and germicidal UV fixtures, among others. USAID has also supported the development and operationalization of the WHO TB Infection Control Guidelines, which specifically address recommendations for infection control in congregate settings.

These guidelines have been rolled-out globally/across USAID TB priority countries to stop the spread of new infections in places like prisons, where overcrowding, poor ventilation, frequent transfer of individuals between facilities, malnutrition, and limited access to health care, among other factors, make those in correctional facilities vulnerable to TB.

In Zambia, USAID supported TB prevention, testing, and treatment services in nine correctional facilities in 2021. Individuals are screened upon entry, as they seek various health services, bi-annually, and upon release. In addition, contact investigations are implemented for all individuals in close contact with those with bacteriologically confirmed TB.

In Nigeria, a USAID local partner implemented active TB case finding in 17 correctional facilities across four states in the country. The project used the WHO-recommended four-symptom screen (W4SS), comprising screening for a current cough, fever, night sweats or weight loss, and prioritized individuals who had complained of TB

symptoms and/or visited the prison clinic within the prior two weeks. After the initial screening, sputum was collected from those identified with presumptive TB and tested using GeneXpert technology. Over a one-year period, a total of 16,641 inmates were screened, yielding 20 percent with presumptive TB and nine percent with confirmed TB. Those with confirmed TB were linked to a directly observed treatment (DOTS) officer for appropriate treatment and care. To control further spread, all inmates of cells where there was a confirmed TB case were screened during the following visit.



LOOKING FORWARD

While 2021 showed some recovery from the pandemic's impact on TB, the world is not on track to meet the 2022 UNHLM targets, and urgent efforts are needed to meet the Sustainable Development Goal of ending the TB epidemic by 2030 by decreasing TB mortality by 90 percent compared to 2015. The 2023 UNHLM provides an opportunity for heads of state and global stakeholders to recommit and refocus global TB efforts.

USAID remains committed to leading the global response. The Agency will continue to increase its efforts through focused interventions that will make the largest impact, adapting our programs, and quickly rolling out new tools and innovations. However, increased efforts and commitments from countries, partners, and donors will be needed to regain and further accelerate progress to get back on track to meeting targets and ending TB.







APPENDIX

This appendix provides a snapshot into achievements during Fiscal Year (FY) 2021 in each of the 24 countries in which the U.S. Agency for International Development (USAID) provides bilateral assistance to end tuberculosis (TB).

NOTES:

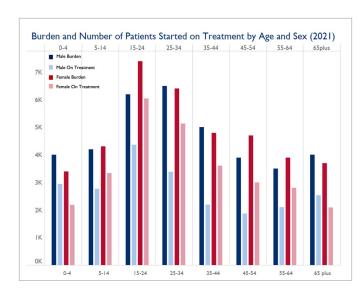
- · Unless otherwise noted, notification data is used as a proxy for diagnosed and started on treatment.
- The charts use 2021 data for the estimated burden.
- The Stop TB Partnership calculated the targets for "40×22" (diagnosing and enrolling an additional 40 million people on treatment for TB by 2022, with a focus on countries with the highest burden of the disease) and "30x22" (enrolling 30 million on preventive therapy for TB) by using the latest estimates generated by the World Health Organization (WHO) for the incidence of TB and the number of notifications available publicly. With the exception of the Republics of India and The Philippines, USAID calculated all projections by using the Tuberculosis Impact Model and Estimates (TIME) model implemented by Avenir Health. To reflect country ambition, USAID adjusted upward the targets for TB treatment in India and the Philippines based on their governments' announcements at the United Nations General Assembly High-Level Meeting on TB (UNHLM) in September 2018. Please note that the Stop TB Partnership updated the targets in November 2019 to reflect most recent burden estimates. This report uses the updated targets for 2019 and onward.
- For the purpose of this appendix, "drug-resistant TB" (DR-TB) means a strain of the disease resistant to at least isoniazid and rifampicin.
- The target for preventive treatment for TB includes three categories: under-five child household contacts of bacteriologically confirmed TB cases, adolescent and adult household contacts more than five years of age, and persons who are living with HIV (PLHIV). This is in alignment with the goals set at the UNHLM.
- Complete data for preventative treatment for TB in 2021 were either partially available or unavailable for Afghanistan; Bangladesh; Burma; the Democratic Republic of Congo; Ethiopia; Malawi; Mozambique; Pakistan, South Africa; Tanzania; and Uzbekistan.
- Data on the number of TB cases attributable to top risk factors were not available for certain risk factors in some countries. Missing data related to these graphs are noted directly on the graphs.
- Data on childhood TB from previous years have been inconsistent due a mixture of programmatic challenges with diagnosing and treating the disease in children, as well as data-reporting problems. Additionally, for the Number of Children Started on Treatment for Tuberculosis graph, the Democratic Republic of Congo did not report any data to WHO on the number of children started on treatment for TB in 2019. Furthermore, Cambodia National TB Program 2021 Report has retrospectively significantly updated the number of children started on treatment for TB in 2019. Therefore this 2019 data point has been updated in their respective graph.
- For the Burden and Number of Patients Started on Treatment by Age and Sex (2021) graph, Uganda did not report disaggregated data to WHO on the number of patients started on treatment for individuals in the age groups of 45-54, 55-64 and 65 plus in 2021, and Mozambique reports data to WHO in the age groups 0-4, 5-14, and 15 plus.
- A few countries had a delayed impact of COVID-19 into 2021 accounting for the declines in diagnosis and treatment, including Cambodia and Vietnam.
- For Pakistan, historic data are shown across the different TB indicators. For consistency, Pakistan's 2021 data were not included in the aggregate total USAID 2021 TB data (except for aggregate funding data). Pakistan country data will be included in the aggregate data set in next year's report.
- The charts present the distribution of USAID's Program funding according to the Agency's internal budgeting and finance system, which includes two TB cross-cutting areas: training and support costs. Training is approximately ten percent across all categories. "Support costs" are defined as system costs to support TB diagnosis and care, including the categories of Health-Systems Strengthening (HSS) and Strategic Information (SI).

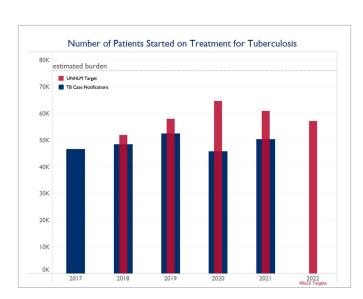
DATA SOURCES:

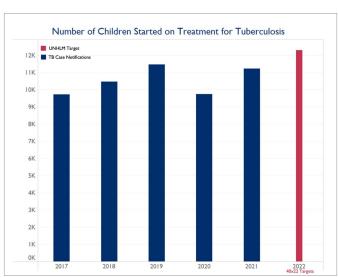
USAID sourced the data for all of the following pages from USAID internal systems, WHO, and NTPs.

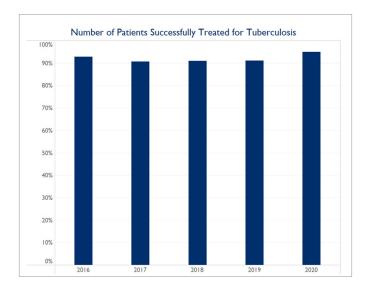
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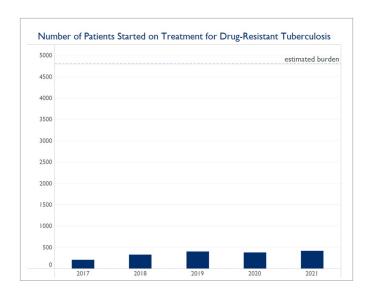
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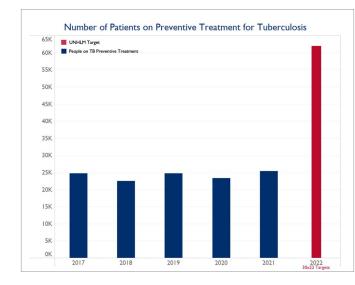


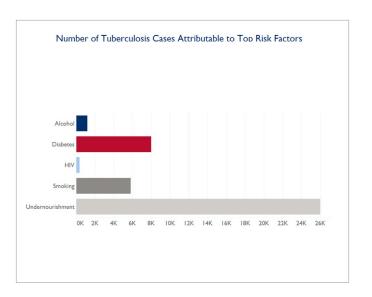


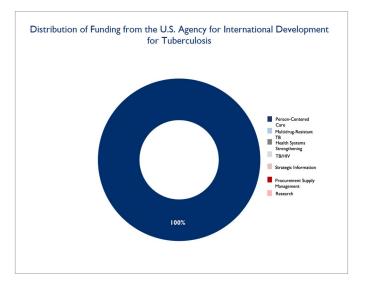






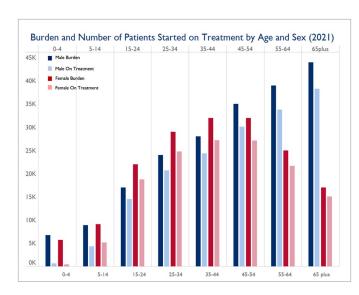


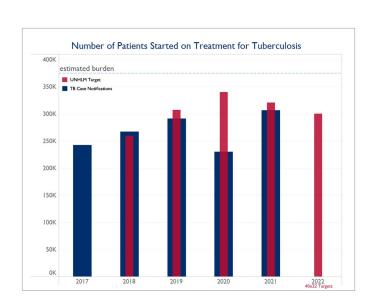


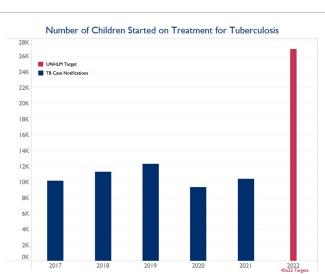


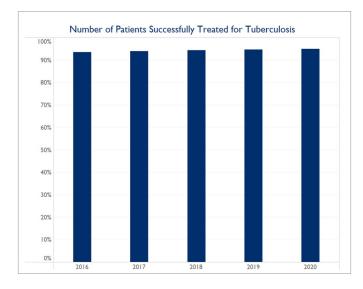
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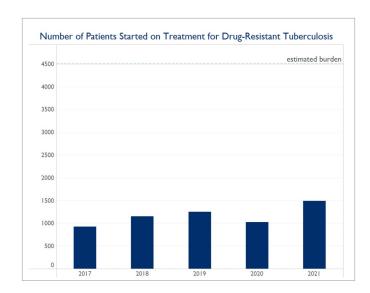
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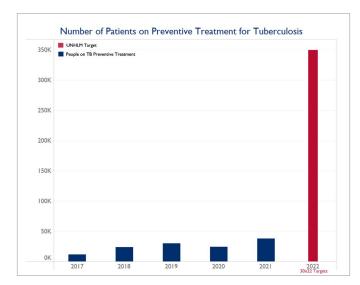


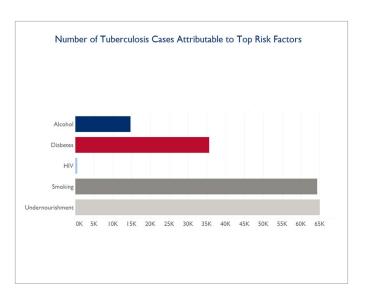


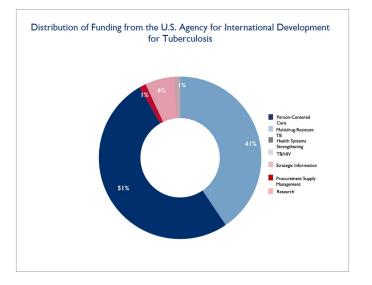






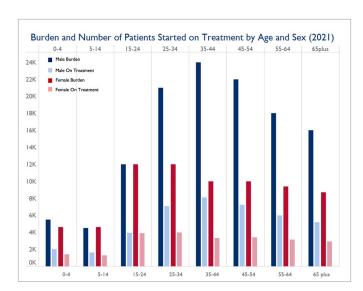


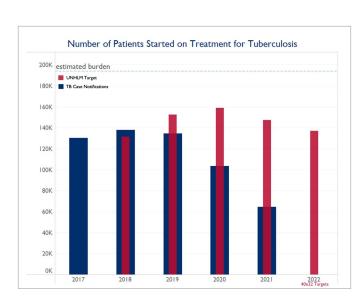


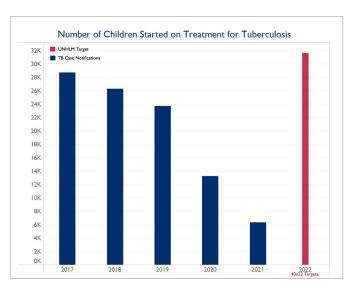


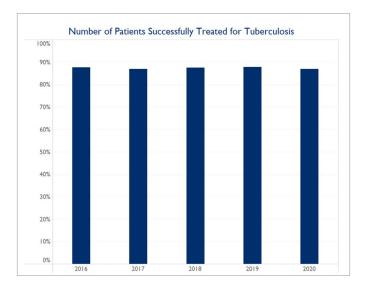
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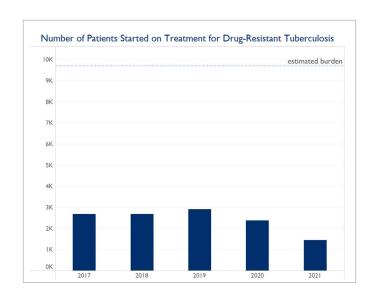
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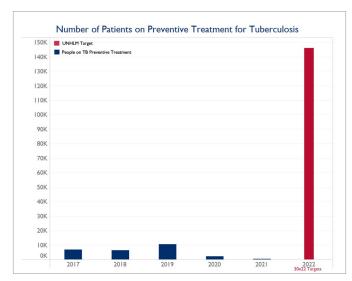


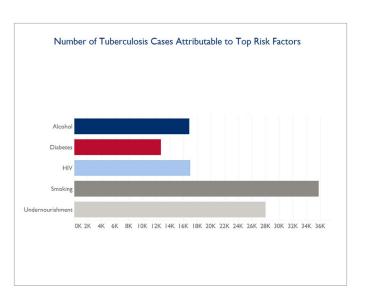


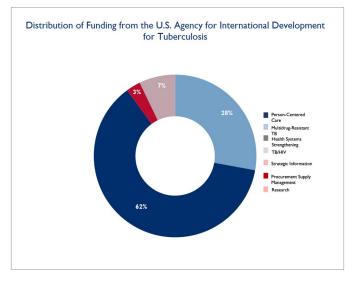






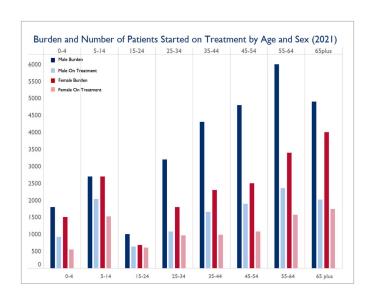


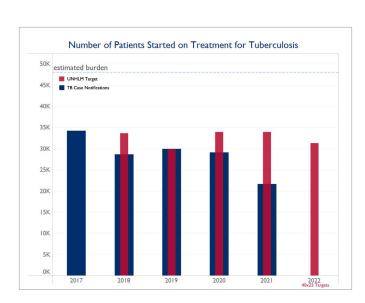


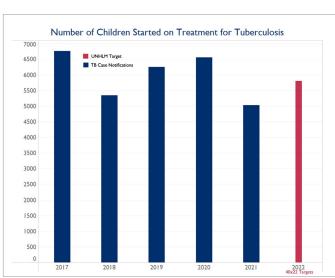


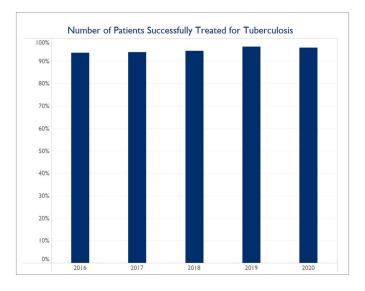
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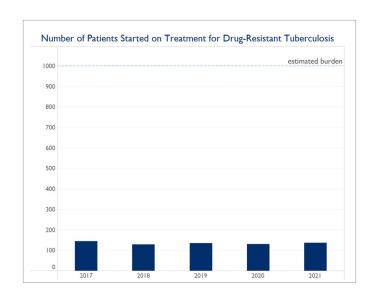
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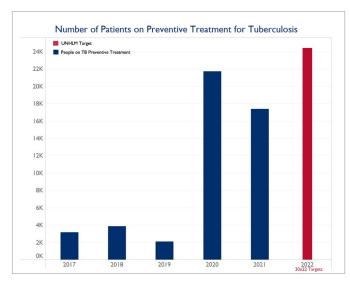


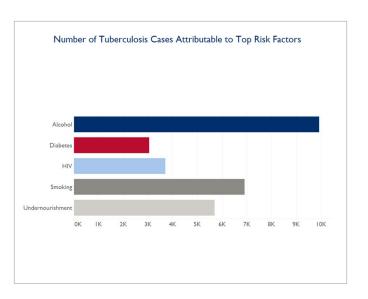


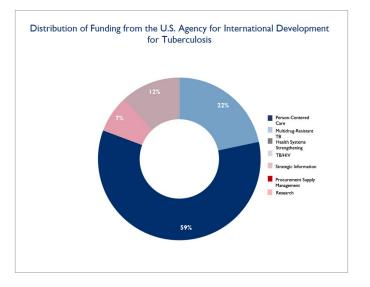






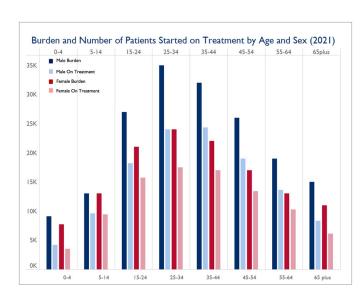


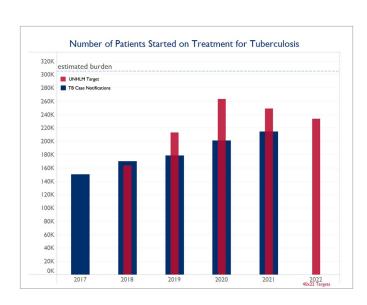


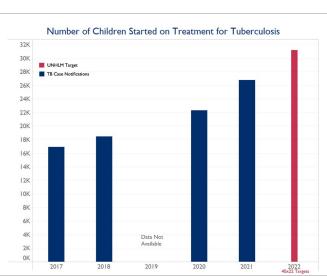


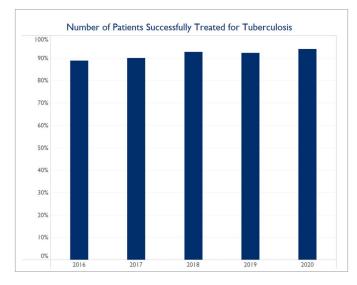
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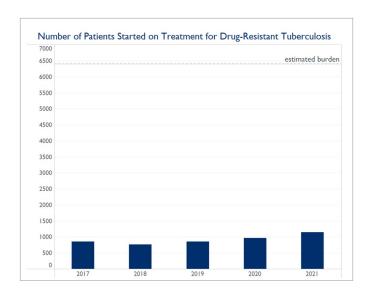
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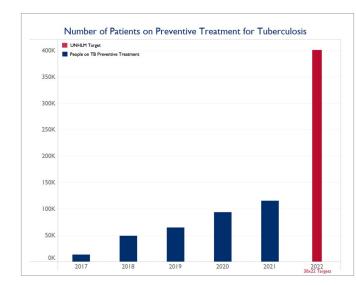


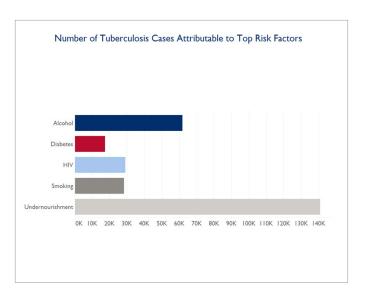


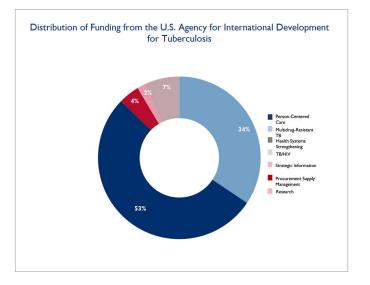






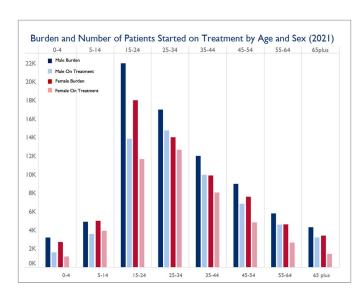


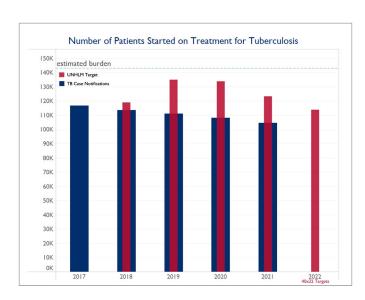


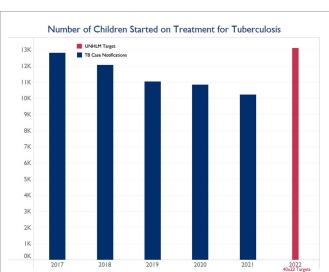


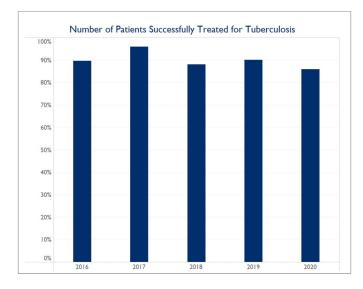
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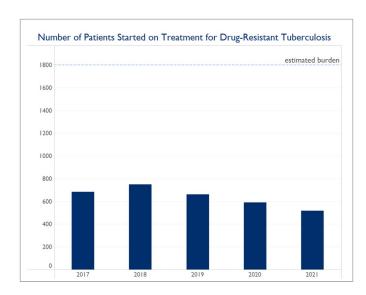
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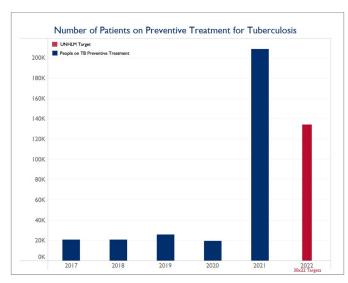


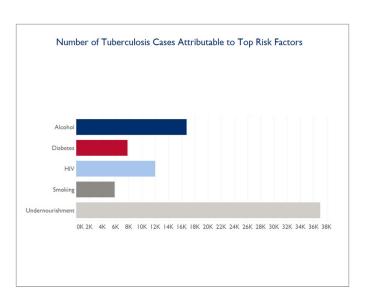


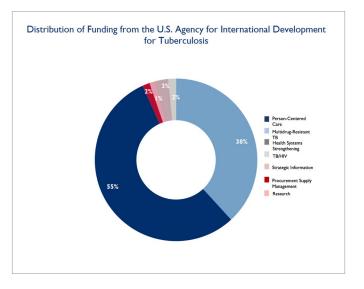






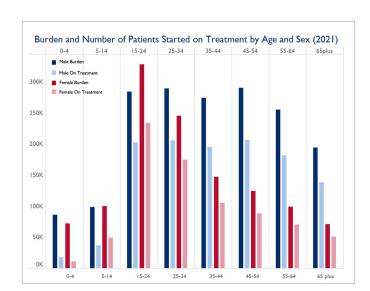


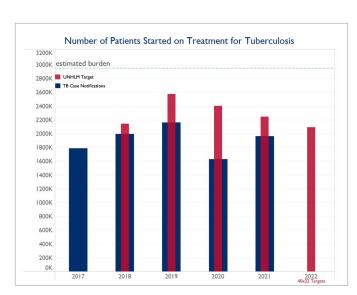


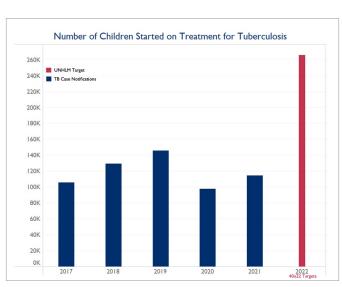


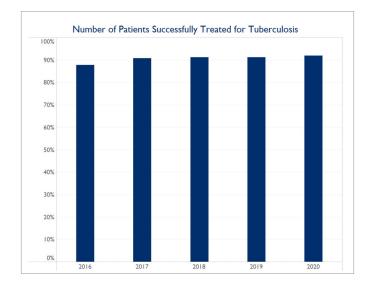
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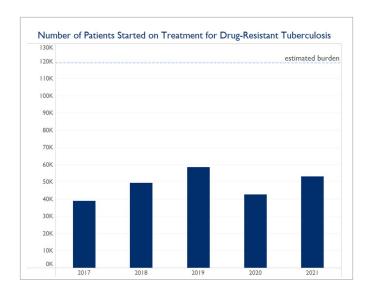
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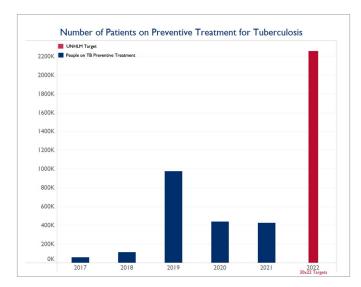


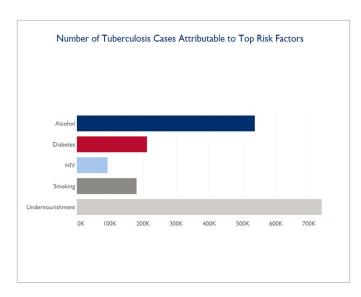


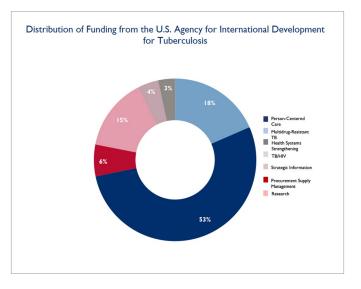






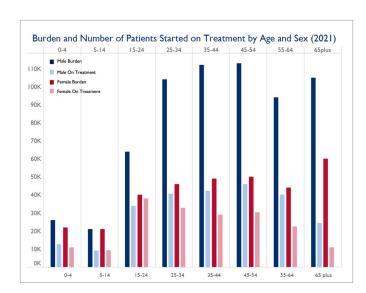


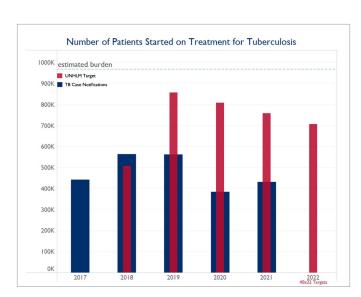


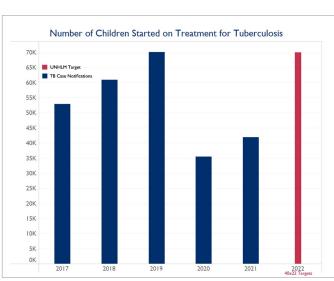


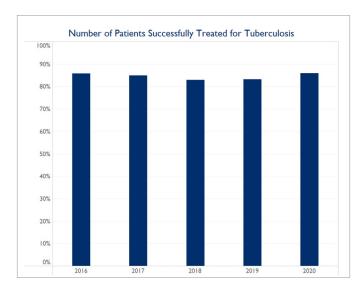
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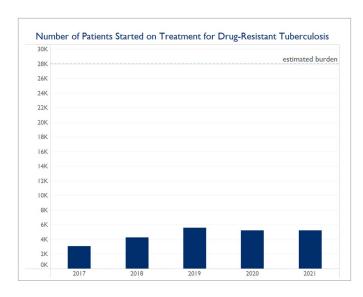
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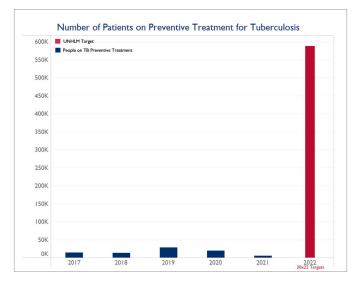


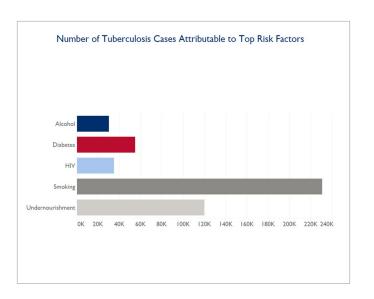


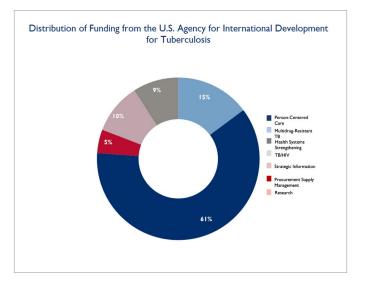






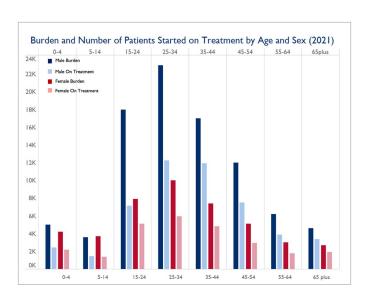


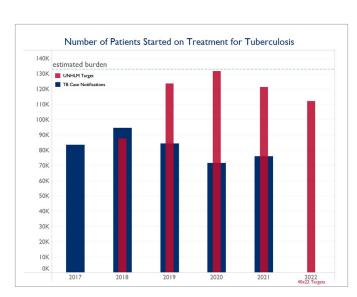


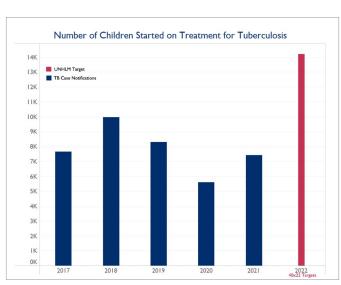


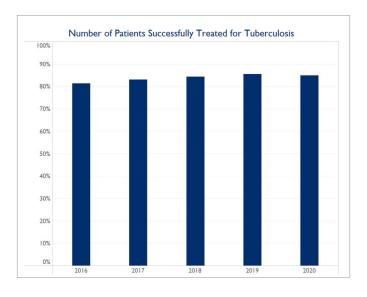
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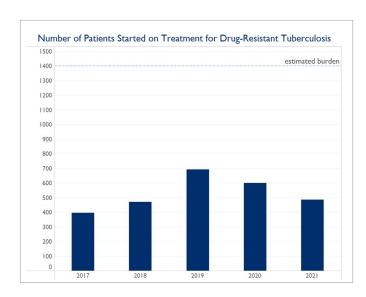
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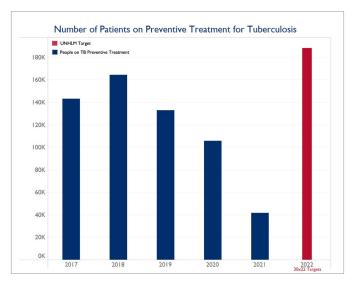


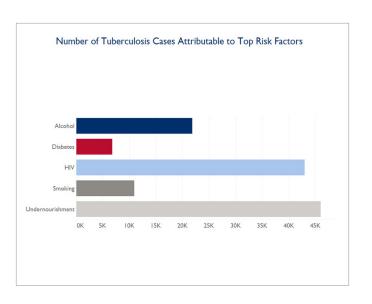


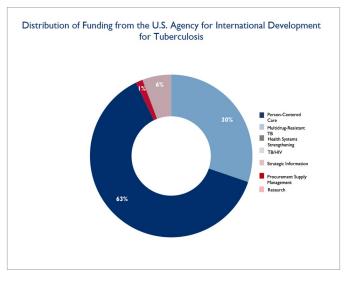






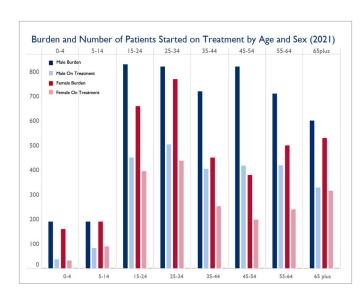


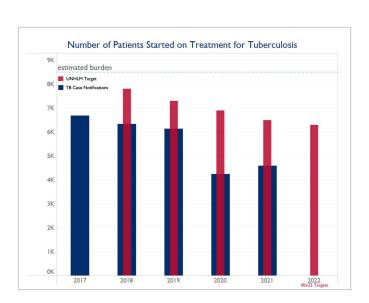


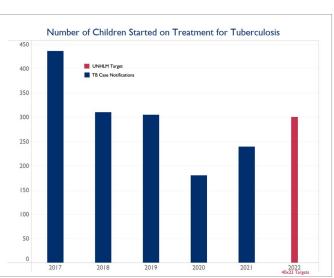


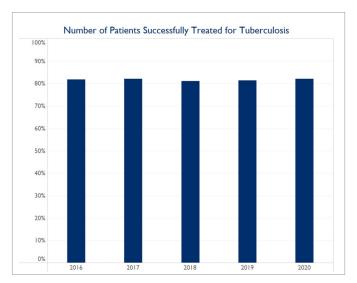
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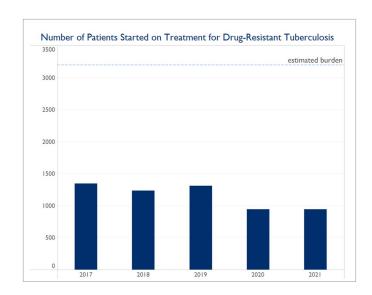
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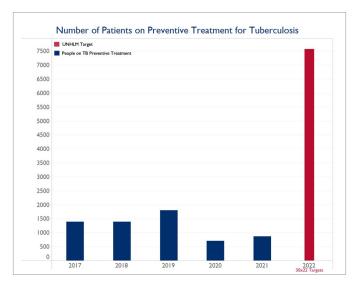


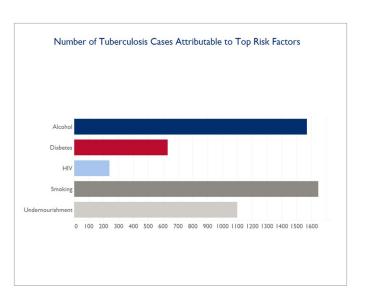


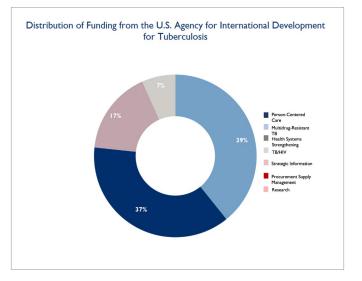






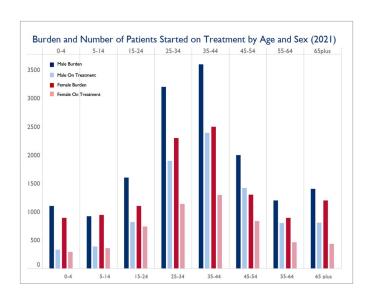


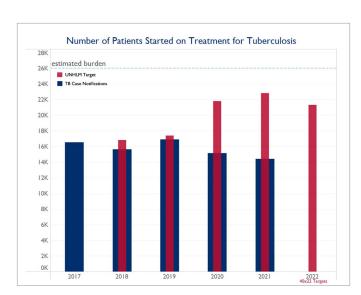


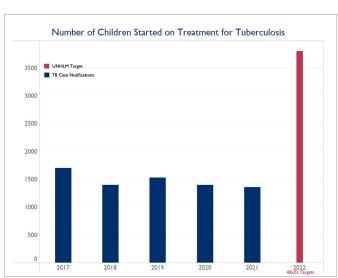


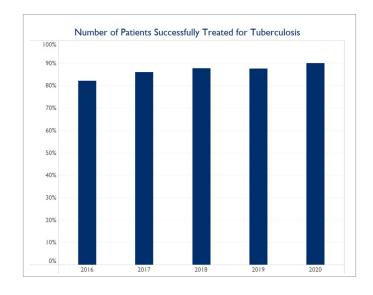
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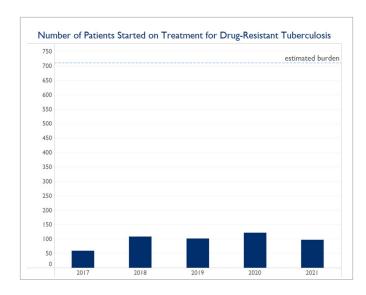
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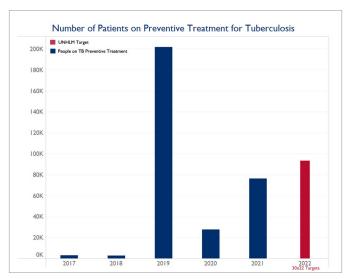


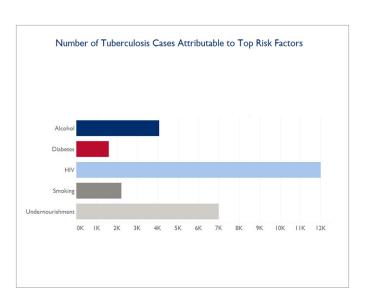


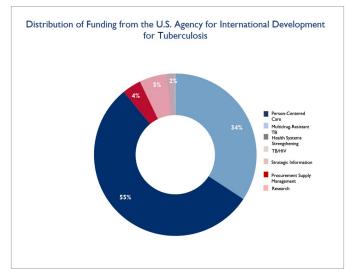






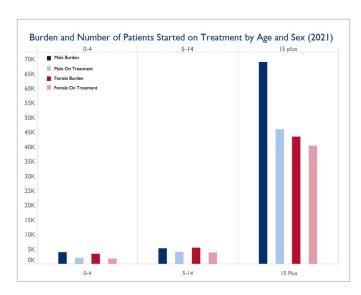


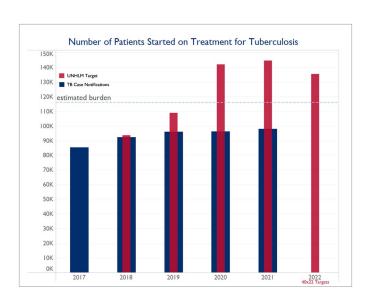


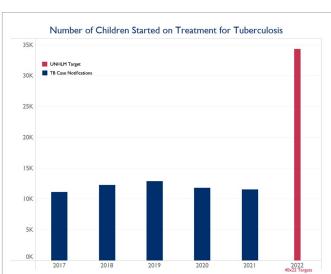


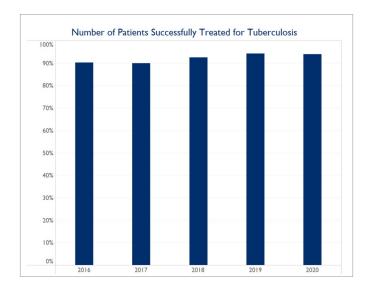
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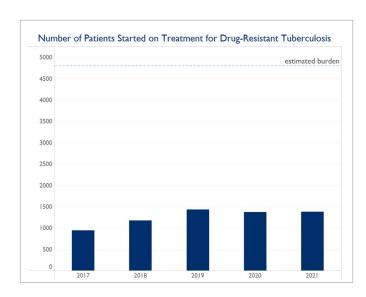
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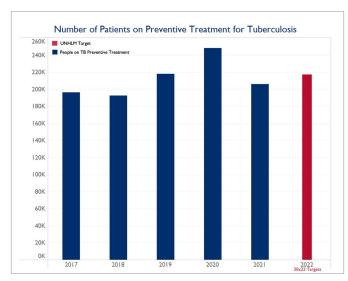


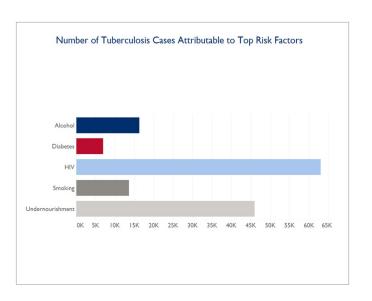


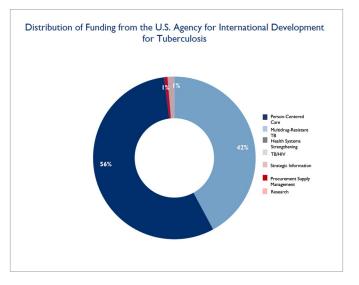






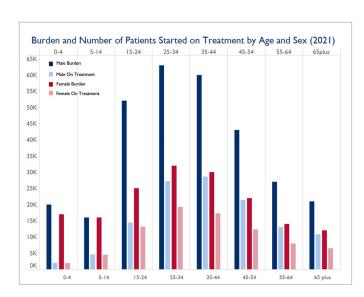


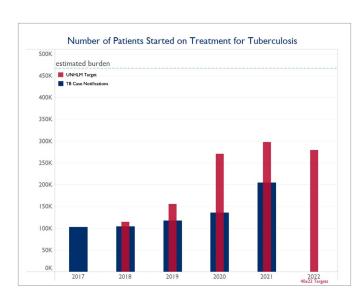


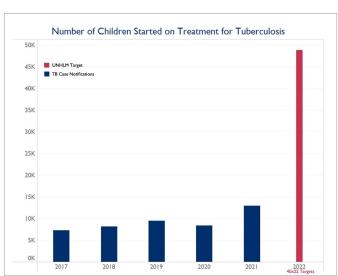


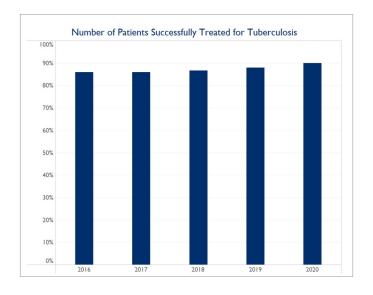
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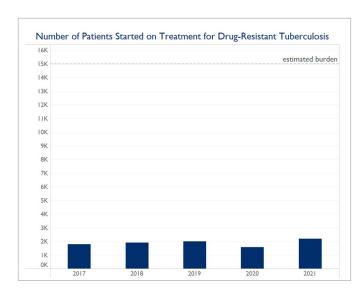
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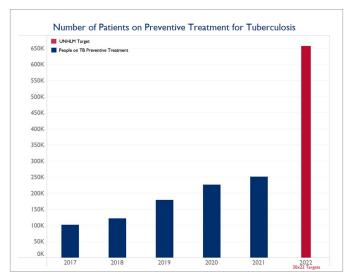


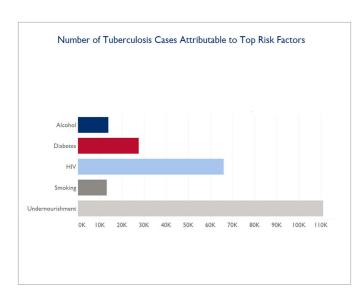


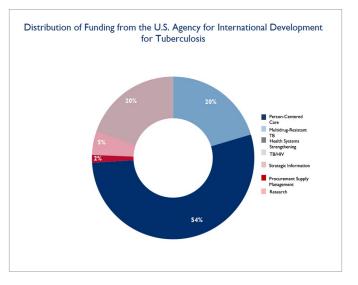








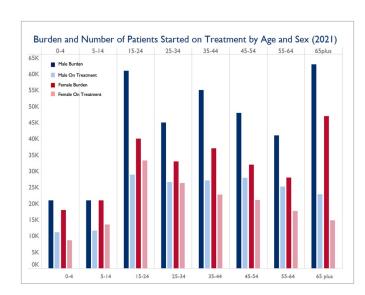


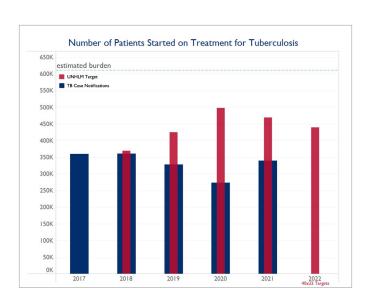


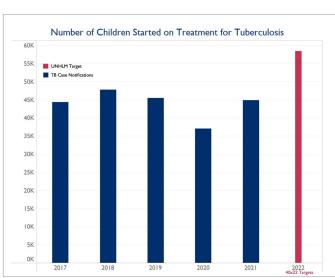
42 | INNOVATING & ADAPTING TO END TB INNOVATING & ADAPTING TO END TB | 43

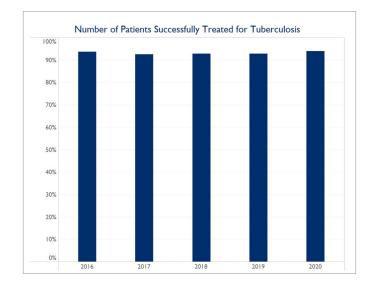
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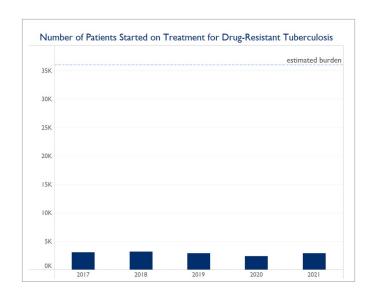
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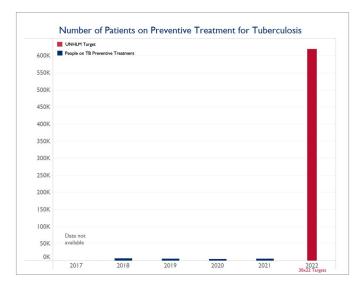


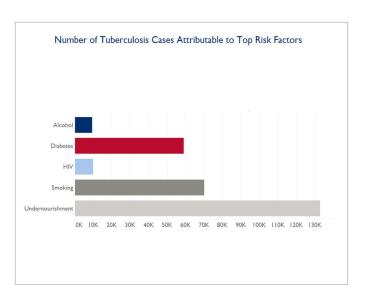


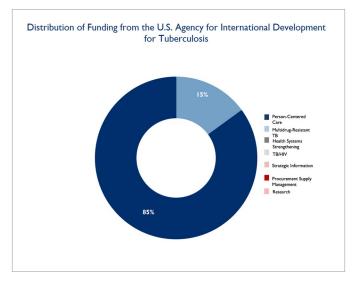








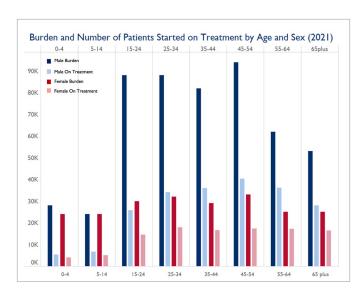


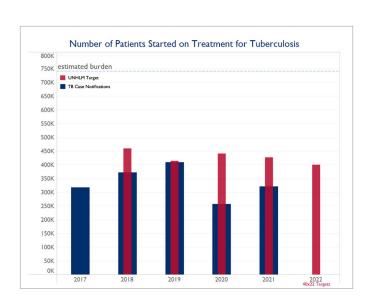


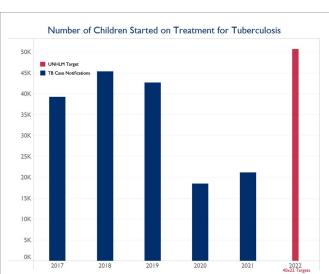
A TIME FOR URGENT ACTION TO END TB

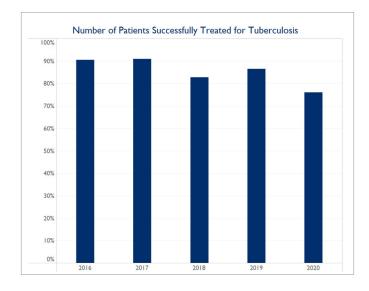
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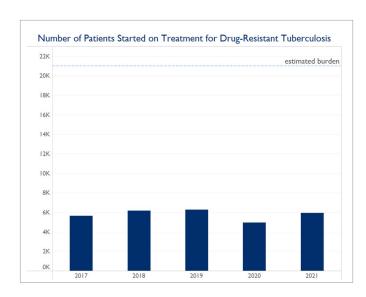
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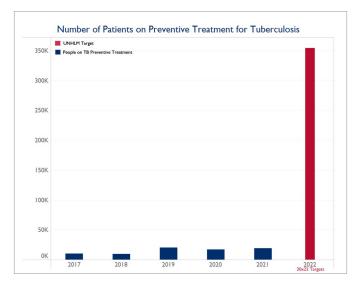


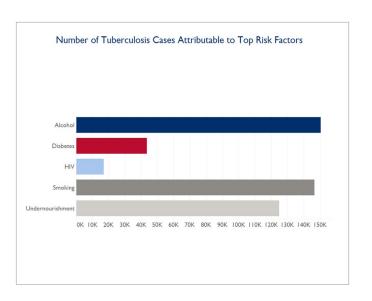


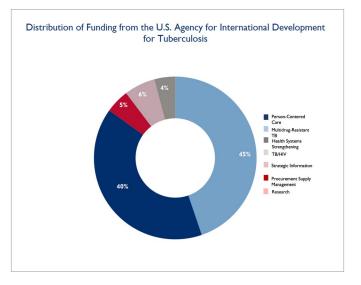






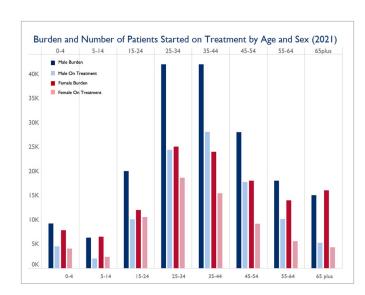


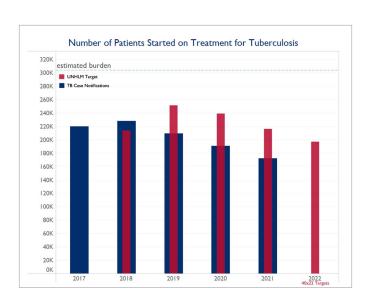


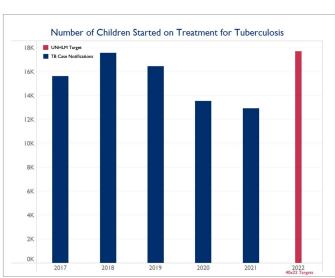


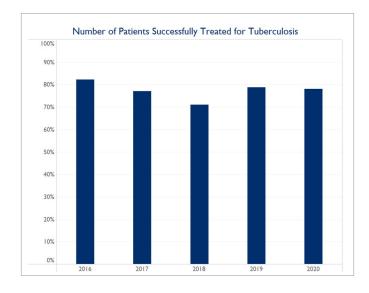
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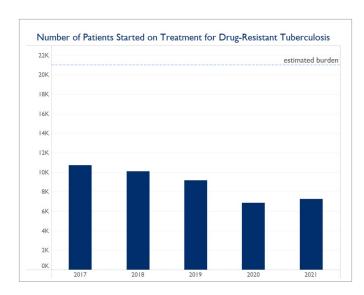
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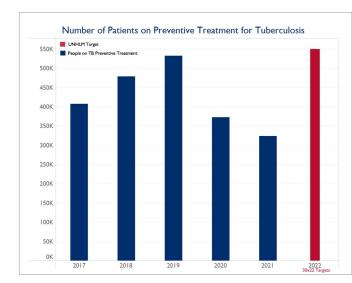


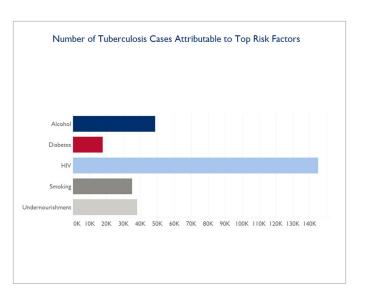


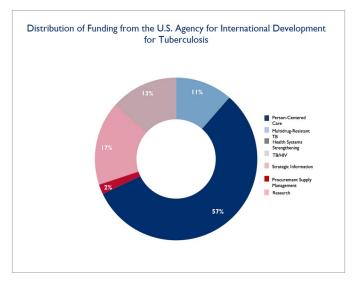






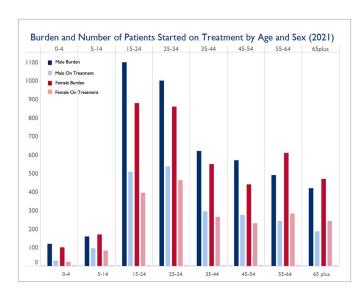


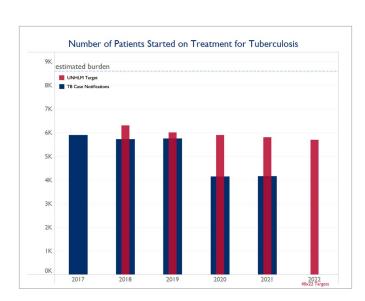


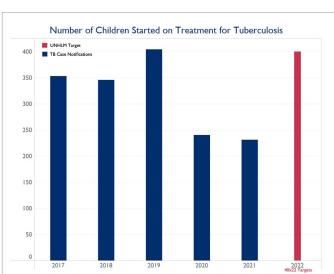


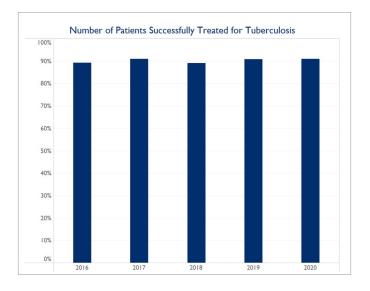
REPUBLIC OF **TAJIKISTAN**

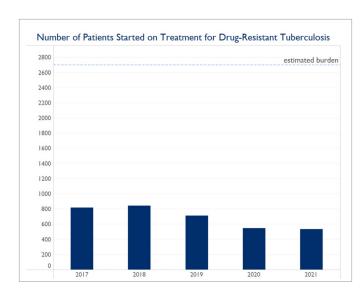
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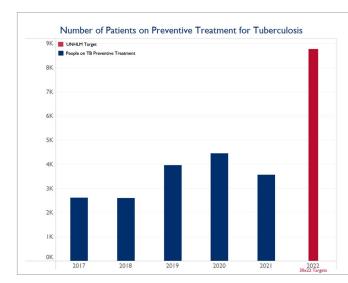


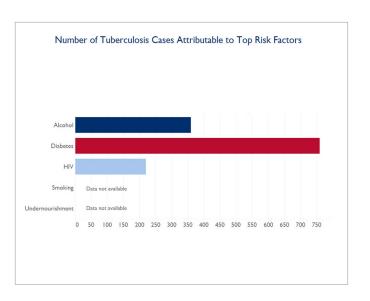


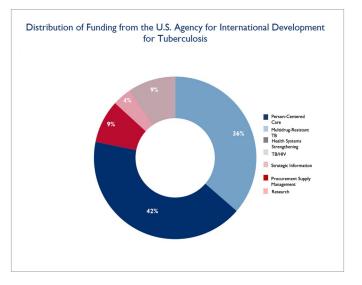








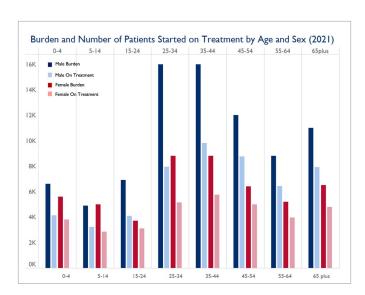


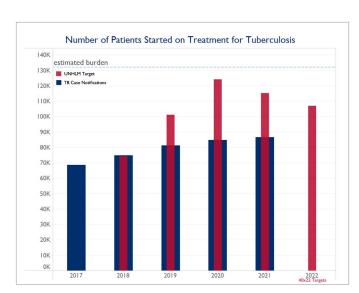


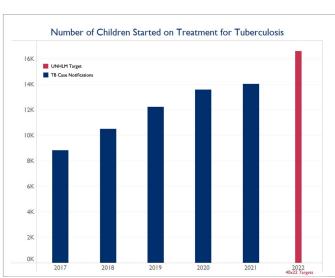
48 | INNOVATING & ADAPTING TO END TB INNOVATING & ADAPTING TO END TB | 49

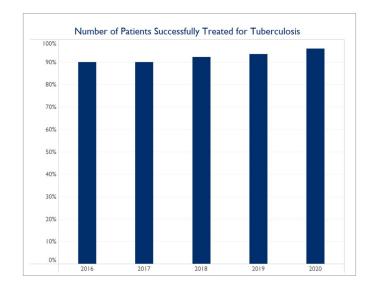
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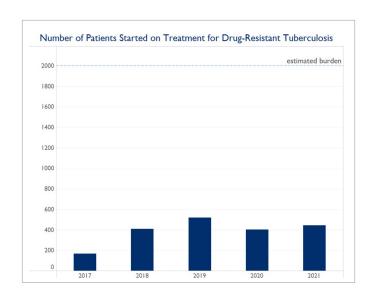
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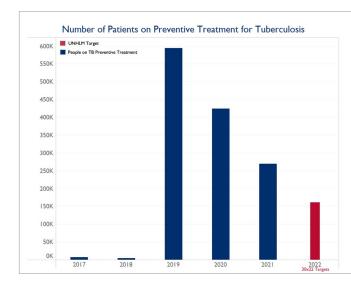


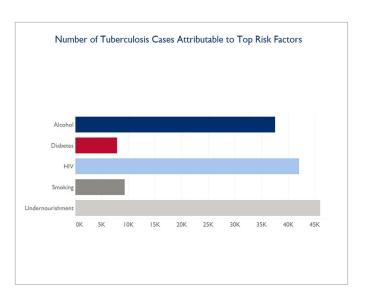


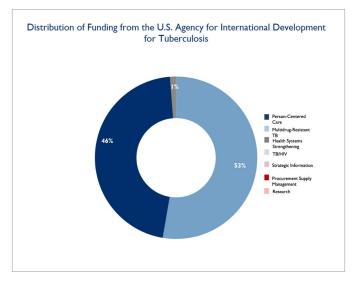








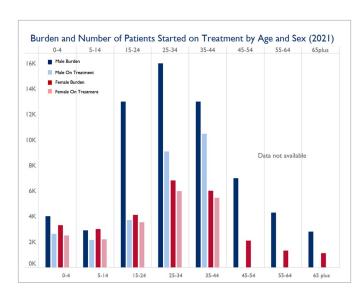


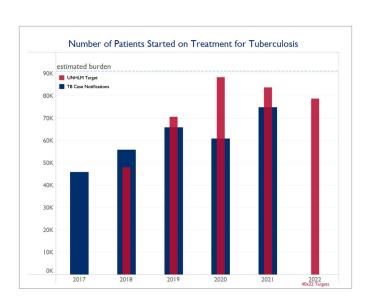


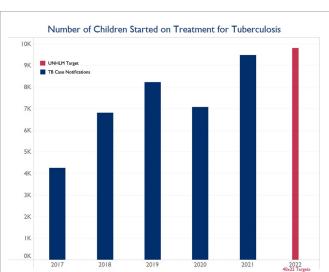
50 | Innovating & Adapting to End TB

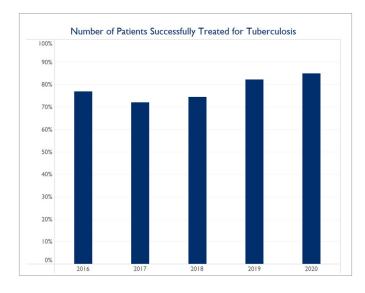
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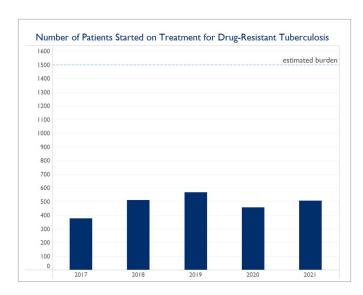
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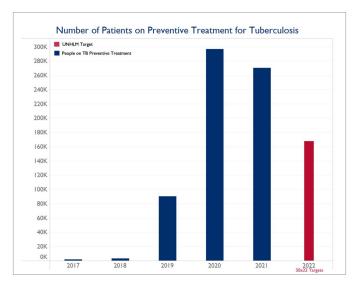


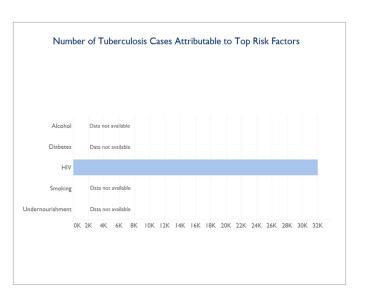


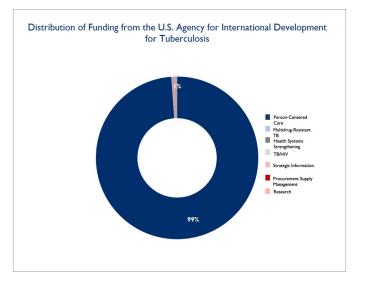




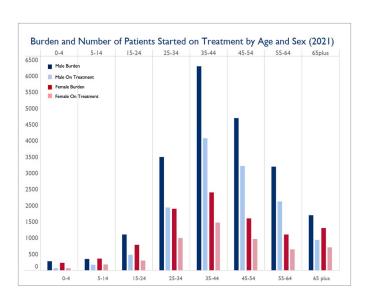


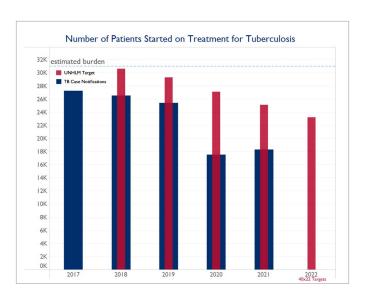


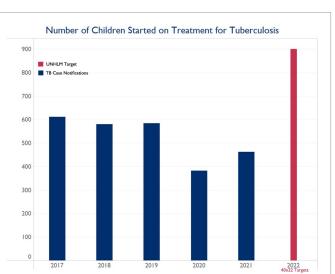


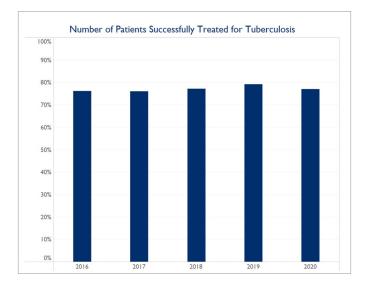


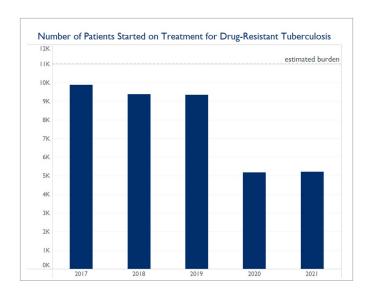
UKRAINE

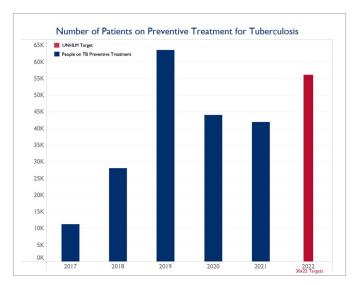


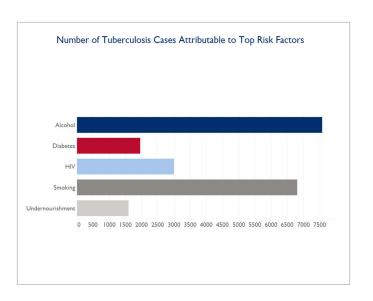


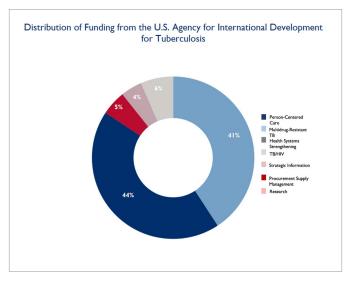






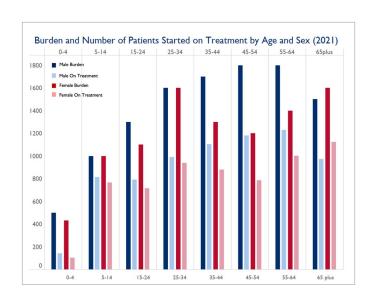


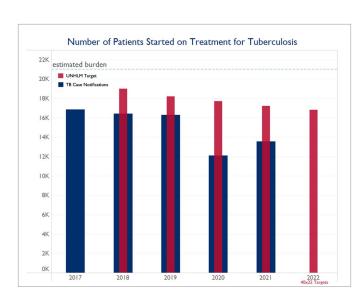


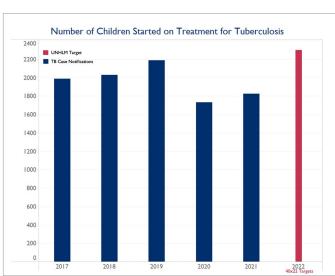


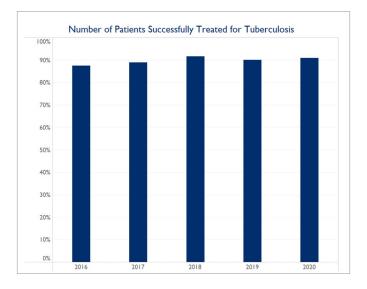
REPUBLIC OF **UZBEKISTAN**

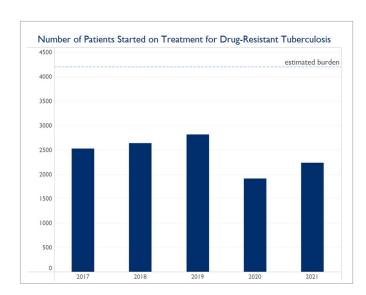
REPUBLIC OF **UZBEKISTAN**

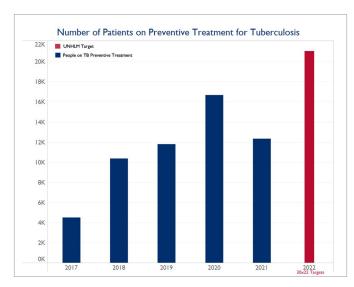


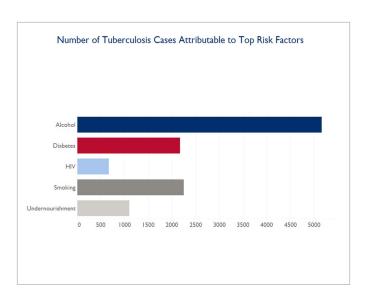


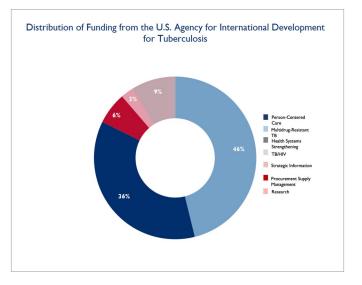






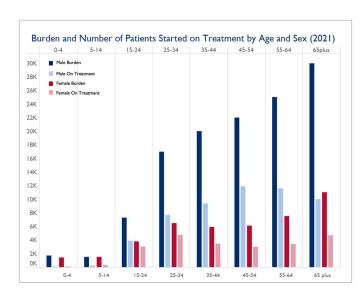


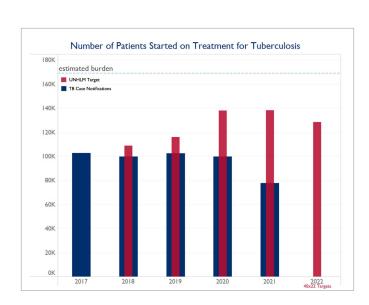


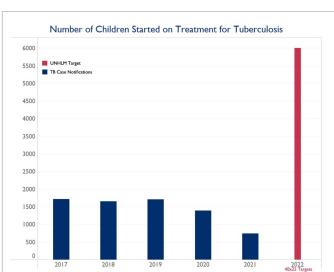


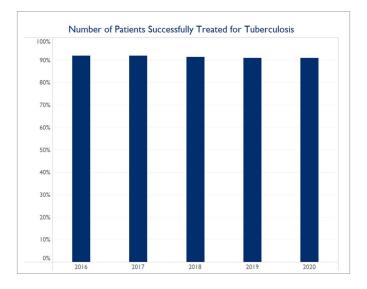
SOCIALIST REPUBLIC OF VIETNAM

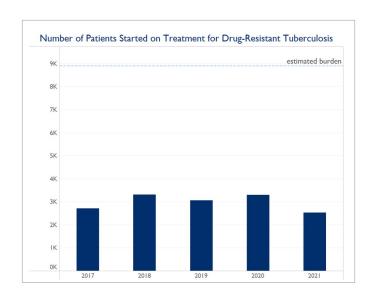
SOCIALIST REPUBLIC OF VIETNAM

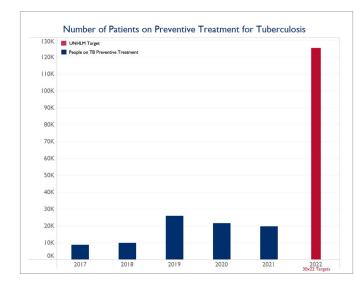


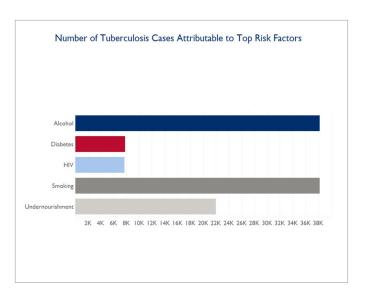


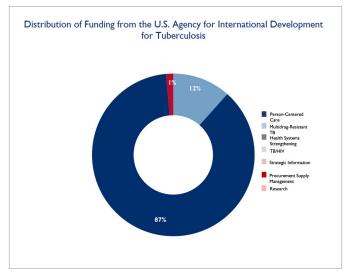






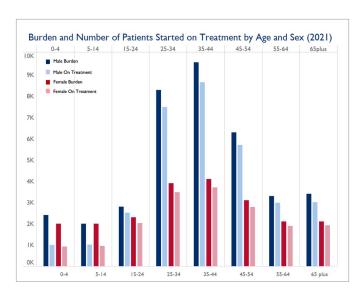


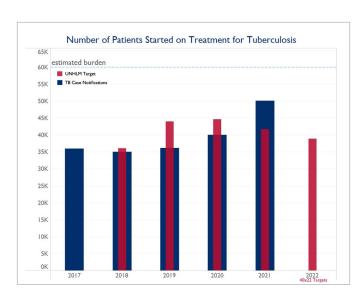


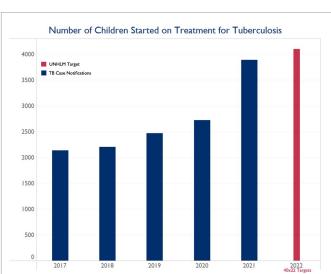


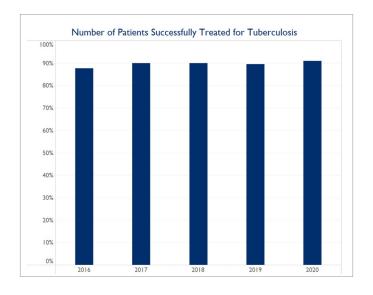
REPUBLIC OF ZAMBIA

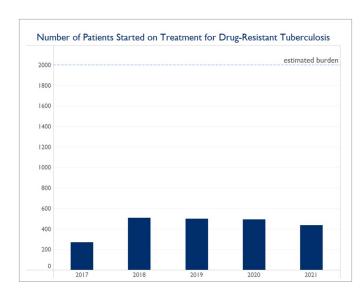
REPUBLIC OF ZAMBIA

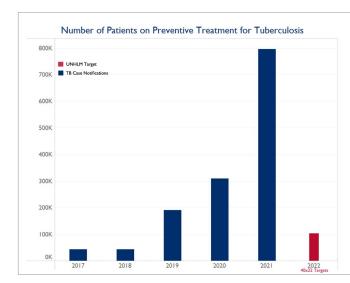


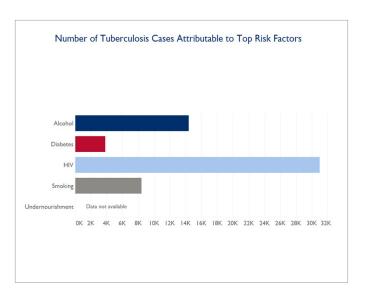


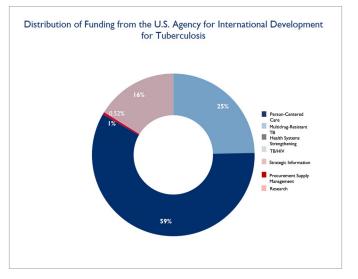








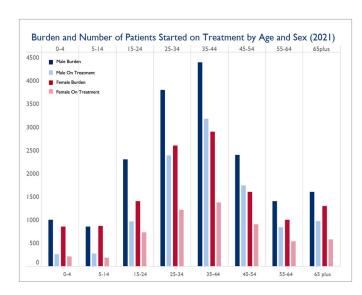


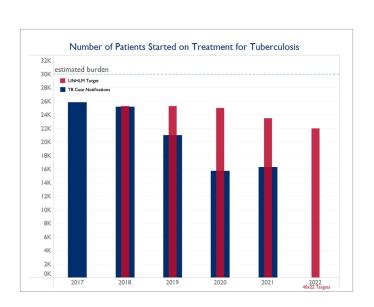


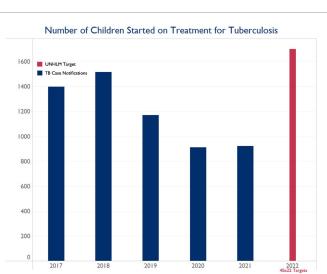
60 | Innovating & adapting to end tb

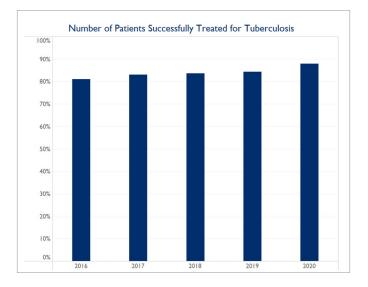
REPUBLIC OF **ZIMBABWE**

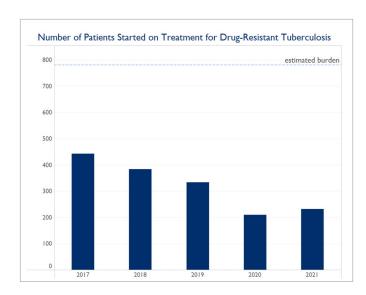
REPUBLIC OF **ZIMBABWE**

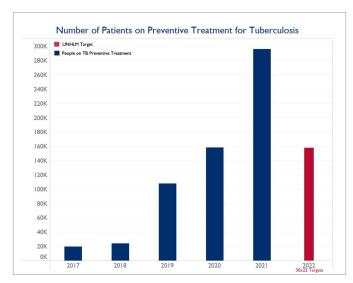


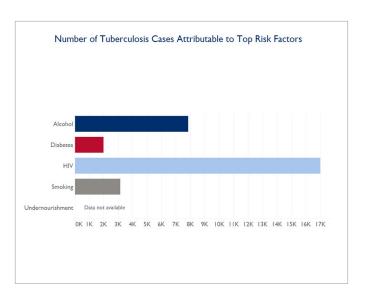


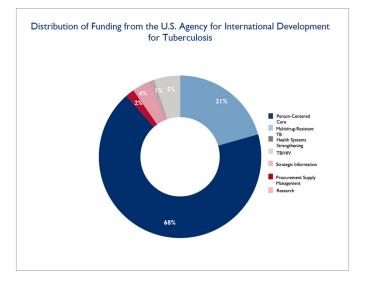












Cover Photo: Urmila Jagganathan for USAID Students participate in a TB awareness meeting at a school in India.

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