



USAID
FROM THE AMERICAN PEOPLE

INFECTIOUS DISEASE DETECTION AND SURVEILLANCE PROJECT

Annual Report, Fiscal Year 2023



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A Message from the IDDS Project Director

The United States Agency for International Development (USAID) Infectious Disease Detection and Surveillance (IDDS) project continues to address challenges including tuberculosis and global health security. IDDS is one of USAID’s leading initiatives to help protect the United States and the world from the increasing threat of infectious diseases.

Fiscal year 2023 includes the sixth year of the project, which ends in May 2024. IDDS has continued to strengthen health systems in Africa and Asia to detect, track, and rapidly respond to infectious diseases and drug-resistant bacterial infections. The project rolled out new tools and techniques to improve the ability of countries’ health systems and workers to detect tuberculosis quickly and accurately. IDDS also bolstered laboratory networks and specimen referral systems for the safe and efficient collection, transportation, and processing of biological samples—aiding effective and timely identification and treatment of diseases. Through these capacity building efforts within diagnostic networks, IDDS ensures that vital technical skills and lessons learned through our implementation are purposefully transitioned to our partners to further align with USAID’s mission to prioritize localization.

We encourage you to read on to learn more about IDDS’s achievements. We thank USAID, our host country government counterparts, partners, other collaborators, and the American people for the opportunity to sustain this project and its outcomes, and our partners and other stakeholders for the collaboration that improves and saves lives.

Lisa Nichols
IDDS Project Director

Cover photos by IDDS: Culture reading in the laboratory at Bungoma County Referral Hospital, Kenya (left); GeneXpert 10-color installation, Cambodia (right).

INTRODUCTION

GLOBAL HEALTH AND THE THREAT OF INFECTIOUS DISEASES

The threat of infectious diseases continues, and outbreaks have increased in frequency and severity since the start of the 21st century. This trend is due in large part to global travel and trade shifts, population growth and migration, climate change, socioeconomic disparities, and increased contact between humans and animals. There has also been a rise in antimicrobial resistance (AMR), with approximately 700,000 people dying each year from [drug-resistant infections](#).

Strong diagnostic and surveillance systems are essential for the provision of quality health care. They enable accurate diagnosis and appropriate treatment. These systems also facilitate the timely detection and reporting of infectious diseases, preventing their spread, and ensure that health officials and others have the information required to take rapid and decisive action. However, many low- and middle-income countries (LMICs) lack the capacity to detect and respond to both known and emerging pathogens, and this is especially important in regions at high risk for diseases with pandemic potential and AMR. Laboratory systems and diagnostic testing capacity are frequently overlooked and underfunded components within health systems in LMICs.

“We have to build the world’s capacity to prevent, detect, and respond to all infectious disease outbreaks—whether they’re caused by new COVID variants, existing threats, or emerging pathogens. Disease outbreaks are urgent national security risks, and governments around the world need to treat them that way—building up our collective defenses, again, against biological threats.”

—USAID Administrator Samantha Power, Center for Global Development, Washington, DC, April 20, 2023

ABOUT IDDS

Established in May 2018, the Infectious Disease Detection and Surveillance (IDDS) project operates in LMICs where there are significant gaps in health systems’ ability to detect, track, and rapidly respond to infectious diseases and drug-resistant infections that pose major threats to public health and global health security. IDDS is funded by the United States Agency for International Development (USAID).

ICF leads IDDS with a consortium of organizations with expertise in infectious diseases, disease detection and surveillance, and health information systems: FHI 360, PATH, Abt Associates, the African Society for Laboratory Medicine (ASLM), the Association of Public Health Laboratories, Gryphon Scientific, the Mérieux Foundation, and Metabiota.

Country teams, led primarily by host-country nationals, collaborate closely with ministries of health (MoHs), other relevant ministries (e.g., ministries of agriculture and ministries of animal welfare) and local partners to ensure that the project’s efforts are aligned with each country’s priorities and tailored to local needs.

IDDS works closely with USAID missions in the respective countries and with USAID headquarters in Washington, DC.

WHAT WE DO AND WHERE

In fiscal year (FY) 2023*, IDDS operated in 25 countries across Africa and Asia, where the project focuses on developing the capacity of laboratories to provide safe diagnostic testing and accurate, quick results—and to effectively communicate those results to health care providers, public health officials, and other key decisionmakers. The project also strengthens diagnostic networks by enhancing specimen referral systems (SRSs), introducing novel tools and approaches that facilitate the detection of infectious diseases, and helping bolster policies and governance.

*This report covers IDDS implementation and achievements for October 1, 2022–December 31, 2023. This corresponds to all of FY 2023 plus the first quarter (Q1) of FY 2024.



World Antimicrobial Awareness Week 2023, Cameroon. Photo by IDDS

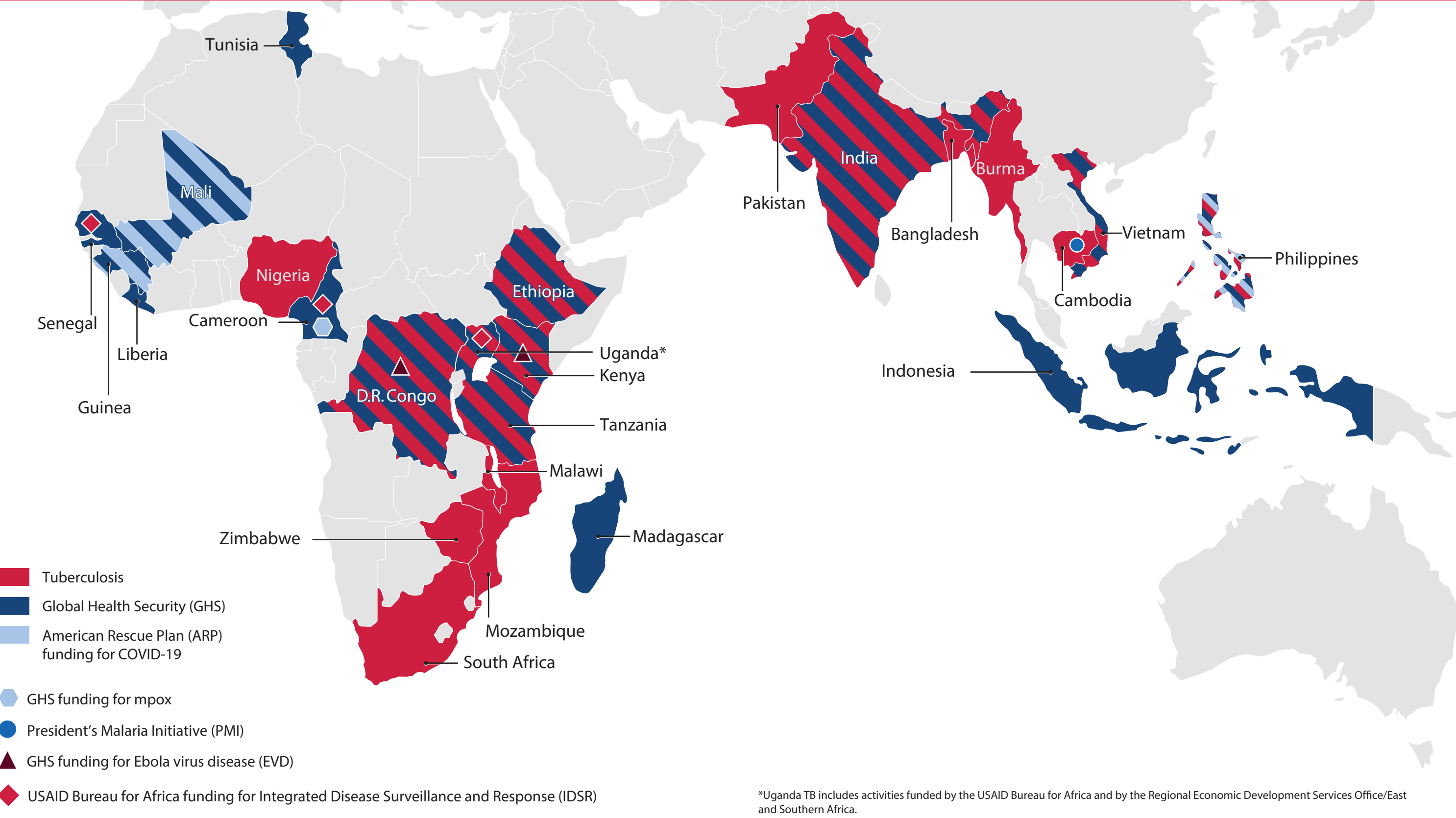
Zoonotic diseases—caused by germs spread from animals to humans—account for three-quarters of new or emerging infectious diseases in people.

Applying a “One Health” approach that recognizes the interconnection between people, animals, and our shared environment, IDDS also works to develop the capacity of animal health systems to detect and report diseases that could become threats to humans, and to foster collaboration and data sharing between the animal and human health sectors.

In close collaboration with national decisionmakers, IDDS implements initiatives that strengthen the diagnosis of diseases and drug-resistant pathogens that have the potential to spread quickly, devastate health outcomes, and disrupt economies. Priority diseases include tuberculosis (TB)—one of the world’s deadliest infectious diseases, causing approximately [1.6 million deaths each year](#)—as well as Ebola virus disease (EVD), Marburg virus disease (MVD), COVID-19, plague, and mpox.

USAID's INFECTIOUS DISEASE DETECTION AND SURVEILLANCE (IDDS) PROJECT

WHERE WE WORK, FISCAL YEAR (FY) 2023

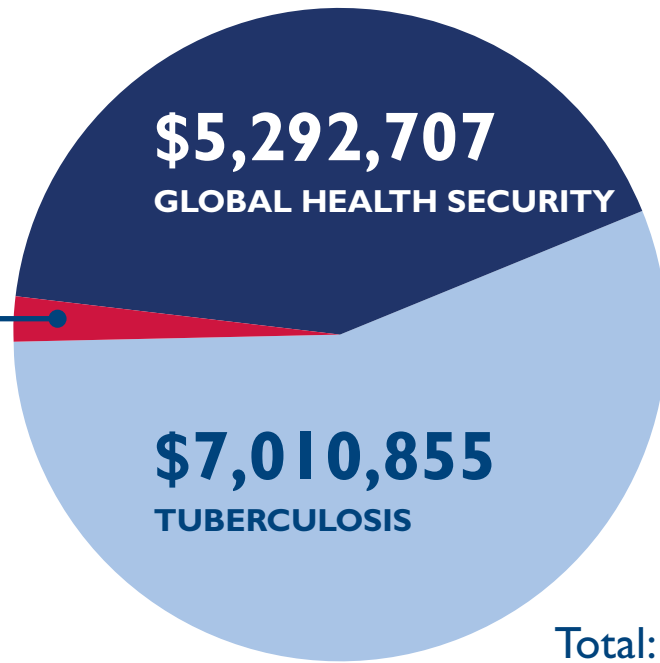


FUNDING

IDDS is a \$135 million project that can accept funds from multiple sources and has proven capabilities to pivot operations quickly as countries' needs and priorities change. During FY 2023, IDDS received a variety of USAID funding: Global Health Security (GHS) funds for general activities and outbreak response activities (including EVD, mpox, and MVD); USAID Washington, USAID mission, and President's Emergency Plan for AIDS Relief funds for TB activities; and USAID Bureau for Africa funds for Integrated Disease Surveillance and Response (IDSR) and TB activities.

IDDS FUNDING FY 2023*

\$300,000
EBOLA



Total: \$12,603,562

*FY 2023 includes FY 2024 Q1

IDDS BY THE NUMBERS FY 2023

650+

Laboratories supported

161

Laboratories offering new testing services

3

Laboratories accredited

6,917

People trained to improve diagnostic capacity

858

People trained to improve surveillance capacity

1,252

People mentored

463

Standard operating procedures, plans, or guidelines developed or updated

19

Surveillance systems strengthened

46

National surveillance bulletins produced

52

Multisectoral data sharing meetings supported

DELIVERING RESULTS

INFORMING DECISIONS

Analyzing networks and forecasting needs

Why it matters: Around the world, far too many people lack access to laboratory tests, either because diagnostic services are unavailable or because testing facilities are too far from where patients live or seek health care. Poor infrastructure for transporting specimens to better-equipped facilities for testing and a lack of functional laboratory equipment are compounded by weak supply chains for the materials that are needed to perform these tests. Designing better diagnostic networks requires analysis of the existing testing capacity, gaps, and opportunities for improvement—and IDDS delivers such information across the countries where we work so that decisionmakers can optimize the placement of new instruments and services to best reach the patients who urgently need them. The ability to provide timely and accurate treatment and health care services based on laboratory test results depends on these efforts to inform expansion of laboratory services.

Global Health Security

Through U.S. President's Malaria Initiative (PMI) funds in **Cambodia**, we assessed malaria polymerase chain reaction (PCR) testing capacity at the National Center for Parasitology, Entomology and Malaria Control (CNM) laboratory and identified opportunities for improvement. Our assessment of malaria diagnostic capacity at Kampong Cham Referral Hospital also laid the groundwork for the site becoming a national reference laboratory (NRL) and contributing to malaria elimination in Cambodia.

In **Tunisia**, we piloted a novel IDDS-developed tool that evaluates the capacity and function of the country's diagnostic network and preparedness to respond to high-risk emerging disease threats. Findings from the pilot were used to inform Tunisia's application to the World Bank Pandemic Fund to build stronger health systems and mobilize additional resources for pandemic prevention, preparedness, and response. This tool can be adapted and applied in other countries and includes a section that specifically examines a country's COVID-19 testing capacity.

In **Mali**, we mapped 47 laboratories in 5 regions. Information on the laboratories will ensure that the country is better positioned to coordinate and allocate resources effectively, leading to improved laboratory services and response capabilities, as well as optimization of the SRS.

Tuberculosis

Following guidance from the World Health Organization (WHO), countries are introducing and expanding use of rapid molecular tests, which are more accurate than smear microscopy, to support TB and drug-resistant (DR) TB diagnosis. These tests include Molbio Diagnostics' Truenat® and Cepheid's GeneXpert® 10-color instruments. (The 10-color technology uses multiple optical channels to enable detection of a range of pathogens and AMR from a single sample.) IDDS worked with national TB programs (NTPs) to develop detailed pictures of their diagnostic networks to support network optimization and placement of the newly introduced diagnostic tools, and to help them to understand domestic consumable needs and supply chain challenges. We did this through laboratory network spatial analysis (LNSA)—a methodology that combines geospatial analysis with population and TB burden data—to determine current network capacity and identify population groups that have limited access to rapid molecular diagnostics. During FY 2023, we supported LNSAs to inform placement of instruments in **Burma, Ethiopia, Malawi, Tanzania, and Zimbabwe**.

IDDS also supported 5 TB diagnostic network assessments (DNAs) this year using an updated tool that scored the TB diagnostic network against 10 core competencies. By using a government-led approach, we built capacity from behind the scenes, enabling NTPs to take the lead in planning and conducting the DNAs, in the **Democratic Republic of the Congo (DRC), Kenya, Malawi, Pakistan, and South Africa**. Results from the DNAs helped IDDS and NTPs identify gaps and generate evidence-based recommendations to improve the access, capacity, and quality of the TB diagnostic network. The DNA findings have delivered valuable impact to NTPs. For example, in **Malawi**, the National TB and Leprosy Elimination Program (NTLEP) used recommendations from the DNA to secure grant funds for 50 GeneXpert 10-color instruments that were successfully distributed in 2023 to TB diagnostic sites across the country.

Generating data to inform policies and plans

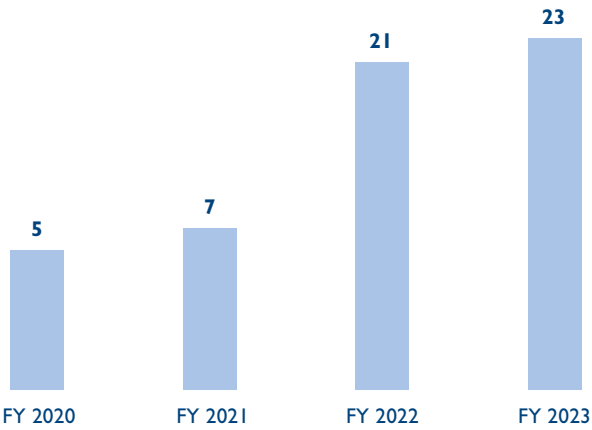
Why it matters: Beyond our efforts to assess national capacity for diagnosing diseases, we work to build the evidence base for national efforts to modernize disease surveillance by developing regulations, revising diagnostic algorithms, and facilitating strategic planning. This involves gathering data from community and regional sources, cleaning and analyzing the data, and submitting the data to national health information systems to enable national monitoring of disease trends and drug resistance, which informs program planning and strategic decision-making.

Global Health Security

IDDS supported the development of 46 surveillance bulletins in 7 countries (**Cameroon, Ethiopia, Guinea, Kenya, Madagascar, Mali, and Uganda**). Of these, 10 bulletins contained surveillance data for both animal health and human health. The bulletins are important for sharing and analyzing surveillance data.

In **Ethiopia** and **Kenya**, we supported efforts to clean, analyze, interpret, and report AMR surveillance data and develop national AMR surveillance reports that inform policy decisions. In **Kenya**, we supported the reporting of annual AMR surveillance to WHO’s Global Antimicrobial Resistance and Use Surveillance System (GLASS), which will help inform international efforts to fight AMR. The number of records submitted from Kenyan surveillance sites to GLASS increased from 608 records in 2022 to 6,481 records in 2023, reflecting enhanced AMR surveillance, improvements in data quality, and enhanced data management capacity.

IDDS-supported laboratories reporting AMR data to WHO’s Global Antimicrobial Resistance and Use Surveillance System



We assisted the Government of **Cameroon** to validate and finalize its strategic plan for the prevention and control of mpox. In **India, Kenya, and Liberia**, we helped draft and validate national AMR surveillance strategies for multisectoral approaches to addressing AMR in each country. In **Indonesia**, IDDS supported the development of the Zoonosis and Emerging Infectious Disease Information System (*Sistem Informasi Zoonoses dan Emerging Infectious Diseases*, or SIZE) mobile apps and website. In collaboration with other global health security partners, IDDS contributed to the official national launch of SIZE by the Coordinating Ministry for Human Development and Cultural Affairs on December 19, 2023. SIZE is now the official One Health-based surveillance system in **Indonesia**, designed to promptly detect disease emergence in both human and animal populations.

Tuberculosis

In **DRC**, we supported the development of a new strategic plan for NTP, as well as a revised supervisory manual and checklists to improve supportive supervision to intermediate-level laboratories. We had also previously supported the incorporation of pediatric TB indicator data into the national health information system platform (DHIS2), and this year we finalized data analysis to understand how this improved the understanding of the TB burden in the country. In **Cambodia, Malawi, Tanzania, and Zimbabwe**, IDDS connected newly equipped laboratories at regional and district levels to connectivity solution providers, such as SystemOne and Savics, to facilitate reporting. IDDS also worked with laboratories in **Cambodia** and **Malawi** to update data collection registers and formats to incorporate data collected from the newly introduced GeneXpert 10-color diagnostic platforms.

Sharing our knowledge

Why it matters: IDDS experts deploy their expertise and research capabilities to further scientific knowledge and understanding of infectious disease prevention and control. Building on our 5 years of experience supporting more than 20 countries, IDDS thought leaders from across our global activities have contributed to webinars, academic conferences, scientific papers, and public health communications, further sharing our experience across countries and regions. We also bring together stakeholders through a community of practice, working groups, and training workshops to align both global and national strategies on best practice approaches to infectious disease control and elimination.

Global Health Security

In **Cameroon, Ethiopia, India, Kenya, and Tanzania**, IDDS teams participated in multiple conferences and organized events during World Antimicrobial Awareness Week in November 2022 and November 2023. Also in **Kenya**, we conducted two webinars on AMR detection and surveillance topics and published an article in *Frontiers in Microbiology* on the development, rollout, and implementation of an AMR training curriculum.

During the past fiscal year, we shared results and lessons learned from our global health security activities in several countries in presentations at conferences held by or associated with the American Society of Tropical Medicine and Hygiene, Association of Schools of Public Health in Africa, and African Field Epidemiology Network, among others. We had 10 abstracts accepted for oral or poster presentation at the 2023 ASLM conference (see sidebar). We also presented a poster on community-based surveillance (CBS) in **Mali** at the 2023 Global Digital Health Forum, and we presented on shipment of EVD specimens in **DRC** at the 2023 Conference on Public Health in Africa.



Meke Christian, a laboratory technician at the National Veterinary Laboratory, Garoua, Cameroon. Photo by IDDS

We hosted a [webinar about SRSs](#) to share our experiences from **Guinea** and **Vietnam**. We also hosted a [webinar on CBS](#), with highlights from **Mali** and **Senegal**. These webinars had 234 attendees in total and convened experts who shared lessons learned and challenges and successes from the field.

Staff members from our team in **India** contributed a chapter on the burden of AMR associated with various infectious diseases to the [Handbook on Antimicrobial Resistance](#), published by Springer Nature. We also communicated about the project’s impact in the areas of AMR, One Health, and global health security through blogs and articles published in Science Speaks, LeaderNet, Eye on Global Health, and Agrilinks, among others.

“The collaboration with IDDS has markedly improved the quality of care we provide in our facility. For instance, in 2023, we successfully treated a patient with recurrent urinary tract infection after multiple failed attempts with expensive antibiotics in other facilities. Prompt identification of the correct organism, and the appropriate and inexpensive antibiotic treatment by our IDDS-supported laboratory led to patient’s full recovery, alleviating suffering, saving a life, and reducing health care costs.”

—Dr. David Wanikina, medical superintendent, Bungoma County Referral Hospital, Kenya

ASLM Conference

The sixth biennial ASLM conference took place in Cape Town on December 12–15, 2023. IDDS had a significant presence. Ten of our abstracts were accepted for poster or oral presentation, and we were able to showcase our work, successes, and impact over the past five years of the project:

Posters:

- Intensified mentorship to lead to ISO 15189 accreditation of microbiology laboratories in Ethiopia
- AMR diagnostic stewardship in Ethiopia
- Establishing bacteriology testing capacity in Guinea
- Public laboratory capacity strengthening during the COVID-19 pandemic in Madagascar
- Introducing Xpert MTB/XDR assay into the tuberculosis diagnostic network in Malawi
- The use of remote technical mentorship for ISO 15189 accreditation for tuberculosis laboratories: a report from Pakistan
- Increasing access to COVID-19 laboratory testing in conflict areas in the Philippines
- Rapid workforce capacity strengthening for COVID-19 response in the Philippines

Oral abstract presentations:

- Impact of mentorship on Laboratory Assessment of Antibiotic Resistance Testing Capacity in Kenya
- Laboratory system capacity building for emergency response to COVID-19 in Mali

DST Workshop

IDDS served as the secretariat for a global training workshop, Closing the DST Gap for DR-TB Patients, which was organized by USAID and the Ethiopian MoH and took place on June 21–23, 2023, in Addis Ababa. The workshop convened more than 100 people from 20 USAID TB priority countries, including multilateral donors like Unitaid and WHO, laboratory experts, and participants from national reference laboratories, NTPs, supranational reference laboratories, technical assistance providers (such as FIND, KNCV, TB Alliance, and the Stop TB Partnership), diagnostic developers (such as Cepheid, Molbio Diagnostics, Hain, BD, Roche, and Oxford Nanopore Technologies), and pharmaceutical companies (such as Viatris), as well as USAID mission staff from Ethiopia, India, and Kenya.


The strategies discussed at the workshop were not “one size fits all.” As Patricia Hall Edison, TB and clinical monitoring team lead for the U.S. Centers for Disease Control and Prevention said: “Differentiated strategy isn’t a bad thing; it’s about making sure the right people have access to the right drugs.” The [workshop facilitated the exchange of knowledge and development of connections](#) to help countries prioritize scaling up DST and expanding DR-TB surveillance to close the DR-TB treatment gap for patients.

Tuberculosis

FY 2023 culminates several years of research and implementation of TB control and elimination programs through IDDS. We published three peer-reviewed articles resulting from operational research in **India** and developed a compendium of DR-TB resources to share the project’s learnings from rolling out new DR-TB diagnostic technologies around the world—the first time this has been undertaken in a programmatic setting. In **Ethiopia**, we co-hosted a workshop on closing the drug susceptibility testing (DST) gap for DR-TB patients, which brought together more than 100 people from more than 20 countries (see DST Workshop sidebar). A [blog on diagnostics for DR-TB](#) complemented the workshop.

We co-hosted a [webinar](#) with the Stop TB Partnership on our experience supporting Truenat external quality assessment (EQA) across 9 countries, including **Cambodia** and **Zimbabwe**, which was attended by 138 people and received 188 views on YouTube. We also posted videos about the innovative “one-stop” solution for TB diagnostics in Hisar, **India**, on the IDDS YouTube channel (see sidebar) and communicated about IDDS’s impact in the TB field through various articles and blogs.

We participated in the virtual Union World Conference on Lung Health in November 2022 (with 3 oral presentations and 11 e-posters) and the in-person conference in November 2023 in Paris (see sidebar), to share information about our efforts to improve the quality of TB diagnostics in high-burden countries. We also presented on our work in **DRC** to integrate pediatric TB indicators into the national health information system at the DHIS2 annual conference in Oslo, and at the Global Digital Health Conference in Washington, DC, and had two posters accepted for the ASLM conference on best practices and lessons learned from IDDS TB activities.



Sample collection window at public health facility participating in private sector laboratory engagement model in Hisar district, India. Photo by IDDS

One-stop TB Diagnostic Solution (Hisar Model)

IDDS implemented a novel approach to private sector laboratory engagement in India, which was documented through a [fact sheet](#). We also supported the production of videos for [patients](#) and [stakeholders](#) and contributed to a [Diagnostics](#) article on the “one-stop” solution.

2023 Union Conference

Every year, the International Union Against Tuberculosis and Lung Disease holds the Union World Conference on Lung Health. The 2023 Union Conference took place in Paris on November 15–18, 2023, with more than 3,650 attendees from more than 155 countries. Eight IDDS technical and country leads attended the conference to share insights and help staff the USAID booth.

Workshop presentations:

- New screening, diagnostic, and digital technologies for TB detection
- Rapid molecular testing for TB and rifampicin resistance
- Using the Aspect connectivity solution to share performance data with Cepheid
- Implementation of stool-based testing for TB
- Enhancing clinical diagnostic capacity for TB in children and adolescents



Oral abstracts and e-poster:

- Increasing access to Truenat technology in Bangladesh
- Utility of Trueprep-extracted deoxyribonucleic acid for line probe assay testing
- Strengthening the TB diagnostic network in Zimbabwe
- Implementation of Aspect connectivity platform for Truenat MTB Plus and MTB/RIF

Satellite and symposium sessions:

- Multi-country implementation of Xpert XDR
- Expediting pediatric TB diagnosis

Our TB experts have also developed and disseminated “super-user” training packages, complete with standard operating procedures (SOPs), checklists, and job aids, to train national and regional laboratory staff for country-led, sustainable technical support for implementation of GeneXpert *Mycobacterium tuberculosis* (MTB)/extensively drug-resistant (XDR) and Truenat instruments. (Super-users are technicians who receive extra GeneXpert or Truenat training to become experts who can pass on their knowledge and troubleshooting skills to others.) Our pediatric TB experts also supported the development of a global community of practice in which participants now meet monthly and share learning and experiences from implementing pediatric TB testing initiatives. For country programs that closed out, including **Bangladesh, Cambodia, DRC, Malawi, and Mozambique**, IDDS presented life-of-project results to NTPs and USAID to showcase achievements and transition activities to local ownership.

EXPANDING ACCESS

Strengthening laboratory systems to decentralize and optimize access to diagnostic services

Why it matters: Bringing diagnostic testing closer to patients makes it easier for people to access needed tests more quickly and equitably. This helps patients obtain timely diagnosis and appropriate treatment decisions. Early diagnosis also helps countries detect priority pathogens quickly and allows governments to take actions to stop the spread of disease and save lives. IDDS introduces new testing capacity at subnational levels through training, mentorship, and the provision of laboratory equipment and supplies. We also work with governments to introduce new diagnostic tools like Truenat that are designed to work in facilities with limited infrastructure and electricity.

Global Health Security

From national and regional laboratories to community health centers, we increase access to diagnostic testing for infectious diseases across the countries where we work. We equipped regional laboratories in **Cameroon**, so they no longer need to send specimens to NRL for mpox testing. In **DRC**, we provided equipment and training so the National Biomedical Research Institute (*Institut National de Recherche Biomédicale*, or INRB) in Goma could begin diagnosing EVD and plague, which were previously difficult to identify without having to send the specimens to Kinshasa or abroad for confirmatory testing. In both **DRC** and **Guinea**, IDDS improved the capacity for detecting hemorrhagic fever outbreaks through strategic expansion and maintenance of a stockpile of diagnostic reagents and supplies tailored for priority pathogens such as Ebola, Marburg, and Lassa. This proactive approach allows for rapid diagnostic processes, facilitating early identification of priority pathogens, and enhances the overall preparedness and responsiveness of health care systems in DRC and Guinea.

In **Madagascar**, we established bacteriology capacity at three laboratories by training and mentoring staff and providing equipment and supplies. In **Senegal**, we provided equipment and training in bacteriology to two additional laboratories in Dakar and Mbour to increase access to diagnostic services in these two cities with large populations.

Expanding access and providing ongoing mentoring and support to laboratories has increased the capacity of the laboratories we support to detect priority pathogens. In FY 2023, 46 laboratories we supported detected 17,007 priority pathogens through bacterial culture, almost a fivefold increase compared with FY 2021.

Tuberculosis

IDDS worked with NTPs to place Truenat instruments in rural, hard-to-reach areas in **Malawi** and **Tanzania**. Presumptive TB patients no longer had to travel long distances and could have their TB and drug-resistant testing results within a few hours instead of days because of our support.

In **Bangladesh, Cambodia, DRC, Malawi, Mozambique, Vietnam**, and **Zimbabwe**, we improved diagnosis of pediatric TB by implementing stool specimen collection and processing—an important alternative method for identifying children with TB, because most young children are unable to produce sputum specimens. We developed SOPs and trained laboratory workers to use the simple one-step (SOS) method for stool specimen processing with GeneXpert instruments. IDDS works with the Uganda Supranational Reference Laboratory (SRL) to study whether Truenat can also be used for testing of stool specimen to further expand access to pediatric TB diagnosis.

In **Cambodia**, IDDS enabled two laboratories to begin conducting culture-based phenotypic DST for second-line drugs through training and the development of guidelines and SOPs. In **Tanzania**, IDDS enabled a zonal TB reference laboratory to start conducting line probe assay (LPA) testing for first- and second-line drugs. This is an important achievement because as new treatment regimens become more widely available to treat DR-TB, it is imperative for countries to understand changing DR-TB resistance patterns.

Improving specimen referral systems

Why it matters: In many countries, specimen collection occurs in remote areas where there are no processing facilities. This requires the transport of specimens from remote areas to central laboratories that are better equipped for testing, which can affect specimen integrity. In addition, the systems for delivering the specimens are often fragmented or pose biosafety and biosecurity risks. Many SRSs also need to be updated and adjusted to incorporate laboratories with new diagnostic technologies. Improving the efficiency and effectiveness of specimen transport systems accelerates the referral of confirmed cases to treatment, prevents resources from being wasted when specimen integrity is compromised during delivery, and reduces biosecurity risks.



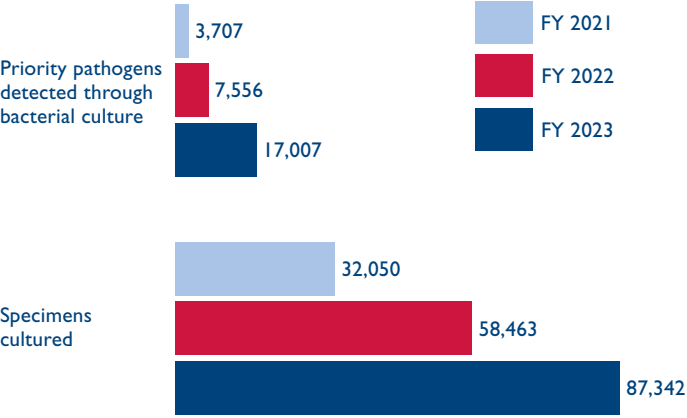
Stool specimen preparation during training, Mozambique. Photo by IDDS

Global Health Security

In a major milestone for access to diagnostic services in **Guinea**, we supported the national expansion of the SRS that we had originally piloted in three regions (Kindia, Mamou, and Faranah). The SRS now reaches 491 health centers located across the country’s 33 health districts and has facilitated the transport of more than 2,500 samples that helped detect ongoing outbreaks of Lassa fever, diphtheria, polio, and whooping cough, among other infectious diseases, within 48 hours.

In **Tanzania**, we supported a pilot SRS to refer specimens requiring culture and antimicrobial susceptibility testing (AST) from lower-tier health facilities to four AMR surveillance sites. The referred specimens increased the testing volume at those sites and bolstered AMR surveillance, which informs patient management and policymaking. In **Vietnam**, the integrated and multisectoral IDDS-supported SRS was successfully piloted in three provinces. This pilot serves as a compelling model for national scale-up. IDDS collaborates with the government, offering cost estimates, training, and tools to facilitate the potential expansion of the system nationally. This expansion is intended to encompass both preventive and curative health sectors, responding to requests from more than a dozen laboratories in both the human and animal health sectors.

Priority pathogens detected and testing volume at 46 IDDS-supported bacteriology laboratories in 8 countries



*Data for Tanzania not included because data validation is ongoing.

*All sites listed are laboratories, except for X-ray computer-aided detection artificial intelligence sites, which are health facilities. Laboratories are counted if they had started providing the diagnostic service.

†Laboratories are only counted once in the total. The total number of laboratories may be less than the sum of laboratories listed by testing type if there are laboratories implementing more than one new diagnostic service.

Tuberculosis

In **Burma**, we continued to provide support to NTP to transport specimens between regional laboratories and the National TB Reference Laboratory (NTRL) for genotypic and phenotypic culture, and between township laboratories and regional laboratories for molecular diagnostic testing.

In **Malawi**, we helped optimize specimen referral routes to three new Xpert® MTB/XDR testing facilities that we equipped with GeneXpert instruments. The hub-and-spoke approach to specimen referral in **Malawi** will decrease the time it takes samples to be transported to a diagnostic laboratory for faster detection of DR-TB.

In **India**, IDDS implemented a pilot of a private sector laboratory engagement model, which brought together public testing facilities and private laboratories with access to the latest molecular diagnostics to improve specimen turnaround times and time to appropriate treatment for patients. An important aspect of this work was to design and implement an SRS that integrated these facilities and ensured that specimens were tested quickly. A barcode attached to each specimen helped track its progress along the diagnostic cascade.

Deploying new tools

Why it matters: Recent innovations in diagnostics and digital health technologies offer significant advantages, such as faster turnaround time for test results and suitability for use in remote areas without access to stable power and refrigeration. Countries with a high burden of infectious diseases need access to these new tools—and critically, training on how to use, maintain, and integrate them into diagnostic networks—so they can improve patient outcomes and save lives.

Global Health Security

In **Kenya**, we restored access to timely and accurate bacteriology testing at two laboratories by repairing equipment that had been out of service for five years. We helped Kitale and Malindi counties secure a one-year service maintenance contract for repair and servicing of the VITEK® 2 Compact instruments at Kitale County Referral Hospital Laboratory and Malindi Sub-County Hospital Laboratory. (The VITEK 2 is a piece of equipment for automated organism identification and AST.)

Tuberculosis

Introduction of new tools and approaches remained a large part of IDDS’s TB work, and we performed this work in close collaboration with USAID, the Stop TB Partnership, and NTPs. In **Malawi** and **Tanzania**, we installed 34 new Truenat instruments in FY 2023, and trained 58 laboratory

staff on how to use them. Across 8 countries (**Bangladesh, Burma, Cambodia, Kenya, Malawi, Tanzania, Uganda, and Zimbabwe**), we trained 253 end users. In **Malawi, Nigeria, and Tanzania**, we trained 80 Truenat super-users.

We also supported the first programmatic introduction of GeneXpert 10-color instruments on which the newest Xpert MTB/XDR cartridges can be used to detect DR-TB and pre-XDR TB. In **Cambodia, Malawi, Zimbabwe, and Uganda**, we installed 18 GeneXpert 10-color instruments and delivered 2,670 Xpert MTB/XDR cartridges to select sites and trained 263 staff on how to use this new test. In **Burma**, we trained 20 staff (7 female) from partner organizations on the ultra-portable X-ray system and computer-aided detection (CAD) software. In **Malawi**, we installed a Delft Imaging portable digital X-ray instrument and Qure.ai software at Ekwendeni Mission Hospital to support initial TB diagnosis, and supported training for two staff on both the instrument and the software. Use of CAD software for X-rays is an important approach to increasing TB case detection in rural areas by triaging patients who need further testing.



IMPROVING QUALITY

Updating government guidelines and laboratory procedures to conform to international standards

Why it matters: The International Health Regulations (2005) set minimum standards for surveillance and reporting of infectious diseases and require that countries adapt their governance strategies to meet these standards. Monitoring and evaluation systems, such as the Joint External Evaluation (JEE) process, assess countries’ capacity to detect, report, and respond to events of global public health significance. IDDS helps countries update their laws, regulations, and organizational policies to comply with the International Health Regulations (2005) and improve their JEE scores.

In 2023, the United Nations High-level Meeting on TB set ambitious new global goals for improving TB diagnosis and care, including a target to reach 90 percent of people who develop TB with quality-assured diagnosis and treatment by 2027. We are contributing to the updated global targets through our work to update TB strategic plans and SOPs.

Global Health Security

In total, we developed or revised 314 SOPs, plans, and guidelines in FY 2023, across 14 countries. Plans and guidelines inform key steps for strengthening capacity and inform investments and resource allocations. SOPs are vital documents that help everyday work from the laboratory bench to the community health clinic, and, in many cases, they represent a key step toward attaining accreditation in alignment with international standards. Our work to translate these materials into local languages, inform health care workers of regulatory requirements, and set up supportive systems to ensure that policies are being followed demonstrates the project’s dedication to following through on all phases of the policy process, including the commitment to transfer knowledge to all levels of the health system during implementation and evaluation.

In **India**, we supported the development of a state action plan to fight AMR in Sikkim, aligned with the IDDS-supported national AMR action plan. In **DRC**, we updated an outbreak action plan to align it with the national laboratory strategic plan. In **Ethiopia**, we developed a manual for veterinary bacteriology. In **Madagascar**, we delivered a management guide for laboratories and medical imaging units in public hospitals. The document will serve as a valuable reference guide for revenue management and the procurement of laboratory reagents and supplies for public diagnostic facilities. In the **Philippines**, we collaborated with various government entities to develop a concept note for the human health, animal health, and environmental health sectors to strengthen the detection of and response to priority diseases. This document will guide the Philippine government to support the activities identified in the National Action Plan for Health Security (2023–2025) that should contribute to increasing the JEE score of the Philippines in 2024.

Tuberculosis

We worked with NTPs to implement activities that contributed to meeting global goals, guidance, and strategies for TB control and elimination. An important aspect is to create national guidance that can cascade effectively to lower levels of the diagnostic network. We assisted NTPs to update strategic plans and SOPs to improve the quality of TB testing in several countries. For example, in **Tanzania**, we supported the National TB and Leprosy Program (NTLP) and the central TB reference laboratory to review and update the national molecular diagnostic guidelines to include new TB diagnostic tools and assays, such as Truenat and stool testing for pediatric TB diagnosis. We provided technical assistance to NTRLs to develop or update SOPs (12 in **Burma** and 25 in **DRC**) on topics including biosafety, equipment maintenance, pipette use, liquid culture, first-line DST, stool specimen management and testing using GeneXpert, and use of Truenat, to align with current global guidelines and

recommendations. We developed guidance and SOPs to support the introduction of Xpert MTB/XDR cartridges in **Cambodia, Malawi, and Uganda**. In **Bangladesh, Cambodia, Malawi, and Mozambique**, we revised each country’s TB diagnostic algorithm, which provides laboratory staff with step-by-step guidance on making a TB diagnosis using a combination of symptoms, signs, or test results, to include newly introduced molecular diagnostics. In **Mozambique**, we also contributed to updating the diagnostic algorithm and developing guidance that includes next generation sequencing. In **Burma** and **India**, we helped develop biosafety manuals for laboratory staff.

Empowering networks through quality management

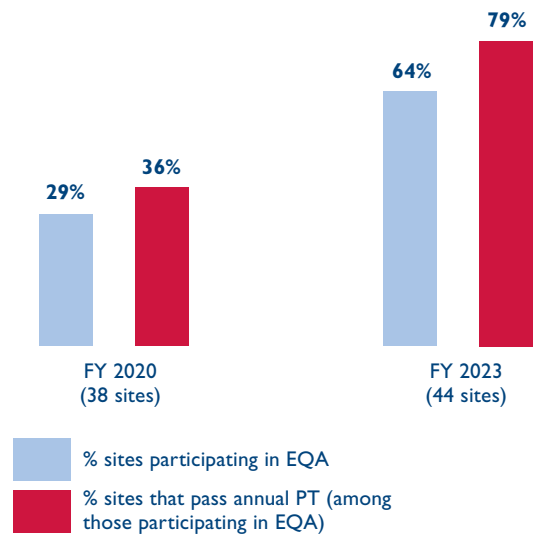
Why it matters: As the technology at a laboratory improves and the services it provides expand, it is vital to closely monitor the quality of its testing services to ensure that the accuracy and timeliness of results remain of high quality. It is also important to improve clinicians’ and patients’ confidence in using newer laboratory diagnostics and services. Quality management systems (QMSs) establish and control work processes to ensure consistent and accurate laboratory results, while laboratory accreditation and EQA programs independently verify results and ensure that they conform to national and international standards. We also work to identify underperforming laboratories and define paths for corrective action and quality improvement in collaboration with governments that ultimately must manage the laboratory networks.

Global Health Security

In **Ethiopia**, we supported Jimma University Hospital and Hawassa University microbiology laboratories to achieve International Organization for Standardization (ISO) 15189:2012 accreditation. In **Uganda**, we supported two animal health laboratories through the accreditation process for ISO/International Electrotechnical Commission standard 17025. In **Liberia** and **Kenya**, laboratory audit and assessment scores from 2023 revealed marked improvements from earlier scores, indicating the success of our efforts to improve the quality of bacteriology services at supported sites in these countries.

We supported laboratories’ participation in proficiency testing (PT) in **Guinea, Liberia, Kenya, Senegal, and Uganda**. PT measures how accurate laboratory technicians are in performing specific tests. As a result of the mentoring and supervision provided by IDDS, the percentage of laboratories passing PT improved from 29 to 80 percent, even as we worked with partners to expand PT to new laboratories.

Proficiency testing improved at laboratories supported by IDDS*



*Includes laboratories supported by IDDS in Cameroon, Ethiopia, Guinea, Kenya, Liberia, Uganda, and Senegal.

Tuberculosis

To ensure that laboratories perform high-quality TB and DR-TB testing, we supported EQA for Xpert MTB/XDR cartridges, which can detect pre-XDR TB, in **Cambodia, Malawi, and Zimbabwe**. In 2023, we also supported EQA for Truenat testing in six countries (**Cambodia, DRC, Kenya, Malawi, Tanzania, and Zimbabwe**). We worked with SmartSpot Quality, an established MTB EQA provider in Africa, to provide simulated specimens (“panels”) to sites in these countries so they could complete three cycles of EQA to verify the accuracy of their Truenat testing procedures. These efforts are crucial to help NTPs own and maintain a high-quality diagnostic network and provide supervision to low-performing laboratories as needed.

We provided technical support to the National Microbiology Reference Laboratory (NMRL) in **Zimbabwe** to prepare for ISO 15189:2022 accreditation. All the non-conformities identified during the assessment were successfully resolved. NMRL then received a recommendation for accreditation by Southern African Development Community Accreditation Services, affirming its status to provide high-quality diagnostic services. In **Pakistan**, we supported NTRL to move toward ISO 15189 accreditation through a series of training sessions on biosafety and biosecurity and a 12-module course on QMS provided to 50 staff from national and provincial laboratories.

Launching digital solutions

Why it matters: Public health officials and other decisionmakers need real-time information from modern, digital reporting systems that are connected to diagnostic equipment, can aggregate information from many sources, and can automate data synthesis and visualization. Digital solutions for diagnostic connectivity and disease reporting provide opportunities for monitoring laboratory performance and maintenance needs, identifying and containing outbreaks, managing inventory to forecast supply needs, and improving network efficiency across sectors.

Global Health Security

We provided training and mentorship in **Cameroon, Ethiopia, Guinea, Liberia, Kenya, and Tanzania** to implement or improve the use of WHONET, a free WHO desktop application for the management and analysis of microbiology laboratory data that has a particular focus on AMR surveillance. In **India**, we established a technical support unit within the National Center for Disease Control (NCDC) that is assisting AMR surveillance sites with checking data completeness using WHONET and supporting AMR surveillance sites in using the new WHONET configuration.

“WHONET software training by IDDS helped to improve the quality of patient care. We are now able to give detailed test results analysis to the doctors, which enables them to make informed decisions in patient care.”

—Samuel Ithatu, microbiologist, Murang’a County Referral Hospital, Kenya

In **Vietnam**, we trained 67 district animal health staff (18 female) to use the Vietnam Animal Health Information System (VAHIS) to report outbreaks—and the country’s Department of Animal Health (DAH) will be requiring the use of VAHIS for animal disease reporting starting in 2024. We also supported the development of a mobile application for VAHIS, which will increase its use at the provincial and lower levels of the laboratory system ahead of the national rollout in 2024.

In **Indonesia**, IDDS supported the development of the SIZE website and mobile apps to improve zoonosis surveillance and One Health Implementation through real-time information sharing. The SIZE website and mobile apps are easy to use, accelerate data collection from field officers, and provide early detection, reporting, and response efforts for cross-sectoral coordination.



DTC training in Cambodia. Photo by IDDS

In **Kenya**, we helped reconfigure and upgrade the laboratory information management systems (LIMSs) at Nyeri and Kitale County Referral Hospital laboratories. Our improvements to the microbiology module of the LIMS allow laboratory technicians to manage AMR data locally and transmit them to the national-level central data warehouse (CDW).

Tuberculosis

In **Cambodia**, we continued to implement an electronic system called DataToCare (DTC), which helps digitize the diagnostic network and make TB testing data accessible to national decisionmakers. During FY 2023, we expanded DTC to 10 new operational districts (ODs), bringing the total number of supported GeneXpert instruments to 40, and backed the connectivity of 15 Truenat instruments to the national health information system. We also established SMS notification of GeneXpert test results to providers. In **Zimbabwe**, we continued our efforts to install and configure a new platform (Aspect) to provide connectivity

between newer technologies such as Truenat and existing reporting systems like GxAlert, so that real-time TB results reporting can be used for patient management and TB program improvement. During FY 2023, we connected 20 Truenat instruments and 144 of 176 GeneXpert instruments to Aspect and trained 6 super-users (all male) on the connectivity software. In **Tanzania**, we supported connectivity to the Aspect platform for 280 GeneXpert and 30 Truenat instruments. From November 2022 to April 2023, the GeneXpert active reporting rate improved from 80.1 percent to 99.6 percent.

CONTAINING OUTBREAKS

Facilitating specimen transport and referral

Why it matters: During an active response to an infectious disease outbreak, specimen transport is paramount to achieving rapid test results and delivering the information that officials need to contain the spread. Moving specimens from peripheral collection sites to well-equipped laboratories for testing by well-trained staff must be done quickly, all while maintaining specimen integrity, preventing breaking or spillage, and complying with international laws when crossing national borders. In addition to rapid confirmatory testing being supported by specimen transport, maintaining sufficient biosafety and biosecurity measures is critical during the initial phases of an outbreak response.

Global Health Security

We supported EVD response and preparedness efforts in **DRC** and **Kenya** by providing supplies for diagnostic testing as well as for specimen collection, packaging, and transport. In **DRC**, we transported 23 EVD specimens from collection sites to a central laboratory, INRB in Goma, for testing. We also engaged the United Nations Humanitarian Air Service to transport 6,966 specimens from 2 previous EVD outbreaks from an INRB site in Beni to the INRB laboratory in Goma, which will ensure that the specimens are stored at the appropriate temperature and with the required biosafety and biosecurity precautions.

Throughout FY 2023, we continued to support the COVID-19 response by collecting 2,471 specimens for testing and transporting 7,165 specimens in the **Philippines**. We also transported 877 specimens for genomic sequencing, allowing the country to track how the virus and its variants were evolving.

Training emergency response workers

Why it matters: An emergency response is only as effective as the health care personnel who are deployed to communities where an outbreak occurs. Our experts train and mentor health care workers on how to detect and collect specimens, conduct testing, and use molecular tools to diagnose COVID-19, EVD, and mpox.

Global Health Security

Throughout FY 2023, our training sessions and webinars assisted frontline workers in **Cameroon**, **DRC**, **Kenya**, and the **Philippines** to respond to various outbreaks as well as the ongoing COVID-19 pandemic. In **Cameroon**, we trained 13 laboratory staff (7 female) in mpox diagnostic techniques. We trained 16 laboratory workers (6 female) in **DRC** and 621 frontline health care workers in **Kenya** in diagnostic testing specimen management for priority pathogens, including EVD, with a focus on biosafety and biosecurity. In the **Philippines**, we trained 101 participants (84 female) in COVID-19 specimen collection, handling, packaging, and transport; 52 webinar participants (38 female)

in respirator fit; and 67 webinar participants (53 female) in biosafety and biosecurity within the context of the COVID-19 response.

Mobilizing crucial supplies and equipment

Why it matters: Part of any public health response to an infectious disease outbreak involves procuring essential supplies, including critical personal protective equipment (PPE), for health workers and laboratories to perform the tests that allow treatment of the disease—and containment of the outbreak. The COVID-19 pandemic created severe shortages and upended global supply chains for health commodities. We continued to offer our expertise not only to meet immediate needs for supplies, but also to optimize logistics for future supply chain resiliency.

Global Health Security

To reduce turnaround time for mpox results, we equipped regional laboratories in **Cameroon** with mpox PCR tests. To improve testing capacity for EVD in **DRC**, we delivered 900 GeneXpert EVD cartridges to INRB in Goma. In **Kenya**, we delivered 36,140 specimen collection, packaging, and transportation supplies to the Ministry of Health to support preparedness for EVD.

To improve capacity for detecting COVID-19 in **Guinea**, we provided two GeneXpert modules to the Siguiri Prefectural Hospital to restore the functionality of its GeneXpert instrument. In **Mali**, we handed over 153,351 commodities to support genomic sequencing for COVID-19 to the National Institute of Public Health (*Institut National de Santé Publique*, or INSP). In the **Philippines**, we procured 126,000 rapid antigen tests and 10,200 PCR test kits for COVID-19 testing sites, as well as 31,498 auxiliary diagnostic commodities, such as viral transport media and reagents for testing. We also delivered 77,352 items of PPE and 74 other general laboratory supplies to support COVID-19 diagnostic testing.

Tuberculosis

The **Uganda** NTRL/SRL supports the strengthening of laboratory systems in **Uganda** and diagnostic networks in more than 20 countries in sub-Saharan Africa, with support from the Ugandan government and global partners. To sustain NTRL/SRL's important role in responding to infectious diseases such as DR-TB, we supported the repair of its high containment biosafety level (BSL)-2 and BSL-3 laboratories so the facility could be certified and operational to maintain its WHO designation as an SRL.

ONE HEALTH

One Health is an integrated approach that recognizes the interdependence among people, animals (both wild and livestock), and our shared environment. As awareness of the dangers of zoonotic diseases—those that jump from animals to people, such as EVD and COVID-19—has grown, so too has momentum for coordinating efforts among sectors. However, collaboration between the animal and human health sectors and formal systems to detect, track, and respond to zoonotic disease outbreaks is still lacking in many countries.

The One Health approach is foundational to our global health security efforts. In our fifth year of project implementation, we are seeing the results of our efforts to improve coordination among the human health, animal health, and environmental health sectors paying off. After creating guidelines and strategic plans for One Health activities, coordinated surveillance of priority pathogens between the human and animal health sectors is now standard in many of the countries in which we work.

We continued our work this year in **Indonesia** to implement a One Health system strengthening approach, to sustainably improve the surveillance and detection of emerging infectious diseases with epidemic and pandemic potential. We supported the launch of two important regulations: a coordinating ministry regulation that will become the basis for all One Health implementation at the local and national levels, as well as a decree for Demak district that establishes a legal, formal platform for preventing the spread of infectious diseases. Our [blog on Agrilinks](#) featured these efforts in Indonesia to implement a One Health approach, including recommendations from a joint risk assessment piloted in Demak district. The blog also highlighted the importance of information technology and laboratory protocol training in helping prevent and detect disease outbreaks.

In the **Philippines**, we developed a concept note for strengthening molecular diagnostic capacities for enhanced surveillance of priority diseases with key stakeholders in the animal health, human health, and environmental health sectors. The concept note is the first step toward providing the Philippine Interagency Committee on Zoonoses (PhilCZ) with a set of actions that will strengthen the integrated surveillance system of priority zoonotic diseases and define the roles of various partners in the One Health field.

In **Cameroon**, we supported the development of a strategic plan for the prevention and control of mpox—a document that guides immunization and outbreak management and reinforces the surveillance system through a multisectoral One Health approach. We also helped the Ministry of Public Health draft surveillance guidelines for the detection, prevention, and control of viral hemorrhagic fevers across



Training in COVID-19 specimen collection, handling, packaging, and transport, Philippines. Photo by IDDS

One Health sectors. Finally, we contributed to a [Scientific Reports](#) article on genomic surveillance of SARS-CoV-2 and published an article in the journal [One Health](#) on the development of a One Health roadmap during the country’s National Bridging Workshop in 2021. At a conference on World Zoonoses Day, we presented our contributions to building AMR surveillance capacity in Cameroon in the One Health context.

These policy approaches build bridges across health sectors by improving One Health governance. At the same time, our work to strengthen the capacity of animal health laboratories and surveillance of zoonotic diseases, in **Ethiopia, Uganda**, and elsewhere, continues to provide the critical information that governments need to make coordinated decisions across sectors. As diagnostic capacity in the animal health sector—and surveillance of environmental risk factors that contribute to zoonotic spillover—continue to improve, we look forward to a safer, healthier world.

COMMUNICATING OUR IMPACT

We increased the visibility of the project and expanded its reach through a variety of communications channels. During FY 2023, we published 19 blogs in [Science Speaks](#), [Health Affairs Forefront](#), [Speaking of Medicine and Health](#), and [USAID Learning Lab](#), among others.

We also published seven articles in [One Health](#), [Diagnostics](#), [Frontiers in Public Health](#), and other journals.

Followers of our [LinkedIn page](#) increased from 684 at the beginning of the fiscal year to 2,893. We increased our followers on [X \(formerly Twitter\)](#) from 184 to 311.

Our followers on LinkedIn and X include global health stakeholders encompassing government agencies, multilateral institutions, nongovernmental organizations, USAID projects, academia, and private sector entities. Our posts on LinkedIn and X regularly receive hundreds of views and are shared widely.

IDDS’s [YouTube channel](#) has 322 subscribers, up from 118 on October 1, 2022. The videos of our SRS and CBS webinars received 538 views. IDDS News, our e-newsletter, has 337 subscribers. We published eight issues of IDDS News over the past fiscal year. We also launched an information page, [iddsproject.org](#), which summarizes the project and hosts fact sheets, briefs, and reports.

LOOKING AHEAD

A healthier, safer, and more secure global community is within reach. As the IDDS project draws to a close in May 2024, we call for our country partners and global partners to redouble their efforts toward securing countries’ capacity for preventing, detecting, and responding to infectious disease threats. In countries where we have already transitioned our programs, we have handed over blueprints for success, so that the crucial efforts to strengthen the architecture of global health security and tackle the age-long menace of TB can continue to be locally led.

On the heels of the COVID-19 pandemic and amid ongoing outbreaks of other infectious diseases, continued investments in global health security are more important than ever. The demand from countries for sustained financing to strengthen health systems’ capacities for pandemic prevention, preparedness, and response is clear—and the impact of projects like IDDS shows the benefits of strategic investments in diagnostic and surveillance networks. While flexibility and resilience are important, so are commitments to quality and speed, when it comes to detecting and responding to outbreaks of global public health importance. This global, collaborative effort takes time and resources—but it is a cost-effective investment in our collective well-being.

BREAKING DOWN BARRIERS: INNOVATIVE APPROACHES TO DIAGNOSING TUBERCULOSIS IN CHILDREN

The World Health Organization reports that there were an [estimated 1.25 million](#) children and young adolescents (0–14 years old) who fell ill with tuberculosis (TB) in 2022, but half of them were not diagnosed or reported to national TB programs (NTPs). Diagnosing pulmonary TB (the most common type, when the TB bacterium affects the lungs) in children is challenging because they frequently have nonspecific signs and symptoms that can be mistaken for other conditions. Young children are often unable to cough up sputum for testing or their sputum may contain undetectable levels of the TB bacterium. Because of this, childhood TB diagnosis relies heavily on clinical diagnosis without bacteriological confirmation, leading to delayed or missed diagnoses or even overdiagnosis.



Stool testing in Malawi. Photo by IDDS

A recent advance has been the use of stool as an alternative sample for childhood TB diagnosis. When children with pulmonary TB cough and swallow their sputum, the genetic material of the TB bacterium survives the digestive process and can be detected in stool samples. The collection of a stool sample is not invasive and can be easily collected at a clinic or in the home.

“Both clinical and laboratory staff are very appreciative of this innovation as it accords us with critical information to provide correct treatment.”
—Grace Mabaso, laboratory technician, Mzuzu Central Hospital, Malawi

In April 2022, the World Health Organization endorsed stool as an alternative specimen for pulmonary TB diagnosis in children. [USAID’s Infectious Disease Detection and Surveillance \(IDDS\) project](#) saw an opportunity to radically increase access to the new method of diagnosing TB. IDDS, together with host NTPs, launched pilots to assess the feasibility and potential of using stool samples for childhood pulmonary TB diagnosis in Cambodia, Malawi, and Mozambique in 2023. IDDS also supported earlier pilots in the Democratic Republic of the Congo in 2022 and Vietnam in 2020.

In Malawi, children contributed to only 8.3 percent of total TB case notifications in 2022, but the target for the year was 11 percent. During the pilot in Malawi from November 2022 to May 2023, 536 stool samples from children presumed to have TB were tested with the new stool sample method, resulting in 31 positive results (6 percent), including among patients with drug-resistant TB. As part of the pilot at eight sites, IDDS, the Malawi NTP, and other implementing partners conducted key informant interviews of community beneficiaries and clinicians at the pilot sites. Most respondents gave feedback that the new technique produces immediate and accurate results. The technique helps with early diagnosis due to its short turnaround time and the simplicity of stool sample collection. With quicker turnaround times, children are put on medication earlier,

resulting in better outcomes for their health. The Malawi NTP plans to integrate stool-based testing into routine use as part of TB diagnostics across the country.

To accelerate stool-based testing techniques beyond the countries it supports, IDDS trained six master trainers from the Uganda Supranational Reference Laboratory on the stool testing method. This laboratory helps countries in East and Southern Africa build resilient TB laboratory systems, including supporting the introduction of new TB diagnostic technologies. Following the training of trainers, the Uganda reference laboratory assisted 10 countries in implementing stool testing using Xpert® MTB/RIF testing for childhood TB diagnosis, even detecting rifampicin resistance in children. This partnership enabled the laboratory to train 29 participants from the assisted countries, including participants from IDDS-supported countries (Cambodia, Mozambique, and the Philippines).

Having stool as an alternative sample for diagnosing pulmonary TB in children allows countries to reach more children who would have been misdiagnosed or who might have been missed as being TB positive entirely. Stool-based testing fills the gap where other specimens are difficult to collect. With IDDS support, countries have shown the feasibility of implementing stool-based testing in different settings at scale. As IDDS ends, our experts have been working with NTPs to integrate this approach into routine data collection as part of their TB diagnostic networks, through scale-up plans and revision of the TB diagnostic algorithm for children. In the coming years, countries like Malawi plan to continue this important new approach to the betterment of children’s health outcomes.

BUILDING LABORATORY CAPACITY AND STRENGTHENING SURVEILLANCE TO COMBAT ANTIMICROBIAL RESISTANCE IN KENYA AND TANZANIA

Antimicrobial resistance (AMR) develops when microorganisms change over time and no longer respond to medicines used to treat infections. It is a growing public health threat that limits our ability to effectively treat diseases caused by microorganisms (parasites, bacteria, fungi, and viruses), thus increasing health care costs and mortality rates. Without concerted efforts, it is projected that by 2050 AMR could cause approximately [10 million deaths annually and result in devastating economic losses](#) due to loss of livestock,

“A four-year-old male child was spotted in a clinic in Maweni Regional Referral Hospital suffering from chronic ear discharge which had occurred since birth. The family and the clinical team had apparently given up on him. A laboratory staff member who participates in [AMR] surveillance activities supported by IDDS advised the family and clinician to perform culture and antibiotic susceptibility testing on the ear pus discharge. *Pseudomonas aeruginosa* was isolated, sensitive only to meropenem and levofloxacin. These are expensive antibiotics and difficult to access locally. They were obtained in another city, and after one month the child was completely healed, and freed from four years of suffering from chronic ear discharge.”

—Latifa Omar, head of the microbiology section, Maweni Regional Referral Hospital Laboratory, Kigoma, Tanzania



Laboratory capacity assessment, Morogoro Regional Referral Hospital, Tanzania, September 2019. Photo by IDDS

misdiagnosed conditions, and sickening of the workforce. If not addressed, AMR might reverse the gains the health sector has made in the control of infectious diseases over the past several decades.

Tracking AMR through systematic surveillance allows countries to estimate the health burden and economic losses attributable to AMR, and to guide targeted interventions to prevent and contain further emergence and spread of AMR. Countrywide campaigns to bolster AMR surveillance in Kenya and Tanzania have benefited from technical assistance provided by [USAID’s Infectious Disease Detection and Surveillance \(IDDS\) project](#).

In Kenya, the National Antimicrobial Stewardship Interagency Committee, a multisectoral, interdisciplinary body that coordinates AMR prevention and containment activities, helped spearhead efforts to implement baseline assessments in 2019 at five AMR surveillance sites supported by IDDS across the country.

In Tanzania, IDDS began collaborating in 2018 with the Ministry of Health and the National AMR Multisectoral Coordination Committee to engage four subnational AMR sites. In both countries, IDDS used the Laboratory Assessment of Antibiotic Resistance Testing Capacity (LAARC) tool to assess the hospital-based laboratories. This assessment tool was developed by the U.S. Centers for Disease Control and Prevention for use in clinical bacteriology laboratories in low- and middle-income countries.

After the LAARC tool was implemented across all sites, IDDS teams in both countries were able to identify the strengths and shortcomings at each site to tailor technical assistance. IDDS interventions included the following: (1) supporting improvement of AMR surveillance activities in priority sites; (2) identifying interoperability requirements for linking laboratory and national surveillance information systems and enhancing AMR data quality for reporting and use at subnational and national levels, and globally through the [Global Antimicrobial Resistance Surveillance System](#); (3) assessing quality management practices related to bacterial identification and antimicrobial susceptibility testing; and (4) monitoring the status of laboratory improvements over time.

In Kenya, the IDDS assessment team found that across all the sites, bacteriology sections where the laboratory performs the bulk of AMR diagnostics were receiving little attention, compared with other laboratory departments such as hematology and chemistry. This might have been due to factors such as the high cost of bacteriology testing reagents and little demand for laboratory tests by the clinicians, compared with other laboratory departments. The five sites also reported commodity stockouts, which impeded continuous laboratory operations, among other challenges. After these gaps were identified, the assessment team was able to tailor mentorship to include topics such as implementation of quality management systems; specimen collection, processing, identification, and reporting; and interpretation of data.

“A few years ago, we did not know there is an organism called *Acinetobacter*, but now with the support of IDDS we are able to isolate *Acinetobacter* and others in this laboratory. We used to share equipment across different laboratory departments, which affected test results turnaround time and quality, but now with the support of IDDS we have enough equipment for microbiology work. The story of microbiology in this laboratory is a story of transformation. We don’t even know if what we were doing before IDDS was scientifically sound.”

—Godfrey Sande, a microbiologist in Kitale, Kenya

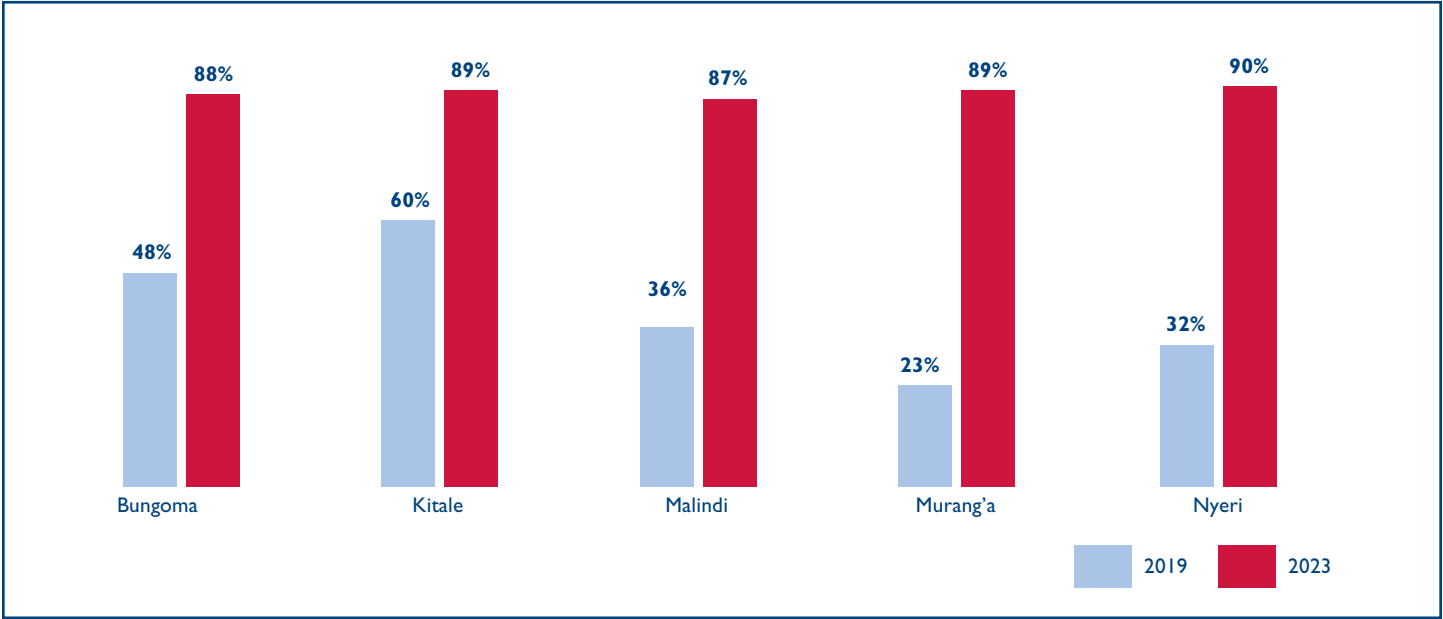
IDDS supported 27 mentorship sessions for laboratory staff and 80 training sessions for 3,375 trainees to improve AMR surveillance in Kenya between October 2020 and September 2023. In addition, the team was able to encourage the use of standard operating procedures, guidance documents, quality assurance and quality control procedures, and general biosafety and biosecurity practices.

This engagement resulted in significant improvements in AMR surveillance capacity across all five IDDS-supported sites in Kenya, with the greatest improvement achieved in the laboratory in Murang’a county, where LAARC scores increased from 23 percent in 2019 to 89 percent in 2023, as shown in the figure on page 26.

In Tanzania, IDDS worked with the National Public Health Laboratory to conduct comparable on-site mentorship programs and integrated supportive supervision visits to four AMR surveillance sites, aimed at strengthening AMR detection, reporting, and surveillance activities. IDDS identified implementation gaps and proposed solutions that ensured that sites continued performing AMR testing to generate quality results both for clinical management of patients and for surveillance.

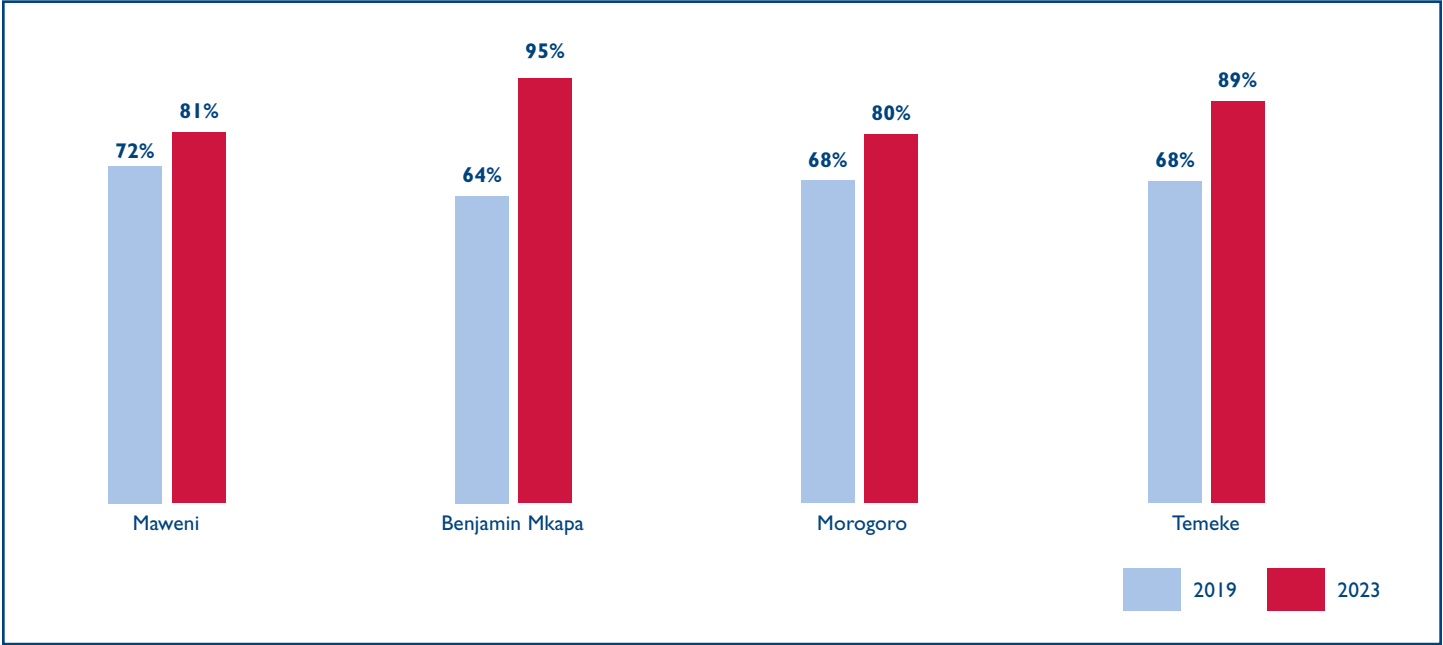
Further, IDDS conducted supportive supervision to equip laboratory staff with the skills to efficiently track and manage laboratory commodities to ensure that laboratory testing and AMR surveillance were not interrupted. In total, IDDS supported 10 training sessions (attended by 170 trainees), 16 mentorship sessions, and 16 supportive supervision visits between October 2019 and July 2023, to improve AMR diagnostic and surveillance capacity at the respective sites.

Overall LAARC scores demonstrating AMR testing capacity across the five IDDS-supported AMR surveillance sites in Kenya, 2019 and 2023



When LAARC assessments were repeated, all four laboratories in Tanzania demonstrated improved scores between 2019 and 2023. The number of bacteriological culture tests conducted annually increased from 117 (in 2019) to 833 (in 2023) on average. The number of antibiotic sensitivity tests by disk diffusion method also increased from 53 (in 2019) to 1,408 (in 2023). Overall, the laboratories had an improvement in all 13 sections of the LAARC tool and safety appendix, scoring an overall average of 68 percent in 2019 and 86 percent in 2023, as shown in the figure below.

Overall LAARC scores demonstrating AMR testing capacity across the four IDDS-supported AMR surveillance sites in Tanzania, 2019 and 2023



Mentorship at Malindi Sub-County Hospital, Kenya, October 2021. Photo by IDDS

Identifying gaps, developing and implementing specific action plans, and having a structured laboratory mentorship model together provide an opportunity for rapid laboratory quality improvement. In addition, committing resources to acquire needed equipment, reagents, and supplies has resulted in progressive improvement in testing services, contributing to priority AMR pathogen detection and surveillance improvements.

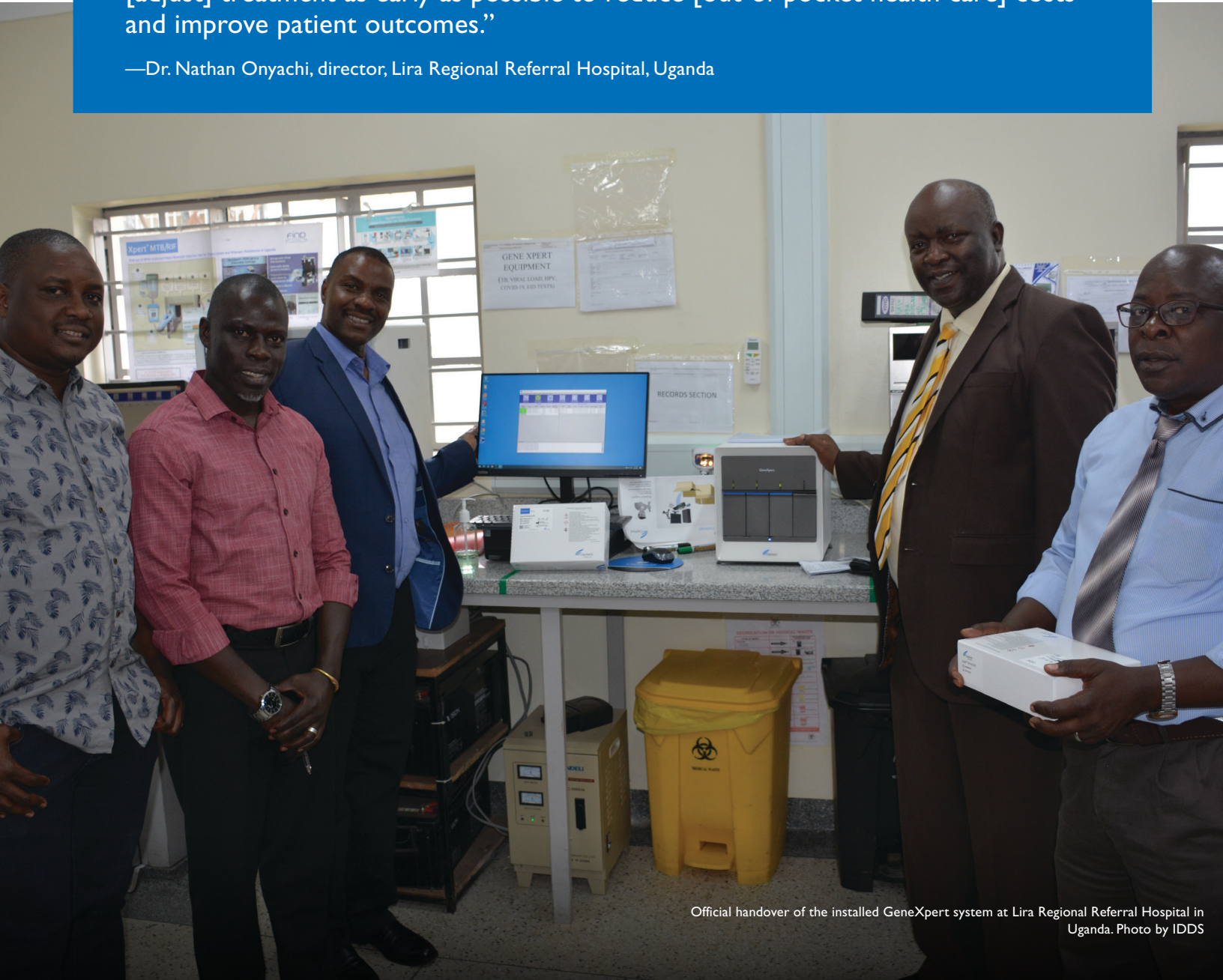
These are all critical capacity building efforts because laboratories are a central component of a robust national public health system. They play a critical role in detection and response efforts, and with AMR presenting one of the greatest challenges facing public health systems, it will be critical to maintain—and continuously improve—testing capacity of laboratory facilities in low- and middle-income countries.

ACCELERATING THE DETECTION OF MULTIDRUG-RESISTANT TUBERCULOSIS

Some forms of drug-resistant tuberculosis (DR-TB), which include multidrug-resistant TB, rifampicin-resistant TB, and extensively drug-resistant TB (XDR-TB), are a major public health challenge. The World Health Organization (WHO) [estimates that globally half a million people fall ill with DR-TB annually](#), and only one in three people are able to access quality care.

“The installation of the I0-color GeneXpert technology at my facility is a dream come true. For the patients, it will lead to faster and more accurate DST results, the potential to test and initiate treatment for drug-resistant TB in a single visit, and [adjust] treatment as early as possible to reduce [out-of-pocket health care] costs and improve patient outcomes.”

—Dr. Nathan Onyachi, director, Lira Regional Referral Hospital, Uganda



Official handover of the installed GeneXpert system at Lira Regional Referral Hospital in Uganda. Photo by IDDS

DR-TB is more difficult and expensive to diagnose and treat than drug-susceptible TB, resulting in a higher mortality rate among DR-TB patients than drug-susceptible TB patients. Drug resistance occurs when *Mycobacterium tuberculosis* (MTB), which causes TB, becomes less susceptible to first-line drugs that are intended to cure the disease.

Diagnostic tests for TB have improved substantially in recent years. WHO now recommends several rapid molecular tests as the initial diagnostic test for TB. Some of these are called multiplex assays, which can detect resistance to first-line drugs at the same time. These tests can be conducted in rural areas without stable access to power or at lower levels of the health system. In addition, genomic sequencing technologies can provide a comprehensive individual profile of drug resistance in a fraction of time compared with traditional culture methods. WHO recommends the Xpert® MTB/XDR assay as an additional test for patients who are diagnosed with TB, to determine whether their infection is DR-TB. In less than two hours, the Xpert MTB/XDR assay can detect resistance to isoniazid (INH), fluoroquinolones (FLQs), and second-line injectable drugs. Timely testing for resistance to these drugs is increasingly important as new treatment regimens are rolled out, and countries need to track growing resistance trends to these drugs.

Most countries that have a high burden of TB do not yet test for resistance to INH and FLQ. To address this need, [USAID’s Infectious Disease Detection and Surveillance \(IDDS\) project](#) worked with national TB programs in Cambodia, Malawi, Uganda, and Zimbabwe to pilot the Xpert MTB/XDR assay in a small number of laboratories that were newly equipped with GeneXpert® I0-color instruments. IDDS created guidance on how to procure GeneXpert I0-color instruments and Xpert MTB/XDR cartridges, describing the standardized process for acquiring these new diagnostics while keeping in mind additional consumables needed for programmatic implementation. IDDS also worked with Cepheid, the maker of the instruments and test cartridges, to provide them to selected sites in Cambodia, Malawi, Uganda, and Zimbabwe. (The I0-color technology has optical channels that enable the detection of a range of pathogens and antimicrobial resistance from a single sample.)

Strategically selecting laboratories and equipping them with GeneXpert I0-color instruments and Xpert MTB/XDR cartridges increase access to drug susceptibility testing (DST) for TB. Developing an implementation plan by IDDS, jointly with national TB programs, and placing instruments in regional hub laboratories as per the plan will improve the ability to rapidly detect resistance to INH and FLQ, which is expected to reduce delays in initiating appropriate treatments for DR-TB patients. In addition to equipping laboratories with instruments and supplies, IDDS also provided technical assistance to strengthen governance, clinical, and laboratory workforce capacity to support the integration of these new diagnostics into the broader TB diagnostic network. IDDS and Cepheid developed a training package that can be localized, including in-country

operational considerations and revisions to the national diagnostic algorithm.

In total, IDDS supported the installation of 18 GeneXpert I0-color instruments at 18 sites across 4 countries and trained 83 people to conduct TB testing using the Xpert MTB/XDR assay. IDDS also provided technical assistance to countries to conduct small-scale validation of the technology to evaluate its functionality and applicability for the setting.

By introducing MTB/XDR testing at provincial and district hub laboratories, IDDS has helped countries as they move toward decentralizing first- and second-line DST, which was previously only possible at national TB reference laboratories. Increasing access to molecular diagnostics at the peripheral level has helped reduce turnaround times and enabled faster initiation of treatment regimens for patients, which strengthens the diagnostic network and reduces morbidity and mortality due to TB.

In Cambodia, out of 414 MTB/XDR tests performed, 18 people were diagnosed with INH resistance and 1 person was diagnosed with FLQ resistance. In Malawi, out of 270 MTB/XDR tests, 13 people were diagnosed with INH resistance and 3 people were diagnosed with FLQ resistance. As countries seek to catalyze progress toward meeting WHO End TB Strategy goals and recommit to targets set at the 2023 United Nations General Assembly High-level Meeting on TB, efforts to equitably increase access to diagnostics are paramount to increasing TB and DR-TB case notifications. Ultimately, these efforts will lead to improved TB outcomes and support countries to meet their TB elimination goals.

ACCREDITING LABORATORIES TO ADDRESS THE GLOBAL HEALTH THREAT OF ANTIMICROBIAL RESISTANCE

The growing threat of antimicrobial resistance (AMR) is a significant concern worldwide, particularly in low-income and middle-income countries (LMICs). The [World Health Organization identifies AMR](#) as a top global health threat, projecting alarming mortality figures associated with bacterial AMR. The implementation of AMR surveillance programs in LMICs is hindered by obstacles such as the absence of national action plans, limited institutional capacity, inadequate investment and human resources, and the lack of robust laboratory infrastructure.

“I want to commend the IDDS project for the support given to the animal health sector to improve the diagnostics and quality of test results by following international standards such as ISO 17025:2017... We pledge support to the process towards the first-ever accreditation of an animal health laboratory in the country.”

—Dr. Eric Enyel, laboratory director, Uganda Wildlife Authority

Laboratories play a critical role in AMR surveillance by identifying pathogens and understanding their resistance profiles. Public health officials and policymakers rely on laboratory data to develop evidence-based policies and design interventions to combat AMR effectively. For laboratories to play a strategic role in assessing the prevalence of resistant strains and guiding local treatment protocols, quality management systems (QMSs) must be established to ensure the accuracy of diagnoses.

Laboratories around the world rely on international accreditation to demonstrate their competency. The International Organization for Standardization (ISO) provides the standards that are widely used for accreditation of medical laboratories meeting international requirements for quality and competence. In LMICs, ISO accreditation for bacteriology is challenging due to the lack of trained personnel, poorly maintained equipment, inconsistent availability of essential reagents and supplies, the absence of or noncompliance with established standard operating procedures, and inadequate internal and external quality assurance systems.

To address these challenges, [USAID’s Infectious Disease Detection and Surveillance \(IDDS\) project](#) partnered with human, animal, and environmental health authorities in Ethiopia, Kenya, and Uganda to strengthen diagnostics and surveillance of AMR and implement strong QMSs.



Microbiology team preparing to subculture quality control strains provided by IDDS, Murang’a County Referral Hospital, Kenya. Photo by IDDS

In Ethiopia, IDDS intensified the AMR detection and surveillance mentorship program at five human health laboratories and one animal health laboratory. In Kenya, IDDS provided technical assistance in strengthening and preparing four human health microbiology laboratories for ISO 15189:2012 standard accreditation. In Uganda, IDDS engaged national partners to refine and adopt an accreditation plan for two animal health laboratories according to ISO/International Electrotechnical Commission (IEC) 17025:2017 standard. In these three countries, IDDS assessed the capacity of the respective laboratories to conduct bacteriology tests. Based on findings from the assessment, IDDS worked with human, animal, and environmental health stakeholders in each country to develop joint work plans to systematically strengthen AMR testing capacity. Following the identification of laboratory shortcomings and the development of improvement plans, IDDS initiated activities to improve diagnostic capacity and strengthen QMSs for AMR detection.

The interventions in these countries also included site refurbishments to improve the workflow and biosafety and biosecurity measures and procurement of equipment, reagents, and supplies for culture and antimicrobial susceptibility testing. IDDS developed policies, guidelines, job aids, and standard operating procedures aimed at standardizing bacteriology testing and reporting methods. IDDS provided training sessions on bacteriology culture and antimicrobial susceptibility testing, internal controls, external quality assessment, and implementation of a practical QMS approach. IDDS organized workshops on microbiology supply chain management, quantification, and forecasting. IDDS also conducted AMR diagnostic stewardship workshops to provide training for clinicians on the microbiology laboratory services, the types of specimens to submit for analysis, and how to effectively use the AMR testing results for optimal patient outcomes.

In Ethiopia, these efforts culminated in the ISO 15189 accreditation of Jimma University microbiology laboratory and Hawassa University microbiology laboratory in 2023; the microbiology laboratory of St. Paul’s Hospital will apply for accreditation in February 2024. In Kenya, the Bungoma County Referral Hospital microbiology laboratory was accredited in 2020; the Murang’a County Referral Hospital laboratory, and Malindi Sub-County Hospital laboratory were accredited in 2021; and Nyeri County Hospital laboratory was accredited in 2022 for bacteriology services.

In Uganda, IDDS worked with the Wildlife Authority and the Ministry of Agriculture, Animal Industry and Fisheries to provide technical assistance to two laboratories pursuing accreditation: the Mbale District Veterinary Laboratory in Mbale City, and Uganda Wildlife Authority Diagnostic and Research Laboratory in Queen Elizabeth National Park, Mweya peninsula. In February 2024, independent assessors from the South African National Accreditation System recommended both laboratories for ISO/IEC 17025:2017 accreditation. The Uganda Wildlife Authority laboratory is the first-ever wildlife laboratory to be recommended for international accreditation in the entire region of East Africa.

These achievements in Ethiopia, Kenya, and Uganda through the concerted efforts of IDDS and government partners highlight the pivotal role of laboratory accreditation in strengthening global efforts to address AMR. Accreditation not only ensures the competency of laboratories but also significantly contributes to instilling confidence in clients, including patients, clinicians, and public health officials, regarding the accuracy and reliability of laboratory services. Moreover, the standardized data generated through accredited laboratories become a cornerstone for surveillance and informed decision-making in addressing the escalating threat of AMR.

QUALITY MATTERS: ENSURING ACCURATE TESTING TO DIAGNOSE TUBERCULOSIS

In 2022, the World Health Organization [estimated that 10.6 million people](#) around the world were sickened by tuberculosis (TB), representing an increase from 10.3 million in 2021. TB once again became the leading cause of death from an infectious disease, after COVID-19, and remains the leading cause of death in individuals with HIV. In most cases, TB is a treatable disease, but the key is to detect cases early so patients can be treated promptly and community transmission is limited. Missing even a single case of TB can lead to further spread. New diagnostic tools, such as Truenat® (manufactured by Molbio Diagnostics), have been developed to bring more sensitive, state-of-the-art testing closer to patients to detect every case and reduce the time to diagnosis.



Laboratory technician preparing sputum for TB testing in Zimbabwe. Photo by IDDS

[USAID’s Infectious Disease Detection and Surveillance \(IDDS\) project](#) helped to deliver the Truenat platform in nine countries that have a high burden of TB, with support from a USAID and Stop TB Partnership initiative called the [introducing New Tools Project \(iNTP\)](#). It was not enough to simply deliver the equipment and training into selected laboratories. A robust and complementary quality assurance program is critical to ensuring that in every laboratory, Truenat results remain accurate and of high quality so they inform effective treatment decisions and reduce community transmission.

Quality assurance activities to ensure reliable diagnostic results are too often not prioritized. For example, when Cepheid’s GeneXpert® MTB and RIF testing was endorsed by the World Health Organization in 2010 and rolled out in high burden TB countries, no external quality assessment (EQA) program to monitor performance was implemented that ensured testing quality. Learning from this, IDDS introduced an EQA program in seven countries to coincide with the iNTP rollout of Truenat to ensure testing quality assurance from the start, while allowing time for countries to develop their own EQA programs. IDDS collaborated with SmartSpot Quality, an accredited manufacturer of Truenat MTB/RIF EQA sample panels, to provide three cycles of EQA in 2022, which were sent to identified laboratories.

Implementing a multi-country EQA program at the Truenat facilities, which are at the lowest level of the laboratory network, posed some unique challenges. During the initial pilot in Zimbabwe, IDDS realized that many of the microscopists performing the Truenat testing had little or no experience with molecular diagnostics and were unfamiliar with molecular EQA programs. Many technicians had only worked with sample rechecking programs managed locally for proficiency testing and had never worked with an EQA provider such as SmartSpot Quality, which required sending samples for further testing. Further, technicians needed to be able to understand results so that appropriate corrective actions could be taken.

To overcome these challenges, IDDS developed materials and training to familiarize Truenat users and national TB program staff with the molecular EQA program, collaborated with SmartSpot Quality to develop instructions for use in local languages, and provided video clips that could be distributed to Truenat users who could not attend virtual training sessions through social media platforms. IDDS trained Truenat “super-users” in eight countries to aid laboratories that lack Internet connections to report their EQA results and assist with troubleshooting. Further, to disseminate the lessons learned from establishing the EQA program for Truenat, IDDS co-hosted a [webinar](#) with the Stop TB Partnership in December 2023 that had more than 130 attendees from around the world.

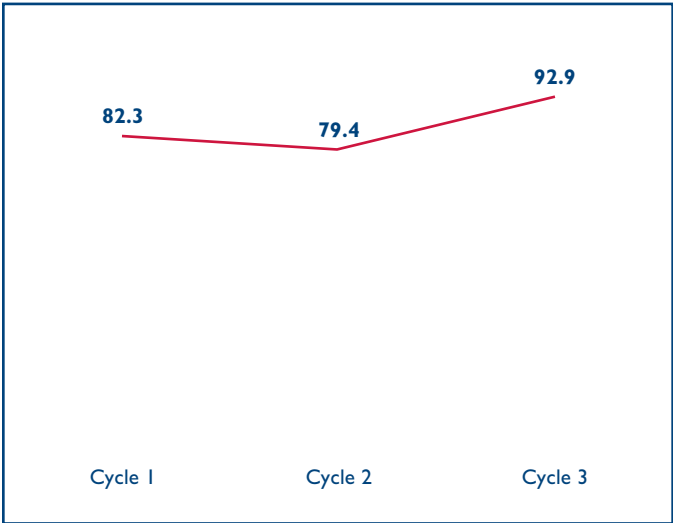
The results from the IDDS-supported Truenat EQA program have been used by national TB program staff to target technical assistance to those laboratories that had low scores. After each cycle of EQA results, IDDS debriefed and discussed the results with national program staff so that necessary supportive supervision measures and mentorship by super-users could be undertaken. In 2022, with technical assistance from super-users, the project saw an increase in EQA scores in countries where additional support was provided in a timely manner to low-performing sites (see figure on page 33). For example, in Uganda, the super-users contributed greatly to the increased reporting rates in 2022 (see figure on page 33).



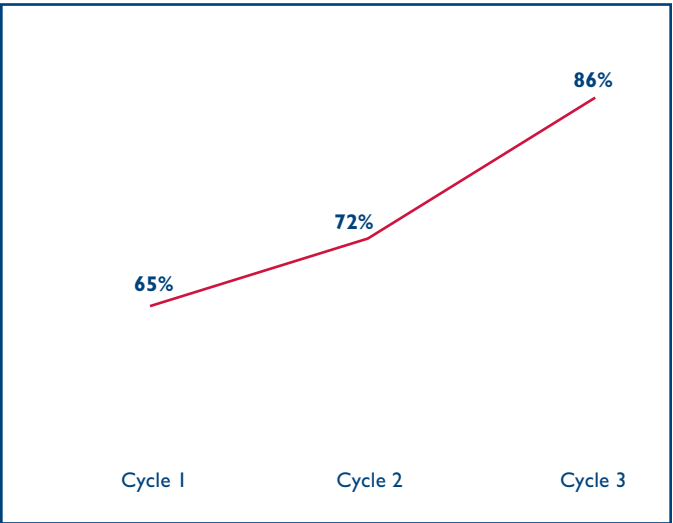
Truenat installation in Cambodia. Photo by Cindy Liu for IDDS

The importance of establishing quality-assured diagnostic testing from the very beginning as new diagnostic tools are introduced cannot be overemphasized. This also supports integration of continuous quality improvement measures into the diagnostic network, which strengthens the quality of the entire network. Participation in EQA programs is an effective way to identify problems with all phases of the testing system, something that we cannot achieve by testing patient samples alone. EQA provides an unbiased assessment of a laboratory’s performance and provides an opportunity for consistent quality improvements. By identifying problems with the Truenat platform, national TB programs are informed of issues quickly and can implement corrective actions to resolve testing issues. A robust testing system, which produces accurate TB test results and can quickly link patients to treatment, is key to reducing TB transmission and ending the scourge of TB once and for all.

Zimbabwe Truenat EQA average percentage score across three cycles in 2022



Uganda Truenat EQA reporting rate in 2022



GLOBAL HEALTH SECURITY INTERVENTIONS BOOST COUNTRY CAPACITY TO IMPLEMENT INTERNATIONAL HEALTH REGULATIONS

The International Health Regulations (IHR, 2005) stand as a cornerstone in addressing global health security and mandate countries to cultivate and sustain capacities for surveillance and response to public health emergencies of potential international concern. To support countries to evaluate their IHR (2005) core capacities, the World Health Organization and its partners developed the IHR Monitoring and Evaluation Framework, featuring the Joint External Evaluation (JEE).

“I am grateful to IDDS for selecting and building the capacity of our hospital through mentorships and supportive supervision on AMR testing and reporting. This has built our confidence.”

—Latifa Omar, head of microbiology section, Maweni Regional Referral Hospital Laboratory, Kigoma, Tanzania



Laboratory technician from Malindi Sub-County Hospital in training at Aga Khan University Hospital, Nairobi, Kenya, March 2022. Photo by IDDS

The JEE serves as a vital tool to measure a country’s specific status and progress in building capacity to prevent, detect, and rapidly respond to public health threats. Comprising 19 technical areas with 48 indicators, the JEE scores countries’ capacities on a 5-point scale: (1) no capacity, (2) limited capacity, (3) developed capacity, (4) demonstrated capacity, and (5) sustainable capacity.

Launched in 2014, the [Global Health Security Agenda](#) is a multisectoral and multilateral partnership aimed at supporting countries to achieve IHR (2005) compliance. [USAID’s Infectious Disease Detection and Surveillance \(IDDS\) project](#), as part of Global Health Security Agenda initiatives, operated in more than 20 countries in Africa and Asia, collaborating with local governments to strengthen health systems for the detection of, surveillance of, and rapid response to infectious diseases, including antimicrobial-resistant pathogens.

Addressing gaps in a health system necessitates a comprehensive strategy. This involves strong leadership and governance, exemplified by health policies and strategic plans backed by government financial commitment, access to health services, quality-assured diagnostic capacity, and efficient surveillance to detect emerging threats.

In Guinea, IDDS supported the Ministry of Health and Public Hygiene to comprehensively assess and enhance the functionality of the existing specimen referral system (SRS). The project developed an innovative electronic tool to track specimens and monitor temperatures during transport. IDDS also trained more than 500 community health workers and union drivers in safe specimen packaging and transport.

After [piloting an integrated SRS](#) (encompassing human, animal, and environmental health sectors), IDDS helped expand it to all 491 health centers across Guinea. The system used public transportation to seamlessly connect peripheral health centers and hospitals to regional and national laboratories. The outcomes of this collaborative effort were highlighted in the 2023 JEE, demonstrating Guinea’s capacity to improve access to diagnostic services, reduce outbreak detection times, and enhance the overall safety and efficiency of specimen management through an integrated SRS.

In Kenya, IDDS provided training, mentorship, and technical and financial assistance to two laboratories (Nyeri County Hospital laboratory and Malindi Sub-County Hospital laboratory). The project facilitated the implementation of national quality standards at these sites, including mandatory licensing required by the [Kenya Medical Laboratory Technicians and Technologists Board](#). These laboratories also enrolled in external quality assessment schemes and integrated best practices for a quality management system in clinical bacteriology. This concerted effort resulted in

both laboratories achieving accreditation from the [Kenya Accreditation Service](#). This accreditation not only attests to their commitment to high-quality laboratory practices but also plays a crucial role in contributing to the overall strengthening of the national health care system in Kenya.

In Tanzania, following the 2016 JEE, which indicated a lack of capacity for antimicrobial resistance (AMR) detection and surveillance, the National AMR Surveillance Framework was developed in 2018. IDDS assisted in enhancing AMR detection and surveillance in four public health hospitals by providing equipment, reagents, training, supportive supervision, and mentorship for diagnostic and data management. Efforts in strengthening AMR detection and surveillance led to improved patient management and outbreak response, as reflected in the 2023 preliminary JEE scores.

The JEE outcomes underscore both strengths and areas for improvement across these crucial technical areas, providing a comprehensive overview of each country’s diagnostic and surveillance capabilities. IDDS generally supports specific regions, districts, or even individual sites, in collaboration with other implementing partners and government agencies, and the JEE scores are a national-level assessment of countries’ capacities and thus cannot be attributed to a single project. Regular assessments and evaluations, such as the JEE, serve as a robust framework for continuous improvement in IHR core capacities. Achieving these improvements requires strong leadership, political commitment, and sustained investment in health care infrastructure.

Table 1: Project outputs related to strengthening diagnostic networks for FY 2023 plus FY 2024 Q1 and the countries that contributed to these outputs (includes GHS, IDSR, mpox, American Rescue Plan, PMI, and Middle East and North Africa funding)

GHS: Gaps in diagnostic networks identified and essential components supported									
	TOTAL	Testing Procedures	Equipment Maintenance	Commodity Management	QMS	Specimen Referral	Biosafety	AMR Dx Advocacy	Other Diagnostic Topics
People trained	3,736	1,371		41	76	829	361	1,027	31
SOPs, plans, and guidelines developed or revised	291	91	5	3	177	8	6	1	
TWG* meetings held	116	56	1	10	9	16	19	1	4
Supervisory visits conducted	70	36	4	4	6	11	3	6	
Pilots conducted	5					4			1
Assessment reports completed	15	7	1		2	4	1		
People mentored	685	219			457	9			
Specimens transported	10,428					10,428			
Countries†									
Cameroon		●			●	●	●	●	
Cambodia		●	●			●			
DRC		●		●	●	●	●		●
Ethiopia		●			●			●	
Guinea		●	●	●		●			
India									
Indonesia		●							●
Kenya		●				●	●	●	●
Liberia		●			●	●	●	●	
Madagascar		●		●					
Mali		●	●		●				●
Philippines						●	●		
Senegal					●				
Tanzania		●		●		●		●	
Tunisia									●
Uganda					●				
Vietnam						●			

*TWG=technical working group.
†Countries listed are those that contributed to specific outputs in FY 2023 and FY 2024 Q1.

Table 2: Project outputs related to strengthening surveillance systems for FY 2023 plus FY 2024 Q1 and the countries that contributed to these outputs (includes GHS, IDSR, American Rescue Plan, and mpox funding)

GHS: Gaps in core functions of surveillance systems identified and essential activities supported						
	TOTAL	Interoperability	Electronic Reporting	Data Quality	Data Analysis and Use	Other Surveillance Topic
People trained	858		450	106	89	213
SOPs, plans, and guidelines developed or revised	23		8	1	2	12
TWG* meetings held	106	24	27	14	10	31
Supervisory visits conducted	330		209	70	30	21
Pilots conducted	5		2	2	1	
Assessment reports completed	2		1			1
People mentored	339		332		7	
Countries†						
Cameroon		●	●	●	●	●
DRC		●				
Ethiopia					●	
Guinea			●	●	●	
Indonesia		●	●	●	●	●
Kenya				●	●	●
Madagascar			●			
Mali			●		●	●
Philippines			●			
Senegal			●	●		●
Tanzania			●	●		●
Uganda			●		●	●
Vietnam			●			

*TWG=technical working group.
†Countries listed are those that contributed to specific outputs in FY 2023 and FY 2024 Q1.

Table 3: Project outputs related to strengthening TB diagnostic networks for FY 2023 plus FY 2024 Q1 and the countries that contributed to these outputs

TB: Gaps in diagnostic networks identified and essential components supported											
	TOTAL	New Diagnostic Tools	Pediatric TB Testing	Other Testing Skills and Procedures	Biosafety	QMS	Equipment Maintenance	Diagnostic Connectivity Solutions	SRS	Private Sector Engagement	Other Diagnostic Topics
People trained	3,181	689	417	1,096	616	221	7	55			80
SOPs, plans, and guidelines developed or revised	149	15	4	12	19	83	8			4	4
TWG* meetings held	17	5	1	4		3		1			3
Supervisory visits conducted	399	161	83	14		28		81		25	7
Pilots conducted	3		2							1	
Assessment reports completed	18	2		2	1	2			1	2	8
People mentored	228	7	68	83		54					16
Countries†											
Bangladesh	●	● ■	●	●		●	●				●
Burma	■	●	●	●	●	●					●
Cambodia		● ■	● ■	■	●			●			●
DRC		■	■	●	●	●	●				● ■
Ethiopia											■
India		●		●	●	●				●	●
Kenya		■									■
Malawi		● ■	● ■	●							● ■
Mozambique		●	● ■	● ■					●		●
Nigeria		■									
Pakistan				■	■	■					■
Tanzania		● ■		●				●			●
Uganda		■									
Vietnam											■
Zimbabwe		● ■	● ■	●		●		■		●	●
Multi-country		■	■								

*TWG=technical working group.
†Countries listed are those that contributed to specific outputs during FY 2023 and FY 2024 Q1.
■=Activities implemented with Core TB funding from USAID in Washington, DC.
●=Activities implemented with USAID field funding.

BANGLADESH

Context

In Bangladesh, IDDS implemented activities to strengthen the TB diagnostic network and systems, focusing on decentralizing testing, ensuring the quality of TB testing, and introducing new technologies and tools to improve TB diagnosis. IDDS closed out activities in Bangladesh on September 30, 2023.

Annual Highlights

Diagnostic

- To build laboratory staff capacity for TB detection at NTRL and regional TB reference laboratories (RTRLs), IDDS organized training sessions on extra-pulmonary TB, stool specimen processing, Xpert MTB/XDR, and preventive maintenance of TB equipment.
- IDDS expanded access to rapid diagnostics for TB detection by providing technical and logistical support to the Bangladesh NTP to complete the rollout of Truenat to 38 peripheral sites, which began in FY 2022. To ensure the quality of Truenat testing, IDDS provided three cycles of EQA for all Truenat sites, which bolstered understanding among NTP policymakers that Truenat technology is reliable for the detection of TB and rifampicin (RIF)-resistant (RR) TB and feasible for implementation at the community level. IDDS trained 40 people in Truenat EQA and 22 people in using Truenat for TB testing.
- To decentralize the detection of DR-TB, IDDS enabled the Khulna RTRL to start performing liquid culture by supporting the installation of a Mycobacteria Growth Indicator Tube (MGIT) instrument and embedding staff at the laboratory. IDDS also finished upgrading the Chattogram RTRL to BSL-2+ for performing culture and DST and has procured items to support the annual servicing and certification of the Sylhet BSL-3 laboratory.
- To enable NTP to implement technologies to detect DR-TB, IDDS developed the SOP, algorithm, and recording and reporting template for Xpert MTB/XDR. IDDS also developed the capacity of 12 trainers (6 female) who will train laboratory staff on GeneXpert. The project completed EQA for GeneXpert by training medical technologists from 200 GeneXpert sites.

Challenges

- Supply shortages of reagents hampered routine testing for Truenat, LPA, culture, and DST. Supply shortages and delays in customs clearance also delayed the implementation of Truenat and GeneXpert activities.

- NTP at first declined to approve training proposed by IDDS because USAID policy does not permit payment of any allowance to local participants. IDDS held several meetings with NTP and finally received approval for IDDS training and other events, after advocating their importance for improving TB diagnostics.
- Power supply to the newly upgraded Chattogram RTRL was not provided by NTP by the time of the project closeout in Bangladesh. Thus, IDDS could not test and validate the functioning of the HVAC system and other equipment at the laboratory.
- Annual certification of the BSL-3 laboratory at the Sylhet RTRL by Air Filter Maintenance Services (based in South Africa) did not take place because the engineers could not obtain visas for travel to Bangladesh before the project closed.

PARTNERS AND COLLABORATORS

- National Tuberculosis Control Program
- Ministry of Health and Family Welfare
- Bangladesh Rural Advancement Committee
- Damien Foundation
- Institute of Epidemiology, Disease Control, and Research
- Stop TB Partnership

What We Learned

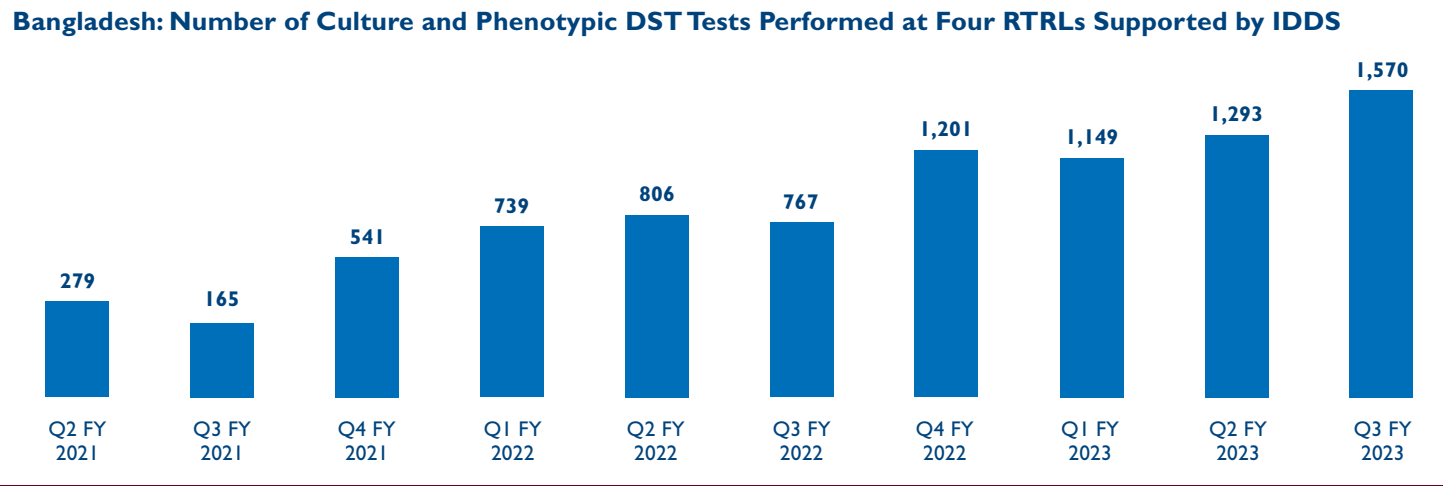
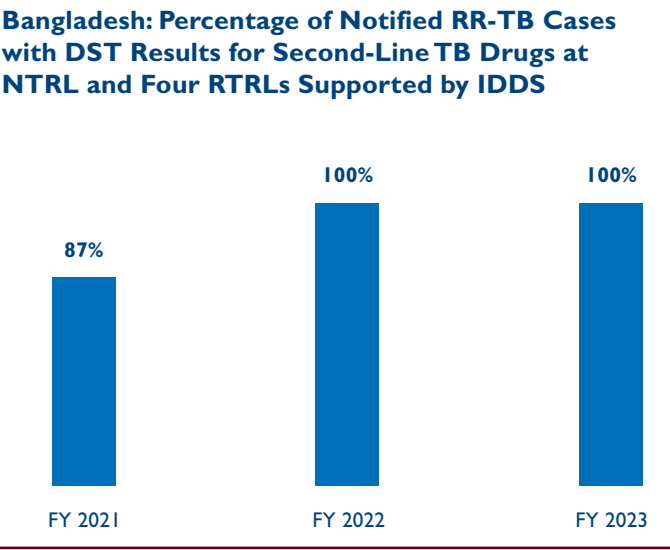
- Procurement of TB equipment and supplies (most of which are not available locally) and customs clearance of the supplies are lengthy processes in Bangladesh. To improve its procurement planning, NTP requires assistance with accurate forecasting and timely placement of orders. IDDS provided limited technical support to improve the procurement planning and forecasting for NTRL and RTRL staff and more frequently followed up with NTP to help expedite customs clearance.
- Implementation of any new technology, such as Truenat, requires months before the technology can be used at its full capacity, and basic training is not sufficient for developing proficiency of laboratory staff. Extensive monitoring, supervision, and mentoring, as well as refresher training and routine follow-up, are critical for developing technical and management skills at the field level.
- Delays in project implementation due to government or organizational policies and regulations can be resolved with NTP's ownership of the project.

Project Results

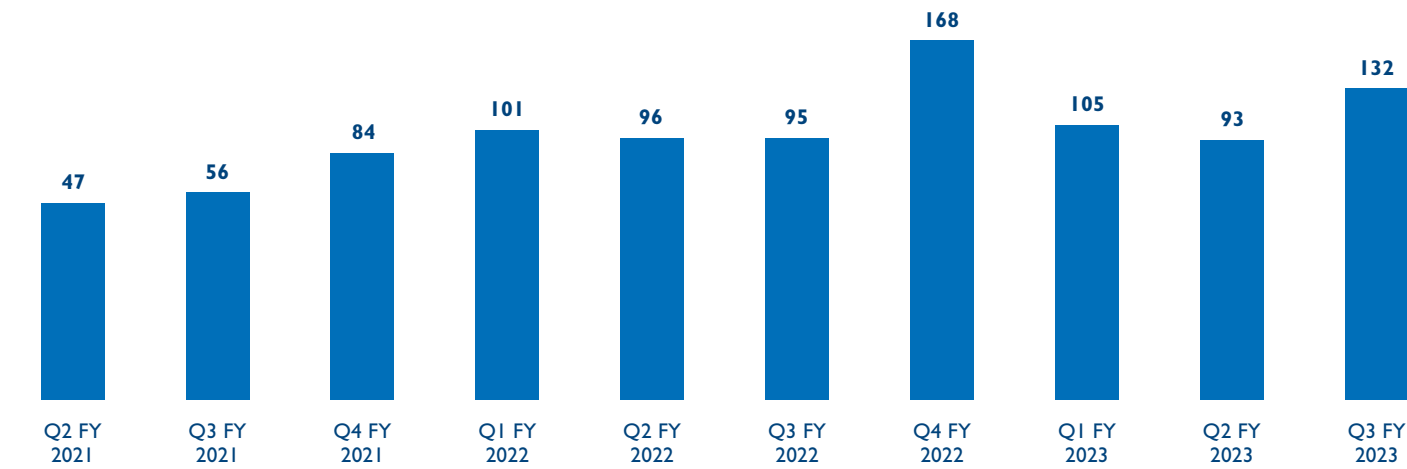
Indicator title and topics	Results*
Laboratories offering a new TB diagnostic service	18†
Truenat	17
Culture (with MGIT)	1
Laboratories supported (NTRL, 5 RTRLs, 38 Truenat sites)	44
People trained	318
Equipment maintenance	7
Pediatric TB stool testing	38
Truenat	62
Xpert MTB/XDR	12
QMS (EQA)	199
SOPs, plans, or guidelines developed or updated	5
Pediatric TB stool testing	1
Xpert MTB/XDR	1
Testing procedures	2
QMS	1
Support supervision visits	65
Truenat	38
Other TB diagnostic activity	7
Testing procedures	7
QMS	13
TWG meetings held	4
Testing procedures	4
Assessments completed	1
Other TB diagnostic activity	1

*Output data are for FY 2023 and include field and core funds.
†Total number of laboratories may be less than the sum of laboratories listed if there are laboratories implementing more than one new diagnostic service.

To decentralize DST and reduce testing burden at NTRL, IDDS built the capacity of four RTRLs to conduct culture and phenotypic DST through mentorship and introduction of BACTEC MGIT 960 in selected sites. IDDS also enabled three laboratories to start conducting LPA testing for second-line drugs. This increased the testing volume at RTRLs and led to the detection of 85 cases with resistance to second-line drugs at these laboratories since May 2021. The percentage of RR-TB patients tested for second-line drugs increased to 100 percent at these sites, up from 87 percent in FY 2021.



Bangladesh: Number of RR-TB Patients Tested With Second-Line LPA at Three RTRLs Supported by IDDS*

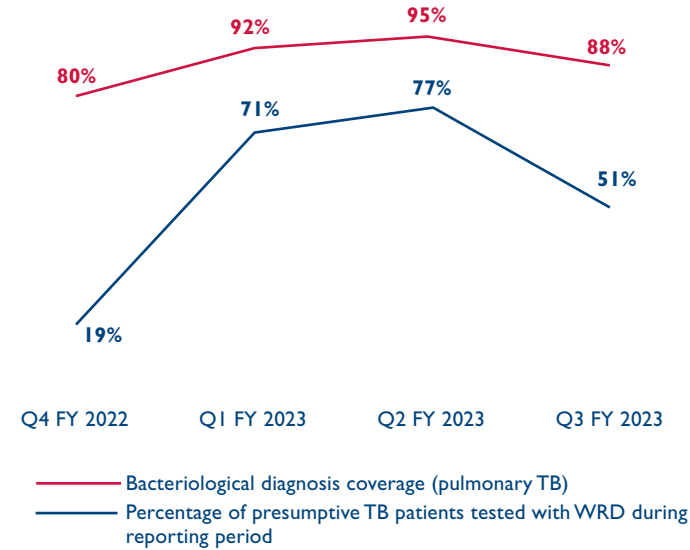


*Two of the RTRLs were not conducting LPA.

The introduction of Truenat at 38 health facilities led to an increase in the percentage of presumptive TB patients tested with a WHO-recommended rapid diagnostic (WRD), from 19 percent to 77 percent over 2 quarters across all 38 sites. Stockouts of Truenat testing kits started in May 2023—after the reagents had expired—and Truenat testing did not resume until late August. This led to dips in rapid diagnostic coverage and bacteriological diagnosis coverage in FY 2023 Q3, although they are expected to increase now that testing has resumed.

In the first 3 quarters of FY 2023, Truenat sites detected 5,943 TB cases and 56 DR-TB cases.

Bangladesh: Rapid Diagnostic Testing Coverage and Bacteriological Diagnosis Coverage at 38 Truenat Sites Supported by IDDS



BURMA

Context

IDDS provides technical assistance to expand access to rapid, reliable, safe, and integrated molecular diagnostics for TB to all people who access the diagnostic network in Burma. IDDS focuses on increasing the detection of TB and DR-TB through expanded and strengthened diagnostic services, microbiological confirmation, and engagement of the private sector.

Annual Highlights

Diagnostic

- To improve TB diagnosis, IDDS worked with partners to enable three facilities to start using X-ray with CAD and artificial intelligence (AI) software to detect TB cases. IDDS provided three Ultraportable X-ray machines with CAD and trained 20 radiographers and medical officers (7 female) in the use of X-ray with CAD and trained 3 staff (2 female) of a local partner on Truenat implementation.
- IDDS helped NTP plan for TB diagnostic network expansion and strengthening by leading a technical group to analyze the coverage and use of GeneXpert and chest X-ray instruments nationally. The findings and recommendations, including an expansion plan, were shared with TB stakeholders to guide the procurement and placement of GeneXpert instruments and digital X-ray instruments.
- IDDS provided technical assistance to NTRL to develop or update 12 SOPs (on topics including biosafety, pipette use, liquid culture, first-line DST, stool specimen management and testing using GeneXpert, and use of Truenat) to align with current global guidelines and recommendations.
- To increase access to diagnostic testing for TB, IDDS continued to provide support to NTP to transport specimens between regional laboratories and NTRL for genotypic and phenotypic culture, and between township laboratories and regional laboratories for molecular diagnostic testing.

Challenges

- NTP has been reluctant to adopt new TB diagnostic modalities, such as private-sector engagement and community strengthening, as well as new diagnostic tools. As a member of the TB Laboratory Technical Working Group (TWG), IDDS has engaged with NTRL and technical partners to overcome the challenges and educate policymakers on the potential public health

PARTNERS AND COLLABORATORS

- National Tuberculosis Program
- National Tuberculosis Reference Laboratory
- Ministry of Health
- Myanmar Private Hospital Association

impact of new TB diagnostic modalities, such as stool specimen testing, which was recently approved by the minister of health for piloting in Yangon region.

- IDDS encountered unexpected delays in procurement due to a policy change notice from the Central Bank of Myanmar to control foreign currency. IDDS discussed how to overcome this challenge with suppliers while maintaining a high level of compliance and emphasizing the project's timeline. After some delay and extensive negotiations with suppliers, IDDS successfully procured priority diagnostic materials, such as ultraportable chest X-ray instruments, artificial intelligence boxes, Truenat instruments, and GeneXpert instruments.

What We Learned

- IDDS supported the central NTP, NTP in Yangon, and NTRL to conduct critical activities to support their proposal to the Global Fund to Fight AIDS, Tuberculosis and Malaria, to continue to provide support to NTP even while waiting for official approval of IDDS activities. IDDS was able to find ways to provide value to NTP through close communication with NTP and the USAID mission.
- Providing technical assistance in a politically challenging environment requires trust and understanding between partners, including government counterparts. Technical assistance providers like IDDS should be able to apply technical expertise and programmatic insights so that activities can be operationalized at an acceptable level of quality. For instance, during CAD implementation, IDDS worked with partners to overcome challenges so the activity could be concluded successfully.

Project Results

Indicator title and topics	Results*
Facilities offering a new TB diagnostic service (X-ray with CAD)	3
Laboratories supported (NTRL)	1
People trained	29
Pediatric TB stool testing	6
Truenat	3
X-ray with CAD	20
SOPs, plans, or guidelines developed or updated	14
Other TB diagnostic activity	1
Pediatric TB stool testing	2
Truenat	1
Testing procedures	7
QMS	2
Biosafety	1
Assessments completed	2
TB DNA	1
Biosafety	1

*Output data are for FY 2023 and FY 2024 Q1.

Since 2021, only data reported by WHO are available for national TB indicators. The data have not been available through NTP. The limited indicators reported for Burma do not align with the work of IDDS, which has focused on creating resources and generating evidence for NTP and NTRL to use to scale up interventions.

CAMBODIA

Context

IDDS supported the National Center for Tuberculosis and Leprosy Control (CENAT) to expand and improve the quality of the TB diagnostic network in line with national priorities. IDDS also worked with CENAT and the Community Mobilization Initiatives to End Tuberculosis project in underserved ODs to develop, implement, and expand TB solutions. IDDS closed out activities in Cambodia on December 31, 2023.

“Before the Truenat implementation in my health center, we hardly found even one bacteriologically confirmed case via smear microscopy in a whole year, but through the new testing tool, Truenat, we can find on an average two to three bacteriologically confirmed TB cases per month.”

—Soun Sokleap, staff member, Prek Anchanh Health Center, Kandal province, Cambodia

Annual Highlights

Diagnostic

- To improve the monitoring and reporting of laboratory results, IDDS worked with partners to expand DTC to 10 new ODs, bringing the total number of supported districts to 40. IDDS supported partners to enable SMS notifications of the GeneXpert test results to prescribers, and establish interconnectivity between DTC and the national TB information system.
- To improve access to rapid TB and DR-TB testing, IDDS enabled three laboratories to start offering DST with GeneXpert MTB/XDR. IDDS delivered 3 GeneXpert 10-color instruments and 1,320 Xpert MTB/XDR cartridges to selected sites and trained 22 staff to conduct quality-assured DST for TB. IDDS also assisted health centers to conduct EQA for Truenat and MTB/XDR testing, and provided 4,000 Truenat MTB Plus tests to replace those that had expired in May 2023.
- IDDS built capacity for quality-assured DST for new and repurposed drugs by training six NTRL and provincial referral hospital laboratory technicians (three female) in phenotypic DST for second-line drugs.
- To increase the use of pediatric TB stool testing, IDDS conducted training in the SOS method for testing stool specimens with Xpert MTB/RIF Ultra. The project trained a total of 139 health workers (29 female) from 6 ODs:

PARTNERS AND COLLABORATORS

- Ministry of Health
- National Center for Tuberculosis and Leprosy Control
- National Tuberculosis Reference Laboratory

GLOBAL PARTNERS

- USAID Community Mobilization Initiatives to End Tuberculosis Project
- Global Fund to Fight AIDS, Tuberculosis and Malaria
- Stop TB Partnership

Battambang, Kampong Tralach, Kong Pisey, Steung Trang, O Raing Ov, and Saang. IDDS supported CENAT to conduct supervisory visits to 18 health facilities from the 6 ODs.

Challenges

- NTRL and Kampong Cham TB laboratory technicians were trained in how to perform phenotypic DST for second-line drugs, but initially they were not able to perform tests due to the lack of the necessary solvent and materials to prepare working drug solutions. IDDS supplied the two sites with the necessary materials, including syringe filters and dimethyl sulfoxide solvent, so they could begin testing.
- The connectivity between Truenat and DTC is limited. At times, the data from the Truenat devices could not be transferred to DTC, even though new DTC and Truenat software updates were deployed by Savics and Molbio Diagnostics.

What We Learned

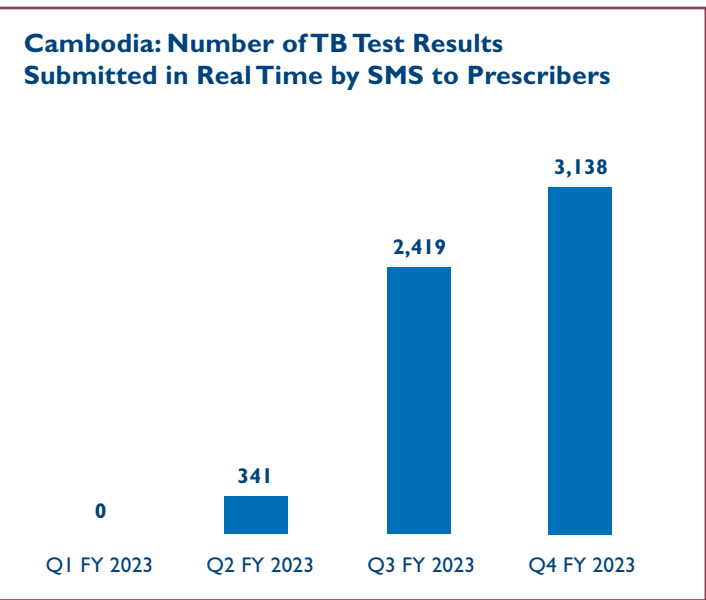
- Staff shortages at the national level, an increased number of GeneXpert instruments, and limited budget for the national staff to resolve GeneXpert problems at the sites were challenges that resulted in delays in performing GeneXpert tests. There is a critical need for referral hospital laboratory technicians who perform GeneXpert TB testing to have basic skills to maintain GeneXpert instruments, rather than relying on the national program.
- Truenat instruments needed a software update from Molbio Diagnostics and realignment of data fields between the two systems prior to connecting DTC to Truenat. In addition, Truenat uses mobile data SIM cards for data connectivity and does not have the advantage of full broadband Internet connectivity that GeneXpert instruments have. Thus, stable 4G data connectivity remains important for the Truenat devices.

- Unique IDs are needed so the GeneXpert system, DTC, and the TB Management Information System can interact with one another, because they are not in the same language. The TB Management Information System is in Khmer, and the GeneXpert and DTC systems are in English.

Project Results

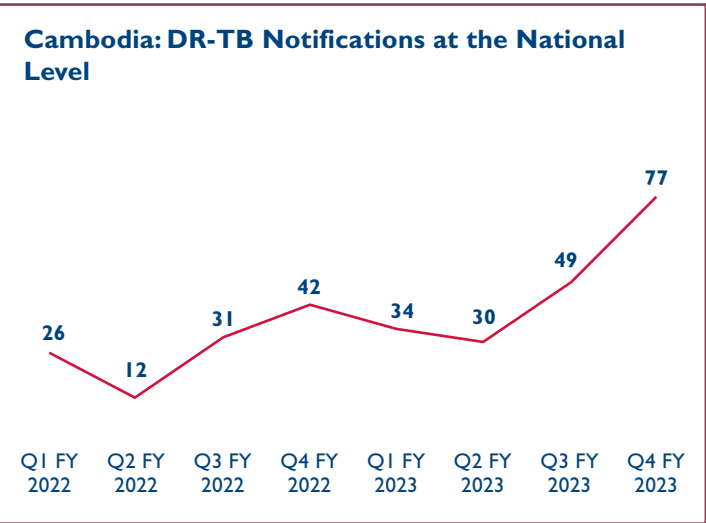
Indicator title and topics	Results*
Laboratories offering a new TB diagnostic service	10†
GeneXpert MTB/XDR	3
Phenotypic DST for second-line drugs	2
Stool testing with GeneXpert Ultra	6
Laboratories supported (40 DTC, 15 Truenat, 6 stool testing, 3 XDR, 2 DST)	57†
Percentage of chest X-ray films posted on platform that received professional feedback	100%
GeneXpert instruments providing real-time results through a connectivity solution	40
People trained	244
Pediatric TB stool testing	139
Truenat	30
XDR	22
Testing procedures	6
Diagnostic connectivity solution	23
Biosafety	18
Chest X-ray Telegram platform	6
Support supervision visits	62
Pediatric TB stool testing	18
Truenat	14
Diagnostic connectivity solution	30
XDR	1
TWG meeting held	1
Diagnostic connectivity solution	1
People mentored	3
Xpert MTB/XDR	3

*Output data are for FY 2023 and FY204 Q1 and include field and Core TB funds.
†Total number of laboratories may be less than the sum of laboratories listed if there are laboratories implementing more than one new diagnostic service.



IDDS worked with partners to enable SMS notifications of the GeneXpert test results to prescribers starting in FY 2023 Q2. A total of 5,898 results have been sent by SMS as of September 30, 2023. This enables prescribers to obtain immediate results and start treatment quicker.

In FY 2023, IDDS expanded DST testing in five laboratories. IDDS enabled two laboratories to conduct phenotypic DST for second-line drugs and supported the introduction of Xpert MTB/XDR testing in three laboratories. From April through September 2023, the Xpert MTB/XDR laboratories diagnosed 61 cases with isoniazid resistance and 6 cases with fluoroquinolone resistance. DR-TB notifications at the national level increased over this period.



CAMBODIA

Context

Through funding from PMI, IDDS worked in Cambodia to support efforts to improve malaria diagnostics in alignment with ongoing efforts to eliminate malaria and prevent drug resistance. IDDS closed out PMI activities in Cambodia on December 31, 2023.

Annual Highlights

Diagnostic

- IDDS completed development of a mapping and assessment tool for malaria diagnostic services in collaboration with CNM, WHO, PMI, the U.S. Centers for Disease Control and Prevention (CDC), USAID, MoH, and other partners that examines 11 components of the laboratory system and network. IDDS trained 18 assessors (6 female) on how to use the new tool. The diagnostic assessment was not implemented because the government prioritized introducing PCR capacity.
- IDDS assessed PCR testing capacity for malaria at CNM’s laboratory and identified opportunities for improvement. In addition, IDDS identified the Kampong Cham Referral Hospital laboratory as a potential regional PCR laboratory for CNM in terms of infrastructure, human resources, and commitment from the site. This finding will lay the groundwork for the site becoming an NRL and improving the capacity of CNM laboratory staff to identify malaria species so clinicians can promptly initiate treatment and contribute to malaria elimination in the country.
- To improve the molecular diagnostic capacity of CNM laboratory staff for malaria species identification, IDDS conducted training on using real-time PCR testing for malaria detection and speciation for eight participants (four female). IDDS conducted a joint supervision visit to the implementation sites on December 12–16, 2023.

Challenges

- CNM was reluctant to approve the implementation of the diagnostic assessment due to the possibility of revealing gaps in laboratory capacity. After IDDS assured them that the results and findings from the assessment would remain confidential (with the exception of sharing with USAID), the CNM leadership team supported an assessment of PCR testing that then informed strategic discussions for setting priorities.

What We Learned

- Ensuring alignment with CNM is critical to minimizing delays in implementation as well as minimizing the potential for duplicative efforts.
- Written approval by the CNM director (in addition to formal and final approval from USAID in Washington, DC) is required for implementation of new activities to avoid misunderstandings and unexpected issues. This is needed even when key technical officials approve a specific activity to proceed.

PARTNERS AND COLLABORATORS

- National Center for Parasitology, Entomology and Malaria Control
- Ministry of Health

Project Results

Indicator title and topics	Results*
Laboratory offering a new diagnostic service (PCR for malaria)	1
People trained	26
Malaria DNA	18
Testing procedures	8
Support supervision visits	2
Testing procedures	2
Assessment completed	1
Testing procedures	1

*Output data are for FY 2023 and FY 2024 Q1.

CAMEROON

Context

IDDS enhanced the detection of AMR and priority pathogens, strengthened AMR surveillance across sectors, and improved the quality of diagnostic testing in Cameroon, including for mpox. IDDS closed out activities in Cameroon on December 31, 2023.

“The [mpox] training was really important and beneficial because the majority of surveillance actors in the animal health sector are not familiar with surveillance [processes]. Two months after the training, the Southwest region started sending and regularly analyzing their data.”

—Dr.A.B.K. Okiwah, chief of service of epidemiological surveillance, Ministry of Livestock, Fisheries and Animal Industries, Cameroon

Annual Highlights

Diagnostic

- To support the early detection of priority pathogens of national importance, including MVD, IDDS supported 336 shipments of specimens to NRLs from the 10 regions of the country.
- IDDS supported workforce development around AMR surveillance by working with the University of Buea, the USAID Mission in Cameroon, and other implementing partners (USAID Medicines, Technologies, and Pharmaceutical Services Program and the Africa One Health University Network) to develop an AMR e-learning platform. This platform will be used in an online master’s level program on AMR and infectious disease, as well as three short-term certification programs, starting in 2024.
- To increase the capacity for and quality of AST, pathogen identification, and proper antibiotic use, IDDS and the National Public Health Laboratory (NPHL) provided various rounds of mentorship to 14 laboratories, including 8 new AMR surveillance sites. IDDS also supported the Yaoundé Military Hospital to conduct a training for 49 biologists and clinicians (19 female) on AMR surveillance data and the proper use of antibiotics. The project also mentored three laboratory staff (all female) from two AMR surveillance sites in Yaoundé on internal quality controls for antibiograms

PARTNERS AND COLLABORATORS

- Ministry of Public Health
- Ministry of Livestock, Fisheries and Animal Industries
- University of Buea
- Africa One Health University Network

GLOBAL PARTNERS

- Food and Agriculture Organization of the United Nations
- USAID Medicines, Technologies, and Pharmaceutical Services Program

Surveillance

- To raise awareness of AMR as a global health threat and provide opportunities for knowledge exchange, IDDS participated in conferences and held events for World Antimicrobial Awareness Week. IDDS also hosted diagnostic stewardship seminars and workshops to increase referrals of specimens for bacteriology testing.
- To extend the reach of the AMR surveillance network, and improve data quality, IDDS trained 14 staff (11 female) from 8 newly enrolled sentinel surveillance sites on the proper collection and reporting of AMR data. Now that these sites are equipped with the staff capacity needed for AMR detection, the surveillance data will be more representative and thus more useful for decision-making at the national level. IDDS also supported NPHL to organize quarterly data quality review meetings to validate AMR data from all 16 AMR surveillance sites, and installed equipment to ensure integration between WHONET and DHIS2.
- To inform national and global AMR surveillance, IDDS supported the National Coordination Center in preparing the 2022 Antimicrobial Surveillance Annual Report and submission of AMR data to GLASS.
- IDDS helped the Ministry of Public Health draft surveillance guidelines for the detection, prevention, and control of viral hemorrhagic fevers by hosting a five-day workshop with representatives from government ministries across the human, animal, and environmental health sectors.

Mpox

- IDDS supported the Government of Cameroon to finalize and validate its strategic plan for the prevention and control of mpox—a document that guides immunization and outbreak management and reinforces the surveillance system through a multisectoral One Health approach. IDDS also supported the development and implementation of guidelines for epidemiological surveillance at all levels of the health pyramid.
- IDDS provided technical and financial support to mpox outbreak investigations and responses conducted in the Littoral, Southwest, and Northwest regions of Cameroon, which enabled the appropriate management of cases and establishment of measures to control the spread of outbreaks at the community level.
- To reduce the turnaround time for mpox test results, IDDS equipped regional laboratories with mpox PCR tests and trained 13 laboratory staff (7 female) from 2 regional and 2 central laboratories in mpox diagnostic techniques. Now that regional laboratories can conduct mpox testing, mpox specimens no longer need to be sent to Centre Pasteur in Yaoundé for testing.

Challenges

- Disease outbreaks and other public health emergencies delayed implementation progress because Ministry of Public Health stakeholders were unable to prioritize IDDS engagements while addressing the various public health emergencies. IDDS pivoted as needed and adjusted timelines accordingly.

What We Learned

- Sustained mentorship and coaching after initial IDSR training were essential in maintaining good performance in surveillance reporting in the Southwest region. This coaching approach could be considered a best practice and applied after training on other topics to further support workforce capacity building and improved outcomes

Project Results

Indicator title and topics	Results*
National surveillance bulletins produced	10
Multisectoral data sharing meetings held	6
Surveillance bulletins produced with animal and human data	8
Data review meetings held	5
Sites providing data to GLASS	6
Laboratories supported	16
People trained	319
Electronic reporting systems	123
Testing	21
Data quality	106
Data analysis and use	20
AMR diagnostic advocacy	49
SOPs, plans, and guidelines developed	3
Data quality	1
Data analysis and use	1
Other surveillance†	1
Support supervision visits	65
Testing	16
Data quality	46
Biosafety and biosecurity	3
TWG meetings held	12
Electronic reporting systems	1
Interoperability	1
Data quality	7
Other surveillance†	3
Assessments completed	2
Other surveillance†	1
Biosafety and biosecurity	1
People mentored	191
QMS	83
Testing procedures	108
Specimens transported	464
Outbreaks investigated	64

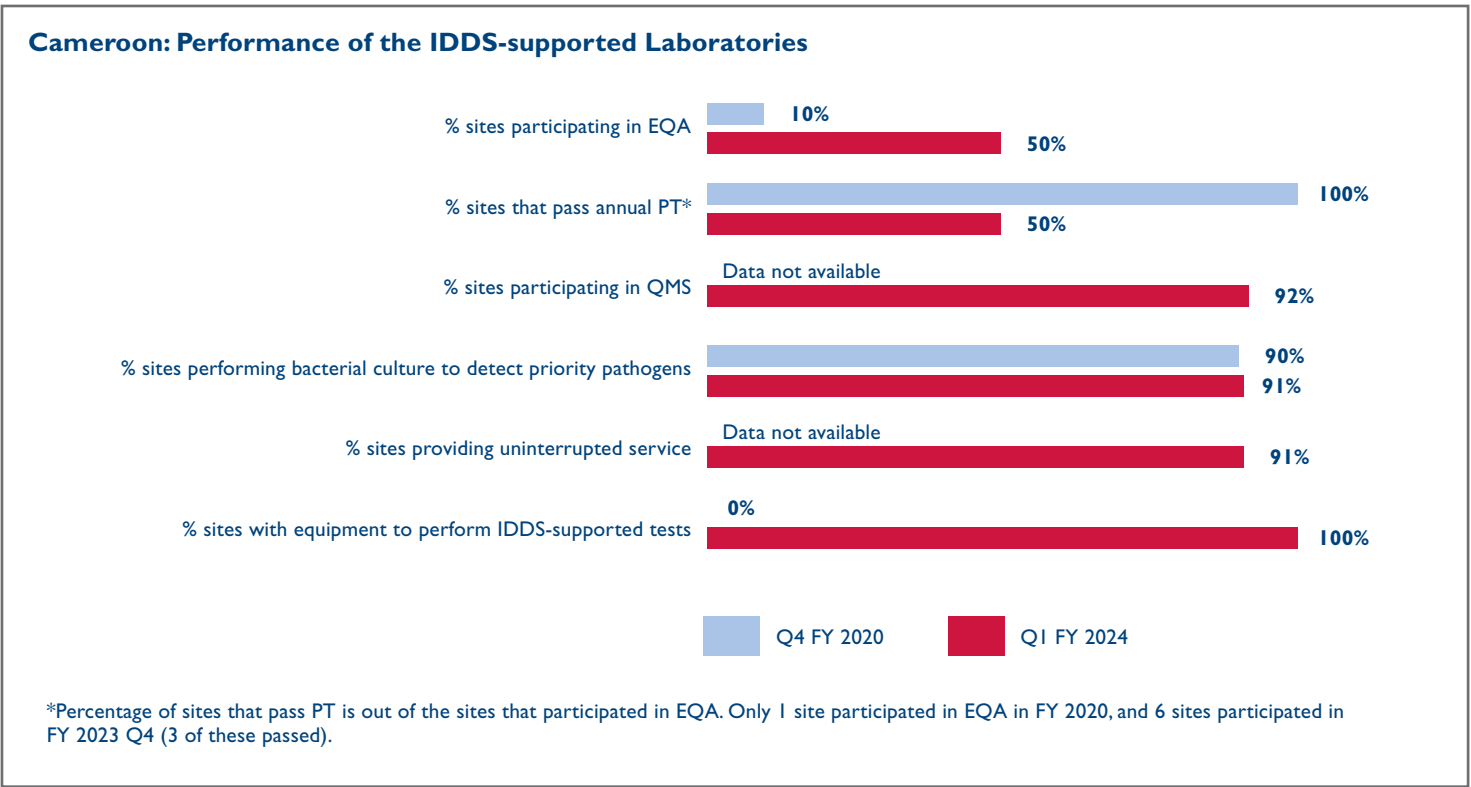
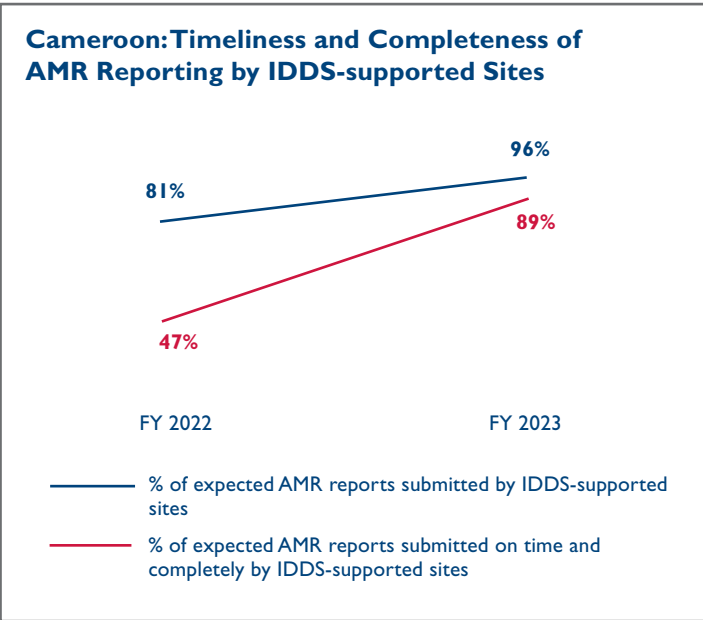
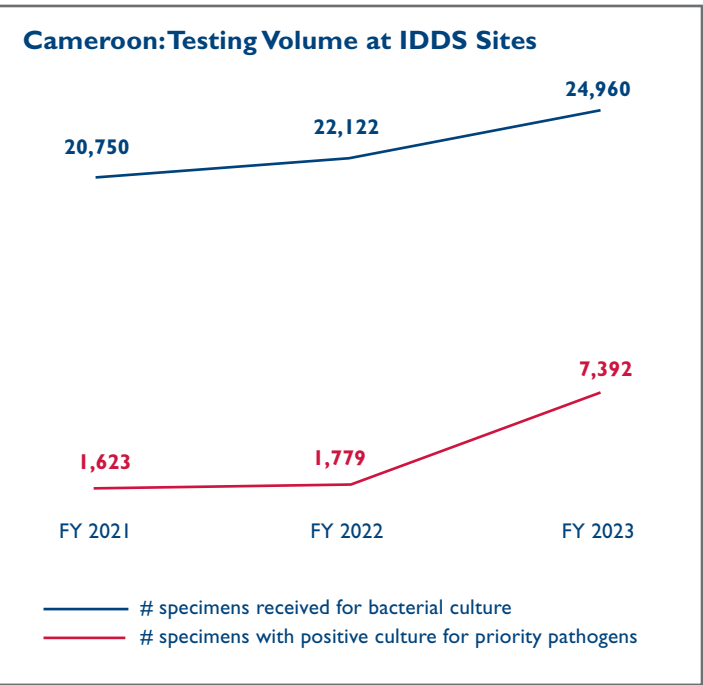
*Output data are for FY 2023 and FY 2024 Q1.
†Other surveillance topics included mpox coordination (SOPs, plans, and guidelines developed); finalization of the Mpox Strategic Plan and Integrated National Action Plan for Mpox, and development of AMR Strategic Plan, 2022–2027 (TWG meetings); and an evaluation of the integrated AMR surveillance system in the sentinel sites (assessments completed).

IDDS strengthened the capacity for bacteriology testing in AMR surveillance sites in Cameroon, which resulted in increased testing and detection of priority pathogens. IDDS supported 8 sites (6 human and 2 animal health) in FY 2021, 10 sites in FY 2022, and 12 sites (9 human and 3 animal health) in FY 2023. Four additional sites received IDDS support for AMR detection and surveillance in FY 2023 but did not report against IDDS indicators. Only priority bacterial pathogens listed by the national government as being of “primary concern” are reported for this indicator. The priority pathogens reported for Cameroon included *E. coli*, *Klebsiella pneumoniae*, *Acinetobacter baumannii*, *Staphylococcus aureus*, *Streptococcus pneumoniae*, *Salmonella* spp., *Shigella*, *Pseudomonas aeruginosa*, *Vibrio cholerae*, and *Neisseria gonorrhoeae*.

IDDS improved the quality of AMR surveillance reporting at supported sentinel surveillance sites. IDDS provided technical assistance, mentorship, and training on WHONET reporting, AMR data management, analysis, and interpretation, and conducted data review meetings. IDDS supported Cameroon to establish the AMR sentinel surveillance sites and reporting system and supported the country to submit data to GLASS in 2022 (for the first time) and in 2023.

“Since 2020, the laboratory at Laquintinie Hospital has been supported by the IDDS project, and we have benefited from a partnership that has enabled us to improve our technical facilities. Several items of equipment have been donated to us by USAID. We have also benefited from laboratory reagents to enable us to extend our range of diagnostic services, as well as mentoring support, with multiple training courses and ongoing monitoring of the results. We’ve improved our turnaround time and benefited from all this equipment and support from IDDS. Another result is that we’ve improved patient care. With all this, the results we offer are of better quality for clinicians and patients alike.”

—Dr. Chrstiane Ingrid, medical biologist, head of Clinical Biology Department, Laquintinie Hospital, Douala, Cameroon



IDDS strengthened the capacity for bacteriology testing by providing intensive training and mentoring to laboratory staff, developing job aids and SOPs, procuring basic reagents and equipment, among other support.

DEMOCRATIC REPUBLIC OF THE CONGO

Context

IDDS implemented activities in DRC to improve preparedness for outbreaks of priority pathogens by supporting national and regional public health laboratories and working to establish safe specimen handling and transport for priority pathogens, including EVD and plague. IDDS closed out activities in DRC on December 31, 2023.

“The concepts learned will not only allow us to culture and identify the causative agent of the plague, but we are also now able to improve certain practices and solve certain challenges that we have always encountered in our bacteriology department.”

—Faïda Kitoga, biologist, INRB Rodolphe Mérieux Laboratory, Goma, DRC

Annual Highlights

Diagnostic

- To improve the ability to respond to and contain disease outbreaks, IDDS reinforced the diagnostic capabilities of the INRB regional laboratory in Goma, which is now able to detect priority zoonotic diseases, including EVD and plague. The laboratory is now able to detect outbreaks that were previously difficult to identify locally. IDDS also supported plague testing in 4 provinces in eastern DRC as well as transport of 55 plague specimens for testing.
- IDDS helped develop and validate an updated outbreak action plan, aligning it with the national laboratory strategic plan. This comprehensive plan, developed in the context of One Health, builds on the 2014 contingency plan, ensuring standardized actions in response to outbreaks with combined resources. IDDS also supported the development of biosafety/biosecurity and quality assurance documents for the national laboratory network.
- To facilitate the smooth transport and referral of specimens during disease outbreaks, IDDS trained 20 individuals (3 female) from the United Nations Humanitarian Air Service and local airlines in the safe handling and transport of biological specimens. This training laid the groundwork for collaboration with local airlines, primarily in the private sector, which will effectively close critical gaps within the diagnostic network and bolster the efficiency of the SRS in eastern DRC and beyond.

PARTNERS AND COLLABORATORS

- Ministry of Public Health
- National Biomedical Research Institute
- Provincial health divisions (North Kivu, South Kivu, Maniema, Ituri)

GLOBAL PARTNERS

- World Health Organization
- Food and Agriculture Organization of the United Nations
- International Federation of Red Cross and Red Crescent Societies
- USAID Medicines, Technologies, and Pharmaceutical Services Program
- U.S. Centers for Disease Control and Prevention
- Africa One Health University Network

EVD

- IDDS provided financing for the safe and efficient transport of 23 suspected EVD specimens from peripheral collection sites bordering Uganda to the INRB regional laboratory in Goma for testing. Upon receipt, IDDS provided technical assistance to INRB in Goma for checking the quality of specimen packages.
- To improve biosafety, IDDS organized and facilitated online training in specimen management for priority pathogens, including the Ebola virus, for 16 laboratory workers (6 female) from INRB in Goma; laboratories in Beni, Bunia, and Butembo; provincial laboratories in Ituri and North Kivu; and the provincial divisions of health in Ituri and North Kivu. The training’s focus on biosafety and biosecurity and the use of PPE reduces the risk that the trained individuals—who are the people most often involved in the management of specimens during infectious disease outbreaks—will expose themselves, their colleagues, and the environment to chemical, biological, pathogenic, and physical hazards resulting from performing their work in the laboratories.
- IDDS engaged the United Nations Humanitarian Air Service to transport 6,966 specimens from 2 previous EVD outbreaks (i.e., the 12th EVD outbreak on February 7–May 3, 2021, and the 13th outbreak on October 8–December 16, 2021) from an INRB sentinel site in Beni to the INRB laboratory in Goma, which will ensure that the specimens are stored at the appropriate temperature and with the required biosafety/biosecurity precautions.

The safe transport and storage of these EVD specimens ensures the security of biological materials in laboratories and protects these specimens—which contain biological agents—from theft, loss, or misuse.

- IDDS facilitated the delivery of 900 EVD Zaire GeneXpert cartridges to INRB in Goma, where they will bolster diagnostic capabilities in the region. IDDS collaborated with local stakeholders to monitor the availability and effective use of the EVD test stockpile in the country, reinforcing DRC’s ability to respond to outbreaks.

Challenges

- Fragile security and irregular flight availability within DRC delayed the implementation of activities and increased operational costs.
- Outbreaks of infectious diseases, including EVD, plague, and mpox, diverted resources and delayed activities. IDDS repeatedly evacuated staff from the Goma office and relocated them to Kinshasa.

What We Learned

- Opportunities to share updates and experience among partners involved in outbreak response support led to effective collaboration. Partners were able to coordinate to avoid overlap of interventions, prevent loss of stock due to expiration, and reduce stockouts of laboratory supplies. One innovation was the incineration of biological waste from INRB laboratories through the United Nations Stabilization Mission when the incinerator of the general hospital of Goma was not operational.
- Collaborative relationships with provincial health authorities, heads of the supported institutions (INRB in Goma and its satellite sites), and other relevant stakeholders allowed project activities to continue, even after the evacuation of the IDDS team based in Goma, with remote coordination from the IDDS office in Kinshasa.
- Prioritizing staff capacity building is essential for integrating local airline companies into the transportation of biological specimens during outbreaks.

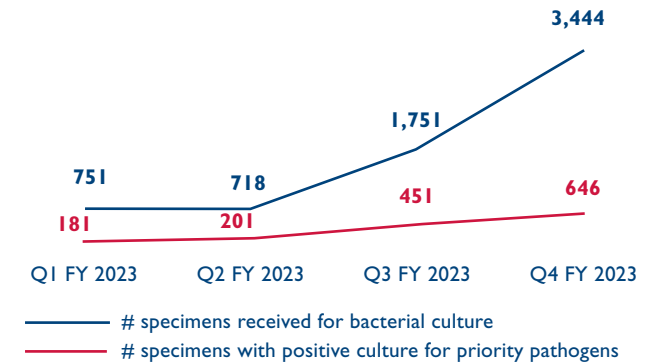
IDDS helped improve capacity for bacterial culture testing at INRB in Goma starting in FY 2023 Q1 by training staff, developing SOPs, and providing laboratory equipment and reagents. In FY 2023 Q4, the number of specimens received spiked due to a cholera outbreak in the region.

Project Results

Indicator title and topics	Results*
People trained	59
Testing	23
SRS	16
Biosafety and biosecurity	20
SOPs, plans, and guidelines developed	10
Testing	3
QMS	1
Biosafety and biosecurity	6
Support supervision visit	1
Testing	1
TWG meetings held	83
Commodity management	7
Interoperability	1
Testing	48
SRS	6
QMS	1
Biosafety and biosecurity	18
Other diagnostic†	2
Assessment completed	1
SRS	1
People mentored	3
Testing	3
Specimens transported	55
Specimens shipped by airfreight	23
Waste bags transported for incineration	69
Specimens transported for safe storage	6,966

*Output data are for FY 2023 and FY 2024 Q1 (October–November 2023).
†Other diagnostic topics included DRC lab improvements and present final year report of the Directorate of Health Laboratories and preparation of the 2023 Operations Action Plan (TWG meetings).

DRC: Testing Volume at INRB Goma



DEMOCRATIC REPUBLIC OF THE CONGO

Context

In DRC, IDDS upgraded the NTRL and improved conditions and service delivery in NTRL and three TB reference laboratories, IDDS also supported the introduction of new testing tools such as Truenat and stool testing with GeneXpert Ultra. IDDS closed out activities in DRC on December 31, 2023.

“With the introduction of [the laboratory information management system], we have a global view of the NTRL’s activities from sample reception, testing, and availability of results for each test. We have immediate access to patient data, and we also have access to laboratory data.”

—Dr. Muriel Aloni, head of Kinshasa NTRL, DRC

Annual Highlights

Diagnostic

- To enhance the Kinshasa NTRL’s overall performance and operational standards, IDDS assisted the laboratory in developing 8 SOPs related to equipment maintenance and revising 17 SOPs related to biosafety. IDDS also installed the LIMS for the Kinshasa site and trained staff on the relevant software.
- IDDS provided equipment and laboratory supplies for the Lubumbashi and Kisangani provincial TB reference laboratories to minimize the risk of contamination. IDDS also provided refresher training in culture testing to three staff (one female) from the Kisangani provincial laboratory to allow them to restart culture testing.
- IDDS contributed to improving waste disposal and biosafety at NTRL by repairing and replacing equipment for sterilization, providing a new incinerator, and rehabilitating the old incinerator as a backup. The new incinerator addresses ongoing waste management issues, such as waste accumulation and contamination, while enhancing the safety of laboratory staff.

Challenges

- Collecting data to monitor and evaluate site performance was challenging because of poor data systems and the lack of dedicated data managers at the three sites.
- The incubator delivered to the Kisangani provincial laboratory did not comply with the technical specifications shared by IDDS. The incubator was returned to the supplier to be exchanged. A new replacement incubator that met the required technical specifications was later installed.

PARTNERS AND COLLABORATORS

- Ministry of Public Health
- National Biomedical Research Institute
- National Tuberculosis Program
- Directorate of Laboratory Services
- Directorate of Epidemiological Surveillance

GLOBAL PARTNER

- Stop TB Partnership

- Testing was interrupted because of expiry and stockouts of Truenat cartridges and reagents. The issues were addressed by the Stop TB Partnership, USAID, and Molbio Diagnostics, with the order of a new lot of testing reagents.
- Expired Truelab® and Trueprep® reagents required disposal, but the respective sites did not have directions for their destruction. After a meeting with USAID, IDDS, NTP, and Molbio Diagnostics, the manufacturer (Molbio) shared the SOPs on how to dispose of the expired reagents. IDDS translated the SOPs into French and shared them with all stakeholders.

What We Learned

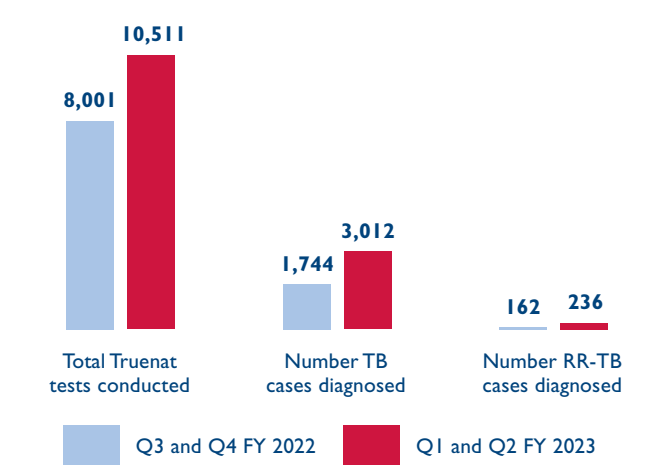
- The TB-NET tool made it possible to conduct an in-depth analysis of the TB laboratory network, which led to a recommendation by the NTP director to customize the tool for the local context and expand its use to the entire TB control program, including areas such as monitoring and evaluation, administration, and finance.
- TB diagnostic network performance requires better planning and management of reagent stocks. IDDS highlighted the contribution of Truenat to the detection of multidrug-resistant TB and RR-TB cases; however, due to the expiration of Truenat reagents, sites that were using the Truenat instrument had to return to microscopy, with the risk of missing cases.
- Synergy in complementary activities and collaboration with NTP/NTRL and other actors and partners will enhance the TB diagnostic network. For example, IDDS provided the class II biosafety cabinet for the Lubumbashi provincial laboratory, and the Global Fund supported the certification done by Air Filter Maintenance Services International.
- Regular monitoring of the equipment maintenance plan in the laboratory by staff will ensure that equipment is in working order. Among the various pieces of equipment replaced at the three laboratories supported by IDDS, many had been damaged due to electricity disruptions, but also by the lack of preventive maintenance.

Project Results

Indicator title and topics	Results*
Laboratories supported (38 Truenat, NTRL, and 2 provincial laboratories)	41
People trained	40
Testing procedures	3
TB DNA	37
SOPs, plans, or guidelines developed or updated	26
Equipment maintenance	8
Biosafety	17
National laboratory strategic plan	1
Support supervision visits	10
Truenat	7
QMS	3
TWG meeting held	1
LNSA	1

*Output data are for FY 2023 and FY 2024 Q1 and include field and Core TB funds.

DRC:Truenat Testing Results at 38 Health Facilities Over 6 Months



IDDS supported 38 health facilities to begin Truenat testing in FY 2022 by providing training to health facility staff. IDDS also established a cadre of super-users to provide support to health facility staff with Truenat implementation and facilitated several rounds of supportive supervision at the sites. A total of 4,756 TB cases and 398 RR-TB cases were diagnosed using Truenat in the first 10 months of implementation (between June 2022 and March 2023), and 18,512 presumptive TB patients were tested.

ETHIOPIA

Context

In Ethiopia, IDDS works with five human health laboratories and one animal health laboratory to strengthen AMR diagnosis and surveillance, by providing technical assistance and mentorship, updating documentation, improving data reporting through the introduction of WHONET, and identifying opportunities to integrate surveillance systems across sectors.

“I would like to extend my appreciation to the IDDS team for what they did on ISO 15189 orientation training, the professionalism, and the endless hours that you have spent.”

—Dereje Mamuye, researcher, Ethiopian Public Health Institute

Annual Highlights

Diagnostic

- In a major step toward recognizing improved quality of laboratory services, Jimma and Hawassa University Hospital laboratories, both of which are supported by IDDS, received ISO 15189:2012 accreditation by the Ethiopian Accreditation Service. IDDS supported another site (St. Paul’s Hospital microbiology laboratory) to finalize the required documents for its application for ISO 15189:2012 accreditation in FY 2024 Q2. IDDS and the Ethiopian Public Health Institute (EPHI) also jointly conducted 19 supportive supervision and mentorship visits at 5 microbiology laboratories (both human health and animal health sites) to support preparations for ISO 15189 accreditation assessments and provide technical support for AMR surveillance.
- To ensure that AMR surveillance sites adhere to ISO 15189 requirements, IDDS collaborated with National Metrology Institute engineers to calibrate and maintain essential equipment—including analytical balances, water baths, refrigerators and freezers, incubators, autoclaves, centrifuges, biosafety cabinets, and PH meters—at St. Paul’s Hospital Millennium Medical College, Jimma Medical Center, and Hawassa Hospital microbiology laboratories, with the goal of improving QMS at each site.

Surveillance

- In a key step for improving AMR surveillance, WHONET mentorship was conducted at two human health AMR sites (Felege Hiwot Hospital and Gondar University Hospital).

PARTNERS AND COLLABORATORS

- Ethiopian Public Health Institute
- Animal Health Institute

GLOBAL PARTNER

- Food and Agriculture Organization of the United Nations

- IDDS supported EPHI in the write-up of the National Laboratory-based AMR Surveillance Annual Report. EPHI will disseminate the final report to relevant stakeholders.
- IDDS participated in the World Antimicrobial Awareness Week celebration (November 18–24, 2023) and supported the printing of a standing banner for the exhibition session. In addition, a commemoration workshop took place on November 17, with the theme of “Preventing Antimicrobial Resistance Together,” and was attended by participants from MoH, the Ministry of Agriculture, the Environmental Control Authority, WHO, the Food and Agriculture Organization of the United Nations, USAID, and CDC, as well as partners supporting the prevention of AMR.

Challenges

- As a result of a state of emergency in Amhara regional state, IDDS mentorship and supportive supervision visits were interrupted at three AMR sites (Felege Hiwot Hospital, University of Gondar Hospital, and Bahir Dar Veterinary Laboratory). IDDS provided remote support to these sites while waiting for the security situation in the region to improve. After a slight improvement in the security situation, IDDS was able to conduct mentorship visits to Felege Hiwot Hospital and University of Gondar Hospital.

What We Learned

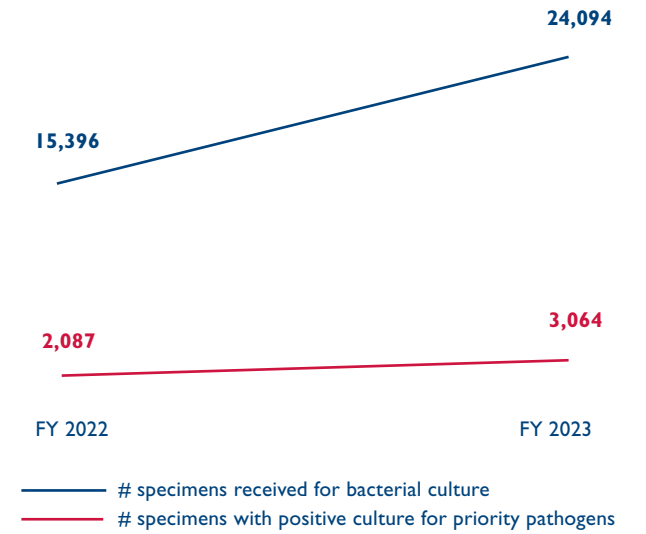
- Holding training sessions, supportive supervision visits, and mentorships jointly with EPHI—and in the regions with AMR sites—helped conserve the limited budget and ensure sustainability of practices.
- Laboratory QMSs can be significantly improved through the implementation of an intensified mentoring program tailored to each facility’s specific needs and “owned” by the laboratory.
- To ensure sustainability and empower diagnostic facilities, responsibility of the coordination of site level training was transferred to the sites themselves (e.g., for the diagnostic stewardship training). Site-level AMR diagnostic stewardship training enhances communication between the laboratories and physicians and increases the volume and quality of specimens collected in patient wards.

Project Results

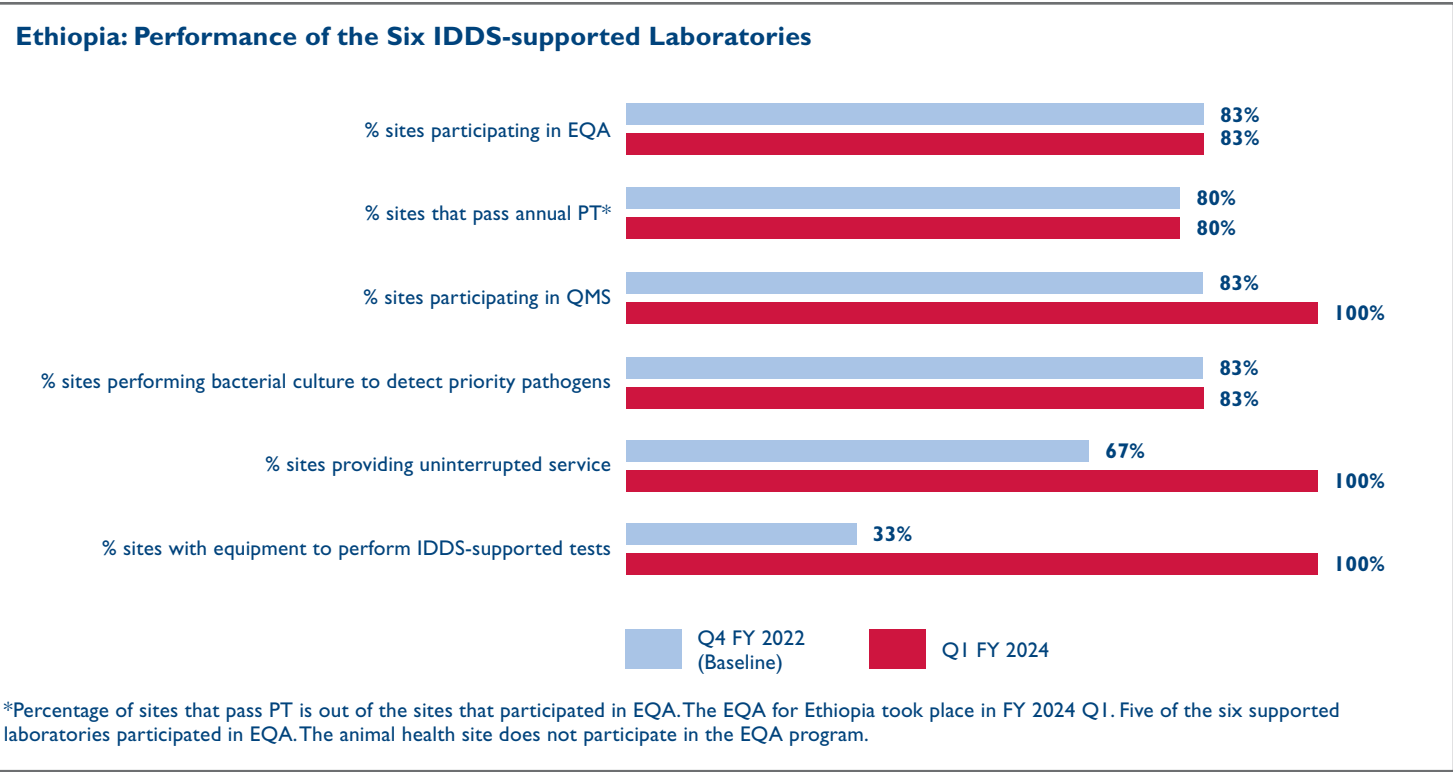
Indicator title and topics	Results*
Laboratory offering a new diagnostic service (bacteriology)	1
Laboratories supported	6
National surveillance bulletin produced	1
Multisectoral data sharing meetings held	2
Data review meetings held	2
Sites providing data to GLASS	5
People trained	251
Commodity management	41
Testing	93
Data analysis and use	16
QMS	19
AMR diagnostic advocacy	82
SOPs, plans, and guidelines developed	73
Testing	1
QMS	72
Support supervision visits	5
QMS	3
AMR diagnostic advocacy	2
People mentored	55
Testing	20
Data analysis and use	7
QMS	28

*Output data are for FY 2023 and FY 2024 Q1.

Ethiopia: Testing Volume at Six IDDS Sites



Since FY 2022 Q2, IDDS has continued strengthening capacity for bacteriology testing in five human health laboratories in Ethiopia and is engaging clinicians to utilize these testing services. The animal health site, Bahir Dar Regional Veterinary General Laboratory, started performing bacterial culture testing in FY 2023 Q3. These efforts have resulted in increased testing and detection of priority pathogens. Only priority bacterial pathogens listed by the national government as being of “primary concern” are reported for this indicator. The priority pathogens reported for Ethiopia included *Acinetobacter spp.*, *E. coli*, *Klebsiella pneumoniae*, *Neisseria gonorrhoeae*, *Pseudomonas aeruginosa*, *Salmonella spp.*, *Staphylococcus aureus*, and *Streptococcus pneumoniae*.



At baseline, the animal health site, Bahir Dar Regional Veterinary General Laboratory, did not perform bacterial culture testing. It began conducting the testing in FY 2023 Q3; however, it does not always receive specimens. In FY 2024 Q1, the site did not receive any specimens due to the state of emergency, and thus was not counted for this quarter.

IDDS procured reagents, culture media, auxiliary equipment, waste containers, and other commodities to ensure that the supported sites had the minimum equipment needed to perform bacterial culture testing.

GUINEA

Context

In Guinea, IDDS builds capacity for AMR surveillance across the national diagnostic system through training, expert inputs into policy and regulatory guidance, and quality assurance. IDDS has also expanded capacity for CBS and strengthened capacity to detect COVID-19.

Annual Highlights

Diagnostic

- Representing a major milestone for access to diagnostic services in Guinea, IDDS supported the national expansion of the SRS that IDDS had piloted in three regions (Kindia, Mamou, and Faranah). IDDS collaborated with Village Reach and CDC to expand the SRS to 491 health centers located across the country’s 33 health districts. Since expanding its reach to the entire country, the IDDS led integrated SRS has facilitated the transport of more than 2,500 samples that helped detect within 48 hours ongoing outbreaks of Lassa fever, diphtheria, polio, and whooping cough, among other infectious diseases.
- To expand and improve AMR surveillance, IDDS conducted baseline assessments of bacteriology and serology/immunology testing capacity at Nzérékoré Regional Laboratory and the Army Reference Laboratory, identifying them as potential sentinel sites.
- To identify corrective actions that will foster improvements to quality services, IDDS visited five regional hospital laboratories, specifically those in Faranah, Kankan, Kindia, Labe, and Mamou, to review documents related to QMS, laboratory results, and stock management. After reviewing the available documents, IDDS developed or updated 21 documents that were missing or out of date, 20 of which were for QMS and testing and 1 on commodity management.

American Rescue Plan (ARP)

- To improve capacity for detecting COVID-19, IDDS provided two GeneXpert modules for Siguiri Prefectural Hospital to restore the functionality of its GeneXpert instrument. IDDS hired a local Cepheid engineer to travel to the site and install the modules, which was completed on October 14–15, 2022. IDDS completed all ARP-funded COVID-19 activities in Guinea in the first quarter of FY 2023.

PARTNERS AND COLLABORATORS

- Ministry of Health and Public Hygiene
- National Directorate of Laboratories
- National Agency for Health Security

Challenges

- Procurement delays affected the implementation of some activities. IDDS worked closely with vendors to ensure the timely delivery of supplies.
- Frequent political protests in Conakry led to some delays in the implementation of field activities. To avoid harm and delays, IDDS closed the office and allowed staff to work from home.

What We Learned

- It is important to collaborate with other implementing partners, such as Village Reach, CDC, and WHO, to improve the integrated SRS in Guinea. This will ensure continuity of the system after IDDS closes out in Guinea in March 2024.

Project Results

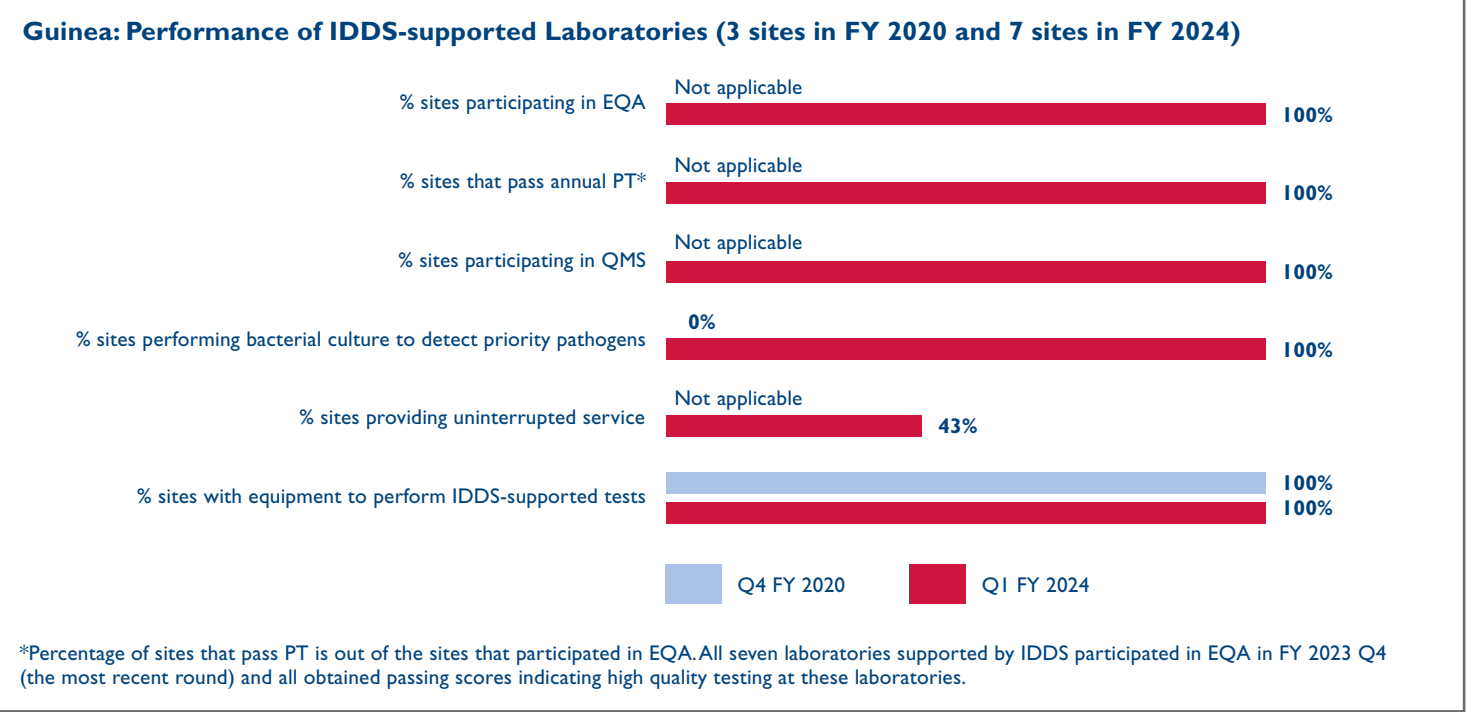
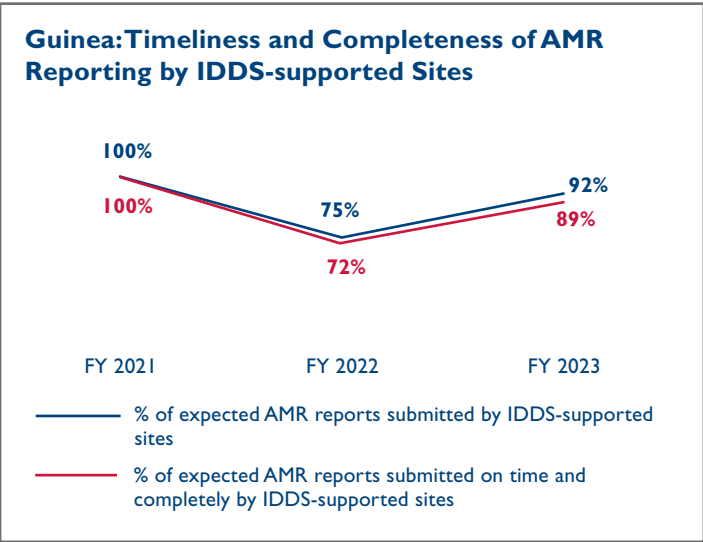
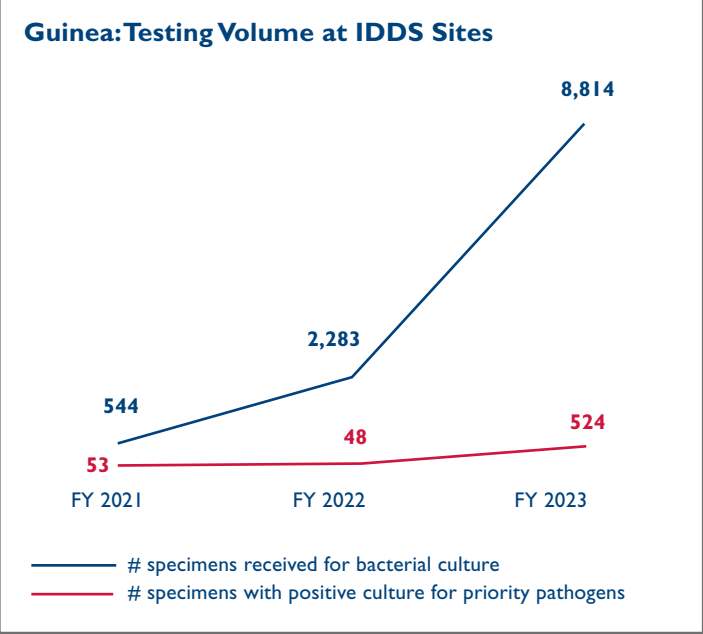
Indicator title and topics	Results*
Laboratories offering a new diagnostic service (bacteriology)	2
Laboratories supported	8
National surveillance bulletin produced	1
Data review meetings held	6
Sites providing data to GLASS*	0
People trained	286
Testing	9
SRS	277
SOPs, plans, and guidelines developed	59
Equipment maintenance	5
Electronic reporting systems	4
Commodity management	2
Testing	48
Support supervision visits	21
Equipment maintenance	4
Testing	6
SRS	11

Indicator title and topics	Results*
TWG meetings held	4
Data quality	1
Data analysis and use	3
Assessments completed	3
Testing	1
SRS	2
People mentored	15
Electronic reporting systems	10
Testing	5
Specimens transported	2,744

*Output data are for FY 2023 and FY 2024 Q1.
†As of December 2023, the Government of Guinea has not yet finalized its registration into GLASS; therefore, no AMR sites have started reporting into GLASS.

IDDS has enabled five human health laboratories in Guinea to start bacterial culture testing: three laboratories started in FY 2021 and two started in FY 2023. In FY 2023, IDDS started supporting two additional laboratories to improve bacterial culture testing, and these two laboratories were doing culture testing prior to IDDS support. IDDS strengthens the capacity for bacteriology testing through training, mentorship, and the provision of equipment and supplies. This has resulted in increased testing and detection of priority pathogens. In FY 2022 Q3, three IDDS-supported laboratories had stockouts of reagents for culture and AST, causing interruption of testing services which impeded the detection of priority pathogens. Only priority bacterial pathogens listed by the national government as being of “primary concern” are reported for this indicator, which for Guinea included *E. coli*, *Klebsiella pneumoniae*, *Acinetobacter baumannii*, *Staphylococcus aureus*, *Staphylococcus xylosus*, and *Streptococcus pneumoniae*.

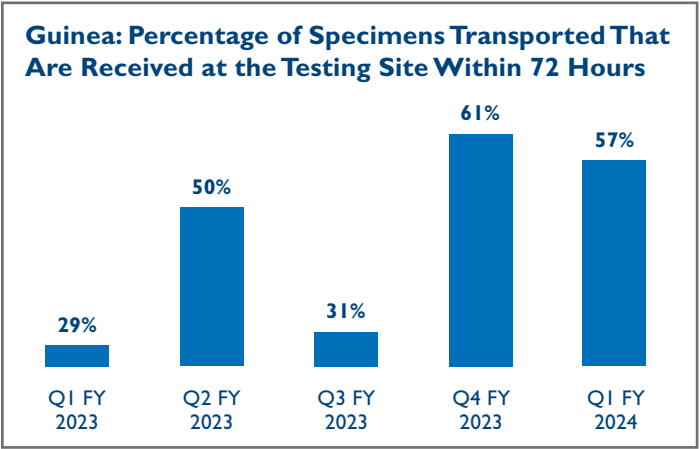
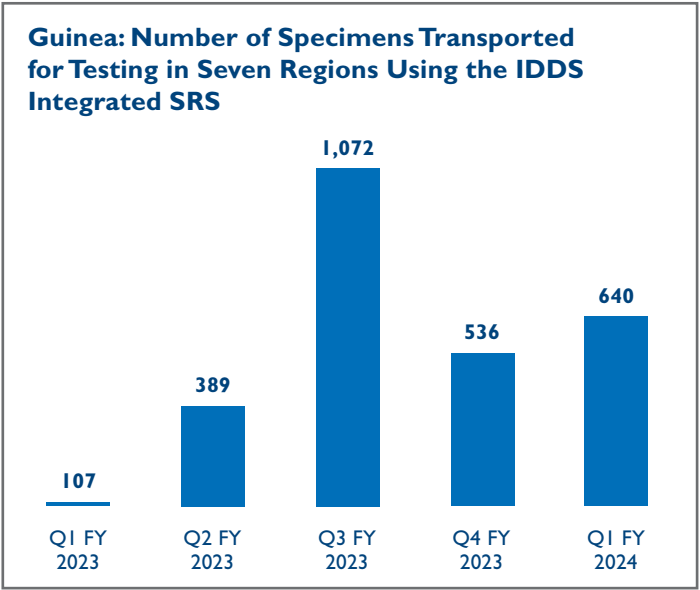
AMR reporting data for FY 2021 are from three AMR surveillance sites, FY 2022 data are from five sites, and FY 2023 data are from seven sites. None of these sites were reporting AMR data prior to FY 2021 and started doing so through IDDS support. The sites mostly submitted their weekly bacteriology reports to the national laboratory on time. However, computer breakdowns and service interruptions due to stockouts at some sites affected reporting rates in FY 2022.



Since the supported laboratories were not yet conducting bacteriology testing in FY 2020 several indicators were not applicable. IDDS sites had available equipment throughout the project, and IDDS supported them with QMS standards on equipment maintenance. In FY 2024 Q1, the testing service interruptions at four of seven IDDS-supported AMR sites were all due to stockouts of reagents for culture and AST or gram staining.

The volume of specimens transported using the integrated national SRS system in Guinea has steadily increased as its implementation expanded to achieve full national coverage. IDDS developed the SRS system and piloted it in three regions of Guinea in FY 2022 and worked with partners to expand it to all seven regions in FY 2023. IDDS provided financial support to implement the SRS in four regions and provided technical guidance, including training and monitoring to all seven regions. During FY 2023 Q3, there was a surge in specimens transported due to a high number of suspected hemorrhagic fever cases in the country.

The proportion of specimens arriving at the testing site within 72 hours of specimen collection has increased over the course of FY 2023 as the SRS performance improved. In FY 2023 Q3, the increase in transport time was likely due to a higher volume of suspected cases of hemorrhagic fever in the country during that period. Collected specimens are referred from health centers to transit sites continuously; however, shipments from transit sites to the testing sites, often at the central laboratory, occur in batches, twice per week. Therefore, there can be a waiting period at transit sites before specimens are shipped to testing sites. Resource constraints have impeded more frequent transport to the central level.



INDIA

Context

IDDS supports strengthening the AMR detection and surveillance system in India in close collaboration with NCDC.

“We acknowledge and appreciate the support of the NCDC, DGHS, MoHFW, Government of India, and the USAID’s IDDS project, for this incredible initiative to support developing Sikkim’s State Action Plan for Containment of AMR.”

—Shri Kunga Nima Lepcha, minister of health and family welfare, Sikkim, India

Annual Highlights

Surveillance

- IDDS improved the quality of the TB diagnostic network IDDS, in coordination with NCDC, finalized the Sikkim State Action Plan for Containment of AMR (SAP-CAR), which represents the fifth SAP CAR for India and serves as a model for other states to follow. The plan was disseminated in January 2024.
- To provide diagnostic and surveillance assistance to NCDC and other key stakeholders, IDDS continued to support a technical support unit within the AMR division of NCDC and submitted a report on its performance and strategic contributions to USAID.

Challenges

- None listed this reporting period.

What We Learned

- To foster comprehensive and efficient AMR systems, it is important to promote coordination within and between departments and sectors, because silos and a lack of communication create redundancies, gaps, and inefficiencies in AMR implementation.

PARTNER AND COLLABORATOR

- National Center for Disease Control

GLOBAL PARTNER

- World Health Organization

Project Results

Indicator title and topics	Results*
Plan developed	1
AMR surveillance	1
TWG meeting held	1
AMR surveillance	1
Report developed	1
AMR surveillance	1

*Output data are for FY 2023 and FY 2024 Q1.

INDIA

Context

In India, IDDS works to strengthen strategic public sector TB laboratories and engage private sector laboratories to improve TB diagnosis and care. IDDS collects evidence on the feasibility and impact of new TB diagnostics and supports laboratory networks in detecting and preventing the spread of DR-TB.

“Since the [IDDS-supported] personnel joined our team, we have witnessed a substantial increase in the volume of laboratory samples processed. Additionally, their assistance has been invaluable as we make strides toward implementing second-line drug sensitivity testing, a critical milestone in our work.”

—Dr. Vasim Ahmad, clinical microbiology diagnosis specialist, Rajan Babu Institute of Pulmonary Medicine and Tuberculosis, Delhi, India

Annual Highlights

Diagnostic

- To help sustain the project’s impact in India, the Central TB Division disseminated six strategic documents and Truenat videos, developed by IDDS, to the National TB Elimination Program (NTEP) network. The guidance documents will serve as a reference for TB laboratory personnel and promote the implementation of biosafety practices in NTEP laboratory tiers, build the capacity of NRLs and intermediate reference laboratories to improve the quality of diagnostic services through stringent on-site evaluation, provide useful feedback, provide support for assessing and encouraging the quality of TB diagnostics in private sector laboratories and their engagement in NTEP, and help optimize Truenat testing at NTEP sites.
- IDDS supported mid-course and endline evaluations of the project’s “one-stop TB diagnostic solution” to engage the private sector in TB screening and treatment in Hisar district of Haryana state. Key achievements included a reduction in days for DR-TB diagnosis, from 66 days to 5 days, and improved access to molecular testing, from 35 percent to 80 percent of people at first point of testing. The lessons learned will inform the expansion of the model to other districts and states and allow partners to improve the diagnostic and operational efficiencies demonstrated through using existing public resources.

PARTNERS AND COLLABORATORS

- Central Tuberculosis Division, Ministry of Health and Family Welfare
- National Reference Laboratories
- Intermediate Reference Laboratories
- Indian Council for Medical Research, National Institute for Research in Tuberculosis
- National Center for Disease Control, Directorate General of Health Services, Ministry of Health and Family Welfare
- National Tuberculosis Elimination Program
- Hisar District Tuberculosis Center
- Haryana State Tuberculosis Cell
- Thyrocare Technologies

GLOBAL PARTNER

- IQVIA through USAID iDEFEAT TB Project/The Union

- To build capacity of laboratory staff and promote learning across laboratory tiers, IDDS supported the Central TB Division in initiating the “TB Wednesday” training sessions. TB Wednesdays are a series of regular, interactive online sessions that focus on important topics for high-quality laboratory work and effectiveness.
- To share the evidence gathered through project activities in India, IDDS published three manuscripts highlighting key findings from the implementation of the “one-stop TB diagnostic solution” ([Diagnostics](#)), the comprehensive assessment of Truenat invalid and indeterminate rates ([Frontiers in Public Health](#)), and the study to establish proof of concept for using Trueprep-extracted deoxyribonucleic acid in LPA testing ([International Journal of Tuberculosis and Lung Disease](#)). All three publications will inform NTEP’s efforts to continue improving diagnostic services for TB, as well as inform national programs in other countries and the broader scientific community.

Challenges

- There was a delay in the transition of the Hisar model to the district NTEP because minor infrastructure modifications were required to deploy nucleic acid amplification testing instruments and process specimens. IDDS continued to coordinate activities, including budget approvals and infrastructure modifications, with the state and district NTEP to complete the model transition within the revised timelines.

What We Learned

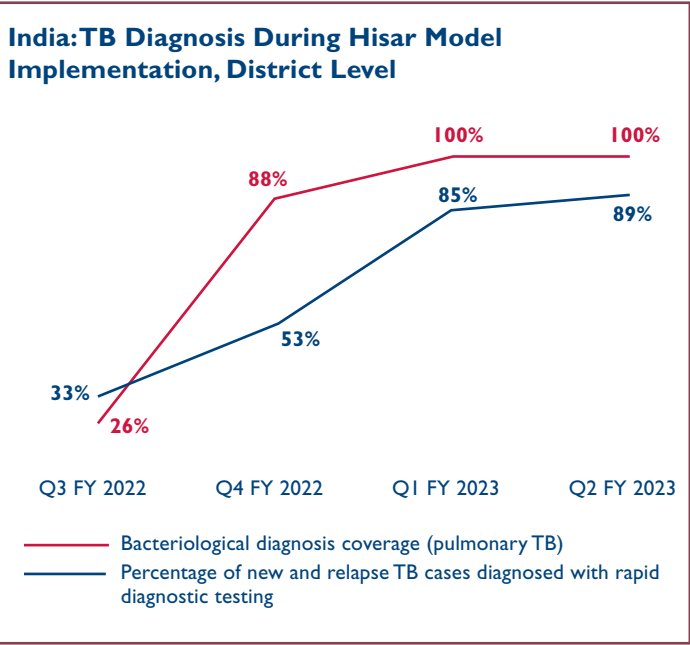
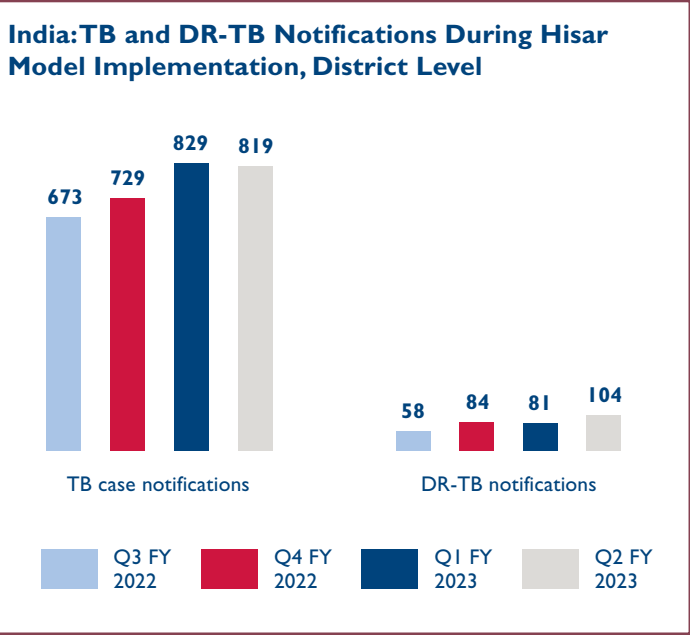
- Weekly program performance reviews with district and block coordinators are critical for program efficiency.

Project Results

Indicator title and topics	Results*
Number of laboratories supported (6 NRLs and 34 RTRLs)	40
People trained	1,609
Testing procedures	1,079
Biosafety	528
Other TB diagnostic activity (Redcap platform)	2
SOPs, plans, or guidelines developed or updated	13
Truenat	7
QMS	2
Private sector engagement	3
Biosafety	1
Support supervision visits	33
Truenat	3
QMS	12
Private sector engagement	18
TWG meetings held	3
QMS	3
Assessments completed	5
Truenat	1
QMS	2
Private sector engagement	2
People mentored	4
Truenat	4

*Output data are for FY 2023 and FY 2024 Q1.

The implementation of the “one-stop TB diagnostic solution” to engage the private sector in TB screening and treatment in Hisar district led to increased utilization of rapid diagnostic tests. The model was implemented between May 2022 and April 2023 and increased TB and DR-TB notifications and the percentage of new and relapse cases diagnosed with WRD from 33 percent to 89 percent during the 12 months of implementation. Bacteriological diagnosis coverage also increased from 26 percent to 100 percent over this period. This demonstrates the potential of engaging the private sector across the diagnostic network.



INDONESIA

Context

IDDS supports the Government of Indonesia’s One Health approach for the detection and surveillance of zoonoses and emerging infectious diseases (EIDs). This includes providing technical assistance to improve the operations and development of SIZE, the country’s integrated health information system that is interoperable among three sectors (human, animal, and wildlife).

Annual Highlights

Surveillance

- IDDS worked to strengthen local and central coordination to quickly detect, prevent, and respond to zoonosis/EIDs that have the potential to be an outbreak, by piloting cross-sectoral integrated surveillance for leptospirosis in Demak district. IDDS received testing results of leptospirosis samples from each sector (human, animal, and environmental) and helped analyze the results to inform pilot expansion to other regions by other implementing partners.
- Building on the project’s work to integrate the surveillance of zoonotic diseases across human health and animal health sectors, IDDS supported the launch of the Coordinating Minister Regulation, entitled Guidelines for the Prevention and Control of Zoonoses and New Emerging Infectious Diseases. This regulation will become the basis for all One Health implementation at local and national levels in Indonesia. The regulation’s guidelines will inform planning, compiling, implementing, and evaluating interventions to combat zoonoses; efforts to prevent and control EIDs; and promotion of related cross-sector policies.
- To establish a legal, formal platform for tackling zoonoses and EIDs in Demak district, IDDS supported the development of the Decree for Local Coordination Team to Prevent and Control Zoonosis/EIDs. The local coordination team established by the decree will coordinate with a central team (established previously) to prevent the spread of infectious diseases both within Demak district and across district borders.
- IDDS, in collaboration with the Directorate of Surveillance and Health Quarantine and the Eijkman Molecular Biology Research Center, conducted monitoring visits for PREDICT protocol implementation at four sites.
- IDDS supported the development of the SIZE mobile apps and websites to facilitate data collection and transmission from the field. IDDS also facilitated training in November 2023 for national SIZE master trainers. The training

PARTNERS AND COLLABORATORS

- Ministry of Health
- Ministry of Agriculture
- Ministry of Home Affairs
- Ministry of Communication and Informatics
- Ministry of Environment and Forestry
- Coordinating Ministry for Human Development and Culture

GLOBAL PARTNERS

- Food and Agriculture Organization of the United Nations
- World Health Organization

covered control measures and emergency protocols for handling zoonoses and EIDs, focusing on the management of cases related to leptospirosis, rabies, avian influenza, and anthrax. The practical aspects of using SIZE were included in the training. IDDS, the master trainers, and other partners then trained 30 provincial and district officers (11 female) from four districts in Nusa Tenggara Province where the new SIZE system will be piloted.

- In collaboration with other global health security partners, IDDS contributed to the official national launch of SIZE by the Coordinating Ministry for Human Development and Cultural Affairs on December 19, 2023. SIZE now stands as the official One Health-based surveillance system in Indonesia, designed to promptly detect disease emergence in both human and animal populations.

Challenges

- Accommodating the various needs of central and local government agencies for upgrading SIZE technology was challenging, because there are 12 central-level agencies as well as agencies from 12 districts in which SIZE has been implemented. IDDS collaborated with a technical consultant to accommodate agency needs, including changes to the database and coding systems for SIZE.

What We Learned

- Prior to delivering training, it is important to verify that institutions have sufficient equipment to practice and implement the new skills in the workplace. If possible, a best practice is to advocate that the government support equipment procurement for sustainability in future implementation.

- It will be useful to collaborate with an information technology expert, especially on SIZE technology development, to accommodate government needs for the more advanced, national version of SIZE. For complex endeavors, such as upgrading SIZE, it is crucial to engage staff from multiple government ministries and coordinate requests for assistance, to identify feasible solutions.
- The existence of a local coordination team (such as the team formed in Demak district, an IDDS pilot area) will strengthen efforts to prevent and control zoonosis/EIDs at the local level. New official efforts to tackle the problem of leptospirosis—such as the clean village competition, public awareness campaigns through local radio, and coordination with community leaders—would be best supported by local coordination teams.

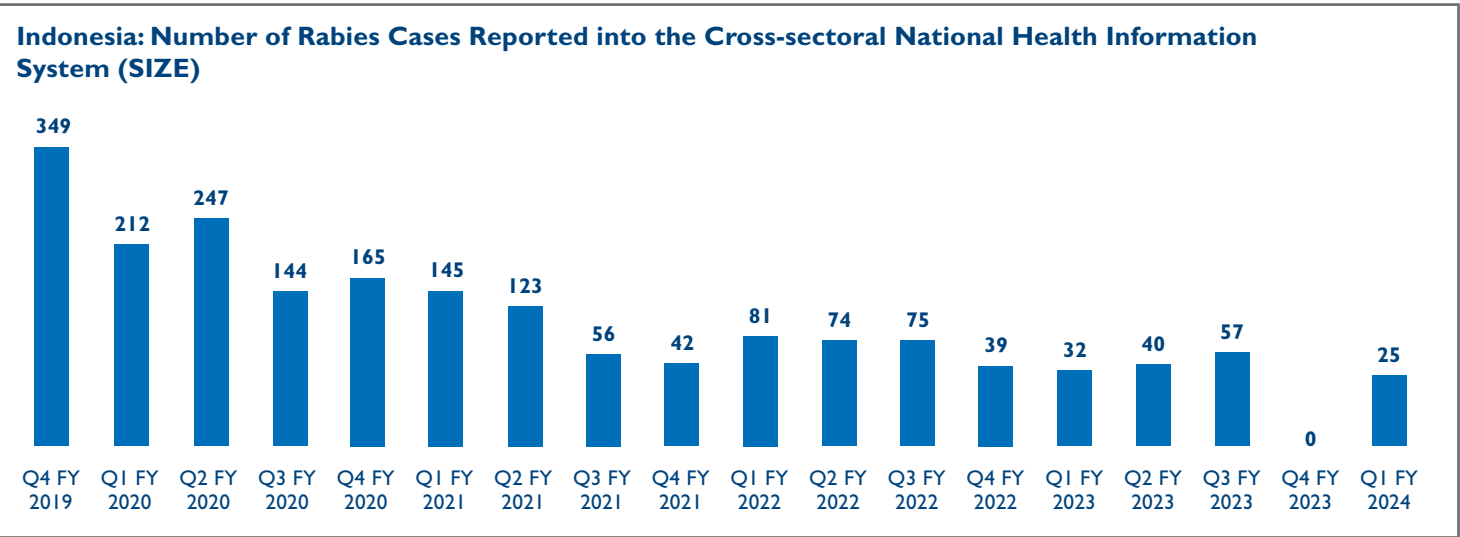
From baseline to FY 2024 Q1, 1,303 rabies cases were opened in the SIZE health information system. Reporting through FY 2023 was from four districts. IDDS has been supporting the government to improve and upgrade SIZE and expand diseases captured in the system and the new system was launched in December 2023. During FY 2023 Q3 reporting to SIZE was paused to allow for some upgrades and system testing. Thus far, only rabies cases have been reported into the system, but case reporting is expected to increase as the system is rolled out.

During the baseline period, which was FY 2019 Q4, a high number of rabies cases were reported due to entering backlogged data, and a limited response system was in place to manage rabies cases. During the project period, fewer rabies cases were reported due to fewer animal bites and higher rabies vaccine coverage.

Project Results

Indicator title and topics	Results*
National surveillance bulletins produced	0
Multisectoral data sharing meetings held	2
Surveillance bulletins produced with animal and human data	0
Cases reported into SIZE database	154
People trained	44
Electronic reporting systems	44
Support supervision visits	4
Testing	4
TWG meetings held	37
Electronic reporting systems	2
Interoperability	22
Testing	2
Data quality	1
Data analysis and use	3
Other surveillance [∞]	6
Other diagnostic [†]	1
Pilots conducted	2
Data quality	1
Data analysis and use	1

*Output data are for FY 2023 and FY 2024 Q1.
[†]Other diagnostic topics included cross-sector coordination on PREDICT testing of viral zoonoses.
[∞]Other surveillance topics included regional and national cross-sectoral coordination of viral zoonosis management and policy development, One Health webinar, four-way linking and integrated surveillance, control of AMR.



KENYA

Context

In Kenya, IDDS works at the national level and five surveillance sites (Bungoma, Kitale, Malindi, Murang’a, and Nyeri Hospital laboratories) to strengthen AMR diagnosis and surveillance. In 2023, IDDS also supported diagnostic testing and safe specimen handling and transport for EVD.

“Our laboratory has capacity to perform blood cultures and antimicrobial susceptibility tests and to give us timely results. In the case of this preterm infant, the laboratory results enabled us to implement interventions in a timely manner that improved outcomes of care in the hospital.”

—Dr. Makokha Felicitas, pediatrician neonatologist, Bungoma County Referral Hospital Laboratory, Kenya, commenting on IDDS contributions to the timely detection of a pneumonia outbreak in the hospital’s newborn unit

Annual Highlights

Diagnostic

- IDDS worked with the National Antimicrobial Stewardship Interagency Committee (NASIC) to create and launch the National AMR Surveillance Strategy, 2023–2027. IDDS provided technical and financial support to NASIC to convene three forums focused on reviewing the existing surveillance strategies, helped draft and finalize the new strategy, and supported its launch and dissemination. The Directorate of Health Standards, Regulations, and Quality Assurance at MoH launched the document, on behalf of the cabinet secretary for health, during the World AMR Awareness Week national symposium in November 2023.
- IDDS repaired equipment at two laboratories that had been out of service for five years. IDDS supported Kitale and Malindi counties to secure a one-year service maintenance contract with bioMérieux for repair and servicing of the VITEK 2 Compact instruments at Kitale County Referral Hospital laboratory and Malindi Sub County Hospital laboratory. (The VITEK 2 is a piece of equipment for automated organism identification and AST.)
- To sustain capacity for AMR surveillance in Kenya, IDDS established a repository of bacterial isolates at NMRL and transitioned management and analysis of bacterial isolates retesting data to NMRL. IDDS built NMRL’s capacity to manage and analyze AMR surveillance data through on-site training and mentorship of designated NMRL staff.

PARTNERS AND COLLABORATORS

- Ministry of Health
 - County health departments
 - Ministry of Agriculture and Livestock Development
- To encourage prudent use of antimicrobials and improve clinical management of infectious diseases, IDDS helped to convene continuing medical education sessions in 4 of the 5 IDDS-supported sites and conducted 2 webinars on AMR detection and surveillance topics, which were attended by a total of 201 health workers. IDDS also published an article in *Frontiers in Microbiology* on the development, rollout, and implementation of an AMR training curriculum in Kenya.

Surveillance

- In October 2022 and October 2023, IDDS provided technical and logistical assistance to validate and analyze AMR surveillance records and disseminate the data through the National AMR Surveillance Reports for both years. The National AMR Surveillance Report provides data on trends in AMR in the country for use by the national government, surveillance sites, and AMR stakeholders. IDDS also provided technical assistance to NASIC to report AMR surveillance data from 17 surveillance sites in 2022 and 19 surveillance sites in 2023 to GLASS. The number of records submitted increased, from 416 in 2021, to 608 in 2022, and to 6,481 in 2023, reflecting enhanced AMR surveillance, improvements in data quality, and increased data management capacity.
- To streamline AMR data review, cleaning, and analysis, IDDS supported the reconfiguration and upgrading of the LIMS at the Nyeri and Kitale County Referral Hospital laboratories. The upgrades and reconfigurations improved the microbiology module of the LIMS, which laboratory technicians use to manage AMR data locally and transmit them to the national-level CDW.
- To strengthen AMR surveillance data analysis and use at the 5 IDDS-supported surveillance sites, IDDS provided refresher training on the use of WHONET to 15 laboratory technologists, quality officers, and health facility antimicrobial stewardship focal persons (10 female). Staff are now empowered to analyze and use AMR surveillance data from the sites, which should, in turn, promote the prudent use of antibiotics at the sites.

EVD

- To improve the safety of and build capacity for detecting EVD, IDDS provided technical assistance to the laboratory subcommittee of the National Ebola Preparedness Incident Management Team to train 621 (280 female) frontline health care workers from 10 high-risk counties in suspected EVD case diagnostic testing and specimen management.
- To provide health workers in testing laboratories and counties across the country with updated standard guidance and reference tools, IDDS collaborated with the laboratory subcommittee of the National Ebola Preparedness Technical Coordination Committee to review and revise the Ebola preparedness laboratory testing strategy and associated SOPs and job aids. These tools help reduce the risk of transmission to health workers and improve the integrity of specimens and test results.
- To strengthen the supply chain of emergency disease outbreak response supplies, IDDS handed over 36,140 specimen collection, packaging, and transportation supplies to MoH. These included blood specimen collection supplies (e.g., needles, tubes, and bandages) and transport commodities (e.g., cooler boxes, ice packs, and biohazard Ziplock bags).

Challenges

- WHONET files require significant configuration before being uploaded to the CDW, which can lead to distortion or loss of data. IDDS worked with NPHL and NASIC to configure CDW and WHONET files received from the sites to allow for seamless uploading from the surveillance sites to the CDW. IDDS also worked with NPHL informatics specialists to resolve a system configuration error at Nyeri County Referral Hospital laboratory that was preventing the site from transmitting more than half of its AMR surveillance records to the CDW.
- The number of culture tests in Murang’a county fell from an average of 450 per quarter in FY 2023 to 130 during the first quarter of FY 2024, due to a new health information system that was installed at Murang’a County Referral Hospital in August 2023, which migrated all services to an electronic platform and discontinued the use of paper-based requisitions. Clinicians had challenges making requisitions in the new system. Through recent system upgrades, microbiology tests were added to the test menu in the new system. IDDS plans to discuss the changes during a clinical-laboratory interface meeting in the second quarter of FY 2024 and expects improvements in utilization.

What We Learned

- A medium-term (two-year) equipment lease contract may be more cost efficient than direct purchase by counties, because equipment repairs and preventive maintenance are part of the contract. Counties can apply cost savings to buying reagents, ensuring continuity of laboratory services.
- AMR surveillance information systems require a dedicated informatics/information technology expert to maintain and guide systems operation for smooth capturing and transmission of data. Lack of a dedicated person at NPHL has markedly affected data capturing and reporting from the surveillance sites to the national level due to systems connectivity delays.
- Continuous efforts to educate clinicians on the benefits of laboratory testing for confirmation of diagnoses and AMR surveillance are essential, especially given the high turnover of clinicians in public facilities. The best way of sustaining this exercise is to integrate training into existing requirements for continuing medical education at the sites.
- Surveillance sites need to adopt laboratory information systems that are easy to use and compatible with national-level or widely used systems, so that technical support for systems operation and maintenance can be streamlined. For example, Bungoma County Referral Hospital has faced major challenges because it is the only site in the country currently using the Basic Laboratory Information System.

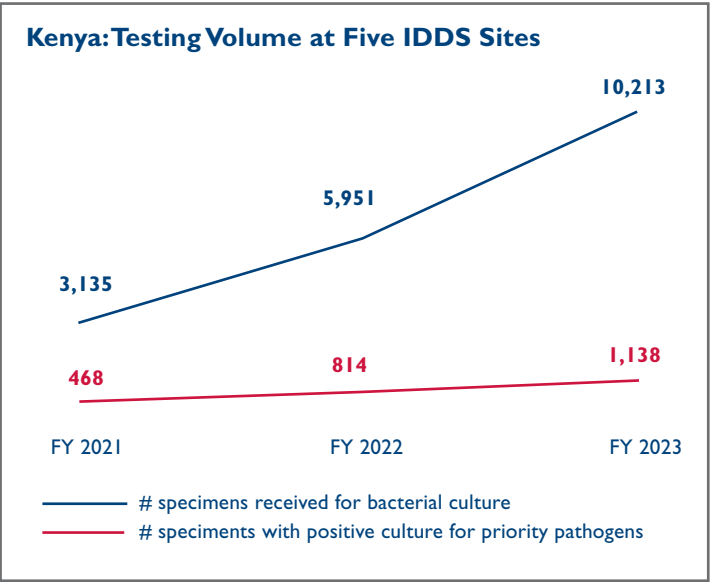
Project Results

Indicator title and topics	Results*
National surveillance bulletin produced	1
Multisectoral data sharing meetings held	7
Surveillance bulletins produced with animal and human data	2
Data review meetings held	10
Sites providing data to GLASS	5
People trained	2,642
Testing	1,121
SRS	353
Data analysis and use	15
Biosafety and biosecurity	282
Other diagnostic [∞]	233
AMR diagnostic advocacy	638
SOPs, plans, and guidelines developed	19
Testing	17
SRS	1
Data analysis and use	1
Support supervision visits	4
AMR diagnostic advocacy	4

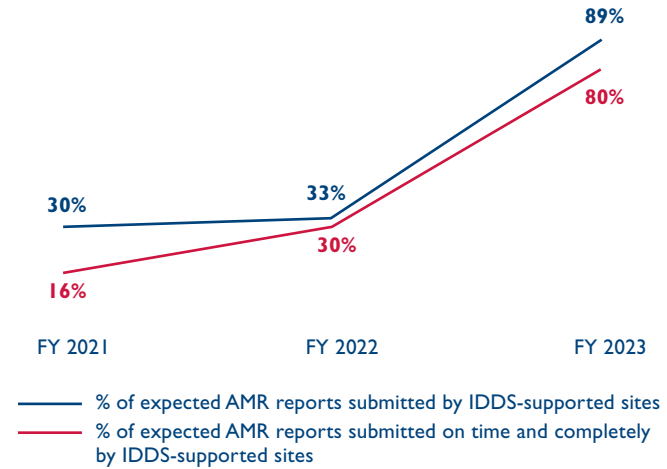
Indicator title and topics	Results*
TWG meetings held	11
Testing	1
Data quality	3
SRS	3
Data analysis and use	2
Other surveillance [†]	1
Biosafety and biosecurity	1
Pilot conducted	1
SRS	1
Assessments completed	6
Testing	6
People mentored	11
Testing	11

*Output data are for FY 2023 and FY 2024 Q1.
[∞]Other diagnostic topics included clinical and laboratory aspects of urinary tract infections and blood culture.
[†]Other surveillance topics included national AMR surveillance data and strategy development.

IDDS observed an increase in the utilization of bacteriology testing and identification of priority pathogens in the five sites it supported, demonstrating the impact and effectiveness of IDDS’s interventions over the last five years. These interventions included clinician sensitization; promotion of good diagnostic stewardship through webinars, training sessions, and clinical-laboratory interface meetings; and establishment of specimen referral from peripheral health facilities. Only priority bacterial pathogens listed by the national government as being of “primary concern” are reported for this indicator. In Kenya, this includes *Staphylococcus aureus*, *Streptococcus pneumoniae*, *Acinetobacter spp.*, *E. coli*, *Klebsiella spp.*, *Pseudomonas aeruginosa*, *Salmonella spp.*, and *Shigella spp.*



Kenya: Timeliness and Completeness of AMR Reporting by Five IDDS-supported Sites

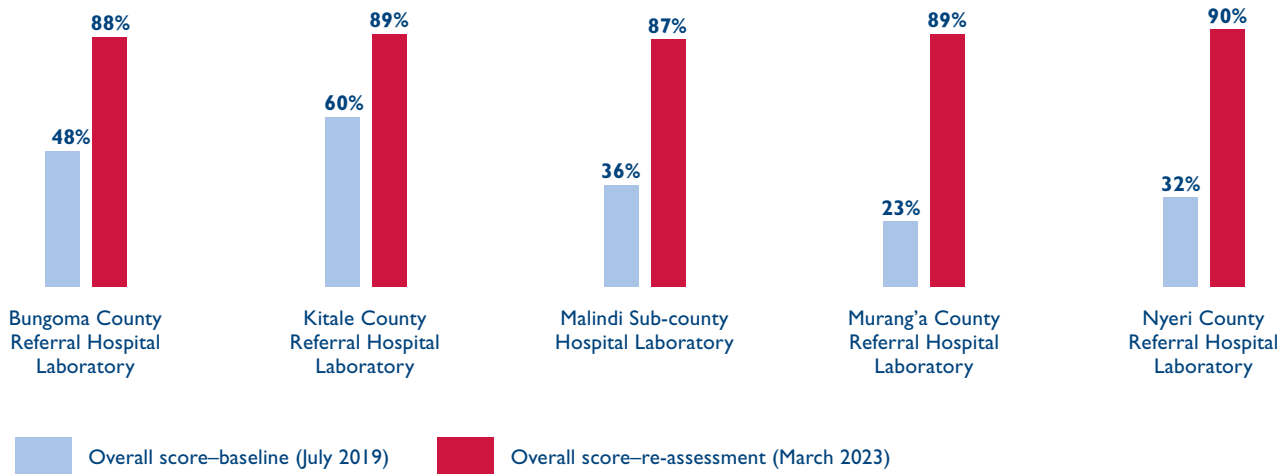


In FY 2021, all five AMR surveillance sites were expected to submit weekly reports, but as of FY 2022 Q3, the expectations for Malindi Sub-County Referral Hospital Laboratory, Bungoma County Referral Hospital Laboratory, and Murang’a County Referral Hospital Laboratory changed to monthly reporting to be consistent with the surveillance strategy and expectations at the national level. The expectations for Kitale County Referral Hospital Laboratory and Nyeri County Referral Hospital Laboratory continue to be weekly reports because their data are provided through the CDW. In FY 2021 and FY 2022 recurring technology challenges at the site and national levels impeded sites from submitting reports as expected. IDDS worked with NASIC to address the issue (see Challenges section above), which improved reporting rates.

Through IDDS interventions, the five project-supported laboratories sites saw significant improvements in AMR testing capacity (see figure on next page). During the initial assessment in 2019, the team found that bacteriology sections in which the laboratory performs the majority of AMR diagnostics received little attention compared with other laboratory departments. After the gaps were identified, IDDS was able to tailor mentorship to include QMS, specimen collection and processing, bacteriology test procedures, and interpretation and reporting of data.

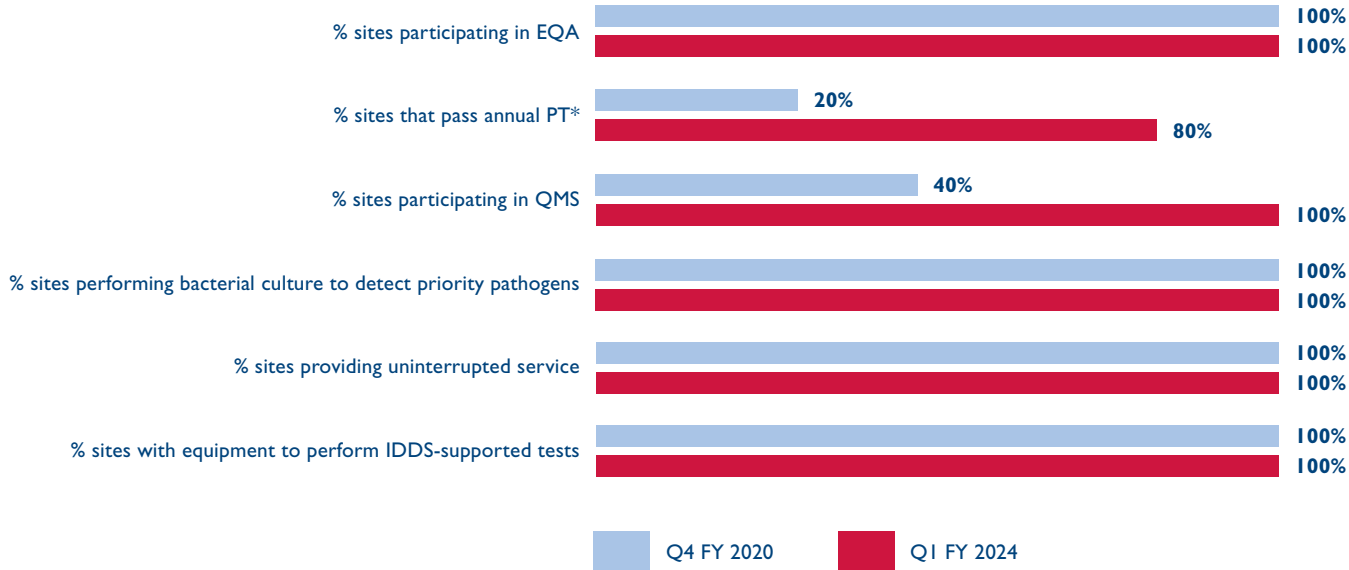
With support from IDDS interventions, the five project-supported sites were able to continually provide uninterrupted testing service and had the minimum required equipment to perform bacterial culture testing (see figure on next page). The only site that did not pass the most recent EQA, conducted in FY 2024 Q1, was Kitale County Referral Hospital Laboratory, with a score of 79 percent. Through IDDS interventions, four of the five sites received ISO 15189 accreditation. The fifth site, Kitale County Referral Hospital Laboratory, was accredited prior to IDDS.

Kenya: Laboratory AMR Testing Capacity*



*As measured through the Laboratory Assessment of Antibiotic Resistance Testing Capacity (LAARC) tool.

Kenya: Performance of the Five IDDS-supported Laboratories



*Percentage of sites that pass PT is out of the sites that participated in EQA. The EQA for Kenya took place in FY 2024 Q1.

LIBERIA

Context

In Liberia, IDDS continues to build capacity for bacteriology testing and supports the National Diagnostics Division (NDD) to provide technical oversight to the diagnostic network, with a focus on improving the quality of services offered.

“I have been able to move knowledge into practice . . . I am now able to identify the right antibiotic for my patients and reduce [the length of their] hospital stay and the cost to the patient.”

—Dr. Siedoh Freeman, medical director, G.W. Harley Hospital, Liberia

Annual Highlights

Diagnostic

- To continue improving the quality of bacteriology services at supported laboratories, IDDS provided on-site mentorship on quality indicators, equipment maintenance, and the development of corrective and preventive action plans. IDDS mentored laboratory technicians at nine county hospitals to address nonconformities identified during previous audits. Three laboratories gained two stars in Stepwise Laboratory Improvement Process Towards Accreditation (SLIPTA) audits conducted in FY 2023, revealing the impact of IDDS mentorship and overall improvement of laboratory QMSs.
- IDDS developed SOPs and EQA forms for bacteriology, and the project collaborated with NDD to support three laboratories to participate in two rounds of EQA to independently measure the accuracy and reliability of their services. Participation in EQA schemes helps laboratories enhance patient safety and patient care by preventing errors and fostering improvement in testing. “IDDS has been instrumental in strengthening the laboratory system in Liberia,” said Henry T. Kohar, director, NDD. “IDDS worked closely with NDD and respected the decision of the NDD, [enabling] Liberia to have a laboratory built to international standards.”
- To validate the Integrated AMR Surveillance Strategy for Liberia, IDDS funded a 4-day meeting attended by 23 participants (8 female), and the project finalized and submitted the strategy to the One Health Coordination Committee. This policy document will guide the multisectoral approach to surveillance of AMR in the country.
- [IDDS](#) and [USAID](#) chronicled laboratory system strengthening in Liberia and its role in global health security.

PARTNERS AND COLLABORATORS

- Ministry of Health
- National Diagnostics Division
- National Public Health Reference Laboratory

Challenges

- Poor road infrastructure affected the timely implementation of SLIPTA audits. IDDS held discussions with NDD and NPHL and resolved to conduct audits during the dry season.
- Tellewoyan Memorial Hospital’s solar system was sometimes unable to support bacteriology culture services because there was not enough power for the incubators at night. This also interfered with the hospital’s participation in EQA for bacteriology. IDDS contracted a technician to improve and stabilize the electricity supply from the solar system.
- There was a reduction in the number of bacteriology specimens received by IDDS-supported sites, due to turnover of intern doctors at the hospitals in which these laboratories are based. IDDS engaged clinicians during grand round meetings to emphasize the importance of utilizing bacteriology services from the hospital-based laboratories.

What We Learned

- IDDS should coordinate QMS implementation through NDD to address key challenges that are directly affecting partner activities, such as staffing challenges. IDDS and the German development agency, GIZ, convened a meeting with NDD in which these issues were discussed, and NDD took responsibility for issues that it needs to address.
- Continuously engaging clinicians with awareness messages on bacteriology is needed to improve specimen flow to the laboratories, as seen in Phebe Hospital. To increase the volume of specimens referred to laboratories, there is a need for increased advocacy efforts and engagement with county officials and the local network of doctors. It is also important to have a champion who leads this advocacy in each facility.
- EQA participation motivates laboratory staff to be more focused on always providing quality services, because they can see their contributions to appropriate patient care.

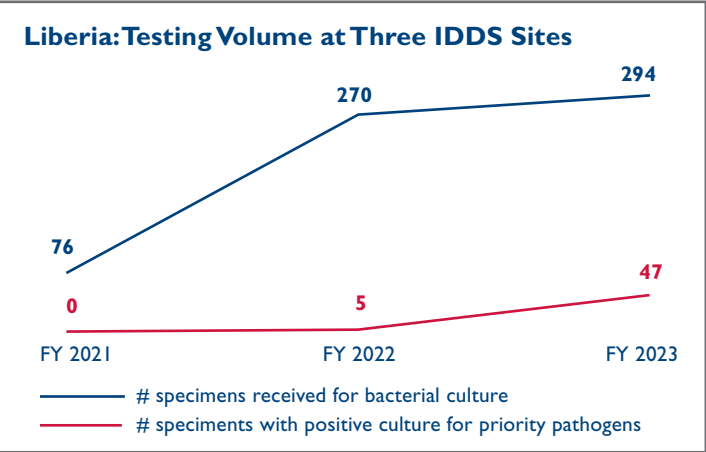
Project Results

Indicator title and topics	Results*
Data review meeting held	1
Sites providing data to GLASS	3
People trained	13
QMS	6
Biosafety and biosecurity	7
SOPs, plans, and guidelines developed	25
Testing	22
QMS	3
TWG meetings held	8
QMS	7
AMR diagnostic advocacy	1
People mentored	290
Testing	58
SRS	3
QMS	229

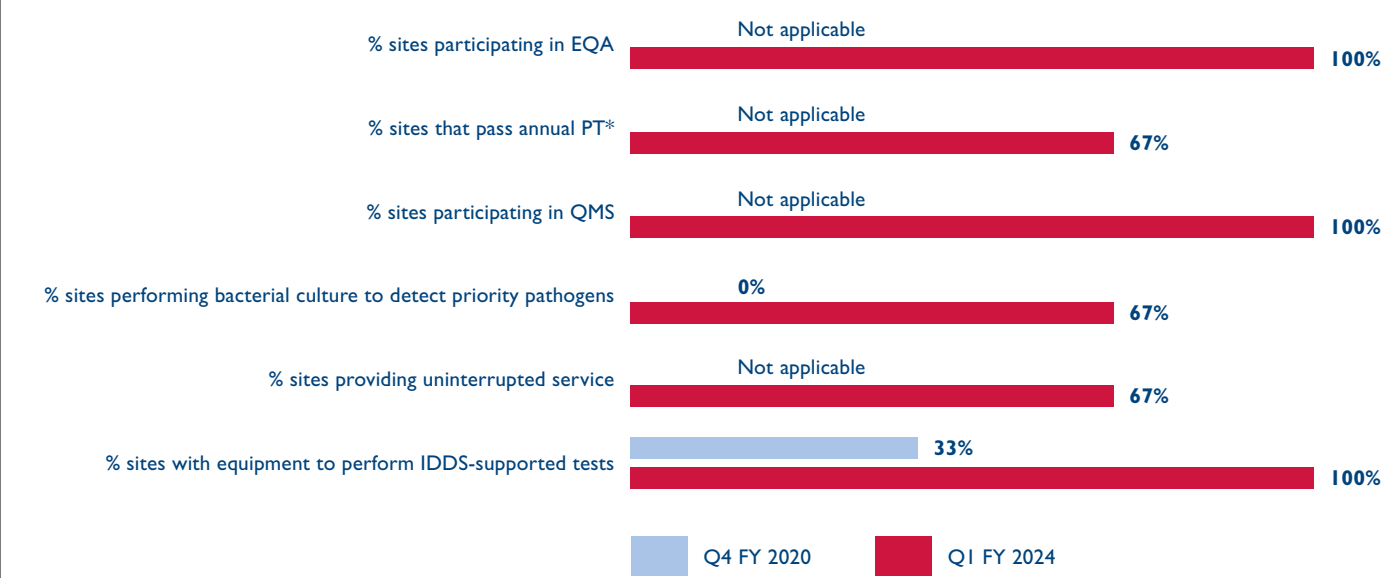
*Output data are for FY 2023 and FY 2024 Q1.

IDDS has continued to strengthen capacity for bacteriology testing in the three supported laboratories by providing continuous training and mentorship, improving infrastructure and equipment maintenance, and standardizing protocols and procedures. This has resulted in increased testing and detection of priority pathogens since the start of the project, despite prolonged testing service interruptions at Tellewoyan Memorial Hospital Laboratory in FY 2023 due to electrical issues. Only priority bacterial pathogens listed

by the national government as being of “primary concern” are reported for this indicator. In Liberia, this includes *Staphylococcus aureus*, *E. coli*, *Klebsiella spp.*, *Pseudomonas aeruginosa*, *K. pneumoniae*, and *Neisseria gonorrhea*. With IDDS support, Phebe Hospital Laboratory began bacterial culture in FY 2021 Q1, and G.W. Harley Hospital Laboratory and Tellewoyan Memorial Hospital Laboratory began bacterial culture in FY 2022 Q1.



Liberia: Performance of the IDDS-supported Laboratories



*Percentage of sites that pass PT is out of the sites that participated in EQA. The EQA for Liberia took place in FY 2024 Q1. Two of the three sites passed the most recent EQA: Tellewoyan and Phebe. The EQA for G.W. Harley and Phebe was for AST and bacterial culture, and the EQA for Tellewoyan was for gram staining only.

Since the three laboratories supported for bacteriology and AMR surveillance were not conducting bacteriology testing in FY 2020 several indicators are not applicable at baseline. Through IDDS interventions, including continuous training and mentorship, procurement of necessary equipment and reagents, and standardization of protocols and procedures, sites can now perform bacterial culture and have the necessary equipment to perform the testing. Service interruptions at Tellewoyan Memorial Hospital Laboratory were caused by ongoing electrical issues.



Phebe Hospital, Bong county, Liberia. Photo by IDDS

MADAGASCAR

Context

IDDS works in Madagascar to improve indicator-based surveillance for priority pathogens and assist with strategic planning for the laboratory and surveillance systems.

We have noted the increase in demand for paraclinical assessment since the arrival of this PCR platform in our laboratory.

—Dr. Rivo Rakotomalala, laboratory biologist, PZaGa University Hospital Center, Madagascar

Annual Highlights

Diagnostic

- To support better forecasting and supply chain management for laboratory commodities, IDDS developed the Management Guide for Laboratories and Medical Imaging Units in Public Hospitals in Madagascar, which represents a significant accomplishment within the strategic framework of the National Strategic Plan for Laboratory Development, 2021–2025. The publication will serve as a valuable reference guide for revenue management and the procurement of laboratory reagents and supplies for public health care facilities.
- To improve the detection of priority pathogens and increase access to critical testing, IDDS established bacteriology units at three subnational laboratories. IDDS provided laboratory equipment, reagents, and supplies; trained 10 laboratory staff (6 female) to conduct bacterial culture and AST; and facilitated on-site mentorship to reinforce skills. The three laboratories newly able to conduct bacterial culture are the Mahavoky Atsimo Mahajanga University Hospital Center and the Marovoay District Hospital Reference Center (both in Boeny region), as well as the Itasy Regional Reference Hospital Center.
- To improve the quality of laboratory services, IDDS developed SOPs for conducting laboratory audits in accordance with the ISO 19011 standard and supported the auditing of three laboratories in RESAMAD, the laboratory network of Madagascar.

PARTNERS AND COLLABORATORS

- Ministry of Public Health
- RESAMAD

Surveillance Highlights

- To prevent the spread of diseases with epidemic potential, IDDS supported the Directorate of Health Monitoring, Epidemiological Surveillance, and Response to develop and validate the Hospital Surveillance Protocol. This protocol will help ensure the early detection, prevention, monitoring, and management of infectious diseases, other priority pathogens, and unusual events in hospitals.
- To raise awareness of the new National Strategic Plan for Laboratory Development, 2021–2025, and to mobilize technical and financial partners for its implementation, IDDS supported the Ministry of Public Health to hold a launch workshop for the document.
- To communicate the results of the weekly monitoring of health events and diseases to public health actors for evidence-based decision-making and partner coordination, IDDS supported the Directorate of Health Monitoring, Epidemiological Surveillance, and Response to hold 14 data review meetings, producing 14 monthly IDSR bulletins throughout the reporting period as well as the 2022 annual IDSR bulletin, which enables policymakers to devise targeted strategies, prioritize resources, and implement effective prevention, control, and response measures.

Challenges

- The funding and period of performance were insufficient to meet the needs of all 24 laboratories in the RESAMAD network that the project had originally planned to support. In coordination with in country partners and USAID, IDDS refocused its efforts to support two laboratories in Boeny region and one in Itasy region with intensive bacteriology testing support.

Project Results

Indicator title and topics	Results*
Laboratories offering a new diagnostic service (bacteriology)	3
Laboratories supported	28
National surveillance bulletins produced	15
Data review meetings held	14
People trained	96
Testing	96
SOPs, plans, and guidelines developed	2
Electronic reporting systems	1
Commodity management	1
Support supervision visits	7
Testing	7
TWG meetings held	6
Commodity management	3
Testing	3
People mentored	5
Testing	5
Number of laboratories equipped with IDDS support	3

*Output data are for FY 2023 and FY 2024 Q1. In addition to supporting 3 laboratories to start conducting bacteriology testing, IDDS continued to support laboratories across the RESAMAD network through training and reinforcing QMS processes.

In addition to supporting three laboratories to start conducting bacteriology testing, IDDS continued to support laboratories across the RESAMAD network through training and reinforcing QMS processes.

MALAWI

Context

IDDS worked in Malawi to assess, expand, and improve the TB diagnostic network and introduce new diagnostic technologies and approaches and stool testing for diagnosis of childhood TB. The project closed out activities in the country by transitioning them to NTLEP and other implementing partners on November 30, 2023.

“Both clinical and laboratory staff are very appreciative for this innovation as it accords us with critical information to provide correct treatment.”

—Grace Mabaso, laboratory technician, Mzuzu Central Hospital, Malawi, describing the impact of the pilot study to use Xpert Ultra to test stool samples for the detection of pediatric TB

Annual Highlights

Diagnostic

- To identify gaps in the diagnostic network and inform placement of new diagnostic equipment, IDDS completed a TB DNA in Malawi, which included 133 site verification visits in January 2023. Findings of the TB DNA provided NTLEP with evidence for a grant proposal to the Global Drug Facility to procure 50 GeneXpert 10-color instruments that were successfully distributed in 2023 to 50 TB diagnostic sites across the country.
- The revised TB diagnostic algorithm developed with IDDS support was incorporated into the TB national guidelines.
- To improve access to testing for TB and DR-TB, IDDS installed three GeneXpert 10-color instruments in three district-level hospitals in Bwaila, Chikwawa, and Mangochi districts. Between February and July 2023, those sites detected 13 cases of isoniazid resistance and three cases of rifampicin resistance. We also installed four Truenat instruments in four other districts. To optimize specimen referral routes to three new Xpert MTB/XDR testing facilities, IDDS finalized a report on optimized pick-up schedules for route points and courier needs. IDDS also provided technical support to train 12 super-users (all male) on both Truenat MTB/RIF and Xpert MTB/XDR and an additional 8 Truenat end users (1 female). To ensure that testing was quality assured, IDDS provided three cycles of EQA for Truenat and Xpert MTB/XDR testing.

PARTNERS AND COLLABORATORS

- National Tuberculosis and Leprosy Elimination Program
- National Tuberculosis Reference Laboratory
- Tuberculosis Local Organization Network partners: Partners in Hope, Development Aid from People to People

- IDDS collaborated with Ekwendeni Mission Hospital to refurbish an X-ray room and equipped the room with two leaded doors and a leaded window. IDDS also installed a Delft Imaging portable digital X-ray instrument and Qure.ai software to support initial TB diagnosis; the project supported training for two staff on both the instrument and the software.
- To improve diagnostic capacity for pediatric TB in eight facilities across the country, IDDS and NTLEP completed a pilot study for testing stool specimens with Xpert MTB/RIF Ultra. After enrolling 595 participants, a subset of 503 interpretable stool samples was analyzed, with researchers identifying MTB in 31 samples (6 percent). NTLEP will supervise continued testing at the enrolled sites and coordinate the national plan to expand stool testing, starting with the central hospital, selected district hospitals, and selected health centers across the country.

Challenges

- IDDS experienced delays in the delivery of the two lead-lined doors for the portable X-ray instrument at Ekwendeni Mission Hospital. This delayed the related activities, including training, which eventually took place one week before IDDS closed out activities in Malawi.

What We Learned

- Each site has unique challenges and solutions. For example, in Kawamba-Kasungu, the laboratory room lacked proper security for the Truenat instrument. IDDS approached the Health Center Advisory Committee, which installed bars on the windows and changed the locks. When peripheral health centers are ready for innovative change, engaging alternate stakeholders can advance implementation instead of waiting for support from the District Health Office.
- Conducting a pre-installation assessment of sites was critical to understanding the actual setup and being able to tailor solutions that are specific to that site.

- For future installations of GeneXpert 10-color instruments, the focal person for GxAlert connectivity should also be involved during the preparation and installation to ensure availability of test data for reporting.
- When conducting a DNA and scheduling facilities or sites to be visited, assessors need to consider the distances between facilities to ensure quality in the data collection process. Further, incorporating the additional checklists for the DNA verification visits into SurveyCTO and not using paper-based tools in the field might improve data capturing efficiency and reduce redundancies of double data entry.

Project Results

Indicator title and topics	Results*
Laboratories offering a new TB diagnostic service	15†
GeneXpert MTB/XDR	3
Truenat	4
Stool testing with GeneXpert Ultra	8
X-ray with CAD artificial intelligence	1
Laboratories supported (4 Truenat, 8 stool testing, 3 XDR, 1 X-ray with CAD artificial intelligence)	15†
People trained	86
FAST strategy	32
Truenat	20
XDR	32
X-ray with CAD artificial intelligence	2
Guideline developed	1
Testing procedures	1
Support supervision visits	23
Pediatric TB stool testing	23
Pilot conducted	1
Pediatric TB stool testing	1
People mentored	53
Pediatric TB stool testing	53

*Output data are for FY 2023 and FY 2024 Q1 and include field and Core TB funds.
†Total number of laboratories may be less than the sum of laboratories listed if there are laboratories implementing more than one new diagnostic service.

MALI

Context

In Mali, IDDS works to improve the detection of infectious diseases by introducing CBS and aims to improve the quality of diagnostic services by conducting training, developing reference documents, and working across sectors to integrate best practices for the surveillance of human health and animal health.

“With the training received on community-based surveillance and the communication tools, I can conduct sensitization sessions in my community on diseases and events under surveillance so I can detect and report suspected cases to my supervisors.”

—Yacouba Kone, community health worker, Niamala, Mali

Annual Highlights

Diagnostic

- IDDS finalized a quality manual for the laboratory accreditation process by providing technical and financial support to INSP to organize workshops that took place in December 2022 in Fana and Koulikoro regions. This document will be used as a reference for quality management at INSP.
- IDDS enabled QMS audits at two supported sites (INSP and Ségou Regional Laboratory) to assess readiness for accreditation in terms of QMS compliance to ISO 15189: 2012 standards.
- To provide a comprehensive understanding of diagnostic capacity in Mali, IDDS mapped 47 laboratories in 5 regions. Equipped with the findings, the country will be better positioned to coordinate and allocate resources effectively, leading to improved laboratory services and response capabilities, as well as optimization of the SRS.

Surveillance

- IDDS conducted four IDSR training sessions in the Kadiolo, Kangaba, and Kati health districts, equipping health staff to effectively detect, report, and investigate cases of diseases and events under surveillance. By improving their capabilities, the health staff will contribute to enhancing the country’s surveillance indicator D2.2. score, which is a vital measure of the effectiveness of the country’s disease surveillance system.
- To build a robust and efficient disease surveillance system

PARTNERS AND COLLABORATORS

- Ministry of Health and Social Development
- General Directorate of Health and Public Hygiene
- Directorate of Pharmacy and Medicine
- National Institute of Public Health

at the local level, IDDS and the General Directorate of Health and Public Hygiene conducted 46 CBS supervision and coaching visits in the Kadiolo, Kangaba, Kati, Kolondieba, and Sikasso health districts. Through these visits, health staff have developed capacities in using surveillance tools, coding forms correctly, identifying community cases, and tracking and investigating suspected infectious diseases. This will lead to more effective and timely reporting and treatment, ultimately improving the overall surveillance and response capabilities of the health districts.

- To enhance the effectiveness of disease surveillance, IDDS carried out supportive supervision visits to 80 community health centers that were underperforming in IDSR across the 8 health districts of Ségou region. The visits aimed to improve the accuracy of data reporting within the facilities included in this initiative.
- A [success story](#) underscored the importance of CBS of diseases.

ARP

- To improve the quality of COVID-19 surveillance data, IDDS provided logistical support and technical assistance to the General Directorate of Health and Public Hygiene to hold two workshops on integrating information systems and validating subnational databases. During the workshops, IDDS and representatives from the General Directorate of Health and Public Hygiene, INSP, and the subnational sites included in the analysis compared subnational datasets to the national database, checked for and revised discrepancies, and updated and finalized databases at all levels.
- IDDS handed over to INSP 153,351 commodities to support genomic sequencing for COVID-19. The commodities included cryotubes, pipettes and tips, mini-centrifuges, buffers, and primers, among others.

Challenges

- We were unable to obtain inputs and responses from the ASLM on the laboratory mapping activity for reporting into the ONA platform. This made data reporting across the IDDS-supported regions challenging.

What We Learned

- Working with local government agents allowed activities to be carried out in insecure areas at a lower cost than using consultants.

Project Results

Indicator title and topics	Results*
Laboratories supported	4
National surveillance bulletins produced	16
Multisectoral data sharing meetings held	4
People trained	173
Electronic reporting systems	154
Data analysis and use	8
Laboratory mapping	11
Guideline developed	1
QMS	1
Support supervision visits	207
Electronic reporting systems	206
QMS	1
TWG meetings held	7
Equipment maintenance	1
Testing	2
QMS	1
COVID-19 surveillance	2
Other diagnostic†	1
Assessment completed	1
QMS	1
Surveillance website visits	83,162

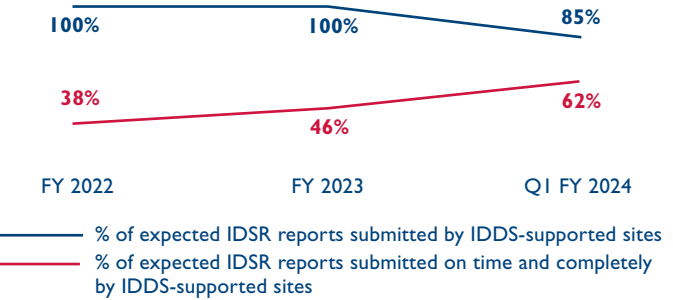
*Output data are for FY 2023 and FY 2024 Q1.

†Other diagnostic topics included laboratory system strengthening, food safety, partner coordination.

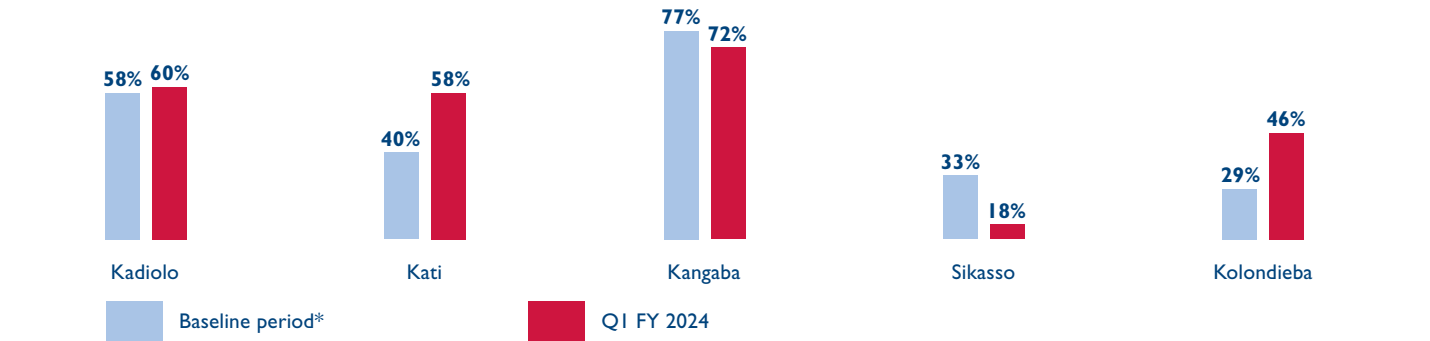
In Mali, IDDS supported the General Directorate of Health and Public Hygiene at the Ministry of Health and Social Development to produce 51 monthly and annual IDSR bulletins during the entire project period and improved the timeliness of the production of the bulletins. In cases in which surveillance bulletins were produced late, IDDS provided support to produce the reports in the following period to catch up from the previous quarter. Delays were often due to the government’s resource limitations and competing priorities for staff.

IDDS, with the Ministry of Health and Social Development, rolled out the CBS system to five districts in Mali in FY 2021 and FY 2022 and have provided periodic supportive supervision of community health workers (CHWs) for CBS activities. These efforts have contributed to improved SMS reporting rates in Kadiolo, Kati, and Kolondieba districts. Rates in Kangaba district have been consistently higher due to CHWs’ experience with tracking community-level cases of Ebola. Challenges to achieving improved reporting rates across all sites include technological problems and coverage with mobile phones, inconsistent routine monitoring of CHWs by district and community health center staff due to resource limitations, irregular payments to the workers by the government, and a few cases of CHW turnover.

Mali: Timeliness and Completeness of the IDDS-supported National Sites



Mali: Percentage of Expected Daily SMS Reports on CBS Sent By Community Health Workers, by IDDS-supported District*



*The baseline period represents the first quarter in which each district began SMS reporting for CBS. Kadiolo began in FY 2021 Q2, Kati began in FY 2021 Q1, Kangaba began in FY 2022 Q2, and Sikasso and Kolondieba both began in FY 2022 Q4. Prior to FY 2021, none of the five supported districts was implementing national CBS guidelines.

MOZAMBIQUE

Context

In Mozambique, IDDS worked to improve diagnostic capacity to detect TB, focusing on detection of pediatric and drug-resistant TB cases. IDDS closed out activities in Mozambique on September 30, 2023.

IDDS “played a pivotal role in establishing technical expertise among technicians in four provinces at the provincial level, enabling them to conduct stool sample testing for the diagnosis of TB.”

—Crimenia Mbate Mutemba, staff member, National Tuberculosis Control Program, Mozambique

Annual Highlights

Diagnostic

- To improve the detection of TB among children, IDDS implemented the SOS method for stool testing using GeneXpert. After developing SOPs and a diagnostic algorithm that includes the SOS method, IDDS created a training package that supported the rollout of the method to 44 health laboratories.
- IDDS provided key insights for strengthening the detection of DR-TB by assessing capacity for DST at Chokwe and Manhica laboratories and developed an implementation plan for TB genome sequencing. IDDS summarized the steps taken to implement DST at Chokwe laboratory, which could inform future efforts to continue decentralizing DST in Mozambique.
- To evaluate the functionality of the TB SRS, IDDS completed a strengths, weaknesses, opportunities, and threats analysis, which included a desk review and visits to three sites in Maputo. The analysis followed the implementation of the Adapting and Modifying Optimized Sample Transport Routes for Achieving Impact project in Mozambique.
- IDDS supported the development of national-level guidance on use of next generation sequencing to support TB mutation detection and diagnosis.

PARTNERS AND COLLABORATORS

- National Tuberculosis Control Program
- National Institute of Health
- Association of Public Health Laboratories

Challenges

- IDDS was not able to implement planned activities to launch DST at Manhica laboratory, due to the delay of a needed signature and unavailability of MoH staff.
- IDDS needed to address GeneXpert errors related to specimen preparation that were affecting the quality of test results. In addition, IDDS was unable to procure GeneXpert equipment and XDR cartridges—activities that were dependent on Core TB funds—following funding challenges with Core TB. The issue was shared with USAID in Washington, DC, the USAID Mission in Mozambique, and NTP. NTP will seek alternate sources of funds for this procurement.
- Funds were not available to support a brainstorming workshop with stakeholders to discuss the status of the TB SRS in Mozambique.

What We Learned

- Stakeholder meetings should happen in advance of work plan development to ensure rapid alignment with national circumstances. The work plan must accommodate MoH expectations, budget availability, and local context.
- The contingency plan for activities must account for slow responses from NTP, the National Institute of Health, or the Clinical Laboratory Division, which can affect project timelines. Identifying MoH focal points for each activity helped accelerate implementation. Continuing meetings with NTP after completion of activities was also important to allow follow-up on the activity’s implementation and prompt technical support.

Project Results

Output data include FY 2023.

Indicator title and topics	Results*
Laboratory offering a new TB diagnostic service	1†
Phenotypic DST for first and second-line drugs	1
Genotypic DST for first and second-line drugs	1
Laboratory supported (bacterial culture for DST)	1
People trained	73
Pediatric TB stool testing	73
Culture DST	8
Support supervision visits	2
Testing procedures	2
SOPs, plans, or guidelines developed or updated	4
Testing procedures	1
Pediatric TB stool testing	1
New diagnostic tools	2
TWG meetings held	5
Xpert MTB/XDR	1
New diagnostic tools	4
Assessment completed	1
SRS	1
People mentored	18
New diagnostic tools	16
Testing procedures	2

*Output data are for FY 2023 and include field and Core TB funds.
†Total number of laboratories may be less than the sum of laboratories listed if there are laboratories implementing more than one testing procedure. The 44 sites newly testing stool with GeneXpert Ultra are not included here. IDDS helped roll out stool testing at the national level by developing resources and a training package and conducting training of trainers. IDDS did not directly support these 44 laboratories to start implementing the testing. Instead, we provided support to other TB partners to provide technical assistance and training. Most implementation occurred in the second half of FY 2023 and did not allow time for monitoring changes in key performance indicators.

PHILIPPINES

Context

In the Philippines using ARP funds, IDDS supported the government’s response to the COVID-19 pandemic through specimen collection and transport, provision of essential supplies, and training and technical assistance. In FY 2023, the project also implemented global health security-related activities to provide support in biosafety and biosecurity, as well as national laboratory system strengthening.

“The USAID donation is a very big help to our local government unit in order to increase our testing capacity and see the true picture to test the symptomatic, to be able to isolate them and eventually prevent the spread of the COVID-19 virus within communities.”

—Dr. Joseph Micheal Espiritu, chairman, Department of Pathology and Laboratory Medicine, Bulacan Medical Center, Philippines

Annual Highlights

Diagnostic

- To identify gaps, challenges, and technical assistance needs for each sector and concur on IDDS’s proposed health security activities, IDDS organized or participated in eight coordination meetings with government stakeholders (e.g., Department of Agriculture, Department of Energy and Natural Resources, Department of Health, Research Institute for Tropical Medicine) and other collaborators (e.g., Philippine Genome Center, Food and Agriculture Organization of the United Nations).
- IDDS developed and shared a concept note on strengthening molecular diagnostic capacities for enhanced surveillance of priority diseases with key stakeholders in the animal health, human health, and environmental sectors. Its development is a key first step toward providing the Philippine Interagency Committee on Zoonosis with a set of actions that will strengthen the integrated surveillance system of priority zoonotic diseases and define the roles of various partners operating in the One Health field.

PARTNERS AND COLLABORATORS

- Department of Health
- Lung Center of the Philippines
- Philippine Genome Center

ARP

- In FY 2023, IDDS transported 7,165 specimens for reverse transcription PCR tests from collection sites to testing sites in 6 provinces (Bulacan, Cavite, Isabela, Laguna, Palawan, and Rizal). In addition, IDDS transported 877 specimens for genome sequencing from 10 collection sites in 5 provinces (Bulacan, Cavite, Laguna, Palawan, and Rizal) to the national capital region.
- Mobile swabbers placed in 5 provinces (Bulacan, Cavite, Isabela, Laguna, and Rizal) collected 2,471 specimens for PCR tests and rapid antigen tests. In Palawan province, IDDS provided transportation for the provincial laboratory staff who engaged in mobile specimen collection. With IDDS’s support, the province collected 181 specimens for PCR tests and rapid antigen tests.
- To strengthen the COVID-19 specimen referral network, IDDS and the Isabela Provincial Epidemiology and Surveillance Unit held 4 training sessions for 101 participants (84 female) on COVID-19 specimen collection, handling, packaging, and transport. IDDS also held 2 training sessions for 52 participants (38 female) on respirator fit, and co-hosted 1 webinar on biosafety and biosecurity, which was attended by 67 participants (53 female).
- IDDS donated 126,000 rapid antigen tests and 10,200 PCR test kits to COVID-19 testing sites, as well as 31,498 auxiliary diagnostic commodities, such as viral transport media and reagents for testing. IDDS also delivered 77,352 items of PPE and 74 other general laboratory supplies to support COVID-19 diagnostic testing.

Challenges

- Changes in the organization and staffing structure of the Department of Health resulted in local government staff overseeing the COVID-19 response (i.e., disease surveillance officers) being placed on a contract break. During this time, the local government unit temporarily assigned other staff to oversee COVID-19 activities. IDDS helped with the orientation of the temporary staff to familiarize them with the daily COVID-19 operations in the local government units of the project-supported sites.

- Implementation of global health security-related activities was delayed due to a moratorium imposed by the Department of Health on government engagement in activities in the human health sector that were not in support of a school-based immunization program. The moratorium ran from May 1 to July 15, 2023.
- An activity to support the development of a Joint Administrative Order of the Department of Health and the Department of Agriculture did not move forward due to shifting priorities. This activity had been planned to streamline disease surveillance and reporting, as well as emergency response, across human health and animal health systems. IDDS replaced the proposed activity with capacity strengthening of identified animal health laboratories on handling, packaging, and transport of biological specimens.

What We Learned

- None to report.

Project Results

Indicator title and topics	Results*
People trained	164
SRS	112
Biosafety and biosecurity	52
Plan developed	1
Electronic reporting systems	1
Specimens transported	8,042
Specimens collected	2,471

*Output data are for FY 2023 and FY 2024 Q1.

SENEGAL

Context

In Senegal, IDDS works to improve capacity for AMR detection and surveillance at nine sentinel surveillance sites and supports the national government in monitoring the data reporting submitted by district-level facilities.

“We really appreciate the continuous support of IDDS in establishing bacteriological test services in our facilities. This support is now going forward by accompanying us to implement quality in every laboratory testing process, which is a high priority for us to ensure accuracy in test results we are delivering.”

—Dr.Abdoulaye Sakho, medical biologist and manager, Tivaouane health facility laboratory, Thiès region, Senegal

Annual Highlights

Diagnostic

- IDDS supported the Directorate of Laboratories to relaunch QMS in laboratories. QMS had not been implemented for more than five years, due to other priorities. QMS implementation will provide more reliable and accurate laboratory test results, including results for priority infectious disease tests. IDDS led audits for 15 laboratories using the SLIPTA checklist, which helped identify priority gaps for technical assistance. IDDS trained 30 laboratory staff (16 female) from the 15 laboratories in various topics that are critical for accreditation readiness. IDDS also conducted mentorship visits to these 15 sites to review or develop SOPs.
- To improve access to testing, IDDS supported two additional laboratories to start conducting bacterial culture.
- In a key step for operational planning and implementation of AMR surveillance, IDDS provided technical and financial assistance to the Directorate of Laboratories to officially designate NRL, national reference centers, and sentinel sites that will be included in the national AMR surveillance system.
- To assist laboratories with managing their own commodities for the first time, IDDS developed a stock management tool and visited nine project-supported sites to orient them to the new tool, help them complete inventory lists, and collect historical data to further inform the tool.

PARTNERS AND COLLABORATORS

- Ministry of Health and Social Action
- Directorate of Laboratories
- Directorate of Prevention
- Division of Health Information System

Surveillance

- To help identify and accelerate the response to unusual events of public health importance, IDDS continued to support the Directorate of Prevention in efforts to expand the Senegalese Syndromic Sentinel Surveillance (4S) network. IDDS expanded the 4S network to two new sites—Pikine and Yeumbeul. At both sites, IDDS conducted assessments, and key staff were oriented on disease surveillance methods under the 4S network. In addition, staff were oriented on specimen collection and transport and case notification to the designated diagnostic reference laboratory within the 4S network.
- To improve the surveillance of events of public health importance, IDDS supported the Ministry of Health and Social Action and the Directorate of Prevention to relaunch the national event-based surveillance system, using tools, guidelines, and SOPs developed by IDDS.
- To inform national-level recommendations for global health security, IDDS participated in the JEE as a national counterpart for the AMR technical area and the national laboratory system area.

Challenges

- A health sector strike delayed data sharing to DHIS2 and general work plan implementation. IDDS worked with regional health officers and laboratory staff to retrieve data directly from them, rather than from DHIS2.
- The activity to establish/improve the national EQA program was delayed due to the election. Department of Laboratories staff were off during June 2023 and were not able to organize the EQA round planned for FY 2023 Q3. The EQA round began during the first quarter of FY 2024, with panel distribution ongoing.

What We Learned

- The development and use of stock management tools in laboratories has helped optimize laboratory operations through efficient inventory and supply management. Regular supervision and monitoring of how the tools are used is important to continuously improve practices.
- The installation of two new sentinel sites as part of the 4S network has boosted surveillance activities in Pikine and Yeumbeul health districts with earlier detection of priority diseases.

Project Results

Indicator title and topics	Results*
Laboratories offering a new diagnostic service (bacteriology)	2
Data review meeting held	1
Sites providing data to GLASS	0
People trained	30
QMS	30
SOPs, plans, and guidelines developed	18
QMS	8
EBS	10
Support supervision visits	4
Electronic reporting systems	2
Data quality	2
TWG meetings held	3
EBS	3
People mentored	49
QMS	49

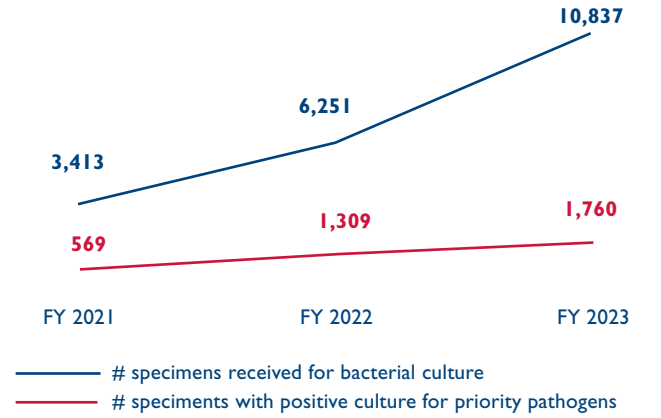
*Output data are for FY 2023 and FY 2024 Q1.

IDDS enabled eight district laboratories to start conducting bacterial culture and AST thereby expanding access to these services and contributing to improved detection of priority pathogens. Bacterial culture and AST began in four laboratories in FY 2021, in two laboratories in FY 2022, and in two additional laboratories in FY 2023. The ninth laboratory supported by IDDS has not yet begun culture and AST due to ongoing site construction.

Increased access to bacteriology testing led to marked increases in testing utilization and in the detection of priority pathogens. IDDS supported the sites through its supervision and mentoring program, training sessions, development of SOPs and policies, and monitoring and technical assistance to implement QMS at each site. Only priority bacterial pathogens listed by the national government are reported for this indicator, which in most reporting periods included *E. coli*, *Klebsiella pneumoniae*, *Acinetobacter baumannii*, and *Enterobacter spp.*

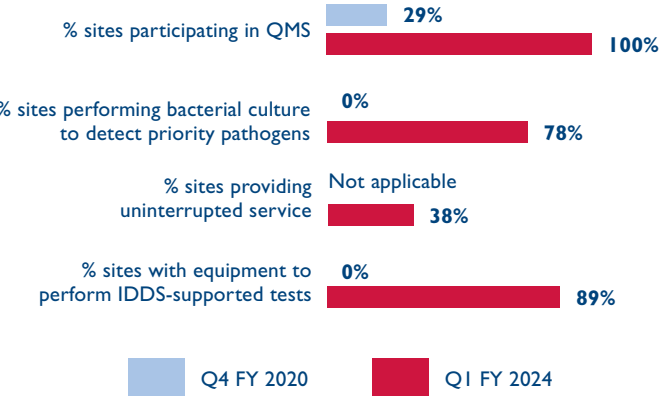
In FY 2020 Q4, two of the seven IDDS-supported sites were participating in QMS after an initial QMS assessment and training; however, none of the sites had begun bacteriology testing and did not have the equipment for testing during that period. In FY 2023, IDDS supported QMS audits in all nine supported laboratories and provided mentorship and technical assistance to these laboratories to develop QMS action plans.

Senegal: Testing Volume at IDDS Sites*



*Since FY 2019 Q4, IDDS supported seven sites, and IDDS supported two additional sites starting in FY 2022.

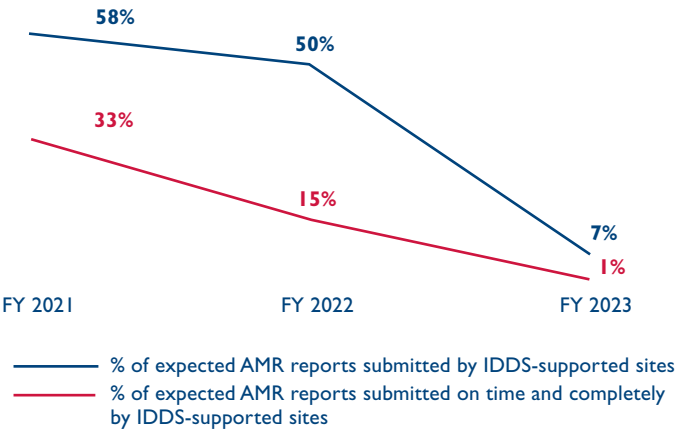
Senegal: Performance of the IDDS-supported Laboratories*



*IDDS supported seven district laboratories starting at baseline (FY 2019 Q4) and started supporting two additional laboratories in FY 2022. The data for FY 2024 Q1 covers October and November 2023.

Interruptions of testing services is only monitored for sites that have begun performing bacterial culture. Five laboratories had service interruptions in FY 2024 Q1 due to stock outs or equipment issues. One site had prolonged interruption and was not able to perform bacterial culture in the reporting period, so it was not counted for that indicator and one site had not begun bacterial culture testing due to infrastructure issues.

Senegal: Timeliness and Completeness of AMR Reporting by IDDS-supported Sites*



*IDDS supported eight laboratories to start reporting bacteriology and AMR data in DHIS2. Monthly reporting was expected once the sites were able to perform bacteriology testing. Four sites started reporting in FY 2021, six sites were reporting in FY 2022 and eight sites were expected to report in FY 2023.

Report submission nearly ceased from FY 2023 Q1 onward; since then, only eight monthly reports have been submitted. The low reporting rate from FY 2022 Q2 onward was due to the national health workforce strike in Senegal, during which laboratories across the country retained their AMR data. The strike continues through the time of this report, and data retention is a method to push the government to action.

TANZANIA

Context

In Tanzania, IDDS works to strengthen laboratory and surveillance capacities by supporting the National AMR Surveillance Framework and enabling the detection of AMR priority pathogens at four supported sites.

“After one month the child was completely healed and freed from four years of suffering from chronic ear discharge.”

—Latifa Omar, head of the microbiology section, Maweni Regional Referral Hospital Laboratory, Tanzania (one of the IDDS-supported AMR surveillance sites), in Kigoma, relating an example of the benefit of increased AMR surveillance, which led to proper treatment of a child’s *Pseudomonas aeruginosa* infection

Annual Highlights

Diagnostic

- To promote diagnostic stewardship, IDDS trained 25 hospital and laboratory staff (11 female) to implement AMR surveillance and infection prevention and control measures. IDDS also held a meeting (attended by 24 participants [8 female]) to raise awareness of AMR and promote specimen referral from lower-level catchment areas to laboratories for AST. This will enable laboratories to generate AMR data tailored to the needs of clinicians, nurses, and pharmacists, informing their antimicrobial drug selection and dispensing practices.
- In FY 2023 Q3, all four IDDS-supported sites began receiving referred specimens requiring culture and AST from lower-tier health facilities within their catchment areas for the first time as part of a specimen referral pilot. In FY 2023 Q4, two of the four sites (Morogoro and Temeke Regional Referral Hospitals) received specimens for AMR testing. A functioning SRS ensures broader access to quality laboratory services. In addition, these referred specimens increased the testing volume at two IDDS-supported sites and supported AMR surveillance, which informs patient management and policymaking.

Surveillance

- IDDS successfully validated and launched the National Plan on Antimicrobial Resistance, 2023–2028, in collaboration with MoH, the Ministry of Livestock and Fisheries, and other stakeholders. The plan showcases IDDS’s contribution to AMR surveillance work in Tanzania over the past few years and provides a foundation on which interventions can be built.

PARTNERS AND COLLABORATORS

- Ministry of Health
- Catholic University of Health and Allied Sciences
- Kilimanjaro Christian Medical College
- National Institute for Medical Research
- National Public Health Laboratory
- Muhimbili University of Health and Allied Sciences
- Sokoine University of Agriculture

GLOBAL PARTNERS

- USAID Medicines, Technologies, and Pharmaceutical Services Program
- American Society for Microbiology

- IDDS collaborated with the President’s Office for Regional Administration and Local Governments to initiate referral of specimens to IDDS-supported testing laboratories from peripheral facilities within their catchment areas, focusing on the identification of priority pathogens and AMR. By including specimen referrals from peripheral laboratories that were previously unsupported, IDDS has expanded the geographic coverage of laboratory services for AMR detection. The extended coverage ensures that the AMR data collected are more representative and applicable to lower-tier facilities, providing valuable insights to help guide clinical decisions.

Challenges

- There are inadequate resources (human, equipment, and supplies) at subnational facilities to sustainably conduct AMR testing and surveillance. IDDS plans to further engage with hospital management teams to allocate resources that support the testing laboratories with adequate diagnostics, supplies, and reagents to sustain AMR surveillance activities at the surveillance sites

What We Learned

- Reliable AMR data from laboratory and surveillance systems are key to obtaining buy-in from stakeholders and other programs for addressing AMR problems through a holistic, multidisciplinary approach.
- Regular supportive supervision, mentorship, and refresher training provided by IDDS were instrumental in enhancing staff capacity for conducting AMR testing, data analysis, and reporting to national and global systems.
- Engagement with hospital laboratory management teams is needed to support the testing laboratories with adequate diagnostics, supplies, and reagents to sustain AMR surveillance activities at the surveillance sites.

Project Results

Indicator title and topics	Results*
Multisectoral data sharing meetings held	4
Data review meeting held	1
Antibiogram tables produced	4
Sites providing data to GLASS	4
People trained	61
Electronic reporting systems	12
SRS	24
AMR diagnostic advocacy	25
Plan developed	1
AMR diagnostic advocacy (national action plan)	1
Support supervision visits	4
Commodity management	4
TWG meetings held	3
Data quality	2
Other surveillance†	1
Pilot conducted	1
SRS	1
People mentored	9
Testing	9

*Output data are for FY 2023 and FY 2024 Q1.
†Other surveillance topics included AMR national action planning and awareness raising of key stakeholders around AMR.

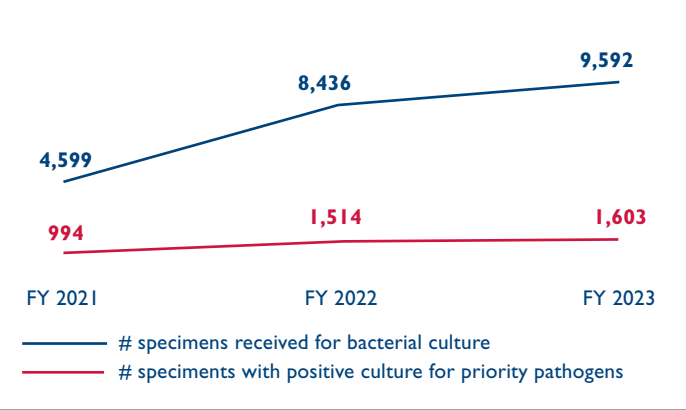
Through IDDS support there was a marked increase in the utilization of bacteriology testing and identification of priority pathogens at the four supported laboratories in Tanzania. IDDS interventions included clinician sensitization, supervision and mentorship of laboratory staff on AMR detection and surveillance, promotion of good diagnostic stewardship, routine training sessions, and piloting a specimen referral system from peripheral health facilities. Only priority bacterial pathogens listed by the national government as being of “primary concern” are reported for this indicator. In Tanzania, this includes *E. Coli*, *Staphylococcus aureus*, *Streptococcus pneumoniae*, *Acinetobacter baumannii*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa*, and *Salmonella*.

IDDS supported the four AMR surveillance sites to use WHONET for AMR data reporting. Each site is expected to submit monthly WHONET AMR reports to NPHL. IDDS provided training, mentorship and supportive supervision to the laboratory staff on all aspects of AMR surveillance reporting including routine data entry to WHONET. During supervision, IDDS identified bottlenecks and challenges to timely and quality reporting, such as backlogged data or staffing gaps and then addressed these with each site. Due in part to these IDDS interventions, timeliness of reporting showed improvements during the project period.

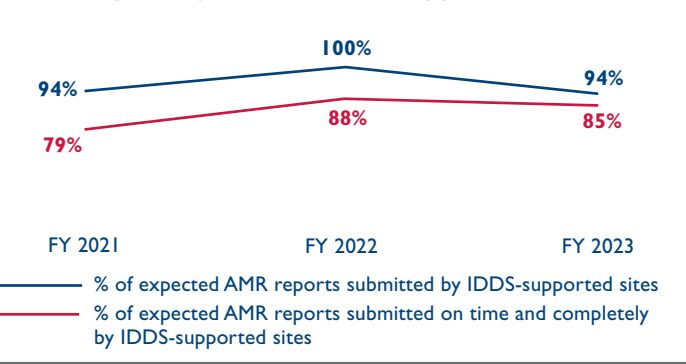
Through IDDS support, the four sites saw significant improvements in their AMR testing capacity. During the initial assessment, the team found that bacteriology sections of the laboratories—in which AMR diagnostic processes are performed—experienced commodity stockouts and demonstrated weaknesses in their laboratory information systems and quality control procedures for AST. After the gaps were identified, the team and the NPHL staff tailored mentorship and supervision to include specimen processing, identification, reporting, and interpretation of data. These interventions resulted in significant improvements in AMR testing and surveillance capacity, biosafety, and specimen management across the four sites, with the greatest improvement achieved at Benjamin Mkapa Hospital Laboratory, showing a 31-point gain.

IDDS interventions enabled the four supported sites to expand their culture testing to include blood and wound/pus specimens. Subsequently, through training on testing and surveillance, supply chain logistical support and commodity management, supervision, and mentorship, all four sites were facilitated to continue providing uninterrupted services. Only one site had a brief interruption due to stockouts in FY 2023. Targeted support for EQA/PT was not provided.

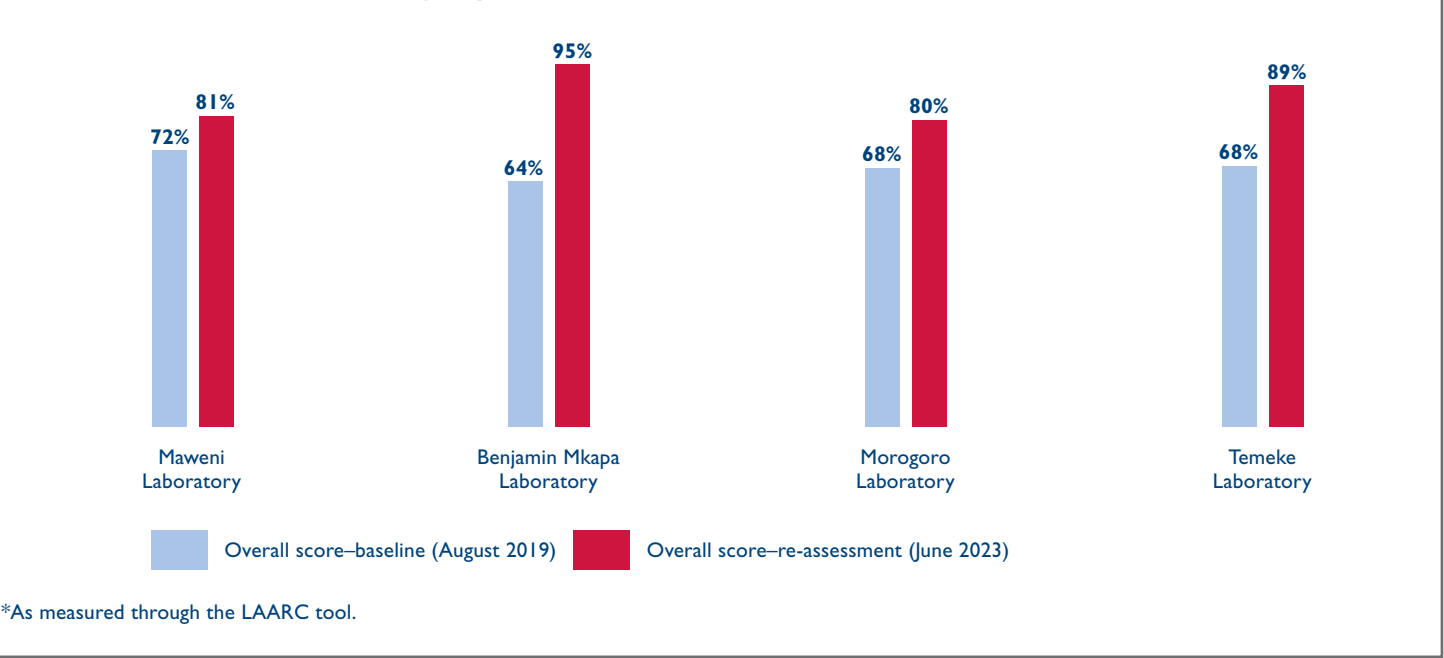
Tanzania: Testing Volume at Four IDDS Sites



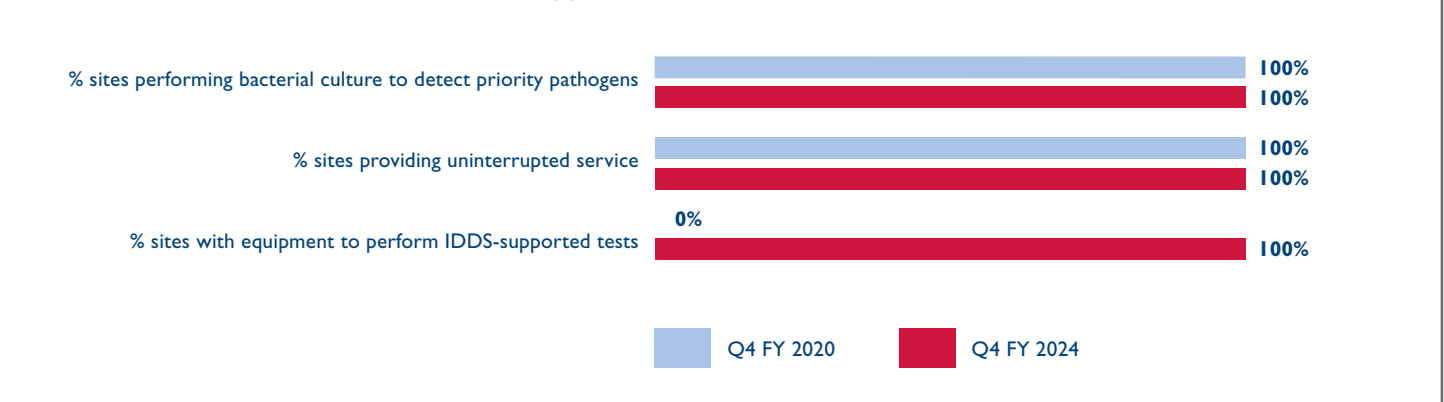
Tanzania: Timeliness and Completeness of AMR Reporting by Four IDDS-supported Sites



Tanzania: Laboratory AMR Testing Capacity*



Tanzania: Performance of the Four IDDS-supported Laboratories



TANZANIA

Context

In partnership with national programs and academic collaborators, IDDS works to increase access to TB diagnostic services in Tanzania by strengthening the GeneXpert network and building the capacity of four zonal laboratories, the central TB reference laboratory, and their respective catchment areas.

“We greatly appreciate the huge efforts and costs incurred by the IDDS project to support all processes in the roadmap toward adopting Truenat technology in Tanzania.”

—Edgar Luhanga, TB laboratory diagnostic network coordinator, National Tuberculosis and Leprosy Program, Tanzania

Annual Highlights

Diagnostic

- To improve connectivity for TB diagnostics and improve patient outcomes, IDDS finished upgrading the GxAlert system to Aspect. IDDS also trained 26 people (4 female) as future trainers in how to use Aspect to conduct TB data analysis and supported the configuration of 30 Truenat instruments to enable connectivity to Aspect after they are installed. The Aspect system can link with other diagnostic devices and laboratory information systems, which enhances real-time TB data sharing between laboratories and clinicians and ensures the timely linking of TB patients to appropriate treatment regimens.
- To improve capacity to detect DR-TB, IDDS facilitated a two-week on-site mentorship, conducted by national mentors, on LPA and culture at each of the four zonal laboratories. Thirteen laboratory staff (five female) were mentored.
- IDDS supported NTLP and the central TB reference laboratory to conduct a three-day workshop to review and update the national molecular diagnostic guidelines to include new TB diagnostic tools and assays, such as Truenat and stool testing for pediatric TB diagnosis.
- To expand access to testing, IDDS helped 30 health centers start Truenat testing. The Truenat laboratories completed their first cycle of EQA. IDDS, in collaboration with NTLP and Molbio Diagnostics, undertook a review of the Truenat laboratories’ performance in December 2023 discussed potential solutions to further improve capacity. Super-users are following up with the sites to provide troubleshooting and technical assistance to support continual quality improvement.

PARTNERS AND COLLABORATORS

- Ministry of Health
- National Institute for Medical Research
- National Public Health Laboratory
- National Tuberculosis and Leprosy Program
- Catholic University of Health and Allied Sciences
- Kilimanjaro Christian Medical College
- Muhimbili University of Health and Allied Sciences
- Sokoine University of Agriculture

GLOBAL PARTNERS

- USAID Medicines, Technologies, and Pharmaceutical Services Program
- American Society for Microbiology

Challenges

- Stockouts of Truenat MTB and MTB/RIF chips, procured through the Global Fund, have led to a stoppage in testing services at the 30 Truenat sites. Laboratories were also unable to complete EQA cycles due to the ongoing stockouts.
- NTLP does not have an existing contract with the connectivity service provider (SystemOne) and currently, no funding partner is supporting a contract engaging with SystemOne to sustain Aspect connectivity for GeneXpert and Truenat instruments.

What We Learned

- Due to the lack of funding for maintaining commercial connectivity (through SystemOne) for GeneXpert and Truenat instruments, a locally developed digital TB data reporting system that links laboratory results with other program data is needed to ensure sustainability.
- Evaluation of the initial Truenat implementation phase was valuable to inform strategic scale-up plans for this technology in Tanzania’s TB diagnostic network.

Project Results

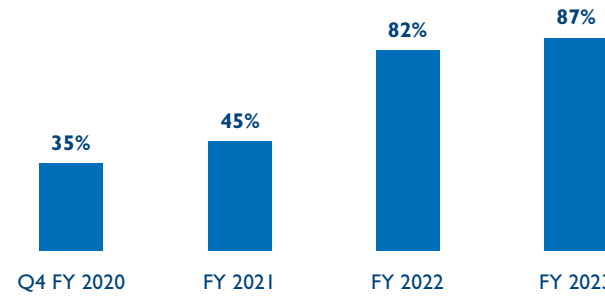
Indicator title and topics	Results*
Laboratories offering a new TB diagnostic service	31
Truenat	30
Line probe assay	1
Number of laboratories supported (30 Truenat, NTRL, 4 zonal laboratories, 268 GeneXpert EQA)	303
People trained	106
Truenat	80
Diagnostic connectivity solution	26
Supportive supervision visits	51
Diagnostic connectivity solution	51
Guideline developed	1
New diagnostic tool	1
TWG meetings held	2
Other TB diagnostic activity	2
Mentorship sessions	4
Testing procedures	4

*Output data are for FY 2023 and FY 2024 Q1 and include field and Core TB funds.

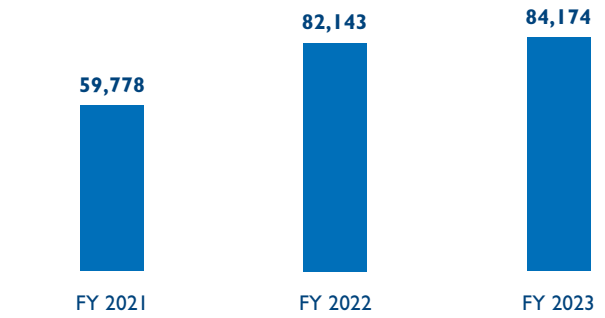
In Tanzania, IDDS supported the expansion of EQA testing across the GeneXpert network to 268 GeneXpert sites, covering 87 percent of the GeneXpert sites. EQA testing contributed to three GeneXpert sites achieving accreditation. EQA testing helps monitor the quality and accuracy of testing at laboratories and identify where additional capacity building is needed.

IDDS improved the functionality of the GeneXpert instruments by expanding connectivity, which allows NTP to monitor the instruments and testing performance across the country. IDDS also contributed 180 GeneXpert modules in FY 2022 and supported troubleshooting and replacement of parts to improve the functionality of the instruments. IDDS efforts to expand, maintain, and connect diagnostic equipment have contributed to increases in TB notifications between FY 2021 and FY 2023.

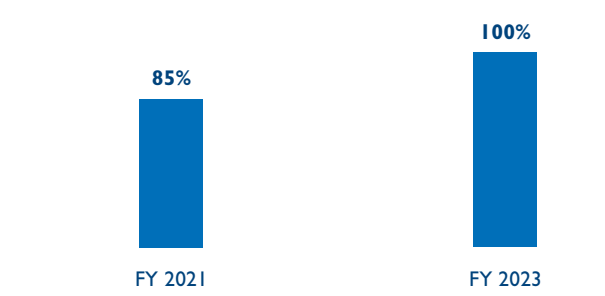
Tanzania: Percentage of WRD Testing Sites That Are Included in a Quality Assurance Program (National Level)



Tanzania: TB Notifications (National Level)



Tanzania: Percentage of GeneXpert Modules that are Functional



UGANDA

Context

In Uganda, IDDS works to improve diagnostics for priority pathogens and integrate disease surveillance across the human health and animal health sectors through quality assurance, creation and implementation of national guidance, and improvement of data quality.

“Before [working with IDDS], we were running tests without any standard operating procedures, no job aids, and practically no documentation of the work done. Now, with constant support in terms of trainings and mentorships, the laboratory team have come to appreciate the importance of having standard processes, and we are grateful to IDDS.”

—Dr. Laura Adong, district veterinary officer, Mbale, Uganda

Annual Highlights

Diagnostic

- To provide technical assistance and supervision for quality improvement, IDDS conducted 7 cycles of QMS mentorship at 3 NRLs in the animal health sector, training and mentoring 8 to 10 staff during each cycle. IDDS worked with the laboratories to develop and update documents to align to ISO 17025:2017 requirements.
- To evaluate QMSs and support laboratories in preparing their applications for ISO 17025 accreditation, IDDS conducted baseline assessments at two facilities (Uganda Wildlife Authority Diagnostic and Research Laboratory at Queen Elizabeth National Park and Mbale District Veterinary Laboratory). IDDS also provided financial support for an internal audit training for facility staff at the two facilities. The two laboratories are now in the final stages of the accreditation process.

Surveillance

- In January 2023, IDDS provided technical support to the National Task Force to hold a virtual meeting to coordinate the response to a yellow fever outbreak in five districts (Buikwe, Buvuma, Kasese, Masaka, and Wakiso). IDDS again provided technical support to the National Task Force in March to organize a virtual meeting to coordinate the response to the Rift Valley fever and bacterial meningitis outbreaks in the districts of Mbarara

PARTNERS AND COLLABORATORS

- Ministry of Health
- Ministry of Agriculture, Animal Industry and Fisheries
- Ministry of Water and Environment
- National One Health Plan
- Uganda Wildlife Authority
- National Livestock Research Resources Institute
- District local governments (Mbale, Moroto, Gulu, and Mbarara)

and Obongi, respectively. In September to November, IDDS attended three National Task Force meetings to coordinate the responses to epidemics of Rift Valley fever, anthrax, and TB.

- To improve data validity and assist in analysis, IDDS provided technical and financial support to the National Animal Disease Diagnostics and Epidemiology Center (NADDEC) to roll out an upgraded digital data entry and analysis tool for [reporting indicator-based surveillance data in 34 districts](#). The new tool replaces a paper-based system and will save time and improve data quality. Dr. Robert Mwebe, the principal veterinary officer at NADDEC, said, “Transition to the revised Excel tool will enable NADDEC to focus on analysis and use of surveillance data instead of using precious time to manually reenter the data.”

Challenges

- Multiple surveillance tools and systems have been developed by different implementing partners. IDDS holds meetings with partners to harmonize proposed surveillance tools.
- Of the 116 districts invited to participate virtually in the workshop on rolling out the upgraded Excel reporting tool, only 16 (14 percent) participated, and of the 20 districts invited to participate in person in the rollout, 18 (90 percent) participated. IDDS held follow-up calls with districts and shared the upgraded tool and user manual through email.
- There were delays in the submission of the South African National Accreditation Scheme accreditation applications. The delays occurred because of the time it took to agree on which tests to present to the accrediting body as test scopes, due to the lack of EQA for most of the tests. IDDS engaged the Ministry of Agriculture, Animal Industry and Fisheries for the validation of several tests, and the project provided EQA materials for the Rose Bengal test for brucellosis. A test scope for accreditation has

since been agreed upon, and accreditation applications have been completed and submitted to the South African National Accreditation Scheme.

What We Learned

- Virtual engagements are not popular among people at the subnational level due to Internet connectivity challenges, and it is harder to troubleshoot issues virtually. Also, trainees are subject to work-related interruptions, especially if they attend online meetings or training in their offices. IDDS learned that on-site mentorship provides a better basis for knowledge transfer than virtual mentorship and provides the opportunity for evidence-based learning from subject matter experts to solve complex requirements and aid implementation.
- Constant engagement of facility teams with the same mentors ensures effective collaboration and teambuilding and aids in the implementation of the requirements. Teams tend to be more productive after they have established meaningful working relationships.
- Convening veterinarian-laboratory interface meetings is critical for improving laboratory service utilization as seen in the number of tests reported and requests received.

Project Results

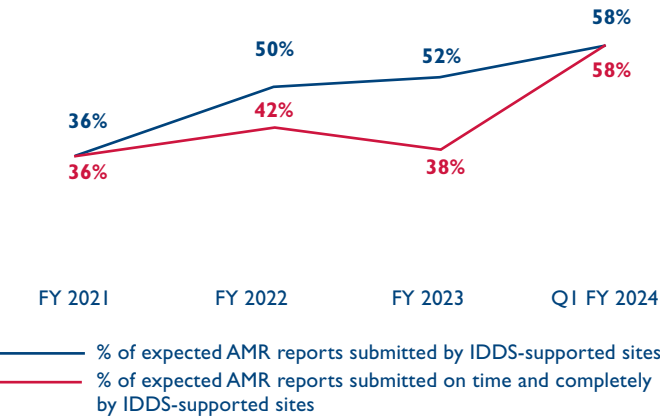
Indicator title and topics	Results*
National surveillance bulletin produced	1
Multisectoral data sharing meetings held	15
Data review meeting held	1
People trained	71
Electronic reporting systems	50
QMS	21
SOPs, plans, and guidelines developed	92
QMS	92
Support supervision visits	2
QMS	2
TWG meetings held	15
Data analysis and use	2
Other surveillance†	13
Assessment completed	1
QMS	1

*Output results are for FY 2023 and FY 2024 Q1.

†Other surveillance topics included coordinating response to various types of outbreaks, coordinating One Health stakeholders, and drafting the Strategy for Coordinated Surveillance of Priority Zoonotic Diseases (2021–2025).

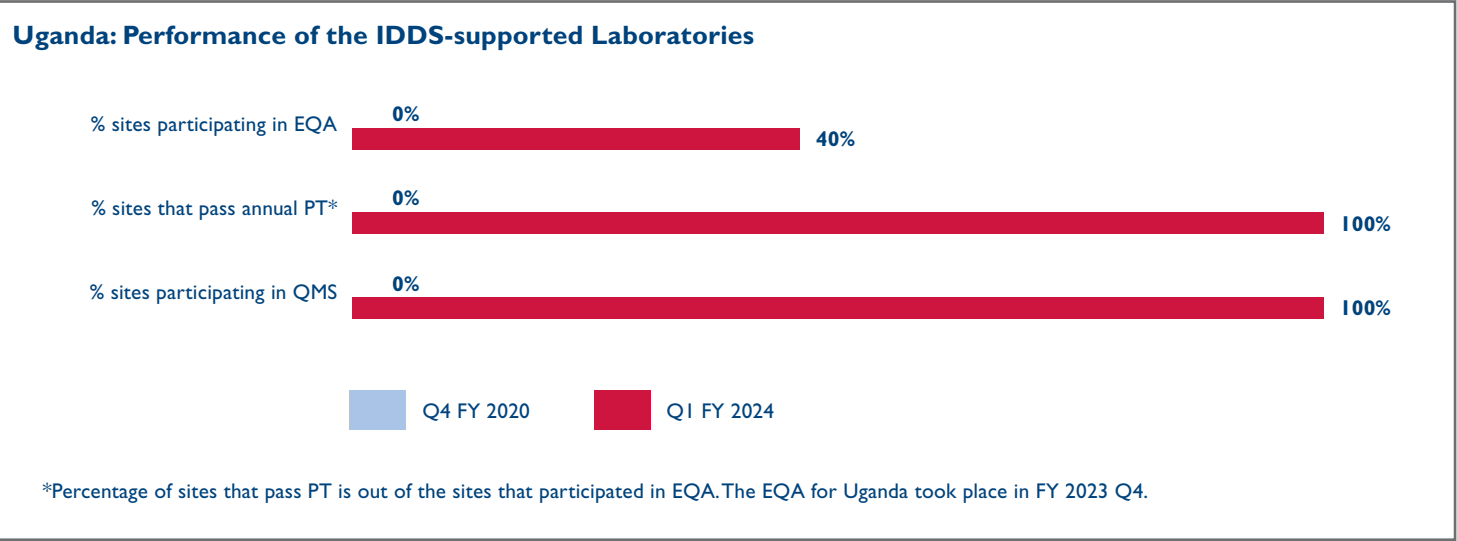
Reporting data are for eight district sites in FY 2021, and for four district sites from FY 2022 onward. In FY 2022 Q2, IDDS started supporting four districts to improve zoonotic disease surveillance by piloting an Excel-based data entry and analysis tool which led to improved reporting rates. In June 2023, IDDS provided technical and financial support to NADDEC to roll out an upgraded tool for reporting indicator-based surveillance data to 34 districts, which led to another bump in surveillance reporting.

Uganda: Timeliness and Completeness of AMR Reporting by IDDS-supported Sites



“I am overjoyed by this great milestone; all our work and efforts are starting to yield the desired effect. I thank you IDDS for making this possible. The next few months we will be able to realize our dream of accreditation to the tickborne identification tests and the Brucella screening tests that will greatly improve our diagnosis and treatment of these diseases, which are predominant in our catchment area.”

—Moses Okotel, laboratory quality manager, Uganda Wildlife Authority



For the first half of FY 2023, IDDS supported five laboratories with QMS activities, and later shifted to focus on two laboratories only. Those two laboratories, Queen Elizabeth National Park Laboratory and Mbale Regional Animal Disease Diagnostics and Epidemiology Center, are the only sites that participated in EQA in the last year. Both sites passed with 100 percent.

VIETNAM

Context

In Vietnam, IDDS works to improve electronic surveillance of priority pathogens across human health and animal health sectors, implement event-based surveillance, and launch innovative SRSs.

“By facilitating direct reporting of animal disease data into VAHIS from the district level, the quality of animal disease data will be improved significantly, and the animal health events will be reported sooner because district staff are often the first-line responders to animal outbreaks.”

—Dang Van Hung, chief epidemiologist, Regional Animal Health Office No. IV, Vietnam

Annual Highlights

Diagnostic

- Throughout Vietnam, more than a dozen laboratories in both the human and animal health sectors have requested to expand SRS services, including the IDDS-customized specimen courier services. The requests reflect widespread demand for SRS-related products, including IDDS-developed training videos on specimen packaging and transport, shipping labels that were translated into Vietnamese, and training slides, revealing the value added by the project in strengthening the diagnostic network through specimen referral. IDDS plans to distribute all project materials to MoH and DAH for dissemination to facilities.
- To control the spread of anthrax outbreaks in Dien Bien and Lai Chau provinces, IDDS partnered with the National Center for Veterinary Diagnosis to provide guidelines, training materials, and standard packaging materials to the provincial subdepartments of animal health. Ensuring the secure transportation of specimens to the laboratory for testing is critical when working to control the spread.

Surveillance

- To improve the surveillance of zoonotic diseases, IDDS supported the development of a mobile application for VAHIS, which will increase its use at the provincial and lower levels, especially among field staff. This included development of a user guide for the mobile application, consisting of an interactive video, step-by-step instructions, and images that will reduce the need for technical assistance.

PARTNERS AND COLLABORATORS

- Ministry of Health
- Department of Animal Health
- Ministry of Agriculture and Rural Development

- Recognizing the success of IDDS efforts to extend VAHIS use to the district level, which has improved the completeness, accuracy, and timeliness of animal disease reporting, DAH proposed using World Bank Pandemic Fund resources to expand the model nationwide. DAH consulted regional animal health office staff on the IDDS model to extend VAHIS use to the district level, and the government is now seeking additional funds for the national expansion.
- To continue institutionalizing the use of VAHIS, IDDS trained 67 district staff (18 female) from Dong Thap, Can Tho, and Thai Nguyen provinces in using VAHIS for animal disease reporting. In total, five provinces have received IDDS support, including follow-up meetings to mentor staff on animal disease reporting and monitor issues. Based on the success of the IDDS pilot, DAH is expected to request that all districts use VAHIS for animal disease reporting starting in 2024.

Challenges

- Field activities in the FY 2023 work plan were significantly delayed because the Government of Vietnam requested that all international aid activities be documented, reviewed, and approved by government authorities, a process that took three to six months.
- The performance of the specimen management software developed by IDDS for the animal health sector at first fell short of expectations. Its usage in provinces was limited, due to challenges in connecting with the software at regional animal health offices. DAH requested that the National Center for Veterinary Diagnosis develop a software solution for use by all regional animal health offices and their laboratories.
- Across three supported provinces, sites did not fully participate in the pilot SRS because they perceived obstacles in handling Social Health Insurance procedures to receive payments for the diagnostic services performed by referral laboratories. IDDS supported the National Institute of Hygiene and Epidemiology to prepare a letter to send to the Vietnam Administration of Medical Services to request that the administration issue official requests to provincial departments of health to boost involvement in the pilot SRS.

What We Learned

- Conducting regular meetings with stakeholders at the provincial level (subdepartments of animal health) will encourage consistent data entry into VAHIS and enable the review and correction of any issues that arise during data entry, such as missing or inaccurate data.
- When seeking approval for animal health activities, IDDS learned that provincial-level government approval is required in addition to national-level approval. IDDS learned that the procedure for obtaining provincial approval for an activity involving a foreign entity (such as IDDS training) may differ across provinces and tends to take two to three weeks to complete. It is important to work closely with human and animal health government officials to quickly address their questions and comments on the work plan to decrease turnaround time and facilitate the approval process.

Project Results

Indicator title and topics	Results*
Multisectoral data sharing meetings held	12
Data review meetings held	17
Events reported into VAHIS database	35
People trained	96
Electronic reporting systems	67
SRS	29
SOPs, plans, and guidelines developed	9
Electronic reporting systems	2
SRS	7
Support supervision visit	1
Electronic reporting systems	1
TWG meetings held	31
Electronic reporting systems	24
SRS	7
Pilots conducted	4
Electronic reporting systems	2
SRS	2
Assessments completed	2
Electronic reporting systems	1
SRS	1
People mentored	328
Electronic reporting systems	322
SRS	6

*Output results are for FY 2023 and FY 2024 Q1.

“The national guidelines for sampling, preservation, packaging, and transportation of animal specimens, along with two instructional videos on packaging, sample transportation, and handling incidents during transport, have been used to train classes for veterinary diagnosticians from provinces throughout Vietnam. These training materials are very useful, and fortunately, there is a channel for disseminating the materials to those in need, especially for animal health staff in Dien Bien province, where the anthrax outbreak happened. After having these materials, teaching becomes much more effective and helps staff to improve their skills in biosafety of specimen packaging and transport.”

—Dr. Nguyen Thi Thuy Man, head of the Pathology and Parasitology Division, National Center for Veterinary Diagnosis, Vietnam

ZIMBABWE

Context

IDDS supports the strengthening of the Zimbabwe national TB diagnostic network to be accessible, accurate, adaptable, timely, and integrated for TB and multidrug-resistant TB diagnosis.

“The use of stool as a specimen for childhood TB diagnosis on the GeneXpert platform is a positive development in Zimbabwe’s case finding efforts.”

—Dr. Raiva Simbi, director of laboratory services, Ministry of Health and Child Care, Zimbabwe

Annual Highlights

Diagnostic

- IDDS accelerated the ability to detect childhood TB by conducting two regional “training of trainers” workshops on the SOS method for stool testing. IDDS also supported these trainers to start expanding the SOS training to six facilities in Harare through on site mentorship, supported SOS training in Harare province that reached 129 health care workers (88 female), and visited 42 sites to provide supportive supervision.
- To support real-time reporting of TB test results, IDDS connected 142 of 176 GeneXpert instruments to Aspect and trained 6 super-users (all male) on the connectivity software. The project also worked with SystemOne to connect 20 Truenat instruments to the Aspect system. Results from the instruments will be transmitted to the clinicians in real time, thus reducing turnaround times and improving patient care.
- IDDS conducted mentorship visits to 25 laboratories in Harare province for competency assessments and PT results management, and to continue to resolve nonconformities identified during laboratory assessments conducted in March 2022.
- To increase access to molecular testing and increase TB and DR-TB case detection, IDDS supported the procurement and installation of 10 GeneXpert 10-color instruments and 250 MTB/XDR test cartridges. IDDS conducted on-site training for 97 health facility staff (57 female) on the use of the Xpert MTB/XDR tests, interpretation of results, and the diagnostic and treatment algorithm. IDDS also trained 20 Truenat end users, and then conducted refresher training and supportive supervision visits, with NTP and NTRLs, to the 20 Truenat sites.

PARTNERS AND COLLABORATORS

- Ministry of Health and Child Care
- Directorate of Laboratory Services
- AIDS and tuberculosis programs
- National Tuberculosis Control Program
- The Union Zimbabwe Trust
- Biomedical Research and Training Institute
- Zimbabwe National Quality Assurance Program
- Jointed Hands Welfare Organization

GLOBAL PARTNERS

- USAID Tuberculosis Implementation Framework Agreement
- U.S. Centers for Disease Control and Prevention
- World Health Organization
- Clinical and Laboratory Standards Institute
- Chemonics
- Clinton Health Access Initiative
- Elizabeth Glaser Pediatric AIDS Foundation

- IDDS provided technical and financial support to NMRL to prepare for an ISO 15189:2022 accreditation assessment by the Southern African Development Community Accreditation Services. Upon successful closing of the nonconformity findings, the accreditation services body has recommended accrediting NMRL.
- To inform future improvements to the TB diagnostic network, IDDS completed the LNSA. The draft results of the LNSA will be used for the Global Fund Grant Cycle 7 application.
- IDDS documented challenges and lessons learned from Truenat implementation in Zimbabwe in an article published in [Lab Culture](#), the magazine of the ASLM.

Challenges

- There was low demand for childhood TB stool testing in IDDS-supported health facilities (25) in Harare province. IDDS administered a questionnaire to elicit both qualitative and quantitative responses to help shed more light on this issue. Earlier indications point to a small number of children (ages 0–15 years) being seen in facilities. IDDS implemented facility-based quality improvement activities that resulted in more children being screened for TB and sent for stool based testing.

- There is an absence of a PT scheme for acid fast bacilli smear microscopy processing in the IDDS supported public facilities in Harare province. These sites will be prioritized in NTRL’s initiative to provide PT materials and results analysis, and IDDS will provide additional commodities. The scheme is currently being piloted.

What We Learned

- Adopting remote mentorship strategies is an efficient way to move activities forward as IDDS awaits approval for on-site mentorship activities.
- Collaboration with the local Molbio Diagnostics agent was important to provide a Truenat competency checklist and training certificates for end users at installation.
- Truenat super-users were essential to provide technical assistance and supportive supervision to improve performance.
- Inclusion of other partners in childhood TB support supervision visits (OPHID, UZT) will ensure continuity in service delivery after IDDS closes out the project.
- Providing EQA panels to coincide with the implementation of new tools (Truenat and GeneXpert MTB/XDR) is important to ensure that testing is quality assured. It is essential to identify low performing laboratories for targeted technical support and mentorship for continual quality improvement.

Project Results

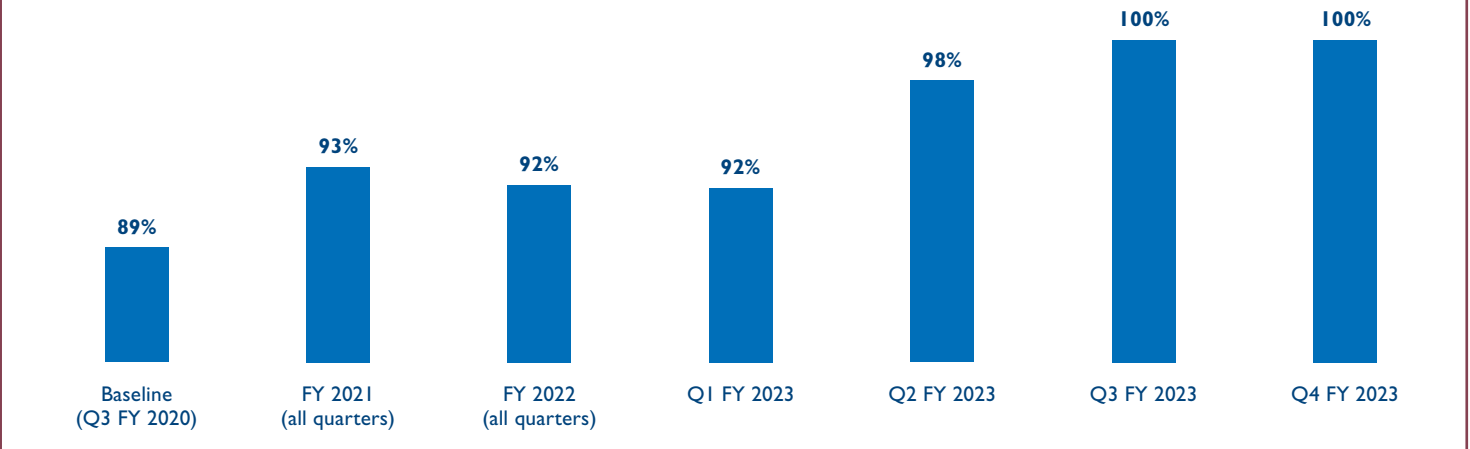
Indicator title and topics	Results*
Laboratories offering a new TB diagnostic service	34 [†]
Stool testing with GeneXpert Ultra	25
Xpert MTB/XDR	10
Laboratory accredited	1
Laboratories supported (25 stool testing with GeneXpert Ultra and QMS, 10 XDR, 20 Truenat, 2 NRL for QMS)	55 [†]
People trained	265
Pediatric TB stool testing	129
Truenat	20
Xpert MTB/XDR	97
QMS	10
Diagnostic connectivity solution	6
Other TB diagnostic activity (research)	3
Support supervision visits	114
Pediatric TB stool testing	42
Truenat	60
Testing procedures	5
Private sector engagement	7

Pilot conducted	1
Private sector engagement	1
Assessments completed	2
Testing procedures	2
People mentored	125
Pediatric TB stool testing	15
Testing procedures	68
QMS	42

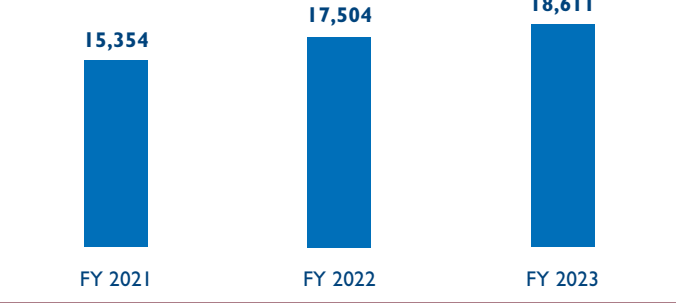
*Output results are for FY 2023 and FY 2024 Q1 and include field and Core TB funds.
†Total number of laboratories may be less than the sum of laboratories listed if there are laboratories implementing more than one testing procedure.

IDDS improved the functionality of GeneXpert instruments from 89 percent to 100 percent over FY 2022 and FY 2023. During this time, Zimbabwe increased the number of GeneXpert instruments from 620 to 736. IDDS helped monitor the network of instruments; provided replacements, computers, and installation of solar power backups at 25 sites; and implemented GxAlert to strengthen monitoring and reporting of laboratory performance and equipment functioning at the national level. Ensuring the continuous functionality of the GeneXpert instruments, together with the rollout of Truenat at 20 health centers, contributed to increased numbers of TB cases notified in FY 2022 and FY 2023. The proportion of presumptive TB patients tested with a WRD also increased over this time.

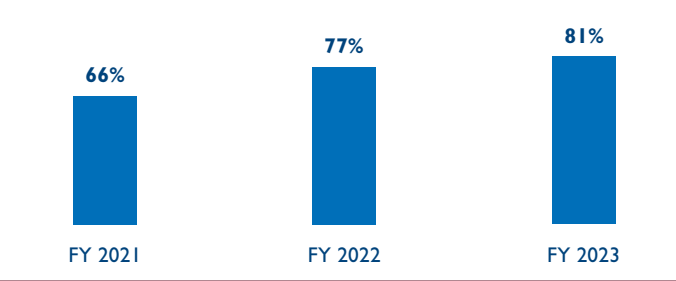
Zimbabwe: Percentage of Functional GeneXpert Modules



Zimbabwe: TB Notifications (National Level)



Zimbabwe: Percentage of Presumptive TB Cases That Are Tested With WRD (National Level)



CORE TB

Context

Through Core TB funding, IDDS worked with NTPs to create comprehensive national TB and DR-TB diagnostic networks by developing revised national TB diagnostic algorithms to support site-level testing, conducting spatial analyses and DNAs, introducing and scaling up new diagnostic technologies and techniques, and strengthening laboratory systems to deliver efficient and quality testing for all potential TB cases. As a global leader in improving the capacity and quality of TB diagnostic networks, IDDS conducted operational research on the implementation of new technologies and regularly presented evidence to advance solutions to problems in TB diagnostics. Core TB activities were stopped in July 2023.

“The installation of the I0-color GeneXpert technology at my facility is a dream come true. For the patients, it will lead to faster and more accurate DST results, the potential to test and initiate treatment for drug-resistant TB in a single visit, and the adjustment of treatment as early as possible to reduce [out-of-pocket health care] costs and improve patient outcomes.”

— Dr. Nathan Onyachi, director, Lira Regional Referral Hospital, Uganda

Annual Highlights

Diagnostic

- To analyze gaps and opportunities for improvement in national diagnostic networks, IDDS conducted LNSAs in **Ethiopia, Malawi, Tanzania, Uganda, and Zimbabwe**, and conducted DNAs in **DRC, Kenya, Malawi, Pakistan, and South Africa**. A [blog](#) noted the initial findings and innovations from assessing the TB diagnostic network in **Malawi**.
- IDDS continued support to NTPs to implement Truenat testing for the rapid detection of TB, providing 4 instruments to sites in **Malawi** and 30 instruments to sites in **Tanzania** (the latter through the Global Fund). IDDS trained 80 super-users and 253 end users in Truenat testing and supported the 2023 Truenat EQA cycles for **Cambodia, DRC, Kenya, Malawi, Tanzania, and Zimbabwe**.

PARTNERS AND COLLABORATORS

- National tuberculosis programs in Bangladesh, Burma, Cambodia, DRC, Ethiopia, India, Kenya, Malawi, Mozambique, Nigeria, Pakistan, the Philippines, South Africa, Tanzania, Uganda, and Zimbabwe

GLOBAL PARTNERS

- introducing New Tools Project
- Stop TB Partnership

- To improve access to pre-XDR TB testing, IDDS installed 8 GeneXpert I0-color instruments to support MTB/XDR testing in **Cambodia, Malawi, and Uganda**, and trained 83 people on how to use this new platform. To ensure that testing is quality assured, IDDS provided 2,023 MTB/XDR EQA panels.
- IDDS developed a compendium of DR-TB resources, which compiles all materials developed as part of the DR-TB activities. IDDS also developed an EQA implementation guide for Truenat and a super-user package for MTB/XDR, which were endorsed by the Stop TB Partnership. These “global goods” advance knowledge on rolling out new TB diagnostic technologies around the world.
- IDDS supported a DST training workshop in **Ethiopia** for more than 100 key stakeholders from more than 20 countries, which helped identify key gaps and challenges in assessing first- and second-line DST for DR-TB patients and will help devise strategies to introduce and increase second-line DST in countries.
- To improve childhood TB case detection rates in **DRC**, IDDS supported NTP to introduce stool-based testing. IDDS concluded the pilot implementation of pediatric stool-based testing at 25 sites in Kinshasa, which enrolled 709 children presumed to have TB, tested 684 stool samples, and detected TB in 125 children. IDDS hosted a webinar to disseminate the results.
- To support sustainable workforce capacity for childhood TB testing, IDDS trained six master trainers from the Uganda SRL and other consultants to allow them to start training in other countries on the SOS stool processing method. The SRL master trainers trained participants from eight countries (**Benin, Botswana, Liberia, Rwanda, Sierra Leone, Somalia, Tanzania, and Uganda**) on the SOS method. IDDS also sponsored two NTP officials from Cambodia and two from Mozambique to attend the regional training on the SOS method that the Uganda SRL hosted.



- IDDS collaborated with USAID and the Uganda SRL to organize the Pediatric TB Community of Practice. This platform aims to strengthen TB diagnosis in children by sharing experiences with new approaches to pediatric TB diagnosis, including stool-based TB diagnosis in USAID-supported countries. IDDS hosted the first meeting on May 22, 2023, with 88 participants in attendance.
- IDDS supported the implementation of connectivity solutions, including Savics’s DTC and SystemOne’s GxAlert/Aspect, for 1,141 Truenat and GeneXpert instruments in 6 countries (**Bangladesh, Cambodia, Mozambique, the Philippines, Tanzania, and Zimbabwe**). Connecting diagnostic instruments to an automated data transfer system provides seamless data transmission from the laboratory, in real time, to national program decisionmakers, patients, and referring clinicians.

Challenges

- Truenat EQA scores were low in DRC and Zimbabwe. IDDS headquarters and country team members developed an end user refresher training workshop agenda for these two countries. The refresher training was completed in Zimbabwe, but funding was not available to complete the refresher training in DRC.
- Multiple actors support diagnostic network optimization activities, and NTPs and NTRLs are often unaware of the differences in the offerings. IDDS worked with USAID and NTRLs to identify other ongoing processes and suspended the plan to complete an LNSA in Pakistan, due to work that FIND conducted for diagnostic network optimization. IDDS staff participated in debriefing a diagnostic network optimization activity in Zimbabwe to ensure that recommendations of the optimization activity and the IDDS LNSA were in alignment.

What We Learned

- Providing three-day end user refresher training is essential to build proficiency and confidence of the Truenat laboratories and address challenges identified through the EQA. For all Truenat training, limit the participant size to 15–20 to better manage the time, and ensure that training laboratories are available for practical exercises.

- Super-user debriefing workshops in DRC and Kenya were key to understanding challenges with Truenat implementation and developing action plans to improve performance of the sites on EQA. IDDS documented [super-users overcoming challenges to Truenat rollout in DRC](#).
- Country teams need clarity on customs clearing processes before placing orders for GeneXpert or Truenat instruments. Limited awareness of processes led to delays in clearing customs, although close collaboration with both USAID mission and NTP staff can speed up these processes.
- Remote mentoring for laboratory accreditation activities is possible and provides a cost-effective alternative when necessary to accommodate the activities.

Project Results

Indicator title and topics	Results
People trained	568
TB DNA	37
Pediatric TB stool testing	62
Truenat	290
Xpert MTB/XDR	83
Testing procedures	14
Biosafety	70
SOPs, plans, or guidelines developed or updated	84
Other TB diagnostic activity [†]	2
Pediatric TB stool testing	1
Truenat	1
Xpert MTB/XDR	1
Testing procedure	1
QMS	78
Support supervision visits	113
Pediatric TB stool testing	7
Truenat	103
Xpert MTB/XDR	1
Testing procedures	2
TWG meeting held	1
Pediatric TB stool testing	1
Pilot conducted	1
Pediatric TB stool testing	1
Assessments completed	7
TB DNA	2
LNSA	4
Truenat	1
People mentored	12
QMS	12

*Output results are for FY 2023.
[†]Drug resistance survey and sentinel site surveillance protocols.

INTEGRATED DISEASE SURVEILLANCE AND RESPONSE

Context

The IDSR framework was developed by the WHO Regional Office for Africa to improve epidemiological surveillance and response in Africa. The IDSR technical guidelines specify what needs to be established at each level of the health system in the WHO Regional Office for Africa to detect and respond to diseases, conditions, and public health events that are responsible for all preventable illnesses, deaths, and disabilities in local communities. The guidelines recommend thresholds for action on priority diseases, public health events, and conditions, and for responding to alerts.

IDDS worked to implement the third edition of the IDSR guidelines in Cameroon, Senegal, and Uganda, funded by the USAID Bureau for Africa. This five quarter report includes activities from two separate IDSR work plans (see quarterly reports for details)

“The Southwest region has now moved from the ninth to the third position regarding surveillance at the regional-level surveillance classification.”

—Dr. Samuel Agwe, regional coordinator of the fight against epidemics, Cameroon

Annual Highlights

Surveillance

- To inform IDSR assessments at the subnational level, IDDS developed a supplemental questionnaire for use by the WHO Regional Office for Africa during IDSR capacity assessments in **Senegal** and **Uganda**. The supplemental questionnaire includes areas not covered by the main assessment tool, such as workforce management and data accuracy.
- In **Cameroon**, IDDS implemented a coaching approach to improve IDSR indicators in the Southwest region of the country. Surveillance focal people who participated in training held by IDDS in the previous quarter served as the coaches and participated in 10 weekly online data review meetings. IDDS provided additional supervision for districts with low IDSR performance that are prone to outbreaks. As gaps were identified during supervision visits, health authorities were able to implement changes to improve the quality of data analysis and interpretation.

PARTNERS AND COLLABORATORS

- Ministries of health
- World Health Organization

- In **Senegal**, IDDS trained 104 health staff (57 female) who will support IDSR in 4 health districts (Bakel, Dianke Makha, Goudiry, and Kidira). IDDS also held a data review meeting for all seven health districts in Tambacounda region, which was the first comprehensive review of data across health districts in more than one year, because various health sector strikes prevented consistent and comprehensive sharing of data. Finally, IDDS supported the Ministry of Health and Social Action and the Tambacounda regional health directorate to conduct supportive supervision visits to the seven health districts, during which staff evaluated knowledge of IDSR guidelines using an IDDS developed checklist.
- To equip health workers in **Uganda** to monitor and respond to infectious disease events, IDDS supported the rollout of the third edition of IDSR technical guidelines by training 109 frontline health workers and veterinarians (49 female) from Buikwe district and 30 health facility-based health workers, fisheries officers, and veterinarians (8 female) from Buvuma district. With MoH and district health teams, IDDS also jointly conducted supportive supervision in 16 health facilities (25 percent of the 65 health facilities) in Buikwe district and 14 of 15 health facilities in Buvuma district.

Challenges

- A health sector strike in Senegal delayed collaboration with key stakeholders in the Ministry of Health and Social Action and across the health sector.
- IDDS experienced delays in implementation in Uganda due to (1) key collaborators in MoH responding to the EVD (Sudan variant) outbreak, and (2) waiting for approval of the exemption memo that allows for IDDS’s engagement with government officials. The EVD (Sudan variant) outbreak was declared over in Uganda on January 11, 2023.

What We Learned

- Post-training support to health facilities is critical to transforming the knowledge acquired into sustained action, because it provides monitoring and reinforces IDSR implementation. By ensuring the dissemination of guidelines to other health workers who did not participate in the training, IDDS ensures that there are opportunities for continuous professional development sessions in health facilities.
- It is critical to closely coordinate with regional organizations that are leading public health activities, such as the WHO Regional Office for Africa, to harmonize field support and align expectations.

Cameroon—Project Results

Indicator title and topics	Results*
Data review meetings held	34
Support supervision visits	22
Data quality	22
Pilot conducted	1
Data quality	1

*Output results are for FY 2023 and FY 2024 Q1.

In Cameroon, IDDS supported the rollout of the third edition of the IDSR technical guidelines in the Southwest region through training and supportive supervision. The initial training was conducted in August 2022 for regional and district-level staff, after which there was an increase in reporting rates. Although support ended in FY 2023 Q3,

IDDS collected data in Q4 to review site performance after the project’s interventions ended.

Senegal—Project Results

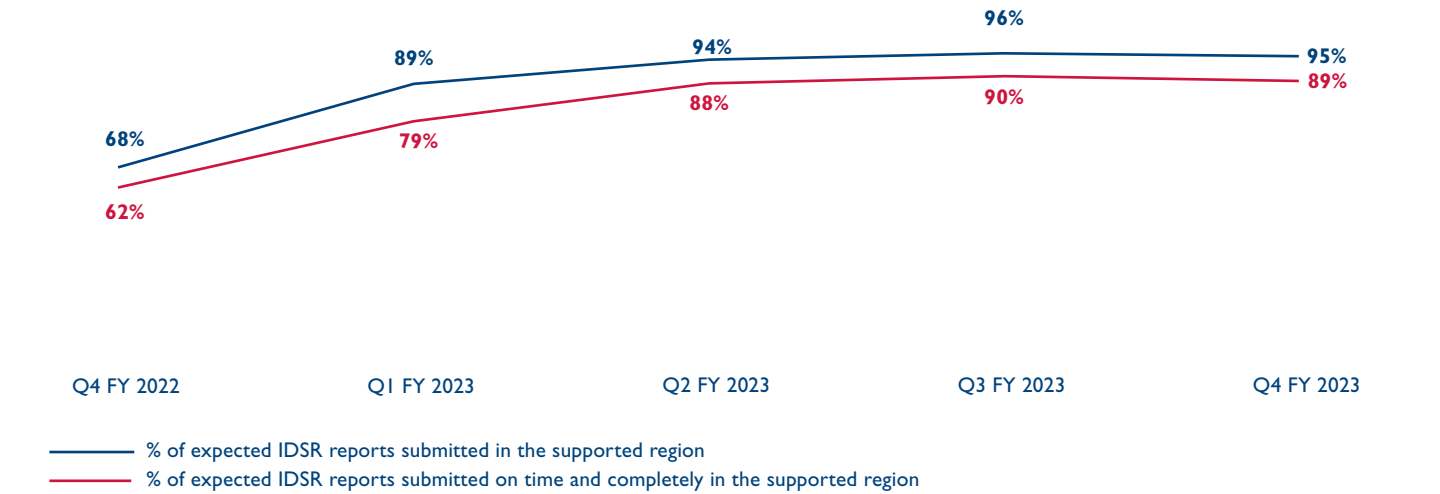
In FY 2023, IDDS supported the Senegalese government to

Indicator title and topics	Results
Data review meeting held	1
People trained	104
IDSR†	104
Support supervision visits†	21
Other surveillance*	21

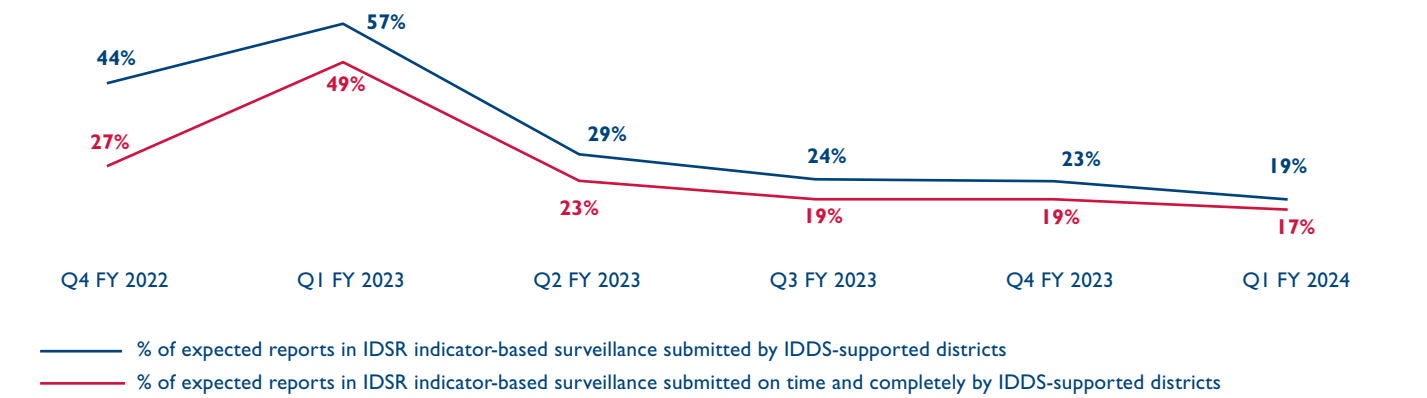
*Output results are for FY 2023 and FY 2024 Q1.
†Included rollout of the third edition of IDSR technical guidelines, and use of the DHIS2 health information system.

roll out the third edition of the IDSR technical guidelines in seven health districts of Tambacounda region through training and supportive supervision, contributing to the strengthening of its surveillance system. Starting in FY 2022 Q1, three health districts were expected to report weekly, and in FY 2023 Q1, an additional four district sites were trained and expected to start weekly reporting (see figure on next page). In FY 2023, the timeliness and submission rates of IDSR reports started to fall, mainly due to surveillance staff across the country retaining their data as part of the national health workforce strike in Senegal, although some reporting units continued to submit their data on time. The strike began in the middle of 2022 and is ongoing. Site staff assert that data retention is a method to push the government to action.

Cameroon: Timeliness and Completeness of Reporting in the Southwest Region



Senegal:Timeliness and Completeness of IDSR Reporting by IDDS-supported Districts ofTambacounda Region*



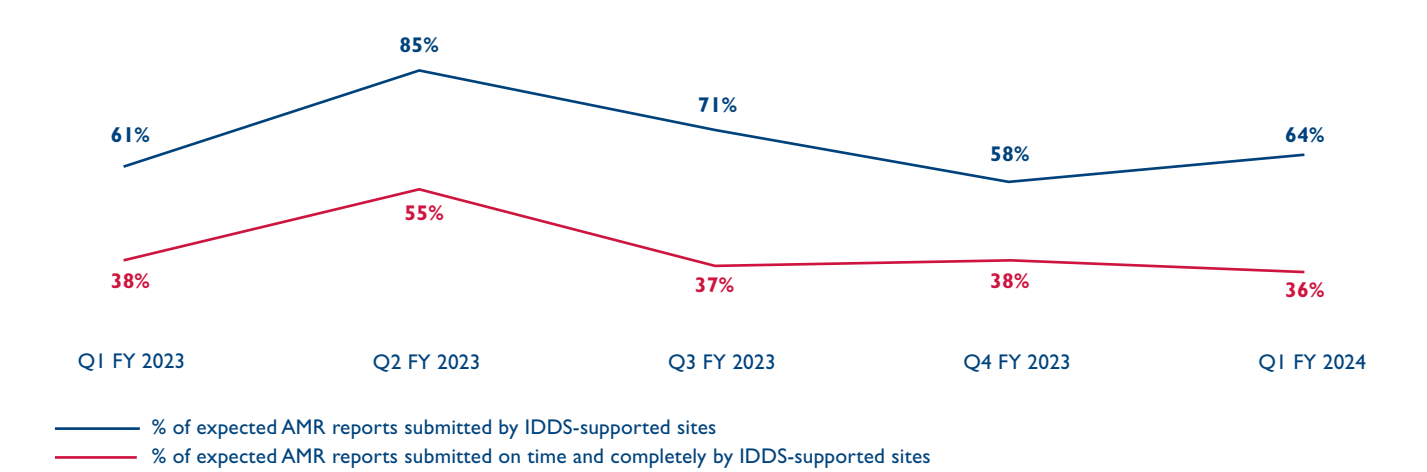
Uganda—Project Results

Indicator title and topics	Results*
Data analysis and use	30
IDSR	109
Support supervision visits	30
Data analysis and use	30
TWG meeting held	1
IDSR	1

*Outputs are for FY 2023 and FY 2024 Q1.

In FY 2023, IDDS supported the Ugandan government to roll out the third edition of the IDSR technical guidelines in Buikwe district through training and supportive supervision, contributing to the strengthening of its surveillance system. In FY 2024 Q1, IDDS supported training and supportive supervision visits in Buvuma district.

Uganda:Timeliness and Completeness of Reporting in the IDDS-supported Sites*



*From FY 2023 Q1 to Q3, 65 health facilities were expected to report weekly, and in FY 2023 Q4, an additional 4 sites were expected to report (totaling 69 health facilities). In FY 2023 Q4, support expanded to Buvuma district, with 13 health facilities expected to report. FY 2023 Q4 is the baseline for Buvuma district.

MIDDLE EAST AND NORTH AFRICA

Context

IDDS led the development of a tool for conducting DNAs in USAID’s Middle East and North Africa (MENA) region, which can be used to evaluate the capacity and function of countries’ diagnostic networks and preparedness to respond to high-risk emerging disease threats. The DNA tool was piloted in Tunisia in FY 2023.

Annual Highlights

Diagnostic

- IDDS created an electronic version of the MENA tool in Airtable and an accompanying data collection tool in SurveyCTO that uses the data housed in Airtable. English, French, and Arabic versions of the tool were created to minimize language barriers and improve usability of the tool in the field.
- In Tunisia, IDDS completed the pilot of the DNA tool, including the self-assessment and site verification visits. Lessons from the pilot informed updates to the MENA DNA tool, as well as pandemic preparedness funding opportunities from the World Bank, WHO, and the Global Fund to Fight AIDS, Tuberculosis and Malaria.
- IDDS conducted an after-action review to solicit feedback and improve the DNA tool. The improved DNA tool, electronic verification checklists, and associated training materials and templates were delivered to USAID and can be used for future assessments.

Challenges

- Ongoing security concerns prevented IDDS from carrying out a second DNA in Yemen as initially planned. Participation from Yemen consultants was not possible, so the sole pilot of the MENA DNA tool took place in Tunisia.
- There was no IDDS in-country consortium partner in Tunisia to provide logistical support for the pilot, including the self-assessment workshop and the assessor training workshop. IDDS contracted an organization used by the USAID Mission, the Tunisian Association for the Fight against Sexually Transmitted Diseases and AIDS, to provide logistical support for the events, including a vehicle and drivers for verification visits.

PARTNERS AND COLLABORATORS

- Association of Public Health Laboratories
- World Bank

What We Learned

- For site verification visits, allowing for three to four hours per facility was not adequate for assessment teams to complete the verification checklists.
- A post-assessment debrief with assessor teams provides important feedback and is essential to improve the DNA tool and processes.
- Expanding the number of sites visited for the verification assessment would improve generalizability of the findings.

ABBREVIATIONS

4S	Senegalese Syndromic Sentinel Surveillance	FY	fiscal year	NCDC	National Center for Disease Control	SLIPTA	Stepwise Laboratory Improvement Process Towards Accreditation
AMR	antimicrobial resistance	GHS	Global Health Security	NDD	National Diagnostics Division	SOP	standard operating procedure
ARP	American Rescue Plan	GLASS	Global Antimicrobial Resistance Surveillance System	NMRL	National Microbiology Reference Laboratory	SOS	simple one-step
ASLM	African Society for Laboratory Medicine	IDDS	Infectious Disease Detection and Surveillance	NPHL	National Public Health Laboratory	SRL	Supranational Reference Laboratory
AST	antimicrobial susceptibility testing	IDSR	Integrated Disease Surveillance and Response	NRL	national reference laboratory	SRS	specimen referral system
BSL	biosafety level	INRB	<i>Institut National de Recherche Biomédicale</i> (National Biomedical Research Institute)	NTEP	National Tuberculosis Elimination Program	TB	tuberculosis
CAD	computer-aided detection	INSP	<i>Institut National de Santé Publique</i> (National Institute of Public Health)	NTLEP	National Tuberculosis and Leprosy Elimination Program	TWG	technical working group
CBS	community-based surveillance	ISO	International Organization for Standardization	NTLP	National Tuberculosis and Leprosy Program	USAID	United States Agency for International Development
CDC	U.S. Centers for Disease Control and Prevention	JEE	Joint External Evaluation	NTP	national tuberculosis program	VAHIS	Vietnam Animal Health Information System
CDW	central data warehouse	LAARC	Laboratory Assessment of Antibiotic Resistance Testing Capacity	NTRL	National Tuberculosis Reference Laboratory	WHO	World Health Organization
CENAT	National Center for Tuberculosis and Leprosy Control	LIMS	laboratory information management system	OD	operational district	WRD	World Health Organization-recommended rapid diagnostic test
CHW	community health worker	LMICs	low- and middle-income countries	PCR	polymerase chain reaction	XDR	extensively drug-resistant
CNM	National Center for Parasitology, Entomology, and Malaria Control	LNSA	laboratory network spatial analysis	PhilCZ	Philippine Interagency Committee on Zoonoses		
DAH	Department of Animal Health	LPA	line probe assay	PMI	U.S. President's Malaria Initiative		
DNA	diagnostic network assessment	MENA	Middle East and North Africa	PPE	personal protective equipment		
DR	drug-resistant	MGIT	Mycobacteria Growth Indicator Tube	PT	proficiency testing		
DRC	Democratic Republic of the Congo	MoH	ministry of health	QMS	quality management system		
DST	drug susceptibility testing	MTB	<i>Mycobacterium tuberculosis</i>	RIF	rifampicin		
DTC	DataToCare	MVD	Marburg virus disease	RR	rifampicin-resistant		
EID	emerging infectious disease	NADDEC	National Animal Disease Diagnostics and Epidemiology Center	RTRL	regional tuberculosis reference laboratory		
EPHI	Ethiopian Public Health Institute	NASIC	National Antimicrobial Stewardship Interagency Committee	SAP-CAR	State Action Plan for Containment of Antimicrobial Resistance		
EQA	external quality assessment			SIZE	<i>Sistem Informasi Zoonoses dan Emerging Infectious Diseases</i> (Zoonosis and Emerging Infectious Disease Information System)		
EVD	Ebola virus disease						



Trainees reading antimicrobial susceptibility test results, Morogoro Regional Referral Hospital, Tanzania. Photo by IDDS



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