

Annex B. Success Stories, FY 2023 Q3

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IDDS Supports Multinational TB Workshop on Drug Susceptibility Testing

As drug-resistant tuberculosis (DR-TB) cases continue to increase globally ([up 3.1 percent between 2020 and 2021](#)), it has become essential to expand access to testing and treatment and to introduce new treatment regimens to address the global crisis. Recently, the World Health Organization endorsed shorter regimens for DR-TB patients: the use of 6-month and 9-month bedaquiline, pretomanid, linezolid, and moxifloxacin regimens, depending on the kind of TB drug resistance, rather than the longer (18-month) regimen that was previously recommended. As a result, countries are now trying to implement the available drug susceptibility testing (DST) options for these new and repurposed DR-TB drugs.

[USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#) recently served as the secretariat for the global workshop on Closing the DST Gap for DR-TB Patients, which was organized by USAID and the Ethiopian Ministry of Health and took place on June 21–23, 2023, in Addis Ababa. The workshop convened 100 people from more than 20 USAID TB priority countries, including multilateral donors, laboratory experts, and participants from national reference laboratories, national TB programs, supranational reference laboratories, technical assistance providers (such as FIND, KNCV, TB Alliance, and Stop TB Partnership), diagnostic developers (such as Cepheid, Molbio Diagnostics, Hain, BD, and Oxford Nanopore), and USAID mission staff from Ethiopia, India, and Kenya.



DST workshop participants. Photo by IDDS

The workshop featured presenters who described the current burden of DR-TB, the newly available DR-TB treatment options, country experiences and challenges implementing phenotypic (by observable physical traits) and genotypic (by genetic information) DST, and cutting-edge diagnostics for DST. New advances in genotypic DST through Cepheid GeneXpert® and Molbio Truenat® instruments have helped rapidly detect DR-TB cases. However, certain challenges such as stockouts and equipment maintenance remain persistent barriers to realizing the full potential of genotypic DST technology.



Presentation on the DST landscape for DR-TB. Photo by IDDS



Panel of diagnostic developers. Photo by IDDS

Various country representatives noted that although they have been conducting culture-based phenotypic DST for bacteriologically confirmed TB patients to detect drug resistance, it remains time consuming and expensive and requires sophisticated biosafety equipment and consumables. This shows that routine phenotypic DST may not be feasible for low- and middle-income countries. There were discussions around alternative, newer molecular methods, such as targeted next generation sequencing (NGS), which can quickly detect mutations and identify genomic strains as drug resistant or drug susceptible for multiple drugs during a single test run. Countries also deliberated the costs and benefits of adopting NGS systems and debated their role in routine DR-TB surveillance. Many of the stakeholders, including those from supranational reference laboratories and diagnostic developers, believed that NGS-based DST might yield promising results for DR-TB surveillance when scaled up.

Several participants and presenters emphasized the importance of equitable program design, community involvement in decision making, and patient-centered care. “Nothing for us, without us,” declared one TB survivor. Harold Hoffman of the supranational reference laboratory in Gauting, Germany, said, “Projects are made by people for people. Involve the people to make it a success.”

Importantly, 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 put it, “Differentiated strategy isn’t a bad thing; it’s about making sure the right people have access to the right drugs.” As national TB programs focus on the strategies that will work best for their particular populations and specific challenges, they are learning from their peers and exploring new collaborations.

The interactions at the workshop led not only to knowledge exchange, but also to meaningful connections that will help countries prioritize scaling up DST and expanding DR-TB surveillance to close the DR-TB treatment gap.

[USAID’s Infectious Disease Detection and Surveillance \(IDDS\) project](#) operates in more than 20 countries in Africa and Asia where there are significant gaps in health systems’ ability to detect, track, and rapidly respond to infectious diseases and drug-resistant infections that pose a major threat to public health and global health security.

IDDS Evaluates the Pilot Implementation of Truenat MTB/RIF Testing in Cambodia

In May 2022, Cambodia's National Center for Tuberculosis (TB) and Leprosy Control (CENAT) introduced Truenat® MTB/RIF, a rapid molecular test for detecting *Mycobacterium tuberculosis* (MTB), and resistance to rifampicin (RIF), at 14 health centers across the country.

[USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#)

evaluated the effect of Truenat on early diagnosis of TB and RIF resistance and its deployment at near point-of-care settings, such as the health centers. The findings are based on a desk review of data, as well as interviews and focus group discussions with patients, health workers, and government officials.



Suon Sokleap a staff member at Prek Anchanh health care center, prepares a sputum specimen for Truenat TB

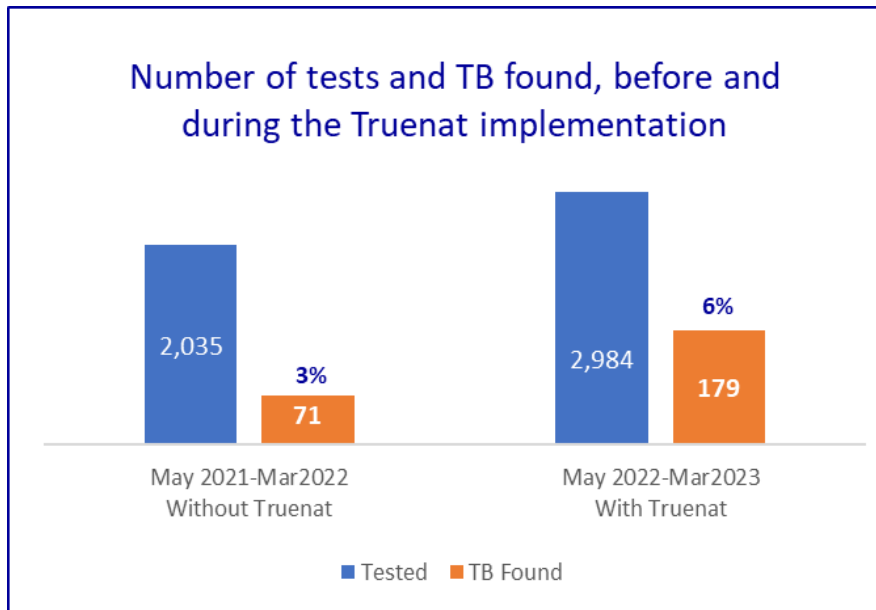
In 2022, Cambodia detected and started TB treatment for 32,865 patients out of the 47,770 (69 percent) estimated TB cases. Limited access to rapid molecular diagnostics, like Truenat, is a primary cause of under-diagnosis and under-reporting of TB cases. Smear microscopy and chest X-ray continue to be the tools of TB diagnosis in Cambodia, and urgent action is therefore needed to increase the detection of TB, particularly in hard-to-reach locations. Bringing World Health Organization-recommended rapid diagnostics closer to patients is a key priority for the National TB Control Program.



Installation and training on Truenat TB test. Photo by IDDS

With this aim, IDDS supported CENAT to conduct operational research from May to November 2022, to evaluate the operational feasibility of Truenat testing at the lowest level of the health system. Data was collected from a register of presumptive TB cases from May 2022 to March 2023 and compared with the same period from the previous year (May 2021–March 2022) from all 14 health

centers that have Truenat equipment. A total of 2,984 presumptive TB cases were tested with Truenat, of which 179 were positive. A comparison of data between the two periods shows a substantial increase in bacteriologically confirmed TB cases, from 71 (May 2021–March 2022) to 179 (May 2022–March 2023), an increase of 152 percent. Among these, 12 cases were detected as RIF-resistant. The number of TB cases detected using Truenat varied across the 14 health centers, with Prek Russey health center reporting the lowest number of cases, and Sandan health center reporting the highest number of cases. The variability with TB case detections may be due to differing disease burden, number of presumptive TB cases tested at each site, or Truenat testing practices. In addition, when questioned, laboratory technicians said that they became comfortable in performing Truenat testing after 10 tests.



The use of Truenat at near point-of-care eliminates the need for specimen transportation and detects RIF resistance at the patient’s first visit. Using Truenat reaches people who are not typically reached through existing pathways and reduces the time to detect and initiate treatment. Based on the initial success, Cambodia now plans to

replace smear microscopy with Truenat.

“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,” said Soun Sokleap, a staff member at Prek Anchanh health center, Muk Kampoul district, Kandal province.

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IDDS Supports Cameroon’s Southwest Region to Reinforce Surveillance After Integrated Disease Surveillance and Response Training

[The World Health Organization’s \(WHO\) Integrated Disease Surveillance and Response \(IDSR\)](#) technical guidelines are designed to effectively link disease surveillance and response to counter outbreaks. First released in 2002, WHO’s Regional Office for Africa has since updated the guidelines to improve them and stay on top of new developments in global health.

WHO released the third edition of the IDSR guidelines in 2019, recommending that member states adapt the guidelines to their specific needs. Cameroon immediately joined this process and is currently implementing the new guidelines with support from [USAID’s Infectious Disease Detection and Surveillance \(IDDS\) project](#). Health professionals from Cameroon’s Southwest region were trained on the third edition of IDSR in August 2022, with the recommendation to establish a mentoring/coaching process after the training. In 2021, the Ministry of Public Health in Cameroon developed an innovative strategy that includes mentoring and close follow-up of surveillance activities at all levels.

The mentoring process, supported by IDDS, started in the Southwest region with training of the new coaches. A two-day event was held in November 2022 to train regional and district coaches on the approach, the activities to be conducted, and the expected results. In total, 21 district coaches (12 female) from 18 of the Southwest region’s 19 health districts, and 3 regional coaches from the Delegation of Public Health, were trained. For the implementation of the IDSR guidelines, IDDS provided cell phone credits to regional and district coaches from January to May 2023, supporting the weekly data review meetings as well as phone calls to improve disease surveillance at the district level. In total, 21 weekly data review meetings were held at the regional level from December 2022 to June 2023.

An analysis of IDSR performance at the regional and the district levels was carried out in April to evaluate the effects of the coaching. The analysis showed that some surveillance indicators have been improved with the coaching process. Dr. Agwe Samuel, the regional coordinator of the fight against epidemics in the Southwest region said, “The Southwest region has now moved from the ninth to the third position regarding surveillance at the regional level surveillance classification.”

Following the analysis of IDSR performance, low-performing health districts were prioritized for supervision. In total, 11 health districts and 11 health facilities were supervised on April 17–21, with IDDS support. The main recommendation from the analysis was to expand coaching at the local level to improve data collection, analysis, and interpretation. The coaching/mentoring process will continue in the Southwest region.



Supervision of IDSR activities at Presbyterian Hospital Manyemen, April 2023. Photo by IDDS



Supervision of IDSR activities at Kumba South District, April 2023. Photo by IDDS



Coaching training session in the Southwest region, November 2022. Photo by IDDS

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IDDS Supports Cameroon to Decentralize Testing and Boost Mpox Surveillance

Mpox made headlines around the world in July 2022, when the World Health Organization declared a multi-country outbreak of the infectious disease to be a Public Health Emergency of International Concern. Mpox is a zoonotic virus (one that can be transmitted from animals to humans), similar to smallpox.

Cameroon was one of the affected countries, and although the public health emergency was declared over in May 2023, it has continued to detect cases, with more than 60 recorded in 2023.

The majority of the mpox cases continue to come from Cameroon's Southwest region, which poses a major challenge for diagnostics. All the mpox samples in Cameroon are tested at Centre Pasteur in the capital Yaoundé, which is the only reference laboratory able to confirm human mpox virus. Yaoundé is more than six hours by road from the Southwest's regional capital of Buea. To improve diagnosis turnaround time, Cameroon's Ministry of Public Health is working to decentralize mpox specimen testing to the most affected regions with the support of [USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#).

The process started with the evaluation of three regional laboratories (Bertoua Regional Hospital in the Eastern region, Bamenda Regional Hospital in the Northwest region, and Laquintinie Hospital in Douala, Cameroon's largest city, which is less than two hours from Buea) on February 6–15, 2023, to identify their gaps and needs for mpox diagnosis. After conducting this assessment, IDDS purchased 1,500 mpox polymerase chain reaction tests and associated reagents and consumables to support mpox testing at the national level and regional training, and provided the small equipment required to improve diagnostic capacities in the different laboratories.

To operationalize a regional diagnostics plan for mpox, IDDS technically and financially supported training for staff from two of the regional laboratories (Laquintinie and Bertoua) and two central laboratories (National Veterinary Laboratory and National Public Health Laboratory). The four-day training workshop took place in at Laquintinie Hospital in Douala on May 22–25, 2023, and was facilitated by Centre Pasteur of Cameroon.

In total, 13 participants (7 female) from the 4 laboratories were trained. The representative of the National Public Health Laboratory thanked IDDS during the training for the opportunity to decentralize mpox testing, which will allow rapid confirmation of cases. This will strengthen mpox surveillance, for early outbreak detection and timely response. The next steps after the training included practice on mpox diagnosis by the laboratories and mentorship by Centre Pasteur of Cameroon to be sure that all the laboratories are working safely and delivering reliable results. After

the practical phase, three out of the four laboratories succeeded in recording accurate mpox test results.



Evaluation of Bamenda regional laboratory, February 2023. Photo by IDDS



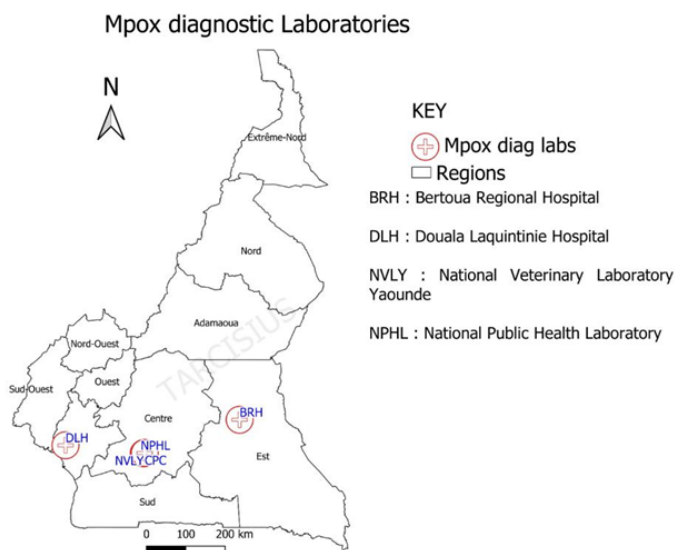
Practical session during the training of laboratory personnel on diagnosis of mpox, May 2023. Photo by IDDS



Microcentrifuges and fridges donation to Laquintinie laboratory, May 2023. Photo by IDDS



Group picture during the training of laboratory personnel on mpox diagnosis, May 2023. Photo by IDDS



Map showing the geographical distribution of laboratory trained on mpox diagnosis, July 2023. Photo by IDDS

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IDDS Supports the Introduction of a Laboratory Information Management System at the Democratic Republic of the Congo's National Tuberculosis Reference Laboratory

National reference laboratories are leading the fight against infectious diseases in the Democratic Republic of the Congo. They must have robust diagnostic and quality-based testing capacity, including accurate and timely reporting of laboratory data. However, the Kinshasa National Tuberculosis Reference Laboratory (NTRL) has been short of a vital team member: a laboratory information management system (LIMS).

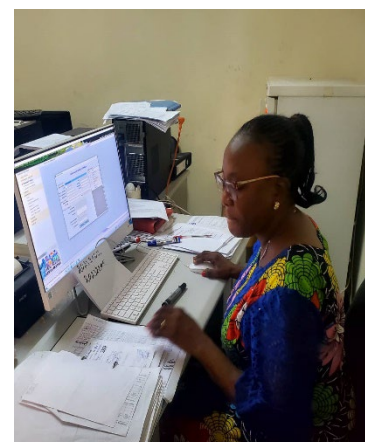
An LIMS is software that improves laboratory productivity and efficiency, by keeping track of data on specimens, laboratory workflows, and instruments. An LIMS can automate workflows and share and track the results that a laboratory generates every day. Until recently, Kinshasa NTRL relied on a paper register for tracking specimen receipt and an Excel spreadsheet for management of other related data.

An LIMS was needed to manage laboratory data on drug resistance patterns, turnaround time for testing, and consumable management, and to attain results that are not available in the current system. An LIMS can also enable accurate and timely transmission of data to inform public health practices, better manage human and laboratory resources, track quality control data, manage workflows, and store data for long-term recordkeeping. It is also an important component of a laboratory's quality management system.

Kinshasa NTRL leadership felt that an LIMS was critical for the Kinshasa laboratory to support clinical service delivery, public health program operations, and research activities. NTRL approached [USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#) to kick off the process of obtaining the right LIMS and putting it to work. Kinshasa NTRL also benefits from the technical support of the Supranational Reference Laboratory (SRL) Cotonou, in Benin. IDDS provided all the necessary equipment for running the LIMS, including two computers, a barcode printer, and an Internet connection, and helped install the software. IDDS also supported training for 10 of NTRL's information technology and laboratory technicians (8 female) in Ab-lab and Evalio software, which NTRL chose as the most suitable LIMS platform.

After the training, the first three months of 2023 served as a period of software experimentation and patient registration. Regular follow-up between IDDS, Kinshasa NTRL, and SRL Cotonou was set up to monitor progress with the LIMS and tackle any problems. So far, results have been impressive, with the specimen registration rate increasing from 55 percent in January–March, to 100 percent in April–June. Kinshasa NTRL is able to monitor patients' tests in real time, from the moment a patient is registered in the database to the moment their results become available.

Biologist Françoise Mukuba has been working at NTRL for nearly 30 years and oversees the specimen reception service. She sees the new LIMS very positively: “A few months ago, my team and I had to register patients in registers that are not always well kept and to which everyone had access, thus violating the rule of confidentiality,” she explained. “Some information was not always available in the registry. Today, all the information is filed in one place and is available, and we can have the follow-up with the patient in real time.”



Biologist Françoise Mukuba registering patients. Photo by IDDS

Dr. Muriel Aloni, head of Kinshasa NTRL added, "With the introduction of LIMS, we have a global view of the NTRL's activities from sample reception, testing, and availability of



Dr. Muriel Aloni reviewing patient results. Photo by IDDS

results for each test. We have immediate access to patient data and we also have access to laboratory data. We can print the results as soon as they are available and even send them by email to the requesting doctor, even in the countryside.”

She continued, “The process of validation and transmission of data is relaxed. And it makes decision-making much easier. Even if it is not always easy to make such a change, we adapt slowly but surely to new tools. We are still counting on the support of USAID through the IDDS project as well as the collaboration with SRL Cotonou to perfect the connectivity of the network and have an overview on the management of laboratory input stocks in real time.”

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IDDS Supports the Democratic Republic of the Congo's National TB Reference Laboratory to Update the Supervisory Checklist and Supervision Manual of TB Diagnostic Network

The success of a national laboratory network depends on the proper execution of the tasks assigned to laboratory technicians at different levels, in accordance with standard procedures, as well as the technical support of higher-level laboratory staff.

The Democratic Republic of the Congo's (DRC) tuberculosis (TB) diagnostic network is organized into three levels:

- Central: National TB Reference Laboratory (NTRL) in Kinshasa
- Intermediate: 27 provincial TB reference laboratories
- Peripheral: more than 2,000 TB diagnostic and treatment centers

The central level receives technical support from the Supranational Reference Laboratory Cotonou, in Benin, at least once a year. The intermediate level receives technical support from NTRL twice a year. Finally, the peripheral level receives quarterly technical support from the intermediate level and monthly support from the health zone's technical team (DRC has 516 health zones).

To conduct quality supervision that improves the performance of staff, the general secretary of the DRC's Ministry of Health recommends that supervisors have the technical expertise and skills to use an appropriate method and tools to effectively identify problems and apply the right corrective action.

[USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#) and NTRL conducted an assessment of laboratory supervision and mentorship to lower-level laboratories in 2022. This assessment showed several weaknesses, including the use of a checklist not adapted to the current configuration of the network. IDDS also conducted a TB diagnostic network assessment 2023, which supported the findings of the 2022 assessment.

To improve the quality technical support of the TB diagnostic network at all levels, IDDS started working closely with the NTRL technical coordinator, Jean-François Buteka. The goal was to revise and update the checklist and the supervision manual to cover the various tests currently used in the DRC TB diagnostic network, including microscopy, molecular tests (GeneXpert® and Truenat®), culture tests (solid and liquid) and QuantiFERON, as well as other quality management system aspects.

With technical and financial support from IDDS, Buteka organized several working sessions and three workshops to revise the old checklist and supervision manual to integrate the updates. A draft was shared with a technical review team (made up of TB and primary health care experts), and the feedback was incorporated. The new checklist was tested at the peripheral and intermediate levels, and a validation meeting

for the final version of the checklist and supervision manual was held on March 15, 2023.

The old manual and checklist were on paper, but the new versions are available both in paper and electronic formats. They include a scoring option, making it easier to summarize priorities and problems, and automatically generate the key elements of supervision reports.

Buteka explained, “The lack of a standard supervision tool at all levels of the network was a major weakness. We appreciate the technical support received from USAID/IDDS, for updating the supervision manual and checklist. The validation of the new supervision checklist improves the quality of the entire set of operations and procedures of the TB diagnostic network and the path of workflow at all levels. Also, this is a key step for the NTRL, which is in the process of accreditation.”



Biologist Jean-François Buteka analyzes supervision reports. Photo by IDDS

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End user installing the Truenat instrument at NTRL. Photo by IDDS

Truenat Implementation in DRC Supplements Use of GeneXpert to Improve Detection of Drug-resistant TB

In 2010, the World Health Organization's endorsement of Xpert® MTB/RIF testing promised to improve early detection of bacteriologically confirmed tuberculosis (Bacc-TB) and resistance to rifampicin (a key first-line anti-TB drug). In 2011, the Democratic Republic of the Congo (DRC) introduced its first GeneXpert® instrument (the molecular testing instrument that runs the Xpert test) and incorporated it into its TB testing algorithm as the initial test.

A Bacc-TB study and the TB diagnostic network assessment (DNA) conducted in DRC by [USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#) in 2022 and 2023, identified the barriers to

systematic use of the new algorithm: low coverage of molecular tools, frequent breakdowns of GeneXpert modules and no maintenance service program, stockouts of cartridges, and intermittent power supply. Furthermore, the Bacc-TB study found that the proportion of presumptive TB tested by molecular testing increased from just 3 percent to 8 percent, from 2017 to 2021; and the TB DNA concluded that the current algorithm used is not suitable for a high TB burden country, such as DRC. The low detection of multidrug-resistant TB (MDR-TB) cases is one of the main problems for DRC's TB program: from 2019 to 2022, only 40 percent of the target set in the TB strategic plan was reached. The ability to detect MDR-TB is heavily reliant on the availability of molecular diagnostic tools such as Truenat® and GeneXpert.

In 2022, in collaboration with the Stop TB Partnership, IDDS supported the introduction and installation of 38 Truenat instrument in 4 provinces of DRC: Kinshasa (10 instruments), Kasai-Oriental (7 instruments), Lualaba (11 instruments), and Haut-Katanga (10 instruments). Like GeneXpert, Truenat is a rapid molecular diagnostic platform capable of providing rapid bacteriological confirmation of TB and rifampicin resistance. Since the introduction of Truenat, the national capacity for rapid molecular testing increased by 20 percent and has slightly improved molecular diagnostic coverage, especially in the respective provinces where microscopy is primarily used.

For drug resistant TB (DR-TB), at least 70 percent of identified MDR-TB patients come from five provinces, including three where IDDS introduced Truenat (Kinshasa, Haut-Katanga, and Kasai-Oriental). Since introducing Truenat to provinces with high DR-TB cases this past year, the three provinces have increased the number of MDR-TB patients detected compared with the previous year: by more than 30 percent for Haut-Katanga, 15 percent for Kasai-Oriental, and 11 percent for Kinshasa.

The Bacc-TB study and the TB DNA highlighted gaps in DRC’s diagnostic network—gaps that have been somewhat addressed by the introduction of Truenat. With the existing fleet of GeneXpert instruments and IDDS’s support to introduce Truenat in four provinces, DRC’s national TB program reported a 30 percent increase in detected MDR-TB cases (361 cases) from January to March 2023.

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Successful Shipment of 6,966 Ebola Specimens Across a Security Fragile Environment in Eastern DRC Using UNHAS Flight

Since Ebola virus disease (EVD) was first identified in the country in 1976, the Democratic Republic of the Congo (DRC) has suffered several outbreaks, particularly in its eastern region. This includes the provinces of North Kivu, South Kivu, and Ituri, which are supported by USAID's [Infectious Disease Detection and Surveillance \(IDDS\) project](#).

However, security in this region due to conflict has long been a problem, making transporting specimens during EVD outbreaks very challenging, especially from remote places where clashes between different armed groups are frequent.

As a result of the security situation, 6,966 specimens from the DRC's 12th and 13th Ebola outbreaks in 2021 and 2022 could not be transported by the Ministry of Public Health from the satellite laboratories of Beni and Butembo to a more secure facility. This increased the risk of new Ebola outbreaks with potential intentional or accidental virus breakout from the laboratories.

In November 2022, the Ministry of Public Health, through the National Institute of Biomedical Research (INRB), requested IDDS support for the transport of the almost 7,000 specimens to the INRB laboratory in Goma for long-term safe storage. (INRB uses two locations to store all specimens from outbreaks: INRB in Goma for the eastern provinces of DRC, and INRB in Kinshasa for the other provinces. Specimens are not destroyed but are used for quality control and research.) IDDS started a dialogue with the Ministry of Public Health to discuss how the Ebola specimens could best be transported from the satellite laboratories to the final destination. IDDS was already negotiating with the United Nations Humanitarian Air Service (UNHAS) to sign an agreement to allow transport of specimens from affected sites to testing laboratories during major outbreaks like Ebola, plague, and other dangerous infectious diseases in eastern DRC provinces.

Due to the urgency of the ministry's request, IDDS managed to reach a partial agreement with UNHAS to transport the Ebola specimens from Beni, where an airport exists, while continuing to pursue a full agreement. As a result, in collaboration with INRB in Goma, IDDS supported the transport of specimens kept at the Butembo INRB satellite site to Beni, and on January 31, 2023, all 6,966 specimens from the 12th and 13th EVD outbreaks were finally transported by UNHAS flight from Beni to Goma for safe and long-term storage at the INRB regional laboratory.

IDDS learned some valuable lessons from the experience of relocating the Ebola specimens:

- Close collaboration between Ministry of Public Health and IDDS resolved the long-term issue of the inability to move highly dangerous biological specimens from an unsafe environment to a safe storage location.
- IDDS's foresight in negotiating the transport of biological specimens with UNHAS enabled the movement of specimens over areas where the security situation was unpredictable.
- Fighting broke out in the region a few weeks after the transport of EVD specimens was completed. Consequently, UNHAS interrupted its flights in eastern DRC. However, IDDS, in collaboration with the Ministry of Public Health, managed to move almost 7,000 Ebola specimens to a safe location and protect the community from potential danger of new outbreaks or a biological weapon that could result from accidental or intentional breakage of specimens kept in a very fragile security environment with frequent armed conflict.



Specimen arrangement and packaging in isothermal boxes by INRB staff in Beni.



Transport of EVD specimens from Beni to the INRB laboratory in Goma, in collaboration with UNHAS. Photos by IDDS

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IDDS Strengthens Animal Health AMR Detection and Surveillance in Ethiopia

Antimicrobial resistance (AMR) occurs when disease-causing pathogens evolve and are no longer responsive to the same medicines. The World Health Organization has declared AMR a threat to global health and called for urgent action. Implementing appropriate strategies to restrict the spread of AMR and reduce its impact, as well as to support the effective identification and surveillance of AMR, is essential. In 2021, Ethiopia's Ministry of Health, Ministry of Agriculture, and Ministry of Environment, Forest and Climate Change developed a third strategic plan (2021–2025), which recognized the growing concern over AMR and its potential impact on both human and animal health.

According to the results of a baseline assessment of AMR surveillance facilities conducted by [USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#) in April 2022, Bahir Dar Animal Health Investigation and Diagnostic Laboratory (BAHIDL) was not fully functional. It had a poor workflow, had limited capacity for processing microbiological specimens, did not have an AMR surveillance system in place, lacked a quality management system, and lacked AMR detection and surveillance collaboration across animal and human health institutions.

Together with Ethiopia's Animal Health Institute (AHI) and BAHIDL staff, IDDS initiated an AMR surveillance program with the aim of identifying priority AMR pathogens and operationalizing BAHIDL's laboratory diagnostics. The program used a mentorship approach that included training the staff in inoculation and identification, media preparation, sterilization techniques, biosafety, and laboratory quality management systems, to prepare the laboratory for International Organization for Standardization 17025 accreditation, which covers the competency of laboratories. IDDS also facilitated the certification of the laboratory's biosafety cabinet and trained the laboratory staff on WHONET installation, configuration, data entry, data analysis, and dissemination. WHONET is the World Health Organization's free microbiology laboratory database software, which focuses on AMR surveillance.



Figure 1: Workflow arrangement in the specimen processing and identification room before (left) and after (right). Photos by IDDS



Figure 2: Collection of milk at farm level, performing of CMT test, and laboratory microbiology culture isolation and identification at Bahir Dar Animal Health Investigation and Diagnostic Laboratory. Photos by

In addition to the technical support, IDDS assisted in the procurement of the necessary reagents and consumables and provided financial support to collect and transport surveillance specimens from farms to the testing laboratory. After the laboratory conducts the test, the test result report will be shared with AHI.

From May to June 2023, staff from IDDS and AHI visited 49 farms and households in 3 milk production areas in Ethiopia's Amhara region districts of Durbeti, Wereta, and Adite. They inspected 122 cows and checked 481 teats, with 74 teats (15.4 percent) reported as positive for California Mastitis Test (CMT), a potential bacterial mastitis infection. Milk specimens from the 74 detected infected quarters (a cow breast has 4 teats, and each teat is considered a quarter) were

sent to the laboratory for bacterial identification and antimicrobial susceptibility testing.

Of the 74 CMT-positive milk specimens isolated, 24 (32.4 percent) were *S. aureus* positive and 5 (6.75 percent) were positive for *E. coli*. The *S. aureus* isolates were 100 percent resistant to the drugs streptomycin, amoxicillin, and ampicillin.

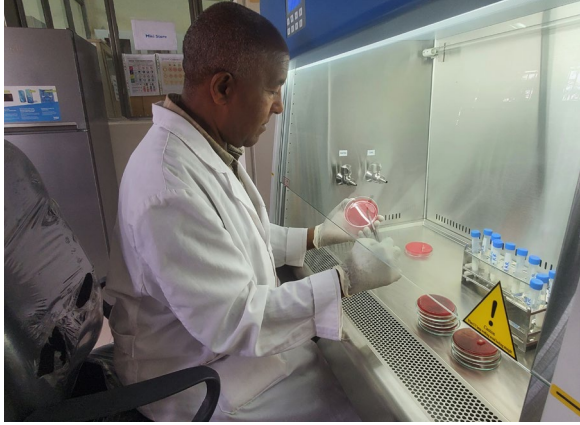


Figure 3: Microbiologists process milk samples collected from nearby farms in a certified biosafety cabinet. Photo by IDDS

With IDDS support, the laboratory identified priority bacterial pathogens and detected AMR strains in mastitis that are resistant to frequently administered antimicrobial drugs. The collected data provide valuable insights into the prevalence and patterns of AMR in mastitis in the region where the milk samples are collected. It will enable AHI and BAHIDL to develop evidence-based policies and guidelines for the correct use of antimicrobials in animal agriculture. This will further aid in minimizing the risk of AMR. AHI and BAHIDL can also implement targeted interventions to prevent the spread of resistant bacteria and protect animal health.

The IDDS project's experience could serve as a model for other animal health laboratories experiencing challenges providing AMR detection and surveillance in their efforts to combat antibiotic resistance in the agricultural sector.

[USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#) operates in more than 20 countries in Africa and Asia where there are significant gaps in health systems' ability to detect, track, and rapidly respond to infectious diseases and drug-resistant infections that pose a major threat to public health and global health security.

Biosafety and Rapid Diagnostic Trainings Provide Enhanced Protections Following Guinea's 2021 Ebola Outbreak



Government of Guinea and U.S. government officials at the launch of the Ebola rapid diagnostic test training at Nzérékoré. Photo by IDDS

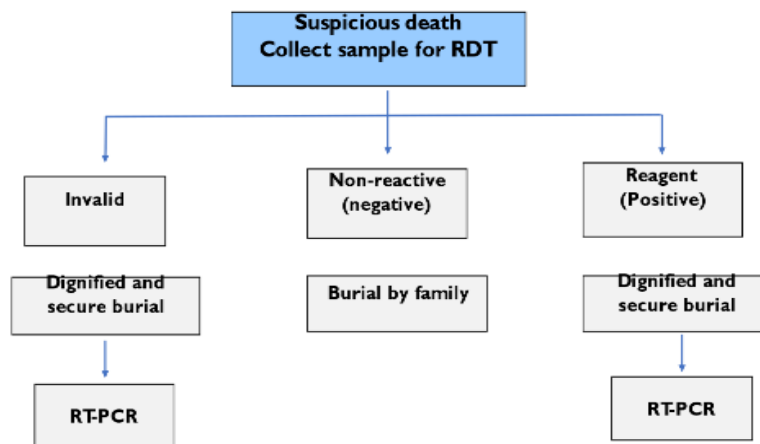
The 2014–2016 Ebola outbreak in Guinea killed 2,544 people, many of them health care workers. Trainings on biosafety and biosecurity (BS/BS) improved during the 2014–2016 outbreak, but the country still encounters challenges with health care worker experience and adoption of BS/BS measures. For example, in Guinea's 2021 Ebola outbreak, half of the infected patients were health care workers. The recent outbreak also burdened Guinea's laboratory diagnostic capacity at a time when the country was also responding to the COVID-19 pandemic.

To contain the 2021 Ebola outbreak and avoid additional health care worker and community-level infections, [USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#) provided support to Guinea's Ministry of Health. Additional support was provided by the U.S. Centers for Disease Control and Prevention, the International Committee of the Red Cross, International Federation of Red Cross and Red Crescent Societies, and Institute Pasteur. IDDS provided technical and financial assistance to increase the knowledge of health care workers and laboratory staff in the health zones on BS/BS practices and how to perform OraQuick Ebola rapid diagnostic tests (RDTs). The efforts focused on post-mortem surveillance during the 90-day period following the outbreak to reduce the risk of accidental infection in laboratory and clinical settings (hospitals and health centers) and at the community level.

Close collaboration with the Government of Guinea and implementing partners also led to the formation of a country-level technical working group. The technical working group met regularly to develop protocols, training materials, standard operating procedures, job aids, and Ebola diagnostic algorithms for using RDTs. The algorithm included steps that health care workers should follow during the testing process. For example, if the patient is suspected to be infected with Ebola virus disease (EVD) or if the test result is indeterminate, patient specimens are sent to a laboratory for confirmatory testing using polymerase chain reaction.



Use of Ebola RDTs at community and hospital deaths



Quality Assurance: Retest all positives, all Invalids and 10% of Negatives

Figure: EVD rapid diagnostic algorithm



Participants at BS/BS Training in Kindia. Photo by [unreadable]

In addition, three BS/BS and waste management training sessions were organized in Nzérékoré and Kindia for 45 health care workers from the Nzérékoré and Conakry health districts, and an RDT training was conducted by IDDS in collaboration with the Ministry of Health.

The goal of the six-day, hands-on RDT training was to strengthen the capacity of health care workers in the Nzérékoré region to screen for the Ebola virus in corpses through the safe use of OraQuick Ebola RDTs. Held in June 2021, a total of

55 people were trained, including laboratory technicians, morgue staff, safe and dignified burial personnel, epidemiologists, Red Cross volunteers (such as swabbers and hygienists), and health center chiefs from the 17 health zones in Nzérékoré Prefecture. Each of the 17 health centers (1 per health zone) received a series of

test kits, consumables, personal protective equipment, and quality assurance materials and tools.

Following the training, all unidentified deaths not screened for Ebola using the case definition were evaluated at the community level by Red Cross staff and each health center chief using OraQuick RDTs to ensure that the person did not die of Ebola. If an RDT test was negative, the family could conduct the burial. But if the test was positive, the Red Cross would bury the body using safe burial procedures to ensure that dignified funerals were conducted for those who had died from EVD without endangering family and other mourners.

The training and the algorithm developed undoubtedly averted additional infections in the community and at health centers, saving lives and limiting the outbreak. No additional Ebola infections were identified after the 90-day enhanced surveillance period. The training materials, algorithm, standard operating procedures, and job aids are now integrated into a national training and quality assurance package that a country can deploy for any Ebola outbreak.



BS/BS Training in Kindia. Photo by IDDS

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IDDS Pilots a New Strategy to Improve Guinea's Specimen Referral System

Rapid detection of infectious diseases is crucial for the surveillance of and response to disease outbreaks, and a key part of this process is the transport of specimens to laboratories for testing. However, specimen transport remains a major challenge in Guinea due to high transportation costs from distant rural health districts to the reference laboratories in Conakry. There is also no integrated specimen referral system (SRS), which results in specimen transport for certain diseases over others because of disease specific funding. Some of the lower-priority specimens may eventually be tested at the community level, but thousands never make it to a reference laboratory for testing. Additional challenges include the following:

- Specimen transfer is very costly, because the system relies on health care workers whose transport and lodging are funded by partners, like the World Health Organization.
- Poor quality/unusable specimens arrive at the central-level laboratory and cannot be tested.
- Clinicians and patients experience long delays in receiving laboratory results, slowing treatment and potentially allowing infections to spread in the community.

In response, [USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#) developed a new strategy to strengthen Guinea's SRS for the diagnosis and surveillance of priority pathogens. The pilot phase of the strategy has been very successful, with major improvements in the quality of specimens received at the central laboratories. Based on the success of the pilot, IDDS is now supporting a national roll out of the new SRS, which started with training 450 health care workers across more than 400 health centers on the new SRS in June 2023.



IDDS's pilot strategy aimed to reduce the transport cost and improve the turnaround time from specimen collection in the health districts to receipt by the regional and reference laboratories in Conakry. In February 2020, IDDS collaborated with the Ministry of Health, the National Directorate of Laboratories, the National Institute of Public Health, the National Agency of Health Security, and the Central Veterinary Diagnostic Laboratory to evaluate the specimen transport system in three pilot sites

and identify problems in specimen collection, packaging, and transport. The pilot also estimated the cost of specimen transport from the prefectures¹ to the regional and reference laboratories.

The evaluation results showed fragmented systems, a lack of an integrated multisectoral SRS network, and that health workers must leave their posts (and other duties) and travel to the region or to Conakry to take specimens to the laboratory. These health workers also needed training to improve the specimen quality and to ensure safe and timely specimen transport.

Based on the evaluation's findings, a new SRS strategy was designed and piloted in collaboration with transport unions, the *Medecin Chargé de la Maladie*, laboratories, prefectural hospitals, and regional hospitals in three pilot regions (Kindia, Mamou, and Faranah). IDDS developed tools for collecting and transporting specimens, including an electronic specimen tracking system through a mobile application. In 2022 the pilot was expanded to the Nzérékoré region, which is more than 550 miles from Conakry by road. Nzérékoré is potentially a crucial region for rapid specimen transfer as it was the center of the 2014 Ebola outbreak.

IDDS signed a memorandum of understanding with drivers' unions to facilitate the transport of specimens between prefectures, regions, and Conakry using public transport, and also signed a contract with motorbike couriers to facilitate the transport of specimens from the bus/taxi stations to the reference laboratories in Conakry. IDDS also provided specimen transport materials and consumables (such as ice packs) for safe transport of specimens. Figure 1 shows the flow of specimens from the community, prefectural, and regional levels to the national level.

¹ Guinea is divided into eight regions, and seven of those regions are subdivided into 33 [prefectures](#), or administrative jurisdictions.

Figure 1: Flow of Specimens from Community, Prefectoral, and Regional Levels to the National Level

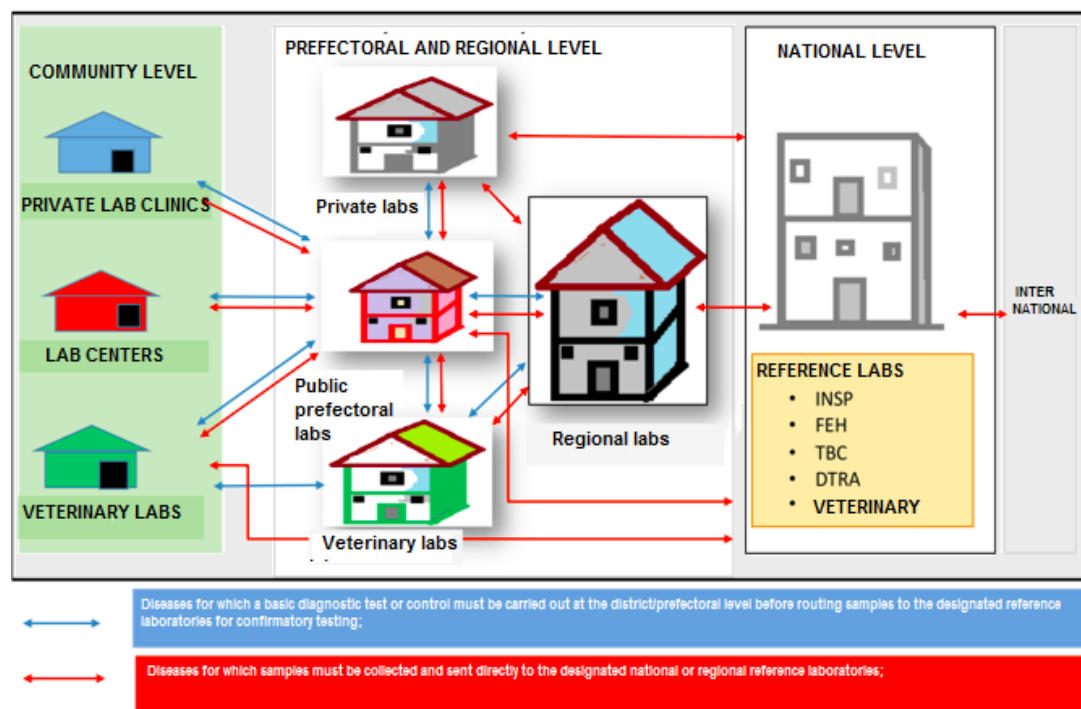


Table 1: Geography and Health Center Structure of the First Three Pilot Regions

Region	Location	Distance from Conakry	No. of Prefectoral Hospitals	No. of Urban Health Centers	No. of Community Health Centers
Kindia	Lower Coast	133 km	4	5	15
Mamou	Center of Guinea	245 km	3	7	34
Faranah	Upper Guinea	430 km	3	10	37

In November 2021, a training brought together health workers from the Ministry of Health, the Ministry of Agriculture and Livestock, and transport unions from the three pilot regions. The training covered the use of the specimen tracker mobile application, the Global Positioning System, and thermometers; the correct method to package and secure specimens for transport; and biosecurity during the transport of infectious biological specimens. The key staff involved in the SRS, including 14 laboratory focal points, 18 transport union members, and the couriers, were granted monthly call credit refills. IDDS funded the transport costs incurred by the laboratory focal points for transporting specimens from the laboratory to the regional bus station and from the regional bus station to Conakry.

The pilot phase was conducted from December 2021 to March 2022. The regional laboratories were identified as hubs where all specimens from health centers, prefectures, and regions were shipped daily; when the regional laboratory could not perform the tests, specimens were sent to the reference laboratories in Conakry twice a week (Tuesday and Thursday).



During this period, 246 specimens were transported during 69 trips from the 3 regions and prefectures to the Hemorrhagic Fever Laboratory, the National Institute of Public Health Reference Laboratory, and the Tuberculosis Reference Laboratory. These reference laboratories received all specimens within 24 hours (per the standard operating procedure) and at the required temperature. The mean temperature during transport was 11.4°C at departure and 17.3°C at the reception in the reference laboratory, which is within the acceptable range. Only one specimen was rejected at the Hemorrhagic Fever Laboratory due to insufficient volume. Overall, the pilot phase saw a rejection rate of only 0.4 percent.

The success of the pilot will guide the IDDS as it supports the national expansion of the SRS strategy. IDDS is also looking into making sure the new system is sustainable by coordinating with drivers' unions, Guinea's health leadership, and international donor organizations.

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IDDS Supports India’s First “TB Wednesday” Session for Improving Cross-Learning Among Laboratory Tiers

Close coordination and communication between India’s laboratory tiers—national, regional, and local—is vital to ensuring quality-assured and efficient diagnostic services throughout the country’s tuberculosis (TB) laboratory network. To bring staff from different laboratories tiers together in a learning environment, India has launched TB Wednesday (Nidaan Samvaad). With the support of USAID’s Infectious Disease Detection and Surveillance (IDDS) project, TB Wednesday is a series of regular, interactive online sessions that will focus on important topics for high-quality laboratory work and effectiveness.

The first TB Wednesday was held on May 31, 2023, and was hosted by the Central TB Division (CTD) of the Ministry of Health and Family Welfare, in collaboration with national reference laboratories and IDDS. The first session was Biosafety and Biomedical Waste Management at Treatment and Diagnosis Centers. The expert invited for the session was renowned microbiologist, Dr. Jyoti Iravane, who is a professor and the head of microbiology at the Government Medical College in Aurangabad. More than 500 participants, including district TB officers, laboratory staff from national and intermediate reference laboratories, staff from TB culture and drug susceptibility testing sites, and district-level health staff from different states across India, joined the session.

First, the official biosafety manual and its contents were introduced to the participants, followed by slides highlighting potential biosafety risks at treatment and diagnostic centers. The presentation then covered safe specimen collection, handling, and good laboratory practices that should be followed while working with specimens. Dr. Iravane shared her expertise on biomedical waste management, spill management, fire safety, chemical safety, electric safety, and regular health check-ups of laboratory staff.



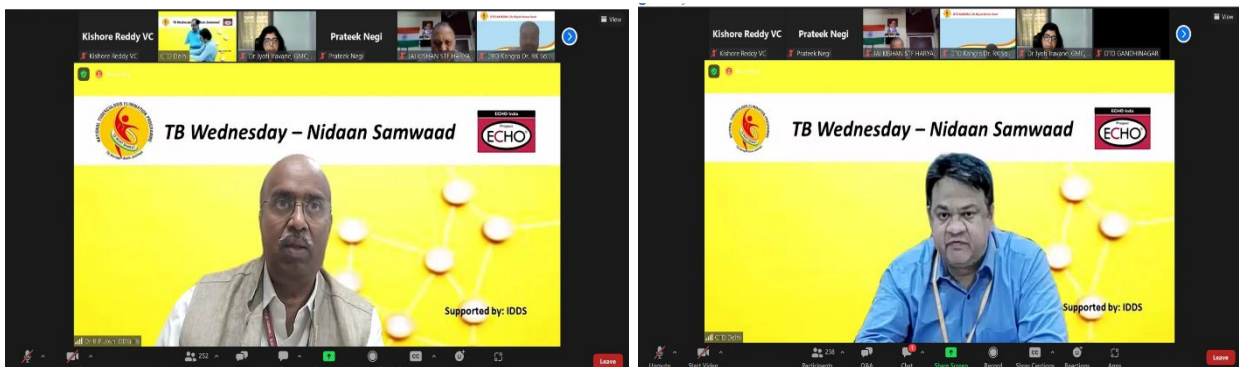
CTD’s laboratory team and IDDS attending the first session of TB Wednesday (Nidaan Samvaad) on May 31, 2023. Photo by IDDS

The session was introduced by Dr. R.P. Joshi, deputy director general-TB, in the presence of Dr. Nishant Kumar, joint director (public health), CTD, Dr. Ranjini Ramachandran, national program officer, World Health Organization, and Dr. Shibu Balakrishnan, national program officer, World Health Organization, in addition to staff from IDDS and the CTD laboratory team. The welcome address was delivered by Dr. Sanjeev Saini, team lead for IDDS in India, followed by remarks from Dr. Ramachandran and Dr. Kumar.

The participants asked questions, which were answered by Dr. Iravane and the CTD laboratory team. Feedback on the session and suggestions for topics for future sessions was requested from participants through a Google form shared after the session.

These sessions will be conducted on the second Wednesday of every month and will provide an opportunity to discuss gaps, underlying challenges, and possible solutions for experts from various fields (laboratory, clinicians, public health experts, etc.) to enhance efficiency in the TB diagnostic network.

Dr. Joshi and Dr. Kumar said that Nidaan Samvaad will provide a platform for improving communication, cross-learning, and networking among different TB laboratory tiers, as well as among district-level officials and staff from the National TB Elimination Program.



Deputy Director General-TB (L) and Joint Director (Public Health) (R) from CTD, Ministry of Health and Family Welfare, addressing the participants in the first session of TB Wednesday (Nidaan Samvaad). Photos by IDDS

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Collaboration Between Hospital Laboratories in Liberia's Nimba County Reaps Rewards

Collaboration between health care institutions plays a vital role in optimizing diagnostic services and improving patient care. There have been remarkable achievements resulting from the collaboration between Liberia's G.W. Harley Hospital and Ganta Rehab Hospital laboratories in specimen collection, referral, and testing. By joining forces and playing to their respective strengths, these two laboratories have created a seamless workflow that enhances efficiency and accuracy, and ultimately benefits the patients they serve.

Following support from [USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#) in establishing bacteriology testing services at G.W. Harley Hospital laboratory, the county diagnostic officer of Nimba, Quensiah S. Gbehmie, recognized the need for improved coordination in specimen collection, referral, and testing between G.W. Harley and Ganta Rehab Hospital, both in Nimba county.

Ganta Rehab Hospital serves many patients but has limited capacity in conducting some specialized tests, including bacteriology testing, which require advanced equipment and expertise. It does not have the capacity for bacteriology testing, and patients with infections from bacterial pathogens are treated based on clinical symptoms. The county diagnostic officer discussed this issue with the hospital management of the two hospitals, and Ganta Rehab Hospital agreed to cover the transportation costs of specimens to G.W. Harley, and G.W. Harley agreed to have the specimens referred and tested at its laboratory at no additional cost.

With mentorship from IDDS, the two hospital laboratories established a standardized specimen collection protocol. IDDS worked with laboratory technicians, led by Peter Paye (G.W. Harley laboratory supervisor), to develop clear guidelines, provide training sessions, and ensure consistent collection techniques. Two laboratory technicians from Ganta Rehab Hospital laboratory (Augustine Darbeh and Sheraton Nya) were trained on April 5, 2023, at G.W. Harley Hospital, on the protocol to ensure compliance of safe specimen collection, packaging, and transport.

This harmonized approach facilitated accurate specimen acquisition and labeling at Ganta Rehab Hospital, and transportation to G.W. Harley Hospital laboratory for testing, minimizing pre-analytical errors and ensuring specimen integrity. G.W. Harley Hospital laboratory in turn ensures that results are communicated to Ganta Rehab Hospital laboratory in a timely manner, and Ganta Rehab Hospital technicians collect the hard copies of the results when they transport specimens.

The collaboration between G.W. Harley and Ganta Rehab Hospital laboratories has yielded many positive outcomes. Patients are receiving timely and accurate diagnoses, which has led to accurate and timely treatment decisions and improved treatment outcomes. The risk of misdiagnosis has been reduced, improving patient safety. The collaborative efforts also resulted in higher patient satisfaction, increased staff engagement, and enhanced resource optimization. In addition, the partnership between the two hospitals has strengthened the laboratory network in Nimba, which will have long-term benefits for the county's population.

Between April 11 and June 27, 2023, a total of 27 patient specimens were collected, packaged, and transported from Ganta Rehab Hospital to G.W. Harley Hospital, and none rejected.



Augustine Darbeh delivering specimens to G.W. Harley Hospital laboratory. Photo by IDDS

“The collaboration between G.W. Harley and Ganta Rehab laboratories has had a great impact on the diagnostic network in Nimba,” said Quensiah Gbehmie, county diagnostic officer, Nimba county. “Following this initiative, we are looking into reaching out to other laboratories in the county to do the same and utilize the bacteriology services at G.W. Harley, thereby ensuring optimal use of resources. We are also hoping to get the approval to start processing all bacteriology specimens in the county and refer isolates for confirmation at the NRL.”

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Timely Diagnosis of a Drug-resistant Infection at Liberia's Phebe Hospital

Phebe Hospital in Liberia's Bong county serves a large and diverse patient population. It often receives difficult cases of patients with complex infectious diseases caused by suboptimal treatment, leading to prolonged patient suffering.

An eight-year-old patient was admitted to the hospital on April 20, 2023, with a wound that had been treated with unknown antibiotics and herbal medicine without getting better. On seeing the pus-filled sore and feeling the warmth around the wound, the doctor requested collection of pus for culture and antimicrobial sensitivity testing (AST). [USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#) provided mentorship to the hospital's laboratory technician to aseptically collect pus from the sore and immediately take the specimen to the laboratory and perform a gram stain, a test that checks for bacteria at the site of a suspected infection (the specimen was inoculated on blood agar, MacConkey agar, and chromogenic agar). Within a few hours, a preliminary result showing a bacterial infection (gram-positive cocci in cluster) was sent back to the doctor.

With technical support from IDDS, the laboratory was able to identify and isolate *staphylococcus aureus* (a staph infection, which can become very serious), AST was set up, and the laboratory results confirmed the presence of methicillin-resistant *Staphylococcus aureus* (MRSA). The strain was found to be resistant to multiple antimicrobial drugs: oxacillin, erythromycin, cefoxitin, amoxicillin, and augmentin. IDDS provided financial support for the media and reagents used for the identification and detection of MRSA. The strain was, however, sensitive (not resistant) to clindamycin, cotrimoxazole, chloramphenicol, and doxycycline, which are among the antibiotics available in the local hospital pharmacy.

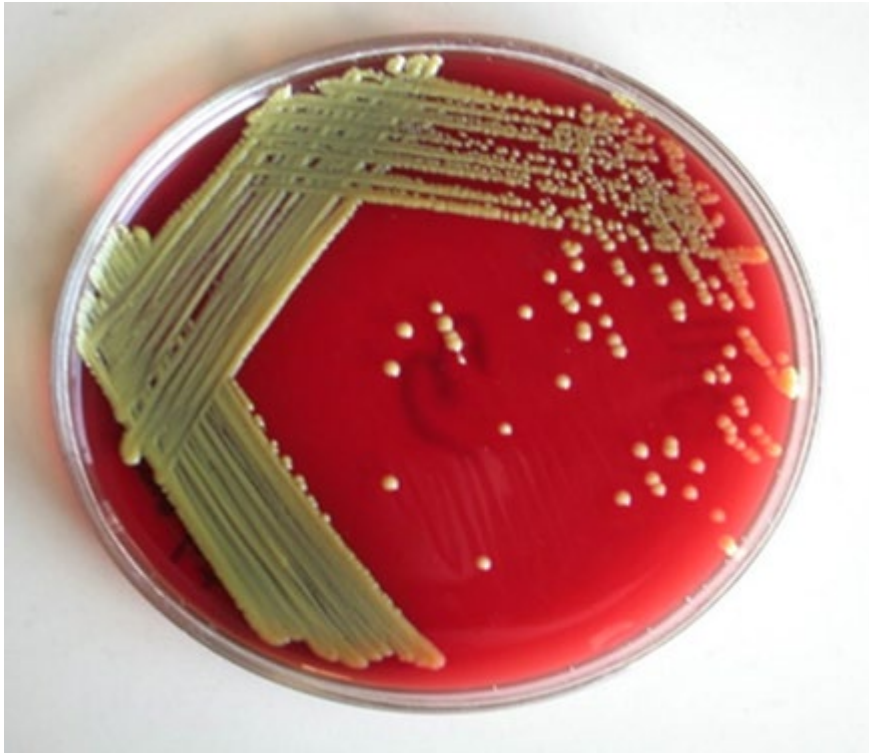
The doctor received the test results and immediately adjusted the patient's treatment plan based on those results. In addition to prescribing the antibiotics, the doctor advised the patient to keep the affected area clean, avoid scratching or picking at the rash, and practice good hand hygiene to prevent the spread of infection.

Thanks to the prompt diagnosis of MRSA by the laboratory, the patient received the appropriate treatment without delay. The laboratory staff followed up in the ensuing weeks and determined that the patient's symptoms gradually improved and the infection was beginning to heal.

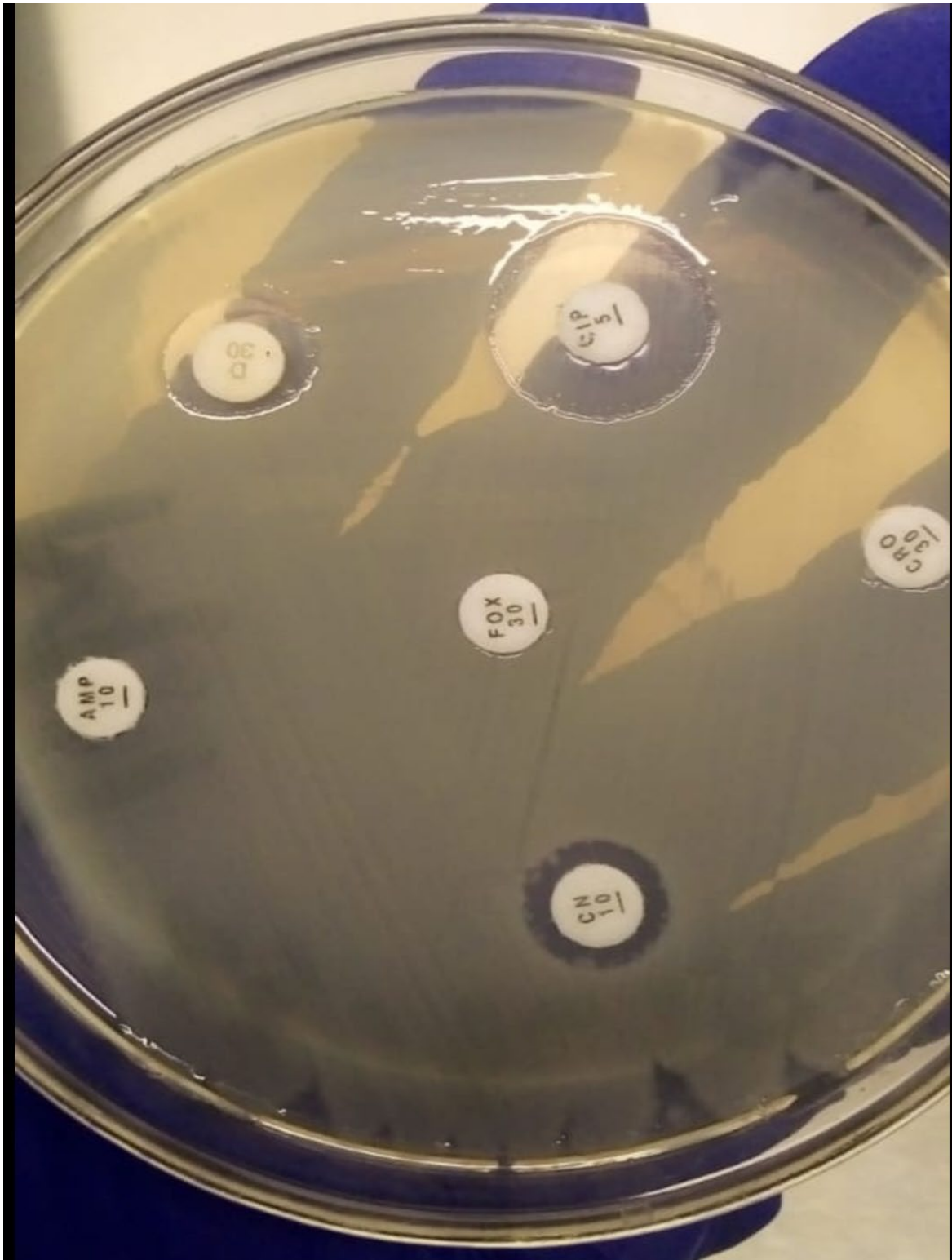
The case of this young patient highlights the crucial role that a prompt diagnosis by the laboratory played in identifying MRSA and enabling timely treatment, resulting in a positive outcome for the patient. It also demonstrates the importance of collaboration between health care providers and laboratories in the diagnosis and management of antibiotic-resistant infections to optimize patient care.

Sub-Saharan Africa has the [world's highest mortality rate attributable to antimicrobial-resistant infections](#), which kill 23.5 per 100,000 people in the region and pose enormous costs to patients and the health care system. The World Health Organization estimates that [antimicrobial resistance could kill 4.1 million people](#)

[across Africa by 2050](#) if the health care system does not adjust its practices to prevent the misuse of antimicrobials and the spread of resistant infections.



Colonies of Staphylococcus aureus on blood agar plate. Photo by IDDS



AST plate of MRSA showing resistance to cefoxitin. Photo by IDDS



Phebe Hospital in Liberia's Bong county. Photo by IDDS

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IDDS Introduces Xpert MTB/XDR Assay into the TB Diagnostic Network in Malawi

Drug-resistant tuberculosis (DR-TB) is a major global health problem, emerging when TB medicines are used inappropriately and confounding efforts to prevent the infectious disease from spreading within vulnerable communities. Often, clinicians do not realize that their patients have DR-TB because they do not have access to laboratory services that can confirm the bacteria's resistance to the most common TB drugs.

A TB drug resistance survey conducted in Malawi in 2018–2019 by the National TB Program showed that the prevalence of multidrug-resistant/rifampicin-resistant TB (MDR/RR-TB) was relatively low, at 2.1 percent among new patients and 6.1 percent among retreatment patients. However, the survey flagged some alarming trends, like a threefold increase in the prevalence of RR-TB. Further, less than 20 percent of patients infected with MDR/RR-TB strains underwent testing for resistance to fluoroquinolone, a key TB drug often used in cases when the bacteria is resistant to rifampicin or isoniazid. and there was increased prevalence of isoniazid-resistant TB (8.2 percent among new patients and 13 percent among retreatment patients), showing the need for urgent action to improve drug susceptibility testing and contain the spread of DR-TB.

USAID's Infectious Disease Detection and Surveillance (IDDS) project embarked on an initiative to strengthen TB diagnosis and testing in Malawi. From January 29 to February 4, 2023, IDDS successfully procured and installed three 10-color GeneXpert® instruments and 3,000 Xpert® *Mycobacterium tuberculosis* (MTB)/extensively drug-resistant (XDR) cartridges, distributing them strategically to three high-volume district hospitals: Bwaila, Chikwawa, and Mangochi. The Xpert MTB/XDR test can simultaneously detect the presence of the TB bacteria as well as mutations associated with resistance to TB medicines, to help detect rare cases of XDR-TB that are resistant to multiple TB drugs.

To ensure the effective use of these resources, IDDS took the lead in revising the TB diagnostic algorithm and incorporating the Xpert MTB/XDR test into existing testing protocols at supported laboratories. The updated algorithm now provides health care professionals with clear guidelines on when and how to utilize the test, increasing diagnostic accuracy.

To equip health care workers, IDDS also conducted comprehensive on-site training sessions on January 29–February 4. A total of 32 health care workers (15 female) were provided with in-depth knowledge and practical skills related to the Xpert MTB/XDR test. The training covered test use and description, specimen collection and storage, kit handling, and internal quality control. This ensured that the health care workers were well-prepared to administer the test and accurately analyze the results.

IDDS also conducted a geospatial analysis in November 2022, using a hub-and-spoke model to optimize the transportation of specimens across the three districts:

Bwaila, Lilongwe, and Mangochi. This analysis resulted in revised transportation routes operated by the national specimen courier, enabling more efficient and widespread specimen testing throughout the district. As a result, specimens can now be promptly and safely transported, reducing delays in diagnosis and treatment initiation.

Through the concerted efforts of IDDS, the Xpert MTB/XDR test has been integrated into the diagnostic network at supported laboratories, and IDDS is working with the National TB Program to incorporate the new capacity into the diagnostic network and health information systems more broadly. From February to April 2023, 221 MTB/XDR tests were conducted at the 3 IDDS-supported sites. Among these tests, the presence of XDR-TB was identified in 1 percent of the analyzed specimens. IDDS's comprehensive approach, involving algorithm revision, health care worker training, and improved specimen transportation, is helping support strengthened TB diagnosis and drug susceptibility testing in Malawi and will lead to improved health outcomes for DR-TB patients.



10-color GeneXpert instruments installed at Bwaila District Hospital. Photo by IDDS



On-site training on Xpert MTB/XDR at Chikwawa District Hospital. Photo by IDDS

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Pakistan: IDDS Conducts Remote Technical Mentorship for ISO Accreditation

The International Organization for Standardization (ISO) standard 15189 specifies the requirements for quality and competence in medical laboratories. It is globally recognized as the gold standard for quality management systems (QMSs) in medical laboratories, ensuring that medical laboratories provide accurate and reliable test results. Obtaining ISO 15189 accreditation assures users of laboratory services that the laboratory has undergone evaluation based on global standards.

Remote technical mentorship provides an opportunity for laboratories seeking ISO 15189 accreditation to receive guidance from highly qualified mentors through virtual communication channels. This approach offers several advantages, including access to expertise (regardless of geographic location and time zone), cost reduction, and increased flexibility.

[USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#) carried out remote technical mentorship in Pakistan to support the ISO 15189 accreditation process for the National Tuberculosis (TB) Reference Laboratory and three provincial TB reference laboratories (PRLs), located in Sindh, Punjab, and Khyber Pakhtunkhwa.

Over 12 months, IDDS experts delivered guidance, conducted QMS training sessions, reviewed the implementation of standard operating procedures (SOPs) during dedicated meetings, and ensured adherence to compliance standards through internal audits.

To support the National TB Reference Laboratory and three PRLs to deliver high-quality TB diagnostic services, IDDS delivered a 12-module QMS training package to 52 staff (12 female) working across the 4 supported TB laboratories from September 2022 to January 2023. IDDS also supported the adaptation of all technical and management SOPs, guidelines, and materials required for ISO 15189 accreditation.

After completing the 12-week QMS training program, participants showed significant improvements in performance. The average scores of pre- and post-tests increased, from 68.9 percent to 81.9 percent. Out of the 52 staff who participated, an impressive 49 successfully obtained their ISO certification. The supported laboratories prepared, reviewed, and revised the laboratory quality manual, safety manual, technical and management SOPs, and forms needed for a functional QMS.

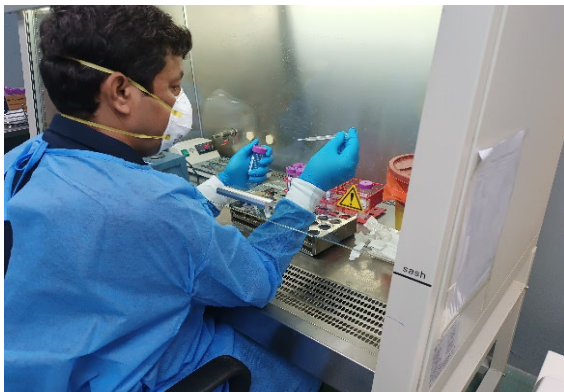
In addition, the training resulted in the certification of 12 quality officers and deputy quality officers, equipping them with the necessary skills to conduct internal audits. The QMS and internal audit training resulted in a local pool of trained and competent staff to support accreditation and diagnostic strengthening work.

IDDS also supported 12 laboratory staff (4 female) from the 4 laboratories to provide remote support to the laboratories to conduct internal audits and review reports through weekly QMS implementation calls from November 2022 to June 2023.

To enhance the mentorship process and to assess the QMS implementation at the laboratories, in-country consultants made on-site visits in May 2023 to each of the

four supported laboratories. The visits demonstrated a significant increase in the audit scores, as compared to the baseline audits conducted in August–October 2022. In less than one year, all four laboratories increased from an average of 25 percent to an average of 72 percent. After completion of the second audit, corrective action plans were developed with each laboratory so that they can continue to improve the quality of their services and eventually attain ISO accreditation.

IDDS's experience in Pakistan provides evidence for the effectiveness of remote technical mentorship for ISO accreditation. By fostering effective communication, implementing innovative approaches, and focusing on capacity building, this approach can be successfully employed in supporting laboratories to deliver TB diagnostic services of superior quality in the future. All four laboratories will soon be able to apply for ISO 15189 accreditation after they complete all steps in the corrective action plans.



PRL Sindh during country consultant visit in May 2023. Photo by IDDS PRL Lahore during country consultant visit in May 2023. Photo by IDDS

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IDDS Enhances Laboratory Quality Management in Senegal

Quality management systems (QMSs) are vital for ensuring high-quality testing at all laboratory facilities. In Senegal, [USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#) supported the strengthening of QMSs of biomedical laboratories (facilities that are qualified to carry out research and development) to improve the accuracy and reliability of laboratory test results.

Together with Senegal's Ministry of Health, IDDS had previously established laboratory bacterial testing, including antimicrobial susceptibility testing for drug-resistant pathogen detection, in nine biomedical laboratories. To ensure the quality of bacterial test results, IDDS has supported the Ministry of Health and Social Action/Directorate of Laboratories (DOL) to assess QMS implementation in 15 biomedical laboratories.

The World Health Organization's Stepwise Laboratory Improvement Process Towards Accreditation checklist, which enables assessments of laboratory capacities, was used to conduct these laboratory audits. It contains 12 sections based on the requirements of the International Organization for Standardization's standard 15189, which specifies requirements for quality in medical laboratories.

Baseline audits were conducted in the 15 laboratories, including the 9 IDDS-supported laboratories, across the Louga, Thiès, Diourbel, Saint-Louis, Sédhiou, and Dakar regions between February 27 and March 30, 2023. A team of 10 auditors drawn from DOL, IDDS, and national subject matter experts (2 auditors per laboratory) visited laboratories to conduct the audits and develop reports that highlighted gaps in QMS implementation.

The gaps revealed training topics necessary to improve laboratory capacity. DOL and IDDS held a training session on 7 topics (methods validation, biological risks evaluation management, human resources management, nonconformities management, documents and records management, board committee meeting, and management of internal and external quality assurance) at the national public health laboratory in Thiès region on May 5–10. Thirty staff (16 female) from the 15 biomedical laboratories were trained.

In addition, laboratory staff were coached to develop post-audit action plans based on findings from their individual audit reports. Implementation of the action plans will improve QMS in the 15 biomedical laboratories. A QMS paves the way for the accuracy of bacteriological test results, which is critical for effective antimicrobial resistance surveillance and early interventions to reduce the risk of resistance.

During the training closing ceremony, Dr. Abdoulaye Sakho, medical biologist and manager of the Tivaouane health facility's laboratory in Thiès region, said: "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."



Audit in Touba Ndamatou laboratory (DOL auditors in blue coats, lab quality officer in white coat, and lab technician in red coat). Photo by IDDS



Audit in Richard Toll laboratory (DOL auditors on left, laboratory manager [auditee] on right). Photo by IDDS



DOL auditor (left), laboratory quality officers (right), during the Tivaouane laboratory audit. Photo by IDDS

[USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#) operates in more than 20 countries in Africa and Asia where there are significant gaps in health systems' ability to detect, track, and rapidly respond to infectious diseases and drug-resistant infections that pose a major threat to public health and global health security.

IDDS Champions the use of AMR Data in Tanzania as Part of Efforts to Improve International Health Regulations Core Capacities

In 2016, Tanzania was one of the first countries to conduct the World Health Organization Joint External Evaluation on International Health Regulations core capacities. One of the major findings of the evaluation was a lack of capacity to detect and conduct surveillance for pathogens (the microbes that can cause disease) with antimicrobial resistance (AMR). AMR occurs when pathogens evolve and are no longer responsive to the same medicines. The World Health Organization has declared AMR a threat to global health and called for urgent action.

Tanzania's National AMR Surveillance Framework noted the need for laboratory-generated AMR surveillance data to monitor the emergence and spread of AMR, to inform decision-making and provide the evidence base for local and national action and advocacy.

[USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#) has built Tanzania's capacity in laboratory and surveillance systems to detect AMR, improved AMR data quality and reporting, and strengthened the use of AMR data for patient management and disease surveillance. Building on this work, IDDS conducted training on diagnostic stewardship in March 2023. The project trained 16 hospital staff (6 female), including clinicians, laboratory technicians, and pharmacists involved in the implementation of laboratory-based AMR surveillance, infection prevention and control, and antimicrobial stewardship programs, to ensure that efforts in the fight against AMR are linked and complement each other at the facility level. The training emphasized the effective use of laboratory, clinical, and epidemiological data to design interventions and improve prescribing and dispensing practices, all with the aim of reducing the spread of AMR at the facility and community levels.

In preparation for the upcoming Joint External Evaluation in August 2023, Dr. Kokuhabwa Catherine Mukurasi, public health specialist at the U.S. Centers for Disease Control and Prevention, advised Tanzania's Ministry of Health to take note of best practices and cases in which laboratory data inform infection prevention and control efforts in Maweni Regional Hospital, one of the IDDS-supported sites. Doing so could demonstrate collaborative efforts to improve International Health Regulations core capacities.

IDDS support has led to improved clinical decisions, optimized antibiotic use, reduced suffering, and improved patient treatment outcomes.

[USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#) operates in more than 20 countries in Africa and Asia where there are significant gaps in health systems' ability to detect, track, and rapidly respond to infectious diseases and drug-resistant infections that pose a major threat to public health and global health security.

IDDS Introduces Electronic Tool for Indicator-based Surveillance Reporting in Uganda’s Animal Health Sector

Despite the health sector entering the digital age many decades ago, a digital divide still impedes vital global health detection and surveillance functions. The 2017 Joint External Evaluation of Uganda’s International Health Regulations capacities and the 2018 Performance of Veterinary Services (PVS) pathway identified critical gaps in detection of zoonotic disease threats, including reliance on paper-based reporting tools in the animal health sector.

To improve electronic reporting in the animal health sector, [USAID’s Infectious Disease Detection and Surveillance \(IDDS\) project](#) developed and piloted a macro-enabled Microsoft Excel tool in four districts (Gulu, Mbale, Mbarara, and Moroto) in 2021. Macros enable the program to connect with other digital tools and conduct simple tasks automatically. The Excel tool is now used for indicator-based surveillance: the collection, monitoring, and analysis of data on disease outbreaks.

The pilot ran from February to March 2022, and the feedback gathered from the pilot was incorporated in the revised version of the tool. The revised tool was then rolled out to 34 of Uganda’s 111 districts on June 19, 2023, during a hybrid (virtual and in-person) workshop convened at the Nile Village Hotel in Jinja district.

IDDS developed the Excel tool with the Ministry of Agriculture, Animal Industry and Fisheries’ National Animal Disease Diagnostics and Epidemiology Center (NADDEC). District veterinary officers and surveillance focal persons will use the tool for animal health surveillance data capture and reporting.

While opening the workshop, 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.”



Dr. Babiye Priscilla, a veterinary inspector at NADDEC (right), shows participants how to use the revised Excel data entry and analysis tool. Photo by IDDS

[USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#) operates in more than 20 countries in Africa and Asia where there are significant gaps in health systems' ability to detect, track, and rapidly respond to infectious diseases and drug-resistant infections that pose a major threat to public health and global health security.

IDDS Supports Uganda Plan for Accrediting Animal Health Laboratories

Achieving, maintaining, and improving laboratory quality management systems (QMSs) guarantees the continuous release of laboratory test results that are accurate, timely, and reliable—but this remains a major challenge for animal health laboratories. A QMS is a system built to support a laboratory’s efforts to effectively use the policies, processes, and procedures that work together to deliver services.

The success of a QMS depends on resources devoted to meeting specific requirements of the International Organization for Standardization (ISO). Improving a laboratory’s QMS requires active participation and commitment from laboratory staff at all levels, from the bench to the top levels of management; provision of adequate resources; and, above all, provision of strategic guidelines and policy documents that guide operations.

Laboratories that establish and maintain a QMS are recognized by accreditation bodies through the issuance of a certification. In Uganda, [USAID’s Infectious Disease Detection and Surveillance \(IDDS\) project](#) engaged national partners and agencies to refine and adopt an accreditation plan for two animal health laboratories (one Regional Animal Disease Diagnostics and Epidemiology Center, located in Mbale district, and one national reference laboratory operated by the Uganda Wildlife Authority) as a key step to ownership and sustainability. In addition to working with management from both laboratories, IDDS also engaged the Uganda Ministry of Agriculture, Animal Industries and Fisheries and Mbale district leadership. IDDS presented a proposed roadmap to accreditation and activities to be followed during the accreditation preparation of the two facilities.

Dr. Eric Enyel, the laboratory director for the Uganda Wildlife Authority’s research and diagnostics laboratory, noted the need to increase support to strengthen and improve the quality of laboratory services in the animal health sector. “I want to commend the IDDS project for the support given to the animal health sector to improve the diagnostics and quality of tests results that our animal health laboratories are releasing through supporting the standardization of practices across the laboratories by following the international standards such as ISO 17025:2017. We pledge support to this cause and are happy to support the process towards the first-ever accreditation of an animal health laboratory in the country.”

The district veterinary officer of Mbale, Dr. Laura Adong, recognized IDDS for its work to propel the regional laboratory toward accreditation, specifically in terms of standardizing the practices of the laboratory. In her remarks, Dr. Adong said, “The efforts of IDDS are visible. Before the project was introduced to us, 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 (mainly comprised of veterinary personnel) have come to appreciate the importance of having standard processes, and we are grateful to IDDS.”

Although the animal health laboratories must continue to improve their QMSs, they are well on their way to achieving accreditation, which will improve trust in the public health system and utilization of essential laboratory services.



Top: Chief administrative officer of Mbale district and IDDS team lead after signing a commitment to support the accreditation process of Mbale's Regional Animal Disease Diagnostics and Epidemiology Center. Photo by IDDS

Below: Mbale district leadership, including the chief administrative officer, laboratory leadership, acting district veterinary officer and quality manager, and the IDDS team after signing the accreditation roadmap commitment. Photo by IDDS

[USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#) operates in more than 20 countries in Africa and Asia where there are significant gaps in health

systems' ability to detect, track, and rapidly respond to infectious diseases and drug-resistant infections that pose a major threat to public health and global health security.

IDDS Simplifies TB Drug Susceptibility Testing by Equipping Two Laboratories in Uganda

Rapid and more accurate diagnostic tools are critical to achieving the global targets for ending the tuberculosis (TB) epidemic. The World Health Organization's [End TB Strategy](#) calls for universal access to drug susceptibility testing (DST) to guide treatment of drug-resistant TB using new oral drug treatments.

Doctors and laboratories are discovering more and more cases of TB that are resistant to isoniazid, an important first-line TB drug. To detect these cases and understand how they are contributing to the overall landscape of resistance to multiple TB drugs, low- and middle-income countries that bear the burden of TB cases need rapid molecular DST that can detect resistance to the most common first- and second-line drugs.

To increase simple and effective DST in Uganda, [USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#) supported the procurement and installation of 10-color GeneXpert® instruments at Lira and Mbarara regional referral laboratories and provided training to the respective hospital staff. These instruments can support the diagnosis and detection of multiple *Mycobacterium tuberculosis* (TB bacteria) mutations across several genes, using a single specimen from a patient.

The new 10-color GeneXpert instruments have an expanded optical system that can detect multiple genetic mutations, which can indicate drug resistance, in one run. Combined with the frontline Xpert® MTB/RIF Ultra test, which detects the presence of TB bacteria as well as resistance to rifampicin, the Xpert® MTB/XDR test sets new standards by detecting as many as eight gene mutations associated with resistance to isoniazid, fluoroquinolones, second-line injectable drugs (amikacin, kanamycin, capreomycin), and ethionamide—all in a single test.

“The installation of the 10-color GeneXpert technology at my facility is a dream come true,” said Dr. Nathan Onyachi, the director of Lira Regional Referral Hospital. “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.”



The IDDS drug-resistant-TB Africa advisor, Kelvin Charambira, with the IDDS Uganda team lead, Derrick Mimbe handing over the 10-color GeneXpert instrument to the Lira Regional Referral Hospital leadership (hospital director and principal hospital administrator on the left). Photo by IDDS

[USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#) operates in more than 20 countries in Africa and Asia where there are significant gaps in health systems' ability to detect, track, and rapidly respond to infectious diseases and drug-resistant infections that pose a major threat to public health and global health security.

Stopping Anthrax in Vietnam

Anthrax is feared around the world as a potentially fatal bacterial disease that can spread from animals to humans (a zoonotic disease). Commonly, an outbreak starts when a domestic or wild animal ingests anthrax spores from contaminated soil, plants, or water. The bacteria can then potentially spread to anyone who ingests contaminated animal products, or agricultural workers who come into contact with contaminated animals or material.

Containing an anthrax outbreak takes a strong, coordinated public health response, especially when the bacteria has contaminated food products. USAID's [Infectious Disease Detection and Surveillance \(IDDS\) project](#) actively supported the Government of Vietnam in controlling a recent anthrax outbreak.

Thirteen anthrax cases were reported in Dien Bien and Lai Chau provinces in northwestern Vietnam during May and June 2023. The outbreak was traced to contaminated buffalo meat. The training materials and guidelines developed by IDDS were employed to train animal health staff in Vietnam's provinces, equipping them to effectively respond to the outbreak. This training was extended to more provinces, including Dien Bien and Lai Chau, going beyond the project's initial pilot sites.

Since 2019, IDDS has been supporting the Department of Animal Health in Vietnam, to create an integrated specimen referral system that serves both animal health and human health sectors (in line with the [One Health approach](#)). Previously, there was no organized specimen referral system with appropriate services and biosafety procedures for the transport of infectious substances. This is crucial to support the diagnostic system in detecting and responding to potential outbreaks of infectious diseases, such as anthrax.

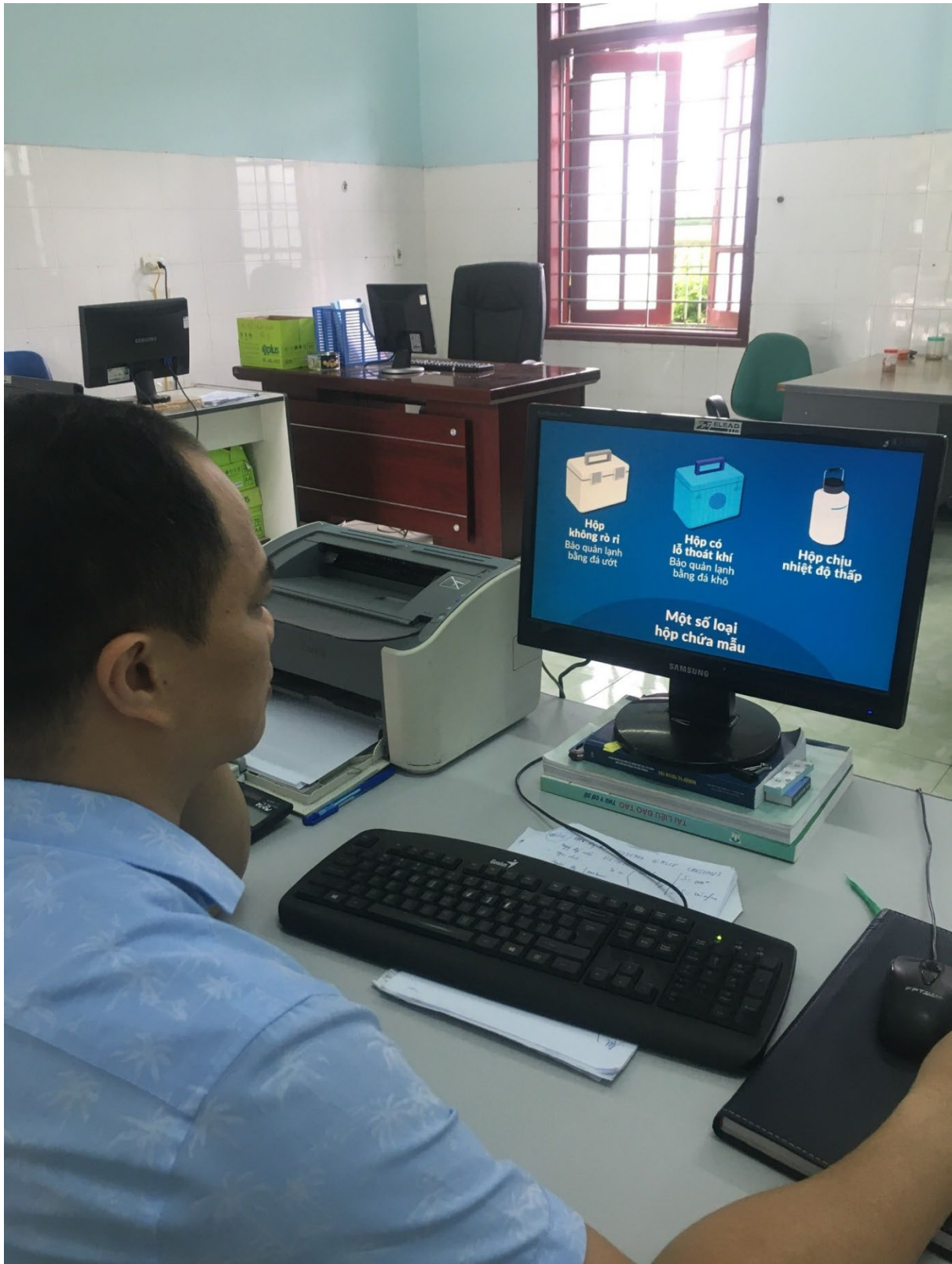
IDDS supported the Department of Animal Health to develop and issue national guidelines and training materials on the collection, packaging, and transportation of animal specimens for disease control and prevention.

These resources were disseminated and used by the animal health surveillance and outbreak response system. They greatly facilitated the prompt response to disease outbreaks in Vietnam's animal health sector. During the recent anthrax outbreak in Dien Bien and Lai Chau provinces, the national guidelines and training materials were extensively used to educate provincial animal health staff who responded to the outbreak.

Dr. Nguyen Thi Thuy Man, head of the Pathology and Parasitology Division at Vietnam's National Center of Veterinary Diagnosis, said, "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."

Dr. Nguyen continued, “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 on biosafety of specimen packaging and transport.”

The IDDS-supported guidelines and training videos are also available on Vietnam’s National Center for Veterinary Diagnostics [website](#). Animal health staff in 63 provinces can easily access these resources, which promote proper procedures and improve biosafety practices. Early detection and control of zoonoses, such as anthrax, are important to protect human health.



An animal health officer studies a training video on specimen packaging taken by an animal health staff at Lai Chau, Sub Department of Animal Health on June 21, 2023. Photo by IDDS

[USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#) operates in more than 20 countries in Africa and Asia where there are significant gaps in health systems' ability to detect, track, and rapidly respond to infectious diseases and drug-

resistant infections that pose a major threat to public health and global health security.

World Health Day: 5 Ways Countries are Embracing One Health for a Safer Planet

(This article was first published in [LeaderNet](#).)

“[One Health](#)” is an approach that recognizes the interdependence between 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—has grown, so too has momentum for coordinating efforts among sectors.

On March 27, 2023, four United Nations agencies issued a [joint call to action](#) recognizing zoonotic diseases, antimicrobial resistance, ecosystem degradation, and climate change as “pressing and complex challenges facing our society” and listing seven actions for nations to prioritize that will build resilient health systems and embed the One Health approach into policy.

Though awareness of the approach is growing, collaboration between the animal and human health sectors is still nascent in many countries. Formal systems are needed to prevent, detect, track, and respond to zoonotic disease outbreaks—and the best time to respond is before new animal diseases spill over to humans. USAID’s [Infectious Disease Detection and Surveillance \(IDDS\) project](#) supports more than 20 countries in Asia and Africa where there are significant gaps in health systems’ ability to detect, monitor, and rapidly respond to infectious diseases and drug-resistant infections that pose a major threat to public health and global health security.

Here are five ways that IDDS-supported countries are already responding to the United Nations’ call to action:

1. Strengthening national One Health policies, strategies, and plans

In 2020, [IDDS supported the government of Indonesia to establish the One Health Coordination Working Group](#), which aims to support the government in handling emerging infectious diseases through cross-sectoral collaboration and coordination nationally and locally. In 2021, the One Health Coordination Working Group was formally legalized under the Deputy Decree of the Coordinating Minister. In Mali, IDDS supported One Health committee meetings convened by the National Institute of Public Health. The meetings provide a forum for discussing strategies to strengthen community laboratory systems, study antimicrobial resistance in health care settings, and implement quality control across sectors.

2. Accelerating the implementation of One Health plans

In Uganda, IDDS operationalized the country’s [One Health Strategic Plan](#) by assembling and training District One Health Teams (DOHTs) in Mbale and Kazo districts, which have experienced several zoonotic disease outbreaks in the last five years. Prior to the launch of the DOHTs, many of the human health officials had never spoken to veterinary officials in the districts. Now, the DOHTs meet monthly to share data and strategize to prepare for a future outbreak. When there is an active outbreak, the DOHTs meet weekly to share new developments, coordinate their

response, and prevent the outbreak from spreading. [According to Musa Sekamatte, the national One Health coordinator](#), “with this implementation plan in place, we can now move the One Health concept from national-level meetings to actual One Health practice at a community level.”

3. Building intersectoral One Health workforces

A One Health approach can be instrumental in improving detection of antimicrobial resistance in humans and food-producing animals, which occurs when pathogens become resistant to the medicines we use to treat them. In Cameroon, IDDS assisted the National Public Health Laboratory to implement a pilot program to improve surveillance of these deadly superbugs by focusing on improving testing at seven bacteriology laboratories. The pilot implemented new standard operating procedures and provided supervision to laboratory staff, to ensure that the standards for laboratory testing were harmonized for both human and animal specimens.

4. Preventing pandemics and health threats at their sources

To prevent disease spillovers from animal populations to humans, investments in land conservation and biodiversity protection, sustainable agriculture, and climate mitigation are urgently needed. At the same time, health services need to be located closer to potential disease hotspots where humans have close contact with wild animals and livestock. In Uganda, clinicians and veterinarians sometimes wait a long time for laboratory results to be returned from centrally located laboratories that can perform testing on human and animal specimens. To reduce these turnaround times, [IDDS focused on empowering regional laboratory staff](#) to conduct testing at their facilities.

5. Integrating information and data across health sectors

Real-time disease reporting systems provide visibility across health sectors and inform policies and decisions in emergency situations. In Indonesia, [IDDS works to improve the operations and development of the country's integrated health information system](#), which is interoperable among three sectors (human, animal, and wildlife). In 2019, the system was piloted to detect rabies in four provinces (North Sulawesi, West Kalimantan, Riau, and Central Java). Vietnam also has an online disease reporting system designed to enable real-time reporting of animal diseases, [but it was barely being used prior to IDDS support](#). With IDDS technical support, in June 2020, five Vietnamese provinces started reporting, and by December 2021, all of Vietnam's 63 provinces were successfully reporting disease outbreak data through the online system. In 2022, provinces reported 185 outbreaks, including outbreaks of African swine fever, lumpy skin disease, and rabies.

Since the causes of zoonotic disease emergence are known, there are opportunities to intervene before local outbreaks become global pandemics. To contain outbreaks, the human and animal health sectors must be able to work together, and act quickly based on the available evidence across all levels of government. Initiatives like IDDS stand ready to support countries in accelerating their efforts to bring a coordinated, multi-sectoral approach to disease detection and surveillance.

[USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#) operates in more than 20 countries in Africa and Asia where there are significant gaps in health systems' ability to detect, track, and rapidly respond to infectious diseases and drug-resistant infections that pose a major threat to public health and global health security.

World Health Day 2023: Four Ways We Can Prevent Future Pandemics to Help Secure “Health for All”

(This article was first published by Eye On Global Health on [Twitter](#) and [LinkedIn](#).)

April 7, World Health Day, is a day to celebrate global progress in achieving collective public health impact and redouble our efforts to achieving [Sustainable Development Goal 3: health and wellbeing for all](#). Public health can boast numerous accomplishments in the 21st century: the mortality rate for children under five years old [has been cut in half since 2000](#), universal health coverage [has increased significantly](#), and life expectancy [continues to climb](#).

Yet the COVID-19 pandemic has revealed how fragile these gains are and how quickly an outbreak can overwhelm health systems, disrupt the global economy, and even reverse trends in life expectancy. [Chief among the World Health Organization’s aims](#) on this World Health Day is protecting people from future pandemics. Here are four strategies for pandemic prevention that are achievable, cost-effective, and evidence-based.

1. Build resilient health systems

Primary health care systems are key to managing emergency situations, including infectious disease outbreaks, because they often serve as the interface between communities and national health systems. When individuals cannot access health care, including both diagnosis and treatment, they are more likely to spread an infection to others in their community. The World Health Organization [recommends seven key policies for building resilient health systems](#) that are based on primary care, including investment in emergency risk management and health equity. Resilient health systems are those that can withstand a crisis and still provide patients with uninterrupted quality care.

2. Invest in community health workers

By 2030, [we may be facing a shortfall of 10 million health workers](#) around the world, and the gap will likely be most severe in low- and middle-income countries. These workers are critical to advancing health security and preventing future outbreaks, because they perform the essential work of delivering vaccines, referring patients to clinics and laboratories for testing, and educating communities about health behaviors to prevent the spread of disease. [Investments in health worker education, workforce development, and job creation](#) are urgently needed—as are efforts to restore trust in the public health system. These interventions are possible even in low-resource nations; [Liberia is a world leader in creating new jobs for community health workers](#), who have greatly increased access to care in rural areas.

3. Prevent new spillovers at their source

Disease spillovers occur when a pathogen jumps from an animal population to humans, and [they are often associated with activities that bring humans and animal ecosystems closer together, such as farming, hunting, wildlife trade, and changes in land use](#) (especially tropical deforestation). Climate change also causes ecological

shifts that can result in new spillover events. To minimize the opportunities for disease spillover, investments are needed in sustainable agricultural practices, land use conservation and reforestation, and new research to understand where future outbreaks are most likely to emerge. These interventions can be much more cost-effective than responding to a global pandemic after it has already spread.

4. Fight antimicrobial resistance

The global death toll from drug-resistant infections could reach [10 million per year by 2050](#). That's about the same number of people expected to die worldwide because of climate change—and even more than the projected annual death toll from cancer. To achieve health for all, we need a coordinated global One Health response to antimicrobial resistance that monitors the problem and reduces unnecessary use of antimicrobials. Initiatives like the [USAID-funded Infectious Disease Detection and Surveillance \(IDDS\) project](#) support the development of national action plans on AMR, educate clinicians and laboratory staff on how to detect and prevent AMR, and help countries report their AMR data into global surveillance systems.

[USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#) operates in more than 20 countries in Africa and Asia where there are significant gaps in health systems' ability to detect, track, and rapidly respond to infectious diseases and drug-resistant infections that pose a major threat to public health and global health security.

Tuberculosis: Let's Recommit in 2023 to Ending It

(This article was first published on [ICF.com](https://www.icf.com).)

Back in the first decades of the 20th century, tuberculosis (TB) was the leading cause of death in the U.S. And it wasn't even close: [280 out of every 100,000 New York City residents died from TB in 1900](#). My grandfather's family lived in New York at that time and when he fell ill, he was sent to the White Mountains in New Hampshire for the "fresh air cure" and his baby sister, my great-aunt, went to an "open air" school, exposed to the elements all winter to avoid infection. We've made enormous strides in TB control and now, in the 21st century, the U.S. has greatly reduced the impact and incidence of TB to less than 10,000 cases per year with steady reductions over the last several decades.

While richer nations tend to regard TB as history, it rages on in much of the rest of the world. Until 2020, when the COVID-19 pandemic struck, TB had been the world's leading killer among infectious diseases. And while attention was diverted from TB to COVID-19, TB refused to go away. The disease rebounded with infection rates and mortality rising for the first time in years: [10.6 million people sickened and 1.6 million killed in 2021](#).

But it doesn't have to be this way. TB is detectable, preventable, and treatable, even in its most complicated presentations.

The United Nations High-Level Meeting on Tuberculosis in New York in September 2018 set ambitious targets to accelerate progress to end TB. Optimism was high that a [90% reduction in TB deaths by 2030](#) could be realized. This September, New York will host the second High-Level Meeting on TB against a backdrop of a global surge in tuberculosis cases. While we have fallen short of our 2022 targets, we can—and must—recommit ourselves to realizing the 90% reduction by 2030 and redouble our efforts to expand access to diagnostics and treatment.

Applying advances in science, data, and technical expertise to accelerate progress

Despite the pandemic, we have opportunities to end TB that we have not had before. New innovations are available for TB detection, prevention, and treatment and many of the investments in COVID-19 response can also support the TB response. In many countries where routine care is challenging, there is still a need for basic diagnostic and treatment access. In addition to increasing the ongoing efforts to overcome those challenges, the United Nations should lead with targets on increased access to the latest tools for TB for the countries with the highest burdens of TB, such as India, Kenya, and Ukraine, where TB remains among the 10 leading causes of death. That means access to the full suite of solutions on hand: rapid molecular diagnostics, highly effective treatment regimens, and preventive therapies, as well as improved systems to deliver these tools.

These interventions can be integrated into existing systems like primary or universal health-care programs and related disease responses (e.g., COVID-19, HIV,

diabetes, and nutrition programs), which employ a “whole patient” approach in meeting their needs for both health care and social services.

In low burden countries, like the United States and Japan, sharing lessons learned and technical expertise with high burden countries, combined with targeted domestic programs, will reduce disease transmission because TB anywhere is TB everywhere.

A renewed commitment to ending TB is going to take funding, but it doesn't have to be hugely expensive. There are new models emerging to drive down costs of delivering test results and patient care as well. For example, an innovative private-sector partnership model in India's Haryana state is greatly increasing patients' access to testing, including for drug-resistant strains, and rapid follow-up care. It is a replicable model that could be the basis for TB diagnosis in every high-TB burden country with an effective private sector.

The response to COVID-19 showed that the world can mobilize incredible resources to respond to a pandemic. It's time the same determination is brought to the fight against TB. Or else we're just putting our faith in fresh air.

[USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#) operates in more than 20 countries in Africa and Asia where there are significant gaps in health systems' ability to detect, track, and rapidly respond to infectious diseases and drug-resistant infections that pose a major threat to public health and global health security.

The Big Deal with Diagnostics for Drug-Resistant TB

(This article was first published in [Speaking of Medicine and Health](#).)

The stage is set for new diagnostics to accelerate detection of tuberculosis (TB). Against the backdrop of the [United Nations General Assembly stakeholder convenings on TB](#), the [World Health Assembly Resolution to Strengthen Global Diagnostics Capacity](#), and the declaration of the [end of the COVID-19 pandemic emergency by the World Health Organization](#) (WHO)—all in the same month—anticipation is growing for the [second United Nations high-level meeting \(UNHLM\) on TB](#) in September 2023. As COVID-19 cases recede, TB is again the top cause of infectious disease deaths globally and there is wider understanding that inequitable access to testing and treatment affects us all.

While TB has sickened people for centuries, newer drug-resistant (DR-TB) versions are more complex and costly to treat, requiring specialized knowledge and resources to address. In 2022, only [60 percent of the estimated 10.6 million people with TB were notified](#) that they had the disease, and of these only one third were tested for DR-TB—leaving the [WHO’s End TB goal of universal drug susceptibility testing by 2030](#) a far reach.

Despite the daunting challenge, there is global optimism that the political will that united the world to combat the COVID-19 pandemic can also boost research and rollout of the latest diagnostics for DR-TB. The COVID-19 pandemic revealed the importance of rapid and convenient testing and the benefit of “putting diagnostic ownership into patients’ hands,” as Claudia Denkinger shared during a recent McGill University [Advanced Diagnostics course](#). Technological and digital innovations have diffused across all fields of health, and high-quality diagnostics are a boon for DR-TB control.

Advances of note relate to [decentralized and point-of-care molecular diagnostics](#), enabling testing of rural populations despite unstable power or inadequate infrastructure, and [advanced triaging tools such as artificial-intelligence read chest X-rays](#). [Portable molecular diagnostics](#) allow patients to receive DR-TB test results in a few days, instead of weeks or months, and reduce the number of patient specimens needed. Often, these innovations are delivered via novel, high-value partnerships between [governments and the private sector](#). Molecular instruments can now conduct simultaneous multi-disease testing, allowing countries to potentially benefit from programmatic cost savings and overcome human resource challenges. [Digital health applications](#) closely link testing and treatment, allowing health providers to promptly initiate treatment using more palatable, shorter drug regimens for patients with DR-TB. These actions also provide health systems savings, allowing governments to [reprogram the cost of additional months of treatment toward better quality services or additional case-finding](#).



A laboratory technician prepares samples for testing on a GeneXpert instrument in Pakistan. Photo by IDDS

These diagnostic advances could be life-changing for the [almost half-million people who develop DR-TB annually](#), but they have yet to reach the most needy patients. The task at hand is to support national TB programs, laboratories, clinicians, all of whom make up the diagnostic front line, to provide [timely and accurate testing for DR-TB patients](#). [USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#) is one such effort, collaborating with governments to increase access to diagnostics and build country capacity for DR-TB testing. The project works with national TB programs to strategically introduce and place new molecular diagnostics such as Molbio Diagnostics' Truenat® instruments and Cepheid's GeneXpert® instruments, which use Xpert® MTB/XDR cartridges to detect [pre-extensively drug-resistant TB](#), i.e., TB that is resistant to multiple drugs, including rifampicin and fluoroquinolone.

National TB programs and their partners are also building local capacity for TB drug susceptibility testing for new and repurposed TB drugs, which do not have standardized molecular profiles. This diagnostic gap can be filled by bolstering capacity for phenotypic drug susceptibility testing using broth microdilution or the Becton Dickinson MGIT 960 system. Governments and implementing partners are also paying close attention to potential applications of targeted next generation sequencing, which can be used to analyze the entire *Mycobacterium tuberculosis* genome to assess resistance across existing and emerging drugs.

While genomic sequencing remains [cost prohibitive in many countries](#), requiring significant investment in laboratory workforce and infrastructure, [WHO's upcoming guidance](#) will guide countries on how to harness this technology to strengthen diagnostic networks.

These efforts by governments, researchers, drug development and resource partners, and implementers such as IDDS all contribute to meeting UNHLM targets for TB control and elimination. More funding is needed to improve TB detection and strengthen diagnostic networks in high-burden countries. Already, earlier UNHLM goals remain unmet, due to under-diagnosis of TB patients. Forums such as the UNHLM on TB are opportunities for stakeholders to explore partnerships that mobilize resources and capitalize on global movements such as universal health coverage, pandemic preparedness, and climate change adaptation and mitigation. As the global epidemiology of TB continues trending toward increased drug resistance, working with countries to introduce and integrate the latest diagnostics into diagnostic networks and promptly link patients to appropriate treatments is the only way to meet End TB Strategy and UNHLM goals—and this is quickly becoming the biggest deal of all.

[USAID's Infectious Disease Detection and Surveillance \(IDDS\) project](#) operates in more than 20 countries in Africa and Asia where there are significant gaps in health systems' ability to detect, track, and rapidly respond to infectious diseases and drug-resistant infections that pose a major threat to public health and global health security.

No Silver Bullets in Tuberculosis Prevention and Control

(This article was first published in [Health Affairs Forefront](#).)

Global progress to reduce the number of people who fall ill with tuberculosis (TB) has stalled. More than [10 million people are still getting sick](#) every year, and the COVID-19 pandemic overwhelmed health systems, diverting resources from essential services needed to detect and treat TB. As the COVID-19 pandemic subsides, TB is now reclaiming its ignominious title as the world's leading killer among infectious diseases, claiming [more than 1.5 million lives per year](#).

From artificial intelligence to new diagnostic testing methods, technology is transforming the global effort to eradicate TB. Yet the countries that stand to benefit the most have fragile health systems that are not well positioned to support new technologies.

Technological Innovation

The global community will need to use every available tool at our disposal to continue the fight against TB. And a wave of innovation is rapidly changing what's possible in diagnosing, monitoring, and treating TB. [AI-assisted chest X-rays](#) promise to relieve the burden on overworked radiologists who can make mistakes when looking at images of patients' lungs. [Rapid molecular diagnostic tests](#) such as GeneXpert and Truenat allow laboratory workers to quickly confirm whether a patient is infected with TB and check for drug resistance, even in remote areas without access to stable power. [Diagnostic connectivity solutions](#) generate electronic reports from diagnostic equipment in laboratories to allow clinicians and patients to receive test results more quickly and allow real-time monitoring of disease patterns. Even outside the clinic and laboratory settings, new tools are changing health services: [Drones are used to transport patient specimens](#) where roads are impassable, and mobile phone applications can monitor temperature conditions and specimen quality while specimens are in transit to the laboratory.

It's easy to get excited about the public health potential of these tools and technologies—because every TB infection that is quickly and accurately detected can be one less person spreading the disease in the community. Yet if we are to realize their full potential to contribute to the [global goal of ending TB by 2030](#), we must remember that the places that need these new tools most are the very places that are hardest to reach with technological innovations. [TB is concentrated in low- and middle-income countries](#) with fragile and underfunded health systems that often lack the infrastructure, trained workforce, and supply chains necessary to support new tools and diagnostic approaches.

Limits of Technology

I've seen firsthand the problems that arise when new tools for detecting and treating TB are deployed to health systems that cannot support them. In the Democratic Republic of Congo, we found 209 functional GeneXpert instruments with 998 installed modules, but nearly one third of the modules were broken (data not publicly

available). Module breakdowns often last for more than six months because there are no contracts in place for preventive maintenance and repair. Sometimes even functional laboratory equipment sits unused—while specimens and other materials spoil—if there are major disruptions to the power supply or trained technicians are unavailable. In other countries, we have found biohazardous materials piling up because laboratories had no systems in place for safely handling the waste from conducting TB tests using the new technology.

We can avoid these problems if we think more strategically about which tools are needed, where they should be placed within a country, and how they are best supported. From community health clinics to centrally located reference laboratories, many organizations play a role in determining whether a patient is ill with TB, and together they comprise a “diagnostic network.” One of the first steps to improving TB detection is understanding the network’s capabilities, services offered and their locations, and challenges that prevent the network from performing efficiently and effectively. To do so, many countries have commissioned a “[diagnostic network assessment](#)” that analyzes gaps in the network and opportunities for improvement.

A number have turned to my team at USAID’s [Infectious Disease Detection and Surveillance \(IDDS\) project](#) for support. IDDS helps national TB programs determine which recommendations are most applicable and appropriate for their country. It is not a “one size fits all” approach, because countries have very different needs when it comes to TB programs and strategic planning. For example, Malawi has a high rate of TB among children and a government-funded health care delivery system that is capable of delivering stool testing, a new diagnostic approach for detecting pulmonary TB in children unable to produce sputum for testing. Zimbabwe, on the other hand, really needs to accelerate detection of TB among people who are living with HIV, by implementing bi-directional screening and expanding the use of rapid tests using urine samples, a decade-old technology. Countries like Mozambique ask for investment in whole genome sequencing technology, but they are still missing TB cases and would do better by investing in primary health care centers and health care workers to improve health outcomes for TB patients and all Mozambicans.

Investing in Health Systems

The improvements we recommend may sound like basic health systems strengthening, because they are: address gaps in supply chains, secure better maintenance plans for laboratory equipment, figure out how to forecast which supplies will be needed to prevent waste, and invest in workforce development for essential community health workers. In fact, many of the recommendations from our diagnostic network assessments are not even specific to the diagnostic field. We are recommending solutions that are common to the fields of sustainable global development, climate change resilience, and emergency planning. That’s a good thing, because it means there are secondary benefits if we take this approach to TB prevention and control.

There is an opportunity to take advantage of new tools and technologies, but they will languish without creating supportive environments. At the [United Nations High-Level Meeting on TB](#) set to take place this September, we have an opportunity to determine the best way to use our limited resources to reduce the scourge of TB in

the world's most vulnerable communities—and we must be strategic. To be able to support newer tools, equal (or greater) investments are needed in the health systems that support them.

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