Infectious Disease Detection and Surveillance (IDDS) Quarterly Report FY21 Q3: Annex B. Success Stories

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Kenya's Murang'a County Referral Hospital Laboratory Receives International Accreditation of Bacteriology Tests

Murang'a County in central Kenya is home to more than one million people. The county's leading healthcare facility is the Murang'a County Referral Hospital, but the hospital's laboratory had not been carrying out bacteriology testing since March 2018. Bacteriology is a crucial tool to detect microbes resistant to antibiotics and support the treatment of patients needing antibiotics.

With support from USAID's Infectious Disease Detection and Surveillance (IDDS) project, Murang'a restarted bacteriology testing in February 2020, and in June 2021, the hospital's laboratory received International Organization for Standardization (ISO) accreditation for bacteriology tests: ISO 15189:2012, which specifies requirements for quality and competence in medical laboratories. ISO is the world's largest developer of voluntary international standards. It represents the standards organizations of its 165 member countries.

IDDS support also led Kenya's Bungoma County Referral Hospital Laboratory in western Kenya to successful ISO 15189 accreditation of bacteriology tests in September 2020.

"Both Murang'a and Bungoma are not just carrying out bacteriology testing, they are hitting the highest standards," said David Mutonga, IDDS Team Lead in Kenya, who was a part of the team that supported the successful accreditation at both hospital laboratories.

The road to accreditation in Murang'a started in 2019, with a laboratory assessment to identify gaps or barriers to resuming bacteriology testing. After this, IDDS staff met with the county and health facility teams to plan together how to support the laboratory to achieve resumption.

"I think this initial meeting to get buy in from the county was absolutely key," explains Mutonga. "We presented the laboratory assessment findings to a large group, including all of the key stakeholders, such as the county director of health and the county executive committee member for health, the referral hospital medical superintendent, and the county medical laboratory coordinator. This technical assistance empowered the county to take tangible steps to improve vital bacteriology diagnostics."

IDDS and county staff jointly developed an improvement action plan, with specific actions for the laboratory manager, the health facility management, the county teams, and for IDDS support. Part of the health facility action was to secure supplies, dedicate staff including a quality assurance officer, and put in place mechanisms to ensure that the laboratory followed its action plan.

In February 2020, Murang'a County Referral Hospital restarted bacteriology testing and designated a quality assurance officer to the laboratory. In August 2020, the laboratory started sending antimicrobial resistance surveillance data to the national database, a crucial step in tracking drug-resistant microbes.

Although bacteriology tests at the hospital laboratory have been successfully accredited, there are further challenges ahead. The hospital does not currently have a digital health information management system, and IDDS is advocating with county government for the purchase of a system. There is also limited space for bacteriology at the laboratory. IDDS and the Murang'a County Referral Hospital laboratory team have addressed this in the short term through a

workflow reorganization to make more effective use of existing space before the construction of new building.

IDDS will continue to work with Murang'a to make the hospital laboratory a center of excellence in the county to support lower-level health facilities to also start offering bacteriology services.

The IDDS and Murang'a laboratory teams during ISO accreditation. Photo by IDDS.

Strengthening Biosafety and Biosecurity in Mali

Biosafety and biosecurity are vital issues for all laboratories. Biosafety ensures the safety of laboratory staff from laboratory-acquired infections, and biosecurity protects the public from accidental or intentional exposure to infectious pathogens, the microbes that can cause disease. The problems of biological risk management can be of particular concern in lower-income countries, where funding, training, and equipment can be scarce.

The World Health Organization's Joint External Evaluations (JEEs) assess and score the strengths and weaknesses of a country's health system. The 2017 JEE for Mail in West Africa scored the country at 1 out of possible 5 for its biological safety and security system.

Mali has taken action to address this risk with the support of USAID's Infectious Disease Detection and Surveillance (IDDS) project. IDDS has worked together with Mali's National Institute of Public Health (INSP) to meet a priority need identified in the JEE assessment: "Set up a national external and internal assessment program for biological risk" (Mali JEE 2017 report, p.16).

Between January and February 2021, INSP and IDDS completed some important steps in biosafety and biosecurity. These include reviewing, updating, and approving the national Biosafety and Biosecurity Emergency Response Procedures Manual, and producing a laboratory assessment form for biosafety/biosecurity. Equipped with the new documents, INSP and IDDS carried out biosafety and biosecurity evaluations at the INSP laboratory in the capital, Bamako, and at the laboratory of the regional public hospital Nianankoro Fomba in Ségou.

IDDS support resulted in the identification of the biosafety and biosecurity weaknesses at the two laboratories, the production of improvement plans for the laboratories, and actions to address the urgent measures in the improvement plans.

The emergency response manual and the assessment form were developed using the One Health approach. One Health is a multisectoral approach that recognizes the interconnection between people, animals (wild and livestock), plants, and our shared environment. The process of creating the two documents brought together representatives of all of these sectors. The documents will serve as a national reference for all key stakeholders in human, animal, and environmental health, and they should help increase Mali's score in the next JEE evaluation.

Participants at Mali's national workshop for biosafety and biosecurity documents lid ti Ph t b IDDS

Biosafety and biosecurity condition assessment at Ségou regional lab with the consultant (left), INSP representative (middle), and Ségou lab quality assurance officer (right). Photo by IDDS.

A First Map of Mali's Laboratories: Human, Animal, and Agricultural

Mali is one of Africa's largest nations, but it has never had a comprehensive map of all of its laboratories, the centers for diagnosis for its public health system. Neither has Mali had a map that covered all health sectors: human (public and private), animal, and agricultural laboratories.

Now 4 of Mail's 10 provinces, plus its capital Bamako, are fully mapped, with the support of USAID's Infectious Disease Detection and Surveillance (IDDS) project. The mapping data provides vital information for the country's health system, such as the organization of specimen transport: moving patient specimens from point of collection to point of testing (the laboratory).

By mapping all health sectors, IDDS is using the One Health approach, the integration of human, animal, and environmental health sectors. Some 75 percent of new infectious diseases, such as COVID-19, are zoonotic, diseases that can jump from animals to humans, a key area of One Health. A One Health approach to public, animal, and environmental health will be vital to preventing future pandemics, as well for detecting and tracking existing zoonotic diseases like rabies.

The last laboratory mapping in Mali was carried out in 2017 and covered only the public health laboratories in Kayes and Sikasso regions. To update these data, IDDS supported the Ministry of Health and Social Development to map laboratories in four regions—Kayes, Koulikoro, Ségou, and Sikasso, plus Bamako. The remaining six regions of the country will be covered later in 2021 or early 2022.

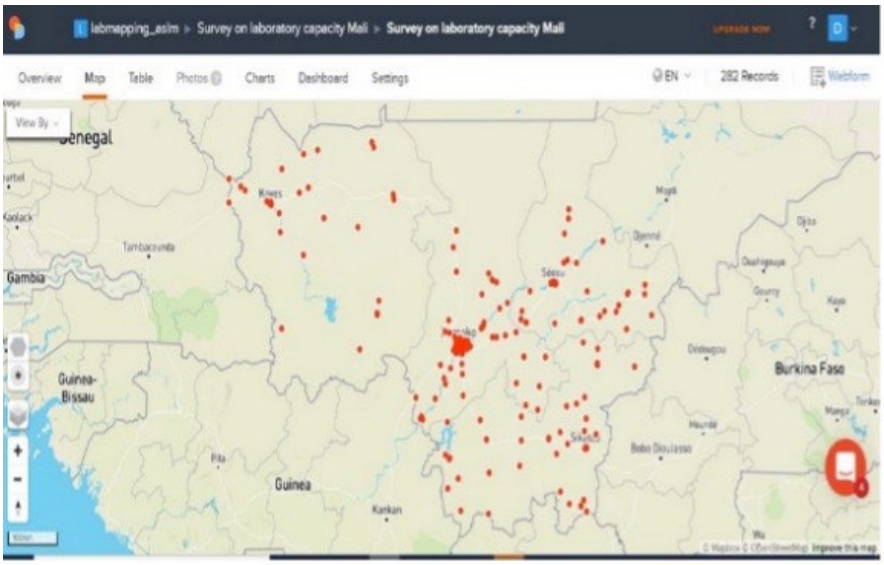
To conduct the mapping, IDDS trained 23 personnel on data collection with the ODK Collect tool, an app that replaces paper forms and can be used on smart phones and tablets. The data were collected from December 2020 to April 2021 and were checked for gaps before being uploaded to the Ona storage platform.

A total of 282 laboratories were mapped: 95 in Bamako, 34 in Kayes, 63 in Koulikoro, 43 in Ségou, and 47 in Sikasso.

In addition to the number, type, and location of the laboratories, the mapping collected data on the capacity and services available, such as the equipment on location, maintenance system, quality management system, collaboration with other laboratories, staffing, and the type of testing available, for example for antimicrobial resistance (detecting drug-resistant microbes).

These data are an essential baseline for planning laboratory improvements and upgrading the entire diagnostic process across Mali. In addition to developing an improved specimen referral system, the data will also be used to develop a plan to strengthen operations at all the laboratories now mapped.

Data completeness checking session before uploading to Ona platform. Photo by IDDS.



View of laboratories mapped on Ona platform. Photo by IDDS.

IDDS Increases the Number of Laboratories Capable of Performing Antimicrobial Resistance Detection and Surveillance in Senegal

Drug resistance is an increasing threat to health globally as the bacteria, parasites, viruses, and fungi (also known as pathogens) that cause diseases evolve resistance to the antibiotics that once proved effective, making it more costly and difficult to treat patients. Antimicrobial resistance (AMR) can develop anywhere and increasing the number of laboratories that can perform AMR detection and surveillance is vital to equipping scientists to combat it.

Through AMR detection, a laboratory is able to identify the microbials or drugs to which pathogens are resistant. With AMR surveillance, patterns in resistance can be identified and effective treatments prescribed. Linking detection to surveillance is the reporting of testing results into national and international AMR databases.

To promote AMR detection and surveillance, USAID's Infectious Disease Detection and Surveillance (IDDS) project held a workshop at the National Public Health Laboratory in Senegal's Thies Region, from April 12 to 16, 2021.

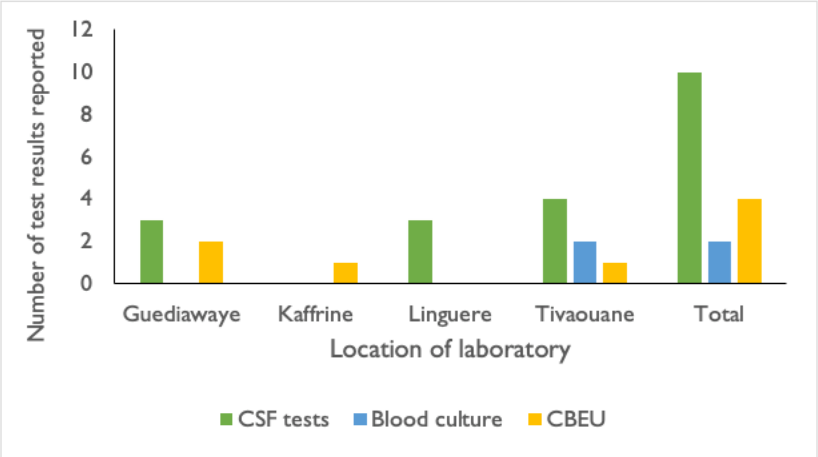
The workshop was carried out by 6 trainers from Senegal's Ministry of Health and IDDS, with 12 laboratory technicians attending. This workshop was part of the technical assistance and training that IDDS is providing to seven laboratories across the country: Kaffrine Laboratory in Kaffrine Region, Magatte Lo de Linguère Laboratory in Louga Region, Mame Abdou Aziz Sy de Tivaouane Laboratory in Thies Region, Richard Toll Laboratory in St. Louis Region, Roi Baudouin de Guédiawaye Laboratory in Dakar Region, Sédhiou Laboratory in Sédhiou Region, and Touba Ndamatou Laboratory in Diourbel Region.

During the training, all the participants successfully performed antibiotic sensitivity tests on *Klebsiella*, *E. coli*, and *Streptococcus*, three different types of bacteria that can cause life-threatening infections. With this training, the seven laboratories now have full capability to perform AMR detection and surveillance, This brings Senegal to 47 laboratories that are conducting AMR detection and surveillance.

Senegal's Director of Laboratories, Professor Amadou Moctar, recognized the importance of the training: "I would like, in turn, to thank IDDS, all the facilitators, and the Director of the National Public Health Laboratory for having hosted the training, as well as all the participants for attending. IDDS, you have done a very good job and the Senegalese people will be grateful to you."

The seven IDDS-supported laboratories are also now collecting AMR data and sharing them nationally with the Directorate of Laboratories. AMR testing and reporting started in June 2021. Kaffrine Laboratory identified and reported two positive tests for antibiotic-resistant E. coli, and Tivaouane Laboratory identified multi-drug resistant Klebsiella pneumonia.

After the completion of the training, a summary of the training was posted on the official Directorate of Laboratories website: http://dirlabosn.com/formation-sur-la-detection-et-la-ram/. Before the training, from December 2020 to January 2021, IDDS had supplied all seven facilities with basic equipment and supplies for AMR detection.



CSF=cerebrospinal fluid
CBEU=cytobacteriological examination of urine
Antibiogram test results reported in Guediawaye, Kaffrine, Linguere, Tivaouane in June 2021, N=16

The graph shows the number of tests reported by the laboratories in June 2021

AMR detection and surveillance training workshop at the National Public Health Laboratory in Thies, April 12–16, 2021. Photo by IDDS.

To Contain Disease Outbreaks, IDDS Improves the Quality Assessment of Animal Health Data in Uganda

In June 2021, Uganda was facing several zoonotic disease (diseases that can jump from animals to humans) outbreaks, including anthrax, plague, Crimean Congo hemorrhagic fever, and Rift Valley fever. Early detection of these outbreaks is critical to prevent zoonotic diseases from spilling over from animals to humans and requires quality animal health surveillance data that are accurate, comprehensive, and extensive.

In 2018, the Food and Agriculture Organization of the United Nations examined the animal health surveillance system in Uganda. The evaluation established that animal health surveillance data captured only 10 percent of Uganda's animal health events (reports that may signal a disease outbreak) and that the accuracy of the data was as low as 20 percent. In addition, there was no standardized procedure for conducting routine data quality assessments in the animal health sector.

To bridge the gap in the quality of animal health data, USAID's Infectious Disease Detection and Surveillance (IDDS) project supported the Ministry of Agriculture, Animal Industry and Fisheries (MAAIF) to draft and validate guidelines and tools for conducting data quality assessments, finalizing the document in February 2021.

In his remarks during the validation meeting, Dr. Joseph Sserugga, a Senior Veterinary Officer at MAAIF, recognized the importance of the new guidelines and tools: "I thank IDDS for the technical and financial support. These guidelines and tools fill a critical gap identified in the performance of veterinary services assessment."

The guidelines and tools will be used to conduct data quality assessments at national and rural surveillance levels, improving the quality of animal health data. This will also improve Uganda's score for the World Health Organization's International Health Regulations benchmark 9.3: *Systematic analysis of surveillance data for action is in place*.

With only 10 percent of animal health events captured, IDDS is seeking to further improve surveillance, working with the Food and Agriculture Organization and other key partners to improve data entry, quality, analysis, and reporting.

Dr. Rose Ademun (right), Commissioner for Animal Health, MAAIF, participating in the data quality assessment guidelines and tools validation meeting, with Derrick Mimbe, IDDS Team Lead in Uganda. Photo by IDDS

Improving the Detection of Infectious Diseases in Uganda's Animal Health Laboratories

Maintaining quality management systems (QMS) in laboratories is one of the surest ways of obtaining quality, reliable, traceable, and reproducible testing results. In this era of new and re-emerging zoonotic diseases — diseases capable of jumping between animals and humans — it is critical to ensure that laboratories, whether they are national, regional, or district laboratories, are fully functional and ready to do their work.

QMS are sets of processes, such as guidelines, protocols, and checklists, designed to ensure high-quality results. Making sure that QMS are in place is essential for attaining the gold standard in laboratory competence, the International Organization for Standardization (ISO) certification for 17025.

In March 2021, USAID's Infectious Disease Detection and Surveillance (IDDS) project in partnership with Uganda's Ministry of Agriculture, Animal Industry, and Fisheries and Regional Disease Detection and Epidemiological Centers (RADDECs) held the first ever training on ISO 17025 for the animal health sector in Uganda for laboratory-based veterinarians who are tasked with investigating animal disease outbreaks. This is part of IDDS's initiative to improve the detection of zoonotic diseases, such as anthrax and rabies, and to eventually attain ISO certification for these laboratories.

Between April 26 and May 7, 2021, IDDS conducted the first laboratory QMS mentorship exercise at four RADDECs in Uganda's Gulu, Mbale, Mbarara, and Moroto districts. The mentorship exercise involved experienced QMS experts who were previously trained with support from IDDS, working onsite closely with the RADDEC laboratory teams.

The mentors ensured that the laboratory teams understood the audit checklist, which will be used by IDDS-trained auditors as they periodically assess the implementation of laboratory QMS. The onsite mentorship activities used the mentorship toolkit that was developed by a multi-sectoral team of ISO experts (auditors, trainers, and mentors) with support from IDDS.

Dr. Alfred Opiyo, the District Veterinary Officer at Gulu RADDEC, said, "I appreciate IDDS so much for the training and mentorship exercise that has helped us appreciate the ISO 17025 standard and its implementation of the different clauses. It now makes more sense to an ordinary veterinarian like me with little laboratory science background. Without these efforts so far, the standard would have been a complicated puzzle."

Ms. Gloria Akurut, the Uganda Wildlife Authority (UWA) laboratory lead and one of the mentors who participated in this exercise, said, "I am now a better QMS mentor because of this mentorship exercise. I can now practically connect the dots from interpreting the standard, implementing it hands on with the facilities and drawing the relationships this standard has with other closely related standards such as ISO 15189:2012. Thank you so much IDDS. This knowledge will be vital as we embark on building the laboratory quality management systems of the UWA sector."

Participants during onsite mentorship at Gulu Regional Disease Detection and Epidemiological Center. Photo by IDDS.

Five Provinces Report into Vietnam's Animal Health Information System for the First Time, Leading Disease Reporting Rates in Their Regions

When an outbreak of avian influenza, African swine fever, or another zoonotic disease (diseases that can jump from animals to humans) strikes a farm, authorities must act quickly to protect livelihoods and public health and prevent further spread of the disease. To report when these diseases strike, provinces in Vietnam should enter the information into the national animal disease reporting system.

In 2018, Vietnam launched the Vietnam Animal Health Information System (VAHIS), an online disease reporting system designed to enable real-time reporting of animal and zoonotic diseases. Despite the use of VAHIS being required by the Ministry of Agriculture and Rural Development, as of June 2020, none of the five provinces supported by USAID's Infectious Disease Detection and Surveillance (IDDS) project had ever made a report into VAHIS, like most provinces across the country.

To learn why provinces were not using the system, IDDS, together with the Regional Animal Health Office staff of the provinces, conducted an in-depth situation analysis on VAHIS in June and July 2020. The IDDS team conducted 18 focus group discussions with a total of 79 participants from provincial sub-departments of animal health (SDAHs), district veterinary stations, and commune animal health workers; 6 in-depth interviews with SDAH leaders; and 6 consultation meetings with 122 veterinary staff from different levels.

The IDDS team also led a planning process with veterinary staff to develop a plan to improve VAHIS use at all government levels. The plan was validated at a consultation meeting organized by IDDS in January 2021, with 22 leaders and staff of the Vietnam Department of Animal Health, 3 Regional Animal Health Offices, and 5 provincial SDAHs.

From February to June 2021, IDDS conducted online and onsite monitoring and supervision trips to the five provinces to help animal health staff understand how to report into VAHIS. IDDS provided on-the-job training and coaching for VAHIS users at the SDAHs and encouraged staff to report the animal disease outbreaks into VAHIS.

The IDDS project team, together with national and regional leaders, conducted meetings with provincial animal health staff to explain the importance of reporting into VAHIS and emphasize that the VAHIS information-sharing procedure does not lead to a negative impact on the local economy, a common misconception. Animal health leaders at the various government levels now understand more about VAHIS and endorse its use by their staff. As a result, the five IDDS-supported provinces of Thai Nguyen, Khanh Hoa, Binh Dinh, Can Tho, and Dong Thap have started using VAHIS. The quality of the reporting has also improved, along with the quantity.

"Working with IDDS helped me understand that reporting outbreaks into VAHIS does not lead to leaking information to irrelevant people so it is not harmful to the local economy. Now we are confident to report into VAHIS to support animal disease prevention and control in the regions," said Le Dac Vinh, Director of Thai Nguyen SDAH.

An example of the successful use of VAHIS is that on May 26, 2021, a case of avian influenza was detected in a chicken farm in Dong Thap province. Dong Thap SDAH reported the outbreak

into VAHIS immediately. Through sharing information, animal health staff cooperated with human health staff to start prevention and control measures to stop the disease from spreading to other farms and humans.

The five IDDS-supported provinces have become leaders in their regions in using VAHIS. In a June 14 meeting on VAHIS use and avian influenza surveillance organized by the Department of Animal Health, regional heads of epidemiology divisions indicated that the five IDDS-supported provinces had reported the highest numbers of outbreaks in their regions.

VAHIS situation analysis: focus group discussion to rank the barriers to using VAHIS. Photo by IDDS.

The VAHIS interface.