



USAID'S INFECTIOUS DISEASE DETECTION AND SURVEILLANCE (IDDS)

Functional Equipment Technical Approach

Overview

A responsive, optimized diagnostic network offers tiered test services from the point of care to the national and supranational reference laboratory. To achieve this, the diagnostic network requires suitable working equipment in the right location to meet demand. This reduces the strain on weak specimen referral systems and increases network resilience against outbreaks. In many countries, however, the systems and infrastructure needed to support functional diagnostic equipment are limited.

Infectious Disease Detection and Surveillance (IDDS) aims to support countries' efforts to strategically acquire, maintain, and use equipment across its lifecycle. IDDS works with partner countries in six main areas: inventory, needs analysis, selection and procurement, human resources, IDDS equipment procurement, and lifecycle management.

Technical Approach

The IDDS five-year technical approach will assist countries to identify existing essential and auxiliary equipment, gaps, and the need for new equipment, repair, or maintenance. This approach will help stakeholders develop an understanding of available equipment in their network and inform a strategic equipment procurement, maintenance, and lifecycle strategy. This will include providing technical assistance to address those needs, including increasing capacity for local maintenance and proper use by equipment users. IDDS will assist countries to select and procure equipment through standardization and harmonization practices and will advise on equipment placement (existing or new) based on diagnostic network need after optimization analyses. IDDS will purchase equipment with comprehensive service packages where permitted to facilitate manufacturer or supplier

support. The result will be a maintained and sustainable diagnostic equipment capability that supports ongoing surveillance for Global Health Security Agenda (GHSA) priority pathogens, antimicrobial resistance (AMR), and tuberculosis (TB).

In project year 1, IDDS activities are focused on creating and revising national equipment policies, conducting equipment inventories (including determining whether the equipment is functioning well), providing trainings for diagnostic personnel on routine and preventive maintenance, and developing a cadre of laboratory bioengineers. In addition, IDDS will procure some select equipment to support immediate gaps to be able to detect GHSA priority pathogens and AMR. IDDS has currently proposed to provide support for these types of activities in Cameroon, Ethiopia, Liberia, and Mali.

Inventory

IDDS can assist country partners to prepare an inventory of their diagnostic and safety equipment (such as biosafety cabinets) used for priority pathogen and AMR testing. Network equipment mapping will help with national capacity planning, not only for routine needs, but also for the ability to surge in the event of an outbreak or to support testing needs at other testing laboratories in the event of laboratory down time. This approach will support country stakeholders to determine what equipment they have, including its location and operating status, determine where equipment has capacity to perform additional tests and might be used to inform optimization of specimen referral systems, and identify unmet equipment needs, including training, spare parts, and maintenance. This information can also inform further procurement, maintenance, and training efforts to improve capacity across the diagnostic network. An equipment inventory and associated asset tracking system can be maintained by a country and updated in response to changing needs over time.

IDDS will explore systems that may already be used in countries, such as LabEQIP, a Geographic Information System-based platform, Llamasoft, and ArcGIS.

Needs Analysis

With an inventory, an equipment needs analysis provides a systematic process for determining, prioritizing, and addressing diagnostic equipment needs. The findings of an equipment-needs analysis strategically inform equipment and resource allocations. These actions may include the reallocation of existing equipment, strategic acquisition of new equipment, changes in specimen referral systems, creation of advocacy plans, and implementation of training programs. Training and mentoring country stakeholders in the needs analysis process ensures that equipment can be strategically reevaluated as operating requirements change in country.

IDDS will provide technical assistance to help country partners develop a strategic equipment needs assessment that can be used to inform further equipment acquisition, deployment, and maintenance plans, as well as system-wide strengthening efforts. IDDS will collaboratively define the goals, objectives, and scope of the analysis, and will begin to identify existing resources and in-country stakeholders to inform the process. In future years, with country buy-in and data, IDDS could develop an electronic program that could propose optimizations.



Selection and Procurement

IDDS Purchasing

IDDS will procure laboratory equipment identified to fill gaps in diagnostic capability and laboratory safety. IDDS will use information from baseline laboratory assessments (either existing from other partners or IDDS assessments), equipment inventory data, Joint External Evaluation reviews and other evaluations, risk analyses, and stakeholder input to inform recommendations for equipment purchases. IDDS will consider the full equipment lifecycle during procurement, including technical requirements, set-up commissioning, maintenance, operating cost, calibration, performance evaluation, and decommissioning.

IDDS will use a standardized procurement process when buying equipment on behalf of, or in conjunction with, country stakeholders. When procuring equipment, IDDS intends to purchase packages that support certification, commissioning, training, and initial maintenance costs. IDDS will leverage its combined purchasing power whenever possible for all diagnostic equipment purchased.

Technical Assistance for Country Procurement

Each country has a unique system of diagnostic equipment procurement with opportunities and challenges, and equipment procurement systems must be responsive to a country's needs. IDDS will provide technical assistance and subject matter expertise to country stakeholders to develop sustainable and efficient procedures for equipment procurement that comply with applicable country regulations and international best practices. IDDS will work with national stakeholders to standardize

and select equipment. Working from the baseline standards put forward by the Maputo Declaration of 2008, the resulting Consultation on Technical and Operational Recommendations for Clinical Laboratory Testing Harmonization and Standardization, the Asia Pacific Strategy for Strengthening Health Laboratory Services, and the Freetown Declaration of 2015, IDDS will work with the partners and stakeholders to create new, national standardized equipment policies, inclusive of priority pathogens and AMR platforms.

After the equipment is selected, IDDS will support the implementation of robust and sustainable equipment procurement plans by providing technical assistance and subject matter expertise to identify vendors, comply with applicable laws and regulations, and negotiate pricing and comprehensive service packages.



Human Resources

IDDS will work with countries and institutions to identify and train bioengineers to service equipment at all levels of the tiered network. When a cadre is identified, IDDS will provide technical assistance to identify and leverage existing training resources and to develop and deploy new training materials as appropriate. Existing training opportunities may include external workshops, manufacturer-sponsored trainings, existing certification programs, and peer-to-peer mentorship programs. New training content and activities will be assembled from existing open-source materials or generated as needed. Training modules will include train-the-trainer workshops, active learning approaches, and online content delivery. This approach increases in-country impact and sustainability and will generate a suite of open access tools that can be used by other IDDS countries and beyond.

Lifecycle Management

Prior to the purchase of equipment, the lifecycle management process begins. This process manages equipment usage and maintenance throughout the lifecycle or period of ownership. It includes planning, budget, financing, usage, maintenance, decommissioning and disposal, and monitoring and evaluation.

IDDS will provide lifecycle management assistance throughout the tiered diagnostic network. IDDS will provide technical assistance for equipment management for administrative personnel, such as laboratory managers, administrative staff, and support personnel. Training can be provided for equipment management systems and will include the following: tracking equipment maintenance, calibration, and certification; determining when advanced maintenance is required; determining which maintenance tasks must be conducted by a vendor or trained repair person; and instituting procedures to ensure that all laboratory personnel are appropriately qualified and authorized to use equipment. Materials may be drawn from existing trainings on laboratory management and may be combined with other training topics relevant to laboratory managers as appropriate.

In cases in which training is not provided by manufacturers, IDDS will train laboratory personnel (through a training of trainers model) to understand equipment operation, capabilities, maintenance requirements, and associated biosafety concerns. Training materials and assistance will also be available for routine equipment preventative maintenance. "End of life" technical expertise can be provided to instruct countries on decommissioning and disposal of equipment safely. Throughout the lifecycle, monitoring and evaluating will take place, which will contribute to monitoring the equipment lifecycle and allowing for review and improvement of processes.