

Powering One Health: The Integrated GIS Tool Transforming Africa's Laboratory System

In early June 2026, a quiet but powerful transformation began to take shape in Accra, Ghana. Experts from Africa CDC, the African Society for Laboratory Medicine (ASLM), Member States, and the UK Health Security Agency (UKHSA) came together with a shared mission to redefine how Africa strengthens and connects its laboratory systems to better detect and respond to evolving health threats. What emerged was not just an updated tool, but a bold and practical shift toward data-driven health security across the continent.

At the center of this transformation is the redesigned Integrated GIS Laboratory Mapping Tool, fully aligned with the Framework for GIS Mapping of Laboratory Systems and Network Capacities in Africa developed by Africa CDC in partnership with ASLM and Member States. Guided by this continental framework, the tool now fully embodies the One Health approach integrating human, animal, and environmental health systems, alongside chemical detection capacities to provide a comprehensive, interconnected view of laboratory networks. This approach reinforces a critical principle: GIS laboratory mapping is the essential entry point for strengthening laboratory systems and networks. By first understanding where laboratories are, what they can do, and where the gaps exist, countries can move from assumptions to precision planning, targeted investment, and measurable impact.

Turning Data into Action

Across countries, this shift is already delivering results. In Zambia, GIS laboratory mapping has provided a detailed, country-wide view of laboratory services across all provinces and levels of care. The analysis revealed geographic disparities in diagnostic coverage, with stronger capacity in urban areas while rural and hard-to-reach districts face limited access to essential testing, longer turnaround times, and weak sample referral systems. It also identified gaps in equipment, testing capabilities, and data reporting consistency. While the WHO Joint External Evaluation (JEE) assesses these capacities at a national level, GIS mapping goes further providing granular, facility-level intelligence. This enables precise targeting of interventions, improving efficiency through strategic resource allocation, optimized referral systems, and tailored network strengthening. As a result, Zambia has strengthened coordination across national, provincial, and district levels, enhancing both preparedness and response capacity.



Stakeholders in Ghana convene to strengthen laboratory systems using GIS-based capacity mapping.

In Mozambique, the mapping exercise is shaping future ready laboratory systems. Findings showed that services are highly concentrated in major urban centers, leaving peri-urban and rapidly growing metropolitan areas underserved. These insights are now guiding forward-looking planning, aligning laboratory expansion with urbanization trends, population growth, and risk profiles, while addressing gaps in infrastructure, equipment, and workforce capacity at district level.

Addressing Critical Chemical Detection Gaps

At the regional level, collaboration with the UK Health Security Agency (UKHSA) has brought renewed focus to chemical detection capacity, a key but often overlooked component of health security.

Assessments revealed that:

- Over 65% of laboratories lack essential equipment for advanced chemical analysis
- More than 70% lack trained personnel in chemical detection and toxicology
- Only a limited number have standardized protocols for chemical event detection and response

These findings highlight significant vulnerabilities in preparedness for non-biological threats, directly aligning with WHO JEE chemical event indicators (CE1-CE3). In response, countries are prioritizing investments in chemical surveillance systems, workforce development, and laboratory readiness.

From Mapping to Continuous System Strengthening

Building on these insights, Africa CDC and ASLM are advancing a self-assessment, sustainable approach to data collection, enabling countries to continuously update and own their laboratory data. This shift moves countries

beyond one-time assessments toward continuous system strengthening, driving: More efficient decision-making, Stronger disease surveillance systems and Smarter and more equitable resource allocation and Greater alignment with JEE preparedness and response goals.

With the development of an interactive GIS decision-support dashboard, countries will now visualize gaps in real time turning data into actionable intelligence. With tool integration, translation, and pilot testing progressing toward October 2026, and a Steering Committee guiding implementation, the initiative is rapidly advancing toward continental scale. What makes this effort transformative is the shared commitment behind it. Countries, regional institutions, and global partners are working together toward a common goal: A future where no outbreak goes undetected, no region is invisible, and no community is left behind. This is not just mapping laboratories. It is mapping Africa's resilience, readiness, and future.

About the Initiative

The GIS Laboratory Mapping (LabMap) initiative, led by Africa CDC in partnership with ASLM, and guided by the Framework for GIS Mapping of Laboratory Systems and Network Capacities in Africa, has mapped laboratory systems and network capacities in 29 countries, covering over 5,558 laboratories laying the foundation for stronger, smarter, and more connected health systems across the continent.



Africa CDC, ASLM, UKHSA and member states reviewing the GIS mapping survey tool reviewing GIS Mapping insights in Ghana

ECHO Session Summary

April – June 2026

Between April and June 2026, a total of 11 ECHO sessions were convened, attracting 2,959 participants from 110 countries, each attending at least one session. The median participation time was 53 minutes (IQR: 27–67 minutes).

The sessions focused on the launch and dissemination of guidance documents and tools, task sharing to improve service access, and the use of data for strategic decision-making and governance.

process. The tool evaluates the progress of national laboratory systems in delivering clinical, public health, and global health laboratory functions that contribute to achieving Universal Health Coverage targets and requirements. Assessment results help inform national laboratory strategies, guide investments, and benchmark laboratory system progress over time. Watch this session [here](#).

Number of Participants by Country

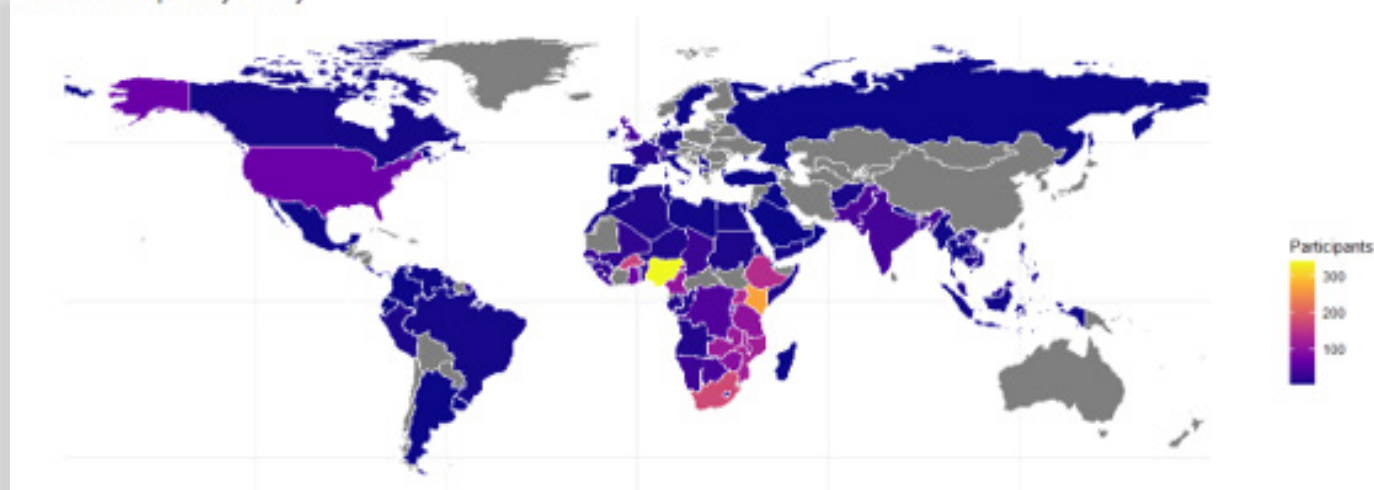


Fig 1. Heat Map Showing number of participants attending the sessions by country

Session Highlights

Launch and Dissemination of Guidance Documents and Tools

Four sessions were dedicated to the launch and dissemination of four key guidance documents and tools.

Laboratory System Maturity Monitoring (LMM) Tool

The Laboratory System Maturity Monitoring (LMM) tool, jointly owned by Africa CDC and WHO AFRO, provides a standardized framework for measuring laboratory system maturity through a voluntary and collaborative assessment

Quality Management System (QMS) Toolkit for Multi-Disease Testing in Non-Laboratory Settings

As countries continue to decentralize services and expand task sharing, conventional quality management systems (QMS) have proven too complex for non-laboratory settings. In response, WHO, in collaboration with external experts, implementing partners, and country representatives, developed a new QMS Toolkit for multi-disease serological testing in non-laboratory settings.

The toolkit is practical, simplified, and designed for real-world

Diagnostic Network Optimization (DNO) Implementation Guide

implementation. It outlines the minimum quality management activities that any testing site can adopt to ensure reliable and accurate results. With available ongoing technical support from WHO, Ministries of health and partners are guided to utilize this tool to support quality testing in non-lab sites. Watch this session [here](#)

Waste Management Guidance

The African Society for Laboratory Medicine (ASLM), the U.S. Centers for Disease Control and Prevention (CDC), and Waste Not Want Not (WNWN) jointly developed comprehensive guidance to address pressing laboratory waste management challenges across Africa. The guidance provides practical recommendations for selecting and implementing waste treatment technologies appropriate for African settings. The session also featured findings from a situational analysis highlighting existing gaps in infrastructure, policy, technical capacity, and financing for laboratory waste management. Proper waste management is never an afterthought, it is planned for, budgeted for, implemented and monitored for success. Watch this session [here](#)



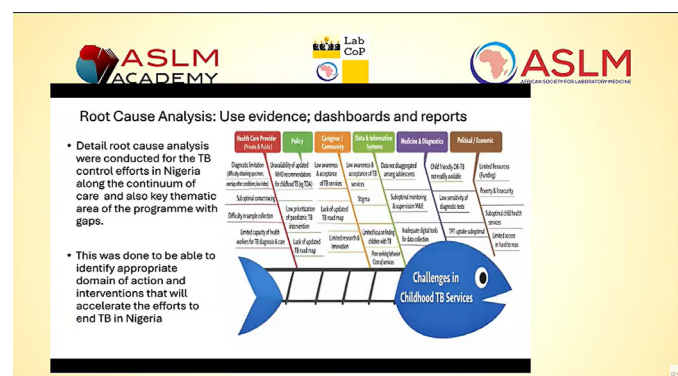
Edward Krisiunas, President of WNWN International, presenting a slide of practical treatment and disposal methods for laboratory diagnostic waste

To promote wider adoption of Diagnostic Network Optimization (DNO) for strategic planning and strengthening diagnostic networks, FIND and the Global Laboratory Initiative (GLI) developed a comprehensive stepwise implementation guide. The guide highlights the core pillars of successful DNO implementation, including assessing data availability, engaging stakeholders, selecting and applying the most appropriate analytical model, and translating findings into actionable plans to improve diagnostic access, optimize device placement, strengthen sample referral systems, and integrate testing services. This guidance document further clarifies critical steps in DNO implementation to ensure effective and efficient DNO conduct. Watch this session [here](#)

Data Use for Strategic Decision-Making

Two sessions focused on the use of data for strategic decision-making.

The first featured lessons learned from Nigeria's National TB Program in applying the WHO framework for data use in strategic planning during the development of their 2027-2031 National Strategic Plan. The presentation demonstrated how evidence-informed prioritisation and scenario planning strengthened the budgeting and planning process and enabled integration of laboratory systems strengthening objectives into the national strategy. Watch the session [here](#)



Dr. Obioma Chijioke-Akaniro, Dpt Director and Monitoring & Evaluation Mgr, FMOH Nigeria, presenting a slide on the use of root cause analysis and data-driven quality improvement to strengthen tuberculosis services



Prof. Norbert Ndjeka, Chief Director of the TB Control & Mgt Programme, South Africa NHLS, presenting a slide on best practices for quality improvement to strengthen TB diagnosis, treatment, and

The second session focused on data-driven tuberculosis (TB) control, highlighting South Africa's commitment to strengthening transparency, accountability, and public access to health information. Participants learned about the country's public-facing TB dashboard, developed as part of broader efforts to enhance government accountability and improve access to timely TB information. Watch this session [here](#).

Other sessions

Diagnostic innovation

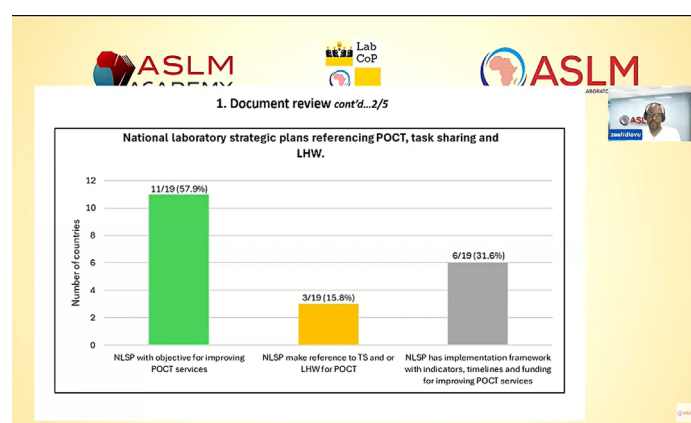
The Unitaied-funded Start4All consortium generated global multi-country evidence demonstrating that pooled sputum testing can significantly improve access to molecular TB diagnosis while maintaining diagnostic test validity while substantially reducing cartridge use and overall costs. The findings from the Start4All consortium, contributed to the

recent WHO recommendation on pooled sputum testing. The session highlighted the laboratory, operational, and programmatic value of pooled sputum testing and its potential to strengthen TB diagnostic services. Watch this session [here](#).

Task Sharing

Task sharing involves the rational redistribution of responsibilities among health workforce teams by transferring specific tasks from highly qualified health professionals to health workers with shorter training and fewer qualifications. This approach enables more efficient use of available human resources for health while expanding access to services.

During this session, participants reviewed findings from an assessment of national policy adoption and implementation of task sharing for point-of-care (POC) testing across 19 African countries. The session also examined key considerations for scaling up task sharing with lay cadres within national health programmes. Watch this session [here](#)



Dr. Zee Ndlovu, Regional Epidemiologist and Diagnostics Advisor, MSF, presenting findings on task sharing for point-of-care testing

WHO Launches a Practical QMS Toolkit for Multi-Disease Testing in Non-Lab Settings

Responding to real-world needs

As countries expand access to testing by decentralizing services and task-shifting to trained lay providers, many testing sites face a critical gap: existing quality management systems (QMS) are too complex for non-laboratory settings. Without adapted tools, maintaining test accuracy and patient safety at community level becomes a challenge. To bridge this gap, WHO – in collaboration with external experts, implementing partners, and country representatives – developed a new QMS toolkit for multi-disease serological testing in non-laboratory settings.

The toolkit is simplified, practical, and built for real-world conditions. Rather than requiring full QMS implementation, it outlines a minimum set of activities that any site can apply to ensure reliable results. It covers HIV, syphilis, hepatitis B and C, and other rapid serological tests delivered outside traditional labs.

“The QMS tool kit does NOT replace existing tools but provide set of crucial activities to implement, in case comprehensive package cannot be implemented”_Celine Lastrucci, Consultant at WHO.

“Donors and countries need a common, realistic standard for quality where testing actually happens. This toolkit gives us that baseline – practical, scalable, and tied to impact.”. Get involved in your next cycle funding request development, reach out

to your CCMs, Principal recipients and prioritize QMS and once approved, implement with fidelity. – Fatim Cham-Jallow, Team Lead, Integrated Laboratory Systems Strengthening Team, The Global Fund

Call to Action:

Bring the Toolkit to Your Country

1. Ministries of Health, implementing partners, and testing programs: Download the toolkit and session slides [here](#)
2. Request technical support from WHO to adapt the minimum QMS steps to your national HIV/TB/hepatitis testing guidelines.

QMS tool kit for non-lab settings using RDTs

Essential activities where resources are limited: simple, multi-disease decentralized and integrated approaches

Pillar 1 Organization, governance, planning	Pillar 2: Workforce development	Pillar 3 Procurement, supply chain and inventory management
• National engagement framework • Roles, responsibilities and network at different levels (including QA officer's team) • Financial plan: budget checklist • Regulation of IVDs: selection and registration of IVDs	• Organograms, job profiles • Training and supervision: competency-based assessment, training curriculum, 12 training modules,	• Define site needs, alert and buffer stocks, quantity to order • Site inventory management: stock cards, inventory templates, temperature monitoring log...
Pillar 4: process control, assessment and continuous improvement	Pillar 5: documents, records and information management	Post Market Surveillance
• EQA: PT and supportive site supervision • Quality control: internal and third party • Monitoring and Evaluation: register, reporting form and use of data • Occurrence management and process improvement	• Testing site documents and record check list • Generic templates: SOPs, Bench aids, EQC result form...	• Guidance and procedures • For to document IVD problems • PMS user feedback form • Manufacturer incident investigation report



WHO non-lab settings QMS tool kit- March 2026

WHO Quality Management System (QMS) Toolkit for Non-Laboratory Settings Using Rapid Diagnostic Tests (RDTs)

Building resilient diagnostics systems in a constrained fiscal environment

Foreign aid has played a critical role in driving improvements in health outcomes across low- and middle-income countries. A major example is the [United States President's Emergency Plan for AIDS Relief \(PEPFAR\)](#), launched in 2003, which became one of the largest sources of international support for the global HIV response. By 2024, PEPFAR had enabled 71million people to receive HIV testing, supported antiretroviral treatment (ART) for nearly 20.5million people, helped 5.5million babies to be born HIV-free to mothers living with HIV, and directly supported over 327,000 health care workers to deliver and improve HIV care and other health services. These investments also strengthened broader health systems and delivery. Therefore, the sudden withdrawal of U.S. foreign aid through dismantling of the United States Agency for International Development (USAID) in early 2025 created major disruptions across health programmes. The HIV [market impact memo](#) from the Clinton Health Access Initiative reported significant disruptions to HIV services across 8 countries, including a 12% decline in HIV testing, 9% decline in new ART initiations and 21% decline in viral load testing. A [separate analysis](#) of 29 countries estimated that combined support from the United States and the Global Fund could fall by about \$4.3billion between 2027 and 2029.

[ASLM's analysis](#) of funding cuts to diagnostic networks showed that in early 2025, 80% of the 16 countries assessed relied on donor funding for critical laboratory services, primarily sample transport networks, equipment maintenance, and quality assurance and control. More than half did not have contingency planning, meaning these

systems would collapse due to funding shocks. To help countries protect essential diagnostic services, ASLM developed the [Minimum Package of Laboratory Services \(MPLS\)](#). The framework identified four priority areas: procurement of tests for priority diseases guided by the National Essential Diagnostics List (NEDL), basic equipment maintenance services, retention of core staff, and quality control and assurance. It was accompanied by a self-assessment tool to help countries evaluate the vulnerabilities in their laboratory systems. Responses from the self-assessment were received in September 2025 from 18 countries, including 10 supported by PEPFAR. Almost all countries reported that they had prioritised system elements to ensure continuity of testing services. However, among 13 that had an NEDL, only two said they were actively using it to guide prioritisation. Countries identified nine core laboratory functions as priorities aligned to the MPLS: basic equipment maintenance, biosafety and biosecurity, governance & management, laboratory information management systems, procurement & supply chain, quality control & assurance, retention of core staff, sample collection & storage, and sample referral. However, more than 90% of the estimated budget for basic equipment maintenance (~\$450k), laboratory information management systems (~\$700K), quality control & assurance (~\$350k), and sample referral systems (~\$2M) came from donor funding making them most vulnerable to funding cuts. On average, countries expected a 40% reduction in funding for these areas. This means without urgent action, some of the most essential parts of diagnostic systems could be severely weakened.

Several countries have already begun taking steps to improve sustainability. These include starting discussions on domestic resource mobilisation and using national planning processes to safeguard essential laboratory services. For example, some are adding priority tests to national health insurance schemes and universal health coverage packages, while integrating them into national cost-recovery mechanisms. Others are piloting the use of postal services and immunisation programmes to transport samples. However, while prioritisation of diagnostic core functions is underway, there is need for stronger alignment between sustainability plans, laboratory priorities, and financing decisions to avoid fragmented responses and protect the services most important to public health. Countries also need sustainable financing strategies that combine prioritisation, domestic investment, and coordinated donor support.

There is potential to leverage the 5-year funding that is available through PEPFAR to strengthen diagnostic systems as domestic funding increases. Prioritising domestic resource mobilisation is urgently needed to broaden financing options, reduce donor reliance, and ensure sustainable funding for essential diagnostic services. Strategic private sector partnerships can be leveraged to improve efficiency and strengthen diagnostic services. Through the Laboratory Director's Forum, ASLM will support countries in engaging ministries of finance and the private sector on domestic financing. ASLM is also providing technical support to strengthen the development and implementation of NEDLs as tools for prioritisation, procurement, and advocacy. In addition, a few countries have already started using the MPLS framework to develop harmonised, standardised laboratory testing guidelines.

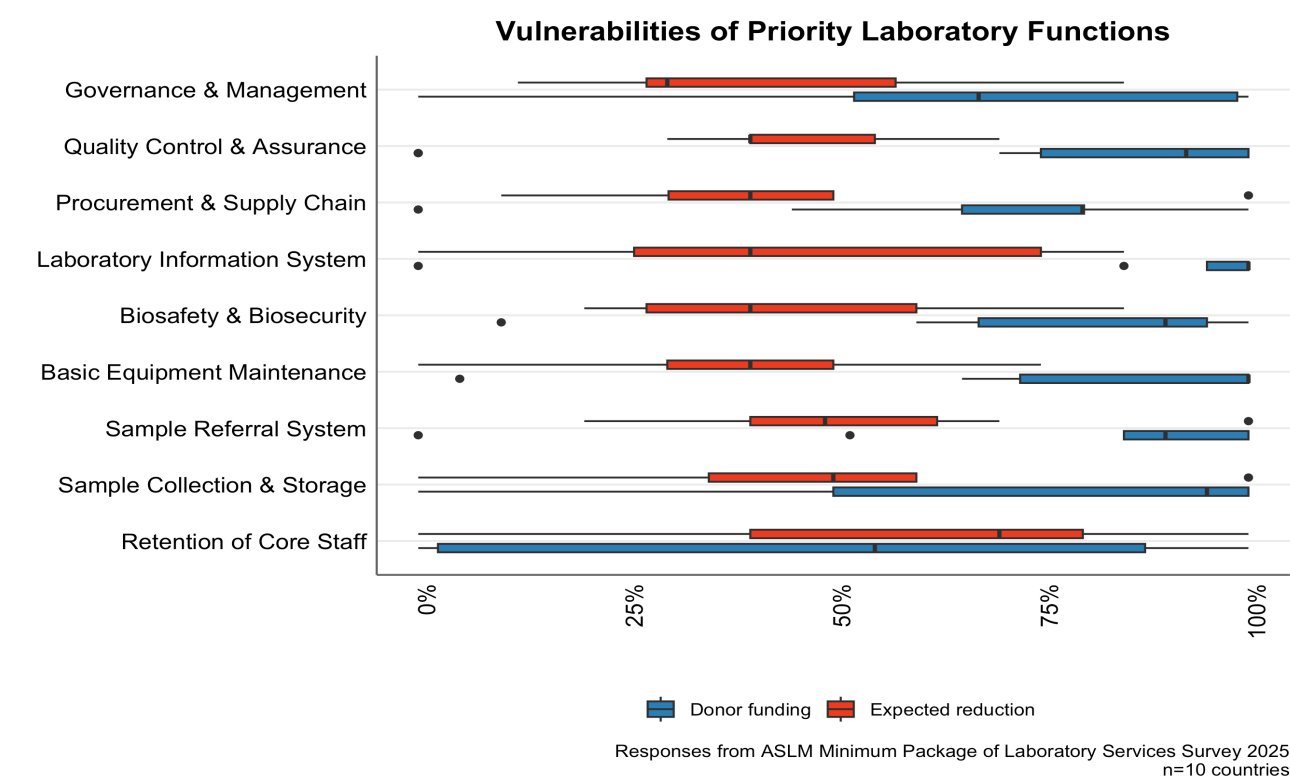


Figure 1: Vulnerabilities of Priority Laboratory Functions by Donor Funding Dependency and Expected Funding Reductions

Expert Experience



The LabCoP management team recently sat down with Dr. Collins Otieno Odhiambo, Portfolio Lead at the African Society for Laboratory Medicine (ASLM), to discuss the evolution of the Laboratory Community of Practice (LabCoP), its impact on strengthening laboratory systems across Africa, and the next chapter in building resilient, integrated, and sustainable laboratory systems that support health security, universal health coverage, and outbreak preparedness

ASLM: LabCoP has now completed its third iteration since its formation in 2017. Looking back, what would you consider the biggest achievements?

Dr Collins: *One of the biggest lessons we have learned is that countries learn best from one another when they have a structured platform to share experiences and solve problems together.. What began as an initiative focused on strengthening HIV viral load systems has evolved into one of Africa's largest laboratory systems learning networks, bringing together 24 Ministries of Health, national laboratory directorates and technical partners. Over the years, we've seen countries openly discuss common challenges, exchange practical solutions and adapt successful approaches to their own settings. More than 9,000 participants from over 160 countries have engaged in webinars, ECHO sessions and technical exchanges, creating an unprecedented platform for South-to-South learning. Most importantly,*

this collaboration has led to real improvements in laboratory systems, stronger governance and better access to diagnostic services.

ASLM: What tangible impact has LabCoP had at country level?

Dr Collins: *We have seen some encouraging results at the country level. Countries have completed multiple evidence-based assessments covering laboratory systems, leadership, laboratory network maturity, minimum laboratory service packages, funding sustainability and task sharing. These assessments have helped countries identify where the biggest gaps are and prioritize practical actions to address them. Among both the founder and newly enrolled LabCoP countries, we have observed substantial improvements across critical laboratory system components including:*

- Demand creation
- HIV viral load testing capacity
- Specimen transportation
- Waste management and Biosafety
- Results utilization

Perhaps one of the strongest indicators of

success is that many countries have been able to turn these plans into funded investments. On average, about 73% of the activities submitted for funding received support, showing that strong evidence and good planning make a compelling investment cases.

ASLM: Despite these gains, your recent assessments suggest laboratory systems remain vulnerable. What are the biggest concerns?

Our recent sustainability assessments highlighted an important reality. Many laboratory systems have become stronger, but they remain heavily dependent on external financing.

Only a small number of countries reported that they could sustain essential laboratory services for more than one year without donor support, while most countries lacked comprehensive contingency plans for maintaining services during funding disruptions (ASLM survey 2025). Recent funding uncertainties have



already affected sample referral networks, equipment maintenance, quality assurance programmes and commodity availability in several countries. This reinforces an important point: strengthening laboratory systems alone is no longer enough. We also need to ensure they can withstand financial shocks and continue delivering essential services

ASLM: How does this inform the future of LabCoP?

Dr Collins: The next phase of LabCoP is really about evolving to meet today's realities. While disease-specific programmes remain important, we're broadening our focus to strengthen the entire laboratory system as a foundation for health security, universal health coverage and emergency preparedness. The emphasis will shift from implementing isolated interventions to helping countries build resilient, integrated laboratory systems that continue functioning even during financial shocks, outbreaks and public health emergencies.

ASLM: What new areas will the LabCoP focus on?

Dr Collins: There are several important areas we will be focusing on moving forward. First, we will expand our focus beyond HIV and TB to support integrated laboratory systems that strengthen surveillance, outbreak preparedness and priority disease programs. Second, we will also work more closely with countries

to define and implement [Minimum Packages for Laboratory Systems](#), so they can identify which essential laboratory services must be protected, even when resources are limited. Third, LabCoP will strengthen laboratory governance through leadership development, laboratory maturity assessments and stronger National Laboratory Directorates. Another priority is helping countries use GIS-enabled laboratory mapping, diagnostic capacity and surveillance data to improve planning, referral networks and equitable access to services. Finally, the Community of Practice will continue expanding peer learning while introducing more differentiated support based on country needs, allowing intensive technical assistance where it is most needed.

ASLM: How will countries benefit from this new approach?

Dr Collins: Countries will have access to better and more timely information for decision-making. Rather than relying only on periodic assessments, countries will increasingly have access to near real-time laboratory intelligence to identify diagnostic gaps, understand system vulnerabilities and prioritize investments. Countries will also benefit from practical tools for investment prioritization, laboratory network optimization, workforce strengthening and sustainable financing. Ultimately, the goal is to help countries move from reacting to problems to planning ahead.

ASLM: What role will partnerships continue to play?

Dr Collins: Partnerships have always been central to LabCoP's success and will remain so. The success of the Community of Practice has been built on strong collaboration between Ministries of Health, national laboratory directorates, Africa CDC, WHO, Global Fund, PEPFAR, Gates Foundation and many technical partners. LabCoP brings countries and partners together in a neutral space where they can share experiences, review evidence and work together on practical solutions. As laboratory challenges become increasingly cross-cutting, this collaborative approach will become even more important.

ASLM: Finally, what message would you like to leave with LabCoP members?

Dr Collins: LabCoP's journey over the past several years has shown what's possible when countries learn from one another and use evidence to guide decisions. But today's environment also reminds us that building stronger systems isn't enough—they also need to be resilient, integrated and sustainable. LabCoP is designed to support exactly that vision—helping countries protect essential diagnostic services, strengthen surveillance systems, improve preparedness for future outbreaks and ensure that every investment in laboratory systems delivers lasting impact. The next chapter of LabCoP isn't about doing more for the sake of it. It's about helping countries build laboratory systems that can continue serving communities - today, during emergencies and well into the future.

What's New

Waste Cost Assessment Framework (WCAF) v2.0 for Laboratory Waste Management

Developed through a collaboration between Roche, the U.S. Centers for Disease Control and Prevention (CDC), and the African Society for Laboratory Medicine (ASLM), the Waste Cost Assessment Framework (WCAF) v2.0 provides a practical, web-based solution to strengthen laboratory waste management across Africa.

The tool enables countries to quantify, budget, and plan for the safe and sustainable management of waste generated from diagnostic platforms, including HIV, TB, HPV, HBV, HCV, and SARS-CoV-2 testing. By supporting the management of hazardous laboratory waste—including GTC-containing liquid waste—WCAF v2.0 advances biosafety, biosecurity, environmental sustainability, and cost-effective laboratory operations.

Already implemented in several African countries, the framework supports national efforts to strengthen laboratory systems, improve waste management planning, and build resilient diagnostic services that contribute to health security and quality patient care.

Learn more [here](#) and Watch the Waste Management ECHO session Launch [here](#).



Looking Ahead

ASLM2026 in CapeTown

ASLM's biennial conference returns to Cape Town, South Africa, 8-11 December 2026. ASLM2026 offers the opportunity to hear from world-renowned experts on infectious disease control and public health from Africa and across the globe. This year's theme is 'Integrated Diagnostics for Health Security: Investing in Sustainable Impact'. Learn more and register at <https://aslm2026.org/registration/>

Upcoming ECHO sessions

Some exciting LabCoP ECHO Sessions are scheduled in the coming weeks, focusing on strengthening patient-centred diagnostics and resilient laboratory systems across Africa. Topics include optimizing cryptococcal screening for people with Advanced HIV Disease (AHD), the Sample Management Framework, early lessons learned from implementation of Near Point-of-Care (NPOC) testing in CHAI-supported countries, and building the case for a multisectoral approach to tuberculosis control. These sessions provide opportunities to explore practical solutions and share experiences from across the continent. If you missed earlier webinars, you can catch up in the LabCoP ECHO archive [here](#).

