



**AfricaCDC**  
Centres for Disease Control  
and Prevention



**World Health  
Organization**

African Region

# EPIDEMIC PREPAREDNESS AND RESPONSE IN AFRICA

GUIDELINES FOR THE DECENTRALIZATION  
OF LABORATORY CAPACITIES



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A joint commitment led by the Africa Centres for Disease Control and Prevention (Africa CDC) and the World Health Organization Regional Office for Africa (WHO AFRO), in collaboration with other public health partners, to strengthen epidemic preparedness and response across the continent.

## ACRONYMS AND ABBREVIATIONS

<b>Africa CDC</b>	Africa Centres for Disease Control and Prevention
<b>ASLM</b>	African Society for Laboratory Medicine
<b>DHIS2</b>	District Health Information Software 2
<b>EOC</b>	Emergency Operations Centre
<b>EQA</b>	External Quality Assessment
<b>GIS</b>	Geographic Information System
<b>IAR</b>	Intra-Action Review
<b>IDSR</b>	Integrated Disease Surveillance and Response
<b>IHR</b>	International Health Regulations
<b>IMST</b>	Incident Management Support Team
<b>IPC</b>	Infection Prevention and Control
<b>KPI</b>	Key Performance Indicator
<b>LabMap</b>	Laboratory Mapping Tool
<b>MEAL</b>	Monitoring, Evaluation, Accountability and Learning
<b>Mpox</b>	Monkeypox
<b>NPHI</b>	National Public Health Institute
<b>PHC</b>	Primary Health Care
<b>PHECS</b>	Public Health Emergency of Continental Security
<b>PHEIC</b>	Public Health Emergency of International Concern
<b>PHEPR</b>	Public Health Emergency Preparedness and Response
<b>POCT</b>	Point-of-Care Testing
<b>PPP</b>	Public–Private Partnership
<b>QA</b>	Quality Assurance
<b>QMS</b>	Quality Management System
<b>RCCE</b>	Risk Communication and Community Engagement
<b>RDT</b>	Rapid Diagnostic Test
<b>RISLNET</b>	Regional Integrated Surveillance and Laboratory Network
<b>RT-PCR</b>	Real-Time Polymerase Chain Reaction
<b>SOP</b>	Standard Operating Procedure
<b>TB</b>	Tuberculosis
<b>TWG</b>	Technical Working Group
<b>UHC</b>	Universal Health Coverage
<b>UKHSA</b>	United Kingdom Health Security Agency
<b>WHO</b>	World Health Organization

## FOREWORD

This Guideline represents a joint commitment led by the Africa Centres for Disease Control and Prevention (Africa CDC) and the World Health Organization Regional Office for Africa (WHO AFRO), in collaboration with other public health partners, to strengthen epidemic preparedness and response across the continent.

The increasing frequency and scale of public health emergencies in Africa underscore the urgent need for early detection, rapid response, and equitable access to laboratory capacities. Centralized laboratory systems have often proven insufficient, especially in remote and underserved areas, resulting in delayed case confirmation and reduced effectiveness of outbreak control measures.

Decentralization of laboratory capacities is therefore a transformative strategy to address these gaps. By bringing testing closer to the point of care, countries can detect outbreaks earlier, respond more effectively, and strengthen public trust in health systems.

This Guideline offers a comprehensive framework to support African Union Member States in designing, implementing, and sustaining decentralized diagnostic networks. It promotes equity, country ownership, multisectoral collaboration, and integration with broader health system functions. Furthermore, the document underscores the importance of maintaining quality standards in decentralized settings. It recommends the implementation of tailored external quality assessment schemes, targeted supervision mechanisms, and alignment with national quality assurance frameworks.

Africa CDC, WHO, and other partners remain committed to supporting Member States through technical assistance, coordination platforms, and resource mobilization. Together, we can build a resilient, responsive, and inclusive diagnostic ecosystem that safeguards the health of all communities across the continent.

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## EXECUTIVE SUMMARY

The decentralization of laboratory capacities is a critical strategy for improving epidemic preparedness and response in Africa. Centralized systems often delay case confirmation, hinder timely interventions, and exacerbate the impact of outbreaks, especially in rural and hard-to-reach areas.

This Guidelines outlines a structured approach to decentralization, focusing on:

**Strategic Goals:** Strengthening laboratory capacity at subnational levels to ensure timely detection and control of epidemic-prone diseases.

**Guiding Principles:** Equity, country ownership, multisectoral collaboration and evidence-based decision-making.

**Implementation Framework:** Practical steps for planning, executing, and sustaining decentralized diagnostic networks, with intra- and post-implementation reviews for continuous improvement.

**Integration:** Alignment with existing surveillance, case management and infection prevention and control (IPC) systems, with a focus on the One Health approach.

While the Guidelines is informed by the Mpox outbreak response, it is adaptable to other priority diseases and aligned with the International Health Regulations (IHR 2005), the Africa CDC Strategic Plan (2022-2027), and the WHO Health Security Framework.

## 1. Introduction

Africa continues to face recurrent public health threats from epidemic-prone diseases such as viral haemorrhagic fevers, cholera, yellow fever, COVID-19 and more recently, Mpox. The management of these outbreaks has exposed significant gaps in the timely detection and response to health emergencies, particularly in remote and underserved regions. Major contributing factors are the centralized and weak laboratory capacities, which limit access to timely confirmation and delay outbreak control measures, ultimately increasing morbidity and mortality. Decentralizing laboratory capacities is a strategic solution to these challenges.

By bringing testing capabilities closer to the communities through point of care, countries can reduce delays in case confirmation, improve outbreak response times, and enhance health system resilience. This is especially critical in settings with weak sample referral systems, limited trained laboratory personnel, and limited laboratory surge capacity.

The Mpox outbreak, declared as a Public Health Emergency of Continental Security (PHECS) and Public Health Emergency of International Concern (PHEIC) in August 2024, further underscored the urgent need for robust, decentralized and sustainable diagnostic systems across Africa. In response, the Africa Centres for Disease Control and Prevention (Africa CDC), the World Health Organization (WHO) and other partners through the Continental Incident Management Support Team (IMST), identified diagnostic decentralization as a strategic priority under the Mpox Continental Response Plan 2.0.

Testing capacities expansion during the Mpox outbreak response in countries such as Burundi and the Democratic Republic of the Congo (DRC) demonstrated the transformative impact of decentralized diagnostics. In Burundi, the number of operational laboratories at district level was expanded from one laboratory to fifty-six within five months, using GeneXpert platforms. Similarly in the DRC, the number of operational laboratories expanded from two to twenty-seven, including veterinary laboratories, significantly enhancing diagnostic coverage.

These experiences underscore the value of decentralization not only for epidemic response but also for strengthening broader public health interventions. Moreover, decentralization supports the One Health approach by facilitating integrated surveillance across human, animal and environmental health sectors.

This Guideline builds on this foundation, offering a comprehensive framework to support African Union Member States in planning, implementing and sustaining decentralized laboratory networks as a core component of epidemic preparedness and response.

## 2. Purpose and Scope

This Guideline is designed to assist African Union Member States in developing and operationalizing decentralized laboratory capacity within their national Public Health Emergency Preparedness and Response (PHEPR) strategies. Furthermore, the Guideline recommends strong integration with existing disease-specific programmes such as tuberculosis (TB), Human Immunodeficiency Virus (HIV) Malaria, and others, which already operate decentralized diagnostic networks supported by well-established sample referral mechanisms and quality assurance frameworks.

Specifically, the Guideline:

- Outlines key principles, strategies and practical steps for implementing decentralized laboratory capacities.
- Provides tools, indicators and minimum standards to support effective implementation.
- Encourages laboratory data integration with existing surveillance, case management, and Infection Prevention and Control (IPC) systems.

### 3. Target Audience

This Guideline is intended for a broad range of stakeholders involved in strengthening public health and laboratory systems, including:

#### **Government & National Authorities:**

- Ministries of Health/Relevant Government Bodies.
- National Public Health Institutes (NPHIs).
- Laboratory Directorates.

#### **Technical and Financial Partners:**

- WHO, Africa CDC, and other multilateral/regional agencies.
- NGOs (National and International Non-Governmental Organizations).

#### **Laboratory & Professional Networks:**

- Laboratory Networks and Implementing Organizations.
- Professional Laboratory Associations and Regulatory/Accreditation Bodies.

#### **Broader Sectors:**

- Academic and Research Institutions (Universities, Research Centers).
- Other stakeholders from the public and private sectors.

### 4. Rationale for Decentralization of Laboratory Capacities

Centralized laboratory capacities, while effective in some contexts, often fall short in responding to the unique challenges posed by epidemics in Africa. These systems typically result in:

- Delayed outbreak detection, especially in rural and hard-to-reach areas.
- Limited response capacity due to bottlenecks in sample management.
- Inefficient resource utilization, with overburdened central laboratories and underused peripheral facilities.
- Limited human resources.

Decentralizing laboratory capacities addresses these challenges by bringing testing capabilities closer to the communities most at risk. This approach enables:

- Faster and reliable detection and confirmation of cases by reducing turnaround time.
- More timely and targeted public health interventions to improve outbreak control.
- Increased public trust in health systems through improved accessibility and responsiveness.

### 5. Guiding Principles and Strategic Objectives

#### 5.1. Guiding Principles

The decentralization of laboratory capacities must be grounded in a set of core principles that ensure effectiveness, sustainability and inclusivity. This Guideline is built upon the following foundational principles:

### **Equity and Inclusivity**

Ensure that all populations, especially those in remote and underserved areas, have timely access to laboratory capacities.

### **Country Ownership and Leadership**

Empower national governments, public health institutions and laboratory directorates to lead the design, implementation and oversight of decentralized laboratory capacities.

### **Multisectoral Collaboration**

Promote One Health coordination by leveraging existing clinical and public health labs, including those offering routine tests, to strengthen surveillance, enhance epidemic preparedness, and avoid parallel systems.

### **Evidence-Based Planning and Decision-Making**

Use data-driven tools and methods to guide planning, implementation and evaluation of laboratory capacities.

### **Sustainability and Resilience**

Build systems that are adaptable, financially sustainable, and capable of responding to future public health threats.

### **Resource Optimization**

Efficiently allocate resources, avoiding duplication and maximizing utilization across multiple sites.

## **5.2. Strategic Goal**

To strengthen decentralized laboratory capacities across Africa, ensuring timely detection, and effective management of epidemic-prone diseases at all levels.

## **5.3. Strategic Objectives**

To achieve this goal, the following strategic objectives are prioritized:

- **Strengthen governance and coordination mechanisms:** Establish clear roles, responsibilities, and coordination structures at continental, regional, national, and subnational levels.
- **Build and equip national and subnational laboratory capacities:** Expand access to essential diagnostic tools, services, and technologies at all levels for both communicable and non-communicable diseases, while building infrastructure and expertise across multiple sites to support testing, research, and training.
- **Establish and/or reinforce quality management system:** Ensure high standards of quality, safety, and compliance across all decentralized laboratories by implementing standardized procedures and robust quality controls to deliver reliable and accurate results.
- **Reinforce capacity and enhance laboratory human resources:** Develop and sustain a skilled workforce capable of operating, maintaining, and managing laboratory services effectively at all levels.
- **Foster multisectoral integration:** Promote One Health collaboration by leveraging and integrating

laboratory capacities across human, animal, and environmental health systems, including routine clinical and public health laboratories, to strengthen surveillance, enhance epidemic preparedness, and avoid parallel systems.

- **Enhance data systems for real-time decision-making:** Improve data collection, analysis, and reporting, linking laboratory information with health systems to support timely and informed public health responses.
- **Optimize cost efficiency:** Achieve cost savings through distributed operations, shared resources, and reduced overhead.

## 6. Governance and Coordination Structure

Effective governance and coordination are essential for the successful decentralization of laboratory capacities. A well-structured governance framework ensures alignment across all levels of the health system, and facilitates efficient resource allocation, accountability and sustainability.

### 6.1. Continental and Regional Level

Africa CDC, WHO and other partners provide overarching technical guidance, coordination and support to Member States. Their roles include:

- Facilitate regional collaboration through platforms such as the Regional Integrated Surveillance and Laboratory Network (RISLNET).
- Support the process of deployment of emergency technical assistance mechanisms during public health emergencies.
- Provide tools, training and technical assistance for implementation and monitoring of laboratory capacity decentralization.
- Promote harmonization and standardization of best practices across countries.
- Facilitate timely and efficient procurement of laboratory equipments and supplies.

### 6.2. National Level

At national level, Ministries of Health, other relevant government bodies, NPHIs or similar structures and laboratory directorates should lead the development and oversight of decentralized laboratory capacities. Key responsibilities include:

- Establish national laboratory Technical Working Groups (TWGs) and subcommittees.
- Develop policies, guidelines, and Standard Operating Procedures (SOPs).
- Establish/reinforce national quality control programs and policies to verify and approve diagnostic products, including reagent testing and assay validation before public health use.
- Coordinate training and supervision of laboratory personnel.
- Coordinate with veterinary and environmental health sectors under the One Health approach.
- Coordinate supply chain management.
- Ensure integration with national Emergency Operations Centers (EOCs) and surveillance systems.

## 6.3. Subnational Level

Subnational governance structures such as regional health authorities and district health offices play a critical role in operationalizing decentralized laboratory capacities. Their responsibilities include:

- Implement laboratory capacities decentralization plan in line with national guidelines.
- Manage local laboratory networks and referral systems.
- Coordinate training and supervision of laboratory personnel.
- Coordinate implementation of QMS, biosafety and biosecurity.
- Ensure forecasting and timely submission of supply demand.
- Monitor performance and report data to national authorities.
- Ensure integration with rapid response teams

## 7. Implementing Laboratory Capacities Decentralization

The successful decentralization of laboratory capacities requires a systematic, phased approach that integrates technical, operational, and policy components. Implementation should focus on rolling out holistic laboratory services that cover both communicable and non-communicable diseases. This section outlines the key steps and enablers for effective implementation.

### 7.1. Situational Analysis and Mapping

A comprehensive baseline assessment is essential to identify existing capacities, gaps and opportunities. Key actions include:

- Conduct a comprehensive laboratory assessment using tools such as LabMap (Annex 1) or referring to national laboratory inventories.
- Map existing diagnostic infrastructure, human resources and supply chains.
- Identify underserved regions and prioritize subnational facilities across human, animal, and environmental health sectors for decentralized laboratory services.

### 7.2. Designing Tiered Laboratory capacities

Laboratory capacities should be structured in a tiered model to ensure appropriate technologies are deployed at each level of the health system, including use or development of guidelines and diagnostic algorithms for each tier, for example:

- **Community and Frontline Facilities:** Utilize existing POC testing (RDTs, basic microscopy) with trained staff at health centers.
- **Sub-district / Intermediate Laboratories:** Deploy molecular testing (e.g., RT-PCR) and support field sample collection using portable kits during outbreaks.

- **Reference Laboratories:** Provide advanced testing (sequencing, confirmatory tests), training, and quality assurance for lower-tier labs.
- **Mobile Laboratories (Surge Capacity):** Used only for emergency outbreak response, supplementing existing fixed labs and trained personnel; not for routine operations due to cost and sustainability constraints.

### 7.3. Establishing Integrated Sample Referral and Transport Systems

Efficient sample referral and transport systems are essential to link decentralized sites with higher-level laboratories for complex assays, confirmation testing, and early outbreak diagnosis. Key components include:

- Adhere to standardized sample management and biosafety protocols to ensure safe and reliable handling.
- Leverage pre-existing vertical program sample referral systems where possible and define referral pathways, turnaround time targets, and feedback mechanisms.
- Ensure cold chain integrity throughout sample transportation.
- Engage courier services or community/government transport networks to guarantee timely and secure specimen delivery.

### 7.4. Implementing Digital Tools and Data Integration

Digital solutions enhance the efficiency, transparency, and reliability of laboratory services and surveillance systems. Recommended actions include:

- Deploy electronic data capture tools at all testing sites, adaptable to all priority pathogens and including data quality control steps to ensure accuracy and completeness.
- Integrate laboratory data with national health information systems (e.g., DHIS2) to support routine lab-based disease surveillance and reporting.
- Develop dashboards for early alerts, real-time monitoring, and informed decision-making across all levels of the health system.

### 7.5. Training and Workforce Development

A skilled and motivated workforce is essential for sustaining decentralized laboratory capacities. Key strategies include:

- Develop and implement competency-based syndromic diagnostic training packages tailored to each laboratory tier for priority diseases.
- Establish mentorship models at each tier to reinforce skills and support ongoing professional development.
- Strengthen biosafety, biosecurity, quality assurance, and data management skills across all laboratory staff.

- Create clear career paths and retention strategies for trained personnel to ensure sustainability and motivation.

## 7.6. Infrastructure management

Infrastructure must be specifically designed or upgraded to support decentralized laboratory capacities in a safe, efficient and sustainable manner. This includes:

- Build and/or upgrade laboratory facilities to comply with national and international biosafety and biosecurity standards, including ventilation, waste management, and infection control measures.
- Ensure appropriate spatial layout and workflow design to minimize contamination and support safe operations.
- Provide a reliable and uninterrupted power supply, including alternative/backup sources such as solar power or generators.
- Ensure access to clean water.
- Ensure stable internet connectivity to support digital data transmission and remote support systems.
- Adhere to equipment installation and infrastructure requirements, including space, electrical load and environmental conditions, as outlined in national equipment management policies.

## 7.7. Maintaining Quality of Laboratory Services

As laboratory services are decentralized, ensuring consistent quality across all levels becomes a critical challenge and priority. Weak quality systems can compromise patient safety, generate inaccurate data, and undermine outbreak responses. Therefore, the decentralization of testing must be accompanied by robust QMS.

### 7.7.1. External Quality Assessment (EQA)

An essential component of quality monitoring is the implementation of a harmonized External Quality Assessment (EQA) system extending to decentralized laboratories. Member States should:

- Develop national EQA plans that include all levels of the laboratory network, from reference laboratories to point-of-care sites.
- Design EQA schemes suitable for national and subnational laboratories
- Ensure regular participation in EQA programs (PT panels, cross checking, inter-lab comparison, etc...) at all levels through nationally coordinated in-country or international programmes.
- Analyze and disseminate EQA results within the context of a national quality management system, develop corrective action plans, and provide targeted follow-up training or mentorship as needed.

## 7.7.2. Supervision and Mentorship for Quality Improvement

To complement EQA efforts, countries should:

- Implement structured national audit/supervision protocols using standard checklists covering infrastructure, documentation, quality and biosafety, and test performance, etc.
- Deploy mentors in a tiered, cost-effective manner to support sites with poor performance or no accreditation, providing on-site quality assessments and coaching.
- Utilize digital platforms to record supervision findings and trigger alerts for non-compliance or recurring issues.
- Promote a culture of continuous quality improvement through periodic quality review meetings and peer-to-peer learning.

## 7.8. Supply Chain Management

Logistics systems must be adapted and strengthened to ensure a reliable and timely flow of laboratory inputs in support of decentralized operations. This includes (where not in place):

- Strengthen procurement, storage, and distribution systems for reagents, consumables and equipment, including personal protective equipment (PPE).
- Strengthen or enhance forecasting, quantification and supply planning.
- Establish real-time inventory tracking at all levels of the laboratory network for better visibility and accountability.
- Enhance cold chain capacity and transport logistics, especially in remote or hard-to-reach areas.
- Develop and regularly update contingency plans for supply continuity during emergencies or disruptions.
- Develop and/or enforce an expired products management plan.

## 7.9. Laboratory Equipment Management

To ensure the reliability and longevity of laboratory equipment in decentralized laboratories, the following measures should be prioritized (where not in place):

- Develop and implement a preventive and corrective maintenance plan for all tiers of the laboratory network, encouraging in-country collaborative maintenance service
- Maintain a national equipment inventory and maintenance tracking system integrated with broader laboratory information systems.
- Train laboratory personnel at all levels in basic equipment care and troubleshooting.
- Establish maintenance contracts (for selected equipment) and ensure access to pre-qualified service providers.
- Ensure compliance with calibration and verification protocols for laboratory equipment.
- Stockpile critical equipment spare parts
- Establish and implement equipment donation, replacement and disposal policies

## 8. Monitoring, Evaluation, Accountability, and Learning (MEAL)

A robust Monitoring, Evaluation, Accountability and Learning (MEAL) framework is essential to ensure the effectiveness, quality and sustainability of decentralized laboratory capacities. This framework enables continuous improvement, accountability, and evidence-based decision-making.

### 8.1. Objectives of MEAL

The MEAL system aims to:

- Track progress in the implementation of decentralized laboratory capacities.
- Assess the quality, accessibility and timeliness of laboratory testing.
- Identify gaps and inform corrective actions.
- Facilitate learning and knowledge sharing across countries and regions.

### 8.2. Key Performance Indicators (KPIs)

Member States are encouraged to adopt a core set of KPIs using the One Health Approach aligned with Africa CDC and WHO frameworks. These indicators should include:

- **Coverage:** Number and distribution of laboratory sites.
- **Timeliness:** Turnaround time from sample collection to result reporting.
- **Quality:** Number of laboratories participating in EQA for defined priority pathogens and diagnostic tests and achieving the recommended performance score.
- **Data Management:** Number of laboratories sharing data to national reporting systems using interoperable electronic data management systems.
- **Laboratory supply chain management:** Number of laboratories experiencing service interruption for more than a week, due to stockouts of critical laboratory commodities for diagnosis of priority pathogens.
- **Equipment management:**
  - Number of laboratories experiencing service interruption for more than a week due to equipment failure
  - Number of laboratories with regular equipment maintenance and calibration services
  - Number of laboratories with functional backup power.
- **Workforce Development:** Proportion of laboratory personnel trained and certified per laboratory.
- **Domestic funding:** Percentage of laboratory budget released from domestic sources. (total amount of laboratory funding from domestic sources/ total budget allocated for laboratory programme).

### 8.3. Tools and Approaches

To support effective MEAL, countries should utilize:

- Digital dashboards for real-time data visualization and analysis.
- Supervision checklists for routine site assessments.
- Periodic review meetings to evaluate progress and share lessons learned.
- Inter, intra and after-action reviews of outbreak responses to identify strengths and areas for improvement.

MEAL activities should be integrated with national health information systems and aligned with broader public health monitoring frameworks. Tools such as Africa CDC's LabMap can support geospatial tracking of laboratory capacity and service delivery.

## 9. Financing and Sustainability

Sustainable financing is a cornerstone of successful and long-term implementation of decentralized laboratory capacities. Without consistent and adequate funding, gains in laboratory capacity risk being short-lived or unevenly distributed.

### 9.1. National Budget Integration

Countries are encouraged to:

Integrate decentralized laboratory services for both communicable and non-communicable diseases into national health plans and budget cycles to ensure long-term financial commitment.

Align laboratory investments with broader health system strengthening initiatives, such as universal health coverage (UHC) and primary health care (PHC) reforms.

Leverage domestic resources, including public health insurance schemes and national and subnational contingency funds.

### 9.2. Partner and Donor Engagement

External partners play a critical role in supporting the scale-up and sustainability of decentralized laboratory services. Recommended actions include:

- Engage bilateral and multilateral donors to align funding with national priorities.
- Coordinate with technical partners to avoid duplication and ensure efficient resource use.
- Advocate for flexible, multi-year funding to support infrastructure, training and system maintenance.
- Leverage technical expertise from partners.
- Participate actively in funding opportunities.

### 9.3. Public–Private Partnerships (PPPs)

Innovative financing models, including public–private partnerships, can enhance sustainability to:

- Facilitate access to diagnostic technologies and supply chains.
- Support workforce development and digital infrastructure.
- Encourage local manufacturing and technology transfer.
- Leverage technical expertise in the private sector.
- Promote capacity transfer at all levels of the health system, including installation, maintenance and equipment metrology.
- Support infrastructure development.

## 10. Implementation Roadmap

The implementation of decentralized laboratory capacities should follow a phased approach to ensure systematic planning, capacity building, and integration into national health systems. This phased approach allows for adaptive learning, continuous improvement, and sustainable scale-up of laboratory capacities across diverse contexts. This roadmap outlines three key phases:

### Phase 1: Situational Analysis and Planning (0–6 months)

- Conduct a situation analysis of laboratory capacities.
- Conduct a comprehensive baseline assessment and map existing laboratory capacities and gaps using tools such as LabMap or national laboratory inventories.
- Identify priority pathogens and geographic areas for decentralization.
- Develop national and subnational decentralization plans and roadmaps.
  - Supply chain, equipment deployment, human resource capacity
  - Develop and/or review SOPs, manuals and policies
- Engage stakeholders across sectors to ensure alignment and buy-in.

### Phase 2: Implementation, Integration and Capacity Building (6–18 months)

- Build or upgrade infrastructure to meet biosafety and operational standards.
- Deploy tiered diagnostic platforms (RDTs, molecular POC tests, RT-PCR, sequencing) with necessary reagents and supplies based on facility levels.
- Establish integrated sample management and referral systems with defined protocols.
- Establish and/or strengthen quality management systems, including biosafety, biosecurity and waste management.
- Train laboratory personnel using standardized curricula and mentorship models on all necessary protocols.

- Establish and integrate digital tools for data capture, transmission, analysis and feedback.
- Integrate laboratory services for epidemic prone diseases with other existing programmes.
- Link laboratory service data with surveillance, IPC, RCCE, and case management pillars.
- Monitor performance using dashboards and KPIs.

### Phase 3: Consolidation and continuous improvement (12–24 months)

- Conduct regular supervision and quality assurance assessments.
- Conduct inter-intra and after-action reviews and periodic evaluations.
- Institutionalize decentralized laboratory capacities within national health systems and budgets.
- Continue to monitor performance using dashboards and KPIs.

## 11. Annexes

### 11.1. Annex 1: Laboratory Assessment Checklist

The Africa CDC-ASLM Lab Map tool checklist can be used during the situational analysis phase to assess existing laboratory capacities and identify gaps for decentralization: <https://aslm.org/wp-content/uploads/2019/11/Survey-on-laboratory-capacity-English.pdf>

### 11.2. Annex 2: Key Performance Indicators (KPIs) and Targets

KPIs help monitor the implementation and quality of decentralized laboratory capacities for diseases of public health importance. Suggested indicators include:

Indicator	KPI Description	Suggested target (Illustrative)
Coverage	Proportion of available laboratory services among health targeted area (districts, Health zones, etc...) for disease of public health importance	≥ 80%
Timeliness	Average turnaround time from sample collection to result reporting	≤ 48 hours
Quality	% of labs participating in any form of EQA	≥ 90% of participating labs
	% of labs achieving EQA scores above national threshold	≥ 80%
Data Systems	Proportion of labs sharing data using electronic interoperable data tools (e.g., DHIS2)	100%
Supply Chain	Proportion of labs without stockouts > 7 days in last 3 months	≥ 95%
Equipment	% of labs with functioning and maintained equipment	≥ 95%
	% of laboratories experiencing service interruption for more than a week due to equipment failure in the last 3 months	< 5%
	% of labs with functional backup power supply	≥ 90%
Workforce Development	% of Laboratory personnel trained and registered per laboratory.	100%
Domestic Financing	% of lab funding covered by national budget	≥30% by year 3

### 11.3. Annex 3: Timeline for Implementation / Gantt Chart

A proposed phased roadmap for implementing decentralization over 24 months:

Activity	0–6 months	6–18 months	12–24 months
Situational assessment (LabMap, checklist, etc.)	✓		
Development of national decentralization plan	✓		
Stakeholder engagement and coordination	✓	✓	✓
Infrastructure upgrades		✓	✓
Deployment of tiered diagnostics (RDT, RT-PCR, etc.)		✓	✓
Training and mentorship		✓	✓
Digital tools deployment (data systems, dashboards)		✓	✓
EQA implementation		✓	✓
Routine supervision and monitoring (M&E)		✓	✓
Integration with national systems (QA, HMIS)		✓	✓
Sustainability planning and budget integration		✓	✓

(✓ = expected timeline for action)

## 12. References

1. Ngongo N, Gaye AB, Boum II Y, et al. Africa's second plan to stop Mpox outbreaks through intensification, integration, and legacy. *J Public Health Africa*. 2025;16(4), a1452. <https://doi.org/10.4102/jphia.v16i4.1452>
2. Africa CDC-WHO. Mpox Testing Strategy, November 2024. <https://africacdc.org/download/Mpox-testing-strategy-november-2024/>
3. Africa CDC-WHO. Mpox Continental Preparedness and Response Plan for Africa. <https://africacdc.org/download/Mpox-continental-preparedness-and-response-plan-for-africa/>
4. Africa CDC-WHO. Mpox Continental Response Plan <https://africacdc.org/download/Mpox-continental-response-plan-2-0/>
5. World Health Organization. Diagnostic testing and testing strategies for Mpox. Interim guidance, 12 November 2024. <https://iris.who.int/bitstream/handle/10665/379547/B09166-eng.pdf>
6. Africa CDC. Africa requires skills to plug gaps in diagnostic capacity and disease surveillance. 2024. Available from: <https://africacdc.org/news-item/africa-requires-skills-to-plug-gaps-in-diagnostic-capacity-and-disease-surveillance/>
7. Africa CDC. Building Testing Capacity for Epidemic-Prone Diseases. 2023. Available from: <https://africacdc.org/download/building-testing-capacity-for-epidemic-prone-diseases/>
8. Africa CDC. Africa Collaborative Initiative to Advance Diagnostics (AFCAD). Available from: <https://africacdc.org/programme/laboratory-systems-and-networks/africa-collaborative-initiative-to-advance-diagnostics/>
9. Fleming KA, Horton S, Wilson ML, Atun R, DeStigter K, Flanigan J, et al. The Lancet Commission on diagnostics: transforming access to diagnostics. *Lancet*. 2021 Nov 27;398(10315):1997–2050. doi: 10.1016/S0140-6736(21)00673-5. Epub 2021 Oct 6.

