

Beyond DNO: The Changing Landscape of Laboratory Services

Matthew Wattleworth, Senior Laboratory Systems Advisor, USAID

Agenda

- Objectives for today's event
- DNO as a tool to inform strategic planning and activities
- Network Approach and Applying DNO Operationally— Andres McAlister, GHSC-PSM
- Using DNO to Support Laboratory Services in Lesotho - Muccara du Preez
- Diagnostic Network Optimization (DNO) Implementation in Nigeria - Eruona Etubi
- Questions and Discussion

Objectives

- Be able to describe how DNO can be applied to support national laboratory network operations, efficiency, and planning
- Describe the elements of “Network Approach”
- Consider the examples and lessons learned of DNO in Lesotho and Nigeria
- Consider how DNO can support strategic objectives, efficiency, and national laboratory planning in your country

DNO can be a powerful tool in supporting national laboratory network policy development and strategic planning

- Diagnostic Network Optimization (DNO) is a process that involves all national laboratory stakeholders to support geospatial mapping and analysis of the diagnostic network
- All DNO efforts should include an operational plan to outline the activities necessary to move from the “current network” to the “future/optimized network”
- The DNO operational plan should be developed and approved by all national laboratory stakeholders, it should include timelines, persons/groups responsible, and contingencies



Network Approach and Applying DNO Operationally

Andres McAlister, Integrated Supply Chain Manager – Laboratory, GHSC-PSM

Agenda

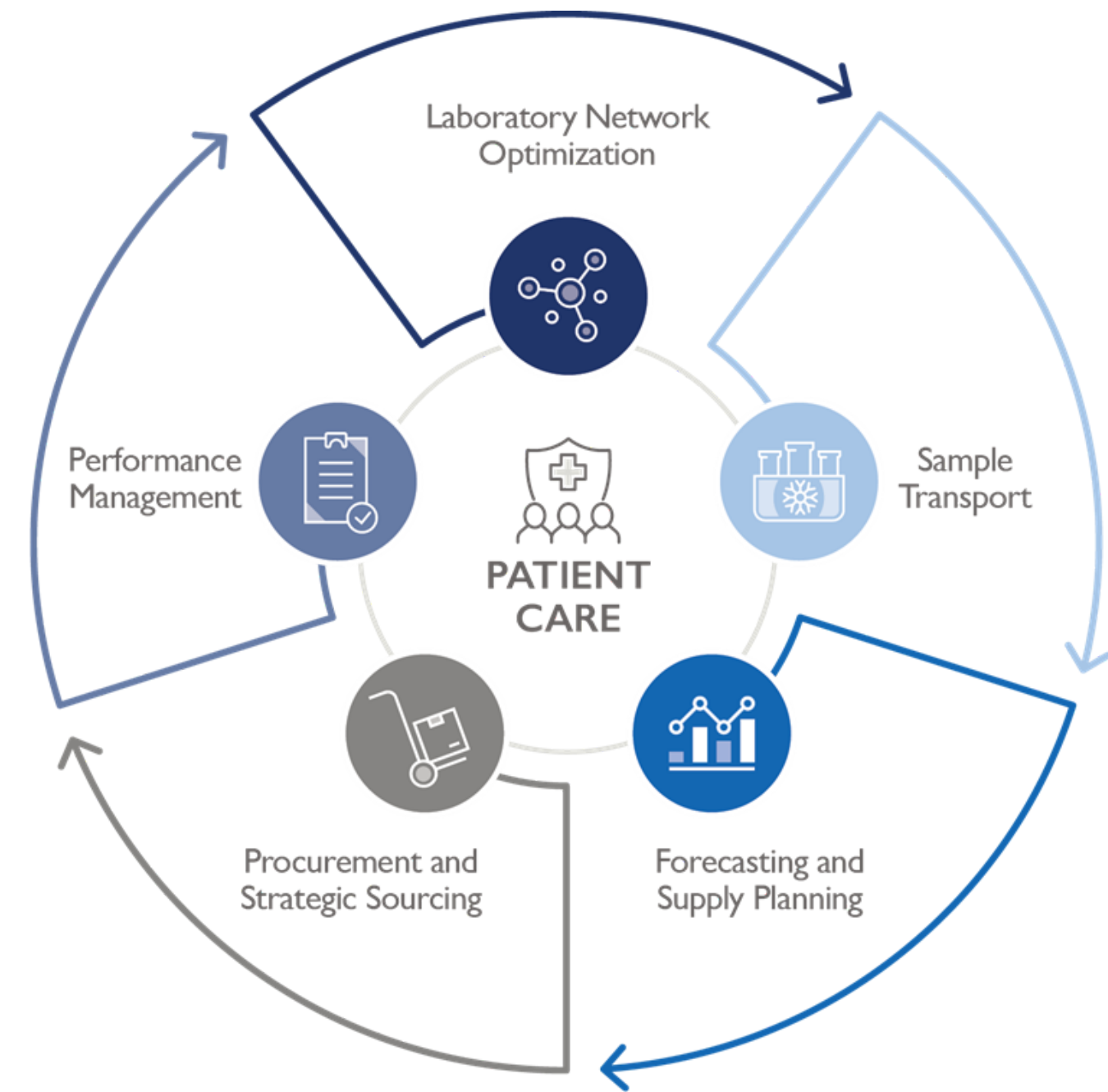
- The Network Approach to Strengthening Laboratory Networks
- The Network Approach Elements
- What is DNO and How Can Outputs Be Applied
- Future Webinars on Remaining Elements

The Network Approach to Strengthening Laboratory Networks

- Aligns instrument capacity with patient demand and diagnostic equipment utilization
- Enables procurement and placement of laboratory equipment through all-inclusive service delivery agreements
- Allows for costed implementation plans to create more efficient transport of patient samples
- Informs laboratory-related decision making at the national level, national laboratory policy, and vendor management of machines and commodities

Network Approach Elements

- Diagnostic network optimization (DNO)
- Sample Transport
- Forecasting and supply planning
- Procurement and strategic sourcing
- Performance management



How Can DNO Outputs be Applied?

- Facilitates country leadership decisions on instrument mix (conventional vs Point of Care) and Multi-plexing
- Enables procurement transition to Service Level Agreements for diagnostic testing needs
- Provides costed implementation plans that can be used by governments and donors to properly support laboratory and sample transport network
- Develops resiliency by leveraging national testing capacity to reduce result turnaround times and minimize sample backlogs

Beyond DNO: The Changing Landscape of Laboratory Services – Lesotho

Muccara du Preez, Quantification Coordinator, Supply Chain Management
Directorate, Lesotho Ministry of Health

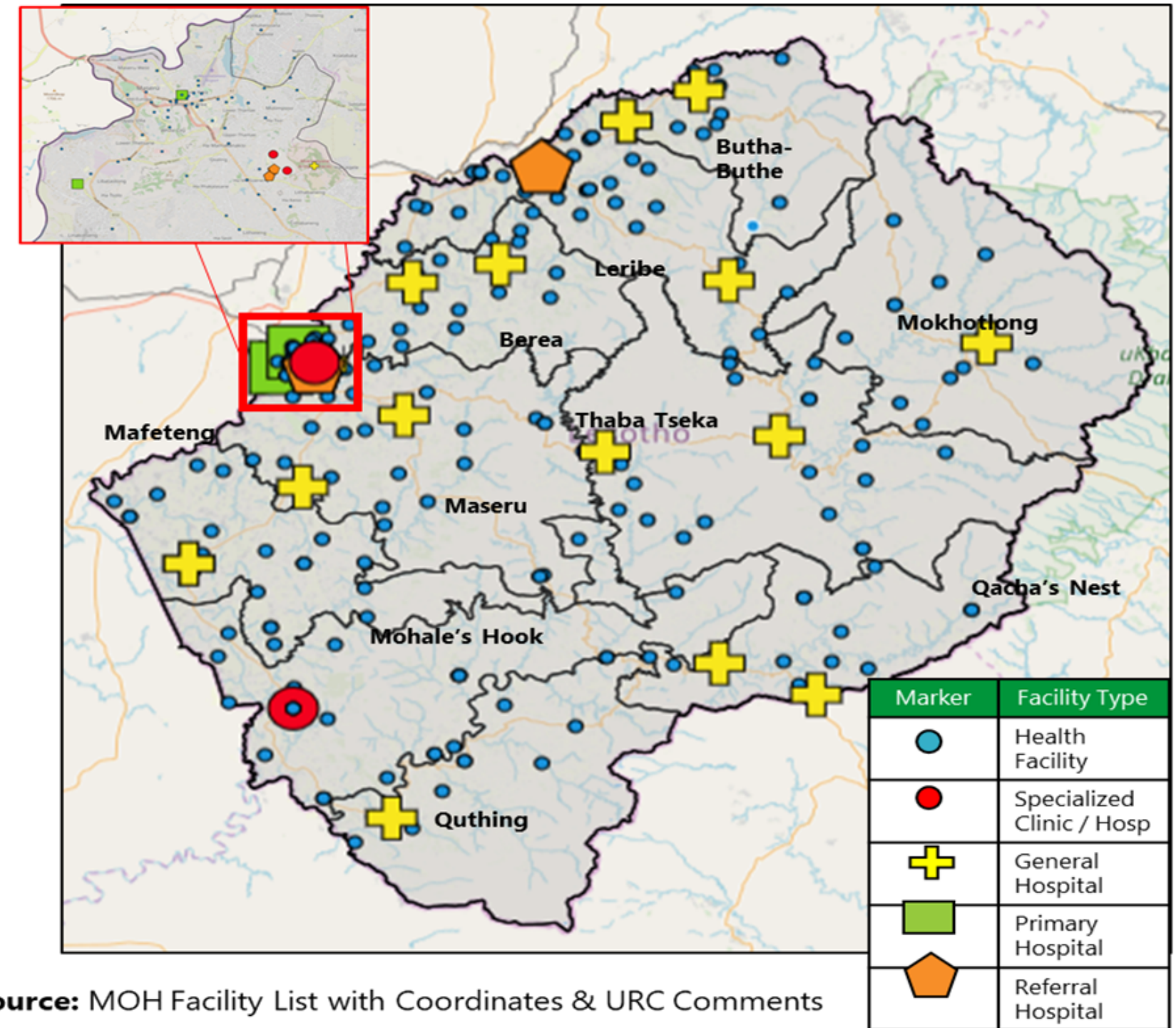
Background

By expanding the country's viral load testing capabilities, the government of Lesotho modified its HIV/AIDS services to better meet the needs of people living with HIV (PLHIV). In 2019, despite having five viral load laboratories, more than one in every four people living with HIV/AIDS in Lesotho still lacked access to viral load testing services.



Background

- To provide coverage to all HIV/AIDS clients the Ministry of Health (MOH) with the support of GHSC-PSM and other implementing partners joined forces to implement an ambitious diagnostic network optimization program.
- Diagnostic network optimization is a data-driven approach that includes the mapping of various network models to develop more efficient and cost-effective laboratory services.



Implementation

- The program began with a workshop in September 2019 where participants mapped an optimized diagnostic network for HIV viral load, early infant and tuberculosis diagnosis that included a mix of large and small laboratory sites around the country, including 13 minilabs.
- The MOH's infectious disease control and laboratory directors combined efforts to form a task force to lead implementation, leveraging each participating organization's expertise and define clear roles.



Photo credit: Arturo Sanabria

Implementation

- The task force prioritized point-of-care (POC) viral load testing for pregnant and breast-feeding women to provide faster identification and access to care and prevent mother-to-child transmission.
- MoH and Partners launched a pilot program in February 2020 at five central ‘hub’ sites, with eventual full rollout of the program in July 2020. In March 2021, POC viral load scale up began with inclusion of infants and children (0–19 years).












Photo credit: Arturo Sanabria

Lesotho HIV VL, EID and TB Instruments

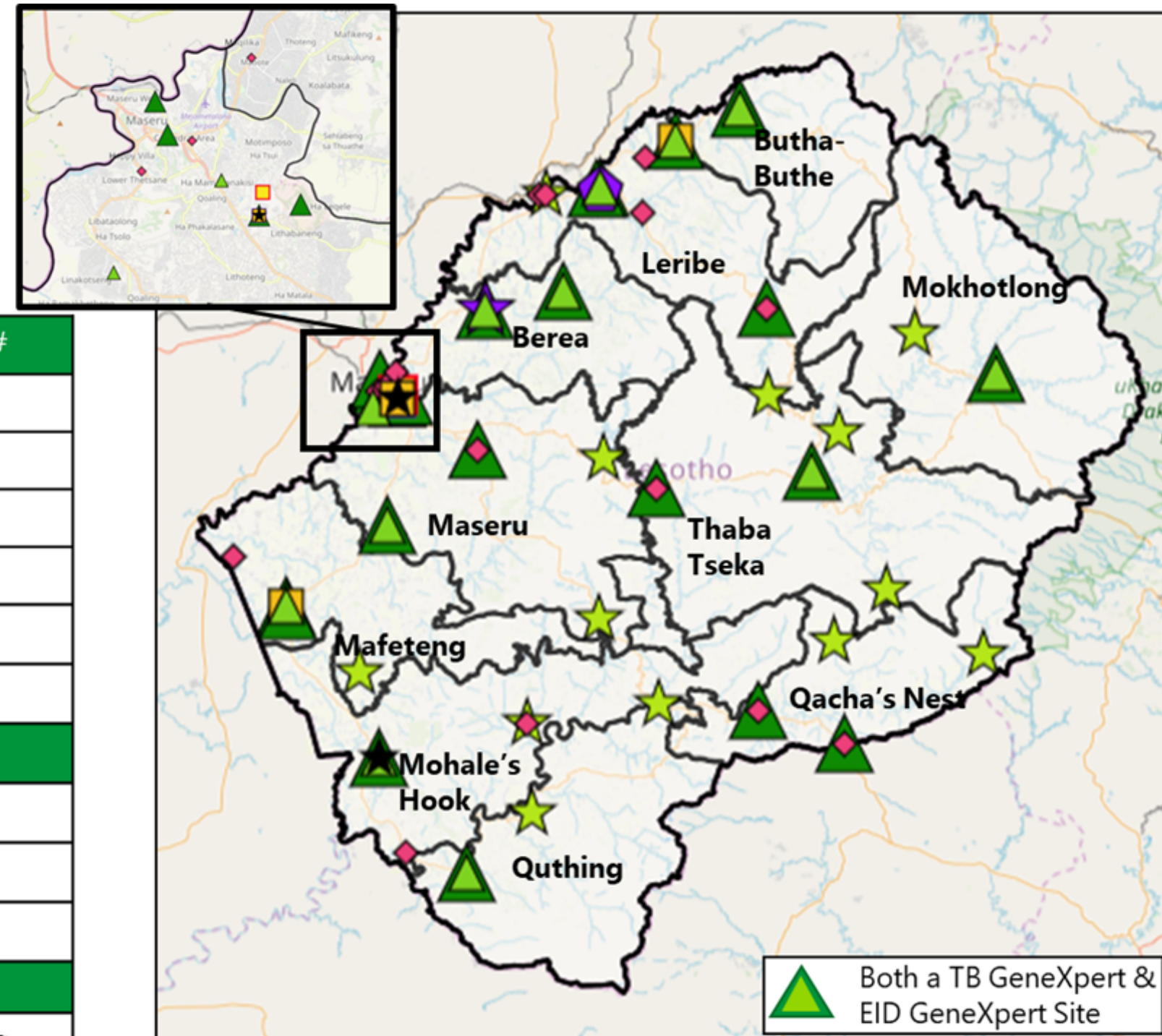
Instrument Overview: ALL

Current: 35 Test Sites & 72 Machines

Projected: 46 Test Sites & 87 Machines

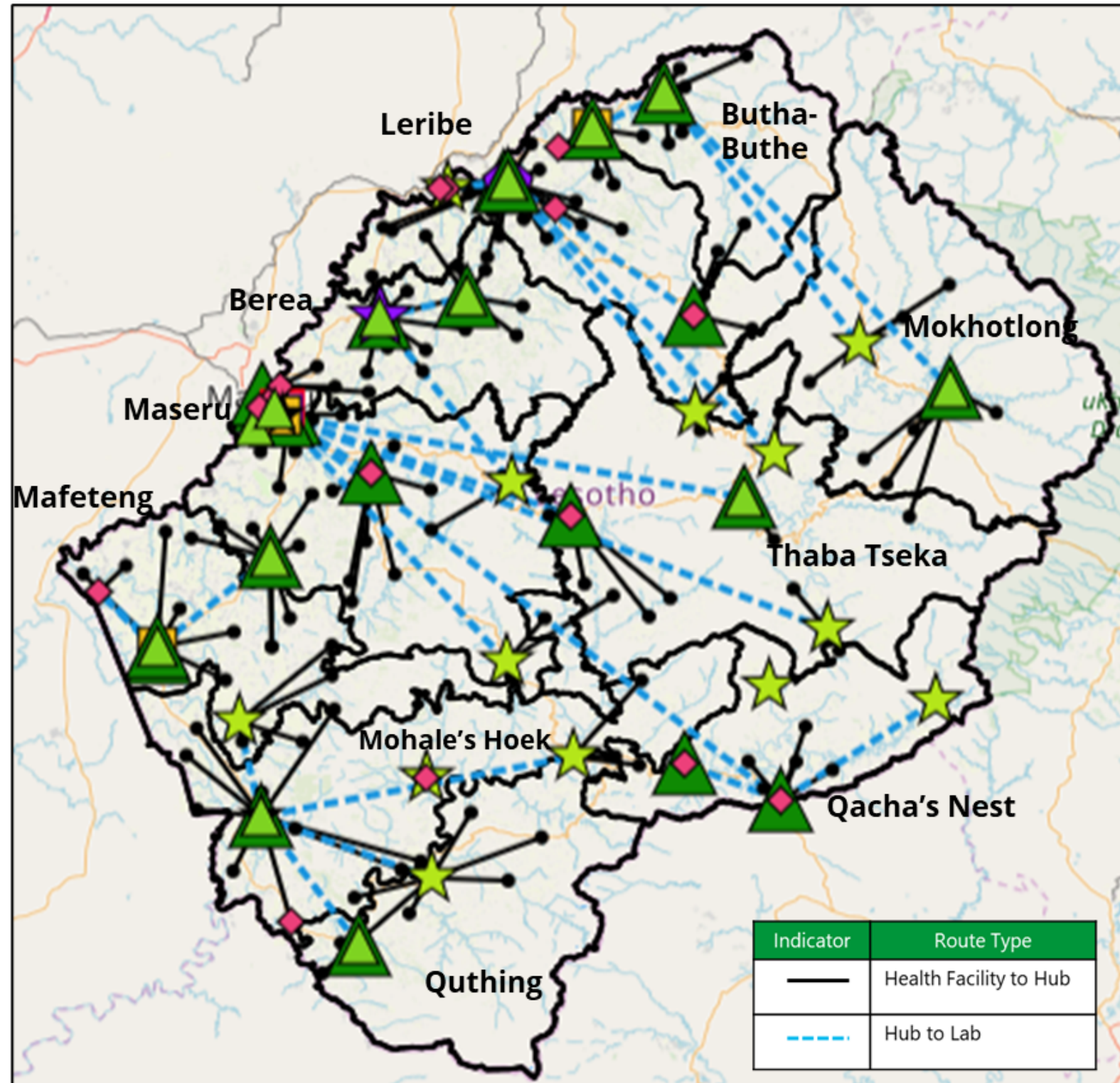
Marker	Equipment Type	Total #
	Alere-Q	15
	GeneXpert	50
	Roche CAP/CTM48	1
	Roche CAP/CTM96	3
	Roche 4800	2
	Hologic Panther	1
Current State: Grand Total		72
	GeneXpert (Mini-Labs)	13
	Roche 4800	1
	Hologic Panther	1
Projected: Grand Total		87
*Roche CAP/CTM96 @ NRL does both EID & VL testing		

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Data Source: Lesotho_LabEQIP Template (VL) & GeneXpert Directory – 2019 (MOH) & URC Comments

Optimized Referral Linkages



Instrument footprint includes:

All projected instruments operational

- 13x GeneXpert Mini-Labs
- 1x Hologic Panthers
- 6x Roche C4800

Program integration for co-located GeneXperts

GeneXpert Mini-Labs operate as sample collection hubs

Marker	Equipment Type
	Alere-Q
	GeneXpert
	Roche CAP/CTM48
	Roche CAP/CTM96
	Roche 4800
	Hologic Panther
Current State: Grand Total	
	GeneXpert (Mini-Labs)
	Roche 4800
	Hologic Panther
Projected: Grand Total	

*Roche CAP/CTM96 @ NRL does both EID & VL testing

Challenges Faced during Implementation

- COVID-19 restricted implementation
- Expiry of 210 kits in April 2021
- Poor inventory management at the facilities
- Shortage of cartridges and delay in their delivery led to slow scale up of pediatric expansion to other remaining POC VL sites
- Rotation of trained nurses to other departments
- There was lack of capacity at facility level hence extensive training on POC VL testing procedures was required

Remedial Actions

- Initiate meetings virtually to address challenges with implementing partners
- Conducted training virtually
- Supportive supervisions in collaboration with Implementing Partners

Partner Efforts



Photo credit: Arturo Sanabria

Along the way, implementing partners provided much-needed support, including advocacy to include more patient groups in viral load testing, design of tools for supportive supervision, monitoring and evaluation, roll out of training, supportive supervision and mentorship, commodity management, data management and reporting.

Partner Efforts

Sub-national partners provided key support for implementation while the District Health Management Teams and district-level staff of partner organizations co-facilitated trainings, provided post-training support and supervision, managed supply chains and supported waste management. Riders for Health provided trained for laboratory sample transportation.



Photo credit: Arturo Sanabria

Current Status

- To date more than 400 health facility staff have benefited from training in the various skills needed to implement diagnostic network optimization. Because of challenges related to COVID-19, some of the training programs took place virtually.
- After implementation of diagnostic network optimization, the time required from laboratory sample collection to delivery of results at facilities dropped from a range of 13-43 days to less than 24 hours. Most importantly, healthcare providers reported a significant increase in patient satisfaction, especially among pregnant and breast-feeding women.



Photo credit: Arturo Sanabria

Moving Forward

Preparations are underway to carry out training at remaining sites for the inclusion of infants and children. There is ongoing supervision and mentorship for the support of trained personnel, and training of more personnel to minimize gaps during rotations. The next steps of the program include plans to reach patients with unsuppressed viral load and those with advanced HIV disease.





Diagnostic Network Optimization (DNO) Implementation in Nigeria

Eruona Etubi, National AIDS and STDs Control Programme, Federal Ministry of Health, Nigeria



Presentation Outline

- Nigeria laboratory services background
- DNO implementation
- Current status
- Lessons learned
- Next steps



Nigeria Laboratory Services: Background

Nigeria's adoption of the test and treat strategy in FY16 necessitated increased system efficiency to address programmatic and operational gaps.

Limited access to PCR testing and other diagnostic services

Long test to result TAT

Poor laboratory capacity utilization

Poor coordination

High operational costs

Limited accountability

Supply chain challenges

No standardized framework for performance management

Data management gaps

Elements of DNO: Addressing Dysfunctional Systems



Nigeria commenced DNO in 2018 for VL/EID testing using the following approach:



Sample referral network design

Mapping of lab and clinical facility geolocations. Identification of instruments, utilization rates, cost and patient demand.



Streamlining PCR Testing Labs

Scale down of the number of PCR testing labs from 27 to 17.



Equipment Upgrade

Analysis of equipment utilization rates and throughput. Mix of vendors to increase competition.



Performance Management

Design of key performance indicators. Regular performance reviews with vendors.



Policy Framework

FMOH approved policy manual and appointment of national focal person.



Coordination

Planning for integration of services across disease areas.

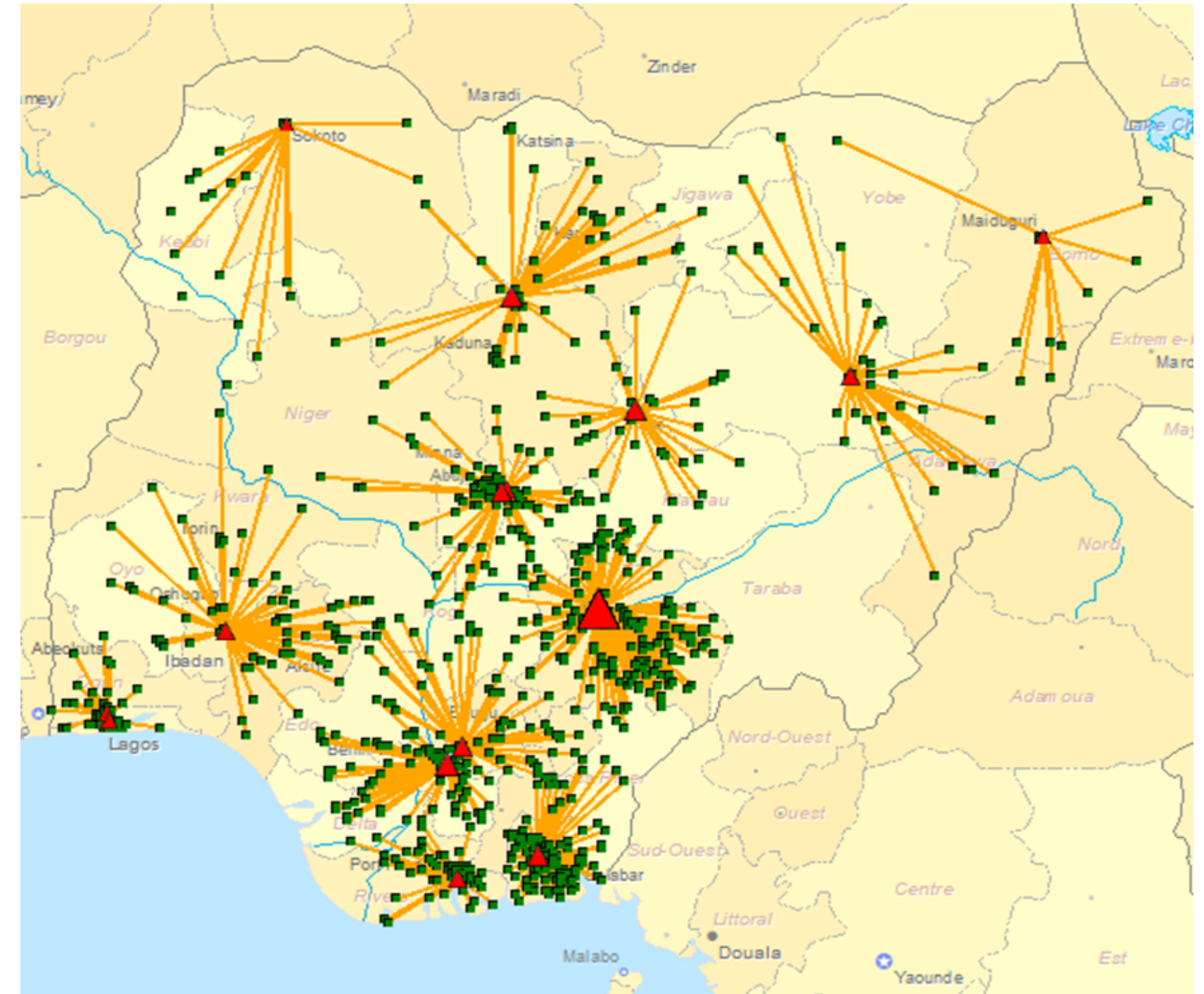
Routing meeting with stakeholders.



DNO Implementation

Outcome of Optimization of VL/EID Labs:

- Optimized Network mapping (Average Service Distance: 65km, Distance Range: 0 – 347 km)
- 27 PCR labs were consolidated to 17 for efficiency
- Balanced and efficient workloads across testing laboratories
- More cost-efficient laboratory testing: higher utilization rates and lower operational costs

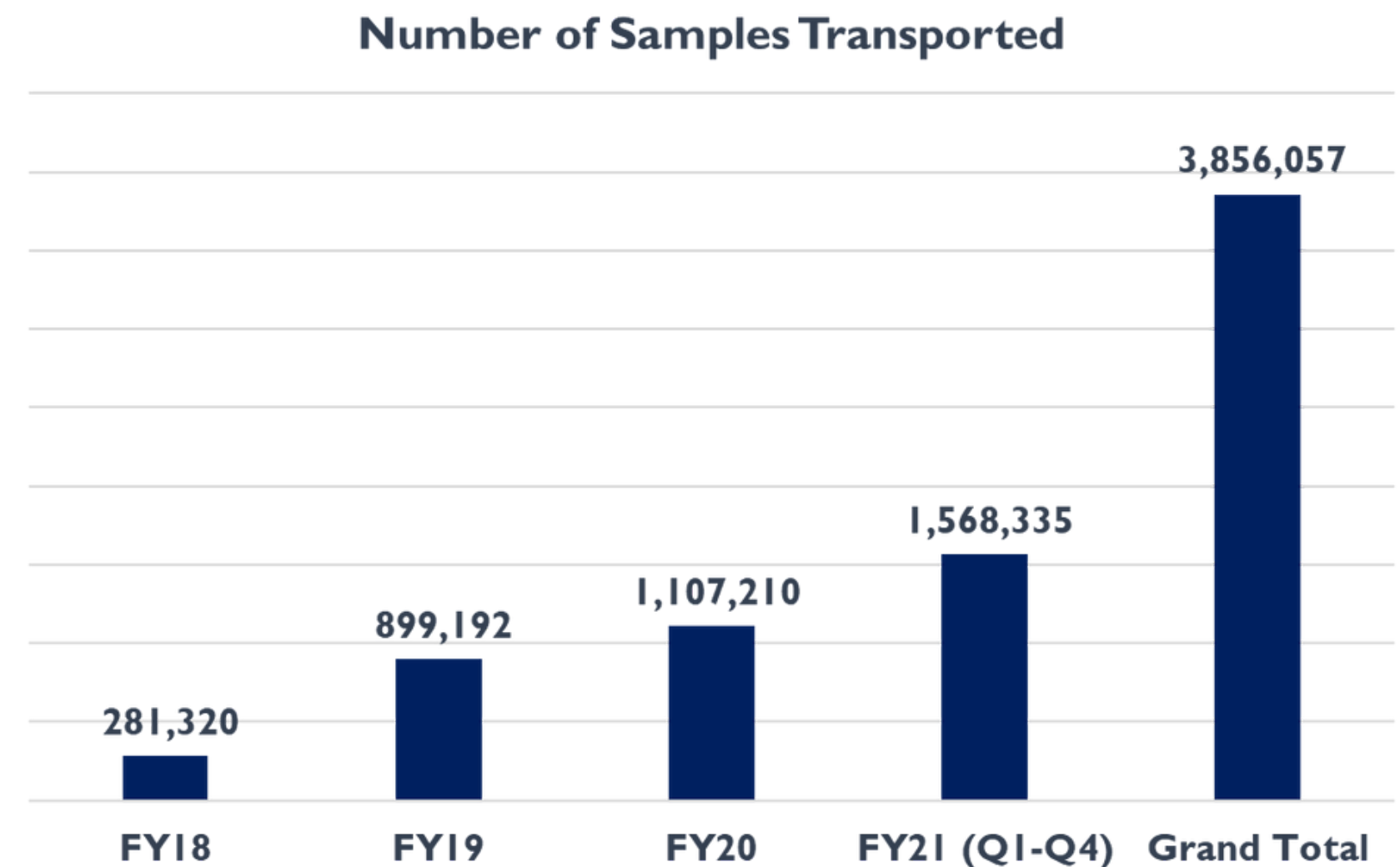




Current Status: Execution

Achievement of VL Diagnostic Network Optimization

- National Sample Referral Network established and had transported about 4 million samples since inception (March 2018)
- Increased instrument capacity utilization
- Reduced reagents pricing and improved in-country service

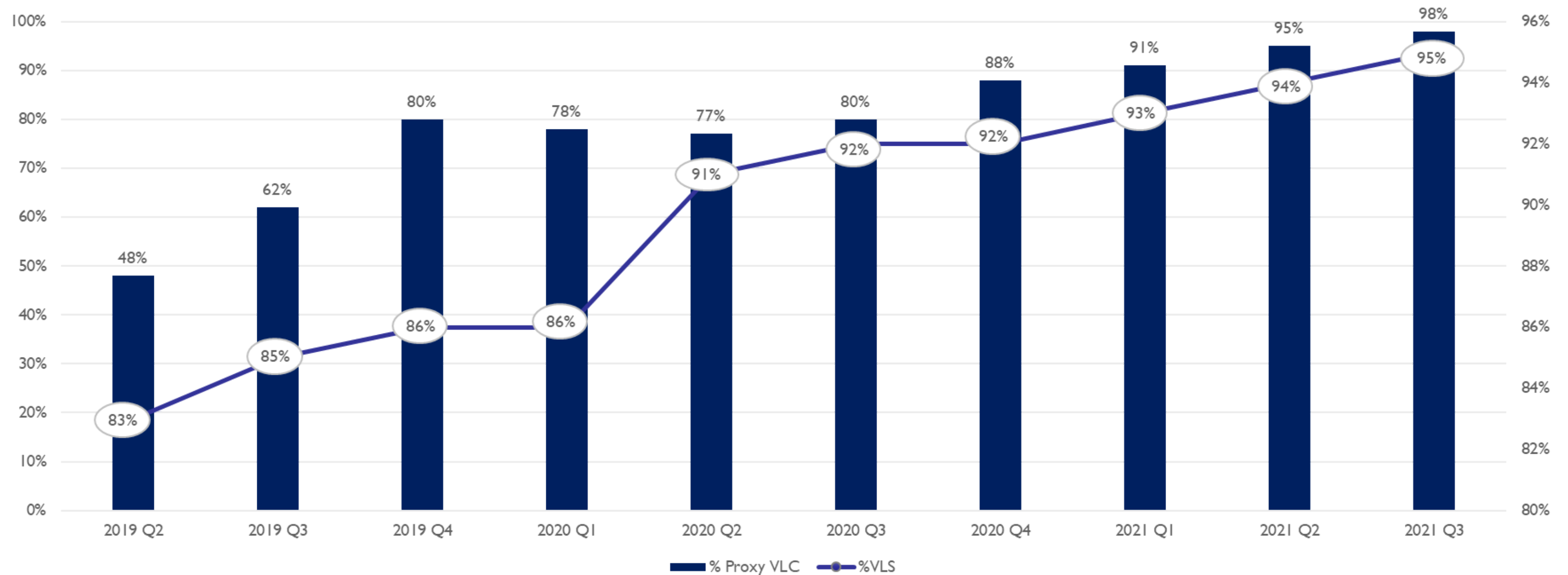




Nigeria Viral Load Trend

Steady Improvement in Viral Load Coverage and Suppression

Steady Improvement in Viral Load Coverage and Suppression

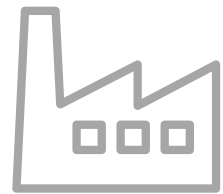




With Diagnostic Optimization, Nigeria Benefits

Achieving a Better Deal by Leveraging Testing Volume through DNO

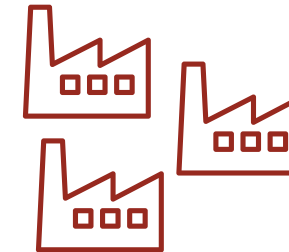
From



Limited competition



To



Increased competition



High pricing with limited price transparency



Transparent, low, all-inclusive reagent rental prices



Poor accountability for service performance



Standardized service levels, KPIs and operational data connectivity



Purchased equipment



Leased equipment (reagent rental)



Lessons Learned

- Landscape analysis and geo-location mapping are critical to the design of a functional referral system – issue an RFI if necessary.
- It is important to define service level expectations – with KPIs.
- Ensure DNO is complete with mapped sample transport lanes to inform RFP with national buy-in.
- Quarterly performance reviews with all stakeholders are vital for continuous improvement.
- Routine costs and performance evaluation help ensure efficiency.
- Annual renegotiation of contracts based on performance evaluation help to promote accountability.
- Service integration across disease areas is required to achieve optimal benefit from DNO.



Next Steps

- Consolidate on the gain of DNO on HIV/AIDS and TB to expand to other disease areas.
- Expand the National Integrate Specimen Referral Network to transport other sample types (COVID-19).
- Ensure the buy-in of other stakeholders for the sustainability of NiSRN beyond the funders' support.
- Bring the sub-nationals (state governments) to take ownership of diagnostic network optimization at state level.

Nigeria MOH Dr. Ehanire Flagging the NiSRN SOP



Thank you!

Discussion Questions

- What are some ways that DNO could support national laboratory network strategy and policy development in your country?
- Are there currently plans or discussions to support a national DNO in your country? Are there certain challenges or opportunities you foresee?
- What are the key lessons you took away from how Lesotho and Nigeria improved laboratory services through DNO ?

Beyond DNO: A network approach to strengthening and scaling up laboratory services

Access the newly published guidelines by scanning the QR code.



Thank you!

Panelists

Matthew Wattleworth, Senior Laboratory Systems Advisor, USAID

Andres McAlister, Integrated Supply Chain Manager - Laboratory, GHSC-PSM

Muccara du Preez, Quantification Coordinator, Supply Chain Management Directorate,
Lesotho Ministry of Health

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