USAID GLOBAL HEALTH
SUPPLY CHAIN PROGRAM
Procurement and Supply Management

Optimizing Ghana's TB And HIV Diagnostic Networks For Improved Access, Efficiency, And Reduced Cost: Findings From A National Diagnostic Network Optimization Analysis

Ghana has a network of laboratories with varying diagnostic capacities from sub-district to national levels across both public and private facilities. However, these laboratories operate a siloed, vertical testing and referral system for HIV Viral Load (VL), Early Infant Diagnosis (EID) and Tuberculosis (TB).

Background

The Global Fund Laboratory Activity (GFLA) supported by USAID aims at using Diagnostic Network Optimization (DNO) Analysis to address the challenges of siloed, vertical testing and referral systems for each disease burden and improve TB case detection, early infant diagnosis (EID) and viral load (VL) coverage.

Approach

- Initial stakeholer engagement and defining the scope of analysis in terms of diseases, tests and geographies.
- Data collection, detailed geospatial and graphical analysis of the baseline diagnostic network.
- Scenario designa dn mathematical optimization using the OptiDx tool.
- Analysis reporting, stakeholder validation and development of a strategy and implementation plan.

Scenarios for DNO Analysis

HIV: PCR Placement
Based on the anticipated procurement of new Abbott and Roche devices to replace expiring CAP/CTMs, what would be the ideal regional placements to minimize referral distances for the most patients? How does this compare to the expected placements?

TB: GeneXpert Placement How many new GeneXpert (GX) laboratories would be needed for all referral distances to be under 50km? Which districts would need laboratories to allow this distance-based access goal to be achieved.

Multiplexing: Using GeneXpert Network to Fill HIV Access Gaps
Given an expected placement of conventional PCR instruments, how many (and which) existing GeneXpert laboratories would need to incorporate HIV testing to enable all referral distances in the HIV network to be under 200 km?"

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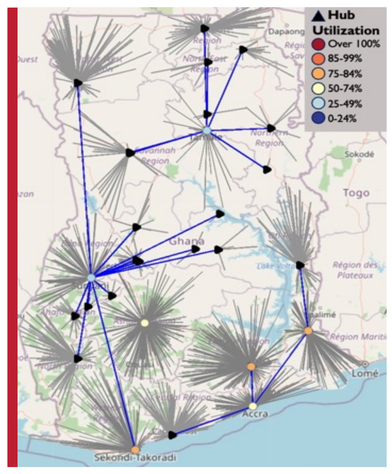
Results

HIV: PCR Placement

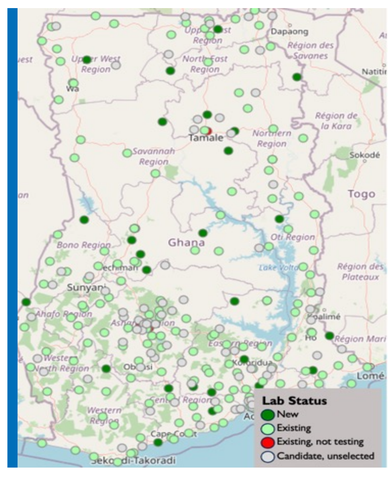
Key changes in expected equipment placements:

1. Updating of planned COBAS 5800 device in Kumasi with a COBAS 6800 model to avoid over-utilization
2. Adoption of multiplexing in all five Northern Regions instead of placing a COBAS 5800 in a central location
3. Average equipment utilization was reduced from 118% to 74.5%



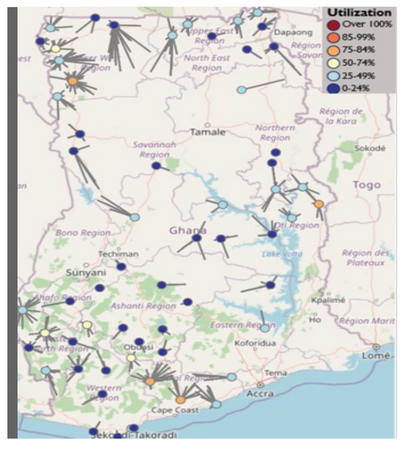
TB: GeneXpert Placement

1. Addition of 29 new GeneXpert laboratories
2. No of TB health facilities referring over 50km reduced from 30 to 6
3. Reduced TB sample transportation costs from estimated $358k to $107k



Multiplexing: Using GeneXpert

1. Reduced average referral distance for HIV VL and EID from 264km to 16km
2. Reduced annual HIV sample transportation costs from an estimated $1.25M to $920k
3. Reduced PCR machine utilization from 74.5% to 67.7%



Conclusion

The implementation of the DNO analysis will reduce sample referral distances and cost, improve patient access to diagnostic services, improve efficiency and reduce cost of the diagnostic network.

Lessons Learned

- Stakeholder collaboration strengthened engagement, mitigated challenges and ensured country ownership and a well coordinated DNO process.
- Using digital technology optimizes patient access to diagnostic services, contributing significantly to viral load suppression and TB epidemic control.

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