Assessing specimen referral systems across West Africa to strengthen laboratory networks

By Ms. Kameko Nichols, Mr. Aaron Pattillo — The Nichols Group LLC November 2017

Background

As part of the 'Building Laboratory Capacity to Support the Global Health Security Agenda Project' implemented by the African Society for Laboratory Medicine (ASLM), a subject matter expert was hired as a consultant to perform a situational analysis on the status of specimen referral systems across West Africa. The initial analysis was performed onsite in the West African countries of Burkina Faso, Cote d'Ivoire, Guinea Bissau, Senegal, Mali, and The Gambia from October 2015 through May 2016.

The aim of the initial assessments was to understand the current referral systems and laboratory networks in each country and provide recommendations on how they can be strengthened to effectively respond to global health security threats. The consultant's team worked with the respective Ministries of Health and health partners to review and report on existing laboratory networks and specimen referral systems including evaluation of status, coverage, strengths, readiness to respond to epidemics, integration with various disease types, running costs, private sector engagement, etc. The assessments were presented to the countries in report format for initial fact-checking and feedback. They were then shared with stakeholders. A set of recommendations on next steps to strengthen the specimen referral networks in the respective countries was also offered.

Observations/comparisons of specimen referral networks across different countries

One commonality in the countries assessed was the lack of robust specimen referral systems that are typically found in Southern and East African countries with high burdens of HIV and tuberculosis. In high-burden countries, the large volume and high frequency of specimens that require referral to higher-level laboratories often justify a dedicated logistics system for specimens. However, in the countries ASLM performed the assessment, specimens are generated at a much lower-volume and on an irregular basis, mainly for diseases under surveillance such as meningitis, measles, yellow fever, cholera, etc., although HIV-and tuberculosis-related specimens are also collected. Thus, the methods for specimen referral were more commonly ad-hoc. For example, specimens might be sent on public transportation, either accompanied or un-accompanied by a staff member from the referring facility.

Other similarities in the specimen referral systems were the fragmentation and lack of coordination across specimen types and disease programs, lack of communication and transparency among stakeholders, and lack of mapping out various systems. Another notable difference between countries was the engagement of various government and private sector stakeholders. In Mali and Burkina Faso, for instance, the national postal system is quite strong and has the ability to potentially transport specimens, although there was no current engagement in this area. In Cote d'Ivoire, however, the national postal system was not as viable as a potential service provider for specimen transport due

Health center staff in Burkina Faso.
[Source: Kameko Nichols, Independent Consultant, ASLM].

Outside the National Public Health Laboratory in Cote d'Ivoire.
[Source: Kameko Nichols, Independent Consultant, ASLM].

to its collapse during the civil war. However, Cote d'Ivoire does have a highly functional central medical store, which could provide a good touchpoint for lessons learned and logistics system details (such as routing, transport management, etc.).

Key recommendations

Key recommendations for all of the countries assessed were as follows:

- Build on the efforts of any disease programme that has already initiated a specimen referral mechanism.
- Explore and utilise software or other platforms that allow for mapping of the surveillance/diagnostics networks, as well as optimisation and simulation.
- Improve coordination and information sharing/transparency through a specimen referral technical working group or coordinating body, fully inclusive of various stakeholders (regardless of the specimen or disease), who meets regularly and is governed by clear terms of reference.
- Develop national plans, policies, and guidelines for specimen referral.

Other recommendations were country-specific, such as:

- Build on other assessments that had been recently performed.
- Learn from the central medical store logistics/distribution.
- Increase biosafety and biosecurity measures for specimen referral.

In certain countries, these recommendations served as an extension into the second phase of the project, which focused on the design and implementation aspects of piloting specimen referral networks. In Burkina Faso (right) and Mali, the report and its recommendations led

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Highlight on Burkina Faso

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Assessing, designing, and piloting a specimen referral system for acute respiratory illness surveillance using the national postal system

Phase I – Assessment. In 2015, the assessment to understand specimen referrals was performed in partnership with the Burkina Faso Ministry of Health and the United States Centers for Disease Control and Prevention (CDC). The assessment mapped the existing referral networks, examined existing infrastructure, and analysed various strengths and weaknesses reported by key stakeholders. In Burkina Faso, it was found that specimens are carried by laboratory staff on public transportation to referral laboratories, which is costly and takes qualified staff away from their duties.

Sonapost showing how the post packages its shipments. [Source: Kameko Nichols, Independent Consultant, ASLM].

Phase II – Design. Under the Global Health Security Agenda and during the transition to phase II of the project, Burkina Faso was focused on strengthening surveillance for severe acute respiratory infections, which generates specimens requiring transport to the National Influenza Reference Laboratory (Laboratoire National de Référence pour les Grippes, LNR-G). Design of a pilot system for severe acute respiratory infections samples was undertaken by performing primary research and interviews at multiple levels of the health system, including the primary health center, district laboratory, LNR-G and central Ministry of Health levels. Key partners, including the consultant, ASLM, CDC

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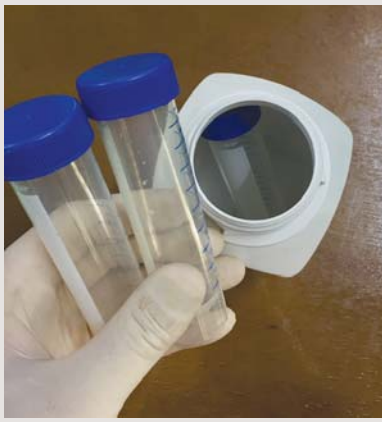
The team from CDC-Burkina Faso, Davycas, Sonapost and ASLM. [Source: Kameko Nichols, Independent Consultant, ASLM].

to strengthening of the referral network through ASLM support. Limitations on funding and readiness precluded the advancement into the second phase, which will be highlighted in more detail in the future, for every assessed country.

The overall assessment process and tools developed by the consultant under this project have also served in other specimen referral assessments across Africa with other partners and funders, such as in Mozambique, Zambia and Nigeria. Since the initial assessments, the Global Laboratory Initiative (GLI) launched its Guide to TB Specimen Referral Systems and Integrated Networks. The Guide is a comprehensive document to help support in-country Ministries of Health and laboratory partners in developing and strengthening integrated specimen referral networks. In addition, a companion specimen referral toolkit was also recently released by GLI, which will provide tools, resources, and links to other relevant information.

The assessments reported in this article were provided by The Nichols Group LLC. The Nichols Group works with a range of clients to focus on aspects of transport and logistics within health systems across primarily sub-Saharan Africa and Asia. Projects have included designing a module of an assessment for vaccine management systems, conducting specimen transportation network assessments and system design across 17 countries, analysing a costing tool for cold chain equipment maintenance and recommending alternative cost frameworks. For more information, please visit: http://www.thenicholsgroupllc.com/



Four photos - right: Triple packaging for biosafety and biosecurity, as well as specimen quality. [Source: Aaron Pattillo, Independent Consultant, ASLM]

and a local organisation, Davycas, then developed a sample referral design that was approved by the Ministry of Health to connect four district laboratories to LNR-G. This design was tendered out and awarded to SONAPOST (the national postal system), using their Express Mail service.

Phase III – Implementation. Following the design phase and identification of the transport partner, the implementation of the pilot programme began. A key element of this process involved incorporating and negotiating critical components of the pilot programme into the agreement with the transport partner, including:

- Delivery to LNR-G within 24-hours of collection from any site
- Training to ensure specimen quality and biosafety
- Cost-containment using volume-based package pricing
- Customised communication, data collection and tracking mechanisms
- Ability to incorporate other specimen types (to realise cost savings).

Activation of the pilot programme began 15 April 2017, initially for a six-month period. The implementation and performance of the programme will be studied in detail separately.

In sum, the three-tiered approach used in Burkina Faso to assess, design, and implement the country's first specimen referral network can serve as a model for other countries to follow.

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