APHL GLOBAL HEALTH CAPABILITIES

INFORMATICS

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Supporting Laboratory Informatics Worldwide

The Association of Public Health Laboratories (APHL) supports countries in the evaluation, design and implementation of digital solutions for more efficient management of laboratory processes. Since 2005, APHL has supported informatics projects at a wide range of international laboratories—from clinical to public health, small district laboratories to national reference and public health laboratories—in more than 20 countries. APHL provides services that support the core needs of laboratories, including specimen collection and referral, data automation, electronic laboratory reporting, and system integration with clinical and surveillance systems for decision making.

APHL is a key laboratory partner in the recent data modernization initiative both in the United States and globally. APHL uses the evolution of public health laboratory informatics in the US as a roadmap to chart possible paths for other countries. By increasing the availability of data and modernizing data systems and related processes at all levels, countries are better able to respond to outbreaks, prepare for future pandemics and improve surveillance capacity.

ABOUT INFORMATICS

Informatics enables reporting of laboratory data from public health and clinical laboratories by improving laboratory data integration, interoperability, visualization, centralization and standardization. Informatics allows for the timely and effective utilization of laboratory data by surveillance and clinical programs.

APHL Informatics Capabilities

- **LIMS**
  APHL collaborates with ministries of health (MOHs) to optimize or enable selection of a new Laboratory Information Management Systems (LIMS), and executes LIMS implementation, training and support.
- **Electronic Sample Referral Network**
  APHL provides electronic capture of test orders at point of specimen collection.
- **Centralized Laboratory Data Storage**
  APHL implements central lab data repositories for data storage, transfer and visualization.
- **Reporting and Data Visualization**
  APHL guides MOHs on how to use dashboards and graphics to display close-to-real-time outbreak trends.
- **Data Integration**
  APHL provides technical assistance to ensure laboratory systems and instruments can “talk” to each other.
- **Data Standardization**
  APHL trains MOH staff on health data standards such as LOINC, HL7 and FHIR.
- **Mapping Laboratory Capacity**
  APHL captures and analyzes capacity data to inform resource allocation, staffing, sample collection, testing strategy, and preparedness and response.
- **Data Management for Proficiency Testing**
  APHL works with national reference laboratories to develop proficiency testing (PT) systems for the laboratories in their networks.
- **Workforce Development**
  APHL creates resources that laboratory staff can use to build their informatics skills, such as competency assessment tools, e-learning modules and webinars.

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Informatics Success: COVID-19 Data-sharing in Kenya

The COVID-19 pandemic created a unique challenge for laboratory and surveillance teams at ministries of health (MOHs) around the world. When testing for infectious diseases, sharing of detailed laboratory data is critical to ensure appropriate follow-up actions can be taken, such as contact tracing. However, with growing testing capacity in both public and private sectors, it was challenging to ensure all testing sites shared data, the data remained protected, and that these data were available to both laboratory and surveillance leadership for appropriate decision making.

As a results of these efforts, **100% of laboratories** (40% private, 60% public) conducting COVID-19 testing in Kenya are sharing data with the National COVID-19 data repository.

In Kenya, APHL leveraged critical partnerships with the MoH's National Public Health Laboratories (NPHL) and the National Emergency Operations Center (EOC) to overcome these challenges by:

- ## Creating a National COVID-19 Data Repository
  A centralized national laboratory data repository was established at the NPHL to consolidate COVID-19 laboratory data from all Kenyan RT-PCR testing laboratories to ensure data were available for surveillance. The repository was built as an extension of NPHL's established LIMS system.

- ## Building Consensus on Data Sharing
  NPHL engaged all testing laboratories—both public and private—to communicate the importance of laboratory data sharing and reporting. Their efforts resulted in a commitment to share COVID-19 laboratory data with the national data repository.

- ## Ensuring Data Privacy
  The MOH restricted access to the National COVID-19 data repository to authorized users who sign non-disclosure agreements that govern data privacy and confidentiality. Any result submitted to or accessed from the repository is fully audited with details on who, what and when data were accessed. All integrations with external systems take place through IP addresses that are pre-approved on NPHL's server for added security.

- ## Standardizing Data Extraction Tools
  Standard tools were developed to allow all testing laboratories—regardless of the information system used at the laboratory—to easily extract and transmit data to the national repository. To avoid adding undue burden to current laboratory systems, the tools were simple to use and could easily fit into the laboratory's workflow.

- ## Integrating with Decision-making Platforms
  To reduce the burden of data entry while enabling surveillance teams to meet their core mandate, the repository was integrated with the national surveillance system (DHIS2). All positive test results are pushed to DHIS2 automatically so the surveillance team at the EOC can quickly update case information.

- ## Data Visualization for Data Driven Policy Decisions
  To enable NPHL and MOH to make rapid decisions regarding testing capacity, a dashboard of deidentified laboratory data provides daily and monthly summaries on COVID-19 testing status. The data displayed through the dashboard is used to determine the distribution of test kits and the burden of testing/ workload across counties; focusing on capacity building, training efforts and informing decisions around safety and prevention guidelines. Data from the repository can be extracted to conduct data modeling for projections and forecasting.

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