

Strengthening Mali's Epidemiological Surveillance System

Introduction

Disease surveillance tells health planners the prevalence and potential risk posed by contagious diseases in their countries or regions. Before March 2014, Mali depended on a surveillance center in Guinea for information on emerging diseases, but then that country became the epicenter of the emergence of the Ebola virus disease. This outbreak in West Africa revealed the fragility of health systems in developing countries and the lack of coordination among epidemiological surveillance systems worldwide.

Today, Mali relies on the Epidemiological Alert System located in-country, where it is regulated by the National Directorate of Health (DNS) through its Division of Prevention and Control of Disease and the division's epidemiological surveillance unit. The alert system is supported by the National Institute for Research in Public Health (INRSP) to identify diseases with epidemic potential and is accredited by the World Health Organization (WHO).

Mali's national epidemic management strategy is based on a new integrated disease surveillance and response system (IDSR). Epidemiological data are collected weekly and the transmission of information is supported by a radio communication network, telephone, fax, mobile phones, and Internet networks. This new system has many shortcomings, such as a lack of coordination among programs, inadequate technical and financial resources, and a lack of good-quality data available in time for decisions at all levels.

To address these issues, the Global Health Security Agenda (GHSA) has stepped in to help Mali strengthen its surveillance system so it can better manage and respond to possible epidemics, such as Ebola. GHSA was launched in February 2014 to help make the world safe from infectious disease threats; to bring together nations to make new, concrete commitments; and to elevate global



The epidemiological surveillance manager in the Kayes region helps a participant complete practical disease notification exercises in DHIS 2. Source: MEASURE Evaluation

health security as a priority. In Mali, GHSA is using a multisectoral approach that brings together several partners to improve the system.

Since January 2016, the U.S. Agency for International Development (USAID), through its funded project MEASURE Evaluation, has supported GHSA's effort by providing technical assistance to the DNS to improve the collection, analysis, and availability of epidemiological information in real time. This initiative encompasses 435 community health centers (CSCoM) in 19 health districts in the Kayes, Koulikoro, Sikasso, and Bamako regions, near Conakry, Guinea.

Coordination among partners

Partners for the GHSA project in Mali are International Medical Corps (IMC), Catholic Relief Services (CRS), the Moroccan Biosafety Organization, IntraHealth, MaliHealth, Soutoura, Amprode Sahel, Fondation Mérieux, and MEASURE Evaluation. MEASURE Evaluation first mapped partners working in disease responses and health information systems in Mali, then

initiated a framework for exchange between the GHSA and Mali implementing partners (funded by the U.S. Centers for Disease Control and Prevention [CDC] and USAID) to share work plans and the intervention areas of each project. This framework created a climate of trust that fosters collaboration to achieve the overall goal of strengthening the country's epidemiological surveillance system.

Following the partner meetings and under the leadership of the DNS, MEASURE Evaluation supported the creation of a technical working group that included all relevant epidemiological surveillance actors from the Malian government and national and international partners. This group meets monthly to provide updates on activities, to discuss difficulties encountered, and to identify strategies for coordinating activities. In addition to these regular meetings, members of the group participate in the development of standard operating procedures and support for the epidemiological surveillance system. Other partners are supporting the group, and the hosting of the meetings rotates among CRS, IMC, and MEASURE Evaluation.

Situational analysis

In 2016, partners wanted to prioritize outstanding issues for strengthening the epidemiological surveillance system in order to direct the interventions of the Ministry of Health and Public Hygiene (MSHP). Several partners, such as CRS, IMC, and WHO, conducted evaluations of the

surveillance system in alignment with their areas of interest (i.e., diagnosis and biosafety, laboratory biosafety, the “One Health” concept (a worldwide strategy linking the health of human beings, animals, and the environment), and the application of international health regulations.

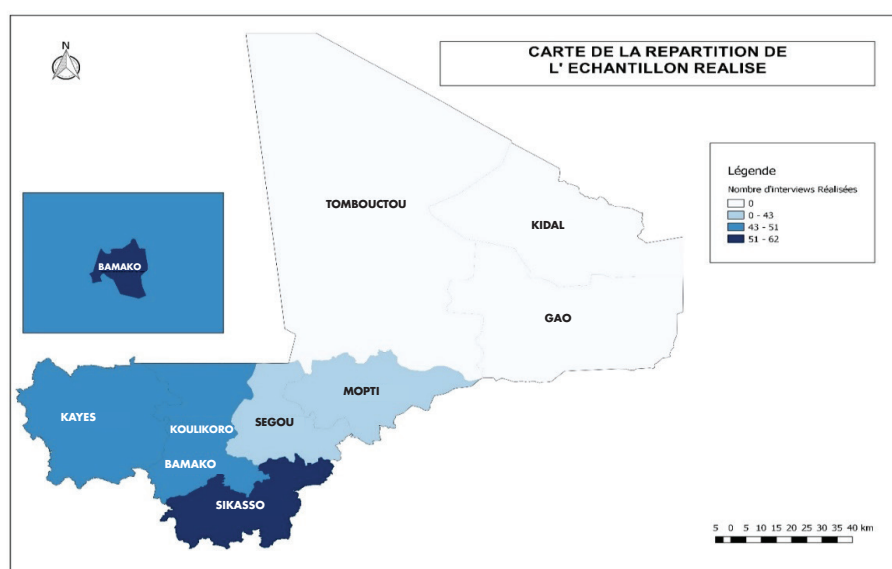
In addition to those evaluations, MEASURE Evaluation conducted a situational analysis in collaboration with the DNS to inform the MSHP on the strengths and weaknesses of the system, with a possible goal of integrating Ebola surveillance with the epidemiological surveillance system.

This analysis was conducted in July 2016 in five regions of Mali and the district of Bamako. The analysis surveyed 296 structures (national and regional directorates and laboratories, plus district- and community-level health facilities). The situational analysis verified that standard documents and procedures were in place (an IDSR guide, technical guidelines, and data collection and supervision tools); that means to support the system (system organization; coordination mechanisms; and human, material, and financial resources) were available; and that epidemiological information was being managed adequately. This analysis was supplemented by a qualitative survey on stakeholder engagement in epidemiological surveillance.

The situational analysis by the DNS and MEASURE Evaluation—like that conducted by CRS, IMC, and WHO—also identified priority areas for strengthening the surveillance system to guide future interventions by the MSHP and its partners. It identified the following strengths and weaknesses of the surveillance system:

- The system was well-organized and had available human resources, data transmission, and information feedback channels.
- The system's inadequacies centered on a need to update collection tools; problems of completeness, timeliness, and accuracy of system data; the lack of a harmonized electronic database for all diseases under

Figure 1. Sample distribution map for the situational analysis





The Kayes Regional Director of Health gives a computer to a DHIS 2 user at a community health center. Purchases of computers and other equipment in Mali were supported by USAID/ASSIST (an HIS partner in Kayes).

Source: MEASURE Evaluation

surveillance at all levels; and difficulties in disseminating standard tools and procedures at the operational level (district and community levels).

Priority need: Integration of the epidemiology surveillance system with DHIS 2

This analysis led to the prioritization of the integration of all data collection subsystems—including the epidemiological surveillance system—and other programs in DHIS 2: the software platform for the national health information system (HIS). This need became a priority of the MSHP and is supported by other HIS partners.

The joint deployment of DHIS 2 in health districts with integrated disease surveillance is a result of the analysis and cooperation among partners. For example, HIS partners—among them USAID’s Applying Science to Strengthen and Improve Systems (USAID/ASSIST); the United Nations Children’s Fund; Population Services International; and the USAID-funded Services de Santé à Grand Impact—bought cell phones, tablets, and computer equipment for the DHIS 2 platform. These investments helped convince the health ministry to use these information technology tools for the HIS, epidemiological surveillance, and other programs.

Integrating disease surveillance with DHIS 2 offered MEASURE Evaluation’s Mali team an opportunity to better coordinate and combine resources to expand

implementation of Ebola surveillance and the rollout of DHIS 2 in these regions. MEASURE Evaluation set up coordination meetings and technical meetings with the DNS surveillance team and implementation partners working on the HIS and DHIS 2 in Mali. This coordination resulted in several steps to integrate surveillance activities in the HIS, such as:

- An orientation for the surveillance team to DHIS 2
- Participation of the central team of the DNS in incorporating the surveillance system module in DHIS 2, including the tools for collecting surveillance data on 22 priority diseases, a weekly report template, management of drug stocks for epidemics and disasters, and key surveillance indicators
- Development of a DHIS 2 user guide that includes epidemiological surveillance

In addition to the activities coordinated with the support of MEASURE Evaluation mentioned above, the MSHP and HIS partners also supported and coordinated the following surveillance activities:

- Joint organization and financing of HIS training sessions and supervision visits to health facilities (Supervision visits help reduce the cost of training courses supervised by MEASURE Evaluation and allowed the deployment of the surveillance system in DHIS 2 to extend its reach to more facilities.)
- Post-training follow-up for DHIS 2 users



DHIS 2 training in Kayes

Source: MEASURE Evaluation

Figure 2. Weekly report compiling epidemiological surveillance data (cholera, meningitis, and measles) from the health district of Commune IV, in Bamako, for Epidemiological Week 8, 2017

The screenshot shows the DHIS2 web interface for the 'Système d'Information Sanitaire du Mali'. The main content is a table titled 'RAPPORT HEBDOMADAIRE DE NOTIFICATION DES CAS DE MALADIES A DECLARATION OBLIGATOIRE'. The table is organized by disease (Choléra, Méningite cérébrospinale, Fièvre jaune) and then by age group (0-11 mois, 1-4 ans, 5-14 ans, 15-44 ans, 45-59 ans, 60 ans et +). For each age group, data is provided for Masculin and Feminin. The table also includes columns for 'Total' for each age group and a final 'Total' column. The data shows zero cases for all categories.

Maladies		0-11 mois		1-4 ans		5-14 ans		15-44 ans		45-59 ans		60 ans et +		Total
		Masculin	Feminin	Masculin	Feminin	Masculin	Feminin	Masculin	Feminin	Masculin	Feminin	Masculin	Feminin	Total
Choléra	Cas suspects	0	0	0	0	0	0	0	0	0	0	0	0	0
	Décès	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cas prelevés	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cas confirmés	0	0	0	0	0	0	0	0	0	0	0	0	0
Méningite cérébrospinale	Cas suspects	0	0	0	0	0	0	0	0	0	0	0	0	0
	Décès	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cas prélevés	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cas confirmés	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cas vaccinés	0	0	0	0	0	0	0	0	0	0	0	0	0
Fièvre jaune	Cas suspects	0	0	0	0	0	0	0	0	0	0	0	0	0
	Décès	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cas prélevés	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cas confirmés	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cas vaccinés	0	0	0	0	0	0	0	0	0	0	0	0	0

Results

With the priority need identified, and both surveillance staff and HIS staff trained on the integrated DHIS 2, the partners' analyses are bearing fruit.

The deployment of the epidemiological surveillance system, which was originally planned for 435 health facilities and districts, will eventually cover all four areas near Conakry: 232 CSCom in Kayes, 249 CSCom in Sikasso, 60 CSCom in the district of Bamako, and 236 CSCom in Koulikoro (whose process is under way), for a total of 777 health facilities covered.

Today, Mali's disease surveillance staff has access to surveillance data at all levels and at all times in the regions that have already benefited from this support. This access is particularly important for monitoring emerging diseases, because it allows district and regional staff to have immediate access to data captured by health facilities and

aggregated by level (health facility, district, region, and national). These improvements and efficiencies will also allow staff more time to analyze data and provide feedback to health facilities.

More still needs to be done to foster bottom-to-top, two-way communication mechanisms that use SMS (short message services, or texting). These efforts, together with the work already carried out in response to the Ebola epidemic, will make it possible to improve the responsiveness of the Malian health system in future crises.

Conclusion

A strong coordination mechanism mobilized partners for action in Mali. This effort has helped to guarantee the success of an integrated DHIS 2 platform, strengthening the country's epidemiological surveillance system and HIS management as a whole.