

Real-time Epidemiological Surveillance in Mali:

Data Quality for Good Decision Making to Prevent and Respond to Epidemics

Introduction

From the beginning of the response to the Ebola epidemic in Mali in 2014, the country's Ministry of Public Health and Hygiene has prioritized strengthening the reporting system of key diseases that have the potential to become epidemics.

In 2016, MEASURE Evaluation, funded by the United States Agency for International Development (USAID), in collaboration with the National Directorate of Health (DNS) and the Division of Disease Prevention and Control in the Ministry of Health, set up real-time epidemiological surveillance and reporting in DHIS 2 for better evidence-informed decision making.

MEASURE Evaluation assisted to adapt DHIS 2 to cover the chief diseases, conditions, and priority events the country selected: hemorrhagic fever, measles, meningitis, yellow fever, cholera, and anthrax, among others.

Mali uses DHIS 2 at all levels of the health system (central, intermediate, and operational), except for health facilities located in conflict zones (about four percent of all health facilities). DHIS 2-based epidemiological surveillance data is now available to all users regardless of their decision-making level (community, district, regional, and central). MEASURE Evaluation and the DNS developed a user monitoring plan, implemented one year after DHIS 2 deployment, that features post-training follow-up visits and supervision.

Two years after the implementation of DHIS 2, however, data quality issues became a major challenge for the DNS. Poor data



Regional data quality review meeting, Kayes, Mali.

quality limited Mali's ability to use data for decision making because the data did not meet quality standards—such as completeness, timeliness, accuracy, and reliability.

Response Adapted to the Situation

Aside from data quality issues, technical and human resource issues also were a problem. Users trained to use the computerized epidemiological system in DHIS 2 either moved or were transferred. User mobility only compounded persistent problems of Internet connectivity and the maintenance of hardware (computers, Internet connection, access to data sources). Taken together, these issues exacerbated the lack of good-quality and timely data and, over time, DHIS 2 data were no longer used for decision making.

To improve data quality, MEASURE Evaluation worked with the DNS to set up regional and national meetings to enable staff at the data-producing levels of the health system to discuss quality issues. MEASURE Evaluation prioritized regional quarterly reviews of data quality in the annual work plan (October 2017 to September 2018) in Kayes, Koulikoro, Sikasso, Ségou, Mopti, and Bamako and a national biannual data quality review. Regional reviews at the health district level allow users an opportunity to discuss data completeness, timeliness, and consistency and to share successful experiences to address common challenges. The participants identified the chief issues and then developed a regional plan to address them. The biannual national data review provides players at the central level the opportunity to interact with regions and monitor their progress on data quality.

Prior to implementing the national data review meetings, MEASURE Evaluation supported the DNS to develop a standard data review template to track completeness and timeliness, data inconsistencies, missing data or outliers, and data accuracy.

Completeness and timeliness of epidemiological surveillance data in DHIS 2 in 2016

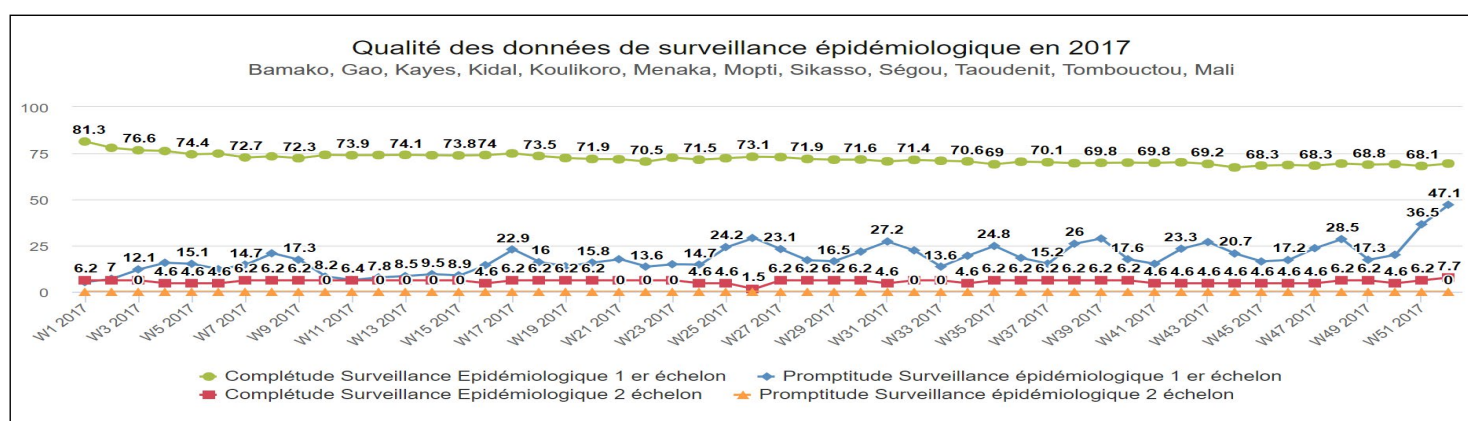
Region	Current reports	Expected reports	Percent	Timely reports	Percent on time
Kayes	7734	12948	59.7	203	2.6
Ségou	4703	10712	43.9	104	2.2
Bamako	1144	3120	36.7	11	0.9
Mopti	3064	8996	34.1	0	0
Sikasso	2568	12636	20.3	168	6.5
Timbuktu	884	4732	18.7	6	3.7
Koulikoro	159	11336	1.4	0	0
Menaka	10	1248	0.8	0	0
Gao	23	3484	0.7	0	0
Taoudenit	0	1092	0	0	0
Kidal	0	936	0	0	0
Mali	20289	71240	28.5	492	2.4

Result

By 2017, the DNS had revised primary data collection tools to prioritize indicators most important for data use and to minimize

duplication by improving data collection forms, which further improved completeness and timeliness (see Figure 1).

Figure 1. Quality of epidemiologic surveillance data in 2017



In 2018, the regional health directorates, with the technical and financial support of MEASURE Evaluation, organized eight regional and one national review during which each region applied the framework that MEASURE Evaluation had developed. The national review examined the recommendations made during the regional reviews and discussed unresolved issues in the regions.

In addition, they found alternative solutions to technical problems—such as the persistent problems of low connectivity, the purchase of Internet service plans, and staff mobility—through sharing experiences among those involved in different levels of review.

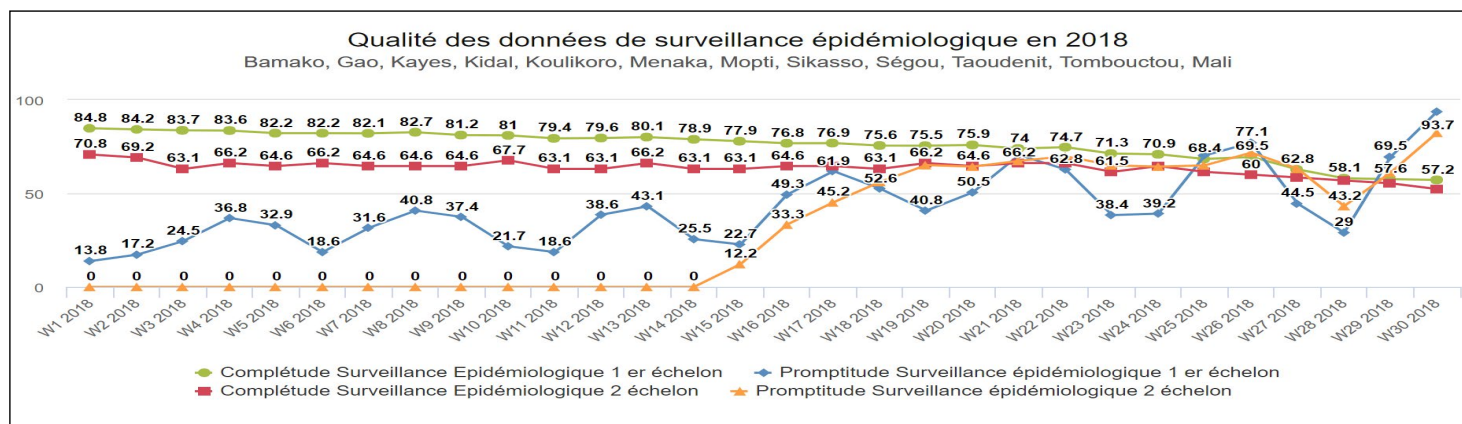
Even after only one set of reviews was complete, MEASURE Evaluation saw a marked improvement in data quality (see Figure 2). However, the team also noted that data improvement was more impressive for the data produced by community health centers (CSCOM) than for the data produced by referral health centers (CSREF).

Meanwhile, a remote monitoring and follow-up plan is being set up by the DNS, which will allow USG partners to perform remote data analysis and send feedback to the northern regions to correct problems.

Conclusion

The automation of health information systems is revolutionizing health systems in developing countries such as Mali, but strengthening these systems requires continuous monitoring to ensure that quality data is produced and thereby to facilitate data use.

Figure 2. Quality of epidemiologic surveillance data in 2018



Limitations

MEASURE Evaluation continues to work with the DNS to identify other partners in Mali that will support data reviews in the northern regions (Timbuktu, Gao, Kidal, Menaka, and Taoudeni) where U.S. government (USG) partners cannot work.