WORKING PAPER

Lessons in Health Information System Strengthening
What Worked in Mali

March 2019

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ABBREVIATIONS

CPS	planning and statistical unit
HIS	health information system
IP	implementing partner
M&E	monitoring and evaluation
MOH	Mali Ministry of Public Health and Hygiene (Ministère de la Santé et de l'Hygiène Publique)
USG	United States Government
DESAM	Développement Sanitaire du Mali (Healthy Development of Mali) database
DNS	Mali National Directorate of Health

INTRODUCTION

Since 2010, MEASURE Evaluation has worked with the United States Agency for International Development (USAID) mission in Mali to strengthen national- and community-level health information systems (HIS), with an emphasis on malaria monitoring and evaluation (M&E).

In collaboration with units and programs of the Mali Ministry of Public Health and Hygiene (MOH), MEASURE Evaluation streamlined data collection systems and strengthened governance and leadership and HIS management, to improve quality and use of health data. MEASURE Evaluation supported HIS strengthening by partnering with the MOH and working closely with United States Government (USG) implementing partners (IPs) and non-USG partners. The project also built MOH capacity to use and manage the HIS and use HIS data for decision making, by customizing electronic platforms, providing necessary hardware and software, and training and mentoring MOH staff. These approaches yielded the following gains:

- Nine parallel systems (on non-web-based platforms that were previously only available in electronic version above the site level) were combined into one streamlined system that is available at all levels of the health system on the DHIS 2 platform.
- HIS management and governance tools, resources, and coordinating bodies were established that have standard operating procedures, guides, steering committees, and technical working groups.
- More than 2,200 staff members and providers at all levels of the health system were trained in DHIS 2 use, data use, and other relevant topics through training of trainers and cascade trainings. Select staff at the central level were also trained in the customization of DHIS 2.
- One hundred percent of regional hospitals, 100 percent of district health facilities, and 98 percent of community health facilities reported in DHIS 2.
- Mechanisms for data monitoring (e.g., data review meetings, data competitions, a quarterly health management information system bulletin, and supportive supervision visits) were established.

These accomplishments can be quantified, but it is also important to understand HIS users' experiences and the context in which the system was strengthened and improved. To do so, in 2019, we conducted stakeholder interviews to capture perceptions and experiences of MOH staff who interact with Mali's HIS. An analysis of these interviews yielded common themes of what worked in HIS strengthening in Mali. The objective of this document is to summarize lessons learned and highlight effective HIS strengthening approaches and interventions and their outcomes.

METHODS

In January 2019, an independent consultant conducted 12 interviews with 17 staff at central, hospital, regional, district, and community facilities in Mali who use the HIS (on the DHIS 2 platform) to report data and who use information from the system to make decisions regarding HIS management, performance, and population health. These interviews documented HIS users' perceptions of their own ability to manage and work with the DHIS 2, and their experiences with changes in system performance and management practices, as well as perceived facilitators of strong HIS. Findings were coded and grouped into two themes describing successful approaches to HIS strengthening.

FINDINGS

1. Deploying DHIS 2 and ensuring that it was accessible at levels of the health system supported improved data quality and use of data.

A 2013 assessment of the Mali HIS identified parallel, nonintegrated systems, a lack of HIS guidance and governance documents, no electronic platform available at the community health center level, a high data entry burden at the district level and above, irregular and weak supportive supervision practices, and sporadic use of data for decision making, especially at subregional levels. To address these and other issues, USAID/Mali decided to unify fractured systems in the DHIS 2 platform and positioned MEASURE Evaluation as a technical lead for this effort. The project began this work by mapping the stakeholders working in HIS strengthening. During this mapping, and it became evident that there was no dedicated body to coordinate, lead, and monitor these unification efforts. MEASURE Evaluation, with USG support, established the necessary coordinating mechanisms on behalf of the MOH. The mechanism involved not only host-country entities, but also USG and non-USG partners ranging from bilateral (USAID and its IPs and the Embassy of the Netherlands) to multilateral partnerships (UNICEF and the Global Fund to Fight AIDS, Tuberculosis and Malaria, and Gavi, the Vaccine Alliance).

As relevant stakeholders were brought on board, MEASURE Evaluation supported information generation by developing supportive supervision tools and training curricula. The project used these to conduct national trainings of trainers for central and regional level staff on topics such as DHIS 2 use and concepts related to data quality and data use. The donors divided up financing of DHIS 2 deployment by region: USAID funded four regions; the Global Fund funded two; UNICEF funded two, and the Vaccine Alliance funded one. MEASURE Evaluation then supported partners as they developed the enabling environment for HIS strengthening by conducting trainings at the regional level for district health officers, co-led by trainers who had been trained during the training of trainers. Subsequently, district health officers trained community health facility staff, and MEASURE Evaluation provided remote technical assistance as needed. At the same time, MEASURE Evaluation led the development of DHIS 2 management procedures, governance documents, and customization of DHIS 2, in close collaboration with the MOH and IPs.

The rollout of DHIS 2 to scale meant that all levels of the health system, nationwide were able to access and use this platform, mitigating the burden of data reporting, especially at the district level. Previously, district facility data and data from community facilities within a district had to be entered by hand. Because stakeholders at all levels now have timely access to DHIS 2, they have access to valuable data to support decisions about HIS improvement and population health.

In an interview, the senior level staff member at a facility managed by the Cellule de Planification et de Statistique [planning and statistical unit] (CPS) spoke about what being connected to the DHIS 2 platform, and no longer reporting into a separate information system, meant for hospitals. He said:

> *Previously, there was not a standardized software platform; there were delays; data was incomplete and inaccurate. We can now see everything that is happening in hospitals across the country.*

He added:

> *Before, our data entry was rudimentary; we relied on hard copies of data; compilation was done using Excel or a hand calculator. It was difficult to do analyses—cross tabulations or trend analysis. Decision making was not timely.*

When asked how DHIS 2 has changed their ability to do analyses, the staff member said:

We can report on what we want now. For instance, there were inconsistencies between pediatric surgeries and data from ophthalmology. We asked CPS for DHIS 2 assistance, and we were able to get this information teased out. Ninety percent of anything we want to know is already in DHIS 2.

This anecdote highlights the ability of the updated HIS to meet the information needs of the health system.

The availability of DHIS 2 at subdistrict levels has allowed staff to use the system to identify actionable issues. The head of M&E for CPS said, "By having DHIS 2 at the district level, we have reinforced capacity at the service-delivery level. Information now automatically flows. It is possible to give immediate feedback." This sentiment was echoed by regional, district, and community health center staff. At the district level, the chief medical doctor from a district described the situation with the Développement Sanitaire du Mali (Healthy Development of Mali, DESAM)—the Access database that the Mali National Directorate of Health (DNS) formerly used to collect and manage routine health data.

Before, it was complicated, and we had to work from physical instruments (registers; sheets). Also, only the HIS data manager had access to the data [in DESAM].

In describing changes in his ability to work within DHIS 2, the doctor said:

In general, I can now see what the situation is, for anything I want, and across any levels. . . . Now, the system can easily pick up inconsistencies. For instance, you can't have a situation where 25 deaths for a disease are recorded but no cases for that same disease had been recorded. When issues are highlighted, we can take decisions in real time, based on data that we know are reliable. There is flexibility at the lower levels during data entry, cleaning/validation, but once it gets to higher levels, they can note data that they have questions about, but they cannot go in and change the data. This avoids inappropriate changing of data.

Support included improvement of management practices, through development of, and improved access to, manuals and standard operating procedures and trainings on topics such as HIS and routine data quality analysis. The doctor discussed the changes that resulted, saying, "We are now able to put our knowledge into practice—analysis, data quality, arriving at decisions and taking action, evaluating the results of our actions." He went on to describe changes specific to data quality and data use:

Now, we have 100 percent timely reporting, and many people have user accounts, which gives them access to information in real time. . . . In terms of decision making, we work in thematic groups to identify the problems and make decisions together. We also follow up on those decisions. Before, we didn't do this.

The improvements in data quality and subsequent data use were possible because DHIS 2 was made accessible at all levels.

At the community facility level, a high-level manager of a health center spoke about how more accessible data visualization tools, customized within DHIS 2, can support decision making. He explained, "Before DHIS 2, we could get monthly graphs, but it was not as easy to do, and it took more time. Now we can get a greater variety of information, and the program does it automatically, which saves us time." As an example, he mentioned discovering a drop-off between the number of children starting their vaccination series and those completing it. His response was to plan a vaccination campaign in early 2019 to address this drop-off, which may not have come to light or been addressed as quickly under the old system. The ability to access data easily and quickly enables community-level facilities to identify issues in their communities and act to support health of the population that they serve.

Some challenges related to the rollout and use of DHIS 2 remain. Issues with parallel, duplicate systems persist, specifically issues with vaccinations, thus the reporting burden is not yet fully mitigated. Although nationwide rollout of DHIS 2 occurred in 2017, primarily owing to infrastructure, resource, and security reasons, some

sites are not able to or do not report regularly in the system. Furthermore, as more health facilities begin reporting in the system, or as system updates are completed, timeliness and completeness of data in DHIS 2 vary. Despite these challenges, improvements in routine data quality are already evident.

The Performance of Routine Information System Management Series Tools (PRISM) assessment was conducted with the MOH in 2013 and 2018. A comparison of results from the 2013 and 2018 assessments demonstrated that data completeness improved from 91 percent to 100 percent at the district level. A major shift occurred in the availability of timely data, which increased from an aggregate of 17 percent for the community and district levels to 68 percent at the community level and 39 percent at the district level. Furthermore, data element completeness for routine reports at the community level improved from 58 percent to 84 percent.

2. "Leading from behind" is an effective approach to collaboration for strengthening systems at all levels of the health system.

Although the creation of an enabling environment (the foundation for developing, maintaining, and using an HIS) is an important part of HIS strengthening, stakeholders must trust each other and take ownership of an HIS for it to be truly useful. Our approach to collaboration with MOH, leading from behind, has been an integral component of success in strengthening HIS. This approach gathers all the relevant stakeholders and fosters open communication, ensuring that all stakeholders' needs are discussed and addressed, thereby creating an HIS that is customized to the Malian context.

As part of HIS-strengthening efforts, MEASURE Evaluation supports leadership and governance by convening and participating in several technical working groups and committees at the national level. These working groups bring together the MOH, funders, and IPs to identify and address issues pertaining to the HIS. Additionally, MEASURE Evaluation has a resident advisor working closely with the National Malaria Control Program (NMCP) and supports convening of data review meetings, gatherings, and workshops that seek to develop information-sharing resources, such as the Statistical Yearbook. An official at the Unit for Planning, Training and Health Information System with the DNS who participates in these working groups said, "*Working with MEASURE Evaluation has been one of the best collaborations that I have had during my career. We have frank discussions, meet regularly, discuss, and then execute.*" These discussions and collaborations have resulted in development of manuals that govern use and management of DHIS 2 and improved data collection and reporting forms. The same stakeholder spoke about changes he has witnessed and how those changes have affected pride in his department:

> *We went from theory to practice, due to the "push" from MEASURE Evaluation. We now control data quality, because MEASURE Evaluation staff pay much more attention to data quality. Before, nobody wanted to work in HIS/M&E departments; it was seen as a punishment or a dead-end posting. Now, we have lots of candidates trying to get hired to work in HIS/M&E.*

The "push" from MEASURE Evaluation came through collaborative efforts that engaged stakeholders in discussions and problem-solving through collaboration and coordination mechanisms. Although the project may have contributed to the changing perception of the HIS and M&E departments, the work of dedicated and engaged MOH staff transformed them from "dead end" to competitive units. This stakeholder provided the following as a takeaway for future work: "We understand that the quality of the collaboration depends on the people involved. Good, frank discussions and communications are MEASURE Evaluation's best practice."

Our collaborative approach also extends to the way that MEASURE Evaluation shares technical expertise with stakeholders. In 2015, MEASURE Evaluation began the development process for supportive supervision forms and, in 2016, began holding workshops on DHIS 2 customization and harmonization of data reporting forms and requirements. These tasks, though supported by MEASURE Evaluation, were conducted by

experts from programs and different levels of the HIS, to ensure that all stakeholder needs and challenges were being considered. This approach also ensured that those who will be using and managing the HIS provided the technical solutions. This learning-by-doing approach ensures that stakeholders feel empowered to use and alter the system to meet their needs. A senior central-level staff member at the NMCP, who has worked with MEASURE Evaluation since 2008 on strengthening routine surveillance of malaria and HIS, noted:

> *Best practice* [applied by MEASURE Evaluation] *of having technical assistance to the program* [NMCP] *being completely integrated. The project activities "don't parachute from the sky." We discuss and plan everything jointly.*

This type of collaboration ensures that stakeholders' input is being heard and that HIS-strengthening activities are a joint effort, supported but not dictated by the project. This approach helps create an HIS that meets stakeholders' needs. Although gathering all of the necessary stakeholders seems like a time-intensive effort, it is actually an efficient approach in the long run. Ensuring that necessary stakeholders were in the room minimized potential duplication of data collection, thereby minimizing the burden on data managers and establishing safeguards to enhance and maintain data quality.

After rollout of DHIS 2, the system and data collection and reporting tools are still modified periodically, with ongoing support from MEASURE Evaluation. One data manager working with surveillance data at the central level, within the DNS, has collaborated with the project on numerous workshops. She has developed skills to customize DHIS 2 and participated in development of data-collection tools and reporting requirements for surveillance data. In 2018 this data manager was part of the team that, in response to low weekly surveillance reporting rates, launched an investigation to identify the cause during supportive supervision visits. Upon learning that the complexity of the weekly report was a major barrier, her team acted with support from MEASURE Evaluation. She said the following about her experience:

> *The collaboration on the revision of various tools, formats, was most beneficial for me and the epidemiologic surveillance team in Mali. We were able to reduce the number of diseases, conditions, on the mandatory disease reporting form as well as add additional items.*[1]

The MOH demonstrated enhanced self-reliance by exhibiting the capacity to change the HIS environment; it identified a problem then carried out the solution. As a result of changes to the mandatory disease reporting form, data completeness increased from 33 percent to 61 percent within USG-supported districts.

The staff at the subnational levels who benefitted from MEASURE Evaluation-supported trainings and supportive supervision visits also shared their appreciation for how the project's approach to collaboration has enhanced their ability to use the HIS. At the regional level, a senior-level official at the Direction Régionale de la Santé, (Regional Directorate of Health) said the following:

> *Participating in these activities* [data review meetings, supportive supervision visits, and trainings] *and working with MEASURE Evaluation has opened my eyes. It taught me to go into depth, look for causes, find solutions and propose action. It gave me the passion to do better. With MEASURE Evaluation, there has been a revolution in the world of HIS.*

Ensuring that stakeholders at all levels feel engaged and motivated builds commitment of staff to learn and use the HIS.

At the district level, staff emphasized commitment to collaboration by project staff. One staff member expressed the following:

[1] Weekly reporting requirements were reduced from 1,162 data elements to 158 in 2018.

> *Their* [MEASURE Evaluation's] *willingness to work and their availability, even outside normal work hours; assistance even in areas that are not strictly their normal responsibility. They* [MEASURE Evaluation] *work alongside us; very good communications; they encourage, motivate people.*

The result of the collaborative working relationship is the ability to use data to support population health. Senior staff for the same district said that they now compare health trends across periods, something that was not routinely done before, and discuss trends, issues, and solutions. In one such comparison, a review of antenatal visit data showed a decline between CPN1 and CPN4[2] visits, prompting the district to send reminders to women about importance of attending appointments.

Through collaborative efforts, MEASURE Evaluation has supported the MOH in learning to use and manage HIS on DHIS 2 platform and to use the data to support decisions about health initiatives. This approach has been well received and may guide the MOH's future HIS strengthening. Because the MEASURE Evaluation project is ending, its collaboration and leadership duties will be handed over to other partners and the MOH. Currently, the project is working closely with the MOH, IPs, and USAID to transition it technical assistance and coordination responsibilities.

[2] CPN is a French abbreviation for antenatal care visit

CONCLUSION

MEASURE Evaluation's work in Mali has yielded measurable gains in HIS performance and the ability of MOH staff to use the system. Findings from this qualitative data collection activity demonstrate how respondents at the central, regional, district and community facility levels of the health system perceive MEASURE Evaluation's contributions to creating a stronger HIS. Upon examination of what worked in HIS strengthening, two themes that emerged were the project's emphasis on creating an enabling environment to collect, report, and use quality data by making DHIS 2 accessible nationwide, at all levels of the health system, and "leading from behind," an approach that fostered a sense of ownership and bolstered self-reliance. Both themes led to improved data quality and data use, demonstrating that the current HIS meets stakeholder needs. In cases where the system falls short, stakeholders are now empowered to, with some support, make changes to how the system functions or is managed.

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