CAMEROON

GABON

CONGO

Nord-Ubangi
Sud-Ubangi
Mongala
Equateur
Tshuapa
Bas-Uele
Haut-Uele
Ituri
Tshopo
Nord-Kivu

UGANDA

Lake Victoria

RWANDA

BURUNDI

Mai-Ndombe
Sankuru
Sud-Kivu
Maniema

Kinshasa

Kongo Central

Kwilu

Kasai Oriental
Kasai
Kasai Central
Lomami

Kwango

Haut-Lomami

Tanganyka

TANZANIA

Atlantic Ocean

Lualaba

Haut-Katanga

ANGOLA

ZAMBIA

Data Use in the Democratic Republic of the Congo's Malaria Program

National and Provincial Results

April 2017   TR-17-165

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CDC

U.S. President's Malaria Initiative

MEASURE Evaluation

Data Use in the Democratic Republic of the Congo's Malaria Program

National and Provincial Results

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April 2017

ACKNOWLEDGMENTS

CONTENTS

FIGURES

TABLES

ABBREVIATIONS

ANC	antenatal care
COE	center of excellence
DDU	data demand and use
DPS	Division Provinciale de la Santé (Provincial Health Division)
DRC	Democratic Republic of the Congo
DSNIS	Division du Système National d'Information Sanitaire (Division of the National Health Information System)
IPTp	intermittent preventive treatment in pregnancy
ITN	insecticide-treated net
HMIS	health management information system
M&E	monitoring and evaluation
NGO	nongovernmental organization
NMCP	National Malaria Control Program
PMI	United States President's Malaria Initiative
PRISM	Performance of Routine Information Systems Management
SNIS	Système National d'Information Sanitaire (National Health Information System)
UNAIDS	Joint United Nations Programme on HIV/AIDS
USAID	United States Agency for International Development

BACKGROUND

Evidence-informed decision making is essential for the success of health systems, programs, and services. Global commitments to improving health systems and outcomes have led to improved monitoring and evaluation (M&E) and health information systems, thus providing an opportunity to use data for decision making and not simply for reporting.

Overall, the relationships among improved information, demand for data, and continued data use constitute a cycle that leads to improved health programs and policies. Improving data demand and use (DDU) is necessary to improve the effectiveness and sustainability of a health system.

MEASURE Evaluation, which is funded by the United States Agency for International Development and the United States President's Malaria Initiative, undertook an assessment to understand the data-use context for those working in the Democratic Republic of the Congo (DRC) in the National Malaria Control Program (NMCP) and the Division du Système National d'Information Sanitaire (DSNIS, or Division of the National Health Information System), as well as in Haut Katanga, Kinshasa, and Lualaba provinces. The purpose of this assessment was to identify how data are currently being used for decision making and how future interventions can be designed to promote the demand for and use of data in decision making.

METHODS

This mixed-methods assessment was based on MEASURE Evaluation's conceptual approach and logic model, which provides guidance on best practices in data-informed decision making and data use. The model looks at three determinants of data use: technical, organizational, and behavioral. These determinants are adapted from the Performance of Routine Information Systems Management (PRISM) framework developed by Aqil, et al. (Aqil, et al., 2009). The assessment used four tools to assess an organization's data-use capabilities, as well as key barriers to and facilitators for developing and sustaining a culture of data use.

The **semi-structured interview guide** contains 15 open-ended questions that cover eight themes: (1) assessing and improving the data-use context, (2) engaging data users and data producers, (3) improving data quality and data availability, (4) identifying information needs, (5) building capacity in data-use core competencies, (6) strengthening the organization's DDU infrastructure, (7) monitoring and evaluating, and (8) communicating DDU successes. These eight themes make up the MEASURE Evaluation DDU conceptual framework, which describes the "specific interventions that can improve the demand for and use of data from all health information systems." The conceptual framework "demonstrates how information systems improve the other health system building blocks [and] outlines the underlying assumptions and activities that are necessary to achieve the desired outcome of increased data-informed decision making" (Nutley, 2012).

The **self-assessment survey** looks mostly at the technical and behavioral determinants of data use. First, it asks about the perceived skills of data users and producers in data-use core competencies. It then examines these competencies with a short test that demonstrates their actual skills. The self-assessment survey results identify concrete areas that need to be addressed to build the technical capacity of an organization. The tool also asks questions about people's perceived notions of organizational capacity where they work.

The **group assessment tool** asks questions about the organizational determinants of data use, specifically the existence of data-use guidance documents, the regular use and communication of information in decision making, and the existence of supportive supervision and feedback.

The **site-visit checklist** serves as additional evidence to support the group assessment tool, by having interviewers check to see if guidelines, procedures, and information products mentioned in the group assessment are present in health facilities.

Together, these four tools provide a complete picture of the eight components of the DDU conceptual framework, as well as the three determinants of data use from PRISM, in order to understand the data-use context of an organization, along with the barriers to and facilitators of institutionalizing a culture of using data in the decision-making process.

Semi-Structured Interviews

Qualitative interviews were conducted with 12 informants using a semi-structured interview guide. Respondents were from DSNIS, NMCP, and a national nongovernmental organization (NGO). Participants represented different levels of the health system (national, provincial, and health zone), and they included representatives from three provinces: Haut Katanga, Kinshasa, and Lualaba.

The MEASURE Evaluation team asked respondents about the use of data in decision making, barriers to and facilitators for data use in their department or organization, organizational support for facilitating data use, data-flow and data-review procedures, technical capacity and assistance for data use, and data-communication guidelines and procedures. Interview facilitators took notes to capture direct quotes and summary responses from participants. A codebook was created and applied to each interview to identify and categorize responses. Codes were developed based on the questions and themes in the interview guide, and they organized the data based on how they corresponded to each code. Each interview report was initially read for data content and quality. Codes were applied during a second reading.

The team manually analyzed coded text using Microsoft Excel software for frequency, intensity of discussion, and context. After coding the data, we looked for common patterns and organized the responses around themes, which provided answers to the research questions.

Self-Assessment Survey

A self-assessment survey collected data on skills and confidence in data analysis, interpretation, and use. The sample of respondents consisted of 26 people from NMCP, DSNIS, and a national-level NGO. Eight respondents were from the national level, and 18 were from the provincial and health-zone levels. At the national level, one respondent was an NGO representative and two were representatives of DSNIS. At the provincial level, five respondents were representatives of the Division Provinciale de la Santé (DPS, or Provincial Health Division). Two of these representatives were data users, or people who use data in their jobs to make decisions, and three were data producers, or people who collect, analyze, and manage data to be used in decision making. Finally, at the health-zone level, there were four respondents, all of whom were head doctors.

Respondents were asked to rate their self-efficacy and confidence in performing a variety of tasks related to using data in decision making on a scale of 1 to 4. A rating of 1 indicated no confidence, and a rating of 4 indicated high confidence. Table 1 shows the full list of tasks assessed.

Table 1. Self-assessment survey: Assessing confidence to perform tasks

	Tasks
1	Understanding the information needs of your organization
2	Organizing a meeting with decision makers to discuss data for a program review
3	Creating graphs that effectively communicate health data
4	Explaining M&E findings and their implications for programs
5	Using data to identify program gaps and set targets
6	Calculating means and medians correctly
7	Communicating variation of reported numbers from a target
8	Calculating percentages and rates
9	Accessing health data as needed for program management
10	Using data to make decisions about health programs

Respondents were also asked questions regarding the use of data in their organization, including the frequency of data-review meetings, the allocation of resources based on the review of data, the usefulness of indicators in decision making, and the existence of official records based on data-review meetings.

Group Assessment

Two DDU group assessment workshops were conducted with national and provincial-level representatives using the DDU group assessment tool. The group assessment tool is a modified version of the 12 Components Monitoring and Evaluation System Assessment Tool, developed by the Joint United Nations Programme on HIV/AIDS (UNAIDS) to assess the essential components of an M&E system and create action plans to improve them for organizations working in the HIV and AIDS sector. MEASURE Evaluation adapted and expanded the data-use component of the UNAIDS tool and facilitated a stakeholder meeting with representatives from NMCP and DSNIS at the national level and all three provinces.

During each workshop, participants formed five groups based on their location and division: DSNIS (national level), NMCP (national level), DPS Haut Katanga (provincial level), DPS Kinshasa (provincial level), and DPS Lualaba (provincial level). Each group reviewed their organization against 16 criteria related to data use and then classified the criteria as completely present, partly present, or not at all present. Table 2 provides the full list of criteria.

Table 2. Group assessment data use criteria

	Criteria
1	Data use plan or strategy exists.
2	Stakeholder information needs have been assessed.
3	Information products are regularly disseminated to those who collect or report data.
4	Information products are regularly sent to a wide variety of other stakeholders.
5	Information products meet stakeholders' information needs.
6	Information products are used in decision making.
7	There are guidelines to support the analysis, presentation, and use of data.
8	Data-review meetings are held quarterly at the sub-national level.
9	Directors and district medical officers request information before and during data review, planning, or program costing meetings.
10	In the last 12 months, the quality of data available has been sufficiently adequate for decision making.
11	M&E staff participate in program management and planning teams.
12	Stakeholders have access to data and information products in the public domain.
13	Directors and district medical officers use the HMIS for day-to-day management activities.

Criteria	
14	Supportive supervision guidelines have been defined.
15	Supportive supervision has been conducted in the past six months.
16	Supportive supervision results have been recorded and feedback provided.

Site-Visit Checklist

The final assessment tool was the site-visit checklist. This checklist was used to observe the presence of procedures, activities, and guidance that facilitate the use of data in decision making. Activities were ranked as either completely, partly, or not at all present during the site visit. The purpose of this tool was to validate findings from the other assessments. The MEASURE Evaluation team visited four centers of excellence (COEs)—two in Haut Katanga and two in Lualaba.

RESULTS

Program Decisions and the Decision-Making Process

Respondents were asked about the types of decisions they regularly make in their services or programs. These decisions mainly relate to performance management (such as where and how often to conduct supportive supervision and monitoring visits, specific training, and technical assistance), allocation of resources (such as drugs and commodities or human resources), investigation and response to epidemics and other disease outbreaks, and where to implement programs or outreach services.

These decisions are made at the national, provincial, and health-zone levels of the health system. At the national level, respondents mentioned decisions about allocating resources to the provinces and prioritizing service-delivery activities. At the provincial level, respondents highlighted decisions to allocate resources (e.g., human, financial, and equipment) to health zones, provide supportive supervision and training to health zones, and investigate disease outbreaks in health zones. At the health-zone level, respondents pointed to decisions about organizing vaccination campaigns, investigating reported disease outbreaks, and conducting health zone-level supportive supervision for capacity building in clinical services and M&E activities.

Data Use in Decision Making

Respondents were asked whether and how they used or consulted data to inform decisions about the malaria program. We analyzed how data are used in decision making across five groups of decision types: performance management, disease surveillance, supply-chain management, priority setting, and advocacy. Overall, respondents mentioned data use for performance management most frequently. For example, most respondents reported that malaria-specific data were used for corrective action within the program, for the development and implementation of service-delivery activities to inform supportive supervision plans and visits, and to determine training and technical assistance needs. Some respondents also cited examples of data use to set priorities and monitor targets, to manage supply chains, to inform budget and resources allocations, identify emerging issues such as emerging epidemics, and respond to disease outbreaks. One national-level respondent stated that "the allocation of resources [is done] according to

the needs in the different provinces [and is decided] after data analysis." Another respondent said that the allocation of funding for various programs and projects is based on data.

Data appeared to be rarely used for advocacy (e.g., to garner additional funds, support, or resources from organizations or individuals) at either the national or provincial levels. Our findings also revealed limited documentation of success stories that involve the use of data. We asked each respondent if he or she had ever documented data-use success stories and whether these had resulted in additional funding for programs, more data-use activities, or M&E system improvements. Respondents were generally unable to point to a specific data-use success story that had been disseminated. According to one respondent, after they disseminated their

Examples of data use in decision making

1) After analyzing malaria data, the team found inconsistencies in the data. In turn, the central health zone office chose to build the capacity of service providers in the diagnosis and treatment of malaria through supportive supervision.
2) Epidemiological surveillance data are constantly monitored. In the case of an "epidemic catastrophe," field visits can be initiated to investigate reported disease outbreaks and orient decision making on how to stop the spread of the disease.
3) Performance data are used to create supportive supervision plans for the health zones and prioritize needs. The worst performing health zones are prioritized when the DPS decides where to conduct trainings, supervision, and mentorship.
4) An analysis of commodities data showed that long-lasting insecticide-treated bed nets were not being distributed evenly, and some health zones had a very low supply of bed nets. National-level decision makers then reallocated resources to ensure that health zones were covered and had adequate supplies.

programmatic success (that was noted in the data), the province did not receive additional funding to enhance M&E or data-use activities, because most funds remain frozen for specific activities. Without clear documentation of data-use successes or documentation of data-use success stories, it is difficult to highlight the value added for efforts to improve the use of data.

When asked in the self-assessment about the promotion of data in decision making, 19 out of 25 respondents said that senior managers "sometimes" or "often" allocated resources based on data.

Figure 1. How often do senior managers allocate resources based on data?
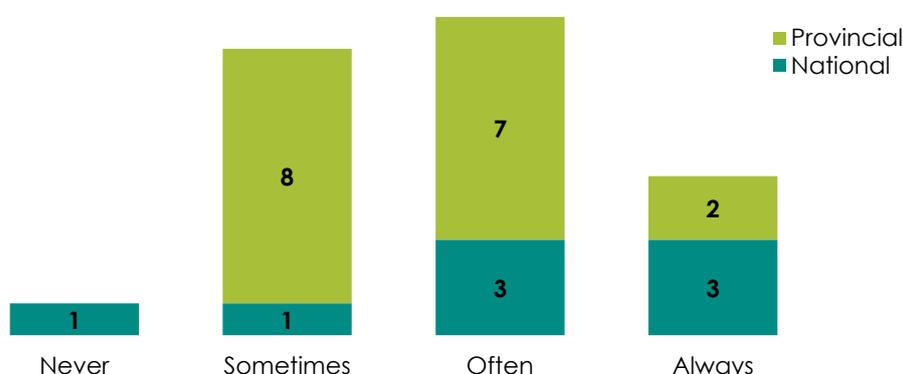
Data Sources and Data Management

Participants were asked about the different sources of data they used to inform decision making within the malaria program. The primary sources of routine data are DHIS 2, the NMCP database, and weekly epidemiological surveillance reports. Nonroutine data sources include qualitative and quantitative evaluations and operations research. Generally, DHIS 2 data are obtained directly from facility-based health management information system (HMIS) registers and are the main sources of data that stakeholders use. Surveys are also conducted to address any additional data needs. Examples of these surveys are the service availability and readiness assessment, the Malaria Indicator Survey, and the mortality survey.

"Availability of data is not assured, because data are stored in DHIS 2, which is a web-based platform. Sometimes access is compromised (due to lack of internet) when data are needed for a decision."

—National-level respondent

Participants were asked about data management practices. According to participants, the HMIS normative framework and its accompanying procedural manuals, registers, and forms provide some guidance on data collection and management at each level of the health system. In particular, the "normative framework explains the flow of health information and provides norms for management of health information."

As Figure 2 shows, data are collected at the health-facility level and are sent to the corresponding health zone, where they are again analyzed and reviewed and entered each month in DHIS 2. Feedback is also sent back to the facility, based on the quality of data reviewed. Data entered in DHIS 2 are then sent to the provincial level, where they are further analyzed. Provincial-level respondents differed in whether they analyzed these data weekly or monthly. Data verification and review meetings are held (either weekly or monthly) where data quality is reviewed. Feedback is given to the health-zone level, and the data are sent to the head of the DPS, who sends the data on to the national level. At the national level, data are analyzed monthly by an internal team and quarterly by a larger team of partners and stakeholders. Feedback is sent to the provinces every quarter. This process, when it works and is operating properly, is well organized and focuses not only on sending information up the health pyramid but also on sending feedback down the pyramid. However, many respondents noted that the process does not always work as intended. Health zones and provinces often do not have enough money to organize data-review meetings or to hold them regularly. This could contribute to problems of data quality if data are being transmitted without being properly verified or reviewed.

Figure 2. Data management flow and processes
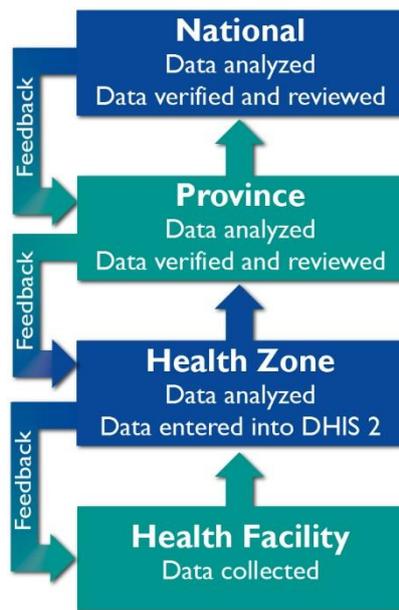
Access to Data for Decision Making

Malaria-related data are collected through the routine HMIS and are available and easily accessible on DHIS 2. All participants said that in theory, data are easy to access on DHIS 2; however, inconsistent and unreliable Internet connectivity poses a major problem for access to data, because DHIS 2 is an online platform. Findings indicate that most of the health zones do not have the necessary hardware for Internet connection. Some respondents at the health-zone level said that they have received funds to purchase Internet credits to ameliorate this problem. Some respondents also noted that the use of personal computers made data access difficult. If data are stored on someone's personal computer, they can no longer be accessed when that person switches jobs.

Institutional Support for Data Collection and Use

Policies and Guidance

Participants did not mention any specific policies or guidance on the review and use of data in decision making at the national or provincial levels. Findings from the DDU group assessment showed that the Kinshasa Provincial M&E Plan and the National Health Development Plan M&E Framework provide some guidance on data use, but these have limited applicability. Respondents stated that they have some guidance from the SNIS normative framework, which has policies on data collection, aggregation, and reporting timelines. For example, at the site level, a manual provides instructions on filling out the forms and registers. The manual also explains how to disaggregate the data. For those who analyze data, an analysis guide is available at the facility level. When we conducted site-visit assessments, however, there were mixed results regarding the availability of guidelines at COEs. Two out of the four COEs did not have any data management guidelines present; however, all COEs had either "partial" or "complete" guidelines or standard operating procedures on data analysis and reporting.

Supportive Supervision

Several respondents reported that data-quality supportive supervision visits aimed at improving reporting completeness and timeliness are conducted at the provincial and health-zone levels. According to a national-level respondent:

> *We as technical assistants analyze the data encoded in the DHIS 2 in terms of completeness and quality and the indicators and verify the problem provinces that are contacted and we make the decision to go down to the field to discuss with and identify possible solutions to the problems.*

During the site visits, three sites had partial trip reports and feedback reports from supportive supervision visits, and one site had a complete trip report from a supportive supervision visit.

Capacity Building and Technical Assistance

Training and technical assistance was mentioned as an institutional support for improving data use. Some respondents reported that M&E trainings aimed at strengthening routine data systems at the national, provincial, and health-zone levels have addressed improving data quality. For example, specific trainings have been organized for provincial-level supervisors to strengthen their capacity to collect, compile, and analyze health-zone data, as well as supervise targeted health zones. Some respondents also cited examples of technical assistance to support data use, especially at the health-zone level. A provincial-level respondent stated:

> *Organizational supports from monthly reviews in health zones are supported technically by [the] provincial health division. With respect to M&E and organizational data analysis, we have a national level data manager who provides TA and also MEASURE through an M&E workshop.*

These findings are confirmed by the site visits, which showed that all COEs visited were either partially or completely able to present analyzed data displayed in charts, graphs, or tables; that they were able to show that analyzed data were shared with facility or district managers; and that data visualizations, such as charts, graphs, or maps, were displayed in the facilities.

- At the provincial level, **63 percent** of respondents said that they felt confident in their ability to calculate averages; however, when tested, although **79 percent** could calculate means, only **5 percent** could calculate medians and standard deviations.
- At the national level, **63 percent** of respondents said that they could calculate averages. However, only **50 percent** could correctly calculate means, **25 percent** could calculate medians, and **13 percent** could calculate standard deviations.
- When asked to explain M&E results, **58 percent** of provincial-level and **63 percent** of the national-level respondents said that they felt confident or very confident to do so, even though only **42 percent** of provincial-level respondents and **13 percent** of national-level respondents could do so correctly when tested.

When asked if respondents had received training in M&E in the last year, about 60 percent of subnational-level respondents said that they had, and about 38 percent of national-level respondents said that they had:

> *We received training in M&E to progressively improve data quality at all levels. We have a coach who provides technical support from the provincial health division each time that we have difficulty doing M&E for certain*

indicators during monthly reviews with health zones. With respect to M&E and organization of data analysis, we received training in M&E, provided by NMCP and MEASURE (last year).

Despite this support and the existence of data displayed at COEs, technical capacity for data use varies. There is a noted gap in respondents' perceived skills compared to their actual skills, as documented by the self-assessment survey. The full results of the self-assessment tool can be found in Appendix 5.

National-level respondents' actual skills in calculating rates and explaining M&E results were much lower than their perceived skills.

"[The] frequency [of data-review meetings] is theoretically weekly; however, meetings are irregularly held and when decisions are made they do not always reflect the analysis of data."

—Provincial-level respondent, Haut Katanga

Figure 3. Perceived skills compared to actual skills: National level

Skill	Actual skill	Perceived skill
Calculate rates	25	88
Communicate variation from a target	50	38
Use data to set targets	50	75
Explain M&E results	13	63
Calculate averages	50	63
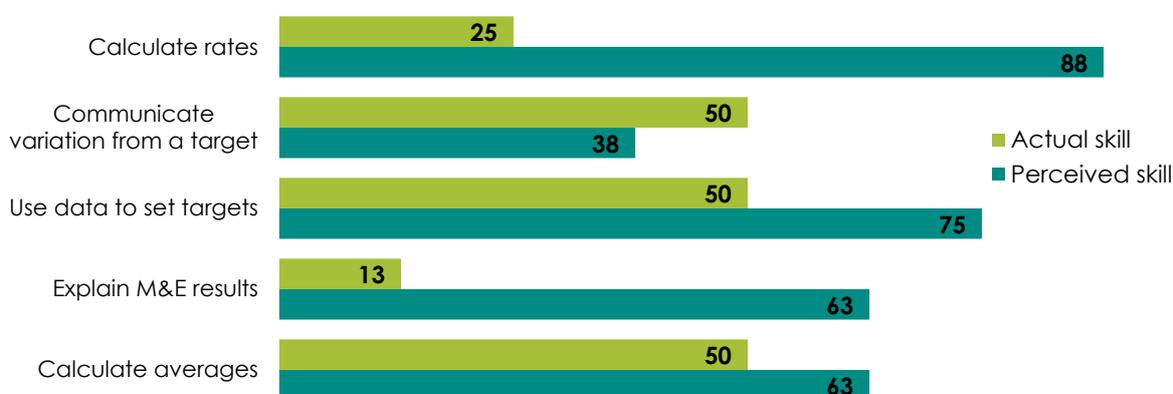
Provincial-level respondents' skills in setting targets and calculating rates were much lower than their perceived skills; however, their ability to calculate averages was better than they perceived.

Figure 4. Perceived skills compared to actual skills: Provincial level

Skill	Actual skill	Perceived kill
Calculate rates	47	95
Communicate varation from a target	47	42
Use data to set targets	37	74
Explain M&E results	42	58
Calculate averages	79	63
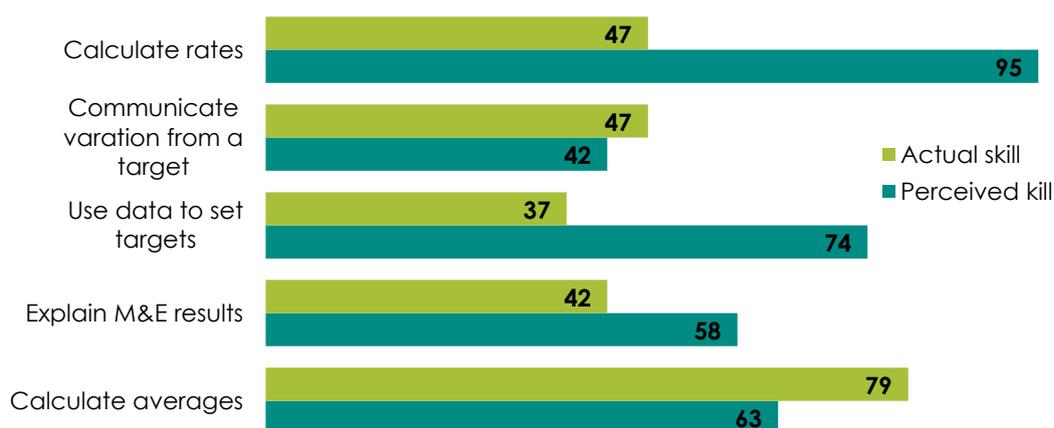
Measures to Promote the Use of Data in Decision Making

Respondents described examples of activities undertaken to promote the use of data in decision making. At the national level, one respondent stated that they were in the process of preparing training modules in

data use. These trainings will be aimed at all levels of the health pyramid. At the health-zone level, as noted before, some respondents said that they had received Internet modems and credits to ensure timely reporting and improve access to data in DHIS 2.

At the health-facility level, technical assistance to strengthen data use remains limited. Multiple respondents stated that healthcare providers at the facility level needed to be trained on data management and use in order to improve the quality of data being produced, as well as the understanding of the importance of high-quality data in the decision-making process. The site visits confirmed that most health facilities have at least partial guidelines on data analysis, management, and reporting, so there is a notable gap between the availability of guidance and the understanding of and training on that guidance.

Data-Review Meetings

Participants discussed several meetings in which analyzed data were reviewed. Examples are provincial-level and annual program-review meetings; provincial quarterly data-review meetings; monthly data-review meetings at the health-zone level; and weekly data-surveillance meetings, in which all of the heads of office and analysts convene to analyze health information from all zones. When asked about the frequency with which data-review meetings were held, respondents provided varying answers regarding the consistency of the meetings at the provincial level; however, at the national level, almost all respondents stated that meetings were held quarterly.

Provincial data-review meetings are generally held monthly, and national data-review meetings are held quarterly.

Figure 5. Frequency of data-review meetings
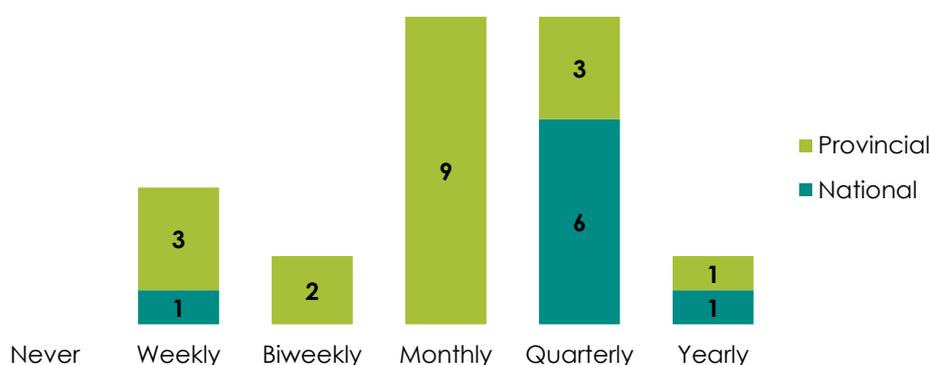
During the semi-structured interviews, many respondents noted that data-review meetings did not occur regularly owing to a lack of funding. In addition, when the data-review meetings do occur, the purpose of the meetings is primarily to review the quality of data produced, rather than to review data for their programmatic implications in decision making.

Data Quality

Poor data quality was described as a major impediment to data use. The main issues regarding data quality related to data completeness and timeliness. Poor data quality often led to discrepancies in the available information and resulted in an inability to make decisions or led to delays in decision making. According

to one respondent "Collected data always pose a problem with quality. They are not exhaustive, they are incomplete and late, and there are errors." Another respondent stated:

Completeness remains a problem for the entire country and sometimes we have data needs and we cannot obtain the data at the moment we need it. Sometimes data could be available but not at the moment when we have the most need, which means that a completeness without promptitude is worth noting. One must have complete data and without delay.

The poor quality of data was largely attributed to the lack of training for and inadequate supervision of healthcare providers who are mandated to complete the forms and registers. One respondent stated:

The major obstacle to data use is the fact that the data we have are of poor quality. This poor quality is linked to the lack of training of service providers, which affects data management.

Another participant said, "This problem of data quality is due to the lack of supervision of healthcare providers at the data production level but also at the data entry level." Finally, because of inadequate supervision, some "health providers do not complete all of the forms."

In addition, data collected are not often used by health-facility staff for service delivery planning and decision making, which affects staff motivation to collect good-quality data:

The nonappropriation of data for health trainings at the health-zone level negatively influences data quality. The majority of service providers think that they produce data for the higher levels.

Although almost every respondent cited poor data quality as the main barrier to data use, 60 percent of national-level and 38 percent of subnational-level respondents who completed the self-assessment tool said that they had received an M&E training in the past 12 months, and site visits confirmed the availability of analyzed data, such as through graphs and reports.

Data Communication

The SNIS normative framework contains guidelines on communicating data. Respondents stated that data are segmented by audience and tailored to each audience. For example, at the community level, data are usually disseminated by community animators for easy interpretation. Respondents also noted that the NMCP used radio, television, the Internet, and weekly bulletins to disseminate information to the general public. However, when communicating with service providers, data are generally communicated in more technical terms, with an emphasis on indicators. During the site visit, however, three of the four COEs visited did not have a copy of a newsletter or report that staff from the site had published in the past 12 months.

> "When we find a health problem in a health area, we don't communicate the indicator, but rather information according to community definitions. The communication therefore takes into account the target audience. Community animators take health messages and formulate them to sensitize the population and incite a favorable change with regards to [the] health behavior."
>
> *—Provincial-level respondent, Lualaba*

Understanding Information Needs

Information needs are the priority questions that decision makers need to answer in order to make informed decisions about their programs. Without a clear understanding of what data are needed to

answer a question, a decision will not be informed by data. An important part of understanding information needs is the involvement of stakeholders who have a role in or impact on the programs being assessed. Stakeholders provide insight into the data and information that are available and the questions that are helpful to inform or improve programs. An assessment of information needs can take the form of a workshop to identify core program data analyses, a research priority-setting workshop, or the harmonization of program indicators. During the DDU group assessment, participants were asked if their information needs had been assessed. National-level representatives reported that this had been done completely; however, provincial-level representatives said that this had been done only partly. For example, provincial-level respondents said that the information needs of data producers had not been sufficiently assessed.

Once information needs are understood, information products, such as briefs, newsletters, and bulletins, can be created that summarize findings from data analysis and respond to programmatic questions of interest. Information products provide valuable data that can help stakeholders better implement their programs or make better-informed decisions. The creation of useful information products is predicated on the notion that information needs have been assessed and that these products directly flow from the stated needs. These products are not useful if they are not in line with stakeholders' needs. National-level respondents in the DDU group assessment reported that available information products completely met their needs. Provincial-level respondents stated that information products only partially addressed their information needs. This partial satisfaction can be explained by incomplete information needs assessments that produce products that are not aligned with stated needs.

KEY FINDINGS AND RECOMMENDATIONS

Based on the analysis of interview responses and the responses from the group assessment, self-assessment, and site-visit checklist, the MEASURE Evaluation team recommends several interventions for agencies in the DRC to promote the use of data in their decision-making processes.

Finding 1. Data-review meetings do not have the necessary resources to occur regularly.

Recommendations:

Support data-review meetings at the health-zone and provincial levels. Data-review meetings are a key step in the data use process and often directly lead to data-informed decision making. There is a need for more staff at both the provincial and health-zone levels to understand routinely collected indicators and their implications for service delivery. Data-review meetings are a strong motivation for provincial, health-zone, and health-facility staff to prepare questions they have about the services they provide and review data they routinely collect.

Increase funding. Although the SNIS normative framework includes guidance on regularly convening data-review meetings, most respondents stated that due to insufficient funding, these meetings were either held infrequently or not conducted effectively. Funding should be allocated specifically for this purpose to ensure that data are regularly discussed, analyzed, and reviewed.

Develop operational support. Guidelines for data-review meetings should be created so the meetings become standardized in terms of timing, processes, attendance, and follow-up. Currently, these meetings focus mostly on reviewing data for data quality and not program performance; however, the emphasis of these meetings should shift over time toward using data for programmatic decision making. A regular

schedule should be developed to ensure proper planning and attendance. Guidance on who should attend and their roles and responsibilities before, during, and after the meetings should be developed. Guidance on how to prepare for and follow up on recommendations from the meetings should be elaborated in the document. With robust support for data-review meetings, NMCP and DSNIS will be able to track the frequency of data-informed decision making. Staff should also be trained in data analysis, presentation, and interpretation as well as how to follow up on data-informed recommendations in preparation for these meetings to improve data-informed decision making.

Finding 2. Healthcare providers have low capacity in data management skills.

Recommendation:

Build capacity in data management skills at the health facility level. The biggest stated impediment to data use was poor data quality. Many respondents pointed to the lack of capacity of healthcare providers to properly fill out forms, as well as low motivation to ensure that data are being used in the decision-making process. Capacity building in data management and the value of data to program improvement could create awareness and excitement among healthcare providers about the importance of using data to make decisions and their role in this process. Training healthcare providers in basic data management principles, including proper data collection and form completion, could reduce the number of mistakes being made, which in turn would improve data quality. Combining this with a training on the importance of data in the decision-making process could give healthcare providers insight into the role of data in decision making and how they directly impact the quality of decisions being made within NMCP. It should be noted that 60 percent of national-level and 38 percent of subnational-level respondents who completed the self-assessment tool said that they had received an M&E training in the past 12 months, and site visits confirmed the availability of analyzed data. Existing training materials should be reviewed to assess data quality sections to ensure that they are robust and sufficient for improving actual skills.

Finding 3. Skills in data analysis are low at both the national and provincial levels.

Recommendation:

Build capacity in data-analysis skills at the national and provincial levels. Findings from the self-assessment tool showed low capacity for national- and provincial-level staff to conduct data analyses. Of note, many respondents perceived their skills to be much higher than they actually were. When asked to calculate rates, medians, and standard deviations, respondents struggled. It is possible that some of the respondents who were assessed do not have data-analysis skills, because they tend to be involved more in decision-making processes and less in data management processes. Nevertheless, understanding the basics of data analysis concepts is an important component of data use. Training on data analysis should be strengthened to increase number literacy, understanding of basic data analysis concepts, and data-analysis skills.

Finding 4. Skills in data interpretation are low at both the national and provincial levels.

Recommendation:

Build capacity in data interpretation skills at the national and provincial levels. Although data analysis and interpretation are often grouped together as the same skill, it is important to separate and highlight them as two distinct skill sets. We define data interpretation as a process by which key

stakeholders discuss analyze data and determine the programmatic implications of these data (e.g., why targets or goals have or have not been met) (Judice, 2009). Participants had low capacity to interpret data—only 13 percent of national and 42 percent of provincial respondents were able to explain an M&E result. If data users and producers do not understand how indicators are calculated, what denominators and numerators mean, and how to interpret analyzed data, it is difficult to understand the programmatic implications of those data and how to use them to make decisions. Capacity building in data interpretation, along with data analysis as stated above, is crucial to improve data use and decision making in DRC.

Finding 5. Organizational protocols or guidance on data use do not exist.

Recommendation:

Develop written protocols for organizational guidance promoting data use. One of the most effective facilitators for data use is the existence of organizational support for data use at the highest levels. This support starts with written protocols that promote the use of data in decision making. Although most respondents seemed to be aware of the necessity of using data in decision making, it is crucial to have organizational guidance on this topic to ensure that it happens at all levels of the health pyramid. The NMCP should also develop an overarching plan for improving data use at all levels of the health pyramid. A data use plan should include guidance on the following for all levels of the health system: schedules for data-quality reviews; conduct of data-review meetings (see Recommendation 1 for guidance at the health-zone and provincial levels); data-use roles and responsibilities for all cadres of staff; a comprehensive capacity-building plan for data-use core competencies; infrastructure requirements for data use; guidance on stakeholder engagement for data-informed planning; and a repository of tools, guidance documents, and capacity-building materials to facilitate data use. A comprehensive plan can help guide the NMCP in its data-use activities and help prioritize data-use interventions in order to establish a culture of data use.

Finding 6. Poor data quality impedes the use of data in decision making.

Recommendation:

Implement standardized data quality assurance protocols and train staff on data quality. Data quality consistently came up as a major impediment to data use. Without complete, accurate, and timely data, confidence in available data will be low, and data use will remain stagnant. Although poor data quality was cited by almost every respondent as the main barrier to data use, many participants had stated that they had received an M&E training in the past year, and site visits confirmed the availability of analyzed data and data visualizations. It is unclear where the disconnect is occurring. It is possible that the trainings are insufficient to produce quality results or information products. We did not conduct a data-quality assessment, but the findings from the semi-structured interviews, self-assessments, and site visits seem to contradict each other. A review should be implemented to ensure that data-quality protocols conform to recent global guidance and standards and that existing data-quality training materials also adhere to the standards. The training materials should also be reviewed to ensure that adequate time is dedicated to this component of the training. Moreover, a data-quality review should be undertaken to understand specific data-quality issues, and tailored interventions should be implemented to address weaknesses.

Finding 7. Lack of data use trainings and inconsistent M&E trainings.

Recommendations:

Conduct data use trainings at all levels of the health pyramid. M&E trainings have been conducted at the national, provincial, and health-zone levels; however, specific trainings on data use have not yet been conducted. These trainings would further emphasize the importance of data use and provide participants with examples of how data can improve health-service provision that are relevant to their work. The trainings would also improve skills in data-use core competencies (e.g., data analysis, interpretation, visualization, communication, and data-informed advocacy). All staff should also be trained in the importance of data-informed decision making, the theory behind the link between data use and improved data quality, and data-use tools (e.g., data-use conceptual framework, framework for linking data with action, seven steps to improved information use, and information-use map).

Conduct regular supportive supervision for M&E at the health-zone level. Although supportive supervision for M&E is currently conducted, it is not implemented regularly, and there are reports of insufficient feedback on the supervision conducted. Supervisees often do not see the benefit of supportive supervision, because they do not receive any feedback from supervisors on how to improve the work on which they were assessed. Lack of feedback on areas to focus on for improvement after supportive supervision impedes capacity improvement and learning. Supportive supervision in M&E, when combined with consistent M&E- and data-use trainings, can contribute to increased individual capacity and regular learning at the health-zone level. Supportive supervision visits should go beyond providing feedback on data quality by also helping teams answer key programmatic questions using available data, both routine and nonroutine. Direct mentoring in data use and joint problem solving for data use during supervision visits will ensure that skills are reinforced and relevant to job functions. A plan for structuring the visits and ensuring that they are systematic in their support of teams will be key to their success.

Finding 8. Information needs are not assessed at the subnational level and information products are not useful in decision making.

Recommendation:

Conduct provincial-level information needs assessments and develop tailored information products from DHIS 2 to respond to assessment findings. Information products, when developed correctly, can be extremely useful in explaining data and improving evidence-informed decision making. Findings from this assessment showed that national-level stakeholders had their information needs assessed and therefore found that the corresponding information products were useful to them when making decisions. At the provincial level, however, respondents felt that information needs assessments had not been sufficient, particularly for data producers, and that information products did not meet their needs. We recommend that a full information needs assessment be conducted for all provincial-level data users and producers. Information products, such as charts, tables, graphs, and maps, can then be created in DHIS 2, which all staff within NMCP and DSNIS are already using, to meet the stated needs of provincial-level stakeholders. This in turn will lead to improved planning and decision making that are rooted in relevant evidence and data.

Finding 9. Staff are not using data in decision making, because data are of poor quality.

Recommendation:

Start now! Most participants noted that they are not using data in the decision-making process, because data are of poor quality. DDU is a cycle. As decision makers discuss data and work to understand the programmatic meaning through data analysis, they often also discuss data quality. Discussing the quality of data in this context facilitates a commitment to improving the data, because it is at this moment that data users see the value of the data to program improvement. The more data are used, the better the quality becomes, which leads to more use and improved quality. For this reason, we emphasize data use regardless of the quality of the data. Efforts to use the data often garner support to improve quality. Each team that participated in the data-use assessment is encouraged to prioritize three key programmatic questions to answer in the next two months. They should use action plans to delegate tasks, responsibilities, and timelines for these activities to ensure that they are completed. Starting now will enable teams to start the data use cycle, which will eventually lead to better quality data.

REFERENCES

Aqil, A., Lippeveld, T., & Hozumi, D. (2009). PRISM framework: A paradigm shift for designing, strengthening and evaluating routine health information systems. *Health Policy and Planning, 24*(3), 217-228. Retrieved from https://academic.oup.com/heapol/article-lookup/doi/10.1093/heapol/czp010

Foreit, K., Moreland, S., & LaFond, A. (2006). *Data demand and use in the health sector: A conceptual framework.* Chapel Hill, NC: MEASURE Evaluation, University of North Carolina. Retrieved from https://www.measureevaluation.org/resources/publications/ms-06-16a

Judice, N. (2009). *7 steps to use routine information to improve HIV/AIDS programs.* Chapel Hill, NC: MEASURE Evaluation, University of North Carolina. Retrieved from https://www.measureevaluation.org/resources/publications/ms-09-38

Nutley, T. (2012). *Improving data use in decision making: An intervention to strengthen health systems.* Chapel Hill, NC: MEASURE Evaluation, University of North Carolina. Retrieved from https://www.measureevaluation.org/resources/publications/sr-12-73

Nutley, T., & Reynolds, H. (2013). Improving the use of health data for health systems strengthening. *Global Health Action, 6.* Retrieved from https://www.measureevaluation.org/resources/publications/ja-13-148

APPENDIX 1. SUMMARY OF GROUP ASSESSMENT RESULTS

Consistent with findings from the semi-structured interviews and site visits, several areas were identified as needing significant improvement in the data demand and use group assessment workshops. These include the need to strengthen supportive supervision and for specific guidelines on data use. In addition, there is a need to ensure that information products are regularly disseminated to those who collect and report data. See Table 1A for a full explanation of items identified as needing improvement in the group assessments.

Table 1A. Summary of results from group assessments

Assessment item	Results
A data use plan or strategy exists.	No specific data use plan or strategy was cited by both national and provincial-level representatives. The Kinshasa provincial M&E plan and the National Health Development Plan M&E framework provide some guidance on data use. However, these have limited applicability.
Stakeholder information needs have been assessed.	National-level representatives felt that this has been done "completely." Provincial-level representatives felt that this was "partly" done. For example, information needs of data producers have not been sufficiently assessed.
Information products are regularly disseminated to those who collect or report data.	All groups felt that this was "partly" done.
National and subnational information products meet stakeholders' information needs.	Unlike the national-level representatives, provincial-level representatives reported partial satisfaction. This partial satisfaction explains in large part the multiplicity of parallel tools in DSNIS.
Information products disseminated are regularly used in decision making for programs and services.	Four out five groups felt that this was partially or completely not done.
Data review meeting are held quarterly at the subnational level to discuss key program indicators with program managers and other decision makers.	Data review meeting are irregular.
Directors and provincial and district medical officers request information before or during data review, planning, or program costing meetings.	This is rarely done. Linked to poor perceptions of data quality.
Supportive supervision was conducted in the past six months.	Inconsistent, due to budgetary and logistical constraints. Supervision plans were only partially implemented.

APPENDIX 2. DEFINITIONS OF GROUP ASSESSMENT QUESTIONS

Data-use plan or strategy exists—A data use plan or strategy is a formal document that describes when and how data should inform decision making. This document can include: the specific planning and decision making forums data should inform; how often data analysis and review should take place; guidance on who should be involved; guidance on ensuring accountability (e.g., how to move findings from data analysis into action); and how to follow up on data-informed recommendations and track data use. This can be a stand-alone document or part of a monitoring and evaluation plan or other guidance.

Stakeholder information needs have been assessed—Information needs refer to the priority questions program managers or policy makers have about their programs. An assessment can take the form of a workshop to identify core program data analyses, a research priority-setting workshop, or the harmonization of program indicators.

Information products are regularly disseminated to those who collect or report data—Information products exist that summarize findings from data analysis. They can include malaria bulletins or district summary reports. These products should be disseminated to anyone in the program or organization who is involved in data collection and decision making at least semiannually, preferably quarterly.

Information products are regularly sent to a wide variety of stakeholders, other than those who collect and report data—This can include implementing partners, funders, the media, and universities. These should be sent at least semiannually, preferably quarterly.

National and subnational information products meet stakeholders' information needs—Information products provide valuable data and information that can help stakeholders better implement their programs or make better informed decisions. Decision makers are not experiencing data gaps.

Information products disseminated are regularly used in decision making for programs and services (provide examples)—Information products are referred to and provide data during program planning and monitoring such as during annual work planning and program performance review meetings. Respondents should be able to cite examples of when these products have been used.

There are guidelines to support the analysis, presentation, and use of data at the subnational and facility levels, such as graphs on walls showing cumulative coverage—Guidelines exist that discuss what analyses should be done; what data should be used; how data should be presented and displayed (e.g., graphs, charts); which indicators should be analyzed; and how this information should be used at the provincial, district, and facility levels.

Data-review meetings are held quarterly at the subnational level to discuss key program indicators with program managers and other decision makers—Data-review meetings are held at a minimum every six months and ideally every quarter to monitor data for program performance. Data-review meetings include data users and data producers.

Directors, provincial, zonal, and facility heads request information before and during data review, planning, or program costing meetings—Decision makers request data on key indicators being discussed in meetings before the meetings occur so they are already aware of trends, analysis, and performance.

In the past 12 months, the quality of data available has been sufficiently adequate that it can be confidently used in decision making (e.g., completeness, accuracy, timeliness)—Data are assessed for completeness, accuracy, and timeliness. Decision makers trust the quality of data needed to inform National Malaria Program decision making.

M&E personnel are part of performance monitoring and planning teams—Data producers, such as monitoring and evaluation personnel or information records officers, are included in teams with data users during data-review meetings to explain the results of data analysis, the information presented in graphs, and how indicators are constructed to ensure a clear understanding of the data being reviewed.

Stakeholders have access to the data and information products in the public domain (online or through a central information center)—Data can be accessed via a website or central server (such as DHIS 2, a website that houses past information products and data sets).

Directors, provincial, zonal, and facility heads use the health management information system for day-to-day management of their facility or districts—DHIS 2 or another information system is accessed on a regular (i.e., weekly or monthly) basis to refer to data and look at trends.

Supportive supervision procedures, guidelines, and responsibilities are defined—Standardized processes and guidelines for the supportive supervision of data collection, management and use exist. Guidelines include what is required before, during, and after supportive supervision and what is expected of everyone involved.

Supportive supervision was conducted in the past six months—Supportive supervision of those involved in malaria data collection, management, and use was conducted in at least 50 percent of provinces in the past 6 months. Respondents should be able to provide documentation in the form of supervision schedules and site visit reports.

Supportive supervision results are recorded and feedback provided to supervisees—Findings and information from supportive supervision visits is fed back down to the supervisees at least 75 percent of the time to ensure learning and improvement.

APPENDIX 3. SITE VISIT ASSESSMENT

		Centre mère enfant Barumbu	Centre de santé Tembo	Kibangu	Site Scholastique
1	Guidelines, standard operating procedures, or protocols are present that describe steps to aggregate, analyze or manipulate data for each level of the reporting system.	1	1	2	2
2	Guidelines, standard operating procedures, or protocols are present that describe how to develop and disseminate data synthesis products to a variety of stakeholders.	2	2	2	2
3	For a healthcare entity that routinely reports data, there are guidelines present that describe reporting requirements, deadlines, and instructions on how to compete data collection and reporting forms/tools.	1	2	1	1
4	For a healthcare entity that routinely collects and reports data, there are guidelines present that describe how to manage data to ensure quality.	3	3	1	1
5	A training schedule is present. PROBE: If yes, comment on whether training topics include: data management, data analysis, data interpretation and/or data use.	2	3	2	2
6	Staff are able to present analyzed data displayed using a table, graph, map or other format from the previous 2 months or 2 quarters. PROBE: If yes, comment on staff position(s) responsible for data analysis.	2	2	1	1
7	Staff are able to show evidence that analyzed data were shared with facility or district managers (i.e., meeting minutes, activity report, an email, an information product, etc.).	2	2	1	1
8	There are specific data-review meetings to present and discuss findings from analyses.	2	2	1	1
9	Data visuals such as a chart, graph, map, or other format are displayed in the office. PROBE: If yes, identify the data sources.	2	2	1	2
10	A map of the catchment area is displayed in the office. PROBE: If yes, identify the data sources.	3	2	1	1
11	An estimated summary of populations in the catchment area by target group is displayed in the office. PROBE: If yes, identify the data sources. PROBE: If yes, indicate when last updated.	3	1	1	1
12	Feedback reports on the accuracy, completeness, and timeliness of reported data are present. PROBE: If yes, indicate the dates of the reports	2	3	1	2
13	Feedback reports on program performance are present. PROBE: If yes, indicate the source of the feedback (i.e., National Malaria Control Program, district, province, or other organization).	4	2	2	2

		Centre mère enfant Barumbu	Centre de santé Tembo	Kibangu	Site Scholastique
14	A trip report or checklist from a recent monitoring and evaluation supportive supervision visit is present. PROBE: If yes, review trip report or checklist to verify whether the support provided incorporated training or coaching in the use of data for decision making. PROBE: If yes, indicate the dates of the reports.	2	2	3	2
15	There is present a report from either the district or national level that contains routine health management information system data that includes recommended actions. PROBE: If yes, comment on source of report. PROBE: If yes, indicate the dates of the reports.	2	2	2	2
16	There is present a copy of a newsletter or report that staff from the site has published in the past 12 months.	3	3	1	3

APPENDIX 4. SEMI-STRUCTURED INTERVIEW GUIDE

Introductory Script

The purpose of this questionnaire is to identify the strengths and weaknesses in your organization's data use culture and infrastructure. The assessment information will be used in conjunction with other assessment materials to draft a plan of action to promote data use.

In health systems as well as in organizations, the purpose of collecting and analyzing data is to improve programs by enabling more informed decisions or decisions based on data. However, information is not always available to make decisions. If it is available, it is not always used.

Your participation is requested to provide insight about the current situation within your organization. Your participation is very important, but is entirely voluntary. Your responses will be treated as confidential, and we will ensure that any statements or comments you make cannot be linked to you as an individual. We will use the interviews to develop potential interventions to strengthen the demand for and use of data in decision making.

Do you have any questions? May we begin?

Part 1: Decisions

1. What are the different types of program decisions that are made in your organization?
   - Probe: For example, there may be decisions related to where to provide services, how to allocate resources or plan for new activities. How are decisions like these made in your organization?
   - Probe: Who is involved in the decision-making process?
   - Probe: What sources of information do you think they rely on to make decisions?

2. Could you give me some examples of times during your work when you consulted data to inform a decision about a health service or program?

3. What specific targets are you currently tracking for your malaria-related programs?
   - Probe: How do you know when a program is not meeting these targets?
   - Probe: If you are aware that a program is not meeting expectations, what kinds of things can you do about it?

4. Could you tell me about any current organizational plans, policies, procedures or guidelines that relate to the collection, review or use of data?
   - Probe: Does anyone's job description specifically address the review or use of data?
   - Probe: What are their job titles?

Part 2: Assessing Data Demand and Use

5. Can you tell me what typically happens in your organization with data collected by your organization?
   - Probe: How often do you think decisions in your organization are informed by data?
   - Probe: When data is available, who in the organization reviews it?
   - Probe: Who among your colleagues discuss new data or reports?

6. Has your organization ever taken steps to improve the use of data?
    - Probe: If so, please tell me about those efforts.
    - Probe: Did they result in improvements for the organization?
    - Probe: What were the obstacles?

7. Does your organization need data that you don't have?
    - Probe: How do you identify data that you need?
    - Probe: What process do you go through to get it?

8. In your opinion what is the biggest obstacle to data use in your organization?

Part 3: Data Availability and Quality

9. Tell me about the availability of data within your organization. When you need to access it for decision making, how easy is it to do so?
    - Probe: How easy is it to get the data from each section/unit i.e. M&E unit (different areas and different data collection points)?

10. Can you give me an example of a time when you provided input on the design of data collection instruments?
    - Probe: Can you give me an example of a time when you provided input on the design of an indicator?

11. Tell me about the data quality in terms of accuracy, timeliness and completeness of the information available to you from both routine and non-routine sources.
    - Probe: Who is responsible for managing data and assuring data quality within the organization?
    - Probe: In your opinion, what are the primary causes of data quality issues?
    - Probe: How often do you perform data quality checks?
    - Probe: When supportive supervision visits are conducted for M&E and data quality do the supervisors spend time on facilitating the use of the data?

Part 4: Capacity in Data Use

12. What do you think about the technical capacity within your organization to collect, analyze, review and use data?
    - Probe: What kinds of technical assistance in M&E or data review have you received in the past 6 months?
    - Probe: Who provided the technical assistance?

Part 5: Communicating Data

13. Does your organization have a protocol, policy or written guidance for sharing or communicating data internally or externally? Please describe them.
    - Probe: Does sharing data include both directions, that is from communities up to headquarters AND feedback from headquarters down to service providers?

14. Do you segment your communication to different audiences?
    - Probe: Who are your audiences for data generated by your programs?
    - Probe: How do you communicate data to your different audiences?
    - Probe: What types of information products are available to you?
    - Probe: What kinds of performance feedback does your team receive?
    - Probe: How frequently do you receive feedback?

15. Has your organization ever documented success stories that involved the use of data?
    - Probe: If yes, how were these stories identified and disseminated?
    - Probe: Have they resulted in additional funding for programs, more data use activities, M&E system improvements?

APPENDIX 5. SELF-ASSESSMENT TOOL

Introduction

The purpose of this survey is to collect information from individuals on their skill level analyzing and using data. Please express your opinion honestly. Your individual responses will remain confidential. Aggregate information from across all surveys will be analyzed to inform an assessment of capacity and use of data for the DRC health system. We appreciate your cooperation in completing this questionnaire. It should take approximately 1 hour to complete. Thank you.

A1. Date completed survey: _____

A2. Name of organization you work for: _____

A3. Your professional title in this organization: _____

A4: Your age:

Please circle one. a. Below 30 years b. 31 – 39 years   c. 40 – 49 years d. 50 years and above

A5: Gender

1. Female

2. Male

A6: Your highest level of formal education:

1. Diplôme d'Etat

2. Gradué

3. Licencié ou Equivalent

4. Master's degree (15 to 16 years)

5. Doctorate or Ph.D.

6. Professional diploma or degree: Specify: _____

7. Other type of education: Specify: _____

A7: Years of professional career employment: _____

A8: Did you receive any training in Monitoring and Evaluation in the last year?

1. Yes

2. No

SELF-EFFICACY

This part of the survey is about your confidence in performing tasks related to using and analyzing data. High confidence indicates that you could perform the task listed, while low confidence means there is room for improvement or training. Please rate your confidence that you can accomplish the activities listed. Rate your confidence for each activity with a percentage from the following scale:

1   not confident

2   somewhat confident

3   confident

4   very confident

B1: I understand the information needs of my organization.	1	2	3	4
B2: I can organize a meeting with decision-makers to discuss data for a program review.	1	2	3	4
B3: I can create graphs that effectively communicate health data.	1	2	3	4
B4: I can explain M&E findings and their implications for programs.	1	2	3	4
B5: I can use data for identifying program gaps and setting targets.	1	2	3	4
B6: I can calculate means and medians correctly.	1	2	3	4
B7: I can communicate the extent to which a series of reported numbers vary from a set target.	1	2	3	4
B8: I can calculate percentages and rates.	1	2	3	4
B9: I can access health data as needed for program management.	1	2	3	4
B10: I can use data to make decisions about health programs.	1	2	3	4

C1: How often do you think senior managers in your organization allocate resources based on a review of data?

Never...All the time
                    1   2   3   4

C2: How useful are program indicators to senior managers in your organization when they make planning decisions?

Not Useful...Very Useful
                    1   2   3   4

C3: How frequently does your organization have routine meetings for managerial or administrative matters where health data are discussed? SELECT ONLY ONE RESPONSE.

1. Never
2. Weekly
3. Every 2 weeks
4. Monthly
5. Quarterly
6. Yearly
7. There isn't a regular schedule

C4: Is an official record maintained of management meetings where health data is discussed?

1. Yes
2. No

C5: In June, the National Malaria Control Program initiated a new pilot training for nurses who provide IPTp [intermittent preventive treatment in pregnancy] to pregnant women attending ANC [antenatal care] clinics. The goals of the training were to: 1) attract new clients to ANC services and 2) increase the number of pregnant women receiving IPTp. The Monitoring and Evaluation (M&E) Specialist for the project collected the following data on routine indicators from the clinic:

Table 1: IPTp services at ANC clinic for 2012

Indicators	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Number of ANC visits	350	375	355	358	303	340	401	488	495	525	507	455
Number of women receiving at least two doses of IPTp	107	112	121	112	102	114	133	189	199	221	233	212
Proportion of pregnant women attending ANC who received two or more doses of IPTp	31%	30%	34%	31%	34%	34%	33%	39%	40%	42%	46%	47%

C5a.) Create a graph that the M&E Specialist can use to best communicate to the National Malaria Control Program the effect of the pilot nurse training on the number of people accessing malaria services.

C5b.) Create a graph that the M&E Specialist can use to best communicate to the Ministry of Health the effect of the pilot nurse training on the number of pregnant women receiving IPTp.

C6) In June, the National Malaria Control Program initiated a new pilot training for community health workers in two districts. The goals of the training were to: 1) increase the number of people sleeping under an ITN [insecticide-treated net] and 2) increase the number of pregnant women sleeping under an ITN. The M&E Specialist for the project collected data from each household on the indicator: proportion of population of all ages who slept under an ITN the previous night. The data was displayed with this graph:

Proportion of population of all ages who slept under an ITN the previous night, two districts, 2012
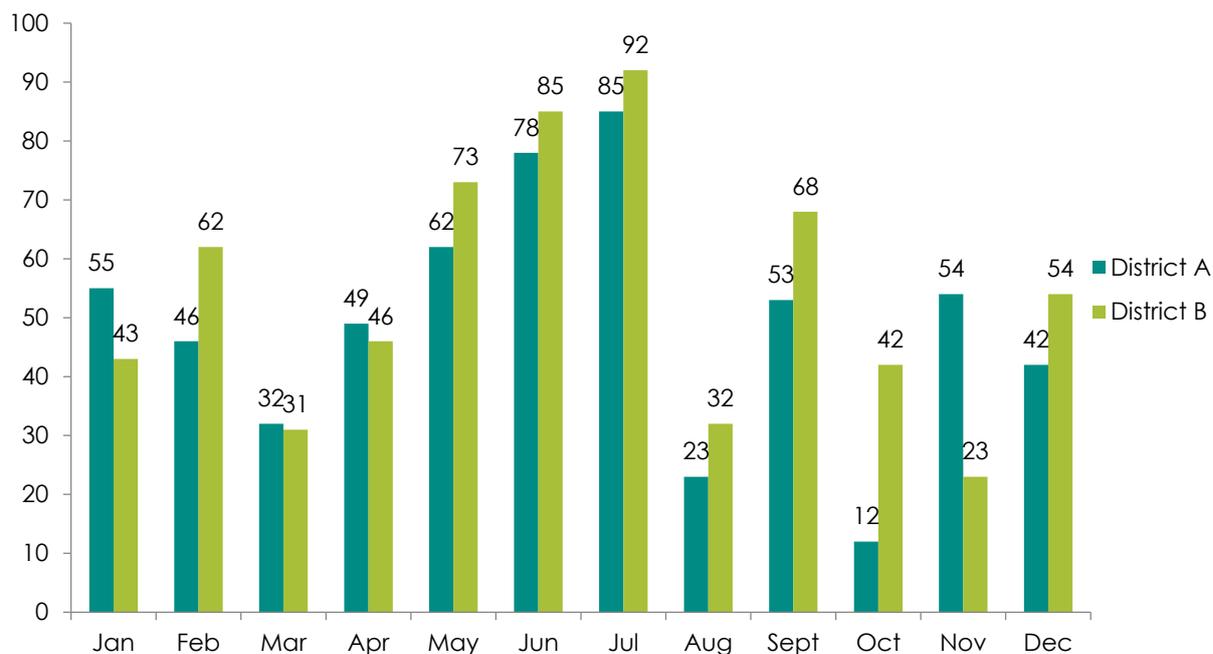
C6a) What does the data in this graph indicate about the new pilot training for community health workers?

The M&E Specialist for the project also collected data from each district on the indicator: Proportion of pregnant women who slept under an ITN the previous night. The data was displayed with this graph:

Proportion of pregnant women who slept under an ITN the previous night, two districts, 2012
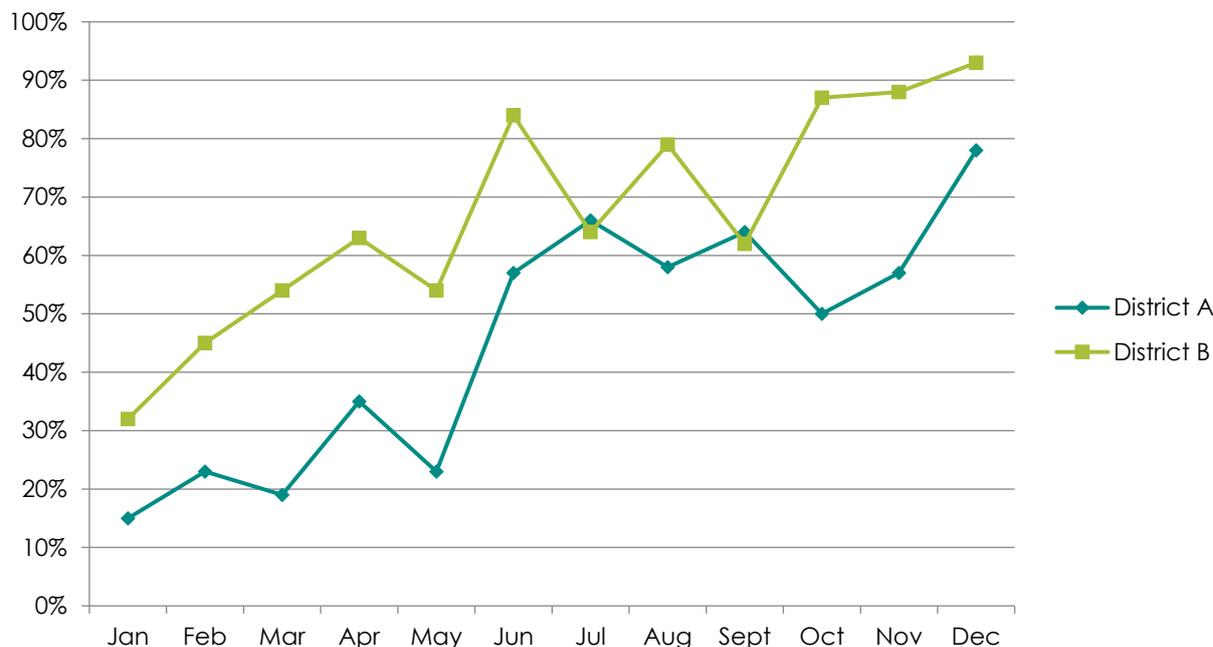
C6b) Since the new pilot training for community health workers, the proportion of pregnant women who slept under an ITN the previous night in these two districts has:
1. Increased
2. Remained the same
3. Decreased
4. No visible trend or pattern in the data

C6c) Based on these 2 graphs in question C6, select the option that provides the most <u>precise</u> conclusion about the pilot community health worker training program:

1. The program was effective in increasing the proportion of people of all ages sleeping under an ITN the night before.

2. The program was effective in increasing the proportion of people of all ages sleeping under an ITN the night before, but less so in increasing the proportion of pregnant women sleeping under an ITN the night before.

3. The program was effective in increasing the proportion of pregnant women sleeping under an ITN the night before, but less so in increasing the proportion of people of all ages sleeping under an ITN the night before.

4. The program was not effective in increasing the proportion of people of all ages sleeping under an ITN the night before or the proportion of pregnant women sleeping under an ITN the night before.

C7: The M&E Specialist shared with the community health workers in both districts a table presenting the average proportion of pregnant women who slept under an ITN the night before and after the pilot training in June.

Table 2. Average percentage of women who slept under an ITN the previous night in two districts for 2012

District	January to June	July to December
District A	29%	62%
District B	55%	79%

The community health workers in District A requested advice on setting a reasonable target for improving their performance in increasing the proportion of pregnant women who slept under an ITN the night before over the next 6 months, from January to June 2013. Which of the following 6-month targets would you recommend?

1. 100%
2. 45%
3. 75%
4. 65%

C8: The table below shows the number confirmed malaria cases at District B hospital in 2012.

Table 3: Number of confirmed malaria cases at District B Hospital for 2012

Indicators	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Confirmed malaria cases	350	375	355	358	303	340	401	488	495	525	507	455

C8a) What is the mean number of confirmed malaria cases for 2012 (write a single digit in each box and round to the nearest whole number)?

C8b) What is the median number of confirmed malaria cases for 2012 (write a single digit in each box and round to the nearest whole number)?

C8c) What is the standard deviation relative to the mean number of confirmed malaria cases for 2012 (write a single digit in each box and round to the nearest whole number)?

C9a) In 2009, a health center had 31,155 confirmed malaria cases. During that same time period, 1,536 patients died from malaria. What was the mortality rate for malaria patients in this health center for 2009 (type a single digit in each box and round to the nearest whole number)?

        deaths per   confirmed cases

C9b) The estimated number of pregnant mothers in the catchment area for a health center is 340. Antenatal clinics have registered 170 pregnant mothers for IPTp. What is the percentage of pregnant mothers in the catchment area attending antenatal clinics (type a single digit in each box and round to the nearest whole number)?

APPENDIX 6. SUMMARY OF RESULTS OF SELF-ASSESSMENT TOOL

Demographic	Provincial	National
Age of respondents	<30: 1 31–40: 8 41–49: 7 ≥50: 4	<30: 1 31–40: 2 41–49: 2 ≥50: 3
Sex	M: 13 F: 6	M: 6 F: 2
Education level	State diploma: 1 Graduated: 1 License or equivalent: 3 Master's degree: 4 Doctoral or PhD: 1 Professional degree: 2 Other: 0	State diploma: 0 Graduated: 2 License or equivalent: 3 Master's degree: 2 Doctoral or PhD: 1 Professional degree: 0 Other: 0
Years of experience (average)	13.5	16
M&E training in last year	Yes: 6 No: 1	Yes: 4 No: 4

Skills	Provincial		National	
	I can do it	I can <u>actually</u> do it	I can do it	I can <u>actually</u> do it
Create graphs	79%	79%	75%	100%
Explain M&E results	58%	42%	63%	13%
Use data to identify gaps and set targets	74%	37%	75%	50%
Calculate averages	63%	79% (mean) 5% (median) 5% (standard deviation)	63%	50% (mean) 25% (median) 13% (standard deviation)
Communicate variation from a target	42%	47%	38%	50%
Calculate rates and percentages	95%	47% (rate) 89% (percentage)	88%	25% (rate) 88% (percentage)

APPENDIX 7. DATA DEMAND AND USE CONCEPTUAL FRAMEWORK

The data demand and use conceptual framework[1] provides guidance on best practices in data-informed decision making and data use. It looks at three determinants of data use: technical, organizational, and behavioral determinants. These determinants are adapted from the Performance of Routine Information Systems Management framework developed by Aqil, et al.[2] The framework describes the "specific interventions that can improve the demand for and use of data from all health information systems." The conceptual framework "demonstrates how information systems improve the other health system building blocks [and] outlines the underlying assumptions and activities that are necessary to achieve the desired outcome of increased data-informed decision making."[3]

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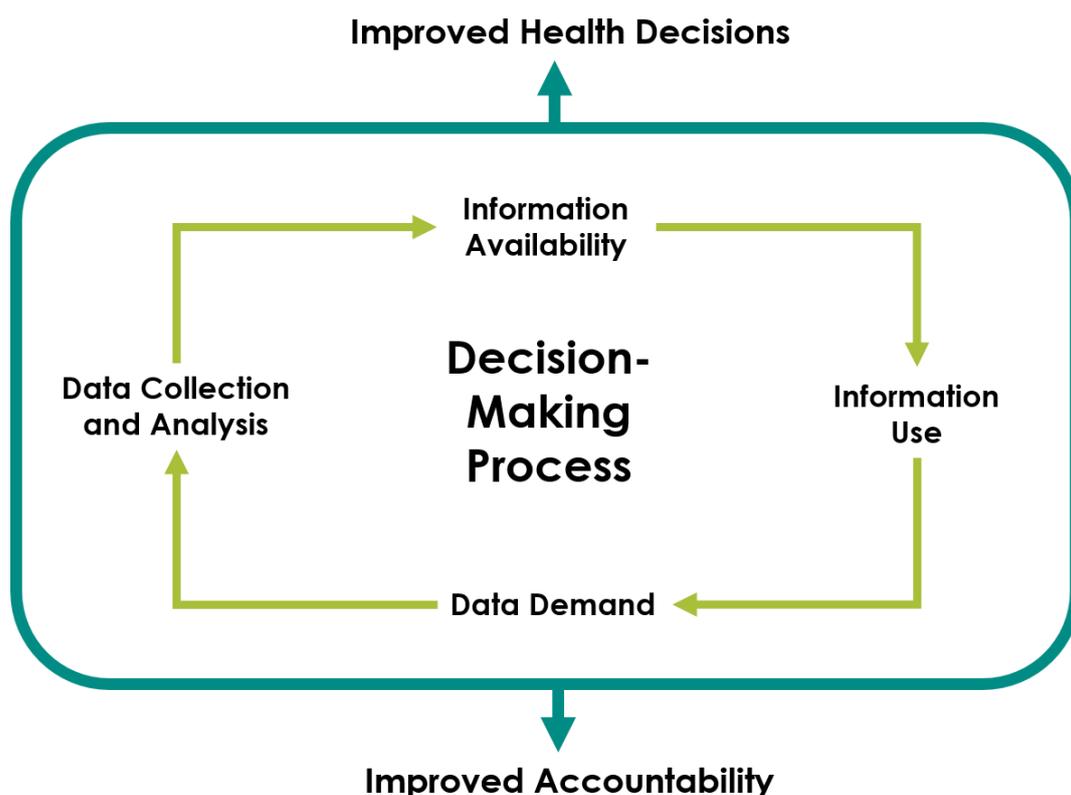
[1] Foreit, K., Moreland, S., & LaFond, A. (2006). *Data demand and use in the health sector: A conceptual framework.* Chapel Hill, NC: MEASURE Evaluation, University of North Carolina.
[2] Aqil, A., Lippeveld, T., & Hozumi, D. (2009). PRISM framework: A paradigm shift for designing, strengthening and evaluating routine health information systems. *Health Policy and Planning, 24*(3), 217-228.
[3] Nutley, T. (2012). *Improving data use in decision making: An intervention to strengthen health systems.* Chapel Hill, NC: MEASURE Evaluation, University of North Carolina.

APPENDIX 8. LOGIC MODEL FOR STRENGTHENING THE USE OF HEALTH DATA IN DECISION MAKING

This logic model[4] builds off of the data demand and use conceptual framework and describes the inputs, processes, outputs, and outcomes involved in improving the use of data in decision making, particularly in the health sector. The eight processes listed in the logic model comprise the eight data use core interventions that MEASURE Evaluation implements to strengthen the demand for and use of health data.

Inputs	Processes	Outputs	Outcomes
	Activities to strengthen demand for and use of data		
	Assess and improve the data use context	Interventions to improve data use context implemented	**Intermediate outcomes**
	Engage data users and data producers	Data users/producers regularly participating in M&E activities; data and program review; program planning, research, and policy development activities	Individual data use skills, capacity, attitudes, and behavior improved
Health information system resources	Improve data quality		Operationalized data use procedures, policies, and support mechanisms institutionalized and functioning
	Improve data availability	Quality data available and information regularly shared in appropriate formats with appropriate audiences	
	Identify information needs		**Long-term outcome**
Indicators, data sources, data management	Build capacity in data use core competencies	Information most relevant to decision making regularly identified	Data and information regularly demanded, analyzed, synthesized, reviewed, and used in program review and planning; advocacy and policy development; and decision making processes
	Strengthen the organization's data demand and use infrastructure	DDU knowledge and skills increased	
	Monitor, evaluate, and communicate results of data use interventions	DDU procedures, policies, and support mechanisms operationalized	

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[4] Nutley, T., & Reynolds, H. (2013). Improving the use of health data for health systems strengthening. *Global Health Action,* 6.

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