WORKING PAPER

Conceptualizing and Measuring Data Use

A Review of Assessments and Tools

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June 2018

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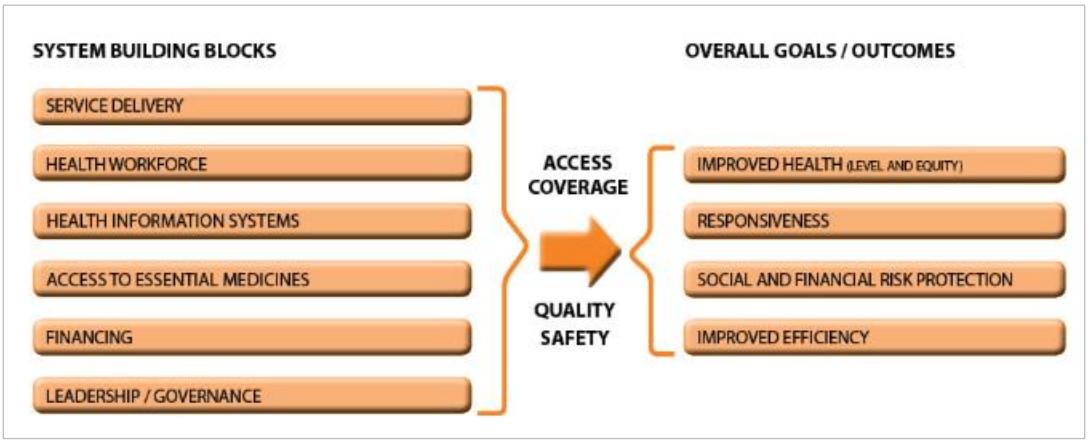
ABBREVIATIONS

DDU	data demand and use
DQA	data quality assurance
HIS	health information system(s)
HISSM	Health Information System Strengthening Model
M&E	monitoring and evaluation
MECAT	Monitoring and Evaluation Capacity Assessment Toolkit
MEval-PIMA	MEASURE Evaluation PIMA
OBAT	Organizational and Behavioral Assessment Tool
PEPFAR	United States President's Emergency Plan for AIDS Relief
PRISM	Performance of Routine Information System Management
RHIS	routine health information system
USAID	United States Agency for International Development
WHO	World Health Organization

INTRODUCTION

Health information is one of the six core functions of the health system (Figure 1) (World Health Organization [WHO], 2007). The purpose of a health information system (HIS) is to produce high-quality information that can be used at all levels of a health system for decision making about program monitoring and review; program planning and improvement; advocacy; policy; and health strategy planning and implementation. Although each core function is important for the improvement of a health system and, ultimately, for better health outcomes, high-quality and timely data from the HIS are the foundation of the overall system. Health data inform decision making in each of the other five core functions (i.e., service delivery, health workforce, access to essential medicines, financing, leadership and governance) (AbouZahr & Boerma, 2005). Strengthening the HIS is a priority on many global and national health agendas as a way to improve health outcomes.

Figure 1. The World Health Organization (WHO) Health Systems Framework



Source: WHO, 2010

To monitor and evaluate the success of HIS strengthening interventions, it is critical to measure the outputs of data quality and data use. Definitions of and methods for the monitoring and measurement of improvements in data quality are well developed (i.e., accuracy, reliability, precision, completeness, timeliness, integrity, and confidentiality) (MEASURE Evaluation, n.d.). However, definitions and methods for monitoring and measuring data use for decision making have proven more challenging. Different types of data users and producers contribute to and employ the HIS in complex ways, and there is not always consensus about the actions that constitute data use. For example, data sharing, visualization, dissemination, and review are often considered cases of data use. In the literature, measures of data use have included such dimensions as transparency, timeliness, visibility, accessibility, dissemination of information, calculation of key indicators, preparation of information products, and presentation of the achievement of targets (Abajebel, Jira, & Beyene, 2011; Mwencha, Rosen, Spisak, Watson, Kisoka, & Mberesero, 2017). Measuring the use of data is challenging because it is affected by diverse factors, such as decision-making processes; ongoing sector-wide HIS strengthening activities to improve data availability and quality; actors across different levels in the health

system; and information flows. Unlike data quality, there is no standard approach to defining and measuring data use.

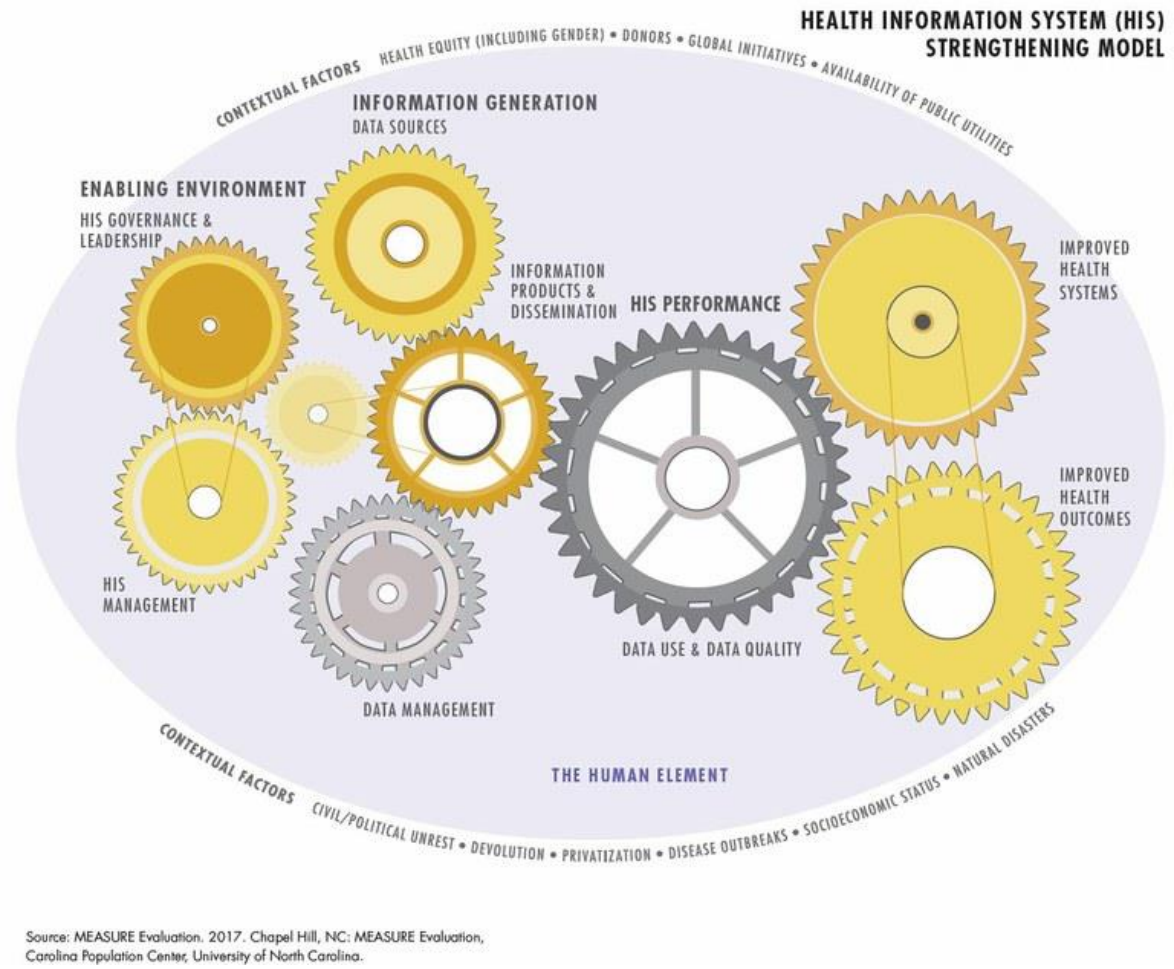
MEASURE Evaluation is at the forefront of developing guidance for the monitoring and measurement of data use—a key output of HIS strengthening. This paper has the following purposes:

- Expand on the Health Information System Strengthening Model (HISSM) definition and conceptualization of the use of data, especially for acting on and implementing decisions related to health system performance.
- Describe activity areas to strengthen the demand for and use of data for decision making.
- Summarize indicators to measure the process and outputs of data use.
- Review tools to measure the dimensions of data use.

DATA USE IN THE HEALTH INFORMATION SYSTEM STRENGTHENING MODEL

MEASURE Evaluation developed a model (Figure 2) for strengthening the HIS in low- and middle-income countries: the HISSM (MEASURE Evaluation, 2017a). Its purpose is to explore ways to promote the HIS as an essential function of a health system; define HIS strengthening; measure HIS performance; and monitor and evaluate HIS interventions.

Figure 2. MEASURE Evaluation Health Information System Strengthening Model



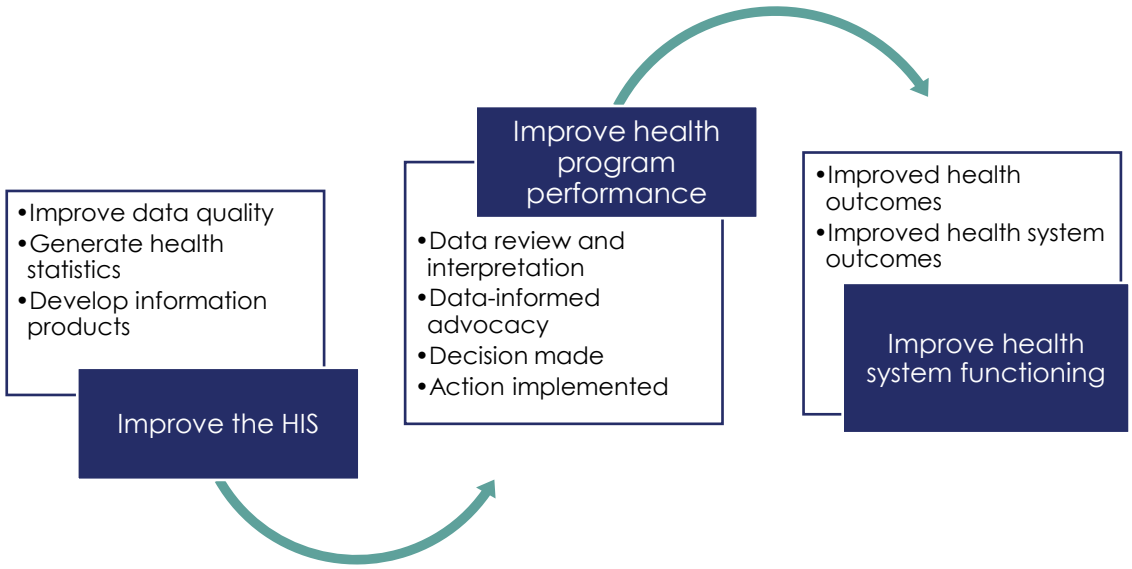
Source: MEASURE Evaluation. 2017. Chapel Hill, NC: MEASURE Evaluation, Carolina Population Center, University of North Carolina.

As shown in the model, HIS strengthening is the implementation of one or more interventions targeting one or more components of the HIS to improve the quality and use of data for decision making at all levels of the health system. The output of a strengthened HIS is measured by data quality and data use, that is, the

improved availability of high-quality data that are used on a continuous basis for decision making at all levels of the health system.

As described in the HISSM, data use involves two main stages: (1) improving the HIS; and (2) improving the performance of health programs, with the ultimate goal to improve the functioning of the health system and improve health outcomes (Figure 3). The first stage consists of steps to enhance the HIS: the analysis and synthesis of data to identify data quality issues for improvement; the generation of health statistics to answer key health questions; and the development of tailored information products to synthesize and disseminate findings. The second stage of data use includes steps to drive data-informed decision making for health program improvement. This conceptualization of data use requires that data are reviewed as part of a specific decision-making process, for example, to create or revise a health program strategy or work plan; to develop or revise a policy; to advocate for a policy or program; to allocate resources; or to monitor program performance. Following the data review and interpretation process, a data-informed recommendation is submitted to a higher level of management or a decision maker with a request for action, the decision to act is made, and follow-up actions are implemented that lead to improved health outcomes.

Figure 3. MEASURE Evaluation continuum of data use



The HISSM does not fully expand on the second aspect of data use, that is, decisions made and acted on to improve health programs. This aspect of decision making, which moves a data-informed recommendation to an implemented action, often involves engaging decision makers who may have competing priorities, biases, and values. Decisions may be more influenced by factors other than data, including the availability of funds to implement decisions, political jockeying, donor pressure, personal interests, and competing agendas. Moreover, decision-making authority may lie with organizations and departments outside those managing the HIS (i.e., decision makers from various health system functions, including service delivery, human resources,

commodities/infrastructure, financing, stewardship) and those outside the health sector (such as policy units, finance commissions, etc.).

The development of skills in data communication, data advocacy, and leadership is needed to increase the capacity of decision makers to influence and act on data-informed recommendations to achieve and sustain improved outcomes in health system performance. Strong coordination and feedback loops are also necessary to ensure the availability of relevant data that respond to information needs of multisectoral decision makers at prime decision-making opportunities. There is often a lack of interaction and understanding of roles and responsibilities between those working in HIS strengthening and the decision makers who are the target audience for using data to inform program planning, policy, and service delivery decisions. The HISSM does not focus extensively on the engagement of stakeholders outside the HIS and monitoring and evaluation (M&E) domains. To address this, MEASURE Evaluation developed a logic model that describes the role that data use plays in strengthening the health system.

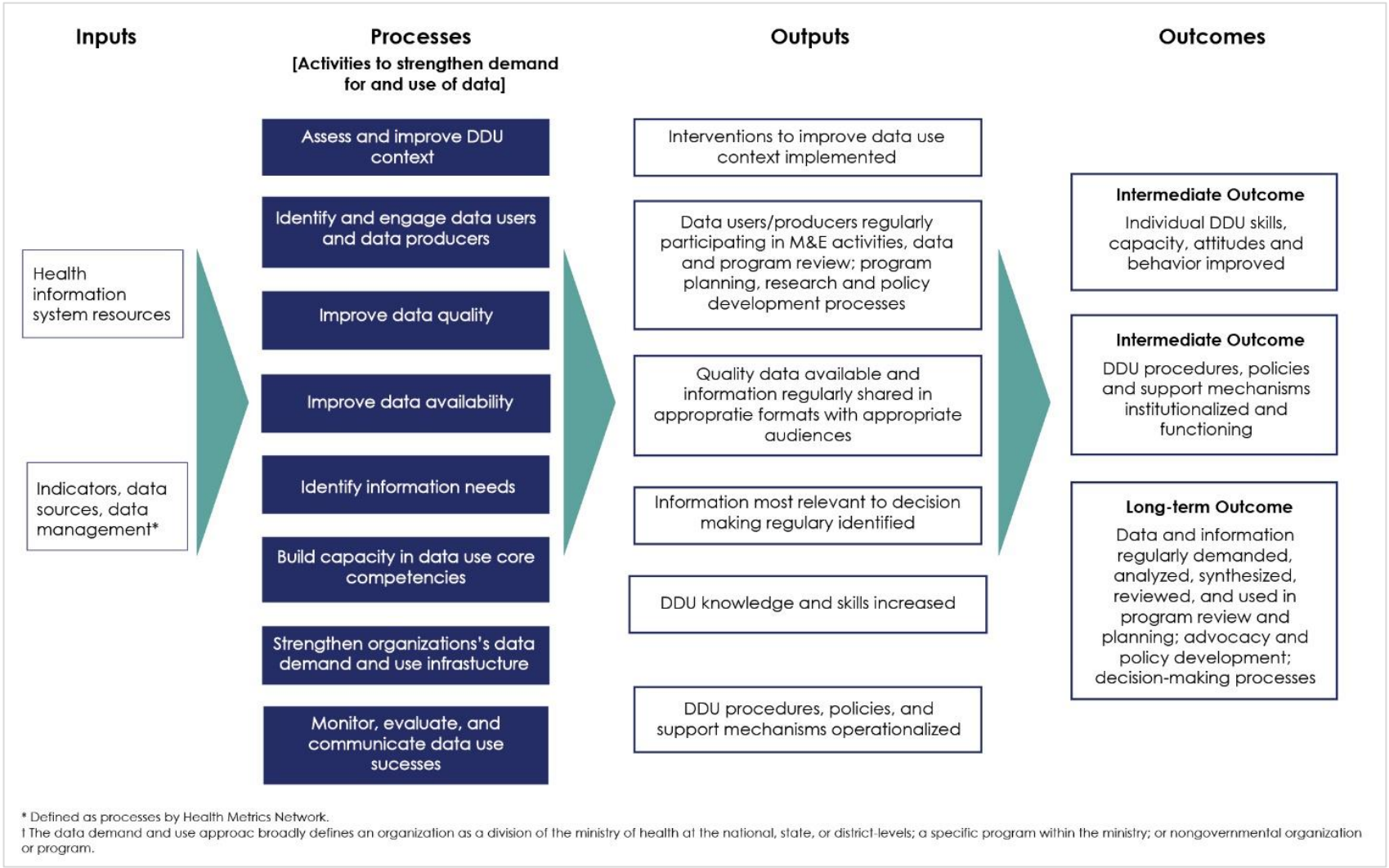
MEASURE EVALUTION LOGIC MODEL FOR IMPROVING DATA USE

MEASURE Evaluation developed the Data Demand and Use (DDU) Logic Model to describe the specific activities and interventions needed to improve the use of health data for improved health programs and policies (see Figure 4). The model maps the influence of data use intervention inputs and activities on the outputs and outcomes of routine and sustained use of data in program review, planning, and policy. It also outlines the theoretical assumptions under which the interventions are intended to influence data use and health outcomes (Nutley & Reynolds, 2013). It specifies and provides a practical strategy for developing, monitoring, and evaluating interventions to strengthen the use of data in decision making. The model comprises eight domains of activities that have been identified in the literature and through MEASURE Evaluation's implementation experiences as critical to affect the technical, behavioral, and organizational determinants of data-informed decision making. The domains are:

1. Assessing and improving the data use context
2. Engaging data users and data producers
3. Improving data quality
4. Improving data availability
5. Identifying information needs
6. Building capacity in data use core competencies
7. Strengthening the organization's DDU infrastructure
8. Monitoring, evaluating, and communicating DDU successes

Table 1, on page 17, presents examples of activities in each of the eight domains of the DDU Logic Model.

Figure 4. MEASURE Evaluation DDU Logic Model



Source: Nutley & Reynolds, 2013

Activities to strengthen the demand for and use of data are built on a foundation of inputs essential to implementation, including resources, indicator definitions, data sources, and data management. For the purposes of the DDU Logic Model, these inputs are informed by HIS inputs and processes defined by the Health Metrics Network (Health Metrics Network, 2008) because efforts to improve the demand for and use of information will only be successful if they are implemented in a HIS that is functioning effectively or is in the process of being strengthened.

The data use strengthening activities lead to such outcomes as improved individual DDU skills and capacity, institutionalized DDU procedures and policies, and a long-term outcome of improved and sustained DDU. Indicators to measure the process of strengthening data use are summarized in Box 3 on page 26 and are detailed in Appendix A.

MAPPING THE DDU LOGIC MODEL TO THE HISSM

The HISSM and the DDU Logic Model both employ a systems-level approach to improve the HIS and data use. However, the HISSM and the DDU Logic Model offer two different lenses through which we can conceptualize and unpack data use.

The HISSM describes data use in the overall context of HIS strengthening and considers it to be an output of a strengthened HIS. The DDU Logic Model is built on the assumption that efforts to improve the use of data are successful only when implemented as part of long-term HIS strengthening activities, such as those outlined in the HISSM model (for example, legislative, regulative, and planning frameworks; resources, such as personnel, financing, information and communications technology; and indicators, data sources, and data management). On the other hand, the DDU Logic Model describes a subset of HIS strengthening activities that are most likely to catalyze improved and sustained data-informed decision making. This model builds on the HISSM by providing specific and detailed ways to support the use of HIS data. DDU interventions are not necessarily unique to DDU. For example, activities to improve data quality also strengthen the output and performance of the HIS. Moreover, the DDU Logic Model includes activities to engage with multisectoral stakeholders outside the HIS environment who are needed to advocate for and implement decisions based on HIS data. Table 1 maps the DDU Logic Model to the areas and subareas of the HISSM.

Table 1. Mapping interventions in the DDU Logic Model to areas in the HISSM

HISSM Area		Illustrative DDU Strengthening Activities in the DDU Logic Model	Comparison
Enabling environment	HIS governance and leadership consist of legislation that outlines specific activities under the HIS. It also involves partnerships and coalition building to leverage resources; governance structures, policies, and standards; HIS financing; and the existence of HIS champions.	**Strengthening DDU infrastructure** • Develop data-informed normative health sector guidance (e.g., strategic plans) • Institutionalize governance structures to regularly review data and program progress (e.g., technical working groups) • Develop organizational guidance and standardize job descriptions for data user and producer roles in M&E, program and data review, program planning, research, and policy processes • Develop protocols and guidelines to govern data processes and clearly support data-informed decision making (e.g., data management; data quality assessment [DQA]; timely data synthesis and dissemination; data review; data use framework) • Prioritization of data-informed management, leadership, and advocacy to support data-informed recommendation development, planning, organizing, and budgeting for DDU activities (e.g., human resources) **Identify and engage data users and data producers** • Assess and identify stakeholders • Ensure data user participation in M&E and HIS design and development processes • Develop organizational guidance and clarify roles for data user and producer engagement in program planning, monitoring, and policy development processes • Include data users in M&E and research training • Convene working groups to regularly review data and program progress, and identify programmatic questions/data needs • Jointly analyze and interpret data **Identify information needs** • Implement the Framework for Linking Data with Action tool[1] • Ensure that the HIS design responds to the information needs and presentation preferences of data users • Identify upcoming decisions, link decisions and questions to existing data sources and identify data gaps	Both models emphasize the importance of the organizational context. Systems with clear guidelines, strong leadership and governance structures, and defined roles and responsibilities are better positioned to support HIS strengthening and DDU. Strong HIS leadership and governance are needed to identify and engage with key decision makers (especially those outside the HIS domain) and to institutionalize governance structures that regularly bring together data users and data producers to review and employ data during opportune decision-making moments. Organizational supports, such as organizational guidance and clarifying roles and responsibilities in program planning and monitoring, can also improve the engagement of data users and data producers.

HISSM Area		Illustrative DDU Strengthening Activities in the DDU Logic Model	Comparison
Enabling environment	**HIS management** consists of planning and organizing HIS activities and resources, financial management for HIS, information management, and infrastructure development.	**Assess and improve the data use context** • Assess the organizational, technical, and behavioral factors affecting decision making **Monitor, evaluate, and communicate results of DDU interventions** • Monitor and evaluate data use interventions • Document DDU successes • Develop DDU advocacy materials • Widely disseminate DDU successes to various audiences in appropriate formats	Assessing, monitoring, and evaluating data use interventions are essential HIS activities that should be planned and budgeted under HIS management processes. An initial assessment of the data use context is important to guide the adaptation of interventions to improve data use. This is highlighted in the DDU Logic Model because many HIS assessments do not adequately evaluate organizational and behavioral factors that most proximally affect data use. Monitoring data use outputs is a core aspect of both models. Communicating the results of data use interventions by highlighting the links among data use, advocacy, and improved service delivery also helps build the value of data use, generates data demand, and reinforces the benefits of investments in data use interventions.
Human element	Sustained data-informed decision making requires a dedicated workforce made up of individuals in various job functions who are motivated to collect, analyze, review, and discuss data.	**Build capacity in core data use competencies** • Capacity building in data analysis, interpretation, synthesis, presentation, and communication • Training and coaching in data-informed leadership and advocacy • Apply and implement DDU procedures, guidelines, policies, and support mechanisms • Manage change around adopting a culture of data use	The human element is foundational both for HIS and DDU strengthening. The DDU Logic Model emphasizes the importance of the human element to build a culture of data use through effective management and communication and collaboration between data users and data producers. It defines data users and data producers and underlines the specific core competencies that are needed by these cadres to strengthen their ability to use information.

[1] The Framework for Linking Data with Action is a management tool which brings together data users and producers to identify programmatic priorities, understand key performance indicators, identify the types of analyses needed to inform regular decisions, conduct basic data analysis and interpretation, and use their findings for decision making. It is available at https://www.measureevaluation.org/resources/publications/ms-11-46-b.

HISSM Area		Illustrative DDU Strengthening Activities in the DDU Logic Model	Comparison
Information generation	**Data sources** include institution-based, population-based surveys, and mixed-data sources.	In the DDU Logic Model, data sources are considered foundational elements of a functioning HIS. Data sources are necessary inputs to the success of DDU interventions.	Data sources are highlighted in the HISSM, but not in the DDU Logic Model.
	Data management refers to data collection and storage, ensuring data quality, and data processing and compilation.	**Improve data quality** • Develop and disseminate data quality protocols and tools • Standardize data collection processes and simplify/improve the design and usability of data collection forms • Training on data entry, data management, DQA • Regular data quality review meetings • Conduct supportive supervision/mentorship Conduct regular data quality audits	In the DDU Logic Model, data management is an input that serves as a prerequisite to the success of DDU interventions (e.g., data collection, cleaning, processing, and management). However, activities to improve data quality are specifically highlighted in the model as one of the interventions most proximate to improving the use of data in decision making.
	The creation, generation, and dissemination of **information products** for a variety of users and purposes.	**Improve data availability** • Create interoperable data systems • Develop a data dissemination and communication plan • Synthesize data and develop information products for different data user audiences responding to their data needs • Develop standard auto-generated reports • Actively disseminate information products bidirectionally • Develop multidirectional feedback mechanisms for data sharing	Both models highlight the importance of targeted, summarized, and synthesized data in the form of visualizations and/or information products that are easily understood and relevant to decision makers. The DDU Logic Model further highlights of the importance of strengthening access to data, for example, by linking data sources and integrating fragmented information systems.

SUMMARY OF TOOLS TO MEASURE DATA USE

MEASURE Evaluation has developed and applied several tools to measure the dimensions of data use. This section provides an overview of the assessment tools and the measures of data use that have been employed by the project to monitor the process of strengthening data use both to improve the HIS and to improve health programs. A summary of the purpose, framework, and the stages of the data use continuum that each tool measures is provided in Table 2.[2] Then each tool is discussed in detail.

[2] Table 2 does not include tools that focus solely on the measurement of data quality.

Table 2. Comparison of assessment tools to measure data use

				Data Use Continuum						
Tool	**Purpose**	**Framework**	**Examples of assessment statements for data use**	**Data quality**	**Health statistics**	**Info Product**	**Data review**	**Advocacy**	**Decision**	**Action**
PRISM	Assess the performance of a RHIS	Technical, organizational, and individual barriers to data quality, data analysis practices, and use of information	•Management of RHIS and/or discussion about RHIS findings reviewed during routine meetings • Have they made any decisions based on these discussions? • Has any follow-up action taken place on the decisions made during previous meetings? • Are there any RHIS-related issues that have been referred to the regional/national level for action?	✓	✓	✓	✓	✓	✓	✓
RHIS Rapid Assessment Tool	Rapid assessment of local health information systems against global standards	WHO Health Facility and Community Information System Toolkit, MEASURE Evaluation Guidelines on Data Management Standards	•Health planners use the results of the analysis of facility data to produce analytical reports on progress and performance for health sector review •Appropriate staff have received training in data analysis •Periodic data summaries (e.g., bulletins) are produced and distributed •Dashboards and summary charts are used to convey information to diverse target audiences •There is a comprehensive data dissemination strategy •There is demand for information from donors, policy makers, program planners, etc. •Facility and community-based data are used in health sector planning •Facility managers use data to improve infrastructure, equipment, and human resources	✓	✓	✓			✓	

				Data Use Continuum						
Tool	**Purpose**	**Framework**	**Examples of assessment statements for data use**	**Data quality**	**Health statistics**	**Info Product**	**Data review**	**Advocacy**	**Decision**	**Action**
Assessment of Barriers to Data Use in the Health Sector Toolkit	Monitor progress in improving the use of data	Technical, organizational, and individual barriers to data use across the eight intervention areas of the DDU Logic Model	Qualitative analysis synthesizing barriers to DDU intervention areas. Sample statements include: • In the past 12 months, the quality of data available has been sufficiently adequate that it can confidently be used in decision making. • Information products are regularly sent to a wide variety of stakeholders. • There are guidelines to support the analysis, presentation, and use of data. • Data review meetings are held quarterly at the subnational level to discuss key program indicators. • Can you give me some examples of times when you consulted data to inform a decision about a health service? • How often do you think decisions in your organization are informed by data?	✓	✓	✓	✓		✓	
12 Components M&E Systems Strengthening Tool	Assess a national M&E system	Status of elements across the 12 components of a national HIV M&E system	• Information products are regularly disseminated to data providers. • Information products are regularly sent to a wide variety of stakeholders, other than the data providers. • National and subnational information products meet stakeholders' information needs. • There are guidelines to support the analysis, presentation, and use of data at the facility level.	✓	✓	✓				
MECAT	Assess an organization's capacity and performance in M&E	Existence, quality, and autonomy of elements across the 12 components of a national HIV M&E system	Existence, quality, and financial/technical autonomy in the development of: • organizational data use plan • information products • data analysis and presentation guidelines	✓	✓	✓				

Performance of Routine Information System Management

The Performance of Routine Information System Management (PRISM) toolkit, developed by MEASURE Evaluation, assesses the broad context in which routine health information systems (RHIS)[3] operate. The framework asserts that RHIS performance, defined as quality data that are continually used in decision making, is a function of RHIS processes and their behavioral, technical, and organizational determinants. The PRISM toolkit consists of four tools that are administered to comprehensively assess RHIS performance; identify the technical, behavioral, and organizational factors affecting RHIS performance; aid in designing and prioritizing multidimensional interventions to improve RHIS performance; and support ongoing efforts to monitor and evaluate data quality and data use. PRISM can be applied to quantitatively assess data use across the data use continuum. It employs a series of dichotomous indicators to assess whether RHIS information is discussed in staff meetings, whether decisions evolved from these discussions, and whether these decisions were referred to upper management for action (Box 1).

The four PRISM tools are: (1) RHIS Performance Diagnostic Tool; (2) RHIS Overview and Facility/Office Checklist; (3) Organizational and Behavioral Assessment Tool (OBAT); and (4) RHIS Management Assessment Tool. Depending on the implementation methodology selected, these tools can be used to understand the existing RHIS at one point in time, identify any changes following the implementation of RHIS interventions (if applied at two points in time), or monitor progress in data quality and data use over time (if applied routinely). The PRISM toolkit can be used by any type of organization, such as ministries of health, health districts, nongovernmental organizations, and private sector organizations, and across sectors. Depending on the nature of the organization, the tool should be administered to a diverse mix of staff and at various organizational levels to get a representative sample of the organization. For example, it can be applied at the community, facility, district, subnational, and central levels of a health system.

Box 1: Data use measures contained in the PRISM toolkit

- Discussion of RHIS analyses
  - Were the following topics discussed during routine meetings for reviewing managerial or administrative matters: management of RHIS (data quality, reporting, or timeliness) or RHIS findings (patient utilization, disease data, service coverage, stock outs)
- Decisions taken
  - Have they made any decisions based on the above discussions?
- Decision implemented
  - Has any follow-up action taken place on the decisions made during previous meetings?
- Decision referred to upper management for action
  - Are there any RHIS-related issues or problems referred to regional/national level for action?

[3] An HIS encompasses all health data sources required by a county to plan and implement its national health strategy. These include health facility data, surveillance data, census data, population surveys, vital event records, financial data, and logistics and supply data. RHIS comprise data collected at regular intervals at public, private, and community-level health facilities and institutions. The sources of these data are generally individual health records, records of services delivered, and records of health resources.

Overview of the Assessment Tools

The RHIS Performance Diagnostic Tool is the primary component of the PRISM toolkit; it evaluates overall RHIS performance. This tool consists of four forms (to be administered at the facility and district or higher levels) covering the dimensions of data quality and data use. The tools on data use deal with the production of reports; display of information; existence of meetings to discuss RHIS information; and the use of information for problem identification, problem solving, decision making, resource mobilization, and monitoring. There are a series of dichotomous indicators about discussions and decisions made using RHIS information during routine meetings.

The RHIS Overview and Facility/Office Checklist examine the technical determinants of RHIS performance, including the structure and design of existing information systems; data collection and reporting forms; information flows; RHIS resources; and interactions among different information systems. This tool can help one understand how data and information flow from data collectors to users (and vice versa); inventory information that is currently available for decision making; and how to identify opportunities to improve data collection, analysis, and sharing to ensure the use of data.

The OBAT covers perceptions about the behavioral and organizational factors that affect RHIS performance. It features rating scales and a written test to assess task competency and problem-solving skills. The tool contains questions on data demand; the promotion of an organizational culture of information; levels of motivation and confidence; and knowledge, competencies, and skills in RHIS tasks. It can be applied alone or in conjunction with the RHIS Performance Diagnostic Tool to identify strengths and weaknesses in organizational processes for promoting a culture of information and behavioral factors that affect the performance of RHIS tasks.

Last, the RHIS Management Assessment Tool looks at the management and supportive practices of the RHIS to aid in the development of recommendations for better management of the RHIS. Although there are no specific questions on data use, this tool assesses the larger managerial and enabling context, including such management functions as governance, planning, training, supervision, use of performance improvement tools, quality standards, and financial resources.

The PRISM toolkit has been applied in over 23 countries to assess RHIS performance and guide RHIS strengthening, including in Ethiopia, Haiti, Liberia, Mozambique, Pakistan, Rwanda, South Africa, and Uganda. It has also been employed in Cote d'Ivoire to evaluate the impact of interventions described in the DDU Logic Model on data quality, data availability, and the use of information, using a pre- and post-test design (Nutley, Gnassou, Traore, Bosso, & Mullen, 2014).

RHIS Rapid Assessment Tool

The RHIS Rapid Assessment Tool, developed by the WHO and MEASURE Evaluation, provides a rapid assessment of the local HIS as against harmonized global standards for data management of information systems. This tool identifies gaps and weaknesses to facilitate planning for RHIS strengthening at any level of the health system, including the national, subnational, district, and service delivery point levels (e.g., health facility and community-based information systems). The RHIS Rapid Assessment Tool can be implemented in a workshop setting with representatives from different levels of the health system, as a self-assessment involving RHIS stakeholders, or through the deployment of assessment teams to a sample of health facilities and subnational

RHIS units. Depending on the assessment methodology selected, the RHIS Rapid Assessment Tool can be applied as a one-off assessment prior to RHIS reform efforts or as a regular aspect of RHIS performance assessments conducted every two to three years.

Overview of the Assessment Tool

The RHIS Rapid Assessment Tool is a checklist of standards for health facility and community information systems that can be used for any level of the health system involved in data collection, reporting, aggregation, and transmission of RHIS data. The checklist covers standards for the following thematic domains and subdomains:

- Management and governance, including policies, planning, and human resources
- Data and decision support needs, including data standards
- Data collection and processing, including data reporting, data quality, and information and communication technology
- Data analysis, dissemination, and use

Standards for all domains (including data analysis, dissemination, and use) are presented as statements. Respondents describe the extent to which the standard applies at the selected health system level using a five-point Likert scale (0=no answer/not applicable; 1=not present, needs to be developed; 2=needs a lot of strengthening; 3=needs some strengthening; 4=already present, no action needed). The measures of data use in the RHIS Rapid Assessment Tool cover the use of data to improve information systems (e.g., data analysis and the generation of health statistics; development of information products, such as data summaries and dashboards); the use of facility and community-based data to monitor patient care and outcomes; to improve facility infrastructure, equipment, and human resources; to develop service delivery strategies; and for health sector planning. Box 2 lists examples of data use measures in the tool. Different components of the tool have been implemented in the Gambia, Madagascar, Malawi, and Myanmar.

Box 2: Illustrative data use measures in the RHIS Rapid Assessment Tool

- Data analysis
  - General principles for data cleaning/analysis of facility data are defined (e.g., as standard operating procedures).
  - Appropriate staff (i.e., facility and community information system managers, program managers, etc.) have received training in data analysis.
- Data dissemination
  - Periodic data summaries (e.g., bulletins) are produced and distributed to key stakeholders describing key findings and interpretations.
  - There is a comprehensive data dissemination strategy relevant to each level of the health system with key products defined.
- DDU
  - A culture of information use is promoted by policy leaders and decision makers.
  - There is demand for information by donors, policy makers, planners, program managers, etc.
  - Facility managers use data to improve infrastructure, equipment, and human resources.
  - Facility and community-based data are used in health sector planning (e.g., health sector reviews).

Assessing Barriers to Data Use in the Health Sector: A Toolkit

Assessing Barriers to Data Use in the Health Sector: A Toolkit—a collection of four assessment tools—can be used to measure the status of data use (if applied at one point in time) and progress toward improved use in an organization (if applied at two or more points in time) (MEASURE Evaluation, 2018).[4] These tools serve three purposes:

- Identify existing barriers and constraints to data use
- Identify factors that facilitate data use
- Help in designing and prioritizing an action plan to address the barriers and constraints to data use

The tools are (1) In-Depth Interview Guide; (2) Self-Assessment; (3) Group Assessment; and (4) Site Visit Checklist. Together, they identify barriers to data use across the eight intervention areas in the DDU Logic Model (Figure 4). This suite of tools can be employed to monitor the implementation of an activity to strengthen data use, by assessing the status of and progression in each of the data use intervention areas of the DDU Logic Model (Box 3). It can also be applied to qualitatively assess the use of data to improve the HIS (e.g., improve data quality, generate health statistics, develop information products); for data review and interpretation; and to determine whether data are used to inform decision making.

The assessment tools can be used at the national, subnational, or organizational level or in some combination of the three levels. The Site Visit Checklist is administered at the health-facility level. The four tools can be adapted to suit the needs of the organization being examined, whether in terms of content area, type of organization, health program area, or level of the health system.

Box 3: Indicators to monitor the implementation of activities to strengthen DDU

MEASURE Evaluation has developed a set of indicators that measure the status of and progression in each of the data use intervention areas of the DDU Logic Model (Appendix A). The indicators map directly to each intervention activity in the Logic Model and can be measured using our toolkit on assessing barriers to data use in the health sector. The level of maturity of each activity area can be assessed and scored. A score of 0 (*absent*) indicates that the activity being measured is nonexistent. A score of 1 (*nascent*) indicates that the initial steps of activity implementation are present. A score of 2 (*emerging*) indicates that the activity is present but in an ad hoc and unsystematic way. A score of 3 (*robust*) indicates that the activity is regularly and systematically implemented. Repeat measurement can provide a qualitative assessment of improvements in the areas necessary for data use to occur and progression toward regular and sustained data use. Monitoring the implementation of activities to strengthen the demand for and use of data can help determine whether the right set of interventions to support lasting, sustainable improvements in data use are being implemented.

[4] An organization is broadly defined as a division of a ministry of health at the national, subnational, or district level; a specific program in the ministry; or a nongovernmental organization or program.

Overview of the Assessment Tools

The **In-Depth Interview Guide** contains 15 open-ended questions that cover the eight data use interventions listed in the DDU Logic Model—the specific interventions that can improve the demand for and use of data from all HIS. 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** covers the technical and behavioral determinants of data use. It examines the perceived skills of data users and producers in the core competencies of data use (e.g., data analysis, synthesis, interpretation, and presentation). It then reviews these competencies using a short test that demonstrates their actual skills. The results of the self-assessment 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** poses 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** collects additional evidence to support the Group Assessment tool, by having interviewers observe whether guidelines, procedures, and information products mentioned in the Group Assessment are present at health facilities.

Together, these four tools provide a complete picture of the eight components of the data use conceptual framework, and the technical, behavioral, and organizational determinants of data use 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.

The toolkit has been applied in a variety of settings by MEASURE Evaluation, including in Lesotho (MEASURE Evaluation, 2014b), Ethiopia (MEASURE Evaluation, 2014a, revised 2015), Tanzania, and the Democratic Republic of Congo (Brodsky & Nyanzi, 2017).

Adaptations of "Assessing Barriers to Data Use in the Health Sector: A Toolkit"

Components of the toolkit for assessing barriers to data use in the health sector have been adapted to meet specific needs of the MEASURE Evaluation project, across activities, technical areas, and countries. Examples are as follows:

Checklists

The MEASURE Evaluation PIMA (MEval-PIMA) project aimed to build sustainable M&E capacity of health decision makers in Kenya to use quality health data for evidence-based decision making. A key component of the project's DDU strategy was to improve data availability, stakeholder engagement, and the interaction between data users and data producers by facilitating data review meetings for national programs, county health management teams, and referral sentinel sites. To strengthen the organizational infrastructure for DDU, MEval-PIMA developed guidelines to help support data review meetings for Ministry of Health and Civil Registration

Services programs. These guidelines included a Data Demand and Use Checklist intended for MEval-PIMA staff to document and track outcomes from data examined during data review meetings. The checklist tracked whether the following events occurred: data were presented, data were reviewed, decisions were made, and an action plan was developed.

Data use checklists have also been incorporated as part of MEASURE Evaluation's research and evaluation portfolio. For example, a recent study assessed the effect of the "pivot strategy" of the United States President's Emergency Plan for AIDS Relief's (PEPFAR). The strategy is a geographic reprioritization of investments in Kenya and Uganda on health outcomes and HIS performance areas, such as data quality and data use. The study employed a mixed-methods approach, collecting quantitative data on health system performance using routine health information and qualitative key informant interviews at the subnational level. It assessed data use, by determining whether data generated by the HIS were employed for programmatic or policy decisions. A checklist was administered to illuminate the processes supporting data use at the district level. It had questions on whether meetings were regularly held to review health data, the frequency of and participants in these meetings, and the existence of notes or meeting agendas to document data use. Two rounds of qualitative interviews were conducted, focusing on how PEPFAR support for data use activities has affected data use trends, and the evolution and support of data review processes (Box 4).

Box 4: Data use measures in MEASURE Evaluation Pivot Study

- Describe if and how data are discussed during the data review meeting
  - What data are presented? How were the data presented?
  - Do the data meet the information needs of stakeholders?
  - Are data available and accessible for all participants?
- Describe if and how the data are used for program planning and decision making
  - Provide examples, if any, of action plans developed based on data
- Describe if and how the data are used for information system or data quality improvement
  - Provide examples, if any, of action plans developed based on data

Case Studies and Qualitative Interviews

Components of "Assessing Barriers to Data Demand and Use in the Health Sector: A Toolkit" (MEASURE Evaluation, 2018) have also been adopted for specific case studies and qualitative studies looking at data use interventions in depth. For example, the In-Depth Interview Guide was adapted for an investigation of information products in Kenya and Tanzania—an exercise that focused on the types of information products available in those countries and how they could be improved to facilitate their use in decision making (Geers, Nghui, Ekirapa, Rop, Mbuyita, Patrick, & Kusekwa, 2017). Questions about the types of program decisions made, data availability, plans, policies, procedures/guidelines for communicating data, and segmentation of communication to different audiences were customized to focus specifically on information products using RHIS data. For this study, qualitative group interviews were conducted with key informants in the ministries of health

at regional, district, and health facility levels covering such topics as data sources, experience with specific information products, and support for and barriers to the use of these products.

The In-Depth Interview Guide was also adapted for a case study investigating the factors that contribute to successful data use interventions in MEASURE Evaluation's Associate Awards in Kenya, South Africa, and Tanzania. These projects aimed to strengthen the national HIS and have implemented various DDU activities in the eight intervention areas (Figure 4) as core components of the project. Key informant interviews using an adapted interview guide were conducted with ministry of health staff with exposure to data use interventions in one province/region in each country. Questions about the types of program decisions made, stakeholders involved in decision-making processes, and data sources consulted were included, as were questions about the outputs, facilitators, and barriers to specific data use intervention domains from the DDU Logic Model.

12 Components M&E Systems Strengthening Tool

The 12 Components M&E Systems Strengthening tool, developed in 2009 by the global M&E Reference Group for HIV and AIDS, assesses a national M&E system (Joint United Nations Programme on HIV/AIDS [UNAIDS], 2009). It was initially developed for HIV programs but can be adapted to address other diseases and program areas. The tool provides a comprehensive assessment of the 12 components of a national HIV M&E system. It can be used to understand the overall strengths and weaknesses of an M&E system forming the basis for the development or revision of the national multiyear M&E plan and/or costed M&E work plan. It is recommended that an assessment be conducted every two to three years to monitor progress in M&E implementation.

The tool has been employed to assess data use by orphans and vulnerable children programs implemented by Rwanda's National Commission for Children (2013); HIV/AIDS programs with mainland Tanzania's National AIDS Control Program and the Zanzibar AIDS Control Program (2015-2017); and as part of the national HIV Monitoring and Evaluation System assessment in Nigeria in 2010 (Mharadze, Ogungbemi, Boone, & Oyediran, 2010).

Overview of the 12 Components Tool

An assessment using this tool is built around the 12 components necessary for the effective functioning of a national M&E system (UNAIDS, 2008). The components are organizational structures for M&E; human resource capacity for M&E; M&E partnerships; M&E plan; costed M&E workplan; M&E advocacy; communications and culture; routine program monitoring, surveys, and surveillance; M&E databases; supervision and data auditing; evaluation and research; and data dissemination and use. Data use is measured by a series of benchmarks and performance statements given in the "data dissemination and use" section of the tool. Group consensus is employed to score performance using either a five-point scale (completely, mostly, partly, not at all, not applicable) or a three-point scale (yes, no, not applicable). The tool can be administered to quantitatively assess the use of data to improve the HIS, especially the development and dissemination of information products that meet the identified information needs of relevant stakeholders. Examples of data use measures are given in Box 5.

Box 5: Data use measures contained in the 12 Components M&E Systems Strengthening Tool

- Stakeholder information needs have been assessed.
- Information products are regularly disseminated to the data providers.
- Information products are regularly sent to a wide variety of stakeholders, other than the data providers.
- National and subnational information products meet stakeholders' information needs.
- There are guidelines to support the analysis, presentation, and use of data (e.g., graphs on walls showing cumulative coverage) at the facility level.
- Stakeholders have access to data/information products in the public domain.

Monitoring and Evaluation Capacity Assessment Toolkit

The Monitoring and Evaluation Capacity Assessment Toolkit (MECAT) was developed by MEASURE Evaluation and its Kenya associate award, MEval-PIMA, to examine an organization's capacity and performance in M&E. MECAT assesses M&E across the 12 components of a well-functioning M&E system (described above). DDU is one of the 12 capacity areas. In addition to measuring the existence of essential elements for a M&E system (status), MECAT explores how well the M&E system functions according to established norms (quality); internal capacity to accomplish M&E tasks (technical autonomy); and the organization's ability to financially support M&E tasks (financial autonomy).

The tool can be applied to health management teams at all levels of a government—from an individual in an M&E unit, to hospitals and district/regional health centers, to ministries of health. The purpose of the tool is to:

- Understand, document, and clarify an organization's M&E performance objectives.
- Determine the status of performance and capacity in M&E.
- Identify gaps in the capacity of an organization to meet M&E performance objectives.

The tool can be employed as an internal assessment to develop capacity building plans in M&E, as a baseline M&E assessment prior to capacity building interventions, and if implemented regularly, as a routine assessment to monitor an organization's M&E capacity. MECAT has been applied to assess DDU at national and subnational levels in Kenya. It has also been employed at the national level to examine the M&E capacity of programs in different ministries (e.g., the Ministry of Health and Ministry of Immigration) and, at the subnational level, to evaluate countywide M&E systems. For three programs (National Malaria Control Program, and the Reproductive Health and Maternity Services) and in three counties, MECAT was used at project end line to assess changes in M&E capacity after three years of technical support from MEval-PIMA, to respond to gaps identified during the baseline MECAT assessment (MEASURE Evaluation, 2017b-e).

Overview of the MECAT

The four tools in MECAT are (1) group assessment; (2) individual assessment; (3) key informant interviews; and (4) desk review.

The **group assessment** is a participatory organizational self-assessment targeting key M&E staff and stakeholders and covering the 12 components of an M&E system. The DDU component defines capacity in terms of a data use plan, the dissemination of information products, and data analysis and presentation guidelines (Box 6).

The **individual assessment** is a self-evaluation by M&E staff of their competencies in leadership; data collection and management; evaluation; data analysis, dissemination, and use; and overall management. The data analysis, dissemination, and use section has items evaluating competencies in quantitative and qualitative analysis methods and interpretation; knowledge about stakeholder information needs; dissemination of information products; understanding of key program priorities; and how data from routine monitoring can be applied for decision making.

Key informant interviews with M&E stakeholders outside the organization are conducted to understand the larger context for M&E and stakeholder views on current M&E capacity levels and constraints. Stakeholders are asked about the organization's capacity to undertake M&E functions, including DDU; their knowledge about experiences with the organization using data for planning and monitoring M&E goals; and additional information required to make policy or program decisions.

Last, a **desk review** of key M&E documents and records related to strategic and organizational planning is conducted to identify the background and history of M&E in the organization, the status of activities, and documentation related to M&E capacity and gaps.

Box 6: Data use measures in the MECAT

- Existence and quality of an organizational data use plan
  - An organizational data use plan exists.
  - The data use plan is embedded in the organization's strategic plan and M&E plan.
  - The data use plan conforms to best practices on collecting, recording, collating, analysis, and reporting.
  - The data use plan is informed by an assessment of user needs.
  - The data use plan was developed with external technical assistance/government support.
- Existence and quality of disseminated information products
  - The organization disseminates information products to stakeholders, including the Ministry of Health data users and producers.
  - Information products have contributed to influences in policy and practice.
  - Information products are disseminated with external technical assistance/with support from the government.
- Existence and quality of data analysis and presentation guidelines
  - Data analysis and presentation guidelines exist.
  - Staff know and apply these guidelines.
  - Gender analysis and reporting are included as an element of the data analysis and presentation guidelines.

DISCUSSION

This working paper presents a data use continuum that identifies the stages of data use for improving the functioning of the HIS and to drive informed decision making. Each stage of the continuum may require different considerations when identifying measurement indicators and methodologies.

All tools reviewed here measure the use of data to improve the functioning of the HIS, that is, dimensions of data use related to improving data quality, generating health statistics, and developing information products. "Assessing Barriers to Data Use in the Health Sector: A Toolkit," in particular, assesses the implementation process across the eight interventions identified as essential to strengthening the demand for and use of data. Several tools (such as the 12 Components and MECAT) conceptualize data use as "data analysis and dissemination," and contain measures on the development and dissemination of information products and the existence of guidelines and protocols for data use. These indicators mainly relate to the inputs and activities that contribute to data-informed decision making (i.e., the process of strengthening data use).

Monitoring the use of data for improved health program performance, by tracking the application of data-informed recommendations into action (i.e., decisions made and follow-up actions taken to improve health program performance), is challenging to measure, especially using quantitative methods. The implementation of decisions informed by HIS data to improve health programs depends on multisectoral decision-making processes, which may be influenced by other functions inside and outside the health system, including leadership and governance (e.g., who has the authority to make decisions?) and financing (e.g., is budget available to implement the decision as recommended?). These decisions often lie beyond the authority and control of the organization responsible for the HIS, and can be influenced by factors outside the health sector that inhibit data use, such as political ideology, political will, competing priorities, personal interests, capacity of decision makers, and commitment to transparency and accountability. Decision-making meetings are often ad hoc and unpredictable, and may not include the individuals who generate, analyze, and synthesize the data. Moreover, there is often a considerable gap in time between data generation, data review, data use, and eventual impact on the health program and health system performance.

Few tools that measure the outcome of data use for improved health program performance exist. Many tools contain an assessment item on the existence of meetings for data review and interpretation, and qualitative assessments of whether decisions made by an organization are taken based on data. However, PRISM is the only standardized tool that measures the full spectrum of the use of data to improve decision making. It measures the extent to which data are employed in decision-making processes, conceptualized as whether RHIS information is discussed during meetings, whether decisions evolved from these discussions, and whether decisions are referred to upper management for action. PRISM also incorporates an overall RHIS assessment capturing measures of data quality and data availability across multiple levels of a health system, thereby providing a comprehensive overview of the technical, organizational, and individual barriers impacting data use. However, the implementation of a full PRISM is a resource-intensive activity that requires sampling multiple units across facility, district, and central levels.

MEASURE Evaluation has developed checklists to be applied during data review meetings to track whether data presented during these meetings lead to decisions made and the development of action plans (Geers, Sagno, Camara, & Bureau de Strategie et Developpement au sein du Ministere de la Santé de Guinee, 2017). More experience is needed applying and capturing the outcomes of the use of the data review checklists for the

purposes of measuring data use. Qualitative approaches are also often employed to understand how data have been used to improve health program performance. For example, a question in the interview guide in the toolkit for assessing barriers to data use in the health sector asks for instances when data were consulted to inform a decision about a health service or program. Desk reviews can be conducted to understand whether data were consulted for planning and budgeting purposes. However, it is often difficult to gather evidence to retrospectively determine whether recommendations, decisions, and actions were informed by data and led to improvements in health programs and health outcomes. Documentation on recommendations and decisions made are often not kept or are not accessible because of time lags between the formulation of a recommendation and the implementation of the recommendation, and the time between a decision and subsequent outcomes at the service delivery level.

Conducting targeted follow-up of data-informed decision making can be a lengthy, costly, and labor-intensive endeavor. Better measures of the outcome of data use are needed, along with ways to easily track the health program and health system outcomes associated with decisions that are implemented. There is a need to identify low-cost data collection methods to routinely track data use during an organization's regular planning, program monitoring, and budgeting cycle. This is especially true because information systems and analytical approaches to data use are evolving to be better able to routinely generate information for continuous learning and adaptation. Additional guidance and criteria should also be developed to help users objectively assess whether data were employed to inform key decisions (e.g., strategic plans, budgets, action plans, etc.).

CONCLUSION

This document summarizes how MEASURE Evaluation has conceptualized, defined, and monitored data use for decision making. The project has expanded the concept of data use beyond the generation of statistics and the review of data, and has articulated the steps necessary for data-informed decision making to take place (i.e., data-informed recommendation for action, decision made, and decision implemented). Although the project has developed tools that capture this definition of data use (e.g., PRISM), it recognizes that measuring data-informed decision making, and especially the programmatic outcomes of data-informed decisions, is difficult because of the complexity of decision-making processes and the often retrospective nature of reporting on governance processes.

MEASURE Evaluation has contributed other approaches to assessing and measuring data use because there has been a gap in some HIS and M&E capacity assessments. These measures aim to capture the process of strengthening data use to improve information systems (such as improving data quality, generating health statistics, and developing information products), and activities to support the use of data for improved health programs (such as the existence of meetings to review and discuss data). MEASURE Evaluation remains committed to enhancing the standards for the measurement of data-informed decision making as new tools and processes are developed in this area.

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APPENDIX A. INDICATORS TO MONITOR THE IMPLEMENTATION OF ACTIVITIES TO STRENGTHEN THE DEMAND FOR AND USE OF DATA

Determinant	Indicator	Level 0	Level 1 - nascent	Level 2 - emerging	Level 3 - robust
Assess & improve data use context	- Assessment implemented - Plan for improvement developed - DDU interventions regularly implemented	- No previous efforts to assess data use - No previous efforts to improve data use	- Previous efforts to assess data use - Previous efforts to improve data use	- Formal assessment implemented with specific data use questions - Action plan developed - Action plan implemented	- Data use interventions implemented regularly as part of the work plan
Engage data users & producers in: - M&E/HIS system development (or improvement) - Data/program review meetings	- Representation of data producers & data users in activities - Regularity of interactions - Discussion/interpretation of data in relation to program improvement	- Limited representation of data users - Limited opportunities for interaction - Limited discussion/ interpretation of data	- Representation of both data users and data producers - Data users and data producers meet semi-regularly/ad hoc to discuss program progress	- Representation of both data producers and data users with ability to make decisions present - Meetings are regularly scheduled but not always held	- Data and information regularly demanded and reviewed and used in decision making - Implementation of recommendations is followed up

Determinant	Indicator	Level 0	Level 1 - nascent	Level 2 - emerging	Level 3 - robust
- Research development & implementation - Policy dialogue - Planning	- Data informed recommendation(s) made - Tools/procedures that facilitate interaction implemented	- No tool/procedure implementation	- Data are presented and discussed at meetings - Recommendations are made based on data	- Relevant data users & data producers invited but do not always attend - Incomplete data presented and discussed - Data informed recommendations sometimes made	
Improve data quality - Accuracy - Timeliness - Completeness	- Data quality assessment tool implemented - Skills building in data entry and data management	- No previous efforts to assess data quality - No electronic data system - Parallel systems exist for data capture	- Ad hoc, unsystematic assessment of data quality - Ad hoc, unsystematic efforts to improve data quality	- Formal, organized data quality assessment (DQA) conducted, action plans developed, and implementation started	- DQA improvements completed and evidence of improvements made - DQA audits regularly conducted (e.g., quarterly) - Evidence of data regularly cleaned, stored securely, and reported

Determinant	Indicator	Level 0	Level 1 - nascent	Level 2 - emerging	Level 3 - robust
Improve data availability (access, synthesis, communication)	- Databases linked / interoperable - Clear guidelines for data sharing exist - Data dissemination and communications plan[5] exists - Information products exist that synthesize information for different audiences - Multidirectional feedback mechanisms in place, based on relevant stakeholders	- Parallel databases - Few individuals can access raw data - No data sharing protocols exist - No data communication plan exists - Little communication beyond donors and government - No formal feedback mechanisms in place	- Plans for linking data have been discussed but no action has taken place - Data communication plan exists - Few communication products exist and are not tailored to audiences - Weak feedback mechanisms - Limited consideration of audiences and/or inappropriate messaging	- Interoperability/ integration plans underway but in pilot phase - Guidelines for data sharing developed but not widely distributed - System for registering new research developed - Communication plan exists and partially implemented - Plan to improve feedback system developed and partially implemented - Information product templates exist	- Primary data systems integrated/ interoperable - Varied data users have access to data -New research regularly tracked - Communication plan fully implemented - Feedback improvement system functioning for internal and external stakeholders - Data regularly shared with targeted audiences in appropriate formats

[5] Document that lays out a strategic process of tailoring messages for specific audiences, i.e., standardized reports generated by the RHIS for identified key target groups; feedback mechanisms and dissemination schedule outlined, by audience.

Determinant	Indicator	Level 0	Level 1 - nascent	Level 2 - emerging	Level 3 - robust
Identify information needs	- Tool/strategy/workshop implemented that generates questions about the program - Key stakeholders involved in identifying information needs (producers and users) - Data-informed strategic plan exists - Actively reviewing and discussing data and identifying opportunities for additional data/ information -Data-informed recommendations made - Data-informed budgets, work plans, policy exist	- Not discussing questions (starting with the data and focusing on reporting) - Insufficient data review/little data interpretation - Decision making does not involve a range of stakeholders - No strategic plan/ strategic plan with no targets	- Program questions/core analyses irregularly identified - Reviewing data but not regularly - Irregular in-depth investigation into issues highlighted by data review - Involvement of stakeholders but inconsistent and with limited stakeholders - Strategic plan with unscientific targets	- Program questions/core analyses regularly identified - Guidelines for data review defined and implemented but not consistently - Opportunities for additional research/data analysis identified - Expanded group of stakeholders involved in data review - Recommendations made based on data but not consistently - Strategic plans based on data review	- Core analysis identified/process for regular inquiry established - Data review process fully functioning -Additional research/analysis regularly conducted - Regularly review of strategic plans - Data gaps addressed either through additional analysis or new research - Regularly engage with stakeholders - Data-informed recommendations acted upon

Determinant	Indicator	Level 0	Level 1 - nascent	Level 2 - emerging	Level 3 - robust
Build capacity in data use core competencies	- Capacity building plan for M&E/DDU - Individuals trained in DDU skills (analysis, interpretation, synthesis, presentation, communication) - Individuals trained in DDU skills (concepts and tools, advocacy, leadership, managing change) - Individuals trained in developing and implementing DDU procedures, guidelines, policies, and support mechanisms - Individual skill level increased	- Have basic M&E skills - No/limited capacity in M&E tasks - No DDU skills - No skills in DDU procedures/policies	- DDU capacity exists but not sufficient (reach/breadth) - DDU skill level is low - No DDU skills	- DDU capacity building plan exists - DDU capacity exists in key staff - DDU skills exist but are insufficient - Some DDU skills transfer (ability of facilitator to replicate DDU training/workshop facilitation)	- DDU capacity and skills exist in all relevant staff (breadth and depth) - DDU skills normative - Regular DDU skills transfer (core set of trainers, more replication)
Strengthen organizational data demand and use infrastructure	- Organizational mission, vision, and strategic plan that reflect DDU	- Have M&E organizational supports (e.g., M&E plan) but do not	- Advocacy efforts implemented to prioritize DDU	- Mission/vision reflect DDU	- Regular, annual budget line items for DDU interventions

Determinant	Indicator	Level 0	Level 1 - nascent	Level 2 - emerging	Level 3 - robust
	- Advocacy efforts to strengthen DDU in the organization implemented - Existence of organizational supports (policies and procedures to support DDU, data review guidelines, guidelines for registering new research, staff DDU roles clarified, regular meetings for data user/producer interaction) - Existence of DDU successes - Incentives for data use exist	include DDU beyond reporting	- One to three DDU organizational supports in place	- Larger-scale advocacy efforts implemented - Four to six organizational supports implemented - Incentives exist for data use	
Communicate data use successes	- Existence of DDU success stories - Existence of data on DDU interventions - Promotion of DDU success stories	None	- Some experience with DDU documented	- Existence of ad hoc M&E efforts to monitor DDU interventions - Ad hoc communication of successes	- Systematic M&E of DDU interventions - Widely disseminate DDU successes to varied audiences in appropriate formats

Determinant	Indicator	Level 0	Level 1 - nascent	Level 2 - emerging	Level 3 - robust
				inside/outside the organization - Recognition of DDU successes by the organization at various levels	

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