

Improving Data Use in Decision Making

An Intervention to Strengthen Health Systems



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Cover photograph by Tom Furtwangler, courtesy of Photoshare, shows a nurse starting her shift on the men's ward at Tambaram Sanatorium near Chennai, India.

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Introduction

Health systems strengthening has become a top priority of many global and national health agendas as a way to improve health outcomes. With the global health context becoming increasingly complex, national health systems are beginning to move away from a focus on disease-specific health responses to comprehensive strengthening of health systems. The global community agrees that without a systems approach, population health outcomes will not further improve and health related development goals such as the United Nation's Millennium Development Goals (MDGs) for 2015 will not be met (Reich, Takemi, Roberts & Hsiao, 2008; Singh, 2006).

The World Health Organization (WHO)'s framework for health systems strengthening identifies six attributes of a health system (WHO, 2007). The attributes, or building blocks, include a health workforce; health services; health financing; governance and leadership; medical products, vaccines, and technologies; and health information. While each building block of the WHO framework is important to improving health systems and ultimately health outcomes, quality and timely data from health information systems are the foundation of the health system and inform decision making in each of the other five building blocks of the health system (AbouZahr & Boerma, 2005). For example, for a workforce to be trained and deployed in adequate numbers to deliver quality services, information about disease burden, the geographic distribution of target groups, and available infrastructure and commodities is necessary. Health systems require quality data from health information systems to plan for and ensure that the workforce is fully funded and equipped with the necessary commodities, infrastructure, resources, and policies to deliver services. Health data are, in and of themselves, prerequisites to improving each of the other five building blocks.

This paper will discuss the unique role of health data in strengthening the other five building blocks of health systems; define specific interventions to strengthen the use of data in decision making; and provide a framework for developing, monitoring, and evaluating interventions to improve the use of and demand for data (see figure A). The overall aim of the paper is to articulate specific interventions that can improve the demand for and use of data in decision making so that improvements in the other health building blocks can be realized.

Health Information Systems and Data Use

Health information systems (HIS) are comprised of six components: health information system resources, indicators, data sources, data management, information products, and dissemination and use (Health Metrics Network, 2008b). This paper focuses on the demand for and use of data as captured in various data sources. Common data sources in HIS include data from population-based surveys and civil registers, and from the operations of institutions that deliver health services, most commonly health facilities. Health data sources also capture data generated through the administrative, management, and logistical process of those institutions that support the delivery of

health services (e.g., labor, finances, and commodities). Data sources from sectors that also affect health (for example, food and agriculture); and those organizations that report select health outcomes (for example, police) are also rich sources to that can inform decision making (Health Metrics Network, 2008a). Different data sources have different levels of importance to each health system building block. For example, human resources data sources are important to health workforce decision making, while commodities data sources are important in making decisions about logistics, and facility data sources are important for service delivery decision making.

In this paper we discuss the ‘use’ of data as the analysis, synthesis, interpretation, and review of data for data-informed decision-making processes, regardless of the source of data. ‘Data-informed decision making,’ then, refers to the proactive and interactive processes (Patton, 2008) that consider data during program monitoring, review, planning, and improvement; advocacy; and policy development and review. By these definitions, it is clear that data use goes beyond filling out data reporting forms at the various levels of a national health information system and the passive dissemination of reports and information products.

Recent years have witnessed significant commitments to and investments in the strengthening of information systems. Calls to action, consortia, and guiding frameworks have been developed to guide the role of information in health systems strengthening as evidenced by the commitment in 2005 to the Paris Declaration; the creation of the Health Metrics Network in 2005; the crafting of the World Health Organization’s Framework for Action; the Strengthening Health Systems to Improve Outcomes in 2007; and the restructuring of the U.S. response to global health with the U.S. Global Health Initiative, which calls for “strengthening existing public health surveillance and other data collection systems for monitoring diseases, conditions, health service provision, and health outcomes” (U.S. Global Health Initiative, 2011) as part of an integrated approach to strengthen health systems. These commitments are based on the understanding that by improving information systems the quality, relevance, and comprehensiveness of data will improve leading to an increased use of data and data-informed decision making. Positive experiences using data in turn contribute to a demand for additional data and a continued commitment to improving the quality of data and continued data use. The relationship of improved information, demand for data, and continued data use creates a cycle that leads to improved health programs and policies. (Foreit, Moreland & LaFond, 2006).

Given these recent investments in information systems globally, there is increasing interest in understanding how improving health information ultimately improves health outcomes. Architects of information systems stress the central role of data for decision making (as presented in the Joint United Nations Programme on HIV/AIDS (UNAIDS) publication *Organizing Framework for a Functional National HIV Monitoring and Evaluation System* [UNAIDS Monitoring and Evaluation Reference Group, 2008]); however, it is the lack of use of quality data in the decision-making process where this causal chain is breaking down.

Improving health information systems will lead first to outputs of higher quality and timely data. Then those data must be used to improve the functioning of the five other building blocks—health services, the workforce, medical supplies, financing, and leadership—to finally affect service delivery and health outcomes. However, too often data sit in reports, on shelves, or in databases and are not sufficiently used in program development and improvement, policy development, strategic planning, or advocacy. Part of the reason for the breakdown in the process is the complex nature of the causal pathway between the collection of data and how it affects health outcomes. Health information systems are inherently complex and the outputs of health information systems (quality data) are not proximately related to improved service delivery (Hotchkiss, Diana & Foreit, 2012). The output of improving the health workforce, for example, is directly related to improvements in service quality and coverage, while the output of improved information systems is higher quality and timely data. The complexity of how organizations are contributing to and using HIS (Braa, Hanseth, Heywood, Mohammed & Shaw, 2007), of decision-making processes, of the flow of information, and of the time lag between the availability of data and use of data and the eventual changes in services and health outcomes all contribute to a breakdown in the causal pathway and an underutilization of data in decision making (Harrison & Nutley, 2010; Hotchkiss et al., 2012). The existence of quality data is insufficient to ensure use (AbouZahr & Boerma, 2005) because data use has not been adequately integrated into decision-making processes and the information needs of decision makers are often not adequately represented in data collection efforts (Lomas, 1997).

Conceptual Framework and Logic Model

One of the objectives of this paper is to define interventions and describe them within a framework in order to improve the use of data in the decision-making process. The paper builds on the framework that Aqil and colleagues (Aqil, Lippeveld, & Hozumi, 2009) developed to improve routine health information systems. That framework, called the Performance of Routine Information System Management (PRISM), identifies three interrelated components that are necessary to improve routine information systems and the use of the data they generate. The three components include technical, behavioral, and organizational elements. The technical component refers to systems such as data collection processes, systems, and methods. The behavioral component refers to the behaviors of data users and how data are used for problem solving and program improvement. The organizational component refers to the structure and processes of the organizations that use the resulting information. The authors note that specific technical, behavioral, and organizational activities need to be implemented to improve demand for, analysis, review, and use of health data in decision making.

To build on this effort, this paper provides a conceptual framework (figure A) and logic model (figure B) that list the specific interventions that can improve the demand for and use of data from all health information data sources. This paper also focuses specifically on those interventions that most directly affect the demand for and use of data. These interventions include:

- assessing and improving the data use context
- engaging data users and data producers
- improving data quality; improving data availability
- identifying information needs
- building capacity in data use core competencies
- strengthening the organization’s data demand and use infrastructure
- monitoring and evaluating
- communicating data demand and use successes.

Specifically, the conceptual framework represented by figure A demonstrates how information systems improve the other health system building blocks. It outlines the underlying assumptions and activities that are necessary to achieve the desired outcome of increased data-informed decision making. The framework also conceptually illustrates how increased data use leads to improved services and health outcomes. The framework is based on the assumptions of:

- an existing commitment at the national level to health information systems improvement (functioning information systems are necessary to produce data for use in decision making; thus, for improvements in data demand and use to occur, concurrent efforts to improve information systems are fundamental);
- an increased use of data in decision making that leads to improved health systems functioning;
- positive experiences using data leads to demand for additional data and improved health information systems thus a continued cycle of data use; and
- tailoring activities to improve data demand and use for national and subnational levels, as the decision-making contexts in which they play out will be different.

The logic model represented in figure B and expanded in table 1 lists the specific activities that MEASURE Evaluation has identified as critical to affect the technical, behavioral, and operational determinants of data-informed decision making. The activities draw upon inputs that are necessary for a health information system to function. The Health Metrics Network defines these inputs as “the legislative, regulatory and planning frameworks required to ensure a fully functioning health information system, and the resources that are prerequisites for such a system to be functional. Such resources involve personnel, financing, logistics support, information and communications technology, and coordinating mechanisms within and between the six components of a health information system” (Health Metrics Network, 2008b). Efforts to improve the demand for and use of information will only be successful if these efforts are implemented within a health information system that is functioning or in the process of being strengthened. For this reason, we have also included indicators, data sources, and data management as inputs into our logic model, while the Health Metrics Network defines them as processes in health information systems.

The logic model (figure B) provides a framework for implementing, monitoring, and evaluating interventions to improve the demand for and use of data in decision making. By linking outcomes to specific activities the logic model provides a clear causal pathway of how investments in activities to improve the demand for and use of data result in improved data-informed decision making, an improved health system, improved health outcomes, and additional demand for quality data in decision making. Table 1 defines the activities to strengthen data use in more detail so that outputs and outcomes can be translated into indicators to evaluate the effect of activities to strengthen data demand and use. For data demand and use activities to be supported and funded, data on their effectiveness in terms of increasing the demand for and use of data is critical.

Strengthening the Demand for and Use of Data

The activities to strengthen data demand and use listed in the conceptual framework and logic model focus on the following areas:

- *Assessing and improving the data use context* – Factors that inhibit the use of data vary between countries, organizations, levels of the health system, and facilities. Assessment of the organizational, technical, and behavioral factors that affect decision making is necessary to diagnose where to intervene with activities to improve demand for and use of data. Most assessments of health system functioning, with the exception of PRISM tools, assess information dissemination and use (Aqil et al., 2009; Health Metrics Network, 2008a; UNAIDS Monitoring and Evaluation Reference Group, 2010) but fall short of in-depth analyses of the organizational and behavioral factors that affect the role of data and information in decision making. This information is needed to comprehensively improve data-informed decision making.
- *Identifying and engaging data users and data producers* – Efforts to collect, analyze, synthesize, interpret, and use data in decision making may be done by the same person, but are more commonly addressed by people in different job functions, at different levels of the health system that have varying levels of understanding about each other's work. The lack of interaction between individuals who design, implement, and manage research and information systems – the data producers – and professionals who use data in program improvement and development – the data users – contributes to the breakdown in the decision-making cycle (Lomas, 1997; Lomas, 2007). When data users and data producers work together, they become more aware of the data collection processes and methods, the available data sources, and the quality of those data. They have the opportunity to address barriers to data use and improve the sharing of data resources. They can also discuss concerns and seek clarification about the data collection process (Patton, 2008), and identify key programmatic questions and link these questions to the data available in their settings. They can jointly analyze and interpret data to answer programmatic questions. In this context, ownership of data is built so that, when data-informed decisions are made, the necessary buy-in exists to move the

decisions forward. By first understanding who your data users and producers are, and then linking them to each other's work, the information cycle is strengthened and the value of data in relation to program improvement becomes clear (Berg, 2001; Blanchard & Aral, 2011; Koon, Nambiar, & Rao, 2012; Lomas, 1997; Lomas, 2007; Patton, 2008).

- *Improving data quality* – For consistent data use to occur, data need to be of high quality so that data users are confident that the data they are consulting are accurate, complete, and timely. Without quality data, data-informed decision making will not occur and program efficiency and effectiveness will suffer (Mavimbe, Braa, & Bjune, 2005). In addition, when data quality is poor the demand for data drops, thus crippling the cycle of data-informed decision making even further (Braa, Heywood, & Sahay, 2012; Foreit et al., 2006). Data quality protocols need to be developed, communicated, and implemented, as well as training and retraining of health professionals on data quality techniques and approaches.
- *Improve data availability (synthesis, communication, access)* – Ensuring that data are understood by potential users requires that data be synthesized and disseminated in formats that are targeted to the individual and organizational contexts in which they are intended to be used. Data users have different information needs, need information at different levels of detail and complexity, have different intensities of interest, and have different roles in the decision-making process (Davies, Hodge, Aumua, Malik, & Lee, 2011). All of these factors need to be taken into account when data are synthesized and communicated into information products for stakeholders at the different levels of the health system. Making data available through the development of targeted information products that respond to specific data users' information needs is important (Aqil et al., 2009). Well-designed information systems often include information technology infrastructure, policies, and report templates to support the communication of synthesized data through dissemination and feedback techniques. What is often underdeveloped in these systems is the availability for data users to be able to access and share data easily that may not be part of the regular dissemination process. This issue becomes more apparent when data users seek to access data that are not part of the routine HIS. The consideration of data synthesis, communication, and access all need to be improved to support the use of the information in decision making (Aqil et al., 2009).
- *Identifying information needs* – Information systems are developed to meet the needs of multiple data users throughout a health system. Because of the many types of data users that access information systems and their diverse needs, the resulting data may not necessarily respond to the specific information needs of all data users (Davies et al., 2011). Moreover, the vast amount of information may be overwhelming to the potential users who are ill equipped to navigate the data resources available to them. To facilitate data use, a focus needs to be placed on what stakeholders need to know to effectively run health programs instead of what data are available to them. In addition, data producers that focus on the practical questions data users have about their programs and the upcoming decisions that they have to make, are able to hone in on the specific data that

will inform relevant questions and decision-making processes (Devadason & Lingam, 1997; Koon et al., 2012; Patton, 2008). In other words, those who design information systems and collect data through research also need to focus on collecting information that is directly linked to decision making by targeting the ‘need to know’ rather than the ‘nice to know.’

- *Building capacity in data use core competencies* – To improve sustainable demand for and use of data in decision making individual capacity in core competencies to demand and use data must exist at all levels of the health system. Competencies include skills in data analysis, interpretation, synthesis, and presentation, and the development of data-informed programmatic recommendations. For data producers, these competencies should be built as part of standard monitoring and evaluation (M&E) training or basic research training, but often training programs have a short-term perspective (one to four weeks) with limited follow up. Skills are not fully developed and newly trained professionals are under-equipped to apply their new skills in the work setting (Clotteau, Boily, Darboe, & Martin, 2011). M&E and research capacity building programs also tend to place a greater focus on developing and managing M&E systems and research studies with little or no pedagogic emphasis on interpreting data and using them in decision making. Moreover, the target audience for M&E and research training is the data producer. Data users often struggle with an underdeveloped ability to understand analyses and interpret them in the programmatic context. This population also needs to be targeted with training in how to analyze, critically review, and interpret data and understand what data they need and when so they can demand data. Moreover, for data-informed decision making to become normative and sustained, funding will be needed to implement and sustain the interventions outlined in this paper. Training in leadership and advocacy skills is critical to equip managers to leverage the funding and buy-in needed to implement and sustain interventions to improve demand for and use of data.
- *Strengthening organization’s data demand and use infrastructure* – The effectiveness of an organization, is directly linked to the performance of its employees (Michie & West, 2004). As outlined by Aqil and colleagues, data users and producers function in an organizational context (Aqil et al., 2009). The organization is governed by rules, processes, values, and systems. These rules, processes, values, and systems have the ability to support or hinder an individual’s ability to use data in decision making (Aqil et al., 2009). For example, an organization that has structures and processes for improving the interaction of data users and producers, providing clear guidelines for data quality processes, and defining roles and responsibilities related to using data will strengthen other interventions put in place (such as those outlined in this paper) to improve data-informed decision making. An organization that has a guiding strategy and mission that clearly supports data-informed decision making will be better positioned to support data-informed decision making. Policies and standard operating procedures that govern how work is accomplished should clearly state the role and value of data in organizational functioning. Human resource documents should specify employee roles and responsibilities for data use. Management tools should be institutionalized that enable

and facilitate employees to use data. By addressing organizational systems, such as those just mentioned, potential barriers to data use can be overcome and data-informed decision making can be improved and sustained.

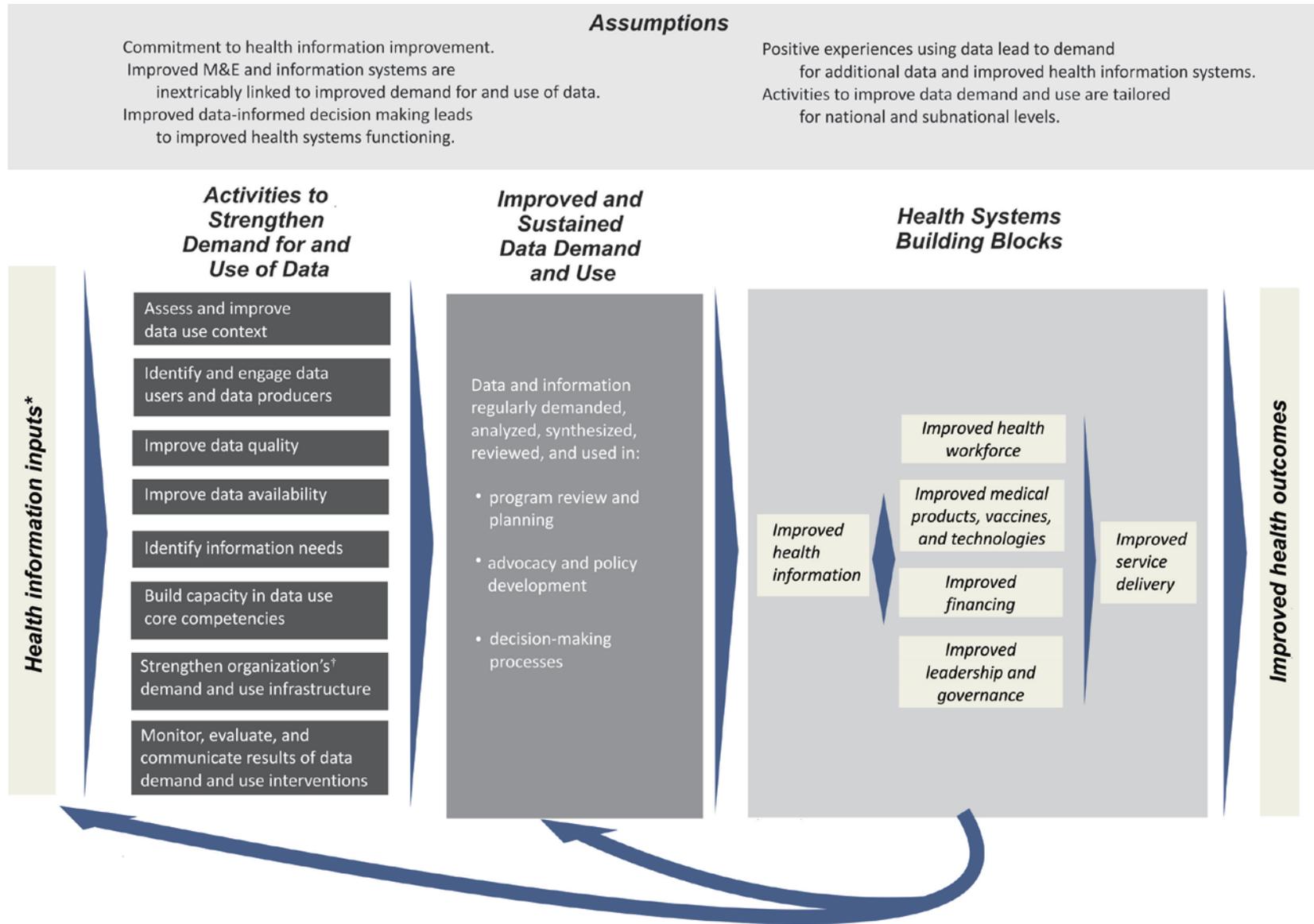
- *Monitoring, evaluating and communicating results of data demand and use interventions* – In order for stakeholders and decision makers to use data in decision making, they need to place value on data (Lavis, Lomas, Hamid, & Sewankambo, 2006). This value can be built through a positive experience using information to support a decision, through training or through exposure to positive messages about the benefits of using data in the decision-making process (Foreit et al., 2006). The higher the value the data user puts on data-informed decision making, the more likely they are to use data. Regular use of data in decision making generates demand for quality data and the reinforcement of data-informed decision making processes. Through the evaluation of data demand and use interventions and the communication of data demand and use successes, the knowledge base is built for substantiating investments in interventions to strengthen data demand and use.

Summary and Conclusions

This paper stresses the central role that health information systems play in strengthening health systems while at the same time underscores the insufficient reliance on data in health decision making. The lack of demand for and use of data limits the health system's ability to respond to priority needs throughout its many levels. The failure to consider empirical evidence regularly before making program and policy decisions is due primarily to the complex causal pathway between data collection, its use, and improvement in health outcomes. Further, specific and comprehensive guidance to improve data demand and use is lacking. This paper fills this gap by providing specific recommendations for how to improve data-informed decision making by suggesting domains of interventions, activities, actors, tools, and resources to involve in the process in each step. The eight activity areas listed in the conceptual framework and the further detail provided in the logic model provide a comprehensive roadmap for how to design, monitor, and evaluate interventions to improve the demand for and use of data in decision making.

More experience is needed applying the comprehensive framework in different contexts. The factors influencing demand for and use of data are dependent on the local context and specific needs. It is probable that all of the activity areas discussed in this paper may not need to be implemented as part of an intervention to improve the demand for and use of data; and that other activity areas not listed here, will be relevant instead. Moreover, the relative importance of each activity area is unknown, as is the level of intensity of each activity area. Nonetheless, this conceptual framework and logic model contribute to the literature on comprehensive approaches to improving the use of data in decision making.

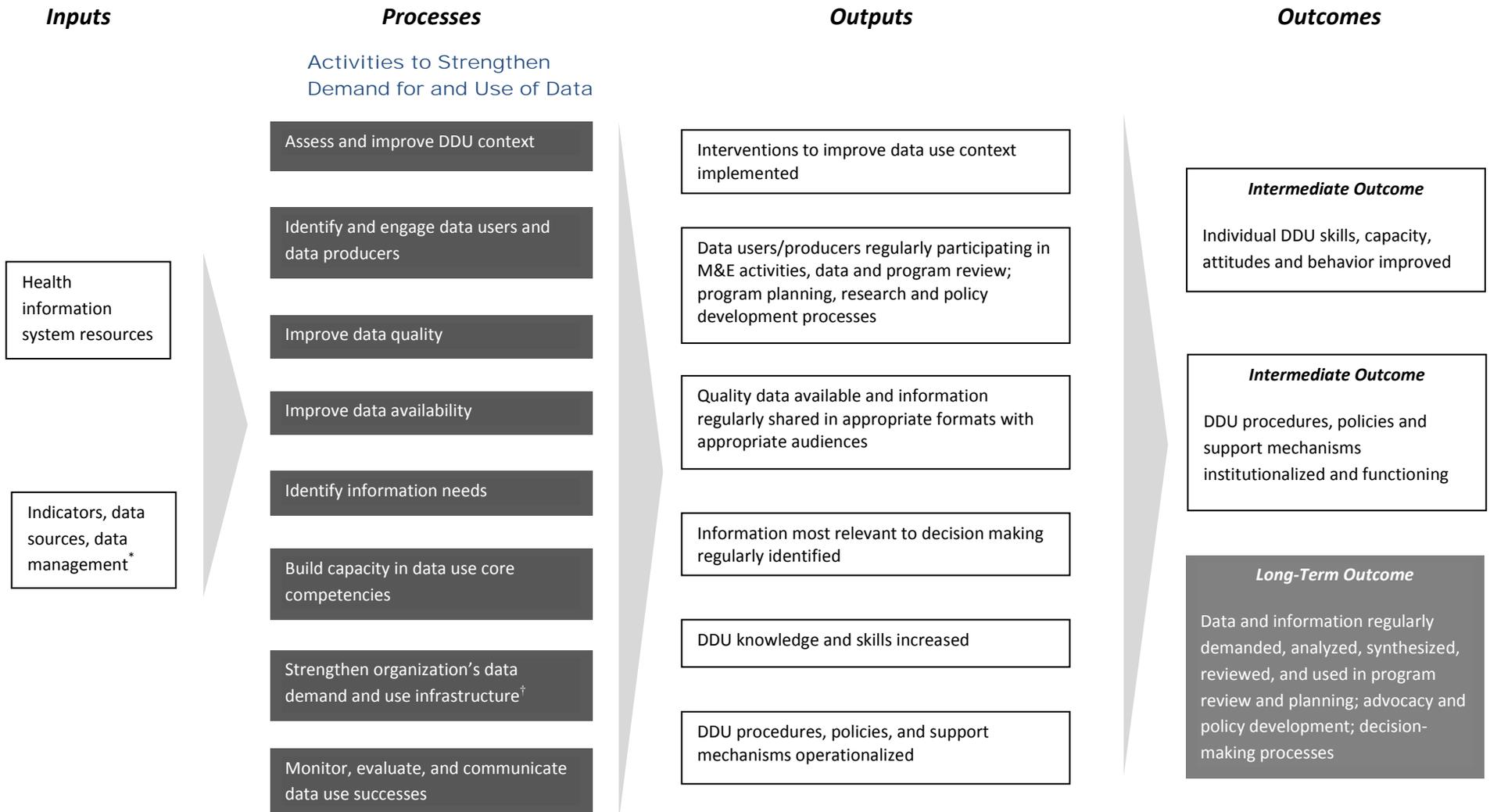
Figure A: Conceptual framework – the role of data use activities in health systems strengthening.



* Defined as processes by Health Metrics Network.

† The data demand and use approach broadly defines an organization as a division of the ministry of health at the national, state, or district-levels; a specific program within the ministry; or nongovernmental organization or program.

Figure B: Logic model for strengthening the use of health information in decision making.



* Defined as processes by Health Metrics Network.

† The data demand and use approach broadly defines an organization as a division of the ministry of health at the national, state, or district-levels; a specific program within the ministry; or nongovernmental organization or program.

Table 1: Detailed Logic Model for Strengthening the Use of Health Information in Decision Making

The detailed logic model shown in this table provides an expanded view of figure B. Outcomes are represented on a continuum with the intermediate outcomes occurring before the longer term outcomes, listed in the final column. Specific inputs, listed first, are necessary to support the implementation of the activities. The activities listed are not exhaustive. They represent activities that have been observed by MEASURE Evaluation to result in the use of data in decision making. The detail provided here will assist in the development of interventions, and the monitoring and evaluation of activities, to strengthen the demand for and use of data in decision making.

Health Information INPUTS*	
Health Information System Resources:	Legislative, regulatory and planning frameworks; personnel and financing resources; logistics support; information and communication technology; coordinating mechanisms
Indicators:	A core set including related targets
Data Sources:	Population-based, institution-based, and other sources
Data management:	Data collection, storage, quality-assurance, flow, processing, compilation, analysis

* This paper considers indicators, data sources, and data management as health information inputs whereas the Health Metrics Network considers them processes.

ACTIVITY	MEASURE Evaluation TOOL/PRODUCT	OUTPUT	Intermediate OUTCOMES	Long-Term OUTCOMES
<i>Assess and improve data use context</i>				
<ul style="list-style-type: none"> • Assess individual data use skills, behaviors, and organizational capacity to support data use • Assess barriers to data use • Assess information flow • Assess data quality • Assess stakeholders and their roles in strengthening the 	<ul style="list-style-type: none"> • PRISM • Assessment of Constraints to Data Use Tool, PRISM • Information Use Map, PRISM • Data Quality Assessment Tool, 	<ul style="list-style-type: none"> • Plans to overcome barriers to data use developed • Interventions to improve data use context implemented 	<ul style="list-style-type: none"> • Barriers to data use overcome 	<ul style="list-style-type: none"> • Data and information regularly demanded, analyzed, synthesized, reviewed, and used in: program review and planning/advocacy and policy development/decision-making processes.

ACTIVITY	MEASURE Evaluation TOOL/PRODUCT	OUTPUT	Intermediate OUTCOMES	Long-Term OUTCOMES
demand for and use of data <ul style="list-style-type: none"> Develop and implement plans to overcome barriers to data use and improve data use context (illustrative activities outlined in the following sections) 	Routine Data Quality Assessment Tool, PRISM <ul style="list-style-type: none"> Stakeholder Engagement Tool 			
<i>Identify, engage, and involve data users and data producers</i> In HMIS and M&E activities, data and program review; program planning, research and policy development processes				
<ul style="list-style-type: none"> Assess and identify stakeholders & define their level of involvement Ensure data user participation in M&E and information system development and improvement processes Ensure data users and producers participate in: program planning and monitoring, policy development processes and research process Include data users in M&E and research training Convene working groups/workshops to regularly review data and program progress and to identify programmatic questions/data needs Develop organizational guidance for data user and producer engagement 	<ul style="list-style-type: none"> Stakeholder Engagement Tool Framework for Linking Data with Action, Information Use Map Framework for Linking Data with Action Integrating Data Demand and Use into a Monitoring and Evaluation Training Course: A Training Tool Kit. Conducting High Impact Research 	<ul style="list-style-type: none"> Stakeholder Engagement Tool implemented regularly Data users and producers regularly participating in M&E activities, data and program review; program planning, research and policy development processes Research, M&E & information systems informed of priority data needs Data gaps identified Data users knowledge increased in M&E 	<ul style="list-style-type: none"> Data and information regularly shared in appropriate formats with appropriate audiences Individual attitudes and behavior about the value or investing time in identifying information needs, collecting, reviewing and using data improved 	<ul style="list-style-type: none"> Data and information regularly demanded, analyzed, synthesized, reviewed, and used in: program review and planning; advocacy and policy development; decision-making processes

ACTIVITY	MEASURE Evaluation TOOL/PRODUCT	OUTPUT	Intermediate OUTCOMES	Long-Term OUTCOMES
<i>Improve data quality</i>				
<ul style="list-style-type: none"> • Routinely assess data quality • Build skills in data entry, data management, data quality assessment • Use data in decision making to identify areas of data quality weakness • Conduct training on the value of data in decision making • Develop data quality standard operating procedures 	<ul style="list-style-type: none"> • Data Quality Assessment tool, Routine Data Quality Assessment tool • Data Demand and Use Concepts and Tools: A Training Tool Kit 	<ul style="list-style-type: none"> • Plans to overcome poor data quality developed • Interventions to improve data quality implemented 	<ul style="list-style-type: none"> • Quality data regularly available 	<ul style="list-style-type: none"> • Data and information regularly demanded, analyzed, synthesized, reviewed, and used in: program review and planning; advocacy and policy development; decision-making processes
<i>Improve data availability</i> Access, synthesis, communication				
<ul style="list-style-type: none"> • Link databases, improve database interoperability • Develop a data dissemination and communication plan • Develop information products that synthesize information into easily understandable formats for different target groups • Develop multi-directional feedback mechanisms for data and information sharing • Develop a national system for registering new research, 	<ul style="list-style-type: none"> • Information Use Map 	<ul style="list-style-type: none"> • Databases interoperable • Communication methods and materials that respond to specific audiences and their information needs developed 	<ul style="list-style-type: none"> • Individual data demand and use attitudes about value of investing time in identifying information needs, collecting, reviewing and using data improved • Data and information 	<ul style="list-style-type: none"> • Data and information regularly demanded, analyzed, synthesized, reviewed, and used in: program review and planning; advocacy and policy development; decision-making processes

ACTIVITY	MEASURE Evaluation TOOL/PRODUCT	OUTPUT	Intermediate OUTCOMES	Long-Term OUTCOMES
communicating findings, storing data			regularly shared in appropriate formats with appropriate audiences	
<i>Identify information needs</i>				
<ul style="list-style-type: none"> • Apply the Framework for Linking Data with Action tool • Identify upcoming decisions and questions needed to monitor, evaluate and plan programs • Link decisions and questions to existing data sources, identify data gaps 	<ul style="list-style-type: none"> • Framework for Linking Data with Action 	<ul style="list-style-type: none"> • Priority programmatic and policy questions/decisions linked with data • Quality data and information most relevant to decision making linked with questions/decisions • Data gaps identified • Indicators harmonized 	<ul style="list-style-type: none"> • Individual attitudes and behavior about the value or investing in identifying information needs, collecting, reviewing and using data improved • Data and information regularly shared in appropriate formats with appropriate audiences 	<ul style="list-style-type: none"> • Data and information regularly demanded, analyzed, synthesized, reviewed, and used in: program review and planning; advocacy and policy development; decision-making processes

ACTIVITY	MEASURE Evaluation TOOL/PRODUCT	OUTPUT	Intermediate OUTCOMES	Long-Term OUTCOMES
Build capacity Through training, technical assistance, coaching				
<ul style="list-style-type: none"> • Apply data demand and use concepts and tools • Analyze data • Interpret data • Synthesize data • Present data & information • Communicate data & information • Lead & advocate for data use activities • Apply and implement data demand and use procedures, guidelines, policies and support mechanisms • Manage change around adopting a culture of data use 	<ul style="list-style-type: none"> • Data Demand and Use Concepts and Tools: A Training Tool Kit • Introduction to Basic Data Analysis and Interpretation for Health Programs: A training tool kit • Conducting High Impact Research • Using Data to Improve Service Delivery: A training tool kit for pre-services nursing education • Data Demand and Use an on-line course • Data Use for Program Managers 	<ul style="list-style-type: none"> • Data demand and use knowledge increased 	<ul style="list-style-type: none"> • Individual data demand and use skills, capacity, attitudes and behavior improved • Leadership for data demand and use improved • data demand and use procedures, policies and support mechanisms institutionalized and functioning • Data and information regularly shared in appropriate formats with appropriate audiences 	<ul style="list-style-type: none"> • Data and information regularly demanded, analyzed, synthesized, reviewed and used in: program review and planning; advocacy and policy development; decision-making processes

ACTIVITY	MEASURE Evaluation TOOL/PRODUCT	OUTPUT	Intermediate OUTCOMES	Long-Term OUTCOMES
<i>Strengthen organizational data demand and use infrastructure</i>				
<ul style="list-style-type: none"> • Strengthen organization’s mission and vision statements to reflect on data demand and use • Advocate for dedicated data demand and use funds and activities • Institutionalize working groups to review data & program progress and to identify programmatic questions/data needs • Develop organizational guidelines and recommendations for data user and producer engagement in M&E activities, data and program review, program planning, research, and policy development processes • Develop organizational procedures and policies for: cleaning, managing, storing and sharing data • Develop national guidelines and protocols for registering new research • Develop organizational procedures & policies for sharing, storing, reviewing and using data • Revise job descriptions to 		<ul style="list-style-type: none"> • Interventions to improve data use context implemented • data demand and use procedures, policies & support mechanisms developed • Data users/producers regularly participating in M&E activities, data & program review; program planning, research and policy development processes • Quality data and information most relevant to decision making regularly identified and available • Data gaps identified • Communication methods and materials developed 	<ul style="list-style-type: none"> • Data demand and use activities present and funded in work plans • Organizational data demand and use procedures, guidelines, policies and support mechanisms developed, institutionalized and used • Data and information regularly shared in appropriate formats with appropriate audiences 	<ul style="list-style-type: none"> • Data and information regularly demanded, analyzed, synthesized, reviewed, and used in: program review and planning; advocacy and policy development; decision-making processes

ACTIVITY	MEASURE Evaluation TOOL/PRODUCT	OUTPUT	Intermediate OUTCOMES	Long-Term OUTCOMES
clarify data use roles <ul style="list-style-type: none"> • Develop & implement data use supportive supervision tools (supervision checklist, coaching guides, job aids) • Strengthen organizational data feedback mechanisms 				
<i>Monitor, evaluate, and communicate data demand and use successes</i>				
<ul style="list-style-type: none"> • Monitor and evaluate data demand and use interventions • Document data demand and use successes (via case studies, factsheets, publications, video, etc.) to use in advocacy efforts for additional interventions & funding • Develop data demand and use advocacy materials • Widely disseminate data demand and use successes to varied audiences in appropriate formats 	<ul style="list-style-type: none"> • Logic Model for Strengthening the Use of Health Information in Decision Making 	<ul style="list-style-type: none"> • Communication and advocacy materials on benefits of investing in data demand and use developed • Data demand and use knowledge increased 	<ul style="list-style-type: none"> • Data demand and use success stories regularly shared in appropriate formats with appropriate audiences • Attitudes toward value of data demand and use improved 	<ul style="list-style-type: none"> • Data and information regularly demanded, analyzed, synthesized, reviewed, and used in: program review and planning; advocacy and policy development; decision-making processes

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