

Mapping a Path to Improve Uganda's Health Information System

Using the Stages of Continuous Improvement Toolkit

Workshop Report

February 2019



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MEASURE Evaluation
University of North Carolina at Chapel Hill
123 West Franklin Street, Suite 330
Chapel Hill, North Carolina 27516
Phone: +1 919-445-9350
measure@unc.edu
www.measureevaluation.org

This publication was produced with the support of the United States Agency for International Development (USAID) under the terms of the MEASURE Evaluation cooperative agreement AID-OAA-L-14-00004. MEASURE Evaluation is implemented by the Carolina Population Center, University of North Carolina at Chapel Hill in partnership with ICF International; John Snow, Inc.; Management Sciences for Health; Palladium; and Tulane University. Views expressed are not necessarily those of USAID or the United States government. WS-19-52



ACKNOWLEDGMENTS

We thank Dr. Sarah Byakika, Caroline Kyoziira, Jamiru Mpiima, and Nathan Lubowa, all of the Ministry of Health of Uganda, for their facilitation of the assessment tool's initial implementation and for their feedback and guidance on the tool and the text of this report. We also thank all workshop participants for their valuable contributions to the assessment process and feedback on the tool.

The HIS Stages of Continuous Improvement tool was developed by Manish Kumar, Abby Cannon, and Liz Millar, of the United States Agency for International Development (USAID)-funded MEASURE Evaluation, and Xenophon Santas and James Kariuki of the United States Centers for Disease Control and Prevention (CDC), in collaboration with the Health Data Collaborative Digital Health and Interoperability working group. We thank Tom Oluoch of the CDC and Alex Tumwesigye, of John Snow, Inc., for their contributions to the assessment process and adaptation of the tool to this context.

We thank MEASURE Evaluation's knowledge management team for editorial, design, and production services.

We thank USAID for its support of the assessment workshop and publication.

Suggested citation:

MEASURE Evaluation. (2019). Mapping a Path to Improve Uganda's Health Information System Using the Stages of Continuous Improvement Toolkit. Workshop Report. Chapel Hill, NC, USA: MEASURE Evaluation, University of North Carolina.

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ABBREVIATIONS

| | |
|------|--|
| CDC | United States Centers for Disease Control and Prevention |
| DHI | Division of Health Information |
| HDC | Health Data Collaborative |
| HIMD | Health Information Management Division |
| HIS | health information system(s) |
| ICT | information and communication technologies |
| M&E | monitoring and evaluation |
| MOH | Ministry of Health |
| SOCI | Stages of Continuous Improvement |
| TWG | technical working group |

SUMMARY

A strong health information system (HIS) gets the right data in the right hands at the right time, enabling effective decision making to strengthen health systems and improve health outcomes. To strengthen a country-level HIS, the first step is to assess what gaps exist and what actions are needed to improve the HIS to better meet the health system's information needs. Uganda's Ministry of Health (MOH) is committed to ongoing strengthening efforts in HIS coordination and governance, especially through the development of an HIS strategic framework.

To develop a framework for the HIS, the MOH carried out an assessment to describe the status of the country's HIS and map a path forward. The assessment enabled key stakeholders to determine elements of the HIS that need attention and priorities for progress to an HIS that is well-equipped to meet Uganda's health information needs.

The MOH wanted to better understand essential components of HIS strengthening, determine the status of the country's HIS, and identify the desired or goal status of the HIS across each essential component. Thus, a leadership team representing the ministry and supported by the United States Agency for International Development (USAID)-funded MEASURE Evaluation implemented the HIS Stages of Continuous Improvement (SOCI) Toolkit.¹ Key stakeholders gathered for a two-day workshop to apply the tool to the HIS. They used the results to design a road map of actions needed for the HIS to progress. In mid-2019, Uganda will share an HIS strategy that will complement the 2018 eHealth strategy and provide a framework for the country's HIS, moving forward. The process has been and will continue to be guided by the HIS/Data Management thematic technical working group (TWG) of the MOH and MOH leadership, through the Division of Health Information and Planning Department.

¹ The HIS SOCI Toolkit was collaboratively developed by the Health Data Collaborative Digital Health and Interoperability Working Group, MEASURE Evaluation, and the United States Centers for Disease Control and Prevention. It is available here: <https://www.measureevaluation.org/his-strengthening-resource-center/his-stages-of-continuous-improvement-toolkit/>.

BACKGROUND

Strong HIS can play a critical role in building strong health systems to achieve better health outcomes.² A strong HIS gets the right information in the hands of the right people at the right time, enabling informed choices about patient care, health program planning, and resource allocation. However, the process of building and improving an HIS is rarely linear and understanding of what combinations of interventions improve HIS performance has been limited.

Uganda's health sector has made great strides in strengthening HIS coordination and governance, through its TWGs. Despite this effort, challenges remain in coordination of data to facilitate comprehensive, evidence-based decision making. To address this, Uganda's MOH recognized a need to identify gaps in and challenges with the HIS in order to develop a strategy for improvement. The intended strategy would complement the existing National eHealth Policy and Strategy, as well as the Sector Monitoring and Evaluation Plan.

Uganda is committed to applying and using globally developed and recommended assessment tools. In June 2018, the MOH led an "interoperability maturity" assessment workshop,³ to help prioritize investments toward achieving interoperable data systems. The next step was to conduct a more holistic assessment, to consider the status of the broader HIS framework, encompassing all HIS processes, people, and capabilities.

Uganda's MOH had the following objectives for the workshop:

- To describe the current state of the HIS in Uganda at all levels
- To establish a baseline and follow-up evaluation of the HIS that will be comparable over time
- To establish the key issues and challenges facing the HIS
- To use assessment findings to inform the development of an HIS strategic framework and mobilize resources for its implementation

² WHO Resolution WHA58.28 eHealth

³ <https://www.measureevaluation.org/resources/publications/fs-18-275/>

ASSESSMENT PROCESS

Development of the Tool

The call from Uganda’s MOH to conduct a broader assessment of the HIS corresponded with the recognized global need for such a tool in the digital health community. The HIS SOCI tool was jointly developed by the United States Centers for Disease Control and Prevention (CDC), the Health Data Collaborative (HDC) Digital Health and Interoperability working group, and the USAID-funded MEASURE Evaluation. The tool was developed to respond to a demand voiced through the HDC for a way to take a broad and holistic approach to HIS strengthening. The tool was developed jointly through efforts coordinated by the HDC Digital Health and Interoperability working group, in order to identify key elements of HIS strengthening, assess the status of the HIS, and identify gaps and priorities to inform a road map.

The tool measures current and desired HIS status in five HIS core domains across 39 subcomponents. The status is measured across five stages: emerging, defined, repeatable, managed, and optimized. This method draws from the maturity model approach developed in the business and information technologies industries and initially used for quality improvements related to software. This stages model offers a relatively simple way of describing the progression toward higher capabilities in terms of process, people, technology, and organizational capabilities. Progression through each stage is characterized by defined metrics across the domains and components (see Table 1).

Table 1. Description of the five stages of continuous improvement

| Stage | Description |
|---------------------------|--|
| 1. Emerging/ad hoc | <ul style="list-style-type: none"> • Formal processes, capabilities, experience, or understanding of HIS issues/activities are limited or emerging. • Formal processes are not documented, and functional capabilities are at the development stage. • Success depends on individual effort. |
| 2. Repeatable | <ul style="list-style-type: none"> • Basic processes are in place based on previous activities or existing and accessible policies. • The need for standardized processes and automated functional capabilities is known. • There are efforts to document current processes. |
| 3. Defined | <ul style="list-style-type: none"> • There are approved, documented processes and guidelines tailored to HIS projects or activities. • There is increased collaboration and knowledge sharing. • Innovative methods and tools can be implemented and used to extend functional capabilities. |
| 4. Managed | <ul style="list-style-type: none"> • Activities are under control using established processes. • Requirements/goals have been developed, and a feedback process is in place to ensure that they are met. • Detailed measures for processes and products are being collected. |
| 5. Optimized | <ul style="list-style-type: none"> • Best practices are being applied, and the system is capable of learning and adapting. • The system uses experiences and feedback to correct problems and continuously improve processes and capabilities. • Future challenges are anticipated, and a plan is in place to address them through innovation and new technology. • Processes are in place to ensure review and incorporation of relevant innovations. |

The HIS SOCI measurement scale is made up of five core HIS domains, with 13 corresponding components and 39 subcomponents (see Table 2).

Table 2. HIS Stages of Continuous Improvement (SOCI) toolkit: Core domains and components

| HIS Core Domain | Components | Subcomponents |
|---|---|--|
| HIS leadership and governance | HIS strategy | HIS strategic planning |
| | | Monitoring and evaluation (M&E) plan |
| | Policy, legal, and regulatory framework, and compliance | Existence of HIS policies and legislation |
| | | Policy compliance enforcement |
| | | HIS leadership and governance organizational structures and functions |
| HIS leadership and governance organizational structures and functions | HIS leadership and coordination | |
| | HIS organizational structure and function | |
| HIS management and workforce | HIS workforce capacity and development | HIS competencies (knowledge, skills, and abilities) |
| | | HIS training and education (includes continual professional development) |
| | | HR policy |
| | Financial management | HIS financing plan |
| | | Resource mobilization |
| HIS information and communication technologies (ICT) infrastructure | Operations and maintenance | Reliable power/electricity |
| | | ICT business infrastructure |
| | | Hardware |
| | Communication network (LAN and WAN) | Networks and internet connectivity |
| | Business continuity | Business continuity and processes and policies |
| HIS standards and interoperability | Standards and guidelines | HIS standard guidelines |
| | | Data set definitions (clinical and indicator) |
| | | Data exchange standards |
| | HIS core services | Master facility list |
| | | Indicator registry |
| | | Terminology management |
| | | Unique person identity management |
| | | Enterprise architecture |
| | Interoperability (data exchange) | Person data exchange |
| | | Aggregate data exchange |
| | | Commodity management data exchange |
| | | Data security exchange |
| | Data quality and use | Data quality assurance |
| Data management | | |
| Data use | | Data use availability strategy |
| | | Information/data availability |
| | | Data use competencies |
| | | User/stakeholder engagement |
| | | Data synthesis and communication |
| | | Reporting and analytics features |
| | | Data use impact |
| | | Data collection alignment with workflow |
| | | Decision support (clinical or other) |

ASSESSMENT

Initiating the Assessment in Uganda

The Assistant Commissioner of the Health Information Management Division (HIMD) initiated the assessment, by presenting the concept to the Health Information Systems (HIS) and Data Management thematic working group. From there, it was again presented to the Supervision Monitoring, Evaluation and Operational research technical working group for consensus and participation from the Ministry of Health technical programs. This process ensured that the assessment would be well grounded and that all stakeholders would be committed to the results and also participate in the activities and action plan of the assessment in terms of strengthening the health information system of Uganda.

Assessment Methods

MEASURE Evaluation facilitated the HIS SOCI assessment in Uganda in November 2018. The method of facilitation focused on establishing Genuine Contact⁴ with and among the participants. Open Space Technology⁵ meeting methods were adapted to this workshop's purpose. This method has been recognized to be appropriate for complex issues, addressing diverse people and experiences, when time is short, and there is a commitment for resolution of the issues at hand. The processes allowed participants to contribute based on their interests, expertise, and motivation, while creating a space for open and candid discussion.

Formation of Assessment Leadership Team

The leadership team consisted of one representative from MEASURE Evaluation and representatives of the Uganda MOH's Planning Department and HIMD who had the appropriate expertise and experience to oversee the assessment process. The leadership team reviewed the assessment tool and adapted the tool to best suit the context in Uganda. The leadership team then decided on the assessment's scope and goal and constructed a list of key personnel who should be invited to participate.

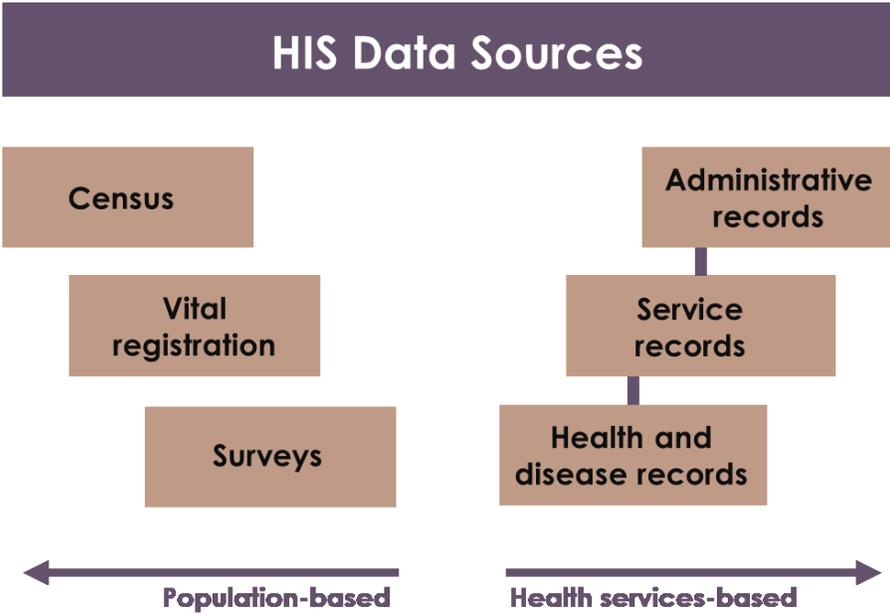
Definition of HIS in Uganda

In Uganda, HIS is defined as a system providing information support to decision making at all levels of the health system. It incorporates information generated both by population-based (census, Uganda Demographic and Health Survey, vital registration, surveys) and institution-based data sources (health management information system [HMIS]; surveillance), as indicated in the figure below. This understanding of the purpose and function of the HIS informed the assessment's scope.

⁴ <https://genuinecontact.net/>

⁵ <http://openspaceworld.org/wp2/what-is/>

Figure 1. Uganda's depiction of its HIS



Assessment Workshop Day 1

The assessment can be implemented using a variety of approaches, including individual assessments, group assessments, or a hybrid approach to consensus building in determining final scores (see user guide for more information). The Uganda workshop was conducted over the course of two days and included the 35 key personnel identified and invited by the MOH (see Table 3).

The assessment leadership team presented the assessment’s goals, scope and processes. Each participant had the opportunity to complete an individual assessment, indicating their views of the current and goal status for the assessment’s 39 subcomponents. After having adequate time to review and complete the assessment individually, participants were asked to join a group representing one of the five domains in which they had the most expertise. Each group then discussed and built consensus to determine the current and goal status for each subcomponent falling under their respective domain. Results from each group were shared in plenary. Participants had the opportunity to respond with questions and comments. Senior MOH leadership provided feedback, and there was additional discussion around what the final score for each subcomponent should be.

Table 3. Organizational affiliations of the assessment workshop participants

| Ministry of Health (MOH) and MOH Programs | |
|--|---------------|
| Organization | Number |
| MOH Planning Department | 2 |
| Health Information Management Division (HIMD) | 6 |
| Pharmacy Division | 1 |
| Human Resource Department | 1 |
| AIDS Control Program | 2 |
| National TB and Leprosy Program | 1 |
| MOH Call Center | 1 |
| Vector Control Division | 1 |
| ICT unit of MOH | 1 |
| MOH: Kayunga district | 2 |
| Other Organizations, Agencies, Partners, and Academia | |
| Organization | Number |
| Malaria Consortium | 1 |
| Living Goods | 2 |
| MEASURE Evaluation, JSI | 2 |
| IntraHealth: Strengthening Human Resources for Health | 1 |
| Uganda Orthodox Medical Bureau | 1 |
| United Nations High Commissioner for Refugees | 1 |
| Uganda Healthcare Federation | 1 |
| Makerere University School of Public Health | 2 |
| Uganda Muslim Medical Bureau | 1 |
| UNICEF | 1 |
| Uganda Catholic Medical Bureau | 1 |
| JSI | 2 |
| BRAC Uganda | 2 |
| HISP Uganda | 1 |
| Total | 37 |



Acting Assistant Commissioner of the HIMD giving opening remarks



Participants discuss scoring in groups

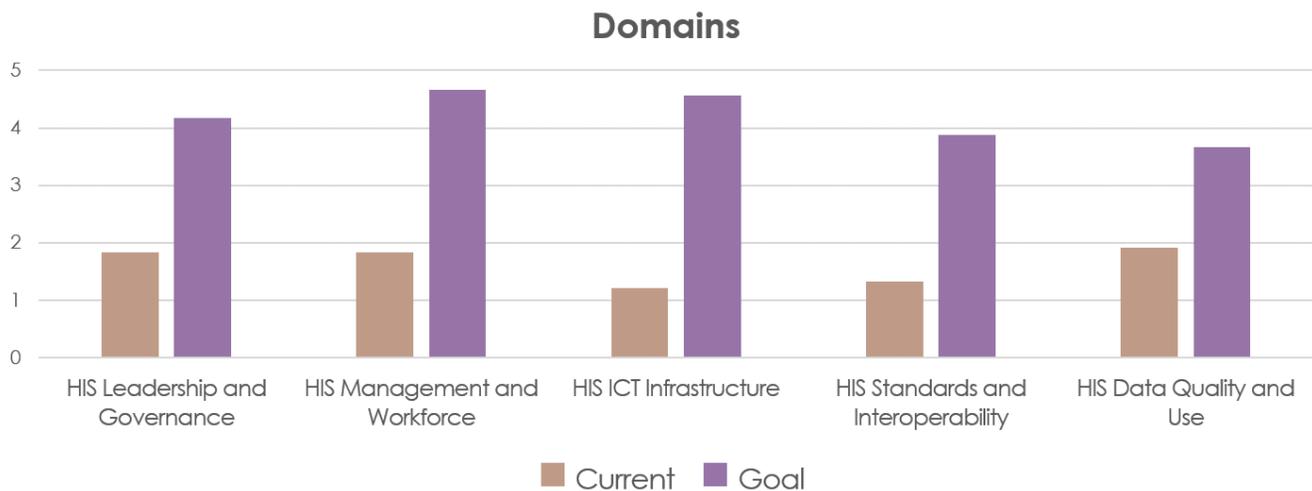
Assessment Workshop Day 2

During the second day of the assessment workshop, participants reconvened in plenary to determine final scores for each subcomponent. Participants had the opportunity to respond and offer their opinions. Final scores for each subcomponent were then determined or affirmed by the group in plenary. The focus then shifted to identification of priority areas and planning for corresponding action items. The resulting road map was designed to improve the status of Uganda's HIS performance.

RESULTS

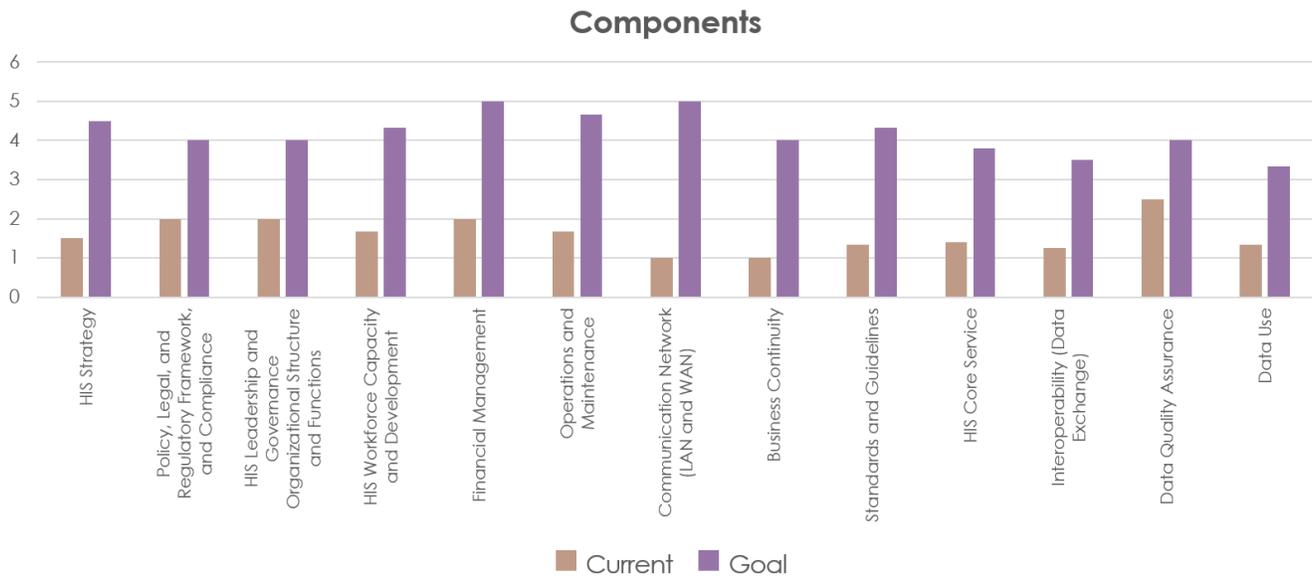
The final assessment scores that were decided in plenary for each of the 39 subcomponents, in both current and goal status, were recorded in the Excel-based tool. Subcomponents under each domain were averaged, giving overall current and goal scores for each of the 13 components and five domains. Visual bar charts displayed the current and goal status for each component side by side to provide a visual representation of the gaps between current and goal status (Figures 1 and 2). The scoring from one to five reflects the stages laid out in the tool's measurement scale and indicates the status as emerging, repeatable, defined, managed, or optimized. In order to be categorized as a specific stage, the subcomponent needed to meet every attribute laid out in the measurement scale (see Appendix A). The current status of all HIS components was found to be between stage 1 or 2 (emerging to repeatable), except for data quality assurance at 2.5. Goal status across the subcomponents ranged from 3.5 to 5 and reflected what stakeholders felt would suffice to meet the information needs of the overall health system.

Figure 2. Results of the group assessment, by domain



The graph shows that the current status of the domains is level 1.5, on average. The goal that workshop participants set for all the domains was level 4 on average, to be achieved in five years.

Figure 3. Results of the group assessment, by component



A Road Map for HIS Progress

Following the determination of current and goal status, participants turned to a plan to progress the performance of the country HIS. Participants were each given the opportunity to choose six subcomponents that they felt should be prioritized for action. A poster listing all 39 subcomponents was posted around the room, and participants were each given six stickers. Participants then moved around the room, using their stickers to indicate which subcomponents should be prioritized. The subcomponents with the largest number of stickers were chosen.

This resulted in the identification of five priority areas on which to focus:

1. Data management
2. Master facility list
3. HIS strategy
4. HIS leadership and coordination
5. HIS competencies (knowledge, skills, and abilities)

Participants then formed five groups, each one dedicated to a distinct priority subcomponent, and convened to design a road map to address the gap in current and goal status for the respective subcomponent. Each group used the SOCI measurement scale to identify specific gaps related to the subcomponent, determined activities to address gaps, and established responsible parties and specific timelines for implementation. Each work plan was then presented to the plenary group. The group further discussed how each of these individual road maps could be harmonized to contribute to an HIS strategic plan for 2019–2024. Participants identified the need to include corresponding mechanisms to enforce and monitor the implementation of identified actions. It was also recognized that no subcomponent operated in complete isolation and that improvements in one area (such as HIS competencies) should lead to improvements and considerations related to other areas (such as capacity building and HIS workforce).



Planning Department Commissioner Dr. Sarah Byakika guiding the road map design and planning



Participants determine priorities for action

The assessment results will inform Uganda's HIS strategy (planned for 2019). During the workshop, the following aims were identified for the HIS strategy:

- Establish, operationalize, and institutionalize standards for health data and information management
- Promote use of health information for evidence-based decision making, promote accountability, and empower citizens to make healthy choices
- Define data management processes, including roles, dissemination, and utilization strategies
- Develop guidelines for data security, including confidentiality
- Provide guidance for cadres managing health data at all levels of health service delivery

Priorities, action items, and the road map were then presented to the HIS/Data Management Thematic TWG of the Uganda MOH for feedback and additional guidance on advancing the road map and HIS strategic plan.

NEXT STEPS

Workshop participants have now established a baseline across 39 HIS subcomponents and have highlighted strengths in the country's HIS framework, as well as gaps in performance. The assessment also aided in the identification of goal status, illuminating the gap between current status and the goal and providing concrete action items to progress from one stage to the next. One important overarching step will be to develop an HIS strategy by mid-2019 to complement the existing eHealth strategy and M&E plan.

This report will be presented to the Sector Monitoring Evaluation & Research TWG of the MOH, which will later take it to the Senior Management Committee. The MOH leadership team will facilitate a follow-up assessment of HIS using the HIS SOCI tool in 2020.

APPENDIX A. IMPROVEMENT ROAD MAP: EXAMPLES OF ACTIVITIES DEVELOPED DURING THE WORKSHOP

| Improvement Road Map | | | | | | |
|---|--|---|--|---|---|----------------------|
| Domain and subcomponent | Activity | Specific Gap Addressed | Responsible Entity | Resources Needed | Documentation/ Means of Verification | Timeline |
| HIS Leadership and Governance: HIS Leadership and Coordination | Set up a steering committee for the HIS strategy <ul style="list-style-type: none"> Identify suitable membership from all stakeholders Terms of reference for steering committee Schedule meetings and timelines for progress assessment Ensure that the steering committee regularly updates the HIS/Data Management thematic TWG | No steering committee to develop HIS strategy | HIS/data management thematic TWG/DHI | Financial support to conduct 1-day committee meeting; availability of key stakeholders | Steering committee in place | End of November 2018 |
| | Review the existing relevant policies, including eHealth, Health Sector Development Plan and Program specific documents | Different programs and stakeholders have independent plans | Steering committee/ DHI | Financial support to conduct 5-day committee document review meeting; availability of key stakeholders | Components needed for the HIS strategy/domain available | End of January 2019 |
| | Develop an HIS strategic plan | No HIS strategy exists | Steering committee/ DHI | Financial support to conduct 5-day committee document review meeting; availability of key stakeholders | Present to TWG and receive go-ahead to disseminate nationally | February 2019 |
| HIS Management and Workforce: Health Information Systems Competencies (Knowledge, Skills, and Abilities) | Identify key program indicators for monitoring and reviewing progress at subdistrict, district, and national levels | Lack priority program indicators to monitor and review progress at various levels | Program manager/ officer/ appropriate personnel in the program management team | Financial support to conduct 1-day consultation and publish document; availability of key stakeholders; program indicator documents | Document describing indicators and review schedule | March 31, 2019 |

| | | | | | | |
|---|--|--|--|---|--|-------------------|
| | Need for development of in-service training curriculum for the HIS cadre defining the skills and ability needs | Building capacity for HIS-related cadres based on the job competencies required to provide the service | MOH Technical Programs, Division of Health Information, Public Service & Ministry of Education | Government of Uganda National Training Plan; scheme of service for workforce; National Development plan; Health Sector Development plan; availability of stakeholders; financial support for stakeholder engagement | National HIS In-Service Curriculum | December 30, 2019 |
| HIS Standards and Interoperability: Master Facility List | Set up Master Facility Registry Workgroup for Governance | No working group or equivalent exists to guide and lead the processes of implementing master facility list | MOH/DHI, partners | Financial support to conduct 1-day consultation; availability of key stakeholders | Master Facility Registry Workgroup for Governance, terms of reference for the team defined | December 31, 2018 |
| HIS Data Quality and Data Use: Data Management | Adapting national guidelines for data management process in peripheral levels of the health system | Access and use of data management process guides and standard operating procedures | Biostatisticians, HMIS focal people, health information assistants | Financial support to conduct 5-day consultation and adapt guidelines for use at district and health facility financial support for printing and distributing | Number of districts and HFs using the adapted guides | March 2019 |

APPENDIX B. ASSESSMENT LEADERSHIP TEAM

| Name | Role | Affiliation |
|-------------------|---|--|
| Dr. Sarah Byakika | Commissioner Health Services | MOH Planning Department |
| Caroline Kyoziira | Acting Assistant Commissioner | Health Information Management Division |
| Jamiru Mpiima | Health Informatics Specialist | Health Information Management Division |
| Nathan Lubowa | M&E Specialist | Pharmacy Department |
| Manish Kumar | Senior Technical Specialist—Health System Strengthening | MEASURE Evaluation |

APPENDIX C. PARTICIPANTS

| | | | |
|------------------|---------------|---|---|
| Dr. Sarah | Byakika | Commissioner Health Services | MOH Planning Department |
| Samson | Olum | Assistant Commissioner Health Services | MOH Human Resources Department |
| Caroline | Kyozira | Assistant Commissioner Health services | MOH Division of Health Information (DHI) |
| Nathan | Lubowa | M&E specialist | MOH Pharmacy Department |
| Jamiru | Mpiima | Health information specialist | MOH DHI |
| Judith | Nakate | Communication officer | MOH Call Center |
| Patrick | Zzimula | Capacity building officer | BRAC Health Program |
| Patrick Okecho | Omiel | HIS analyst | HISP, Uganda |
| Mariam | Baiga | Health management information system (HMIS) trainer | MOH, Kayunga District |
| Paul | Musimami | Data manager | MOH DHI |
| Sarah | Nyafwono | HMIS officer | BRAC |
| Ismail | Wadembere | Information manager | Intrahealth Uganda |
| Sam | Ariaitwe Emma | Sr. biostatistician | MOH |
| Christine Shirah | Karungi | Data manager | Malaria Consortium |
| Amanda | Ottosson | Sr. technical advisor | Living Goods |
| Simon | Mutamam | Sr. technical advisor | Living Goods |
| Micheal | Kasusse | Logistics management information system technical advisor | MOH |
| Alex | Tumwesigye | Technical advisor | MEASURE Evaluation, JSI |
| Mary | Namuyomba | HMIS trainer | MOH |
| Aloysious | Kato | M&E Officer | Uganda Orthodox Medical Bureau |
| Philip | Waiswa | HMIS trainer | MOH |
| Moses | Doka | Senior information scientist | MOH DHI |
| Emmanuel | Omwony | Health information assistant | United Nations High Commissioner for Refugees |
| Denis | Mugabi | HIS | Uganda Healthcare Federation |
| Benjamin | Tinkitina | Data manager | MOH Vector Control Division |
| Job | Kyakakasibwa | Data manager | MOH DHI |
| Nicholas | Isabirye | HMIS, family planning | MOH DHI |
| Vincent M. | Kiberu | Lecturer | Makerere University School of Public Health |
| Muzamiru | Kivumbi | M&E officer | Uganda Muslim Medical Bureau |
| Alex | Muhereza | HIS specialist | UNICEF |
| Sandra | Agutu | Clinical officer | MOH, Kayunga District |
| Joseph | Sekitoleko | ICT manager | MOH ICT |
| Justus | Muhangi | Strategic information advisor | Uganda Catholic Medical Bureau |

MEASURE Evaluation
University of North Carolina at Chapel Hill
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