



# Strengthening the Performance of Kenya's Health Information System

## Improvements in Data Quality and Use at the County Level

April 2019



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Health workers at a clinic in Kenya. Photo: © Jill Edwardson, courtesy of Photoshare

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## ABBREVIATIONS

CHMT	county health management team
FGD	focus group discussion
HIS	health information system
HISSM	Health Information System Strengthening Model
M&E	monitoring and evaluation
MECAT	Monitoring and Evaluation of Capacity Assessment Tool
MESST	Monitoring and Evaluation Systems Strengthening Tool
MEval-PIMA	MEASURE Evaluation PIMA
MSC	most significant change
SDG	Sustainable Development Goal
TWG	technical working group
USAID	United States Agency for International Development

# INTRODUCTION

Health information systems (HIS) are an area of ongoing and significant investment by governments, donors, and organizations. Such investments compel evidence for accountability and decision making. HIS have not traditionally been a subject for rigorous study and evaluation.<sup>1</sup> The lack of systematic evidence has limited learning, sharing, and cultivation of best practices to strengthen country-led HIS.

The Sustainable Development Goals (SDGs) call for high-quality data to track progress and achievement (United Nations, 2017), assuming that relevant data are readily available and accurate. Nationally representative cross-sectional surveys such as Demographic and Health Surveys and Multiple Indicator Cluster Surveys have commonly been used to track progress in health sector initiatives (Corsi, Neuman, Finlay, & Subramanian, et al., 2012). However, sample sizes used in such national surveys may be imprecise for measuring progress in select indicators (Alegana, et al., 2017). Use of facility- and community-based data to assess coverage and prevalence of maternal and child health indicators, for example, has been recognized as an opportunity to provide more precise estimates (Maina, et al., 2017), not only to track progress toward the SDGs, but also for use at the local and regional levels to improve health sector planning and resource allocation.

In addition, progress toward the SDGs requires progress within the health system itself. A health system needs internal capacity and mechanisms to be able to develop performance targets, track progress, and support continuous improvement. This includes organizational, technical, and behavioral determinants for the strengthening of routine health information systems (Aqil, Lippeveld, & Hozumi, 2009). Health programs, however, often lack the necessary skills and resources to use data effectively and efficiently to inform decisions (Braa, Heywood, & Sahay, 2008), and HIS themselves are often fragmented, complex, and not fully responsive to the information needed for health system planning (Wilkins, Nsubuga, Mendlein, Mercer, & Pappaioanou, 2008).

In July 2014, MEASURE Evaluation was asked by its funder, the United States Agency for International Development (USAID), to implement activities to justify and build an evidence base showing which investments in HIS are effective and useful. In response, we developed the HIS Learning Agenda (<https://www.measureevaluation.org/resources/publications/fs-18-313>), to explore what works to strengthen HIS. To learn more about how HIS strengthening happens, we have turned to our project activities, taking a systematic approach to documenting successes and lessons learned in progressing HIS performance, measured by data quality and data use (MEASURE Evaluation, 2018).

One example of this work under the Learning Agenda has been to learn from the USAID-funded MEASURE Evaluation PIMA (MEval-PIMA) project—an associate award of MEASURE Evaluation. To shed light on how to strengthen HIS to meet the needs of the health sector, particularly by improving data quality and data use available for decision making, we studied efforts to strengthen the organizational, technical, and behavioral components of routine health information systems in Kenya through participatory approaches with the county health management teams (CHMTs). Although the context of this study is specific to Kenya, we aimed to learn from the processes used for HIS strengthening within regional units of the health sector.

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<sup>1</sup> Health information encompasses all health data sources that a country requires to plan for and implement its national health strategy. Examples are electronic health records for patient care, health facility data, surveillance data, census data, population surveys, vital event records, human resource records, financial data, infrastructure data, and logistics and supply data.

## BACKGROUND

MEVal-PIMA was a five-year project funded by USAID from 2012 through 2017 to support the government of Kenya to build sustainable monitoring and evaluation (M&E) capacity in producing and using high-quality data for evidence-informed decision making to improve the effectiveness of Kenya's health system.

MEVal-PIMA sought to provide strategic support to the health management teams of the M&E systems of county governments. It was established shortly after the 2010 implementation of the new Constitution of Kenya, which brought sweeping changes to Kenya's policy and institutional framework. Devolution is at the heart of the new Constitution, establishing a more decentralized government and putting increased control in the hands of county governments. The Constitution established 47 new county governments, shifting healthcare management and funding decisions to the newly established counties of Kenya (World Bank, 2018). Delivery of good-quality healthcare services is a key mandate for the county governments under the new constitution. CHMTs are responsible for providing overall planning and implementation of this mandate.

MEVAL-PIMA addressed poor data use practices and other challenges impeding M&E capacity by working with targeted counties in three areas: developing and strengthening organizational capacity; promoting data demand and use practices; and developing M&E capacity at the organizational and individual level. Activities to strengthen M&E capacity at the county level were mapping the needs of county health departments to conduct a participatory baseline assessment; promoting collaboration and partnership; developing and promoting data use practices for planning, data quality practices, and information sharing; and integrating leadership skills for M&E capacity at the county level.

In 2014, MEVAL-PIMA undertook an assessment of M&E capacity in CHMTs from 17 counties using the MEVAL-PIMA-developed Monitoring and Evaluation Capacity Assessment Toolkit (MECAT) (<https://www.measureevaluation.org/pima/m-e-capacity/me-capacity>). The assessment sought to identify the status of behavioral, organizational, and technical capacity in the use of data for programming. Baseline scores were used to identify priorities and inform interventions and to establish a benchmark for measuring progress in project M&E. Shortly after the baseline assessments, changes in funding priorities led MEVAL-PIMA to shift their work to a subset of 10 counties identified as high-priority in the areas of reproductive health, malaria, HIV/AIDS, or a combination of the three.

The baseline assessment (<https://www.measureevaluation.org/resources/publications/tr-16-145/>) revealed that counties did not have data use strategies in place that would enhance a culture of evidence-based decision making. Additionally, dissemination and use of data were not clearly defined and were not happening regularly. Because promoting regular use of data at the county level was one of MEVAL-PIMA's strategies to strengthen the capacity of CHMTs to identify and use data for decision making, key MEVAL-PIMA interventions included developing information products, supporting periodic performance reviews, and supporting the development of annual work plans.

MEVAL-PIMA then worked with CHMTs in the 10 target counties to design packages of support to promote the use of data for decision making through development and promotion of data use practices in the key M&E functions of planning, data quality practices, and information sharing. MEVAL-PIMA further supported CHMTs in establishing partnership and mechanisms to better leverage M&E resources and drive the M&E agenda in the county. MEVAL-PIMA also supported counties in the development of policies, strategies, and plans identified as crucial to support M&E functions for a better health system.

## **PURPOSE AND OBJECTIVES**

Because MEVAL-PIMA conducted baseline assessments in 17 counties but then ended up working in only 10 counties, a good opportunity arose to capitalize on these initial investments and study the effect over time in comparison and intervention counties. Thus, the study aimed to assess how MEVAL-PIMA-supported interventions affected changes in data quality and data use compared with the comparison county.

## METHODS

To better understand changes in data quality and data use at the county level, data for this study were collected from a variety of sources. Quantitative data were drawn from pre- and post-intervention Monitoring and Evaluation of Capacity Assessment Tool (MECAT) assessment results, along with monthly reporting rates of county health indicators from DHIS 2. Qualitative data were drawn from key informant interviews and focus group discussions (FGDs) with county health staff and MEVAL-PIMA implementing program staff and were collected during post-intervention assessment workshops, using the most significant change (MSC) method (Davies, 2015) and outcome mapping (Earl, Carden, & Smutylo, 2001) methods. Relevant documents from MEVAL-PIMA's planning, implementation, and results were also reviewed.

### Monitoring and Evaluation of Capacity Assessment Tool (MECAT)

MEVAL-PIMA developed the MECAT in 2012 (<https://www.measureevaluation.org/pima/m-e-capacity/me-capacity>). Assessment criteria and tools were adapted from several other capacity assessment tools, including the Monitoring and Evaluation Systems Strengthening Tool (MESST) (<https://www.cpc.unc.edu/measure/publications/ms-07-18>) of the Global Fund to Fight AIDS, Tuberculosis and Malaria; UNAIDS' 12 Components tool ([http://www.unaids.org/en/media/unaids/contentassets/documents/document/2010/2\\_MERG\\_Strengthening\\_Tool\\_12\\_Components\\_M\\_E\\_System.pdf](http://www.unaids.org/en/media/unaids/contentassets/documents/document/2010/2_MERG_Strengthening_Tool_12_Components_M_E_System.pdf)); and MEASURE Evaluation's PRISM tools (<https://www.measureevaluation.org/resources/tools/health-information-systems/prism>).

The MECAT consists of a group capacity assessment, individual capacity assessment, and key informant interviews. The results presented here are from the MECAT group assessment tool. The tool was completed through a participatory process in which key personnel from CHMTs engaged in FGDs to build consensus on indicators in 12 M&E capacity areas: organization structures; human capacity; partnerships and governance; national M&E plan; annual costed M&E plan; advocacy, communication, and cultural behavior; routine monitoring; surveys and surveillance; national and subnational databases; supervision and auditing; evaluation and research; and data demand and use.

Each MECAT capacity area poses questions across four domains:

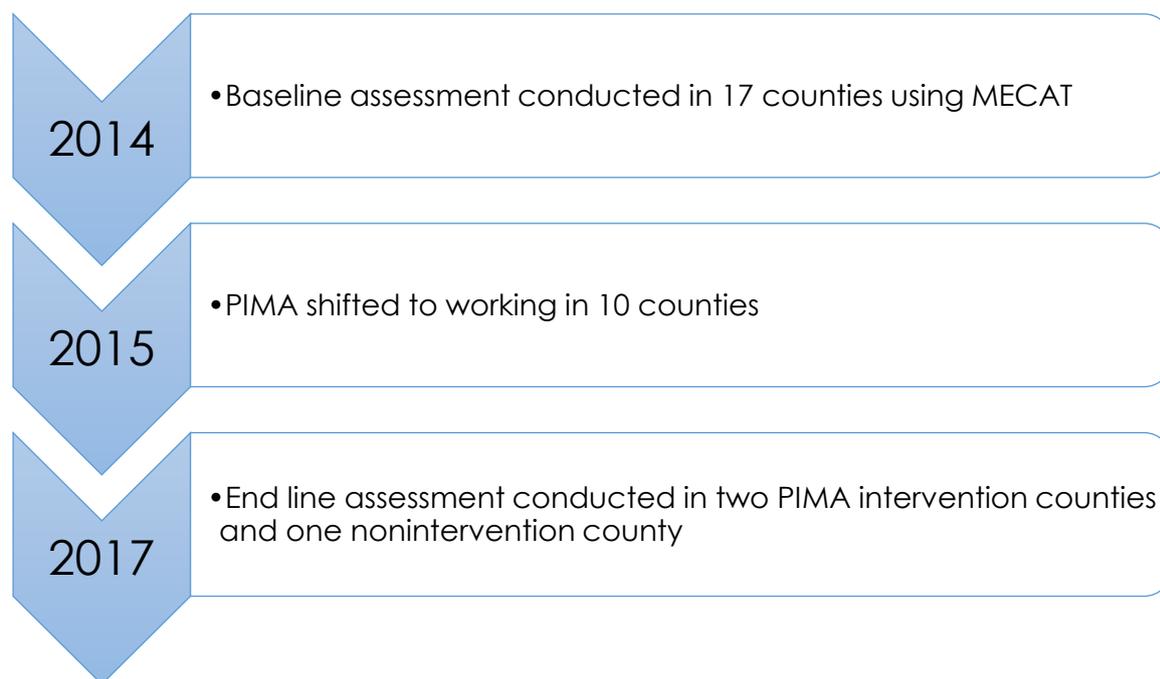
- **Status:** Whether a given element exists, such as a county M&E plan
- **Quality:** Whether the element conforms to established quality norms and includes mechanisms for operationalization
- **Technical Autonomy:** The extent to which the county can develop and execute the element on its own
- **Financial Autonomy:** The extent to which the county can develop and execute the element using its own resources

The group and individual data are entered in Excel-based assessment tools that automatically generate scores based on responses to each question. Questions in the group assessment tool have a variety of possible responses, from Yes/No to a five-point scale (such as weekly, monthly, quarterly, biannually, or annually). Because of this variation in response categories, responses are scaled to correspond to numbers from 0 to 10 (e.g., No=0, Yes=10). Responses are automatically aggregated to produce a total score for each of the 12 capacity areas in each of the four domains.

When MEval-PIMA applied the tool in Kenya, it yielded 48 unique scores per county. Respondents were also asked to record relevant comments, to further explain their responses.

At both baseline and end line, the MECAT assessment was administered by MEVAL-PIMA staff and consultants contracted by MEVAL-PIMA during a three-day workshop attended by key personnel from CHMTs: the head of preventive and promotive health services, health records and information officers at the county and subcounty levels, and selected stakeholders that provide technical assistance to the county. End line assessments were conducted in February and March of 2017.

**Figure 1. MECAT assessment timeline**



Although the MECAT produces scores in 12 capacity areas of M&E, for this paper we were interested in the outcomes of data quality and data use. To measure outcomes of data quality, we examined MECAT scores from the areas of routine monitoring to assess data collection practices, and supervision and auditing to assess practices for data quality assurance. To measure outcomes of data use, we looked at the capacity area data demand and use. The other nine capacity areas are more broadly focused on efforts to improve the M&E of the health system, while the three capacity areas of interest captured outcomes of HIS performance for which PIMA interventions for HIS strengthening were directly focused (Table 1). The scores considered for this study were for “quality”—the MECAT domain that measures if elements that fall under each capacity area conform to established norms and include mechanisms for operationalization. Scores in the quality domain tell us how well a given HIS-related element is being employed at the county level.<sup>2</sup>

<sup>2</sup> This measures above and beyond “status” (if a given element exists). Technical and financial autonomy were not intended outcomes of PIMA’s efforts in HIS strengthening; therefore, they were not considered in study outcomes.

**Table 1. MECAT areas measuring data quality and data use**

Measures of HIS Performance	Corresponding MECAT Capacity Areas	What the Capacity Area Measures
Data quality	Routine monitoring	Data collection procedures, mechanisms for data management, and routine transfer of data
	Supervision and auditing	Guidelines for the management of data collection and data quality assurance practices
Data use	Data demand and use	Analysis, presentation, dissemination, and use of data for planning or decision making

### Most Significant Change (MSC)

In addition to the MECAT assessment, during the end line workshops, qualitative data were collected using the MSC method (Davies, 2015). Participants were asked individually to write up to three significant changes in each of the five domains of change where MEVAL-PIMA had worked. Capacity areas were as follows

1. Strengthening structures and mechanisms for M&E coordination
2. Making good-quality data available
3. Promoting data use practices
4. Developing M&E leadership competencies
5. Building capacity of MOH staff in M&E

Participants then worked in small groups to identify the most significant changes within their capacity area, and then all groups came together to decide on and document the top three most important changes in each capacity area. Participants then engaged in an outcome mapping exercise in which they were asked to identify suggestions and conditions needed to sustain each change identified as significant. Group sessions were audio-recorded, and MEVAL-PIMA staff members took notes during a consensus-building exercise.

### DHIS 2

DHIS 2 is a software platform that Kenya uses to manage HIS. Monthly reporting rates from the DHIS 2 database were reviewed for the percentage of health facilities in each county that were reporting into the DHIS 2 database. We reviewed the completeness and timeliness of expected reporting from January 2014 through December 2016.

**Table 2. Overview of methods used**

Research Question	Methods	Data Collection Tool/Source	Target
How have data quality and data use changed from baseline to end line?	FGDs and individual self-assessment	1. MECAT	CHMTs in 3 counties
	DHIS 2 data extraction	2. DHIS 2	3 counties
What are the reasons for changes in data quality and data use?	MSC through FGDs	1. FGD guide	CHMTs in 3 counties
	Desk review	2. MEASURE Evaluation-MEVAL-PIMA work plans, quarterly reports, etc.	MEASURE Evaluation-MEVAL-PIMA project
	Key informant interviews	3. Interview guide	MEASURE Evaluation-MEVAL-PIMA staff
What are barriers to data quality and use?	Outcome mapping through FGDs	1. FGD guide	CHMTs in 3 counties

## Data Analysis

MECAT quality scores for the capacity areas of routine monitoring, supervision and auditing, and data demand and use were drawn directly from the MECAT’s automated scoring method. The tool generates an average score for each capacity area, based on the responses given by the group. Baseline and end line data for the capacity areas of interest were extracted and aggregate scores were verified against individual question scores. Respondent comments were also reviewed to note any areas of interest or concern related to final scores.

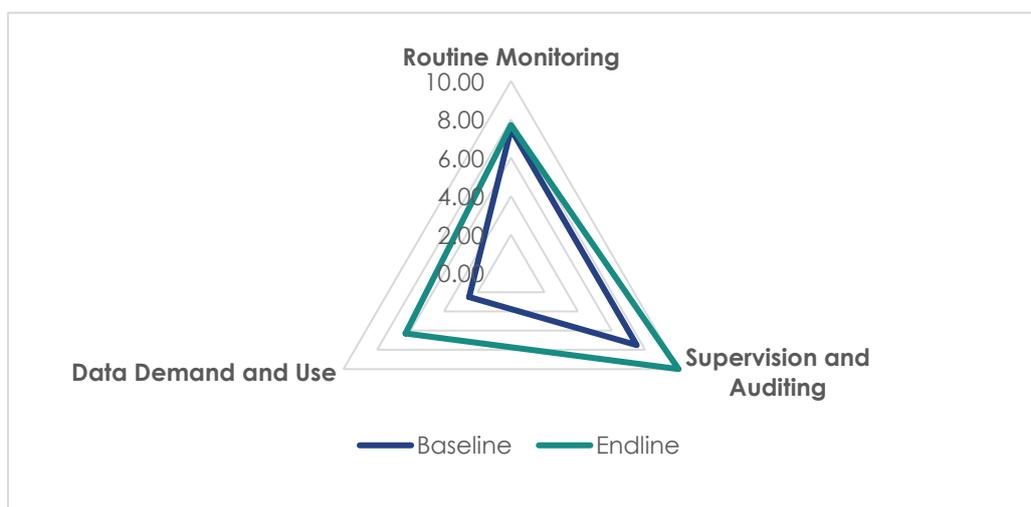
The qualitative data resulting from the MSC portion of the workshop in each county were reviewed to identify MEVAL-PIMA-supported interventions that respondents felt had contributed to changes in data quality and data use, as well as any barriers to improvements, and any non-MEVAL-PIMA interventions that contributed to change. The most significant changes in each MEVAL-PIMA capacity area were then mapped to MECAT capacity areas scores and compared to DHIS2 reporting rates to triangulate reported changes in data quality and data use. The results from across all three counties were then analyzed for consistencies and themes in the drivers of data quality and data use at the county level.

## RESULTS

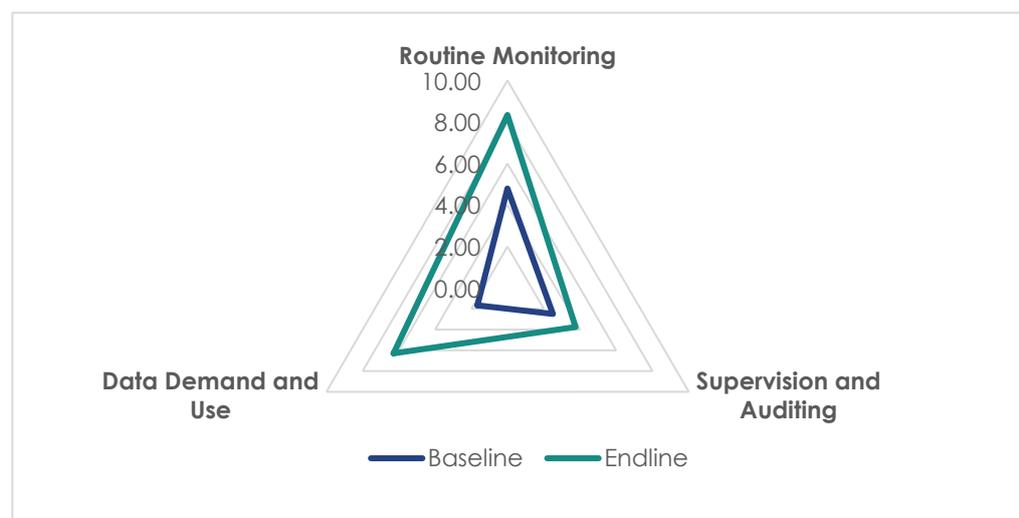
This section presents quantitative scores from the MECAT baseline and end line scores in routine monitoring, supervision and auditing, and data demand and use in the domain of quality (defined by whether a given element conforms to best practices, is embedded in the county M&E plan, etc.). Following the review of quantitative MECAT scores, we also present the drivers of improvements in each capacity area, describing the results captured in each county using the MSC method.

Figures 2–4 are a visual representation of the MECAT capacity areas of interest at baseline and end line, by county.

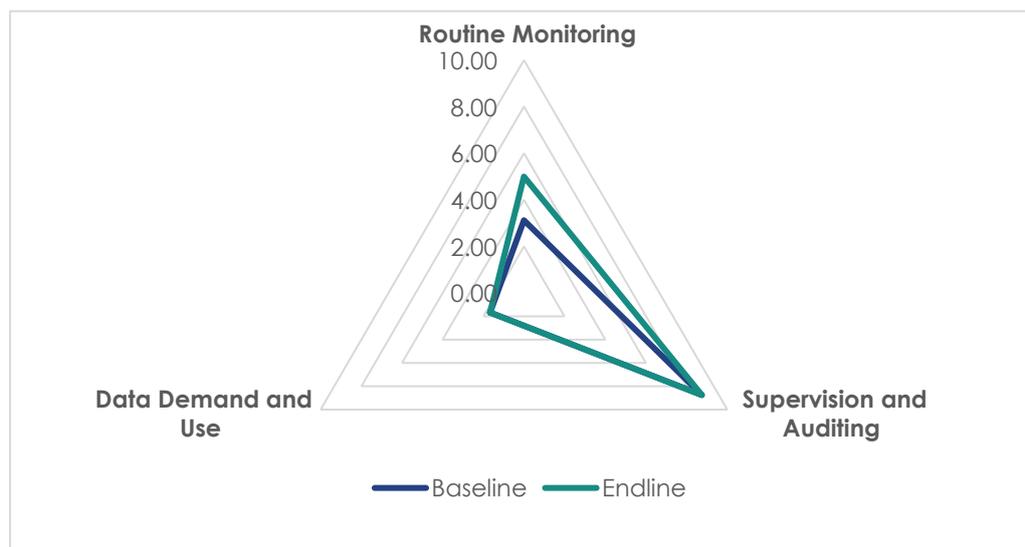
**Figure 2. MECAT scores of quality in MEVAL-PIMA-intervention county Siaya**



**Figure 3. MECAT quality scores in MEVAL-PIMA-intervention county Kakamega**



**Figure 4. MECAT quality scores in control county Narok**



## Data Quality

### Routine Monitoring

All three counties saw improvements in routine monitoring, with Kakamega County experiencing the largest improvement in capacity (from 4.8/10 at baseline to 8.3/10 at end line). The increase in score was mainly because of improvements in the quality and availability of essential tools and equipment for data management, and identification and resolution of gaps between reporting forms and database entry fields. Kakamega also made improvements in gender-based analysis. M&E guidelines conforming to national best practices for data management remained in place.

Siaya County scored high at baseline (7.5/10) and slightly higher at end line (7.8/10). Improvements in the score were because of the CHMTs' identification of gaps in the reporting tools, as well as because of a recent update of the guidelines for collecting and analyzing data. Siaya's high score reflects its ongoing use of standard data collection forms and capture of essential indicators for routine performance monitoring.

Narok County scored 3.1/10 at baseline and improved to 5.0/10 by end line. Narok's improvements were because of the resolution of gaps in the data elements their reporting tools collected and updates of missing indicators in the DHIS 2 reporting database. Narok continued to lack both a county M&E plan and mechanisms for coordination of data collection and management. Participants also reported frequently lacking the necessary tools for data collection and management, because the county did not have a mechanism to print or distribute data collection forms.

### Supervision and Auditing

Both MEVAL-PIMA-intervention counties saw improvements in this area. Siaya improved from 7.5/10 to 10/10, owing to the finalization of guidelines and tools for supportive supervision. Siaya continues to conduct regular data quality audits and now shares findings with stakeholders on a quarterly basis. Kakamega increased from 2.5/10 at baseline to 3.8/10 at end line, because of improvements in their supportive supervision procedures to comply with national best practices. Kakamega continued to have county-coordinated data quality audits. In addition, all tools being used in the county were program-

specific, and their use was driven by implementing partner organizations. The county recognized a need to customize nationally available tools for use in Kakamega.

Narok County did not see any change in this capacity area but remained high at 8.75/10, because it had largely adopted national guidance in this area; the tools had not been specifically adapted to the county context but were nonetheless in use. In addition, data quality audits were being conducted regularly in conjunction with a partner organization (Christian Health Association of Kenya).

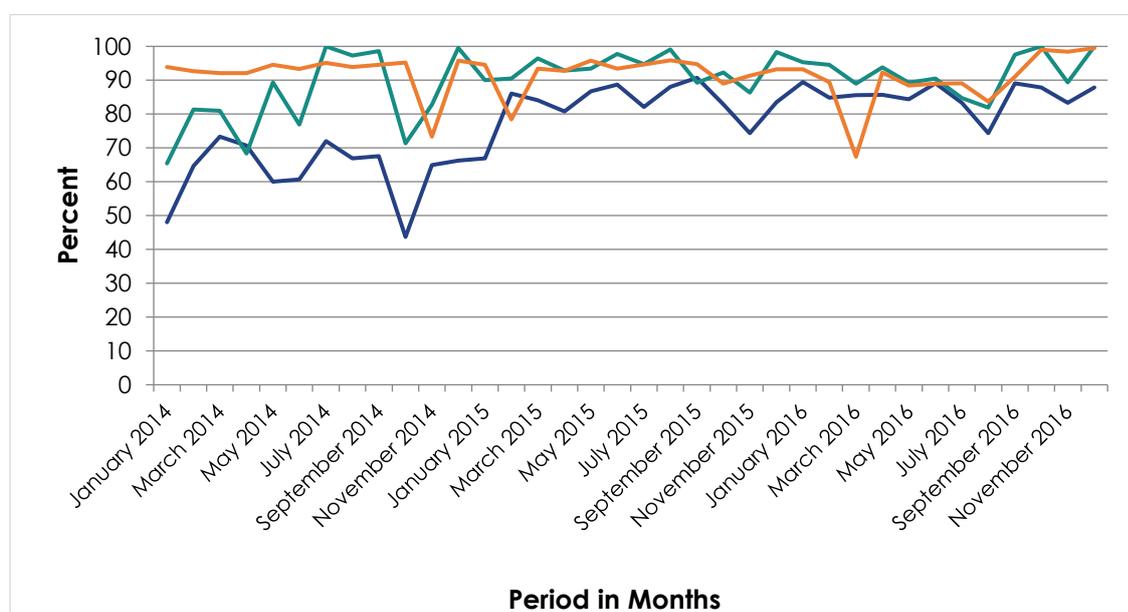
**Table 3. MECAT scores in routine monitoring and supervision and auditing, baseline (2014) to end line (2017)**

	Routine Monitoring		Supervision and Auditing	
	Baseline	End line	Baseline	End line
<b>Kakamega</b> (MEVAL-PIMA intervention county)	4.8	8.3	2.5	3.8
<b>Siaya</b> (MEVAL-PIMA intervention county)	7.5	7.8	7.5	10.0
<b>Narok</b> (Non-MEVAL-PIMA intervention county)	3.1	5.0	8.8	8.8

### Drivers of Improvement in Data Quality

The MECAT scores across all three counties show improvements in the capacity to produce high-quality routine data. This was further supported by monthly reporting rates extracted from the DHIS 2 reporting system for each county (Figure 5). All three counties showed improvements in completeness and timeliness of reporting between January 2014 and October 2016, when the MEVAL-PIMA project was active.

**Figure 5. Percentage of facilities by county reporting complete health data by month, January 2014–October 2016**



(Gray = Siaya, orange = Kakamega, blue = Narok)

When asked about improvements in the availability of high-quality data, stakeholders in Kakamega County felt that the main drivers of improvement were the increased skills of CHMT staff in data management and reporting, the creation of a county M&E work plan that was aligned with the county's annual work plan, and the establishment of a county technical working group (TWG). The TWG now meets regularly to share best practices and review data. Additionally, CHMT staff have been trained on the use of visual data dashboards, use of the World Health Organization's International Classification of Diseases (ICD)-10 coding schemes for classification of death reporting (<https://icd.who.int/browse10/2016/en>), and the ability to access and use these data for county planning. Respondents felt that MEVAL-PIMA had built the capacity of staff in data management skills by providing trainings in data analysis; ongoing mentorship and on-the-job training; technical and financial support for regular data review meetings; and regular data quality assessments.

Siaya County stakeholders indicated that the increased access to data, the availability of tools, and guidance from the national level were important reasons for improvements in the availability of high-quality data and pointed to the need for data to inform strategic planning at the county level following devolution as an important driver. They also pointed to the requirement by county leadership to have good reporting rates, as well as dissemination of quarterly reports on county performance. Siaya County stakeholders pointed to MEVAL-PIMA's role in lobbying for increased access to data for the county and procurement of tools for supervision and reporting, as well as improved Internet access. Respondents also stated that the MECAT baseline assessment was crucial to inform planning that had resulted in improved data quality. This was supported by mentorship, on-the-job training, and regular MEVAL-PIMA-supported data review meetings.

Narok County stakeholders pointed to the national rollout of the DHIS 2 platform for data collection and increased national interest in timely reporting of health data. Narok's capabilities in the areas related to data quality mostly stemmed from specific partner interest, and data quality auditing was usually limited to a specific program area. They also cited concerns about the lack of ownership in data collection among county leadership, as well as the erratic supply of data collection tools because of uncertainties in who had responsibility for printing and dissemination. Respondents also felt that they lacked adequate training on the use of standard tools.

## **Data Demand and Use**

In the area of data demand and use, Kakamega County improved from 1.7/10 to 6.3/10 by end line. The main reason for improvement was the creation of a county data use plan that was embedded in the county M&E plan and informed by the needs of end users, and that conformed to best practices in collecting, recording, collating, analyzing, and reporting. Dissemination of the data reports had been a weakness identified at baseline, and that improved. However, the county continued to lack data analysis and presentation guidelines, and participants felt that CHMTs could benefit from indicator manuals to guide analysis. They also saw a need to document procedures for data analysis and presentation.

The MEVAL-PIMA intervention county of Siaya improved from a baseline of 2.5/10 to 6.3/10 at end line. Like Kakamega, Siaya saw an improved score because of the development of a data use plan embedded in the county M&E plan. Other improvements in scored elements were the inclusion of data analysis and presentation guidelines in the county M&E plan and the inclusion of gender analysis and reporting as a regular element of data analysis and presentation.

Narok County showed no improvement in this area (1.7/10 to 1.7/10), because it lacks a data use plan and guidelines for data analysis and dissemination to stakeholders.

## Drivers of Improvements in Data Use

Stakeholders in Kakamega County identified competition for limited resources and the need for evidence-based program budgeting as the main drivers of improvements in data use. Stakeholders also felt that MEVAL-PIMA had played a large supporting role in the development of the data use plan, by providing technical and financial support for its development and distribution. Additionally, as a result of findings from the baseline assessment, county M&E officials had undertaken training on gender analysis. Respondents felt that the main threat to sustaining the positive change would be the lack of financial support for the data review forums once the MEVAL-PIMA project ends.

County stakeholders from Siaya County felt that the main drivers of data use were MEVAL-PIMA-supported forums for regular data review and planning, along with availability of a data use plan and increased understanding of use of indicators for planning and commodities forecasting. In addition, MEVAL-PIMA supported the development of county health profiles to support regular analysis and dissemination of health information to stakeholders. The group also cited overall improvements in data quality as important to facilitating the use of data.

Both counties reported the increased access to data as being significant to regular use, due to the national rollout of the DHIS 2 database and the ability to access county and subcounty data more easily. In addition, both counties discussed county ownership of the M&E costed plan, which included mechanisms and procedures to support data use as being important. All three counties felt that the creation of a county M&E technical working group had been instrumental in enacting the annual work plan and coordinating the tracking of indicators. All counties also talked about the importance of having a forum for data review and the need for ongoing mentorship in use and understanding of indicators.

Narok County stakeholders identified the need to hold regular data review meetings but noted the lack of financial and technical support to conduct such reviews as a major limitation to using data.

**Table 4. MECAT scores in data demand and use, baseline (2014) to end line (2017)**

	Data Demand and Use	
	Baseline	End Line
Kakamega (MEval-PIMA intervention county)	1.7	6.3
Siaya (MEval-PIMA intervention county)	2.5	6.3
Narok (Non-MEval-PIMA intervention county)	1.7	1.7

## DISCUSSION

This study sought to assess changes in the availability and use of high-quality data at the county level in Kenya following implementation of the MEVAL-PIMA project and to document specific interventions that led to the improvements. In each county, numerous factors contributed to the improvements. MEASURE Evaluation's Health Information System Strengthening Model (HISSM) (MEASURE Evaluation, 2017) provides a helpful template to organize the interventions (Appendix 1).

In the HISSM's enabling environment in all three counties, the baseline capacity assessment played an important role in identifying gaps in existing mechanisms and organizational capacity. County respondents also discussed the importance of CHMTs' sensitization of standards, systems, and tools for data management that did not previously exist at the county level. For example, the baseline assessment provided an impetus to map county stakeholders and establish county TWGs for M&E.

The addition of ongoing technical and financial support from MEVAL-PIMA in Kakamega and Siaya Counties enabled the creation of a costed M&E work plan, an accompanying data use plan, and regular support for data review meetings in both Siaya and Kakamega Counties. While Narok saw some improvements in routine monitoring, it lacked technical support and dedicated financing to support such M&E activities as the finalization of an M&E plan, staff training, and support to develop feedback mechanisms—all of which limited the capacity that the county was able to build during the period between baseline and end line.

In the information-generation area of the HISSM, the national rollout of and support for the DHIS 2 platform also played an important role in all three counties in improving the availability and quality of data. The DHIS 2 served as a unified platform for collecting and sharing data and also minimized errors in the data before they were uploaded to the central database. In Kakamega and Siaya Counties, MEVAL-PIMA supported the creation and dissemination of county health profiles to support analysis and dissemination of data collected on select indicators. They also supported the creation of and training on a visual dashboard to support regular review and use of data.

The package of interventions implemented by MEVAL-PIMA has resulted in improvements in capacity, mechanisms, and structures to support the availability and use of high-quality data for decision making in Kakamega and Siaya Counties. County stakeholders did, however, express concern over the ending of committed financial structures and ongoing training that had been supported by MEVAL-PIMA and a potential lack of ability to sustain the gains they had made.

**Table 5. MEVAL-PIMA interventions mapped to the HISSM**

HISSM Area	HISSM Subarea	Intervention
Enabling environment	HIS governance and leadership	<ul style="list-style-type: none"> <li>• Establishment of M&amp;E TWG</li> <li>• Costed M&amp;E plan that's aligned with the county annual work plan</li> <li>• Data use plan embedded in the annual work plan</li> <li>• Development of county strategic investment plan</li> <li>• Identification of indicators</li> </ul>
	HIS management	<ul style="list-style-type: none"> <li>• Baseline capacity assessment to identify gaps and inform planning</li> <li>• Availability of standardized data collection tools</li> <li>• Support of regular data review meetings</li> <li>• Infrastructure to improve Internet access</li> <li>• Standards and database to increase access to aggregate data at the county level</li> </ul>
Information generation	Data sources	<ul style="list-style-type: none"> <li>• National rollout of and support for DHIS 2 platform for data collection</li> <li>• Introduction of new referral system to support collection of data at community level</li> </ul>
	Information products and dissemination	<ul style="list-style-type: none"> <li>• Development and dissemination of county health profiles</li> <li>• Creation of visual data dashboards</li> </ul>
	Data management	<ul style="list-style-type: none"> <li>• Support for data quality assurance practices</li> <li>• Technical support for management and reporting of data</li> <li>• Supportive supervision tools</li> <li>• Ongoing skills training, especially in data analysis</li> </ul>

## Strengths and Limitations

A strength of this study is that it draws data from two points in time across all three counties, using the MECAT to facilitate data collection. In addition, the scores were derived through a participatory group process to build consensus. In addition, we were able to draw from a number of data sources to describe the status of data quality and data use at the county level.

A limitation of this study is that the MECAT capacity areas are part of a broader M&E-focused assessment, and therefore, the capacity areas we drew from were proxy measures of outcomes related to data quality and data use. In addition, participants in the assessment workshops varied from baseline to end line, depending on which HIS representatives were available and filling specific roles at each point in time. Moreover, although we have an in-depth understanding of the HIS strengthening interventions that MEVAL-PIMA implemented, and although we asked participants about outside interventions, we do not have a detailed record of every concurrent intervention to strengthen HIS.

## CONCLUSION

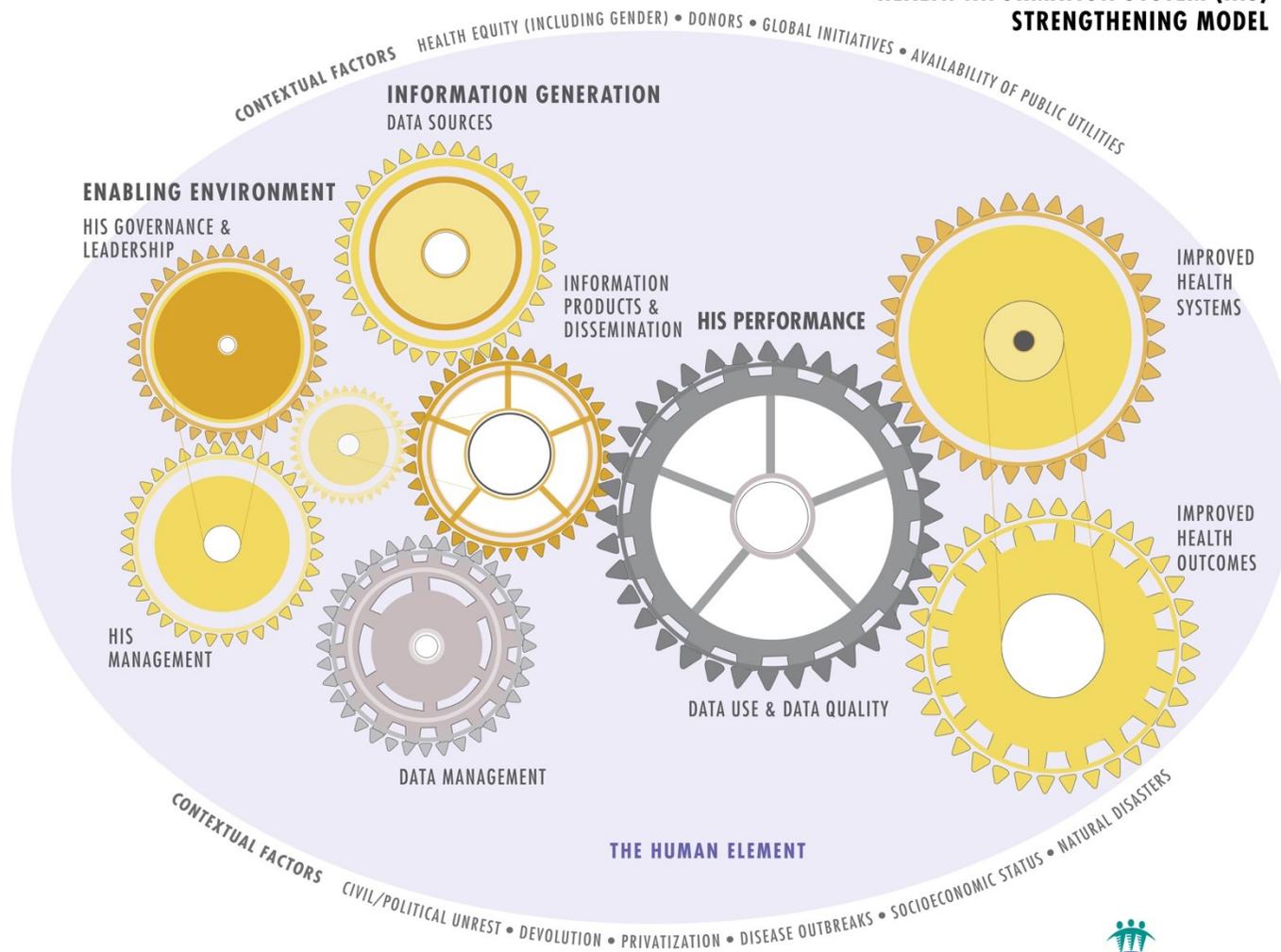
The results of this study show that MEVAL-PIMA-supported interventions to strengthen HIS at the county level resulted in improvements in data quality and data use over time. We have captured key interventions that led to this outcome (Table 5). The description of MEVAL-PIMA activities in this report provides a detailed account of a package of interventions that worked together to strengthen HIS. Further investigation is needed to determine if this package of interventions can be applied in other settings and contexts. The detailed package of interventions as organized across the HISSM can be used by country and government representatives, donors, implementing partners, and others designing interventions for HIS strengthening.

## REFERENCES

- Alegana, V. A., Wright, J., Bosco, C., Okiro, E. A., Atkinson, P. M., Snow, R. W., ... Noor, A. M. (2017). Malaria prevalence metrics in low- and middle-income countries: An assessment of precision in nationally-representative surveys. *Malaria Journal*, 16 (475). Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/29162099>
- Aqil, A., Lippeveld, T., & Hozumi, D. (2009). PRISM framework: A paradigm shift for designing, strengthening and evaluating routine health information systems. *Health Policy and Planning*, 24 (3), 217–228. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2670976/>
- Braa, J., Heywood, A., & Sahay, S. (2012). Improving quality and use of data through data-use workshops: Zanzibar, United Republic of Tanzania. *Bulletin of the World Health Organization*, 90, 379–384. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/22589572>
- Corsi, D. J., Neuman, M., Finlay, J. E., & Subramanian, S. V. (2012). Demographic and health surveys: A profile. *International Journal of Epidemiology*, 41 (6), 1602–1613. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/23148108>
- Davies, R. (2015). *The “most significant change” (MSC) technique: A guide to its use*. Retrieved from [https://www.researchgate.net/publication/275409002\\_The\\_'Most\\_Significant\\_Change'\\_MSC\\_Technique\\_A\\_Guide\\_to\\_Its\\_Use](https://www.researchgate.net/publication/275409002_The_'Most_Significant_Change'_MSC_Technique_A_Guide_to_Its_Use).
- Earl, S., Cayden, F., & Smutylo, T. (2001). *Outcome mapping: Building learning and reflection into development programs*. Ottawa, ON, Canada: International Development Research Center. Retrieved from <https://web.archive.org/web/20090427071811/http://www.idrc.ca/openebooks/959-3/>
- Maina, I., Wanjala, P., Soti, D., Kipruto, H., Droti, B., & Boerma, T. (2017). Using health-facility data to assess subnational coverage of maternal and child health indicators, Kenya. *Bulletin of the World Health Organization*, 95 (10), 683–694. Retrieved from <https://www.who.int/bulletin/volumes/95/10/17-194399/en/>
- MEASURE Evaluation. (2017). *Strengthening health information systems in low- and middle-income countries—A model to frame what we know and what we need to learn* (tr-17-156-en). Chapel Hill, NC, USA: MEASURE Evaluation, University of North Carolina. Retrieved from <https://www.measureevaluation.org/resources/publications/tr-17-156>.
- MEASURE Evaluation. (2018). *What are the factors and conditions of HIS performance progress?* (fs-18-318). Chapel Hill, NC, USA: MEASURE Evaluation, University of North Carolina. Retrieved from <https://www.measureevaluation.org/resources/publications/fs-18-318>.
- Wilkins, K., Nsubuga, P., Mendlein, J., Mercer, D., & Pappaioanou, M. (2008). The data for decision making project: Assessment of surveillance systems in developing countries to improve access to public health information. *Public Health*, 122 (9), 914–922. Retrieved from <https://www.ncbi.nlm.nih.gov/pubmed/18490035>
- United Nations (2017). *The Sustainable Development Goals Report 2017*. New York, NY, USA: United Nations. Retrieved from <https://unstats.un.org/sdgs/report/2017/>
- World Bank. (2018). *Kenya’s devolution*. Washington, DC, USA: World Bank. Retrieved from <http://www.worldbank.org/en/country/kenya/brief/kenyas-devolution>.

# APPENDIX A. HIS STRENGTHENING MODEL

## HEALTH INFORMATION SYSTEM (HIS) STRENGTHENING MODEL



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





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