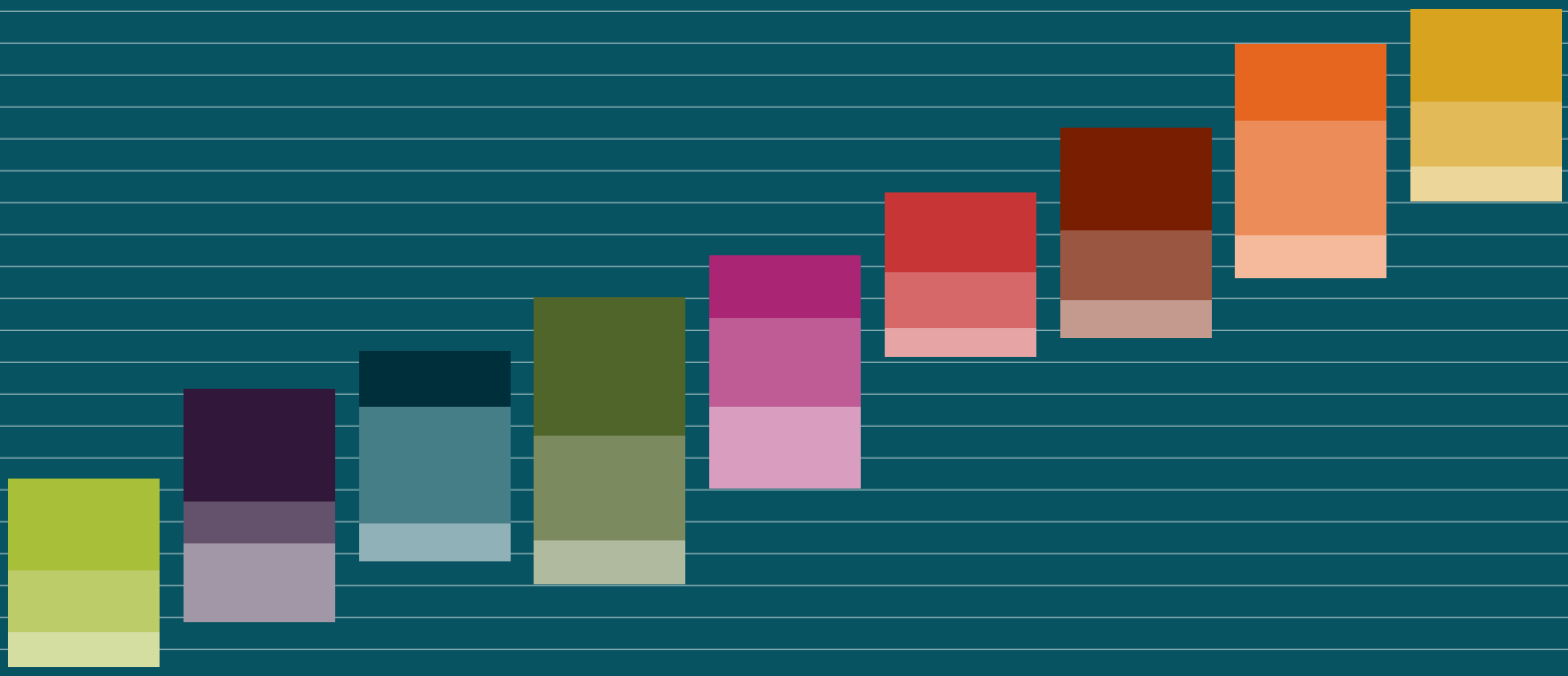

Health Information Systems

Analysis of Country-Level Strategies, Indicators, and Resources

April 2019

USAID
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MEASURE Evaluation

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CONTENTS

ABBREVIATIONS

DQA	data quality assessment
DRC	Democratic Republic of the Congo
HIS	health information system(s)
HISSM	Health Information System Strengthening Model
HMIS	health management information system
HMN	Health Metrics Network
LMICs	low- and middle-income countries
M&E	monitoring and evaluation
MFL	master facility list
PEPFAR	United States President's Emergency Plan for AIDS Relief
RHIS	routine health information system
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WHO	World Health Organization

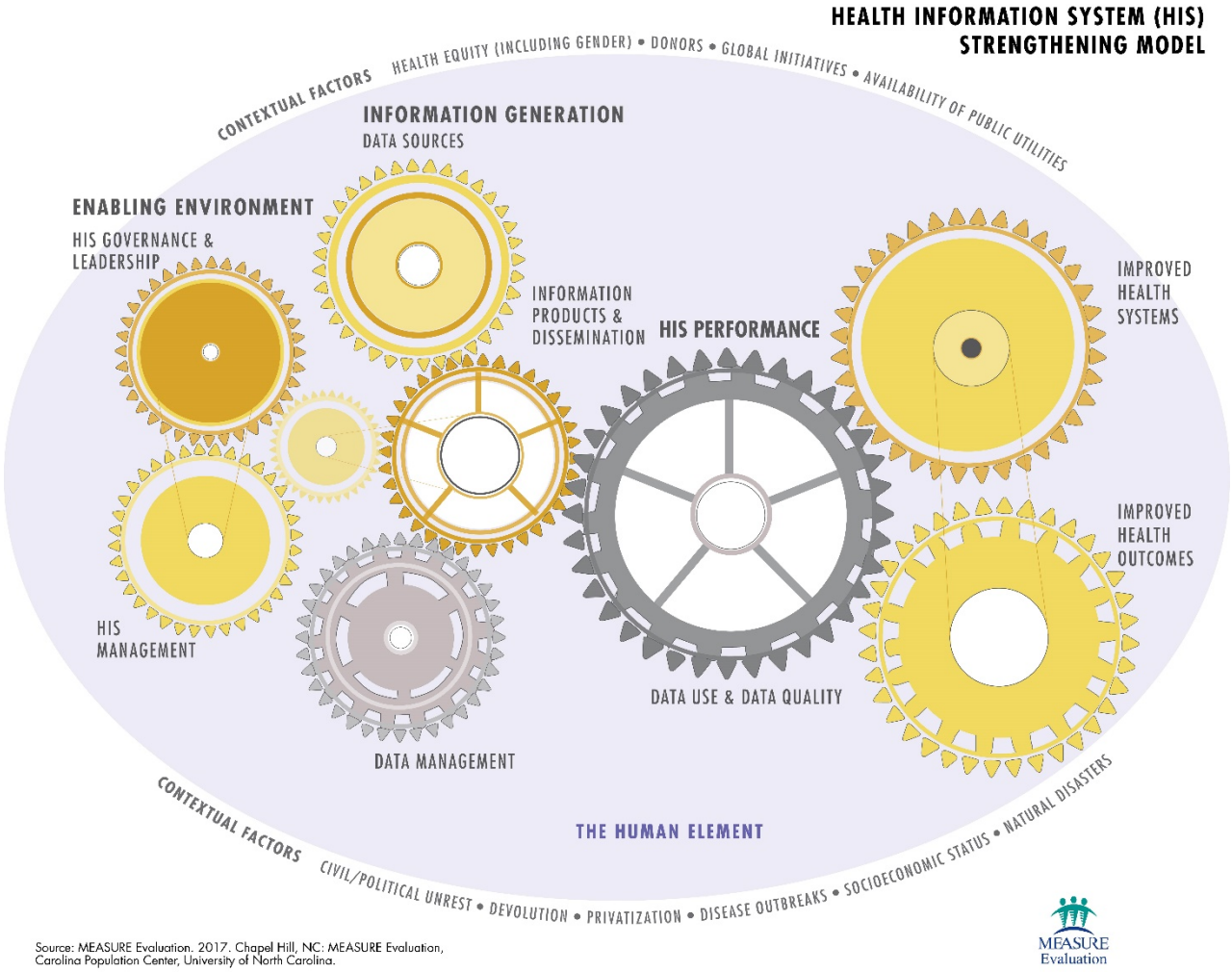
BACKGROUND

Strong health information systems (HIS) are the backbone of strong health systems. A properly functioning HIS gets the right information into the right hands at the right time, enabling policymakers, managers, and individual service providers to make informed choices about everything from patient care to national budgets.

The Learning Agenda is MEASURE Evaluation's response to a request by the United States Agency for International Development (USAID) to explain the effects of investments in strengthening HIS. As part of the Learning Agenda, MEASURE Evaluation launched the **Health Information System Strengthening Resource Center** (https://www.measureevaluation.org/his-strengthening-resource-center), an online repository of learning, information sharing, and resources for HIS development and strengthening. It is designed to help visitors explore and share what works to strengthen HIS in low- and middle-income countries (LMICs), and to build the evidence about how strong HIS improve health.

MEASURE Evaluation has been developing a validated, standard set of metrics and description of methods for use in HIS evaluation and strengthening. We started by designing the **Health Information Systems Strengthening Model** (HISSM), which frames what we are learning and standardizes the language we use to describe HIS functioning and performance. The HISSM articulates the project's current understanding and guides ongoing learning about how HIS in LMICs are designed, developed, and implemented over time to support health systems and improve health outcomes. This model is a starting point for framing what we know now and the opportunities we have to learn more about the four main ways to strengthen HIS: promoting HIS as an essential tool of a health system, defining HIS strengthening, measuring HIS performance, and evaluating HIS interventions.

Figure 1. HISSM



The HISSM is divided into four areas:

(1) The human element: All of the people who interact with the HIS and drive its development and maintenance
(2) The enabling environment: The foundation for planning, implementing, and maintaining the HIS. The enabling environment includes HIS leadership and governance, and HIS management
(3) Information generation: The operationalization of the HIS, which includes data sources, data management, and information products and dissemination
(4) HIS performance: The measurement of HIS performance, including data quality and use

The HISSM visually depicts the relationship between strengthening the HIS and improved health outcomes and services, as a reminder of the importance of the HIS in serving the information needs of the health sector. It also shows the contextual factors that can influence the HIS positively or negatively. Each of these areas builds on the others to create a strong HIS, which the model reflects as leading to improved health systems and improved health outcomes.

As part of the Health Information System Strengthening Resource Center, **country profiles** provide practical resources and learning for countries and organizations working to strengthen HIS. The HIS country profiles:

- Show the status of HIS in selected USAID-priority countries—in terms of indicators, such as HIS governance and leadership, HIS management, data quality, data use, etc.
- Create a baseline of HIS indicators for the selected countries to measure changes over time.
- Help participating countries to share and learn from one another.

HIS Country Profile Analysis

This HIS country profile analysis summarizes the status of the HIS in 39[1] USAID priority countries through 30 indicators. The results are presented for (1) all countries, (2) for United States President's Emergency Plan for AIDS Relief (PEPFAR) countries, and (3) for focus countries where USAID is working to achieve the goal of preventing child and maternal deaths. The individual country profiles can be accessed at https://www.measureevaluation.org/his-strengthening-resource-center/country-profiles.

The report presents:

- The 30 indicators and their definitions
- The status and ranking of the HIS in the three categories of USAID priority countries for these indicators

A caveat for this type of analysis is that the number of indicators we have been able to collect for each country varies and, therefore, some countries may appear to have a lower score than expected. This does not mean that they do not have these indicators but, rather, that we were unable to collect the data.

[1] Forty-three country profiles were prepared, because two provinces in Pakistan and two provinces in Zanzibar have separate HIS.

Indicator Definitions

The 30 indicators selected by MEASURE Evaluation to assess the status of HIS and their definitions follow. Each indicator can be categorized in one of the eight HISSM components: HIS governance and leadership; HIS management; data management; information products and dissemination; data quality; data sources; data use; and HIS performance.

Table 1. Indicators for HIS governance and leadership

Indicator	Is the date important?	Description
Country has a national health strategy (year)(indicator #1)	Yes	A national health strategy outlines a country's vision, priorities, budgeting, and planned action to improve and maintain people's health. Ideally, any activities for strengthening HIS are documented in the national health strategy.
Country has a health sector monitoring and evaluation (M&E) plan (indicator #2)	Yes	Once a country has a national health strategy, it should have an accompanying M&E plan. An M&E plan provides feedback on the effectiveness of the country's strategic plan for all major disease programs and health systems. The motivation to improve HIS is often driven by national M&E needs. The M&E plan should outline arrangements and processes that will measure the performance of the health sector, track objectives and milestones, and set targets to ensure that resources are efficiently deployed to achieve the greatest impact. The health sector M&E plan should be aligned with the national health strategy.
Country has an HIS policy (year) (indicator #3)	Yes	Policies that govern national HIS are one indicator of its strength. HIS policies outline a deliberate system of principles to guide decisions and achieve better HIS outcomes. The HIS policy should describe expectations for both users and producers of HIS data at all levels of the health system and the guiding principles, mission, and vision of the HIS.
Country has an HIS strategic plan (year) (indicator #4)	Yes	Strategic plans for HIS are based on HIS assessments, such as those that were developed based on the Health Metrics Network (HMN) Framework (see indicator #8 below). Strategic plans outline approaches to strengthen an HIS and describe costed interventions to achieve results. The strategic plan focuses on performance gaps and problems that

Indicator	Is the date important?	Description
		should be prioritized. The plan contains information on the implementation of the costed interventions proposed in the short, medium, and long term.
Country has set of core health indicators (year updated) (indicator #5)	Yes	A list of core health indicators helps track progress. The availability of indicators and information on definitions, data sources, and data collection methods are indicative of HIS performance and organization. Data should be comprehensive and cover all categories of health indicators: determinants, inputs, outputs, outcomes, and health status. A core list of indicators can be part of the health sector M&E plan.
Country has master facility list (year updated) (indicator #7)	Yes	A master facility list (MFL) is a list of health facilities in a country (both public and private) and includes information that identifies each facility (unique ID). An MFL is important in monitoring health infrastructure and the services provided and assists in calculating the percentage of facilities included in routine health data collection. This list should be updated regularly.
Existence of policies, laws, and regulations mandating public and private health facilities/ providers to report indicators determined by the national HIS (indicator #22)	No	Countries should have a regulatory framework for the generation and use of health information, which helps to ensure data availability from public and private providers. This may include specific laws but, in some cases, it may be contained in other policies or regulations.
Routine health information system (RHIS) data collection forms allow for disaggregation by gender (indicator #25)	No	To ensure gender equity in health, countries need to collect and analyze data by gender. Data collection forms should allow for gender disaggregation in RHIS.
eHealth strategy (indicator #29)	No	With the introduction of information communication technologies into healthcare, countries should set a strategy of how eHealth will be organized and used. This strategy should be current with the national health planning cycle.

Table 2. Indicators for HIS management

Indicator	Is the date important?	Description
National HIS coordinating body/committee (indicator #6)	No	An interagency body or steering committee should oversee implementation of the national HIS strategy. This body should include representatives from the ministry of health, national statistics office, academia, telecommunications, local government, and the private healthcare sector. This committee can provide a technical advisory role for health and social welfare data managers in collaboration with other partners.
Conducted Health Metrics Network (HMN) assessment (year) (indicator #8)	No	This is a self-assessment tool to identify strengths and weaknesses of the national HIS, identify priorities for improvement, establish a baseline to monitor progress, and provide a basis for strategic planning.
Availability of standards/guidelines for RHIS data collection, reporting, and analysis (indicator #23)	No	To ensure uniformity and standardization in the collection of RHIS data, countries need standards or guidelines describing how data should be collected, reported, and analyzed. This information is used for training and should be available as reference documents.
Performance of Routine Information System Management (PRISM) assessment conducted in any regions/districts (indicator #17)	No	This is an assessment of the performance of a RHIS or HMIS. The framework consists of tools to assess RHIS performance; identify technical, behavioral, and organizational factors that affect RHIS; aid in designing priority interventions to improve performance; and improve quality and use of routine health data.

Table 3. Indicators for data management

Indicator	Is the date important?	Description
Country has electronic system for aggregating routine facility and/or community service data (indicator #12)	No	Many countries are transitioning from paper-based systems of aggregating routine health data from facilities and community services to electronic systems. Electronic systems assist data collection, data transmission, data quality, and aggregation. This can be DHIS 2 or another system.
Country has national statistics office (indicator #13)	No	This government agency should be a designated and functioning mechanism charged with analysis of health statistics, synthesis of data from different sources, and

		validation of data from population-based and facility-based sources.
Data quality assessment (DQA) conducted on prioritized indicators aligned with most recent health sector strategy (year of most recent) (indicator #16)	No	DQAs are important to gauge the overall quality of routine health data. DQAs are conducted at the facility level where essential data are gathered for monitoring interventions to address specific health areas such as HIV, tuberculosis, and malaria. DQAs should be conducted within the current health sector strategy cycle; they are not conducted on an annual basis.
Presence of procedures to verify the quality of data (accuracy, completeness, timeliness) reported (indicator #24)	No	As part of an effort to assure data generated by the HIS is of high quality, countries need procedures to assess data quality. This can include data accuracy checklists prior to report acceptance, internal data quality audits, and written feedback forms.

Table 4. Indicators for data sources

Indicator	Is the date important?	Description
Population census (within the last 10 years) (indicator #9)	Yes	A population census collects data on the size, distribution, and composition of the population, plus social and economic information. It provides sampling frames for surveys (household and other types). These population projections are used to calculate health indicators.
Availability of national health surveys (indicator #10)	No	National surveys include data collection on health-related behaviors and bioclinical measurements (e.g., Demographic and Health Survey, Multiple Indicator Cluster Surveys, and living standards measurement survey).
Completeness of vital registration (births and deaths) (indicator #11)	No	Vital registration systems record the occurrence and characteristics of vital population events (e.g., births and deaths) and are a main source of population statistics. Countries with complete vital statistics registries (at least 90 percent coverage) may have more accurate and timely demographic indicators.
At least one national health account completed in last five years (indicator #26)	Yes	This is a process through which countries monitor the flow of money in their health sector. The information is needed to determine the level of financing provided to the HIS.

Indicator	Is the date important?	Description
National database with health workers by district and main cadres updated within the last two years (indicator #27)	Yes	This database gathers data from multiple sources, including census, labor force surveys, professional registers, training institutions, and facility assessments. The information is needed to estimate the current workforce and plan for future staffing needs.
Annual data on availability of tracer medicines and commodities in public and private health facilities (indicator #28)	Yes	This indicator assesses the availability of data to measure the use of medicines and health commodities, both to measure service provision and to monitor availability of medicines and commodities to ensure there are no stockouts and that necessary commodities are available in facilities.

Table 5. Indicators for information products and dissemination

Indicator	Is the date important?	Description
National health statistics report (annual) (indicator #14)	Yes	This report summarizes the status of health indicators. It is produced annually and should provide information on health statistics nationally and by region and can include service delivery statistics and specific health outcomes. It can be called by various names—such as an annual health management and information system (HMIS) report, annual performance report, health and health-related indicators report, etc.
Country's ministry of health has an updated website (indicator #15)	No	A health ministry website should have the most recent health data and make available various reports covering different health and health program areas. It may link to other national and subnational departments and websites.

Table 6. Indicators for data quality

Indicator	Is the date important?	Description
Percentage of facilities represented in HMIS information (indicator #18)	No	Countries should define core data that all facilities report at prescribed times throughout the year (monthly, quarterly, biannual, or annual). The percentage of facilities that report should be recorded in HMIS reports (the number of facilities

		reporting [numerator] divided by the total number of health facilities [denominator]).
30. Completeness of disease surveillance reporting (indicator #30)	Yes	Percentage of disease surveillance reports received from districts to the national level compared to the number of reports expected. This percentage will indicate whether such data are available and note the most recent compilations (by year or month).

Table 7. Indicators for data use

Indicator	Is the date important?	Description
Proportion (facility, district, national) offices using data for setting targets and monitoring (indicator #19)	No	Use of routine and nonroutine data helps in setting annual targets and monitoring key indicators. It is critical for evidence-informed decision making. This information may be available from country reports, meeting minutes, or through special studies.

Table 8. Indicators for HIS performance

Indicator	Is the date important?	Description
Measles coverage reported to World Health Organization (WHO)/ United Nations Children's Fund (UNICEF) (indicator #20)	No	The ability to report the proportion/percentage of children aged one who received one dose of measles vaccine is a measure of HIS performance. The WHO site that is the data source for this indicator presents information from both the United Nations/WHO estimates and official government figures, which allows comparison of the two.
Number of institutional deliveries (births) available by district and published within 12 months of preceding year (indicator #21)	Yes	Births that occur in institutions (e.g., hospitals and health clinics) and that are attended by skilled and trained staff can provide necessary supervision, care, and advice to women during pregnancy, labor, and the postpartum period. The number of institutional deliveries is the numerator in determining coverage and is an indicator of HIS performance.

Data Collection

To record the status of indicators for each country, we searched for documents online: on government websites and other publicly available data sources, including government-sponsored surveys, registries, administrative databases, and vital statistics. Once this Internet search was completed, we contacted professionals working in the countries to populate the remaining indicators. The most current data as of March 19, 2019 were used in the analysis. MEASURE Evaluation continues to document additional indicators in the Resource Center as information becomes available.

Indicator Scoring

The indicators were ranked using a scorecard. For each indicator, countries were assigned a score of 2, 1 or 0. The scoring system permits the monitoring of a country's HIS performance. Under this indicator scoring system, the highest number of points a country can have is 60.

Table 9. Indicator scoring system

Criteria	Description	Scorecard rating
Available	Indicator is available, even if the percentage is not indicated where necessary	2
Available and current	Indicator is available and current based on the period criteria specified in the indicator description	2
Available and not current	Indicator is available but not current based on the period criteria specified in the indicator's description	1
Partially available	Indicator is partially available, but some aspects specified in the indicator's description are missing or not available	1
Available and undated	For indicators with a specified period, indicator is available, but the date of the last update is unknown	1
Not available	Indicator is not available or has not been completed	0
Unknown	Status of indicator is unknown	0

RESULTS

Indicator Performance

The average indicator scores were similar across all three country categories, as shown in Table 11. PEPFAR countries had an average score of 36, countries where preventing child and maternal deaths is a priority had an average score of 38, and all countries had an average score of 35.

Table 11. Average scores for the PEPFAR, preventing child and maternal deaths, and all-country categories

Type of category	# of countries	Average score	% of indicators achieved
PEPFAR	30	36	61%
Preventing child and maternal deaths	27	38	63%
All countries	43	36	61%

Table 12 presents the most and least common indicators in the country profiles with a score of 2 (the highest possible point value for each indicator). Indicator 10 (availability of national health surveys) was the only common indicator with a score of 2 identified in all country categories. This indicator was found for all PEPFAR country profiles, preventing child and maternal deaths country profiles, and all countries. All PEPFAR country profiles had a national statistics office (indicator 13), whereas the preventing child and maternal deaths countries had an electronic system for aggregating routine facility and/or community service data (indicator 12), and measles coverage reported to WHO/UNICEF (indicator 20). The least common indicator for preventing child and maternal deaths country profile and all countries was indicator 11, completeness of vital registration. In the all countries category, only three countries had a score of 2. None of the country profiles for the preventing child and maternal deaths category had a score of 2 for this indicator. For PEPFAR country profiles, indicator 14 (availability of annual national health statistics report) was the least common indicator. Only two PEPFAR countries had a score of 2 for this indicator.

Table 12. Most and least common indicators in the country profiles (with a score of 2), by type of category

	Most common indicators			Least common indicators		
Type of category†	**Indicators††**	**# countries with indicator**	**% of countries with indicator**	**Indicators††**	**# countries with indicator**	**% of countries with indicator**
PEPFAR	#10, #13	30	100%	#14	2	7%
Preventing child and maternal deaths	#10, #12, #20	27	100%	#11	0	0%
All countries	#10	43	100%	#11	3	7%

†There are 43 country profiles in the all countries category, 30 country profiles in the PEPFAR category, and 27 country profiles in the preventing child and maternal deaths category.

†† Indicators: 10. Availability of national health surveys; 11. Completeness of vital registration (births and deaths); 12. Country has electronic system for aggregating routine facility and/or community service data; 13. Country has national statistics office; 14. National health statistics report (annual); and 20. Measles coverage reported to WHO/UNICEF.

The distribution of the indicator scores varied for all indicators (Figures 2 to 4). For the PEPFAR country profiles, the highest performing indicators were numbers 1, 9, 10, and 13 with a score of 2 or 1. Among the country profiles for preventing child and maternal deaths, indicators 1, 9, 10, 12, and 20 scored either 2 or 1. Among the all countries category profiles analyzed, indicators 1, 9, and 10 had either a score of 2 or 1.

Across all 30 PEPFAR country profiles, indicator 19 (proportion of offices using data for setting targets and monitoring) had the most countries assigned a score of zero. Among the country profiles for preventing child and maternal deaths, indicator 3 (HIS policy) had the most countries assigned a score of 0. Similar to the PEPFAR country profiles, most of the zero scores for the all countries category were for indicator 19.

Figure 2. Distribution of indicator performance for PEPFAR country profiles

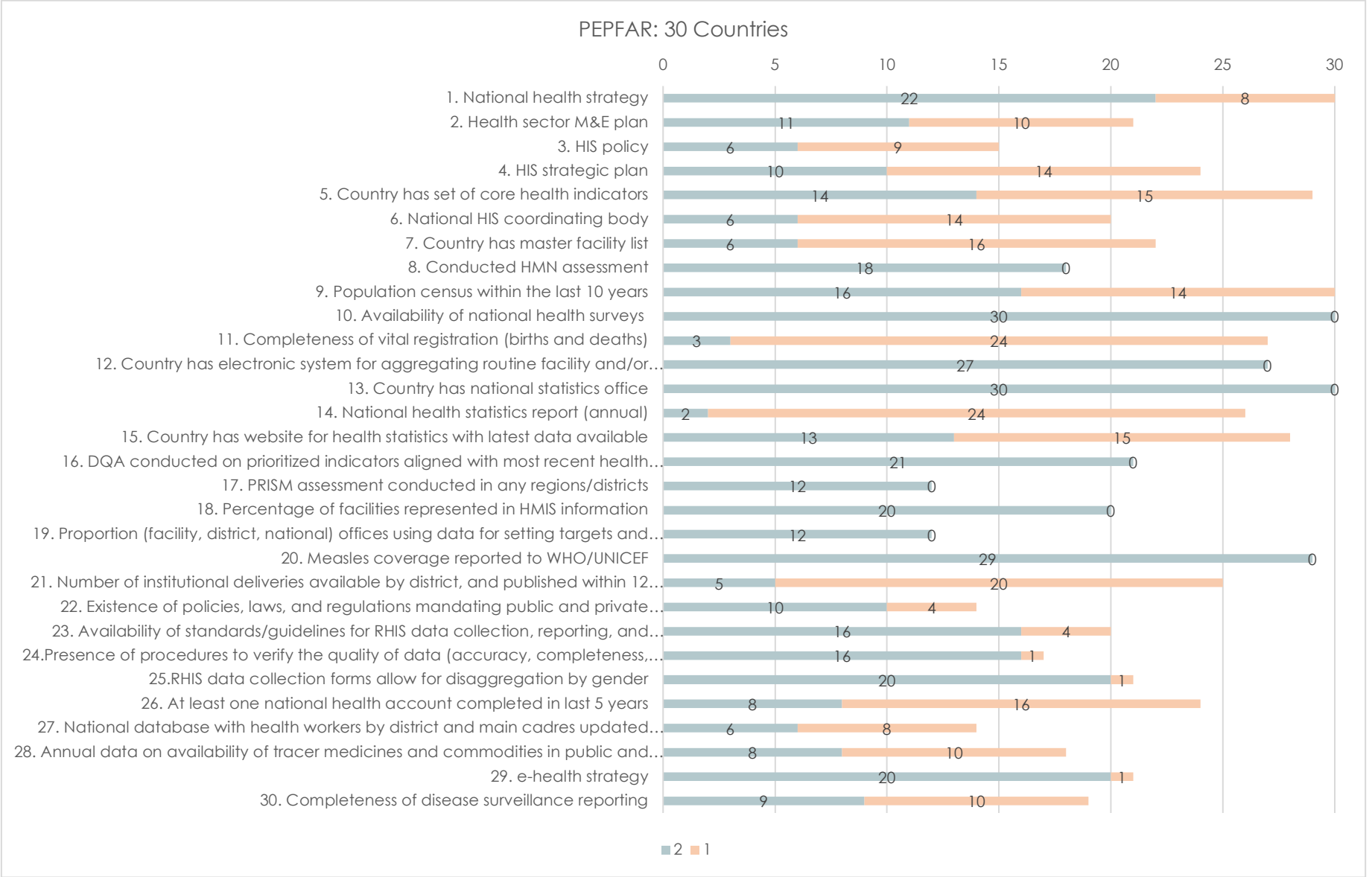


Figure 3. Distribution of indicator performance for profiles of countries focused on preventing child and maternal deaths

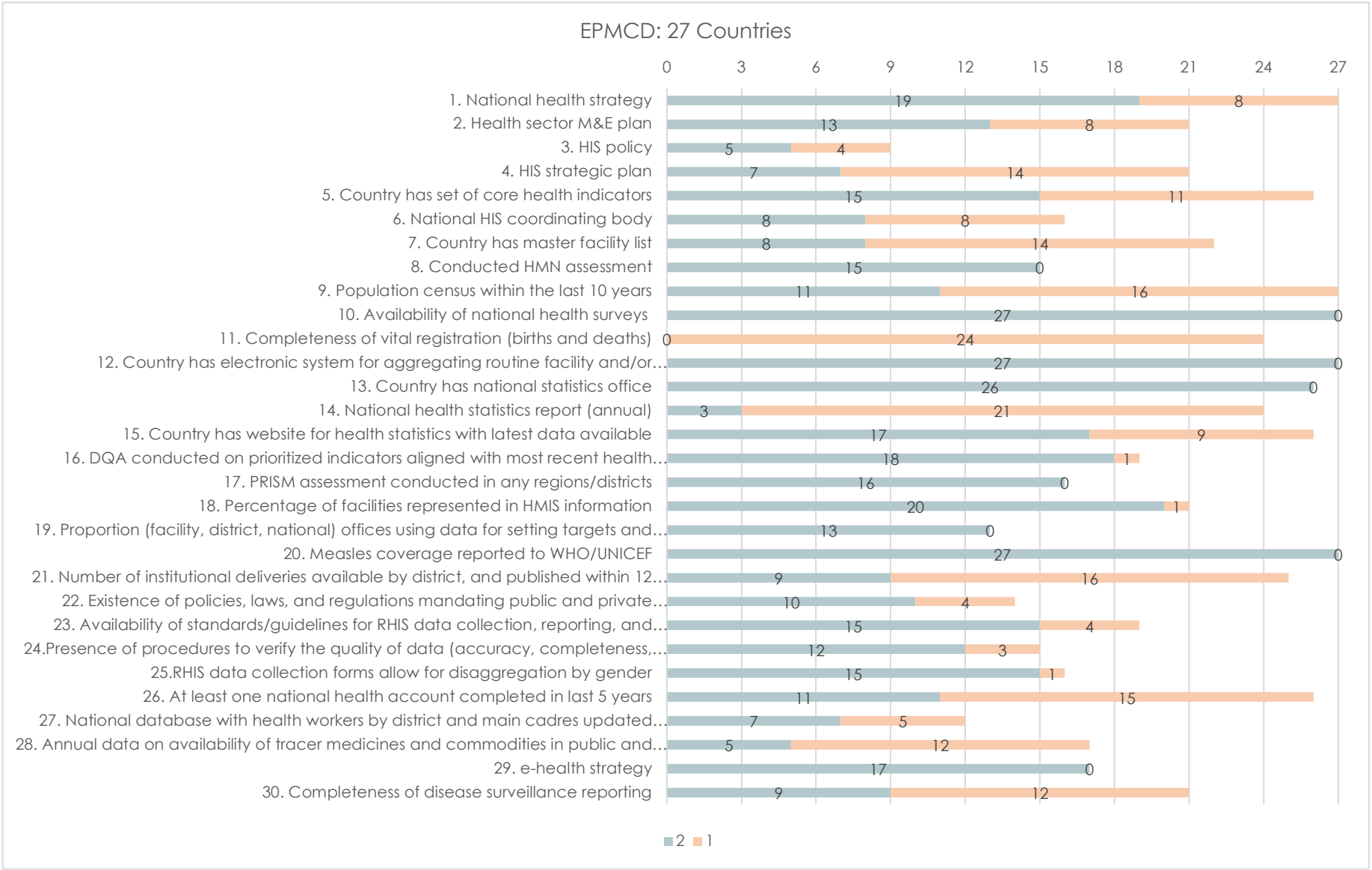


Figure 4. Distribution of indicator performance for all country profiles

Country Profile Indicator Scores

This section presents the country profile indicator scores for all 43 countries (all countries category), the 30 PEPFAR country profiles, and the 27 profiles of countries where the focus is on preventing child and maternal deaths. The scores varied across the various country profiles and each country profile could earn a maximum total score of 60.

Table 13 presents the scores of the individual PEPFAR country profiles. PEPFAR country profiles scores ranged from 16 to 51, with a median of 40 and a mean of 36.

Table 13. Indicator scores of PEPFAR country profiles

Country	∑ Indicator score		Country	∑ Indicator score
Botswana	39		Kenya	31
Burma (Myanmar)	39		Lesotho	34
Burundi	48		Malawi	44
Cameroon	16		Mozambique	32
Côte d'Ivoire	51		Namibia	33
Dominican Republic	43		Nigeria	40
DRC	44		Rwanda	40
Eswatini	31		South Africa	47
Ethiopia	41		South Sudan	38
Ghana	41		Tanzania	45
Guatemala	29		Uganda	50
Guyana	18		Ukraine	17
Haiti	43		Zambia	32
India	23		Zanzibar	41
Indonesia	19		Zimbabwe	41

The indicator score of preventing child and maternal deaths country profiles is shown in Table 14. The preventing child and maternal deaths country profiles had a median score of 40, and a mean of 38 indicators. The scores ranged from 19 to 50.

Table 14. Indicator scores of the 27 country profiles of countries focused on preventing child and maternal deaths

Country	∑ Indicator score		Country	∑ Indicator score
Afghanistan	34		Nepal	40
Bangladesh	40		Nigeria	40
DRC	44		Pakistan, Balochistan	26
Ethiopia	41		Pakistan, Khyber Pakhtunkhwa	34
Ghana	41		Pakistan, Punjab	34
Haiti	43		Pakistan, Sindh	38
India	23		Rwanda	40
Indonesia	19		Senegal	44
Kenya	31		South Sudan	38
Liberia	50		Tanzania	45
Madagascar	45		Uganda	50
Malawi	44		Yemen	22
Mali	50		Zambia	33
Mozambique	32			

Table 15 presents the indicator scores of all 43 countries. The median score for all the countries profiles was 39 and the mean score was 36, with a minimum of 16 and a maximum of 51.

Table 15. Indicator scores of all countries

All	∑ Indicator score		All	∑ Indicator score
Afghanistan	34		Malawi	44
Bangladesh	40		Mali	50
Botswana	39		Mozambique	32
Burma (Myanmar)	39		Namibia	33
Burundi	48		Nepal	40
Cameroon	16		Nigeria	40
Côte d'Ivoire	51		Pakistan, Balochistan	26
Dominican Republic	43		Pakistan, Khyber Pakhtunkhwa	34
DRC	41		Pakistan, Punjab	34
Eswatini	31		Pakistan, Sindh	38
Ethiopia	41		Rwanda	40
Ghana	43		Senegal	44
Guatemala	29		South Africa	47
Guinea	19		South Sudan	38
Guyana	18		Tanzania	45
Haiti	23		Uganda	50
India	19		Ukraine	17
Indonesia	31		Yemen	22
Kenya	50		Zambia	33
Lesotho	34		Zanzibar	41
Liberia	45		Zimbabwe	41
Madagascar	44			

LIMITATIONS

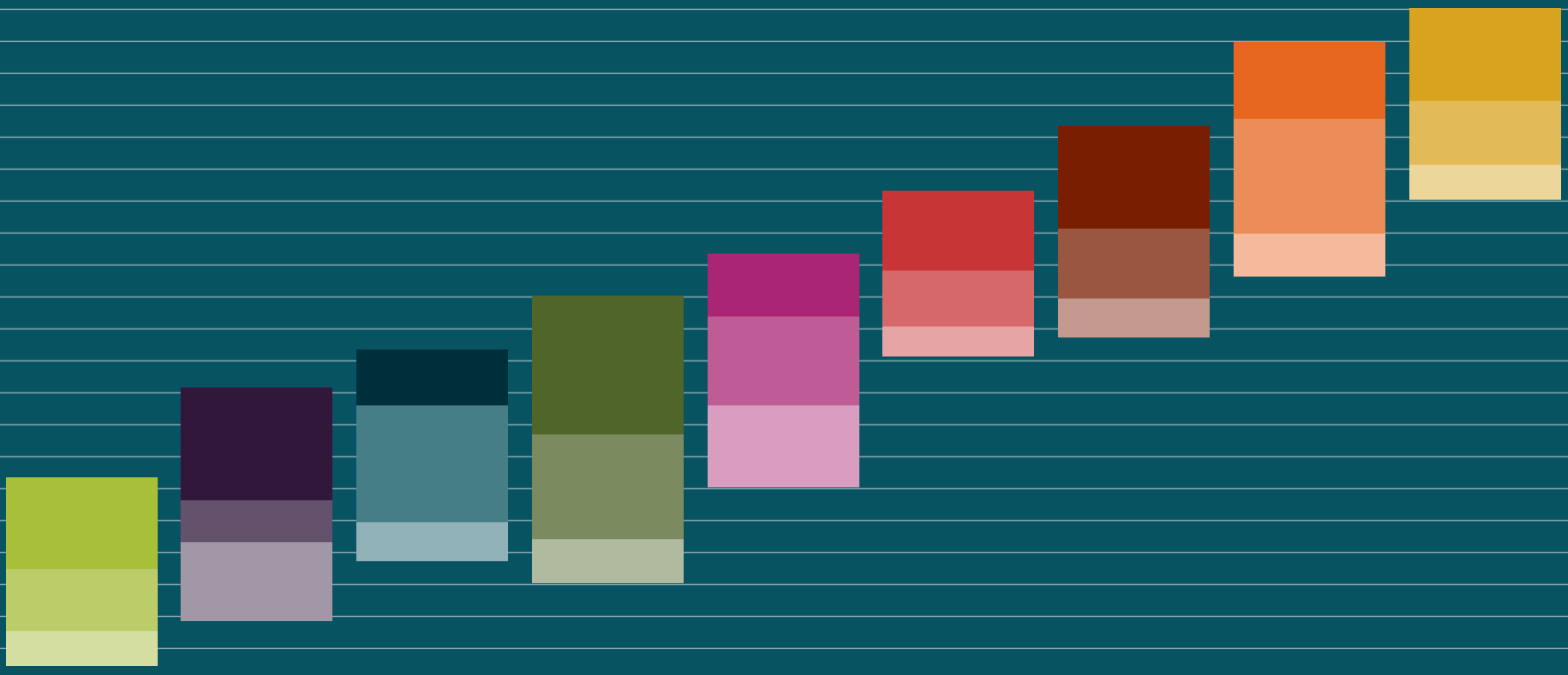
There is a great deal of variation in the total number of indicators located. In some cases, countries may have had these indicators even though we could not collect the data. MEASURE Evaluation has a significant presence in four of the five countries with the highest scores. In some cases, our work has focused on some of the selected indicators (e.g., PRISM assessments, DQAs, MFLs) but in addition we have strong contacts who can provide information.

It is difficult to say with certainty that a country with a higher rank has a stronger HIS than does one with a lower rank, because we were looking for specific indicators. For example, we were able to obtain information for Burundi and Rwanda, and Burundi has a higher score. Other indicators could have been selected that would have changed the rankings: for example, qualitative measures not captured in the profiles. The indicators were selected by reviewing multiple international sources and consulting with experts, but they could be improved upon.

DISCUSSION AND CONCLUSION

This analysis allows us to see what the countries studied are doing, which can guide strategic planning for future activities and interventions. For example, only eight countries have an updated HIS policy and ten have an outdated policy, which means that 25 countries do not have a policy at all. The same is true for an eHealth strategy. These foundational documents are critical in planning national-level strategies. A national census is an important data source, and only 21 countries had conducted one within the past 10 years.

Data collection is ongoing, and we will update this analysis as more information becomes available.



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