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MINISTRY OF HEALTH-ETHIOPIA

PATHWAYS TO IMPROVE HEALTH INFORMATION SYSTEMS IN ETHIOPIA

Analysis Report on the Stages of Continuous Improvement — Defining
the Current Status, Goal, and Improvement Roadmap of the HIS

August 2021



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- **MoH Directorates:** Health Information Technology Directorate (HITD), Policy, Plan and M&E Directorate (PPMED) and Human Resource Development Directorate.
- **MoH Agencies:** Ethiopian Public Health Institute (EPHI), Amour Hansen Research Institute (AHRI), Ethiopian Pharmaceutical Supply Agency (EPSA) and Ethiopian Food and Drug Administration (EFDA).
- **Regional Health Bureaus:** Addis Ababa City Administration Health Bureau, Afar Regional Health Bureau and Oromia Regional Health Bureau.
- **Implementing Partners:** Ethiopia Data Use Partnership (DUP), Ethiopia Digital Health Activity (DHA), Clinton Health Access Initiatives (CHAI) and ICAP.
- **Universities:** Addis Ababa University, University of Gonder, Hawassa University, Jimma University and Mekelle University.

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Ministry of Health, August 2021



Group work, HIS Maturity Assessment, February 1, 2021 Adama



CHAPTER ONE
INTRODUCTION

CHAPTER ONE: INTRODUCTION

1.1 Background

Striving to tap into the huge benefit and positive impact of health information systems (HIS) for the health sector, the Ministry of Health of Ethiopia (MoH) identified digital transformation and its governance as one of the major pillars of the health sector transformation plan (HSTP-II, 2020-2025). The MoH also prepared the Information Revolution (IR) Roadmap and Digital Health Blueprint (DHBp) to provide overall guidance for all stakeholders to adhere to and use as a basis for the HIS/digital health investment in the country. As implementing HIS/digital health is a resource intensive engagement, developing countries, like Ethiopia, should wisely implement these systems with a priority-based approach. Further, countries should devise a mechanism to regularly assess if these systems are performing as per their set objectives and take managed actions to rectify problematic areas. There should also be a coordinated effort among all relevant stakeholders in the sector to identify the HIS/digital health priority areas which are aligned with the sector's strategic objectives to take advantage of the continuous advancement of information and communication technology (ICT).

The importance of assessing the maturity level of HIS endeavors, using maturity model-based assessment tools, has grown. These methods are useful to describe the current maturity level of the HIS in terms of human resources, business processes, technology, and organizational capabilities. The methods also facilitate users' ability to set goals for future levels of maturity and inform the development of improvement plans to realize the next maturity level towards a stronger HIS for a country to meet its public health goals. The HIS maturity assessment gives due emphasis to the institutional maturity of the information system in its entirety (based on the concept of HIS Stages of Continuous Improvement) as well as the maturity of individual HIS components and interoperability maturity of those systems.

Based on the current maturity status of the HIS and the future levels the country aims to attain, the assessment results will give insight on the areas that need special attention by the different stakeholders.

1.2 Rationale: Why this Assessment?

Driven by the IR Agenda and guided by the national DHBp, the MoH is committed to ensuring the availability of strong digitalized HIS in the country to achieve the strategic goals of the sector at all levels. This lofty goal will require a continuous improvement process that is done incrementally and measured meticulously for its appropriateness. While much progress has been made over the last few years regarding the implementation of different electronic HIS in the health system, the overarching maturity of those systems and their level of interoperability has yet to be measured. This measurement gap leaves MoH and its partners with little to no evidence on where the country stands and what further steps are needed. It also leaves MoH and stakeholders short of ideas, aspiring to leapfrog from the eHealth era to digital health era. We need our HIS/digital health initiatives assessed for their level of maturity and in particular, the business continuity of the systems and their interoperability.

The HIS maturity assessment results can guide strategically linked, continuous improvement processes. They are critical to obtaining a thorough understanding of the HIS' current position and where it aims to be in the future. The maturity assessment enables MoH to describe the process components that are believed to lead to better outputs and outcomes. A low level of maturity implies a lower probability of success in consistently meeting MoH's HIS/digital health goals, and a higher level of maturity implies a higher probability of success. Such assessments can be a reference point for identifying the foundational elements needed to create an enabling environment for systems within a national HIS to become interoperable. If applied regularly, maturity assessment results can drive improvements in HIS, from current to desired status. The results of such assessments can also serve to develop a clear roadmap on how to improve processes from one level to the next by helping to define the attributes of each level.

This assessment; therefore, was conducted with the aim of generating solid evidence on the maturity status of the HIS/digital health endeavors of the MoH and its strategic partners by conducting a landscape analysis and identifying the existing capacity, processes, and structures and the required levels of maturity.

1.3 Goal and Objectives of the Assessment

The broader goal of this assessment is to measure the HIS/digital health maturity level based on its major domains and subdomains, using the HIS Stages of Continuous Improvement (SOCl). In addition, the assessment identifies the future status/goals (end of 2024) and provides a clear roadmap with the necessary actions to build a strong national HIS with attendant subsystems that are able to receive and share data. By doing so, the assessment aims to identify the factors that are critical to achieving mature and interoperable HIS, and creating a developmental path towards a resilient information system.

The specific objectives of the assessment are the following:

1. To establish a systematic basis of measurement for describing the HIS landscape in the sector by setting a baseline (end of 2020) of HIS improvement in Ethiopia.
2. To set goals (end of 2024) for all subcomponents of HIS to progress through SOCl.
3. To set a roadmap toward resilient and interoperable systems, and prepare action plans for improvement.



CHAPTER TWO

ASSESSMENT APPROACH

CHAPTER TWO: ASSESSMENT APPROACH

2.1 Scope of the Assessment

The HIS maturity assessment aims to evaluate the maturity level of the overarching HIS at national/subnational levels, based on the HIS domains and subdomains, with the intention that having an understanding of such will serve as a foundation and provide baseline information for other HIS/digital health initiatives.

Even though dealing with individual HIS is not in the scope of the current assessment, the digital health systems, implemented and owned by the MoH, Regional Health Bureaus, and agencies were given due consideration during the assessment process. Moreover, each domain was evaluated in light of the HIS/digital health enhancement efforts made from Service Delivery Points (SDPs) all the way to the national level.



Group work, HIS Maturity Assessment, January 30, 2021, Adama

2.2 The Assessment Tool - Stages of Continuous Improvement (SOCI)

After doing a thorough landscape analysis of the existing maturity assessment tools, the MoH decided to adopt and use MEASURE Evaluation’s Stages of Continuous Improvement (SOCI) tool which is suited to assess the national HIS of developing countries like Ethiopia. The tool measures current and desired HIS status in five core domains across 13 components and 39 subcomponents. The status is measured across five stages: *Emerging*, *Defined*, *Repeatable*, *Managed*, and *Optimized*. Table 1 and 2 below will unpack the HIS Maturity Stages and the domains and components of SOCI.

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

Table 2: SOCI Core domains and components

HIS Core Domain	Components	Subcomponents
1.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 coordination
		HIS organizational structure and function
2.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
	3.HIS Information and communication technologies (ICT) infrastructure	Operations and maintenance
ICT business infrastructure		
Hardware		
Communication network (LAN and WAN)		Networks and internet connectivity
Business continuity		Business continuity and processes and policies
4.HIS Standards and interoperability		Standards and 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

5.Data quality and use	Data quality assurance	Data quality assurance and quality control
		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)

2.3 The Assessment Process

This assessment was a collaborative process that was carried out through careful planning, with engagement of all key stakeholders, and by doing a comprehensive review of several strategic documents, digital health policies, and global trends. It started by clearly defining the scope and intended objectives of the processes. The major steps and processes that followed are outlined as follows:

Step 1: Establish the Assessment Core Team: MoH’s Health Information Technology Directorate (HITD) and the Policy, Planning and M&E Directorate (PPMED) jointly led the HIS Maturity Assessment. Senior experts from the two directorates took the overall technical and administrative leadership in the entire processes.

Step 2: Define the Scope and Assessment Approach: Since this assessment was the first in its kind, it was agreed that it should be able to explore the overarching HIS/digital health maturity status based on major domain areas. Measuring the maturity level of the individual HIS components was lined up as the next phase after completing this task.

Step 3: Complete Landscape Analysis and Desk Reviews: A thorough landscape analysis of the available HIS/digital health maturity assessment

results of different countries along with the methods employed and the tools used for the assessment was carried out in the initial phase of this task. Moreover, relevant documents available at the MoH, agencies, and partner organizations were collected and analyzed. Global and domestic digital strategies and guiding documents, publications, research papers, and assessment reports were analyzed, organized, and used for the assessment.

Step 4: Map Stakeholders: A stakeholders mapping was done with the participation of all relevant stakeholders, including directorates of the MoH, agencies under Ministry, regions, implementing and funding partners, and Capacity Building and Mentorship (CBMP) universities.

Step 5: Organize Assessment Workshop: A four-day assessment workshop was conducted with the participation of a total of 41 senior experts from the identified stakeholders. A hybrid of a self- and facilitator-administered approach was employed for the assessment. During the workshop, participants defined the current status and future state of the HIS/digital health maturity and prepared the improvement roadmap. The first day of the workshop was spent on creating a common understanding among participants regarding the assessment tool and its domains and components; providing details on the major national digital health initiatives; sharing available materials; and building consensus on the scoring mechanisms. The remaining three days were used for the actual scoring, evidence generation, and dialogue.

Step 6: Organize a Write-Up Workshop: Followed by the assessment workshop and the availability of the initial assessment documentation, a three-day write-up workshop was organized to critically analyze the assessment results and to define the future maturity states targeted on each component and subcomponent. Accordingly, the findings were organized; perceived high-impact interventions were also identified based on expert opinions. In addition, an improvement roadmap was outlined to reach the targets set with respect to each domain and component.



CHAPTER THREE

HIS CURRENT MATURITY STATUS (AS IS – DECEMBER 2020)

CHAPTER THREE: HIS CURRENT MATURITY STATUS (AS IS – DECEMBER 2020)

Introduction

Assessing the current maturity level of digital HIS in the country will provide information for policymakers, planners, and implementers in the health sector to understand its areas of strength and those that need more attention for better performing digital health; prioritize areas for future investment; and set targets and a roadmap for the aspired changes. The SOCI tool used for this assessment helped us measure the current digital health maturity level with respect to major digital health domains, subdomains, and components. It also helped in mapping out characteristics with the strategic goals of the health sector. The current digital health maturity level (end of 2020) is described in the following sections in light of the five domains.



Group work, HIS Maturity Assessment, January 30, 2021, Adama

3.1 Leadership and Governance

Leadership and governance is one of the core, interrelated digital health building blocks, and it ensures the digital health strategic policy, legal, and regulatory framework for compliance and accountability. The domain deals with improving the impact of quality deliverables and organizational efficiency towards building strong governance on data quality, data management, data sharing, data use, privacy and security, and business process continuity. It also delivers operational certainty and stability focusing on HSTP- II as well as DHBp's goals which are crucial in terms of improving the enforcement of policies, legislation, strategies for digital health; the alignment and implementation of the M&E plan; the definition of the organizational structure, coordination, and functions of HIS; and setting the mechanism for HIS compliance.

While promising progress were made with regard to drafting workable documents, engaging stakeholders, establishing technical and administrative committees, etc., the sector still will have to strive to improve particular areas like endorsing draft governance documents, defining the career path, revising the HIS structure, and budgeting the M&E activities. The following matrix will provide some insight regarding where the Ethiopian health sector is in Leadership and Governance.

Domain Name	HIS Leadership and Governance
Current Cumulative Score	2.47 out of 5
Areas of Strength	Major Gaps
<p>HIS/Digital Health Strategy: The HIS strategic plan was prepared in the context of the health priorities of the country; the strategy has a vision for management and use of health information; it contains a plan of action for delivering the vision, and arrangements for M&E; digital strategy also has been prepared to facilitate the leapfrogging to the digital health era.</p> <p>M&E Plan: A draft framework prepared for regular evaluation (both formative and summative) of HIS activities; the M&E plan is aligned with HSTP-II and is regularly reviewed; dissemination platforms available.</p> <p>Policy, legal, and regulatory framework and compliance Existence of HIS policies and legislation: Draft HIS policies and legislations available to guide decisions and achievements of HIS outcomes.</p> <p>Policy compliance enforcement: There are specific enforcing mechanisms in some settings. For example, data sharing policies in EPHI and MoH.</p> <p>Organizational structures and functions HIS leadership and coordination: Have established technical and administrative committee such as NAG, TWG, PMT, IR steering committee; had a meeting on different committees such as JSC (MoH with the RHBs heads) to address political issues and to manage national HIS affairs at all levels of a country's health system; the governance structure consists of the mechanisms, processes, and institutions through which actors and stakeholders articulate their interests, by defining the roles and responsibilities with meeting schedule.</p> <p>HIS organizational structure and functions: Defined organizational structures and processes at some levels, there are job titles and clear descriptions of duties and responsibilities;</p>	<p>HIS/Digital Health Strategy: The HIS and Digital Health strategies are not yet endorsed and put into action.</p> <p>M&E Plan: The HIS activities are not well-aligned with the HIS strategy; M&E is not fully implemented, sufficiently budgeted, nor consistent; the M&E lacks checks and balances across all HIS systems.</p> <p>Policy, legal, and regulatory framework and compliance Existence of HIS policies and legislation: Compliance documents are not updated and endorsed; they lack oversight for adherence and wider stakeholder engagement; duplication of policies and legislations do exist (e.g., Data Sharing Policies drafted by EPHI, MoH, and partners).</p> <p>Policy compliance enforcement: No clear process for the review, validation, and enforcement of policies, legislation, and regulations; no specific mechanisms and regulatory body to ensure adherence to organizational policies, procedures, and best practices related to HIS/digital health; weak accountability mechanisms; no strong metrics on compliance and noncompliance of the policies.</p> <p>HIS leadership and coordination: Lack regularity to oversee the function and implementation of the HIS; high turnover at the executive leadership level; weak coordination and oversight at national-level; weak established process for sharing and reviewing HIS information with all HIS stakeholders.</p> <p>HIS organizational structure and functions: The structures are not uniform across all levels and are not attached to an accountability framework.</p>

3.2 Management and Workforce

HIS management and workforce is a key component for the health sector at large to rely on health information for evidence-based decision-making, health service planning, and delivering quality patient care. It entails the availability of adequate personnel with characteristics, attributes, and capabilities to perform tasks to achieve the intended goals. In the Ethiopian health sector, there are well defined and documented competencies, roles, and responsibilities for HIS task forces at almost all levels, even though much work has to be done in making regular HIS capability assessments and analyses. The training, academic curricula, and processes for developing training and education programs to build HIS skills and competencies nationally are standardized to impart the desired knowledge and skills of the HIS workforce. It requires a review of the training programs on a regular basis and adapting to the changing requirements. There are strong HIS policies that avail hiring mechanisms, with documented roles and responsibilities and that are harmonized with the IR roadmap and other health sector plans; however, the human resource information system (HRIS) is not fully utilized to manage the data of the health workforce at all levels. There is a multi-year HIS financing strategy aligned with healthcare and HIS strategic priorities, and financial sources are identified for sustained HIS activities, which requires setting priorities in resource allocation.

Domain Name	HIS Management and Workforce
Current Cumulative Score	3.37 out of 5
Areas of Strength	Major Gaps
<p>HIS competencies (knowledge, skills, and abilities): There are well defined and documented competencies, roles, and responsibilities for HIS task forces at almost all levels; the competencies for the HIS workforce are aligned and practiced with the HIS strategies; HIS training program courses are aligned with established core competencies to meet training needs; an established career path is defined for HITs.</p>	<p>HIS competencies (knowledge, skills, and abilities): The informatics and project management concepts are used in limited settings (just in some projects at the national level) for developing, implementing, and managing digital health activities and project; limited HIS capability assessments and analyses; lack of a strong hiring mechanism of distributing HIS workforce to all health offices and facilities; the workforce distribution significantly varies from region to region regardless of the demand.</p>
<p>HIS training and education (includes continuous professional development): Training, academic curricula, and processes for developing training and education programs to build HIS skills and competencies nationally are standardized; training and education programs conducted periodically at government- designated institutions. Clear and measurable learning outcomes are defined for training courses; training and education plans are integrated in HIS implementation plans and the results are measurable.</p>	<p>HIS training and education (includes continuous professional development): Training and education programs are not being reviewed on a regular basis by the designated authority to ensure alignment with HIS needs and technology.</p>
<p>HR Policy: There is a structured hiring mechanism that distributes staff to some subnational facilities; HIS competencies, roles, and responsibilities of staff are clearly documented; human capacity needs are integrated in the HIS and/or health plan and monitored by a designated government authority; the HIS Workforce Analysis/Labor Market Analysis (HLMA) is conducted nationally to forecast future demands.</p>	<p>HR Policy: The workforce is not sufficient to meet HIS workforce demands at health offices and health facilities; data on vacancies and staffing needs are not collected and managed in the HRIS on a regular basis nor are they used to inform hiring, distribution of staff, training and education needs, or advocating for budgets to meet national HIS needs; HIS/digital health competencies, roles, and responsibilities of staff performing HIS functions are not disseminated to the concerned staff; region specific HIS Workforce Analysis/Labor Market Analysis (HLMA) is not conducted to forecast future demands.</p>

<p>HIS financing plan: There is a multi-year HIS financing strategy aligned with healthcare and HIS strategic priorities, and sources are identified for sustained HIS activities; HIS implementation is funded using capital financing, revenue, and grants; expenditure reports are shared with the relevant HIS team/unit; financial audit processes are in place and regularly carried out to promote accountability in HIS spending; established financial management system is owned, reviewed, tracked, and revised by the government using the Integrated Financial Management System (IFMIS).</p>	<p>HIS financing plan: Limited private-public partnership (PPP) funding for HIS implementation; lack of strategic HIS investment guidance to dictate future demands of HIS/digital health; lack of inclusiveness of the financial plans.</p>
<p>Resource mobilization: The resource mobilization plan for HIS activities is integrated in the HIS and/or health plan at the appropriate level of implementation (national, regional).</p>	<p>Resource mobilization: The resource mobilization plan is not periodically reviewed/ revised to accommodate financial requirements needed to support evolving HIS activities and emerging health sector needs at the appropriate level of implementation (national, subnational).</p>

3.3 HIS ICT Infrastructure

The digital health ICT infrastructure deals with the implementation of required technology by applying standard operating procedures to enhance the daily business of the health sector and its stakeholders. Based on the assessment, the current status of the health sector has its strong points and there are also areas that need consideration and improvement in order to realize the country’s goals before the end of 2024. As of September 2019, more than 3,800 sites have been connected through a virtual private network (VPN), called HealthNet. This massive initiative was integral to ensuring the connected facilities strategy. The shortcomings identified are lack of stable power sources, lack of capable hardware, and the use of outdated ICT infrastructure at different levels of the health sector. Lack of proper documentation and a business continuity plan are also weaknesses that were identified from the assessment. Hence the MoH, agencies, regional health bureaus, and relevant stakeholders need to exert more effort to address these gaps in a prioritized manner.

Domain	HIS ICT Infrastructure
Score	2.29 out of 5
Areas of Strength	Major Gaps
<p>Operations and Maintenance: There is a responsible team within the Ministry that handles power management issues; there is a backup power source installed at the national level (MoH's Datacenter), some RHBs and agencies (though not capable of handling the current demands). ICT policies/directives are prepared at Ministry and agency levels; IT Internship programs have been promoted by engaging IT professionals who are recent graduates to facilitate support and maintenance at woredas and health facilities.</p> <p>Communication Network (LAN and WAN): There is a dedicated ICT infrastructure and virtual private network at the MoH, agencies, as well as at the regional level; Health-Net and LAN are deployed in many health facilities; enhancing the network and Internet connectivity is considered as one of the key initiatives of the Digital Health Strategy; mechanisms exist to identify challenges of connectivity (e.g., Service Availability and Readiness Assessment [SARA]).</p> <p>Business continuity: To avoid business discontinuity, a backup datacenter has been implemented at the national level for key HIS.</p>	<p>Operation and Maintenance: Lack of a sustainable/ alternative power source at most healthcare facilities; lack of a business continuity plan related to power supply in most of the health institutions; lack of collaboration between health facilities and small-scale enterprises to address maintenance and technical assistance demands at the facility level; poor planning for replacing outdated/damaged hardware; lack of a clear plan to address the increasing hardware equipment demand at woreda and facility levels.</p> <p>Communication Network (LAN and WAN): Communication gaps between the Internet service provider (Ethio-Telecom) and health institutions; inadequate follow-up and technical support from the MoH and regions in sustaining HealthNet utilization; lack of regular network and Internet connectivity assessment and reporting methods; lack of redundant Internet/WAN connection options.</p> <p>Business Continuity Plan (BCP): While there are some decent business continuity discussions and plans, they are not well documented, prioritized, nor endorsed; no clear BCP for health facilities; no business continuity standard procedures thus far.</p>

3.4 Standards and Interoperability

The HIS standards and interoperability domain deals with the realization of a health data exchange using nationally and internationally known and accepted standards. In Ethiopia's health sector, there is a recognized need for data standardization and interoperability. Efforts such as developing national eHealth architecture, harmonized indicator reporting, and national health data dictionary (NHDD) have taken place. The use of standards is a driving factor to operationalize shared/core services. The development of a master

facility registry (MFR), a single source of truth for facilities, was also one of the successful endeavors that was part of the Ethiopian national eHealth Architecture. Though those efforts are promising, there is still much work yet to be done. The following matrix will provide some details regarding where the Ethiopian Health sector is in terms of the HIS Standards and Interoperability.

Domain Name	HIS Standards and Interoperability
Current Cumulative Score	2.47 out of 5
Areas of Strength	Major Gaps
<p>Standards and Guidelines: All data sets are developed in-line with national guidelines; the indicator set is integrated into the national health strategy; aggregated data sets are harmonized/mapped with those from internationally recognized standards; there is a recognized need for a harmonized data exchange of HIS and better coordinated stakeholder initiatives; national Indicator Reference Guidelines, national health data dictionary (NHDD), MFR guidelines, and data management guidelines are centrally prepared.</p> <p>HIS Core Services: The MFR system is at a final stage to be operational and much effort is needed to scale it up at a national level; the national digital health strategy has identified leading indicators to monitor progress and is being implemented using national HMIS/DHIS2; NHDD terminology has been introduced using a mobile application for collection, dissemination, and use of the terminologies; efforts to access metadata are consolidated and available from a single portal; national health information architecture is up-to-date and being implemented and includes foundational interoperability tools required to perform HIS functions.</p> <p>Interoperability (Data Exchange): Though data exchange implementation is not at a large scale, it has been localized and ad hoc efforts are observed. Interoperability between DHIS2 and MFR is a pilot stage.</p>	<p>Standards and Guidelines: Foundational standards and guidelines have been developed but not endorsed by MoH, which hinders the adoption and practicality of the standards; clinical minimum data sets are not developed; standards for data exchange/messaging are not yet prepared.</p> <p>HIS Core Services: Registry services are foundational for other health data exchange and harmonization, but there is a limitation in the regular update and feedback process of the implemented core services; a client registry is not developed and lack of a national digital ID has made it hard to do so.</p> <p>Interoperability (Data Exchange): Some essential shared services, such as unique person identification, are missing and that hinders a national-level person data exchange; aggregate data exchange practices exist but are on a limited scale; there are no security standards for the data exchange implemented; national interoperability LAB does not exist to test and there is no certification for implementers to stick to.</p>

3.5 Data Quality and Use

Data quality and use is one of the HIS domains that mainly addresses data quality and data use culture-related issues for informed decision-making through well-organized systems and standard methods and techniques. Currently, data quality and use procedures with clear and defined rules for data collection, processing, analysis, and use are implemented at all levels. A regular schedule is defined for conducting data quality reviews and audits.

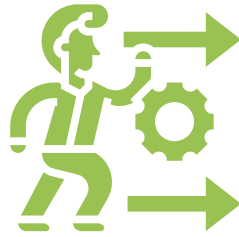
Despite those efforts, this assessment indicates, among other things, the need for having a functional national data quality and use governing body with an established and standardized process by engaging health data actors. It also shows the need for developing data quality plans that will be reviewed periodically, using defined standards and procedures by a coordinating body at all levels. Moreover, it calls for a concerted effort in nurturing a data use culture through advocacy and promotion, establishing knowledge management centers to transfer knowledge and skill, using recognition and incentives mechanisms, tracking data use impact, and monitoring data use culture improvements.

Domain Name	Data quality and use
Current Cumulative Score	2.99
Areas of Strength	Major Gaps
<p>DQ assurance and control: Procedures for data collection, processing, analysis, and use are defined and implemented at all levels; a regular schedule is defined for conducting data quality reviews and audits; a national coordinating body (PMT) was established to oversee data quality; there are procedures for documenting metadata (indicators, data elements, data set, registers, tally sheets).</p>	<p>DQ assurance and control: A national coordinating body (PMT) is not doing regular data quality checks; data reviews and audits are not automated and are not analyzed as required; metrics reported on data quality issues are not used for continuous improvement; the data quality assurance plan is not periodically reviewed by the coordinating body to meet the evolving data quality needs; standards are not sufficiently used to implement data exchange and to avoid double-entry.</p>
<p>Data management: Data management processes (timely data collection and reporting, analytics and visualization) are implemented and monitored for compliance; HMIS standards (data quality and data use guides, recording and reporting guides, and indicators reference guides) are available both in electronic and manual formats.</p>	<p>Data management: The standard operating procedures for data management are not integrated with the national HIS plan; data quality is not actively monitored and shared with stakeholders.</p>
<p>Data use strategy: An integrated data quality and data use PMT platform and governance body has been established and documented.</p>	<p>Data use strategy: Implementation of the data use strategy is not monitored, reviewed, and given proper oversight by the established governing body; relevant data are not consistently shared with stakeholders; the data use strategy is not adapted to meet emerging decision-making needs of program managers, policymakers, and providers interacting with HIS, such as quality improvement projects, equity indicators, etc.</p>
<p>Information/Data availability: Data systems/ sources (routine, population-based) are clearly defined, designed, and implemented to support longitudinal availability of health data.</p>	<p>Information/Data availability: Not all required stakeholders are accessing the data they require; data availability is not monitored for continuous improvements and to meet emerging health sector needs.</p>
<p>Data use competencies: Data use competency development is not tracked by user type and is also not level-based; there is no standardized plan for tracking and measuring competencies; though there are a few start-up efforts, there is no established mechanism to reward data use.</p>	<p>Data use competencies: Data use competency development is not tracked by user type and is also not level-based; there is no standardized plan for tracking and measuring competencies; though there are a few start-up efforts, there is no established mechanism to reward data use.</p>

<p>User/ Stakeholders Engagement: The HIS stakeholders engagement strategy is available; guidance — PMT for users’ engagement is documented and available.</p>	<p>User/ Stakeholders Engagement: The guidelines for stakeholders’ engagement is not periodically reviewed and revised to address emerging and future decision-making needs of users.</p>
<p>Data synthesis and communication: Guidance on the design and use of information products (monthly analytical reports, Annual and Semi-annual Review Reports, Joint Steering Committee Report, Annual Special Bulletin, KP Dashboards, etc.) - is documented and availed.</p>	<p>Data synthesis and communication: Guidance on the design and use of information products is not monitored for compliance by an established governing body, and it is not periodically reviewed and revised to ensure its applicability and relevance to emerging and future decision-making needs; no clear guidance is available for the design and use of advanced analytics.</p>
<p>Reporting and Analytics feature: Established national systems and guidelines to support standardized routine reporting; automated data reporting from point of service to national systems (via the likes of DHIS2, eCHIS); basic reporting and analysis features within applications (e.g., DHIS2, eCHIS).</p>	<p>Reporting and Analytics feature: Lack of consistency in the use of metrics on reporting and analysis capabilities; equity issues (across regions of the country) in terms of automating and implementing data reporting tools from point of service to national systems.</p>
<p>Data use impact: Parameters on the measurement of the impact of data use are defined nationally.</p>	<p>Data use impact: Parameters on the measurement of the impact of data use are not integrated in the HIS and/or health plans, and are not monitored and documented.</p>
<p>Data collection alignment: Some health-care workflows are documented and are aligned with data collection processes; some capability to reuse collected data within a documented workflow exists locally.</p>	<p>Data collection alignment: Technology applications from different entities may not serve a common goal and are not linked and exchanging data; HIS applications often do not comply to the country’s interoperability plan; only limited capabilities exist to reuse collected data and resources seamlessly within the workflows (particularly the gap is huge at service delivery levels).</p>
<p>Decision support: Decision support tools exists in some settings and are based on alerts and reminders to the program managers, care providers, and patients; there is a recognized need and motivation to establish standard procedures to support decision- making.</p>	<p>Decision support: Lack of decision support tools that incorporate program and clinical guidelines; lack of well-defined condition-specific order sets and documentation templates to facilitate decisions; lack of knowledge management systems.</p>



Group work, HIS Maturity Assessment, January 30, 2021, Adama



CHAPTER 4

FUTURE HIS MATURITY STATE

(GOALS – DECEMBER 2024)

CHAPTER 4: FUTURE HIS MATURITY STATE (GOALS – DECEMBER 2024)

Introduction

Based on the findings of the current maturity status of the HIS in the country, the strategic initiatives of the Health Sector Transformation Plan (HSTP-II), and some game-changer initiatives that are already in the pipeline, the 'Future State' of the HIS/digital health interventions are defined as follows. The pain points that need special attention and tailored high-impact interventions also are described in this section for each HIS domain.

4.1 Leadership and Governance

To meet the aspired goals of the Leadership and Governance domain, MoH and its key stakeholders/partners will have to deal with regular updating, endorsing, and overseeing of comprehensive HIS policies, legislation and strategic plans, and allocation of the required budget to yield the desired impact on HIS outcomes.

Moreover, the availability of structured processes and application of specific mechanisms is required to address noncompliance. Regulatory agencies should help in ensuring compliance and law enforcement. Applying law enforcement for compliance matters brings regularity of HIS leadership, coordination, function, and implementation of the HIS. Additionally, having a clear HIS organizational structure and functions will make the implementation process uniform across national and sub-national levels. It is worth noting also that defining a clear career path will motivate the health workforce and contribute to the effective and efficient implementation of HIS. The following matrix will provide some crucial items to consider regarding where the Ethiopian Health Sector is expected to reach on the Leadership and Governance.

Domain Name	HIS Leadership and Governance
Current Cumulative Score	2.47 (out of 5)
Future Status (2024)	4.33 (out of 5)

Improvement Roadmap: HIS Leadership and Governance

Gaps to be addressed #1: Both the HIS Strategic Plan and the M&E plan are not endorsed; they are not comprehensive, and are not up-to-date. There is a lack of follow-up on the adherence to the SOPs.	
High-impact interventions identified to address the gap	Strengthen/re-establish a designated body responsible for checking the timely finalization, endorsement, and implementation of HIS policies and legislation. Develop and promote an HIS accountability and transparency framework and a transparent M&E system by engaging relevant stakeholders with clearly defined roles and responsibilities.
Resources required to get there	Sufficient skilled manpower with commitment; appropriate time and budget with costing exercise.
Primary Responsible Body	MoH, RHBs, and agencies
Means of Verification	Regular report review/inspection, surveys, where applicable, supportive supervision, review meetings.
Timeline	Before the end of HSTP-II (2024)

Gaps to be addressed #2: There is no clear structure, process, or a specific mechanism to address noncompliance; no law enforcement to ensure adherence to organizational policies and procedures. Irregularity is seen in this regard.

High-impact interventions identified to address the gap	Create a defined body with structures, process, and procedures that can define standard measures or metrics of compliance to ensure adherence with SOPs.
Resources required to get there	Skilled manpower with commitment/allocation of appropriate time and budget.
Primary Responsible Body	MoH (Policy Planning and M&E and Legal Services Directorates), agencies, and RHBs
Means of Verification	Inspection of implementation process and functions; formal and non-formal report review; survey; and supportive supervision.
Timeline	Until the end of HSTP-II (2024)

Gaps to be addressed #3: HIS functions are not uniform across national and sub-national levels, and there is no clear career path that serves for all concerned levels.

High-impact interventions identified to address the gap	Prepare and execute a national plan for HIS/Digital Health career development; create a standardized and formal process for review and updates of organizational structure with job descriptions for HIS across all national and sub-national levels; enhance capacity building and mentorship program/plan for continuous professional and career development; devise mechanisms for retention of HIS personnel.
Resources required to get there	Skilled manpower with commitment/allocation of appropriate time and budget
Primary Responsible Body	MoH (PPMED, HITD, HR Development), all line agencies, and RHBs
Means of Verification	Inspection of implementation process and functions, regular review of job descriptions.
Timeline	Before the end of HSTP-II (2024)

4.2 HIS Management and Workforce

Gaps related to management and workforce have been identified and detailed in the current status assessment section of the domain. For each identified gap, major intervention mechanisms were proposed. With respect to training, it is suggested to provide long- and short-term training for HIS workforce on project management and informatics concepts and on HR manual/guidelines for the HR focal persons at all levels. In order to put mature HIS workforce in place, appropriate guidelines and standards, including applying project management principles and informatics concepts, should be prepared. Review of the HIS training and education program, as per HERQA/TVET, which clearly defines the engagement platform in HIS financing, and the guide on review mechanisms of the financial requirements should be performed. With regard to the HIS workforce assessment, there should be a capability assessment and supportive supervision on the recruitment. Assessments should also be carried out on hiring mechanisms, HIS workforce needs, and HIS financial needs throughout the HIS implementation lifecycle. The integrated human resource information system (iHRIS) should be fully implemented at all levels. Assessment findings in staff competencies, roles, and responsibilities should be disseminated to all concerned bodies. It is vital to review the existing HIS strategies regularly based on the assessments conducted within this domain.

Domain Name	HIS Management and Workforce
Current Cumulative Score	3.37 (out of 5)
Future Status (2024)	4.67 (out of 5)

Improvement Roadmap: HIS Management and Workforce

Gaps to be addressed #1: Informatics and project management concepts are used only in limited settings (and only in a few projects at the national level) for developing, implementing, and managing HIS activities and projects

High-impact interventions identified to address the gap	Develop standards/guidelines or SOPs on how to apply project management principles and informatics concepts in the HIS projects and prepare a short- and long-term training, coaching, and mentoring on project management and informatics to HIS workforce at national and regional levels.
Resources required to get there	Trainers with tailored training manual/ multimedia training content and a supporting budget.
Primary Responsible Body	MoH, RHBs, partners
Means of Verification	Evaluating standard/guideline/SOPs prepared on informatics and project management documents.
Timeline	Until end of 2021

Gaps to be addressed #2: Training and education programs are not being reviewed on a regular basis by the designated authority to ensure sufficient HIS workforce and for alignment with the evolving HIS needs and technology.

High-impact interventions identified to address the gap	Prepare implementation guidelines to review HIS training and education program as per HERQA/ TVET training and education standard and conduct workforce analysis/labor market analysis (HLMA), and HIS capability assessment and analysis to forecast future demands.
Resources required to get there	HERQA/TVET training and education standard, skilled personnel and budget.
Primary Responsible Body	MoH, RHBs
Means of Verification	Updated HIS Training and Education Program.
Timeline	Until end of 2022

Gaps to be addressed #3: Financial planning is not done in a holistic way for the entire HIS implementation lifecycle and there is a lack of consideration of HIS investments for different healthcare priorities that include sustainability. The resource mobilization plan is not periodically reviewed/ revised to accommodate financial requirements needed to support evolving HIS activities and emerging health sector needs at the appropriate level of implementation (national, subnational). At the same time, there is no or very limited private-public partnership (PPP) for funding of HIS implementation.

High-impact interventions identified to address the gap	Conduct detailed study for the financial need of HIS implementation lifecycle with identification of healthcare priority areas and incorporating the study in the HIS strategy document. Prepare guidelines/ SOP which guide the review mechanisms of the financial requirements. Prepare guidelines which clearly defines the PPP engagement platform in HIS financing.
Resources required to get there	Experts to conduct the study and prepare the SOP; budget to conduct the study.
Primary Responsible Body	MoH
Means of Verification	Analysis and review of financial and resource mobilization plan.
Timeline	Until end of 2022

4.3 HIS ICT Infrastructure

To meet the aspired goals of the HIS ICT infrastructure domain, MoH and its stakeholders will have to work towards ensuring stable power sources, fulfilling hardware requirements, enhancing connectivity, developing expert-level capacity, and establishing business continuity at all concerned levels. To address the current gaps, developing harmonized and comprehensive plans is inevitable. The following matrix will provide some priority areas to consider.

Domain Name	HIS ICT Infrastructure
Current Cumulative Score	2.29 (out of 5)
Future Status (2024)	4 (out of 5)

Improvement Roadmap: HIS ICT Infrastructure

Gaps to be addressed #1 : Lack of an alternative power source and business continuity plan (BCP) related to power supply; lack of a responsible body that will consistently follow-up on power failure issues in most of the health institutions.	
High-impact interventions identified to address the gap	Document, endorse, and cascade feasible mechanisms and interventions based on the current circumstances of the areas where the health institutions are located. Design the BCP and get it approved. Assign a responsible body to follow power issues at the different levels.
Resources required to get there	Budget, BCP document.
Primary Responsible Body	Individual health institutions are responsible. There should be escalation mechanisms to the next level.
Means of Verification	Supervision reports, periodic reports, HelpDesk reports.
Timeline	End of 2024

Gaps to be addressed #2: Poor engagement of the private sector in laying out network infrastructure at public health facilities.	
High-impact interventions identified to address the gap	Engaging the private sector to work on ICT infrastructure deployments at public facilities.
Resources Required to get there	Procedure/mechanisms to guide the engagement
Primary Responsible Body	MoH, RHBs, agencies
Means of Verification	Regular follow-up and monitoring.
Timeline	Until the end of the budget-strategic fiscal year by 2024

Gaps to be addressed #3: Poor coordination between Internet Service Provider (ISP) and health sector benefactors.

High-impact interventions identified to address the gap	Regular discussion with the ISP (Ethio-Telecom) to minimize the gap concerning Internet connection and VPN disruption. Develop operations and maintenance SOPs that could bring MoH to the driver's seat of the service scale-up endeavors.
Resources required to get there	Procedures and rules of engagement with the ISP; sufficient financial resources by understanding the existing and emerging requirements.
Primary Responsible Body	MoH
Means of Verification	Regular progress update and problem-solving meetings; M&E sessions; and developed SOPs.
Timeline	Until the end of 2024

Gaps to be addressed #4: Lack of national technical standard/specifications for hardware required for HIS implementation.

High-impact interventions identified to address the gap	Develop a national hardware technical specification/standard and regularly update it based on the technology and need changes.
Resources required to get there	Experts that prepare the specification documents.
Primary Responsible Body	MoH, agencies, RHBS
Means of Verification	Regular monitoring of compliance to hardware standards.
Timeline	End of 2024

Gaps to be addressed #5: Lack of a regular network and internet connectivity assessment and reporting methods.

High-impact interventions identified to address the gap	Implement a network monitoring tool and enforce system failure reporting procedures at a national and subnational levels.
Resources required to get there	Connectivity Monitoring tools and solutions.
Primary Responsible Body	MoH, national, and subnational stakeholders
Means of Verification	Frequent system status update reports generated centrally.
Timeline	End of 2024

Gaps to be addressed #1: Lack of standard BCP. The existing business plans are not documented.	
High-impact interventions identified to address the gap	Develop and establish BCP and SOPs; ensure that proper documentation is in place.
Resources required to get there	Skilled personnel.
Primary Responsible Body	MoH
Means of Verification	Regular monitoring and survey.
Timeline	End of 2024

4.4 Standards and Interoperability

HIS need to exchange and use health data so that data collected by one system could be used by another system and for these systems to exchange data properly there should be standards for data elements and messaging mechanisms.

The lack of established HIS standards and guidelines and the need to develop a client registry service and enhance other existing national registry services based on a formal feedback process is the main gap identified regarding data exchange efforts. Maximum effort from MoH and its stakeholders is needed to address the gaps in standards, guidelines, and minimum data set development, update, and maintenance.

The section below outlines the identified gaps and their corresponding intervention, needed resources, responsible organization, and the key performance indicators to measure the results.

Domain Name	HIS Standards and Interoperability
Current Cumulative Score	2.38 (out of 5)
Future Status (2024)	4.11 (out of 5)

Improvement Roadmap: HIS Standards and Interoperability

Gaps to be addressed #1: HIS data standards and guidelines are not endorsed.	
High-impact interventions identified to address the gap	Socializing and promoting prepared and updated standards and guidelines, and endorsement of these documents by authorized bodies.
Resources required to get there	Expertise on data standards.
Primary Responsible Body	MoH
Means of Verification	The analysis and review report of HIS standards and guidelines and shared data standards and guidelines.
Timeline	End of 2024

Gaps to be addressed #2: Data exchange standards are not developed; no exchange standards between commodity management and HIS are established; and such exchange is not integrated in the national HIS plan.	
High-impact interventions identified to address the gap	Develop industry-based health data exchange and messaging standards and have them approved; review and monitor health data exchange and messaging standards and integration in the national health plan; define security requirements for preparation of data, application, and network infrastructure to support data exchange.
Resources Required to get there	Expertise on data exchange standards.
Primary Responsible Body	MoH, partners, universities/academia
Means of Verification	Survey and regular monitoring on standards developed and implemented.
Timeline	End of 2024

Gaps to be addressed #3: Limited implementation and utilization of core registry services.	
High-impact interventions identified to address the gap	Periodic update of registry services in-line with the HIS strategic plan and establishment of a feedback process to review and address gaps of the registry services.
Resources required to get there	Expertise on core registry services.
Primary Responsible Body	MoH, partners, universities/academia
Means of Verification	Monitoring of the capability of interoperability with other systems using central terminology, facility, and indicator registries, Registry Maturity and Governance document, HIS/Digital health projects inventory report on the existing status of eHA components and the maturity level of a shared health record as a service.
Timeline	End of 2024

Gaps to be addressed #4: Lack of an unique person identification system.	
High-impact interventions identified to address the gap	Develop client registry to share unique identifiers developed and assigned by other programs/systems and enable participating systems to share personal unique identifiers.
Resources required to get there	Expert and budget resource
Primary Responsible Body	MoH, agencies (particularly INVEA), partners, universities/academia
Means of Verification	Review of client registry and the implementation guide which depict the procedure on how implementers should handle issues of client identification.
Timeline	End of 2024

4.5 Data Quality and Use

Nationally there should be a well-established data quality assurance and quality control mechanisms. Data use strategy and competencies should also be there to ensure the quality of the data coming from all sources throughout the health hierarchy and that the right decisions are made based on the data. This assessment; however, has shown that the SOPs for data management are not integrated into the national HIS plan and data use

competency development is not tracked by user type or level. Moreover, there is no consistently used standard or feedback mechanism for tracking and measuring such competencies to address gaps.

Domain Name	HIS Data quality and use
Current Cumulative Score	2.99 (out of 5)
Future Status (2024)	4.72 (out of 5)

Improvement Roadmap: HIS Data quality and use

Gaps to be addressed #1: Data reviews and audits are not conducted on a regular basis using automated and manual DQA processes to ensure defined levels of quality. Limited use of metrics reported on data quality issues for continuous improvement. DQA plan is not periodically reviewed by the coordinating body to meet the evolving data quality needs.	
High-impact interventions identified to address the gap	Develop periodic data quality improvement initiative (it primarily identifies data quality issues, planning, conducting, monitoring, using the metrics for continuous improvement and sharing the results for all actors).
Resources required to get there	Budget for capacity building, tools review, M&E framework preparation, national and subnational DQA activities, workshops on data quality, etc.
Primary Responsible Body	All data actors (facilities, administrative health offices, MoH, partners, donors, other stakeholders)
Means of Verification	External data quality audit.
Timeline	End of 2024

Gaps to be addressed #2: No SOPs for data management integrated with the national HIS plan.	
High-impact interventions identified to address the gap	Adopt and implement SOPs for data management (collection, reporting, analytics data quality assurance techniques, and information use) in the national HIS plan.
Resources required to get there	Budget for workshops
Primary Responsible Body	Facilities, administrative health offices, MoH, HIS partners
Means of Verification	Evaluating (doing review) of the developed and executed data management SOPs.
Timeline	End of 2024

Gaps to be addressed #3: The data use strategy is not adapted to meet emerging decision-making needs of program managers, policymakers, and providers interacting with HIS. Condition-specific order sets and documentation templates are not defined. Knowledge-based systems are not implemented in some settings to support decision-making.

High-impact interventions identified to address the gap	Continuously revisit, adopt and implement data use strategies to accommodate the emerging needs of data use for care providers and program managers.
Resources required to get there	Budget for workshops on developing and reviewing standards and procedures for PMTs, quality improvement teams, clinical audit, incentive mechanisms, and condition-specific clinical documentation.
Primary Responsible Body	MoH, RHBs, facilities, partners, and other stakeholders
Means of Verification	Review/analyze adopted and implemented data use strategies periodically.
Timeline	End of 2024

Gaps to be addressed #4: The data systems/applications in use do not fully ensure reliable and appropriate access of data at all levels for authorized users; changes in reporting requirements have significant disruptions to data availability.

High-impact interventions identified to address the gap	Develop and manage data repositories and warehouse to ensure data availability(from case-based systems, aggregate reports and population-based sources) for authorized users.
Resources required to get there	Budget to develop and manage the data repositories and data warehouse (along with business intelligence tools).
Primary Responsible Body	MoH, RHBs, agencies, partners
Means of Verification	Availability of reliable and appropriate access to relevant data at all levels.
Timeline	End of 2024

Gaps to be addressed #5: Data use competency development is not tracked by user type and not level-based.

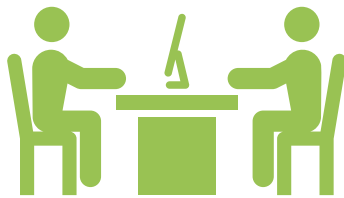
High-impact interventions identified to address the gap	Develop, review, and implement data quality and use training guides based on different levels of competencies and implement a competencies measurement, tracking, and feedback platform.
Resources required to get there	Budget for revision and development workshops, training.
Primary Responsible Body	MoH, regions, and partners
Means of Verification	Revised and tailored data quality and data use training guides (both facilitator and participant)
Timeline	End of 2024

Gaps to be addressed # 6: Guidance on the design and use of information products is not up-to-date, implemented, and monitored for compliance by an established governing body.

High-impact interventions identified to address the gap	Develop and implement information product generation, dissemination and compliance guide.
Resources required to get there	Budget for guidelines development, workshops, training.
Primary Responsible Body	MoH-PPMED, agencies, other stakeholders such as CSA
Means of Verification	Review of information product generation, dissemination, and compliance guide
Timeline	End of 2024

Gaps to be addressed #7: Parameters on the measurement of the impact of data use are not well-defined, implemented, or monitored. Metrics on reporting and analysis capabilities are not used for continuous improvement.

High-impact interventions identified to address the gap	Develop a strategic guide by defining the metrics and monitoring mechanisms for measuring data use impact. Provide capacity building training on advanced data analytics.
Resources required to get there	Budget for development, workshops, and training.
Primary Responsible Body	MoH - PPMED with support of relevant actors (partners)
Means of Verification	The development and implementation of the data use impact measurement strategic guide.
Timeline	End of 2024



CHAPTER 5

**DISCUSSIONS, CONCLUSIONS
AND RECOMMENDATIONS**

CHAPTER 5: DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Discussion and Conclusions

MoH initiated this HIS maturity assessment with the intention of measuring the current status of the HIS/digital health system at the national level; setting goals for the components of the system; and producing a few high-impact interventions for continuous improvement.

The results of the current overarching HIS maturity assessment clearly indicated where the sector is in terms of the five key domain areas. Generally, it shows that the national HIS maturity level is between **Repeatable (Stage 2)** and **Defined (Stage 3)** with the average score of **2.68**, meaning basic HIS/digital health processes are in place; the processes are based on existing and accessible policies; the need for standardized processes and automated functional capabilities is known and partly practiced; there are approved, documented processes, and guidelines tailored to HIS projects and activities; and a sense of collaboration and knowledge sharing among stakeholders is increasing. This finding fairly agrees with WHO's findings (2019) that is based on the Global Digital Health Index (http://index.digitalhealthindex.org/country_profile/ETH).

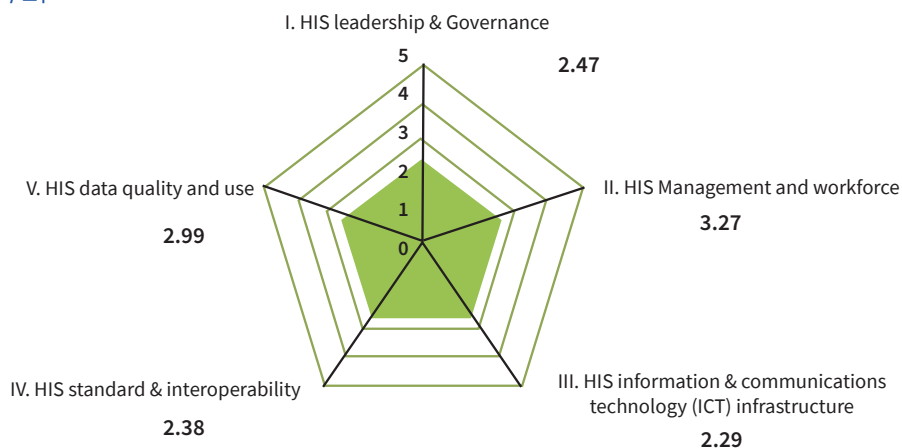


Figure 1: A spider chart describing the current HIS

The assessment results show that the *HIS Management and Workforce* and the *Data Quality and Use* domains are generally rated well with scores of 3.27 and 2.99; however, the other three domains need further effort (ICT Infrastructure: 2.29, HIS Standards and Interoperability: 2.38, and Governance and Leadership: 2.47). Figures 1 and 2 show us this fact.

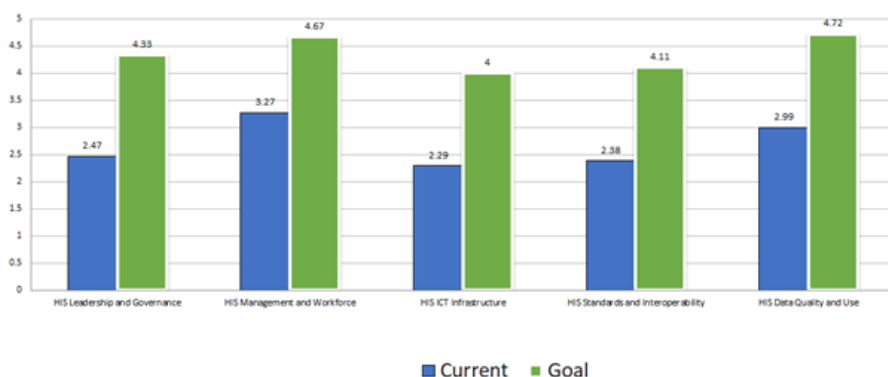


Figure 2: A chart showing the Current and Future States of the HIS by the 5 domains

Zooming-in to the individual components of each domain, we can further understand the exact pain-points and where to invest in the years to come on top of maintaining what has worked well. Examples of such areas include enforcement of policies and legislation (1.5), data exchange among systems (1.85), and ICT infrastructure business continuity plans (2.0). See Figure 3 and Table 2 below.

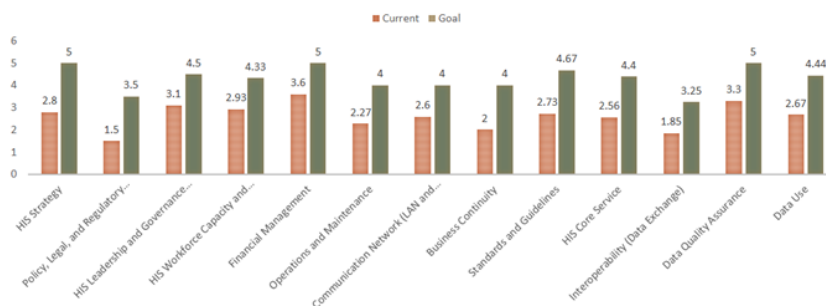


Figure 3: the HIS Future State by 13 components of the five domain areas

The aspired future HIS State which is targeted for 2024 (end of HSTP-II) is to reach a **Managed Stage (Stage 4)** on average (average score: **4.37**), where 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; and, detailed measures for processes and products are in place and are exercised to the acceptable level. The key game-changer tasks to be accomplished to get there are suggested in this document. The summary of such tasks are put in Table 2 below.

After understanding the strengths and areas of improvement for the current HIS and setting the aspired status for 2024, we have developed an improvement roadmap and identified the responsible actors (refer to Chapter 4); however, it will take a tailored and coordinated effort to get there.

Table 2: Summary of the current and future maturity scores based on domains

Domain Name	Current Cumulative Score (End of 2020)	Future Status (HSTP-II 2024)	Pain points that need special attention
Leadership and Governance	2.47 (out of 5)	4.33 (out of 5)	<ul style="list-style-type: none"> ▪ Senior management endorsement and enforcement of policies and legislation; ▪ Strengthening structures, processes, and specific mechanisms for enforcement of policies; ▪ Inclusive coordination mechanisms.
Management and Workforce	3.37 (out of 5)	4.67 (out of 5)	<ul style="list-style-type: none"> ▪ Mainstreaming the informatics concept, including in academia; ▪ Clear HIT structures and incentive mechanisms; ▪ Tailored competency enhancement training and development programs for a HIS/digital health workforce; ▪ Assessing and deploying the digital health workforce to meet the growing demands.

Domain Name	Current Cumulative Score (End of 2020)	Future Status (HSTP-II 2024)	Pain points that need special attention
ICT Infrastructure	2.29 (out of 5)	4 (out of 5)	<ul style="list-style-type: none"> ▪ Business continuity plan/policy – particularly to address issues of sustainable power sources, connectivity infrastructure, and hardware demands; ▪ Speeding up the pace of the HealthNet scale-up and maintenance; ▪ Creating strong collaboration with the service providers (particularly with the private sector and the telecom service provider); ▪ Addressing the increasing hardware demands.
Standards and Interoperability	2.38 (out of 5)	4.11 (out of 5)	<ul style="list-style-type: none"> ▪ Reviewing, endorsing, and implementing secure data exchange, messaging, and terminology standards; ▪ Defining the minimum national clinical data sets based on international standards; ▪ Implementing and utilizing core registry services (e.g., MFR, MPI, Provider Index, etc.) ▪ Ensuring security standards for data exchange and enforcement procedures; ▪ Coordinating & working with stakeholders (the likes of INVEA) on a unique person identification system.
Data Quality and Use	2.99 (out of 5)	4.72 (out of 5)	<ul style="list-style-type: none"> ▪ Regular/consistent data reviews and audits - and automating the process; ▪ Dynamic data use strategy to meet the emerging decision support needs at all levels, including DU competency mechanisms; ▪ Developing and managing data repositories and warehouse; ▪ Data use competency mechanisms; ▪ Standardizing the design, use, and dissemination of information products; ▪ Developing and using guidelines on data use impact.

5.2 Recommendations

The assessment team has made the following key recommendations based on the assessment's findings:

- 1. Regular assessments:** Measuring the maturity level of a country's HIS is not a one-time task; rather, it is a continuous process which should be conducted regularly in order to have a clear picture as to where the system stands and how it is moving towards its targets. As this maturity assessment is the first of its kind for MoH, it is expected to provide a glimpse into national HIS and digital health in its broader sense.
- 2. Measuring maturity of individual systems:** MoH has a good track record of implementing digital HIS that have played pivotal roles in the improvements seen towards addressing the access, quality, and usability of health and health-related data. Consequent to this study, therefore, individual HIS, which have wide impact and coverage in the country, should be assessed and action plans should be set in order to address the gaps identified and execute the proposed interventions.
- 3. Using the findings in the documents that have national relevance:** The results and recommendations of the current assessment should also serve as one of the main basis of evidence for drafting the DHBp and subsequent strategies.
- 4. Publishing the document:** This document should be shared with the wider HIS/digital health community using an appropriate channel to garner expert inputs as well as to inform digital health investments.



HIS Maturity Assessment Team, February 2, 2021 Adama



**PATHWAYS TO IMPROVE HEALTH
INFORMATION SYSTEMS IN ETHIOPIA**

