

TECHNICAL REPORT | FEBRUARY 2019

HRIS Status Review in Indonesia: Results and Recommendations

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Cover photo: A woman seeks health services at an Indonesian puskesmas (health center). (Credit: Andi Gulton/Chemonics 2018.)

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Abbreviations

API	application program interface	MDS	minimum data set
BKD	<i>Badan Kepegawaian District</i> /District Civil Service Association	MOH	Ministry of Health
BKN	<i>Badan Kepegawaian Negara</i> /National Civil Service Association	MORTHE	Ministry of Research, Technology, and Higher Education
BPJS-K	<i>Badan Pelaksana Jaminan Sosial Kesehatan</i> /Social Security Agency for Health	MTKI	<i>Majelis Tenaga Kesehatan Indonesia</i> /Indonesian Health Workers Assembly
BPPSDMK	<i>Badan Pengembangan Dan Pemberdayaan Sumber Daya Manusia (SDM) Kesehatan</i> /Ministry of Health Board of Human Resources for Health Empowerment and Development	NHWA	National Health Workforce Accounts
CME	continuing medical education	PHO	provincial health office
CPD	continuing professional development	PPNI	<i>Persatuan Perawat Nasional Indonesia</i> /Indonesian National Nurses Association
DHO	district health office	PSE	preservice education
GOI	Government of Indonesia	PUSDIK	human resource for health education information system
HAF	HRIS Assessment Framework	PUSLAT	human resource for health training information system
HRH	human resources for health	PUSRENGUN	<i>Pusat Perencanaan dan Pendayagunaan SDM Kesehatan</i> /Center for Workforce Policy and Planning
HRH2030	Human Resources for Health in 2030 Project	SDM	<i>Sumber Daya Manusia</i> /Human Resources for Health
HRIS	human resource information system	SI-SDMK	<i>System Informatasi SDM Kesehatan</i> /Human Resources for Health Information System
HWR	health worker registry	SIMK	Sistem Informatasi Keanggotaan/Membership Information System
IBI	<i>Ikatan Bidan Indonesia</i> /Indonesian Midwives Association	USAID	United States Agency for International Development
IDI	<i>Ikatan Dokter Indonesia</i> /Indonesian Doctors' Association	WHO	World Health Organization
IS	information system		
IST	in-service training		
JKN	<i>Jaminan Kesehatan Nasional</i> /National Health Insurance		
KKI	Indonesian Council for Health Professionals		

Executive Summary

The Ministry of Health (MOH) of Indonesia and the Human Resources for Health in 2030 (HRH2030) Project administered the HRIS Assessment Framework (HAF) as a review of the functionality and capacity of the MOH's human resource information system, SI-SDMK. Using a participatory review process, the SI-SDMK scored 2.7 out of 5 on functionality and 4.3 out of 5 on capacity. The review resulted in a mapping of flows of HRH data, a mapping of stakeholders of HRH data and documentation of motivations and barriers to data entry and use. Finally, recommendations were made to enhance the capacity of the SI-SDMK in support of improved interoperability, data analytics, and decentralized use of the system and data.

As a first step in supporting the MOH's of Indonesia's HRH Directorate, (BPPSDMK, *Badan Pengembangan dan Pemberdayaan SDM Kesehatan*), in particular the Sub-Division for Data and Information, to better understand the current state of the multisectoral HRIS implementation and to prioritize investment areas for HRIS improvements, HRH2030 worked with the BPPSDMK to apply the HAF tool. Overall, the review involved working collaboratively with the BPPSDMK to interview stakeholders, including the Center for Workforce Policy and Planning, Center for HRH Education, Center for HRH Training, MTKI (Health Workers Assembly), IBI (Midwives Association), PPNI (National Nurses Association), provincial health office (PHO), district health office (DHO) and *Puskesmas*, to understand the scope and structure of the health workforce data and information systems in Indonesia.

HAF helps countries assess the functionality and capacity of their HRIS, as well as determines what is needed to advance implementation of the WHO's [National Health Workforce Accounts \(NHWA\)](#) platform. HRIS of a country can serve as a key source of data to inform NHWA indicators, as many of the data points needed for these indicators are capturing in an HRIS. Due to this, strengthening an HRIS ultimately support efforts toward improving the quality of data for NHWA.

To begin the process, HRH2030 as part of the HRIS review team conducted an examination of the HRH data flows was conducted and system processes, motivators, and barriers to data input and use of the HRIS were

documented. From this examination, the HRIS Review team developed a comprehensive data flows mapping to better understand data flows from the facility to the central level. Secondly, the team identified barriers and motivations to data entry and use. Motivations and barriers touch on incentivization to enter and use data, autonomy to make decisions, training on data entry and use, ability to analyze the data readily, and policies on use of data.

The review involved working collaboratively with Indonesia's HRH Directorate (BPPSDMK) and a wide array of stakeholders.

Finally, the HRIS review team conducted the HRIS review to assess the functionalities and capacities of the SI-SDMK, as it was determined that this system will sit at the center of NHWA data compilation and analysis. SI-SDMK is the central HR information system for the MOH, in particular the BPPSDMK, to support their role in the strategic management and planning of the health workforce. The SI-SDMK includes data on the health worker, such as name, basic biometric information, national identification number, facility location, category, employment status, entry/exit date, educational background, continuing education and in-service training data, as well as registration and licensure data. As such, HRH2030 assessed the SI-SDMK in terms of the eight components of functionality, with other complementary

information systems noted: preservice education, registration and licensure, staffing gaps and needs, payroll information, personnel actions, in-service training, exit/attrition, and registry. The eight components of capacity were also reviewed:

technology/infrastructure, decentralization, use of standards, data quality, sustainable financing, human capacity, interoperability, and use of data. Through a self-assessment, facilitated by HRH2030 and responded to by the Sub-Division for Data and Information, the SI-SDMK scored 2.7 out of 5 on functionality and 4.3 out of 5 on capacity. Overall, the SI-SDMK scored a 3.5 out of 5 in strength. This result is primarily due to gaps in data and weaknesses in available functionalities of the SI-

SDMK. Based on the HRIS review, HRH2030 developed recommendations for enhancing SI-SDMK capacity in support of improved interoperability, data analytics, and decentralized use of the system and data, all in support of strengthening NHWA.

These recommendations were integrated into the USAID/WHO joint implementation plan and ultimately will assist the Government of Indonesia (GOI) to identify the priority investment areas and the most appropriate technical solutions to strengthen their HRIS into a robust and dependable source of data for their NHWA, thus supporting their efforts to better build, manage, and optimize the health workforce.

Introduction

Human resources for health (HRH) are essential drivers for strengthening health systems. Having reliable, standardized, up-to-date, complete, and quality health workforce data that spans the lifecycle of the health worker is critical for planning and decision making. To combat the issue of siloed and disparate systems and data sources, a central human resources information system (HRIS) is important to ensure a base level of standards, sharing of data, governance, and interoperability between complementary systems, including multisectoral HRIS.

Having reliable, standardized, up-to-date, complete and quality health workforce data that spans the lifecycle of the health worker (Figure 1), is critical for effective HRH planning and decision making. Despite progress in recent years, many countries struggle to have informed, evidence-based policy and decision-making processes. Data is often incomplete and of poor quality and databases-when existing- are mandated across different sectors, often lacking interoperability. The problem of fragmentation of information systems, such as a Human Resource Information System (HRIS), is minimized through the implementation of a governance framework that sets forth national standards, data-sharing between institutions, and automated mechanisms for interoperability between information systems. A HRIS is intended to provide necessary information for planning the continuous development of a *fit-to-practice* and *fit-for-purpose* national health workforce to ensure that population health needs – including maternal and child health, family planning, and HIV services – are met through access to the appropriate HRH skills mix and distribution. For many years, USAID and the U.S. President's Emergency Plan for AIDS Relief (PEPFAR)

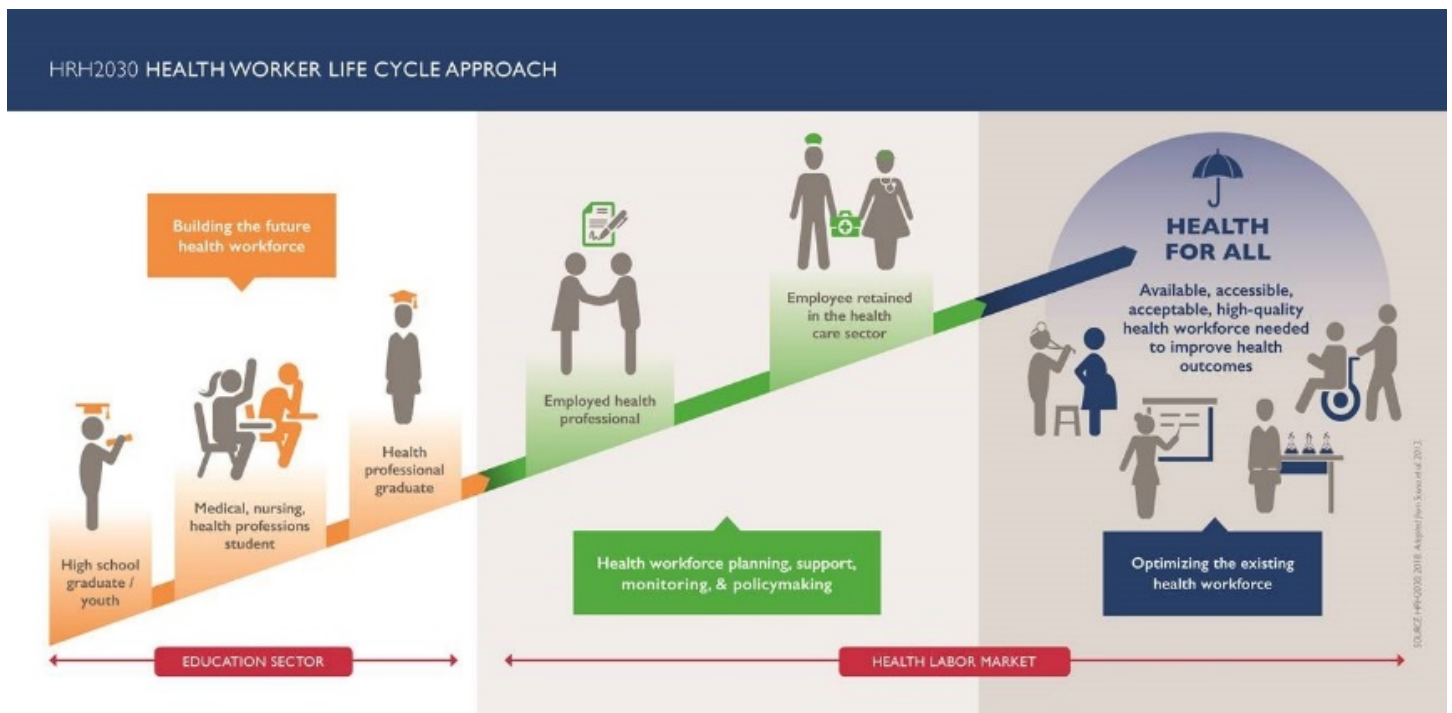
have contributed substantially in this area by helping countries develop their HRIS in a manner that minimizes fragmentation. More recently, as a result of these efforts, the HRIS Assessment Framework (HAF) (see Annex B) was developed. HAF helps countries assess the functionality and capacity of their HRIS, as well as determines what is needed to advance implementation of the WHO's [National Health Workforce Accounts \(NHWA\)](#) platform. NHWA is a harmonized and integrated approach for the collection and use of HRH information to better understand the health workforce size, characteristics, and dynamics, and the use of the HAF is a critical first step for the conceptualization process. With health workers spread across its 17,000 islands, the Government of Indonesia (GOI) understands the need to consider the state of their HRIS and plan for the development of NHWA. In 2017, the MOH committed to the development and use of NHWA as a mechanism by which to better build, manage, and optimize the health workforce in manner aligned with Indonesia's HRH Development Plan (2011–2025). In support of the MOH's commitment to NHWA, HRH2030 conducted a joint mission with WHO to provide technical assistance

on the implementation of NHTA, including initiation of coordination towards application of the HAF. The mission resulted in both recommendations for strengthening the information system architecture and governance platform for NHTA development and in a WHO/USAID joint implementation plan to coordinate and synergize efforts between WHO and HRH2030 in support of carrying out these recommendations.

In line with these recommendations, in September/October 2018, HRH2030 supported the MOH's HRH Directorate, BPPSDMK, to apply the HAF, a prioritized activity under the USAID/WHO joint implementation plan, as a first step in understanding the current state of the multisectoral HRIS implementation and to prioritize investment areas for HRIS improvements, particularly those needed for NHTA

implementation. The HRIS review team conducted an examination of HRH data flows and system processes, motivators, and barriers to data input and use of the HRIS, called SI-SDMK, were documented. The review involved working collaboratively with the BPPSDMK to interview stakeholders implementing an HRIS, other GOI stakeholders, as well as users of HRIS data, to understand the scope and structure of the health workforce data and information systems in Indonesia. Overall, these recommendations were integrated into the USAID/WHO joint implementation plan and ultimately will assist the GOI to identify the priority investment areas and the most appropriate technical solutions to strengthen their HRIS into a robust and dependable source of data for their NHTA, thus supporting their efforts to better build, manage, and optimize the health workforce.

FIGURE 1 HRH2030 HEALTH WORKER LIFECYCLE



HRIS Status Assessment Review Process

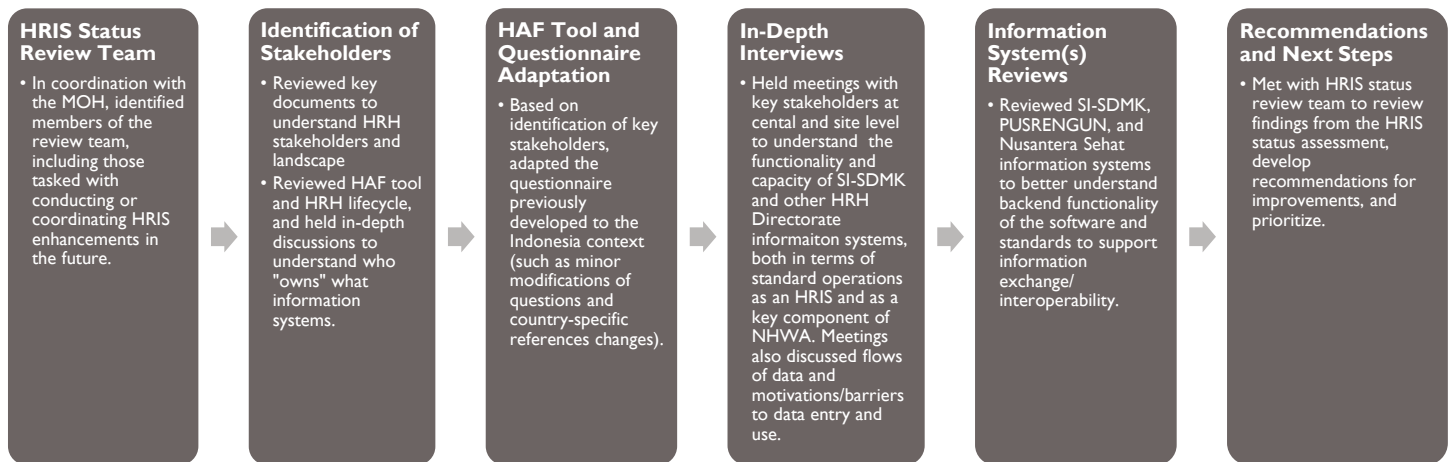
The HRIS Status Assessment was conducted using in-depth interviews with key stakeholders managing HRH data and a review of information systems managing HRH data.

To conduct the review, it was critical that the BPPSDMK, in particular the Sub-Division for Data and Information, take the lead in the HRIS review for these vital reasons: (1) to ensure that they, the key stakeholder in managing and using HRH information were fully involved in informing the review process; (2) to grant them ownership of the process and, consequently, generate confidence in the results to carry forward advocacy efforts; and (3) to build their capacity in understanding of inputs and indicators of maturity and to apply the tool in the future.

The status review process began with establishing a review team to identify key stakeholders at various levels

of the health system that use HRIS or HRH data and adapt the HAF tool questionnaire to the local context. With this tool, the review team conducted key informant interviews, mapped flows of data, and documented barriers and motivations to data entry and use. The team also conducted a technical review of the back end of several HR information systems. Overall, the process resulted in an overview of HRH data and information systems, including flows of data, as well as findings on the functionality and capacity of the main HRIS, and finally recommendations to strengthen the HRIS for more effective use of data, and NHWA readiness. (See Figure 2 for an overview of the process.)

FIGURE 2 HRIS STATUS REVIEW PROCESS



HRIS Status Review Team

The HRIS review team comprised HRH2030 technical advisors and representatives from the Sub-Division on Data and Information, which is tasked with management of all HRH data of public and private health workers for the MOH, including the development and management of the HRIS, or SI-SDMK (*Sistem Informasi SDM Kesehatan*). The Sub-Division on Data and Information also manages the server room of the BPPSDMK, where all HRH information systems are hosted, as well as interoperability layers for sharing of data between the various information systems. While the SI-SDMK was

the base of most of the review, it was critical that representatives from the Sub-Division be part of the review team, as these representatives have both the role within the institution, as well as the technical expertise, to implement recommendations from this review. They can also reuse the review process to provide continuous quality improvement to the BPPSDMK's information systems. Overall, the Sub-Division is the key stakeholder for management of HRH information systems, as well as synthesis and analysis of data to enable other stakeholders to make decisions.

Identification of Stakeholders

In conducting information systems reviews, gaining an understanding of the key stakeholders can be a complicated process, as a variety of stakeholders can be involved in designing the system, managing/maintaining the system, inputting data, using the data to make decisions or inform their actions, or even using pieces of data from an external source to inform their system. Who “owns” a system can, in some cases, be difficult to determine. After a review of the HAF tool and in-depth discussions with the BPPSDMK’s Sub-Division for Data and Information, the functionalities noted in the HAF were mapped to the stakeholders who “own” the information systems, defined as those who have been designated as the key managers to ensure that the data is up to date and accurate. Based on this mapping, our key target stakeholders were determined based on availability and feasibility to set meetings and in-depth interviews and reviews of information systems occurred (see Table 1; see Annex 1 for a list of key stakeholders).

HRIS Assessment Framework Tool and Questionnaire Adaptation

The HAF provides a structure to assess the developmental stage of a country’s HRIS by measuring the functionality and capacity of the system. Eight elements of functionality and eight elements of capacity are assessed as shown in Figure 3:

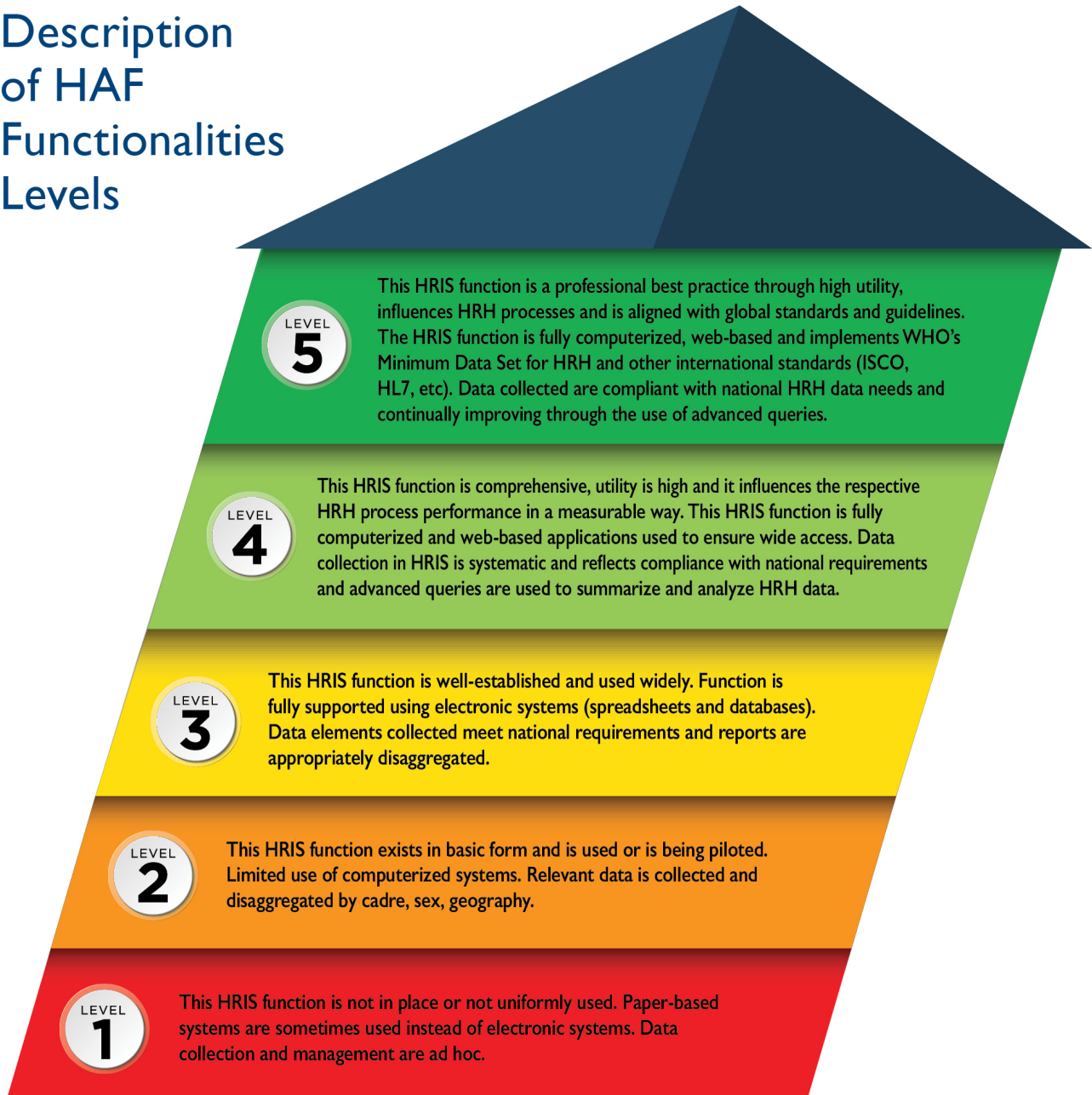
FIGURE 3 HAF FUNCTIONALITY AND CAPACITY ELEMENTS



Stakeholders assign a score for each function and capacity area, ranging from 1 to 5 (see Figure 4 on page 6 and ‘Capacities’ section in Results and Recommendations, page 18). The scoring system provides brief information on the characteristics of the HRIS at each level of development. In the original version of the tool, there was limited detail on how to break down each of the levels to truly assess where one believes the particular function or capacity lies, a gap that was identified through the application of this tool in the Philippines. In consideration of this gap, HRH2030 developed a questionnaire to help guide and structure stakeholder interviews. Adaptations to this questionnaire were made both to ensure that questions were relevant to the Indonesia context and to add additional aspects to the questionnaire to include global standards, best practices, and assess NHWA information gaps (see Annex B).

FIGURE 4 DESCRIPTION OF HAF FUNCTIONALITIES LEVELS

Description of HAF Functionalities Levels



In-Depth Interviews and Information Systems Review

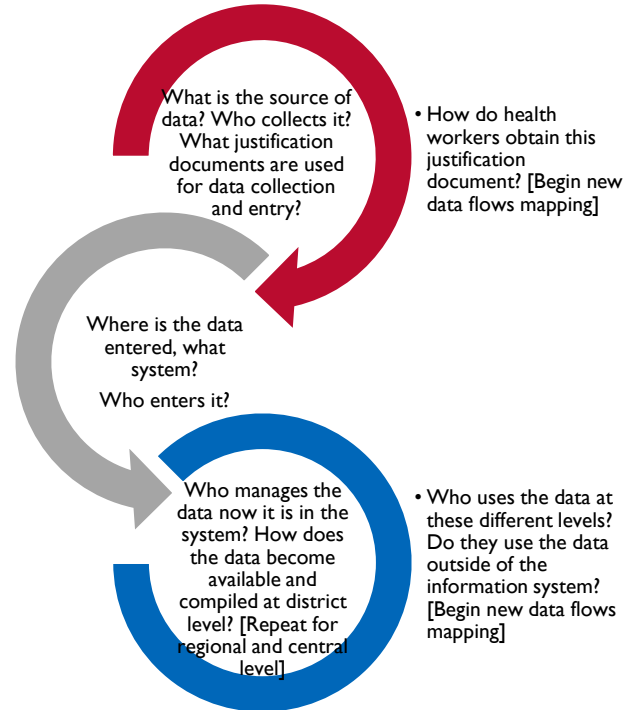
Using the list of identified stakeholders and the adapted tools, the review team conducted in-depth interviews and reviews of information systems to complete the HAF, map flows of data, and document the system processes, motivations, and barriers to data input.

In-depth interviews and a structured questionnaire were used to review the HRIS, conduct a data flows mapping and identify motivations and barriers to data input.

In-depth interviews included discussions with the BPPSDMK's Sub-Division for Data and Information, Center for Workforce Policy and Planning, Center for HRH Education, and Center for Training. Discussions were also held with the Indonesian Health Workers Assembly (MTKI, *Majelis Tenaga Kesehatan Indonesia*), two provincial health offices (PHO), one district health office (DHO), and four puskesmas (or health centers). Using the HAF tool, these discussions were geared to achieve better understand the systems' functionalities and capacities. The discussions – while touching on technological, institutional, and infrastructural aspects of the systems – primarily focused on users' experience and systems' functionalities. For stakeholders who did not manage the information system, such as those working in puskesmas, discussions focused more on understanding their role in the input, management, and use of data, and what they saw as motivators or barriers to carrying out this role. Discussions followed the adapted questionnaire and were in the form of a facilitated conversation.

After these discussions, the team conducted a technical review of the information systems. This review involved exploring the information systems with stakeholders to understand the front end in terms of data fields, data-entry methods, existence of standardized and validated input controls (such as dropdowns), processes for entering data, quality assurance mechanisms, structure of the forms, and capacity for analytics. The back end of the system was also reviewed and discussed in terms of standards, development frameworks, architecture, and mechanisms in place for interoperability. This review also allowed the HRIS review team to understand in a

FIGURE 5 DATA FLOWS MAPPING PROCESS



more comprehensive manner the feedback received during the in-depth interviews. Table 1 shows the different stakeholders who participated in the in-depth interviews and information systems review, as well as the functionality topic of focus and name of information system.

In addition, more high-level discussions were held with the Indonesia Nursing Association (Persatuan Perawat Nasional Indonesia, PPNI), the Indonesia Midwives Association (Ikatan Bidan Indonesia, IBI), preservice education (PSE) institutions, and one private hospital. While these discussions did not go into much technical detail, they were informative for contextualizing the flows and use of data from professional associations and public and private PSE institutions to the overall HRH data structure.

As part of the review process, participants were also asked to describe the lifecycle of the data points (see Figure 6 on page 9). This allowed the HRIS review team to develop an information flows map. Also, the review team asked questions to better understand what motivated users to collect, enter, manage and use data. It was important to understand from those that interact with the data what intrinsic value they see in data and how the data is useful for them. It was equally important to understand what prevents them from collecting, entering, managing, and using data. It was also

important to ask the stakeholders to reflect on what they would like to see improved, such as in the information system, flows of data, and analysis of data. If we understand what the users of information systems and data want to see, we can identify information gaps and better inform recommendations to strengthen information systems. Overall, the goal of this portion of the discussion was to understand the human environment

that surrounds data collection, entry, management, and use, as these details can at times be significant in ensuring complete, updated, and quality HRH data.

TABLE 1. HRIS FUNCTIONALITY, STAKEHOLDER, AND INFORMATION SYSTEM MAPPING

Function	Stakeholder Who Owns the Data	Participated in In-Depth Interviews? (Name of Information System in <i>Italics</i>)	Participated in Information System Review? (Name of Information System in <i>Italics</i>)
1. Preservice Education	Ministry of Technology, Research and Higher Education (MORTHE)	✗ <i>Unavailable during the time of the Review, data is included in SI-SDMK</i>	✗ <i>Data points included in SI-SDMK reviewed</i>
	HRH Education (MOH) for MOH Polytechnic Schools	✓	✗ <i>PUSDIK- MOH's own information system still in development</i>
2. Registration and Licensure	Registration: MTKI, KKI (Secondary stakeholders include PPNI, IBI and IDI)	✓ <i>MTKI specifically</i>	✗ <i>Lack of authority to review system</i>
	Licensure: District Health Office	✓	✓ <i>SI-SDMK</i>
3. Staffing Gaps and Needs	Center for Workforce Policy and Planning (MOH)	✓	✓ <i>PUSRENGUN: MOH's workforce pressure and planning information system</i>
	District and Provincial Health Office	✓	✓ <i>PUSRENGUN</i>
4. Payroll Information	Ministry of Home Affairs	✗ <i>Confidentiality issues</i>	✗ <i>No review conducted</i>
5. Personnel Actions	Some data managed by the Sub-Division for Data and Information (MOH)	✓	✓ <i>SI-SDMK</i>
	MOH employee data managed by the Staffing Bureau of the MOH	✗ <i>SIMK-Confidentiality issues</i>	✗ <i>Data included in SI-SDMK reviewed- see above</i>
6. In-service Training	Center for HRH Training (MOH) for all MOH-led trainings	✓	✗ <i>Data included in SI-SDMK reviewed- see below</i>
	All training data included in the Sub-Division for Data and Information (MOH)	✓	✓ <i>SI-SDMK</i>
7. Workforce Exit/Attrition	Officially managed by Ministry of Manpower/Civil Service Association (BKN)	✗ <i>Most likely no formal clear information system on this with BKN, data is included in SI-SDMK</i>	✗ <i>Data included in SI-SDMK reviewed</i>
8. Health Worker Registry	Sub-Division for Data and Information SI-SDMK	✓	✓ <i>(SI-SDMK)</i>
	Social Insurance Administrative Organization (JKN)	✗ <i>Most likely no formal clear information system on this with JKN, data is included in SI-SDMK</i>	✗ <i>Data included in SI-SDMK reviewed- see above</i>

HRIS Review Results & Recommendations

HRH information systems in Indonesia involve several stakeholders who manage and maintain the various types of data needed to build, optimize, and manage the health workforce. Figure 6 shows the key stakeholders who collect, enter, manage, and use HRH data, in line with the key functionalities and the information systems in which they live.

Overview of HRH Data and Information Systems in Indonesia

Key stakeholders include the Ministry of Research, Technology and Higher Education (MORTHE), MOH, Ministry of Manpower, and Ministry of Home Affairs. The national insurance system, Social Insurance Administrative Organization (JKN), also collects HRH

data to inform insurance payments and other accreditation standards it requires for a facility to be an official provider. However, JKN was not included as a key stakeholder in the review, as it operates a parallel data collection system and it is uncertain at this time what, if any, data is shared with the Ministry of Manpower and Ministry of Home Affairs (no data is shared with the MOH).

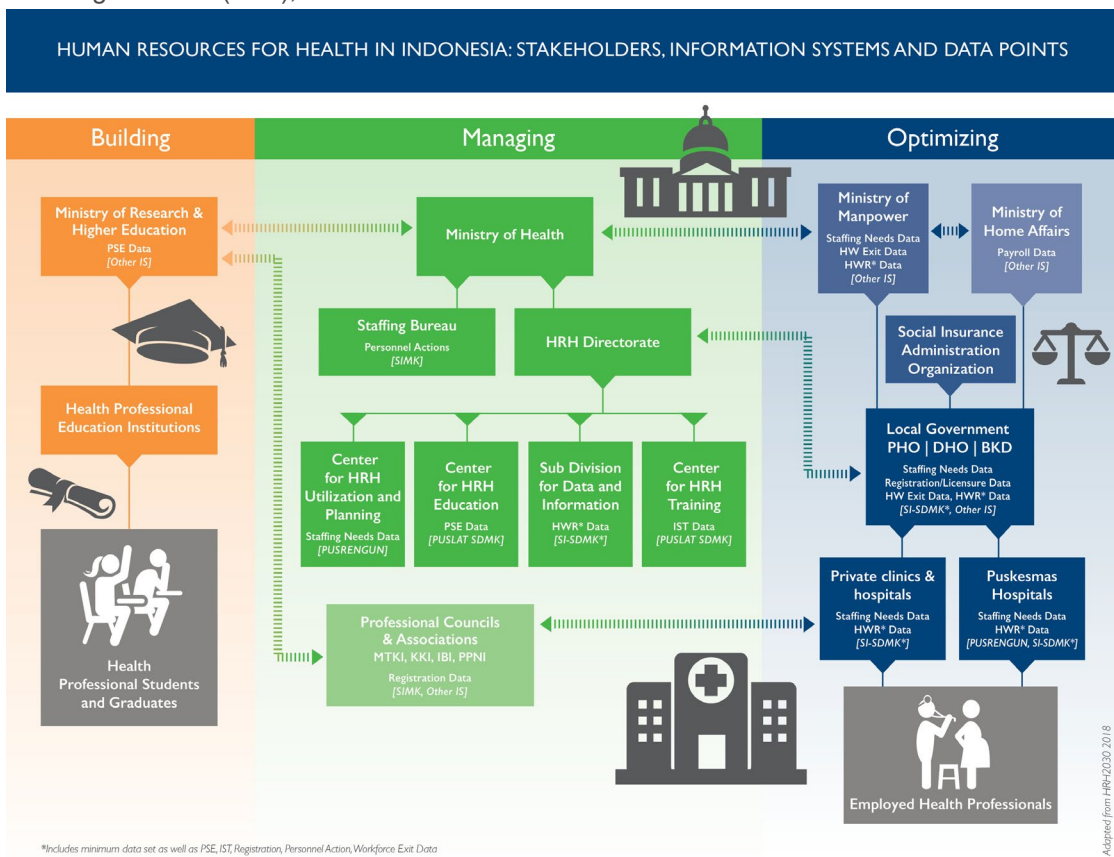


FIGURE 6 STAKEHOLDERS, INFORMATION SYSTEMS AND DATA POINTS

It should be noted that these descriptions are not exhaustive of all data and information systems that these

stakeholders manage. For example, puskesmas have five information systems in which they are required to

enter data, three of which require HRH data: HRH Planning and Empowerment Information System, PUSRENGUN, for workforce pressure and needs calculations; SI-SDMK as the human resource information system; and another information system that is for medical equipment management.

Overall, information systems are managed by their respective agencies. MORTHE manages a system for all data on students in public and private institutions. Professional associations manage data on their members in terms of registration, continuing medical education (CME), and continuing professional development (CPD). The local governments report data to the provincial-level Ministry of Manpower, which then liaises with the Ministry of Home Affairs in separate information systems. Finally, the MOH manages one central HR information system, SI-SDMK, and three

other information systems that serve specific purposes for workforce pressure and planning (PUSRENGUN), PSE information for the MOH polytechnic schools (PUSDIK SDMK), and tracking training participants for MOH training institutions (PUSLAT SDMK). This will be explored in more detail below, demonstrating the variety and type of stakeholders involved in HRH data and information systems.

Throughout the mapping process and discussions with key stakeholders, barriers and motivations to data entry and use were identified. Overall, the motivations and barriers touch on incentivization to enter and use data, autonomy to make decisions, training on SI-SDMK, ability to analyze the data readily, and policies on use of data. The following shows SI-SDMK motivations and barriers found, both for data entry and data use.

Motivations	
<p>Data Entry</p> <ul style="list-style-type: none"> ▪ Incentives for complete, up-to-date, and accurate data ▪ Multiple reporting structures requiring complete data ▪ Staffing to handle data entry burden 	<p>Data Use</p> <ul style="list-style-type: none"> ▪ Ability to make staffing/hiring and budgeting decisions
Barriers	
<p>Data Entry</p> <ul style="list-style-type: none"> ▪ Lack of understanding/training on SI-SDMK ▪ No access to the system ▪ Following reporting schedules, thus only seeing the HRIS (SI-SDMK) as a reporting system for central levels ▪ Double-entry on duplicative systems ▪ No policies to mandate data entry 	<p>Data Use</p> <ul style="list-style-type: none"> ▪ Lack of autonomy to make decisions on staffing/hiring ▪ Lack of data visualization tools to make decisions ▪ Perception that reporting is only for central-level decision makers ▪ Lack of understanding of site-level decision-making possibilities ▪ No policies to mandate data use

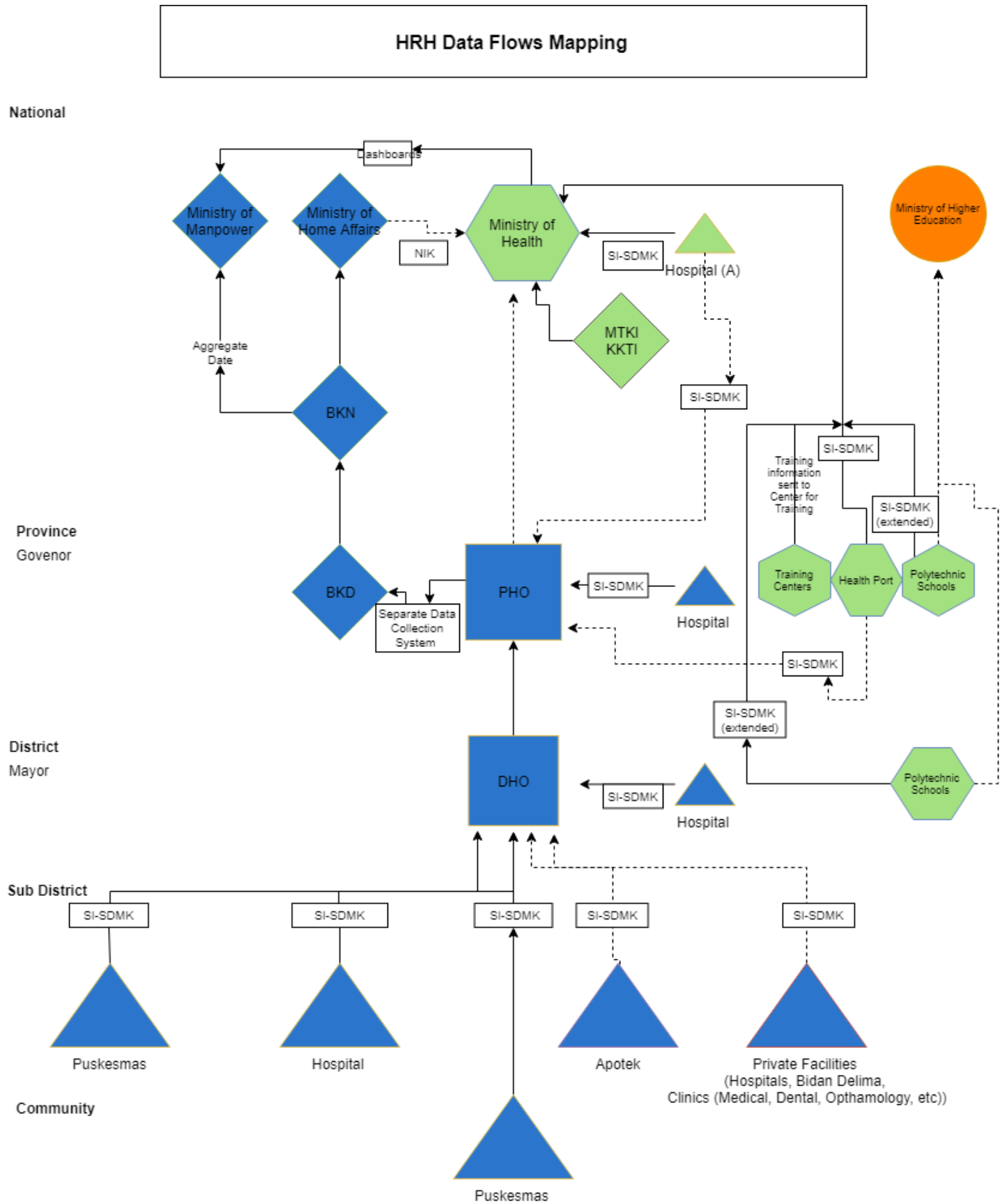
Data Flows Mapping

While there are several stakeholders at different levels that manage HR data and barriers to data input, there are different lines of reporting and data sharing between the information systems. Mapping of flows of data related to building, managing and optimizing the health workforce both allowed the review team to understand the data landscape in Indonesia as well as understand motivations and barriers to input, management, and use of data (see Figure 7 on the next page).



Photo 1: HRIS Review Team Members (From Left to Right: Stuardo Herrera, Leah McManus, Aditya Sasmita and Shinta Dewi)

FIGURE 7 HRH DATA FLOWS MAPPING



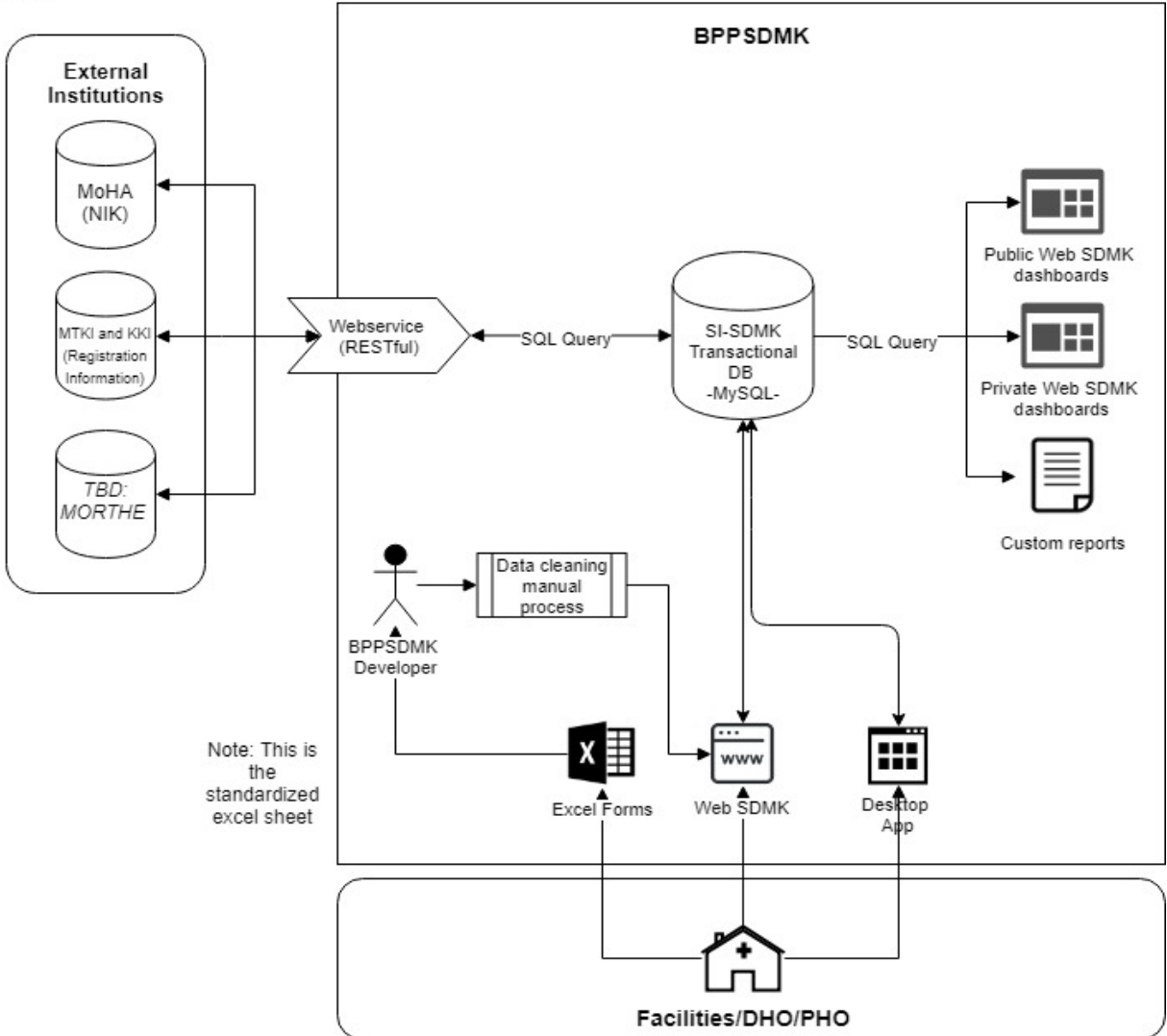
SI-SDMK

As SI-SDMK holds a central piece in this flow of HR data, a deeper look in to the SI-SDMK is necessary to better understand the importance of this central system.

SI-SDMK is the central HR information system for the MOH, in particular the BPPSDMK, to support their role in the strategic management and planning of the health workforce. The SI-SDMK stores data on the health worker, including name, basic biometric information, national identification number, facility location, category, employment status, entry/exit date, educational background, continuing education and in-service training data, as well as registration and licensure data. The SI-SDMK is managed by the Sub-Division for Data and Information of the BPPSDMK, which is the charged with the management of all HRH data for the MOH.

There are three modalities by which health facilities, DHO, and PHO can enter information into the SI-SDMK: (1) an online platform, which all PHO, DHO and facilities can access; (2) an Excel form that can be completed by the facility and sent up the line to the DHO and then PHO for entry and submission to the BPPSDMK (and potentially other stakeholders); and (3) a desktop app that can sync, when online, to the online platform. The most prevalent form of data entry to SI-SDMK at this time is by Excel form. That being the case, it was reported that during the 2018 annual meeting of PHO and DHO HR managers, there was a commitment made by the PHO and DHO to utilize the online SI-SDMK system.

FIGURE 8 SI-SDMK CURRENT ARCHITECTURE



Though there are three methods to enter data, all data is centralized in the online SI-SDMK from the various Excel databases and desktop client apps. When considering interoperability and sharing data, while much of the data is entered manually, SI-SDMK does receive data automatically, through an application program interface (or API), from professional councils such as MTKI and Indonesia Medical Council (KKI, *Konsil Kedokteran Indonesia*) for registration information and the Ministry of Home Affairs for national ID information. In addition, SI-SDMK sends information to other BPPSDMK systems such as the staffing needs information system (PUSRENGUN) (providing information on existing health workers) and to support the information system that manages the *Nusantara Sehat* deployment strategy (determining what facilities and health workers are eligible to participate based on the existing workforce and the health workers’ file). Both this receipt and sending of data is critical to understand for developing standards for interoperability between HRH information systems in Indonesia. The review team also mapped the current flows of data to and from SI-SDMK as a way to demonstrate data flows in or out of SI-SDMK and the current interoperability architecture, as shown in Figure 8

Overall, the SI-SDMK contains a near-comprehensive dataset, touching almost all points of both the lifecycle of

the health worker (Figure 1) and the HAF. Some functionalities like preservice education or payroll information are not currently being captured by the system. The content and role of the SI-SDMK have well positioned the database to serve as a main source of data for all platforms that would like to conduct HRH analysis, and in particular for NHWA. It is also the only HR information system that has established mechanisms for interoperability with other information systems; thus, there is a base to build off for other interoperability efforts. The Sub-Division for Data and Information, which manages the SI-SDMK, employs staff highly skilled in information systems development and management; thus, focusing on SI-SDMK will allow this team to address the areas needing strengthening to ensure the system is operating at its full potential. Finally, they are the key coordinators of the NHWA development process described above.


Based on the information presented above, the HRIS review team determined that the focus of the HAF, and HRH2030 and WHO’s continued joint support for HRIS strengthening for NHWA in Indonesia, would be on the Sub-Division on Data and Information’s SI-SDMK. As such, the SI-SDMK is the subject of the HRIS status review.



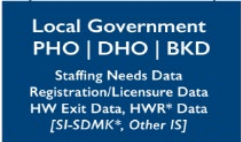




HRIS Status Review Findings: Functionalities

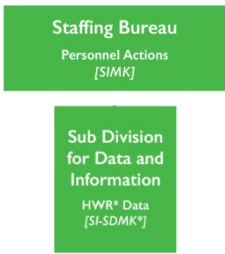


Table 2, below, reviews the findings of the assessment related to the functionalities of the SI-SDMK, with notes made on stakeholder, data, and information systems that come from other sources. In addition, recommendations

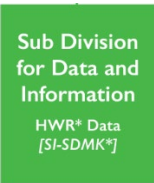
to strengthen the functionality are noted which serve as a base to inform next steps. For a more detailed description on the information system, see Annex A: HRIS Status Review Deep Dive.

TABLE 2: HRIS STATUS REVIEW FINDINGS: FUNCTIONALITIES

Function & Definition	Stakeholder, Data and Information System	HRIS Review: Level Ranking & Findings	Recommendations
<p>1. Pre-Service Education: Health worker student intake, pipeline, and graduations from medical, nursing, public health schools, and other health training institutions is aggregated and analyzed.</p>		<p>N/A Comprehensive management of preservice education data is not the responsibility of the SI-SDMK; this responsibility lies with the MORTHE. However, it is included in SI-SDMK to better understand the educational background of health workers, and aggregate information on students and graduates should be shared with the BPPSDMK to allow proper planning and management of the health workforce. In support of this, the HRH Directorate is taking steps to ensure interoperability between the MORTHE information system and the SI-SDMK.</p>	<ul style="list-style-type: none"> Ensure that any interoperability mechanisms developed use an architecture that can be leveraged for data exchange with other information systems. Harmonize information between systems by: Incorporating SI-SDMK standards and defining a data dictionary.

Function & Definition	Stakeholder, Data and Information System	HRIS Review: Level Ranking & Findings	Recommendations
<p>2a. Registration and Licensure: Regulated health workers are registered by a regulatory organization.</p>	 	<p>4 Registration is well maintained by the professional councils (MTKI and KKI), and these data are shared with SI-SDMK via a web service as a mechanism for interoperability. This allows for accurate data to populate the SI-SDMK, with less chance of human error or falsification of data.</p>	<ul style="list-style-type: none"> Update dashboards or notifications to prompt appropriate action for SI-SDMK users when registration is about to or has expired (as recommended by users of SI-SDMK)
<p>2b. Registration and Licensure: Regulatory organizations' information is maintained on regulated health worker license status and renewal.</p>		<p>3 Licensure data is entered manually into SI-SDMK by the facility or other HR managers in the province or district and due to this there are issues of completeness and accuracy.</p>	<ul style="list-style-type: none"> Promote use of the online SI-SDMK system could support enforcement of data quality measures, as well as identification of persons with more than three licenses. Specifically, enhance the functionality of SI-SDMK to identify whether a health worker has more than the allotted three licenses.
<p>3a. Staffing gaps and needs: Vacancies (unfilled established positions) are tracked and reported.</p>		<p>N/A Vacancies are managed and tracked by local governments and the Ministry of Manpower. While it is unclear what information system is used to manage this data, SI-SDMK does not contain information on positions filled or vacant and focuses more on the management of the individual health worker data.</p>	<ul style="list-style-type: none"> Coordination or sharing of data should occur, regularly and systematically, between the Ministry of Manpower and the BPPSDMK to compare data on health workers and vacancies. Interoperability with Social Insurance Organization, or BPJSK, systems should be explored.
<p>3b. Staffing gaps and needs: Staffing needs: number of employees needed to fill facility staffing norms established and used for planning</p>	 	<p>N/A Staffing needs are managed in two ways by the PUSRENGUN system and stakeholders such as the Center for Workforce Policy and Planning, local governments, and the Ministry of Manpower: (1) comparing current staff to minimum staffing standards, and (2) using HR information, workload standards, and service statistics to measure the workload pressure on a facility and identify needs. Currently actual HR data for the first analysis comes from SI-SDMK through a mechanism for interoperability.</p>	<ul style="list-style-type: none"> The Sub-Division for Data and Information should continue with plans to add grade levels to the SI-SDMK for workload pressure analysis.
<p>3c. Staffing gaps and needs: Employment status of health workers is tracked and reported, e.g., active, contract/permanent, intern, unemployed, suspended, retired, etc.</p>		<p>4 Employment status of an individual health worker is managed by local governments, but it is also noted in the SI-SDMK minimum data set form.</p>	<ul style="list-style-type: none"> More exploration of connection between local government information systems for documentation of this status and SI-SDMK should be explored, as it is very likely the local government system is a simple Excel report that could be produced by SI-SDMK.
<p>4. Payroll Information: Information on wages of health workers is tracked and reported, including salary source information: (e.g., host government, donor,</p>		<p>N/A Due to roles and responsibilities in payment of health workers, SI-SDMK does not include payroll information. This is the norm in many countries where separate financial management software is used for this purpose.</p>	<ul style="list-style-type: none"> There are no immediate recommendations on payroll information for SI-SDMK. However, those in charge of payroll should participate in NHWA processes.

Function & Definition	Stakeholder, Data and Information System	HRIS Review: Level Ranking & Findings	Recommendations
<p>national insurance scheme, etc.)</p> <p>5. Personnel Actions: Personnel management actions are documented and reported, e.g., performance evaluations, promotions, disciplinary actions, leave management (includes all types of leave, e.g., annual leave, sick leave, unpaid leave), and transfers.</p>		<p>3 There is no comprehensive system that manages all personnel action data, thus limiting the ability to conduct analysis to ensure the promotion of a high performing health workforce. However, the MOH Staffing Bureau manages this information for MOH employees only, and promotion and transfer data is inherently captured in SI-SDMK as per updates from the facilities, DHO, and PHO.</p>	<ul style="list-style-type: none"> SI-SDMK should be augmented to include these data points and coordination be enhanced between the Staffing Bureau and local governments as SI-SDMK could be an important transversal and dynamic database for the documentation of this information.
<p>6a. In-service Training: Government is planning, tracking, managing, and regulating in-service training programs.</p> <p>6b. In-service Training: Regulatory boards/councils and professional associations track and apply continuing professional development (CPD) credits from in-service training towards relicensure.</p>		<p>4 The BPPSDMK is capturing training data in two ways to ensure a comprehensive picture of data collection. (1) Data are collected by the Center for HRH Training via the PUSLAT, which includes data on training conducted at MOH training institutions. Additional data for in-service training that is not provided by the MOH are also captured, when input into the SI-SDMK. (2) The SI-SDMK also tracks data of health workers who are pursuing continuing education.</p> <p>N/A Professional councils and associations track information on CPD and CME. This data is currently tracked by MTKI and KKI for relicensure. PPNI also allows members to input data on their CPD and CME credits in their online profile.</p>	<ul style="list-style-type: none"> SI-SDMK and PUSLAT should share data when the PUSLAT is ready to do so. In addition, it would be important for the Center for HRH Training to share any information on “accredited” or “approved” training programs or institutions that are outside of the MOH so that data in SI-SDMK can be analyzed to verify if health workers are receiving training from quality institutions. MTKI and KKI should share data on CPD and CME to ensure that data is accurate and consistent between stakeholders.
<p>7. Workforce Exit/Attrition: Exits from the health workforce are tracked and reported by type, e.g., retirement, voluntary discharge (including out-migration), involuntary discharge, disability, and death.</p>		<p>2 Workforce exit and attrition is managed primarily by the Ministry of Manpower as they manage payroll and benefits. However, this data also exists in SI-SDMK in the form of entry and exit from the position as well as employment status.</p>	<ul style="list-style-type: none"> SI-SDMK should add additional data fields to better understand the reasoning behind the health workers’ departure from the health workforce, e.g., retirement, voluntary discharge (including out-migration), involuntary discharge, disability, and death) and where they are exiting to (i.e., private hospital, non-health field). In addition, reports and dashboards for entry, exit, and attrition rates should also be developed in SI-SDMK to identify trends.

Function & Definition	Stakeholder, Data and Information System	HRIS Review: Level Ranking & Findings	Recommendations
<p>8. Health Worker Registry (HWR): Consolidates a minimum data set of health worker information from several systems to create a national representation of the health workforce. Serves as a canonical source of health worker information for other eHealth and mHealth applications.</p>		<p>5 The SI-SDMK contains all MDS data needed for an HWR, as well as PSE, IST, registration, personnel action, and workforce exit data. In addition, the foreign health workforce is tracked, which is important for NHWA. Overall, the structure and content of the system is strong, though use of the system is lacking at a decentralized level.</p>	<ul style="list-style-type: none"> Enhancements should be made to the system, such as additional drop downs and use of a unique identifier to enhance data quality. In addition, development of dashboards or other “alerts” to assist HR managers would allow for greater utility of the system. A data dictionary should be developed to ensure that the system is following a standardized taxonomy for exchange of data between systems. Using the NHWA process, discussions should also be held on how to enhance the sharing of information between the SI-SDMK and other systems such as JKN/BPJSK and Ministry of Manpower.

HRIS Status Review Findings: Capacities

As the focus of the review was related to SI-SDMK, this section discusses the system’s capacity, based on the areas defined by the HAF and as per the stages of maturity defined by the HAF. This section is presented

using the HAF tool template to ensure assessment stages are fully captured.

TABLE 3: HRIS STATUS REVIEW RESULTS: CAPACITIES

Capacity Area	Level 1	Stage 2	Stage 3	Stage 4	Stage 5
<p>1. Technology Infrastructure Findings: SI-SMDK uses three main data-entry tools: Excel forms, a software application, and a web-based platform. Health facilities at local levels choose the tool they will use. Data is stored on a relational database, and dashboards are visualized on the internet. Recommendations: Continue to reinforce via supportive supervision and other non-financial incentives/motivations, such as development of dashboards and governance/policies for reporting to promote use of the web-based platform at the decentralized level.</p>	<p>A combination of paper forms and spreadsheets are used for health workforce information systems</p>	<p>Health worker data is entered onto spreadsheets for easier analysis and use</p>	<p>Health worker data is entered into a simple database (such as Access)</p>	<p>Data is entered into an advanced database (such as SQL)</p>	<p>Ranking: 5 Data is entered into a web-based advanced database accessible at all levels</p>
<p>2. Decentralization Findings: 100 percent of all facilities have access to all three data-entry tools. Approximately 20 percent of facilities use the web-based tool. Most facilities use Excel Forms. All public sector facilities must update data at least annually. Reporting by private sector facilities is low. Recommendations: Same as Technology Infrastructure. Though this is rated 5, supportive supervision is needed to reinforce widespread access to the system.</p>	<p>System only exists in one site (such as a single office building or school) in one institution</p>	<p>System is accessed in more than one site or institution</p>	<p>System is accessed in 50 percent of relevant sites and institutions</p>	<p>System is accessed in 90 percent of relevant sites and institutions</p>	<p>Ranking: 5 System is routinely accessed at all relevant sites and institutions</p>

Capacity Area	Level 1	Stage 2	Stage 3	Stage 4	Stage 5
<p>3. Use of Standards</p> <p>Findings: Excel: no drop-downs. Software application: all data elements selected through drop-downs. Web-based tool: all data elements selected through drop-downs. Some data elements, such as cadres, have been harmonized with a national master list.</p> <p>Recommendations: Conduct review of drop-down menus and develop data dictionary to ensure that all taxonomies are standardized to assist in interoperability.</p>	Information systems have few to no drop-down menus; data is largely recorded freehand	Drop-down menus are used for data elements (such as location or cadre) to ensure data entry is consistent	Ranking: 3 Choices in drop-down menus are based on standards agreed upon by stakeholders	At least one health workforce data element is harmonized with international standards (such as the ISCO classifications supported by ILO)	All possible data elements are aligned with appropriate national and international standards
<p>4. Data Quality</p> <p>Findings: Some data quality processes are used to verify completeness and integrity of data, but they are not documented. Most data quality and data-cleaning processes are done manually by Sub-Division for Data and Information developers. Data quality processes are conducted each time there are major updates by the PHO and DHO.</p> <p>Recommendations: Develop governance, SOPs, and other documented processes to promote data quality. Enhance SI-SDMK to include more auto-checks during data entry. Automate data-cleaning and data quality check processes.</p>	No or minimal data quality processes are in place	Periodic data quality checks conducted but not documented	Ranking: 3 DQA processes documented, but inconsistently applied	DQA processes documented and consistently applied based on an established protocol	Commitment to quality evident in consistently documented quality reviews based on a national protocol
<p>5. Sustainable Financing</p> <p>Findings: The SI-SDMK has long-term, full funding from a local institution (MOH/BPPSDMK). SI-SDMK staff are directly employed by MOH.</p> <p>Recommendations: Enhance funding in areas that promote use of SI-SDMK at decentralized level.</p>	Little or no direct financing by host-country institutions	Sustainable plan in place for joint financing	HRIS activities are jointly funded by host-country institutions and external sources		Ranking: 5 Key HRH stakeholders have a long-term plan, which includes sustainable financing for HRIS
<p>6. Human Capacity</p> <p>Findings: The SI-SMDK team consists of four developers who, in addition to maintaining the system, perform data cleaning processes (each developer has been assigned several provinces), and provide technical support and network administration of BPPSDMK building. Personnel in charge of HRH and data entry at the facilities level are usually nurses or midwives.</p> <p>Recommendations: Develop CPD pathways for local developers to continue skills building for advanced areas of software development and interoperability. Ensure that personnel in charge of HRH and data entry at the facilities have an understanding on use of data to make decisions (and not only entry of data). Continue to promote capacity building efforts for these staff to utilize SI-SDMK properly.</p>	Most staffing and support for the system comes from expatriates and external TA	Data collection and entry routinely performed by trained local staff	Most staffing and support come from local staff employed by international organizations	Bugs fixed and development support provided by local development team	Ranking: 5 New functionality routinely provided by local developers; system is supported entirely by local staff employed by local organizations

Capacity Area	Level 1	Stage 2	Stage 3	Stage 4	Stage 5
<p>7. Interoperability</p> <p>Findings: Exchanges of information occur between the Center for Planning, Ministry of Home Affairs, and Staffing Bureau. Data exchange occurs when new data is entered into the system or, in some cases, depending on other systems' processing quota (Ministry of Home Affairs, for example). There are no general policies to regulate data-entry or interoperability between systems. For systems within DHO, information exchange is defined through agreement letters. For external systems, MOUs are signed between parties.</p> <p>Recommendations: Develop interoperability architecture, standards, roadmap, and governance to guide interactions with other partners for more mature interoperability between external information systems. Advance coordination within the MOH to ensure SI-SDMK serves as HWR for all health worker data needs.</p>	Data exchange between systems is being planned but is not yet functional	Data is being imported or exported routinely with at least one other system, e.g., management and regulatory, or between HRIS and HMIS)	<p>Ranking: 3</p> <p>Interoperability is automated, routine and consistent between at least two national information systems</p>	A health workforce information policy and architecture are in place defining component systems, e.g., management, regulatory and training systems, as well as the information exchanged between them	Interoperability with all appropriate systems is routine and consistent, guided by a larger national e/mHealth architecture
<p>8. Data Use</p> <p>Findings: Data is used by stakeholders outside BPPSDMK (Ministry of Manpower, Center for Data and Information/Internal Affairs) to validate data on individual health workers for hiring purposes. It is also used to plan deployment of personnel. Data is reviewed by DHO for certain HRH functions. Information is used mainly by management-level users to validate data for hiring purposes and deployment of HRH. Some operative-level users in health facilities use individual HRH records as a staff registry.</p> <p>Recommendations: Enhance use of data through dashboards as well as supportive supervision and mentoring with key stakeholders on how to utilize SI-SDMK in daily management and strategic decision making on the health workforce.</p>	HRIS is used solely to look up individual records	HRIS is used to support basic management functions, such as retirement planning and vacancy analysis	Data from the HRIS is routinely reviewed by an intersectoral stakeholder leadership group, e.g., national health workforce observatory	HRIS data is used to inform HRH policies such as training and deployment of special cadres based on disease burden and distribution	<p>Ranking: 5</p> <p>HRIS is routinely used to inform more sophisticated HRH functions, such as health workforce planning and advocacy and is consulted routinely to inform key management and policy decisions</p>

HRIS Status Review Findings: Summary

Overall, the SI-SDMK scored a 3.5 out of 5 in strength, primarily due to gaps and weaknesses in available functions of the SI-SDMK. Recommendations were developed to address these gaps. Lessons learned were also documented as per findings from implementation of the HRIS review process.

Overall HRIS Strength	3.5
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Functions Total Score	2.7
FUNCTIONALITY	
1. Pre-service education	N/A
2. Registration and licensure	3
3. Staffing gaps and needs*	1.3
4. Payroll information	N/A
5. Personnel actions	3
6. In-service training*	2
7. Exit/attrition	2
8. Registry	5

Capacity Total Score	4.3
CAPACITY	
1. Technology/Infrastructure	5
2. Decentralization	5
3. Use of standards	3
4. Data quality	3
5. Sustainable financing	5
6. Human capacity	5
7. Interoperability	3
8. Use of data	5

**Functionality includes multiple elements, not all of which are applicable to the SI-SDMK so were not evaluated during this review.*

Readiness for NHWA

In addition to an overall scoring, a rapid analysis was conducted to identify readiness of the SI-SDMK to support NHWA. While the results seem as if the SI-SDMK has minimal readiness for NHWA, when

considering the comprehensiveness of data fields, as well as maturity of interoperability, SI-SDMK is well positioned to become a main information system for NHWA.

TABLE 4. NHWA READINESS

Area of Readiness	Readiness Rating: Yes, No, Partly	Findings
Ability of HRHIS to generate information to report on International Health Regulations	No	Function not currently available in SI-SDMK
Ability of HRHIS to generate information to report on implementation of the WHO Global Code of Practice on the International Recruitment of Health Personnel	No	Function not currently available in SI-SDMK
Ability of HRHIS to generate information for reporting on skilled attendance at birth requirements	Partly	While function not currently available in the SI-SDMK, could be available with minor modifications in the PUSRENGUN
Ability of HRHIS to generate information for reporting on outputs from education and training institutions	Partly	SI-SDMK has partial information on in-service training programs, but does not include outputs from PSE institutions
Ability of HRHIS to generate information to track entrants to the labor market	Yes	SI-SDMK has the MDS, which can track entrance into the labor market (including registration data). Issues with completeness and private sector data.
Ability of HRHIS to generate information to track active stock on the labor market	Partly	SI-SDMK has the MDS, which can track active labor market. Issues with completeness and private sector data.
Ability of HRHIS to generate information to track exits from the labor market	Partly	SI-SDMK has the MDS, which can track exit from the labor market. Issues with completeness and private sector data.
Ability of HRHIS to generate geocoded information on the location of health facilities	Partly	Some facilities are geo-coded.

HRIS Review Recommendations on Next Steps

Based on the above review, the following areas have been highlighted as recommended next steps for strengthening of the current SI-SDMK (see Annex C). These recommendations have also been integrated into the WHO/USAID joint implementation plan to ensure coordination and leveraging of efforts with WHO. In

general, recommendations revolve around enhancing the capacity of SI-SDMK to support interoperability, data analytics, decentralized use of the system and data (embedded throughout) and finally, prioritization for NHWA.

Further develop SI-SDMK's level of interoperability to enhance overall capacity

- Establish vision for interoperability architecture to set requirements and standards for interoperability with internal and external systems.
- Develop roadmap to implement vision, including steps to engage key stakeholders in the process.

Increase data use (at all levels) and data input (at decentralized levels) by developing a business intelligence architecture, data analytics, and dashboards

- Identify business intelligence components and design dashboards.
- Develop data warehouse to separate analytical information for decision-making from the day-to-day transactional databases.
- Conduct user testing with Daerah Khusus Ibukota-Jakarta (current strong users of SI-SDMK) for feedback prior to roll out.

Increase use of SI-SDMK (at all levels) through establishment of governance and regulations

- Design governance framework for SI-SDMK (data entry, use of data, information sharing between systems).

Link SI-SDMK strengthening with NHWA

- Integrate all SI-SDMK strengthening efforts into NHWA planning.
- Develop business intelligence dashboards to analyze NHWA indicators.
- Target stakeholders for NHWA in interoperability efforts.

Lessons Learned

The process of conducting any review or applying any assessment tool will undoubtedly reveal key lessons, which are important to growth and development of a practice. This is particularly important for the HRIS status review, as WHO has put a focus on HRH information systems being functional and interoperable with complete, accurate, and up-to-date data to feed into NHWA. This section highlights the various lessons learned in Indonesia, divided into stakeholder engagement and the HAF tool itself; these lessons learned should be applied for global learning on the tool.

Stakeholder Engagement

- **Pre-developed relationships are critical to an effective HRIS review.** Stakeholders, to the extent possible, must participate in and even lead the review. They must fully understand the intentions and the outcomes of the review team and how this review will benefit them in the end. In addition, a strong understanding of lines of authority must be clear to ensure that the right stakeholders are engaged at the right time. An external team with little connection to the Ministry of Health will have difficulty implementing this tool in any context. The stakeholder engagement “step” should not be underemphasized when planning an HRIS review.
- **A complete HRIS review requires inputs from multidisciplinary stakeholders;** thus, there can be challenges when a project's main relationships are with the MOH. It is not the MOH's authority to oversee the higher education ministry or professional council's data. Thus, if the review team's main stakeholders are MOH staff, they may not be able to participate in the review or make connections for the review at other ministries. Placing this review in the context of a NHWA TWG could support the needed multidisciplinary stakeholder engagement.

– **Address question about and ensure data confidentiality at the outset of the review.**

Throughout the processes, reviewers might see that while stakeholders feel comfortable talking about their information system, they are not comfortable with actually showing the information system to a review team. There are many reasons for this hesitation: confidentiality of data, uncertainty of how the reviewers might interpret the data, and sensitivities to data ownership (for example, the data is housed at the Center for Workforce Policy and Planning, so why would a review team made up of members of the Sub-Division for Data and Information and the HRH2030 program be allowed to see it?). However, actually seeing the information system is extremely important to understanding the breadth and depth of the system. It

should be made clear from the beginning of the assessment that the review team does not need access rights (user name, password) to any information system, unless there is a demo version or a way to have “viewers access” which includes only non-confidential data. The team should explain that they would like to review the system, with a user, to see the structure of the systems and data sets and emphasize the value that this review will bring. While of course it would be ideal for an independent review team to gain access to get an in-depth review, when referencing HR data, this can be particularly difficult in any context.

– **When conducting the review, an IT specialist should always be engaged as a key stakeholder.**

A stakeholder involved in conceptualization of the information system or monitoring, and evaluation of the system should also be engaged. This is important for understanding the structure, design, standards, and quality-assurance mechanisms that are in place for an information system. When preparing for the review, stakeholders should be informed about these specific personnel that should be involved.

HAF Tool Implementation

The HRH2030 team is using the Indonesia experience to revise the HAF tool for future use. Areas for revision include:

- The HAF tool is developed to review functionalities and capacities. However, the current structure of the tool makes it difficult to assess an information system that both captures data (i.e. data entered directly into the system by a user) or integrates data from other

information systems (i.e. extracts data from other sources through interoperability), which can ultimately introduce bias into the result (see Table 5).

- When various HRIS are managed by different stakeholders with different roles and responsibilities, as in Indonesia, not all functions will be filled by one HRIS (preservice education, registration and licensure, personnel action, etc.). In the current structure of the HAF tool, this complexity can affect the overall score an HRIS will receive, though perhaps this design of multiple systems, with overlapping data points even, was intentional. These different contexts must be considered and weighted differently. Overall, given the more recent development of NHTWA and its processes and steps, HRH2030 recommends that the **HAF be revised to serve as more structured tool for HRIS scoping, diagnostic, and planning to better capture what is needed for NHTWA.**
- The HAF tool should provide context on how the information systems are structured and how they are performing based on that intended structure. For example, SI-SDMK has several types of interfaces (standalone software, web interface, Excel forms). The SI-SDMK is strong due to the fact that there is a web interface that contains most of the functions and operates well for most of the capacities. However, even if SI-SDMK received a high score for having a web interface, most of the puskesmas are still using the Excel form. Due to this, SI-SDMK is not fully utilized to its full potential.
- The **assessment elements in the HAF should be defined more specifically to increase objectivity.** The current HAF assessment levels are structured in a manner that makes it difficult to routinely and objectively monitor progress. Most maturity models list out various points/aspects/indicators, which when responded to individually lead to an assessment on the level of maturity of a system. In the current HAF tool, reviewers are requested to assess progress made based on levels. For example, to be at level 3, you have to have 100 percent completed level 1 and 2. In practice, this becomes difficult. At times a system has partially completed portions of each level, thus making it difficult to score the system. The revised HAF tool will develop specific assessment elements for each of the functions and capacities.
- There are many health information system maturity models available, and some have modules for

assessing a human resource information system. **A review of the HRIS components of these maturity models will be done to understand the difference between the content and subsequently recommendations will be developed on the roles and responsibilities of each maturity model, including the HAF.**

- While the HAF tool is an important and effective way to assess the maturity of an information system and identify areas for improvement and feasibility of interoperability, **data mapping and key informant interviews are always necessary to complement this exercise.**
- As emphasis grows on the need to assess the health labor market of a country, the HAF tool should be modified in such a way to allow countries to

understand if their information systems can track particular indicators. For example, understanding better if, and if not how to develop, information systems can track graduates who are not entering the labor market in their country to either take other employment or to enter the health labor market of another country, would be extremely helpful for decision making and planning.

These lessons will be discussed with USAID for application and use in the future as HRH2030 continues support to Indonesia in strengthening its SI-SDMK for NHTWA and as support grows in other countries for NHTWA in general.

Table 5. HAF Tool Structure Comments

If function is...	The <i>entire</i> <u>information system</u>	or	<u>A data point(s)</u> <i>within</i> an information system
	<i>For example:</i> While the SI-SDMK does have data on the education background of health workers, it is not the function of the SI-SDMK to manage that data. This data is managed by the MORTHE for current health workforce students, in a separate information system. Thus, in the review of SI-SDMK, the pre-service education function was deemed “non-applicable” and thus contributed to a lower score for the SI-SDMK. The tool currently makes it difficult to distinguish between functionality as the information system itself (MORTHE Information System) or as a simple data point (educational background in SI-SDMK).		
If capacity is...	Applied to the <i>entire</i> <u>information system</u>	or	Applied to <u>a function</u> <i>within</i> the information system
	<i>For example:</i> While SI-SDMK does have mechanisms for interoperability, such as the exchange of registration number data between the KKI and MTKI, SI-SDMK is not fully interoperable as this exchange of data is specific to this data point and currently does not allow for other variables of data sharing. As such, as per the structure of the HAF tool the ranking for interoperability was assessed in reference to two data points, and not on the capacity of the entire system to be interoperable. The tool makes it difficult to assess if the capacity is for the entire information system, or for discrete functions (such as Registration number) within the information system.		

Conclusions

Having reliable, standardized, up-to-date, complete, and quality health workforce data that spans the lifecycle of the health worker is critical for planning and decision making.

In Indonesia, important steps have been taken by the BPPSDMK to improve health workforce data through the HRIS status review process. Based on this review, the BPPSDMK’s Sub-Division for Data and Utilization will be supported in needed enhancements to SI-SDMK, both in terms of structure, as well as data entry and use. All enhancements recommended for SI-SDMK are meant to ensure both an increase in efficiency of data input,

analysis and sharing, and increased use of HRH data, resulting in improved data quality and improved HRH decision making processes. Not only will this HRIS status review support the further enhancement of SI-SDMK for both GOI use of the system and HRH data and NHTWA in Indonesia, but it will also contribute to global goods on HRIS assessments and the conceptualization phase of NHTWA implementation.

Annex A. HRIS Status Review Functionalities Deep Dive

This annex provides more detail on the findings from the HRIS Status Review on SI-SDMK functionalities. For each function, a general description is given on the status of information systems and data for each function, followed by a focus on SI-SDMK, which was the main subject of the HRIS status review.

PRESERVICE EDUCATION

Preservice education data is needed to understand better the incoming graduates that will soon be entering the health workforce. This data, for both public and private institutions, is managed primarily by the MORTHE, which is also charged with accreditation of institutions. However, the MOH oversees a network of polytechnic schools; thus, the Center for HRH Education's PUSDIK SDMK manages this data.

While the review team was not able to examine these information systems, it was reported that the Pangkalan Data Pendidikan Tinggi (MORTHE information system) includes the following aggregate data, which is critical for NHWA:

- number of applications to higher education programs (physicians and nurses)
- number of newly registered students to a higher education program (physicians and nurses)
- number of annual graduated students, by occupation (physicians, nurses, midwives, dentists, and pharmacists)

In terms of data points for individual health workers for both the MORTHE and Center for HRH Education, the review found that these include (but are not limited to) name of student, national identity number, institution name, and graduate exam status (passed or failed), all of which is relevant to following a health worker throughout their career.

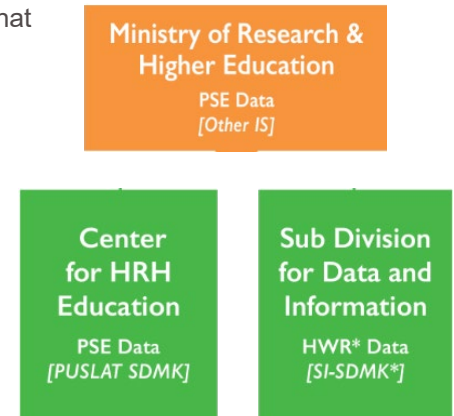
SI-SDMK currently includes basic information about the educational background of the health worker such as their degree, graduation year, and name of school. Found in Form A1 of the SI-SDMK, this data is entered manually by the HR manager at a facility. Form A1 is also the minimum data set (MDS) of SI-SDMK. Thus, it can be said that SI-SDMK's role is not to serve as a database or information system for analysis of comprehensive preservice education data, but to ensure that within a health worker's personnel record, accurate data on their education background is included. There are currently discussions in progress with the MORTHE to share this type of data directly (using mechanisms for interoperability) with the SI-SDMK to ensure that the data is accurate and complete. This interoperability and exchange of data could facilitate both the development of a wider interoperability platform for information sharing with other systems, as well as improve efficiencies and accuracies in SI-SDMK data for all functions, not just PSE.

Within the MOH, data is already shared between the PUSDIK SDMK and SI-SDMK. It should be noted that when considering use of the data, provincial health officers and puskesmas HR officers claimed that they regularly compare education data with the position of the health worker at the facility to ensure that the health worker has the formal educational training required for the role.

Overall, it was decided that the preservice education function of the SI-SDMK could not be assessed as it is not the designated role of SI-SDMK to manage this data, and it is included as part of the MDS (assessed under Health Worker Registry below).

REGISTRATION AND LICENSURE

Registration and licensure are needed to ensure that practicing health workers are trained and qualified to provide services. In Indonesia, registration and licensure data is managed by separate groups: registration by professional councils (such as MTKI and KKI), and licensure by local government offices. MTKI (for the cadres such as nurses, midwives, and other health workers) and KKI (for doctors and dentists) have separate information systems to manage



health worker registration data. The HRIS review team was not able to examine the MTKI or KKI information systems, but the link between these systems and SI-SDMK was discussed with key stakeholders (see below).

The Indonesia National Nurses' Association, PPNI, also has an information system, SIMK, (Sistem Informatasi Keanggotaan) that includes registration data. While the system is online, managed by the PPNI and available for all nurses to enter and manage their own data, there is no connection between the SIMK and other information systems or groups. Other professional associations, such as IBI, either have or are in the process of developing their own systems for managing their members' information.

Regarding licensure, local governments manage the process of licensure for all health workers. This allows local governments to better manage the health workforce in the province and district, but little was known or learned by the HRIS review team about the information system that is used to manage data on licensure. It should be noted that one health worker, such as a doctor, can have as many as three licenses, depending on where the doctor is practicing, thus making the case for a centralized information system for licensure data.

SI-SDMK includes data on registration and licensure in Form A4, as part of the minimum data set. In addition, registration data is pulled directly from the MTKI and KKI database using a web service as the mechanism for interoperability. Licensure is also included in SI-SDMK, but this data is manually entered by facility HR managers. The Sub-Division for Data and Information believes that the exchange of data with MTKI and KKI is critical for ensuring that data is accurate and for managing registration expiration. In discussions with puskesmas and PHO, both said this type of data in SI-SDMK was important to their regular analysis as their facility could lose accreditation or the province could lose funding.

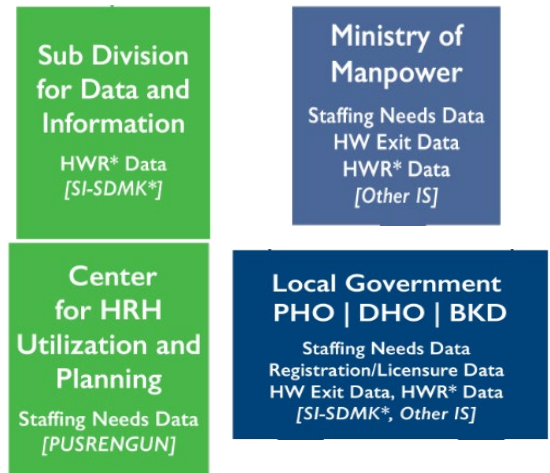
STAFFING GAPS AND NEEDS

Understanding gaps in staffing is important to comprehend where the health workforce could potentially be failing to respond to the populations' health needs. Understanding staffing needs can represent the workforce required to respond to these health needs, and support planning of the health workforce. While local governments manage immediate vacancies in positions, health workers' employment status, and basic analysis of staffing needs, the BPPSDMK's Center for Workforce Policy and Planning is the primary manager of staffing needs. Both provide this information to the Ministry of Manpower for decision making on staffing allocations and to the Ministry of Home Affairs for budget discussions.

Local governments manage vacancies as health workers come in and out of facilities under their authority. Most likely this data on vacancies is collected in reports provided to the provincial level Ministry of Manpower. Local governments, for payroll purposes, are also aware of the

employment status of a health worker. Finally, puskesmas and hospitals are required to submit data on staffing needs in the PUSRENGUN. The facility uses PUSRENGUN to report in two ways: (1) comparing current staff to minimum staffing standards, and (2) using HR information, workload standards, and service statistics to measure the workload pressure on a facility and identify needs.

The PUSRENGUN is also used at the central level for a higher-level analysis by the BPPSDMK's Center for Workforce Policy and Planning. The review team was allowed an in-depth look at the PUSRENGUN, which operates the two modules noted above. While the PUSRENGUN was methodologically a strong system, having many of the elements needed to calculate workforce pressure, the review team was not able to identify how the Ministry of Manpower or Center for Workforce Policy and Planning are using this analysis to better plan for and deploy the health workforce. In addition, though data is submitted by facilities to the district level on staffing needs in the two reports described above, there is no clear process by which this data is used to make decisions at the district, provincial or central level.



While the SI-SDMK does not analyze vacancies or staffing needs, it does track the employment status of a health worker in the A1 form, as part of the minimum data set. Interestingly, at the central level, PUSRENGUN does utilize SI-SDMK data, using a web service as its mechanism for interoperability to calculate staffing needs as compared to minimum staffing standards, but not workforce pressure. This is due to the fact that workforce pressure is analyzed based on the grade (i.e., level 1, level 2, etc.) of the health worker. However, grades are not currently included in SI-SDMK, though there are plans to do so.

PAYROLL INFORMATION

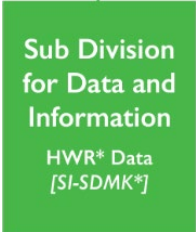
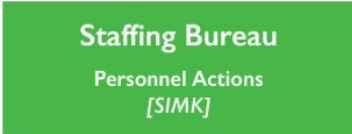
Payroll information is important for budgeting of the health workforce, ensuring equitable pay, as well as serving as a motivation for an incentivized career ladder. As in most countries, Indonesia’s public sector payroll is managed by a civil service body, the Ministry of Home Affairs. The Ministry of Home Affairs manages payroll for all public sector health workers based on staffing rosters provided by the District Level Civil Service Association (BKD, Badan Kepegawaian District) to the Ministry of Manpower. Based on these rosters, provincial health officers are then allocated a budget to pay their public sector health workers.



Due to this division of duties and to the sensitive nature of payroll information in any country, as well as the fact that on-time payment is not a major issue for health workers in Indonesia, it is understandable that payroll data is not included in SI-SDMK. As the data is not included in SI-SDMK, this functionality was not reviewed.

PERSONNEL ACTIONS

Personnel actions are important to understand if there are trends in high performance or, conversely, issues with quality. Some personnel action data, such promotions and transfers, can be found in SI-SDMK, as per inputs by facilities, DHO, and PHO, but there is no ability to verify the quality of this data and the data is often incomplete. In addition, for the MOH workforce (central MOH staff, polytechnic school staff, training institution staff and MOH facility staff) all personnel actions are managed by the MOH’s BPPSDMK’s Staffing Bureau in a system called SIMK. The MOH employed workforce is a limited portion of the human resources for health in Indonesia, as most are managed by the Ministry of Manpower or private-sector institutions. In addition, the Staffing Bureau, for reasons of protecting privacy of employees, will not share data with the Sub-Division for Data and Information (or SI-SDMK), thus limiting the ability for a central information system to manage this type of health workforce data.



IN-SERVICE TRAINING

Continuing professional development (CPD) and continuing medical education (CME) through in-service training are important components of a highly skilled and fit-for-practice workforce. Currently this data is tracked in multiple ways.

To begin, the data is tracked by professional councils, such as MTKI and KKI in their respective information systems, to ensure that health workers have completed their CPD credits to receive registration. In addition, professional associations, such as PPNI, use this information system to better understand their members’ status in CME and CPD, and to inform feedback to the MOH on designing CME and CPD standards.



In addition, the BPPSDMK’s Center for HRH Training has a separate information system, the PUSLAT SDMK, that includes data on training, including registration of students and accreditation of training conducted at the eight MOH training institutions throughout the country. The review team does not know what platform the PUSLAT is operating from, though it is possible that the information is still managed in Excel (there are plans to move it to an online platform).

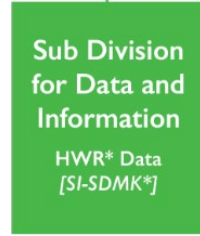


All in-service training information, including continuing education, is included in Forms A2 and A3 of the SI-SDMK. Continuing education is in relation to health workers that are currently undergoing a more advanced degree and undergoing specialized education (such as doctors and dentists). This data comes from the facility, DHO, and then PHO,

as per evidence from the health worker. SI-SDMK is a strong source of in-service training data, as it can triangulate multiple points.

WORKFORCE EXIT/ATTRITION

Workforce exit and attrition data is needed for a comprehensive assessment of the health workforce pipeline. This data can also support an understanding of trends for planning purposes. Currently, this data is officially managed by local governments and provided to the Ministry of Manpower to ensure proper payment and recruitment. It is not clear how this data is shared between local governments and the Ministry of Manpower, though it is probably in the form of reports similar to those referenced in personnel actions. In general, there is no system that documents and analyzes these trends to support planning.



SI-SDMK does track health workers' exit from their current position in Form A1; there are fields for entry into the position and exit from the position, as well as the employment status of the health worker. This provides limited insight to understanding exit and attrition as it is not documented where the health worker goes upon exit and no formal analysis is conducted to understand these trends.

HEALTH WORKER REGISTRY (HWR)

An HWR is a piece of health information systems architecture that pulls a minimum data set from multiple HRIS. At times, when an HIS architecture is still growing, systems like the SI-SDMK can serve as the HWR. That being the case in Indonesia, the SI-SDMK not only contains the minimum data set recommended by WHO, but also includes data from other information systems (as referenced above). The SI-SDMK contains data on health workers' name, national identity number, cadre/position, career advancement, education history, registration and licensure, and CPD and CME information (and more nuanced data collection points for each). In addition, the foreign health workforce is also tracked, which is important for NHWA considerations. It is possible that other institutions track similar data, such as the Ministry of Manpower and the JNK bodies, but while SI-SDMK feeds data to these institutions, rarely is data provided to the SI-SDMK.



Annex B. HRIS Assessment Framework

Annex C. HRIS Status Review Interview Guide Template

Annex D. SI-SDMK Strengthening Plan



Program Partners

- Chemonics International
- American International Health Alliance (AIHA)
- Amref Health Africa
- Open Development
- Palladium
- ThinkWell
- University Research Company (URC)

About HRH2030

HRH2030 strives to build the accessible, available, acceptable, and high-quality health workforce needed to improve health outcomes.

Global Program Objectives

1. **Improve performance and productivity of the health workforce.** Improve service delivery models, strengthen in-service training capacity and continuing professional development programs, and increase the capacity of managers to manage HRH resources more efficiently.
2. **Increase the number, skill mix, and competency of the health workforce.** Ensure that educational institutions meet students' needs and use curriculum relevant to students' future patients. This objective also addresses management capability of pre-service institutions.
3. **Strengthen HRH/HSS leadership and governance capacity.** Promote transparency in HRH decisions, strengthen the regulatory environment, improve management capacity, reduce gender disparities, and improve multi-sectoral collaboration for advancing the HRH agenda.
4. **Increase sustainability of investment in HRH.** Increase the utilization of HRH data for accurate decision-making with the aim of increasing investment in educating, training, and managing a fit-for-purpose and fit-for-practice health workforce.



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