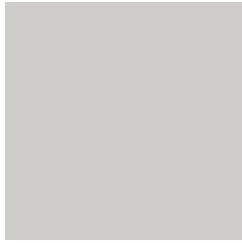


## National Health Workforce Accounts Case Study Series | February 2021



# Optimizing Health Workforce Information Systems and Data Analytics to Improve Decision Making in Indonesia

## Innovating to Improve Decision Making on Health Workforce Issues

“There is no health without the health workforce.” This quote, commonly cited by Indonesia’s Ministry of Health (MOH), is especially pertinent in a country with more than 273 million people, 1.2 million health workers, approximately 2,823 hospitals, 9,993 health centers, and 85,000 clinics, all spread across an archipelago of over 17,000 islands. Despite Indonesia’s expansive health system, the country has some of the highest maternal and neonatal death rates in the Asia Pacific region (in preventable deaths), is facing a growing HIV epidemic which disproportionately affects vulnerable communities, and is seeing rising cases of drug-resistant tuberculosis. These issues are exacerbated by underlying health workforce challenges, which include urban-rural maldistribution; gaps in skill mix of health graduates to meet the evolving epidemiological and demographic needs; inadequate regulation of health professional education and health service quality; and a fragmented ecosystem of HRH information platforms with disparate stakeholders that inhibits evidence-informed decision-making. While Indonesia’s information systems, infrastructure, and institutional capacity for health workforce data use are relatively strong, incomplete, or limited quality data hinders effective data use to strategically address health workforce policy challenges.

Given the vast health workforce, decentralized nature of management, and expansive number of stakeholders involved in the health system, it is key for the MOH and stakeholders to focus on improving data analytics and use through improved information systems. The Government of Indonesia has demonstrated its commitment to optimizing information systems through several national initiatives such as the [Presidential Decree on One Data](#) and the [Presidential Decree focusing on governance for electronic platforms](#), and various government regulations calling for health information system

improvements. Further, Indonesia has demonstrated its commitment to improving the health workforce through a focus on health workforce strengthening in the mid-term national development plan, the [National HRH Strategic Plan](#), and the signing of key health workforce World Health Assembly Resolutions [69.19](#) and 70.18 related to strengthening data and evidence on the health workforce, and overall country emphasis on the importance of the [Global Strategy on Human Resources for Health in 2030](#).

Based on these commitments, the WHO National Health Workforce Accounts (NHWA) have proven to be a strategic mechanism in Indonesia for optimizing information systems and data analytics on the health workforce using innovative approaches such as interoperability (connections and data exchange between systems) and business intelligence (the ability to turn data into action) to improve overall decision making. This case study highlights the key health workforce priorities identified by Indonesia, and documents the actions and steps taken by the MOH’s [Badan Pengembangan Dan Pemberdayaan SDM Kesehatan](#) (BPPSDMK, the Board of Human Resources for Health Empowerment and Development) to optimize health workforce information and data analytics to improve decision making related to the health workforce.

## Setting Health Workforce Priorities

To support the BPPSDMK in the conceptualization and operationalization of NHWA, the United States Agency for International Development (USAID), with representation from USAID Washington, USAID Indonesia, and the Human Resources for Health in 2030 Program (HRH2030) along with representatives from the World Health Organization (WHO) headquarters, South East Asia Regional (SEAR) Office, and

Indonesia Country Office, held a joint mission in July 2017. The joint mission produced a landscape analysis on HRH stakeholders and their information systems, and a draft NHTWA implementation plan with priority activities clearly outlined that focused on information systems and overall buy-in from senior MOH officials. The recommendations from this joint mission not only guided initial implementation of NHTWA in Indonesia, but optimized collaboration between technical assistance partners USAID, WHO, and HRH2030.

### REGIONAL COMMITMENTS TO PRIORITIZE HEALTH WORKFORCE INDICATORS

Indonesia's health workforce priorities, set during the joint mission, came from regionally agreed upon indicators outlined in WHO's "[Decade of HRH in SEAR](#)" initiative (2015-2024), which addresses the health workforce challenges across South East Asia. These indicators—quantitative metrics linked to monitor performance and measure achievement, specifically in HRH—are part of NHTWA. The NHTWA is a modular system, tied to the three main areas of the Health Labor Market Framework: education, labor markets, the labor market, and serving population health needs. There are 10 modules in total, spread out across these three areas. See box at right.

Using these indicators as a starting point, a preliminary NHTWA Technical Working Group convened to identify and assess the availability and quality of data for reporting. The following 10 NHTWA indicators were prioritized to guide implementation and engage stakeholders:

- *Active Health Workforce Stock:* Indicators 1-01: Health worker density; 1-02: Health worker density at subnational level; and 1-04: Female health workforce
- *Education and Training Regulation and Accreditation:* Indicators 3-02: Accreditation mechanisms for education and training institutions and their programs; and 3-08: Continuing professional development
- *Governance and Health Workforce Policies:* Indicators 9-01: Mechanisms to coordinate an intersectoral health workforce agenda; 9-02: Central health workforce unit; and 9-03: Health workforce planning processes
- *Health Workforce Information Systems:* Indicators 10-05: HRHIS for tracking the number of active stock on the labor market; and 10-08: HRHIS for producing the geocoded location of health facilities.

### BRINGING TOGETHER A FRAGMENTED ECOSYSTEM OF HRH INFORMATION

Indonesia has a wide ecosystem of health workforce stakeholders and related information systems, with each having a critical role in building, managing, and optimizing the health workforce. The ecosystem consists of over 20 information systems within the BPPSDMK alone, with complementary information systems from stakeholders including the Ministry of Culture and Higher Education, professional councils & associations, Ministry of Manpower,

## What are National Health Workforce Accounts?

Developed by the WHO and adopted by the global health community, National Health Workforce Accounts (NHTWA) support countries to **progressively** (step-by-step) improve the **availability, quality, and use** of health workforce data to help achieve HRH and health goals for a high-performing health system.

NHTWA groups HRH indicators through a set of **10 modules**, categorized under the three main areas of the Health Labor Market Framework: **education, labor markets, and serving population health needs**. The modules are:

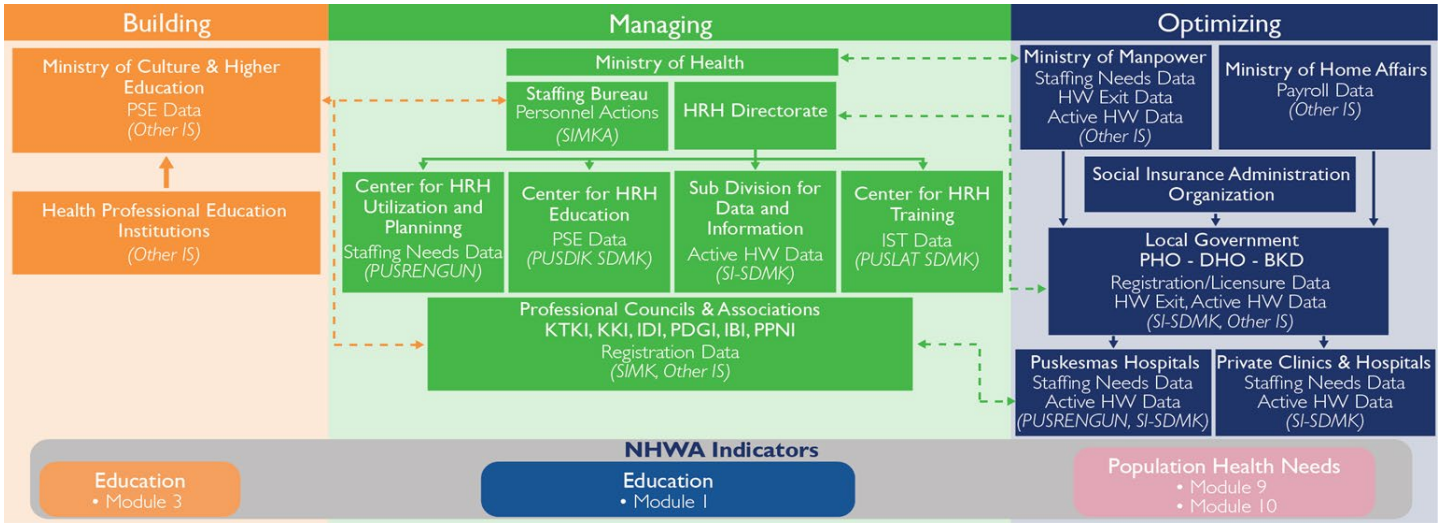
1. *Active health workforce stock*
2. *Health workforce in education*
3. *Education regulation*
4. *Education finances*
5. *Health labor market flows*
6. *Employment characteristics and working conditions*
7. *Health workforce spending and remuneration*
8. *Skill mix compositions for models of care*
9. *Performance and productivity*
10. *Health workforce governance, information systems and planning*

Through the online, DHIS2-enabled NHTWA platform, country governments can routinely report and review data.

The NHTWA promotes effective stakeholder relationships to define country-level data standards, governance, and interoperability, allowing **efficient multisectoral data sharing** for **real-time data analysis and decision making** sustained within a self-reliant health system.

Ministry of Home Affairs, Social Insurance Administration Organization, local governments, and public and private clinics and hospitals. This has led to a fragmentation of health worker data, affecting the ability of the country to respond to and act on both national and regional health objectives. Core data components such as the national identification number, registration number, license number, and education background were prioritized as existing data sets that could be leveraged using interoperability to enhance the completeness and quality of the BPPSDMK's human resource information system (HRIS), SI-SDMK. The SI-SDMK, due to its role as the information system supporting comprehensive individual health worker data, was designated to be the central information system for NHTWA (see Figure 1).

**FIGURE 1. HEALTH WORKFORCE DATA MAPPING BY INSTITUTION & SYSTEM IN INDONESIA**



### Improving Information Systems for NHWA Implementation in Indonesia

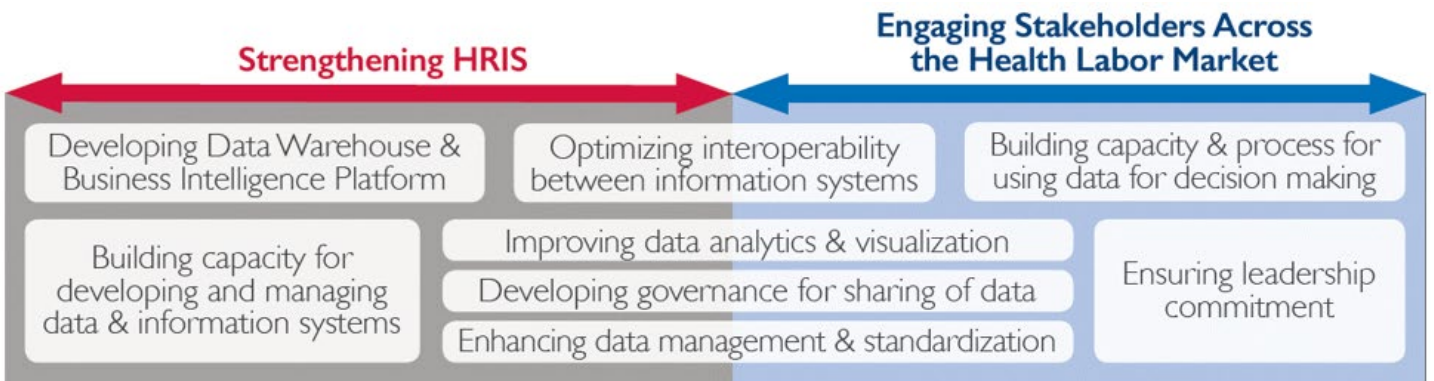
As recommended by the WHO, NHWA implementation in Indonesia was **progressive**—done in a stepwise fashion, based on availability and quality of data—**multi-sectoral**, and **built on existing systems**, focusing on improving availability, quality, and use of data to strengthen evidence-based decision making on the health workforce. Indonesia offers a unique perspective regarding the approaches used to implement NHWA, focusing on strengthening information systems, using data analytics, and engaging stakeholders in the process of data sharing and use. These approaches include the development of interoperability—connecting different systems—and business intelligence platforms, which convert raw data into meaningful information, (see Figure 2 below). Efforts to support NHWA implementation were the focus of USAID’s assistance through HRH2030 in Indonesia and have provided a strong base for improving the availability and use of quality data in the COVID-19 response, demonstrating further the importance of such investments in strengthening of health workforce data and analytics.

### STRENGTHENING HRIS

#### HRIS Assessment

The HRIS Assessment Framework (HAF) developed by PEPFAR was [applied in Indonesia](#) to assess the status of SI-SDMK’s functionalities and capacities, map stakeholders and flows of data, and determine the country’s overall readiness for NHWA. The assessment found that SI-SDMK, while strong in many aspects, needed further investments to facilitate connections and data exchange between systems (interoperability) and improve data validation and quality. In addition, the HAF revealed a need to increase data use (at all levels) and data *input* (at decentralized levels) through the establishment of data governance and regulation. Finally, the assessment recognized the need to strengthen SI-SDMK’s data analytics capabilities, so that users could transform data into actionable insights, requiring new business intelligence platforms. With these findings, the HAF provided the key evidence needed for the Government of Indonesia to justify investments in NHWA conceptualization and operationalization.

**FIGURE 2. CONTINUUM OF MULTI-FACETED APPROACHES TO IMPROVE DECISION MAKING**





*Optimizing HR information systems to build a business intelligence platform for dynamic data analytics*

NHWA stakeholders took advanced measures to create an interoperable HRIS architecture that allowed for data compilation from different points across the health labor market (see Figure 1). The architecture followed the [Principles for Digital Development](#), and accounted for data standards, integration mechanisms, and interoperability using an open-source platform, [OpenHIM](#), and various web application programming interfaces (APIs). In addition, it defined the structure for business intelligence—the ability to turn data into action—using HRH Datawarehouse ([DHIS2](#)), which compiles individual data into an aggregate form that is imported into [Tableau](#), a data analytics and visualization platform. The MOH and BPPSDMK have designated Tableau as the platform that meets their data analytics requirements and thus are invested in using it for the long term.

With data now available from across many separate systems, the BPPSDMK and its collaborators developed dynamic dashboards using this multisectoral data to better understand the health labor market dynamics at play. They use these dashboards to respond to specific health workforce and health policy decisions, including the rapid analysis and visualization of data for responding to priority maternal child health outcomes, [non-communicable diseases such as hypertension](#), provision of services for HIV treatment and care, and planning and responding to the [COVID-19 pandemic](#). Figure 3, below, shows a dashboard developed in the early months of the COVID-19 outbreak, which illustrated potential options to redeploy and redistribute

health workers to provide surge support in higher-need areas.

**ENGAGING STAKEHOLDERS ACROSS THE HEALTH LABOR MARKET**

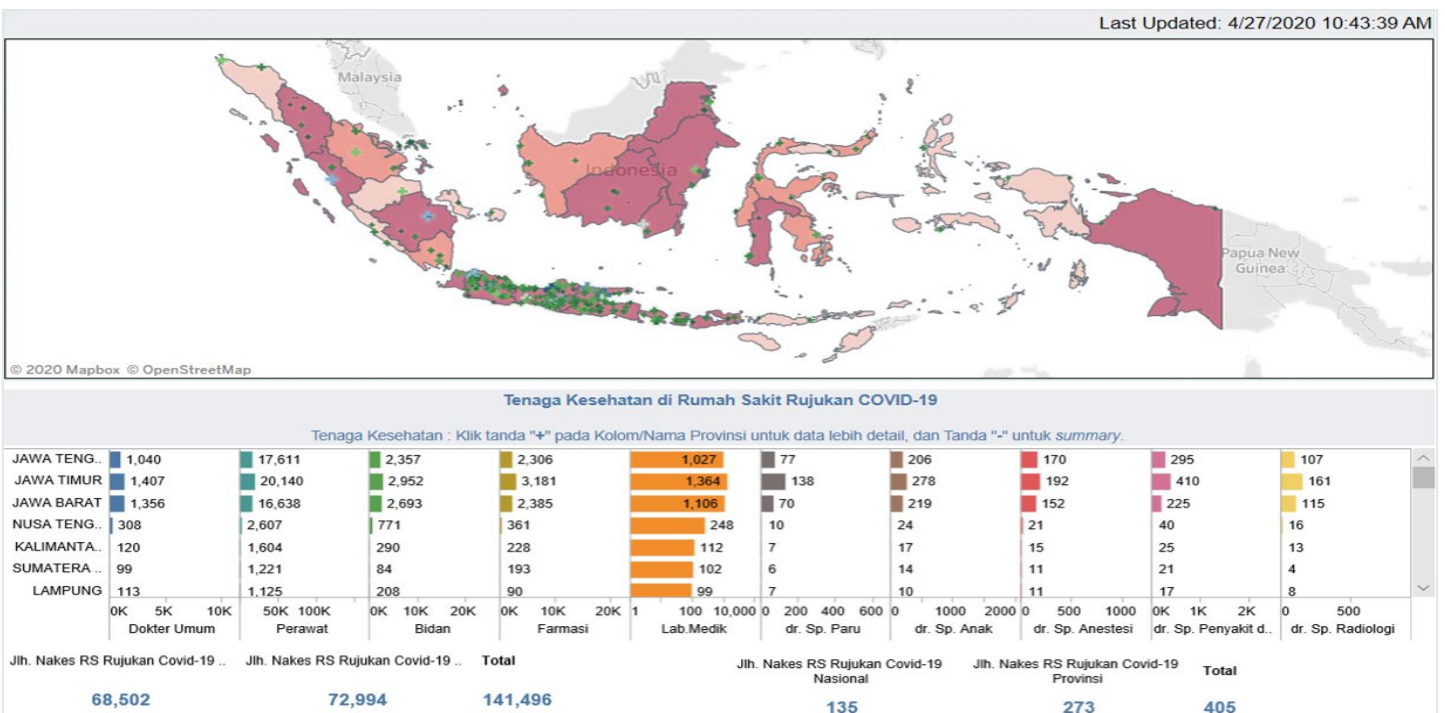
Indonesia has taken a progressive approach for engaging stakeholders to define policy questions and share data, based on availability of data. Overseen by an NHWA Technical Working Group (TWG), the NHWA plan was stepwise in nature, starting with health sector data on the active labor stock, then progressively moving to data generated by the education sector. This approach resulted in strong, meaningful relationships among stakeholders, with formal HRH *data sharing* occurring regularly, along with comprehensive data analysis. However, *use of data and analytics* by these stakeholders remained weak and thus was increasingly emphasized in next phases of engagement.

**BUILDING CAPACITY**

*Increasing capacity for developing and managing data and information systems.*

Enhancing the BPPSDMK’s capacity to develop and manage information systems occurred through formal training, mentoring, coaching, extensive documentation using web-based platforms, and technical assistance to ensure sustainability. HRH2030 and the WHO supported trainings with key BPPSDMK units on system administration, maintenance, data set development, and using the HRH Datawarehouse and dashboards. Training was not implemented as one-off formal stand-alone sessions, but by directly integrating mentors and advisors from HRH2030

**FIGURE 3. MOH/BPPSDMK DASHBOARD OF HEALTH WORKERS AT REFERRAL HOSPITALS & COVID-19 CASES**



Source: Indonesia MOH BPPSDMK <http://bppsdmk.kemkes.go.id/web/content/113/informasi-sdmk-rs-covid-19>

Indonesia within the BPPSDMK to support a culture shift and institutionalize learning outcomes from capacity building efforts. While NHWA is not solely focused on information systems, ensuring the MOH has the capacity to maintain these systems is critical for sustained, routine sharing and analysis of high-quality data.

#### *Building a culture of using data for decision making*

Having a system that provides access to data for data's sake is not enough. Using this information systematically and strategically—in other words, building a culture of data use—is equally as important as having a comprehensive, well-maintained system. To begin developing a culture of data use, HRH2030 conducted several workshops and mentored key BPPSDMK team members on translating data into action. They found that data visualizations were critical to effectively communicate various health workforce situations/scenarios to the diverse types of decision makers in Indonesia. As such, HRH2030 and the BPPSDMK agreed to focus on developing national capacity for using Tableau and DHIS2 software, as well for creating tools, infographics, web documentation, and short tutorials to sustain these capacities. Being responsive to what motivates stakeholders—at all levels—to use data in their context is critical for NHWA operationalization.

## **Lessons Learned on Improving Information Systems for NHWA**

### **I. A SECTOR-WIDE APPROACH CAN OPTIMIZE INFORMATION SYSTEMS**

Given the range of stakeholders generating and using HRH data in Indonesia (see Figure 1), a system-wide approach was needed to optimize information systems. This approach—which included improving the information system architecture to ensure interoperability, establishing a governance structure for collaboration, and promoting use of data across the country's vast multisectoral data ecosystem—paid off. For example, the BPPSDMK worked with the District Health Office licensure body to exchange data on health worker information and licenses that improved the quality of licensing data in SI-SDMK and sped up the process for issuing licenses. The BPPSDMK and licensure body now have stronger data on health workforce and licensure. This successful engagement lays the groundwork for future moves towards actual use of data for the planning (ex. Ministry of Culture and Education), managing (ex. Ministry of State Apparatus), and distribution (ex. Ministry of Home Affairs) of the health workforce.

### **2. UNDERSTAND POLICY MECHANISMS AND MOTIVATIONS FOR DATA SHARING**

Policies, such as the One Data policy, coupled with local actors' motivations to improve operations efficiencies, proved important to advance efforts to strengthen information systems and engage stakeholders in NHWA. Many stakeholders knew that they needed quality data. The BPPSDMK took the time to identify each stakeholder's specific data and information priorities; subsequently the

BPPSDMK mapped how these stakeholder priorities aligned with broader NHWA priorities. For example, the Ministry of Home Affairs (MOHA) wanted to ensure that any health worker that applied for a transfer was truly working in the facility to which they had originally been assigned. Therefore, the MOHA and BPPSDMK began exchanging health worker data on current posting (BPPSDMK), and transfer posting (MOHA) so that the MOHA had the right information needed to approve transfers. This data exchange has resulted in more real time updates regarding health worker location, which is useful to guide decision making to address HRH maldistribution challenges and develop evidence-based strategies to ensure that more Indonesians can access a qualified health worker to meet their health needs.

### **3. INTEGRATE NHWA PROCESSES INTO ROUTINE OPERATIONS**

Ensuring that NHWA is not a standalone or additional initiative is key. In Indonesia, NHWA implementation was seamlessly integrated into regular operations of the BPPSDMK, with a two-track focus of strengthening the information systems and engaging stakeholders to improve the availability and quality of data, which are existing roles of the BPPSDMK. NHWA was used strategically as a mechanism to prioritize these efforts both internally at the central level, and PHO and DHO levels and externally, thus mutually beneficial for health workforce decision making in Indonesia and global level data requests from WHO. Engaging other directorates within the MOH beyond the BPPSDMK was critical to advance health workforce data use.

### **4. DEMONSTRATE THE POWER OF DATA ANALYTICS**

Maps, charts, graphs, and other visualizations that can be readily manipulated, designed, and developed using accurate, complete, and up-to-date data proved to be a huge motivator to stakeholders investing time in NHWA reporting. Effective data visualizations deliver a more rapid, shared understanding of the key areas for action and were critical for cultivating initial interest and gaining buy-in for longer-term strategic use of NHWA indicators. For example, using data analytics, local health offices were able to visualize which primary health centers (*Puskesmas*), did not have the required cadres, and identify health workforce gaps to inform planning and budgeting for future staff. In addition, when analytics highlighted specific gaps in nursing data in 2019, stakeholders could prioritize filling them to provide a more complete, accurate [country profile](#) for the [State of the World's Nursing Report, 2020](#). NHWA data analytics provide information for the TWG that can assist the education sector to anticipate cadre- or skill-specific health worker production needs; they also demonstrate potential for optimization between the public and private sector. Investing in even the simplest of data analytics and visualization can inspire long term and sustained investments in NHWA overall. Health workforce data analytics help convey to decision makers what number and skills mix of health care workers are available for quality health service delivery.

## Future Planning

Indonesia has embraced the step-by-step nature of NHWA implementation, focusing on the identification of critical health workforce issues, and then bringing together stakeholders and data to respond. Country leaders have welcomed the NHWA mandate for multi-sectoral coordination, adopted the platform for data standardization and sharing, and ultimately are more collaborative in identifying and acting together to resolve health workforce issues to meet population health needs. Moving forward, the BPPSDMK will continue to garner understanding from leadership on how to routinely use health workforce data for strategic decision making. The BPPSDMK will also continuously identify policy questions based on health workforce needs and integrate stakeholders into the NHWA TWG to support a response to these policy questions. Focus will be on building more proactive participation from TWG stakeholders, truly ensuring that members are using data to make evidence-based decisions. Emphasis will be placed on using data to respond to key issues such as redistribution of health workers, planning production of certain type of workers, informing changes to curriculum, and building career paths for certain worker types.

The BPPSDMK is also focusing on optimizing the health workforce information ecosystem through the development of an HRIS Roadmap, which will provide the vision, regulation, and process for managing and coordinating these information systems across the health labor market. This will allow the BPPSDMK to further operationalize NHWA by expanding to report on additional modules and indicators over time. Options will also be explored to identify how the HRIS can be used by individual health workers to manage their own continuing professional development. Continued capacity building trainings will ensure that the BPPSDMK has the capacity to institutionalize and sustain all information systems and data use efforts within the MOH directly.

Throughout 2020 and into 2021, NHWA has also served as the blueprint for engaging key stakeholders in data and decision making during [Indonesia's COVID-19 response](#).

There is an urgency to gather data from across the health, education, and other sectors, and use analytics on health worker availability and distribution for emergency preparedness and response to COVID-19. Key health workforce data priorities include information on:

- Students at pre-service education institutions, to identify cohorts of new graduates to recruit for response work.
- Professional association members, to identify volunteers to support referral and emergency facilities.
- Private sector workforce staffed at hospitals and other facilities, to understand the complete picture of health system capacity to both respond to the emergency and maintain essential services.
- Data around cases, infection prevention control resources, and risk levels to better understand workload pressure for the workforce.

Overall, Indonesia's strategic roll-out and implementation of NHWA has positioned the country to systemically review and improve the availability, quality, and use of data on its health workforce and improve outcomes for maternal and child health, TB, and HIV/AIDS health goals. While actions to better integrate data for the COVID-19 response are ongoing, this initial operationalization of the four NHWA modules, as well as multi-sectoral stakeholder engagement through the NHWA TWG, has built a strong foundation for a more rapid, multisectoral response to integrating health workforce data.

Ultimately, Indonesia's implementation of NHWA began with strengthening existing information systems to analyze data and engage stakeholders. Moving forward, these stakeholders will build on this base and continue to use NHWA as the vehicle to continuously bring HRH data together for better-informed decision-making to address health workforce shortages, mal-distribution, and skills gaps needed to achieve health for all.



[www.hrh2030program.org](http://www.hrh2030program.org)

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