

# Human Resources Information Systems (HRIS): A Review across States of India

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## ABOUT THE REPORT

This report gives a synopsis of the human resources information systems (HRIS) currently being used in 14 states in India. Appendix A provides more detailed information on the HRIS for each individual state. It should be noted that despite our best efforts to contact the right person to get details about each HRIS, we were not able to collect complete information for all states. (However, a list of all study respondents is available, with names, designations, contact information, and email approvals for the study responses.)

A note on terminology: HRIS, HRMIS (human resources management information system), and HRHIS (human resources for health information system) are terms used throughout this document. They are terms of art in the domain of human resources for health systems and software. Quite often, HRIS denotes any general application that deals with human resources for health. HRMIS and HRHIS applications, however, have subtle differences in their functionality that become important when considering how they are used. For example, an HRIS can be a system to help inform policy implementation such as distribution of cadres across a jurisdiction. A HRMIS is a system that might do that but might also be used to actively manage a cadre or even an individual within the system—such as promoting them or changing their assignment where the system produces the appropriate paperwork for such changes. Finally, many times these are terms incorporated into the proper name of the system being used.

## EXECUTIVE SUMMARY

India faces critical human resources shortages for key cadres such as doctors, specialists, nurses, and midwives. Other key challenges include suboptimal deployment of staff exacerbated by a skewed urban-rural distribution, gaps in certain specialties, and inefficient use of staff due to poor rationalization of tasks.

Lack of comprehensive, reliable, and up-to-date data and an absence of commonly agreed definitions and analytical tools make the task of managing the health workforce all the more difficult. Currently, most human resources information system (HRIS) information is neither complete nor up-to-date and is often found in disparate paper files.

The Government of India has established human resources for health (HRH) as an important policy initiative in its 12th five-year plan. The most effective method to bring together such data is in a web-based information system. However, states use a variety of approaches that range from paper-based systems to electronic spreadsheets.

This study reviewed HRIS across all 28 states and 7 union territories of India to assess their purpose, scope, coverage, software technology, usability, and sustainability. The inquiry included electronic searches as well as interviews with state officials.

The responses showed that 19 states and union territories have either a paper-based system or one with some data in electronic spreadsheets. Fourteen states have a web-based human resources for health system, and two states have begun developing one. The depth of the data compiled across state systems varies widely. Some systems have only 10 data elements (Haryana), but two systems have more than 200 fields (Bihar and Jharkhand). Moreover, the protocols for data quality and updating also span a wide spectrum, from few checks to very sophisticated ones to assure quality and accuracy. Staff training and role definition also range from very light to well-defined. Data use across the jurisdictions varies from none to frequent use to identify vacancies and address transfers and postings. None of the systems, however, reported developing a protocol for regular analysis and review. Most HRIS systems are maintained by third parties and not directly by the government.

The study points out the need for a national HRIS framework to move all states to a web-based platform with common technologies and data structures. Using open source technologies can avoid licensing fees and enable modifications to meet evolving needs. Such a program will ensure that data are up-to-date and usable by local through national officials. The approach taken needs to build in-house staff technical capacity for developing, deploying, adjusting, and maintaining the systems. A common approach can make costing a predictable factor in rollout and support. To achieve these objectives, ongoing leadership is needed to garner the benefits such systems will bring.

## BACKGROUND

Health systems and services depend largely on the size, skills, and commitment of the health workforce. However, fundamental questions regarding the status of the workforce, its level of performance, and the problems health workers face remain largely unanswered. Lack of comprehensive, reliable, and up-to-date data and an absence of commonly agreed definitions and analytical tools make the task of managing the health workforce all the more difficult.

Although human resources (HR) are the largest component of health care delivery in India, the country faces critical HR challenges in the health sector, including shortages of key cadres such as doctors, specialists, nurses, and midwives. In addition to shortages, other key challenges include suboptimal deployment of staff exacerbated by a skewed urban-rural distribution, gaps in certain specialties, and inefficient use of staff due to poor rationalization of tasks.

One of the major obstacles in strengthening human resources for health (HRH) in India is the absence of comprehensive information on the health workforce. The limited information that is available is neither complete nor up-to-date and is often found in disparate paper files. This reduces decision-makers' ability to access and use accurate and timely data to efficiently deploy health workers and manage performance to improve access and quality of health service delivery.

Human resources information systems (HRIS) are used to acquire, store, analyze, retrieve, and utilize information to ensure that the right health workers are in the right place, with the right skills, at the right time. An HRIS tracks data about individual health workers' position, qualifications, training, place of posting, transfers, promotions, and deputation from the time of their joining until the time they exit from the system due to retirement, resignation, or for other reasons.

In India, national policies and programs such as the National Health Mission (NHM) have recognized that maintaining a sufficient, sustainable, and effective health workforce is essential for improving health outcomes for India's poor. NHM emphasizes the importance and urgency of strengthening its human resources and has been investing in health workers and the systems that support them.

## STUDY RATIONALE

The Government of India (GOI) has included establishing a human resources management information system (HRMIS) for health workers as an important priority in its 12<sup>th</sup> five-year plan. The GOI's reproductive, maternal, newborn, child, and adolescent health and nutrition (RMNCH+A) strategy also emphasizes the mandatory disclosure of all facility-level deployment of human resources on the state NHM website.

An effective HRIS provides accurate and timely data about the health workforce. In India, these systems are currently at different stages of progress in development, data collection, and

verification. While some states continue to maintain HRH data on paper, other states have initiated efforts to computerize the data either through simple Excel-based spreadsheets or more sophisticated web-based HRIS. The aim of these initiatives is to use the HRIS data to improve recruitment, deployment, and training of health workers to expand access, quality, and use of health services. Where an integrated web-based HRIS is in place, such a system can help track individuals as they move through the health workforce system; improve the accuracy and availability of HRH data; allow sharing of information across sectors to gain a national workforce perspective; simplify data analysis and generation of reports; project workforce needs in the future; monitor training requirements and licensing status; and decrease the labor and effort required to maintain the enormous amount of information generated.

To date, there has been limited documentation and sharing of knowledge about India's different HRIS efforts. However, it is important to understand the different systems and summarize lessons learned to facilitate cross-learning between states and draw out key recommendations for building a national HRIS framework. To this end, the IntraHealth International-led *CapacityPlus* project, with guidance from USAID/India, conducted a study of the systems used by various state governments in India to maintain their health workforce information.

## OBJECTIVES

The main objective of the study was to conduct a review of HRIS across all states and union territories in India to assess the systems' purpose, scope, coverage, software technology, usability, and sustainability. The study's specific objectives were to:

1. Collect and review basic information on various state-level HRIS efforts
2. Identify innovative practices, successes, and failures
3. Summarize key lessons and recommendations to inform a national framework and facilitate cross-learning between states.

## METHODOLOGY

### Study Period and Geographic Coverage

The study covered all 28 states and 7 union territories in India. The interview component of the study (with HRIS personnel from the departments of health and from state health societies managing NHM) took place from October 2013 to January 2014.

### Information Sources

The study used Internet searches and interviews to collect four types of information: (1) Internet search of key search terms; (2) Internet search of relevant websites; (3) key informant interviews; and (4) state-level interviews.

### Internet search

The project searched electronic databases (Google and Google Scholar) using the search terms “human resources for health,” “human resources information system,” “human resources for health information system,” “health information system,” and “human resources management information system” to identify relevant HRIS studies, reports, documentation, and tools.

### Website search

Additionally, the team scanned the websites of India’s Department of Health (DOH), NHM, National Health System Resource Centre (NHSRC), Public Health Foundation of India (PHFI), and Swasti Health Resource Centre for information. The project also contacted key national-level organizations on HRH and HRIS to get insight into existing HRIS across Indian states.

### Key informant interviews

The project identified key informants (information officers) at all state DOH and NHM offices using information on state websites and phone calls (snowball sampling method). These key DOH/NHM personnel were then contacted by telephone to gather basic information on how they maintain HR data for health workers. This first round of interviews indicated that 14 states had already developed and two were in the process of developing web-based HRH systems.

### State-level interviews

The next level of interview focused on HRIS officials in the 16 states with established or developing web-based systems. CapacityPlus contacted these state officials multiple times (as needed) and collected detailed information either through telephone interviews (using an HRIS interview guide) or an emailed HRIS questionnaire (see Box 1).

#### **Box 1: Key Questions for HRIS Review**

- Which Indian states have an established web-based HRIS?
- What are the purposes of setting up these systems?
- Who provided the technical and financial inputs?
- What HRH components are captured by these systems?
- What is the coverage, in terms of cadre and geographical location?
- What are the software technology details?
- What approach(es) have been used to implement HRIS systems?
- How are the HR data collected and used?
- What are the challenges and lessons learned?
- How long has the system been operational?
- How sustainable is the system?

## Study Tools and Analysis

CapacityPlus developed an interview guide to conduct telephone interviews with the state-level HRIS officials. The interview guide was also converted into a self-reported open-ended questionnaire emailed to respondents who were not available for telephone interviews. CapacityPlus staff reviewed all Internet and interview data and carried out content analysis around broad information areas.

## KEY FINDINGS

### Objective of Setting Up an HRIS

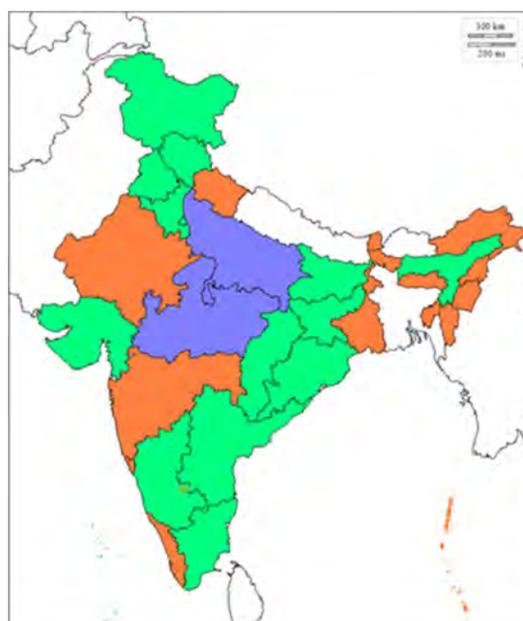
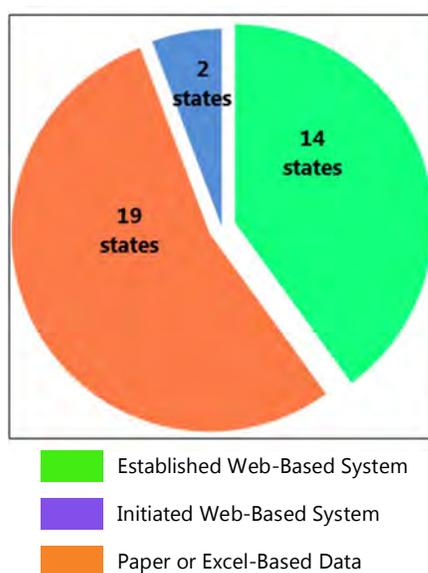
The universal purpose of setting up an HRIS in the different states is maintaining a centralized web-based employee database to ensure efficient utilization of human resources for effective health care delivery. States also have the vision of using their HRIS to identify vacancies and ensure efficient transfer or posting of employees and maintain transparency in HR processes. Some states also aim to reduce paperwork by using their HRIS as digitized service books to generate HR-related government orders and for payroll processing.

### Type of HRIS

Of the 28 states and 7 union territories in India, 19 maintain their health workforce data in paper-based systems with some data in Excel spreadsheets. Fourteen states have developed a web-based HR system for health, and the remaining two states recently initiated the process of developing web-based HR systems (see Box 2). The rest of the Findings section focuses on the 14 states with established web-based HRIS.

**Box 2: Type of HRIS in 28 States and 7 Union Territories of India**

Established web-based system (n=14)		Initiated web-based system (n=2)	Paper or Excel-based system (n=19)		
Andhra Pradesh	Himachal Pradesh	Madhya Pradesh Uttar Pradesh	A&N Island	Lakshadweep	Rajasthan
Assam	Jammu & Kashmir		Arunachal Pradesh	Maharashtra	Sikkim
Bihar	Jharkhand		Chandigarh	Manipur	Tripura
Chhattisgarh	Karnataka		D&N Haveli	Meghalaya	Uttarakhand
Delhi	Odisha		Daman & Diu	Mizoram	West Bengal
Gujarat	Punjab		Goa	Nagaland	
Haryana	Tamil Nadu		Kerala	Puducherry	



## Nomenclature for HRIS

Among the states with established web-based HRIS, different states use different terms to refer to their systems (Box 3). The names most commonly used are Human Resources Information System (HRIS), Human Resources Management System (HRMS), and Personnel Management Information System (PMIS).

**Box 3: HRIS Nomenclature**

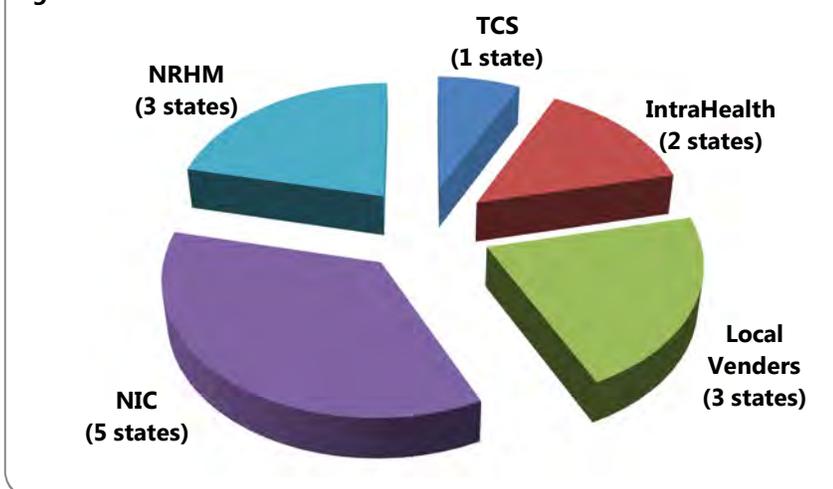
State/union territory	Name of HRIS
1 Andhra Pradesh	Human Resources Management System (HRMS)
2 Assam	e-Human Resource Management Information System (e-HRMIS)
3 Bihar	Human Resources Information System (HRIS)
4 Chhattisgarh	Human Resource Management Information System (HRMIS)
5 Delhi	Employee Information System (EIS) (part of MIS)
6 Gujarat	Human Resources Management System (HRMS)
7 Haryana	Unnamed (can be called NHM software for HR)
8 Himachal Pradesh	Personnel Management Information System (PMIS)
9 Jammu & Kashmir	Unnamed (can be called HRMS)
10 Jharkhand	Human Resources Information System (HRIS)
11 Karnataka	Human Resources Management System (HRMS)
12 Odisha	Odisha Health Information System (OHIS)
13 Punjab	Doctors Daily OPD Monitoring System (includes a paramedics module)
14 Tamil Nadu	Personnel Module under HMIS

## Technical Assistance and Funding for Establishment of HRIS

State health leaders from DOH and/or NHM guided the development of HRIS in all 14 of the states with web-based systems.

In Punjab, Haryana, and Assam states, the in-house information technology (IT) cell of NHM largely developed the system (see Figure 1). In three other states (Jammu & Kashmir, Gujarat, and Delhi), the DOH/NHM IT team hired local software developers and agencies to develop the HRIS. The National Informatics

**Figure 1: HRIS Technical Assistance**



Centre (NIC) provided technical support to five states (Andhra Pradesh, Chhattisgarh, Himachal Pradesh, Karnataka, and Odisha). Finally, three states utilized external technical assistance (Jharkhand and Bihar from IntraHealth, Tamil Nadu from TATA Consultancy Services or TCS).

All of these states developed their HRIS primarily utilizing funds allocated to DOH or NHM. Six states received additional financial and technical assistance support—Karnataka and Tamil Nadu from the World Bank, Jharkhand from USAID, and Bihar from both USAID and the United Kingdom’s Department for International Development (DFID).

## Integration and Interoperability with Other Systems

Most of the HRIS are standalone and independent systems, but a few are part of larger information systems:

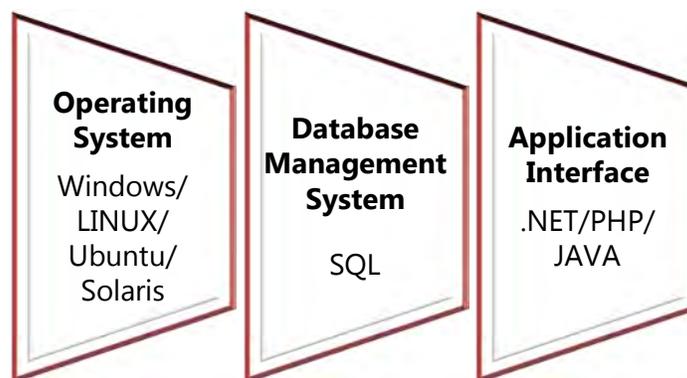
- Tamil Nadu’s Personnel Module was developed under the umbrella of the Health Management Information System
- Assam’s e-HRMIS is a part of the state’s Integrated MIS GIS System
- Delhi’s Employee Information System is part of a larger Management Information System
- Bihar is in the process of establishing interoperability with the DHIS2 health management information system.

## HRIS: Human Resources Information Systems

### Technology platform

Of the 14 states that have a web-based HRIS, six states reported using Windows as their operating system; three states use LINUX and two reported using Ubuntu. The state of Tamil Nadu is currently using a Solaris operating system but is planning to migrate to the LINUX platform (Box 4). All 14 states are using some form or another of SQL (My SQL/Postgre SQL/SQL) as their database management system.

**Box 4: Variation in Technology Platform**



For the front-end application interface, six states reported using a .NET framework, 3 states are using PHP, and two reported using JAVA.

### Server

WINDOWS and LINUX are the most commonly used server platforms, reported by four states each. The state of Tamil Nadu’s server is on the GlassFish platform.

In six states, NIC hosts the HRIS server, while in three states, the HRIS application is hosted on DOH or NHM-owned or hired servers. Five states are dependent on third-party hosting of their HRIS server.

### System maintenance and customization

The HRIS in Andhra Pradesh, Himachal Pradesh, Karnataka, and Odisha are hosted, maintained, and customized by NIC. In Chhattisgarh and Delhi, the system is hosted at NIC but maintained and customized by in-house system analysts at DOH or NHM. Of the five HRIS applications hosted at a third-party server, four are maintained and customized by the third party, except in Punjab, where the system is maintained and customized by in-house system analysts at NHM.

Of the three HRIS hosted at DOH or NHM-owned or hired servers, only Assam is maintained and customized by in-house system analysts at NHM, while the Bihar and Tamil Nadu systems are maintained and customized by a third party (IntraHealth and TCS, respectively).

### HRIS Coverage

Each of the 14 web-based HRIS covers health workers across the entire state (from each district and block). With the exception of the three states of Jammu & Kashmir, Odisha, and Tamil Nadu all systems include data for both regular and contractual employees. Eleven states maintain data on all cadres (including doctors, paramedics, and program and support staff). Punjab maintains data only for doctors and paramedics, while Jammu & Kashmir and Odisha maintain data only for doctors.

### HR Data

#### Information fields

There is huge variation in terms of the HR information captured by the 14 HRIS. The number of HR data fields varies from only 10 fields in Haryana to more than 200 fields in Bihar and Jharkhand.

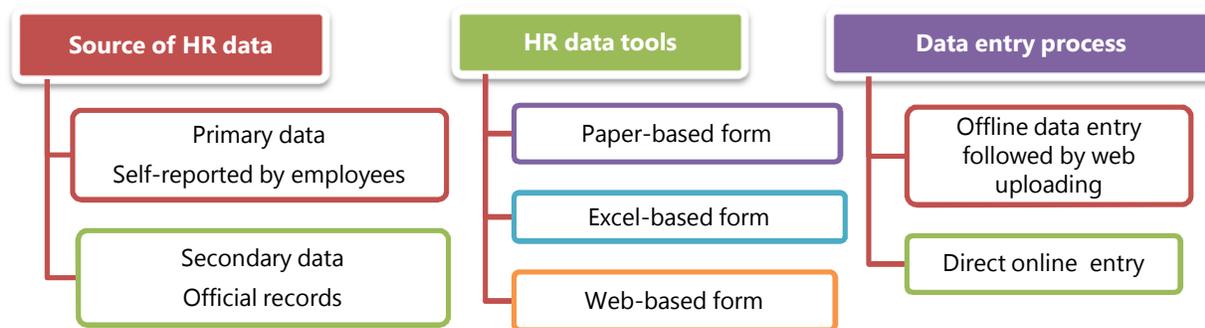
Most states collect data on personal information, service history, and qualifications. In some states, data are also collected on on-the-job trainings received. Haryana collects data on health services provided at the health facilities where employees are posted. In states such as Delhi and Chhattisgarh that use their HRIS for payroll processing, the system collects data on employee salaries, bank information, attendance/leave status, and other details relevant for payroll.

During the HRIS review study, only a handful of states shared a copy of their HR data collection form, which limited more detailed comparison of forms across states.

#### Data collection, entry, maintenance, and security

Most states collect primary data from employees through self-reported tools and/or use existing secondary HR data from official service records. Some states deploy a mixed strategy, using existing secondary HR data from official service records and requesting that employees provide the remaining information to fill any gaps. In cases of primary data collection, states use paper-based forms for data collection. In the states using secondary data, staff first transport or key available data into an Excel-based spreadsheet and then add additional data gathered directly from employees (Box 5).

### Box 5: Data Collection and Entry Processes



All the HRIS have web-based HR forms for each employee. Data entry of the employee data collected on paper-based forms is done online on the web portal or offline in an Excel sheet, which is later uploaded on the web portal.

Data verification and validation are commonly undertaken in states where employees have self-reported the HRIS data. The information gathered through self-report is verified first at the facility level and then by district officials, with assistance from block personnel. Data are cross-checked vis-à-vis the employee’s service records. Some states have constituted a nodal team for verification of data. Boxes 6 and 7 provide examples of the data collection, verification, and entry process.

#### Box 6: Primary HR Data Collection in Andhra Pradesh

Employees’ self-reported data are collected on paper-based HR forms. The employee’s respective controlling officer verifies the HR form using existing data from service registers and certificates and validates it. Government personnel dealing with establishment matters and responsible for maintaining personal and service records were trained on HR data entry.

#### Box 7: Use of Secondary HR Data in Chhattisgarh

Initially, a webpage was developed for online data entry. State, district, and block-level establishment data officers and district accounts managers were made responsible to get the HR data from official records and were trained by the IT team to enter the data through authorized user IDs and passwords. Online data entry is being done. Data on regular staff are cross-checked with the official treasury records available with the drawing disbursement officer (DDO), who processes payroll. The data of contractual staff are cross-checked with the NRHM database.

In most states, data entry personnel are responsible for updating the HRIS data from time to time, although there is no fixed schedule or protocol for doing so. Only a few states such as Bihar and Jharkhand either already have or are developing a data update protocol. Staff transfers and turnover are the main challenges in data entry and updating. Sluggish Internet connections and an irregular electricity supply are at times also a hindrance to accessing and updating HRIS, especially below the district level. In states where all government orders (new recruitments, transfer, joining) are generated through the HRIS or where salary disbursements are linked to the HRIS, there is a continuous process for updating of records.

In most of the states, role-based permissions are required to access the HRIS data. For example, employees are given a secure log-in code so they can view only their individual records.

## Staff Roles and Capacity

All 14 states have allocated roles and responsibilities to government personnel at the state, district, and block levels for HRIS administration (see example in Box 8).

### HRIS workflow and staff capacity-building

Only a few states reported formal training for staff to build personnel's capacity for HRIS-related tasks. Even fewer developed user manuals, data update protocols, security protocols, or other documents for clearer guidance (see Box 9 for an example).

#### **Box 8: Clear Roles and Responsibilities in Assam**

##### System maintenance and troubleshooting

- For server: System Administrator, System Assistant
- For software: Programmer, Data Analyst
- Data administrator: MIS Manager, Human Resource Development (HRD) Consultant

##### Date entry

- State level: Computer Assistants
- District level: District Data Manager, Assistant District Data Manager, Computer Assistant
- Block level: Block Program Manager, Block Data Manager, Program Assistant (School Health Program)

##### Data verification and validation

- State level: Verified by HRD Consultant and countersigned by Mission Director, NRHM
- District level: Verified by Superintendent of Civil Hospital and countersigned by Joint Director of Health Services
- Block level: Verified by Sub Divisional Medical & Health Officer or in charge of the Block Primary Health Center and countersigned by Joint Director of Health Services

##### Data updates

- For state-level employees: HRD Consultant, NRHM initiates the action
- For district and block-level employees: District Program Manager, NRHM & District Data Manager, NRHM initiates the action

##### Data analysis

- State level: MIS Manager & HRD Consultant
- District level: District Program Manager (DPM), District Data Manager (DDM)

#### **Box 9: HRIS Workflow and Capacity-Building in Jharkhand**

Employees complete self-reported, paper-based HR forms and submit them to their respective health facility/offices for verification. The health facility/office verifies the HR form and submits it for data entry to the respective block, district, or state data manager.

For data collection, data entry, and updates, training was provided to clerks to the civil surgeon and block or district data managers or operators. Data are entered online on the HRIS portal and validated by state-level officials. Jharkhand is currently finalizing a data update protocol that authorizes the block, district, or state data managers to update data in cases of new joining, promotions, transfers, deputations, suspensions, retirement, etc.

An advanced software training was provided to the staff responsible for handling the software. Secure user login and data security protocols are provided by the server hosting company.

## HRIS Data Use

### HRIS reports

All 14 HRIS have individual employee service records or eService books so that staff directories can be generated by:

- State, district, and/or block
- Health facility (e.g., district hospital, first referral unit, community health center, primary health center, health subcenter)
- Designation (e.g., specialist, doctor, nurse)
- Type of employment (e.g., regular, contractual).

In most of the states, these basic HR reports are available on the NHM portal.

All 14 HRIS can generate real-time reports from the HR data to provide insights into the status of the health workforce. Some of them have also developed more advanced built-in HR reports such as reports on:

- Filled positions, vacancies, or extra staff against sanctioned positions
- Training
- Retirement
- Doctors' service in backward or home districts
- Duration of doctors' current posting.

In two states where the salary details are collected, establishment-related reports are also generated. These include reports on disciplinary cases, salary bill reports, annual performance appraisal reports (APAR), reports on transfer or promotion orders, and eEstablishment registers.

### Data use

The main users of the HRIS data include state-level consultants; state, district, and block managers; nursing councils; chief medical officers and block medical officers; and MIS managers. However, analysis and use of HRIS data in all 14 states remains in a nascent stage, with significant variation across states ranging from "no use" to "frequent use" of HRIS data for identifying vacancies and decisions on transfers and postings.

None of the states reported developing a protocol or process for regular analysis and routine review of HR data.

## Sustainability

In a few states, the information system (including server) is being managed by government personnel, and a few are managed by NIC. However, a number of HRIS are still dependent on third-party support. A one-time set-up cost for hardware (purchase of server, computer, antivirus and other equipment) and software (server license, server software, etc.) was necessary in states that obtained no external assistance in developing their HRIS. States where NIC is

involved did not incur any additional costs other than for staff time and training. Third-party involvement, though cost-effective at present, may affect maintenance capacity, as continuous external funding will be required for its upkeep.

## RECOMMENDATIONS

### 1. Develop a national HRIS framework.

Only 50% of India's 28 states have developed a web-based information system for capturing health workforce data. The remaining states and all 7 union territories continue to maintain their health workforce data either in Excel-based files or paper files. The 14 HRIS have been developed for varying purposes using different technical approaches and are at varying levels of data completeness and use. Further, huge variation in the HR data being captured by the different states limits the potential to collate or compare data and influence national policies and program decisions. It is critical to develop a national HRIS framework that includes a recommended list of minimal HR fields to be captured by every state HRIS.



When there is single YouTube in the world being used by various nations, why not single e-HR system for health sector in the country.

Personnel from NIC, Andhra Pradesh

### 2. Select an appropriate technology platform and appropriate software.

Before moving forward with establishing a computerized HRIS, it is important to understand systems requirements and analyze the pros and cons of the technology platform and software proposed for use. It is advisable to use open source software that is free and can be modified as needed to conform to evolving HR policies and procedures without recurring fees for every update. Software should also be able to aggregate, analyze, and export data in a variety of ways and produce standard or customized reports to answer key management and policy questions. In addition, it is important to examine the potential to integrate other existing data systems and establish interoperability.

### 3. Establish systems that ensure regular data updates and use.

A key strength of a web-based HRIS is that it provides real-time access to accurate and up-to-date data, thereby improving objectivity, transparency, and efficiency in human resources decision-making. When establishing a computerized HRIS, it is very important to also establish systems that ensure regular data updates with built-in triggers and checks. For this to happen:

- Develop clear data update protocols with clear roles and responsibilities
- Mandate that all HR-related orders (recruitments, transfers, joinings) be generated through the HRIS

- Link the HRIS to important processes that matter to employees, such as salary disbursement.

#### **4. Encourage review of HR data during monthly and quarterly review meetings.**

Regular review and use of data pushes the need for updated data. Currently, none of the 14 states are analyzing or using HRIS data to their system's full potential.

#### **5. Build in-house staff capacity.**

Providing initial formal training followed by on-the-job mentoring and refresher training as needed builds in-house staff capacity to maintain high-quality and real-time data. Training areas should include data entry, verification, updating, and use at all levels from blocks up to states. Taking into consideration the state's IT capacity and systematically planning to build the capacity of a core team (at least at the state level) can ensure capacity for administration of the HRIS and software customization.

#### **6. Conduct a detailed costing study.**

Establishing an HRIS entails one-time set-up costs for hardware (purchase of server, computer, antivirus and other equipment) and software (server license, server software, etc.), in addition to the recurrent expenses incurred for staff time and training. Conducting detailed costing studies would enable information to be collected on actual costs and would permit assessment of the cost-effectiveness of different HRIS.

#### **7. Ensure ongoing leadership involvement and ownership.**

Continuous engagement of HRH leaders is critical for optimal use of an HRIS as well as for ensuring maintenance and improvements to the system in the future. To set up an effective HRIS, it is important to implement every one of the recommended steps detailed in Annex B, as each one of them is critical to ensure system sustainability.

## APPENDIX A: HRIS STATE SUMMARIES

### 1. Andhra Pradesh

Andhra Pradesh set up its Human Resource Management System (HRMS) in 2007. The system was developed in-house by the Department of Health, Medical and Family Welfare, Andhra Pradesh and is being implemented under Directorate of Public Health. It is a detailed HRIS. Moreover, it is also used as an online recruitment system and provides online counseling software for transfers and an online training management system.

#### Web link

Not made available

#### Technical assistance and funding

NIC-Hyderabad provided the technical guidance in development of the HRMS and is responsible for server hosting and maintenance, software updating, and troubleshooting, with its user department holding the administrator's rights. HRMS was developed using state funds.

#### Software

Both online and offline versions of HRMS exist. The software platforms used are JAVA and LINUX, and the server is on a LINUX platform. Using web services, the HR data from this system is interoperable with service delivery data.

#### Coverage

The system covers all doctors, nurses, and support staff (both regular and contractual) across the entire state.

#### Data collection, entry, maintenance, and security

Employees' self-reported data are collected on paper-based HR forms. An employee's controlling officer verifies the HR form using existing data from service registers and certificates and validates it. Training was provided on HR data entry to government personnel dealing with establishment matters and responsible for maintaining personal and service records. The data entry is currently in progress. So far, HR records of 1,200 specialists, 2,200 doctors (out of 3,653) and 94,811 nurses have been entered.

As noted, HRMS has useful features such as an online recruitment system, online counseling software for transfers, and an online training management system, all of which also ensure data updates. A role-based data update protocol is in place for regular and event-based updating by authorized personnel.

Government orders are to be issued to ensure HRMS use for event-based updates at the source. Government DOH personnel have been trained through video conferencing and hands-on trainings for data maintenance and analysis. A role-based data security protocol is in place and a

digital signature-based authentication is required for access. In future, an encryption feature may be activated, if necessary.

### Data use

Different types of built-in HR reports are generated regularly through the system. The primary users of the data are the Department of Public Health, Directorate of Medical Education, registered nurses, nursing councils, and other decision-makers, who frequently use the information on eRecruitment, transfers, trainings, registrations, renewals, and No Objection Certificates for decision-making on recruitments, promotions, postings, transfers, and trainings.

### Sustainability

Minimal cost was incurred to set up the HRMS, as existing data center resources of NIC were used. Open source technology has allowed the system to avoid annual license update costs. Costs of trainings, printing, and security auditing have been borne by the user departments. Capacity of government personnel is being built to collect, enter, update, and analyze the HR data. User manuals, policies, government orders, and reports are available for quick reference. NIC officials are available at the district and state levels for technical support and guidance. Funds will be required only for regular maintenance of HRMS. Overall, the HRMS seems to have strong potential for sustainability.

## 2. Assam

The National Health Mission (NHM) set up an eHRMIS (e-Human Resource Management Information System) in 2011, and in 2013 NHM redesigned the system under the broader umbrella of the Integrated MIS GIS System. It is a detailed HR information system. As it is part of the larger Integrated MIS GIS System, it can easily track staff locations and performance. The software is currently hosted on a shared server but will shortly be hosted on a recently procured in-house server. There is a plan to add a salary module so that payslips can be generated using this system, followed by direct bank transfer of salaries.

### Web link

[www.nrhmassam.info](http://www.nrhmassam.info)

### Technical assistance and funding

eHRMIS was developed using NHM funds by in-house NHM software developers, with occasional guidance from NIC. NHM personnel also take care of system maintenance, updating, troubleshooting, and customization.

### Software

The software platform used is OS-LINUX with My SQL as the database management system. For the front-end application interface, Assam is using PHP. The server is on a LINUX platform. The system has been developed using open source technology.

## Coverage

The system covers all doctors, nurses, and support staff, both regular and contractual, across the entire state. The system captures all official information, personal information, qualifications, trainings attended, and service history.

## Data collection, entry, maintenance, and security

Employees' self-reported data are collected on paper-based HR forms called Employee Master Database Management Forms. These forms are then verified by the respective supervisors and validated or countersigned by higher-level supervisors. Government personnel from the program management unit and other data managers or computer assistants carry out online HR data entry. A user manual has been provided to ensure uniformity among various data entry operators. So far, HR records of 25,327 employees are available in the eHRMIS.

HR data are regularly updated in cases of new joinings, promotions, transfers, deputations, suspensions, retirements, and so forth. As HR-related government orders get issued, district or state-level personnel initiate the action to update the HR data in the system. A secure user login is in place for access. The server hosting company also applies various data security measures.

## Data use

The system has many built-in HR reports which are generated at regular intervals. Moreover, HR data analysis is done at the district and state levels as per requirements (for example, at the time of salary disbursements or vacancy analyses). The primary users of the data are state, district, and/or block-level consultants, managers, and executives, who frequently use the information for decision-making regarding employee details, training status, vacancies to be filled, rational deployment of manpower, and disbursement of salaries.

## Sustainability

To set up the entire Integrated MIS GIS System, including the eHRMIS module, a one-time cost was incurred for procurement of hardware (server, server operating system, antivirus, UTM device, etc.). Software development costs were not applicable as the system was developed using open source technology and an in-house programmer and staff supported by NHM funds.

System users find it user-friendly and more effective than the earlier paper-based MIS. With strong in-house capacity to manage the system, the eHRMIS in Assam has strong potential to be sustainable.

## 3. Bihar

The state of Bihar set up a Human Resource Information System (HRIS) in 2010. The state Department of Health and the State Health Society-Bihar initiated and implemented the HRIS. The objective and purpose of setting up this system is to have a centralized web-based HR system for health employees of Bihar. Efforts are underway to establish interoperability between HR data from HRIS and performance data from DHIS2.

### Web link

<http://hrisbih.cloudapp.net/bihar-manage/login>

### Technical assistance and funding

IntraHealth provides the technical guidance for HRIS and is responsible for maintenance, customization, and troubleshooting, with its user department holding the administrator's rights. The software is hosted at the government cloud.

HRIS was developed using state funds and external aid during 2010-2012 from USAID-India (under the Vistaar Project) and then from 2012 onwards from DFID (under the HRIS project).

### Coverage

The HRIS covers all cadres of regular and contractual employees of the Department of Health for the entire state. The system captures all official and personal information, including qualifications, trainings undertaken, current position, and service history.

### Software

IntraHealth offers the iHRIS Suite of free and open source HRIS solutions. iHRIS Manage is the HR management component of the iHRIS Suite, and the Bihar HRIS is based on iHRIS Manage. The web-based software platform used is OS-Ubuntu, with My SQL as the back-end database management system. The front-end interface used is PHP. The software is hosted at the government cloud.

### Data collection, entry, maintenance, and security

Initially, data were self-reported on a paper-based HR form, which each employee completed and submitted to their respective health facility for entry in iHRIS. The health facility verified the HR form and submitted it for data entry to the respective block, district, and state data manager. For data collection and data entry, training was provided to clerks to the Cabinet Secretariat and the block and district data managers and other data entry operators. Data were entered online on the HRIS portal and validated by state-level officials. Currently, about 47,980 HR records (~95%–98%) are available in the HRIS.

Secure user login with password and frequent data backup are some of the data security measures. Bihar has a data update protocol that authorizes the block, district, and state data managers to update data in cases of new joinings, promotions, transfers, deputations, suspensions, retirement, etc.

### Data use

The HRIS has several built-in reports including staff directory, current posting duration, training reports, retirement reports, and regular or contractual staff directories. Data analysis is done as per requirement by the district and state data managers, MIS manager, and by IntraHealth. Reports are generated by all authorized users, with a standard set of reports being generated regularly. Most of the HR-related decisions in the state are made using the HRIS data.

## Sustainability

Users of the Bihar HRIS find the system simple, easily customizable, and more effective than the earlier paper-based system. The system administrator and data managers have been trained on managing the system, data entry, and updating of data, respectively. IntraHealth conducted an advanced software training for government staff to build their capacity for HRIS customization, troubleshooting, and overall management. With the use of open source software, development of protocols and user manuals, and efforts to build in-house capacity to manage the system, the HRIS in Bihar has strong potential to be sustainable.

## 4. Chhattisgarh

Chhattisgarh developed a Human Resource Management Information System (HRMIS) in 2012, initiated and implemented by the National Health Mission (NHM), Chhattisgarh. It is a detailed HR information system. Apart from maintaining the employee database, it is also used for online payroll processing. Currently, salaries of contractual employees are processed through the HRMIS, and the final salary sheet of all regular employees is prepared by the system. The system is currently being used for salary processing only.

### Web link

<http://cg.nic.in/health/healthreports/Pages/dashboard.html>

### Technical assistance and funding

HRMIS was developed in-house by a team of software programmers, under NHM/Chhattisgarh, with technical support from NIC.

NHM personnel are responsible for software maintenance and regular updating of data and hold the administrator's rights. The software is currently hosted on a NIC server, and NIC is responsible for server maintenance. HRMIS was developed using NHM funds.

### Coverage

The system covers all doctors, nurses, and support staff, both regular and contractual, across the entire state. The system captures all official information, personal information, qualifications, current and past posting details, salary and bank details, and a monthly attendance sheet updated by the district account manager.

### Software

The software platform is OS-Window-based, with SQL as the back-end and .NET as the front-end application interface.

### Data collection, entry, maintenance, and security

Initially, a webpage was developed for online data entry. State, district, and block-level establishment data officers and district accounts managers were made responsible to get the HR data from official records and were trained by the IT team to enter the data through an authorized user ID and password. Online data entry is being done on the web portal through an authorized user ID and password.

Data on regular staff are cross-checked with the official treasury records available with the drawing disbursement officer (DDO), who processes salaries. The data of contractual staff are cross-checked with the NHM database. With over 90% of the data already having been entered, about 30,000 employee records are available on the HRMIS. Because salary processing is made through the HRMIS, both employees and the salary DDOs keep the data updated to prevent discontinuation of salary.

As the server is hosted at NIC, all of NIC's security protocols are followed.

#### Data use

The built-in HR reports generated online in the system include the distribution of current manpower details and vacancies. Additional customized reports can be generated and uploaded, if necessary. Currently, the HRMIS system is being used for processing salaries only. Other HR reports will be developed once all the employee data are entered.

#### Sustainability

Minimal cost has been incurred in setting up the HRMIS in Chhattisgarh. Expenses include the salaries of the software developers and time cost of NIC staff and of establishment employees in data entry and updating. The major challenge, however, has been to retain the efficient in-house programming staff. With in-house software programmers and technical assistance from NIC, the HRMIS in Chhattisgarh has strong potential to be sustainable.

## 5. Delhi

In late 2013, the NHM cell of the state of Delhi launched a Management Information System (MIS), including an Employee Information System (EIS) module for use as a web-based payroll system. The purpose of setting up this system is to maintain an online attendance monitoring system and for online computation of salary. The MIS is primarily a web-based payroll system, including a basic HR module. All new HR-related orders such as transfer orders, joining orders, and others can only be generated online from this system.

#### Web link

<http://health.delhigovt.nic.in/mis/frmllogin.aspx>

#### Technical assistance and funding

The MIS, including the EIS, were developed by a team of software programmers under the NHM IT cell and by external software developers. NHM personnel are responsible for software maintenance and regular updating of data and hold the administrator's rights. The software is currently hosted on a NIC server, and NIC is responsible for server maintenance. The EIS was developed using NHM funds.

#### Coverage

The EIS covers all program-based and facility-based regular employees and facility-based contractual employees of the state Department of Health and Family Welfare. The system

captures personal and official information, salary and bank details, attendance and leave records, and current transfer posting details (past details are not recorded).

### Software

The software platform is OS-Window-based, with SQL as the back-end and the .NET framework as the front-end application interface.

### Data collection, entry, maintenance, and security

Information was initially collected from existing official records maintained by the drawing disbursement officer (DDO), who processes salaries; hence, data verification and validation are not required. The initial data were entered in the online data system by IT staff. Data entry is being done on the web portal through authorized user ID and password. The following guidelines and protocols were developed and are being followed:

- Payroll user manual
- Transfer module user manual
- Instructions for updating the working office of all employees.

About 20,500 HR records (~93%) have already been entered in the system. A separate module has been developed for the 2,000-2,500 NHM program employees.

As the server is hosted at NIC, all of NIC's security protocols are followed. Secure user login and data security are provided by NIC. Different users have been given different levels of access within the system. The data are updated regularly, as all new HR-related orders (such as transfer orders, joining orders, and others) can only be generated online.

### Data use

The built-in HR reports generated in the system include salary bill reports and designation-wise and facility-wise employee distribution. Real-time reports can be generated on request. Data from this system are currently being used only for salary disbursements.

### Sustainability

The system is used to generate all new HR-related orders, which ensures that the data are continuously updated. With user manuals and efforts to build in-house capacity and technical assistance provided by NIC, the EIS in Delhi has strong potential to be sustainable.

## 6. Gujarat

A Human Resources Management System (HRMS) has been developed in Gujarat, initiated and implemented by the National Health Mission (NHM), Gujarat.

### Web link

<http://103.20.104.170:8081/HRMS/>

### Technical assistance and funding

NHM developed HRMS with technical support from a third party, (n)Code Solutions, an Ahmadabad-based software consultancy group. This third-party vendor is responsible for software maintenance and holds administrator's rights. The software is currently hosted at the vendor's server and they are responsible for server maintenance.

### Coverage

The HRMS covers all regular and contractual employees of the state Department of Health and Family Welfare. The system captures personal and official information and transfer posting details.

### Software

The software platform is OS-Windows-based, with SQL as the back-end and JAVA as the front-end application interface, hosted on a third-party Windows-based server.

### Data collection, entry, maintenance, and security

The data were initially entered in Excel spreadsheets by government employees and then uploaded by third party on the web portal. About 30% (i.e., 3,000) employee records have been entered.

### Data use

There are no built-in HR reports in the system. The HR data are analyzed separately and made available on the NHM portal.

### Remark

*Despite many phone calls and e-mails to various officials of DOH, NHM and (n)Code Solutions, no one was forthcoming in sharing any information. Finally, a quick 5-minute interview was held with one employee from (n)Code Solutions, in which very limited information could be gathered. With such limited information, it would be difficult to comment on the system's sustainability, strengths, or challenges.*

## 7. Haryana

The NHM in the state has developed a simple web-based HR system using in-house developers. The system has no official name and captures very limited fields of HR information.

### Web link

[http://www.nrhmharyana.org/hr\\_report.aspx](http://www.nrhmharyana.org/hr_report.aspx)

### Technical assistance and funding

The Haryana web-based HR system was developed in-house by NHM software developers, who hold all the administrator's and developer's rights and are responsible for customization. The software is currently hosted on a private third-party server; however, they are in the process of shifting it to the government server. Software was developed using NHM funds.

### Coverage

The system covers all health facility-based staff (separately for contractual and regular staff) posted across the state. The system only captures name, designation, and number of staff at health facilities and availability of key services (Medical Termination of Pregnancy, tubectomy, dental, Newborn Care Corner, Out-Patient Department, In-Patient Departments).

### Software

The software is on a web-based platform, with .NET as the front-end application interface. The software is hosted on a private third-party Window-based VXL server.

### Data collection, entry, maintenance, and security

After the web-based program was developed, the web link was sent to all data entry personnel at health facilities (up to the primary health center level) to enter the facility-level data. District monitoring and evaluation (M&E) officers were given orientation training to help them provide assistance and guidance to the facility-based data entry personnel. As the data were entered by the facility-level staff on basic HR fields, no verification and validation were required. Built-in checks were developed in the HR system that prevented wrong or duplicate entries. Data for all 11,241 employees spread over 6,411 health facilities have been entered in the system.

Secure user login with password and frequent and double data backup are some of the data security measures. There is no written data security protocol. Data entry personnel are expected to update the data at regular intervals. In reality, however, data updates are not being carried out.

### Data use

There are no built-in HR reports in the system. The HR data are analyzed and reports are made available on the NHM portal. Though most of the data are posted on the website, the state has yet to initiate use of this HR data.

### Sustainability

As the HR system in Haryana was developed in-house by the state NHM unit, it is cost-effective and sustainable. The simplicity of the HR software, though an advantage of the system, also limits its scope and use. The system is not based on open source technology so it has limited capacity to be used with performance data. It will perhaps need to be expanded in future to include other aspects of HR, which will render it more useful and effective.

## 8. Himachal Pradesh

The Personal Management Information System (PMIS) was set up in 2010 by the Department of Health and Family Welfare, Government of Himachal Pradesh (GoHP). The purpose of setting up this system was to digitalize service books and reduce paperwork. It is a generic web-based workflow system for management of Department of Health employees.

### Web link

<http://admis.hp.nic.in/genpemis/Aspx/DepartmentVerifyDetails.aspx>

### Technical assistance and funding

NIC, Himachal Pradesh provided technical guidance in developing PMIS and is responsible for server hosting, maintenance, frequent software customization, and troubleshooting, with its user department holding the administrator's rights. PMIS was developed using state funds.

### Coverage

The PMIS covers all regular and contractual employees of the Department of Health. The system captures employees' personal, professional, and educational information; service history; departmental proceedings; leave history; and salary-related information. Moreover, the system also hosts the Annual Confidential Reports (ACR) of all employees.

### Software

The web-based software platform used is SQL as the back-end and .Net framework as the front-end interface. The software is hosted on the NIC server.

### Data collection, entry, maintenance, and security

NIC conducted a one-day training of state officials who, in turn, trained the district and block-level officials on data entry and updating. Initial data entries were made in offline mode and were later uploaded online. The basic data were gathered from employee service books and then digitalized. This information was shared with district officials, who filled in the data gaps with support from block-level officials. HR data were validated by 12 district NIC offices, who cross-checked the data with employee service books, available at chief medical officer (CMO) offices.

The state has 19,125 approved health worker positions; however, only 13,792 posts are currently filled. Among these employees, eService book entries have been completed and verified for 13,406. Secure user login with password and frequent data backup are some of the data security measures. There is no written data security protocol. Changes in employee records or additions of new staff are undertaken by the office where the service book of the employee is hosted. The CMO office, block medical officer (BMO) office, and medical colleges have the authority to update records, using a secure user login. Each employee has been issued a PMIS code to view their records. The data are updated regularly, as all new HR-related orders such as transfer orders, joining orders, and others can only be generated online. A user manual developed by NIC is followed for data entry and updates. However, there is no data update protocol.

### Data use

The PMIS has several built-in reports including eService books, employee posting details, retirement details, and transfer and promotion orders, to name a few. The CMO and BMO office employees can generate built-in reports as and when required. All HR-related decisions in the state are made using the PMIS data. However, it is not linked to salaries and payments.

### Sustainability

Minimal cost has been incurred in setting up the PMIS. Expenses include the salaries of a few DOH staff and time costs for NIC staff and establishment employees in data entry and updating. Both employees and managers find the current web-based PMIS more useful and effective than

the earlier paper-based system. With a high sense of ownership by the government of Himachal Pradesh and in-house capacity and technical assistance provided by NIC, the system has strong potential to be sustainable.

## 9. Jammu and Kashmir

The state of Jammu and Kashmir has developed a web-based HR system for regular doctors, called the Human Resource Management System (HRMS). The system was initiated and implemented by the Department of Health and Medical Education. For contractual doctors, the HR information is maintained in Excel spreadsheets, which are updated every quarter. The purpose of setting up this system is to ensure efficient transfers and postings of doctors. The state has formulated a transfer policy (notified by the Department of Health, available at <http://www.jkhealth.org/notifications/transfer.pdf>) for effective management of regular doctors in the department.

### Web link

<http://jkhealth.org/biodata/>

### Technical assistance and funding

The state developed the HRMS in-house, with support from a local third-party software developer, who is also responsible for server hosting, maintenance, software customization, and troubleshooting, with its user department holding the administrator's rights. HRMS was developed using funds from the Department of Health and Medical Education.

### Coverage

The HRMS covers all regular doctors of the state Department of Health and Medical Education. The system captures personal and official information of the state government doctors, including details of their qualifications and service history.

### Software

A Window-based software platform is used. The respondent from DOH was not able to share further details, as HRMS is managed by a third party and was developed under his predecessor officer.

### Data collection, entry, maintenance, and security

Initially, web-based HR forms were used to collect the data, which were later uploaded online by district and division-level staff, using a secure user login and password. There is no process of data verification or validation. Records of all regular doctors have been entered in the system. The data are regularly updated by division-level staff.

### Data use

No built-in reports are generated regularly, nor are the data analyzed for any purpose. The information is used solely for the purpose of transfers and postings.

## Sustainability

The HRMS in Jammu and Kashmir covers only regular doctors and includes very little information, which is being used for a limited purpose. With the system totally dependent on the third-party vendor for its maintenance and upkeep, it may not be sustainable.

## 10. Jharkhand

The state of Jharkhand initiated a Human Resource Information System (HRIS) in 2010. The state Department of Health and Family Welfare (DoHFW), Jharkhand and the Jharkhand Rural Health Mission (JRHM) initiated and implemented the HRIS. The objective and purpose of setting up this system is to have a centralized web-based HR system for health employees of Jharkhand.

### Web link

<http://59.90.54.109/jharkhand-manage/login>

### Technical assistance and funding

IntraHealth provided the technical guidance in development of the HRIS and is responsible for server hosting, maintenance, frequent software customization, and troubleshooting. HRIS was developed using state funds and external aid from USAID-India under the Vistaar Project and, later, the CapacityPlus project.

### Coverage

The HRIS covers all regular and contractual employees of the Department of Health. In the first phase of HRIS, records of all the regular and contractual doctors across the state were entered, along with records of all the regular and contractual health workers in Ranchi district. In the second phase, HR data of all the health workers across cadres and districts are being collected and entered. The HRIS in Jharkhand captures all official and personal information, including qualifications, trainings undertaken, current position, and detailed service history.

### Software

IntraHealth offers the iHRIS Suite of free and open source HRIS solutions. iHRIS Manage is the HR management component of the iHRIS Suite. The web-based software platform used is OS-Ubuntu, with My SQL as the back-end database management system. The front-end interface used is PHP. The software is presently hosted on the IntraHealth server but will shortly be transferred to the government server.

### Data collection, entry, maintenance, and security

Initially, data were self-reported on a paper-based HR form, which each employee completed and submitted to their respective health facility for verification. The health facility verified the HR form and submitted it for data entry to the respective block, district, and state data manager. For data collection and data entry, training was provided to clerks at civil surgeon's offices, block and district data managers, and other data entry operators. Data were entered online on the HRIS portal and validated by state-level officials. Currently, about 10,698 HR records (~60%) are available in the HRIS. Secure user login with password and frequent data backup are some of the data security measures. Jharkhand is currently finalizing a data update protocol.

### Data use

The HRIS has several built-in reports, including current posting duration, training reports, retirement reports, and regular and contractual staff directories. Data analysis is done as per requirement and is conducted by the block, district, and state data managers, MIS manager, and by IntraHealth. Reports are generated by all authorized users, with a standard set of reports being generated regularly. The chief medical officer (CMO) and block medical officer (BMO) office employees can generate built-in reports as and when required. Most of the HR-related decisions in the state are made using the HRIS data.

### Sustainability

Users of the Jharkhand HRIS find the system simple, easily customizable, and more effective than the earlier paper-based system. User manuals and data protocols have been developed. The system administrator and data managers have been trained on managing the system, data entry, and updating of data. An advanced software training was conducted for government staff to build their capacity for HRIS customization, troubleshooting, and overall management. HRIS Jharkhand seems to be a sustainable system.

## 11. Karnataka

The Department of Health and Family Welfare (DoHFW) set up a Human Resource Management System (HRMS) in 2009-2010. The main objective of setting up this system is to ensure transparency in transfers, depositions, and service record updates, and to maintain details of facilities and individual employees on the web portal.

### Web link

Not made available

### Technical assistance and funding

The World Bank-assisted Karnataka Health System Development and Reform Project (KHSDRP) provided the technical guidance in developing and implementing the system. The National Informatics Centre, Andhra Pradesh also provides technical support. The software platform for the HRMS in Karnataka was developed by NIC and is hosted on the NIC server. NIC is also responsible for system maintenance, updating, and software troubleshooting. HRMS was developed using state funds and external aid from the World Bank.

### Coverage

The HRMS in Karnataka covers all regular and contractual employees of all cadres working in the DoHFW. There are separate forms (Forms A and B) in the system to collect institutional and individual data, respectively.

### Software

The software is developed and hosted by the NIC. The respondent was not able to share any further information about it.

### Data collection, entry, maintenance, and security

Individual employee information was self-reported on the prescribed form and entered on the web portal at the facility level, after verification by the drawing officer. Facility-level data were collected from the medical officer of the institution. Data were then entered by the identified and trained staff at the district, block, and primary health center levels. Data verification and validation is done by the district nodal officers and a team constituted for the purpose. Both institutional and individual data of the 45,000 employees working in 12,000 facilities across the state have been entered in the system.

The HRMS data is updated annually, and as and when there are new joinings, promotions, transfers, etc. The district health officer at the district level and the Chief Planning Officer at the KHSDRP/CAO, Directorate of Health and Family Welfare Services at the directorate have been allocated responsibility for data updates. There is a data update protocol.

### Remark

*Despite many phone calls and e-mails, we received only a partially complete study questionnaire. No information could be gathered on how the data are being used; what reports are being generated; or on the costing or cost-effectiveness of the system. With limited information, it would be difficult to comment on the system's sustainability, strengths, or challenges.*

## 12. Odisha

The state of Odisha developed a Health Information System (OHIS) for regular doctors in 2010. It is an initiative of the Department of Health, under the Tamil Nadu Health Systems Project, initiated in 2005. The objective of setting up this system is to capture the detailed records of doctors. After completion of initial data entry, the education and posting details are planned to be used for decision-making in transfers and postings. The state also has a Human Resources Management System (HRMS) for contractual doctors, which is managed by NHM.

### Web link

Under development

### Technical assistance and funding

OHIS was developed by the Directorate of Health Services and supported by NIC and DFID. DFID provided technical assistance, equipment, and manpower through the Odisha Health Sector Plan (OHSP). NIC is responsible for system maintenance, updating, customization, and software troubleshooting and holds the administrator's rights. OHIS was developed with financial assistance from DFID.

### Coverage

The system covers all regular doctors in the state. The data on contractual doctors will be linked with this system. The OHIS captures all personal and official information, qualification details, details of trainings undertaken, and service history.

## Software

Currently, the data are being entered in Excel. Once completed, the data will be uploaded on a web-based platform. The software is hosted at a Window-based server located at NIC. The back-end database management system is SQL, while the front-end application interface is ASP.NET.

## Data collection, entry, maintenance, and security

The basic data were picked up from employee service books available at districts, seniority lists, and gradation lists. Some information was filled in by district-based clerks at the directorate office. The data were directly transferred or entered into Excel-based software by the data manager at state headquarters. The data were picked up from verified and validated sources and do not require any further verification and validation. The state currently has 4,362 approved positions for doctors; however, only 3,900 posts are filled. Of these, information for around 2,500 doctors has been entered over the past four years. Presently, there is no data security protocol, but in future they are planning to develop one. So far, the data manager at state headquarters is responsible for all data entry and data updates.

## Data use

There are nearly 20-25 built-in reports that are being generated in the system. These include the facility-wise and education-wise distribution of doctors, lists of doctors who have been posted in backward districts, lists of doctors who have provided services in their home district, and retirement reports.

## Sustainability

The system only covers regular doctors. Another parallel HR system for contractual staff exists in the state. Data entry has been very slow, and there is no routine mechanism for data updates. The sustainability of the system is unclear.

## 13. Punjab

The Directorate of Health Services, Punjab developed an HR management system for doctors based at health facilities, called Doctors Daily OPD Monitoring System, including a module on paramedics, in the year 2010. The objective of setting up this system is to maintain the HR details of health employees. The state also has a Human Resource Management System (HRMS) for contractual administrative employees of NHM.

## Web link

<http://www.pbnrh.org/login.aspx>

## Technical assistance and funding

The Department of Health and Family Welfare initiated the system with technical assistance from the National Rural Health Mission, Punjab. The software is hosted on a dedicated third-party Window-based server. The system analyst at NHM-Punjab is responsible for system maintenance, updating, customization, and software troubleshooting. The Doctors Daily OPD Monitoring System was developed with financial assistance from NRHM.

## Coverage

The Doctors Daily OPD Monitoring System covers records of all doctors and paramedics.

## Software

The HR system in Punjab is on a web-based platform. The software platform used is OS-LINUX, with SQL as the back-end database management system. The front-end application interface is .Net framework C Sharp.

## Data collection, entry, maintenance, and security

The basic data were collected through online forms, with the data being entered by district and block-level staff on an online portal. A state-level team built the capacities of the district-level staff in data entry and updating. Currently, the data entry process is ongoing. With all state doctors and paramedics covered through this system, the Doctors Daily OPD Monitoring System contains HR records of nearly 3,000 doctors and 7,573 paramedics. Secure user login with password and frequent data backup are some of the data security measures. There is no protocol for data security. In case of any change in the existing employee records or new recruitments, the data are updated. The District Authority has the authority over updates, and they initiate the updates. The data are updated as and when required. However, there is no data update protocol.

## Data use

Reports can be generated at different levels by different users, as and when required. MIS reports are frequently generated and used for decision-making. The information is updated regularly and is frequently used in HR-related policy decisions. No capacity-building efforts have been undertaken for data analysis, report generation, or use of data.

## Sustainability

The users of the web-based HR system in Punjab find the Doctors Daily OPD Monitoring System more useful than the earlier paper-based information. User manuals, policies, and HR reports have been developed, and related government orders were issued for system management. The system is being maintained at the state level, and all HR-related decisions are based on it. Since the HR system in Punjab was developed in-house by the state Directorate of Health Services, it will likely be sustainable.

## 14. Tamil Nadu

Tamil Nadu developed a Personnel Module under its Health Management Information System (HMIS) in 2008. It is an initiative of the Department of Health, under the Tamil Nadu Health Systems Project, initiated in 2005. The objective of setting up the HMIS is to have a centralized web-based health management information system for all government-run secondary care hospitals and medical colleges under the Tamil Nadu Health Systems Project.

The broad objective of the project is to use information and communication technology (ICT) in improving the ability to collect, store, and analyze accurate health data across the state. The

project was conceptualized to provide critical health data across the health chain for quick and timely intervention by health directorates.

There are broadly two modules under the HMIS:

- Hospital Management System (HMS): These modules are a patient management information system. The HMS collects data on patient registration, outpatient, inpatient, medical records, laboratory investigations, X-ray and other investigations, pharmacy, stores, blood bank, diet, linen, the module for online daily report generation (MRD), and final diagnoses mapped to ICD-10 classification.
- Management Information System (MIS): These modules are regarded as a unified health reporting system. The MIS collects data on clinical information, ancillary services, administrative information, and program information. The administrative information includes Buildings, Finance, **Personnel**, Vehicle, and others. The Personnel Module maintains HR records of all the health facility-based employees to maintain an employee database, locate vacant positions in the health facilities, and ensure efficient utilization of human resources.

The HR data from the personnel component of the MIS is fully interoperable with service delivery data from HMIS since the Personnel Module is part of the larger HMIS. Users can use the same login and password to access both the systems. All clinical and management data are already integrated in Tamil Nadu.

#### Web link

<http://www.tnhmis.org/hmis/>

#### Technical assistance and funding

The HMIS was developed and is being implemented by the Tata Consultancy Services (TCS). HCL and Accel (third parties) have been contracted for maintenance of the server, while TCS is responsible for system maintenance, updating, customization, and software troubleshooting. HMIS was developed with financial assistance from the World Bank.

#### Coverage

The HMIS covers all regular employees of all three directorates under the state Department of Health, across the state and across cadres. (Once the data entry for regular employees is completed, data entry for contractual employees will be initiated.) The Personnel Module includes establishment-related forms to capture all personal and official information, qualification details, transfers and postings, attendance and leave information, and details of trainings undertaken.

#### Software

The HMIS in Tamil Nadu is a centralized web-based application on an open source platform. It is on a Solaris Operating System, but there are plans to migrate the HMIS onto the LINUX platform. The PostgreSQL database is the back-end database management system, and J2EE

(Java 2 enterprise edition) is the front-end interface. The software is hosted on the state data center (SDC) for Tamil Nadu, on a GlassFish application server.

### Data collection, entry, maintenance, and security

Initially, the health facilities were provided with an Excel-based spreadsheet to complete the personnel details of all their employees. Those responsible for data entry were provided with training and were given a user manual (currently being updated). The completed Excel sheets were submitted to TCS, to be uploaded on their web portal. Since the HR data were collected at the site of posting, they did not require additional verification. The system currently includes the HR records of about 51,000 employees and is in the process of adding another 10,000 HR records. Security is ensured through a secure user login with password. The server, hosted at the state data center, is STQC-certified (Standardization Testing and Quality Certification) and has a secure backup mechanism. A HIPS (host intrusion prevention system) is provided for the application, and strong antivirus protection is in place. Once the HR database is ready, district and subdistrict hospitals will be made responsible for keeping the data regularly updated.

### Data use

Built-in HR reports are generated in the system, while other need-based reports can also be generated with ease. Data analysis and report generation is carried out by the individual directorates.

- Currently, all information on transfers and promotions is generated out of this system.
- Capacity-building efforts and trainings conducted in individual hospitals are monitored and strengthened by providing additional training in deficient areas.
- Sanctioned positions and vacancy details are referred to for new recruitments and transfers.
- Cadre and specialty-wise vacancy lists can be generated, allowing appropriate personnel to be posted to fill in vacancies.
- Salary increment details are captured, meaning that a list of personnel eligible for increment can be generated and necessary steps can be initiated.

The state is in the process of setting up a State Health Data Resource Center that will provide all levels of health data analysis.

### Sustainability

Integrating the Personnel Module with service delivery data will ensure that the system is maximally utilized. Other states that are considering developing an HMIS may want to review and adapt the Tamil Nadu model. Users of this system feel that the live data ensure transparency, improve monitoring, and lead to effective management. Since the HMIS is a state government initiative, it will most likely be a sustainable effort.

## APPENDIX B: KEY RECOMMENDED STEPS IN SETTING UP HRIS

### Establish HRH Stakeholder Leadership Group

- Promote formation and functioning of a HRH Stakeholder Leadership Group (SLG), including public and private sector representatives, training institutions, professional councils, and development partners
- Define purpose, scope and HRIS priorities through SLG consultations

### Assess and Improve Existing System

- Conduct System Requirement Study to guide HRIS strengthening activities
- Develop and finalize data collection tool
- Standardize job titles
- Facility mapping
- Develop data entry update protocol

### Developing Software Solutions

- Develop/customize HRIS software to meet needs
- Establish web-based HRIS
- Enter data into the software
- Verify and validate data
- Review and test online system

### Use of Data for Decision-Making

- Reports available for analysis and use
- Identify and assign different roles to data users and HRIS managers

### Ensuring Sustainability

- Regular Stakeholder Leadership Group meeting
- Continuous information sharing with district and state officials
- Follow-up support by district and state officials
- Build local capacity to manage and customize iHRIS software
- Train officials on use of data



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