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CASE STUDY: INDIA

SUPPLY CHAIN LEADERSHIP IN INDIA: THE CASE OF RAJASTHAN

ABSTRACT

Geographical Area

Rajasthan, India

Focus areas

This case study revolves around the **supply chain leadership** in the state of Rajasthan through the establishment of a centralized procurement agency. This has led to the makeover of the **supply chain workforce** needed for ensuring access of the essential medicines to 70 million people. It also aims to highlight the stakeholder coordination in the state and management of resources at the corporation and other associated organizations. Finally, the case study attempts to determine the successful HR approaches in Rajasthan that can be replicated in other parts of the world through South-South collaboration.

Intervention

The state of Rajasthan took a bold and decisive step in achieving universal health coverage through a **Free Medicines Scheme** in 2011. In compliance to the scheme, a central procurement agency was established in collaboration with all key stakeholders in the state. Hence, **Rajasthan Medical Services Corporation** took the centre stage in the procurement and supply chain of health commodities, which led to a fully sustainable enabling environment for supply chain functions. With the corporation in place, the state has seen a tremendous turnaround in the number of resources working in supply chain of essential medicines with dedicated staff at the centre for procurement, logistics, quality assurance, IT, finance and other related functions. In addition, the government has also positioned staff at the district level (at each of the 40 district warehouses) and each of the drug distribution centres (more than 3,000) for drug dispensing and managing the inventory based on a web application called e-Aushadhi.

A patient registering at the DDC.

Pharmacist and warehouse helper conducting Physical Verification of Stock.

INTRODUCTION

Background

Rajasthan is located in the northwest part of India and is the largest state in the country by size (10% of the total area of India). It has the eighth largest population in the country (6% of total population). The state is largely rural in nature where about 75 per cent of the population resides in the rural areas. Rajasthan has one of India's most difficult terrains, comprising the Thar Desert (60% area of state), thereby limiting the population density. The climate of the state is varied, with average winter temperature ranging from 8°C to 28°C and average summer temperature ranging from 25°C to 46°C. Figure 1 shows various demographic information and indicators for the state.

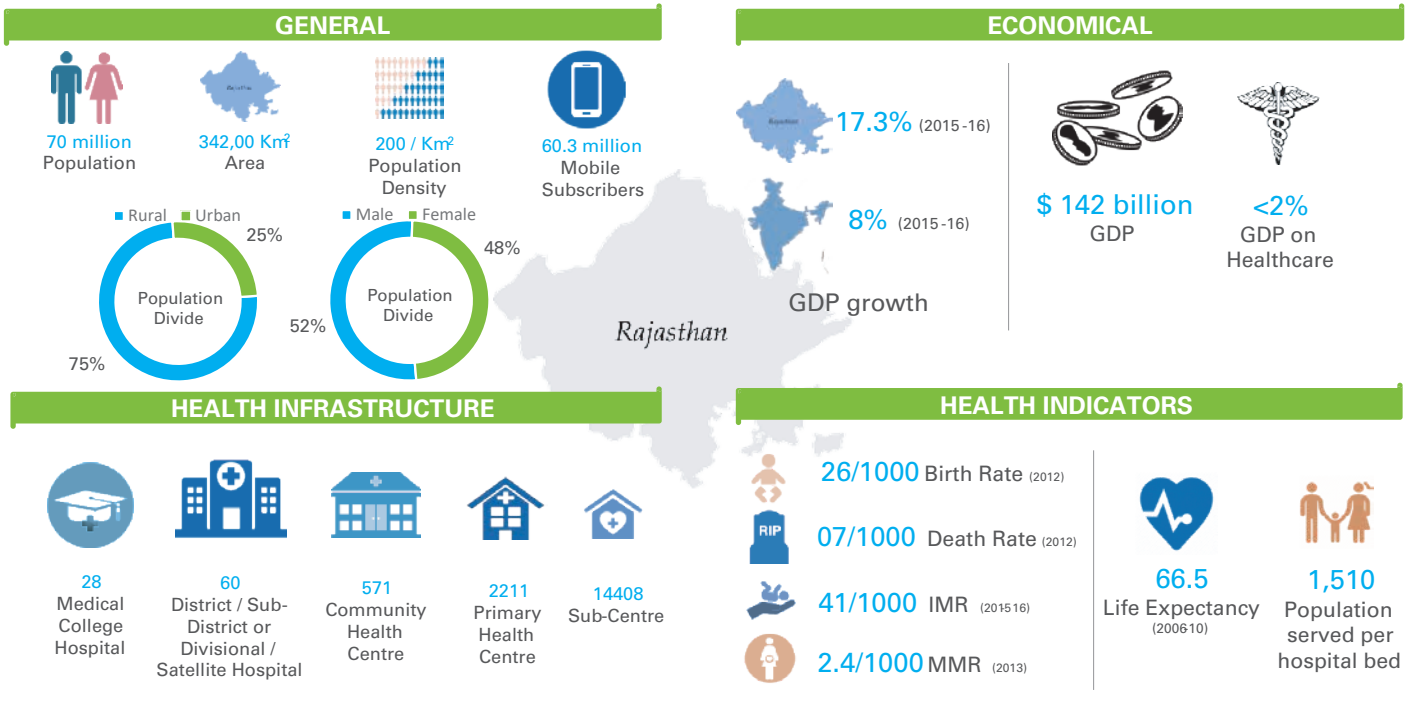
Objectives

i) Understand the extent of supply chain workforce in the state managed by the directorate and RMSC

ii) Understand the supply chain leadership and management of all resources in the state

iii) Determine the capacity building and workforce development approaches in the state

FIGURE 1: Demographics of Rajasthan



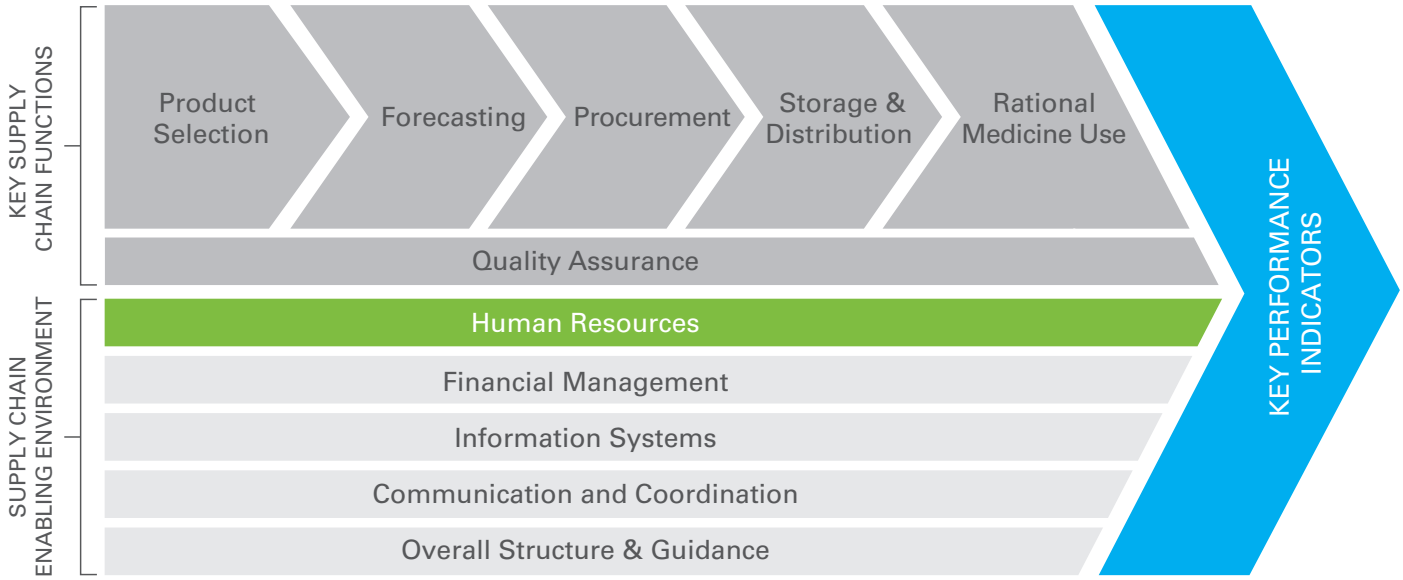
Key Stakeholders

The Department of Health and Family Welfare is responsible to ensure availability of essential medicines throughout the state. Since the beginning of the Free Medicines Scheme, the overall function of procurement and supply chain is managed by Rajasthan Medical Services Corporation and Directorate of Medical Health & Services, in close collaboration with the Department of Medical Education (under which all the medical colleges and universities in the state are operating). Further, some other organizations, such as National Health Mission in the state, Drugs Control Office, Department of Ayurveda and Department of Finance, are also involved in the supply chain along with the primary stakeholders.

Several United Nations agencies and NGOs support the government departments in providing programmatic or funding support to execute programmes in the state. Figure 2 depicts the stakeholders in the state involved in supply chain of medicines.

FIGURE 2: Key stakeholders involved in supply chain in Rajasthan

FIGURE 3: Supply chain framework



Methods and tools

A mix of qualitative and quantitative research has been conducted to develop this case study. The overall framework to assess the supply chain workforce is presented in Figure 3, where the key supply chain functions were studied with respect to the key enabling environment of Human Resources. The case would assess the supply chain in the state of Rajasthan using the Human Resources lens.

Interviews and field visits were used as the methods for data collection. In-person interviews were conducted with several key personnel working in the state of Rajasthan (conducted at several levels) and their views on the supply chain were collected. Further, several data points of supply chain were collected from e-Aushadhi (LMIS) and materials available in the public domain.

SUPPLY CHAIN LEADERSHIP: RAJASTHAN

Introduction

The state of Rajasthan embarked on its journey towards 'Access to Essential Medicines for All' in the year 2006 when the government started to open medicine stores operated by co-operative department and the Medical Relief Society. These medicine stores would provide the medicines (generic) at a cheaper rate than available in the private medicine shops. However, this scheme could not create an impact due to the lack of availability of medicines across these stores, led by the decen-

tralized nature of procurement in the state. The District Central Medical Officer's office was responsible for procurement (by issuing purchase orders) based on the rate contracts developed by the Stores Purchase Organization (SPO) (Directorate of Medical and Health Services).

> *"It was very fortunate to have RMSC established just after RHSDP was finished, which allowed absorption of several resources from RHSDP to RMSC. In fact, we are still using the computers at RMSC which were purchased during RHSDP project, and they work really well till now" – senior logistics official at RMSC*

However, because of a lack of proper structure and manpower, the rate contracts were possible for only very few items (approximately 30% of total essential medicines). Further, the absence of a comprehensive infrastructure for a seamless supply chain was a major constraint to fulfil the medicine needs of the state. The facility of logistics and distribution was not built in the system; there was a dire need for strengthening of MIS and quality assurance systems in the state. Hence, the lack of a high-quality health care structure in the state was one of the major reasons for its poor health indicators in comparison to other states in India.

Rajasthan Health Systems Development Project

The government of Rajasthan had already begun the mission to provide essential medicines to the public at a fraction of the cost; however, lack of manpower and infrastructure restricted progress towards this goal. To rectify this, the state of Rajasthan started a health systems strengthening project called Rajasthan Health Systems Development Project (RHSDP) under the support and funding from World Bank. Although the conception of the project had begun in 2004, the work could only get under way by 2006. The objective of the project was to assist Rajasthan in improving the health status of its poor and underserved population, through (i) extending equitable and greater access to health care; and (ii) improving the effectiveness of health care via institutional development and increasing the quality of health care. Among other outcomes, the project was successful in upgrading and renovating several health facilities, enrolling several staff at various levels for key functions along the value chain and training of those staff in various topics including supply chain (where relevant). The project was completed by 2011 and as per an independent review conducted by World Bank, the outcomes under the project were 'moderately satisfactory'. The impact of RHSDP on the state health machinery was substantial, and it led to a massive improvement in the health indicators. However, after six successful years of RHSDP, access to medicines still posed a major challenge, owing to decentralized procurement mechanisms.

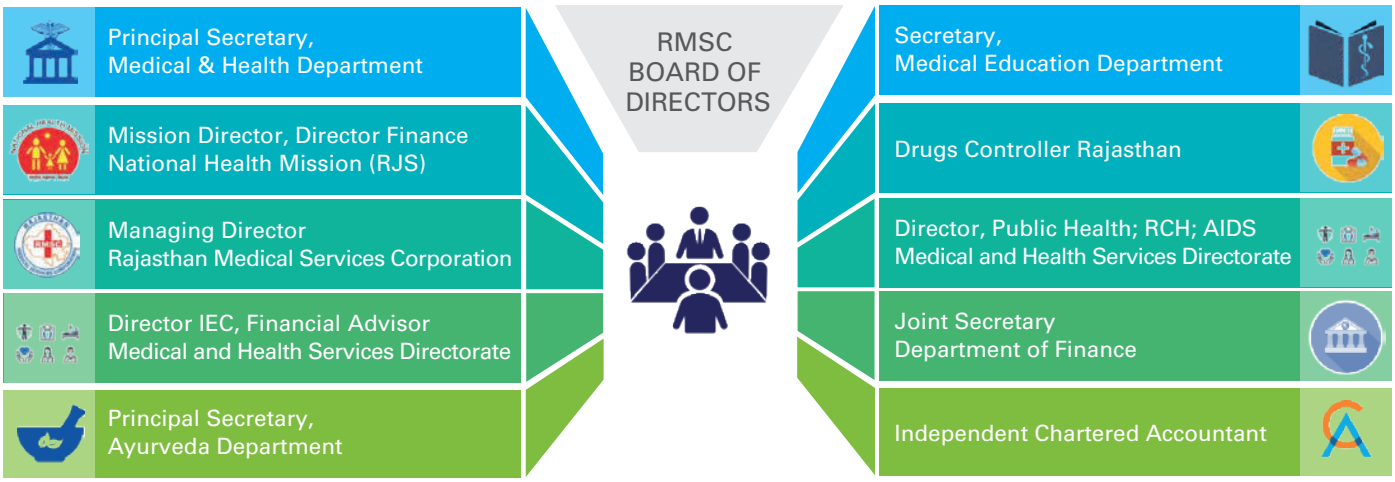
Establishment of the Rajasthan Medical Services Corporation

In 2011, the government of Rajasthan announced a rather ambitious scheme of providing free generic medicines to everyone in the state. The budget for the Mukhyamantri Nishulk Dawa Yojana (Free Drug Scheme) was declared during the budget announcement of 2011–2012, and Rajasthan Medical Services Corporation (RMSC) was established as the Centralized Procurement Agency in May 2011 in compliance to this scheme. The timing of establishment of RMSC could not have been better, as it took over all the supply chain systems developed / strengthened by the RHSDP project. It was a great achievement by the government to establish the much-talked central procurement agency in such a short span of time.

Rajasthan Medical Services Corporation was incorporated on 4 May 2011 as a public limited company under the Companies Act, 1956 (India). It is a wholly owned government (of Rajasthan) company. The primary objective of RMSC was to procure and distribute generic medicines, surgical and diagnostic equipment for the Department of Health and Family Welfare, Department of Medical Education, Department of Ayurveda and other medical relief societies to cater to patients visiting the public health care facilities.

From 2011, RMSC took the centre stage in the procurement and supply chain of health commodities in Rajasthan, which led to a fully sustainable enabling environment for supply chain functions.

FIGURE 4: Constitution of the board of directors at RMSC

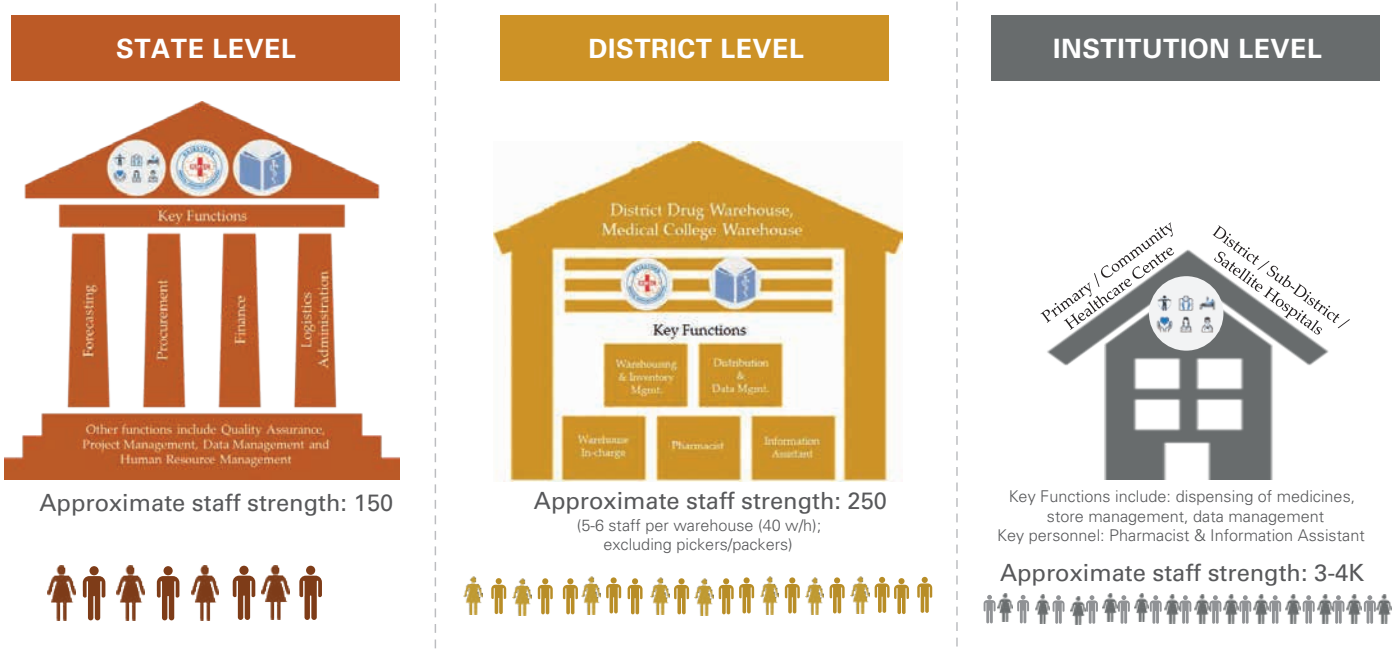


The leadership at RMSC is governed by a board of directors, the members of which represent the gamut of public health care in the state. The corporation creates a strong enabling environment for the supply chain in Rajasthan, with all possible stakeholders involved in decision-making. Figure 4 represents the constitution of Board of Directors at RMSC.

Supply Chain Workforce Development in Rajasthan

With the support of the government, the first initiative for RMSC was to develop specialized supply chain workforce to manage every supply chain function in the state. The organizational structure of RMSC was developed to address all the critical bottlenecks. The corporation had developed divisions for all important aspects in supply chain, starting from the Drugs and Therapeutics Committee (called TAC), procurement, logistics, quality assurance, IT, equipment and others. All these central divisions were sufficiently staffed (about 150 personnel) to match the needs for the state. Further, human resources strengthening of the lower levels was also conducted, with sufficient staffing at all the district warehouses (about 250 in 40 warehouses) deputed from the RHSDP project. The government further opened a drug distribution centre (DDC) at each service delivery point to manage the outpatient load and recruited about 1,500 pharmacists to manage all the DDCs. Subsequently, every service delivery point was appointed with an information assistant (at least one at each point) to manage the supply chain data.

FIGURE 5: Extent of supply chain workforce in Rajasthan



The human resources strengthening was a long process that took close to two years. The workforce development in the state was a collaborative effort by the Directorate of Medical & Health, ensuring fulfilment and management of positions at the service delivery points and RMSC managing the HQ and the district warehouses.

All these personnel had clear job roles and responsibilities with adequate training to manage the supply chain of health commodities. Figure 5 illustrates the supply chain workforce in the state, with various competencies associated at various levels.

Development of Computerized LMIS

The government of Rajasthan also addressed the long pending tailback in managing the data of the supply chain system by deploying a computerized Logistics Management Information System called e-Aushadhi at each level of the supply chain. E-Aushadhi is a Government of India–sponsored Logistics Management Information System developed by a centralized agency and deployed in several states in India including Rajasthan. It provides separate interfaces to personnel at each level based on their job responsibility.

> *"Earlier, I had to call the warehouses and service delivery points to collect data on supply chain. But with the advent of e-Aushadhi, the data from any facility is just a few clicks away." – a senior supply officer at RMSC*

For example, the interface for information assistant and pharmacist at the health centre are most simplified, which enables them to submit indents to warehouses, collect and monitor consumption data for their facility, and collect and monitor prescription data. The facility-wise information is also monitored by the respective drug warehouses, the supply/logistics/IT department at RMSC HQ and the programme managers at the directorate of medical and health.

E-Aushadhi records all commodity transactions originating from the manufacturers and ending at the health care facilities (distribution based on indent from facility to warehouse). This enables a seamless system of 'pull' distribution whereby the health care facilities own the process of demand estimation and ordering. E-Aushadhi is now the primary software used in the state of Rajasthan for all essential medicines supplied by Rajasthan Medical Corporation Services. The role of information assistant / data entry operator is crucial in the success of e-Aushadhi by being responsible to collect and submit all the prescription and transactional data in the

system. This enables the DMHS and RMSC to adjust the demand within a cycle and prepare annual estimation plans.

Along with this, two separate but similar software programmes called e-Saadhan and e-Upkaran are used to manage the supply chain of family planning products (managed by Medical and Health Directorate with support from National Health Mission and UN-FPA in Rajasthan) and equipment, respectively. The government has also provided necessary IT infrastructure on all facilities to run e-Aushadhi.

Operations at RMSC

The mandate for RMSC is to ensure that all the products on the Essential Drugs List reach the service delivery points for dispensing at the right quantity, quality, price and time. RMSC started with supplying around 200 essential medicines in 2011, a number that has now increased to more than 600. A technical committee meets at specific intervals to identify essential medicines for the state, which upon approval are subsequently added to the list. All the medicines are written in their generic nomenclature and RMSC is allowed to procure and distribute only generic medicines.

Annual forecasting is the primary responsibility of the programme managers at the Directorate of Medical and Health, who collect data from all facilities available on e-Aushadhi and estimate the demand for a full year. The annual demand is made available to the procurement division at RMSC, which after validation of the data uses it to start the procurement cycle. The team further extrapolates the data for two years of demand and issues tenders to establish long-term agreements with qualified manufacturers. With this, they ensure lower prices, less supply lead time, more commitment from the manufacturers and better quality of medicines over a longer period.

Once the long-term agreements (rate contracts) are established, the supply division at RMSC issues the purchase orders to the manufacturers based on actual demand from the drug warehouses. Manufacturers are required to adhere to a timeline of 45 days to supply (it can vary based on mutual discussion) the required commodities at the respected warehouse, which are sampled and sent to an empanelled laboratory for testing once received. The received commodities are kept in a quarantine section of the warehouse until the positive test reports are uploaded on E-aushadi. This entire process is overseen by the quality assurance division at RMSC to ascertain adherence to stipulated timeline.

It remains the responsibility of the logistics division at RMSC to provide necessary amenities to the warehouses managing the stock and ensuring storage and distribution as per established good practices and data is regularly updated.

RMSC's sustainable and transparent model

RMSC was established on the same lines of the other medical corporations in the country. The corporation is fully owned by the government of Rajasthan but the decision-making machinery for the day-to-day operations is kept independent through the managing director of RMSC, with the overall competent authority residing with the principal secretary of the Department of Health and Family Welfare. The vision was to reduce the procurement lead time by reducing the approval time in the government systems. However, care was also taken in the constitution where the most important decisions pertaining to procurement is required to pass through a board of directors comprising all stakeholders from the state. Hence, the central procurement agency was established to work in tandem with all other organizations in the state (not in isolation).

To make the operations sustainable, RMSC levies a 5 per cent operations fee on the total procurement budget it processes annually. The majority of the procurement is conducted for the health programmes under the Directorate of Medical Health and services, which then compensates RMSC each quarter, allowing it to manage all its overhead and maintenance costs. The corporation has also started procurement service for some other smaller agencies in the state on the same model, thereby making itself a revenue centre rather than a cost centre. With the operations fee that RMSC levies, it manages the payroll of all its manpower, all the costs associated with the IT systems, and all other maintenance and management costs throughout all the warehouses it manages.

Owned by the government of Rajasthan, the corporation now comes under the purview of the Transparency Act in India, making all operations data and records accessible under the Right to Information Act and hence available to the general public on request. Further, transparency in the systems is also managed through the use of e-Aushadhi, which is accessible to all the government agencies and the programme managers associated with RMSC.

Workforce management in the state

The supply chain in the state of Rajasthan is managed by a total of 3,000 to 4,000 personnel working at various levels. All these officials are either on the payroll of the Directorate of Medical Health & Services, the Corporation or contracted by any of them for a fixed time based on their skills and the requirement of the respective institution. However, the focus in the state is to keep as many permanent staff as possible, which reduces attrition and increases the efficiency of the institution.

All the permanent staff are compensated as per the central government's seventh pay commission. According to the structure of the commission, the officials are assigned a compensation grade and a band under that grade, based on their education level and years of experience. Annually, every official gets the opportunity to get promoted to a higher band of a grade by virtue of good performance. Further, as the officials enhance their skills, they can also appear in the state-run recruitment drive to be positioned at a higher post in the system. This generally keeps all the officials very motivated to work on the government payroll, which also provides several benefits like house rent allowance, pension, travel allowance, annual bonus, health insurance, etc.

Based on the interviews conducted for the project, the rate of attrition in the state was low, with many officials working with the same institutions throughout the last six years. However, there is always some movement of senior staff from one department in the government to another, and as most of the staff at the corporation are deputed from the state government, they are sometimes relocated to other departments as per need.

The working hours for the officials are mostly fixed, while varying a bit based on the job role. The usual norm is to work eight hours a day for six days in a week. Annual leaves are provided as per Government of India rules.

Impact of supply chain strengthening in Rajasthan

The state has seen a tremendous improvement in both supply chain and health indicators in the last six years since the supply chain structure was strengthened by the government. Table 1 depicts the changes in indicators by comparing the data from 2011 against that of 2017.

CHALLENGES

While there was a great push from the government to strengthen the supply chain in the last six years, they have also faced several challenges while fulfilling the health care needs of the state. The challenges are divided into two categories: a) challenges faced during establishment of the new system; and b) challenges faced in operations.

a) Challenges faced during establishment:

i) Identification of suitable workforce: The concept of a centralized procurement agency was new for the state of Rajasthan and hence it was difficult to find personnel with suitable technical expertise. However, overcoming these difficulties, the corporation was able to retain a number of staff from the RHSDP project and get others deputed from the Department of Health and Family Welfare. The staff was then trained based on their job responsibilities.

ii) Rolling out of systems and processes in every facility: Rajasthan is a large state, with most of its area covered in desert. There are several facilities located in the remote areas that are difficult to reach. Initially, the officials found it challenging to make all the systems and guidance available to the remote locations and thus it took more time than expected.

TABLE 1: Health and supply chain indicators in Rajasthan, 2010 vs. 2017

S.No.	Indicator	Year 2010	Year 2017
1.	Beneficiaries served by public health institutions (in a year)	<40 million prescriptions per year	>100 million prescriptions per year
2.	Number of health products procured by the state	Less than 200	More than 750
3.	Procurement budget	INR 1.4 billion	INR 4.5 billion
4.	Days of stock out	Data not available	Less than 20 days on average per facility per product
5.	Number of medicines in the state EML	~200	~600
6.	Number of medicines under rate contract	~60	~550
7.	Medicines availability at facilities	Data not available (but based on several interviews, 30-40% of essential medicines were available)	75-85%
8.	Infant Mortality Rate (per 1000 live births)	55	41 (2015-16)
9.	Maternal Mortality Rate (per 100000 live births)	265	244 (2013)

b) Challenges faced during operations:

i) Manual data management: In the first two years of RMSC's operation, the logistics data were managed through a manual

system. It was thus very difficult for the procurement and supply teams at RMSC and programme managers at the directorate to fully understand the requirements at the facility level, which led to several instances of inaccurate forecasting. This was finally addressed when e-Aushadhi was fully operational in 2013.

ii) Retaining IT workforce at the facility level: The Directorate of Medical Health and Services had recruited several Information Assistants to work on e-Aushadi. These were mostly fresh engineering (IT) graduates in the state. But after a few months of recruitment, it was observed that the staff was overqualified for the work of data entry and indent management. Further, several information assistants were relocated by the government towards election campaigns held in the state. This created a void in the peripheral centres, and collecting and managing data became a challenge. However, the void was partially filled by the pharmacists who were also trained in e-Aushadhi and later managed fully by recruiting data entry operators in the health centres.

iii) Shift of government's focus towards health insurance scheme: Once the government in Rajasthan was changed in the year 2013, the focus shifted from the free medicine scheme to a statewide health insurance scheme. Although the insurance scheme is complementary to the free medicines scheme, lack of focus on the medicines procurement thwarted any new innovation in the operations of the corporation and resulted in frequent changes in the leadership of RMSC (MD).

INNOVATION AT RMSC

A centralized approach of procurement and supply chain was established when RMSC was formed in 2011. The state of Rajasthan decided to take a collaborative approach to manage the supply chain in the state, with all the important stakeholders coming together in the decision making through RMSC. A fully functional enabling environment was developed at RMSC to support the key supply chain functions. The state of Rajasthan thus has a functional support machinery like Finance, HR, IT and Communication to ensure a streamlined supply chain. It was also understood that an appropriate workforce is essential in managing such a large supply chain, and thus manpower was appointed at each level and have been managed as per the central government's guidelines.

LESSONS LEARNED AND APPLICATIONS

Several lessons to be learned from the case of Rajasthan are listed below; these can be applied to various countries with a similar demographic profile to that of Rajasthan:

a) **Execute donor funded projects with long-term impact**: There are plenty of donor-funded projects in the developing countries, but it is very important for the governments to work on projects that have a long-term impact. In the case of Rajasthan, the Health Systems Development Project funded by the World Bank created a tremendous impact on the state, leading to sustainable supply chain machinery and a long-term improvement in the health indicators of the state.

b) **Establish a centralized procurement agency**: One of the important lessons to be learned from the Rajasthan case is to establish a centralized procurement agency for the country, which should procure the medicines needed in bulk and lower prices. Based on the underlying conditions of any country, they can invest in constituting an independent agency under the leadership of the Ministry of Health, which works on a commission model to procure essential medicines based on the country's EML.

c) **Develop an enabling environment for the supply chain functions**: As mentioned earlier, the state of Rajasthan has invested in ensuring that all the levers are available for a seamless supply chain. The countries that are looking to strengthen their supply chain should first assess and strengthen all the key enablers, such as HR, infrastructure, IT systems, guiding documents, etc. This can be a donor-funded project to strengthen overall health systems, including the levers for supply chain.

d) **Ensure stakeholder coordination and commitment towards supply chain**: As evident in Rajasthan, RMSC alone could not have exerted enough influence on the state's mediocre supply chain system. Only when all the stakeholders came together and ensured commitment towards the areas they were managing is the government now able to maintain the services for more than 50 million people. Hence, it is very important for the countries to first identify all the relevant departments that would be part of the initiative and then practice seamless communication and coordination amongst them all.

e) **Availability of workforce:** One of the reasons for the success of the supply chain system in Rajasthan is the availability of workforce at each level. Similar supply chain systems have been developed in various other states in India, but they could not deliver much impact as compared to Rajasthan due to lack of appropriate manpower at each level. In fact, recruiting and retaining manpower at various levels have been termed as the biggest challenge in the state of Rajasthan as well. Hence, the most important lesson learned from this case is to hire sufficient staff with appropriate technical expertise, provide them with learning opportunities in the system and retain them to ensure continuity in the operations.

   Further, the organizations working in the supply chain should be provided flexibility for recruitment. Typically, it takes more time to identify and recruit permanent staff in a country, leading to positions being vacant for the period. However, in Rajasthan, the institutions were given flexibility by the Directorate of Medical amd Health to hire contractual staff while they were able to fill the positions permanently. This was also applicable when some staff would leave the organization.

RELATED LINKS

Refer to Internet-based resources that provide additional information relevant to the initiative's history, development or outcomes.

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APPENDIX

GRAPHIC 1: Supply chain pipeline diagram

GRAPHIC 2: HR strengthening framework

	PRODUCT SELECTION	QUANTIFICATION	PROCUREMENT	WAREHOUSING, QUALITY & TRANSPORTATION	RATIONAL USE AT FACILITY	DATA COLLECTION AND MANAGEMENT
Managed by:	Technical Advisory Committee	Logistics, Procurement, and Program Divisions	Procurement & Supply Divisions	Logistics & Quality Division	Program and Logistics Division	IT Division
Institution / Level	DMHS,RMSC,MH / Central	DMHS, RMSC / Central	RMSC / Central	RMSC, DMHS / Central & District	DMHS, RMSC / District, Peripheral	DMHS, RMSC / Central, District, Peripheral
Number of Staff	10-15	10-15	~40	~300	~2,500	~2500
Key Positions	Program Managers, Logistic and Procurement Managers, Medical Officers, Nurses, Pharmacists	Program Managers, Logistics and Procurement Managers, IT manager	Procurement Manager, Supply Managers	Logistics Manager, Drug Quality in-charge, Pharmacists, Warehouse in-charge	Pharmacists	Information Assistants, IT manager
Established	2011	2011	2011	2011/2012	2011/2012	2012/2013

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