# Drug supply chain management for mental health in the Indian public sector
## A comprehensive review

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**NOTE**

This report consolidates publicly available literature on drug supply chain management with a specific focus on mental health in India. The sources include policy documents, government reports, press releases, newspaper articles, blogs, and academic publications available in the public domain. Although comprehensive in scope, this is not a systematic review. Rather it is a purposive and thematic narration intended to capture the current scenario, promising practices from India and other countries, challenges, and opportunities for strengthening drug supply chains in the Indian context through the lens of mental health.

## ACKNOWLEDGEMENTS

## LIST OF ABBREVIATIONS

| | |
|---|---|
| C-DAC | Centre for Development of Advanced Computing |
| CDSCO | Central Drug Standard Control Organisation |
| CHC | Community health centre |
| CHO | Community health officer |
| CPHC | Comprehensive primary health care |
| CTD | Central TB division |
| DALY | Disability-adjusted life year |
| DDD | Decentralised drug distribution |
| DMHP | District Mental Health Programme |
| DSCM | Drug supply chain management |
| DVDMS | Drug and Vaccine Distribution Management System |
| EHR | Electronic health record |
| FDA | Food and Drug Administration |
| FMR | Foundation for Medical Research |
| FRCH | Foundation for Research in Community Health |
| GDP | Good Distribution Practice |
| GBT | Global Benchmarking Tool |
| GoM | Government of Maharashtra |
| GSP | Good Storage Practice |
| HBPCL | Haffkine Bio-Pharmaceutical Corporation Limited |
| HCI | Health care institution |
| HIMS | Hospital information management system |
| HMIS | Health management information system |
| HIV | Human immunodeficiency viruses |
| HR | Human resources |
| HWC | Health and wellness centre |
| INR | Indian Rupee |
| IPHS | Indian Public Health Standard |
| IT | Information technology |
| LMICs | Low-and middle- income countries |
| MEDD | Medical education drug department |

| | |
|---|---|
| MO | Medical officer |
| MoHFW | Ministry of Health and Family Welfare |
| NABL | National Accreditation Board for Testing and Calibration Laboratories |
| NCD | Non-communicable disease |
| NHM | National Health Mission |
| NHS | National Health Service |
| NHSRC | National Health Systems Resource Centre |
| NLEM | National List of Essential Medicines |
| NMHP | National Mental Health Programme |
| NPPA | National Pharmaceutical Pricing Authority |
| OCD | Obsessive-compulsive disorder |
| PBS | Pharmaceutical Benefits Scheme |
| PHC | Primary Health Centre |
| PHD | Public Health Department |
| PtD | People that Deliver |
| RSS | Regulatory Systems Strengthening |
| SCM | Supply chain management |
| SDG | Sustainable Development Goals |
| SMS | Short message service |
| SOP | Standard operating procedure |
| SEARN | South-East Asia Regulatory Network |
| STEP | Strategic Training Executive Programme |
| STG | Standard treatment guideline |
| TB | Tuberculosis |
| UHC | Universal health coverage |
| USAID | United States Agency for International Development |
| US | United States |
| WHO | World Health Organization |

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# CHAPTER 1

## INTRODUCTION

The World Health Organization (WHO) defines 'mental health conditions' as a broad category that encompasses mental disorders and psychosocial disabilities, as well as other mental states associated with significant distress, impairment in functioning, or risk of self-harm.[1] More than 1 billion people globally live with mental health disorders, according to WHO. People with severe mental health conditions have poorer life expectancy, and die 10 to 20 years earlier than the general population. Moreover, a mental health condition increases the risk of suicide and vulnerability to human rights violations.[2]

Quality mental health services and accessible, affordable medicines are essential components of Universal Health Coverage (UHC), which Sustainable Development Goal (SDG)-3 emphasises. In lower-and middle-income countries (LMICs), however, availability of psychotropic medicines at primary healthcare levels is significantly lower than for infectious and other noncommunicable diseases due to financial, cultural, and workforce constraints.[3, 4] A number of factors obstruct progress towards UHC in mental health: shortage of qualified healthcare providers, under-prioritisation of mental health services and drug supply, weak supply chain systems, complex regulatory frameworks [psychotropic drugs are categorised under controlled substances due to their potential for misuse and dependency], and inadequate monitoring of medicine management.

**The Indian scenario: Inefficient procurement derails treatment**

In India, 197.3 million people (14.3% of the population) had mental health conditions in 2017, contributing 4.7% of total disability-adjusted life years DALYs (the years of healthy life lost due to premature death and the time lived with illness or disability), up from 2.5% in 1990.[5, 6] Access to mental health services is challenging, particularly for people from marginalised populations or inaccessible areas due to unequal resource distribution, contributing to significant treatment gaps[7, 8, 9].

Despite being the world's leading producer of vaccines and generic medicines (contributing 20% to the global supply),[10] India faces recurrent shortages of essential medicines[11] due to inefficiencies in the procurement system.[12] In rural areas, poor infrastructure and long distances between healthcare facilities lead to delays in drug distribution and increase the likelihood of medicine stockouts.[13, 14]

Fragmented supply chains, poor inventory management, and logistical barriers disrupt the availability of essential psychotropic medicines. In addition, low profit margins, and pricing policies constrain access to medicines.[15] Mental health services are often not integrated into primary healthcare systems, resulting in lower prioritisation of psychotropic medicines within national health programmes.[16]

In India, as in other LMICs, supply chain disruptions force patients to stop their medication mid-way, leading to worsening symptoms, relapse and prolonged hospital stays.[17]

Mental health conditions require continuous treatment,[3] and this is where efficient drug supply chain management (DSCM) comes in. There is a need for sustainable and long-term investments in DSCM to ensure reliable access to quality and affordable medicines.

**Purpose of this review: Covering the road from challenges to good practices**

But a first step to bringing in investment or building strategies for a well-oiled supply chain is gaining a deeper insight into the current scenario and best practices. However, there is no document that covers the breadth of Indian policies, programmes, and the challenges and opportunities in this area. This review aims to consolidate the current evidence on innovative global promising practices, Indian policies and programmes, and the learnings for mental health DSCM in India. It intends to guide the formulation of strategies and policies to strengthen DSCM and improve mental health service delivery as an integral component of India's primary healthcare.

## CHAPTER 2

## SUPPLY CHAIN MANAGEMENT FOR MENTAL HEALTH DRUGS IN INDIA-SETTTING THE CONTEXT

The drug supply chain management (DSCM) is the regulation of flow of goods, finances, and information related to products or services spanning from procurement to distribution to end-users.[18] It comprises several key stages: selection of appropriate medicines guided by the NLEM and standard treatment guidelines (STGs); quantification and forecasting to estimate the future demand; procurement through hybrid systems (mix of centralised and decentralised mechanisms); storage and distribution in healthcare facilities while ensuring drug integrity; and ultimately, dispensing to patients by trained healthcare professionals.[19] The efficient DSCM practices are important to ensure timely distribution of the right products in the right quantity at the right place.[17] Despite its critical role, the DSCM is often an overlooked component of the health systems.[3]

In India the Central Drugs Standard Control Organisation (CDSCO) serves as the central authority overseeing national policies, standards, approvals, and interstate coordination, whereas the state bodies implement licensing, inspection, and enforcement at the ground level. Regarding supply chain specifics, the CDSCO mandates strict compliance with the Good Distribution Practices (GDP) and Good Storage Practices (GSP), which are especially important for the temperature-sensitive drugs such as vaccines and biologics.[20] However, when it comes to procurement and distribution, the CDSCO has a limited role. In practice, since the public procurement of medicines including psychotropics is managed mostly at the state level and funded through state health budgets; only certain items (e.g., vaccines under the Universal Immunization Programme and specific supplies for TB and HIV) are procured centrally through agencies under the Ministry of Health and Family Welfare (MoHFW). This makes state-level drug procurement corporations and medical supply agencies the real backbone of DSCM in India.[18]

Furthermore for the mental health DSCM, each stage is governed by national and state-level policies such as the National Mental Health Policy (2014), the Mental Healthcare Act (2017), and state-specific procurement systems. The National Mental Health Policy underscores the importance of ensuring availability of essential psychotropic medicines at all levels of the public health facilities; while the Mental Healthcare Act 2017, legally mandates the right to access psychotropic medicines free of cost at government health facilities when needed. Together, these policies and legal frameworks influence the drug selection, budgeting, procurement timelines, and distribution mechanisms, thus directly affecting the availability and accessibility of psychotropic medicines at the health facilities.[21, 22] Despite these frameworks, access to psychotropic medicines is highly variable. Indian states such as Tamil Nadu and Rajasthan have pioneered robust, streamlined procurement and distribution systems through dedicated agencies-Tamil Nadu Medical Services Corporation and Rajasthan Medical Services Corporation, respectively. These models, built on transparent e-tendering, bulk purchasing, and rigorous quality assurance, consistently achieve

lower prices and more reliable supplies.[23, 24] However other states struggle with limited access and inconsistent availability of essential psychotropic medicines partly due to gaps and inefficiencies in supply chain systems.[25, 12]

It is evident that, unlike the DSCM for many other essential medicines, the mental health DSCM faces unique complexities- a) the stringent licensing because of the categorisation of psychotropic drugs under controlled substances due to their potential for misuse and dependency; b) perceived stigma surrounding mental illness suppressing treatment-seeking behaviours, and further weakening forecasting and planning; and c) the chronic nature of psychiatric conditions requiring long-term treatment adherence.[26, 27] Low demand on account of concerns, fears and lack of confidence among peripheral public health providers regarding prescribing permitted psychotropics may further hamper forecasting and planning.[28, 29] The regulatory oversight, while necessary for the public safety, imposes an additional accountability related to procurement and distribution processes, frequently resulting in delays or shortages at the healthcare delivery points.[22]

The pricing system can limit access to essential medicines. In India, the National Pharmaceutical Pricing Authority (NPPA) controls prices of drugs listed in the National List of Essential Medicines (NLEM), including some mental health drugs.[29] However, most psychotropic formulations remain outside its purview and are freely priced by manufacturers. Branded psychotropics often cost two to three times more than Jan Aushadhi generics.[31]

Market-based pricing may discourage production of low-profit essential drugs, leading to shortages. While price ceilings keep some drugs affordable, they do not ensure a consistent supply in public sector and can reduce manufacturers' incentives to produce low-margin medicines. Availability also depends on state procurement efficiency—strong systems like Tamil Nadu's Medical Services Corporation use transparent, pooled procurement to secure prices lower than NPPA ceilings and improve access.[32]

Additionally, low perceived demand for mental health drugs, especially in rural areas, discourages private wholesalers and retailers from maintaining stock.[33,34] Since psychotropic markets are small and less profitable, pharmaceutical companies often invest less in their production and distribution infrastructure.[35]

**Text box 1** and **Table 2** present prices of the psychotropic drugs w.r.t price variance and price range. **Text box 2** is a list of key Indian manufactures of psychotropic drugs listed in the NLEM.

Text box 1 - Example of price variance of psychotropic medicines in India

The greatest expense variance was found to be amitriptyline 25 mg (195%), fluoxetine 50 mg (95%), sertraline 50 mg (83%) and the lowest % cost variation was of fluvoxamine 20 mg (13.8 mg), duloxetine 20 mg (16%) and escitalopram 10 mg (38%).[36]

Table 1-Mental health drugs listed in India's National List of Essential Medicines (NLEM) 2022 [37, 38, 39, 40, 41, 42] with their approximate general market price ranges in Indian Rupees (INR)

| Drug | Indications | Approximate Price Range (per unit) |
|---|---|---|
| Haloperidol | Psychotic disorders | ₹1-5 per tablet |
| Clozapine | Psychotic disorders | ₹10-30 per tablet |
| Fluphenazine | Psychotic disorders | ₹10-20 per injection dose |
| Risperidone | Psychotic disorders | ₹5-15 per tablet |
| Chlorpromazine | Psychotic disorders | ₹2-5 per tablet |
| Amitriptyline | Depressive disorders | ₹2-10 per tablet |
| Fluoxetine | Depressive & obsessive-compulsive disorders (OCD) | ₹5-15 per capsule |
| Escitalopram | Depressive disorders | ₹10-30 per tablet |
| Lithium carbonate | Bipolar disorders | ₹10-30 per tablet |
| Sodium valproate | Bipolar disorders | ₹5-20 per tablet |
| Carbamazepine | Bipolar disorders, seizures | ₹5-20 per tablet |
| Clonazepam | Anxiety, sleep disorders | ₹5-15 per tablet |
| Zolpidem | Sleep disorders | ₹8-20 per tablet |
| Clomipramine | OCD, panic disorder | ₹10-30 per capsule |
| Buprenorphine | Substance use disorders | ₹30-80 per sublingual tablet |
| Buprenorphine + Naloxone | Substance use disorders | ₹50-150 per sublingual tablet |
| Nicotine gum | Nicotine dependence | ₹3-10 per gum piece |

[1]

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[1] These resources were synthesised using the AI tool- Perplexity. Free version (2025) [Large language model]. "Mental health drugs listed in India's National List of Essential Medicines and general market prices", Retrieved on November 3, 2025, https://www.perplexity.ai/search/mental-health-drugs-listed-in-qtI12WgYRmecHM0h4POVhA

[2]

Consequently, inefficiencies in DSCM such as poor demand forecasting, delayed procurement cycles, inadequate warehouse infrastructure, and fragmented last-mile distribution networks, exacerbate the inaccessibility of mental health treatments, particularly in rural and underserved areas of India.

In addition, the uneven quality assurance across states poses risks, as weak oversight in one state can allow substandard medicines to circulate widely through interstate trades. While India possesses a strong pharmaceutical sector, its DSCM with these systemic gaps must be addressed through effective planning and streamlined implementation.

In this context, the report further examines the overall DSCM system in India, along with specific policies and programmes that shape DSCM broadly and for mental health drugs in particular.

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[2] These resources were synthesised using the AI tool- Perplexity, Free version (2025) [Large language model] "Major Indian Manufacturers of Mental Health Drugs listed in NLEM", Retrieved on November 3, 2025, from https://www.perplexity.ai/search/major-indian-manufacturers-of-ifo22Mf6Swijea3by2W3Ag

## CHAPTER 3

# OVERVIEW OF PROGRAMMES AND INNOVATIONS IN PUBLIC HEALTH SUPPLY CHAIN MANAGEMENT IN INDIA

Understanding the overall structure of the public health supply chain in India is essential before looking into the specific mechanisms governing mental health DSCM. This chapter provides an overview of the key programmes, schemes, and innovations that define India's public health supply chain landscape. It examines how various national and state-level initiatives such as the Jan Aushadhi Scheme, e-Aushadhi, and supply chain models implemented in Tamil Nadu, Kerala, and Rajasthan, have contributed to improving the availability, affordability, and quality of essential medicines. The chapter further outlines supply chain mechanisms for non-communicable diseases (NCDs) and tuberculosis (TB) in the public health sector of India, highlighting their operational features and integration with the broader public health system. Together, these examples illustrate India's approach to improving the availability of quality medicines, consumables, and surgical items at affordable prices for all and reducing out-of-pocket expenditure. The chapter also discusses major challenges in ensuring effective enforcement of drug safety regulations in India in light of the recent cough syrup tragedy.

### 3.1.    Generic medicines and the Jan Aushadhi scheme (JAS)

Generics are the medicines that are not branded but are proven to be bioequivalent to the branded medicines and must show similarity with their reference drug in terms of dosage form, strength, and route of administration.[46] Generic medicines constitute a significant share of the Indian pharmaceutical market, however many healthcare providers perceive their quality to be inferior compared to their branded counterparts, despite such similarity.[47] The confidence and habit of generic prescribing need to be inculcated into our medical fraternity by providing the information and education particularly in the areas of bioequivalence and regulatory aspects, and dispelling myths, fears, doubts, or false ideas about generic medicines.[48]

Jan Aushadhi Scheme (JAS) is a public healthcare initiative launched by the Government of India in 2008 and revamped in 2015 for providing affordable and quality medicines to the masses, particularly in the underserved and economically disadvantaged areas. The scheme is implemented by a society registered under the Societies Registration Act, namely, the Pharma and Medical Bureau of India. It comprises 2047 medicines and 300 surgical items. While the scheme primarily focuses on generic medicines for a wide range of medical conditions, it has proven to be an innovative model for the supply chain of mental health medicines as well.[46]

The Jan Aushadhi centres are placed across India to maximise accessibility of affordable generic medicines. Although availability varies across states, the model demonstrates the feasibility of public-private mechanisms for improving access to mental health medicines.[49] The overall percentage price difference between the mean price of

branded medicine and the Jan Aushadhi medicine was + 252% for antipsychotics, indicating that the mean branded price was 252% (2.52 times) the Jan Aushadhi price.[31]

### 3.1.1. Key features of the Jan Aushadhi Scheme [31, 50, 51]

- **Wide distribution network**

As of early 2025, 15,057 Jan Aushadhi Kendras/ centres are operational covering every district in the country, including remote and aspirational areas, thus ensuring widespread geographical reach.[52] Indian government aims to further expand the network to 20,000 centres by the end of 2025 and 27,000 by 2027. These centres provide both- general and mental health medicines to the public.

- **Government-subsidised drug prices**

Under the JAS, the medicines are sold at a significantly lower price than their branded counterparts. For example, the antidepressants, antipsychotics, and other mental health medicines are made available at prices much lower than those found in the market. This subsidy makes mental health care more affordable and accessible, particularly for those from economically disadvantaged backgrounds.

- **Generic medicines**

The JAS focuses on providing high-quality generic medicines that are bioequivalent to the branded medicines. These generics include mental health medicines such as fluoxetine (for depression), clozapine (for schizophrenia), and valproate (for bipolar disorder). The goal is to ensure that patients receive effective treatment without the high cost typically associated with branded versions.

- **Quality control and regulation**

Medicines provided under the JAS are sourced from government-approved manufacturing units that follow the strict quality control standards. The central agency coordinating this procurement is the Bureau of Pharma Public Sector Undertakings of India (BPPI), which oversees the purchase, quality control, distribution, and marketing of generic medicines through the Jan Aushadhi Centres across the country.[53] The medicines undergo rigorous testing to ensure their efficacy and safety, making them a reliable option for patients needing mental health care.

### 3.1.2. Advantages of the Jan Aushadhi Scheme [51, 54, 55]

- Cost reduction: Generic medicines supplied through Jan Aushadhi Centres are typically priced 50–90% lower than branded equivalents, reducing out-of-pocket expenditure for patients
- Improved access in underserved regions: The rapid expansion of Jan Aushadhi Centres has increased the availability of essential medicines, especially in rural and other marginalised areas

- Quality assurance: All medicines are procured from WHO-GMP–certified manufacturers and tested in National Accreditation Board for Testing and Calibration Laboratories (NABL)-accredited laboratories, ensuring quality, safety, and efficacy
- Support for UHC: By improving availability and affordability, the scheme aligns with national objectives of reducing household expenditure and achieving UHC

### 3.1.3. Challenges of the Jan Aushadhi Scheme [51],[56],[57]

- Low public and provider awareness: Limited awareness of the scheme and persistent misconceptions about generic drug quality
- Supply-chain inconsistencies: Incidences of stock-outs and irregular availability of key medicines
- Uneven geographical coverage: Inconsistent expansion and operational performance across states, contributing to inequitable access
- Limited pharmacovigilance visibility: Weak post-marketing surveillance reduces transparency regarding product quality and safety outcomes

The JAS has demonstrated potential in expanding access to affordable, quality-assured medicines across the country. To build on these promising features, further action is needed to strengthen awareness among prescribers and patients, enhance digital supply-chain systems to reduce stock shortages, and reinforce regulatory oversight through routine quality testing and post-marketing surveillance. Strategic expansion of Jan Aushadhi Kendras in rural and remote areas can improve its coverage. Additionally, establishing standardised monitoring and evaluation frameworks will support evidence-based decision-making and help the scheme contribute more effectively to lowering out-of-pocket expenditure and ensuring equitable access to essential medicines nationwide.

### 3.2. The e-Aushadhi system in India

The e-Aushadhi is a comprehensive web-based software solution for managing the annual demand, purchase, inventory and distribution of various drugs and consumables in India. It is modelled on the unique combination of the administration-centric and pharmacy staff centric paradigm with the main objective of providing benefits to healthcare providers and patients. It is used both for centrally procured supplies and for many state procurement processes, though adoption varies. It aims to streamline the procurement, storage, and distribution of medicines and surgical supplies to public health facilities. It includes centralised inventory control, real-time data reporting, demand forecasting, and efficient stock management- ensuring equitable access to quality medicines. The e-Aushadhi operates as a modular system with features such as- indent generation, drug locator and tracking, a multilingual user interface, barcoding and real-time dashboards, mobile access and short message service (SMS) alerts, and integration with the Hospital Information Management System (HIMS), Drug and Vaccine Distribution Management System (DVDMS), and Jan Aushadhi platforms.[58],[59] However, the e-Aushadhi's role in mental health DSCM has not been systematically documented.

### 3.2.1. Advantages of the e-Aushadhi system [58, 59, 60, 61]

- Transparency and accountability: The e-Aushadhi provides a real-time visibility of drug inventories and ensures timely procurement and drug distribution.

- Improved quality control: The eAushadhi integrates quality assurance processes, allowing for quick identification and stopping of distribution for any substandard drugs, ensuring only quality-approved medicines are dispensed.

- Improved drug access: It enhances the availability of essential medicines across government facilities by streamlining and automating the drug supply chain, which particularly in the underserved areas reduces the out-of-pocket expenditure.

- Operational efficiency: By digitising procurement and distribution, the system reduces the manual errors and time consumption, accelerates supply chains, and improves documentation.

- Scalability and impact: It is implemented in over 23 states and union territories and is positioned to play a crucial role in India's broader digital health ecosystem, including the National Digital Health Mission.

### 3.2.2. Bottlenecks and challenges of the e-Aushadhi system [60, 61, 62]

- Infrastructure deficiencies: The inadequate internet connectivity, frequent electricity outages, and limitations in hardware at the primary healthcare levels affect the system usage.

- Shortages of human resources (HR): Pharmacists prefer to use the traditional manual method of stock-book maintenance and consider electronic stock maintenance as an additional burden. There is a lack of dedicated and trained personnel for data entry, inventory management, and troubleshooting.

- Limited real-time usage: Several facilities still use the offline workflows, causing delays and data discrepancies.

- Interdepartmental coordination gaps: The weak linkages between warehouses, procurement departments, and facility-level users slow down the processes.

- Policy and monitoring gaps: The absence of uniform implementation guidelines and weak performance monitoring across states lead to gaps in seamless functioning.

The e-Aushadhi system provides a foundational digital infrastructure for strengthening the health supply chains within the Indian public health sector. Despite its progress there are gaps in terms of a shortage of trained and dedicated staff, lack of proper infrastructure, incomplete adoption of barcoding and digital signatures, and absence of dedicated internet connectivity. The success of this programme depends on the sustained investments in infrastructure, training, system improvement, and policy-level coordination. For scaling this model across the country and utilising the full potential of this digital health initiative, there is a need for ongoing training, clear implementation guidelines for public health facilities, and awareness campaigns to inform the public about their right to free medicines. [60, 61]

### 3.3. Initiatives for strengthening public health supply chain management in India

### 3.3.1. Reimagining public health supply chains across nine Indian States- Ministry of Health and Family Welfare, together with the Gates Foundation and PATH [63] (Figure 1)

To address gaps in public health supply chain management—including stockouts, expiry, and process inefficiencies that compromise last-mile delivery—the Ministry of Health and Family Welfare, in collaboration with the Gates Foundation and PATH, is overhauling public health supply chains across nine Indian states.

The initiative began with a comprehensive "as-is" assessment, which identified unreliable forecasting, inconsistent warehouse practices, poor data quality, disrupted distribution mechanisms, and workforce capacity gaps. Based on these findings, state-specific roadmaps were developed in partnership with the National Health Systems Resource Centre (NHSRC) and state health authorities. PATH provides tailored technical assistance for implementation, focusing on five priority areas:

- Digitising for precision- Transforming the Drug and Vaccine Distribution Management System (DVDMS) into a proactive, data-driven platform with integrated forecasting and auto-indenting, and expanding its reach to sub-health centres and Ayushman Arogya Mandirs via a new mobile application

- Ensuring timely drug access- Streamlining and stabilising distribution through fixed schedules, optimised delivery routes, and engagement with third-party logistics providers

- Smart warehousing- Establishing model warehouses, standardising storage practices, and deploying a Warehouse Management Information System (WMIS) for faster, more reliable operations

- Empowering workforce- Strengthening state and district-level SCM capacity through hands-on training, standard operating procedures (SOP)s, toolkits, and reference guides, alongside efforts to institutionalise expertise through dedicated SCM teams and Centres of Excellence

- Public-private partnership- Leveraging partnerships, including Tata 1mg for technology-driven efficiencies and Centre for Development of Advanced Computing (C-DAC) for seamless integration into DVDMS, enabling scalability and long-term sustainability

Figure 1- Achievements of PATH, Gates Foundation and MoHFW initiative- April 2025



Infographic: PATH.

### 3.3.2. Exemplars of promising public health supply chain practices- Tamil Nadu, Kerala and Rajasthan [23, 24, 64, 65, 66, 67, 68, 69]

Some states in India have established government-owned agencies to streamline procurement, distribution, and management of medicines, medical equipment, and healthcare supplies for public health institutions. They operate under respective state health departments, and play a key role in ensuring drug quality, transparency, and cost-effectiveness- **Table 2**.

Table 2- Exemplars of promising public health supply chain practices - Tamil Nadu, Kerala and Rajasthan

| Key points | Tamil Nadu Medical Services Corporation Ltd | Kerala Medical Services Corporation Ltd | Rajasthan Medical Services Corporation Ltd |
|---|---|---|---|
| **Established in** | 1994 (operational from 1995) | 2007 | 2011 |
| **Key features** | • First state-level autonomous corporation in India dedicated to streamlined procurement, quality testing, storage, and distribution of essential medicines, surgical items, and medical equipment for government health facilities<br>• Introduced competitive tendering, mandatory batch testing through NABL-accredited labs, and district-level warehousing backed by a computerised inventory management system | • Manages streamlined procurement and distribution of drugs, equipment, and medical supplies across all government health facilities in Kerala<br>• Operates through competitive tendering, GMP - certified suppliers, and a two-tier warehousing system<br>• Uses an e-procurement and inventory management system for real-time monitoring and forecasting. | • Established in response to a state government initiative to provide commonly used essential medicines free of cost to all patients visiting government health facilities<br>• Functions as the central procurement, testing, and distribution agency in Rajasthan<br>• Supported by the eAushadhi platform ensures end-to-end tracking of drug stocks, automated requisitioning, and state-level competitive bidding<br>• All batches undergo mandatory lab testing of all batches<br>• Blacklisting of non-compliant suppliers |
| **Strengths** | • Transparent procurement<br>• Prompt supplier payments<br>• Reliable drug availability across facilities | • High transparency<br>• Efficient logistics<br>• Strong focus on quality and rational drug use | • Provision of strong information technology (IT)-enabled transparency and stock visibility through eAushadhi<br>• Strong quality control through active enforcement mechanisms |
| **Risks** | • Forecasting accuracy depends on data quality<br>• Occasional tender delays and last-mile logistics issues | • Occasional procurement delays due to complex administrative processes and dependence on supplier performance | • Logistical challenges in reaching remote areas and administrative delays in procurement cycles |
| **Lessons** | This efficient, transparent model became a national benchmark, influencing similar corporations across India | Integration of digital systems with transparent procurement practices improved access and accountability, aligning closely with Tamil Nadu's best practices | Rajasthan's combination of a robust IT system and a centralised procurement agency has improved accountability and transparency, though last-mile supply chain efficiency remains a focus area. |

### 3.3.3 A case example of Maharashtra- Availability of drugs, medicines, equipment, and other consumables – 2024[70]

For Haffkine Bio-Pharmaceutical Corporation Limited is a Government of Maharashtra (GoM) undertaking responsible for vaccine production, procurement, and adverse event monitoring, playing a role in pharmaceutical supply in the state. Another dedicated body to streamline procurement of medical goods for public health institutions- the Maharashtra Medical Goods Procurement Authority (MMGPA)- was established in 2023. This authority has recently started implementing transparent procurement processes, including e-tenders for medical equipment and essential medicines for the financial year 2025-26.

This section presents key points from a performance audit report titled 'Public Health Infrastructure and Management of Health Services in Maharashtra' which was prepared for submission to the Governor of Maharashtra (2024) under Article 151 of the Constitution of India. This performance audit was conducted to assess the availability of the HR, medicines and equipment besides the adequacy and quality of healthcare infrastructure in the State. It also assessed a) funding and expenditure under the central and centrally sponsored health sector schemes, b) adequacy and effectiveness of regulatory mechanisms, and c) improvement in the health and well-being of people as per SDG-3. This audit was conducted for the period 2016-17 to 2021-22 through a test-check of records at the public health department (PHD) and medical education drug department (MEDD). It was in conformity with the 'Auditing Standards' issued by the Comptroller and Auditor General of India.[71]

Based on this report, **Table 3** presents an overview of the key points related to the availability of medicines, medical supplies, equipment, and other essential consumables in public health facilities across Maharashtra.

## Table 3- Availability of drugs, medicines, equipment, and other consumables- Maharashtra- Key points*

| Key audit points | Standards expected | Observations during the audit |
|---|---|---|
| Procurement process | • Adoption of a centralised procurement system in July 2017 through an established independent procurement cell under Haffkine Bio-Pharmaceutical Corporation Limited (HBPCL) by the GoM<br>• Local bodies in the state (urban and rural, such as municipal corporations) could procure either through HBPCL or via their own systems, following internal procedures for demand estimation, tendering, supplier selection, and budget management.<br>• The PHD used the e-Aushadhi, a web-based supply chain management system for procurement and inventory management of medicines and consumables.<br>• The procurement cell, HBPCL, used the e-Tendering system, a web-based system of the GoM. | • Deficiencies in finalisation of tenders in the centralised procurement system<br>• Need to streamline HBPCL's procurement process to ensure timely supply of medicines and equipment to health care institutions (HCIs) |
| Purchase of medicines | • Annual demand of respective HCIs consolidated by PHD and MEDD and submitted to administrative departments for approval<br>• Budget allocation- 90% to HBPPL and 10% to local HCIs<br>• Seventy-one percent of items demanded by test-checked HCIs were not supplied by HBPPL from 2017 to 2022<br>• GoM consultant to prepare an SOP for procurement procedure | Instances of delays in finalisation of rate contracts resulting in local purchase of medicines by HCIs |
| Availability of essential medicines | • Decisions about which medicines are essential remain a national responsibility based on the country's disease burden, priority health concerns, affordability concerns, etc.- NLEM 2015-376 medicines are listed for 30 therapeutic uses.<br>• The Commissioner of Health Services, Maharashtra's list has 198 types of medicines for different therapeutic uses- of which 88 and 70 types of medicines were marked as vital drugs for- tertiary and secondary level hospitals; and Primary Health Centres (PHCs)-respectively, in the e-Aushadhi. | A shortfall of 42% in availability of vital medicines in audited HCIs |
| Storage of drugs and medicines | • As per the Indian Public Health Standard (IPHS), medicines and consumables should be stored in a dedicated area with adequate space, proper lighting, ventilation, pest control, and a cool, dry, and safe environment.<br>• Temperature- To be stored at 68–77°F (20–25°C) for most medicines; humidity controls are recommended as elevated humidity can accelerate degradation and chemical changes.[72]<br>• Near-expiry drugs should be segregated and stored separately. | Improper storage observed under staircases and in corridors due to space shortage, with poor labelling, no temperature charts on freezers, and no separate area for expired drugs. |
| Quality control | • Different mechanisms of quality control in the public health department and medical education drug department<br>• In PHD- After the supply of medicines to indenting HCIs, the concerned officer should get the drug samples (random) tested from a government- approved laboratory. As per the order, laboratories should furnish test reports within 10 days from the receipt of the samples in the case of tablets, capsules, powder/liquid oral preparations, and consumables, and within 21 days from the receipt of the sample in the case of intravenous (IV) fluids and injectable surgical drugs. | • Delay in delivery of analysis report- 17% test reports received after the stipulated time<br>• No independent testing following in MEDD<br>• Recommendation to establish a standard quality control system to ensure supply of quality medicines. |

*Based On Performance Audit Report Of The Comptroller And Auditor General Of India On Public Health Infrastructure And Management Of Health Services In Maharashtra) [https://cag.gov.in/en/audit-report/details/121279] [71]*

It is important to recognise that not all states face the same level of difficulty. The States like Kerala, Tamil Nadu and Rajasthan demonstrate that systemic public health supply chain challenges can be effectively addressed through institutional reforms. Highlighting these positive examples offers a roadmap for Maharashtra and other states in India in terms of –

- Having a responsible and efficient procurement agency to enable evidence-based, transparent, and timely procurement
- Implementing real-time monitoring and demand-based forecasting via eAushadhi
- Applying standardised, time-bound quality checks and blacklisting non-compliant suppliers
- Upgrading warehouse infrastructure and storage to meet the IPHS norms
- Streamlining financial flows to prevent payment delays

## 3.4    Drug supply chain management for other disease conditions in the Indian public sector

The following section presents supply chain management mechanisms for NCDs and TB in India. It aims at giving an overview of key mechanisms and major challenges.

### 3.4.1    Drug supply chain management for non-communicable diseases [34, 73, 74, 75, 76, 77, 78, 79]

The DSCM for NCDs in India operates through a multi-tiered system combining a national programme, state-level procurement agencies, and public generic retail outlets. Most states procure essential NCD medicines through autonomous medical services corporations such as the Tamil Nadu Medical Services Corporation, Kerala Medical Services Corporation Limited, and Rajasthan Medical Services Corporation. These agencies use centralised or hybrid pooled procurement models to achieve economies of scale, transparent bidding, and standardised quality assurance. States like Maharashtra have formalised this process under the Maharashtra Medical Goods Procurement Authority Act, 2023 to professionalise and improve efficiency.

**Key mechanisms of NCD related supply chain management [73, 74, 75, 76, 77, 78, 79]**

- Programmatic procurement under the National Programme for Prevention and Control of Non-Communicable Diseases (NP-NCD) – The NP-NCD allocates funds for essential NCD drugs and consumables through state and district health societies. Drug and logistics supply is a key strategic component—each facility is required to maintain adequate stock, provide at least a one-month supply to patients, and build buffer inventories based on patient load. Stable patients may receive up to three months of medicines to ensure continuity of care.
- Public generic retail mechanism- The JAS expands access to affordable generics, including anti-hypertensive and anti-diabetic drugs, through over 15,057 Jan Aushadhi Kendras nationwide. This complements facility-based supply and provides an alternative access point for patients outside government facilities.
- Digital and logistical advancement- The National NCD Portal integrates patient management, screening,

and drug tracking across facilities. States have adopted IT-enabled supply chain systems such as e-Aushadhi to improve transparency, stock visibility, and forecasting, which are critical to prevent stockouts.

Text box 3 - Challenges and strategic improvements needed in drug supply chain management of drugs for non-communicable diseases

**Major Challenges**

- Procurement models vary across states: centralised in Tamil Nadu and Rajasthan, mixed in Maharashtra and Uttar Pradesh, causing disparities in medicine availability and pricing.

- Frequent stockouts of NCD medicines, particularly in rural areas, disrupt treatment; anti-cancer and endocrine drugs are available in under 30% of public facilities in some states.

- Limited government facility access and quality concerns push patients to private sector, increasing out-of-pocket costs.

- Poor quality assurance and inconsistent procurement adherence affect drug quality.

- District-level logistics and procurement are often managed by undertrained staff; budget constraints and delayed funding worsen supply reliability.

**Strategic Improvements**

- Adopt pooled procurement using National Cancer Grid and state models to consolidate demand and improve price and quality efficiency.

- Expand IT-enabled inventory systems (e-Aushadhi/LMIS) linked with NCD registries for real-time stock visibility and forecasting.

- Establish statutory procurement authorities in all states to enhance governance and transparency.

- Integrate JAS outlets with public supply to boost last-mile access.

- Invest in structured training and supervision for district-level procurement and logistics staff.

- Increase funding for NCD drugs, ensuring multi-year contracts and buffer stocks for sustained availability.

### 3.4.2    Drug supply chain management for tuberculosis [79, 80, 81]

The DSCM for TB medicines in the Indian public health sector involves a highly centralised and multi-layered process. It primarily operates as a vertical model aimed at ensuring uninterrupted access to quality anti-TB drugs.

**Typical characteristics of the TB supply chain as a vertical model**

- Centralised procurement and distribution- top-down approach by the Central TB Division (CTD) and national agencies, with defined roles at each level—national, state, district, and facility

- Drugs flow from central warehouses through state stores to districts and lower levels- through strict programme protocols rather than integration with broader drug supply networks.

- Digital platforms for tracking (e.g., Nikshay-Aushadhi) and standardised logistics- support centralised control and consistency across all regions but often with less local flexibility.

**Key mechanisms of TB supply chain management** [80, 81, 82, 83, 84]

The CTD under the MoHFW oversees procurement and DSCM of TB medicines. All TB medicines are procured centrally, primarily through the Central Medical Services Society and the Global Drug Facility. Demand forecasting, procurement, distribution (from central through state and district drug stores, then to health facilities), and tracking occur through platforms like the web-based Nikshay-Aushadhi portal. Drugs are dispensed in monthly packs tailored to each patient's regimen and resistance profile. Distribution follows set logistics protocols from central warehouses to state, district, and TB unit stores, often with third-party logistics support. All levels track inventory to ensure stock adequacy and drug quality.

Text box 4 - Challenges and strategic improvements needed in drug supply chain management of drugs for tuberculosis

| **Major Challenges** | **Strategic Improvements** |
|---|---|
| • Frequent stock-outs—especially of DR TB medicines—disrupt treatment and force health facilities to ration supplies, leaving many patients without doses for extended periods. <br><br> • Poor digital use, weak inventory systems, and coordination gaps worsen these disruptions <br><br> • Centralisd supply and logistical barriers limit timely access in remote areas; while sudden demand surges, funding delays, and regulatory hurdles often trigger emergency | • Recommendations include better coordination, strengthening data-driven stock management, robust training for logistics personnel, and more decentralised planning to mitigate interruptions. <br><br> • Programmes also call for expanded use of e-portals, real-time inventory tracking, and policy agility for emergency response to supply disruptions. |

This vertical approach is designed for programmatic control and streamlined accountability, but it can create challenges in responsiveness and integration compared to more decentralised or "horizontal" supply systems.

Overall, while India's TB drug supply chain is built around strong central mechanisms and digital platforms, persistent gaps require coordinated reforms to eliminate stock-outs and ensure reliable access for every patient. India's supply chain mechanisms for NCDs and tuberculosis demonstrate two distinct yet complementary models within the public health system- a decentralised approach for NCDs emphasising integration, digitalisation, and patient continuity of care, and a vertically structured, centrally managed model for tuberculosis ensuring programmatic control and quality assurance. While both systems have shown progress in improving access to medicines, challenges continue in coordination and last-mile delivery. It is important to strengthen the linkages between different disease programmes and improve the integration of digital data systems. Building capacity at all

levels of the supply chain is also crucial. These steps will help ensure uninterrupted access to essential medicines and promote equitable public health outcomes.

## 3.5    Drug safety: Current regulations and challenges in India [85, 86, 87, 88, 89]

Drug safety is a key component of an effective and reliable public health supply chain in India. Ensuring that medicines are safe, efficacious, and of assured quality is essential not only for patient well-being but also for maintaining public trust in the health system. In a country where most of the population depend on publicly supplied medicines, failures in drug safety can have multiple consequences such as therapeutic failure, adverse drug reactions, antimicrobial resistance, or even preventable deaths. The following sections discuss the major challenges in ensuring effective enforcement of drug safety regulations in India in light of the recent cough syrup tragedy.

India is facing an acute shortage of drug inspector, severely undermining the country's capacity to ensure drug quality and regulatory compliance across its vast pharmaceutical industry. The country currently has around 10,500 manufacturing plants but only 1,467 active drug inspectors. This shortage means each inspector supervises hundreds of manufacturing units, far exceeding international norms, such as the United States (US) (Food and Drug Administration) FDA's ratio of one inspector for about 25 facilities. In Maharashtra, only 46 inspectors cover more than 200 sanctioned posts, leaving over 150 vacancies. This has drastically reduced testing frequency, with only 3,000 samples analysed annually against a target of 10,000, thereby allowing substandard medicines to infiltrate the market. Delays in recruitment, court litigations, administrative inefficiencies and limited career progression are considered to be the main causes of persistent vacancies in these posts.

These staffing gaps have led to weak enforcement of GMP and infrequent post-marketing surveillance, resulting in recurring drug quality failures. The Indian Medical Association has noted that this shortage of inspectors and controllers creates conditions under which spurious and substandard generic drugs can circulate freely. The Narcotic Drugs and Psychotropic Substances Act (NDPS) and Drugs and Cosmetics Acts are expected to operate jointly—the former governing control and misuse prevention, the latter ensuring therapeutic availability under safety. However this Act lacks clear provisions for workforce planning, inspection frequency, and coordination between central and state authorities.

In response, the Ministry of Health recently announced 49 new inspector recruitment positions for CDSCO to partially address the national shortfall. However, industry experts and retired regulators argue that the hiring pace is far too slow to match the rapid expansion of India's pharma manufacturing base.

The persistent shortage of drug inspectors in India directly compromises drug quality assurance, as evidenced by repeated lapses like the 2025 cough syrup contamination deaths- **Text box 5**. The regulatory actions have reshaped the cough syrup industry landscape of Tamil Nadu due to safety concerns. However, the approach to

drug safety and regulation has been criticised for being reactive and crisis-driven—rather than pursuing systemic, sustainable reform. This underscores the same pattern, where regulatory responses such as emergency inspections, temporary bans and ad-hoc crackdowns; are triggered post-tragedy rather than embedded in long-term capacity strengthening.

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**Text box 5 - Cough syrups and questions???** [90, 91, 92, 93]

The latest cough syrup quality issues have centred on reports of deadly contamination in India, particularly involving a cough syrup called Coldrif, which has resulted in child fatalities across several states in late 2025. The contamination is primarily attributed to the substitution or adulteration of pharmaceutical-grade solvents with cheaper, industrial-grade chemicals, as well as lapses in quality control, contamination at the manufacturing stage, and inadequate regulatory oversight. These ongoing events highlight persistent risks in the medicine supply chain, especially the vulnerability to toxic excipients when quality and regulatory systems are weak or circumvented.

| Questionable procurement? | Negligent production? | Lack of quality checks? | Untrained human resources? | Regulatory gaps? | Weak legal enforcement? | No accountability? | Poor drug literacy? |
|---|---|---|---|---|---|---|---|

Following the latest incidents, additional national advisories and joint inspections have been mandated for risk-prone drugs like paediatric cough syrups, and licensing requirements for manufacturing and distribution are under renewed scrutiny across state lines. In 2022, the Indian government tightened the rules for exporters of cough syrups. However, for domestic sales of the medicine, no such rule was imposed, indicating a deeper systemic problem.

</div>

Furthermore, without filling vacancies and strengthening laboratory capacity, both CDSCO and state drug authorities will continue to struggle with inadequate regulation, risking public health and safety and India's export credibility and reputation in global markets.

Recently, the Central Government of India is in the advanced stages of framing a comprehensive Drugs, Medical Devices and Cosmetics Act, 2025, which is intended to replace the colonial-era Drugs and Cosmetics Act of 1940. This Act is expected to ensure accountability and transparency at every stage of the supply chains and transform the fragmented and reactive drug regulatory framework into a digitised, risk-based, and harmonised system designed to uphold national and global pharmaceutical credibility.[94]

Additionally to address the gaps in quality assurance and regulatory enforcement, India has recently proposed an independent audit and benchmarking of its drug regulatory system by the WHO. This audit is worldwide treated as a gold standard for medicine quality and is often used in global tenders to purchase drugs. It aims to strengthen regulatory oversight and restore confidence in India's position as the 'pharmacy of the world'. It will evaluate key regulatory functions such as inspections, approvals, and post-marketing surveillance using a maturity framework on a scale of 1 to 4. This audit is expected to identify systemic gaps, inform regulatory reforms, and enhance transparency, with important implications for public health protection.[95]

Despite these efforts/ advancement, persistent challenges remain. Variation in implementation across states, periodic stockouts of essential medicines, and uneven digital infrastructure hamper the achievement of a fully efficient supply chain. Addressing these issues requires a holistic framework that integrates procurement, distribution, and monitoring under a unified governance structure.

## CHAPTER 4

## INDIAN POLICIES, PROGRAMMES AND MENTAL HEALTH DRUG SUPPLY CHAIN MANAGEMENT

Policy and regulatory frameworks are key to the availability, accessibility and distribution of essential psychotropic medicines within a health system.[96, 97] Here are the components and benefits of a strong framework:

1.  Consistent availability: Sound strategies ensure a steady supply of essential medicines in rural and urban health facilities

2.  Affordability: Price control mechanisms make medicines accessible to those in need

3.  Accessibility: Well-knit distribution networks can cover primary, secondary, and tertiary healthcare facilities

4.  Quality assurance: Strategies and checks maintain the safety and efficacy of medicines

5.  Legal protection: Clearly defined legal rights facilitate access to treatment

India's public health system operates through a decentralised governance model, wherein both the central and state governments hold distinct yet complementary responsibilities. The central government is responsible for policy formulation, regulatory oversight, and financing of national health programmes.[98] State governments, on the other hand, ensure service delivery, procurement and distribution of medicines, infrastructure development, and human resource management.[99, 100] However, this centralised system faces several challenges, particularly in mental health service delivery including shortages of HR, variable implementation at national and district level programmes, under-funding,[101] urban-rural disparities, and implementation gaps.[102]

This chapter presents:

a)  A snapshot of existing policies and frameworks influencing mental health DSCM in India, specifically Maharashtra

b)  Mental health medicines in India

c)  An analysis of gaps in mental health DSCM implementation in India

d)  The impact of JAS on mental health DSCM

### 4.1. Existing policies and frameworks

**Table 4** presents key national and state policies, laws and frameworks that govern or influence mental health DSCM in India (specifically Maharashtra).

Table 4- India and Maharashtra- policies, acts, frameworks and key documents for mental health-related drug supply chain management (DSCM)

| Governing documents | | Details | Relevance/provisions related to mental health DSCM | Implementation status/impact/ challenges |
|---|---|---|---|---|
| National policy frameworks | National Mental Health Policy, (India) 2014 | Aims to promote mental health, prevent mental illness, and ensure universal access to mental health care | ▪ Ensure availability of essential psychotropic medicines at all public health facilities<br>▪ Integrate mental health into primary healthcare services under the National Health Mission (NHM) | • Limited budget allocations (mental health receives 1% of India's total health budget)[103]<br>• Medicines often available only at district hospitals, rarely at primary health centre (PHC)/community health centre (CHC) levels[104]<br>• Lack of /inadequate training for PHC/CHC level non-mental healthcare providers on delivering primary mental health care |
| | Mental Healthcare Act, India, 2017 | Recognises mental healthcare as a right | • Section 18(4): Right to access psychotropic medicines free of cost at government health facilities<br>• Section 19: Provisions for community-based mental health services | • Has provided a strong legal foundation<br>• However, slow alignment of states towards service delivery and procurement systems |
| | National Health Policy, India, 2017 | Broader focus: UHC, with mental health as a component | • Strengthening the Free Drugs Service Initiative<br>• Ensuring availability of the essential medicines (including for mental illnesses) at public facilities | • Mental health drugs often not prioritised during drug forecasting and tendering processes |
| Drugs and Cosmetics Act and Rules | Drugs and Cosmetics Act, 1940 and Rules (1945) | Mental health medicines are legally anchored in this Act. Ensures that all drugs manufactured, sold, or distributed in India maintain specified standards of quality, safety, and efficacy[88, 105] | • Sections 18–27, mental health drugs (antidepressants, antipsychotics, and anxiolytics) can only be manufactured or sold under a valid license, with periodic state inspection.[106]<br>• Governs control and prevents misuse of drugs[107]<br>• Schedule H and X drugs can be dispensed only on a doctor's prescription, and pharmacies must maintain usage records<br>• Regulation of mental health drugs through licensing at multiple nodes | • Lack of clear provisions for workforce planning, inspection frequency, and coordination between central and state authorities[89] Persistent gaps in monitoring, inspection, and enforcement related to the quality, distribution, and pricing of psychotropic and psychiatric medications, particularly at the regional level |

| Governing documents | | Details | Relevance/provisions related to mental health DSCM | Implementation status/impact/ challenges |
|---|---|---|---|---|
| Narcotic Drugs and Psychotropic Substances (NDPS) Act, 1985 | NDPS Act 1985 complements the Drugs and Cosmetics Act | Specifically regulates psychotropic substances due to their potential for abuse | • Operates jointly with the Drugs and Cosmetics Act to ensure therapeutic availability | • The law has created a robust enforcement framework, it has often overlooked the socio-economic, public health, and rehabilitative dimensions of drug abuse[108] |
| Essential Medicine Frameworks | National List of Essential Medicines (NLEM), India(2022) updated in 2025 | Lists key psychotropic drugs such as fluoxetine, diazepam, risperidone, and haloperidol | • States encouraged to base their procurement lists on the NLEM | • Many newer, safer mental health drugs (e.g., newer-generation antidepressants) are not included, limiting therapeutic options[43, 44, 45] |
| | Drug Price Control Order, 2013 | Order by NPPA, India-monitoring prices of scheduled and non-scheduled drugs | • Price control over essential psychotropic drugs | • Ensures affordability but discourages pharmaceutical companies from manufacturing low-margin psychotropics, causing supply chain instability[33] |
| National Programmatic Frameworks | National Mental Health Programme (NMHP),1982 | Components-District Mental Health Programme (DMHP) and tertiary care institutions | • Provide mental health services at the primary care level<br>• Ensure drug availability through decentralised supply | • DMHP operational in 738 districts (2022), but drug stockouts remain frequent[109] |
| District Programmatic Framework | DMHP (launched in 1996, currently continues to be implemented based on the guidelines issued in 2015 under the 12th Five-Year Plan) | Added to NMHP in 1996 decentralisation of mental health services and their integration with the general healthcare system | • Provision of essential psychotropic drugs at district hospitals and selected PHCs/CHCs<br>• Staff training on mental health diagnosis and drug use | • Drugs often unavailable at PHCs<br>• Funding irregularities impact medicine procurement<br>• Earlier funded through the NHM's flexi pool for non-communicable diseases. In the 2025-26 budget estimates, this component is not listed separately, indicating a likely merger with flexi pools for reproductive and child health, and health system strengthening[103] |
| | | Redesigning India's DMHP under Niti Ayog's guidance-2025 | • Recommends use of technology-smart supply chain management to ensure availability of drugs | • Psychotropic drug availability –supply chain issues and quality control as one of the limitations of DMHP |

| Governing documents | | Details | Relevance/provisions related to mental health DSCM | Implementation status/impact/ challenges |
|---|---|---|---|---|
| | | | | • Ensuring drug availability-mentioned as a pillar of DMHP 2.0[112] |
| State-specific frameworks- Maharashtra | Maharashtra Mental Health Policy, 2019 (Draft) State Mental Health Programme | • Guidelines for regional mental health hospital<br>• Guidelines for implementing the DMHP and Tele MANAS website | • Emphasises integrating mental health into NHM structures<br>• Plans to expand DMHP to taluka and PHC levels | • Drug procurement for mental health is still lumped with general drug procurement, leading to prioritisation issues[103] |
| | E-Aushadhi - Maharashtra | • Web- based supply chain management application software solution | • Adoption of e-procurement modules<br>• Managing annual demand, purchase, inventory and distribution of various drugs and consumables to distribute drugs to patient [111] | • Variable internet connectivity in rural areas affecting real-time reporting<br>• Fragmented governance and inadequate coordination among the state health department, procurement agencies, and district-level managers leading to stock imbalances[51] |

**14.4 Drug Regulation**- This policy encourages the streamlining of the system of procurement of drugs; a strong and transparent drug purchase policy for bulk procurement of drugs; and facilitating spread of low-cost pharmacy chain such as JAS stores linked with ensuring prescription of generic medicines.

**14.7 Pricing- Drugs, Medical Devices and Equipment:** The regulatory environment around pricing requires a balance between the patients concern for affordability and industry's concern for adequate returns on investment for growth and sustainability. Timely revision of NLEM along with appropriate price control mechanisms for generic drugs shall remain a key strategy for decreasing costs of care for all those patients seeking care in the private sector. An approach on the same lines but suiting specific requirements of the sectors would be considered for price control with regard to a list of essential diagnostics and equipment.

**16 Medical Technologies-** India's role in new drug discovery and drug innovations including bio-pharmaceuticals and bio-similars for its own health priorities is limited. Making available good quality, free essential and generic drugs at public health care facilities is the most effective way for achieving the goal. The free drugs would include all that is needed for comprehensive primary care, including care for chronic illnesses, in the assured set of services.

**17 Public Procurement:** Quality of public procurement and logistics is a major challenge to ensuring access to free drugs and diagnostics through public facilities. An essential pre-requisite is a well-developed public procurement system.

**18 Availability of Drugs and Medical Devices** The policy advocates the need to incentivize local manufacturing to provide customised indigenous products for Indian population in the long run.

**20 Improving Public Sector Capacity for Manufacturing Essential Drugs and Vaccines:** Public sector capacity in manufacture of certain essential drugs is essential and public institutions need more investment, appropriate human resources (HR) policies and governance initiatives to enable them to become comparable with their benchmarks in the developed world.

*All the above points have their implications for improving broader DSCM and mental health DSCM is to be considered as an integral part of this..*

### 4.2. Mental health medicines: Policy considerations in India

The NLEM 2022 for India aligns closely with WHO's Essential Medicines List and includes a comprehensive range of medicines for common as well as severe mental disorders. Most of these medicines are intended to be available at the primary healthcare level, with the exception of clozapine, which is restricted to tertiary care, and lithium, which is designated for use at the secondary and tertiary levels.[40]

However, most mental health drugs available in India were developed more than half-a-century ago, with innovation confined to improving drug tolerability or minimising side effects rather than introducing fundamentally new therapies.[113] Although the recent inclusion of newer psychotropic medicines such as aripiprazole in NLEM 2025 is a positive step, India still has a long way to go in ensuring wider access to newer, safer, and more affordable psychotropic medicines. Like higher-income countries,[116, 117] India should aim not only

for higher alignment with the WHO list but also consider a number of additional medicines to support advanced and specialised care.

**To control prices or not, is the question**

India applies price control to many essential medicines, including those for mental health, setting the ceiling through a market-based formula. This has succeeded in lowering the cost of many psychotropic medicines.[114] [112] However, smaller and low-margin manufacturers are more likely to leave the market [Price controls lead to prices of competing products falling, and sales of price-controlled products declining], which reduces the diversity of generic options. This can paradoxically hurt access for the economically weakest populations.[115]

Price control is a double-edged weapon. On the one hand, it rationalises profits of major pharmaceuticals, making medicines more accessible. On the other, lifting it [such as in the US], results in increased research and development (R&D) expenditure[118]. At any rate, R&D is not guaranteed; it may increase marketing expenses, and yield incremental innovation rather than ground-breaking discoveries.[119]

Considering this duality, India should focus on maintaining affordability; and instead of lowering prices or lifting price control, it should provide incentives or subsidies for genuine innovation.

This is especially required since scientific and systemic challenges plague innovation in psychotropic drug development. The complexity of brain architecture, difficulty in crossing the blood-brain barrier, and absence of definitive biological markers for most mental disorders hinder the discovery of novel therapeutics.[120] In addition, high costs, low success rates, and prolonged timelines associated with psychiatric research and development deter pharmaceutical companies' investments.[121]

Policy interventions will need to consider these multiple layers, and accordingly, balance price control with promoting innovation, as well as prioritising the availability and accessibility of essential medicines at all levels of the public health system.

Text box 7- Media spotlights on shortage of mental health drugs

**Although Indian newspapers have started drawing attention to the gaps in availability of mental health drugs, intensified and regular coverage will build public awareness and advocacy for improved drug supply.**

### THE TIMES OF INDIA

## Over 50% healthcare facilities showed 100% shortage of mental health drugs in Uttarakhand: CAG

Feb 22, 2025, 11.50 PM IST

**PILMAN**
A Tajuti Raj Website

**India's Push for Affordable Mental Health Meds: Triumphs and Challenges in 2025**

### THE ECONOMIC TIMES News

**India faces manpower shortage amid deepening mental health crisis**

By Param Choudhary, ET Bureau | Last Updated Aug 04, 2025, 09:40:00 PM IST

**Why India Lacks Access to Its Homegrown Drugs for Mental Illness**

Nearly 100 million Indians deal with depression or anxiety, but 85% with common mental disorders do not get help

### THE TIMES OF INDIA

## Law student helps patients grappling with drug shortage, sends legal notice

TNN | Dec 6, 2019, 04.26 AM IST

Pune: He could have simply looked away and focussed on his law books, but his dogged determination helped several in need of psychotic treatment.

### 4.3. DSCM in India: Sound policies, poor implementation

While India's policy and programmes for mental health and drug supply are among the progressive in the LMICs due to their emphasis on rights to access of medicine and integration of mental health in primary healthcare. India's legislative and programmatic frameworks affirm comprehensive, decentralised services and access to psychotropic medicines free of cost at government health facilities.[7] However the implementation gaps continue to undermine their effectiveness across various stages of DSCM. The following section elaborates on these critical gaps-

#### 4.3.1. Structural issues

Centralised procurement systems, while offering advantages in bulk purchasing and standardisation, often fall short in addressing context-specific and local healthcare needs. States that adopt multi-channel procurement mechanisms, involving state-run procurement agencies, autonomous bodies, and public-private partnerships, demonstrate improved supply chain governance, reduced wastage, and enhanced quality of medicines.

Decentralised channels allow for greater responsiveness to local demands and more efficient allocation of resources. Additionally, untied funds [a flexible amount that health facilities can use to meet urgent needs] and local government allocations serve as supplementary resources, enabling immediate procurement of essential medicines at district or facility levels.

#### 4.3.2. Financial constraints

Mental health continues to receive less than 1% of the total health budget across most Indian states,[103] reflecting its low prioritisation in the health financing landscape. According to the 2025 NHSRC Financial Gap Analysis Report, there is an estimated shortfall of ₹6,683 crore between current allocations and the target normative cost [ideal cost of providing a specified list of treatment services at target coverage levels, required for comprehensive mental health service delivery].[122]

Delayed or irregular fund transfers from the Union government to states under DMHP, coupled with fragmented coordination among directorates within state health departments, often impede timely procurement and distribution of psychotropic medicines. DMHP can be reimagined to include financial sustainability as one of its pillars, implement ring-fenced financing, and allocate funds exclusively for mental health programmes.[103, 111]

The launch of the Free Drug Service Initiative in 2015 is a move towards the provision of free and quality medicines through the rollout of comprehensive primary health care (CPHC) in health and wellness centres. However, the success of such initiatives is contingent on state-level commitment, strategic procurement mechanisms, and prioritised integration of mental health drugs into essential medicines.[123, 124, 125]

### 4.3.3. Operational weaknesses

The forecasting for psychotropic drugs faces significant limitations such as low prioritisation and investment by pharmaceutical companies, inadequate mental health services, and poor demand, often driven by stigma. Additional challenges include slow market uptake or acceptance due to concerns over efficacy, side-effect profiles, prior negative experiences with novel drugs, and healthcare providers' wariness to switch stable patients to new treatment.[26, 33, 34, 126, 127]

Inefficiencies such as prolonged lead time in getting ordered medicines, stockouts, and medicine expiration can be addressed by information technology platforms (such as for drug forecasting, e-prescription), real-time monitoring of consumption patterns and stock positions, besides strong hardware and software support arrangements, especially at primary healthcare facilities.[17] Effective procurement must link with an efficient logistic system with due consideration of temperature control, storage space, stock movement protocol, and use of technology for timely distribution and efficient inventory management.

### 4.3.4. Lack of (competent) human resources

The shortage of competent HR personnel for DSCM is a significant challenge. The supply chain workforce frequently lacks specialised training in handling psychotropic medicines, which require stringent management due to their storage, dispensing, and regulatory complexities.[13, 128]

Among the 'human' factors that hinder access to quality medicines are low prioritisation of medicine kit replenishment, inappropriate prescription practices, inadequate dosage for chronic conditions, irrational use of antibiotics, unscientific treatment durations, and a persistent skill gap in store and logistics management among the frontline facility staff.[17]

Staffers are hesitant to screen and diagnose mental health disorders, and therefore do not easily prescribe psychotropic medicines or be accountable for patient management.[28, 29] Unless these gaps are addressed through training, supervision, and supportive policy environments, the availability and rational use of essential medicines, particularly for mental health, will remain suboptimal.[18]

Training should focus on core competencies such as inventory and material management, as well as demand estimation and indenting, tailored to state-specific procurement and distribution practices. The aim is to build a skilled and resilient DSCM workforce.

Equally important is the dissemination of knowledge to end-users involved in DSCM, ensuring that information flows across all levels of the system to complete the knowledge-to-practice loop.

### 4.3.5.    Inadequate communication and dissemination of policies

An effective articulation of policies and consistent dissemination of guidance documents are critical to a functional DSCM system. The quality-of-service delivery and the optimal use of resources within the DSCM are closely linked to communication and the adoption of STGs, NLEM and prescription protocols across all levels of the health system. Ensuring that these tools reach healthcare providers, particularly at the primary and peripheral levels, is fundamental to improving prescribing practices, ensuring medicine availability, and enhancing patient outcomes.[129]

Moreover, there is a need to enhance pre-service education and training for healthcare providers. Curricula should include sensitisation on the use of generic medicines, principles of rational prescribing, adherence to treatment guidelines, and the importance of a continuum of care in managing both acute and chronic conditions, including mental health.

This foundational knowledge is essential for equipping future healthcare professionals with the competencies required to uphold quality standards and support medicine accessibility across the health system. Additionally, periodic updates on newer drugs should be embedded as a part of their continuous professional development.

### 4.4.    How can drug supply chain management be strengthened?

In the context of the Indian public health system, DSCM will be more robust when backed with:

- A state-specific drug policy
- Essential medicines list across levels of care
- A procurement policy with flexible financial and purchasing empowerment of districts and healthcare facilities
- A policy on free medicines, and distribution strategies
- Information technology platforms for addressing inefficiencies such as stockouts and medicine expiry
- Apportionment of stocks across facilities to minimise wastage[122]
- Training and continuous education of health workers including DSCM staff

Text box- 8- Impact of the Jan Aushadhi Scheme on mental health drug supply chain management

The Jan Aushadhi Scheme (JAS) has had a mixed impact on the supply of mental health drugs in India's public health sector. While the scheme has reduced medication costs and increased the availability of general medicines, persistent and significant gaps remain, specifically for mental health drugs. Here are the challenges of implementing JAS for supply of mental health drugs:

- **Limited availability:** Jan Aushadhi Kendras often lack adequate stocks of crucial mental health medications, and supply disruptions and local shortages are commonplace. This is more acute outside major urban centres, affecting continuity of care for psychiatric patients from rural areas.[130]

- **Supply chain and implementation challenges:** Persistent supply chain disruptions, inadequate storage facilities, and lack of awareness among healthcare providers about mental health protocols hinder effective distribution of psychiatric drugs.[131]

- **Equity issues:** Uneven distribution of outlets and drug shortages in specific therapeutic categories (such as psychiatry and tuberculosis) persist, limiting the reach of the scheme for mental health needs. [130, 132]

- **Social and systemic barriers:** A shortage of trained mental health professionals, diagnostic bottlenecks, stigma, and limited public awareness increase mental health drug access gaps.[131]

Addressing these gaps will require strengthening of psychiatric drug procurement, supply chain resilience, and integration with community mental health services.

# CHAPTER 5

## DRUG SUPPLY CHAIN MANAGEMENT: GLOBAL LANDSCAPE

The global landscape of DSCM is defined by the need for increased resilience, transparency, adaptability, and technological opportunities. This chapter outlines the Regulatory Systems Strengthening (RSS) programme of WHO, the selected technological innovations, exemplars of innovative and effective practices in DSCM including those from India, alongside illustrative case studies that demonstrate an effective mental health DSCM. These examples offer potential models and insights for the DSCM -related policy and programme adaptation all over India.

### 5.1.     Regulatory Systems Strengthening (RSS) Programme of WHO[133,134]

The World Health Organization's (WHO) RSS Programme, mandated by World Health Assembly Resolution WHA 67.20 (2014), aims to ensure that medicines, vaccines, and medical devices are quality-assured, safe, and effective. Recognising that many countries lack sufficient regulatory capacity, the RSS programme supports WHO Member States in developing robust, transparent, and efficient regulatory systems—an essential foundation for public health and access to essential medical products.

The Global Benchmarking Tool (GBT) underpins RSS by assessing national capacities and guiding Institutional Development Plans with targeted investments, via partnerships with the Coalition of Interested Parties which fosters coordinated action among WHO, national authorities, and development partners.

In the WHO South-East Asia Region, the South-East Asia Regulatory Network (SEARN), established by the 11 Member States; including India has been instrumental in fostering regional collaboration and regulatory convergence. The SEARN serves as a platform bringing regulators from across the region to interact, share knowledge, and harmonise practices related to medicines, vaccines, diagnostics, and medical devices.

In Africa, significant progress has been observed under the RSS framework. Recently in September 2025, Ethiopia was recognised by WHO for achieving Maturity Level 3 (ML3) using the GBT framework. This highlights the Ethiopian FDA's ability to ensure that medicines and imported vaccines meet global standards of quality, safety, and efficacy. With this achievement, nine African countries viz., Ethiopia, Egypt, Ghana, Nigeria, Rwanda, Senegal, South Africa, Tanzania, and Zimbabwe have reached ML3 status. This marks a major milestone in strengthening regulatory systems across the continent.  WHO's classification ranges from Maturity Level 1 (nascent system) to Maturity Level 4 (advanced and continuously improving system), with ML3 representing a globally recognised benchmark for effective regulatory oversight.

## 5.2. Technological innovations

The technological innovations are playing an increasingly significant role in optimising mental health DSCM, particularly in the resource-constrained settings where the inefficiencies, delays, and stock-outs are common. Having consistent access to psychotropic medicines is crucial for mental health services and technological innovations can enhance transparency, responsiveness, and cost-efficiency across all the levels of supply chains and thus contribute to improving access. Examples of technology used for enhancing DSCM across various countries are highlighted in the **Text box 9**.

Text box 9- Use of technology for drug supply chain management

**Inventory Management Systems (IMS)**

Tools like the OpenLMIS and mSupply are being used in several LMICs to track the medicine flows, minimize expiries, and automate replenishment. For example, the mSupply in Timor-Leste supports both facility-level and national stock visibility.[135]

**Mobile-based ordering systems**

In countries like Rwanda and Malawi, the mobile tools allow healthcare workers to request medicines, report stock levels, and receive alerts. These systems are particularly effective for the remote PHCs and can be adapted to the mental health service points. These tools reduce communication delays between the rural health posts and central warehouses, helping to maintain a steady supply of essential mental health drugs even in the hard-to-reach areas.[73, 136]

**Electronic health records (EHR)**

The electronic health records (EHRs) facilitate a real-time forecasting of medicine demand by integrating the clinical prescription, procurement, and inventory data—supporting data-driven planning and improved care delivery. While the EHRs are recognised as essential for information management, their adoption in mental health has been limited due to concerns about the data sensitivity, lack of standardization, and potential impacts on therapeutic relationships. To address this, the EHR systems must enable nuanced information sharing that respects confidentiality. Combining the EHR data with machine learning offers a promise for precision psychiatry, though data quality and patient-reported outcomes require greater emphasis.[137, 138]

The recent supply chain interventions implemented across Ethiopia, Ghana, Mozambique, Tanzania, and the WHO/AFRO region have demonstrated measurable improvements in the availability and accessibility of essential medicines, particularly at the last mile. The **Table 5** highlights these case-based exemplars of innovative and effective practices that have contributed to improved access to medicines- such as the use of digital tools for enhancing supply chain visibility, strengthening HR, supply chain process optimisation, strategic public-private partnerships, decentralised distribution, robust monitoring, and system integration.

## 5.3. Exemplars of global innovative and effective practices

Table 5- Exemplars of global innovative and effective drug supply chain management practices

| Title | Key features | Impact | Future directions |
|---|---|---|---|
| Ethiopia's pharmaceutical supply service (EPSS) and the Admas Programme[139, 140] | 1. Workforce development and training<br>2. Process optimisation and efficiency gains<br>3. Reduction in supply lead times and costs<br>4. Strengthening supply chain maturity | • Improved medicine availability<br>• Increased distribution efficiency | • Expand its training initiatives<br>• Integrate advanced digital tools<br>• Strengthen collaborations with international health organisations |
| Ghana Integrated Logistics Management Information System (GhiLMIS)[141, 142] | 1. Improved coverage and accessibility<br>2. Increased uptake and utilisation<br>3. Operational efficiencies<br>4. End-to-end visibility of near real-time data | • Addressed long-standing challenges such as medicine shortages, procurement inefficiencies, lack of data standardisation, medicine shortages, procurement inefficiencies, and lack of data standardisation<br>• Improved efficient demand-based allocation | • Expand GhiLMIS to all health centres and community facilities<br>• Explore advanced interoperability features to integrate with global health supply chain networks |
| WHO/AFRO's AFRiSC- a mobile social learning tool to enhance capacity and competencies of cold chain and logistics staff for immunisation supply chain systems across 47 African countries[143, 144] | 1. Flexible self-learning opportunities<br>2. Peer learning and knowledge sharing<br>3. Comprehensive training resources<br>4. Gamification and certification<br>5. Real-time notifications and updates | • Improved the knowledge and skills of HR<br>• Helped bridge the gap between traditional classroom learning and on-the-job skill development<br>• Standardised training content<br>• Cost-effective learning solutions<br>• Scalability | • Expand AFRiSC's reach<br>• Integrate advanced learning analytics to track user engagement and training effectiveness<br>• Evolve with new modules, covering emerging challenges in vaccine distribution, cold chain optimisation, and supply chain |
| Mozambique's Decentralised Drug Distribution (DDD) Model[145] | 1. Multi-Month Dispensing<br>2. Private pharmacy engagement<br>3. Digital Tracking Systems<br>4. Public-Private Partnerships | • Improved Access<br>• Reduced Facility Burden<br>• Enhanced Adherence<br>• Supply Chain Efficiency | • A satisfaction survey among clients and healthcare providers<br>• Evidence-based decisions on scaling up the DDD model for additional differentiated drug distribution options |
| Tanzania's SMS for Life pilot project[146] | 1. Implemented over 21 weeks in three rural districts<br>2. Aimed at strengthening DSCM of anti-malarial drugs at the health facility level<br>3. Used mobile phones, SMS messages, and electronic mapping technology | • Demonstrated feasibility of mobile-based infrastructure in remote settings to improve stock visibility and reduce medicine stock-outs<br>• Achieved ≥93% response rate for weekly stock submissions, with a low average error rate | • Expand this initiative in other countries with locally available mobile telephone networks<br>• Implementing this system for other priority medicines |
| Thailand 's Public Health Supply Chain[147, 148] | 1. Ministry-led centralised procurement<br>2. Regional hospitals and local pharmacies manage logistics for essential medicine<br>3. Selection via NLEM<br>4. inventory management | • Cost-effective procurement<br>• Prioritised essential drugs;<br>• Structured distribution improves urban and semi-urban access<br>• Technological initiatives enhance efficiency | • Strengthen internal logistics coordination<br>• Improve rural access<br>• Enhance monitoring and quality assurance through capacity building and IT integration |

While these case studies focus on general pharmaceuticals rather than mental health medicines, they provide important examples of addressing systemic supply chain issues applicable across various therapeutic areas, including mental health. They demonstrate that a combination of technology-enabled, capacity-focused, people-centred, and context-responsive approaches can significantly strengthen the DSCM across diverse settings in sub-Saharan Africa and beyond.

## 5.4. Case studies of mental health related drug supply chain management

Several countries have adopted integrated and innovative strategies to improve the DSCM for mental health medicines. These best practices underscore the significance of hybrid- centralised and decentralised- planning, data-driven decision-making, and a strong commitment to equitable access. The following section presents the case studies that illustrate how the selected countries have successfully implemented these approaches in diverse health system contexts for the mental health DSCM.

### 5.4.1. The United Kingdom (The National Health Service)

The United Kingdom's National Health Service (NHS) employs a hybrid procurement model for medicines and medical supplies, including those used within the mental health services. This model is characterised by centralised procurement coordinated at the national level, primarily through the NHS supply chain and other national frameworks. This kind of centralisation enables economies of scale, supports cost containment, and ensures consistency in product quality and standards across the health system. Simultaneously, the model maintains flexibility at the local level, allowing individual NHS Trusts to undertake independent procurement under specific circumstances, such as urgent needs, specialised services, or availability issues with the nationally contracted products. This dual approach facilitates both efficiency and responsiveness, aligning the national procurement strategies with the local operational requirements.[149]

> **Text box 10 - Key points of the National Health Service- Drug supply chain management**
>
> - Hybrid procurement model- with centralised procurement system-bulk purchasing, cost reduction, and consistency of quality, as well as flexibility at the local level for the NHS trusts for independent procurement when necessary
> - National guidelines for prescribing mental health drugs- standardize medicine choices
> - Real-time stock monitoring and distribution system- efficient resource allocation and prevention of medicine shortages
> - Electronic prescription and digital integration- increase in efficiency and traceability of psychotropic drug distribution
> - Drug distribution through community and hospital pharmacies- local procurement mechanism and patient assistance

By integrating mental health services into the broader health system, the NHS aims at providing comprehensive care for achieving physical and mental well-being and promoting a holistic approach to patient treatment. The use of national guidelines for prescribing the mental health drugs helps standardise the medicine choices across

the NHS. These guidelines are evidence-based and regularly updated to reflect the latest research and clinical best practices.

At the local level, the individual NHS trusts are responsible for managing their own inventory through the real-time stock monitoring and distribution systems. This localised approach to supply chain management allows for more efficient allocation of resources and helps prevent shortages of the critical medicines, including psychotropic medicines used in mental health treatment. This system benefits from an electronic prescription and digital integration, which increases the efficiency and traceability of the psychotropic medicine distribution.[150]

The medicines are sent through both community and hospital pharmacies, which are supported by the NHS supply chain and local procurement mechanisms. The community pharmacists also provide patient assistance, which has proven beneficial for the long -term remedies, including mental health conditions.[151]

Despite the established structure for procurement and logistics frameworks, the NHS experiences weak oversight and irregular tracking of cost savings. Additionally balancing cost-efficiency with the product quality limits the impact of this initiative.[152]

### 5.4.2. Australia

One of the major strengths of the supply chains for the Australian Pharmaceutical Benefits Scheme (PBS) is its ability to maintain the national consistency in drug pricing and availability, thereby preventing the regional disparities in access. This uniformity ensures that individuals across the metropolitan, rural, and remote areas have equal opportunities to obtain the necessary medicines. The scheme works in tandem with the Medicare-funded mental health services, promoting an integrated, person-centred care that encompasses pharmacological and psychological interventions under a single national framework.

> **Text box 11 - Key points of the Pharmaceutical Benefits Scheme - Australia**
>
> - Pharmaceutical Benefits Scheme (PBS)- enhancing equitable access to mental health treatments
> - Structured co-payment system for financial accessibility of mental health medicines
> - Pharmaceutical Benefits Scheme Safety Net- capping medicine costs and offering additional subsidies
> - Maintain national consistency in drug pricing and availability- preventing regional disparities in access
> - Pharmacological and psychological interventions under a single national framework
> - Pharmaceutical Benefits Scheme - responsive towards regular updating to include new and evidence-based therapies
> - Rigorous assessments of clinical effectiveness, cost-efficiency, and safety
> - Performance audits and the use of a national medicines database support ongoing monitoring of drug availability, stock levels, and distribution timelines

The PBS demonstrates responsiveness to the emerging treatment needs by regularly updating its formulary to include the new and evidence-based therapies. For instance, the inclusion of Esketamine (Spravato) for treatment-resistant depression marks a significant advancement in expanding the therapeutic options for patients who do not respond to the conventional antidepressants. This dynamic updating process is guided by the rigorous assessments of clinical effectiveness, cost-efficiency, and safety conducted by the Pharmaceutical Benefits Advisory Committee.

In addition to improving the access and affordability, the PBS contributes to the transparency and efficiency of the pharmaceutical supply chains. The performance audits and use of the national medicines database, support an ongoing monitoring of drug availability, stock levels, and distribution timelines. These measures are crucial for ensuring timely access, particularly in the rural and underserved regions, where the healthcare infrastructure and pharmacy density may be limited. The combination of financial subsidies, consistent pricing, integrated services, and logistical oversight positions the PBS as a cornerstone of Australia's mental healthcare system, promoting both equity and quality in the treatment delivery.

The PBS plays a key role in enhancing equitable access to mental health treatments in Australia by subsidising a broad spectrum of psychotropic medicines, including antidepressants, antipsychotics, anxiolytics, and mood stabilisers. By significantly reducing out-of-pocket costs for patients through a structured co-payment system, the PBS ensures that essential mental health medicines remain financially accessible. The PBS Safety Net further supports patients who have high expenses for their medicines, capping their costs and offering additional subsidies, etc. This is particularly beneficial for individuals requiring long-term or multiple medicines, such as those managing chronic or severe mental illnesses.[153]

### 5.4.3. Rwanda

Rwanda has successfully implemented the Electronic Logistics Management Information System (eLMIS) to streamline the forecasting, procurement, and distribution of essential medicines, including the psychotropic drugs for mental health conditions. This digital system integrates the real-time data management, allowing healthcare providers to efficiently monitor the stock levels and predict demand, significantly reducing the medication shortages.

One of the unique features of the eLMIS is its accessibility, extending even to the rural health centres, ensuring that mental health treatments are not limited to the urban areas. By automating the

> **Text box 12 - Key points of the eLMIS- Rwanda**
> - Leveraging mobile technology to improve the efficiency of medicine supply chains
> - Real-time monitoring of stock levels and re-ordering of medicines ensuring consistent availability of medicines
> - Inclusion of basic mental health medicines in the essential drug list for ensuring their prioritization in procurement and distribution
> - Digitization of reports and reordering process
> - Data transparency and accountability for informed policy decisions

inventory tracking and providing alerts for the low stock levels, the system enables timely replenishment, preventing stock-outs and improving continuity of care for the mental health patients. Additionally, the eLMIS enhances the supply chain transparency, enabling policymakers to make informed decisions based on data-driven insights, ultimately contributing to a more reliable and efficient medicine distribution network. Through this innovative approach, Rwanda has strengthened its healthcare infrastructure, ensuring that the psychotropic drugs are consistently available to those in need and supporting the broader national mental health initiatives.[154]

### 5.4.4. Malawi

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**Text box 13 - Key points of the drug supply chain management- Malawi**

- Electronic Logistics Management Information System (eLMIS)- streamline forecasting, procurement, and distribution of essential medicines, including psychotropic drugs
- Integration of real-time data management- efficient monitoring of stock levels, prediction of demand and reduction in medicine shortages
- Extension of access to rural health centres- prevention of stock-outs and improvement in continuity of care
- Increased transparency of supply chain- enabling policymakers to make informed and data-driven decisions towards an efficient medicine distribution network

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Malawi has successfully leveraged the mobile technology to improve the efficiency of medicine supply chains, particularly for essential psychotropic drugs used in the mental health treatments. Through a mobile-based tracking system, Health Surveillance Assistants can monitor the stock levels and reorder medicines in real time, reducing the stock-outs and ensuring consistent availability across both the urban and rural healthcare centres. The inclusion of basic mental health medicines in the essential drug list ensures their prioritisation in the procurement and distribution efforts. By digitising the reporting and reordering process, this system eliminates delays associated with the manual tracking, allowing for a quicker replenishment and better forecasting of medicine needs.

The mobile system is particularly effective in bridging the last-mile gap, ensuring timely access to psychotropic drugs even in the remote areas, where the healthcare infrastructure may be limited. The initiative also promotes data transparency and accountability, enabling the policymakers to make informed decisions on procurement and distribution strategies. As a result, Malawi's mobile-driven medicine tracking model has significantly enhanced the mental health care accessibility, strengthened supply chain efficiency, and improved treatment outcomes for patients in the underserved regions.[136]

The global innovations in the DSCM implemented by these countries offer valuable lessons for enhancing medicine availability and improving system responsiveness. India's public health system can benefit significantly by adapting and contextualising these proven approaches to address the persistent gaps and challenges documented within its current supply chain practices. Evidence from the best-practice settings further affirms that DSCM is not operated as a separate system for mental health but rather integrated within the broader

DSCM. Nevertheless, to ensure uninterrupted access to psychotropic medicines, context-specific modifications are necessary to address their particular prescribing practices, demand variability and regulatory requirements.

# BUILDING HUMAN RESOURCES FOR DRUG SUPPLY CHAIN MANAGEMENT: GLOBAL FRAMEWORKS

Supply Chain Management (SCM) professionalisation in India is at a critical juncture. While India recognises the importance of a robust SCM in healthcare, the field historically lacks formal career pathways, competency standards, and dedicated professional recognition,[51] elements that are significantly addressed in global SCM professionalisation frameworks.

The People that Deliver (PtD) Initiative, in partnership with the United States Agency for International Development's Global Health Supply Chain Programme, has generated considerable evidence and technical resources on the role of HR in building resilient and professionalised health supply chain workforces.[155] The following narrative is based on SCM frameworks developed under these programmes,[156, 157, 158, 159, 160, 161, 162] which can be operationalised in an Indian setting.

## 6.1.    Competent human resources

### 6.1.1.    Critical role of competencies in supply chain workforce

Competencies in the SCM workforce [pharmacists, logisticians, warehouse staff and related personnel], are fundamental to healthcare delivery, especially in LMICs. Well-trained SCM professionals ensure the smooth flow of essential health commodities, directly impacting the availability and quality of healthcare services. WHO and other international organisations foresee a rising demand for qualified professionals, heightening the urgency of targeted investments in workforce development and professionalisation.

### 6.1.2.    Systemic challenges undermining workforce effectiveness

Despite the important role the SCM workforce plays, the systemic neglect has resulted in:

6.1.2.1.    Underqualified staff or professionals lacking specialised SCM training

6.1.2.2.    Clinicians or administrators considering SCM roles as auxiliary duties, rather than those that trained professionals perform; SCM not recognised as a formal profession

6.1.2.3.    Lack of professional standards or competency frameworks resulting in hampered workforce planning and development

6.1.2.4.    High turnover due to unclear career pathways and job descriptions not reflecting on-ground requirements

These challenges weaken the quality, reliability, and efficiency of public health supply chains, impeding the national progress towards UHC and SDGs.

## 6.2. Supply chain management professionalisation frameworks [161, 162]

To address these constraints, recent global initiatives have put in place professionalisation frameworks that offer practical solutions to governments, employers, and educators.
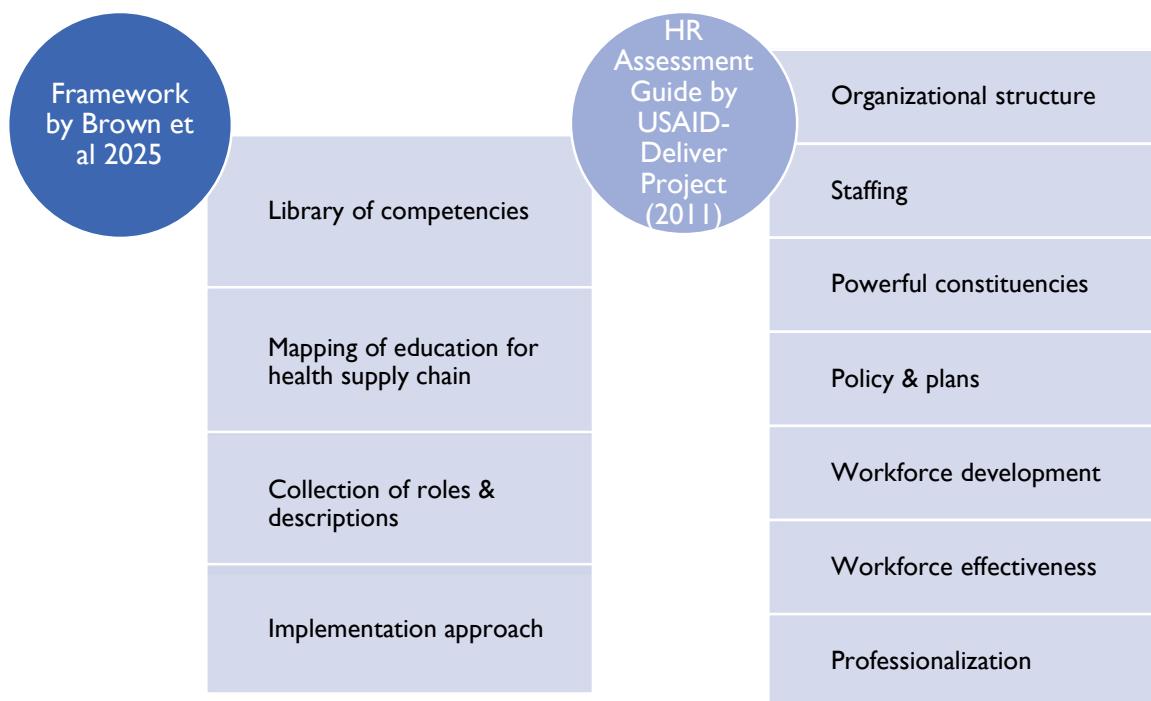


Figure 2- Supply chain management frameworks- Brown et al (2025) & HR Assessment Guide by USAID-Deliver Project (2011)

### 6.2.1. Key components of supply chain management professionalisation framework by Brown et al (2025)[161] [Figure 2]

The SCM professionalisation framework is built around four interconnected components that collectively strengthen the health supply chain workforce:

- Library of competencies: A catalogue of 672 behavioural competencies spanning five professional levels (3,360 specifications), clarifying expectations, and facilitating targeted training/development throughout SCM careers.

- Mapping of education for health supply chains: This aligns academic curricula with SCM competencies to ensure educational outputs meet health sector needs. It not only guides curriculum development but also supports workforce planning through a clearer definition of roles and career advancement opportunities.

- Collection of roles and descriptions: A standardisation of job roles and descriptions aids in recruitment, deployment, and performance assessment

- Implementation approach: Countries can be guided through operationalising competencies, ensuring individuals are matched to roles that suit their skills and qualifications, and supporting the institutionalisation of HR policies around SCM.

This structured, standards-based approach is particularly significant for LMICs working to overcome professionalisation and capacity bottlenecks.

### 6.2.2. The HR Assessment Guide by USAID-DELIVER Project[162] [Figure 2]

The USAID DELIVER Project, in collaboration with WHO and other partners, developed the guide by leveraging field experience in health commodity supply chains in LMICs and identifying key HR elements for assessment. This guide offers a systematic tool to assess seven thematic areas of HR management in public health SCM, including the organisational structure, capacity development, and professionalisation processes. It enables countries to benchmark progress, identify HR strengths and gaps, inform workforce policy, and design targeted interventions. This guide supports the development of a sustainable pool of skilled SCM professionals through evidence-based HR planning and continuous quality improvement.

By operationalising clear competency standards and professionalisation strategies, countries can:

- Improve recruitment, training, and retention of SCM professionals
- Enhance the efficiency, equity, and reliability of health commodity supply chains
- Elevate SCM as a recognised and attractive professional field, supporting staff motivation and career progression
- Foster stronger integration of supply chain functions within broader health systems

Adopting and implementing SCM workforce professionalisation frameworks are essential steps towards strengthening the public health systems globally. For LMICs in particular, these tools offer a structured, evidence-based path to tackling the longstanding HR challenges and building a foundation for health systems that are more resilient, responsive, and effective in meeting people's health needs.

## 6.3. Leadership development and collaborative approaches

### 6.3.1. Strategic Training Executive Programme (STEP 2.0)[157]

The Strategic Training Executive Programme (STEP 2.0) is an innovative leadership development programme designed specifically for SCM professionals in the LMICs. The concept of leadership within the STEP 2.0 framework is characterised by a collaborative, problem-solving and professionalising approach to improving medicine availability and health outcomes. Its main objective is to enhance leadership, change management, and collaborative problem-solving as key competencies for the supply chain leaders. It comprises a blended learning approach, private sector engagement, and tangible organizational impact. By focusing on leadership competencies such as planning, executing and evaluating alongside technical supply-chain skills, the programme helps participants navigate complex system challenges, mobilise staff, and implement change initiatives that improve uninterrupted access to essential medicines. Since 2022, STEP 2.0 has been deployed in multiple

LMICs, including Kenya, Nigeria, Togo, DRC, Rwanda, and Uganda, impacting hundreds of the SCM professionals.

In 2023, a group of 25 leaders from the Rwanda Medical Supply (RMS) completed STEP 2.0. The cohort worked together to address the issues like employee turnover, data quality, manual processes, and manufacturer engagement. Through collaborative learning and application of advanced leadership concepts, they successfully implemented organizational changes and developed a shared approach to overcoming challenges.

The important benefits were-a) strengthened SCM leadership, b) provision of a scalable model, and c) long-term impact in terms of more resilient supply chain systems and improved health outcomes.[157]

### 6.3.2.    People that Deliver (PtD) Coalition[159, 160]

People that Deliver (PtD) is a global coalition that champions professionalisation of the SCM workforce, bringing together stakeholders across public and private sectors to shape policy agendas and strengthen supply chain leadership.

Achievements of PtD:

- Development of technical tools: PtD has produced resources and frameworks to support national-level strategies for recruiting, developing, and retaining supply chain professionals
- Convening power: It brings together donors, implementing agencies, governments, and the private sector to align efforts and promote best practices for SCM workforce development
- Programme management: It oversees the strategic direction and quality of programmes like STEP 2.0, ensuring alignment with global health priorities and needs of local systems

Despite these achievements, PtD faces challenges of sustainable funding and an inability to systematically track and measure the long-term effects of professionalisation on health supply chain outcomes.

While these externally-aided global efforts have emphasised the importance of a professionalised and competent supply chain management workforce for improved public health outcomes, India still faces critical gaps in recognising and structuring this workforce within its health system.

### 6.4.    Developing skills and accountability in India

Recently, the Ministry of Health and Family Welfare developed the 'Competency-based Training Manual for Public Health Supply Chain Workforce' to strengthen human resources engaged in drug supply chain management. Aimed at drug warehouse staff, pharmacists, and community health officers, this manual provides structured modules that build practical skills and professional accountability across the supply chain.

Key competencies include demand forecasting, inventory management, distribution processes, stock verification, logistics information systems along with non-technical modules on good pharmacy and dispensing practices, drug regulation, communication, and ethical conduct. The manual emphasises solving real-time challenges, and in mental health, it refers to:

- Managing psychotropic drugs: This includes secure storage, double-lock systems, and strict dispensing protocols to prevent misuse while ensuring patient access

- Analysis of control of high-cost medicines: The manual outlines techniques for identifying which medicines should be prioritised based on the available financial resources. This helps in prioritising high-cost or high-consumption psychotropics for closer monitoring and frequent reordering

- Disaster preparedness: This section includes how to ensure availability of medicines for anxiety, depression, psychosis, and epilepsy during emergencies, alongside infection control and trauma care

- Patient counselling: This section focuses on improving medication adherence in chronic conditions like epilepsy and depression, using clear, culturally- appropriate communication

By including such specialised items in training, the manual moves beyond general supply chain principles to address mental health needs, regulatory compliance for controlled substances, and resilience in emergencies. However, details regarding the use of this manual in training programmes are unavailable.[163]

Additionally, the Pharmacy Council of India has collaborated with State Pharmacy Councils for pharmacist upskilling programmes, and established training centres in several states (Andhra Pradesh, Telangana, Karnataka, Tamil Nadu, Kerala) aimed at strengthening workforce capacity. These programmes cover good manufacturing practices, patient counselling, pharmacovigilance, pharmaceutical marketing, good dispensing, rational use of medicine and instruments training.[164]

The training cell of CDSCO conducts training programmes for regulatory and quality assurance personnel across states to build drug regulatory capacity. These include induction and risk-based inspection training for both central and state officials.[165]

Though there are initiatives in this direction, there is not enough documentation describing the scope, frequency, or quality of state-level programmes, highlighting challenges in standardisation, or consistent coverage across India.

An improvement is also needed in adaptation and implementation of standardised guidance on SCM professionalisation frameworks; standardisation of job descriptions; revision in training curricula, and implementation of continuous professional development training for addressing SCM workforce gaps, besides overall SCM strengthening.

**CHAPTER 7**

## KEY LEARNINGS FOR EFFECTIVE MENTAL HEALTH DRUG SUPPLY CHAIN MANAGEMENT IN INDIA

A robust and reliable drug supply chain system can ensure continuous availability of essential psychotropic medicines, reduce the mental health treatment gap and thereby contribute to achieve UHC in India.

In the context of mental health, India has made significant progress through supportive policies such as the Mental Healthcare Act, 2017, and initiatives like DMHP. However, major challenges persist in implementation, workforce capacity, digital infrastructure, financing mechanisms, and DSCM. These gaps continue to limit equitable access to mental health medicines.

This concluding chapter presents key lessons for strengthening mental health DSCM for India, which can be extrapolated to strengthening DSCM for other health problems.

The key lessons are presented in four categories in **Text box 14** as follows:

Text box 14 - Key lessons for mental health drug supply chain management in India

**Reform policy...**

- Provide targeted budgets for mental health

- Regular and timely revisions of the NLEM to ensure inclusion of the newer and safer mental health medicines

- Balanced pricing policy for maintaining affordability and offering incentives/ subsidies for promoting medicine inventions and innovations

- Enforce legal provisions for guaranteed access to free drugs

- Improve communication and public engagement

**Build human resources...**

- Adapt and institutionalize standard DSCM professionalization frameworks for improving HR competencies with wider dissemination and implementation of recent Indian training initiatives

- Develop leadership for DSCM

- Integrate DSCM in pre- and in-service training focusing on knowledge, skills and addressing providers' concerns, fears and apathy towards prescribing psychotropic medicines

**Integrate technology...**

- Real-time inventory and procurement platform

- Mobile-based ordering and stock alerts

**Improve operational processes...**

- Uninterrupted fund availability and efficient financial planning

- Hybrid forecasting and procurement mechanism

- Integrated inventory and stock monitoring systems

- Strengthening warehouse infrastructure and last-mile distribution

## 7.1. Reform policy

### 7.1.1. Provide targeted budgets for mental health

Despite the clear mandates under the NMHP and DMHP, mental health continues to receive less than 1% of total state health budgets,[103] severely limiting its reach and impact. This chronic underfunding contributes to the persistent challenges in the procurement and continuous availability of essential psychotropic medicines at the state and district levels.

It is imperative to enforce dedicated budget lines for the mental health drug procurement and SCM infrastructure within the NHM or through alternative funding mechanisms. Such earmarked allocations would help ensure the predictable and sustained funding flows for mental health commodities and related logistics. Furthermore, the budget line should ensure that the funds should not be concentrated at the central or tertiary institutions.

### 7.1.2. Ensure regular and timely revisions of the National List of Essential Medicines for inclusion of mental health medicines

Though NLEM is aligned closely with WHO's list of essential medicines, it has long faced challenges in terms of including newer and safer medicines [such as second-generation antipsychotics], which are vital for expanding treatment options and guiding procurement decisions. The recently-released NLEM (June 2025)[166], though, has added newer psychotropic drugs like aripiprazole, a second-generation antipsychotic, alongside medicines for other priority conditions.

Previous versions of NLEM, including the 2022 list,[167] have been critiqued for including all the available formulations and strengths indiscriminately and for limited alignment with clinical guidelines.[45] Therefore, regular, timely revisions of NLEM remain essential, ensuring continuous alignment with evolving clinical guidelines, emerging evidence, and disease burden.

### 7.1.3. Implement balanced pricing policy for maintaining affordability and offering incentives/ subsidies for promoting medicine inventions and innovations

Drug price control and pharmaceutical innovation are closely-linked policy areas, often involving a trade-off between making medicines affordable and encouraging new drug development. Price control lowers pharmaceutical companies' excessive profits and thus makes medicines more accessible. However, lifting price control may not guarantee drug inventions and innovations. Hence, rather than lowering prices or lifting price control similar to the US, India should consider the provision of incentives or subsidy for promoting genuine drug innovation, maintaining drug affordability.

### 7.1.4. Enforce legal provisions for guaranteed access to free drugs

Section 18 (4) of the Mental Healthcare Act, 2017, mandates provision of free access to essential psychotropic medicines at government health facilities. However, frequent and prolonged stockouts highlight a persistent disconnect between legal entitlements and on-ground service delivery.[22] This gap underscores the need to establish a responsive supply chain system with defined performance indicators, such as stockout frequency, order fill rates, and lead times, to enable real-time monitoring and course correction.

Additionally, enforcement mechanisms, including legal and administrative provisions to hold the relevant authorities accountable for continuous medicine availability, are critical to ensuring full compliance with the Act's provisions.

### 7.1.5. Improve communication and public engagement

A critical weakness in the DSCM system is limited awareness among healthcare providers and patients regarding availability of essential medicines, including psychotropic drugs. This affects demand-supply dynamics by suppressing service uptake and contributing to inaccurate demand forecasting.

Targeted awareness campaigns and deployment of digital dashboards displaying real-time stock availability at public health facilities can empower patients, strengthen community engagement, and stimulate demand generation at the grassroot level. Concurrently, establishing communication channels for healthcare providers to provide updates on stock levels, procurement cycles, and medicine availability will improve supply chains' responsiveness.

## 7.2. Build human resources

### 7.2.1. Adapt and institutionalize drug supply chain management professionalisation frameworks for improving human resource competencies

The shortage or absence of trained pharmacists, logisticians, and store managers in public health facilities undermines inventory control, drug storage, and overall supply chain efficiency. In particular, the lack of specialised training in psychotropic medication management and scientific prescribing practices contribute to irrational drug use, suboptimal treatment outcomes, and increased risk of medicine wastage.

Adaptation and institutionalisation of global best practices, such as SCM Professionalisation Framework developed by USAID and WHO[158, 159] can strengthen core competencies of HR involved in DSCM.

India's recently-developed, competency-based training manual for warehouse staff, pharmacists, and CHOs provides structured modules covering good pharmacy practices, inventory management, psychotropic drug

handling, patient counselling, and disaster preparedness. It can also serve as a foundation for standardisation and continuous professional development with wider dissemination and implementation.

### 7.2.2.    Develop leadership for drug supply chain management

Competent and accountable leadership is the foundation of an effective health system, and yet, it remains underdeveloped within the Indian DSCM ecosystem. Weak leadership at administrative levels often results in fragmented coordination, limited innovation, and poor responsiveness in addressing stockouts and supply disruptions.

Programmes such as STEP 2.0 have enhanced leadership capacities for SCM professionals in LMICs. India can benefit from contextualisation of such programmes for cultivating skilled SCM leaders, equipping them to champion evidence-based decisions, optimise resource utilisation, and ensure uninterrupted access to essential medicines, including those for the mental health.[157]

### 7.2.3.    Include drug supply chain management training into pre- and in-service training

Pre- and in-service training curricula require regular updates to incorporate comprehensive content on DSCM for building essential knowledge and skills and generating confidence for prescribing psychotropic medicines. It is essential for the Indian public health system to formally integrate DSCM competencies into education and training of frontline healthcare providers — including nurses, pharmacists, Community Health Officers (CHOs), and Medical Officers (MOs) — to strengthen supply chain effectiveness at all levels. Include DSCM in pre- and in-service training of health providers

Rwanda's example is instructive: by mapping over 4,000 DSCM-related roles and embedding competency-based DSCM education within their health training institutions, they achieved improved demand estimation and procurement accuracy.

Adapting and incorporating similar competency frameworks into the Indian health professional curricula with scope for regular updates can enhance supply chain performance and ensure reliable availability of the essential medicines, including psychotropic drugs.[155]

In India, initiatives such as the Government of India and PATH's training for supply chain strengthening programmes and MoHFW's competency-based training manual provide foundational platforms for in-service training and can be adapted even for pre-service training. These training programmes need to not only focus on improving knowledge and skills but should also address potential concerns, fears, apathy and disinterest among health workers for managing mental health cases and prescribing psychotropic medicines.

### 7.3. Integrate technology

### 7.3.1. Real-time inventory and procurement platforms

Platforms like the e-Aushadhi[58, 59] provide foundational digital infrastructure for managing drug supplies but can be significantly enhanced by integrating functional modules such as e-prescription linkage, expiry alerts, and advanced analytics for demand forecasting. Inclusion of these features will enable more proactive, real-time management of psychotropic medicines and other essential drugs, reducing risks of stockouts and wastage.

mSupply in Timor-Leste and Ghana's GhiLMIS have proved their functionalities in terms of facility-level stock visibility, and reduced logistics process cycle time from seven days to one hour. Learning from these models will enhance end-to-end visibility, accelerate supply decisions, and strengthen inventory management within India's public health system, particularly benefiting hybrid or decentralised mental health drug distribution at district and facility levels.[132]

### 7.3.2. Mobile-based ordering and stock alerts

Remote and hard-to-reach areas, limited infrastructure, and poor connectivity often disrupt timely stock replenishment and monitoring, leading to frequent stockouts and service gaps, particularly for essential medicines like psychotropics. International experiences demonstrate promising solutions: Malawi and Rwanda have deployed mobile-based tracking tools that enable frontline health workers to place medicine orders, monitor stock levels, and receive real-time alerts on impending shortages. These tools improve last-mile visibility and responsiveness, especially in rural and underserved regions.[136]

Implementing and scaling similar solutions in the Indian context can significantly enhance healthcare providers' capacity to ensure uninterrupted drug availability. These solutions can be integrated with existing digital health platforms such as e-Aushadhi, Health Management Information System, and Tele-MANAS to improve coordination, reduce delays, and strengthen the reliability of India's supply chain in remote areas.

### 7.4. Improve operational processes

### 7.4.1. Uninterrupted fund availability and efficient financial planning

DMHP is primarily financed through NHM. However, persistent challenges such as states' underutilisation of allocated funds and over-reliance on a top-down fund flow mechanism, frequently result in interruptions in the availability of essential psychotropic medicines at state and district levels.

To address these inefficiencies, it is crucial to strengthen state-level ownership and accountability in managing mental health budgets. This includes ensuring timely and adequate procurement of psychotropic medicines aligned with service demand across districts. In parallel, there needs to be targeted capacity-building of finance

and logistics officers at the state and district levels with a focus on fund flow mechanisms, budget planning, utilisation tracking, and audit processes.

Australia's PBS is a relevant example. It incorporates structured co-payment systems, rigorous clinical and cost-effectiveness evaluations, regular inclusion of evidence-based therapies, continuous monitoring through performance audits, and a national medicines database, ensuring consistency in pricing, availability, and distribution.[153]

Contextualising such interventions will promote financial transparency and improve the efficiency of drug procurement and distribution systems. They will also prevent fund leakages, reduce procurement delays, and ensure uninterrupted access to quality-assured mental health drugs across all levels of care.

### 7.4.2. Hybrid forecasting and procurement mechanism

Accurate medicine forecasting relies on reliable data and skilled personnel. Strengthening last-mile data systems, and promoting clinical education and task shifting can help nurses, pharmacists, and health workers gather and interpret consumption data effectively. Tracking actual use rather than just issuance records, improves demand accuracy. Analysing prescribing patterns, adherence to medicines and treatment duration helps align procurement with clinical needs, reducing overstocking and shortages.

NHS-UK's example of real-time digital integration between pharmacies and clinical records to guide bulk procurement decisions[149] provides lessons for India in terms of digitisation and integration of health records with systems like e-Aushadhi and HMIS. Such integration will enable dynamic forecasting, support data-based decision-making, and enhance accountability within public health supply chains.

Some states have established government-owned agencies to streamline procurement, distribution, and management of medicines, medical equipment, and healthcare supplies for public health institutions.[23, 24, 64, 65, 66, 67, 68, 69] These agencies, functioning under state health departments, play a key role in ensuring drug quality, transparency, and cost-effectiveness. While these agencies have weaknesses such as procurement delays or dependence on data quality for forecasting accuracy, they have a clear advantage in standardising quality, availability and affordability of medicines. State-based agencies offer a practical hybrid approach, balancing efficiency with flexibility. Moreover, decentralisation anchors accountability at district and state levels, enabling closer monitoring of fund utilisation, inventory management, and procurement performance, ultimately contributing to reduced instances of stockouts.

### 7.4.3. Integrated inventory and stock monitoring systems

The absence of real-time stock visibility hampers timely procurement and replenishment. Although digital platforms such as e-Aushadhi[58, 59] have been implemented in several states, they lack integrated functionalities for ongoing demand forecasting, consumption-based replenishment planning, and real-time analytics.

Adapting models such as Ghana's GhiLMIS and Rwanda's eLMIS[135] can significantly reduce stockouts, improve procurement efficiency, and enhance accountability across all levels of mental health supply chains.

### 7.4.4. Strengthening warehouse infrastructure and last-mile distribution

Rural and semi-urban health facilities frequently encounter significant logistical barriers, including inadequate infrastructure, poor road connectivity, long transportation distances, and fragmented distribution cycles. These challenges contribute to delays in the last-mile delivery of essential medicines, including psychotropic drugs under DMHP. Further, improper storage practices — often a result of insufficient warehousing capacity or lack of compliance with standard storage protocols —compromise drug quality, increase the risk of stock deterioration, and lead to wastage.

Improved warehousing in alignment with IPHS norms for well-equipped, decentralised regional depots, and deploying temperature-controlled logistics can reduce spoilage, ensure product integrity, and improve the distribution network's efficiency and reliability.

While DSCM of mental health drugs shares core similarities with the broader DSCM platform, it presents unique challenges stemming from:

- Stigma, leading to limited demand visibility, hindered forecasting, reduced prioritisation, and procurement
- Stricter regulations on the prescribing authority, record keeping, and controls against misuse or diversion, leading to procurement complications, slow distribution
- Restricted prescriptions and dispensing, especially in resource-limited areas and
- Lack of competencies in tailoring treatment to patient needs

Hence, India's DSCM warrants more systemic, targeted and multi-pronged solutions with additional consideration to the unique requirements of mental health, which must be considered as an integral component of primary healthcare. Ultimately, strengthening DSCM is fundamental to ensuring equitable and reliable access to primary healthcare, including mental healthcare.

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