

Changing Distribution Dynamics in the Indian Pharmaceutical Industry: A Thematic Literature Review of Public, Private, Generic, and Digital Channels

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Abstract

The Indian pharmaceutical distribution system is evolving from one centered around a fragmented network of traditional supply mechanisms towards a more pluralistic system including centralized public purchasing, government-subsidized generic medicine pharmacies, managed chains of existing pharmacies, e-pharmacies, and a globally incorporated system. So far, the strongest and quantitatively based evidence shows 5% gains in quality of medicines when chains enter and a 2% reduction in prices charged by incumbent retailers, and reforms to the Uttar Pradesh public system supply chain moved availability of essential medicines from approximately 40% to almost 100%. But there is no pooled estimate of national distributional change. Public procurement performance varies, with about 20% of drugs purchased failing quality tests in public systems that have been evaluated. The most evident channel diversification has occurred in the domestic generic market: there were 8,012 PMBJK outlets as on August 6, 2021; Davaindia had crossed 550 stores in 23 states by the year 2020; and e-pharmacies offered nationwide door-delivery; generics are shown to be 80-85% cheaper than Branded drugs from comparative evidence. Retail restructuring has also manifested quantifiable changes, with share of unorganized pharmacy decreased from 62.5% in 2019 to 54.2% by 2023, as organized and online channels continue to grow. However, rural penetration, last mile logistics, quality assurance, regulatory, supply constraints and fragmented logistics will continue to be constraints to all. Causal effects are best supported for directional change and specific operational performance but weakly documented for national market share, margins, channel profitability, and impacts beyond observed contexts. Hence, policy should integrate public procurement reform, credible quality management, investment in rural logistics infrastructure and effective wholesaling, moderate regulation on both organized and digital retail. Domestic channel analysis should, in future studies, be directly measured.

Keywords: Distribution, Pharmaceutical, Pharma, Channel

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1.0 Introduction

The Indian pharmaceutical industry includes considerable domestic and global distribution responsibility, alongside extensive manufacturing capacity. Furthermore, its significance stretches far beyond sheer volume; this body of literature identifies the association between distribution with access / affordability of medicines, quality and accessibility, in healthcare service delivery, as well as stewardship of antimicrobials and financial performance within pharmaceutical organizations.

India has an expansive presence globally and is a producer as well as an exporter of low-cost drugs (generics). However, despite the country's considerable potential regarding the volume of drugs to be manufactured there appears to be a disparity regarding accessibility of drugs to those in poor economic and remote communities (Mandlik & Bhangale, 2025; R & B, 2019).

The study defines “pharmaceutical distribution” as an institutional and logistical mechanism through which medicines flow from manufacturers and procurement agencies to wholesalers, distributors, pharmacies, hospitals, public facilities, individual users, and, more recently, online vendors. Contrary to what single-point analysis suggests, this structure is not going through

one singular transition but several changes happening in parallel: the move to centralized buying in public systems, warehouse-based allocation, electronic tracking, quality control, and benchmarking; more competition in retail where organized chains and e-pharmacies compete with neighborhood drug stores, distribution of generic medicine through governmental and private networks and home delivery, and at an international level, acquisition, joint-ventures, global presence via green-field projects, joint contracts, contract manufacturing and exports by Indian pharmaceutical companies (Mahato and Raulji, 2021, Mandlik and Bhangale, 2025).

Meanwhile, the established supply system is still fragmented (China's Ministry of Health; Koul, 2012). Poor infrastructure, spatially scattered rural needs, insufficient cold chain capacity, unreliable forecasting, late orders, transport disruptions and import reliance of API inhibit rapid response and continuity (Bolineni, 2016; Dapke et al., 2021).

Distribution impacts and outcomes are legal and attitudinal; the availability of wholesaler links to informal prescribers and for promoting drug sales, alongside doctor-involvement, trust for generics and pharmacist capacity shapes where medicines actually flow (Kotwani et al., 2022; Manak & Inder, 2025).

While many individual papers concern one or more of the

following aspects public procurement, private market competition, generic medicines, logistics, rural marketing and international supply chains - but none has yet synthesized the different and interconnected impacts the study of distributional changes have so far. The fundamental question addressed here - How and why are distribution patterns changing in Indian pharmaceuticals and with what outcomes with regard to access, quality, efficiency, affordability, and competitiveness - thus builds on a synthesis of this available body of evidence. It delineates supported developments on the one hand and descriptive or inconclusive research findings the other hand from evidence from various modes of distribution - public, private, rural, urban, digital or international - that is already available.

2.0 Methods

2.1 Search Strategy

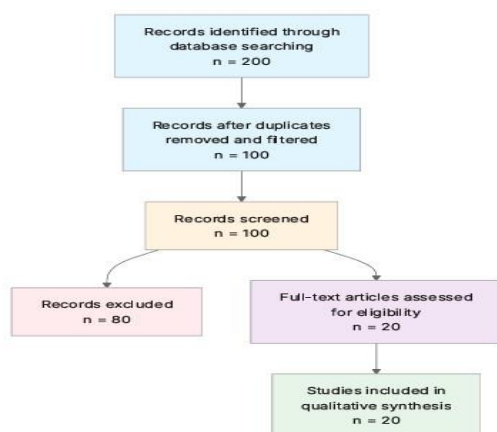
We conducted a thorough literature review of over research papers. Hybrid semantic / keyword-based search technique was adopted to achieve full coverage. Search queries included:

- Changing distribution trends in the pharmaceutical sector in India.
- Indian pharma distribution chain: Wholesaler, Retailer, Stockiest roles.
- Structure and dynamics of pharma distribution channel in India.
- Evolution of drug distribution network in India: supply and trade channels.
- Shifting distribution models in India's generic drug market.

2.2 Study Selection

A primary literature search produced 200 results. The 100 papers which remained, following elimination of duplicates and relevance-based filtering, were then assessed for eligibility and 81 papers rejected yielding 19 papers for the final synthesis.

Figure-1: PRISMA Flow Diagram



Sources: Primary Data

Eligibility criteria included:

India Focus: Does the study center around the Indian pharmaceutical market or is it focused specifically on the Indian drug distribution channels?

Distribution Topic: Is the subject under examination either pharmaceutical distribution, supply chain

channels, stockiest / wholesaler / retailer segments or channel structure?

Change Over Time: Does the study discuss dynamic, changing, evolving or transitioning distribution networks, as against a static portrayal of a particular channel?

Industry Evidence: Does the content of the research is derived either from empirical data, market and industry reports, consumer or market surveys, industry and business case-studies, policy or legislative analysis, or market review on India pharmaceuticals market?

Channel Actors: Does the paper explicitly talk about a market participant (e.g. Manufacturer, CFA, Distributor, Wholesaler / Stockiest, Retailer, Pharmacy, Hospital, E-pharmacy / E-commerce site)?

Business Impact: Are there any observation or findings regarding impact on reach, margins, access, efficiency, competition, operational costs, or other supply chain performance indicators reported in the paper?

Recent Context: Does the paper reflect upon or engage with current trends in supply chain such as GST, digitized distribution, market Consolidation, compliance, legislative changes, or logistics innovation? A few retained papers are neither explicitly about time changing, nor set in a well identified and structured channel structure. Specifically, the information provided on a peri-urban India network does not let ascertain the way to obtain the distribution, actors, sector addressed, manner or result achieved (Makhijani et al., 2016).

Other studies kept in, are not direct longitudinal ones but static schemes, policy narratives or, indeed, marketing materials in support of an industry transformation; they were however collected, given their usefulness to describe context supporting a certain public procurement approach, generic distribution approach, the channel arrangement, any logistics reform or changing, and, although not matching directly with one point of that point, they supply additional info useful.

2.3 Data Extraction and Synthesis

Data extraction focused on the following variables:

- **Distribution Pattern:** Explain how pharmaceutical products are distributed in India or modifications over time.
- **Change Drivers:** Explain how regulation, digitization, consolidation, GST, logistics, competition, pricing, and supply-chain reforms have influenced distribution patterns.
- **Channel Actors:** Identify manufacturers, CFAs, distributors, wholesalers, stockiest, retailers, hospitals, pharmacies and ecommerce platforms in the value chain.
- **Market Scope:** Identify whether study is focused on branded generics, OTC medicines, prescription drugs, rural market, urban market, hospital sales or specialty drugs.
- **Evidence Type:** Identify whether study is an empirical study, case study, review, industry analysis, policy analysis, survey or qualitative interview.
- **Key Findings:** Describe the impact on access, efficiency, margins, reach and competition.

Thematic synthesis was used to draw out patterns from the findings of studies. Evidence strength was defined using number of studies that found the same results and number of groups.

3.0 Results

3.1 Characteristics of Included Studies

Table-1

Study and Year	Study Type	Setting / Population	Distribution Focus	Main Outcome or Contribution
Arumugam et al., 2025	Quantitative performance assessment	Public procurement systems in 7 Indian states, 2021-2022	Institutional procurement and distribution	Efficiency, cost effectiveness, and quality
Bennett and Yin, 2019	Quantitative empirical study	Indian retail pharmacies	Organized chains versus mom-and-pop pharmacies	Drug quality and price
Kotwani et al., 2022	Qualitative interviews	Four wholesalers and one former State Drug Controller in Delhi-NCR	Wholesale-to informal provider antibiotic distribution	Regulatory practice and antibiotic misuse
Namasivayam et al., 2025	Implementation case study	UPMSC and more than 30,000 public facilities	Centralized warehouses, facility pickup, digital tracking	Medicine availability and supply operations
Makhijani et al., 2016	Not determinable from supplied material	Peri-urban India, details unavailable	Not determinable	Findings unavailable
Paliwal, 2026	Scholarly review	Rural Indian pharmaceutical marketing	Conventional and emerging outreach	Policy, infrastructure, and digital innovation
Arumugam et al., 2025	Framework / instrument study	Indian public healthcare distribution	Central warehousing and electronic allocation	System effectiveness dimensions
Travasso, 2015	Policy / service report	Two AIIMS AMRIT pharmacies	Hospital-based discounted dispensing	Affordability and access
Dixit et al., 2021	Qualitative case study	Government supported DDS in Rajasthan	Value-stream mapping, transport, and routing	Waste and operational bottlenecks
Mishra and Sathyaseelan, 2019	Descriptive industry / policy analysis	Indian generic medicine market	Generic production and domestic access	Availability and prescribing barriers
Bolineni, 2016	Qualitative case study	Three supply-chain leaders in Indian pharmaceutical organizations	Fragmented domestic supply network	Logistics, infrastructure, and forecasting
Kaur et al., 2021	Descriptive policy analysis	Selected Indian state agencies	Public drug purchasing	Procurement and quality governance
Magalhaes and Pinho de Sousa, 2006	Operational case study and simulation	Metropolitan distributor-to pharmacy deliveries	Dynamic versus fixed routing	Delivery responsiveness
Sharma, 2013	Conceptual policy/industry analysis	Indian state-hospital and private-hospital markets	Free public distribution and generic prescribing	Sales-force restructuring and competitiveness
Mondal et al., 2025	Theoretical game theoretic model	Unorganized, and Organized online retail	Triple-channel price competition	Prices, profits, and channel coexistence
Manak and Deep, 2025	Narrative review	Indian generic medicine market	PMBJP and underserved populations	Affordability, availability, and trust
Mahato and Raulji, 2021	Descriptive comparative market analysis	Rural and urban generic retail	PMBJK, private chains, and e-pharmacy	Prices, reach, and channel diversification
Mandlik and Bhangale, 2025	Review and industry analysis	Indian and international generic markets	Exports, overseas subsidiaries, M&A, CRAMS	Global integration and supply-chain control
Dapke et al., 2021	Narrative policy analysis	Indian pharmaceutical supply during COVID19	Pandemic disruption and API dependence	Shortages and Resilience

Sources: Primary Data

There is wide variation in study methodologies. Some qualitative and quantitative retail studies provide accurate measures for public procurement outcomes or for the extent of competition, while some qualitative implementation studies have developed measures of availability and value of supply.

Systematic reviews and policy analyses document structural trends but do not usually contain primary data. Finally, sample populations and market contexts differ; there is research on Indian domestic markets, as well as on specific states, rural populations, public institutions, metropolitan pharmacies, or international activities. As a result, the literature lends greater weight to the general direction of the distribution system trend rather than precise national estimates of channel shares, markups, or effectiveness.

3.2 Thematic Findings

3.2.1 From Fragmented Conventional Networks Toward Multi-Channel Retail

In the most clearly observable, this change has led to the existence of three retailers namely-an unorganized, neighborhood-based pharmacy, a group of organized retail chains, and an e-pharmacy.

Theory and description also show unorganized retail to persist due to reasons of location advantage and familiarity, yet diminishing in importance relative to the others. The stated reported share of unorganized retail decreased from 62.5 per cent in 2019 to 54.2 per cent in 2023 with a growth in organized and online segments (Koushik et al., 2025).

A theoretical retail modelling has been considered herein rather than the entire pharmaceutical market in India, taking into context data based on a set up in Eastern India; it may be noted accordingly.

These changes are most obvious and resulted in the presence of three retailers- an unorganized, neighborhood-based pharmacy, organized retail chains and an e-pharmacy. Theory and description also suggest that unorganized retail continued to exist for location advantage and acquaintance, but reduced in relevance. Reported share of unorganized retail decreased from 62.5% in the year 2019 to 54.2% in the year 2023, and organized & online segment grows (Koushik et al., 2025). A theoretical retail modelling has been considered herein than pharmaceutical market in Indian as per setup, taken based on data of Eastern India, it is required to be noted as thus.

This trend of generic distribution shows increased channel pluralism. Thus, by August 6 2021, there were 8,012 PMBJK stores, at the end of 2020 Davaindia had >550 outlets spread over 23 states and 1mg from Tata was a “home delivery channel” nationwide (Mahato & Raulji, 2021) whereas generic medicines are shown to be between 80-85% of price of branded medicines but with still some highly priced medicines and patchy rural coverage (Mahato & Raulji, 2021). This analysis focuses solely on the generic medicine distribution across the Indian urban and rural landscape and not the whole Indian Pharmaceutical Industry. The findings must be analysed with that limitation in mind) Therefore what appears to be happening to the generic market is an evolution away from a primarily traditional pharmacy-based distribution channel towards an architecture

which includes public private and digitally integrated retail distribution channels.

Evidence Confidence: Moderate. Evidence from various empirical, descriptive and theoretical approaches confirms that this tendency to diversity is also true of retail, though not measured at the national level in the case of channel share and the extent of e-pharmacy commerce.

3.2.2 Public Distribution is Becoming More Centralized, Digitized, and Performance-Oriented

Public sector distribution is transformed by procurement coordination, district inventory, electronic allocation, formal monitoring, and accountability. Previously, framework evidence recommended pooled purchasing, consolidated warehousing, bundle coding, electronic passbooks, support for pharmacists, and timely availability monitoring (Arumugam et al., 2025).

The system analysed was a public-health distribution systems not Indian commercial pharmaceutical channels and so should be contextualized. Later evidence of in-practice reforms captured in the public health system in Uttar Pradesh used centralized purchasing, district warehouses, budget-enabled facility collection, private vendor-involving governance reform, staggered tenders, and a digitized, e-tracked, chain of custody (Namasivayam et al., 2025). The study was conducted in the Uttar Pradesh’s public health system and over 30,000 health facilities. The whole Indian pharmaceutical channels and its subsectors are not addressed by the paper, and therefore the paper results should be contextualized.

The operational impacts are significant to the public system investigated in the study. Essential-medicine availability increased from around 40% to almost 100%, with an average of 275 out of 287 medicines in every warehouse. Supply orders jumped from \$58 million to \$112 million, and the facility consumption value increased from \$38 million to \$90 million by April 2024 (Namasivayam et al., 2025). Such positive impacts were contrary to the varied outcomes across seven states; Tamil Nadu and Kerala had better outcomes while Odisha and Chhattisgarh experienced budget allocation and compliance issues, with 20% of purchased drugs falling below quality-control standards overall (Arumugam et al., 2025). As the present study investigated only seven state public procurement systems and not the entire private & public distribution, the study results must be read considering this particular distinction.

Thus, public delivery is not simply being expanded, but is being re-configured on a platform around governance and information. However, challenges in last-mile and timely payment of vendors are in fact in evidence that centralized administration and visible on-line ordering can not necessarily solve the issues that surround the physical supply of goods (Namasivayam et al., 2025).

Evidence Confidence: Strong for the direction of institutional reform and **Moderate** for its generalizability. The combination of a framework, implementation evidence, and multi-state assessment is coherent, but state-level variation limits national extrapolation.

3.2.3 Logistics, Infrastructure, and Crisis Exposure Continue to Constrain the New Pattern

This shift toward more complex channels takes place in a fragmented supply chain landscape. Doctors, wholesalers, hospitals and clinics, independent pharmacies and retail chains, and even grocery stores can be involved in the logistics of delivering medicines; and long distances, dispersed demand, poor communications, a lack of cold-chain capacity, and limited forecasts affect rural channels (Bolineni, 2016). The study analysed three supply-chain leaders rather than drawing a sample across a channel representative of India, with special consideration for rural distribution; and readers will need to be mindful of this disparity. High lead times result from production central and make-to-order supply chain, and lessen responsiveness to local competition.

Lead-time, transportation, routing and waste have been highlighted as practical bottlenecks that can be changed through process-improvement investigations. Using supply chain value stream mapping, Kaizen improvement options and future-state distribution maps, which aim at sending drugs timely to demand, of a certain quantity and quality, were determined in Rajasthan (Dixit et al., 2021). This study analyzed part of the national market for medicines and more specifically a government-sponsored distribution system in Rajasthan; hence, conclusions need to be drawn within that context. In the case of metropolitan pharmacy delivery, fixed, deterministic routing systems were replaced by dynamic variable routing, as requests arrive continuously from pharmacies and must be completed by pharmacy with decreased delivery time (Magalhes & de Sousa, 2006). This research was limited to analysis of an operational distributor-to-pharmacy case in metropolitan region and not nation-wide Indian context.

COVID-19 demonstrated how fragile the linkages among various components are. Shortages occurred due to staff shortages, transportation constraints arising from lockdowns, reliance on Chinese-manufactured active pharmaceutical ingredients, not a failure in production as India is the most productive drug manufacturer (Dapke et al., 2021). This was analysis on a crisis supply system rather than day-to-day channels - these results need be contextualized. The results mitigate a claim about a wholesale update on distribution; while digital technologies, flexible routes and central purchasing strengthen linkages, they rely on resilience within transport systems, labour pools, payments, inventories and, further up supply chains, inputs.

Evidence Confidence: Moderate. The constraints recur across qualitative, process-mapping, operational, and policy evidence, but comparable performance metrics are rarely reported.

3.2.4 Generic and Public-Affordability Initiatives are Reshaping Market Access and Channel Power

Generic distribution is an effective channel for public policy in influencing the pharma distribution system. PMBJP introduces affordable, assured quality generics to the marginalized populace while the PMBJKs, parallel generic brands and retail channels, and generic retailers offer other pathways of delivering medicine to

the patients (Manak & Inder, 2025). We do not study distribution in the Indian pharmaceutical industry as a whole. The study focused only on policy and access to generic medicines for a particular patient and thus, care must be taken when applying the findings and interpretations to other relevant channels of pharma distribution. While these programmes aim to enhance affordability, they are limited in scope due to problems in supply shortages, inconsistency of medicine availability, lower coverage in rural and remote areas, poor training of pharmacy and sale, prescribing behavior by doctors and false belief related to quality.

Also, Public hospital distribution can be taking place of the traditional commercial channels. A free distribution system of drugs by public hospitals and branded generic naming is reported to cut into pharmaceutical companies' sales and shrink wholesalers, retailers and salesmen (Sharma, 2013). As the study analyzed state-hospital prescription distribution and firm responses instead of the entire India market, it has to be read with that limitation in mind. Similarly, hospital-based AMRIT pharmacies bring off-discount, direct distribution of cardiovascular drugs and cancer drugs (including some 186 cardiovascular and 148 other categories of drug) without their impact on domestic market competition and profitability being considered (Travasso, 2015). The analysis focused two institutional pharmacies at AIIMS and not the country's entire distribution.

The market consequence will be rebalancing of channel power – power shifting towards government, hospital, prescribing authority, pharmacy, and digital channel as well as manufacturers and traditionally owned by traded intermediary networks. However affordable prices do not correspond to guaranteed availability. No matter how cheap the medicines become if there is stock or it is not supplied in the villages, the price will not achieve the purpose.

Evidence Confidence: Moderate. The evidence consistently links public and generic initiatives to affordability and channel diversification, but direct causal evidence on national access and commercial displacement is limited.

3.2.5 Distribution is Becoming More Internationally Integrated and Strategically Controlled

This shift is not restricted to domestic channels. Indian companies are also increasingly pursuing a blend of exports with acquisition, local subsidiaries, greenfield facilities, CRAMS (Contract Research and Manufacturing services) engagement, localization of APIs and the launch of high value products like biologics, complex injectables, specialty chemicals, and biosimilar drugs (Mandlik & Bhangale, 2025). International distribution and global pharmaceutical strategy are covered by this analysis; "interpret findings in the light of the distinction made between them, and this study's focus rather than on the organisations of domestic retail in India". The extent of international reach is enormous: Indian firms accounted for an estimated 20% of the total market for world generics, 40% of generics for the US market, and 90% of antiretrovirals for the market in Africa (Mandlik &

Bhangale, 2025); these clearly refer to the position in the global market not on its domestic channel performance. The strategic transformation shifts from easily structured export-led distribution toward more geographically diversified and more tightly controlled vertically managed supply systems.

Local brands, distribution power, and regulatory frameworks come with acquisitions; subsidiaries and greenfield facilities lead to closer integration of manufacturing, quality control, shipping and delivery. Meanwhile, FDA inspection and price degradation, as well as tariffs, dependence on China and regulatory

compliance, present new risks. International integration extends the business network but doesn't inherently minimize the risks; it may exchange the dependency on one export channel for dependence on a system that involves challenging, and costly, regulatory, technological and upstream supply agreements.

Evidence Confidence: Limited to Moderate. The strategic direction is clearly described, but the evidence is primarily review-based and does not quantify changes in domestic distribution, firm-level margins, or comparative efficiency.

3.3 Summary of Evidence

Table-2

Theme	Key Finding	Population Applicability	Effect Direction	Confidence Level	Supporting Studies
Multi-channel retail diversification	Unorganized retail share declined from 62.5% in 2019 to 54.2% in 2023; chain entry improved quality by 5% and reduced incumbent prices by 2%	Indian retail consumers and pharmacies; partial match to the full Indian pharmaceutical industry	Positive for competition and quality; mixed for incumbent retailers	Moderate	Bennett & Yin, 2019, Koushik et al., 2025, Mahato & Raulji, 2021
Public-sector centralization and digitization	Availability increased from approximately 40% to nearly 100%; 275 of 287 medicines were available per warehouse on average	Uttar Pradesh and selected Indian states; public sector Population only	Positive for availability and coordination	Strong	Namasivayam et al., 2025, Arumugam et al., 2025
Public procurement quality and state variation	Approximately 20% of procured drugs failed quality-control tests; Tamil Nadu and Kerala performed better than Odisha & Chhattisgarh on reported indicators	Public procurement systems in seven states; partial match to national industry	Mixed	Moderate	Arumugam et al. 2025, Kaur et al., 2021
Logistics and last-mile constraints	Last-mile delivery, payment delays, infrastructure weaknesses, routing, transport, and cold-chain limitations remain unresolved	Rural, metropolitan, Rajasthan, Uttar Pradesh, and pandemic contexts; geographically partial	Negative for continuity and efficiency	Moderate	Bolineni et al. 2016, Dixit et al., 2021, Dapke et al., 2021
Generic and Public affordability channels	PMBJK reached 8,012 outlets; Davaindia exceeded 550 stores; generics were reported 80–85% cheaper than branded medicines	Generic retail, public outlets, rural and urban populations; partial match to the entire industry	Positive for affordability and reach, but mixed for availability	Moderate	Mahato & Raulji, 2021, Manak & Inder, 2025, Travasso et al., 2015
International integration	Indian firms reportedly supply 20% of global generics, 40% of US generics, and 90% of Africa's antiretrovirals	International generic & specialty markets; does not directly represent domestic distribution	Positive for global reach; mixed for resilience and margins	Limited	Mandlik & Bhangale, 2025
Wholesale regulation and antibiotic distribution	Wholesalers directly supplied informal healthcare providers and Facilitated antibiotic promotion	Four wholesalers and one former regulator in Delhi NCR; narrow population match	Negative for stewardship and regulatory control	Limited	Kotwani et al., 2022

Sources: Primary Data

4.0 Discussion

4.1 Principal Findings and their Interpretation

The main innovative contribution of this research is to demonstrate that India's pharmaceutical distribution is not proceeding along a single teleological route from traditional to modern retailing and is in process of becoming structurally plural. Centralized public procurement, retail chains, e-pharmacies, generic drug outlets, in-house hospital dispensing and supply by internationally regulated logistics are growing alongside established wholesalers, independent retailers and fragmented supply networks. The perceived conflict between modernization and continued fragmentation is best accounted for as one of functional specialization: e-channels and large-scale retail chains enhance the assortment choice, the availability of signaling information, facilitate price competition, or offer better traceability, whilst local and unofficial drug providers and transportation links continue to guarantee availability near the end point and speed of delivery.

The greatest causal evidence is about organized retail. The fact that quality increased by 5% and price decreased by 2% after the entry of chain suggests that economies of scale and reputation signaling could reduce information asymmetry between customers and retailers in a way other than simply diverting market share between retailers' locations (Bennett & Yin, 2019). This mechanism is theoretically consistent with that channel acceptance, distance, operation cost, and assortment work together to determine price and profit (Koushik et al., 2025). This in turn implies that quality has to be altered due to the decision about distribution organization because distribution decision has an effect on consumers' ability to distinguish quality of medicine and on retailers' competition on quality.

Public sector reform seems to have a similar magnitude of impact but via governance, not competition. Joint procurement, definite ownership, budget-based collections and electronic tracking link choices in purchasing to availability of commodities. The change in availability in U.P from some 40% to near 100%, indicates that changing system design can shift public access profoundly within a public network (Namasivayam et al., 2025).

Confidence is high for institutional generalization since we see it reflected in the implementation indicators as well and our institutional design principles support the observation with the model on the previously framed work. It's less for national generalization given differences in capacity, topography, financing, and procurement market condition in different states.

No biological mechanism is demonstrated in the literature. The mechanisms are the logistical and organizational ones. Quality signal, information display and access, routes flexibility and options, governance on purchasing process and resilient supply are the mechanisms considered.

The synthesis suggests high confidence conclusions on structural guidance and moderate conclusions on national outcomes, with relatively shallow conclusion on profitability, margins, and a market-wide domestic efficiency.

4.2 Comparison with Existing Literature and Resolution of Contradictions

Generally, the surveyed evidence on channel diversion supports positive channel impact in the form of increased availability or quality at outlets across segments, but demonstrates that diversification could result in enhanced channel instability. While organized retailing decreases prices and enhances quality at incumbent retail locations, the significance of neighborhood pharmacies is found to center upon accessibility and availability at emergency times, albeit compromising on assortments and incurring stock-outs (Bennett & Yin, 2019; Koushik et al., 2025). As this argument stands against the prior literature, one should note that it does not represent a conflict with the existing theories since; organized pharmacies succeed based on economies of scale, discount and branding, and neighborhood pharmacies succeed based on physical access and proximity in relation to patients; thus, both market formats, are efficient on different aspects of access.

Another more significant contradiction is between efficient production capability and inefficient local availability. Indian export prowess is paralleled with non-availability, erratic supply of PMBJK, limited reach to the rural population, and pandemic shock (Dapke et al. 2021; Manak & Inder 2025; R & B 2019). One answer for this does not emerge out of this evidence, but overall, all studies suggest a disconnect between upstream production and downstream delivery. API dependency, access through transportation constraints, poor sales forecasting and payment delays and last-mile gaps make distribution difficult despite efficient production.

The theoretical prediction that longer distance and transportation cost to unorganized shops might raise profits to the unorganized-retailer is quite puzzling (Koushik et al., 2025). We should not read it as to suggest that longer distance favors the public. It is a price-competition-equilibrium-result of stylized model and it suggests that spatial disadvantage can weaken the substitutability and sustain local retailers. It may be interpreted as market power under limited choice rather than progressive distributional shift. There is no empirical evidence finding in the literature as aforementioned, which confirms the contradiction between profit and policy-goal about access to local shops.

The issue that positive successes in reform, chain entry and digital innovation are likely to be recorded and negative successes and failed initiatives not identified by authors would constitute publication bias. Methodological advances also play a role: output simulations; value stream mapping; indices of implementation and theoretical modelling all reveal different dimensions which do not lend themselves to comparison and substitution one with another as the evidence. Insufficient evidence exists within this corpus of the literature which offers sufficient replication to test for the sustainability of recorded achievements across and within states, states and therapeutic class and states and states and modes of income group.

4.3 Practical Implications

The strongest evidence for public health administrators seems to indicate the benefit of implementing a centralized procurement mechanism combined with a distributed responsibility for collection at facility level, the establishment of digital inventories, a quality testing strategy, unified tendering, and specifically articulated vendor responsibility. This strategy is most directly replicable in large state public health systems like Uttar Pradesh but should ideally involve separate interventions for last mile transport and vendor payment because central warehousing alone is insufficient to drive delivery to facilities (Namasivayam et al., 2025). For states with poor budgetary allocation and compliance, a state level performance benchmark rather than one for the whole country is more appropriate due to differences in geographical context and financial capacity (Arumugam et al., 2025).

For the patients in remote and peripheral areas, simply opening another shop is not sufficient; there need to be consistent availability of stocks, the presence of a qualified and trained pharmacist, the infrastructure for a cold-chain where ever applicable, an efficient transport link between central and outer facilities and above all, public faith regarding the quality of a generic product to pave the way for real access to the right drugs (Bolineni, 2016; Manak & Inder, 2025). Hence public awareness and physician education through training along with PMBJK expansion, is essential for, physician hesitancy towards generics due to lack of confidence, lack of knowledge regarding generics among pharmacist, their lack of interest as well as misinformation among patients in general hinder the use of even the widely available generics.

Regulation must specifically consider the role of wholesale licensing, Good Distribution Practices certification and limitation of manufacturer incentives on channel sales in channels (used by informal providers) supplying the informal provider sector (Kotwani et al, 2022). Regulation must consider the different operational characteristics of organized, unorganized, public and online channels.

From a clinical policy perspective, the argument is that physicians should practice evidence-based prescribing of generics and inform appropriate use when they know to do so. From an industry policy perspective, investment in demand estimation and a more flexible strategically located supply of Inventory, Diversified APIs and a Digitally enabled logistics chain are defensible compared to relying on a down-sizing of the salesforce for such a reform. An argument based on a no threshold for exposure also falls because the available evidence addresses physical distribution issues, not exposure/response relationships for biologically active agents, and the actual policy argument instead is that no one aspect of reform should be judged to achieve its necessary outcome when there is the potential for failures/shortages to occur anywhere along the way.

4.4 Strengths and Limitations

The strengths of this review are its thematic inclusion of public procurement, private retail, generic access, logistics, rural distribution, disruption from pandemics, and global strategy for pharmaceuticals. The strengths

also lie in separating the empirical estimates from the theoretical, descriptive and implementation evidence, and in keeping the numerical results from the original source unchanged.

Weaknesses in the existing literature is considerable. The literature in existing literature was qualitative, narrative, conceptual and many of the examples considered just one state, one institutional system, few cases / informants, theoretical market, etc.

The results are very diverse between quality and prices, warehouse access, total supply price, efficient route use, access, total market share. Commonly we would expect information on channel margins, scale of economy/national presence and retailer profits, but these were infrequently provided. The supplementary information in support of the peri-urban example is insufficient information to characterize the study population, methodology and results (Makhijani et al. 2016).

The limitations to this review are that it relies on the supplied paper data, it is missing some papers where abstracts/structured fields were not present, there was no formal risk of bias score, and meta-analysis was not able to be performed due to non-comparable effect estimates being given in reports. The eligible set also includes papers which only partially meets the criterion of explicitly reporting over time change and this was stated in the methods, casting some doubt on the temporal dimension of the conclusions.

5.0 Gaps and Future Directions

Perhaps the most critical gap is the lack of any nationally representative longitudinal survey that directly tracks shifting shares and roles of manufacturers, CFAs, distributors, wholesalers, stockiest, organized chains, independent pharmacies, public outlets, organized chains, hospitals, and e-pharmacies over time. While the existing evidence indicates a fall in the unorganized retail share from 62.5 per cent in 2019 to 54.2 per cent in 2023, it is based on a theoretical channel model and not on a cohesive market-monitoring data across the nation (Koushik et al., 2025). Future studies ought to merge outlet census data with wholesale transaction data with procurement data along with online transactions of e-pharmacies at both rural and urban levels.

Similar measures of access, availability, lead time, quality failure, price, margin, and stock-out period must also be developed. While public studies tend to describe changes in availability, private studies assess quality and price impacts; there is currently no way to reconcile these. Longitudinal studies are necessary to determine whether the gains made in UP of around 40% availability to close to 100% holds, and also whether these translate into access for patients at the facility level.

Rural customers, informal providers, small wholesalers, cold-chain-dependent products, and eastern and northeastern states are underrepresented. Studies should be made in the future regarding GST-era and post-pandemic logistics, digital ordering and payment systems, and localization of APIs impacting these areas. Mixed-method studies should also determine whether modernization of the channel improves access across

segments or merely reshuffles market power among organized and digital players.

6.0 Conclusion

The distribution in the Indian pharmaceutical sector is not shifting from one channel to another, rather becoming multidirectional: Centralized public systems and organized chains of pharmacies, generic stores and e-pharmacies are increasing organizational variety of distribution while independent pharmacies, wholesalers and fragmented logistics continues to be indispensable. Chain entry is positively related to about a 5% increase in drug quality and 2% reduction in prices at incumbents while re-design of public system in Uttar Pradesh lead to increased availability of essential medicines from nearly 40% to nearly 100% with mean availability 275 out of 287 drugs per depot (Bennett and Yin, 2019; Namasivayam, 2025).

The distribution of generics also became broader with introduction of 8012 PMBJK (Pradhan Mantri Bhartiya Jan Aushadhi Kendra) outlets, over 550 Davaindia stores and with the availability of home-delivery of medicines by e-pharmacies. Generic drugs are stated to be sold 80%-85% cheaper than the branded ones (Mahato and Raulji, 2021). While this work is particularly relevant to the specific retail and public-sector, generic, state, rural, metropolitan and world contexts, it isn't referring to one nationally measured distribution system.

The main question remaining is whether it leads to durable equitable improvements in medicine availability and quality both in rural and urban India and does not just redistribute access and market power between public, private, organized, unorganized and digital channels. Answering this requires nationally-representative, longitudinal measurement of channel structure, stock-outs, quality, prices, margins, delivery performance, and patient access. This evidence base could support innovation without undermines local access, public accountability and supply-chain resilience.

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