

Decentralized Purchasing of Essential Medicines and Its Impact on Availability, Prices, and Quality: A Review of Current Evidence

Lyudmila Nepomnyashchiy and Prashant Yadav

Abstract

Providing patients with high-quality essential medicines requires a well-functioning procurement, distribution, and regulatory system. However, in many low- and lower-middle-income countries (LMICs), public sector supply chain performance is far from optimal, resulting in frequent stockouts at health clinics. Decentralized purchasing of essential medicines by health facilities themselves provides greater autonomy to health facilities in managing their medicine stock, and has the potential to reduce essential medicine stockouts. This paper attempts to synthesize available evidence on the impact of greater facility autonomy in purchasing medicines on medicine availability, price, and quality. We find that literature is sparse on the impact of different roles played by lower-level health facilities in product selection, price negotiations, purchasing, and contract performance management. Our review suggests that decentralized purchasing with regional or central price contracting and supplier selection has the potential to improve the availability of medicines at health facilities, but depends on many prerequisite conditions to be met. These include, at a minimum, requisite capacity at government and health facility levels to support demand forecasting financing and data sharing, and a healthy distributor network that operates under government stewardship. Currently available evidence suggests that institutionalizing an enabling environment under which health facilities can place orders of essential medicines to preselected suppliers who have been vetted for quality and price terms have been negotiated, can provide them a much-needed recourse to secure essential medicines when the public sector supply system is not working.

Keywords: medicines; procurement; supply chain; decentralization; direct financing

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Contents

Background.....	1
Scope of review.....	1
Steps involved in procurement and distribution of essential medicines.....	2
Tradeoffs involved in design of essential medicine supply system.....	5
Financing matters.....	7
Methodology.....	9
Findings	10
Overview of country experiences.....	10
Ghana.....	12
Tanzania.....	13
Cameroon.....	16
Nigeria.....	18
India (Maharashtra).....	21
VA/DOD.....	22
Emerging lessons from the literature review	34
Limitations	40
Conclusion	41

List of figures

Figure 1. Key steps in medicine procurement and distribution	2
Figure 2. Levels of centralized procurement by country and donor dependence (2015 or nearest available year of data).....	7
Figure 3. Where can primary health facilities play a greater role?	9
Figure 4. Concept of the fully functional Jazira Prime Vendor System	15
Figure 5. Pathways to essential medicine availability based on the PBF program in Cameroon	17
Figure 6. Private vs. public procurement among public health facilities.....	21
Figure 7. What could a facility purchasing operating model look like? Hypotheses investigated in review.....	35
Figure 8. Pre-requisites that need to be in place for primary health facilities to purchase and order (<i>public sector</i>)	36
Figure 9. Pre-requisites that need to be in place for primary health facilities to purchase and order (<i>private sector</i>)	37
Figure 10. Inhibiting factors, in order of relevance based on review	39

List of tables

Table 1. Alternative models of pharmaceutical supply systems.....	4
Table 2. Focus: primary health facilities purchasing commodities with domestic resources....	11
Table 3. Identified case studies on HF-led medicine procurement	26

Background

Decentralized purchasing of essential medicines at the facility level is often discussed as an approach to improve the availability of medicines and reduce stockouts. However, there is a lack of consolidated evidence on the impact of greater facility autonomy in purchasing medicines on the availability, price, and quality of medicines. There is also a lack of consolidated evidence on the operational considerations that policymakers must consider when deliberating on when and where such an approach could improve availability without compromising price and quality. Nevertheless, whether officially sanctioned or not, lower level health facilities [HFs] in many low and lower middle income countries [LMICs] routinely purchase medicines from private suppliers when medicines are stocked out in the public sector supply channel.

This review consolidates published evidence on country experiences with devolving decision-making on select aspects of medicines ordering and purchasing away from central and/or regional government actors and towards HFs. We assess the impact of greater autonomy for HFs in select functions of essential medicine procurement and distribution on medicine availability, quality, and price. We also provide a set of pre-requisites and inhibiting factors that are likely to influence the effectiveness of such as program.

Scope of review

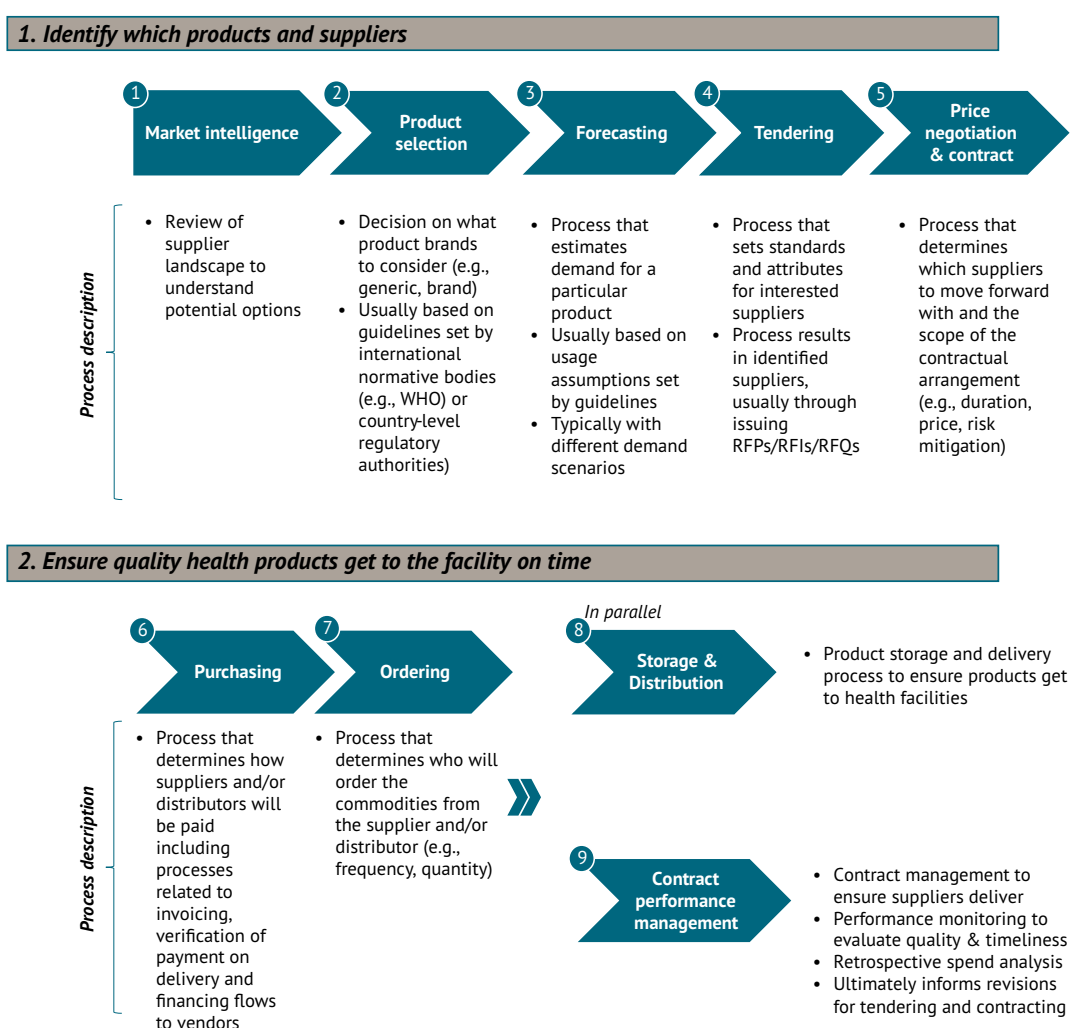
Decentralized purchasing is not a new approach and occurs in many countries at multiple levels in the health system: at the provincial/state level (e.g, India, Nigeria, Mexico), at the district level (e.g, Chile, Indonesia, Kenya, Tanzania, Ghana), and the health facility level. Large hospitals (tertiary and secondary) routinely purchase medicines from private wholesalers/distributors through direct contracting. This review does not include purchasing by provincial/state/district levels or large hospitals. It focuses on purchasing carried out directly by lower-level HFs,¹ or some combination of district and health facilities. For the purposes of this review, lower-level HFs include primary health centers, dispensaries, and/or health centers, among others. The review focuses on the availability of medicines predominantly purchased either with domestic government resources (including IDA on government budgets) and/or with out-of-pocket payments from patients.

¹Thereafter we will refer to lower-level HFs as “HFs” for brevity.

Steps involved in procurement and distribution of essential medicines

Medicine procurement and distribution include two main functions.² The first function is to identify the right products and suppliers. This includes five core steps: (1) market intelligence, (2) product selection, (3) forecasting, (4) tendering, and (5) price negotiation and contract award. The second function ensures quality commodities get to the facility on time and includes four core steps in a continuum: (6) purchasing, (7) ordering, (8) storage and distribution, and (9) contract performance management. Figure 1 provides an overview of these nine sub-functions across the two main categories.

Figure 1. Key steps in medicine procurement and distribution



²We constructed this framework based on the Managing Drug Supply (MDS-3) published by Management Sciences for Health in 2012: <https://www.msh.org/resources/mds-3-managing-access-to-medicines-and-health-technologies>

Different stakeholders may be either directly responsible or influential at each of these steps. The political economy of who is responsible for what depends significantly on who pays for the commodities—whether it is a donor, a government (central, regional, or local), a parastatal agency, or a patient. The role of lower-level health facilities depends on several cross-cutting factors, including the regulatory and legislative environment, the breadth and depth of information flows, financing flows, and management capacity across different levels of responsibility.

There are five main operating models that facilitate medicine supply to HFs across the aforementioned phases.³

1. The central medical store (CMS) model: A traditional approach whereby a government agency at the central level buys and distributes.
2. Autonomous supply agencies: Supply agencies established as parastatals, typically in contexts that have experienced challenges with the CMS. Parastatals are either semi or fully autonomous, centrally conduct purchasing and distribution.
3. Direct delivery system: Suppliers are contracted by a government agency at the central level to manage the storage and distribution of medicines. Medicines are delivered directly to districts and/or major facilities.
4. Pre-qualified vendor (s): Government select and contracts with one or more distributors who are responsible for delivering to districts and/or major facilities.
5. Facilities purchasing directly from private sources of their choice.

For these models, the market intelligence and tendering functions are consistently executed at the central level, so these two phases have been left out of the analysis in Table 1.

³Chapter 8: Pharmaceutical supply strategies. MSH 2012: <https://www.msh.org/sites/msh.org/files/mds3-ch08-supply-strategies-mar2012.pdf>

Table 1. Alternative models of pharmaceutical supply systems

	Models	Product selection	Forecasting	Price negotiation & contract	Purchasing	Ordering	Storage & distribution	Contract performance management	Example countries
1	CMS	Central government				Facility may order through 'pull' mechanism	CMS system	Typically NA	Malawi
2	Autonomous supply agencies	Central parastatal agency				Facility may order through 'pull' mechanism	Parastatal agency	Typically NA	Zambia (MSL) or Kenya (KEMSA)
3	Direct delivery system	Pharmaceutical procurement office (PPO) at the central government or global level				Facility or sub-national government orders from suppliers	Suppliers manage	Central or sub-national government	South Africa (Centralized Chronic Medication Dispensing and Distribution program and Facility Direct Delivery Program)
4	Pre-qualified vendor (s)	Central government—Pharmaceutical procurement office (PPO)				Facility or sub-national government orders from distributors	Distributors manage	Central	US VA/DoD and Tanzania
5	Facility purchasing	Central government determines through STGs and EML (HFs may not adhere)	Facility				Facility manages either self-storage or through arrangements with private suppliers/ distributors	Typically NA	Countries with OOP expenditures-based financing for medicine purchase (e.g., Nigeria, India)

Tradeoffs involved in design of essential medicine supply system

Historical context elucidates why centralization is a common theme across the supply system for medicines in LMICs. The WHO's essential drug program launched in 1972 was based on the tenet that governments centralize purchasing essential medicines at the national or regional level.⁴ This approach is also consistent with economic theory on reducing transaction costs and achieving economies of scale.⁵ Over the last two decades, both governments and donors have created global or regional pooled procurement mechanisms. For example, UNICEF Supply Division (SD) conducts pooled procurement on behalf of donors and governments while PAHO, GCC, and ECDS (Eastern Caribbean Drug Services) were designed to procure on behalf of governments of their member states. A recent study on the impact of pooled procurement on essential medicine prices demonstrated that pooled procurement savings could be as large as 50–75% compared to prices paid by uncoordinated purchasers of the same molecule in the same country.⁶ Procurement institutions that procure on behalf of many countries experience lower prices and reduced delivery times compared to individual government procurement mechanisms.⁷ **While pooled procurement leads to benefits in pricing, it does not necessarily increase availability of medicines.**⁸

Supply chain theory suggests that effective supply chains for items such as medicines have to be designed to provide a high level of supply responsiveness to the needs of the recipient of product and shorter resupply intervals. This requires real-time information flows about demand and use at the point of consumption/service delivery, and shorter demand forecast horizons. The commercial sector has also acknowledged the importance of fewer levels in the distribution system to reduce misalignment between different actors.⁹ More frequent replenishment cycles reduce the time horizon for the forecast on which an ordering entity (health facility, national) bases its order decisions. Shorter forecast intervals lead to more precise forecasts and, as a result, lower stockouts. For health facilities to have more frequent distribution, the distributor (public or private) has to make multiple delivery trips. The cost of more frequent delivery trips can be lowered through economies of scope, i.e., the distributor acting on behalf of multiple shippers (not just government supply of drugs) and optimizing for full truck/van loads.

Health facilities have rich local information about the nature of demand for different medicines. Some of this information can be codified and captured in past consumption data,

⁴Yadav 2017. WDI—25 years on

⁵Potentially: <https://www.sciencedirect.com/science/article/abs/pii/S0277953612005102>

⁶CGD Working Paper 508, April 2019: Pooled Procurement of Drugs in LMIC: <https://www.cgdev.org/sites/default/files/pooled-procurement-drugs-low-and-middle-income-countries.pdf>; included a mix of donor-funded (e.g., for HIV, TB) and non-donor funded molecules (e.g., for diabetes, vitamins, minerals and antibiotics)

⁷Wang et al. 2021: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3926761 (included antiretrovirals, antimalarials, antibiotics and tuberculosis drugs)

⁸Yadav 2021: [https://www.thelancet.com/journals/langlo/article/PIIS2214-109X\(21\)00320-X/fulltext](https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(21)00320-X/fulltext)

⁹Vledder et al. 2019: <https://www.tandfonline.com/doi/full/10.1080/23288604.2019.1596050>

but other information sets about demand at a facility may be more tacit knowledge which is difficult to codify. On the other hand, procurement at the central level allows aggregating the demand of multiple HFs and leads to economies of scale. This results in an intrinsic trade-off between the capture and agile use of rich local information about demand and the economies of scale facilitated by centralized pooled procurement efforts. This trade-off may explain why despite the scale benefits resulting from pooled procurement efforts, the actual availability of essential medicines in public sector health facilities has been notably low across LMICs.^{10,11}

Moreover, the quality of primary service provision in developing countries has been weak largely due to a disproportionate focus by donors and governments on vertical health programs that focus on specific priorities.¹² Performance-based financing (PBF) and decentralized facility financing (DFF) are financing approaches introduced to shift the locus of decision-making to lower levels of the health system in order to address this challenge.

Improving health provider performance is at the core of PBF and DFF programs. In a PBF program, incentives are directed towards providers (not patients) and financial payments depend on the degree to which services are provided at an approved quality.^{13,14} The autonomy of resources (HR, financial) at the facility level is a pre-requisite.^{15,16} Availability of essential medicines is one of the most important Quality of Care indicators in PBF programs.¹⁷ Less evidence is available on DFF independently from broader health system decentralization reform. Work that analyzes the impact of different degrees of choice in the health system (decision space) on essential medicine logistics concludes that more decentralized choice over planning and budgeting is associated with better performance of logistics systems for essential medicines.¹⁸ However, this includes purchasing by both facility and government offices and does not distinguish between the two to focus exclusively on the role of HFs.

¹⁰ Cameron A et al. Medicine prices, availability, and affordability in 36 developing and middle-income countries: a secondary analysis. *Lancet*. 2009;373(9659):240–49. doi:10.1016/S0140-6736(08)61762-6.

¹¹ Mahmic-Kankjo et al. 2018: [https://www.jclinepi.com/article/S0895-4356\(17\)31008-9/fulltext](https://www.jclinepi.com/article/S0895-4356(17)31008-9/fulltext)

¹² Muzammil, S and Lopes, G. 2021: <https://clinmedjournals.org/articles/jfmdp/journal-of-family-medicine-and-disease-prevention-jfmdp-7-138.php?jid=jfmdp>

¹³ Musgrove P. (2011). *Rewards for Good Performance or Results: A Short Glossary*. Washington, DC: The World Bank. <http://www.rbhealth.org/sites/rbf/files/documents/Rewards%20for%20Good%20Performance%20or%20Results%20-%20Short%20Glossary.pdf>

¹⁴ Meessen et al. 2011: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3040374/>

¹⁵ Renmans et al. 2016: Review of PBF schemes - <https://academic.oup.com/heapol/article/31/9/1297/2452979?login=true>

¹⁶ Toonen et al. 2009. Lessons learned from PBF: <https://www.rbhealth.org/sites/rbf/files/PBF%20Synthesis%20report%20KIT.pdf>

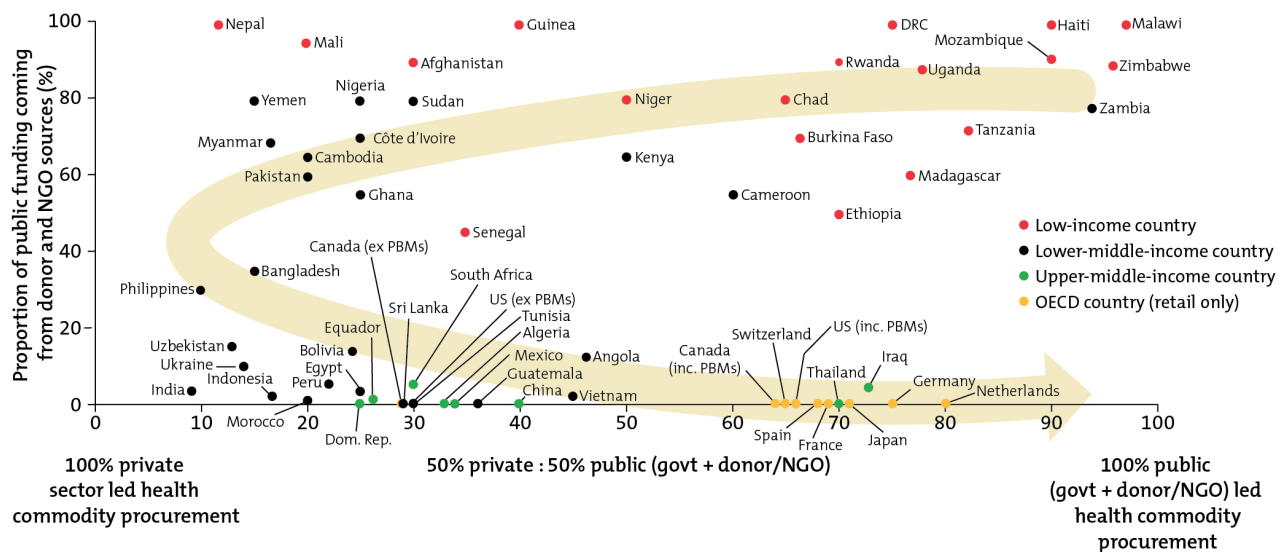
¹⁷ Zeng et al. 2018: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6326387/>

¹⁸ Bossert et al. 2007. Is decentralization good for logistics systems? Evidence on essential medicine logistics in Ghana and Guatemala: <https://academic.oup.com/heapol/article/22/2/73/579593?login=true>

Financing matters

The choice of pharmaceutical supply system depends significantly on the source of financing for medicines in the country. Although donors fund the lion's share of health products (by value) in low-income countries, 80% of medicines in lower-middle income countries are paid for privately, predominantly out of pocket.¹⁹ As shown in Figure 2, countries with higher dependence on donors tend to have greater levels of centralized procurement either through government or NGO channels.

Figure 2. Levels of centralized procurement by country and donor dependence (2015 or nearest available year of data)



Source: CGD 2019—Tackling the Triple Transition in Global Health Procurement.

For most donor-funded commodities such as medicines for HIV/AIDS, malaria, tuberculosis (e.g., funded by Global Fund), and routine immunizations (e.g., funded by GAVI), vertical supply chains have been set up in most LICs to ensure that quality and affordable commodities arrive at the point of care. The operational design and decision-making behind supply chains that support these health products are heavily centralized, with a limited role for lower-level health facilities. Health facilities typically make orders (e.g., through a ‘pull’ arrangement) or receive products (e.g., through a ‘push’ mechanism) from a central procurement agency and/or the central medical store (CMS). They typically do not receive direct financing for medicine purchasing through this channel. Donors centralize quality control and payment mechanisms to reduce organizational risk.²⁰

¹⁹ Figure 6: Private, government and donor/NGO financing as a share of the total estimated market (value) for health products by country income groups. Tackling Triple Transition in Procurement (CGD 2019): <https://www.cgdev.org/better-health-procurement>

²⁰ Mackintosh et al. 2018: <https://pubmed.ncbi.nlm.nih.gov/29421465/>

Decision-making across all medicine procurement and distribution functions for government-funded commodities in LICs are also centralized either at the national or sub-national government levels. These health products may or may not leverage processes set up for vertical supply chains supported disproportionately by donors. There could be as many as four different tiers in the supply chain in some countries before health products arrive at the HF. These are tiers typically mapped to the country's administrative structure. The HF is usually at the final receiving end of the value chain, engaging either in a 'pull' or 'push' arrangement with the CMS. Health facilities play some role in managing funds for procuring medicines. In some countries (e.g., some states in Nigeria), they manage a Drug Revolving Fund (DRF) to maintain medicine stock through a cost-sharing mechanism whereby the government subsidizes a portion of the cost of essential medicines, but the rest comes from user fees/co-payment paid by patients i.e. out-of-pocket payments (OOPs) by patients at public facilities.

Alternatively, health facilities have access to virtual bank accounts or credit lines provided to them by the government to purchase medicines, with a mandate to prioritize purchasing from the public sector supply chain (e.g., Tanzania). In many countries (e.g., DRC), national legislation historically prevented lower-level health facilities from owning physical bank accounts. Performance-based financing (PBF) and fiscal decentralization is challenging that paradigm.²¹

Where medicine procurement is financed primarily through out-of-pocket payments (OOP), patients either purchase their medicines at public HFs or go to the private sector (e.g., private pharmacies or drug shops). Reliance on patient fees incentivizes behavior that will ensure availability, even if deviating from official drug procurement guidelines. This is when health facilities play a more active role in purchasing medicines and may purchase from the private sector if the government cannot ensure timely availability. Even if the government can supply medicines, health facilities that must pay for it on their own might find lower prices for similar products in the private sector. While this behavior may lead to more reliable availability, products may be of questionable quality and not necessarily aligned with standard treatment guidelines since facility managers can easily substitute products and brands.

Unfortunately, stock-out rates of essential medicines at lower-level HFs have historically been quite high, crippling their ability to provide quality care.^{22,23} At the same time, the role of HFs is likely to increase given their importance in providing essential service provision and advancing universal health coverage goals. Our research investigates what it would take for them to purchase high-quality, low-cost essential medicines reliably.

²¹ Eichlar R, Levine R, and the Performance-Based Incentives Working Group, CGD 2009: <https://www.cgdev.org/publication/9781933286297-performance-incentives-global-health-potential-and-pitfalls>

²² WHO 2011. Chapter 17: Storage and supply chain management in *The World Medicines Situation 2011*: <https://www.asrames.org/wp-content/uploads/2016/07/THE-WORLD-MEDICINES-SITUATION-2011-STORAGE-AND-SUPPLY-CHAIN-MANAGEMENT.pdf>

²³ WHO—country reports on in-depth assessment of the medicines supply system—Cameroon, the Congo Mali, Rwanda, Senegal, Chad—2007 to 2010.

Methodology

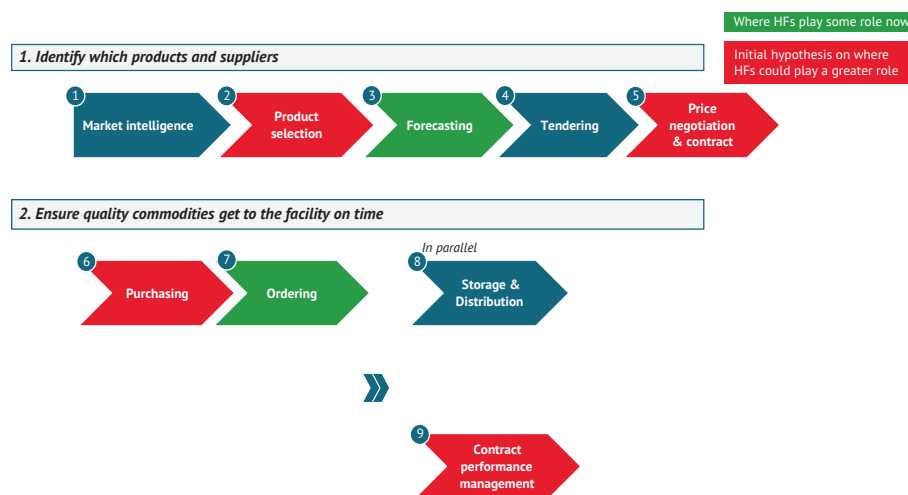
We conducted a literature review and key informant interviews to consolidate evidence and generate insights based on content, context, and process analyses. The literature review was conducted with the following keywords: ‘decentralized purchasing medicines,’ ‘Facility purchasing medicines,’ ‘Primary facility purchasing of medicines,’ ‘drug purchasing primary health facilities,’ ‘drug purchasing peripheral health facilities.’ In addition, we searched for evidence pairing different permutations of these keywords with select countries based on evidence generated through the Delphi method.²⁴ The initial list of countries in scope included: South Africa, India, Zambia, Cameroon, Nigeria, Tanzania, Uganda, Kenya, Thailand, Mexico, Chile, Afghanistan, Guatemala, Ghana, and the US (Department of Defense and Veteran’s Affairs). We intentionally prioritized evidence from low and lower middle-income countries (LMICs). We identified specific states in India and Nigeria with evidence on HF medicine purchasing and honed the search on those states. The literature search was conducted in Google, Google Scholar, PubMed, and websites of the OECD, World Bank, as well as grey literature from various sources.

The following inclusion criteria were applied: publication date between 2004 and 2021; the document presented data and/or opinions focusing on the role of HFs in medicine purchasing, ordering, or any of the other nine functions in the supply value chain.

We identified hypotheses on where the role of HFs could be greater across the key steps of medicine procurement and distribution and identified four potential areas: 1. Product selection, 2. Price negotiation and contracting 3. Purchasing and 4. Contract performance management.

Figure 3 shows our hypotheses on where the role of HFs could be expanded.

Figure 3. Where can primary health facilities play a greater role?



²⁴Delphi Method from the Rand Corporation: <https://www.rand.org/topics/delphi-method.html>

Analysis focused on synthesizing information that would validate or dispute these hypotheses, inform pre-requisites, inhibiting factors, and trade-offs under consideration. Five key informant interviews were conducted to verify the analysis and obtain qualitative insights that enriched the analysis and literature review.²⁵ Additionally, authors leveraged their own experiences working with governments and development partners on procurement and supply chain challenges.

Findings

60 publications were assessed as part of this review: 54 peer reviewed publications, two books and four unpublished country reports. Few countries have implemented formal mechanisms that enable HFs to select products, negotiate prices, purchase medicines, and conduct contract performance management. We identified six case studies that help to reveal the key attributes influencing an HF's ability to engage in at least one of these functions. Ghana, Tanzania, Cameroon, Nigeria (Enugu, Nazarawa, Ondo, Adamawa states), India (Maharashtra state) and the US (DoD/VA). We first present a stakeholder analysis for each of the countries against the aforementioned nine functions. For each country, we then provide a synthesis of available evidence and finally, summarize insights on the key attributes.

Overview of country experiences

Designated government agencies are responsible for each of the nine functions in the medicine procurement and distribution pathway. In most cases, the same agency or unit is responsible for multiple tasks. Table 2 provides an overview of the responsible agencies for each of the functions.

²⁵Informants were from the following agencies: Global Fund, World Bank and USAID.

Table 2. Focus: primary health facilities purchasing commodities with domestic resources

	Function	Ghana	Tanzania	Cameroon	Nigeria	India (Maharashtra)	VA/DoD
I. Identify which products and suppliers	1. Market intelligence*	Ghana Health Service	Medical Store Department	National Essential Drug and Medical Disposable Procurement System (SYNAME), Directorate for Pharmacy and Medicines	FMOH and/or SMOH	Directorate of Health Services	DoD, VA
	2. Product selection*	Central Medical Store					
	3. Forecasting	National Health Insurance Authority, Central Medical Store, Budget Management Centers	Pharmaceutical Services Section within the MoHSW & Medical Store Department	National Centre for the Procurement of Essential Medicines and Medical Supplies (CENAME), regional supply centers (CAPRs)	FMOH and/or SMOH with engagement from other relevant agencies (e.g., National Primary Health Care Development Agency—NPCHDA)	FMOH and/or SMOH	DoD: Defense Logistics Agency (DLA) VA manages a National Contract Service
	4. Tendering		Medical Store Department, district medical officers	FMOH, SMOH, facilities			
	5. Price negotiation & contract						
II. Ensure quality commodities get to the facilities on time	6. Purchasing	Central Medical Store, Budget Management Centers, facilities	Medical Store Department and zonal stores				Facilities
	7. Ordering						
	8. Storage and distribution	Central and regional medical stores				Prime vendors	
	9. Contract performance management	Central Medical Store, facilities				Framework agreements at federal (between government and manufacturers) and regional (between government and distributors) levels	

Ghana

Ghana Health Service established a National Framework Agreement with local private-sector suppliers to use the central-level contracting capacity to negotiate lower prices for decentralized procuring entities. The Procurement Act of 2003 allows public clinics and hospitals to procure from private sector suppliers when products are not available at the government Regional Medical Stores.²⁶ Decentralization of procurement and the introduction of the National Health Insurance Scheme (NHIS) provided greater procurement authority to Budget Management Centers (BMCs) at district, regional and national levels that are responsible for managing drug budgets. In theory, BMCs are meant to capture the needs of all facilities, consolidate at various levels, and request authorization from CMS prior to purchasing from the private sector.²⁷ In practice, in some regions, as much as 85 percent of all products were found to be purchased from the private sector.²⁸ Lower-level facilities (sub-district level) rely disproportionately on the private sector for essential medicines (Ibid). In most instances, facilities are forced to go to the private market because of the unavailability of products at the regional medical stores, which is supposed to be the first point of call for the procurement of drugs for Ghana Health Service facilities, including primary health centers. Primary health centers usually procure not only for themselves but also for Community-based Health Planning and Services (CHPS) centers directly under them. The CHPS centers account to health centers they are under on the drugs used and sold. The health centers vet NHIS claims from the CHPS centers and submit them for reimbursement.

Drug prices vary widely between sectors. In some cases, they are as much as 150% higher than international reference prices. Prices also vary depending on the source (private vs. public) and geography (urban vs. rural), with prices lower among private sources in urban areas and public sources in rural areas. Discrepancies have been observed between sources on the drug prices that the Ghanaian Central Medical Store (CMS) paid for essential medicines. These have been attributed to decentralized procurement at district and sub-district levels that do not benefit from economies of scale as well as limited enforcement of pricing regulations, while facilities had greater financial autonomy, governance and accountability of local institutions were found to be weak. Generally, prices are lower in the public sector facilities than in the private markets. The public facilities usually use a mark-up of between 10–20% compared with about 30–45% mark-up in the private sector. Sometimes distributors quote slightly higher prices for public sector facilities mainly because of the delay in repayment to try and hedge the prices. Public sector facilities usually default in payment for several months and even sometimes up to a year.

²⁶ Dalberg Global Development Advisors, R4D and MIT-Zaragoza 2008: <https://healthmarketinnovations.org/sites/default/files/Private%20Sector%20Role%20in%20Supply%20Chains.pdf>

²⁷ Atuilik et al. 2019: <https://academicjournals.org/journal/JEIF/article-full-text-pdf/42961E161598>

²⁸ Ibid

Tanzania

Lower-level health facilities have been enabled to order medicines directly from the private sector through four different projects with different product & geographical scope, source of funding and exact approach used:

- a Pay-for-Performance (P4P) scheme launched in 2011 in the Pwani region to improve RMNCH service provision,
- a USAID prime vendor model launched in 2011 under the USAID | Deliver program,
- the Jazia Prime Vendor System (Jazia PVS), piloted in 2014 with a nation-wide scale up launched in 2018 and
- direct facility financing (DFF) programs supported by the Global Financing Facility.

The P4P scheme provided financial incentives to health facilities, districts, and regional managers based on pre-defined service delivery targets, including reducing essential medicine stock outs.²⁹ Public health facilities were able to use their funds to procure commodities privately if there were stockouts and there was no availability from the CMS. Anecdotally, as much as 50% of medicines in Tanzania are procured privately because they experience regular shortages of essential drugs and supplies from the public sector.³⁰ While price was not assessed, this program found a significant effect on both availability and stock-outs of all 37 essential RMNCH medicines. Effects were notably pro-poor and greater in rural compared to urban areas. Key success factors included financial autonomy of facilities through bank account ownership, aligned incentives between health facility and district managers and introduction of management practices that were less hierarchical and bureaucratic.³¹

USAID introduced a prime vendor model (PVM) in 2011 as part of its USAID | Deliver program to increase availability of essential medicines for opportunistic infections among care and treatment centers (CTCs) run by implementing partners (IPs).³² The Ministry of Health, Community Development, Gender, Elderly, and Children (MOHCDEGEC) worked with SCMS and IPs to identify prioritized commodities that were high impact and commonly stocked out, assessed local manufacturers and distributors based on Good Manufacturing and Good Distribution standards per WHO guidelines and issued and analyzed bids from vendors. In this model, SCMS managed the contract with a prime vendor and contracts between the prime vendor and vetted sub-vendors. The Muhimbili University of Health and Allied Sciences (MUHAS) and North-West University in South Africa set up quality assurance testing for commodities before distribution. Ultimately, the diversified network

²⁹ Binyaruka et al. 2016: <https://pubmed.ncbi.nlm.nih.gov/27928874/>

³⁰ Ibid and Personal communication with Benjamin Loevinsohn, Oct 8, 2021

³¹ Mayumana et al. 2017: <https://pubmed.ncbi.nlm.nih.gov/28257886/>

³² Supply Chain Management System; USAID | DELIVER PROJECT, Task Order 4; USAID | DELIVER PROJECT Task Order 7. 2016. Health Logistics in Tanzania: Timeline of Accomplishments for Supply Chain Interventions. Arlington VA: Supply Chain Management System; USAID | DELIVER PROJECT, Task Order 4; USAID | DELIVER PROJECT, Task Order 7.

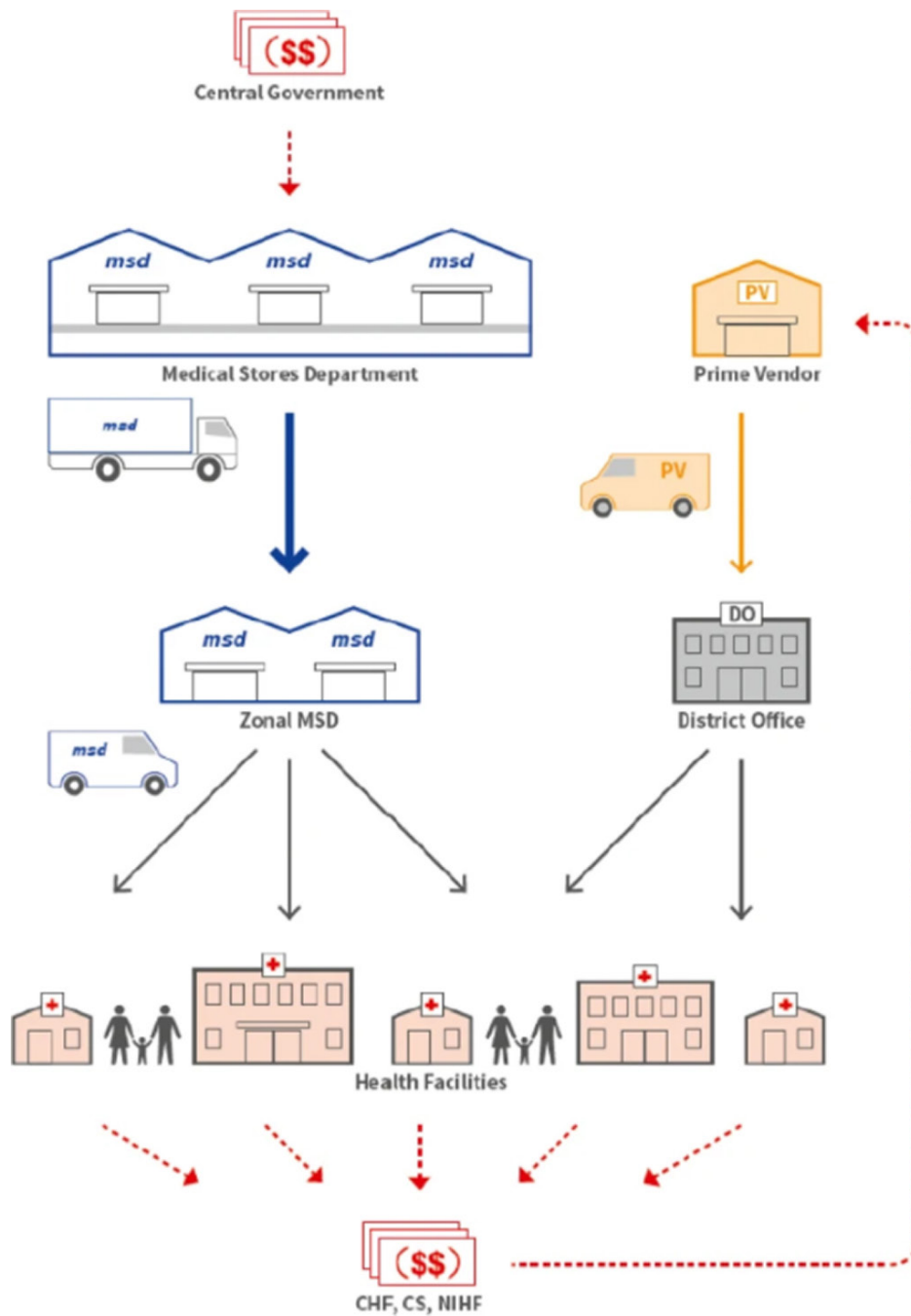
of suppliers resulted in greater coverage and assurance of product availability. The program led to a 50%+ reduction in stockouts at CTCs.³³

A review of the national supply chain in 2013 identified a 40%+ supply gap at the health facility level due to stock-outs and low order fulfillment rates by MSD. In response, the Dodoma Regional Administration and Local Government launched the Prime Vendor system in 2014, later known as the Jazia Prime Vendor System (Jazia PVS).³⁴ Jazia PVS was a public-private partnership whereby the regional government selected one private-sector pharmaceutical vendor as the primary supplier for prioritized essential medicines needed by the public health facilities in the region. In addition to government funds available to facilities to purchase medicines from MSD, facilities also have complementary funds from user fees, a community health fund and national health insurance. Under the prime vendor model, the health facilities can use the complementary funds to purchase from the one appointed prime vendor (PV). The PV was selected through a competitive tender based on agreed standards and offered prices comparable to MSD catalog prices and ensured quality standards set by the Tanzania Food and Drug Authority (TFDA). The success in Dodoma led to expansion in two more regions in 2016 and was incorporated into the Tanzanian Health Sector Strategic Plan IV. Figure 4 provides a schematic overview of the Jazia Prime Vendor Model and the role of facilities.

³³ Ibid

³⁴ Wiedenmeyer et al. 2019: <https://pubmed.ncbi.nlm.nih.gov/30891247/>

Figure 4. Concept of the fully functional Jazia Prime Vendor System



Source: Wiedenmayer K, Mbwasii R, Mfuko W, Mpuya E, Charles J, Chilunda F, Mbepera D, Kapologwe N. Jazia prime vendor system- a public-private partnership to improve medicine availability in Tanzania: from pilot to scale. J Pharm Policy Pract. 2019 Feb 25;12:4. doi: 10.1186/s40545-019-0163-4. PMID: 30891247; PMCID: PMC6388475.

From 2014–2018, the availability of tracer medicines increased by 36%, bolstered by a reduction in delivery times and high order fulfillment rates.³⁵ Since 2018, the program has been rolled out across all 26 regions of mainland Tanzania. A centralized coordination function, national-level vendor selection based on standard operating procedures, adherence to a contractual business relationship by the private sector, political will and strong ownership at regional and district levels have been credited with the successful implementation of the pilot and subsequent scale up plans.³⁶

The MOHCDGEC launched Direct Health Facility Financing (DHFF) reforms in 2018 to improve health system performance by enhancing autonomy, transparency, and accountability at primary health facilities.^{37,38} This is part of a wider health system effort to strengthen fiscal decentralization and drew on results from the aforementioned P4P pilot in Pwani. Supported by the Global Financing Facility (GFF), core components of the program include introduction of bank accounts at the facility level and improved public financial management processes, engagement with the private sector to source medicines when not available through MSD, quality improvement initiatives for inventory management and use of innovative information and communication technology (ICT) to report stockouts. While a full evaluation of this program has yet to be published, there is preliminary evidence from GFF on improved outputs including an increase in the availability of tracer RMNCH medicines from 2016 to 2019.

Cameroon

In 2011, Cameroon launched a PBF scheme to strengthen primary care service provision and improve health outcomes with support from the World Bank. This program triggered devolution of decision-making over resources away from the government and towards lower organizational units, including regional health units (Regional Public Health Delegations and Regional Funds for Health Promotion) and HFs.³⁹ The PBF was designed to incentivize health facilities to improve health outcomes by providing them with financial payments (e.g., bonuses) that they could use either to invest in identified priorities, provide bonuses to health staff and/or purchase drugs/equipment. To improve availability of essential medicines, the program focused on three areas: the supply and distribution system, regulation, and facility management. The PBF program set up a performance purchasing agency (PPA) in each region to identify distributors and wholesalers based on government standards. The PPA was responsible for setting up quarterly performance contracts with regulatory entities at regional or district levels to evaluate the quality of service provision at HFs.⁴⁰ Regional Public Health Delegations (RPHDs) were responsible for maintaining the quality of essential

³⁵ Ibid

³⁶ Kuwawenaruwa et al. 2020: <https://pubmed.ncbi.nlm.nih.gov/32610764/>

³⁷ Mwakatumbula 2021: <https://media.africaportal.org/documents/Health-policy-PB.pdf>

³⁸ World Bank 2015: Project appraisal document, Tanzania: <https://documents1.worldbank.org/curated/en/243871468179947102/pdf/96274-PAD-P152736-IDA-R2015-0121-1-Box391433B-OUO-9.pdf>

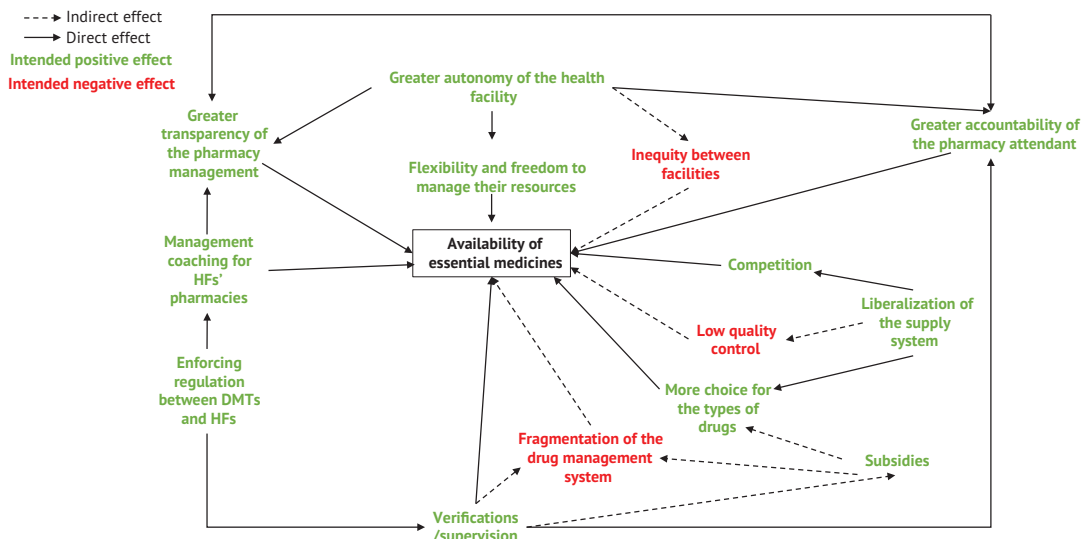
³⁹ Sieleunou et al. 2019: <https://pubmed.ncbi.nlm.nih.gov/31816071/>

⁴⁰ Sieleunou et al. 2020: <https://pubmed.ncbi.nlm.nih.gov/32446280/>

medicines and identifying a list of accredited wholesalers health facilities can select from. The hypothesis was that greater competition between wholesalers would lead to reduced prices from suppliers and greater availability. Quality assurance and availability were included in the performance indicators used to assess facilities.⁴¹

Available evidence provides mixed quantitative results on the effect of this program on essential medicine availability. Only one study evaluated the impact of this program on essential medicine availability and found a significant impact on stock out reduction for family planning medicines only.⁴² There was no effect on other medicines such as antenatal care, IMCI, labour and delivery drugs or vaccines.⁴³ Nevertheless, Cameroon’s PBF experience offers relevant qualitative insights based on analyses of the health system context, provider behavior, and accountability mechanisms. The introduction of accredited private wholesalers into the supply system, increased autonomy over fund and human resources at the facility level, greater accountability of pharmacy attendants and enforced regulation from district management teams were deemed critical influencing factors for facilities that experienced greater availability of essential medicines.⁴⁴ Figure 5 provides a schematic of the key pathways that led to greater availability of medicines at the facility. The schematic has been adapted from Silenuou et al. 2019 to illustrate effects between interventions (direct or indirect) and whether the effects were perceived to be negative or positive.

Figure 5. Pathways to essential medicine availability based on the PBF program in Cameroon



Source: Adapted from Sileunou et al. 2020.

⁴¹ Ibid

⁴² Family planning commodities in this context were provided for free (vs. assisted deliveries and ANC visits that accompanied fees).

⁴³ Ibid

⁴⁴ Sileunou et al. 2019: <https://pubmed.ncbi.nlm.nih.gov/31816071/>

Conversely, the experience raised concerns: perceived worsening quality control of essential medicines due to wholesaler accreditation being based on administrative rather than technical elements. Small facilities in hard-to-reach areas struggled to purchase sufficient supply of medicines because they did not have enough funds based on low-cost recovery, driving a risk of worsening pre-existing inequalities between health facilities. The PBF program did not account for heterogeneity in the levels of preparedness between health facilities that engage in PBF (e.g., quality of buildings, access to water, electricity, equipment, staff) nor the skills of facility managers (e.g., management capacity, understanding of PBF).⁴⁵ Consistent with other reviews of PBF programs, health workers also come up with creative ways to take advantage of and cope with a system that provides rewards for certain indicators at the expense of others. A fragmented drug management system could be an unintended effect of this as health workers choose to separately manage information on performance-related indicators.⁴⁶

Additionally, there was a disconnect between intended and actual facility autonomy. For example, delays in PBF payments, which became worse after the scheme transitioned from a pilot to a national program, prevented facilities from operationalizing their own decisions.⁴⁷ There were also legislative barriers as facility autonomy of funds clashed with existing laws that prevented facilities from managing funds. While theoretically, the laws should have changed, in practice they did not, putting pressure on facilities to comply with national regulations.

Nigeria

Procurement and distribution of essential drugs in Nigeria varies significantly across the 37 states, although the central government plays a crucial function in product selection (by setting and updating the EML and STGs) and regulation (all medicines must be registered, and quality assured by the National Agency for Food and Drug Administration (NAFDAC)). Forecasting and tendering functions depend on how products are financed but may be done at all three levels to some degree: the central, state, and local (through local government authorities [LGAs] that play a role in procurement). Different implementing partners operating across states may play a significant role across all or some of the procurement and distribution functions. In this context, pharmaceutical supply systems for maternal, newborn, and child health commodities are extremely fragmented, differing across states, partners, and initiatives.⁴⁸

Primary health facilities play a strong operating role in fund management and medicine procurement. Drug revolving funds (DRFs) are common, although limited monitoring and support for DRF implementation have resulted in poor inventory management, stock-outs, and DRF collapse. HFs will use their funds to purchase either from the state or LGA medical

⁴⁵De Allegri et al. 2018: <https://pubmed.ncbi.nlm.nih.gov/29607103/>

⁴⁶Sieleunou et al. 2019: <https://pubmed.ncbi.nlm.nih.gov/31816071/>

⁴⁷De Allegri et al. 2018: <https://pubmed.ncbi.nlm.nih.gov/29607103/>

⁴⁸Clinton Health Access Initiative Nigeria Country Assessment for the UN Commission on Life Saving Commodities 2013 (Unpublished)

store or the private sector, relying more on the latter in states where the public sector medical store does not function efficiently. HFs also often refer patients to purchase medicines in the retail sector, alleviating their need to manage inventory. Approximately a third of commodities available in public facilities (secondary and primary) are purchased directly from private distributors or manufacturers instead of the state store.⁴⁹ This context can be helpful when assessing the potential for strengthening the lower-level health facility's role in medicine purchasing.

Although HFs can purchase medicines directly from the private sector, there is limited published evidence on both the operational circumstances and impact on price, availability, and quality. There is some evidence from evaluations conducted as part of the Nigeria State Health Investment Project (NSHIP), a World Bank's supported program launched in 2012 to help improve Nigeria's primary care service provision in light of its poor maternal and child health outcomes, a study that evaluated medicine availability at the PRIMARY HEALTH FACILITY level in Enugu state and a supply chain assessment of essential RMNCH commodities in Nigeria conducted by CHAI in 2013.

NSHIP included two financing interventions: Direct Facility Financing (DFF) and PBF. A study was conducted in 2014–2017 across Nasarawa, Adamawa and Ondo states to assess the impact of DFF and PBF on health service provision, including the availability of essential medicines.⁵⁰ The study was implemented by the National Primary Health Care Development Agency (NHFDA) at federal and state levels and local government authorities (LGAs) at the district levels and assessed the impact between PBF, DFF and control arms.

The DFF and PBF arms had four shared characteristics key to the program: Funds were electronically transferred to a health facility bank account, facilities had autonomy to allocate funds, community engagement was incorporated into facility management, and enhanced supportive supervision through a checklist. Unlike PBF, the DFF scheme did not have facility payments linked to quantity and quality of health services, a remoteness bonus to compensate for hard to reach facilities and salary bonuses to health workers based on performance. DFF facilities were not subject to third party verification on quality or quantity. Operationally, health facilities merged funds from user fees and PBF or DFF disbursements. Facilities had autonomy to purchase drugs from any sources—apart from registration with NAFDAC and legal authority to operate in the state, there were no other limitations for the health facility on medicine purchasing.

Both DFF and PBF demonstrated significant improvements over the control arm on the coverage and quality of maternal and child health services. Notably, the availability of essential drugs increased for both arms (8.5% points for PBF and 7.1% points for DFF vs. control). While the study did not investigate the independent impact of facility fiscal autonomy from other interventions (e.g., community engagement and supervision), it does provide helpful insights for policymakers. Financial management at the facility level

⁴⁹ Ibid

⁵⁰ Khanna et al. 2021: <https://pubmed.ncbi.nlm.nih.gov/34544415/>

needed to be improved because not all protocols were followed, although corruption risks were mitigated by scrutiny through community engagement and strengthened supervision. Nevertheless, DFF was found to be simpler and cheaper compared to PBF due to lower administrative costs, suggesting that it might be a feasible and complementary financing intervention.

Enugu state introduced a district health system (DHS) in 2004 as a decentralization reform to strengthen HF's capacity to deliver key services. Facility autonomy over A recent study evaluated the impact of the DHS policy on HF's service availability and readiness, including the impact on the availability of all 102 essential medicines from the EML and 49 tracer medicines for maternal and child health, communicable non-communicable diseases.⁵¹ 47% of HF's sourced medicines through the open market or private vendors, and 53% of surveyed HF's used a DRF to receive supplies from the state medical store. None of the 60 HF's assessed had all the required medicines available. An average of 27 out of 102 EML medicines were available and urban HF's had greater availability on average compared with rural HF's. Reported challenges include insufficient funds to run the DRF, long distances for rural HF's to reach the local or state store to replenish stock and high costs of drugs in the public sector. Notably, stock shortages at HF's were noted to be a key reason for patients not utilizing services and relying on traditional healers.⁵²

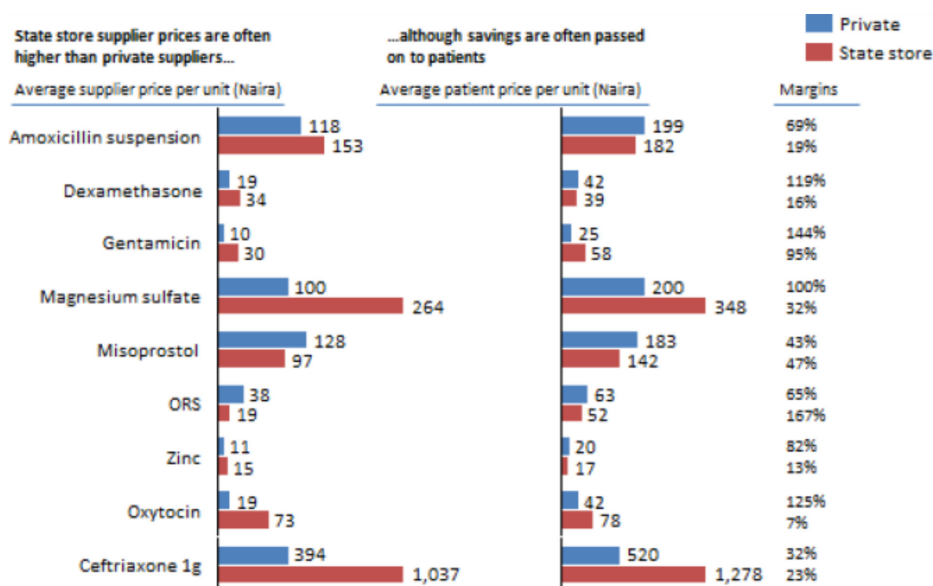
A supply chain assessment in Nigeria that investigated the supply chain bottlenecks inhibiting the availability of essential RMNCH commodities identified three main reasons why HF's purchase from the private sector⁵³: Firstly, HF's experience distrust in public sector procurement based on previous experience that resulted in expired products. Secondly, private distributors physically deliver products to the facilities, obviating the need to arrange transport which is required when purchasing from local or state medical stores and finally, private sector prices can be cheaper than state store prices. Some HF's can procure from at least a dozen different sources and gain greater savings from the private sector. Private distributors leverage aggressive marketing tactics and offer distribution directly to the facility, making them an attractive option, especially in harder-to-reach facilities. Patients, however, do not always see these savings, and as demonstrated by Figure 6, HF's add higher margins on products sourced from private rather than public channels. Brand selection also plays a role in price differentiation, with lower prices for specific brands offered by the private sector.

⁵¹ Ekenna et al. 2020: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7649669/>

⁵² Ibid

⁵³ Based on a CHAI analysis conducted across 64 site visits in five states: Rivers, Kano, FCT, Lagos and Nasarawa in 2013 (unpublished)

Figure 6. Private vs. public procurement among public health facilities



Source: Based on a CHAI analysis conducted across 64 site visits in five states: Rivers, Kano, FCT, Lagos and Nasarawa in 2013 (unpublished).

Since 2014 Nigeria has established the Basic Health Care Provision Fund (BHCPF), which aims to fund a basic package of primary healthcare for all Nigerians by substantially increasing the level of Federal financial resources to cover essential drugs, facility maintenance, equipment and transportation, and strengthening human resource capacity. Under this structure the provision of essential drugs would have some financial resourcing from the Federal government and lesser reliance on user fees.

India (Maharashtra)

Primary health centers (HFs) in the Indian state of Maharashtra play a strong role in medicine purchasing and management. The state government contracts with pre-vetted suppliers that facilities can purchase from and medicines are then delivered directly to the health facilities. Suppliers must meet WHO Good Manufacturing Practics (GMP), but no additional external quality checks are conducted.⁵⁴ While there was no rigorous evidence on impact, one study suggests that the decentralized supply model increases the dependency of primary health centers on the suppliers. These suppliers do not have consistent supply due to sporadic payments and poor planning.⁵⁵ The Directorate of Health Services in Maharashtra is responsible for facilitating a centralized purchase price for about 1850 drugs, incurring significant administrative costs.

⁵⁴ Singh et al. 2013: <https://pubmed.ncbi.nlm.nih.gov/23388196/>

⁵⁵ Ibid

Primary health centers that are part of the National Rural Health Mission (NRHM),⁵⁶ now the National Health Mission, in theory must prioritize purchasing medicines from government contracted suppliers. Stock-outs and low availability of essential medicines are common, driving facilities to purchase from other sources or refer patients to purchase privately elsewhere.^{57,58} The rate of locally purchased medicines was found to be five times higher than the rate of medicines purchased under government contracts.⁵⁹ Observed challenges include poor inventory management at the facility level, inefficient procurement and distribution medicine systems, and inadequate budget.

The public sector medical supply system in Maharashtra was assessed as being unresponsive to demand (for example, medicines would be distributed equally across all HFs based on a standard quota vs. accounting for heterogeneity), struggling to manage multiple sources of supply (between national, state, and district level supply chains) and lack of monitoring (no provision in place to track stock position and utilization of medicines in HFs and no computerized linkages between HFs and district headquarters despite the availability of functional computers). The government of Maharashtra has been exploring setting up a central agency such as in the States of Tamil Nadu, Rajasthan, to purchase aggregate supplies on behalf of all hospitals and HFs. This would switch the system back from central rate negotiation to centralized procurement and purchasing.

VA/DOD

Decentralized facility ordering and purchasing medicines is a core tenant of medicine procurement and distribution in the US under the Department of Defense (DoD) and Veteran's Affairs (VA) health systems. Product selection, tendering, contracting, and contract performance management functions are facilitated centrally. While we did not find any rigorous evidence regarding the impact of this system on medicine availability, price, or quality, its operational design provides many useful implications. The DoD and VA maintain price, quality, and availability through the following mechanisms managed at the central level: a prescription drug formulary, strategic purchasing, and contract performance monitoring through framework agreements.⁶⁰ Contracting and framework agreements happen at two levels: one between the federal government and the manufacturers, and the second occurs between the federal government and distributors. Both the VA and DoD issue open competition tenders for manufacturers to respond to against products on the formulary. They then negotiate distribution and pricing agreements with each supplier and finalize a catalog of pharmaceutical products at negotiated prices available to all government agencies. Distributors, known as prime vendors, are selected at the regional level through a competitive process either as single entities or in combination. Prime vendors engage in separate service contracts with the government for timely delivery of medicines and supplies

⁵⁶The National Health Mission is a government initiative designed to serve the needs of under-served rural areas

⁵⁷Maiti et al. 2015: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4581141/>

⁵⁸Raut-Marathe et al. 2015: <https://journals.sagepub.com/doi/abs/10.1177/0972063414560873>

⁵⁹Ibid

⁶⁰Arney et al. 2014: <https://pubmed.ncbi.nlm.nih.gov/25276589/>

directly to facilities. They manage inventory, transportation, and personnel costs. Vendors may offer additional discounts to the federal government for commodities based on their own negotiations with manufacturers and volumes.

The VA and DoD establish long term and flexible framework agreements, designed to optimize for quality, price and responsiveness. Framework agreements are a contracting mechanism in which long term contracts provide the terms and conditions for smaller, repeat or off-schedule purchasing orders. Framework agreements help when procurements have to happen on an indefinite, repeated or urgent basis. They are set up to reduce the lead times and transaction costs of product delivery by stipulating adjustments including timing of delivery, quantity, and supplier selection.

For example, the VA establishes flexible multi-year contracts of indefinite delivery/indefinite quantity with pre-approved vendors under multiple award schedules. When the VA reviews potential vendors, they look at price (discounts), past performance, technical approach, and participation of small businesses (e.g., SMEs). Multiple-supplier frameworks enable facilities to purchase from alternative vendors if a vendor has a shortfall. It is worth noting that most developed countries rely on the private sector for commodity distribution.⁶¹

Other countries, including LMICs, have also had successful experiences using framework agreements to strengthen procurement practices though evidence is limited to government purchasing on behalf of facilities rather than facility-led purchasing. The MoH engages in single-supplier framework contracts with 5 manufacturers or wholesalers for essential medicines on the Zambia EML in Zambia. These contracts are time-bound with fixed volumes and minimum 2-year durations. Orders are forecasted once for the year and 4 call-off orders and deliveries occur per year per supplier, adding flexibility to order quantities and delivery schedules and consequently increasing medicine availability. In Kenya, KEMSA (the parastatal organization mandated to supply essential medicines and health commodities in Kenya) uses 2-year framework contracts with domestic suppliers for indefinite quantities at fixed prices. Forecasts and orders are made quarterly, and payment occurs upon delivery.⁶² KEMSA created a new contracts management department specifically for this function.

Experience from the US and other countries that have leveraged framework agreements for pharmaceutical supply systems provide a few key lessons. Firstly, public procurement legislation matters- does it allow for the design and use of framework agreements? Technical capacity in contract management (at the level of government which carries out this function) is also critical to prepare, negotiate, manage, evaluate and conduct performance reviews of selected vendors. Multi-supplier framework agreements can involve two stages to account for varying levels of competition and price volatility. For example, the first stage can exclude prices from terms and conditions while the second stage, introduced for ad-hoc orders (e.g., call-off orders), can include a mini-competition at revised prices. Call-off orders may also benefit domestic suppliers or vendors who might be more able to supply smaller volumes.

⁶¹ JSI 2019: https://publications.jsi.com/JSIInternet/Inc/Common/_download_pub.cfm?id=24007&lid=3

⁶² Ibid

Finally, framework agreements are likely more appropriate for health products with mature markets (the majority of essential medicines) rather than new products since their duration and terms may preclude the inclusion of new suppliers.

We identified six key attributes that are key to a HF's ability to expand its role based on relevant evidence gathered from the aforementioned country case studies:

1. **Whether the facility receives a bonus or other forms of direct payment.** This is especially relevant in PBF schemes. Three (Tanzania, Cameroon, and Nigeria) out of six case studies include a bonus payment. HFs may be more incentivized to purchase stock from the private sector to ensure availability in order to achieve the targets for their bonus payments.
2. **Whether HFs are legally sanctioned by the government to purchase from different sources and whether they can do so anytime or under specific circumstances.** This reflects the legal framework in place to support the HF with purchasing commodities from different sources. All six countries have mechanisms in place that allow HFs to purchase outside of the public sector. In two, (Ghana and Tanzania), HFs are only allowed to do this if they cannot source the needed product from the public sector supply chain. In practice, when they do have the money to purchase directly, they are more likely to engage in direct purchasing without necessarily following this rule.
3. **Responsibility of quality control of medicines and how HFs ensure quality products.** This reflects whether there is a mechanism to ensure quality through regular testing, supplier vetting, and/or other quality assurance procedures in the framework agreement. Five out of the six (Ghana, Tanzania, Cameroon, Nigeria, US) include mechanisms for quality control that is typically centralized at the sub-regional or national level.
4. **Level of HF autonomy across product selection/purchasing/ordering.** This reflects the degree of decision-making space that the HF has across these key functions. In all cases but one (Tanzania), facility managers have high levels of autonomy with regards to medicine procurement particularly in the purchasing and ordering functions. Product selection is usually limited to what is on a nationally set formulary or essential medicines list that may or may not be tailored to the local environment. While in theory, all HF service provisions must adhere to national treatment guidelines, in practice, HFs may substitute medicines and brands to optimize for availability at the potential expense of quality.
5. **Whether the facility pharmacist/pharmacy-tech/person in charge of medicines is accountable to the facility manager or a local/regional/central government manager.** Accountability for results varies depending on whether the pharmacist/pharmacy tech reports into the facility vs. a decision-maker in the local government. Across all case studies, the pharmacist/pharmacy tech is accountable to the facility manager in charge.
6. **Whether HFs are involved in contract management.** As key beneficiaries of any supply chain system, HFs arguably should provide input into supplier selection based on their delivery performance. While this was not consistently captured from

the literature, in most cases but one (the US), HFs do not engage in formal contract management mechanisms or provide inputs for contract management. Instead, in some cases (e.g., Nigeria, India), they can choose to switch between pre-vetted suppliers, but they do not provide direct feedback on whether those suppliers perform as expected. Contract performance management is a function that is weak or lacking in LMIC health supply chains irrespective of the level of purchasing.

Table 3 summarizes six country case studies where HFs have had experiences purchasing medicines.

Table 3. Identified case studies on HF-led medicine procurement

Key attribute	Ghana	Tanzania	Cameroon	Nigeria (Enugu, Nasarawa, Ondo, Adamawa States)	India (Maharashtra State)	US: Veteran's Affairs (VA) and Department of Defense (DoD)
Does the facility receive bonus incentives for improved outcomes?	No	Yes – in Pay-for-performance (P4P) context (2011–2013). Not the prime vendor model (tested in 2014–2016, launched for scale up in 2018)	Yes – in the PBF program (2011–2015)	Yes – in PBF and DFF Context (2013–2020)	No	No
Can government run public primary health facilities purchase from different sources?	Yes, if they receive a 'Certificate of non-availability' from the central, regional or district medical store	Yes	Yes	Yes	Yes, although they have to purchase through state government systems who pay the suppliers. HFs that partake in the National Rural Health Mission (NRHM) program can only purchase privately in emergency cases.	Yes – health facilities purchase from pre-approved distributors (managed through the prime vendor model)

Key attribute	Ghana	Tanzania	Cameroon	Nigeria (Enugu, Nasarawa, Ondo, Adamawa States)	India (Maharashtra State)	US: Veteran's Affairs (VA) and Department of Defense (DoD)
Can they do it unconditionally, or is this limited to only when the product is not available in the public sector supply system?	Technically, they should purchase privately if they can't get from the public, but this is not enforced, and facilities often purchase in the private sector because availability is poor at the government regional medical stores	In both the P4P and prime vendor model, HFs could do this only if they cannot obtain medicines from the central medical store. Facilities must request permission from district councils to purchase privately.	Anytime	Anytime	Anytime – facility purchasing and contracting NRHM – only in cases of emergency; most HFs under this program procure medicines privately	Any time per contract arrangement under centrally agreed upon Framework Agreements (e.g., VA Federal Supply Schedule)

Key attribute	Ghana	Tanzania	Cameroon	Nigeria (Enugu, Nasarawa, Ondo, Adamawa States)	India (Maharashtra State)	US: Veteran's Affairs (VA) and Department of Defense (DoD)
Who carries out quality control? Do health facilities purchase from centrally vetted suppliers? (e.g., identified prime vendors or vendors that supply under framework agreements)?	Facilities are tasked with sending reports to district officials of damaged, expired, wrong drugs or drugs of poor quality.	In the prime vendor model, the Muhimbili University of Health and Allied Sciences (MUHAS) worked with the Tanzania Drug Regulatory Authority to do random sample collection and centralized testing of products before distribution.	A central 'Performance Purchasing Agency' (PPA) was set up and signed contracts with Regional Public Health Delegation (RPHD), responsible for maintaining quality of essential medicines and drawing up a list of accredited wholesalers that HFs can use to buy from.	State govts vetted suppliers. NAFDAC approved drugs.	No additional quality checks besides the state FDA	Conducted at the federal level to vet manufacturers and distributors

Key attribute	Ghana	Tanzania	Cameroon	Nigeria (Enugu, Nasarawa, Ondo, Adamawa States)	India (Maharashtra State)	US: Veteran's Affairs (VA) and Department of Defense (DoD)
How much autonomy does the facility have? Product selection/purchasing/ordering	High levels of autonomy—can purchase essential drugs from the private and public sector, charge appropriate mark-ups to manage revenue and budget. The procurement evaluation usually includes a procurement officer from the district health directorate if the HF does not have a procurement officer. Product selection is usually made at the HF based on the prescription level. The NHIS does not reimburse HFs for products categorized beyond the HF level	District Medical Officer (DMO) is responsible for planning and budgeting for the district, including the public health facilities within the district The prime vendor model included a virtual account for each HF that was with MSD (central medical store). When deliveries come to the HF, they are informed about how much funds they have remaining to spend.	Facility managers have total control over pharmacy management (financial, human and equipment). They procure from a pre-approved list of wholesalers.	High levels of autonomy. HFs can purchase essential drugs from the private and public sector, charging patients to facilitate a drug revolving fund.	High levels of autonomy.	Full autonomy: Product selection limited to nationally set formulary Purchasing and ordering happens directly with the vetted suppliers
Is the facility pharmacist accountable to the facility manager or a local/regional/central level manager?	Facility manager and also to the district level head of pharmaceutical services	Facility manager	Facility manager	Facility manager	Facility manager	Facility manager (needs to be validated)

Key attribute	Ghana	Tanzania	Cameroon	Nigeria (Enugu, Nasarawa, Ondo, Adamawa States)	India (Maharashtra State)	US: Veteran's Affairs (VA) and Department of Defense (DoD)
(If relevant) Are facilities involved in contract management and/or performance review of vendors?	Yes. HFs (Health Center Level) award their own contracts when they purchase outside the RMC after obtaining a non-availability certificate. HFs usually have registered distributors who participate in their tenders and could change if distributors are unable to deliver per the tender agreements	No – centrally managed for the prime vendor model. Not a component of the P4P scheme.	No – up to the Regional Public Health Delegation (RPHD).	There weren't contracts—just a selection of suppliers that they could use. There was no agreement on prices.	In theory, they should be, but the quality of this is not captured.	Yes – HFs can switch distributors if they choose to as long as they are part of the prime vendor model arranged at the federal level

Key attribute	Ghana	Tanzania	Cameroon	Nigeria (Enugu, Nasarawa, Ondo, Adamawa States)	India (Maharashtra State)	US: Veteran's Affairs (VA) and Department of Defense (DoD)
Performance Metrics on availability, price, and quality (where available)	Availability Some evidence that lower-level facilities with greater decision space experienced lower stock-outs. ⁶³	P4P was associated with an 8.4 percentage point increase in the availability of all 37 medicines combined (P = 0.002) and an 8.3 percentage point increase in the availability of medical supplies, although this was only borderline significant (P = 0.050) P4P reduced the stock-out of medicines across the RMNCH continuum of care and that of medical supplies benefiting mothers and newborns. Effects on availability were most pronounced for maternal, newborn and child medicines and reproductive health supplies Availability of drugs and medical supplies was found to be lower and stock outs higher in health centers than in hospitals ^{64,65}	PBF scheme accompanied by greater role financial autonomy for health facilities led to mixed impact on stock out reduction across different commodities: 34% significant reduction in stock outs of family planning medicines ⁶⁶	Both a PBF and DFF scheme led to increased availability of 18 essential medicines based on facility autonomy, community engagement, and strengthened supervision. (8.5% points for PBF and 7.1% points for DFF vs control). ⁶⁷	Qualitative insights on sporadic or no availability based on the decentralized purchasing model. ^{68,69}	NA

⁶³ Bossert et al. 2004

⁶⁴ Binyaruka et al. 2016: <https://pubmed.ncbi.nlm.nih.gov/27928874/>

⁶⁵ Mayumana et al. 2017: <https://pubmed.ncbi.nlm.nih.gov/28257886/>

⁶⁶ Sieleunou et al. 2020: <https://pubmed.ncbi.nlm.nih.gov/32446280/>

⁶⁷ Khanna et al. 2021: <https://pubmed.ncbi.nlm.nih.gov/34544415/>

⁶⁸ Singh et al. 2013: <https://pubmed.ncbi.nlm.nih.gov/23388196/>

⁶⁹ Raut-Marathe et al. 2015: <https://journals.sagepub.com/doi/abs/10.1177/0972063414560873>

Key attribute	Ghana	Tanzania	Cameroon	Nigeria (Enugu, Nasarawa, Ondo, Adamawa States)	India (Maharashtra State)	US: Veteran's Affairs (VA) and Department of Defense (DoD)
		<p>The Jazia Prime Vendor model demonstrated a 36% increase in the availability of tracer medicines over 4 years.</p> <p>USAID's prime vendor model for supplementary essential medicines led to a 50% stock out reduction at care and treatment clinics⁷⁰</p> <p>Direct facility financing (DFF) support from the Global Financing Facility(GFF) led to an increase in the availability of 10 tracer RMNHC commodities from 60% (2016) to 96% (2019)⁷¹</p>	<p>In Enugu state, 47% of primary health centers (HFs) essential medicines are sourced through the open market or local vendors. On average, 26% of recommended 102 essential medicines were available. Generally lower availability in rural vs. urban areas.⁷²</p>			

⁷⁰Supply Chain Management System; USAID | DELIVER PROJECT, Task Order 4; USAID | DELIVER PROJECT Task Order 7.2016.Health Logistics in Tanzania: Timeline of Accomplishments for Supply Chain Interventions. Arlington VA: Supply Chain Management System; USAID | DELIVER PROJECT, Task Order 4; USAID | DELIVER PROJECT, Task Order 7

⁷¹GFF annual report 2020: https://www.globalfinancingfacility.org/sites/gff_new/files/documents/GFF-Annual-Report-2019-2020.pdf

⁷²Ekenna et al. 2020: <https://pubmed.ncbi.nlm.nih.gov/33165588/>

Key attribute	Ghana	Tanzania	Cameroon	Nigeria (Enugu, Nasarawa, Ondo, Adamawa States)	India (Maharashtra State)	US: Veteran's Affairs (VA) and Department of Defense (DoD)
Price	In 2007, Ghana procured drugs at 150% of international drug prices (an increasing trend since 2004). Health workers have cited lower prices in the private sector. ⁷³	In the Jazia prime vendor model, prices were fixed and comparable to CMS (MSD) prices ⁷⁴	NA	NA	NA	NA
Quality	Decentralization was also accompanied by increased purchasing from the private sector and increased purchasing of generics. In some cases, facilities chose to purchase products out of EDL scope, and these were often branded. These branded products are sold on a cash basis mostly to help increase IGF	Quality across all experiences was in accordance with the Tanzania National Drug Regulatory Authority. Qualitative feedback from councils and health facilities reported satisfaction on the quality of medicines ⁷⁵	NA	NA	NA	NA

⁷³ Saleh 2013, The Health Sector in Ghana – A comprehensive assessment: <https://openknowledge.worldbank.org/handle/10986/12297>

⁷⁴ Wiedenmeyer et al. 2019: <https://pubmed.ncbi.nlm.nih.gov/30891247/>

⁷⁵ Wiedenmeyer et al. 2019: <https://pubmed.ncbi.nlm.nih.gov/30891247/>

Across all examples, HFs play a greater role in purchasing, whether mandated and regulated or not. Anecdotally, in Tanzania, as much as 50% of medicine purchasing by Hfss is done in the private sector.⁷⁶ In Maharashtra state, private purchasing by HFs can be five times higher than the rate of medicines purchased under rate contracts with the government.⁷⁷ HFs also purchase from the private sector in Nigeria, Malawi, and Kenya.⁷⁸

Other functions such as product selection and price negotiations with suppliers and/or wholesalers are predominantly executed at central or sub-national levels with minimal input from HFs (if any). Contract performance management is poorly documented, so it is not clear how it is typically done and the impact of this specific function on essential medicine availability.

Nevertheless, there is some evidence that suggests essential medicine availability is greater in places that have enabled facilities to purchase medicines directly.

Emerging lessons from the literature review

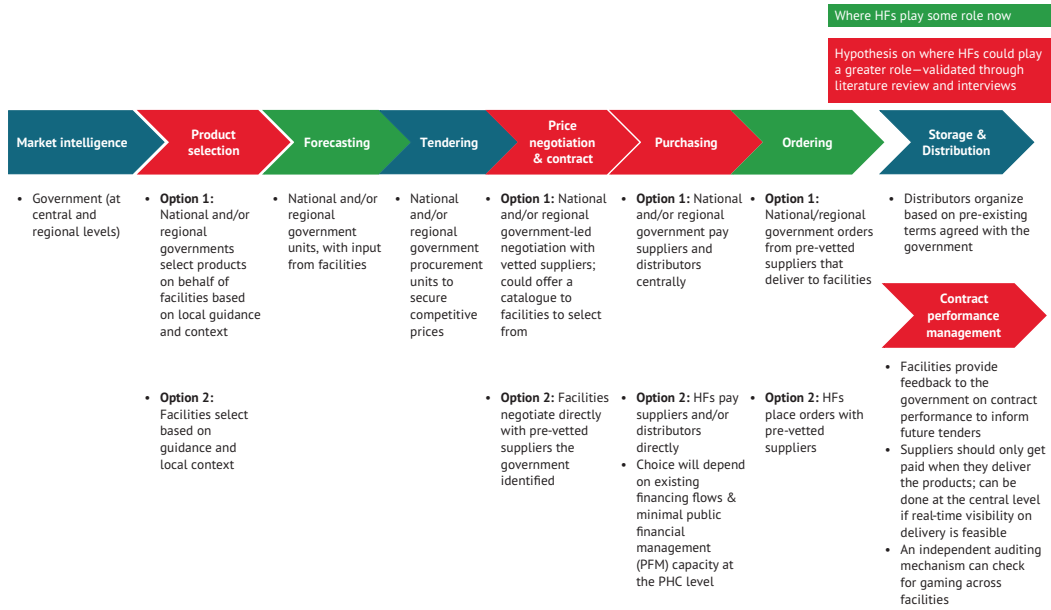
When health facilities have greater autonomy in ordering and purchasing supplies, and they negotiate directly with private suppliers independently of the central or state/district government supply agency, this could lead to loss of economies of scale in pricing negotiations as compared to prices obtained if such negotiations were carried out by aggregating demand across health facilities. Similarly, supplier contract performance management could be better managed across facilities by a centralized government function than by individual facilities. We have summarized potential operating models for an expanded role played by health facilities in managing medicines supply (Figure 7). It is worth noting that these options are not mutually exclusive, and countries may choose different models or their combinations depending on local context and overall system conditions.

⁷⁶ Based on conversation with Benjamin Loevinsohn on 10/8/2021

⁷⁷ Raut-Marathe S et al. 2015: <https://journals.sagepub.com/doi/abs/10.1177/0972063414560873>

⁷⁸ CHAI Country Assessments on the Availability of Life-Saving Commodities prepared for the UN Commission on Life Saving Commodities, 2013 (Nigeria, Tanzania, Kenya, and Malawi)

Figure 7. What could a facility purchasing operating model look like?
Hypotheses investigated in review



Available evidence from the country case studies and the literature review also provides an understanding of the pre-requisites and inhibiting factors that policymakers could consider. The pre-requisites for the public sector are summarized in Figure 8. Figure 9 proposes pre-requisites specific to the private sector.

Figure 8. Pre-requisites that need to be in place for primary health facilities to purchase and order (*public sector*)

Pre-requisites	Descriptions
<p>1. Predictability on needs, financing and processes b/w the relevant actors doing ordering and purchasing</p>	<ul style="list-style-type: none"> • Govt capacity to provide stewardship (e.g., development of enforceable guidelines, standard operating procedures, clarity on roles and responsibilities) • Public sector actors must generate confidence with private suppliers on timely and seamless financing • Visibility on forecasted volumes, particularly if the private sector is a back up for public sector supply chains
<p>2. Commitment from policy and regulatory institutions to provide an enabling procurement and distribution environment</p>	<ul style="list-style-type: none"> • Legislative capacity to set clear and transparent framework agreements to enable suppliers to deliver directly to lower level facilities • Active engagement of regulatory drug authorities to expand potential suppliers based on quality standards by offering technical support for registration • Capacity to identify and vet qualified vendors through tendering contracting and contract management
<p>3. PHC financial autonomy</p>	<ul style="list-style-type: none"> • HFs have mandate to use their own funds for medicine purchasing based on their priorities, even with guidance or conditions for use • They have visibility on funds either through physical accounts or credit lines/virtual bank accounts managed by another party
<p>4. Agile troubleshooting mechanisms in place</p>	<ul style="list-style-type: none"> • Strong communication channels: Transparent content—a procurement strategy, transparency on how it is executed, timely responses from central level to local units. And comms: <ul style="list-style-type: none"> ◦ Mechanisms for facilities to raise challenges or concerns informally to troubleshoot concerns in ‘real time’ to reduce reoccurrence of incorrect practices ◦ Having mechanisms to include perspectives of local facilities in central-level procurement reform (consulted at least) ◦ All needed to minimize anxiety, uncertainty, suspicion and resistance from stakeholders
<p>5. Available, accurate and timely shared data</p>	<ul style="list-style-type: none"> • Electronic data sharing systems in place to ensure timely payment to vendors based on verification of receipt

In the public sector, one of the most critical factors for a system with greater HF autonomy around medicines purchasing to function well is predictability of demand (e.g., volumes), financing, and processes between actors conducting ordering and purchasing. In addition to better overall system performance, such predictability fosters trust, a critical attribute that the private sector needs in order to work effectively with the public sector. Regulatory institutions that can help create an enabling environment for facilities to purchase from alternative sources to ensure quality, affordability, and availability are also an important pre-requisite. Facility-based purchasing does not obviate the need for contracting technical capacity to be able to put in place framework agreements, identify and vet qualified suppliers and work collaboratively with interested suppliers to encourage them to engage productively (e.g., technical assistance to help meet quality standards, transparency on processes). Having such capacity ensures that tenders for supplier selection are transparent, payments are on

time, tendering cycles are shorter and contract lengths longer.⁷⁹ Lower level facilities must have some financial autonomy to manage their own funds, potentially with some guidance for how to use such unrestricted funds for purchasing medicines and health products. Legal frameworks should exist to allow facilities to manage funds. Incentives must account for adherence to STGs and minimize risk of purchasing higher priced medicines (e.g., branded over generics). Health facilities ideally have their own bank account, credit line, or virtual account so that they can see how much funds they have available.

Troubleshooting mechanisms and availability of data that is shared between those ordering, purchasing, and suppliers are critical. Facilities must be updated on revised processes, guidelines and know who to turn to when questions or challenges arise. Sub-national government stakeholders can play a more significant role in supporting facility management with this and provide guidance. Supportive supervision exercises can also be leveraged. Efficient data sharing through technology is important to ensure timely payment upon delivery. Moreover, linking private sector enterprise resource planning systems with facility ordering and stock levels would increase the efficiency of planning and delivery, thereby reducing the risk of stock-outs.⁸⁰

Figure 9. Pre-requisites that need to be in place for primary health facilities to purchase and order (*private sector*)

Pre-requisites	Description
1. A healthy distributor market	<ul style="list-style-type: none"> A “sufficient” number of distributors with national reach (either directly or through sub-wholesaling arrangements). Too many/too fragmented means they are unlikely to have national reach. Too few means no competition to select as Prime vendor. The distributors should have high quality standards, both in the manufacturers they sources from and their warehousing and distribution practices i.e. be GDP compliant. They should have the infrastructure (warehouses, IT systems) to receive orders, track and fulfill then in a timely manner and provide proof of delivery as required.
2. Competitive supplier and distributor landscape	<ul style="list-style-type: none"> This model might work best for commodities that have several suppliers and distributors that cater to high demand. Competition enables the buyer with greater bargaining power and can incentivize accountability with contract management.
3. Distributor access to credit	<ul style="list-style-type: none"> Distributors should have sufficient working capital to buy stock in advance and supply to health facilities with short lead times
4. Full-line distributors	<ul style="list-style-type: none"> If each manufacturer is represented by different distributors then it is not possible to have 1–2 suppliers to contract with. There need to be “full line” distributors who distribute multiple/most manufacturer’s products.
5. Trusting relationship with the government	<ul style="list-style-type: none"> Needs a supportive government that offers to help potential suppliers engage, adapt to needs and mitigate risk Visibility and clarity on standards, preferences and financing conditions

⁷⁹JSI 2019: https://publications.jsi.com/JSIInternet/Inc/Common/_download_pub.cfm?id=24007&lid=3

⁸⁰Ibid

There are also pre-requisites that must be considered for the private sector, notably as it relates to the supplier and distributor market landscape, access to financing, and existing levels of trust with the government. Direct facility purchasing from distributors while ensuring affordability, availability and quality depends on a healthy distributor market that is not too fragmented, can meet quality standards, and have appropriate infrastructure to track and fulfill timely orders. Distributors would also benefit from being ‘full-line, in other words, distributing several commodities rather than solely representing one manufacturer. Distributors also need access to working capital to buy stock in advance and supply to health facilities with short lead times. Large wholesalers can access credit terms secured by suppliers who are based overseas and, in that way, overcome extremely high local interest rates.⁸¹ This is more challenging for smaller wholesalers who may need to borrow from commercial banks. Products with high levels of competition are likely more appropriate for this model so that buyers have bargaining power. Finally, as mentioned previously, the government must provide confidence to the private sector. On average, across five sub-Saharan African countries, wholesalers may wait anywhere from 180–360 days to receive payments from government customers.⁸² This risks limiting interest, involvement and/or higher prices with increased margins to compensate for delays.

There are many reasons why greater facility purchasing could be perceived as a risky venture. Figure 10 offers an analysis of at least eight inhibiting factors highlighted throughout the review. While these are potential risks to watch out for, each is also accompanied by mitigating interventions.

⁸¹ Ibid

⁸² Ibid

Figure 10. Inhibiting factors, in order of relevance based on review

What to watch out for	Risk mitigation
<p>1. Limited human resource capacity and/or bandwidth at the facility level: there is a tendency to 'add on' roles to people with other responsibilities and/or to expect individuals to perform certain functions without adequately training them [Tanzania, Kenya, Uganda]</p>	<ul style="list-style-type: none"> • Conduct facility readiness assessments/Vet facilities for their capacity to take on ordering and/or purchasing function; use to prioritize facilities that can partake in such a program • Identify a vendor management system with the suppliers to minimize the amount of work for the facility; pre-vetting and payments could be limited to the central level to reduce this risk • Invest in schemes to support facility staff (e.g., supportive supervision, mentoring)
<p>2. Increased administrative cost for overseeing multiple purchasing mechanisms that can also have the potential for inefficiency since multiplicity requires oversight over several supply chain system [Tanzania Jazia Prime Vendor Model]</p>	<ul style="list-style-type: none"> • Streamline functions to reduce additional administrative costs (e.g., split purchasing and ordering functions to limit administrative costs at lower levels) • Government can earmark funds for procurement strengthening at decentralized levels
<p>3. Certain stakeholders (e.g., middle tiers and/or public sector supply specialists) might perceive a loss of authority or control when the locus of decision-making moves and/or when there is greater reliance on private sector engagement; worse if those stakeholders were complicit in corruptive practices. [Cameroon]</p>	<ul style="list-style-type: none"> • Generate a comprehensive stakeholder mapping to predict who will be affected and how by operational changes triggered from this process; corruptive practices are common as health systems in LICs are chronically under-funded • Conduct stakeholder consultations to obtain buy-in for the process & mitigate negative repercussions • Adapt roles of middle management staff appropriately (e.g., additional oversight functions)
<p>4. Risk of sub-standard medicines without sufficient quality control [Concern raised in multiple papers but some feedback that this challenge is overblown and/or relevant with specific products]</p>	<ul style="list-style-type: none"> • Ensure investments to strengthen national regulatory authority's ability to register medicines based on quality standards • Purchasing agency can pre-vet suppliers and distributors at the central level beyond what the national regulatory authority stipulates; wholesalers and distributors might be incentivized to partake in the scheme if they get support for quality assurance checks • Reduce the number of commodities to pre-vet to be manageable: focus on key preventive/curative drugs where impact is at risk • Invest in routine spot check surveys to check quality of commodities that have higher value and where there is a known risk
<p>5. Risk of inequity: the HTR/remote/rural facilities might struggle given limited accessibility to distributors [Evidence from Cameroon]</p>	<ul style="list-style-type: none"> • Prioritize hard to reach/low volume facilities for government-led supply chains and/or alternative supply solutions • Extra funds would be needed regardless to reach HTR clinics
<p>6. Health facilities game the system by charging higher prices to patients for certain medicine and/or not aligning care with standard treatment guidelines (STGs) [e.g., Ghana overprescribing ACTs because they were reimbursed at rates higher than what facilities could access from distributors]</p>	<ul style="list-style-type: none"> • Need to accept that this is always a risk, likely due to extenuating and difficult circumstances • A digital system can identify the outliers and unusual patterns with PHC-led inventory management • An independent auditing mechanism could spot check the extent of risks
<p>7. Fiscal advantages that national level stores can achieve through centrally-set tariff/customs discounts might not be available when PHCs deal directly with the private sector—PHCs might be deterred by this [Evidence from Cameroon]</p>	<ul style="list-style-type: none"> • Central purchasing with pre-vetted suppliers and distributors may enable fiscal advantages that individual facilities would not be able to negotiate • Facilities are prepared to purchase only from distributors and suppliers who are pre-vetted
<p>8. Repeat call-off orders: might be challenging to monitor and risk legal violations, creating risks for competition and transparency [US Prime Vendor Model]</p>	<ul style="list-style-type: none"> • Set clear guidelines for how facilities should handle call-off orders & use their funds • Reimbursement could be contingent on call-off orders only with suppliers that have framework agreements

While not well documented in published literature, adherence to standard treatment guidelines (STGs) is another risk when HFs have greater financial autonomy. They may decide to make substitutions for medicines based on pricing or other considerations rather than quality and cost effectiveness considerations.

Limitations

This review was not intended to exhaustively identify all the barriers and potential solutions at peripheral levels to increase the availability of essential medicines. While more research on this topic is needed, our study specifically focused on understanding the role of HFs in the direct purchasing of medicines (with our without centralized framework contracts) from private wholesalers and suppliers. Other solutions may be of equal relevance for policymakers to consider: reducing supply chain tiers more generally as a way to shorten lead times, improvements in supply chain performance monitoring and use of data, instituting market competition for central medical stores, outsourcing supply chain functions to private sector entities and investing in supply chain leadership and technical talent.⁸³

There is also a general trend towards decentralization, and it is worth thinking through how to best leverage that in the context of supply chain logistics to increase medicine availability.^{84,85} The evolving literature on facility autonomy and spectrum of ‘decision space’ also offers insights on different HF functions.⁸⁶ While our focus has been the HF, there are other ways to think about decentralizing medicine procurement, including the role of regional and/or district health authorities. In this regard, lessons from the devolution of fiscal responsibilities to lower health system levels can be gleaned from Kenya, Thailand, and Indonesia.⁸⁷

There are also alternative ways to think about the role of HFs and patients in drug procurement that were not captured in this brief but are relevant. For example, the potential for HFs to be part of a preferred vendor network with private pharmacies and/or accredited drug shops that could supply low-cost vetted drugs (with centralized price negotiation). Also, as National Health Insurance programs in countries start to gain coverage and mature, it will create the opportunity for the retail pharmacy and the public sector health facility to become more important direct players in the overall medicine supply system.

⁸³ Yadav 2015: <https://pubmed.ncbi.nlm.nih.gov/31546312/>

⁸⁴ USAID 2021: Supply chain considerations for implementing decentralized drug distribution: https://www.ghsupplychain.org/sites/default/files/2021-03/DDD_handbook_final_March_2021.pdf

⁸⁵ E&Y 2019: https://assets.ey.com/content/dam/ey-sites/ey-com/en_gl/topics/health/ey-health-supply-chain-of-the-future.pdf?download

⁸⁶ Bossert et al. 2007: <https://pubmed.ncbi.nlm.nih.gov/17324947/>

⁸⁷ Indonesia: Republic of Indonesia Health System Review 2017: <https://apps.who.int/iris/bitstream/handle/10665/254716/9789290225164-eng.pdf>; on quality since the e-catalogue system was introduced (Hasnida et al. 2021): <https://pubmed.ncbi.nlm.nih.gov/34049935/> On Kenya: Tsofa et al. 2017: <https://pubmed.ncbi.nlm.nih.gov/28911328/> On Thailand: Hawkins et al. 2009: <https://openknowledge.worldbank.org/handle/10986/3208?show=full&locale-attribute=es>

Conclusion

Currently, there is a dearth of rigorous evidence regarding the impact of greater autonomy to health facilities on availability, price, and quality of essential medicines. Our review suggests that decentralized purchasing coupled with regional or central price contracting and supplier selection has the potential to improve the availability of medicines at health facilities. But this depends on a number of prerequisites. These include some basic capacity at health facility levels to support demand forecasting, financing and data sharing. It also requires a healthy distributor network that operates under government stewardship. Decentralized ordering and supplier led distribution to health facilities can also create a stimulus for the private distribution network to expand their reach into rural areas where they currently don't serve as systematically. The presence of both public and private suppliers creates competition. This benefits the health facilities because when availability through the public sector supply agency is poor they have a recourse mechanism.

Because of poorly functioning public sector supply systems, health facilities in many LMICs already turn to the private sector to purchase medicines or depend on patients to purchase medicines in the private sector directly, either in private pharmacies, clinics, or drug shops. Health facilities directly selecting suppliers and negotiating prices can lead to potential inefficiencies. However, institutionalizing an enabling environment that allows HFs to place orders of essential medicines to pre-selected suppliers who have been vetted for quality and with price terms that have been negotiated has clear benefits. It can provide HFs much-needed recourse to essential medicines when the public sector supply system is not working, while minimizing the risks of higher prices and poor quality. Moreover, reliance on pre-vetted vendor(s) can send positive market signals through predictable demand, a competitive and transparent bidding process, and enforceable framework agreements. Such a system may in fact further strengthen the government-funded supply chain which can focus its efforts on a smaller list of health products which it is directly responsible for supplying. Strengthening the capacity of health facilities has additional benefits such as improved public financial management capacity and quality of local suppliers through enhanced regulatory oversight at lower levels of the health system.⁸⁸

Uninterrupted availability of essential medicines at convenient points of access is a cornerstone of universal health coverage. Lower-level health facilities in most LMICs already engage in some form of direct purchasing of essential medicines either from the public or private sector. Alternative ways of organizing the supply system which balance the economies of scale in supplier selection, quality assurance, and price negotiation, with the agility and responsiveness of direct purchasing, need to be explored more systematically.

⁸⁸ MacKintosh et al. 2018: <https://pubmed.ncbi.nlm.nih.gov/29421465/>