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Decentralisation of Financing for Essential Medicines and Health Supplies

Finding the Best Fit

SOPHIE WITTER · ANOOJ PATTNAIK · MARIANNE MOUSSALLEM · PETE BAKER

Abstract

Essential medicines are central to quality primary health care, yet availability in public facilities across low- and middle-income countries averages only 8–41 percent. The core problem is not logistics alone but weak supply chain financing: too often, it is slow, unpredictable, fragmented, inflexible, insufficient, and donor dependent.

One important decision which impacts the effectiveness of supply chain financing is whether to conduct supply chain financing functions at a central or decentralised level. This paper uses country evidence, literature review, and expert consultation to consider this question for each of the functions identified in the conceptual framework developed under the remit of the Center for Global Development's Working Group on Improving the Financing of Supply Chains.

We find that:

- There is no universally optimal system-wide configuration, but there are function-specific patterns of comparative advantage, and prerequisites determine whether those advantages are realised.
- Functions requiring scale and technical expertise – such as revenue pooling, procurement negotiation and sourcing, supplier prequalification, regulatory oversight, and market shaping – tend to perform better nationally. In contrast, service-delivery functions like ordering and last-mile distribution benefit from decentralisation when capacity exists. However, most functions are hybrid, meaning that all levels have important roles to play, and the focus should be on coherence between these roles.
- Direct facility financing can bypass the most acute supply chain bottlenecks in multilevel systems but requires enabling public financial management legislation, facility governance structures, and prequalified supplier frameworks to work safely and sustainably.

We lay out key prerequisites for successful decentralisation of some of the functions, including to mid-levels such as districts. Chief amongst these is predictable, adequate fiscal transfers. Without these, decentralisation is likely to worsen outcomes.

Overall, governance structure and institutional capacity most strongly determine supply chain financing performance and need to be in place before decentralisation is enacted. Our analysis suggests that reforming the financing conditions upstream of procurement agencies will have greater impact than focusing reform on procurement operations alone.

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Decentralisation of Financing for Essential Medicines and Health Supplies: Finding the Best Fit

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Contents

Figures

Tables

Boxes

Acronyms

3PLs	Third-Party Logistics Providers
BPOM	National Agency of Drug and Food Control
CGD	Center for Global Development
CMS	Central Medical Store(s)
DFF	Direct Facility Financing
DHS	District Health Stores
DHIS2	District Health Information Software 2
DRF	Drug Revolving Funds
ECOWAS	Economic Community of West African States
EHG	Explicit Health Guarantees
eLMIS	Electronic LMIS
EMHS	Essential Medicines and Health Supplies
EML	Essential Medicines List
F&Q	Forecasting and Quantification
FORNAS	Formularium Nasional
HIV	Human Immunodeficiency Virus
HSI	Health Systems Insight
HTA	Health Technology Assessment
IFMIS	Integrated Financial Management Information Systems
IT	Information Technology
JKN	Jaminan Kesehatan Nasional
KII	Key Informants' Interviews
KEMSA	Kenya Medical Supplies Authority
LGU	Local Government Units
LIC	Low-Income Countries
LMIC	Low- and Middle-Income Countries
LMIS	Logistics Management Information System
MIC	Middle-Income Countries
MSD	Medical Stores Department

NMS	National Medical Stores
NVBP	National Volume-Based Procurement
OOP	Out-Of-Pocket
PBF	Performance-Based Financing
PEPFAR	President's Emergency Plan for AIDS Relief
PFM	Public Financial Management
PHC	Primary Health Care
PITC	Philippine International Trading Corporation
R&D	Research and Development
RSL	Ricarte Soto Law
SAHPRA	South African Health Products Regulatory Authority
SVS	Stock Visibility System
TB	Tuberculosis
UCS	Universal Coverage Scheme
UHC	Universal Health Coverage
URMCHIP	Uganda Reproductive Maternal and Child Health Improvement Project
VAN	Visibility and Analytics Network
WHO	World Health Organization

Executive summary

Essential medicines and health supplies (EMHS) are foundational to quality primary health care (PHC), yet consistent availability of a core set of essential medicines at public facilities in low- and middle-income countries (LMICs) has historically averaged between 8 and 41 percent. When medicines are unavailable through public channels, patients resort to out-of-pocket (OOP) purchases or delayed, partial, and foregone care, undermining health and financial protection and driving households into poverty. The root cause of these failures lies not primarily in logistics management but in how supply chains are financed, with funding that is slow, unpredictable, fragmented, insufficient, inflexible, and heavily donor dependent. Despite this, health financing and supply chain management continue to operate in separate organisational silos, with weak coordination between how funds and supplies move through the system.

This paper addresses the question: which supply chain financing functions are best centralised or decentralised, and what are the prerequisites for success? Analysis is anchored around a novel conceptual framework, developed under the remit of the Center for Global Development (CGD) Working Group on Improving the Financing of Supply Chains, which identifies 10 distinct supply chain financing functions across four phases: planning, procurement, delivery, and monitoring. This framework provides a common language for examining how the "decision space" at different governance levels shapes supply chain performance and is applied here using evidence from a rapid literature review, expert consultations, and LMIC experiences. For each of the 10 functions, the analysis examines what centralised and decentralised configurations look like in practice, the common challenges that arise under each arrangement, and the supportive policy options that strengthen performance.

The evidence shows that decentralisation, which accelerated across Africa and Asia from the 1980s onward, has produced mixed results for EMHS. While it can improve local responsiveness and community engagement, it frequently leads to fragmented procurement, weakened bargaining power, higher prices, and inconsistent quality, particularly when responsibility is transferred without the fiscal, technical, and institutional capacity needed to exercise it. A recent review of reviews found consistently negative impacts of decentralisation on health commodity availability and prices.

The evidence shows that no single governance configuration consistently outperforms the other across the functions as a whole. Rather, performance depends on whether the prerequisites for a given configuration are in place at that level of the system. Functions requiring volume leverage, technical expertise, and standardisation, including revenue pooling, priority-setting, market shaping, regulatory oversight, and sourcing of EMHS, tend to perform better when organised at national or regional level. Fragmenting these functions across subnational entities, as seen in the Philippines with 1,634 Local Government Units (LGUs) each managing their own commodity purchasing, reduces economies of scale and results in higher prices and weaker quality assurance. Conversely, functions closer to service delivery (such as ordering, last-mile distribution,

and facility-level monitoring) tend to benefit from decentralisation when local capacity, direct financing mechanisms, and digital infrastructure are adequate. Promising models combine centralised negotiation and quality assurance with decentralised ordering, as in Indonesia's e-catalogue. A persistent failure across study countries has been devolving budget authority and procurement responsibility to the subnational levels without first establishing the pharmaceutical personnel, financial management capacity, and data systems needed to exercise them, a sequencing problem that has worsened outcomes rather than improved them. Budgeting is consistently the weakest function: even where data systems exist, quantified commodity needs are routinely overridden in political budget negotiations. This makes Forecasting and Quantification (F&Q) an exercise that lacks practical purpose at all levels of the system. Political economy factors are key in driving and blocking reforms to supply chain finance in general.

A recurring finding across the country evidence is that subnational authorities and facilities may be given responsibility for functions like budgeting, procurement, ordering, or distribution while remaining dependent on financing decisions made elsewhere in the system. Diagnosing these failures requires distinguishing three layers that are often conflated: insufficient funding envelopes (the budget itself is too small), public financial management (PFM) rigidity (an adequate budget is appropriated but releases are delayed by serial approvals, line-item restrictions, or year-end lapsing), and cash and foreign exchange availability (funds are released on paper but treasury liquidity constraints or foreign exchange shortages prevent timely payment to suppliers). Similar challenges arise in fee-, capitation-, and reimbursement-funded systems, where facilities accrue receivables faster than cash arrives to finance procurement. These constraints frequently sit outside the control of decentralised actors, meaning that devolving responsibility without addressing upstream financing conditions can worsen performance rather than improve it. Each layer requires a different policy response, and greater local autonomy alone will not resolve bottlenecks rooted in fiscal transfers, cash management, or revenue execution.

Addressing these constraints requires supportive financing, governance, and institutional conditions regardless of where functions are located. Across the country evidence, successful decentralisation was consistently associated with predictable and timely intergovernmental transfers enforced through automatic release schedules; unified budgets covering both commodity procurement and logistics operations; streamlined PFM processes with parallel rather than serial approvals and rollover provisions for unspent funds; pharmaceutical personnel capacity built before or alongside devolution; and integrated financial and logistics data systems that allow commodity stockouts to be correlated with budget allocations and payment flows. Direct Facility Financing (DFF), providing fixed budgets directly to facilities, shows promise in Kenya, Tanzania, and Uganda as a mechanism to bypass district-level bottlenecks but requires enabling PFM legislation and facility governance safeguards to be effective and sustainable. Ultimately, the evidence consistently shows that governance structure, processes, and institutional capacity predict supply chain performance more reliably than income level and that reforming the financing conditions upstream of procurement agencies will have greater impact than focusing reform on procurement operations alone.

Introduction

The availability of essential medical commodities, including medicines, medical supplies, and equipment, is universally acknowledged as a key component of effective service delivery required for maintaining population health (1). Access to these commodities is a cornerstone of quality PHC and is explicitly integrated into global objectives, such as Sustainable Development Goal 3.8. This mandates access to safe, effective, quality, and affordable essential medicines and vaccines for all, which is integral to achieving Universal Health Coverage (UHC) (2). Strong supply chains are fundamental to the performance of all health services and to achieving core health system objectives, including health impact, financial protection, responsiveness, efficiency, and equity (3).

Despite this crucial role, public sector supply chains in many countries, particularly LMICs, frequently fail to deliver on their objectives (4,5). Evidence suggests that medicine availability at public sector health facilities in LMICs is often poor, with historical averages indicating availability in a core set of essential medicines ranging from only 8 to 41 percent (3). Furthermore, stockout levels of some drugs in health centres have increased in recent years. When essential medicines are unavailable through public channels, patients are often forced to seek alternatives leading to high OOP payments, thus undermining financial protection and contributing to poverty (3,5).

The root cause of these pervasive supply chain deficiencies often lies not just in logistics management but in the financing of the EMHS (4), with disbursement delays triggering late procurement initiation and system-wide stockouts (6). The financing of supply chains is a neglected policy area. In LMICs, this financing is frequently characterised by being slow, unpredictable, fragmented, inflexible, insufficient, dependent on donors, and inefficient. Failures in medicine access stem largely from weak coordination between financing and supply chain management, highlighting the need for joint oversight of how funds and supplies move through the system (4).

A core challenge in optimising efficiency involves navigating the choices on degrees of decentralisation of supply chain and financing functions (4,7) in LMICs. For instance, centralised procurement, often managed by a central medical store (CMS) or national agency, is widely recognised for its potential to aggregate demand, increase purchasing power, and achieve significant economies of scale, leading to lower purchasing prices (2,4,8). However, centralised systems often struggle with bureaucratic inefficiencies, procurement delays, and a lack of responsiveness to heterogeneous local needs (5). Decentralisation (i.e., granting greater financial autonomy to subnational governments or local health facilities) is intended to improve responsiveness and reduce stockouts by enabling providers to utilise local knowledge for planning, swiftly deploying funds, and choosing from alternative suppliers who may offer faster lead times (2,5). Yet, decentralisation risks introducing administrative complexity and uncertainty, requiring substantial technical and operational capacity at the local level, potentially compromising on quality and eroding cost efficiencies by sacrificing economies of scale (5,7).

Recognising this trade-off between economy (centralisation) and responsiveness (decentralisation), policy guidance must now move beyond this simple dichotomy (3,5). Effective supply chain reform in LMICs demands a nuanced understanding of which functions are most appropriately centralised and decentralised and of the contextual factors and prerequisites that must be in place to ensure the success or failure of each arrangement (4,9). Research shows that logistics systems rarely operate as entirely centralised or decentralised structures. Their performance improves when certain functions are delegated to lower levels, while others remain under central oversight (9). The allocation of these functions, however, is shaped not only by technical considerations and health system enabling factors but also by the historical evolution of the health system itself. Political, administrative, and social choices made over time often create institutional pathways that favour certain degrees of centralisation or decentralisation and influence the supporting health system components that develop around them. As a result, arrangements that work well in one country may not be readily transferable to another, even when they appear technically optimal. Understanding both the functional requirements and the broader institutional context is therefore critical when designing or reforming medicines financing and supply chain systems. Despite the clear interdependence, the domains of health financing and supply chain policy traditionally operate in institutional and disciplinary silos. Policymakers in LMICs often lack a common framework or language to develop robust national strategies, and rigorous evidence explicitly connecting financing arrangements (e.g., budget processes, PFM rules, and purchasing programmes) to quantifiable supply chain outcomes (e.g., medicine availability and price) remains sparse (7).

Purpose and approach

This paper therefore aims to address a key research question identified by the CGD Working Group: what supply chain financing functions are best centralised or decentralised and what are the factors or prerequisites for success? We examine LMIC experiences to highlight challenges faced and promising practices, as well as some of the trade-offs and supportive systems needed across different options and contexts. The paper should be read in conjunction with other Working Group papers that address complementary topics, such as Cashin et al.'s forthcoming paper on the governance and coordination of the supply chain (10).

This paper was developed through a combination of rapid literature review, expert consultation, and evidence drawn from synthesis across 10 country case studies developed by Health Systems Insight (HSI); see Annex 1 for details. Analysis was guided by the CGD Working Group's conceptual framework for the financing of supply chains (4).

Our focus in this paper is on EMHS, as these are more commonly financed and procured within national systems. As larger hospitals tend to have their own procurement systems, most of the studies identified focus on supplying PHC facilities, which are therefore the main topic of this paper. We take the public system perspective, inclusive of contracting private providers and

drawing on household financial contributions. In relation to decentralisation, we recognise that in large federal states such as Nigeria, India, or Pakistan, the state or province plays a role similar to a national government in smaller country settings, and as such the term "decentralisation" applies to administrative levels below the state or province.

Decentralisation: A brief history

Decentralisation in the health sector refers to the transfer of authority, responsibility, and resources for health service planning, management, and decision-making from central governments to lower-level subnational units or autonomous bodies, or the private sector (9,11). In its most limited form, it can take the form of deconcentration: passing administrative authority to lower-level agents of organisations like the ministry of health. A stronger version is delegation, in which decision-making is shifted to autonomous organisations, such as hospital boards, which are independent but still report to the central authority (12). Devolution is the most significant shift, involving the transfer of authority, finance, and decision-making power to legally constituted local or regional governments, which often have significant autonomy from the central government (1,13). Key is the degree of political, administrative, and financing powers that are shifted; a common challenge is shifting responsibility for service delivery to lower levels of the health system when the control of resources to support them remains centralised.

Within health sectors globally, decentralisation reforms picked up momentum in the 1980s and 1990s, driven by a combination of resource shortages and the post-Alma Ata focus on PHC. This required greater engagement of frontline actors, including communities (14). There were also wider political drivers, which came from beyond the sector, usually linked to political decentralisation.

Results in terms of health system performance in LMICs have been mixed (see Box 1). There have been some gains in terms of local responsiveness but also greater challenges for geographic equity. In contexts where roles, resources, and local capacities were insufficiently defined, decentralised arrangements have led to fragmented procurement, weak bargaining power, and inconsistent practices across the health system, prompting policy reversals toward recentralisation. Evidence from multiple country contexts illustrates how recentralisation often emerges as a corrective response to the limitations of decentralisation.

In Kenya, the 2013 devolution shifted authority to county governments but paradoxically recentralised financial control at the county level, as PFM laws initially restricted facility-level autonomy over funds (11). In Uganda, decentralisation of drug budgets to districts in the early 2000s resulted in significant inefficiencies due to capacity constraints, leading to a recentralisation of procurement through the National Medical Stores (NMS) to restore system coherence and efficiency (7). Similarly, in Maharashtra, India, fragmented and uncoordinated decentralised purchasing reduced system responsiveness, prompting a shift back toward centralised procurement through a single agency to regain economies of scale and coordination (5). China's recentralisation, for example, through the National Volume-Based Procurement (NVBP) policy illustrates how

recentralising the "buy" function can address these shortcomings by leveraging economies of scale, reducing medicine prices substantially, and standardising access across regions, while maintaining limited subnational involvement in supply management (2,3). A recent review of reviews found consistently undesirable impacts of decentralisation across countries on health commodity availability and prices (15). Finding the right balance of authority, accountability, and financial autonomy at different levels of the health system is an issue that most health systems are still grappling with, leading to policies in flux and tensions over roles and resources. Box 1 illustrates the historical evolution and mixed effects of decentralisation across LMICs.

BOX 1. Decentralisation patterns and effects in LMICs

Since the mid-1980s, most African countries began transferring power, resources, and responsibilities to subnational governments (16). By the early 2000s, countries showed varying degrees of administrative decentralisation, with South Africa and Uganda demonstrating high ones, while countries like Rwanda, Zimbabwe, Ethiopia, Burkina Faso, and Eritrea showed moderate ones (17). Kenya's decentralisation, for instance, accelerated following the adoption of a new constitution in August 2010, which devolved authority rapidly as part of resolving the violent conflict that followed the December 2007 elections (18). In Asia, the trajectory differed significantly by country. The Philippines decentralised government health services through devolution to local governments in 1992 (19). In contrast, Indonesia and Pakistan implemented decentralisation suddenly as policy revolutions in the late 1990s and early 2000s, representing overnight changes rather than gradual transitions (20). Brazil's decentralisation from the federal level unfolded gradually in phases during the 1990s and early 2000s, with operational norms playing a crucial role in driving the transition, resulting in 99 percent of Brazilian municipalities being fully or partially in charge of managing their health systems by 2000 (20).

Effects of decentralisation: Mixed evidence

A systematic review of 54 qualitative, quantitative, and mixed methods studies conducted in 26 countries found both positive and negative effects of health system decentralisation in LMICs. Decentralisation of governance, financing, and service delivery showed positive effects on the system, while decentralisation of resource management proved challenging in several settings (21). More recent evidence indicates that while decentralisation improved local responsiveness, enhanced community engagement, and strengthened health system performance in some settings, it also exacerbated disparities in others due to uneven institutional capacity, limited fiscal resources, and fragmented coordination (22).

More granular evidence suggests that the positive effects are primarily driven by the proximity of decision-making to service delivery ("close to ground"), which enables better use of local information, more adaptive planning, and improved alignment of services with population needs. This can translate into increased coverage of preventive and primary care services, as well as more efficient allocation of resources at the local level (23).

A systematic review of decentralisation in LMICs found that it led to deterioration of human resources, medicines, and equipment. This was primarily due to increased bureaucracy and insufficient managerial skills at the local level (21). In the Philippines, after 25 years of decentralisation, researchers found weak evidence of impact on health expenditures and some evidence on certain health outcomes, but surprisingly no studies meeting inclusion criteria examined the impact on local service delivery or health systems fragmentation (24).

At the same time, decentralisation can generate efficiency gains through improved flexibility in resource use and reduced coordination costs, as well as through local hiring and management practices that improve staff retention and reduce absenteeism. In some settings, it also strengthens accountability through the multiplication of governance actors and community oversight mechanisms, contributing to improvements in service quality and user satisfaction. However, these gains are not automatic and may coexist with inefficiencies where coordination across levels is weak (23).

Critical success factors and implementation challenges

Lessons learned from LMICs suggest that factors such as adequate mix of technical skills at the local level to perform decentralised tasks, effective decentralisation of decision-making to the periphery, and political leadership are key factors for successful decentralisation (21). Key performance areas within decentralised systems identified across studies include human resource deployment, financing, access to services, and equity in service delivery, highlighting the significance of inputs like local capacity-building, efficient resource allocation, and integrated planning (22). Lessons from countries that implemented reforms such as Uganda, Cameroon, Zambia, and Ghana highlight that reforms are inherently political and may not be sustained without strong political will and legal framework. Additional factors include the resource intensiveness of sustaining reform processes, the managerial systems and capacity needed, the need for good data and information as a basis for actions, and pacing the reform process within each country's absorptive capacity (25). The phenomenon where devolution led to concentration of power with politicians rather than bringing decision-making closer to people has been called elite capture. Kenya, as an example, showed how rapid transition to devolution led to lack of clarity of roles and mistrust between health system actors, allowing decision-making to be captured by local elites who favoured political interests and populist priorities rather than genuine health needs (19).

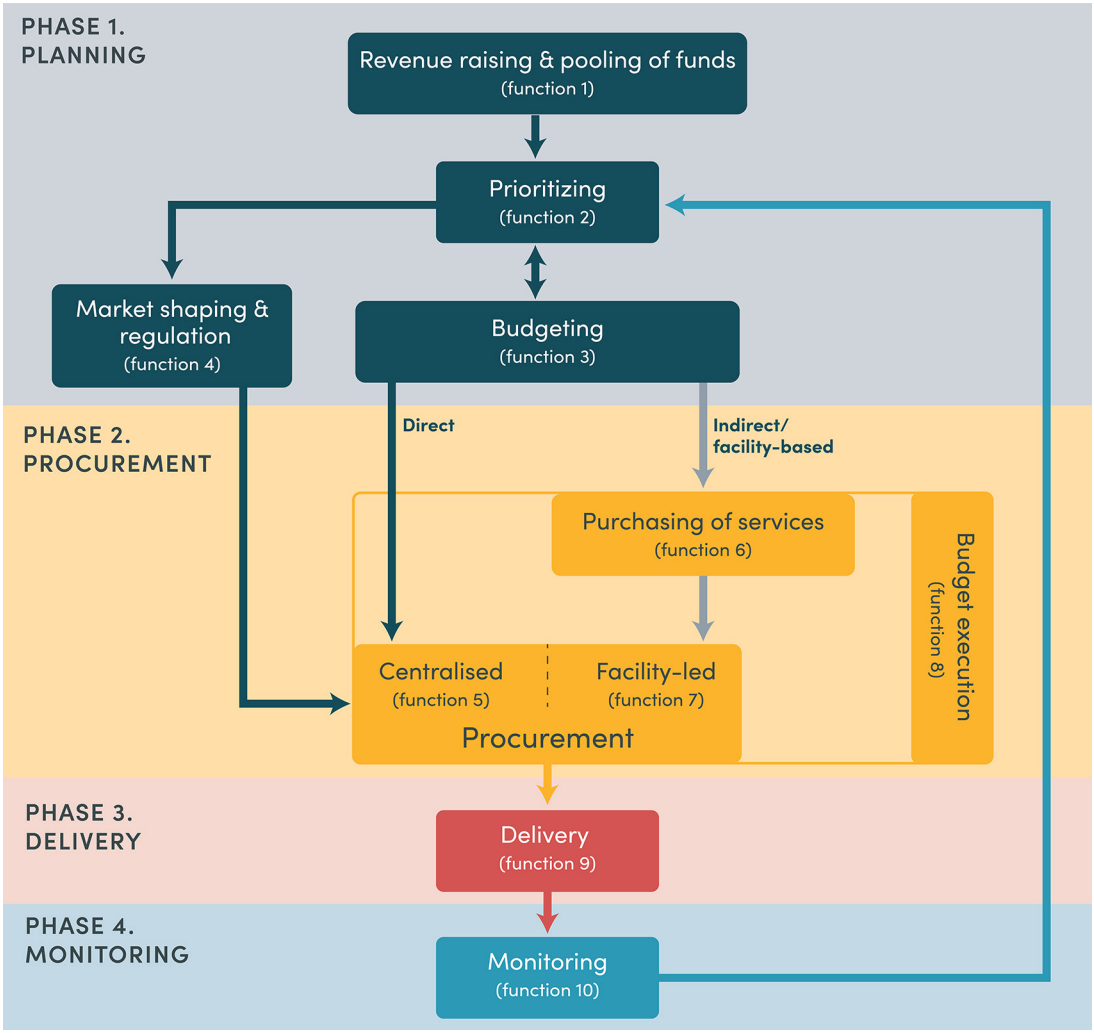
Finally, decentralisation can enhance health system resilience by creating multiple centres of decision-making and funding, allowing different levels of the system to compensate for failures or shocks in others. This "shock absorber" effect is particularly relevant in fragile and resource-constrained settings, although its effectiveness depends on coordination and capacity across levels (23,26).

Health financing and supply chain objectives and functions by system levels

Health financing objectives and desirable attributes are laid out clearly in the Health Financing Progress Matrix tool developed by the World Health Organization (WHO) (27). The key objectives are efficiency, equity in finance, equity in resource distribution, financial protection, health security, quality of care, service use according to need, transparency, and accountability. Supply chain objectives are compatible with this, also focusing on quality of care, equity, and efficiency.

The conceptual framework developed by the Working Group for financing health care supply chains in LMICs identifies 10 distinct functions distributed across four supply chain phases (Figure 1): planning, procurement, delivery, and monitoring. The distinction between centralised and decentralised models in executing these functions hinges on the "decision space." This is the range of choice or autonomy allowed to officials at lower administrative levels, such as district offices or health facilities. The below section describes how each of the 10 functions manifest when managed through more centralised or decentralised models. The framework takes a public sector framing but includes transactions that the public sector may have with the private sector, such as contracting of private providers or collecting private payments in the form of OOP payments by patients.

FIGURE 1. Conceptual framework for financing health care supply chains



Adaptation to context across 10 functions

The choices made locally within and across these 10 functions will be shaped by and need to be tailored to local contexts. For example:

- **Political context:** This includes the degree of willingness to devolve decision-making power and existing political and administrative structures, as well as the level of interest, capacity, and accountability at local levels for this control; the level of decentralisation and its maturity; and the pressure, or lack of it, for regional equity, local control, and efficiency (11,28). In general, we would expect a more decentralised political system to support more decentralised supply chains and their financing.

- **Economic context:** This includes the country's fiscal space, its degree of donor dependence, and its tax structure. All things being equal, we would expect countries with more fiscal space to be able to develop the capacities to manage a supply chain that mixes the best features of centralisation and decentralised financing (3,8,29).
- **Geographic and demographic context:** The degree of population dispersal, size, access barriers, and heterogeneity make decentralisation of supply chain financing more relevant but also more challenging to manage (12,30).
- **Supply chain features:** These include the existence of a strong CMS (or equivalent) versus more localised procurement patterns and the level of capacity for forecasting, procurement, and distribution. This, along with the specifics of local supply chain needs (linked to epidemiology), will of course shape choices in creating a degree of path dependency based on existing structures (3,5,12,31).
- **Market conditions:** These include local pharmaceutical and supply chain production capacity but also (more broadly) the degree of privatisation of health service provision. A country where government contracts mainly with the private sector to deliver care, for example, may need to use strategic purchasing approaches that affect the desirability and feasibility of centralised supply chain financing (2,5,8).
- **Health financing features:** The degree of fragmentation of health financing pools and the nature of purchasing mechanisms will of course influence the financing of supply chains, with a heavily central budget-based system more easily suited to central procurement than one that relies on local revenue generation through fees, local project funding, or insurance premiums, for example (3,5,29).
- **Commodity types:** The optimal level of decentralisation will also depend on the commodity type and characteristics (e.g., criticality, volume of use, etc.) and its funding sources (7). These are changing: in countries transitioning from aid or where aid is declining, items that have until recently been financed and often procured externally, like contraceptives and vaccines, may now need to be domesticated.
- **Historical legacies:** The experience of previous reforms, and legacy of trust or mistrust in state institutions at different levels, tends to shape responses to reforms and regulation, through compliance or disregard/resistance (5,11).
- **PFM system:** Arrangements in the PFM system can be key enablers or blockers. This includes the role of the central treasury or ministry of finance (and its attitude to decentralisation), whether there are effective transfer systems for resources, the balance of autonomy versus accountability in system rules, rules about budget earmarking and retention of locally generated funds, and the reliability and timeliness of fund flows (3,11).
- **Information systems:** These include the digitalisation of supply chain and health financing systems and whether they are linked, which enables more effective oversight for both centralised and decentralised systems (29).
- **Regional (subnational) capacity:** Low local or regional civil service, supply chain, health financing, and PFM capacities are impediments to effective decentralisation (12,13).

The next section describes what supplies financing functions look like in configurations that are centralised and decentralised to varying degrees, examines the challenges that arise within each arrangement, and identifies supportive policy options that can strengthen performance. Drawing on examples from LMICs across Africa, Asia, and Latin America, the analysis illustrates how countries have adapted their approaches to supplies financing based on their enabling environments and institutional capacities.

While the sections below for each function are organised around centralised and decentralised configurations for analytical clarity, we do not view these as binary choices. Most functions involve responsibilities shared across multiple levels of the system, with varying degrees of authority, financing, and accountability distributed between central, subnational, and facility actors. The simplified categorisation used here is intended to highlight broad patterns in the level at which functions tend to perform most effectively, while recognising that actual arrangements are often more nuanced and context specific. This complexity is explored in greater detail through the country examples, which illustrate the diverse ways in which responsibilities are allocated and coordinated across health systems.

Phase 1: Planning

The planning phase encompasses the foundational activities necessary to determine strategic direction, forecast demand, and allocate resources for medicines and supplies.

Function 1: Revenue raising and pooling of funds for EMHS

The total budget available for medicines and health supplies is determined through political negotiations, assessments of health sector needs, and competing demands from other sectors and from dominant expenditure areas within the health sector (notably paying staff, which often squeezes out expenditure on other areas such as medicines and supplies). This foundational function shapes the entire medicines supply chain, as inadequate or unpredictable funding creates cascading challenges throughout subsequent functions – including procurement delays, stockouts, and distribution bottlenecks.

In many LMICs, this function is further complicated by donor dependence and fragmentation across multiple funding streams, which can undermine coordinated planning and sustainable financing for essential medicines and supplies. How countries structure the centralisation or decentralisation of revenue raising and pooling of funds for supplies has significant implications for budget adequacy, predictability, and alignment with local health needs. Some features of centralised and decentralised systems, along with their shared or distinct challenges and potential policy options, are given in Table 1.

TABLE 1. F1: Revenue raising and pooling

	Centralised Configuration	Decentralised Configuration
What it looks like	• Revenue sharing rules typically favour the central level, which then manages the pooled funds (32). These can take the form of public budget lines, purchasing agency funds, aid funds, etc. • Often purchasing items for vertical programmes occurs at the central level, which tend to be better resourced than other essential drugs.	• Subnational governments may have decision-making power, authorised by legislation, to raise local revenues. • Revenue may also be raised and retained at the facility level, such as through user fees or health insurance payments and revolving drug fund payments, if retention is permitted by regulation (32,33).
Common challenges	• Fragmentation of funding pools, with funding for different supplies coming from diverse sources (e.g., donors), are not easily transferable. • Chronic underfinancing of sector and supplies. High dependence on donors in many low-income countries (LICs), e.g., 65–70 percent of public health commodity funding from external sources in Uganda; higher for vertical programme drugs (e.g., Tuberculosis [TB], Human Immunodeficiency Virus [HIV], malaria), even in middle-income countries (MICs) (34).	
Challenges specific to this model	• Funding channels (or supply channels purchased by central funds) may not reach to the service-delivery level in a timely and adequate way. • Revenue discussions at the national level may not take into account the diversity of local needs across the country.	• Can incentivise regressive, informal payments from patients. • Further fragmentation of pools with own rules and administrative processes. • Fiscal constraints at local level reduce revenue raising potential. • Decentralised revenue raising may prevent redistributive efforts between wealthy and poor regions (e.g., between provinces in Pakistan). • Delays in transfers of central funds often long, creating debts in payments for supplies at subnational level (e.g., national-to-county transfers delayed three to six months routinely in Kenya) (34). • Unpredictable transfers create planning chaos; coordination costs multiply; pending bills accumulate across entities.
Supportive policy options within each configuration	• Earmarked funds for supplies, frameworks, regulations for integration or at least alignment across pools.	• Fee structure by patient ability to pay or via insurance coverage; consolidation or alignment between subnational and central pools.

Raising revenues and pooling are core health financing functions by their nature and the consensus from health financing experiences is that funds are best raised at national or regional levels (especially for larger regions), but not at the facility level. This level can create access barriers, typically through use of user fees, while generating low revenues and creating fragmented risk pools (35). However, user fees provide flexible funds to cover medicines and supply costs so replacing them needs to be done carefully to avoid cash flow disruptions (see Box 2). Where social health insurance is a major player in health financing, it too may play a role as a purchaser of commodities from central (public) or private sources, but again benefits from central revenue collection and integration of risk pools (2). This applies across all commodity types but is especially relevant for essential drugs and supplies, which drive many of the OOP payments by users (7). Vaccines, some disease programme commodities,

and family planning supplies are more likely to be funded internationally for LMICs, though this is changing with the reductions in development assistance for health in 2025 (4).

A parallel issue arises on the revenue side in systems that rely on fees, capitation, or claims reimbursement to fund facility-level procurement. Here the execution gap is not at disbursement of an appropriated budget but at revenue generation: facilities accrue entitlements (services delivered, fee waivers granted under exemption policies, claims submitted to insurers), but the cash needed to procure supplies arrives late, partially, or not at all.

The Senegal Yeksina 18-month payment delays, Kenya's post-2013 reimbursement tranches, and Ethiopia's delayed community-based health insurance claims processing described in Box 2 are all instances of the same mechanism: the budget formally exists as a receivable, but until it is converted to cash in a facility account it cannot fund procurement. This revenue-side execution gap should be diagnosed separately from underfunding (insufficient envelope) and from PFM rigidity (delays in releasing appropriated central funds): the relevant levers on the financing side – underwriting, bridging finance, or working-capital facilities for the purchaser – are different from those that address line-item flexibility or transfer scheduling. Box 2 highlights the practical challenges with facility-level financing mechanisms for medicines and supplies.

BOX 2. Challenges for facility-level financing in funding medicines and supplies

Due to shortages of funds to ensure drug supplies in many LMICs, the model of Drug Revolving Funds (DRFs) has been tested since the 1980s. In this model, facilities charge patients fees for medicines (either at cost with a small markup or with cross subsidies to ensure affordability of priority items), with the funds reinvested in resupply (3,11).

- Experience, including in a major scheme in **Khartoum State in Sudan** that was evaluated after 15 years, found that DRFs can improve access to quality drugs and reduce prices for users, but that challenges of financial sustainability and access for the poorest are significant (36).
- **Kenya:** Following the 2013 abolition of user fees at public primary facilities, service utilisation increased, but medicine stockouts worsened because government reimbursement tranches to replace fee revenue were frequently delayed or insufficient (7).
- **Senegal:** The "Yeksina" distribution model relied on facilities paying for logistics through a 25 percent profit margin on drugs; however, slow cost recovery from these facilities led to 18-month payment delays, causing the collapse of outsourced private logistics contracts (3,4).
- **Ethiopia:** OOP payments for medicines account for over 65 percent of total health expenditure, often pushing households into poverty. While community insurance is being scaled, delayed claims processing continues to hinder the ability of facilities to procure supplies (4,7).

In Indonesia, the combination of capitation payments from the national health insurance scheme (Jaminan Kesehatan Nasional, JKN) and operational health grants to facilities that have public service agency status creates a relatively stable revenue base for ordering medicines and supplies through the national electronic catalogue. This reduces reliance on periodic special allocation transfers from the central government. In Kenya, counties that permit facilities to retain revenue generated at the facility level, including reimbursements from the national social health insurance purchaser, provide facilities with an additional financial buffer that can be used when county procurement processes are delayed. DFF can also be considered a promising model from a revenue raising and pooling perspective. Evidence from Tanzania suggests that channelling funds directly to facilities enhances the flow, visibility, and use of financial resources for commodities, contributing to improved availability (37). This aligns with broader health financing evidence that prepayment and pooling mechanisms improve the predictability of facility revenues and support more effective resource allocation (34).

Where pooling remains primarily at the national or subnational government level, the critical supportive condition is predictability of transfers rather than their total value alone. South Africa's constitutionally anchored provincial transfers, which are more consistently released on schedule than in comparator countries, are associated with relatively better supply chain performance (34). By contrast, transfer delays of three to six months in Kenya, Indonesia, and Pakistan undermine planning, generate pending bills, and trigger the debt accumulation cycles that impair procurement agency performance. Institutional mechanisms that enforce transfer timeliness – such as automatic release schedules tied to budget approval or automatic deductions from future transfers where commodity debts accumulate – are therefore as important a supportive system as the adequacy of allocations themselves (34).

A persistent structural challenge across all LICs studied is heavy donor dependency for commodity financing, estimated at 65–70 percent of public health commodity funding in Uganda, with similar patterns in Tanzania and Burkina Faso. Vertical programme pooling through the Global Fund and the US President's Emergency Plan for AIDS Relief (PEPFAR) demonstrates what is achievable when funding is adequate and tied to accountability but creates parallel systems that fragment overall pooling and carry sustainability risk. Reducing this dependency requires both domestic revenue mobilisation and deliberate transition planning that maps the fiscal and functional gap between donor support and domestic capacity, a process none of the LICs studied has yet operationalised at scale for general EMHS.

Function 2: Prioritising medicines and health supplies for budgeting & resource allocation

With revenue raised and pooled, and a sector budget cap agreed upon, the next critical stage is to set priorities for EMHS within this budget constraint. The prioritisation process typically includes defining entitlements for services and EMHS under benefits packages, establishing essential medicines lists (EMLs) and procurement lists, and developing clinical guidelines that shape prescribing patterns and utilisation (including use of generics), with countries including more deliberative processes to involve citizens' values in handling trade-offs.

In decentralised systems, this function raises fundamental questions about which level of government should determine what medicines are available, how standardised formularies should be across jurisdictions, and how to balance local autonomy with the efficiency gains from centralised technical expertise. The degree of centralisation or decentralisation in priority-setting has direct implications for equity in access to medicines across different regions, rational use of limited resources, and the ability to leverage economies of scale in procurement. Table 2 outlines how centralised and decentralised approaches to prioritisation differ in terms of decision-making authority, alignment, and implementation challenges.

TABLE 2. F2: Prioritising

	Centralised Configuration	Decentralised Configuration
What it looks like	• Central authorities determine national EMLs, standard treatment guidelines, and benefits packages to standardise essential medicines and focus resource allocation (4,38).	• Local officials or facilities may have the autonomy to establish or adapt a separate or shorter local EMLs based on local disease patterns (9).
Common challenges	• Lack of alignment between benefits packages for large-scale health insurance schemes and EMLs.	
Challenges specific to this model	• National priorities do not reflect local ones; lack of data. • Capture of process by national/global interest groups. • Vertical programmes set own lists in most countries (donor driven and more highly prioritised than other commodities).	• Local EMLs not aligned with or incorporated into central EML. • Lack of coherence between national health strategies with locally set priorities. • Lack of capacity or data to accurately and routinely identify priorities (e.g., in Indonesia, 60 percent of districts lack pharmaceutical personnel) (34). • Duplication of effort setting priorities in each area. • Capture by local interest groups.
Supportive policy options within each configuration	• Inclusion of local priorities and stakeholders in prioritisation process. • Transparency, criteria-based decision-making, accountability for reasonable approach.	• Strong communication with higher levels; access to data and capacity training. • National strategies informed by local priorities; national frameworks provide options for local choices. • National negative and positive lists with local discretion in the middle.

This function is complex, typically linking to processes for defining health benefits packages and the contents of EMLs (see Box 3). National standardisation ensures clear, high-quality national priorities. However, it can fail to account for geographic variation and be slow to update (new medicines delayed). It needs democratic oversight, particularly since the concept of an "essential" medicine is itself contested and shaped by stakeholder interests rather than being a fixed technical category (39). Thus, it should be centralised to the highest level that is responsible for managing the health budget. This may be at the national level or, in a decentralised health system, the state or regional level, though both would use information on needs and use at lower system levels as inputs to the process (2,4). In more decentralised settings, coordination is needed to ensure that state decisions account for national health (financing, supply chain, and PFM) strategies (2).

BOX 3. Country examples of prioritisation in health financing

- **Thailand's** Universal Coverage Scheme (UCS) provides a significant lesson on the value of a pragmatic start. Initially, Thailand adopted a "negative list" approach, which was comprehensive by default and excluded only specific items like cosmetic surgery or unproven treatments. During this early phase, all clinical conditions and medicines listed on the National List of Essential Medicines were covered, enabling rapid expansion of access through a broad, inclusive design. This allowed for a rapid rollout of universal access. As local technical capacity grew, the country transitioned to a more sophisticated system where adding new high-cost interventions became subject to rigorous Health Technology Assessment (HTA) and a specific cost-effectiveness threshold. This evolution enabled more targeted, product-specific decision-making, including the assessment of interventions such as HIV pre-exposure prophylaxis, guided by explicit cost-effectiveness thresholds (e.g., THB 160,000 per quality-adjusted life year). Importantly, the system retains flexibility, allowing high-cost medicines that do not meet standard thresholds to be included under exceptional circumstances, such as when they are lifesaving or when no therapeutic alternatives exist (2).
- **Chile's** experience demonstrates that prioritisation processes must be transparent and inclusive to remain sustainable. Early iterations of their Explicit Health Guarantees (EHG) lacked full transparency, leading to public dissatisfaction and patient marches demanding coverage for high-cost treatments. The EHG itself functions as a positive list targeting high-burden conditions, initially covering 25 and later expanding to 87 diseases, including chronic conditions such as diabetes and cardiovascular diseases, as well as more recent additions like COVID-19 and Alzheimer's disease. In response, the Ricarte Soto Law (RSL) was established, which institutionalised a prioritisation process involving an expert commission and patient advocacy groups. This shift improved the procedural aspects of priority-setting, including transparency and the opportunity for citizens to appeal decisions. The RSL specifically complements the EHG by targeting rare diseases and high-cost technologies that fall outside standard coverage packages and is supported by innovative purchasing approaches such as Managed Entry Agreements. This allows the government to manage financial risks while expanding access to expensive new treatment (2).

- **Indonesia** has a relatively well-developed national formulary (Formularium Nasional – FORNAS) that is formally tied to the JKN benefit package. The linkage between the formulary and the insurance purchasing mechanism gives priority-setting real teeth; medicines on the FORNAS are what JKN reimburses, creating a functional incentive structure. The process involves a formal HTA body (Health Technology Assessment Committee [HKTK], now integrated into the National Agency of Drug and Food Control [BPOM] and the Ministry of Health [Kementerian Kesehatan/Kemenkes structures]), which gives it some methodological grounding (34). There are key differences, though, between the hospital and PHC levels. Medicine costs are part of the health services included in the INA-CBGs payment system for hospitals. At *puskesmas* (public health centres), by contrast, medicines have to be financed out of the capitation envelope, or through government in-kind supply chains, rather than being triggered by individual claims.
- **Kenya** has the Kenya Essential Medicines List with reasonably regular updates, and the process is relatively institutionalised. But subnational devolution has complicated implementation and counties have discretion that is not always aligned with national priorities (34).

Function 3: Budgeting for medicines and health supplies

Once priorities are established, the next function involves translating them into detailed budgets that match forecasted EMHS needs with available resources. This process is often iterative, with multiyear medium-term expenditure frameworks developed based on high-level priorities and national health sector strategic plans, followed by annual budget setting processes. A critical challenge in LMICs is that multiple funding sources (including central national budgets, extrabudgetary health insurance funds, user fees, and off-budget donor financing) contribute to supply chain financing, each with different budget lines that directly or indirectly support medicines procurement and distribution.

The degree of centralisation or decentralisation in budgeting determines which level of government controls these resource allocation decisions, how well budgets align with local consumption patterns and needs, and the extent to which fragmentation across funding streams can be mitigated through coordinated planning and execution. Table 3 presents the comparative features of centralised and decentralised budgeting arrangements and their implications for aligning needs with available resources.

TABLE 3. F3: Budgeting

	Centralised Configuration	Decentralised Configuration
What it looks like	• Central budget allocation mechanisms are utilised across all systems for essential medical health services (4). • Budgets are often allocated from above with limited scope for facilities to influence the final amounts (11).	• Districts or regions may have budget setting powers, including for purchase of supplies. • Facilities are often empowered to quantify and prepare their own annual procurement plans and budgets (9). • Local officials may modify annual operational plans and make budgetary transfers when faced with budget cuts (9).
Common challenges	• Lack of coordination between financing and supply stakeholders, responding to different priorities. • The disconnect between F&Q and actual budget allocations is common at all levels and creates cascading problems throughout the supply chain. • Limited incentive to do accurate F&Q when the budget to match to it will not be available (e.g., in Uganda, Tanzania, and Burkina Faso, where medicines budgets based on historical patterns and revenues available, not needs) (34).	
Challenges specific to this model	• Lack of insight into local needs. • Central authorities may impose budget cuts after the planning stage, which then forces lower administrative levels to make adjustments (9).	• Multiple decentralised budget holders, each with different timelines, stakeholders, capacities, and priorities may make it challenging for the procurer to plan. • No incentive to budget accurately when funds not available above fixed ceilings. Even when needs assessed accurately (e.g., in Philippines, Kenya), this does not feed into budget allocations at the higher levels (34). • Some facilities may have unused commodity allocations while others are in deficit (e.g., in Kenya).
Supportive policy options within each configuration	• Improved budgetary processes to align needs with available budgets. • Strong health financing and supply chain data systems down to the local level. • Processes for regular adjustments to reflect changing needs and usage.	• Increased F&Q capacity at lower levels. Higher coordination across levels and between health financing and supply chain stakeholders. • More local insight into budget range to develop realistic budget requests. • Fewer unnecessary administrative steps – more autonomy.

This is a function that requires inputs from all levels: bottom-up assessments on needs but also top-down control to reflect national resource allocation decisions and control cost escalation. Budgeting is often done based on nominal percentage increases from the previous year. Even when done well in a bottom-up way, this is often not taken into account by the higher levels due to a lack of data-driven forecasting practices at the district or provincial levels (3) or decision processes that do not include these quantifications. In addition, budgeting is often done separately by supply chain and health financing teams at all levels, with little consultation of how each is influenced by the other. This leads to inefficiency and a disconnect where financial plans do not account for real-world logistical constraints or meet stated entitlements (3,4).

Across the 10 countries studied by HSI, this budgeting function was weak due to disconnects between commodity needs and financing allocations (34). This research shows that three components must exist simultaneously: technical capacity to conduct F&Q using a harmonised methodology, reliable consumption data from a Logistics Management Information System (LMIS), and actual budget linkage where F&Q outputs influence allocations. Centralised systems (e.g., Uganda, Burkina Faso) conduct F&Q and budget formulation primarily at the national/central level, with district

and facility inputs theoretically feeding up but rarely doing so in practice. Decentralised systems (Kenya, Pakistan's provinces, Indonesia, Philippines) have pushed budget formulation down to county, district, or LGU level, but this has mostly just dispersed the capacity problem rather than solved it.

The budget linkage component is generally a political economy problem: budgets are the product of negotiations between health and finance ministries (and between national and subnational levels), conducted under binding revenue ceilings. When F&Q shows commodity needs exceeding available budgets by two to three times, as is common, finance ministries direct health ministries to work within existing ceilings. F&Q is therefore treated as an exercise without teeth by budget holders, and the incentive to invest in it weakens further.

In addition, reliable consumption data from facilities is often lacking and, in decentralised systems, trained staff that can conduct F&Q at lower levels are often limited. This dynamic is compounded in decentralised systems. With budget formulation responsibility dispersed across 47 counties (Kenya), 3 provinces and roughly 140 districts (Pakistan), 514 districts (Indonesia), or 1,634 LGUs (Philippines), the aggregate capacity requirement for meaningful F&Q becomes enormous. Box 4 illustrates how hybrid financing and procurement arrangements can help bridge the disconnect between centralised budgeting and facility-level needs.

BOX 4. Centralising procurement in Uttar Pradesh, India

The redesign of the public health supply chain in Uttar Pradesh demonstrates that centralised financial processing is most effective when paired with decentralised expenditure autonomy at the facility level. The state transitioned from a fragmented legacy model where over 200 units placed uncoordinated orders, failing to achieve economies of scale, to a virtual passbook system. This innovation empowers facility managers with the discretion to customise their medicine mix based on real-time local demand, provided they remain within their allocated monetary budget. This "pull system" ensures that centralised procurement and replenishment are driven by actual consumption data rather than top-down assumptions, which previously resulted in simultaneous wastage and stockouts. Furthermore, by centralising vendor payments through a corporation rather than multiple district-level authorities, the system has improved the predictability of cash flows and increased the state's overall capacity to execute its expanded medicine budget (40).

Effective budgeting linked to F&Q requires three foundational conditions to exist simultaneously at whichever governance level holds budget formulation responsibility. First, trained pharmaceutical personnel must be present to conduct credible F&Q. The absence of qualified staff at district and county level is the most consistent bottleneck across decentralised systems, with Indonesia's 60 percent gap in district pharmaceutical staffing a clear example. Capacity-building in quantification, supply planning, data systems, and budget formulation must accompany decentralisation of this function.

Second, where reporting remains paper based or irregular, a functional LMIS must supply reliable consumption data flowing upward from districts or facilities. This is the case in Tanzania, Burkina Faso, and Pakistan's provinces, where F&Q defaults to historical estimates regardless of technical intent.

The third condition, and the hardest to achieve, is that F&Q outputs must actually influence budget allocations. This requires predictable and timely fiscal transfers, without which subnational planning is structurally undermined regardless of technical quality. It also requires PFM rules and budget preparation calendars that incorporate F&Q as an input to ceiling setting rather than a post hoc justification. Where budget ceilings are fixed before health ministries conduct F&Q, the sequencing itself prevents evidence from influencing allocation. South Africa's relatively more predictable provincial transfers, and Indonesia's e-catalogue providing visibility into real-time district spending, represent partial steps toward these conditions, though no country experience reviewed in this paper has fully achieved them for general EMHS.

One emerging approach to address the rigidity of district-level budget management is DFF, which provides fixed budgets that facilities can use to fill gaps in drug supplies directly at the facility level. Under this model, PHC facilities are empowered to prioritise and utilise resources according to their specific community health needs, bypassing the bottlenecks of district-level management where funds are often delayed or diverted to other priorities (7). Evidence from Kenya and Uganda (under a donor-funded, results-based financing project) suggests that facilities with this kind of budget autonomy experience fewer stockouts than those entirely dependent on district or county supply chains (41,42). However, DFF is typically governed by PFM guidelines that allow facilities discretion over their input mix while requiring adherence to specific budget ceilings and facility mandates (11). This means autonomy is bounded rather than unconditional and requires strong facility-level governance to prevent misuse.

Function 4: Market shaping and regulation

With priorities and budgets established, governments may intervene through market shaping and regulation of the private sector to ensure that downstream procurement achieves good value for money and that quality medicines are available at affordable prices. Market-shaping interventions can include policies such as price controls, quality standards, regulatory oversight of manufacturers and distributors, and strategic use of pooled procurement mechanisms to leverage buying power.

Going beyond regulatory levers, there are market-nurturing interventions that can proactively shape the conditions for markets that function well through a variety of tools. These include demand guarantees, supply-side investment in local manufacturers, price transparency mechanisms,

regulatory harmonisation to lower market entry barriers, risk-sharing arrangements, and demand aggregation to construct markets of sufficient scale to attract diverse suppliers. Long-term reforms may also involve restructuring the operational model of the supply chain, such as establishing centralised procurement agencies or creating frameworks for public-private partnerships.

The degree of centralisation or decentralisation in this function affects a country's ability to negotiate favourable prices, maintain consistent quality standards across jurisdictions, and balance the efficiency of centralised market power with the responsiveness of localised regulatory approaches to context-specific market conditions. Table 4 summarises how market shaping and regulatory functions are organised across centralised and decentralised systems, including key challenges and enabling policies.

TABLE 4. F4: Market shaping and regulation

	Centralised Configuration	Decentralised Configuration
What it looks like	• Central authorities define national quality assurance regimes, pharmaceutical policies, and the overall supply chain operational model (4).	• Decentralisation of regulatory functions may involve empowering subnational or local entities to influence market dynamics. Information on local market intelligence may be used for planning (5).
Challenges specific to this model	• Lack of coordination between different agencies involved in these functions at national level and data for pricing intelligence, demand aggregation, supply planning, market analysis capacity, and limited regulation.	• Lack of capacity at subnational levels. • Lack of influence with national/global level market players such as pharma or wholesale importers.
Supportive policy options within each configuration	• Independent market research capacity, coordination mechanism across public and private actors, adequate operational budgets and enforcement capacity.	

This is often a centralised function for all commodity types (at national and regional/international levels), including research and development (R&D), quality standards, and testing. Regulatory capacity varies across countries but is likely to be stronger at national than decentralised levels, where increased numbers of units also increase transaction costs (34). Box 5 highlights the under-recognised role of mid-level health system structures in mediating between centralised policies and decentralised implementation across supply chain financing functions.

BOX 5. The strategic role of mid-level health system structures in supply chain financing

The mid-level of the health system, represented by districts, regions, or states, acts as the critical bridge between national policy and facility-level execution. Where reforms have expanded autonomy at the facility level in some countries, the role of mid-level actors has shifted away from direct "command and control" toward functions of strategic stewardship, oversight, and coordination. Although literature does not support definitive conclusions about an optimal configuration of mid-level responsibilities, it provides consistent examples of functions that are effectively exercised at the district or regional level.

First, evidence suggests that mid-level authorities are well positioned to perform strategic stewardship and oversight functions (31). Their proximity to service delivery allows them to supervise performance and enforce standards without the logistical and informational distance faced by central ministries. In Tanzania, for example, the introduction of facility autonomy enabled District Medical Officers and District Health Management Teams to refocus on supervision and supportive mentorship rather than micro-management (31). In Pakistan, while regulatory standards are defined centrally, district-level drug inspectors are responsible for sampling and testing medicines received by facilities, reinforcing quality assurance through local enforcement (31). Similarly, in Ethiopia, district managers oversee the implementation of fee-waiver systems and the functioning of facility governing bodies, placing accountability mechanisms at a level close enough to detect operational failures (31).

Second, the literature highlights the possible role of the mid-level in budget aggregation and financial management. Districts and regions serve as consolidators of facility demand, translating local needs into feasible budget proposals aligned with national fiscal constraints. In Uganda and Indonesia, District Health Offices convene planning workshops with facility in-charges to forecast supply requirements and then aggregate these requests for national approval (31).

Third, mid-level units can also play a role in sourcing, contracting, and recourse procurement, especially where central supply systems experience gaps. While bulk procurement remains centralised to achieve economies of scale, districts and regions increasingly manage framework agreements and secondary supply routes. Tanzania's Prime Vendor System assigns each region a competitively selected private supplier to provide medicines when the CMS cannot meet demand. In Pakistan's Sindh province, District Health Offices are authorised to procure up to 15 percent of their supply needs locally to address emergencies and stockouts, illustrating a controlled form of decentralised purchasing (31).

Fourth, districts and regions often host essential logistics, warehousing, and distribution infrastructure that enables last-mile delivery. In Uttar Pradesh, India, district warehouses function as pivotal nodes in the supply chain, maintaining continuous stocks of essential medicines that facilities draw from according to need. Zambia's use of regional distribution hubs similarly decentralises storage and brings bulk supplies closer to points of care, improving responsiveness and reducing delivery delays (31).

Taken together, these examples suggest that the district or regional levels often handle functions that require local knowledge combined with administrative and technical capacity, including demand consolidation, contract management, supervision, and logistics coordination.

Indonesia's national e-catalogue managed by LKPP (the national procurement agency) represents a strong example of market shaping for EMHS. By prequalifying suppliers at national level, negotiating framework prices, and publishing these on a transparent digital platform, LKPP leverages the full country's purchasing volume while allowing districts and facilities to select from an approved menu based on local needs. This model combines the price and quality advantages of centralised procurement with the responsiveness of decentralised ordering and creates competitive pressure among suppliers to improve service and delivery terms. Nonetheless, evidence suggests that compliance with regulated prices remained uneven. In practice, supply-side constraints, provider incentives, and weak enforcement mean that official prices do not always translate into real-world affordability or access, with continued reliance on OOP purchases. This underscores that centralised market-shaping mechanisms require strong enforcement and aligned incentives to be effective (43).

Centralised systems in Uganda (NMS), Tanzania (Medical Stores Department, MSD), and Kenya (Kenya Medical Supplies Authority, KEMSA) similarly achieve meaningful negotiating leverage through volume aggregation and perform reasonably well on market shaping when adequately capitalised. Kenya's KEMSA, for instance, handles around 70 percent of county procurement and prequalifies suppliers through framework contracts.

The most corrosive threat to market shaping across all study countries is the accumulation of pending bills. When counties, districts, or provinces fail to pay central procurement agencies on time or in full, driven by delayed fiscal transfers and budget diversions, agencies lose working capital, forfeit credit terms with suppliers, and must pay cash up front, weakening their negotiating position precisely when fiscal stress is highest. Kenya, Uganda, and provinces in Pakistan exhibit this pattern. Breaking this cycle requires upstream fiscal fixes, predictable transfers, and enforceable payment obligations, as much as procurement agency reform.

Fragmentation compounds the problem in decentralised systems: Pakistan's three provinces negotiating separately, and the Philippines' 1,634 LGUs procuring independently, forfeit the volume leverage that centralised or pooled procurement would provide. This results in higher prices and greater variability in quality (44,45). The CGD/Dubois et al. finding that centralised procurement yields lower prices comes with an important qualification: the price reduction is smaller when the supply side is more concentrated (7). Thus, pooling is not a universal solution, and its benefits depend on the competitiveness of the supplier market.

The key supportive systems for effective market shaping are a centralised purchasing or price-setting function, adequately resourced and insulated from political interference, alongside a robust regulatory authority capable of prequalifying suppliers and conducting post-market surveillance, as well as digital infrastructure enabling price transparency and competitive supplier markets. This centralised function can take several forms: a CMS that handles the full cycle of quantification, tendering, purchasing, warehousing, and distribution (as in Kenya and much of sub-Saharan Africa); a framework contracting body that negotiates prices and prequalifies suppliers nationally while leaving ordering and payment to subnational actors or facilities (as in Indonesia's LKPP); or a purely regulatory reference-pricing body that sets price ceilings within which decentralised procurers must operate. The critical design feature is not the degree of physical centralisation but the concentration of negotiating leverage and the insulation of that function from political capture.

Regulatory capacity correlates with institutional investment. Indonesia's BPOM and South African Health Products Regulatory Authority (SAHPRA) demonstrate stronger regulatory performance than the more fragmented system in Pakistan. Where countries cannot sustain full national procurement capacity, pooled procurement arrangements, whether regional (as attempted through the Economic Community of West African States [ECOWAS] for Burkina Faso) or through aggregation platforms like the Philippine International Trading Corporation (PITC), offer a partial substitute, though coordination costs and political barriers have limited their uptake to date. A summary of findings on the balance of evidence by functions is provided in Table 5 for Phase 1.

TABLE 5. Summary messages for Phase 1: Planning (Budget formulation)

Function	Conclusion on Centralisation vs. Decentralisation
1. Revenue raising and pooling	• Effective health financing requires coordination between multiple funding sources, including government budgets, health insurance schemes, and external development assistance. • Centralised pooling plays a crucial role in maximising national financial resources, ensuring equity, and aligning diverse funding streams toward national priorities. • At the same time, decentralised revenue retention at the facility level – through mechanisms such as user fees, insurance reimbursements, DFF, or revolving drug funds – is vital in some contexts (e.g., if the centralised system is not providing adequate EMHS) for maintaining operational liquidity and responsiveness. Allowing facilities to retain and manage part of their revenues strengthens local accountability and enables timely purchasing of essential inputs, thereby complementing centralised pooling with flexibility at the point of service delivery.
2. Prioritising	• Centralisation remains essential for setting the foundational framework – through national policies, EMLs, and standard treatment guidelines – that ensures consistency, quality, and equity across the health system. • At the same time, decentralisation enables the integration of local knowledge to adapt these frameworks to context-specific needs, ensuring that the mix of commodities aligns with local epidemiological realities and service priorities. • Ultimately, while the national level defines what *can* be procured, it is the local level that determines what *should* be ordered to best meet community health needs.
3. Budgeting	• Decentralisation of budgeting, which grants moderate to high decision space to subnational actors, is generally associated with better performance, as local officials are better positioned to develop contextually appropriate plans and realistic budgets. However, these benefits materialise only when technical capacity for F&Q is adequately strengthened at the subnational level. • Conversely, when central authorities lack local knowledge, budget planning becomes less responsive to actual needs. • Yet decentralisation alone is not sufficient – if facilities continue to operate under rigid, input-based budget structures or face PFM constraints that limit fund reallocation, the advantages of local autonomy are effectively undermined.
4. Market shaping and regulation	• Centralisation of market-shaping activities is necessary to secure lower prices via economies of scale and to enforce quality assurance. • Centralised price negotiation, often through Framework Agreements – where a national authority negotiates prices and quality standards while local units place orders – offers an effective hybrid approach that combines cost efficiency with local responsiveness. Quality control mechanisms, such as national drug testing laboratories and regulatory oversight, are typically centralised to ensure uniform standards. • In contrast, decentralised purchasing can lead to market fragmentation, price variability, and inconsistent product quality, underscoring the need for coordinated central market governance even in decentralised systems.

Phase 2: Procurement

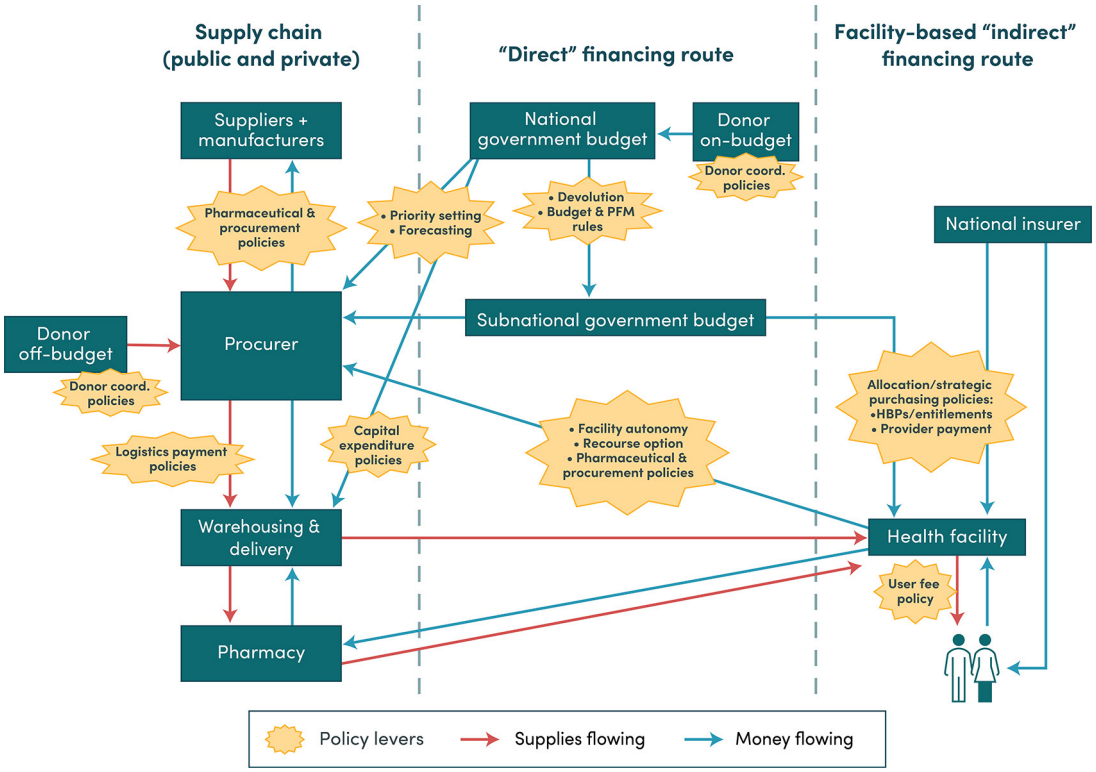
With governance structures in place, budgets and priorities set, and markets regulated, the procurement phase begins. This can be broken into several stages, including tendering, contract negotiation, provider selection, ordering, and payments. This phase operates through two distinct routes: the direct procurement route and the indirect facility-based financing route (see Figure 2).

The direct route is conceptually simpler, with direct allocation of resources from a budget holder to a procurer for centralised procurement. This typically flows from a national or subnational ministry to a procurement agency (such as a CMS), which then tenders, negotiates, and pays suppliers.

The indirect route is more complex: budget holders primarily pay facilities for health service delivery, which provides resources for facility-led procurement of commodities. This means that central planners may have less oversight over what is needed, financed, or procured. In this route, facilities receive budgets (which may include capitation payments or user fee revenues) and use these resources to procure commodities. This is either from the same supply chain as the direct route or from alternative suppliers such as local pharmacies, depending on facility autonomy policies and "recourse" mechanisms when primary procurers experience stockouts.

Both routes involve frequent large transfers of public finances, making efficient budget execution, underpinned by effective PFM rules, critical to ensuring that commodities reach facilities and patients in a timely manner. The degree of centralisation or decentralisation in procurement affects purchasing power, transaction costs, supply chain efficiency, facility autonomy, and responsiveness to local needs.

FIGURE 2. Major flows of commodities and finances in supply chains



Function 5: Direct centralised procurement

Table 6 outlines the characteristics, challenges, and policy options associated with centralised and decentralised procurement arrangements.

TABLE 6. F5: Direct centralised procurement

	Centralised Configuration	Decentralised Configuration
What it looks like	• Resources are allocated directly from a national budget holder (e.g., ministry of finance) to a central procurer (e.g., CMS) (4) or subnational procurer in some contexts. This process aggregates demand and facilitates the use of strategic mechanisms like framework agreements to control costs and quality centrally (31). • Pooled procurement falls under this model, involving joint tendering and financial management.	• In some systems, procurement may be handled at intermediate administrative levels, such as regions or districts, or at facility level for specified products (or up to specified budget limits).
Common challenges	• Price reductions limited when suppliers are concentrated/monopolistic. • Weak regulations around competition, pharma, quality standards, lengthy registration processes.	
Challenges specific to this model	• Procurement delays, inflated pricing. • Poor coordination. • Central public procurement agencies often face challenges of having to supply, regardless of payments, leading to accumulation of debts. • Reduced local flexibility and adaptability. • Lack of independent local agency.	• Lose economies of scale and negotiating power leading to high prices. • Drug quality risk due to lack of quality assurance capacity. • Risk of corruption at local levels. • Can be undermined by late central transfers, as discussed above, along with fiscal mismanagement at local level and reallocation of resources to other priorities. • Districts may over-order in the expectation of the national level covering debts (moral hazard) (34).
Supportive policy options within each configuration	• Sufficient central technical and financial capacity; compatible laws and regulations. • Sufficient market size and prompt payment for suppliers. • Large volume commitments (though this has budget implications). • Stable funding, covering not just the purchasing of commodities but also the operational costs of managing them. • Regulations for enforcing payments.	

The evidence consistently shows that centralised procurement agencies, when adequately funded on time, are relatively efficient actors (see Box 6). Kenya's KEMSA delivers commodities within 10 to 14 days of a confirmed order, and Uganda's NMS procures successfully when commodity funds are released on time (34). The primary bottlenecks are largely upstream: delayed fiscal transfers, pending bill negotiations, and lengthy internal approval processes that slow order confirmation. This distinction matters for policy: reform efforts focused solely on procurement agency performance will have limited impact if the fiscal and PFM conditions feeding into them remain dysfunctional.

BOX 6. Centralised procurement in South Africa

For manufacturers to supply at a good price, they need to have confidence in payments, as well as guaranteed volumes that will be purchased. In South Africa, the central government runs tenders and provincial governments place orders against those, ordering from those suppliers selected by the federal government. However, some provinces have a poor reputation for paying, so suppliers refuse to supply them. Hospitals also buy directly but are often unable to pay their suppliers, leading to gaps, especially in local manufactured surgical supplies.

Underwriting by the national government or another credible funder, or the takeover of this function, may be needed to reduce the risk in the eyes of suppliers (and therefore their prices). Centralisation may also reduce corruption, in which procurement rules are manipulated to purchase from affiliated bidders at the provincial level. The gains from centralisation in this context derive from the National Treasury in South Africa being institutionally strong and controlled, which may not apply in all settings.

Source: Key Informants' Interviews (KII).

Centralised procurement requires several enabling conditions, including adequate and predictable capitalisation of the procurement agency, a unified budget covering both commodity procurement and logistics, and enforceable payment obligations from subnational entities. A unified budget helps avoid the "two-pot" problem documented in Uganda, where commodities are procured but cannot be distributed because operational budgets are delayed, while reliable subnational payments prevent debt accumulation that undermines agency liquidity and supplier relationships. Semi-autonomous governance of procurement agencies, as with NMS, KEMSA, and MSD, supports professional management and insulation from political interference, but requires clear accountability mechanisms to ensure responsiveness to client needs. Digital ordering systems such as an Electronic LMIS (eLMIS) in Kenya and Uganda and the e-catalogue in Indonesia improve efficiency and transparency, but their impact is constrained when upstream financing remains unpredictable.

Where centralised procurement relies on international suppliers, hard-currency availability is itself a supportive system: a procurement agency cannot execute a USD- or EUR-denominated contract on a domestic-currency budget unless the central bank releases the corresponding foreign exchange. Coordination between the procurement agency, ministry of finance, and the central bank to pre-allocate foreign exchange for essential-medicine purchases, or, where reserves are tight, to prioritise health commodity payments in the foreign exchange queue, is therefore as material as the timeliness of fiscal transfers.

Evidence from pooled procurement mechanisms highlights that centralisation only achieves its intended efficiency gains when key prerequisites are met. These include sufficient technical and financial capacity among participating buyers, compatible regulatory frameworks, and the presence of a capable and independent procurement organisation. Suppliers must also face appropriate incentives, like reliable demand volumes and timely payment mechanisms, to ensure sustained participation

and competition (46). However, evidence suggests that mechanisms vary widely in structure and performance, and poorly designed arrangements may fail to deliver expected gains or may even collapse after implementation. This underscores the importance of contextual adaptation and careful institutional design (46).

Functions 6 & 7: Indirect facility-led procurement

Table 7 summarises the dynamics of indirect facility-led procurement under different governance arrangements.

TABLE 7. F6 & F7: Indirect facility-led procurement

	Centralised Configuration	Decentralised Configuration
What it looks like	• Facility-based financing of procurement is inherently decentralised. But centralised authorities can retain substantial control: facilities and subnational authorities may be reliant on the national supplier, with minimal facility autonomy for procurement (47). • Spending may be restricted by line-item budgets (11). There may be "shadow" facility budgets, with money actually moving between higher government authorities and procurers, and subject to tight central control.	• Financial autonomy is transferred to facilities, often through mechanisms like DFF, which electronically deposits funds into facility bank accounts (5). • Facility managers have autonomy to allocate funds (48). • Facilities with autonomy can procure EMHS directly, especially for emergencies (49).
Challenges specific to this model	• Higher stockouts due to slow responsiveness. • Limited flexibility and highly bureaucratic process.	• Weak PFM capacity at lower levels. • Misaligned incentives across budgets from different sources. • Accountability and corruption issues. • Lack of market power in terms of volume and ability to negotiate down on prices as well as quality assure. For example, in Kenya, counties rely on KEMSA for most of their supplies but purchase 28 percent from a non-profit supplier (Mission for Essential Drugs and Supplies), at higher costs and variable quality (34). • Budget constraints create debts to suppliers, causing worsening terms offered, thus a vicious circle. • Limited local production/sellers of products can constrain local purchasing options.
Supportive policy options within each configuration	• Strong data systems down to local level so that there is a clear feedback loop from local use to central planning. • High analytical and operational capacity for frequent "push" of supplies. • Flexibility of central budget structures and fund flows.	• Strong PFM capacity across lower levels and enabling PFM environment. • Facility bank accounts, accountants, and direct transfers rather than reliance on district health office. • Use of virtual funds for districts or facilities so they can use these to pay, avoiding payment blockages (e.g., as used in DRC). • Quality assurance mechanisms and regulatory oversight. • Facility autonomy to manage funds (including reallocation across budget lines within acceptable limits). • Effective local leadership across areas (so that decentralisation benefits are distributed, not just focused on areas with strong local leaders).

There are price advantages from centralised procurement, especially when using competitive tendering. Yet, reliance on one organisation, which can capture resources and suffer from inefficiency and corruption, carries risks (7). The level of sophistication of the health and PFM system can influence choices here. With larger, more decentralised countries, procurement and financing of procurement may be focused at state/province level, rather than national (5). For decentralised systems with many local budget holders, it is harder to achieve economies of scale, quality assurance is more complex, and the inventory management burden increases. In addition, delays in transfers and payments can further increase prices if suppliers are not paid reliably.

BOX 7. Pakistan's mixed procurement systems

Pakistan provides a prominent example of subnational procurement following the 2010 constitutional amendment that devolved health care authority to its provinces (13). The Punjab province operates a hybrid model that combines centralised quality control (where the Directorate General Health Services manages supplier prequalification) with decentralised purchasing executed by District Health Authorities (50). Similarly, in Khyber Pakhtunkhwa, the Medical Coordination Cell centrally negotiates fixed unit-rate contracts, but individual District Health Offices remain responsible for issuing purchase orders and paying suppliers. While these systems allow for local tailoring, they remain vulnerable to PFM bottlenecks, such as unpredictable fund releases from provincial finance departments, which can result in significant budgetary under-execution and medicine shortages (13). They also multiply procurement entities, even within a single province, leading to coordination challenges.

Emerging best practice is represented by Indonesia's e-catalogue model, which involves national prequalification (negotiating price and quality, with competitive pressure for suppliers to offer good terms), but with local units able to select from the approved menu (34); see also Box 7 on Pakistan and Box 8 on Mexico. This enables transparency, responsiveness, and speed but does require adequate pharmaceutical personnel at district or facility levels, as well as the funds at local level to pay for the supplies.

Procurement agencies, at whichever level they are established, need adequate capitalisation and sufficient logistics budgets. Automatic payments from the centre, digital ordering systems, framework contracts with suppliers, and performance incentives (bonuses for meeting fill rates and delivery times) can all improve efficiency (34). Some regions have tried to develop regional pooled procurement (e.g., in ECOWAS), but these have had limited success to date due to political barriers, coordination costs, and logistical complexity.

Emergency systems in the form of alternative suppliers are used in most decentralised systems, albeit with the trade-offs identified in terms of price and quality. Allowing for local (e.g., district) or facility top-ups can reduce the risk of delays and stockouts, especially for products that are

available locally (e.g., supplies and reagents) and with clear guidelines on ceilings and appropriate accountability controls, in accordance with PFM rules (5). However, purchasing from the open market outside of formal framework agreements introduces significant risks, most notably the loss of economies of scale and reduced bargaining power. Evidence suggests that uncoordinated buyers can pay 50–75 percent more for the same medicines than those using pooled procurement mechanisms (5,8,51). In addition, having procurement through multiple entities reduces accountability for stockouts, as each level or agency can blame the other (34).

One model is to decentralise financing to facilities (e.g., as part of capitation payments, DFF, or performance-based financing – PBF) but establish framework agreements so that purchasing is done from sources that are already quality accredited and through national price negotiations (5). This typically applies more for essential drugs, supplies, and reagents, compared to commodities relying more on international purchasing, such as vaccines. However, if these start to be procured nationally, the same issues would likely arise (5). It can also be used with health systems that rely more on user fees or facility revenue raising, and for hospitals, due to their larger volume of patients and capacity to manage procurement (12). Facilities still need sufficient and timely funding to cover EMHS costs.

The example of the Gratuité policy in Burkina Faso illustrates challenges where demand (for free mother and child health services) outstripped the reimbursements received from the government, generating rising arrears owed to facilities. As discussed in F1 above, this reflects a facility-level revenue-generation problem, as well as a budget execution one by the public financing system (discussed in F8 below). In such cases, facilities have an entitlement (for reimbursement) but no cash is received and so procurement halts. Programmes also must accord with PFM laws; in Uganda, the failure of the URMCHIP (Uganda Reproductive Maternal and Child Health Improvement Project) to be compatible with local PFM regulations led to its discontinuation, despite promising results in terms of enabling facilities to procure when the NMS had stock outs (34).

BOX 8. Political reforms to procurement in Mexico

Prior to 2019, the multiple state institutions in Mexico with responsibility for social security were able to use a consolidated national procurement system. The institution with the most experience in procurement compiled needs on behalf of all of them, did market research, and then negotiated the procurement. However, each institution could subsequently set up their own contracts (from their own budgets) with the selected company. This enabled streamlining of work, competition over price, and bigger bids but still allowed for autonomy across multiple institutions in what was a fragmented social security landscape. In parallel, there was a federal process to negotiate prices for all public contracts for single source drugs, which kept prices down.

However, the new government in 2018 dismantled this system in favour of the Ministry of Health taking on the procurement. However, the Ministry of Health had no experience doing this, which has led to years of failure, with disruptions in supply, increases in OOP payments for those who can afford to pay, and substantial increases in price. These problems remain unresolved, and the recentralisation has meant that states are powerless to manage contracts, as they are no longer paying providers. Quantities are set at the central level. The case study highlights the importance of central coordination on sourcing and procurement, while allowing local levels to order according to their needs, as well as the need to respect institutional capacity, independence from politics, and expertise that has been developed over time.

Source: KII; Mexico case study.

Function 8: Budget execution

Table 8 presents the comparative features of centralised and decentralised budget execution processes and their associated bottlenecks.

TABLE 8. F8: Budget execution

	Centralised Configuration	Decentralised Configuration
What it looks like	• Financial control retained at national level, based on strict input budget structures (11).	• Facilities have financial autonomy including coverage of routine operational costs (11).
Common challenges	• Lack of execution of allocated funds due to unpredictable and delayed transfers. • Rigid budget structures (e.g., not being able to carry over savings, leading to rushed spend at end of fiscal year) (34). • Lack of integrated Financial Management Information Systems (FMIS), making it difficult to track spending in real time. • Treasury cash rationing and central bank foreign exchange allocation can block payment to suppliers even when budgets are appropriated and released, particularly for import-dependent essential medicines.	
Challenges specific to this model	• Operational bottlenecks; misalignment between funds and local need.	• Lack of execution due to fragmented fund flows with long complicated admin and approval processes (multiple levels) (e.g., procurement in Punjab takes six–twelve months for larger items). • Approvals done serially, not in tandem. • Weak local PFM capacity. • Poor coordination across stakeholders at multiple levels. • Lack of frameworks or guidelines from central level.
Supportive policy options within each configuration	• Supportive policy options: cash-management coordination with ministry of finance/treasury (to address liquidity issues and cash rationing). • Strong financial management practice to ensure timely fund disbursement. • Integrated FMIS. • Flexible budget structures.	• Streamlined fund flows with clear incentives around supplies. • Increased local PFM capacity. • Clear roles and responsibilities across local levels. • Enabled digital systems; quality assurance mechanisms and regulatory oversight.

Budget execution needs to follow the arrangements for procurement. Unpredictability and delays in fund releases due to long administrative budgeting processes (and other issues) often cascade down the system, leading to stockouts. The level of financial autonomy is important and is one of the factors impacting the gap between budget allocations and execution (11).

Most countries have budget lines for medicines and supplies, and this has the advantage of clarity, protecting resources for this use and enabling auditing. Medicines and medical supplies budgets are sometimes specified at national level (e.g., in Uganda, Tanzania, and Burkina Faso), at county or district level (e.g., in Kenya, Pakistan, and Indonesia), or at facility level (e.g., some facilities in Indonesia and Kenya, which have autonomy, and in the Philippines) (34). However, rigid line-item budget can be a cause of under-execution.

PFM rigidities are a major bottleneck across the 10 countries studied by HSI, including complex and serial approvals needed for procurement, even when budgets have already been approved. In Kenya, there are more than ten approval steps for expenditure within the county, while in Punjab there are six (34). Quarterly releases are also often delayed, causing planning challenges. Pending bills must be paid before new orders can be placed, and funds cannot be rolled over across years in most countries. Each invoice must be verified, which can take weeks, and public procurement rules are onerous. Emergency procurement rules exist but are rarely used due to fears of audit queries, and most processes are manual, adding time to obtain signatures, for example. These apply even in centralised systems, but in decentralised systems, the challenges are typically higher, as each governance level adds its own PFM bottlenecks. In Kenya, for example, the delay from the national level in transferring the equitable share to counties is generally between three and six months, and an equivalent delay of four to six months is due to processes at county level, leading to delays in financing of seven to twelve months in total (see also Box 9). These challenges are particularly damaging when there is a need for fast responses, for example to outbreaks or epidemics/pandemics.

BOX 9. Kenya's challenge of budget execution

In Kenya's decentralised system, a study of four counties revealed that less than half of the allocated medicine budgets were actually executed. This under-execution was driven by delays in fund transfers from the National Treasury to the counties, which led to counties running up significant outstanding bills with the KEMSA. Because KEMSA was starved of these funds, it could not pay its own suppliers, resulting in a breakdown of the supply chain where the central agency could no longer fill county orders. In this example, each link in the financing chain acts as an involuntary lender to the next level, with none having sufficient working capital to absorb the lag in payments. Furthermore, rigid PFM rules requiring funds to be spent within the same financial year meant that late disbursements often lapsed and were returned to the Treasury while facility shelves remained empty (3).

A further execution constraint, distinct from PFM rigidity, is cash management at the treasury and central bank levels. Even when a budget has been appropriated and a release authorised, the procurement agency may not receive disbursable cash on schedule because the treasury is sequencing payments against available liquidity, or, for international purchases, because the central bank is rationing hard currency to preserve reserves. Iran under politico-economic sanctions illustrates the extreme of this constraint: Although medicines are formally exempt, officials reported that disruption of international banking transactions, inability to transfer currency, and sudden drug price increases driven by exchange-rate fluctuations became the binding constraints on procurement (26).

A CMS with a fully approved domestic-currency allocation can still face a payment block if hard-currency conversion is delayed or scaled back. The downstream supply chain consequences are the same as those documented for PFM delays elsewhere in this section. Distinguishing these two layers – fiscal release from cash availability – matters for diagnosis and for policy: PFM streamlining alone will not resolve execution gaps where the binding constraint is treasury cash sequencing or FX allocation.

The key supportive systems for effective budget execution are: streamlined approval processes that run in parallel rather than serially, predictable and front-loaded budget releases to enable full-year planning, and procurement rules that explicitly carve out framework contracts for routine health commodities, reducing the burden of formal bidding for items procured regularly and predictably.

Rollover provisions allowing unspent commodity funds to carry into the next fiscal year would reduce the chance of perverse year-end spending rushes, like those documented in Kenya, where rushed June procurement compromises quality and pricing (41,42). For decentralised systems in particular, each governance level adds its own approval layers and release delays, making coordination mechanisms between national and subnational PFM systems, including automatic transfer schedules and digital approval workflows, an essential investment. Where PFM legal frameworks currently prevent facility-level procurement autonomy, as in Uganda post-URMCHIP, legislative reform to enable DFF within defined ceilings would allow facilities to bypass the most acute execution bottlenecks at district and county level. A summary of findings on the balance of evidence by functions is provided in Table 9 for Phase 2.

TABLE 9. Phase 2: Procurement (Budget execution)

Function	Conclusion on Centralisation vs. Decentralisation
5. Direct centralised procurement	• Centralisation is generally most effective for achieving price efficiency, as pooling demand enables stronger bargaining power and economies of scale. However, centralised systems often struggle with implementation bottlenecks, particularly when budget execution is delayed or unpredictable – for example, when slow fund releases from the ministry of finance disrupt timely contracting and procurement by central medical agencies. • Framework agreements, in which a central authority negotiates prices and quality while allowing local units to place orders, provide a balanced solution that preserves both cost efficiency and operational flexibility.
6. Indirect facility-led procurement via payment for services	• Centralisation of fund pooling is necessary for strategic purchasing, but decentralised payment mechanisms provide resource flexibility to facilities. • When PBF or DFF schemes are implemented, funds are transferred electronically to facility accounts, providing a degree of financial autonomy and explicit funding for operational needs. However, the extent of autonomy varies considerably depending on programme design – many PBF models, for example, include strict spending controls, verification procedures, and earmarked expenditure categories, which can limit flexibility even as they strengthen accountability. When effectively balanced, this approach can still enable timely facility-led procurement (often to fill gaps in central supply) and enhance responsiveness to local needs.
7. Indirect facility procurement	• Decentralisation via granting financial autonomy is a key policy option to increase responsiveness and medicine availability by enabling facilities to use their funds (user fees, insurance claims) for direct purchasing. • This function is most effective as a "recourse option." However, autonomy must be coupled with strong accountability mechanisms and local capacity-building in financial management to mitigate fiduciary risks and misuse.
8. Budget execution	• The primary challenge is the failure of funds to flow predictably and completely down the system, regardless of whether the system is fully centralised or decentralised. Policy solutions must focus on structural reform to streamline, simplify, and clarify fund flows, often through the institutionalisation of DFF, PFM reforms, health insurance, exemption policies, or similar mechanisms.

Phase 3: Delivery

Function 9: Delivery

Delivery is the phase most often neglected by the health financing community, yet efficient financing of distribution to the last mile represents a critical challenge for all health care supply chains. Distribution costs, including storage and transportation expenses, constitute a significant portion of total logistics costs and in some cases transportation costs alone can exceed the value of the medicines being distributed. Key policy questions in this function include how to finance these distribution costs, whether to centralise or decentralise distribution financing and operations, how many distribution tiers to employ, and whether to outsource logistics to third-party providers. The degree of centralisation or decentralisation in delivery affects operational efficiency, reach to remote facilities, cost-effectiveness, and the ability to maintain quality through cold chain and proper storage conditions. Table 10 summarises how delivery and distribution functions differ across centralised and decentralised systems, including operational and cost implications.

TABLE 10. F9: Delivery

	Centralised Configuration	Decentralised Configuration
What it looks like	• Distribution is managed via an Allocation (Push) system, where central or regional stores determine the type and quantity of commodities to be issued to lower levels (52), or via more hybrid models. • Delivery costs are funded centrally.	• Distribution systems characteristic of decentralisation often use a Requisition (Pull) system, where each level determines the quantity of supplies to order based on past consumption and stock status (33,40) or hybrid forms. • Operational functions like transportation may be outsourced to Third-Party Logistics Providers (3PLs), effectively decentralising the distribution function (38). In some settings, drugs are delivered to District Health Stores (DHS) and facilities have to collect them or cover their onward transportation costs.
Challenges specific to this model	• Increased transport costs and longer lead times for longer distribution routes. • Lack of cold chain capacity to local level. • Monopolistic CMS lack cost-reducing incentives. • Higher upfront capital investments for large-scale infrastructure. • Challenges with last-mile delivery. • Lack of capacity for private sector engagement.	• Increased subnational expenditure on warehouse management processes, equipment, transport, and LMIS. • Operational costs such as utilities, security, and maintenance are multiplied across multiple sites. • Higher costs and incurring debt with 3PLs.
Supportive policy options within each configuration	• Adequate capitalisation for centralised infrastructure. • Sustainable funding for ongoing operations and maintenance. • Budget allocation for investment in logistics and storage capacity as demand increases. • Capacity to manage contracts with 3PL for delivery of EMHS (where relevant).	• Robust subnational infrastructure and operational capacity to manage and run storage and transport of supplies. • Integrated digital systems. • Capacity to manage contracts with 3PL (where relevant).

Delivery costs can constitute 10 to 25 percent of the total commodity costs and are typically higher in LICs with poor infrastructure (34). Some countries, such as Uganda, have separate budget lines for commodities and for the logistics of managing them; while the former is timelier, the latter is often delayed, causing commodities to sit in NMS warehouses while facilities have stockouts (34). In other countries, such as Kenya, the delivery cost is integrated within the procurement budget line. In Indonesia, suppliers are paid an inclusive amount to supply and deliver the items, which shifts the burden but may disincentivise provision to remote areas.

Warehousing and distribution costs constitute up to 16 percent of the medicines budget in LMICs, yet these functions are often underfinanced and structurally vulnerable (53). CMS depend almost entirely on annual government budgets, leaving them exposed to the same irregular release and arrears problems that affect procurement. Where service fees can cover storage and transport costs, governments frequently fail to meet their own financial commitments, leaving agencies renting overflow warehouse space while fleets age and deteriorate. The multi-tier structure compounds this: in budget-decentralised systems, a landed-cost-plus-distribution fee is charged by each

successive tier for storage and transport services, with each level adding its own markup before passing commodities downward. This means more tiers directly translates into higher cumulative warehousing costs, potentially representing 10 to 50 percent of the medicine's purchase price (54).

Decentralised storage also generates perverse financing-governance interactions at the subnational level. District personnel can be penalised for stockouts (regardless of whether the cause lies at the district level) and are incentivised to hoard stock. Warehouse managers can be penalised for expired product disposal and thus avoid clearing unusable inventory, leaving storage spaces cluttered and inventory control systems compromised (54).

PBF has been tested as one mechanism to directly address warehousing performance. In Mozambique, USAID conditioned disbursement of up to USD 500,000 per year to the CMS on quarterly performance targets and found improvements across all indicators over one year, though warehouse indicators such as inventory management and order fulfilment proved more challenging than planning indicators (55).

In decentralised systems, unit costs for delivery can multiply due to smaller loads, although local knowledge for transportation is supportive. Some countries (such as Indonesia and South Africa, and some urban LGUs in the Philippines) use 3PL companies to deliver commodities, including to more challenging rural areas, as they have expertise and can potentially be more efficient. However, some governments are reluctant due to perceived high costs, and there may be limited market capacity in lower-income countries and those with very challenging terrains.

PFM rules may also discourage the use of 3PL companies. For example in the Philippines, additional procedures are needed to contract them (34). Having fewer distribution tiers (like in Uganda and Kenya) also improves efficiency. Tier reduction was shown to demonstrably improve performance in Zambia, where a randomised trial found switching from a three-tier to a two-tier direct-delivery model reduced paediatric malaria medicine stockout frequency from 47.9 to 13.3 percent (56). Last-mile delivery to remote and geographically challenging areas remains a genuine constraint in several countries, particularly Indonesia's eastern islands, the Philippines archipelago, and rural Pakistan and Uganda. Distribution costs in these contexts can exceed 30 percent of total commodity costs.

The key supportive systems for effective delivery are: integrated commodity and logistics financing, the avoidance of separate budget lines that can become unsynchronised, adequate and predictable funding for operations alongside procurement, and investment in digital tools such as GPS tracking and electronic proof of delivery to improve route optimisation and accountability. In decentralised systems, the fragmentation of logistics infrastructure across counties, districts, and LGUs drives up unit costs and underutilises assets; coordination mechanisms or shared logistics arrangements between subnational entities would recover some of the economies of scale lost through decentralisation. Cold chain infrastructure investment is an increasingly important complementary

system as countries expand beyond vaccines to insulin, biologics, and temperature-sensitive essential medicines. A summary of findings on the balance of evidence by functions is provided in Table 11 for Phase 3.

TABLE 11. Phase 3: Delivery (Logistics)

Function	Conclusions on Centralisation vs. Decentralisation
9. Delivery (logistics, inventory, warehousing, transportation)	• Effective delivery systems depend on a careful balance between centralised technical control and decentralised operational execution. • Centralisation is critical for ensuring efficiency, consistency, and quality in core logistics functions – such as inventory management, warehousing standards, and transportation scheduling – where uniform procedures like First Expired, First Out and consolidated oversight minimise waste and stock imbalances. However, excessive centralisation can limit responsiveness, particularly when distribution networks mirror administrative hierarchies rather than logistical logic, and there can also be pushback from decentralised governance structures to the imposition of centralised delivery systems, especially where these are seen as not being cost-effective. • Decentralised execution, when supported by clear technical standards and timely fund flows, enables adaptability to local terrain, population needs, and last-mile realities. • Persistent challenges – such as delayed payments to 3PLs and fragmented accountability – underscore the importance of strategic system redesigns that streamline distribution tiers, integrate financial flows (including transport costs within private provider EMHS payments, for example), and align central efficiency with local responsiveness.

Phase 4: Monitoring

Function 10: Monitoring

The final function in the supply chain is effective monitoring of supply chain and financial data, which enables accurate demand-based planning, informs budget formulation, and supports prioritisation of allocations to the highest-impact services. However, due to fragmented supply chains with separate management approaches, lack of standardised digitised data collection, and limited analytical capacity, consumption data is often unavailable to decision-makers. This forces reliance on historical procurement as a proxy for demand and undermining strategic planning. Similarly, tracking data on financial flows in the supply chain and health facilities can detect bottlenecks and ensure liquidity for commodity procurement, yet this data is frequently lacking or not integrated.

The degree of centralisation or decentralisation in monitoring and data systems affects standardisation across jurisdictions, analytical capacity, interoperability between systems, and the ability to generate actionable insights for decision-making at different levels of the health system. Countries must consider how to mandate or incentivise data collection across actors, build capacity to analyse integrated data, and ensure that monitoring systems support improvements to supply chain financing regardless of whether governance is centralised or decentralised. Table 12 outlines the differences in monitoring and data systems under centralised and decentralised configurations.

TABLE 12. F10: Monitoring

	Centralised Configuration	Decentralised Configuration
What it looks like	• Central authorities maintain strict control over key management functions, such as inventory control and information systems (9). • Centralised systems are designed to provide real-time inventory visibility across the network (29). • Data visibility, especially for inventory and consumption, is essential for centralised decision-making, forecasting, and inventory management (9,57).	• Decentralised configuration involves transferring responsibility and decision-making authority from higher tiers of government to lower administrative levels, such as subnational governments or individual health facilities (8). This approach requires the logistics system to adapt to broader health system reforms (9), with public sector management determining the extent of local authority over managerial functions – such as the supervision of pharmacists, oversight of inventory practices, and accountability for financial and performance outcomes.
Common challenges	• Very few countries have integrated finance and LMIS or real-time tracking of commodities (with the exception of donor-funded vertical programme commodities). • Many countries still use paper-based systems, and there are multiple data gaps and lags. Therefore, it is very hard to identify bottlenecks (in financing and/or supply chain managent) when stockouts occur. • Finance and SCM operate in different silos, and integration is expensive (34). • There is no incentive to use data as not fed back into budget setting, as highlighted above.	
Supportive policy options within each configuration	• Commodity tracking systems developed by vertical programmes could provide good examples in some contexts, if integrated and sustained.	• e-catalogue systems, as in Indonesia, can provide data on spend across areas, consumption patterns and supplier performance.

Monitoring and accountability need to follow the procurement arrangements but also track distribution and use at all levels, from centre and down to facility level. Financial, utilisation, and supply chain information systems need to be linked so that consumption and expenditure can be monitored jointly, and this information fed back into planning and budgeting. However, it is commonly the case that these systems operate in parallel (3).

In the 10 countries studied by HSI, commodity tracking was generally better than financial tracking, but neither was strong (34). Information was sometimes available on delivery of commodities but rarely on budget allocations, spending, and payments. No study country has fully integrated commodity and financial data into a unified monitoring system for general EMHS. Commodity tracking systems (LMIS) and provincial budget systems (IFMIS) are typically owned by different institutions, built on different platforms, and not connected, and they themselves may be fragmented into multiple subsystems with different functions and institutional homes. This means it is rarely possible to correlate a facility stockout with the budget allocation, transfer timing, or payment status that caused it. Kenya's eLMIS tracks orders and deliveries but cannot be cross-referenced with county financial systems; Uganda's RxSolution generates facility stock data that is not linked to NMS financial flows or Ministry of Finance, Planning and Economic Development budget releases.

Vertical programmes across all study countries, particularly combating HIV and TB under Global Fund and PEPFAR, consistently outperform general EMHS on monitoring because donor requirements mandate digital systems, timely reporting, and quarterly data review cycles.

These examples share a common feature: monitoring is tied to accountability for resource use, creating an institutional incentive to generate and act on data that is largely absent for general EMHS. However, this took the form of another parallel LMIS system (not integrated in the overall LMIS).

Again, decentralisation multiplies the challenges, creating diverse information systems that are hard to aggregate at national level and compare. Data investment has limited impact, meanwhile, as data is not fed back into financial allocations. Even where data exists, political budgeting processes mean it is rarely used for F&Q or allocation decisions. The incentive to invest in analysis is weak when budget outcomes are determined by revenue ceilings and political negotiation rather than evidence. Box 10 illustrates how integrated digital monitoring systems can overcome fragmentation by linking consumption data with procurement and budgeting processes, enabling more responsive and efficient supply chain financing.

BOX 10. South Africa's use of patient consumption data for procurement and budget formulation

South Africa uses electronic medicine management and stock monitoring systems to support the management of pharmaceutical supply chains in public sector health facilities. RxSolution is an electronic pharmaceutical stock management system used mainly at hospitals and community health centres to manage medicine inventory, monitor stock levels, and support ordering and distribution processes. The Stock Visibility System (SVS) is an electronic stock monitoring system used primarily at PHC facilities to report medicine stock levels and identify potential shortages or stockouts. Both systems submit data to the National Surveillance Centre (NSC), where the information is consolidated into dashboards to support supply chain monitoring, planning, and decision-making.

Data is collected from across 3,500 facilities, which is reported to the NSC and used to inform procurement and budget formulation. In this way, the system has transitioned toward an agile, demand-driven model that reduces wastage and ensures more accurate financial planning (3,4).

The key supportive systems for effective monitoring are interoperability standards and middleware connecting LMIS and financial management systems, dedicated data analysis capacity at county and district level to translate raw data into planning inputs, and institutional accountability mechanisms that make data use a condition of resource access rather than an optional exercise. Investment in District Health Information Software 2 (DHIS2), already used across several study countries, as a platform for integrating commodity and financial data streams should be piloted as a possible pathway that builds on existing infrastructure. Public transparency dashboards publishing aggregated stockout, spending, and supplier performance data would strengthen accountability beyond government systems.

However, building data systems that track effectively from facility level up to national would require substantial investments in Information Technology (IT) infrastructure, capacity at all levels, integration of disparate data systems, and governance arrangements covering data quality, security, and use. A general challenge is that governments struggle to justify substantial IT expenditure in a context of inadequate resources for service delivery. Ultimately, the evidence from vertical programmes suggests that monitoring improves when it is tied to consequences, whether donor reporting requirements, PBF, or public accountability, rather than treated as a technical function operating in isolation from resource allocation decisions. A summary of findings on the balance of evidence by functions is provided in Table 13 for Phase 4.

TABLE 13. Phase 4: Monitoring

Function	Conclusion on Centralisation vs. Decentralisation
10. Monitoring	• Decentralised decision-making combined with multiple funding streams leads to fragmented information systems and conflicting accountability lines. • Centralisation of information standards is key. Less choice (more centralised control) over LMIS was associated with better performance. • Effective monitoring requires accelerating digitalisation and interoperability of key information systems, particularly those connecting EMHS consumption with financial allocations and spend at different levels.

The political economy of centralisation and decentralisation in supply chain financing

Political economy is a significant contributor to why supply chain financing configurations so often diverge from what the technical evidence recommends and why the prerequisites for effective performance so consistently go unmet. Three dynamics recur across the country evidence in this report.

Structural configurations are driven by political bargains, not supply chain logic

The decentralisation reforms that reshaped supply chain financing across LMICs were rarely designed with supply chains, health financing, or the health sector in general in mind. Kenya devolved health authority to 47 counties as part of a constitutional settlement following post-election violence; Pakistan transferred health responsibility to provinces overnight as a constitutional revolution; and the Philippines devolved to 1,634 LGUs as part of a broader democratic reform agenda. In none of these cases was supply chain performance part of the political calculus. Supply chains inherited structures designed for other purposes and have had to adapt to governance arrangements that were never built around their prerequisites.

Recentralisation is equally political. The evidence from this paper documents multiple recentralisation moves framed as technical corrections: Uganda's recentralisation of procurement through the NMS, Maharashtra's shift back to a single agency, and China's NVBP.

However, the Mexico case makes the political dimension unambiguous: an effectively functioning, consolidated procurement system, developed over years and producing efficiency gains, was dismantled by an incoming government seeking to assert ministerial control, with no technical justification and severe consequences for availability and prices. What appears in literature as a "corrective response" is often, in practice, a politically driven disruption; and what looks like institutional progress can be reversed by a single political transition. Thailand's UCS, by contrast, has survived eight rival governments, six elections, and two coups precisely because its governance architecture was deliberately insulated from political budget decisions through legal mandates and institutionalised annual review processes (10), making it the exception that illustrates the rule.

Prerequisites go unmet because powerful actors benefit from their absence

The analysis in this paper consistently finds that the prerequisites for effective supply chain financing – predictable fiscal transfers, adequate capitalisation of procurement agencies, functional F&Q linked to budget allocations, and trained pharmaceutical personnel at subnational levels – are absent across most study countries. The standard explanation is capacity constraints. But a political economy lens asks a different question: who benefits from these conditions remaining unmet?

Delayed fiscal transfers give budget-holding ministries and county governments flexibility to manage competing political priorities. Finance ministries operating under binding revenue ceilings have little incentive to allow evidence-based F&Q to constrain their negotiating room. The paper identifies the budget-F&Q disconnect explicitly as "generally a political economy problem." It is usually a product of negotiations conducted under revenue ceilings rather than needs assessments. Fragmented procurement across Kenya's counties, Pakistan's districts, or the Philippines' 1,634 LGUs creates multiple procurement decision points, each of which represents an opportunity for local political actors to direct contracts, manage supplier relationships, and exercise patronage. The concentration of pharmaceutical personnel in urban and politically connected facilities, visible in Indonesia's 60 percent district staffing gap, similarly reflects political allocation of civil service positions rather than technical deployment according to need.

Payment arrears, one of the most consequential recurring bottlenecks documented across all study countries, are often treated as a PFM failure. But arrears also reflect deliberate budget diversions toward politically visible spending, a dynamic in which health care supply chains, with their diffuse and often politically voiceless beneficiaries, are systematically deprioritised. A political economy analysis of family planning commodity financing in Uganda illustrates this dynamic: politicians channelled domestic resources toward politically acceptable items. Roughly 80 percent of domestic family planning and maternal, newborn and child health commodity funding was spent on "Mama kits" for safe delivery, prioritised by high-level political leaders, while contraceptive commodities, whose benefits are diffuse and contested by religious and cultural constituencies, were deprioritised. The same analysis found the government had little incentive to increase allocations because donors were perceived as willing to cover any gaps (58,59).

The interdependency between political discretion over budget execution and the chronic cashflow constraints that undermine procurement agency performance is not purely incidental: it is how the political economy of public expenditure often operates in fiscally constrained systems.

Local power capture undermines decentralised governance

Decentralisation redistributes decision-making authority, but it does not guarantee that authority is exercised in the service of health system goals. Evidence documents elite capture where rapid transition led to local politicians prioritising populist and politically visible investments over pharmaceutical supply chains (32,54). The same dynamic operates in prioritisation: both centralised and decentralised systems are vulnerable to capture by national or global interest groups at the centre (e.g., national pharmaceutical industry lobbying, donor-driven vertical programme agendas, and global health interest groups) and by local political networks at the periphery (e.g., local political networks and patronage relationships).

Facility autonomy schemes face analogous risks when accountability mechanisms are weak: budget discretion intended to improve medicine availability can be redirected toward other expenditures when governance structures are insufficient to enforce commodity prioritisation.

Implications for reform

Recognising the political economy of supply chain financing does not make technical reforms irrelevant, but more realistic. Governance improvements that redistribute control, increase transparency, or constrain discretion will face resistance from actors who benefit from existing arrangements, and that resistance needs to be anticipated in reform design. Applied political economy analysis offers a practical method for doing so, helping identify interventions that are technically sound but also politically feasible, including deliberately "second-best" designs less likely to be "circumvented by vested interests" (61). Legal mandates and institutional arrangements that insulate procurement and pricing functions from short-term political interference are more durable than coordination mechanisms that rely on voluntary cooperation or goodwill (10). Transparency mechanisms create accountability precisely by making politically motivated diversions visible, which is why they are often resisted. Building the coalitions, among civil society, subnational governments, procurement agency staff, and international partners, that have a stake in reliable supply chain financing is as important a reform investment as any technical intervention. Reform of EMHS financing is, ultimately, a political project as much as a technical one.

Conclusion

Supply chain management and health financing, despite typically operating and being thought about in silos, are compatible in their shared goals. These include timely access to quality essential health products according to population need, the avoidance of catastrophic or impoverishing payments,

and the maximum possible efficiency for the health system. In relation to which functions can be the most effectively delivered at different levels, evidence suggests a functional division: centralisation is generally better suited for functions demanding uniformity and large-scale oversight, such as market shaping and prioritising and establishing frameworks, and the higher functions of procurement, such as choosing and negotiating with suppliers versus ordering (9). Conversely, functions that require adaptation to local conditions, such as planning and having the autonomy to shift funds across budget lines as needed, are typically associated with better performance when greater decentralised choice is granted to local levels and facilities (2). For instance, local knowledge is critical for developing appropriate plans and realistic budgets, as well as when and what to order (9).

However, the effectiveness of decentralisation is contingent upon the contextual prerequisites being met at lower administrative levels (5). The experience of countries that have undergone devolution underscores that the expected benefits of greater financial autonomy and purchasing authority may not materialise if the decentralised level lacks the necessary capacity, predictable cash flow, and flexible PFM systems to fulfil its expanded responsibilities (2,3,11). Predictable cash flows cover both the timeliness of fiscal releases against an appropriated budget and the availability of disbursable cash once those releases reach the procurement agency, including, for import-dependent purchases, the central bank allocation of hard currency. Subnational entities and procurement agencies have limited ability to influence either, which is why coordination with the ministry of finance and the central bank is a prerequisite for decentralisation to work. Furthermore, despite budget allocations, many counties fail to execute their full medicines budget due to delays in fund distribution from the national treasury. In such environments, financial autonomy on paper does not translate into operational effectiveness (9).

Prerequisites for successful decentralisation of some of the functions (and parts of the functions), including to mid-levels such as districts, include:

1. Predictable, adequate fiscal transfers
2. Technical guidelines on what to procure (and from whom)
3. Prequalified suppliers (to ensure quality)
4. Training on procurement, quality assessment and inventory management
5. Financial oversight to prevent misuse and auditing
6. Technical assistance by pharmaceutical staff
7. Enabling PFM rules and systems (including allowance to reallocate resources as required, within limits)
8. Strong equalisation mechanisms across areas (fiscal transfers based on need, not just population)
9. Coordination mechanisms across levels
10. Strengthening of local governance and supervision

The central finding of this analysis is that no single configuration, centralised or decentralised, consistently outperforms the other across all supply chain financing functions. What matters more than the structural choice is whether the prerequisites for that choice are in place and whether the chosen arrangement aligns with the country's broader institutional trajectory, reform priorities, and capacity to progressively strengthen the systems needed to support it. Income level is a weaker predictor of supply chain performance than governance structure and institutional capacity: a low-income centralised system with adequate and predictable funding can outperform a middle-income decentralised one fragmented by fiscal transfer delays and capacity gaps. The evidence points instead to a functional logic: some supply chain financing functions are more likely to benefit from centralisation, particularly revenue pooling, market shaping, regulatory oversight, and centralised procurement, because they depend on volume leverage, technical expertise, and economies of scale that subnational entities rarely possess. Other functions, including ordering, delivery, and monitoring, benefit from decentralisation when it is accompanied by adequate local capacity, DFF, and digital infrastructure (Figure 3).

FIGURE 3. Summary of balance of evidence on decentralisation by function, and supportive factors

EVIDENCE FAVOURS → Centralised | Hybrid | Decentralised

★ Mid-level (district/region) plays a key stewardship/coordination role

	FUNCTION	EVIDENCE & RATIONALE	KEY CONDITIONS
PHASE 1 PLANNING	F1 Revenue Raising & Pooling — CENTRALISED	Centralised pooling maximises national resources, ensures equity, and aligns funding to national priorities. Decentralised retention creates fragmented pools & access barriers.	Predictable transfers via automatic schedules, fiscal discipline enforcement, coordinated pooling, strategic reduction of donor dependency.
	F2 Prioritising Medicines & Supplies — CENTRALISED	National EMLs & benefits packages needed for standardisation, equity, & economies of scale. Local epidemiological inputs should inform; authority stays central.	Transparent, criteria-based process; local needs data as mandatory input; alignment across EMLs, benefits packages, & financing mechanisms.
	F3★ Budgeting for Medicines & Supplies — HYBRID	Hybrid, with both local info on needs and top-down allocation. Decentralised budgeting can help, but only with strong technical capacity. Rigid, input-based PFM constraints undermine local autonomy.	F&Q must feed budget ceiling setting; trained pharmaceutical personnel; reliable LMIS data; PFM calendar sequenced so evidence precedes ceilings.
	F4 Market Shaping & Regulation — CENTRALISED	Centralising market shaping achieves lower prices through economies of scale and consistent quality. Fully decentralised purchasing risks fragmentation and price variability.	Independent price-intelligence capacity, coordination across public & private actors, adequate regulatory budgets, strong enforcement for real affordability.
PHASE 2 PROCUREMENT	F5★ Direct Centralised Procurement — CENTRALISED	Centralised procurement improves price efficiency by pooling demand and bargaining power, but implementation bottlenecks (delayed budget execution) can undermine it.	Adequate, predictable capitalisation; unified commodity/logistics budget; enforceable subnational obligations; digital ordering (eLMIS, e-catalogue).
	F6/7★ Facility-Led Procurement — HYBRID	Hybrid: centralise the frame, decentralise the order. Central pooling enables strategic purchasing & quality control; facility-level financing improves responsiveness.	Facility-direct transfers & functional bank accounts; PFM accountability mechanisms; framework agreements; alignment with national EML & quality frameworks.
PHASE 3 DELIVERY	F8 Budget Execution — HYBRID	Contested-cascade failures at every level. The challenge is predictable fund flows regardless of configuration. Structural reform via DFF, PFM reform, or health insurance is needed.	Predictable fund releases; streamlined approvals; integrated FMIS for real-time tracking; clear roles across governance levels; digital approval systems.
PHASE 4 MONITORING	F9★ Delivery-Logistics, Warehousing, Transport — HYBRID	Hybrid: centralise standards, decentralise execution. Central standards ensure consistency; local implementation with timely funding enhances responsiveness.	Integrated commodity & logistics financing; adequate & predictable operations funding; digital tracking (GPS, proof-of-delivery); shared logistics across entities.
	F10★ Monitoring-Data, Performance & Accountability — HYBRID	Centralising information standards is key. Less LMIS fragmentation → better performance. Decentralised data gathering and data use for planning.	LMIS-FMIS interoperability; DHIS2 as integration platform; data use tied to allocations/PBF; public transparency dashboards; district analytical capacity.

For policymakers considering reforms, three practical principles emerge from this analysis. First, centralise the functions that require scale and expertise, procurement negotiation, supplier prequalification, regulatory oversight, and market shaping. Decentralise ordering and distribution to levels with the capacity to manage them, supported by national framework agreements and

digital platforms like Indonesia's e-catalogue that preserve quality and price benefits while allowing local responsiveness. Second, build capacity before or alongside devolution, not after (if possible): the consistent failure across study countries has been devolving budget authority to counties, districts, and LGUs that lack the pharmaceutical personnel, financial management skills, and data systems to exercise it effectively. Third, treat DFF as a targeted tool for bypassing the most acute bottlenecks in multilevel systems (evidence from Kenya and Uganda shows it reduces stockouts) but recognise it requires enabling PFM legislation, facility governance and accountability structures, and prequalified supplier frameworks to work safely and sustainably.

In terms of sequencing, countries may benefit from first strengthening foundational capabilities such as predictable financing flows, PFM flexibility, accountability mechanisms, and supply chain information systems before expanding autonomy over budgeting, procurement, or other supply chain functions. Operational functions such as ordering and inventory management may often be decentralised earlier, while strategic functions such as procurement, contracting, and market shaping may require stronger centralised coordination.

At the same time, not all functions are equally amenable to reform. Some are embedded within longstanding political, fiscal, and institutional arrangements involving powerful stakeholders and may require substantial negotiation and system-wide change. Countries may therefore benefit from pursuing feasible, high-impact reforms where opportunities exist, while gradually building the conditions needed for more complex structural reforms over time. The appropriate sequence will vary by context, but the evidence suggests that gradual expansion of authority alongside institutional capacity development is more likely to succeed than rapid devolution of responsibilities alone.

For global and regional stakeholders, priorities should include developing practical diagnostic tools, maturity models, and peer-learning platforms. These can help countries assess how medicines financing and supply chain functions are allocated across central, subnational, and facility levels, and whether the enabling conditions for those arrangements are in place. Rather than promoting centralised or decentralised models as universal solutions, future efforts should help countries identify which functions are most appropriately located at different levels given their institutional context, historical trajectory, and implementation capacity. Regional learning networks and development partners can support comparative learning on topics such as the role of facility autonomy, CMS financing, intergovernmental transfers, procurement governance, digital financial-logistics integration, and donor transition, while documenting the governance, financing, PFM, workforce, and data systems that enable these arrangements to function effectively. As donor financing declines and countries assume greater responsibility for financing and managing commodities previously supported through vertical programmes, there is a growing need for operational guidance on how these functions can be integrated into national and subnational systems, what reforms should be prioritised and sequenced, and how countries can pursue feasible, high-impact improvements while building the foundations for longer-term institutional change.

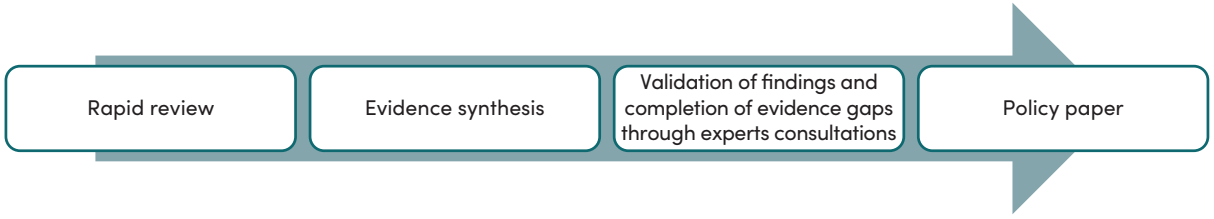
Finally, this analysis highlights a structural gap that policy reform alone cannot close: the persistent separation between health financing and supply chain management as institutional disciplines. Budgeting, forecasting, procurement, and monitoring functions are routinely managed with limited joint oversight of how funds and supplies move through the system: between ministries of health and finance, between ministry of finance cash-management and debt units and the central bank's foreign exchange desk, between supply chain teams and financial management teams within the health sector, ministry of health and other agencies such as purchasers and CMS, and between vertical programme systems and general EMHS. Integrated financial and logistics data systems, joint planning processes between supply chain and health financing stakeholders at all levels, and accountability mechanisms that link resource allocation to supply chain performance outcomes are therefore not optional investments: they are prerequisites for evidence-based, responsive EMHS financing.

This paper argues for moving beyond debates over centralisation versus decentralisation toward a more functional, evidence-informed approach to supply chain financing. The conceptual framework provides a practical starting point for countries to assess where responsibilities should sit, identify the prerequisites needed for success, and prioritise reforms that are feasible within their institutional context. As countries navigate fiscal constraints and declining donor support, further pragmatic tools and approaches will become increasingly important for building resilient and sustainable systems for financing EMHS.

Annex 1. Methods

The paper employed an iterative process consisting of two complementary approaches: a rapid literature review, followed by expert consultations with members of the advisory group and other key stakeholders (See Figure A1).

FIGURE A1. Methodology



Rapid review

Information sources and eligibility criteria

The rapid review drew on a mix of databases for peer-reviewed articles and grey literature sources. Searches were conducted primarily in PubMed (to capture health systems, public health, and global health policy literature), Embase (to provide broader coverage of pharmaceuticals, procurement,

and supply chain issues, including European and LMIC sources not indexed in PubMed), and Scopus (to ensure inclusion of cross-disciplinary evidence on governance, economics, and public administration). Grey literature searches targeted reports and technical documents from key organisations active in supply chain financing and procurement, including the WHO, World Bank, CGD, ThinkWell, Global Fund to Fight AIDS, Tuberculosis and Malaria, the Gavi Alliance, and implementing partners such as Management Sciences for Health (MSH), John Snow, Inc. (JSI), the Program for Appropriate Technology in Health (PATH), Chemonics International, Abt Associates, and Results for Development (R4D).

The eligibility criteria guiding the selection were structured around the Population, Intervention, Comparator, and Outcomes (PICO) framework, complemented by specifications on timeframe, language, and study design. These criteria are presented in Table A1.

TABLE A1. PICO criteria and additional limits for the search strategy

Criterion	Details
Population	All countries.[1]
Intervention	Any financing or governance arrangement affecting the centralisation or decentralisation of supply chain functions.
Comparator	Studies comparing different levels of centralisation/decentralisation or alternative financing models, when applicable.
Outcomes	Reported effects of different practices on the four phases and 10 functions of the supply chain financing framework (planning, procurement, delivery, and monitoring), including how centralisation or decentralisation influences their performance.
Date range	January 2005–October 2025.
Language	English and French.
Study design	All relevant publications, including peer-reviewed articles, policy papers, technical reports, donor and government evaluations, and other grey literature.

Search strategy

A comprehensive Boolean search strategy was developed combining controlled vocabulary terms (e.g., MeSH in PubMed, Emtree in Embase) and free-text keywords addressing the core concepts. Search strategies were adapted to the syntax of each database, focusing on PubMed, Embase, and Scopus, and supplemented by Google Scholar (screening the first 100 results for relevance). To capture policy and implementation evidence, grey literature searches targeted institutional repositories and websites. Targeted Google searches using domain filters (e.g., who.int, worldbank.org, msh.org, cgdev.org, thinkwell.global, gavi.org, globalfundassistance.com) complemented the strategy. Snowballing techniques and review of reference lists of included articles were used to identify additional relevant studies. No restrictions were applied on study design; however, language (English and French) and timeframe limits (January 2005–October 2025) were used to ensure relevance and manageability. All search results were exported, deduplicated in Zotero

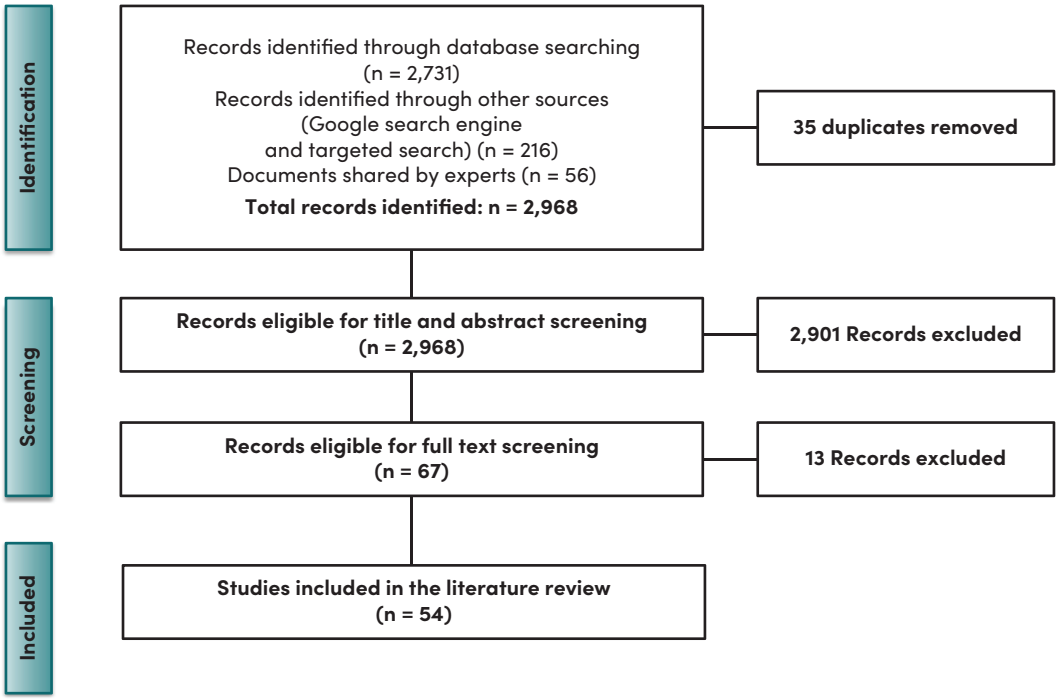
1 The focus will be only LMICs, but high-income countries' examples will also help identify successes and good practices.

(citation manager), and transferred to Covidence (systematic review management platform) for screening and data extraction.

Selection process and data extraction

After uploading all references into Covidence, screening was then conducted in two stages: title and abstract screening, followed by full-text review for records deemed potentially relevant. In line with accepted rapid review methodology, each reference was screened by a single reviewer. The selection process followed a purposive logic rather than a strictly exhaustive systematic review, prioritising relevance and policy applicability. Eligible documents were then extracted and organised for analysis. A total of 54 records were included in the data extraction stage. See Prisma in Figure A2.

FIGURE A2. PRISMA flow chart of the search process



Data from each included record was extracted by a single researcher using a standardised extraction form detailed in Table A2.

TABLE A2. Data extraction tool

Focus and Analytical Dimensions	Description
General information	Title, authors, publisher, year, country/region, publication type (peer-reviewed article, technical report, grey literature, evaluation).
Overview of supply chain archetypes and organisational models	Describes key structural models for supply chain organisation and maps their functions and financing flows across the four stages of the supply chain cycle (planning, procurement, delivery, and monitoring).
Historical background and articulation of the problem	Provides (1) a background on centralisation/decentralisation reforms in supply chains financing over recent decades, (2) evidence on centralisation vs. decentralisation in terms of governance or financing arrangements
Comparative analysis across system levels and commodity types	Analyses • The pros and cons of centralisation versus decentralisation across international, national, regional, district, and facility levels. Examines variations by commodity type (e.g., essential medicines, diagnostics, vaccines, supplies) as well as funding streams (e.g., donor financed versus locally procured). • Enabling conditions (e.g., governance structures, information systems, accountability mechanisms) and barriers (e.g., PFM constraints, limited capacity, political economy factors) that shaped outcomes. • Includes case study boxes illustrating reform experiences and contextual prerequisites for success.
Synthesis of lessons and policy combinations	Summarises which functions and levels of decentralisation perform best under specific contexts and institutional arrangements, identifying combinations of policies and enabling factors that enhance efficiency, responsiveness, and equity.
Recommendations, evidence gaps, and research priorities	Presents policy recommendations, identifies remaining evidence gaps, and outlines areas requiring further empirical investigation to guide future research and practice.

Data synthesis

Preliminary findings from the rapid review, including illustrative case studies, were reflected in the first draft of the report and guided following consultations aiming at enriching findings and capturing missing nuances.

Expert consultations

Drafts were shared at two advisory group meetings in 2025 and 2026, and enriched with feedback and expert review, which was complemented by interviews carried out with country stakeholders – three additional semi-structured interviews for this work, but also incorporating the 10 country case studies developed by HSI. That analysis examined EMHS financing across 10 countries through the CGD/ARC framework's 10 supply chain functions. The countries spanned low-income (Burkina Faso, Tanzania, Uganda), lower-middle-income (Kenya, Pakistan provinces, Philippines), and upper-middle-income (Indonesia, South Africa) contexts, with varying degrees of decentralisation.

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