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Governance and Coordination of the Financing of Supply Chains

CHERYL CASHIN · KATHERINE KLEMPERER · PETE BAKER

Abstract

While countries have made progress strengthening supply chain operations, persistent challenges such as fragmented funding flows, opaque procurement processes, and weak accountability continue to undermine system performance and create access barriers. Authority over supply chain financing functions is typically split across ministries of health and finance, procurement agencies, insurance schemes, and donors with little formal coordination or accountability for results. These challenges are not technical or logistical but are inherently governance problems.

This paper draws on experience from six countries—Canada, Chile, Ethiopia, Ghana, Indonesia, and Thailand—spanning a range of income levels and health system structures, to identify five elements of effective supply chain financing governance: aligned legal, regulatory and policy frameworks; effective formal coordination mechanisms; mechanisms to ensure transparency; performance-based accountability; and adaptive learning and evidence-informed decision-making. Together these elements help align financing, procurement, and service delivery to achieve better outcomes.

We find that consolidating funding sources and supply chain financing functions can reduce fragmentation, but consolidation alone does not guarantee better outcomes, and few countries have managed to achieve it. Countries can use the five governance elements to counter the effects of fragmentation even without merging funding streams, provided enabling conditions are in place, particularly strong public financial management and reliable payment systems. To achieve equitable access, however, supply chain financing governance improvements have to take place in the context of equitable coverage, which ultimately determines who gets access to more affordable and available medicines.

The overall finding is that every country, regardless of where it starts, can take practical steps to improve governance and better align supply chain financing. The country experiences suggest a progress pathway that may inform the sequencing of these steps. However, sustained gains in affordability, availability, and equitable access to medicines, will also require investments in public financial management, expanded and equitable coverage, and well-designed incentives for providers and patients.

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Acronyms

APTS	Auditable Pharmaceutical Transactions and Services
AUGE	Acceso Universal con Garantías Explícitas (Universal Access with Explicit Guarantees, Chile)
BPJS	Badan Penyelenggara Jaminan Sosial (Social Security Administering Body, Indonesia)
CADTH	Canadian Agency for Drugs and Technologies in Health (now Canada's Drug Agency)
CBHI	Community-Based Health Insurance
CDA-AMC	Canada's Drug Agency
CDSS	Committed Demand and Supply System
CENABAST	Central de Abastecimiento del Sistema Nacional de Servicios de Salud (Central Supply Agency, Chile)
CGD	Center for Global Development
CSMBS	Civil Servant Medical Benefit Scheme (Thailand)
DHIMS	District Health Information Management System
DHIS2	District Health Information System 2
DHSC	Department of Health and Social Care (UK)
DRG	Diagnosis Related Group
eLMIS	Electronic Logistics Management Information System
EPSS	Ethiopian Pharmaceuticals Supply Service
FMIS	Financial Management Information System
FONASA	Fondo Nacional de Salud (National Health Fund, Chile)
Fornas	Formularium Nasional
GGM	Good Governance for Medicines
GhLMIS	Ghana Logistics Management Information System
GHS	Ghana Health Service
GIFMIS	Ghana Integrated Financial Management Information System
GPO	Government Pharmaceutical Organization (Thailand)
HCMIS	Health Commodity Management Information System
HITAP	Health Intervention and Technology Assessment Program (Thailand)

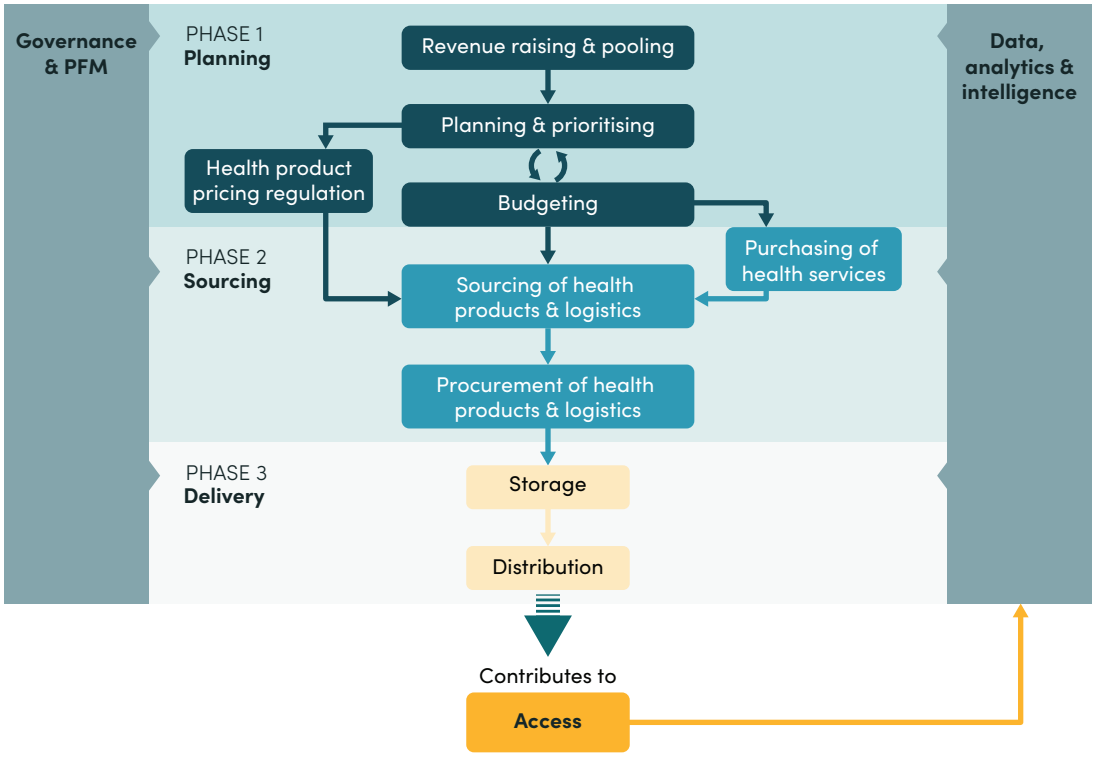
HIV	Human Immunodeficiency Virus
HSTP	Health Sector Transformation Plan (Ethiopia)
HTA	Health Technology Assessment
IFMIS	Integrated Financial Management Information System
ISAPRE	Instituciones de Salud Previsional (Private Health Insurance Institutions, Chile)
JKN	Jaminan Kesehatan Nasional (National Health Insurance, Indonesia)
KEMSA	Kenya Medical Supplies Authority
LKPP	Lembaga Kebijakan Pengadaan Barang/Jasa Pemerintah (Government Procurement Policy Agency, Indonesia)
LMIC	Low- and Middle-Income Countries
LMIS	Logistics Management Information System
MOH	Ministry of Health
NHIA	National Health Insurance Authority
NHS	National Health Service (UK)
NHIS	National Health Insurance Scheme (Ghana)
NHSO	National Health Security Office (Thailand)
pCPA	pan-Canadian Pharmaceutical Alliance
PFM	Public Financial Management
PHC	Primary Health Care
PSTP	Pharmaceuticals Supply Transformation Plan (Ethiopia)
R4D	Results for Development
RKO	Rencana Kebutuhan Obat (National Medicines Needs Estimation, Indonesia)
RMS	Regional Medical Stores
SHI	Social Health Insurance
SMILE	Supply Management Information for Logistics Enhancement (Indonesia)
SPIU	Single Project Implementation Unit (Rwanda)
TB	Tuberculosis
UCS	Universal Coverage Scheme (Thailand)
UHC	Universal Health Coverage
WHO	World Health Organization

I. Background and motivation

Effective governance of financing for health supply chains is a critical determinant of access to essential medicines and health supplies.[1] While many countries have made substantial progress in strengthening supply chain operations, persistent challenges in public financing of essential medicines and other health products undermine system performance and create access barriers. These challenges are inherently governance problems, reflecting how authority and incentives are distributed across ministries of health and finance, procurement agencies, national health insurance agencies, and other financing schemes.[2,3] Thus, the financing of supply chains requires more than adequate resources. Coherent rules, transparent institutional responsibility, and coordinated decision-making are needed to ensure that funds flow predictably and are used efficiently and equitably. Understanding and improving governance of supply chain financing requires examining how financial and supply chain systems interact to create sustainable and responsive pathways for delivering affordable, high-quality health commodities to the people who need them.

Governance in health systems, which is also referred to as stewardship, is one of the core system functions. The World Health Organization (WHO) defines health system governance as the process of setting strategic policy frameworks, ensuring effective oversight, building coalitions, regulating actors, and ensuring accountability.[4] The WHO Good Governance for Medicines (GGM) initiative applies governance principles specifically to the pharmaceutical sector to reduce vulnerabilities in procurement, selection, and registration.[5] For this paper, we define the governance of health supply chain financing as the set of rules, institutions, processes, and accountability relationships that determine how decisions are made, implemented, and monitored. Using the novel conceptual framework proposed by the Center for Global Development (CGD) Working Group on Improving the Financing of Supply Chains (Figure 1), we consider how governance must act across all phases of supply chain financing.[6,7] It is about who has authority and responsibility for each function and how those actors coordinate, align incentives, and are held accountable to ensure that funds flow predictably and products flow efficiently. Ultimately, this should ensure that the population reliably receives affordable, quality-assured medicines and other health products.

FIGURE 1. Conceptual framework for financing health care supply chains



A. Fragmentation as a governance stress test

For many low- and middle-income countries (LMICs), supply chain financing poses deep challenges to effective governance. Multiple domestic and external funders contribute to the financing of essential medicines and the supply chains that get them to the people who need them. Multiple funding sources typically translates into multiple parallel supply chains and supply chain functions. Funding sources may include a central national budget, an extrabudgetary national health insurance fund or other health financing scheme, off-budget donor financing, and direct household out-of-pocket expenditure. The situation is further complicated in fiscally federal or highly devolved states where each local state or district may have the autonomy to decide its own health budget. Different budgets may directly finance the supply chain (for example, a national budget line for the central medical stores) or indirectly finance it (for example, an insurer may pay a facility at a specific tariff or payment rate for treating a patient, and the facility then uses some of this money to procure products from the supply chain). This indirect approach is increasing alongside the drive toward greater use of program-based budgeting and strategic purchasing policies.

The combination of multiple funders and fragmented budgets presents a substantial policy coordination challenge, especially when the funding routes are both direct and indirect, since these budgets must cover and direct the priorities for all aspects of the supply chain, including planning and management, infrastructure, staffing, information systems, and commodity procurement.

Reliance on multiple financing sources to fund essential medicines and other health products is not inherently negative, but it becomes damaging when governance mechanisms fail to coordinate across funding pools, policy domains, and institutions. We therefore use the definition of fragmentation put forth by Bossert et al. as "the division without explicit means of coordination" of functions (both financing and supply chain) or agents (e.g., financing or procurement agencies) in a health system or subsystem.[8]

In the absence of strong governance, financing arrangements can evolve in silos without mechanisms to coordinate decisions or ensure accountability for results.[9] Here, multiple funding sources for supply chains flow through separate, often uncoordinated channels and are managed by separate decision-makers. Donor-funded programs for Human Immunodeficiency Virus (HIV), Tuberculosis (TB), malaria, vaccines, family planning, and nutrition have established parallel systems with strong financial management and data structures, but these rarely integrate with domestic systems for essential medicines financing and procurement.

Governance challenges for supply chain financing also show up in further fragmented policy domains and institutional responsibilities. Financing and supply chain functions are typically designed and managed by different policy communities, each with their own tools and mandates, and planning cycles. Procurement rules are often determined outside of the health sector by ministries of finance or other government-wide procurement regulatory bodies. When service prioritization and benefits package design are managed separately from supply chain considerations, they may overlook the practical requirements for ensuring adequate supplies or aligning service financing flows with the supply chain financing mechanisms that sustain them. Even within a policy domain, institutions may have overlapping functions and responsibilities, or there may be gaps in responsibility for some key functions.[10,11] A further underlying constraint is that supply chain management is not formally recognized as a profession in many LMIC public health systems. This means it lacks defined career pathways, professional standards, and regulatory frameworks. As a result, the institutions responsible for supply chain financing functions often do not have the technical capacity or institutional standing to participate as equals in cross-sectoral governance arrangements.[12]

Countries often lack an overarching pharmaceutical governance or policy framework that fully incorporates financing and guides alignment across these potential sources of fragmentation. Without overarching governance and coordination frameworks or mechanisms, it is difficult to ensure that the total level of funding is appropriate and allocated efficiently and according to need, that there is systematic prioritizing or reprioritizing when funding falls short, and that provider revenue streams match the costs to the providers of procuring needed medicines and supplies.

Finally, in public systems, fragmentation of the supply chains themselves, involving central medical stores and multiple intermediaries, can increase handling and inventory costs and complicate the allocation and tracking of limited budget resources.[13] Without integrated, end-to-end supply chain

financing and governance, costs and markups accumulate across multiple layers, often in opaque ways, reducing the purchasing power of public budgets.

These structural divisions undermine the efficiency and equity of supply chain financing systems. This in turn creates or exacerbates opportunities for leakage and corruption. As a result, even when funding is available, it often fails to reach the right levels of the system at the right time to ensure reliable availability of essential medicines and products.

A rapid analysis by Results for Development (R4D) authors highlights misalignments that are common when there is fragmentation across funding sources, policy domains, or institutional responsibilities (Box 1). These misalignments create chronic payment arrears (both from health providers to central procurement agencies and from central procurement agencies to suppliers), followed by stockouts and higher prices and ultimately availability, access gaps and high out-of-pocket payments.[14]

BOX 1. Common misalignments caused by fragmented supply chain financing

(1) **Overall inefficiency of parallel functions**
Lack of overall picture of financing requirements and allocations; duplicate functions.

(2) **Mismatch between forecasting and budgeting**
Forecasted product needs are not fed into budgeting processes, leading to unrealistic planning and misallocation of budgets.

(3) **Misalignment between centralized and facility procurement**
National centralized procurement and facility-level procurement are carried out under different conditions leading to wide price variations and high out-of-pocket burden on households.

(4) **Disconnect between pricing and payment**
Provider payment rates do not align with product prices set through pricing policy or procurement processes, leading to deficits and arrears to product suppliers (including central medical stores) and stockouts.

(5) **Information silos**
Health managers at different levels (facility, subnational, national) lack complete data to make informed decisions within their responsibilities about budgeting, pricing, supply chain operations, provider payment rates and incentives, etc.

Fragmentation of supply chain financing is also a political economy outcome. The misalignments persist not only because governance mechanisms are insufficient but because the actors with the authority to correct them often benefit from, or are insulated from, the consequences of misalignment. For example, ministries of finance control budget releases and are not affected by the stockouts that follow delayed disbursements; procurement officials working in fragmented systems may use the opacity that consolidation would eliminate to extract rents; and political leaders who set provider payment rates are not impacted by the supplier arrears that result when those rates prove inadequate.

Different pathways are available to address the consequences of fragmented health supply chain financing: for example, consolidating funding streams and the related siloed procurement functions, improving regulation, and better harmonizing financing and procurement functions across the system.[15] All of these pathways require strong governance.

B. Purpose

The purpose of this paper is threefold. First, it aims to provide a deeper understanding of the governance challenges related to supply chain financing. Second, it proposes a vision for effective supply chain financing governance and the corresponding practical elements. Third, it aims to explore how effective governance can mitigate the consequences of fragmentation in financing, policy domains, and institutional responsibilities in order to achieve better outcomes in terms of affordability, availability, quality, and equitable access to essential medicines and health supplies. The paper explores the structures, policies, and processes that can coordinate planning and implementation across funding sources and policy domains, and how prioritization, planning, and financing of services and commodities can be better integrated. The paper will draw from the experiences of countries that are making progress toward that vision. It is one of several produced by the CGD Working Group on Improving the Financing of Supply Chains.

II. Methods

This paper uses the novel conceptual framework developed by the Center for Global Development (CGD) Working Group on Improving the Financing of Supply Chains.[16] This framework specifies the functions across the supply chain and health financing domains that must be carried out to ensure resources are available and allocated effectively for optimized access to essential medicines and health products. We use this framework to guide our exploration of the governance mechanisms countries use to ensure these functions are carried out by appropriate institutions and ensure they are aligned across different financing schemes and parts of the system.

We identified features of "effective governance" based on a review of the literature and from that propose a causal pathway for how governance can lead to improved outcomes by mitigating the misalignments in health supply chain financing functions caused by fragmentation. A desk review and evidence synthesis identified six countries where some or all of these features are in place and have led to more consolidated or better coordinated supply chain financing functions, with resulting measurable improvements in prices and availability, as well as access to quality-assured essential medicines and health supplies.

A structured country case study analysis helped to draw out lessons on steps countries can take to improve governance structures and processes to better consolidate or coordinate supply chain financing functions and ultimately achieve better outcomes. The desk review was complemented by expert consultation and key informant interviews where feasible.

III. Governance as an enabler of alignment

A. Defining elements of effective governance of supply chain financing

A large body of literature converges on a set of principles that characterize effective health system governance: strategic vision, participation and consensus orientation, rule of law, transparency, responsiveness, equity, efficiency, and accountability.[17,18,19,20] Existing frameworks emphasize that governance is not a single structure but a system of relationships among policymakers, providers, and the public through which system rules are made, enforced, and revised.[21] Effective governance therefore depends on both formal mechanisms (laws, policies, reporting systems) and informal norms and incentives (trust, information sharing, ethical conduct) that determine how institutions actually function.

Based on a synthesis of evidence from global health, procurement, and public finance literature, we define governance of supply chain financing as being effective when it is institutionalized through rules-based systems that tightly link fiscal management, procurement, and service delivery. At the same time, there should be clear and coordinated institutional mandates, integrated information systems, and public transparency and accountability mechanisms to ensure that supply chain financing is coordinated through formal processes rather than ad hoc arrangements.

We propose consolidating this into five practical elements that can be observed and leveraged to manage the consequences of fragmentation, vulnerability to corruption and leakage, and other governance failures (Box 2): (1) aligned legal, regulatory, and strategy frameworks; (2) effective formal coordination mechanisms; (3) mechanisms to ensure transparency to make financial and product flows visible and reduce opportunities for corruption; (4) performance-based accountability to link authority with results; and (5) adaptive learning and evidence-informed decision-making, where systematic review cycles and data use drive continuous improvement.[22,23,24,25,26,27]

BOX 2. Practical elements of effective governance of health supply chain financing

(1) Aligned legal, regulatory, and strategy frameworks
(2) Effective formal coordination mechanisms
(3) Mechanisms to ensure transparency
(4) Performance-based accountability
(5) Adaptive learning and evidence-informed decision-making

Together, these elements define a system where financing and product flows are predictable and transparent. It also ensures that resources are used efficiently and equitably to deliver essential health products to the people who need them. These features, which have been validated across income settings, provide a pragmatic blueprint for countries seeking to strengthen their commodity financing systems.

As summarized in Table 1, these governance elements provide an operational lens for assessing and strengthening the governance of supply chain financing systems and understanding how they can be brought to bear on the challenges of fragmented supply chain financing. These elements highlight that governance is not limited to high-level policy oversight but extends to everyday decisions about who sets priorities, how budgets are aligned with product needs, and how performance is monitored and corrected.

TABLE 1. Elements of effective supply chain financing governance

Governance Element	Description	Examples
(1) Aligned legal, regulatory, and strategy frameworks	Legal, regulatory, and strategy frameworks assign institutional mandates for each supply chain financing function, specify how the institutions relate and are accountable to one another, allocate responsibilities between the national and subnational levels, and define the interface between health financing, procurement, and pharmaceutical regulation. Alignment means that the legal and policy obligations in one domain do not contradict or undermine those in another, all functions are clearly assigned, and there are no overlaps or gaps.[28]	**Canada:** Well-defined federal and provincial roles under the Canada Health Act, but significant variation across provinces in the relationship between financing and supply chain functions.[29] The Pharmacare Act passed in 2024 will gradually establish a national universal pharmacy benefit.[30] **Chile:** Legal framework establishes clear and distinct institutional mandates for the Ministry of Health (MOH) (benefit package specification), Fondo Nacional de Salud (FONASA) (financing guaranteed benefits), and the Central de Abastecimiento del Sistema Nacional de Servicios de Salud (CENABAST) (procurement and distribution), and with legally enforceable coverage obligations under Law 19.966 that create binding cross-domain obligations between prioritization and financing.[31] **Thailand:** National Health Security Act (2002) legally mandates the National Health Security Office (NHSO) to finance commodities on the National Essential Drugs List and integrates budgeting, price negotiation, and procurement via the Government Pharmaceutical Organization (GPO).[32] **UK:** Until the 2025 health system restructure, where National Health Service (NHS) England was abolished,[33] there was a clear separation between NHS England (policy and financing), NHS Supply Chain (procurement), and the Department of Health and Social Care (DHSC) (oversight).[34]
(2) Effective formal coordination mechanisms	Institutionalized structures through which actors with distinct mandates make and implement shared decisions about supply chain financing functions with sufficient authority to produce behavioral change across participating institutions. Examples include interministerial committees and standing councils, pooled procurement and price negotiation mechanisms, and donor alignment platforms.	**Canada:** Pan-Canadian Pharmaceutical Alliance (pCPA) through which provincial, territorial, and federal governments collaborate on drug price negotiation.[35] **Ethiopia:** Compact agreements aligning donor and domestic financing.[36] **Rwanda:** The Single Project Implementation Unit (SPIU) to operationalize the MOH's donor coordination mandate; secretariat capacity exists to implement shared reporting.[37] **Kenya:** MOH, Council of Governors, Kenya Medical Supplies Authority (KEMSA): Intergovernmental forums align county commodity budgets with KEMSA framework contracts and e-procurement dashboards; however, persistent county payment arrears have constrained KEMSA's ability to restock.[38]

(Continued)

TABLE 1. (Continued)

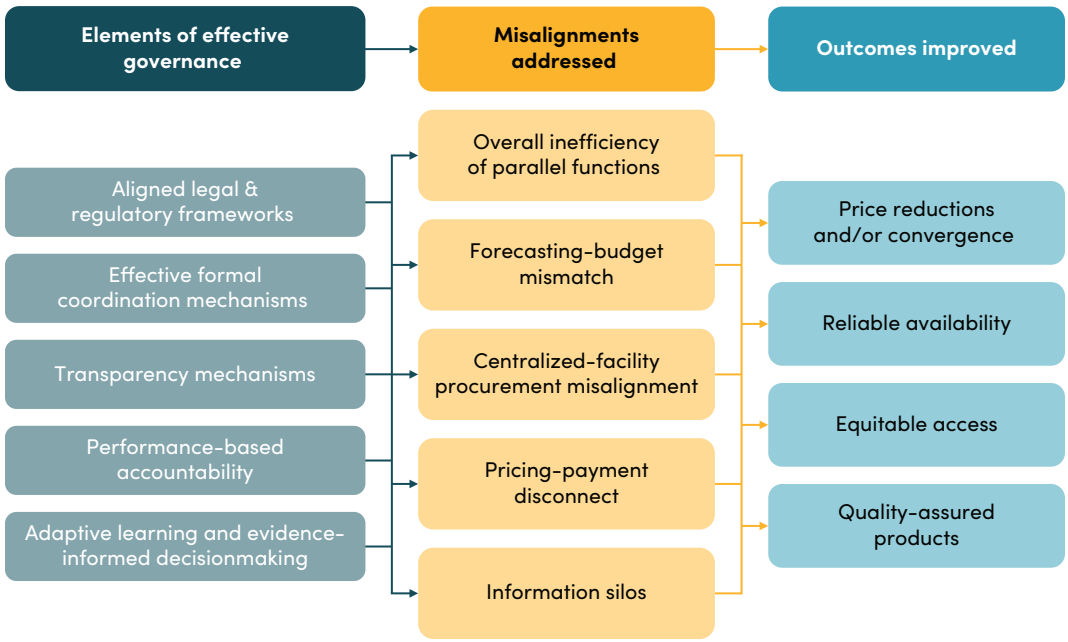
Governance Element	Description	Examples
(3) Mechanisms to ensure transparency	Mechanisms or tools that make information about resource flows, prices, and performance visible to actors who need it to make decisions or exercise accountability.[39,40] Examples include e-procurement portals, price databases, open contract data, and interoperable Logistics Management Information System (LMIS)/Financial Management Information System (FMIS) platforms.	**Chile:** ChileCompra/Mercado Público is an open contracting platform that publishes all public procurement data, enabling civil society to identify conflicts of interest in CENABAST procurement.[41] **Indonesia:** e-catalogue web-based procurement system.[42] **South Africa:** Supplier scorecards covering turnaround time/lead times and buffer stock compliance.[43] **UK NHS:** Model Health System/Purchase Price Index and Benchmark tool publishes supplier scorecards, procurement value metrics, and medicine expenditure data across NHS trusts, enabling benchmarking and accountability.[44,45]
(4) Performance-based accountability	Mechanisms that link institutional authority over supply chain financing functions to defined, measurable performance standards and to consequences when those standards are not met.[46,47] Examples include contractual performance standards with defined consequences for noncompliance or results-linked financing.	**Chile:** Civil society use of open contracting data to hold CENABAST and private pharmacy chains accountable, resulting in two successful collusion prosecutions.[48] **Ethiopia:** Under compact agreements, donor financing is conditional on compliance with national supply chain governance standards.[49] **South Africa:** The national tender system specifies lead times and buffer stock obligations in a publicly available procurement catalogue, with buyout procedures triggered by supplier non-performance.[50]
(5) Adaptive learning and evidence-informed decision-making	Institutionalized processes through which governance bodies systematically collect and analyze performance data and regularly adjust governance systems or policy parameters—benefit packages, procurement prices, reimbursement tariffs, supplier contracts, institutional mandates—in response.[51,52] Examples include annual reviews, operational data feedback loops, audit feedback, and system evaluation and modernization cycles.	**Canada:** pCPA continuous expansion of negotiating scope and mandate; 2019 organizational review leading to stand-alone corporation status and development of expedited and outcomes-based negotiation pathways; Canada's Drug Agency (CDA)/Canadian Agency for Drugs and Technologies in Health (CADTH) health technology assessment (HTA) methodology evolution incorporating real-world evidence.[53] **Chile:** Incremental evidence-based expansion of explicit treatment guarantees with triennial Acceso Universal con Garantías Explícitas (AUGE) benefits package review.[54] **Thailand:** The Health Intervention and Technology Assessment Program (HITAP) produces cost-effectiveness assessments that feed NHSO's annual benefit package proposal, which goes to the Bureau of Budget for fiscal negotiation. It is implemented and then monitored for outcomes that inform the next cycle. GPO procurement prices are renegotiated annually on the same schedule.[55] **UK:** NHS digital transformation reviews.

B. How improved governance can mitigate the consequences of fragmentation

The governance elements described above can help improve supply chain financing outcomes by correcting misalignments caused by fragmentation (Box 1) in the supply chain financing functions (Figure 1) that obstruct reliable and affordable access to quality-assured products. Effective governance most often does not completely eliminate fragmentation but mitigates its consequences by allowing for greater consolidation of funding sources and supply chain financing functions or institutionalizing harmonization and coordination across structures.

We hypothesize a causal pathway through which governance addresses misalignments caused by fragmentation, which in turn produces better outcomes (Figure 2). Legal and regulatory frameworks can impose binding cross-domain obligations, such as requiring that benefit package decisions incorporate supply chain feasibility, or procurement rules that align with provider payment rates to avoid payment arrears and stockouts. Coordination mechanisms may address siloed demand and supply planning that produces budget mismatches and information gaps or parallel procurement functions that produce price variation. Transparency mechanisms can address information silos by making product, capital, and price flows and pathways traceable even when there is fragmentation. They create the data foundation that makes other governance elements possible. Performance accountability mechanisms address fragmentation across institutional responsibilities by linking authority with consequences. Adaptive learning and evidence-based decision-making allow incremental evidence-based improvements in all functions and prevents the accumulation of the consequences of misalignment over time by embedding corrective mechanisms into governance processes.

FIGURE 2. Causal pathway from governance improvements to outcomes



IV. Country examples

Canada: Coordinated price negotiation in a constitutionally pluralistic system

(1) The fragmentation challenge

Canada presents a governance challenge that is constitutionally entrenched and politically nonnegotiable. Health care is funded and administered primarily by the country's 13 provinces and territories, each with its own insurance plan, with locally defined benefits and independent budgets. The federal government provides per capita subsidies through the Canada Health Act but does not directly control provincial service financing or commitments. Health care services are universally covered, but outpatient prescription medicines are largely excluded from provincial plans. This creates a structural coverage gap that affects the approximately 20–27 percent of Canadians who lack adequate private or public drug coverage.[56,57,58]

The pharmaceutical coverage landscape is a "patchwork" of more than 100 public drug plans and 100,000 private insurance plans. Each province operates according to its own public plan, with independent benefit design, formulary decisions, and procurement processes.[59] Historically, each province conducted entirely separate negotiations with pharmaceutical manufacturers. This fragmentated purchasing power led to the duplication of negotiating capacity, systematic overpayment, price variations for identical products, and ultimately inequitable access to medicines across provinces.[60,61,62]

HTA is the evidence framework that connects clinical effectiveness to coverage decisions in Canada. HTA was conducted through the CDA (then CADTH) nationally, as well as separately at the provincial level, but these assessments were not binding for provincial formulary decisions and were often delayed or even ignored. This resulted in coverage decisions in different provinces made on the basis of different evidence assessments, producing interprovincial variation, with no systematic relationship between the medicines covered and the available clinical evidence.

The consequence of this fragmentation was systemic inequity.

(2) The governance entry point: The pCPA

Established in 2010, the pCPA established a formal coordination mechanism that aligned procurement practices across Canada's 13 independent provincial and territorial drug plans without altering the constitutional distribution of authority between them.[63] It was established by the Council of the Federation (a collective of provincial and territorial premiers) to pursue joint

procurement negotiations on innovative and generic drugs being considered for reimbursement through participating public drug plans. All 13 provinces and territories participate, and three of the five federal plans have since joined.

The pCPA does not consolidate provincial drug plans into one national plan, as each participating province retains full authority over its funding and coverage decisions. Each participating jurisdiction also independently decides whether and when to fund the drug within the terms of a confidential product-listing agreement with the manufacturer.[64,65] The pCPA does, however, address the information and procurement challenges created by fragmented supply chain financing and the resulting price variability with this formal coordination mechanism. By combining the procurement processes of participating plans, the pCPA creates a single negotiating body with the combined leverage of 13 jurisdictions. Further, by publishing transparent process information (timelines, scope of negotiations, outcomes of each negotiation), the pCPA dashboard reduces information asymmetry across provinces and limits supplier arbitrage between jurisdictions.[66]

(3) Other governance elements

A summary of governance elements in place for Canada's supply chain financing functions is presented in Table 2 along with a qualitative assessment of whether the element is strong (carried out effectively and routinely according to criteria outlined in Table 1), emerging (in place but not yet institutionalized or effective), or absent.

Aligned legal, regulatory, and strategy frameworks

The pCPA operates within a broader legal and regulatory governance architecture that provides the enabling conditions for the coordination mechanism to function. The Canada Health Act establishes overarching principles, such as universality and comprehensiveness, that apply uniformly across all provincial plans. The CDA provides centralized HTA that generates common evidence recommendations, creating the shared evidence base on which pCPA negotiations are based.[67]

The federal Pharmacare Act empowers the federal MOH to enter into agreements with provincial and territorial governments to expand prescription drug coverage for specific categories—initially contraception and diabetes medicines—representing an incremental federal step toward national pharmaceutical coverage.[68] The federal government has entered into bilateral agreements with individual provinces to expand public drug formularies and improve affordability to levels more comparable to other provinces, providing financial incentives for provinces to close the equity gap that the pCPA coordination mechanism cannot address.[69]

TABLE 2. Supply chain financing governance elements in Canada

Governance Element	Status	Key Mechanisms
Aligned legal, regulatory, and strategy frameworks	Strong	Canada Health Act (overarching principles); Pharmacare Act (2024, limited scope); provincial drug plan legislation
Formal coordination mechanisms	Strong	pCPA joint negotiations; centralized HTA
Transparency mechanisms	Strong	CDA's HTA reports are publicly available; pCPA dashboard is publicly available (only processes and timelines are made public, while prices remain confidential)
Performance accountability	Weak	Under pCPA the provinces are only accountable for adherence to negotiated terms through individual agreements with manufacturers.
Adaptive learning and evidence-based decision-making	Strong	pCPA scope expansion; interprovincial review processes

(4) Outcomes achieved and limitations

Prices: Independent analysis shows annual savings of CA$4.87 billion: CA$3.94 billion for brand name drugs and CA$935 million for generic drugs. These savings are attributed to the coordination mechanism itself, as well as the difference between what provinces would have paid in independent agreements and what they paid through the pCPA's joint negotiating position.[70]

Availability: Although the pCPA successfully negotiates lower prices, the added joint negotiation step increased the total time of the product approval and access pathway. The time from HTA to first provincial listing of new medicines increased by 44 percent in the years after the pCPA was formalized, which has created a measurable delay in access to new medicines.[71,72]

Equitable access: Disparities in access to medicines between provinces are the most persistent consequence of Canada's fragmented supply chain financing. The price convergence the pCPA has achieved across negotiating provinces does not ensure consistency in access. Patients who are in provinces with less generous drug plans, or in provinces that take longer to list pCPA-negotiated medicines, continue to face systematically worse access than those in more proactive provinces.

(5) Lessons from Canada

Canada has achieved better alignment across its supply chain financing functions through coordination rather than consolidation. This approach has required that provinces agree to engage in joint negotiations and to accept the results of those negotiations as the basis for their listing decisions. The mechanism operates within the constitutional framework, and provinces are not obligated to participate, but the savings it generates do create a strong institutional incentive

for continued participation. Some structural inequities do remain, and the benefits from the improvements in supply chain financing governance are not shared equally across the Canadian population. Furthermore, the coordination mechanism has added some bureaucratic steps that are lengthening the time of access to new medicines.

- **Formal coordination mechanisms can achieve significant governance outcomes without consolidating financing authority.** In many LMICs with multiple funding sources and strong regional autonomy, fragmented financing creates barriers for collaboration. Canada's experience shows that that effective coordination can be achieved through voluntary cooperation, without more difficult structural or legal changes, and can mitigate some of the consequences of fragmentation.
- **Coordination mechanisms can achieve better results for price variability without reducing access variability.** The pCPA's achievements in reducing price variation coexist with relatively weak outcomes related to access to new medicines. Outside of the limits imposed by the coordination mechanism, each province independently controls its listing decision. This governance gap prevents price alignment from fully translating into timely access to new medicines, but addressing it would require extending the legal framework to mandate listing timelines or developing a mechanism for performance accountability with consequences for provinces that fail to list negotiated medicines within stipulated timeframes. Neither of these options is available within the current pCPA architecture.
- **Performance accountability can be difficult to establish and enforce in highly decentralized contexts.** Despite multiple efforts at the federal level to establish minimum standards for access to medicines outside of hospital settings, provinces continue to retain complete discretion over which medicines are covered for which populations. The resulting inequity has proven intractable. The Pharmacare legislation is the most recent attempt to address these disparities, but its implementation is still reliant on voluntary agreements with the provinces.
- **Universal coverage for services cannot guarantee equitable access to medicines unless it is explicit aligned with pharmaceutical coverage.** Canada's universal Medicare covers hospital and physician services but does not extend to outpatient prescription medicines. This creates a structural misalignment in the prioritization supply chain financing function that the pCPA governance mechanism cannot address. This gap may be addressed as the Pharmacare legislation roles out, if it successfully creates a universal pharmacy benefit for the country. The lesson for other countries developing or refining universal health coverage (UHC) frameworks is that the function of prioritizing services and the function of prioritizing medicines need to be explicitly aligned or the access to medicines gap will persist even as service coverage improves.

Chile: Legal integration of service prioritization, financing, and procurement

(1) The fragmentation challenge

Chile's health system is segmented between the public insurer, FONASA, which covers approximately 77 percent of the population, and private insurers (Instituciones de Salud Previsional—ISAPREs), which cover the remainder of Chile's population. This fragmentation across funding sources is structurally embedded through legislation.[73] Public and private financing pools operate under different rules, with different benefit designs, provider payment frameworks, and supply chain arrangements.[74]

Institutional fragmentation has been a feature of Chile's health system since the reforms in the 1980s that created FONASA and ISAPREs and enshrined them in the constitution. FONASA serves as the financing body for the public system, collecting and distributing funds, while CENABAST operates as a separate semi-autonomous agency responsible for centralized procurement and distribution of medicines and supplies for public facilities. Service prioritization—which conditions are covered and to what standard—was implicit and uncodified within FONASA, varying across provider types with no binding mechanism to ensure consistency. The lack of an explicit benefits package made it impossible to align prioritized services with prioritized medicines. Furthermore, FONASA and CENABAST have historically operated without a formal mechanism to align procurement prices with provider payment rates, which can leave public health facilities without sufficient funds to procure needed medicines and products.[75,76] ISAPREs fund services delivered by privately owned health centers or independent health care providers and independently manage their own supply financing arrangements.[77]

Prior to the reforms, medicines costs were prohibitively high for many Chilean households, with families often traveling to neighboring countries to purchase medicines at lower prices. Medicines accounted for roughly 30 percent of all out-of-pocket health spending, with health care costs as a whole pushing some households into financial hardship.[78]

(2) The governance entry point: AUGE

The 2005 AUGE reform defined a basic package of guaranteed and explicit treatments for 56 priority health conditions, expanding to over 80 in subsequent years.[79] It created a legally binding mechanism that integrated service prioritization with financing obligations for the first time in Chile.

For each included condition, the law defines clinical protocols, the standard of care, the level of coverage regardless of whether the patient is insured through FONASA or an ISAPRE, the maximum waiting times for diagnosis and treatment, and financial protection limits on patient copayments. The legal guarantee structure means that for the more than 80 conditions currently on the AUGE list, the supply chain is obligated to maintain availability for corresponding medicines

and other products. The Ministry of Finance introduced a Universal Premium (Prima Universal), representing the average economic cost of guaranteeing access to all prioritized conditions, which establishes a legally binding link between benefit package decisions and fiscal planning.[80]

CENABAST procurement alignment

Alongside the AUGE legal framework, Chile developed two procurement governance mechanisms to address the misalignment between centralized and facility-based procurement. CENABAST, initially a central procurement agency for public hospitals and municipal pharmacies, was gradually empowered through legislative reform to increase its purchasing role and reduce the lack of transparency that had characterized its operations.

The CENABAST Law, passed in 2020 following country-wide social protests and a civil society accountability campaign, dramatically expanded CENABAST's mandate. For the first time, private pharmacy chains and independent pharmacies were authorized to purchase medicines through CENABAST, allowing CENABAST's bulk purchasing power to benefit not only public hospitals but retail pharmacies as well, so long as they agreed to sell products at the maximum retail prices set by CENABAST. The law also empowered CENABAST to set maximum retail prices for medicines purchased through the system, directly extending the pricing intervention from the public sector into the retail market. By 2024, CENABAST managed approximately 80 percent of public medicine purchases, giving the agency the market power to negotiate meaningfully with suppliers.[81]

(3) Other governance elements

A summary of governance elements in place for Chile's supply chain financing functions is presented in Table 3 with a qualitative assessment of the element.

Improving transparency through e-procurement

The civil society accountability mechanism that drove the CENABAST Law is itself a governance improvement. Chile became an early leader in e-procurement in 2003, developing a fully digital system (ChileCompra/Mercado Público) that published procurement data publicly. This built the transparency infrastructure that civil society organizations then used to find conflicts of interest and push for governance reform.[82]

Together with investigative journalism and civil society analysis, ChileCompra's open contracting data created a performance accountability structure that held officials responsible for governance failures in a way that formal institutional accountability mechanisms had failed to do. Procurement had been conducted primarily through direct awards at CENABAST, with limited competition or transparency. A 2019 investigation by civil society organizations found that more than half of CENABAST's purchases were made through direct awards and documented conflicts of interest between procurement officials and suppliers that had contributed to substantial overpayment.[83]

Government officials responsible for conflicts of interest resigned, procurement practices improved, and competition increased.

Adaptive learning and evidence-based decision-making

Chile's iterative expansion of the AUGE conditions list from 56 conditions at launch in 2005 to 87 by 2022 has been achieved through a structured, legally embedded adaptive learning process. Each proposed addition to the list of conditions requires the MOH to conduct a cost-effectiveness and burden-of-disease assessment through its health technology evaluation process, the Ministry of Finance to do a fiscal feasibility assessment against a per capita premium ceiling, and the Advisory Council to review it before it can be approved by the MOH. This architecture is designed to prevent expansion of the AUGE commitments beyond fiscal capacity while enabling progressive coverage expansion grounded in clinical and economic evidence.[84]

TABLE 3. Supply chain financing governance elements in Chile

Governance Element	Status	Key Mechanisms
Aligned legal, regulatory, and strategy frameworks	Strong	AUGE Law/GES (Ley N° 19.966); CENABAST law (Ley N° 21.198); ChileCompra legislation (Ley N° 19.886)
Formal coordination mechanisms	Emerging	CENABAST-FONASA-MOH interface—coordination committees for specific programs (e.g., high-cost cancer treatments)[85]
Transparency mechanisms	Strong	ChileCompra/Mercado Público open contracting data; CENABAST price tracking; civil society monitoring
Performance accountability	Emerging	Civil society accountability led to official resignations and reformed procurement practices
Adaptive learning and evidence-based decision-making	Strong	Iterative AUGE expansion with verification studies and fiscal analysis; CENABAST gradual scope expansion

(4) Outcomes achieved and limitations

Chile's supply chain financing governance architecture has produced strong price and availability outcomes, particularly for AUGE-covered conditions. Improvement in equitable access, however, is structurally limited by the two-tiered coverage system entrenched in current legislation.

Prices: Following the implementation of the CENABAST Law, one study showed that CENABAST purchased 60 percent of medicines at a lower price compared to the period immediately preceding the enactment of the legislation. The price decline ranged from over 40 percent to nearly 80 percent for some high-cost drugs.[86] Another study found an average reduction in prices of 23 percent across all of the products procured by CENABAST, with savings of US$879 million over a one-year period.[87] Municipal pharmacies, which purchase through CENABAST, have expanded access to CENABAST-priced medicines for some private sector patients, reducing price variations between medicines accessed through the public and private coverage sectors.[88]

Availability: Availability outcomes are strong for conditions covered by AUGE guarantees and for medicines within the CENABAST procurement system. Patients covered by FONASA accessing AUGE conditions report no significant problems with the availability of medicines covered by AUGE.[89]

Equitable access: While patients who purchase medicines from pharmacies offering the lower prices achieved through the AUGE and CENABAST reforms have benefited significantly, the overall effect is limited by the number of products and pharmacies participating in the system. Despite strong price and availability interventions, households continue to finance approximately 62 percent of medicine expenditures out-of-pocket. For conditions not on the AUGE list, patients—whether FONASA or ISAPRE beneficiaries—purchase medicines at retail prices, accessing the benefits of CENABAST pricing only when they buy medicines through pharmacies using the CENABAST system.[90]

(5) Lessons from Chile

- **Legal integration of service prioritization, financing, and procurement is a powerful governance mechanism but is not sufficient to overcome inequities in access caused by fragmented coverage.** For conditions inside the AUGE framework, the governance improvement has been transformative and led to measurable improvements in prices and access to AUGE-covered medicines. For conditions outside it, however, the gap in outcomes remains substantial. This has been addressed incrementally by expanding the AUGE list of covered conditions, but coverage remains incomplete. The implication for other countries is that the legal integration of services and medicine prioritization and financing may need to be designed with an expansion pathway built in to fully address the consequences of fragmentation and close equity gaps in access.
- **Strong price outcomes do not automatically translate into equitable access.** As in the case of Canada, reducing the prices and price variation of medicines has not automatically translated into more equitable access in Chile because of the inequity across public and private insurance coverage. High out-of-pocket medicine expenditures persist despite reductions in prices and price variation. Equity cannot be achieved unless governance reforms address both the prices at which medicines are procured and the coverage design that determines who gets access to more affordable medicines.
- **In the absence of formal mechanisms of institution-based accountability, civil society accountability can be a powerful complement or substitute.** The CENABAST Law was enacted from civil society organizations using open contracting data to document failures and build public pressure for change—not from institutional corrective action. This demonstrates that the performance-based accountability governance element can exist outside the purview of an institution, and transparency mechanisms are only powerful when actors use the information they create.

Ethiopia: Governance alignment under donor and fiscal fragmentation*

(1) The fragmentation challenge

Ethiopia faces fragmentation across all three dimensions—financing, policy domains, and institutions. Fragmentation across funding sources is particularly challenging, as development partners account for approximately 34 percent of total health expenditure, with the majority flowing through parallel, program-specific channels for HIV, TB, malaria, RMNCH, vaccines, and nutrition, each with independent procurement, logistics, and reporting systems.[91] Government sources and out-of pocket payments account for 32 percent and 31 percent of total health expenditure respectively. This results in a financing landscape marked by a lack of adequate domestic resources and coherent external coordination. Fiscal decentralization further compounds this challenge because regional health bureaus (RHBs) and woreda health offices are given significant autonomy over health budget allocations. This creates a third layer of fragmentation in which national procurement systems must interface with subnational financing decisions that they do not control.[92]

Fragmentation across policy domains and institutions is similarly acute. Pharmaceutical procurement is governed by a federal procurement framework administered through the Ministry of Finance, procurement is managed by the Ethiopian Pharmaceuticals Supply Service (EPSS), and health financing policy is managed by the MOH. Service prioritization through Ethiopia's Health Sector Transformation Plan (HSTP) is developed separately from the budgetary processes that decide what products can be procured. The regulatory environment for pharmaceuticals is distributed horizontally across two federal ministries and vertically between federal and regional authorities, which creates overlapping responsibilities and enforcement gaps that have been shown to contribute to failures in quality and availability.[93]

This fragmentation produces misalignments in compounding ways. First, forecasting errors regularly exceed the WHO's 25 percent minimum acceptable threshold. This is partly due to facility-level managers over-requesting in anticipation of downward budget revisions and partly due to data systems not supporting reliable bottom-up quantification. Second, budget allocations to EPSS do not systematically incorporate available forecasts regardless of their quality. Commodity budgets are set in a line-item process based on available fiscal ceilings rather than demand estimates, and no institution has an explicit mandate to translate forecast requirements into budget requests. As a result, there is a chronic mismatch between planned procurement and the actual needs of the population. There is also no feedback mechanism to communicate the health impacts caused by the gap between the funded and the required amount to budget authorities. Forecasting and budgeting for program commodities (HIV, TB, malaria, vaccines, nutrition, family planning, and maternal and

* The Ethiopia case example is drawn entirely from two recent assessments carried out by R4D: "Comprehensive health commodity financing landscape assessment in Ethiopia" and "Opportunities to align supply chain, market shaping and health financing functions and policies: Ethiopia."

child health) run as separate parallel processes managed at the national level through the MOH, with little to no integration with essential medicines budgeting or the Revolving Drug Funds (RDFs) that facilities rely on for their day-to-day procurement.[94]

Centralized procurement through EPSS coexists with independent facility- and program-level procurement under significantly different conditions and creates wide price variation across the system. There is also a pricing-payment disconnect. EPSS prices its products to meet its cost-recovery requirement, but the payments public health facilities receive from the Community-Based Health Insurance (CBHI) tariffs don't cover that cost, leaving facilities unable to fund procurement and driving an arrears crisis. The CBHI reimbursement tariffs, set by the Ethiopia Health Insurance Service with reference to EPSS prices, are not systematically updated or actively aligned with actual EPSS procurement costs. Public health facilities owed EPSS close to ETB2 billion at the end of 2023/24, which prevented the agency from placing new orders and directly contributed to stockouts.[95] When stockouts and arrears occur, facilities must procure from private suppliers and absorb losses that neither CBHI payments nor the RDF can cover.[96] Multiple siloed data systems—including the Integrated Financial Management Information System (IFMIS) for public financial management, the Health Commodity Management Information System (HCMIS) and Electronic Logistics Management Information Systems (eLMIS) for supply chain management, Auditable Pharmaceutical Transactions and Services (APTS) for facility-level transactions, and District Health Information System 2 (DHIS2) for service delivery data—operate in parallel without interoperability, preventing any actor from maintaining a comprehensive picture of commodity needs, financing availability and flows, and stock levels.[97]

The resulting impact on outcomes is severe. Essential medicines are stocked in only 28 percent of Ethiopia's health facilities, excluding health posts, with regional variation ranging from 15 to 54 percent. At the facility level, studies consistently report stockout rates for tracer medicines ranging from 16 to 60 percent, depending on the type of facility and its location, with average stockout durations of 38 to 62 days. Price variation between the public and private sectors for essential medicines is wide, and equity gaps reflect both the geographic distribution challenges of a large, geographically complex country and the inadequacy of financing flows at reaching remote facilities.[98]

(2) The governance entry points: Consolidating institutional mandates and introducing compact agreements

Measures to address the consequences of fragmentation in Ethiopia's supply chain financing have been incremental, since full consolidation of funding streams is neither politically feasible nor logistically achievable in the near term. Ethiopia's governance entry point has been the consolidation of institutional mandates—especially clarifying who is responsible for procurement and logistics—combined with formal coordination mechanisms to align the behavior of the multiple funding actors.

Consolidated institutional mandate: EPSS

EPSS was established in 2007 with an explicit mandate to centralize the procurement and distribution of pharmaceuticals and medical supplies for the public health sector. Its powers and duties include procuring essential pharmaceuticals and delivering them directly to districts and health facilities through an effective transport network. The creation of EPSS was itself a governance intervention—it concentrated previously dispersed institutional responsibilities into a single agency with a defined mandate, removing ambiguity about who was accountable for supply chain performance.

EPSS has progressively strengthened this mandate. It established 19 regional branch warehouses serving more than 3,800 health facilities, adopted continuous improvement methodologies, and developed its eLMIS to improve data visibility. A 2025 proclamation strengthened the legal mandate of EPSS, including the right to deduct outstanding facility debts directly from facility bank accounts, which aims to address the arrears crisis, although it would not correct the systemic disconnect between provider payment and procurement prices.[99]

Formal coordination mechanism: Compact agreements

Alongside the strengthening of EPSS's institutional mandate, Ethiopia has used compact agreements between the government and development partners as the primary mechanism for addressing fragmentation across funding sources. These agreements have been used to gradually align donor-funded procurement with national systems by channelling products through EPSS rather than parallel supply chains, aligning product selections with national essential medicines lists and harmonizing reporting frameworks with national data systems. Coordination runs through a parallel set of technical working groups that are commodity-specific and led jointly by MOH and EPSS.

Compact agreements have also been used at a higher level of coordination through Ethiopia's Health Sector Development Plans (HSDP), which is now the Health Sector Transformation Plan (HSTP). This serves as overarching framework intended to align donor programming with national priorities. In principle, this framework requires that external partners align their programs, including supply chain functions, with national systems. In practice, compliance has been uneven, and parallel procurement structures for vertically funded programs persist despite stated commitments to integration.[100]

(3) Other governance elements

A summary of governance elements in place for Ethiopia's supply chain financing functions is presented in Table 4 with a qualitative assessment of the element.

Formal coordination mechanism through the Committed Demand and Supply System (CDSS)

Ethiopia has recently introduced the CDSS, which is a formal coordination mechanism that creates binding commitments linking forecasting with planning cycles and budgeting processes to close the gap between forecasting and budgeting. By reconciling facility-level forecasts with available funding and integrating tools like the electronic forecasting and supply planning tool and the eLMIS, the CDSS directly links demand forecasting, financing, and procurement to ensure supplies match committed budgets.[101]

Transparency through the eLMIS

The eLMIS represents an early-stage transparency mechanism, providing commodity flow data at the product hub and health facility levels for products within the EPSS system. The APTS system has been introduced in a subset of hospitals to integrate dispensing, stock management, and financial data. EPSS is also piloting interoperability between HCMIS and APTS to align consumption, revenue, and procurement data, an important step toward the integrated data visibility that accountability mechanisms require.

Adaptive learning and evidence-based decision-making

The continuous improvement model adopted by EPSS represents an early form of adaptive learning with systematic processes for identifying operational failures, generating improvements, and scaling successful practices across the hub network.[102]

TABLE 4. Supply chain financing governance elements in Ethiopia

Governance Element	Status	Key Mechanism
Aligned legal, regulatory, and strategy frameworks	Emerging	National Drug Policy being updated; EPSS legal foundation expanding
Formal coordination mechanisms	Strong	Compact agreements; HSTP alignment framework; CDSS
Transparency mechanisms	Emerging	eLMIS; APTS in selected hospitals
Performance-based accountability	Absent	No systematic cross-institutional accountability
Adaptive learning and evidence-based decision-making	Emerging	Improvement cycles implemented by EPSS

(4) Outcomes achieved and limitations

Consolidating procurement authority under EPSS and using compact agreements as a coordination mechanism have produced meaningful governance improvements. Institutional accountability for supply chain performance has also improved. The eLMIS has improved commodity flow visibility, at least for program commodities within the EPSS system. Operational efficiency has also shown improvement, as order fulfilment rates have increased, and warehouse management indicators have all improved.[103]

Compact agreements with the Global Fund and other partners have reduced the volume of procurement flowing outside the national systems, though parallel channels persist for many programs.

Governance improvements have also been constrained by other factors, however. EPSS's consolidated institutional mandate without aligned provider payment systems and PFM has not fixed many of the structural vulnerabilities at the supply chain's core, such as the arrears and stockouts caused by the disconnect between procurement price and provider payment.

Prices: EPSS centralized procurement has reduced price variation for products within its system compared to the pre-EPSS era of fragmented procurement. However, wide price variation persists between the EPSS system and facility-level procurement and between the public and private sectors.[104]

Availability: Availability and stockout challenges persist, as described above.

Equitable access: Availability and stockout challenges persist, as described above.

(5) Lessons from Ethiopia

- **Compact agreements are a powerful early coordination mechanism because they work within existing financing arrangements without requiring structural consolidation**. Ethiopia's compacts with development partners have reduced parallel procurement without requiring donor systems to merge with national ones. The gains are real but incomplete, since compacts depend on continued partner commitment, and the donor environment has been particularly volatile in recent years.[105]
- **Consolidating the legal mandate for one function such as procurement can be a useful entry point and lead to improvements in some outcomes such as prices, but it does not address most of the sources and consequences of fragmentation.** EPSS has a clear mandate, improving operational capacity, and growing evidence base. Its effectiveness is fundamentally constrained, however, by other misalignments. These include the disconnect between pricing and payment, which constrains its cost-recovery model and leads to persistent arrears and stockouts.
- **Misalignment between forecasting and budgeting and data system fragmentation are governance failures as consequential as procurement failures, but they are less visible and therefore less often targeted for improvement.** Ethiopia's experience shows that even a well-functioning procurement agency cannot ensure the timely availability of goods when the budgets that fund procurement are systematically disconnected from quantified commodity need. The CDSS is the most significant improvement in governance to close this gap, but its effectiveness depends on data systems reliably transmitting timely information across the planning-execution chain. Closing the interoperability gaps between IFMIS, HCMIS, eLMIS, APTS, and DHIS2 is therefore a prerequisite for the governance improvements the CDSS is designed to enable.

- **In Ethiopia's context, improving PFM is a binding constraint.** The government's budget release delays create arrears that cannot be addressed solely through supply chain financing governance. It requires either legal reforms to enforce timely payment (as a current draft proclamation attempts to do) or more fundamental changes in the budget execution processes that determine how and when facilities receive funds.

Ghana: Purchaser-driven alignment through framework contracting†

(1) The fragmentation challenge

Ghana's supply chain financing system is fragmented across different funding sources, policy domains, and institutional responsibilities. Each produces distinct, but interconnected, misalignments that governance reforms have only partially addressed.

Health commodities are financed through four primary channels: the national budget through the MOH and the Ghana Health Service (GHS); the National Health Insurance Scheme (NHIS); donor-funded programs for HIV, malaria, TB, vaccines, and reproductive health; and facility-level internally generated funds that come from NHIS payments and out-of-pocket payments from patients. These sources follow separate planning cycles, coverage rules, and payment mechanisms. The NHIS, for instance, provides coverage for approximately 40 percent of the population. Its benefit package, medicines list, and provider payment rates are determined through separate processes from supply chain financing decisions, leading to persistent mismatches between what the insurance scheme promises to cover and what the supply chain is capable of delivering.[106]

Fragmentation across policy domains exacerbates this because procurement responsibility falls under a national procurement framework administered through the Ministry of Finance, while the MOH and GHS manage medicines policy, and the National Health Insurance Authority (NHIA) sets reimbursement rates for NHIS medicines. This fragmentation results in a disconnect between the different forecasting and budgeting processes. Ghana's quantification occurs across four parallel streams managed by different institutions that have no coordination mechanism. The Regional Medical Stores (RMS) conduct preliminary forecasting for approximately 70 of the essential medicines covered by national framework contracts. These are prenegotiated standing procurement agreements for a set of priority medicines and health products with prices based on median bids and anchoring them to the NHIA tariffs. The NHIA manages a separate list of NHIS-reimbursed outpatient medicines, but NHIA claims data is not systematically fed back into supply planning. Donor-supported program commodities are separately quantified through national program units and are not integrated with the quantification of domestic essential medicines.

† The Ghana case example is drawn entirely from Balsara Z, Cashin C, Munyua A, Gowda B, Amo-Addae M, and Opoku-Agyeman M. (2025c). "Opportunities to align supply chain, market shaping and health financing functions and policies: Ghana." Washington, DC: Results for Development.

The MOH also distributes a further set of primary health care (PHC) commodities (malaria diagnostics, combination therapies, oral rehydration salts) directly to facilities as centrally allocated push distributions, quantified by MOH program units using allocation formulas separate from Ghana Logistics Management Information System (GhLMIS) consumption data. Across these four streams, there is no unified estimate of total national essential medicine financing need.

Each of the revenue streams financing essential medicines goes to providers through a different payment mechanism. In the NHIS provider payment system, medicines are "unbundled" and reimbursed separately from payments for services. When there are stockouts, the RMS allows facilities to procure from the private market. Private procurement prices are often higher and more volatile, with limited quality oversight.[107]

The NHIA medicines tariff operates a de facto price-benchmarking system. This is understood by the MOH, RMS, and health facilities, who procure medicines at the NHIA medicines tariff level in order to avoid patients incurring out-of-pocket payments. This helps keep NHIS payments and the procurement prices health facilities face in alignment, although there may be disparities when tariffs are not adjusted with inflation, currency fluctuations, etc.[108] In 2022, hospital pharmacists reported a gap of approximately 100 percent between tariffs on NHIS-listed medicine prices and actual market prices, driven by currency depreciation, inflation, and increases in supply chain costs that the NHIA pricing review process could not keep pace with. In addition, the RMS and teaching hospitals procure medicines independently under conditions that differ significantly from centralized GHS procurement and creates wide price variation across the system.[109]

The data systems are also siloed. Ghana Integrated Financial Management Information System (GIFMIS), GhLMIS, DHIMS and electronic medical records, and CLAIM-it (insurance claims) do not share data in ways that would allow any single actor to maintain a comprehensive picture of financing flows, commodity availability, and service utilization.[110]

(2) The governance entry point: NHIS purchaser leverage

A key element in Ghana's governance has been purchaser-driven alignment through the NHIA using its market power as the largest single purchaser of health services and drugs. This has aligned procurement prices and reduced price dispersion. Alignment has been carried out through two complementary strategies, the NHIS medicines list and framework contracting for essential medicines in high demand as a coordination mechanism.

The NHIS medicines list

The NHIA has used the NHIS medicines list, which is aligned with the National Essential Medicines List, as a policy tool to standardize which medicines are covered and at what price. By requiring that facilities dispense only the listed generics for conditions covered by the NHIS, and by setting uniform

reimbursement prices across all provider types, the NHIA has successfully used purchaser leverage to address the problem of price dispersions. The NHIA must review and adapt to market prices changes through the annual medicines list review process, which is mandated by Ghana's National Health Insurance Act of 2012 (Act 852), though in practice reviews have been slow relative to market price movements.[111]

Framework contracting for essential medicines

In 2018, Ghana began piloting framework contracting for high-demand essential medicines, building on the NHIS strengthened pricing function. Framework contracting sets prenegotiated price and quantity agreements with suppliers for a defined list of essential medicines. This approach eliminates the need for participating facilities and the RMS to conduct independent procurement tenders. It aims to reduce the centralized-facility procurement price gap by creating a single negotiated price that applies regardless of procurement level, and it improves transparency by making agreed prices visible to all parties. The GhLMIS and broader GIFMIS data systems were designed to support the transparency requirements of the framework, tracking which facilities had drawn on framework agreements, at what prices, and with what supply outcomes.

(3) Other governance elements

A summary of governance elements in place for Ghana's supply chain financing functions is presented in Table 5 with a qualitative assessment of the element.

Legal and strategy framework

Ghana's Act 852 specifies how the NHIA determines the medicines list and tariffs, but direct connections to pharmaceutical policy decisions are not specified in the act.[112]

The Ghana Health Commodity Supply Chain Master Plan (2025–2029) represents Ghana's most significant step toward an aligned legal and strategy framework for supply chain financing. This overarching strategic document that integrates governance, financing, and supply chain management into a single framework enables cross-domain alignment that individual NHIS or framework contracting mechanisms cannot achieve alone. The plan explicitly calls for improved coordination between central, regional, and district levels, including mapping of financial flows and expenditure tracking. The development of a concrete operational work plan to implement this aligned legal and strategy framework has been slow, however.[113]

Transparency mechanisms

The GhLMIS and GIFMIS data systems are gradually improving data visibility across supply chain and financial management functions. GhLMIS is well established at national and regional levels, though utilization of the system at the primary care level remains limited. Since 2019, there has been

ongoing discussion about crosswalking and making the core health data systems interoperable, including the electronic medical records, CLAIM-it, DHIMS, GIFMIS, and GhLMIS, but as of the most recent assessments this integration has not happened.[114]

Adaptive learning and evidence-based decision-making

The creation of the National Medicines Price Committee in 2019 and the Pricing Strategy for Pharmaceuticals in 2022 recommended that NHIA tariffs reflect framework contracting outcomes and establishing a maximum sales price applicable to both public and private sectors. In 2024, the NHIA completed a full tariff revision leading to a 50 percent increase plus a 30 percent top-up, explicitly referencing framework contract outcomes to better match tariffs with real supply chain financing costs, which was the first comprehensive tariff update since 2019. These steps demonstrate an emerging feedback loop between procurement prices, insurance tariffs, supply chain costs, and market conditions. However, challenges remain to sustain tariff-procurement price alignment in an environment characterized by chronic inflation and currency volatility.[115]

TABLE 5. Supply chain financing governance elements in Ghana

Governance Element	Status	Key Mechanism
Aligned legal, regulatory, and strategy frameworks	Emerging	Health Commodity Supply Chain Master Plan (2025–2029); NHIS Act 852
Formal coordination mechanisms	Emerging	NHIS medicines list; framework contracting; multi-stakeholder pricing review
Transparency mechanisms	Emerging	GhLMIS and GIFMIS ecosystem
Performance accountability	Emerging	Framework contracting evaluation reports; NHIA pricing review
Adaptive learning and evidence-based decision-making	Emerging	National Medicines Price Committee reviews

(4) Outcomes achieved and limitations

The NHIS purchaser leverage and framework contracting mechanisms have produced measurable governance improvements in Ghana but outcomes remain modest.

Prices: The NHIS's price reductions in 2018 resulted in a 30 percent price reduction across 600 medicines. This showed that purchaser leverage can achieve price reductions and compress price dispersion. However, the price outcomes have proven fragile. By 2022, the 100 percent gap between NHIS-listed prices and actual market prices had effectively reversed the gains from 2018. The fundamental problem is that the NHIS tariff-setting system does not keep pace with market price dynamics and the broader economic volatility.[116]

Availability: Prior to the implementation of framework contracting, stock availability of the 65 essential medicines covered by framework agreements was typically at 100 percent. After implementation, availability declined and lead times increased by more than 40 percent.

Framework contracting obligated suppliers to fulfil procurement at prenegotiated prices and on pre-agreed terms, but it but did not create corresponding payment obligations for procurers to promptly honor those terms. Suppliers. who faced chronic payment delays from the GHS and facilities, and who in turn faced payment delays from NHIA, then had little incentive to prioritize framework agreement deliveries over cash-paying customers, resulting in low fill rates, stockouts, and, ultimately, reduced availability of the very medicines the framework was designed to secure.[117,118]

Equitable access: With approximately 40 percent of the population insured under the NHIS, the improvements in supply chain financing governance that were achieved through NHIS mechanisms only apply to insured patients. The uninsured, who are disproportionately rural and poor populations, as well as informal sector workers, continue to access medicines at market prices through private pharmacies and drug shops, thus facing the full burden of price variation and affordability gaps that NHIS coverage is designed to mitigate, and may have less reliable access to quality-assured products.[119]

(5) Lessons from Ghana

- **Purchaser leverage is a powerful entry point in governance, but only when payment systems and fund releases are reliable enough to sustain supplier commitment.** A well-designed purchaser-driven procurement mechanism (framework contracting) was able to leverage NHIA's purchasing power, but it ultimately adversely impacted availability outcomes because the enabling condition of reliable payment was absent. The framework contracting mechanism failed because the budget execution and provider payment systems that should have backed up the procurement commitments were not reliable enough to sustain supplier confidence. Addressing this requires improving PFM to ensure timely budget releases, improving NHIA process to shorten claims processing timelines, and establishing payment guarantees for framework agreement suppliers.
- **Price improvements achieved through purchaser leverage are inherently fragile in environments with high inflation and currency volatility without institutionalized mechanisms for dynamic adjustments.** The reversal of the 2018 NHIS price reductions by 2022 was not a failure of the framework contracting mechanism failed but perhaps a result of no system being in place to connect the market's price signals to the NHIA tariff reviews. Adaptive learning through regular, evidence-based review of pricing against market intelligence is critical for maintaining price reductions. This mechanism is emerging in Ghana under the National Medicines Price Committee reviews.
- **Governance mechanisms that only apply to insured populations cannot achieve equity outcomes at the system level when universal coverage has not yet been achieved.** As in Canada and Chile, the structural equity gap in Ghana caused by differential insurance coverage illustrates that supply chain financing governance should be improved within the context of UHC to ensure that the entire population can benefit from lower prices and other positive outcomes.

Indonesia: Consolidated insurance, national formulary, and e-catalogue procurement

(1) The fragmentation challenge

Prior to 2014, health financing in Indonesia was fragmented across various insurance schemes that served different population subgroups and had separate benefit packages, procurement arrangements, and payment systems for providers. Procurement was conducted through opaque facility- and district-level competitive tender processes without a uniform framework. Price variation across facilities for the same medicines was wide and largely invisible to purchasers and policymakers.[120]

Fragmentation across policy domains compounded the institutional fragmentation. Service delivery authority (through the MOH), financing authority (through the multiple coverage schemes) and procurement authority (through the Lembaga Kebijakan Pengadaan Barang/Jasa Pemerintah, LKPP) were split, with no mechanism to coordinate across institutions and functions.[121] The LKPP governed procurement rules but had no health mandate, and the multiple coverage schemes set their own provider payment rates independently. These separate institutions operated on different planning cycles with different decision-making frameworks, resulting in a system in which commodity needs, procurement prices, and reimbursement rates were frequently misaligned.[122] Centralized and facility-level procurement operated in parallel in an uncoordinated way, limiting purchasing power and producing significant price variability. Fragmentation extended to information flows, with financing, procurement, and supply chain data held by different institutions with no shared information across functions.

(2) The governance entry point: Legal consolidation of health coverage schemes

The JKN National Health Insurance System

Indonesia's governance entry point was a major structural overhaul rather than a series of incremental steps. The legal consolidation of the entire national health financing architecture was coupled with two supply chain governance mechanisms that were designed to translate the new health insurance purchasing power into more efficient procurement. The launch of Jaminan Kesehatan Nasional (JKN) in 2014 consolidated all six predecessor coverage schemes into a single national health insurance system managed by a newly created independent purchasing agency, Badan Penyelenggara Jaminan Sosial (BPJS) Kesehatan. The consolidation was comprehensive: Membership rolls, contribution structures, benefit packages, and provider payment systems were all merged and standardized. By 2024, JKN covered over 97 percent of the Indonesian population—more than 260 million people—making it one of the largest single-payer health insurance schemes in the world.[123]

From a supply chain financing governance perspective, JKN created an entirely new governance structure and new opportunities for governance improvements. For the first time, a single entity, BPJS Kesehatan, had both the mandate and the financial resources to act as a national purchaser of health services and medicines. This created the institutional foundation for supply chain financing governance mechanisms that were previously missing, such as a national formulary with binding coverage implications, a centralized vendor selection platform for procurement, and a unified provider reimbursement structure that could be aligned with procurement prices.

Formularium Nasional (Fornas): Evidence-based selection

JKN was accompanied by the introduction of the Fornas, an evidence-based national formulary covering over 500 active ingredients and more than 900 preparations across 29 therapeutic classes. The Fornas serves as the source of information for which medicines are covered under JKN. Medicines included in the Fornas are drawn from the National Essential Medicines List and evaluated by an independent national committee. The Fornas creates a shared reference point that connects clinical guidelines, procurement decisions, and reimbursement.[124]

E-catalogue: Transparency in procurement

The e-catalogue procurement system, managed by LKPP, is a vendor selection and transparency mechanism. The MOH is responsible for developing the Fornas and setting ceiling prices for each medicine. After determining ceiling prices, the MOH submits them along with demand projection data from the Rencana Kebutuhan Obat (RKO or Drug Needs Plan) to LKPP, which then uses that data for electronic bidding to establish procurement prices compiled in the e-catalogue. LKPP runs either open bidding (for medicines with multiple suppliers) or closed negotiation (for medicines with three or fewer suppliers). BPJS Kesehatan then reimburses facilities for medicines they procure through the e-catalogue at e-catalogue prices plus a regulated mark-up.[125]

BPJS Kesehatan maintains its own separate demand projections, and this data is not integrated with the MOH's RKO. As a result, when LKPP processes the quantification data to set national tender volumes, it uses only the MOH figures and the BPJS Kesehatan needs are excluded entirely from the tender planning process. This is a structural coordination failure, as the insurer that funds a large share of the population's medicine consumption has demand data that never reaches the procurement agency. LKPP sets tender volumes based on the MOH's estimates alone, which systematically understate actual JKN-driven demand.[126]

JKN does not specify explicitly that the medicines prescribed in the hospitals must be the medicines listed in the e-catalogue. The regulation only states that the medicines prescribed must be listed in the Fornas.[127] As a result, many facilities are purchasing medicines at prices above JKN national reimbursement ceilings.[128]

(3) Other governance elements

A summary of governance elements in place for Indonesia's supply chain financing functions is presented in Table 6 with a qualitative assessment of the element.

Formal coordination mechanisms

Indonesia's decentralized health system devolves significant procurement authority to the district and facility levels. This can creates challenges for an e-catalogue that is meant to support centralization of certain functions, and there is no coordination mechanism to standardize the use of e-catalog. Furthermore, improving coordination to feed between BPJS Kesehatan's claims data into LKPP's national procurement planning and volume forecasting remains an urgent priority.

Other transparency improvements

Indonesia has successfully developed and expanded SMILE (Supply Management Information for Logistics Enhancement), an open-source digital solution for managing supply chains and logistics. Started as a solution for tracking supplies for routine immunization and the COVID-19 response, SMILE has grown into a nationwide digital system for essential health supplies and now plays an important role in improving stock visibility and system efficiency across the country.[129]

Performance-based accountability

Although BPJS Kesehatan audits reimbursements for medicines, Indonesia currently lacks systematic performance monitoring across the full supply chain financing cycle. In order to create accountability systems that will ensure the e-catalogue's alignment, the government could consider publishing procurement performance dashboards, tracking supplier fulfilment, and monitoring payment compliance.

TABLE 6. Supply chain financing governance elements in Indonesia

Governance Element	Status	Key Mechanism
Aligned legal, regulatory, and strategy frameworks	Strong	JKN Law (40/2004); Fornas regulatory framework
Formal coordination mechanisms	Weak	BPJS Kesehatan-MOH-LKPP interface is weak
Transparency mechanisms	Strong	E-catalogue; SMILE logistics and supply chain management data
Performance-based accountability	Emerging	Reimbursement audit systems; e-catalogue compliance monitoring
Adaptive learning and evidence-based decision-making	Absent	No systematic national learning cycle linking availability and pricing outcomes to governance adjustment

(4) Outcomes achieved and limitations

The governance architecture between JKN, the Fornas, and the e-catalogue has produced significant price improvement, but availability outcomes have remained weak, and the equity achievement is partial.

Prices: Following its mandatory implementation, the e-catalogue achieved price reductions of approximately 18 percent on average for essential Fornas medicines, compared to the previous conventional tender system. The price reductions can be attributed to both the transparency effect—given that buyers and sellers now operate with the same price information—and the JKN demand consolidation effect. With 260 million members, BPJS Kesehatan's purchasing power is enough to negotiate meaningfully lower prices from suppliers—an effect that has been documented for both e-catalogue and non-e-catalogue medicines as market competition responses to the new pricing architecture.[130]

A 2024 review indicates that these price impacts may be eroding, however. Over half of assessed facilities procure above the national JKN reimbursement ceilings (in some cases by up to 10 times), indicating that the e-catalogue governance mechanism is not functioning as intended across the system.[131]

Availability: One survey found that only 22 percent of essential medicines are available in more than 90 percent of PHC centers nationally. The most common reason for unavailability is "not needed," accounting for 46 percent of stockouts. This reflects forecasting and procurement planning failures the governance architecture has not yet resolved. Geographic disparities are severe, with eastern Indonesia showing the greatest unmet need alongside the lowest medicine availability.[132] A more recent survey found that 66 percent of the 50 surveyed medicines were available in PHC centers, with district-level availability ranging from 83 percent in top-performing areas to just 43 percent in the lowest.[133]

The availability gap at least in part reflects three failures. The first is the understating of demand through the fragmented forecasting between the MOH and BPJS Kesehatan. The second is access barriers to the e-catalogue itself. Many facilities lack trained procurement staff or e-catalogue credentials, and reimbursement verification delays and outstanding hospital debts have led wholesalers to restrict stock access, forcing facilities into informal procurement channels. The third is related to timely payment. BPJS Kesehatan reimbursement verification processes are slow and subject to administrative delays, creating cash flow constraints for facilities that prevent them from procuring at the quantities and on the timelines required for reliable availability.

Equitable access: Out-of-pocket payments as a share of current health expenditure has fallen in Indonesia from 45 to 27.5 percent since JKN's launch, a substantial financial protection improvement. Although JKN population coverage is high and financial protection has improved, there are still large equity gaps for effective coverage where the enrolled population can actually access necessary services and medicines. Furthermore, supply side constraints, bureaucratic hurdles, and brand

preference have led many Indonesians to continue buying their own medicines from health facilities, pharmacies or over the counter.[134]

In addition, provider incentives and patient perceptions can direct demand away from access to more affordable products. One study found that hospitals frequently imposed the highest markups on branded medicines and that physicians and pharmacists influenced patients toward products that maximized revenue rather than value.[135]

(5) Lessons from Indonesia

- **Consolidating funding pools creates the institutional conditions for supply chain financing improvements, but funding consolidation may not be sufficient to improve outcomes without other enablers.** Indonesia demonstrates that a vendor selection and price transparency mechanism (e-catalogue) deployed within a consolidated insurance architecture can achieve strong price outcomes. These price outcomes do not translate into availability improvements without other conditions in place, however, such as formal coordination mechanisms between policy domains and timely payments to suppliers.
- **Transparency mechanisms are necessary but not sufficient for equitable access.** Access to the e-catalogue has made prices visible and created the conditions for market competition at the national level. However, knowing lower prices does not help a facility in eastern Indonesia that lacks e-catalogue access credentials, trained procurement staff, or the cash flow to order at the quantities required for continuous availability. Price transparency alone is insufficient to overcome population preferences, such as brand preferences, and incentives for providers to prescribe outside of the negotiated product list.
- **Near-universal enrollment in an insurance scheme is not the same as universal effective coverage.** Indonesia's reformed health financing architecture has succeeded at consolidating funding sources, achieving near-universal enrollment, and leveraging the corresponding purchasing power to reduce prices. However, enrollment without reliable availability of services and essential medicines at the point of care, particularly in remote and underserved areas, does not achieve equitable access. Translating Indonesia's success in enrollment into availability and equitable access to medicines, particularly for the geographic populations whose need is greatest, requires more investments in health system capacity, particularly in remote areas.

Thailand: Monopsonistic purchasing power and institutionalized supply chain governance

(1) The fragmentation challenge

In 2001, Thailand had three separate public insurance schemes, each serving different population groups. The Civil Servant Medical Benefit Scheme (CSMBS) for government employees and their

dependents was managed by the Ministry of Finance; the Social Health Insurance (SHI) scheme for private sector employees was managed by the Social Security Office; and a targeted scheme for the poor was managed by the Ministry of Public Health. Approximately 30 percent of the population remained uninsured. The three schemes operated with different benefit packages, different provider payment systems and rates, and different procurement arrangements. This created institutionalized fragmentation across funding sources.

Fragmentation was also evident in pharmaceutical procurement. Each government hospital conducted its own procurement for almost all medicines. The procurement prices obtained by individual hospitals not only were inefficient, but they were completely disconnected from the provider payment rates of the different coverage schemes. The overall result was a passive purchasing architecture in which the payer had no leverage over procurement prices or service delivery costs, and spending escalated with no governance mechanism to contain it.[136]

Fragmentation across policy domains reinforced this picture. Clinical guidelines were developed by the Ministry of Public Health's Department of Medical Services, while procurement rules were dictated by the Ministry of Finance's central procurement regulations, and provider payment rates were set independently within each financing scheme. These separate policy communities operated without a coordination mechanism that could align clinical necessity, procurement price, and reimbursement rate within a cohesive governance framework.

(2) The governance entry point: The UCS

Thailand's governance entry point was the 2002 UCS and the creation of NHSO as its implementing agency to cover all population groups not covered by CSMBS or the SHI scheme, which is currently about 75 percent of the population. This legal reform simultaneously provided automatic coverage for those who were uninsured, consolidated most of funding under a single scheme, created an institutional purchaser with a legal mandate for strategic purchasing of services and products, and put in place the legal and financial framework for centralized procurement of high-cost medicines.[137]

The National Health Security Act and NHSO mandate

The National Health Security Act (2002) provided NHSO with a legal mandate to purchase services for UCS beneficiaries, specifying that purchasing should be conducted strategically, not through passive fee-for-service payment but through active contracting, defined benefit packages, and closed-end provider payment mechanisms designed to achieve quality and efficiency.[138] This mandate was operationalized through four interconnected purchasing mechanisms:

(1) Capitation payment for primary care: NHSO contracts with District Health System networks, paying an adjusted per capita rate for the registered population and thus creating a defined financial obligation and a corresponding incentive for provider networks to manage referrals and costs efficiently.

(2) Global budget with DRG-based inpatient payment: NHSO pays for inpatient care using Diagnosis Related Groups (DRGs) within a global budget ceiling to prevent cost escalation by placing a system-level cap on total inpatient spending while maintaining case-based payment that preserves incentives for efficient management of each hospital case.
(3) Central procurement for high-cost medicines through GPO: NHSO leverages its monopsonistic purchasing power to negotiate lower prices for high-value medications that individual hospitals could not negotiate effectively. To eliminate price dispersion at the hospital level, the NHSO also mandates GPO procurement for these specific high-cost categories.
(4) Unbundling of specific high-cost interventions from closed-end payment: For conditions where DRG payment would create incentives for under-provision, NHSO disaggregates these interventions and pays on a pre-determined fee schedule.

The E2 program: Institutional procurement for high-cost medicines

The strategic purchasing architecture created by NHSO was extended in 2008 through the E2 program, which introduced central procurement with GPO for selected high-cost specialty medicines. The E2 medicines—initially covering 10 specialty medicines for 21 indications, including oncology therapies—were mandated to be covered by all public insurance schemes for patients meeting specific clinical criteria. NHSO implemented central procurement through GPO for these medicines, replacing the fragmented hospital-level procurement.[139,140]

By centralizing procurement authority for the highest-cost, most variable-priced medicines in the system, NHSO eliminated the largest source of disconnect between pricing and payment at the hospital level. GPO prices, negotiated with NHSO's full purchasing power, became the reference prices for NHSO reimbursement, aligning the procurement price and the payment rate within a single institutional framework.

(3) Other governance elements

A summary of governance elements in place for Thailand's supply chain financing functions is presented in Table 7 with a qualitative assessment of the element.

Formal coordination mechanisms

The three coverage schemes sit under three entirely separate institutional homes in different ministries with no statutory mechanism requiring them to coordinate. Given resistance to institutional integration, Thailand has made iterative efforts to harmonize benefit packages and payment rates across its three insurance schemes. These cross-scheme coordination steps represent a gradual reduction of the fragmentation that the UCS governance architecture manages but does not fully eliminate.[141]

Adaptive learning and evidence-based decision-making

E2 program expansion: The E2 program has expanded progressively from 10 medicines for 21 indications at launch to a broader list, with each addition governed by the same HTA and clinical criteria framework. This represents adaptive expansion of the central procurement mechanism—continuously adjusting which products warrant centralized procurement based on evolving evidence about cost-effectiveness and access.

Benefit package evolution: The NHSO benefit package has progressively expanded to cover high-cost conditions that create catastrophic financial risk, including renal replacement therapy and antiretroviral therapy. Each expansion is governed by an evidence-based HTA process through HITAP, linked to a transparent budget negotiation with the Bureau of Budget. This is a mature, institutionalized adaptive learning cycle in which evidence generated by the HTA assessment informs the NHSO benefit proposal, which in turn informs the budget negotiation. Implementation of the package is monitored, and the outcomes influence coverage decisions in the subsequent year.[142]

TABLE 7. Supply chain financing governance elements in Thailand

Governance Element	Status	Key Mechanism
Aligned legal, regulatory, and strategy frameworks	Strong	National Health Security Act (2002); Public Procurement Act (2017); NHSO mandate; National Essential Medicines List; HITAP legislation; GPO central procurement mandate
Formal coordination mechanisms	Strong	NHSO-Bureau of Budget annual capitation negotiations; cross-scheme emergency care harmonization
Transparency mechanisms	Strong	NHSO annual reports; HTA assessment process publicly available; E2 program clinical criteria published; claims data systems
Performance accountability	Strong	Capitation payment with annual evidence-based review; DRG global budget ceiling; NHSO complaint management system (24-hour call center); supplier accountability through GPO
Adaptive learning	Strong	HITAP-NHSO evidence-to-policy cycle; annual benefit package review; E2 program expansion based on evidence; cross-scheme harmonization iterations

(4) Outcomes achieved and limitations

Thailand's UCS governance architecture has produced strong and comprehensive outcome improvements, demonstrating what becomes possible when supply chain financing functions are largely consolidated and all five governance elements are institutionalized and operating as a coherent system.

However, Thailand's UCS continues to face persistent fiscal pressure, with health costs in the public sector accounting for 15 percent of general government expenditure, a level of major concern to successive governments. Three separate insurance schemes continue to operate with different benefit packages and payment rates, creating residual fragmentation that governance has managed but not eliminated.[143]

Prices: NHSO's exercise of monopsonistic purchasing power through its central procurement and the E2 program led to price reductions for covered medicines. The E2 central procurement model demonstrated that consolidating procurement for high-cost medicines through GPO generated significant savings while maintaining quality standards. Through capitation and DRG provider payment systems, the broader UCS purchasing architecture substantively controls cost escalation that had characterized CSMBS passive purchasing.

Availability: UCS members were entitled to free services at their registered District Health System network from the scheme's inception, and increased utilization was observed for both outpatient and inpatient services. The E2 program's impact on specific availability metrics is documented. After NHSO unbundled cataract surgery from DRG payment and introduced central bargaining on lens prices, the number of cataract operations doubled in four years, from 71,823 lens replacements in 2008 to 143,553 in 2012.

Equitable access: The equity outcomes are also strong. Households experiencing catastrophic health expenditure—for both services and medicines—fell from 6 percent in 1996 to 2 percent in 2015. Out-of-pocket payments as a share of current health expenditure fell from 34.2 percent in 2000 to 12.1 percent in 2016, sustained by a comprehensive benefit package and near-zero copayment at the point of service. Domestic general government health expenditure remained stable as a share of GDP, while coverage expanded to the uninsured population and the benefits package has become more generous, including the coverage of more high-cost medicines. This demonstrates that the governance architecture has delivered efficiency alongside improved access.

(5) Lessons from Thailand

- **A legal mandate for funding consolidation and strategic purchasing, backed by clear institutional authority and effective operational design, can transform supply chain financing outcomes.** NHSO has the mandate, purchasing power, incentive architecture, and institutional capacity to govern supply chain financing strategically and has achieved improvements in prices, availability and equitable access of essential services and medicines.
- **All five governance elements operating as a coherent system produce outcomes that no single element can achieve alone.** All five governance elements helped consolidate funding and create purchasing power and the enabling conditions to achieve the goals of improved access to essential services and medicines. This has been made possible by the legal framework that creates the mandate; coordination mechanisms that align procurement and financing and payment; transparency mechanisms that support the HTA and performance monitoring; and accountability that links authority with consequences. Adaptive learning and evidence-based decision-making has enabled incremental expansion of effective coverage and allows the UCS to align commitments in terms of services and medicines with available resources.

- **Adaptive learning sustains strong governance outcomes over time.** Thailand's UCS has persisted through eight rival governments, six elections, and two coups d'état, maintaining its core governance architecture through political turbulence that would have undermined less institutionalized systems.[144] This resilience reflects the degree to which the governance elements have been embedded and persist independently of political leadership. Adaptive learning is the governance element that has helped protect all of the others for sustained progress.

V. Implications for operationalizing the governance elements

A. What effective governance looks like in practice

The examined country experiences provide insights into how the five supply chain financing governance elements can be effectively organized and operationalized in practice. They also reveal the set of enabling conditions required for governance elements to operate effectively and achieve results. In many cases, these enabling conditions relate to other governance elements being in place, demonstrating their interconnectedness. Across all five governance elements, PFM capacity and interoperable data systems that routinely generate actionable information are foundational enabling conditions. In particular, the country experiences show that legal obligations are unenforceable if funds are not released reliably.

Below, we characterize what each element looks like when it is genuinely operational and identify the conditions that make this possible.

(1) Aligned legal, regulatory and strategy frameworks

In practice, aligned legal, regulatory and frameworks means that the laws governing health financing, public procurement, and pharmaceutical regulation create connections across supply chain and financing policies and functions and are mutually consistent and reinforcing. Chile's AUGE Law combined with the CENEBAST Law, and Thailand's National Health Security Act combined with the Public Procurement Act show that legal frameworks can be transformative when they assign responsibilities for supply chain financing functions to institutions and define how they relate to each other, specify actions that are enforceable, and embed review mechanisms with evidence-based updates to the legal framework.

The country cases analyzed in this paper indicate three key preconditions that are necessary for this element to function.

The first is a **process for finding and resolving inconsistencies between different sectoral laws**. In the process leading to Chile's AUGE reform, the Lagos government's health reform agenda

(2000–2006) was grounded in an explicit diagnosis of legal fragmentation between the FONASA financing framework, the ISAPRE regulatory structure, and the procurement and supply system. This diagnosis led to the design of an integrated reform of Law 19.966.[145] Reform did not consolidate these different legal frameworks, but it created binding obligations across different domains. These obligations bound FONASA to finance a defined benefit package, CENABAST's procurement, and both were integrated with a fiscal verification mechanism in the Ministry of Finance. In contrast, Indonesia demonstrates what happens without a process to diagnose inconsistencies and establish binding obligations across different domains. With the JKN, an integrated legal structure was created for financing through the establishment of the unified national health insurance system. However, the LKPP procurement law and the pharmaceutical pricing regulations governing the e-catalogue were created outside the legal framework of the purchasing agency, BPJS Kesehatan, so the supply chain functions are not integrated with the legal structure concerned with reimbursement.

The second enabling condition is the presence of a **legislative champion with the mandate and authority to initiate cross-domain reform**. The AUGE reform succeeded in Chile because the MOH had the technical capacity and political authority to define binding obligations across different domains. In the absence of such a champion with a mandate and authority, legal reform often stalls. The Minister of Health and the Executive Director of Ethiopia's EPSS jointly spearheaded the Pharmaceutical Fund and Ethiopian Pharmaceutical Supply Service Establishment Proclamation, which expanded the mandate and authority of EPSS, including the legal authority to settle outstanding facility debts by deducting funds from facility bank accounts. This would address one of the consequences of the pricing and payment disconnect, although not the root causes.

The third enabling condition suggested by the country examples is a **compliance monitoring mechanism**: a body or process with the mandate and access to necessary data to verify whether legal obligations are being met and to trigger consequences when they are not (linked to the "performance-based accountability" governance element). In Thailand, for example, NHSO has the mandate and data systems to monitor compliance with its purchasing authority.

(2) Effective formal coordination mechanisms

In practice, effective formal coordination mechanisms mean cross-institutional have defined decision rights, meet regularly, and make decisions that are implemented. The country cases examined in this paper suggest four enabling conditions.

The first of the four conditions for effective formal coordination mechanisms is **a clear mandate specifying which decisions the mechanism owns versus which it advises on**. In the case of Canada's pCPA, if negotiations between the pCPA and a drug manufacturer are successful, both parties sign a Letter of Intent outlining a mutually agreed-upon confidential price, financial risk-sharing structures, and clinical criteria for coverage. This initial agreement is non-binding. Based on the LOI,

individual jurisdictions can go on to complete listing agreements with the manufacturers that are legally binding for that product's price.

The second condition is **a secretariat with dedicated capacity**. Canada's pCPA secretariat was initially hosted by the Government of Ontario, but it became a stand-alone organization in 2019.[146] The secretariat prepares the technical dossiers for each negotiation, tracks the implementation of concluded agreements, maintains the dashboard, and manages negotiation strategies across successive product cycles. In Ethiopia, the compact process to formally coordinate between the government and donors relied on informal secretariat support rather than a dedicated, resourced secretariat function. This support has not extended into the parallel, commodity-specific working groups, which remain fragmented and only loosely coordinated.[147]

The third condition suggested by the country examples is **a shared information base**. This allows all participants to have a common picture of the problem the mechanism is designed to target. An example of this is Canada's CDA HTA: Its reports provide a shared clinical and economic evidence base that all pCPA participants use as the basis for negotiations. Ethiopia's CDSS is also designed to provide this shared information function, but it has been limited by interoperability issues across the five data systems it relies on.

The fourth condition is **a consequence structure for nonparticipation or noncompliance**. The consequence does not necessarily have to be legal. For example, Canada's pCPA has no legal mechanism to enforce participation of provincial governments or over provincial formulary decisions. But for the mechanism to be effective, the cost of non-coordination must be higher than the cost of coordination. Provinces that do not participate in pCPA pay more for medicines for which there is a negotiated price, and through the price dashboard, the price is visible to both the legislature and the health ministries. For Ethiopia's compact model, external resources are provided based on alignment, and therefore, there is a financial incentive for coordination.

(3) Transparency mechanisms

In practice, transparency mechanisms make relevant information accessible to the actors who use it to make decisions and to those who are holding decisionmakers accountable. The country cases examined in this paper suggest three enabling conditions for transparency that leads to improved outcomes.

The first enabling condition requires **data systems that generate the relevant information routinely**. While data systems in all of the countries studied generate routine information that is relevant for improved governance, the most intractable remaining challenge is extending those data systems to front line primary care providers. Ethiopia's eLMIS provides real-time visibility on product stocks across central and regional warehouses, but information on product stocks is not available at the health facility level, the point at which stockouts actually affect patients. In Ghana, the GhLMIS is well established at national and regional levels, but utilization of the system at the primary care level remains limited.

For data to be relevant, different data systems may need to be connected, so the second enabling condition is **interoperability**. Thailand's NHSO claims data, GPO procurement price data, and hospital reporting data are sufficiently integrated for NHSO to simultaneously see what medicines are being prescribed, what GPO procurement prices are, and what the payment obligation of the facility is. It can then use this integrated picture to renegotiate GPO prices and adjust capitation rates that are paid to providers. On the ChileCompra platform, relevant data are linked in ways that allow price comparisons across contracts. It is this link that enabled civil society to identify collusion patterns that were invisible when procurement data was siloed within individual purchasing agencies. However, these are rare examples of successful interoperability: Smith et al.'s forthcoming background paper for the CGD Working Group describes this in further detail.[148]

Instead, data systems in many countries remain fragmented with limited ability to speak to each other. For example, Indonesia's e-catalogue makes prices visible nationally, but the BPJS Kesehatan claims data that captures the details of the prescription process is stored in a separate system that does not feed into procurement planning. Disconnects like this result when data systems are designed for operational purposes within a single institution, and not to answer cross-institutional governance questions.

The third enabling condition is a **data-use mandate and culture**. A data use mandate clearly dictates who is responsible for acting on which data, with failure to comply resulting in sanctions. In Canada, CADTH HTA reports are the mandated technical foundation for pCPA negotiations. Indonesia's e-catalogue, on the other hand, makes prices publicly visible, but there is no institution that has a mandate to monitor whether facilities are procuring at catalogue prices. Data use culture—the behavioral and institutional norms that determine whether the data made visible by a transparency mechanism is used and acted upon in routine decision-making—is a less tangible but important aspect of making transparency meaningful and actionable.[149]

(4) Performance-based accountability

In practice, performance-based accountability means that each institution knows what it is accountable for, to whom, and faces real consequences if it falls short. The country cases examined in this paper suggest three enabling conditions for performance-based accountability.

The first enabling condition is **that institutional mandates need to be precise enough** that accountability can be assigned if a function fails. This is directly related to the "aligned legal, regulatory and strategy frameworks" governance element. Thailand's National Health Security Act mandates NHSO to purchase health services and supplies through strategic purchasing mechanisms with enough precision that accountability for purchasing outcomes can be attributed to NHSO.

The second enabling condition is that **performance has to be visible to the institution or actor with the authority to act on it**. Canada's CDA HTA outputs, for example, provide the basis for holding the

pCPA accountable for achieving value in a negotiation. In contrast, Ghana's GhLMIS and GIFMIS data systems generate stock and budget execution data, but there is no integrated dashboard that allows the MOH or NHIA to see whether supplier performance, payment timeliness, and stock availability are moving in the right direction.

The third enabling condition is that there have to be **consequences** when performance falls short. Through NHSO's annual renegotiation of GPO procurement prices, suppliers who do not meet delivery, quality, or price commitments will be excluded from the GPO procurement mandate for subsequent cycles. Underperformance in one year is reflected in changed contract terms or delisting in the following year.

(5) Adaptive learning and evidence-informed decision-making

Adaptive learning and evidence-informed decision-making is system-level accountability. In practice it means governance bodies have institutionalized cycles in which performance data is systematically analyzed and policy adjustments are made in response. The country cases in this paper suggest three enabling conditions for adaptive learning and evidence-based decision-making.

The first enabling condition is that data systems generate **outcome-level evidence** beyond process metrics. Procurement volumes, disbursement rates, and other process indicators provide information on whether the system is running as designed. They are also useful for holding individual actors accountable. Outcome-level evidence like stockout rates, the level of out-of-pocket payments by patients, medicine availability surveys etc. provide information on whether the system is producing the intended results.[150] Thailand's HITAP program evaluates whether the interventions in the benefits package are actually producing health outcomes that justify their cost and inclusion in the benefits package. That evidence feeds directly into NHSO's annual benefit package review. Ghana's monitoring systems, on the other hand, generate extensive process data (GhLMIS stock records, and NHIA claims totals), but outcome-level evidence is not yet generated systematically. During the 2019–2024 NHIA tariff freeze, the inflation data, the signs of suppliers disengaging, and the facility stockout rates were observable, but the information was not assembled into an assessment that any governance body was required to act on.

Second, there needs to be an **institutionalized review cycle**, or a scheduled process that brings outcome-level evidence to a body or bodies with both the authority and the obligation to act on it.[151] Thailand's annual mandatory process starts with HITAP evidence review that feeds into an annual benefit package proposal, which goes to the Bureau of Budget for fiscal approval. The package is then implemented and monitored for outcomes that inform the next cycle. Chile's AUGE package is reviewed by law every three years, with every proposed addition to the package evaluated for cost-effectiveness and fiscal feasibility. Canada's pCPA reviews its own negotiating scope continuously, and each negotiation generates evidence that shapes the next one. Ethiopia's Pharmaceuticals

Supply Transformation Plan (PSTP) is an emerging example of institutionalized review cycles. A Core Technical Team assessed performance against PSTP I targets and incorporated the findings into PSTP II design, including customer satisfaction survey data from facilities.

Third, the **review process is politically insulated**. Evidence can be brought into the governance process, but if political pressures keep it from being used for meaningful change, misalignments and sub-optimal performance of the supply chain financing system will persist. Countries that are able to act meaningfully on institutionalized review processes insulate them from political pressure, which can allow difficult changes to be enacted. Thailand's HITAP-NHSO cycle has kept making adjustments to the UCS benefits package across eight governments and two coups. Some of the adjustments have been politically unpopular, like reducing coverage for some conditions to free up resources to cover higher-priority interventions. This was possible because the technical review sits outside the Bureau of Budget's annual negotiations and away from the political pressures facing MOH leadership. Chile's 50 percent CENABAST tariff revision in 2024 was a controversial price increase that was nonetheless absorbed by the financing system without system disruption. This was possible because it was enacted following the triennial review cycle and the difficult adjustment was made through evidence and institutional deliberation rather than ad hoc political negotiation. By contrast, Ghana's NHIA tariff remained unchanged from 2019 to 2024 through a period of over 50 percent inflation, not because there was no existing review mechanism but because the tariff revision process was not institutionally insulated from the political pressures that kept the tariffs frozen.

B. The "who" of governance: Initiating, convening, leading, and accounting for political economy

The governance elements described in this paper are institutional and structural, but they need to be managed by bodies or agencies that often have equal or near equal power. The country examples provide some insights into who plays these roles and how the balance of power can be negotiated. This may play out differently at different stages of governance reform—initiating governance reform, and convening stakeholders on a routine basis to implement reforms. There is also an intangible leadership element that may not be directly connected to specific institutional roles.

Initiating governance reform

In every advanced case examined in this paper, governance reforms were initiated by a combination of political leadership and technical champions within government institutions. Thailand's UCS was initiated by a committed prime minister working together with a health finance team that had prepared a reform blueprint. Chile's AUGE system was driven by a presidential health reform agenda and supported by an inter-agency health commission with technical expertise drawn from within and outside of the country.[152] Canada's pCPA was started by provincial premiers acting collectively through the Council of the Federation. In each case, the reform had both a high-level political sponsor who provided the mandate and a technical team who were empowered to design and implement

the reform. In countries at earlier stages—Ethiopia, Ghana, Indonesia—the absence of a sustained political-technical pairing to initiate and sustain governance reforms has been a limiting factor.

Convening

Ministries of health, ministries of finance, procurement agencies, national health insurers, central medical stores, and subnational health authorities all operate with their own legal mandates and, in many cases, none has inherent authority over the others. Who has the authority to convene this group of stakeholders—bring them together, set the agenda, and enforce follow-through—does not typically have an obvious answer.

To navigate the challenge of coordination among agencies with roughly equal political power, the country experience examined here suggests that it is helpful if the convener is not an institution within the health sector but one with political authority above it. In Chile, the presidency is the convener and has the authority to require coordination across the MOH, the Ministry of Finance, FONASA, and CENABAST.

In Thailand, the convener is the statutory purchaser, NHSO, which is an agency within the health sector. NHSO's legal mandate as the purchasing agent for UCS beneficiaries requires the MOH, the Bureau of Budget, GPO, and hospital networks to engage with it because they all depend on the purchasing relationships NHSO controls.

In Canada, the convener is a collective of provincial leaders rather than a single institution. The Council of the Federation established the pCPA as a joint mandate, which means that convening authority rests with the collective political commitment of all participants rather than with any one province or the federal government.

In Ethiopia the compact model provides a coordination architecture, but no domestic institution has the standing to convene the MOH, RHBs, EPSS, and development partners as genuine equals with shared accountability for outcomes. The compact is successful where donor relationships create sufficient incentive for participation and fails where they do not, which is why compact alignment has been uneven.

Leadership

In every case examined, individual leadership, regardless of institutional affiliation and relationships, emerges as a feature of successful governance reform. Thailand's NHSO has been sustained in part by a group of health economists and public health professionals who have held technical leadership positions across successive governments. Canada's pCPA has been in part maintained by provincial health officials who developed trust through years of joint technical work before the alliance was formalized. Chile's CENABAST reforms were partly driven by a sustained civil society and academic community that lasted through multiple political transitions. These types

of leadership dynamics are not easily designed and emerge from long-term investments in human capital across successive political cycles.[153]

C. Political economy and incentive alignment

Supply chain financing governance sits at the intersection of large financial flows and institutional power relationships.[154] Governance reforms like procurement consolidation will reduce the power of some involved, while price transparency reduces the information asymmetries that allow suppliers to price-discriminate or others to engage in behaviors that advantage themselves.[155] Performance accountability creates consequences for officials with underperforming programs. Each of these steps represents both a governance improvement and a political challenge simultaneously, since there will be some perceived or real losers in terms of money and power. The country cases examined here suggest that governance reforms are most feasible when they negotiate this redistribution of power and money gradually and build progressive gains that are visible and can counter individual losses. This may include: (1) creating visible gains for multiple actors simultaneously (e.g., lower prices benefit both insurers and patients); (2) starting with lower-threat interventions (coordination before transparency); and (3) building a constituency of beneficiaries before confronting entrenched interests.[156]

VI. Key lessons and recommendations

A. Key lessons

This study examined six countries' experience in improving health supply chain financing governance to mitigate the consequences of fragmentation. The countries span three geographic regions, four income levels, and five distinct health financing architectures. The following lessons synthesize cross-cutting patterns and are ordered from the most universally applicable to the most system-specific.

Lesson 1: Improved supply chain financing governance can yield measurable outcomes independently of the financing structure

Countries do not necessarily need to consolidate financing pools to mitigate the consequences of fragmentation on supply chain financing outcomes. Each of the five governance elements—aligned legal, regulatory, and strategy frameworks; effective formal coordination mechanisms; transparency mechanisms; performance-based accountability; and adaptive learning and evidence-based decision-making—can be applied within existing fragmented financing arrangements to reduce the consequences of that fragmentation.

Thailand did not achieve its improved supply chain financing outcomes by eliminating the CSMBS or social security schemes: It did so while managing three separate financing arrangements.

Canada did not merge its 13 provincial drug plans, rather it coordinated them through the pCPA to increase price negotiation power. In each case, governance mechanisms worked within the structure of existing financing.

Conversely, as the case of Indonesia shows, consolidation of financing streams does not guarantee improved governance or outcomes. Without clear institutional mandates and formal coordination mechanisms, Indonesia continues to struggle with core misalignments, particularly between procurement prices and provider payment rates.

Lesson 2: Without universal effective coverage, governance mechanisms applied differently to different segments of the population cannot achieve equity outcomes

The structural equity gap in Chile and Ghana caused by differential insurance coverage illustrates that supply chain financing governance should be improved within the context of UHC to ensure that the entire population can benefit from lower prices, improved availability, and better access.

Lesson 3: Properly functioning PFM systems and payment timeliness are binding constraints on the effectiveness of supply chain financing governance

Supply chain financing governance improvements fail to produce sustained results in the absence of reliable, timely disbursement of funds through PFM or the payment systems of public insurance or purchasing agencies. Procurement transparency, like Indonesia's e-catalog, cannot improve availability if suppliers are not reliably paid. Price reductions achieved through a consolidated procurement process, such as Ghana's framework agreements, lose credibility when suppliers are not paid on time, and when facilities and patients bypass procurement mechanisms. Legal mandates cannot prevent stockouts when facilities have accumulated arrears that leave central medical stores unable to replenish stocks and suppliers to disengage. Well-designed governance mechanisms will fail operationally unless complementary investments are made to improve PFM systems to routinely release budgets on time and in full and ensure purchasing agencies make process claims quickly and make timely payments to providers.

Lesson 4: A formal coordination mechanism is the most accessible entry point and can achieve substantial improvements without structural reform

For LMIC governments, the earliest and most accessible governance tools available are formal coordination mechanisms, such as interministerial bodies, compact agreements, joint price negotiation, and pooled procurement platforms, as they do not require new legislation, structural reform, or advanced institutional capacity. Instead, the only requirement is that institutions with relevant authority agree to coordinate, and for that this coordination to be formalized, resourced, and reinforced by consequences for nonparticipation.

Canada's pCPA and Ethiopia's compact agreements, which operate at opposite ends of the system resource spectrum, both demonstrate this. Ethiopia's compacts did not resolve the country's complex fragmentation challenges, but they established the institutional relationships and shared data practices that made other governance improvements like the CDSS system better integrating forecasting and budgeting more effective. Canada's pCPA did not create a single national pharmaceutical benefit program, but it resulted in price reductions of 20–35 percent that no individual province could have negotiated by itself. It may also have played a role in paving the way for Pharmacare, which is gradually bringing greater equity across provinces in access to essential interventions. In both cases, coordination produced outcomes without changing the underlying financing structure.

Lesson 5: Transparency is a necessary but not sufficient enabling condition for accountability

Every advanced governance outcome examined in this study was built on a foundation of transparent, actionable data. ChileCompra's open contracting data allowed civil society to identify and challenge conflicts of interest in CENABAST procurement. Ghana's framework contracting anchored in the NHIS payment rates made prices transparent and increased negotiating power. Indonesia's e-catalogue made medicine prices publicly visible and created the conditions for more efficient procurement down to the health facility level. Thailand's NHSO uses transparent procurement price and utilization data to renegotiate supplier contracts annually.

But transparency alone did not improve supply chain financing outcomes in any of these cases. In Ghana, the framework contract made prices transparent, but suppliers still withdrew their services when NHIS payment arrears accumulated. In Indonesia, the e-catalogue made prices visible, but it did not make those prices accessible in facilities lacking trained procurement staff, e-catalogue credentials, or sufficient cash flow to procure consistently using the e-catalogue. Investments in transparency must be paired with the institutional strengthening and enabling factors that translate visible information into action, such as payment reliability, procurement capacity, and regulatory enforcement. Transparency also needs to apply across the entire system. In Chile, extending ChileCompra negotiated prices to private retail pharmacies has expanded the reach of this governance reform and the share of patients benefiting from the lower prices and reduced out-of-pocket payments.

Lesson 6: Misaligned payment and procurement prices and payment delays remain a central governance challenge for most countries

Disconnects between pricing and payment are root-cause drivers of downstream access barriers, like stockouts and arrears from health facilities to central procurement agencies and other suppliers. The procurement price-payment disconnect appears in every case study with a public health

insurance system: Ghana's NHIA tariff mismatch and reimbursement arrears caused suppliers to withdraw from the framework contracts; Indonesia's BPJS Kesehatan verification delays prevented facilities from using e-catalogue prices; Ethiopia's CBHI tariff structure created mismatches with EPSS pricing that generated arrears in the supply chain.

The governance mechanism that most directly resolves this misalignment is legal institutional mandates that allow purchasers to adjust benefit packages, negotiate prices, and enforce payment processes. Adaptive learning and evidence-based decision-making is also needed to routinely update provider payment rates based on market intelligence and other relevant evidence. In contexts with high inflation and currency volatility, a dynamic approach to revising payment rates is needed for payments to providers to keep pace with more rapidly changing procurement prices. NHSO can set capitation rates, negotiate GPO procurement prices, and unbundle high-cost interventions from DRG payments. This established a payment system that systematically prevented the payment arrears and supplier disengagement patterns that undermined supply chains in the other cases.

Lesson 7: Provider incentive structures and patient perceptions limit what governance improvements can achieve

From the cases of Chile and Indonesia, it is clear that price reductions achieved through greater transparency do not translate into equitable access if provider incentive structures and patient perceptions systematically direct demand toward more expensive products. Supply chain financing governance that does not address the demand side is likely to be undermined by provider and patient behavior.

Lesson 8: Adaptive learning can sustain governance outcomes through political, financial, and product market change

Every country in this study that achieved durable supply chain governance outcomes, such as Canada, Chile, and Thailand, have invested in and implemented governance mechanisms that respond systematically to changing evidence and conditions. By contrast, a country like Indonesia may have robust governance frameworks in design but still lack the systematic learning mechanisms to detect when those changing conditions or system failures, and the feedback mechanisms adjust policies in response. Adaptive learning is the mechanism that allows every other governance element to adapt to the changing context of supply chain financing over time.

B. Toward a progress pathway

The country experience examined in this paper points toward a progress pathway or a logic of progression in which governance elements build on one another, creating the enabling conditions

for the next phase and building a more robust, integrated and resilient governance framework over time. Figure 3 maps the observed status of each governance element in the countries examined to outcomes, which informed the progress pathway outlined in Table 8.

Countries can enter this pathway at any phase, and progress is neither linear nor irreversible, but the country experience shows that certain governance investments are prerequisites for others.

FIGURE 3. Governance elements and associated supply chain financing outcomes in the studied countries

	Governance elements					Outcomes improved		
	Legal & regulatory frameworks	Coordination mechanisms	Transparency mechanisms	Performance accountability	Adaptive learning	Price reductions and/or convergence	Reliable availability	Equitable access
Ethiopia	Emerging	Strong	Emerging	Absent	Emerging	Partial—price reductions achieved but variation persists	Weak—availability and stockout challenges persist	Weak
Ghana	Emerging	Emerging	Emerging	Emerging	Emerging	Partial—price reductions achieved but fragile	Weak—framework contracting worsened availability	Weak—gaps for uninsured and rural poor
Indonesia	Strong but gaps	Weak	Strong	Emerging	Absent	Strong but may be eroding	Partial—wide geographic variation	Partial—out-of-pocket payments fell but geographic variation
Chile	Strong	Emerging	Strong	Emerging	Strong	Strong	Strong	Partial—high out-of-pocket payments continue
Canada	Strong	Strong	Strong	Weak	Strong	Strong	Strong—but increased time to access new medicines	Partial—geographic disparities persist
Thailand	Strong	Strong	Strong	Strong	Strong	Strong	Strong	Strong

Early-stage governance (Phase 1) focuses on mitigating the most acute and immediately harmful consequences of fragmentation: information silos and forecasting-budgeting mismatches, and lack of strategic approaches to pricing policy (setting, negotiating, regulating or influencing prices through the supply chain to end users). These challenges can begin to be remedied with basic coordination mechanisms, clearer mandates for institutions, and more strategic approaches to pricing policy. These responses require relatively modest institutional capacity, and they do not require structural reform of financing arrangements. Phase 1 governance includes examples such as Ethiopia's compact agreements, Ghana's framework agreements, and Canada's early interprovincial drug price negotiation platform. These mechanisms create the platforms and institutional relationships that make more ambitious governance steps feasible. The enabling conditions at this stage include investments in data systems (integration and interoperability of key supply chain,

financing, and service delivery data and simple dashboards), predictable fund release from treasury to health sector institutions, and capacity in the procurement and/or purchasing agency for strategic price setting or negotiation.

Intermediate governance (Phase 2) builds on the coordination foundation by incorporating transparency mechanisms and using market intelligence and purchasing power to progressively consolidate purchasing power and expand strategic pricing policy. In this phase, key purchasing and payment functions are aligned by ensuring supply chain costs are incorporated into product prices, and flowing negotiated prices into budget formulation and provider payment. More sophisticated institutional capacity is required for this phase. Indonesia, and to a certain extent Ghana, are operating in Phase 2 of supply chain financing governance progress. Key enabling conditions include interoperable LMIS and FMIS data with sufficient coverage to make procurement prices and fund flows visible across the system; market intelligence and supply chain cost information to inform budgets; adequate payment reliability to maintain supplier engagement; purchasing agency provider payment rate-setting; and budget execution improvements and claims processing capacity to avoid payment delays and ensure sustained supplier engagement.

Advanced governance (Phase 3) institutionalizes alignment across funding sources, policy domains and institutions through legal mandates, integrated policy and strategy frameworks, interoperable information systems, systematic performance-based accountability, and institutionalized adaptive learning and evidence-based decisionmaking. This phase is characterized by a governance architecture that continuously adapts in response to evidence and changes in circumstances. Thailand's NHSO, Chile's AUGE/GES/CENABAST system, and Canada's pCPA-plus-HTA alignment all represent Phase 3 governance. Examples include fully integrated LMIS, FMIS, and claims data systems with enough interoperability to answer cross-institutional governance questions; program-based budgeting aligned to supply chain cost structures; institutional capacity to conduct outcome-level assessments and to translate evidence into governance adjustments; and technical review processes being politically insulated from short-term budget cycles.

Table 8 illustrates the progress pathway, mapping each phase to its main fragmentation target, governance tools, and enabling conditions, with country examples from this study.

TABLE 8. Illustrative progress pathway for supply chain financing governance

Phase	Focus	Primary Fragmentation Addressed	Governance Investments and Tools	Enabling Conditions	Country Examples
Phase 1	Early coordination and strategic pricing policy	Forecasting-budgeting mismatch; high and variable prices; information silos; uncoordinated donor and government procurement	Clearer institutional mandates; coordination platforms and mechanisms (compacts, interministerial bodies); strategic pricing policy mechanisms (e.g., improved tendering process, framework agreements, etc.); basic transparency through LMIS/FMIS data generation at central and regional levels and integration with a subset of financing and service delivery data	Investments in interoperability of key aspects of data systems and simple dashboards; predictable fund release from treasury to health sector institutions; capacity in the procurement and/or purchasing agency for strategic price setting or negotiation	Ethiopia; Ghana (between Phase 1 and 2)
Phase 2	Purchaser leverage, transparency, and pricing-payment alignment	Centralized-facility procurement misalignment; pricing-payment disconnect; parallel supply chain functions	Central procurement authority (e-catalogue, pooled purchasing); purchaser with clear mandate and tools to align payment rates with procurement prices; transparency platforms linking formulary, price, and claims data and producing market intelligence; expand strategic pricing policy beyond narrow scope (scheme, population, products)	Interoperable LMIS and FMIS data with sufficient coverage to make procurement prices and fund flows visible across the system; budgeting aligned to supply chain cost structures; payment reliability sufficient to sustain supplier engagement; purchasing agency rate-setting and claims processing capacity to align payment rates with procurement prices and pay providers in a timely manner	Ghana (between Phase 1 and 2); Indonesia
Phase 3	Integrated governance	Residual cross-scheme fragmentation; provider incentive misalignment; geographic equity gaps	Legal mandates integrating service prioritization, financing, and procurement; evidence-based benefit packages; strategic pricing approaches used system-wide; performance accountability across full supply chain cycle; adaptive learning systems	Fully integrated LMIS, FMIS, and claims data systems with interoperability sufficient to answer cross-institutional governance questions; institutional capacity to conduct outcome-level assessments and to translate evidence into governance adjustments; political insulation of technical review processes from short-term budget cycles	Canada; Chile; Thailand

Some practical insights for countries seeking to use this progress pathway also emerge. First, most LMICs are in Phase 1 or early Phase 2, and the governance investments that will matter most for them are clarifying institutional mandates, developing effective formal coordination mechanisms, introducing or strengthening strategic pricing approaches, and creating more interoperable data systems that generate actionable data.

Second, advancing through the phases is not automatic, and governance frameworks are not self-implementing. They require the institutional capacity, political will, and financial commitment to implement them effectively. Even when financing streams are not being consolidated, each phase of supply chain financing governance improvement requires progressively more integration—of functions, of data, and across institutions. This cannot be accomplished without strong political will, convening power, and leadership.

Third, countries at any phase can implement specific governance tools from more advanced phases initially on a smaller scale for portions of the system, such as specific product classes, even if broader system-level conditions may be absent. Indonesia's SMILE supplies tracing system started for a narrow purpose, routine immunization and the COVID-19 response, before being expanded nationwide across all essential supplies. Ethiopia's CDSS, which was designed to link facility demand forecasts to committed financing and procurement orders for specific medicines, is a Phase 2 procurement transparency tool being adopted for a set of specific product classes in an otherwise Phase 1 governance context. This is possible because the data systems for EPSS-procured essential medicines are mature enough to support it, even while the broader FMIS/LMIS integration challenge remains unresolved.

Fourth, the outcomes of governance in Phase 3 need to be tested for resilience, or the governance architecture's capacity to uphold performance through instability. Resilience is not automatic in Phase 3 and requires deliberately separating of technical governance functions from political processes, continuously investing in institutional capacity, and designing governance mechanisms with built-in cycles to adapt based on new evidence and changing conditions.

C. Recommendations for supply chain financing governance improvement priorities

The country experience examined in this paper points to five policy priorities:

1. **Build coordination mechanisms first.** Formal coordination mechanisms are the earliest and most accessible tools of available to improve supply chain financing governance. They can lay the groundwork for subsequent governance investments and make them more likely to succeed. Governments should formalize and resource coordination mechanisms with explicit mandates and dedicated support, as well as stipulating consequences for nonparticipation.

2. **Prioritize investments in PFM systems payment reliability.** The most consistent finding across all six cases is that unreliable payment is the most direct driver of stockouts and supplier disengagement. Supply chain financing governance reforms cannot deliver availability and equitable access improvements if the payment infrastructure is unreliable. Governments should prioritize strengthening PFM systems, especially removing budget execution bottlenecks, and streamlining health insurance fund claims processing as prerequisites for, or critical concurrent, supply chain governance investments.

3. **Create the mechanisms to ensure prices reflect supply chain costs and flow through to budgets and provider payment-setting to avoid persistent stockouts and arrears.** Procurement prices, budgets, and provider payment rates are frequently set by different institutions on different cycles. This disconnect is a recurring driver of the arrears and stockouts documented across the case studies. Governments should establish a routine mechanism to align and updates payment rates and budget ceilings with procurement prices. This requires access to routine market intelligence and full information on the supply chain costs that need to be incorporated into prices.

4. **Invest in data integration across supply chain, financing and service delivery information systems as a foundational governance priority, even if initial steps are small.** Every advanced governance outcome in this study was dependent on integrated data to show procurement prices, what products are procured and where they flow, whether they reach patients, and whether payments are being made. This integration does not require a single unified system—Thailand, Canada, and Chile all use multiple data platforms—but it does require interoperability to connect data across systems to answer governance questions. Countries can start small by producing joint dashboards that draw from prioritized indicators taken from siloed data sources. Smith et al.'s forthcoming paper proposes a designated "Exchange Manager" with cross-ministerial authority to strengthen interoperability by assigning accountability for data exchange.[157] Investments in health information systems should from the start be designed to support governance use cases such as supplier performance monitoring, payment audits, procurement price benchmarking, and equity analysis. This design could be supported by allocating a portion of the initial health information system investments to support the Exchange Manager role or by conditioning payments for information systems on demonstrated data exchange.

5. **Extend supply chain governance to provider incentive structures and patient demand.** Supply chain financing governance frameworks that focus exclusively on procurement and pricing will continue to be incomplete and ineffective. They are undermined by provider incentive structures that direct patients toward more expensive branded products and by patient perceptions that more medicines means better treatment or that low cost always means low quality. Indonesia and Chile's case studies show that supply chain financing improvements that reach the facility level but not the patient are insufficient to deliver equity outcomes. Policy responses could include provider payment that decouples provider

income from medicine sales volume; generic medicine quality assurance communication strategies; and pharmacy regulation that enforces dispensing of formulary-listed generics.

6. **Design governance frameworks for adaptive learning and management.** The countries with the deepest and most durable supply chain financing governance outcomes invested in mechanisms that systematically detect and correct misalignment over time. This requires actionable outcome data to be routinely available, institutionalized annual review cycles for such key system elements as benefit packages, procurement processes and prices, and provider payment rates; formal mechanisms for translating process and outcome data into adjustments in system design and operation; and insulating supply chain financing governance decisions from short-term political volatility.
7. **Frame supply chain financing governance in the context of universal health coverage.** To achieve equitable access to essential medicines and products, supply chain financing governance improvements have to take place in the context of equitable coverage, which ultimately determines who gets access to more affordable and available medicines. Governance mechanisms that function well can still fail to deliver equity if they apply only to subset of the population.

VII. Limitations and areas for further research

This paper offers an illustrative set of practical steps countries can take to improve governance of supply chain financing and mitigate the consequences of pervasive fragmentation. The findings serve as a practical guide rather than a definitive causal analysis. This paper draws on a selected set of country cases chosen to illustrate governance approaches across regions, income levels, and system types, not to constitute a representative sample. Assessments of the impacts of the governance elements on outcomes are not substantiated by rigorous methods, which would substantially enrich the evidence base.

Several governance challenges identified in this paper remain underexplored. The governance of high-cost specialty products—a rapidly growing share of global medicine expenditure—is only partially addressed through the E2 program analysis in the Thailand case. The governance of supply chain financing in humanitarian and conflict-affected settings, where donor dependence is highest and state governance capacity is most constrained, is outside the scope of this study.

There are two additional areas that warrant further investigation. First, the applicability of the governance recommendations may be different for different system archetypes (such as integrated public financing and service provision versus more complex health financing systems, highly centralized versus fiscally federal states, or high versus low donor-dependence contexts). Future research could test whether the progress pathway's phases hold across these archetypes or whether different entry points and sequencing are needed. Second, the interface between PFM reform and supply chain financing governance emerged as a critical factor but beyond the scope of this paper.

The conditions under which PFM investments (e.g., predictable transfers, program-based budgeting, integrated financial management systems) produce supply chain financing improvements and how PFM investments interact with governance arrangements for supply chain financing are important areas for further analysis.

VIII. Conclusion

Access to essential medicines and health products is not only a supply or resource problem—at its core, it is a governance issue. The countries that have achieved reliable, affordable, and equitable access to essential medicines and health products have built governance architectures that coordinate the decisions of fragmented institutions, aligned dispersed actors' incentives, and continuously adjust in response to evidence.

The governance framework proposed in this paper, which consists of five elements, three phases, and associated enabling conditions, is one available analytical tool. Countries enter governance reform at different points, with different institutional starting conditions and different fragmentation challenges. The value of the framework is to assist countries in identifying which governance investments they might prioritize.

The most important conclusion of this study is that meaningful supply chain financing governance improvements are universally available. Countries do not need to wait to begin improving governance. They need to start with their specific situation in mind and build the enabling conditions that will make each subsequent governance step possible.

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