CARISCA Centre for Applied Research and Innovation in Supply Chain – Africa

The Role of Supply Chain Management in Healthcare Access in Ghana

Report by: Priscilla Kolibea Mante, PhD

Research Faculty, CARISCA-KNUST and Senior Lecturer, Department of Pharmacology, Faculty of Pharmacy and Pharmaceutical Sciences, KNUST, Kumasi, Ghana.

USAID FROM THE AMERICAN PEOPLE

Arizona State University

KNUST KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

This report assesses the potential of Ghana's healthcare supply chain to ensure availability, adequacy, accessibility, affordability, and appropriateness of essential medicines.

The findings in this report are based on qualitative and quantitative cross-sectional data and retrospective data for the years 2019–2021. The report identifies the main challenges and outlines some good practices in Ghana's healthcare supply chain. It contributes to the body of knowledge on the healthcare supply chain in Ghana and its performance in the rational selection and use of medicines, affordable prices, sustainable financing, and reliability of health and supply systems to deliver medicines to users.

In general, stakeholders should focus on enhancing decentralization in the complex supply chain administrative structure which results in an average medicine availability of about 40% in the public sector. Recommendations include the efficient utilization of data and data tools through enhanced human resources and training as well as interoperability of data systems; decentralization of decision making in the public procurement system to remove unnecessary interference and to increase accountability; incentivization of the use of the e-procurement system; implementation of pricing strategies and price control toward regulated pricing; enactment of drug pricing transparency laws; expansion of private health insurance schemes to deliver equitable health outcomes while efficiently managing healthcare costs; and the harmonization of public and private healthcare supply chains to align resources with the national health strategy.

These strategies are critical in the transition to more sustainable supply chain systems to enhance Ghana's quest toward achieving universal healthcare through increased medicine access.

Inequity in accessing medicines has been underscored as one of the problems that needs to be addressed to improve health outcomes in Ghana. The efficiency of the healthcare supply chains in the country is critical to medicine access, as they ensure that patients are able to access the right medicines in the desired quantities whenever required.

1.0 INTRODUCTION

Within the broader health ecosystem, an effective healthcare supply chain ensures that quality medicines and medical supplies are available in appropriate quantities when and where they are needed. The World Health Organization's Sustainable Development Goal target 3.8 focuses on achieving universal health coverage by 2030. This coverage includes access to quality essential healthcare services and access to safe, effective, quality, and affordable essential medicines and vaccines for all (WHO, 2022).

Despite major strides made in improving access to healthcare in the past decade, Ghana did not meet the Millennium Development Goals 4 and 5 (Ghana Millennium Development Goals, 2015). Healthcare access is a complex and multi-dimensional concept without a consensus definition in literature. Generally, causes of inequitable access include increasing disease burdens, systemic challenges in service delivery, and societal challenges such as poverty and unemployment. With regard to systemic challenges in service delivery, poor access to medicines appears as one of the top challenges.

Effective Supply Chain Management (SCM) systems are instrumental in achieving healthcare access in Ghana. Such systems ensure essential medications are available in the right quantity and quality, at the right place and time, and at the right price. However, SCM systems hinge on the ability to forecast, procure, transport, and store these medications.

It therefore becomes necessary for the healthcare sector to understand and develop efficient supply chain management systems. These systems ensure end-to-end distribution of medical products with the goal of ensuring uninterrupted availability of essential medicines for patients. Such systems are especially important in low and/or middle income (LMICs) countries.

This report assesses healthcare access in Ghana considering the Patient Access Partnership (PACT) Conceptual Framework for Mapping Access to Health Care and the contribution of supply chains to promoting access. The PACT framework, as shown in Figure 1, recognizes five main elements of healthcare access—availability, adequacy, accessibility, affordability, and appropriateness. These elements are discussed in relation to a selected major domain of healthcare access: medicines, in both public and private health sector supply chains.

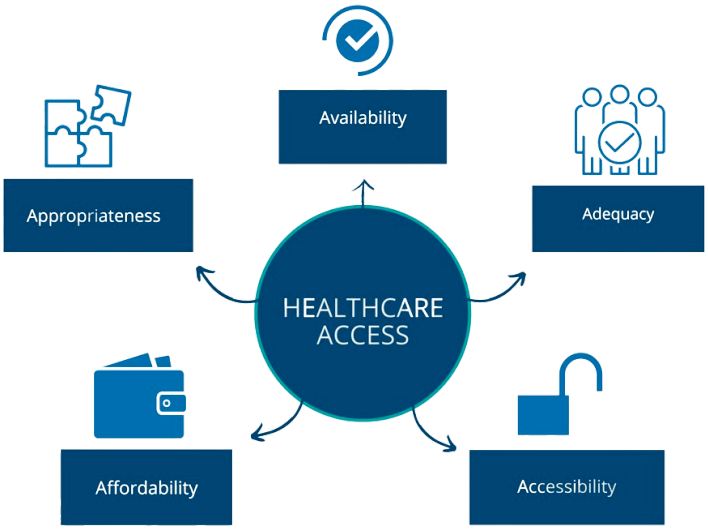


Figure 1: The five main elements of the Patient Access Partnership (PACT) Conceptual Framework for Mapping Access to Health Care (Adapted from the Patient Access Partnership, 2016).

2. OVERVIEW OF GHANA'S HEALTHCARE SECTOR

In order to understand how effective supply chain management can aid in providing better access to healthcare in Ghana, it is important to understand the overview and structure of the country's healthcare sector. Ghana's healthcare sector is one of the more advanced sectors in West Africa, yet it is still far below global standards.

The sector grapples with underfunding, inadequate healthcare professionals, and insufficient infrastructure. Over the years, the government has introduced several initiatives to widen healthcare access, notably the subsidized National Health Insurance Scheme (NHIS). However, Ghana continues to rely on foreign stakeholders for various aspects of the health delivery system. Growth drivers and constraints of the health sector are detailed in Box 1.

Box 1: Assessing Ghana's health sector

Growth drivers

- Local manufacturing sector benefits from government support.
- Domestic drugmakers are moving toward achieving WHO qualification and GMP certification, supported by the government's policies.
- The National Health Insurance Scheme provides basic care to the majority of citizens.
- Ghana's evolving demographic and epidemiological profile provides opportunities for pharmaceutical companies, particularly those producing non-communicable disease treatments.

Constraints

- Low incomes and limited out-of-pocket spending power.
- Generic drug competition from more established manufacturing bases - like India - pose threats to domestic manufacturing.
- Highly dependent on pharmaceutical imports.
- Counterfeit drugs, mainly from abroad, threaten to undermine sales from genuine pharmaceuticals.

2.1 Basic Structure of Ghana's Healthcare Sector

At the top of the hierarchy in Ghana's healthcare system is the Ministry of Health (MOH) and its agencies. These collectively set standards and operational procedures, regulate the sector, coordinate and allocate resources. The Ghana Health Service (GHS) is a subsidiary of the MOH, a public health service delivery agency governed by the GHS Council and established under the Ghana Health Service and Teaching Hospitals Act 525. The responsibility of GHS is to provide and manage health services at the regional, district, and subdistrict levels. The roles of the MOH and GHS sometimes overlap, although the GHS is to merely implement policies created by the MOH.

Teaching hospitals were also established under Act 525 as autonomous agencies under the Ministry of Health. These provide advanced clinical health services to support GHS-provided health services, serve as undergraduate and postgraduate training institutions for the healthcare professions, and engage in health research toward the improvement of health in the country. Each teaching hospital has autonomy with its own board of directors.

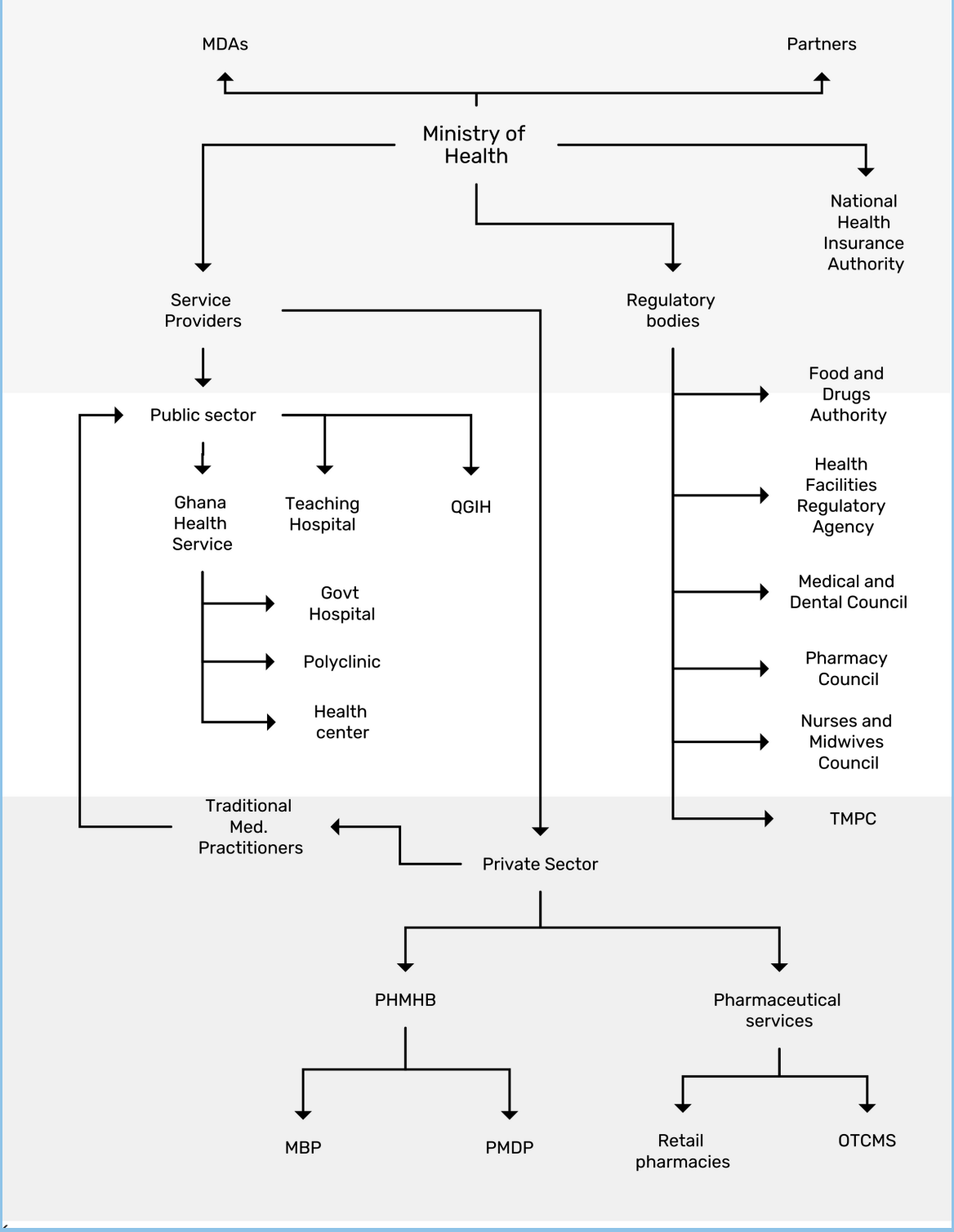
Health services are provided by the public sector, the not-for-profit mission sector

(Christian Health Association of Ghana and the Muslim Ahmadiyya Movement) and the private sector. The public sector provides about 40% of all health services and the mission sector about 30%.

Embedded within the healthcare sector is a more complex administrative structure. Unequal resource distribution within the sector heightens weak management at various levels of the system, resulting in poor medicine access. The complexity of the current healthcare structure, as depicted by Figure 2, provides an average medicine availability of about 40% in the public sector and 70% in the private sector. Although the medicine prices in the latter are often less affordable, private pharmacies are usually the first point of call for people seeking healthcare. These pharmacies are located in the communities and hence are more accessible.

The complexity of the healthcare structure further perpetuates other issues in the formal health sector such as frequent inappropriate prescribing or dispensing and incorrect use by patients, leading to poor health outcomes. Patients are thus driven to the informal sector or medicine peddlers for medicines, heightening issues such as counterfeiting and unapproved drug importation. This further compounds the problem of medicine access since medicine access does not only border on availability and affordability but also quality of the product.

Hence, this situation necessitates health system strengthening approaches that are not only designed within single building blocks of the system, i.e., health financing, health service delivery, but also promote the efficiency of the interconnections within the system. An efficient supply chain is of consequence in achieving the required interconnectedness.



Key:

MDAs: Ministeries, Departments and Agencies
OTCMS: Over-the-counter medicine sellers
PHMHB: Private Hospitals and Maternity Homes Board
TMPC: Traditional Medicine Practice Council
MBP: Mission Based Providers
PMDP: Private Medical and Dental Providers
QGIH: Quasi Government Institution Hospitals

Figure 2: Ghana's healthcare sector map.

3.0 THE HEALTHCARE SUPPLY CHAIN IN GHANA

Ghana's healthcare supply chain is key in achieving the country's goal of universal healthcare. An efficient healthcare supply chain ensures the availability of quality medical supplies and medicines in the right quantities delivered to the right places at the right time. Like all healthcare supply chains, Ghana's supply chain is complex, with several storage and distribution layers.

The supply chain is a three-tier system made up of the central/national level, level two of sub-national-level entities, and level three composed of government-managed health centers and private health facilities (Figure 3). The chain comprises a network of public and private actors and development partners.

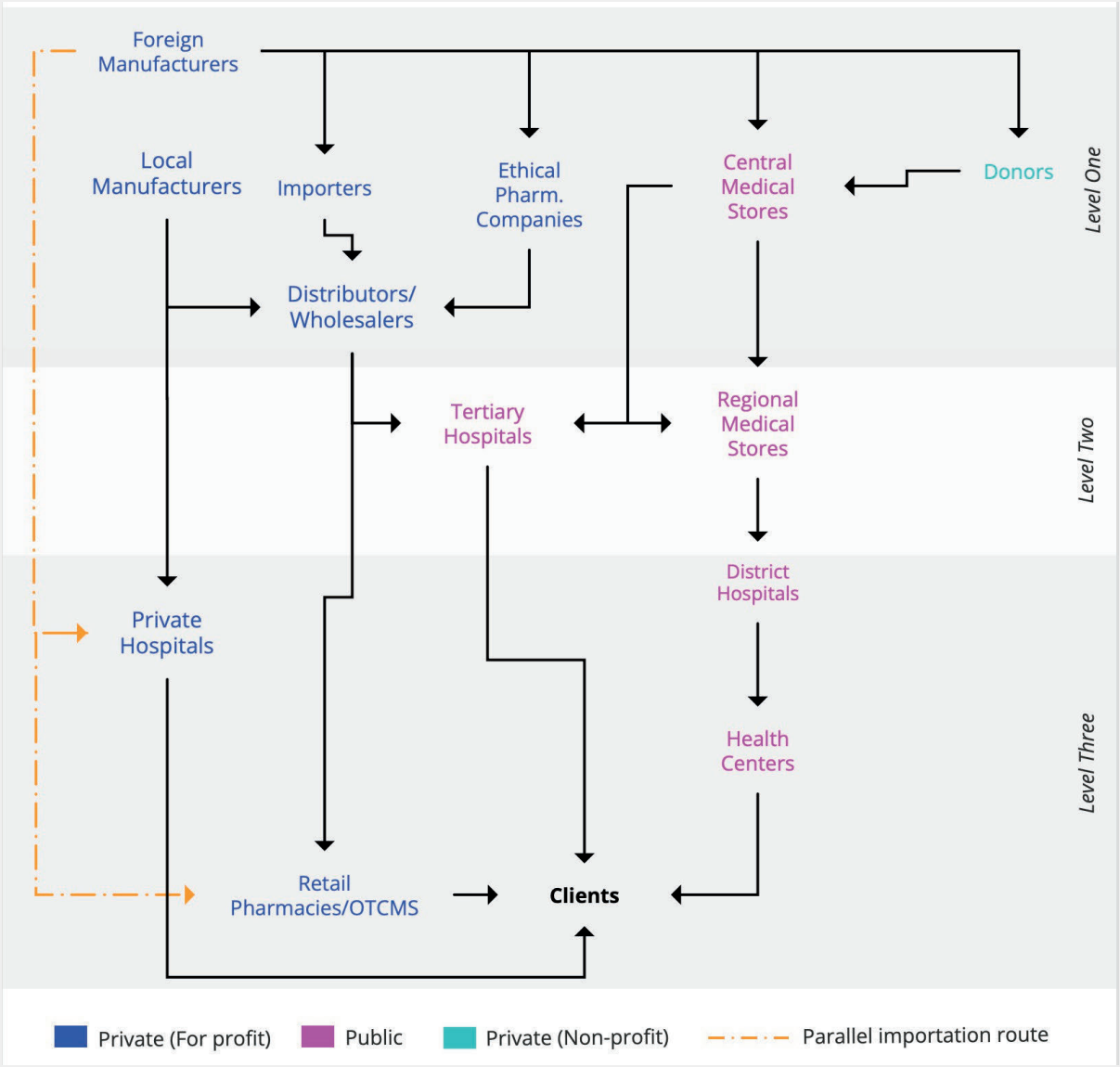


Figure 3: Ghana's healthcare supply chain map.

Public sector supply chain responsibilities are largely decentralized and distinguished by supply from the main central-level warehouses in the capital of the country. These in turn serve 8 tertiary hospitals and 10 regional medical stores. However, in recent years, these 18 lower-level facilities also have had medication in-flow directly from private distributors or wholesalers. Products flow directly from regional medical stores to service delivery points before reaching clients, while products from tertiary hospitals flow directly to the client.

Several development partners also support supply chain systems for various disease programs, including the Global Fund and the United States Agency for International Development (USAID). Health commodities funded by partners may be procured directly by the agency or on its behalf.

Additionally, the supply chain has a wide network of private for-profit actors, i.e., distributors and wholesalers who procure and distribute health commodities for retail pharmacies and private and/or public health facilities. The local manufacturing industry (mainly the private sector) has become an integral player in Ghana's supply chain by providing medication to all sectors. There are also ethical pharmaceutical companies, which are made up of multinational pharmaceutical companies that drive access to innovative medicines within the market.

Although public sector procurement is mediated by the central medical stores (CMS), regional medical stores and service delivery points, facilities are permitted to purchase products from the private sector during stockouts or when they have limited access to medicines. This flow of medicines from the private sector into the public sector has been instrumental in bridging the medicine supply gap created by issues such as non-availability at the medical stores, government indebtedness, and protracted procurement processes.

The tiered system of the public healthcare supply chain in Ghana is structured mainly around the different levels of administration of the health sector. The design does not necessarily consider technical elements that influence the capacity and performance of the supply chain. Although supply chain functions are largely decentralized, this decentralization is yet to be effectively implemented to ensure optimum performance of the system.

The structure of the supply chain in Ghana's public healthcare system described above has several implications for accountability for decision making and performance and may contribute to disruptions of supply chain activities, particularly issues with medicines access. Processes adopted to forecast demand, manage warehouses, rotate inventory, audit stock management practices and other supply chain activities are inefficient and not custom-made to meet the unique requirements of product utilization. This situation further compounds common challenges in healthcare supply chain management, including long resupply intervals. Increase in decision space through decentralization has not necessarily led to better forecasting or more effective procurement practices. The expectation to do more with fewer

resources affects the efficiency of the system. A suggestion would be to increase availability of financial resources through an increase in private healthcare financing, as well as increasing health system managers' control over these resources to positively increase the extent to which they can exercise control over the available decision space towards creating a more efficient supply chain.

As with many other countries in Africa, consumers are abandoning overstretched public sector pharmaceutical supply chains for private sector supply chains. As such, there is an enhanced interplay between private supply chain and public supply chain systems in Ghana.

In summary, managing healthcare supply chains in Ghana is a very complex and fragmented process and medicine access is affected by multifaceted inter-relationships between the public and private sectors. The consequences of this complexity are poor availability, poor affordability, and low quality of medicines in Ghana's healthcare sector. In light of such complexities, effective supply chain management comprising, for example, a decentralized structure that allows for different functions and local choice over some functions like procurement, may lead to higher performance in providing better access to medicine. Additionally, leveraging the strengths of the public and private supply chains simultaneously can create economies of scale and create sustainable returns for the private sector without compromising cost-effectiveness to the public sector in its quest to provide access to medicines.

4. ACCESS TO MEDICINES IN GHANA AND CONTRIBUTIONS OF SUPPLY CHAIN MANAGEMENT

Access to medicines is an essential component of universal healthcare. The World Health Organization (WHO) framework for medicine access shown in Figure 4, cites four medicine-specific factors that are key to ensuring availability and access.

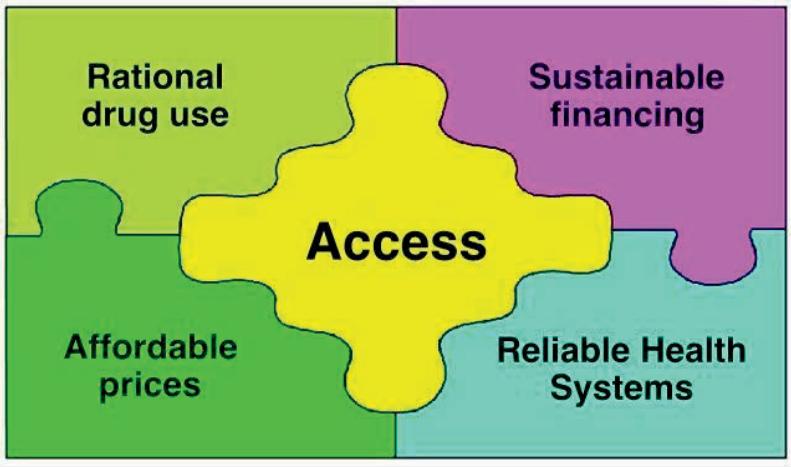


Figure 4: WHO framework for medicine access (Source: WHO, 2004).

Availability of and access to medicines depend on: (1) the rational selection and use of medicines, (2) affordable prices for all actors in the chain, including patients, (3) sustainable financing mechanisms, and (4) reliable health and supply systems to deliver medicines to users.

These four factors need to be in place to ensure effective medicine access for patients. Therefore, these factors are discussed in relation to the contributions of Ghana's healthcare supply chain.

4.1 Rational Selection and Use of Medicines

Ghana has a limited healthcare budget that particularly affects procurement levels of pharmaceuticals in the public sector. It is therefore necessary to optimize expenditures in this regard by selecting essential medicines and promoting rational use of medicines. Ghana's Essential Medicines List (first developed in 1983 and last updated in 2017) provides a rational basis for the supply of pharmaceuticals at various levels within the healthcare system. However, inefficient and irrational use of medicines is a widespread problem at all levels of the Ghanaian healthcare system.

A survey of 42 Ghanaian health facilities indicates that the problem tends to be greatest in public hospitals. Medicines are frequently prescribed according to which medicines are available at health centers and not necessarily according to patients' needs. Regardless, appropriate prescribing was not found to be a major issue, as the larger share of prescribed medicines were found in the Essential Medicines List and were prescribed in accordance with the Standard Treatment Guidelines for Ghana.

Table 1: Prescribing indicators for rational use of medicines (n=250 patients).

Prescribing Indicator	Number of medicines
Mean number of medicines per prescription encounter	3.1 ±1.15
Minimum number of medicines per prescription encounter	1
Maximum number of medicines per prescription encounter	8
Median number of medicines per prescription encounter	3
Number of medicines prescribed annually	1034 ± 23.79

Table 1 provides data on prescribing indicators for rational drug use across 42 health facilities (250 patients). An average of three medicines are prescribed to patients who access healthcare services. The majority of medicines prescribed for patients are dispensed by hospital pharmacies (Figure 5). However, slightly more than 30% of these

medicines have to be sourced outside the hospital by patients. Partial filling of patient prescriptions due to unavailability of medicines is but one of the issues.

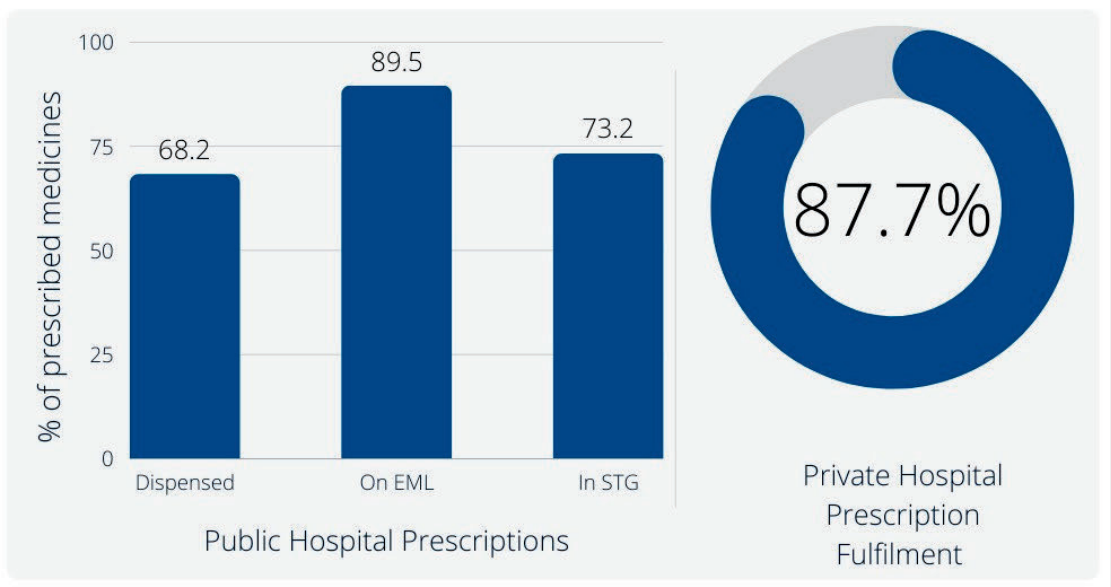


Figure 5: Indicators for rational use of medicines in hospitals (EML: Essential Medicines List; STG: Standard Treatment Guidelines).

Frequent stockouts of specific medicines, especially antihypertensives and antidiabetic medicines, drive this pattern. Data in Figure 6 show that the aforementioned groups of medicines tend to be out of stock for over 100 days across the year in these facilities. These stockouts have been attributed to delayed procurement or insufficient funds for drug purchases, necessitating a capping of drug quantities during forecasting. Additionally, some of these medicines are simply not stocked by facilities due to unattractive reimbursement prices from the National Health Insurance Scheme. The provision of several healthcare services may also significantly increase the budget allocated to drug purchases.

Private health facilities, in contrast, have higher prescription fulfilment rates as they tend to be more specialized in the healthcare services offered. Medicines stocked by these facilities often correspond to services sought by patients, implying procurement of fewer classes of medicines and minimal chance of having expiries.

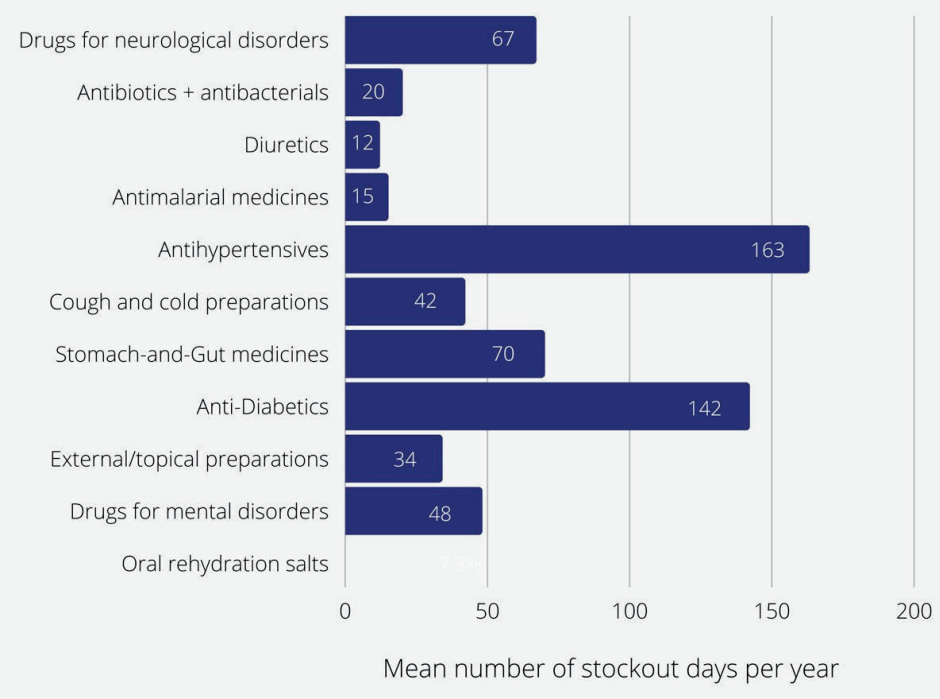


Figure 6: Availability of medicines at hospitals.

In view of the above, ensuring rational selection and use of medicines may require limiting government procurement and supply to essential medicines only. Through pharmaceutical strategic purchasing, public facilities may be able to provide the most cost-effective essential medicines for the neediest clients. This can only be achieved through critical appraisal of procurement practices in the country. Effective procurement processes, among other things, involve the selection of the most appropriate purchasing methods in light of resources available.

4.1.1. Procurement

4.1.1.1 Procurement planning

One process at the heart of rational drug selection is procurement planning.
Inadequate procurement planning is a major weakness faced by many public health facilities. This weakness ultimately leads to unintended expenditures. Routine orders made by the public health facilities in the supply chain may take up to a month to arrive. The determining factor of the lead time for orders depends on the procurement method used. Purchasing from the Regional Medical Stores (RMS) resulted in the longest lead time while restricted tendering (commonly referred to as “shopping”) resulted in the shortest lead time. Restricted tendering, however, comes with the challenge of low thresholds of spending and is subject to approval from the Public Procurement Authority (PPA). The delay in fulfillment of orders from the RMS is a reflection of the typical delay experienced in public institutions owing to issues such as understaffing, inefficient logistical support, and long bureaucratic processes.

Table 2: Average lead times for orders in public hospitals 2019-2021.

Method/Source of Procurement	Average lead time (Weeks)
Routine Orders	
Regional Medical Stores	4
National Competitive Tendering	2
Restricted tendering (Private suppliers)	< 1
Emergency orders	
Restricted tendering (Private suppliers)	<1

On average, these hospitals make 89 orders in a year with an average of 15 orders being placed on emergency basis, as indicated in Table 3. Fulfilment of orders has a service level of approximately 57.63%. This may be considered a reflection of the overall effectiveness and ability of the supply chain to meet current demand for essential medicines. An overall assessment of the procurement system, as shown in Table 4, suggests the need for significant improvements in procurement in order to enhance medicine access. Supply chain managers are of the view that this fulfilment rate can be improved with the institution of real-time inventory management and more efficient distribution options.

Table 3: Performance of procurement systems for medicines supply to the public hospitals in 2019-2021.

Performance indicator	Results
Order fulfilment performance	57.63%
Mean number of procurements per year	89
Mean number of emergency orders per year	15

Table 4: Performance of procurement system on supply of medicines to the hospitals.

Indicator/per order	Ordered	Received	Partially delivered
Mean number of medicines per order	25.4 ± 0.7	14.7 ± 2.3	2.3 ± 1.6
Minimum number of medicines	1.0	0.0	0.0
Maximum number of medicines	156	79	23
Median number of medicines	11	6	1
Total number of medicines	4873	2636	504

Meanwhile, in many instances, actual procurement transactions do not correspond with what has been stated in the facilities' approved Budget and Procurement Plan. Several factors are believed to be responsible for this occurrence. Managers of these facilities listed changes in disease patterns as a major cause. These disease demography changes, caused mainly by outbreaks, do not allow for proper planning during the drafting of procurement plans. Other causes include healthcare provider preference, poorly drafted procurement plans, accidental orders, and a focus on cost reduction leading to purchase of substandard medicines.

Although the majority of these public hospitals operate an Electronic Medical Records System which, among other functions, can track drug consumption, stocks of health commodities were still managed manually or with very minimal automation. Hence, most procurement decisions were based on manual stock counts. This practice commonly resulted in inaccurate forecasting of consumption rates, leading to procuring less than needed or exceeding requirements. The problem with such facilities was not a lack of data but rather inefficient utilization of available data. Managers resorted to manual counts as this method was more comfortable for them. This may be an indication of poorly skilled and trained personnel in the supply chain.

Procurement lapses, however, do not appear to be an issue in private health facilities. These facilities are not subject to the Public Procurement Laws of Ghana and are therefore at liberty to acquire medicines in any manner that is appropriate for their operations. Although most of these facilities resorted to manual tracking of their medicines, their order fulfillment rates were above 90% and they rarely suffered stockouts or oversupply issues.

In conclusion, analysis of the procurement planning in public facilities with a focus on efficiency and reduction of waste of public resources is critical to improving access to medicines in public facilities.

4.1.1.2 Protracted procurement processes

The public sector procurement process is highly protracted. The Ghana Public Procurement Law and the Public Procurement Authority were introduced to streamline public procurement processes. The PPA, for instance, provides tools on its website to guide facilities in the preparation of procurement processes, e.g., a database of common user items price list.

Additionally, the central government has rolled out an electronic procurement system, the Ghana Electronic Procurement System (GHANEPS), to control irregularities and remove unnecessary costs in the procurement process. Despite this, the public procurement process takes a great deal of time, and even essential medicines are not spared these delays. Interference from internal stakeholders is the major reason for the delays. Aspects such as awarding contracts and payment of contractors suffer unnecessary interference. Other related issues include deliberate controlling of competition and low capacity of procurement professionals.

Consequently, decentralization of decision making, for instance in the area of targeted tendering, may be useful for reducing the interference and political clientelism associated with the awarding of contracts. Equally important, incentivizing the use of GHANEPS and improving monitoring and oversight by the PPA can help to streamline public procurement of essential medicines by increasing accountability in the public sector. A streamlined procurement system promotes efficiency and hence increased access to medicines.

4.2 Pricing and Reimbursement Regime

The second factor which is important for ensuring effective medicine access is the issue of the pricing and reimbursement regime. According to the WHO's Medicine Price Study, Ghana has some of the highest medication prices in Africa. As a lower-middle income state, prices of medications are remarkably high and largely unaffordable. High pricing can be a significant barrier to medication access and threatens the achievement of universal health coverage in Ghana, since the financial burden incurred by high medication prices impacts both public and out-of-pocket remittances. High medication pricing in the private sector may be attributed to the fact that pricing is significantly determined by market forces. It is mainly importation tariffs, taxes, and distribution mark-ups that influence the final price. The contribution of these factors to the overall price is indicated in Figure 7. In Ghana, retail mark-ups can be anywhere between 30-200% of the original cost of the medication.

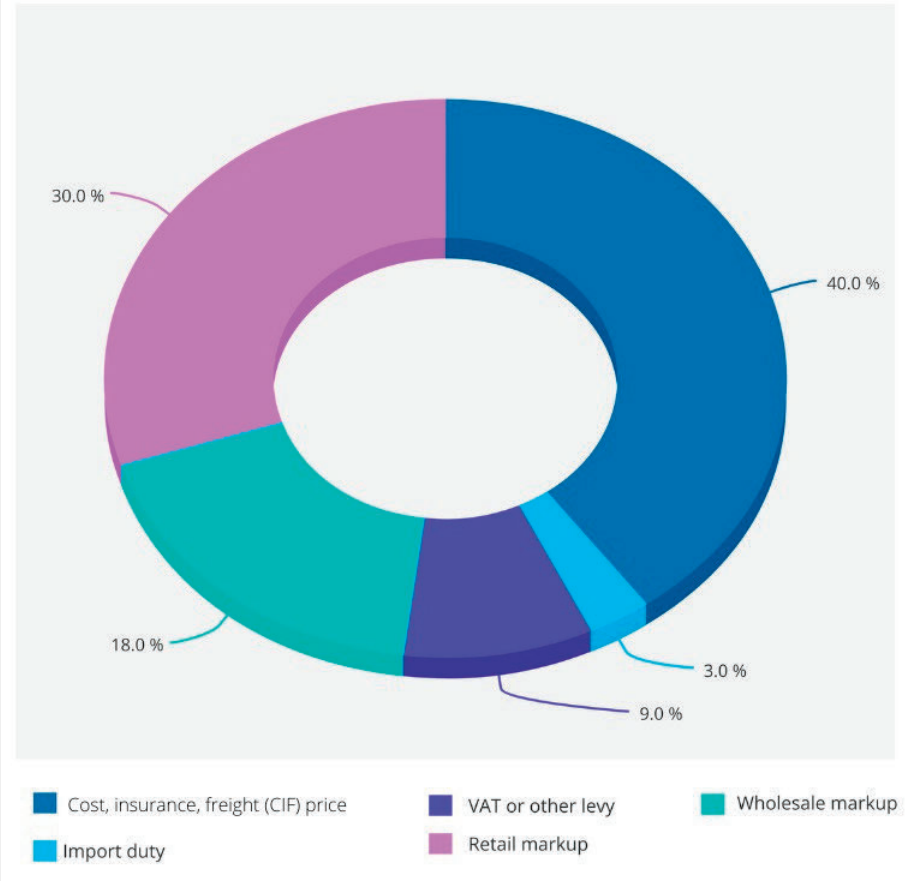


Figure 7: Estimated proportions of add-ons to final patient price for generic drugs in the private retail pharmacy sector.

Drug pricing differs significantly between the public and private sectors. On average, medications in the private sector are more expensive than in the public and private nonprofit sectors. Similarly, private nonprofits' prices are also on average higher than public sector medication prices for the same group of medications. Innovator brands are generally priced higher in all sectors. Using the tracer medicine, Amlodipine (an antihypertensive medication), Figure 8 outlines the price comparisons between the innovator brand and the generic brands as sold by private retailers and per the price list of medicines on the NHIS. Price variations can be as high as 60 times or more.

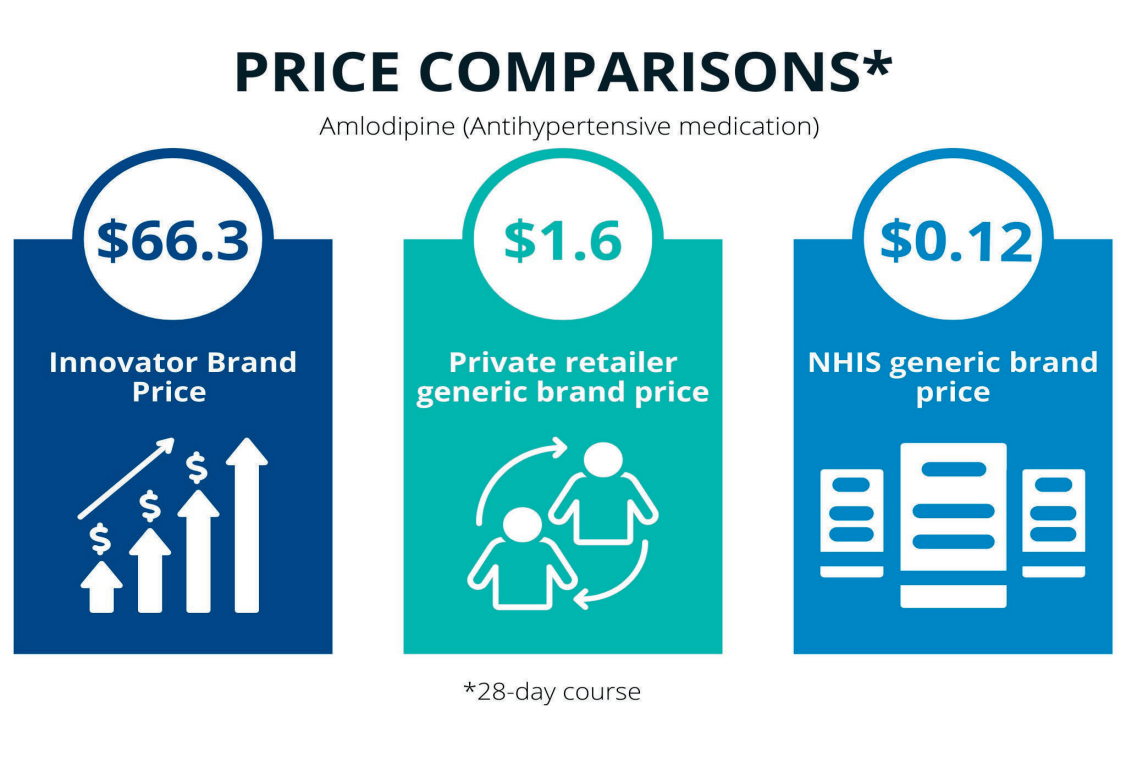


Figure 8: Price comparisons of innovator and generic brands using the tracer medicine, Amlodipine.

Further, prices may differ significantly from the international reference price (IRP). Box 2 summarizes the comparison of medication costs in Ghana to IRPs in both public and private facilities. Analysis of the Ghanaian pharmaceutical market suggests that 60% of purchased medicines are generic products. These are considerably cheaper and would be expected to drive prices down through competition. Yet still, this is not the case. Ghana's lack of structured pricing policies for pharmaceuticals allows the main drivers of pricing to be retail mark-ups and fluctuations in the Forex market; Forex fluctuations are significant due to the high reliance on imported products. One other key strategy to achieve drug price control, is to institute policies or initiatives toward price transparency. Price transparency in the supply chain ensures that there is readily available information on the price of healthcare services to define the actual value of the service and enable patients to compare, and choose providers that offer the desired level of value. Transparency of the actual prices of drugs to the government agencies responsible for drug pricing as well as transparency of drug prices to consumers are equally important.

Box 2: Drug pricing facts

Patients pay between 0.99-165 times the international reference prices for medicines at various health facilities in both the private and public sectors.

Private-owned hospitals charge about ~ 80% more than the public health facilities and ~ 50% more than private retail pharmacies in Ghana cedis.

Innovator brands cost between 1-90 times the lowest-priced generic equivalents in local currency (Ghana cedis).

Additionally, the pharmaceutical supply chain significantly affects drug costs. The complexity and number of actors involved in the supply of medicines in the chain may be one of the major reasons for soaring drug costs. In relation to this, distribution methods may be varied to cater to changing market demands. To cater to large demands, commodities could be shipped directly from manufacturers to retailers. This practice cuts out the constant intermediaries and hence distributor mark-ups. Also, group purchasing by health facilities can encourage competitive pricing. Commercial practices involving discounts and rebates lead to fluctuations in mark-ups. These practices by wholesalers encourage more purchases from retailers, in particular. Some retailers earn additional discounts by trading customer data or making early payments, as suppliers trade higher profits for increased business intelligence or higher cash flow.

Lastly, the private sector supply chain in Ghana is often hit with artificial shortages, which are usually initiated to drive up profits. These shortages can be easily averted by the institution of national systems to track health commodities anywhere in the country.

To sum up, affordable medicines can significantly increase access to medicines even in instances where costs are out-of-pocket. Affordability can be largely enhanced with the implementation of effective national pricing policies or strategies that outline a universal approach to medication pricing in the country.

4.2.1 Pricing Policies and Strategies

Despite the impact of the National Health Insurance Scheme in ensuring affordability of drugs, the scheme has been plagued with several challenges.

These challenges include unfavorable reimbursement of medication prices and delayed reimbursements, which have discouraged the involvement of the private sector. To increase the affordability of medications in Ghana, the MOH in 2019 established a National Medicine Price Committee. The committee is charged with setting maximum sales prices of essential medicines, single source products, patented medicines, and other health technologies for both the public and private sectors.

The committee is also expected to calculate maximum reimbursement prices and provide exchange rate fluctuation buffers. The more stable pricing environment that will be created is predicted to boost sales and increase manufacturers' profits. Healthcare corruption reports are also set to reduce with increased transparency of pricing.

In accordance with the above, a pricing strategy has been consequently developed. Its focus is on the following areas: governance, data visibility and information sharing, price optimization, product availability and sustainable supply, and financial stability of the NHIS. Implementation of these strategies would ensure sustainable financial access to medications.

Despite this development, the pricing strategy in its current form lacks any concrete steps for implementation. At this time, there is the need for the establishment of a medicines price index in order to regulate pricing of essential medicines in addition to the establishment of new strategies towards sustainability of the NHIS.

4.2.2 National Health Insurance Scheme

Health insurance packages are designed to reduce or completely eliminate healthcare costs. Currently, 68.8% of Ghanaians are covered by health insurance, either the national health insurance scheme offered by the government or private health insurance schemes.

The National Health Insurance Scheme established under the National Health Insurance Act in 2012 is to provide financial access to basic healthcare services in Ghana. The act makes provisions for cost exemptions for medications, making them affordable for all, particularly children under five, pregnant women, and the elderly. Currently, more than 66% of Ghanaians are enrolled on the scheme. However, the scheme continues to face numerous challenges. Notable among these are the issues of financial sustainability and delayed reimbursement.

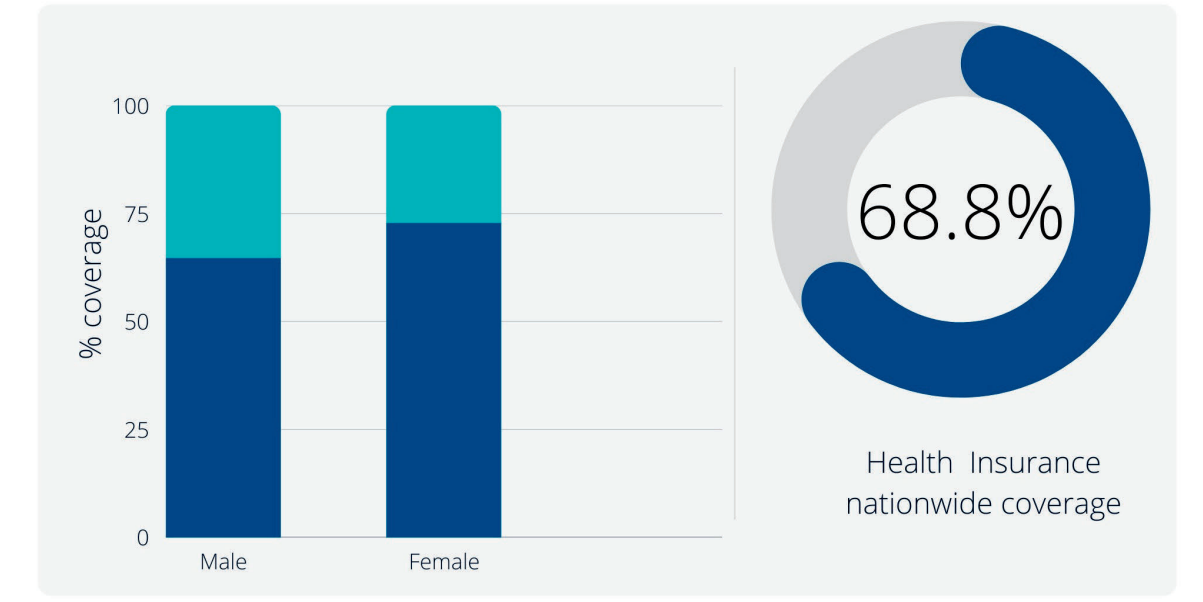


Figure 9: Health insurance coverage. Source: Ghana Statistical Service, 2021.

All medicines on the essential medicines list plus medicines for the treatment of malaria, tuberculosis, HIV/AIDS, non-communicable diseases, and immunization vaccines for children are to be provided at no cost. However, most public hospitals have adopted a co-pay system to support continual medication purchases due to reimbursement challenges associated with the NHIS. Aside from not covering all diseases, the NHIS also covers only a part of patients' overall healthcare costs. Some public hospitals currently require patients to partially bear the cost of antimalarial drugs and iron supplements for pregnant women. Vitamin C, even in the face of the COVID-19 pandemic, is not covered by the NHIS. This significantly increases the out-of-pocket costs for patients, hindering access to affordable medicines.

Although reimbursement rates of medicines are expected to increase biannually, they have remained frozen in recent years despite increasing drug prices. This rate freeze, in addition to delayed reimbursements, has led many healthcare providers to withdraw from the NHIS. Many of these healthcare providers run private community pharmacies. These facilities, due to their accessibility and convenience, are critical to expanding access to medicines.

Summing up, the success of the NHIS is critical to ensuring that the majority of Ghanaian patients can afford essential medicines. The NHIS removes price barriers to medication and therefore increases access. However, the inadequate funding sources for this scheme raises doubts about its financial sustainability in the long term. Its current tax-based funding – National Health Insurance Levy (2.5% levy on goods and services collected under the value-added tax) and Social Security and National Insurance Trust contributions per month (2.5 percentage points), and premiums paid by informal sector subscribers – needs to be replaced with more sustainable financing. A first step would be to expand the coverage provided by private health insurance providers.

4.3 Sustainable Health Financing

Another issue at the core of medicine access is sustainable health financing. Ghana's commitment to achieving universal health coverage (UHC) in the Medium Term Development Plan 2018–2021 prioritizes several goals. These include sustainability of the National Health Insurance Scheme (NHIS), increasing government and domestic health expenditures, co-financing vertical programs, and focusing on sustainability of public health commodities. A key role for sustainable health financing is to reduce health inequities through approaches such as ensuring affordable and fair pricing of medicines through effective health financing mechanisms. Ensuring affordability of medicines should be a priority in the country's health expenditure.

4.3.1 Healthcare Expenditure

The three main health financing schemes in Ghana are the National Health Insurance Scheme (NHIS), Government Budget Financing, and Private Health Insurance.

Healthcare expenditure in Ghana has transited from predominantly government spending to private spending over a span of 13 years (2008-2021). This trend is shown in Figure 10. Total healthcare expenditure in recent years has increased annually. This was estimated at roughly 2.62 billion USD as at 2020 (Figure 10). This increase is mainly attributed to increased developmental assistance from supporting global organizations, such as USAID and other aid agencies due to the pandemic.

Private expenditure remains the major contributor of the market, making up about 51% (2020) of total healthcare expenditure in comparison with government expenditure; it also is forecasted to grow at a faster rate. Although government spending proportions are projected to increase as well due to increased healthcare demands and implementation of NHIS reforms, unresolved challenges of the NHIS pose a hindrance to this plan.

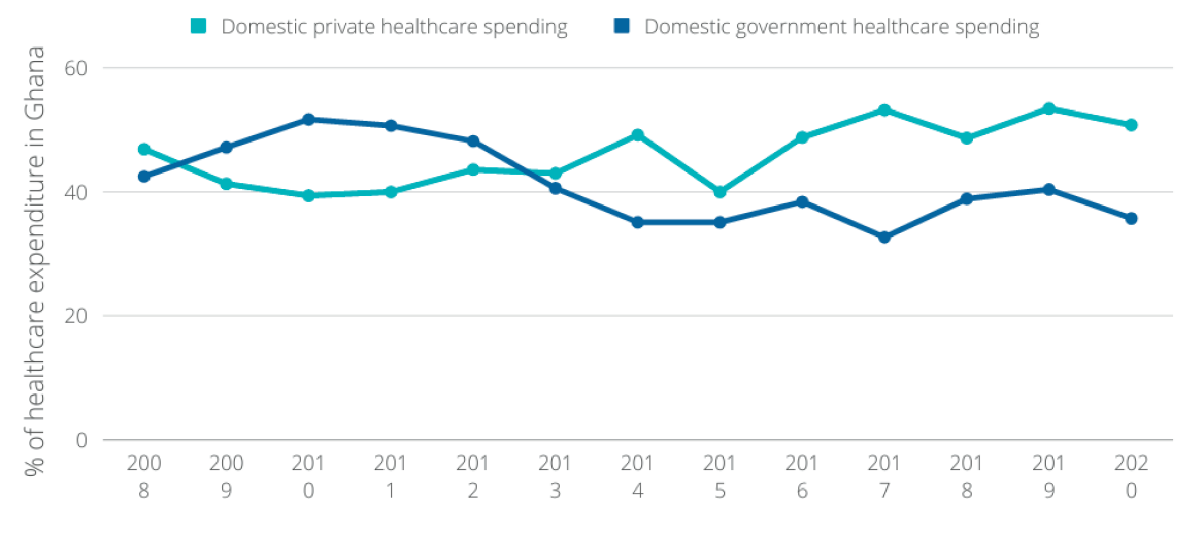


Figure 10 a: Healthcare expenditure in Ghana.

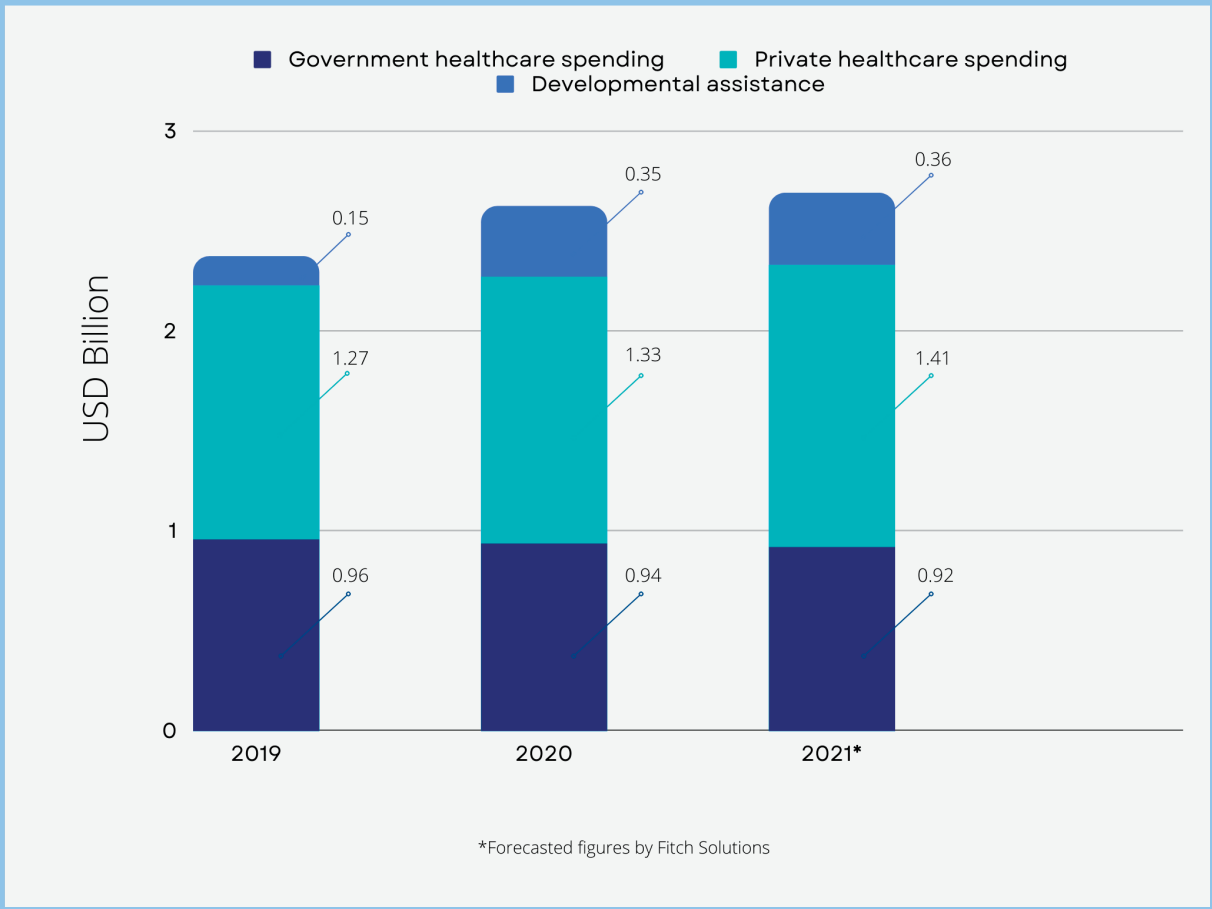


Figure 10 b: Healthcare expenditure in Ghana.

Figure 11 details the components of healthcare expenditure. As of 2019, out-of-pocket payments accounted for over 50% of private expenditure and about 38% of total health expenditure, similar to the government expenditure of 39%. This may in part be due to increased patronization of private healthcare services owing to the progressive loss of trust in public institutions by the populace.

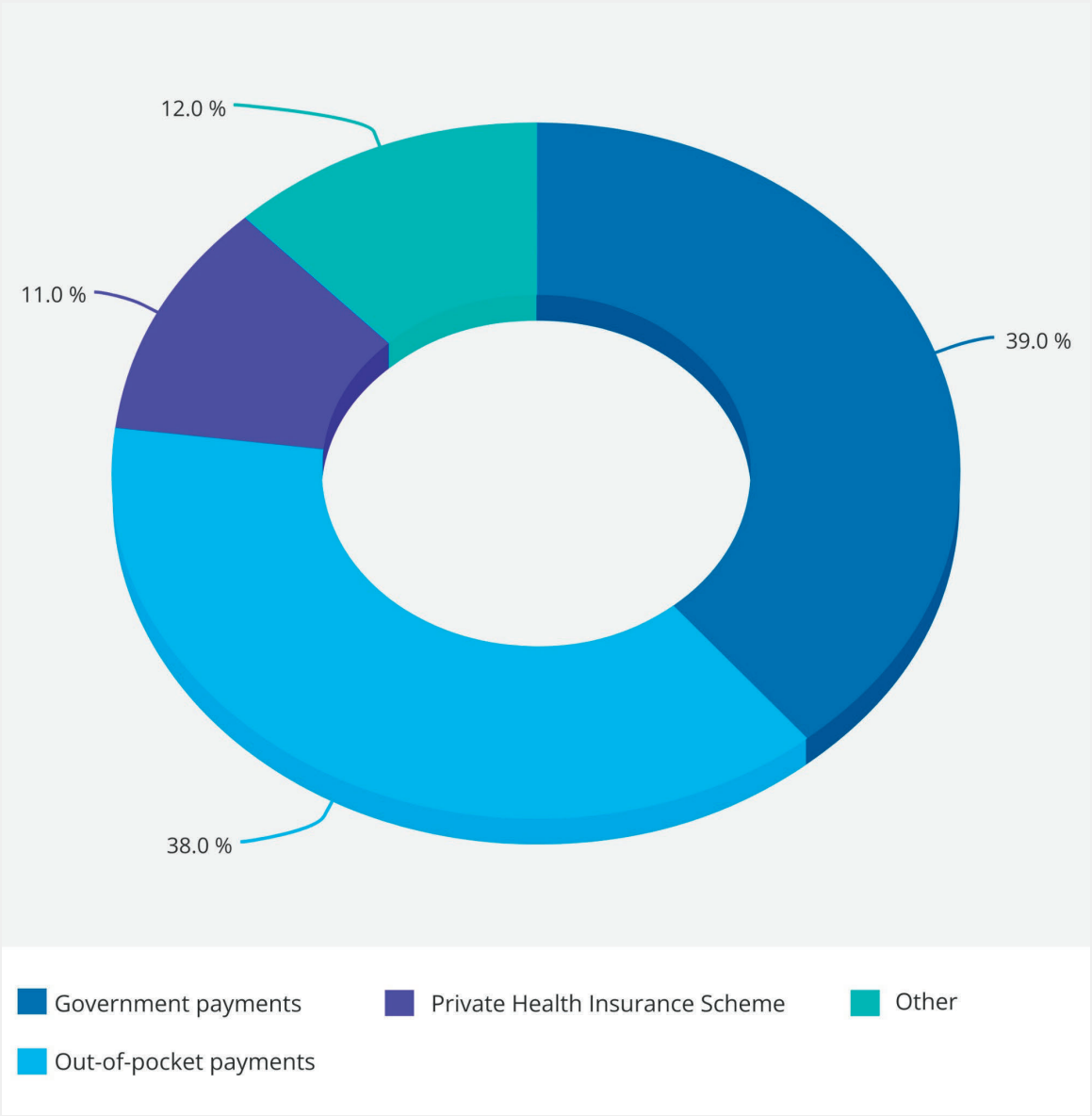


Figure 11: Domestic healthcare expenditure components.

A survey of 30 public hospitals and 120 privately-owned pharmacies revealed that government expenditure on healthcare was slightly higher on communicable disease conditions in contrast to private healthcare spending in 2021. Approximately 42% of private healthcare expenditure went into managing non-communicable diseases, as shown in Figure 12.

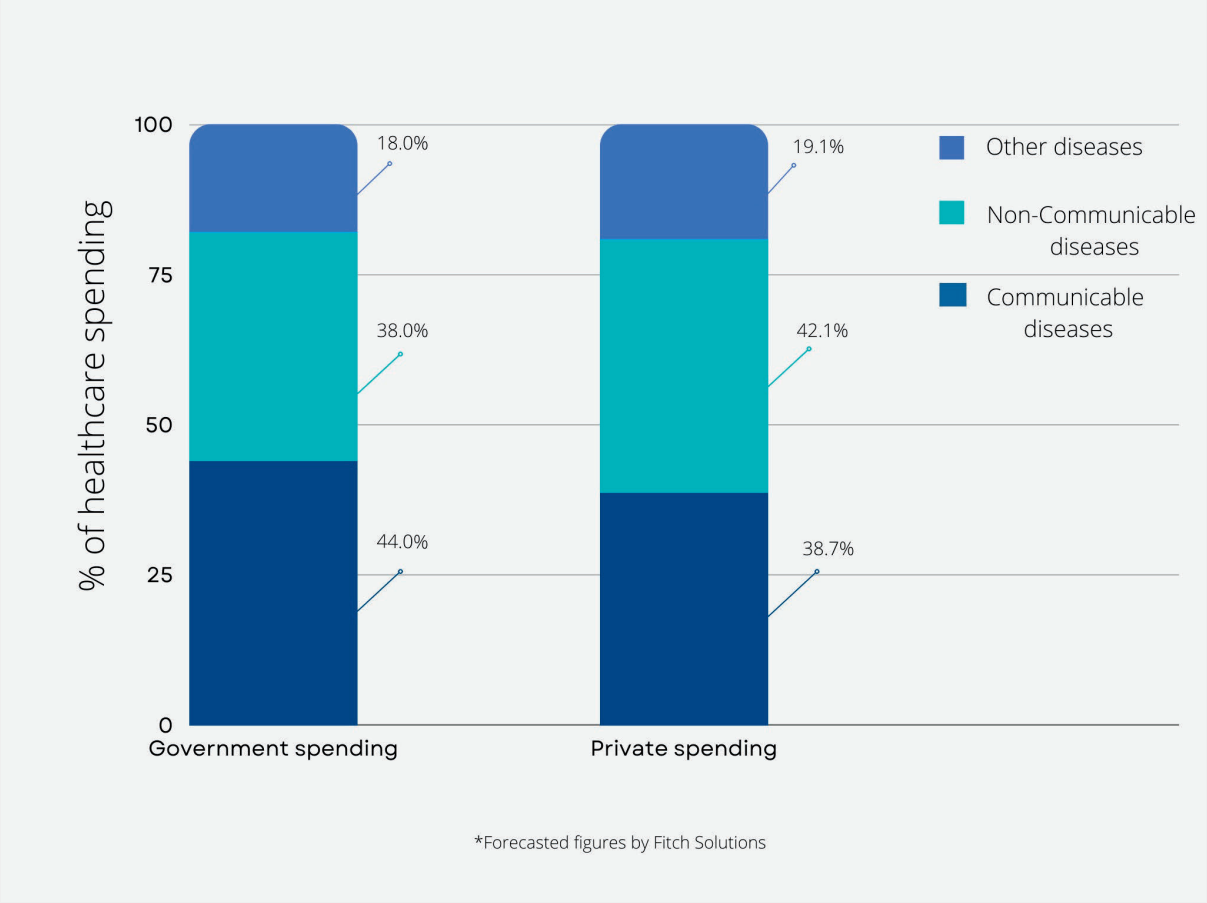


Figure 12: Healthcare expenditure according to disease groups.

Reorganization of healthcare financing has important implications for efficiency of the healthcare supply chain. The current scope of coverage for the NHIS can be reduced by delisting certain items from the “benefits package” and shifting excluded services to the private market. Further, empowering private healthcare insurers takes some of the burden off public healthcare financing, which is unsustainable. Collaborations between private health insurers and suppliers of pharmaceutical products as well as fintechs can provide competitive pricing for pharmaceuticals by providing a ready market.

4.4 Reliable Health and Supply Systems

Finally, availability and access to medicines depends on having reliable health and supply systems. A vital activity in achieving this is effective inventory management.

4.4.1 Inventory Management

Inventory management and control is key to the efficiency of the Supply Chain system of the Health Sector. Efficient management of inventory in most healthcare facilities in Ghana is lacking. Adequate storage space for commodities is sorely inadequate. In most instances where adequate space is available, poor storehouse layout and lack of facilities such as shelves, pallets, and refrigerators for cold chain

commodities is the norm. Additionally, facilities may lack adequately trained personnel for inventory control. Public hospitals recorded roughly 8% expiry of tracer medicines (Figure 13) and about 5% of returned medicinal products by patients due to physical damage. Expiries were mainly attributed to excessive inventory and inadequate inventory management practices. Several expired medicines were those supplied by vertical programs which often had excessive inventory. Critical to effective inventory management in these public facilities is the provision and utilization of adequate inventory and information systems.

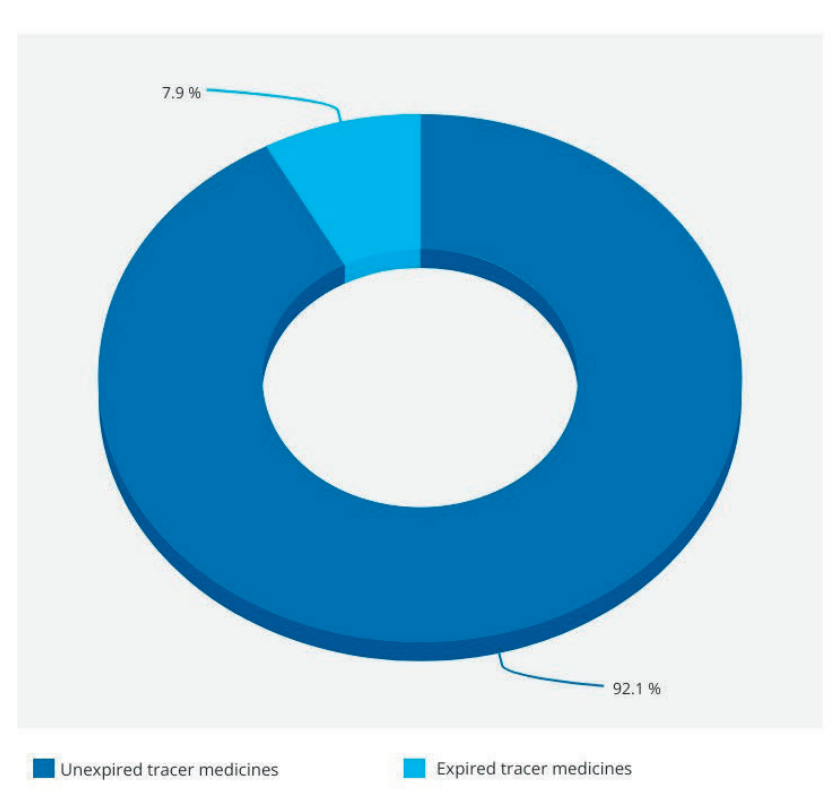


Figure 13: Efficiency of inventory management.

4.4.2 Inventory and Information Systems

Health commodities inventory management can be effectively managed with information management systems that ensure traceability of items. Such systems ensure transparent tracking and promote accurate inventory records, providing real-time information about medication expiry and physical quantities. Most public healthcare facilities use Electronic Medical Records Systems, but the data generated is underutilized. Private healthcare facilities utilize a wide range of management systems; notable among these is Bloom by mPharma. This system promotes standardized operations by networking all mPharma facilities and leveraging data to provide additional services such as membership-based loyalty programs that reduce drug costs for patients. In the public sector, one such system is the Ghana Integrated Logistics Management Information System.

4.4.3 Ghana Integrated Logistics Management Information System (GHiLMIS)

The Ghana Integrated Logistics Management Information System (GHiLMIS) was introduced to help efficiently address public healthcare supply chain needs and access. The system combats manual reporting and shifts the focus to a data-driven supply chain. GHiLMIS currently connects more than 3000 hospitals nationwide. Its implementation is believed to have revolutionized the Ghana public health supply chain, making it agile and responsive. The system has been useful for capturing and processing transactions, while tracking COVID-19-related commodities throughout the supply chain. Demand and supply planning have been based on data derived from this system. Nevertheless, operation of GHiLMIS critically depends on receiving data from the service delivery points. This becomes challenging as you go lower down the supply chain due to a severe lack of technological infrastructure and poor internet connectivity. As much as GHiLMIS is an excellent facilitator of medicine access, the government needs to adequately equip rural and last-mile facilities adequately, in order for its intended effects on medicine access to be achieved in those areas. In addition to this, the system may be expanded in collaboration with some private sector distribution options.

4.4.4 Pharmaceutical Distribution

In recent years, supplies to public sector facilities have most often been directly from the private sector, accounting for about 70% of pharmaceuticals supplied. Most local drug manufacturing companies double as distributors of their products, although separate distributors are also in operation in the industry. Companies such as Ernest Chemists Limited, East Cantonments Pharmacy Limited, and Baseline Pharmaceutical run large distribution operations nationwide. Health facilities in remote areas commonly face delivery problems. Delivery problems may be linked to a lack of transportation facilities or bad road networks. Sometimes health commodities are ‘shipped’ via local transport vehicles and these commodities are picked up at lorry stations. Healthcare staff in such facilities often commute long distances to obtain health commodities. These facilities could therefore benefit from efficient distribution systems to enhance access to essential healthcare commodities. As such, there is an increase in new developments and innovations in drug distribution in Ghana.

4.4.5 Innovation in Drug Distribution

Digitizing distribution to consumers is becoming increasingly popular in Ghana as retail pharmacies, e-commerce, and many startups remain involved. There are currently 31 such innovators in Ghana’s market, as listed in Figure 14. Innovator services may be provider-focused, consumer-focused, or data-focused. A number of innovators, however, offer services in two or more areas. Some also shift from their initial business model as the company grows. A notable example is mPharma, which started as provider-focused, expanded to consumer-focused, and is currently involved in the automation of local supply chain management and distribution in Gabon.

Provider-focused innovators offer services ranging from inventory management software, to digital marketplaces for ordering of products, to digitally-enabled third party product reimbursement to hospitals, clinics, and pharmacies.

Figure 14: Healthcare innovators in Ghana.

Innovators focused on digitizing distribution to consumers make use of e-pharmacies, e-commerce players, retail pharmacies, and telemedicine. Some also offer product locator services and engage patients through SMS or chatbots.

Innovators providing consumers, governments, and manufacturers with product data enable product verification and authentication checks, product movement analysis, and digitally-enabled consumer surveys.

The leading faces of digitized healthcare in Ghana include mPharma, Glovo, Medrx, and Zipline, who, in partnership with the GHS, offer drone delivery services of medical supplies to rural areas. The use of drones has increased the efficiency of last-mile deliveries by providing on-demand emergency deliveries of 148 different vaccines, blood products, and lifesaving medications to remote health facilities in the country, 24 hours a day. Drones eliminate congestion costs and reduce missed deliveries due to the very short delays between item dispatch and delivery. These have been important to the quest of ensuring medicine access to all.

In order to enhance this sector and streamline operations of these innovators, regulatory frameworks have quickly evolved to govern this space. The launch of the electronic pharmacy platform policy and guidelines by the central government, is to regulate online pharmacies – ensuring compliance with applicable laws and regulations and managing institutional risk.

4.4.4.1 The National Electronic Pharmacy Platform (NePP)

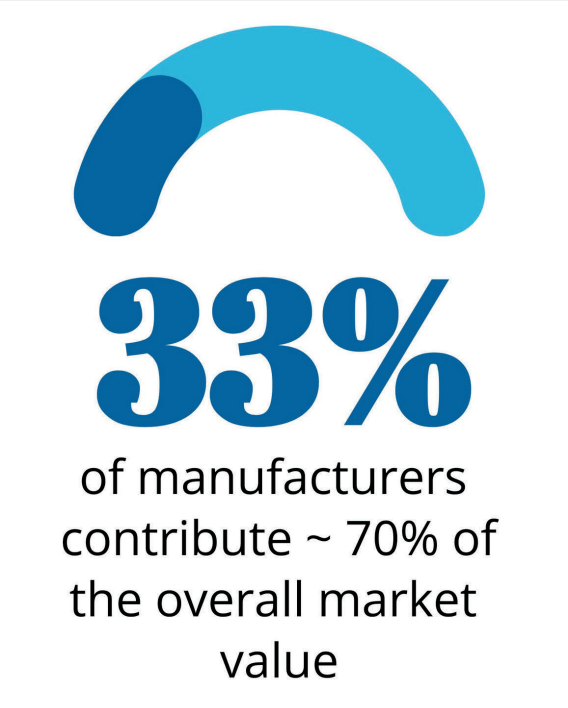
The National Electronic Pharmacy Platform (NePP) has subsequently been launched in Ghana. On a national scale, it is the first of its kind in Africa and is expected to improve pharmaceutical service access and enforce standards.

Ghana contributed only 3.2% of funds raised by e-health startups in Africa in 2021 but this figure is expected to increase in the coming years with the new e-pharmacy initiative and increasing awareness and participation of the population in e-health services. NePP may be the starting point for the harmonization of private healthcare supply chains as well as an integration of private and public supply chains. Integration of both supply chains will improve their collective efficiency and promote synergistic combinations of resources and expertise. Public and private health sectors cannot address current and emerging essential medicine supply challenges individually. Hence, collaboration between these entities in achieving medicine access cannot be overemphasized.

4.5 Role of the Private Pharmaceutical Sector in Achieving Medicine Access

The private pharmaceutical sector plays a major role in ensuring effective healthcare access in Ghana. The sector has been expanding commitments toward addressing barriers to medicine access. Companies in this industry use a variety of approaches including providing cheaper generic medicines, supply chain strengthening, and

community outreach. Changing disease demographics have led to expanded efforts to improve access for non-communicable diseases (NCD) which go beyond the focus on medicines, aiming to address other significant health system barriers to access. The majority of the pharmaceutical trade in Ghana occurs in the private sector.



4.5.1 Pharmaceutical Trade

Private pharmaceutical companies in Ghana drive the trade of health commodities in the pharmaceutical industry, which depends heavily on foreign imports. Currently, imports account for more than 70% of pharmaceutical demand. Over-the-counter (OTC) medicines make up the bulk of locally produced drugs. Similarly, the import to local-produced fractions correlate with the distribution between the prescription drugs and over-the-counter (OTC) medication market sizes.

Ghana's pharmaceutical imports comprising both finished products and raw materials were valued at USD230.74mn in 2020, as shown in Figure 15. This represents roughly a 49% increase in value as compared to imports in 2018. The significant rise in imports has been attributed to the constantly changing epidemiological profile of diseases in the country. Demand for prescription medicines for non-communicable diseases is rising. Unfortunately, local manufacturers largely produce over-the-counter medications; this accounts for 26% of drug demand.

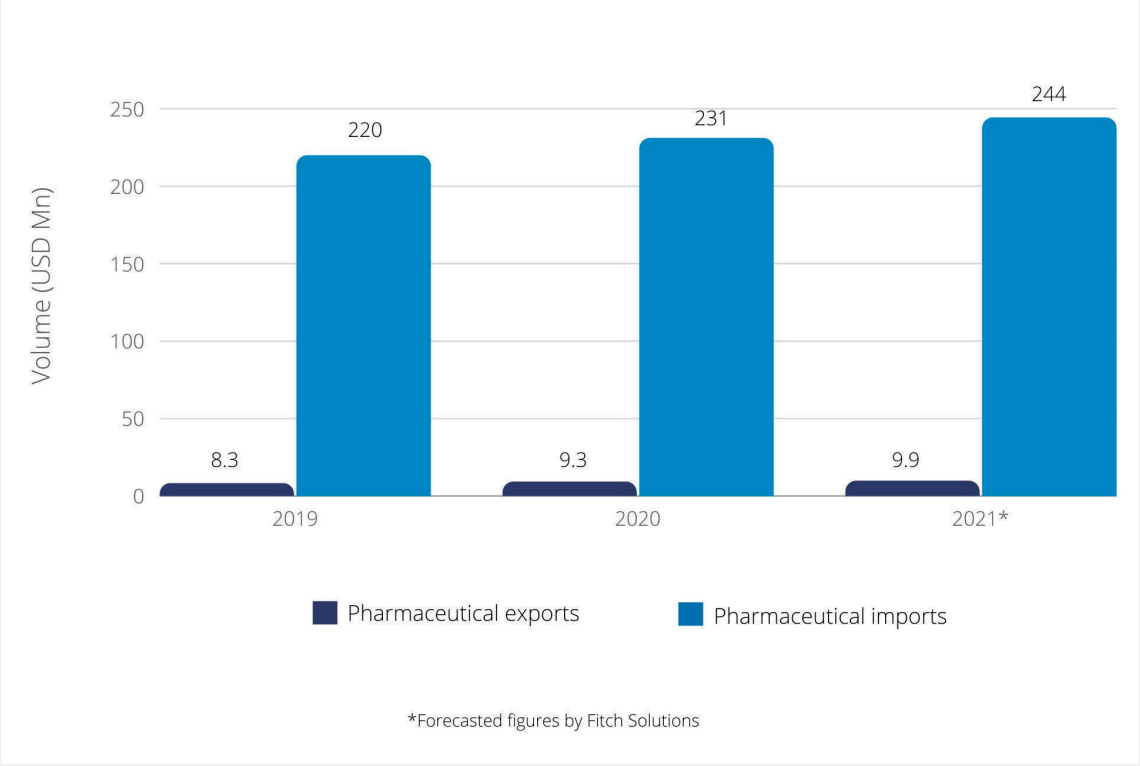


Figure 15: Pharmaceutical imports and exports.

The government, through an Executive Instrument in 2017, banned the importation of 49 medicines, a mixture of prescription and OTCs. These were reserved for local manufacturers to boost local production. However, local manufacturers' affinity for OTC drug production may be attributed to ease of production and ease of sale of these drugs. Further to this, primary production of pharmaceuticals is expensive, and mass production is essential to offset the time lost through prolonged manufacturing methods. Secondary production, in which the manufacturer receives semi-finished products, is an alternative. This can be made even more efficient by increasing the number of product lines. Again, few local drug manufacturers produce essential medicines for export. Exports are largely regional, with more than half of the volume going to Côte d'Ivoire, Cameroon, and Gambia. The real boost in local production may be seen with an increase of governmental financial and infrastructural support for the industry. Several interventions by the government have been proposed toward achieving the aim of making Ghana the ECOWAS hub for pharmaceutical investments.

4.5.2 Government Support of the Local Pharmaceutical/Health Industry

The government of Ghana has proposed and implemented several interventions aimed at supporting and ensuring the growth of the local pharmaceutical industry. The government is determined to support the pharmaceutical market's growth opportunities and has allocated funds for industry promotion, including industry plans to create a pharmaceutical manufacturing industrial park. The Ghana National Chamber of Pharmacy signed a Memorandum of Understanding (MOU) with LMI

Holdings Ltd, a construction firm, for the construction of a pharmaceutical industrial park designated to be in the Dawa Industrial zone. To achieve the aim of becoming an ECOWAS hub in this industry and to support local drug manufacturers, the government has disclosed a number of interventions, some of which are underway, such as tax exemptions for selected imported pharmaceuticals and additional funding for some local pharmaceutical companies. Removal of trade barriers and promotion of Ghanaian pharmaceutical products in the ECOWAS region is being championed by the Ministry of Foreign Affairs and Trade. Currently, there is a zero rate of value-added tax on a number of pharmaceutical inputs. The state has also provided funding for some local drugmakers to construct manufacturing plants and aid in the achieving of international standards. Ernest Chemists and Tobinco Pharmaceuticals Limited are local firms that have benefited from these government fundings to construct manufacturing plants that adhere to GMP and thereby improve prospects for export within West Africa. As laudable as this is, it is unfortunately inadequate.

5. CONCLUSION

As Ghana strives to improve access to healthcare, poor access to medicines appears as one of the top challenges; this can be tackled with the implementation of effective Supply Chain Management (SCM) systems. Based on data from public and private healthcare facilities and the review of secondary data, this report provides data and insights on the current state of medicine access in the healthcare sector of Ghana by detailing the lapses in the supply chain which can be targeted in the quest to achieve increased access to medicines. Efficient supply chain management is critical to ensuring medicine access by enhancing four key factors: the rational selection and use of medicines, affordable prices, sustainable financing mechanisms, and reliable health and supply systems to deliver medicines to users. Ghana's complex administrative structure in healthcare results in an average medicine availability of about 40% in the public sector. This is further compounded by a fragmented supply chain and distribution systems. Improved procurement planning and removal of procurement delays are key for rational selection and use of medicines. High prices of medicines can be combated through practical, enforceable pricing policies based on external reference pricing. A move toward a more sustainable health financing which not only relies on the National Health Insurance Scheme but shared responsibility with private sector insurance can reduce out-of-pocket spending and slow the gradual shift of the healthcare sector toward a cash-and-carry system. Furthermore, innovation in distribution systems in Ghana through digitization is critical to improve access to medicines through efficient last-mile deliveries, elimination of accessibility issues, and enhanced traceability. The role of the government in providing an enabling environment for medicine access cannot

be overemphasized. Through an increase in government support of the private pharmaceutical industry, a projected increase in local drug production may lead to increased availability of medications to the populace and hence affordability of medicines.

Transitioning to more sustainable supply chain systems will enhance Ghana's quest toward achieving universal healthcare through increased medicine access. This transition may become a possibility through consideration of the following recommendations by policymakers, industry, and consumers.

6. RECOMMENDATIONS

Improving decentralization in the public supply chain by enhancing decision space

Due to the complexities of the existing healthcare system and supply chains, it is necessary to reassess the current decentralized structure of the supply chain in terms of the decision space allowed for different functions. Local discretion can be allowed by the government for various functions such as procurement, financing, service delivery, and human resources management. As the system evolves, the range of discretion can vary for some functions and not for others. Increasing local choice over some functions like procurement has the potential to lead to higher performance toward medicine access. Additionally, an increase in health system managers' control over more financial resources is needed for the increase in decision space to positively enhance a more efficient supply chain.

Efficient utilization of data and data tools

Ghana's healthcare supply chain generates significant amounts of data. However, a lot of the supply chain management is performed manually. The healthcare system has adopted many data-driven tools that can improve management of stock. But a lot of these tools designed to handle supply chain data suffer from insufficient interoperability, which leads to inaccurate data capture. For instance, systems designed for commodity management are often separate from revenue management systems. These systems need to be interoperable to create transparency between the cost and revenue sides of the supply chain. In addition, the gravitation toward manual commodity management by supply chain staff can be attributed to inadequate human resources and training of supply chain staff. Aside from recruiting of competent staff, continuous training programs boost the confidence of staff to use the data management tools available to them. Furthermore, supply chain managers can also benefit from outsourcing of supply chain data management to other professionals or third-party data or business analysts that generate reports that are

an easy reference for decision making in supply chain management. The lack of this extra function reduces burden and improves efficiency.

Improvement of public procurement systems

The Public Procurement Law has not been sufficient to curb interferences that occur in the public procurement process. It still suffers from issues such as political interference and exploitation by procurement practitioners, too much paperwork, prolonged bureaucracy, inadequate funding, and insufficient monitoring. Interferences in tender evaluation, beneficiary selection, etc., may be curtailed by decentralization of decision making. Decentralizing decision making can enhance strategic procurement planning, where requirements are well-defined, and contracts are properly awarded. Incentivizing the use of GHANEPS and improving its monitoring and oversight by the PPA will streamline public procurement of essential medicines by reducing paperwork, reducing bureaucracy, and increasing transparency and accountability in the public sector.

Implementation of pricing strategies and price control

Ghana's pricing policies for pharmaceuticals lack practical implementation. Concrete steps toward implementation of the pricing policy should include legislation aimed at regulated pricing, rather than administered pricing. Setting drug prices through negotiating with manufacturers and volume-based pricing policies, or unilaterally setting prices through notice and comment rulemaking and external reference pricing would constitute major policy initiatives that reduce the reliance of medicine prices on market forces. Additionally, enactment of drug pricing transparency laws which require drug supply chain actors such as manufacturers to report actual price costs to government and the general public, would be helpful. This information can be fed into the development of drug price databases, which serve as guides during price negotiations with pharmaceutical companies and/or for monitoring purposes. This further allows consumers to make informed choices on service delivery.

Making the NHIS more sustainable

The success of the NHIS is critical as it is instrumental for eliminating price barriers to medication access. The current funding model is, however, unsustainable. Given the limited public budget for the NHIS, the current scope of coverage for certain medicines can be reduced by delisting certain items from the "benefits package" and shifting these excluded services to the private market. Private health insurance schemes in Ghana have demonstrated capacity to deliver equitable health outcomes while efficiently managing healthcare costs. They are more responsive in finding answers to policy challenges in the healthcare system. The expansion of private health insurance as an additional funding option would enable the government to cut public health expenditure, while providing better quality care to more people. Collaborations between private health insurers and suppliers of pharmaceutical

products as well as fintechs can provide competitive pricing for pharmaceuticals by providing a ready market.

Harmonization of public and private healthcare supply chains

One major failure of the healthcare supply chain is the fragmentation of public and private supply chains. Ghana must move toward a more integrated and harmonized healthcare system by aligning domestic and external resources with the national health strategy and disease-specific interventions of national importance. An efficient integration of the two supply chains would enhance traceability of medicines. The introduction of NePP, which harmonizes private sector supply chains, may be the starting point for this integration. A suggestion would be to establish an interoperable link with GHiLMIS as a first step.

Strategy implementation of government support for local pharmaceutical industry

The policies and strategies from the government of Ghana toward supporting the local industry must be implemented and not merely announced. Tax subsidies and exemptions and minimized importation of selected medications to boost local production will increase access and reduce drug costs significantly.

Notes on methodology:

Qualitative and quantitative cross-sectional data were collected and analyzed between February and June 2022. Retrospective data were collected from 2019–2021. A combination of desk studies, key informant interviews, and stratified random sampling was employed. Data were collected from 30 public hospitals, 12 private hospitals, 120 privately-owned pharmacies, two regulatory bodies, and 250 patients

Data from 2019 to 2021 was retrospectively gathered from 30 designated public hospitals. Alongside this, interviews were conducted with out-patients to assess fulfillment levels of prescribed medicines and procurement orders . This assessment was carried out using the WHO medicine use indicators and operational checklists. The list of tracer medicines was prepared based on the top 10 prevalent diseases for 2019 and excluded those of vertical programs.

References

1. Ghana Statistical Service(2021). Ghana 2021 Population and housing Census, general report, volume 3C, page 62. https://www.statsghana.gov.gh/gssmain/fileUpload/pressrelease/2021%20PHC%20General%20Report%203C_revised%20print_281121a.pdf.

2. Ministry of Health (2013).Holistic Assessment of the Health Sector Programme of Work 2013. Ghana. https://www.moh.gov.gh/wp-content/uploads/2016/02/Holistic-Assessment-Report-June-2014140811072318.pdf.

3. World Health Organization (2004). Equitable access to essential medicines: a framework for collective action. Document number: WHO/EDM/2004.4. https://apps.who.int/iris/bitstream/handle/10665/68571/WHO_EDM_2004.4_eng.pdf?sequence=1&isAllowed=y.

4. World Health Organization (2022).One billion more people benefiting from Universal Health Coverage. WHO Factsheet. https://www.who.int/news-room/fact-sheets/detail/universal-health-coverage-(uhc).

This material is supported by the United States Agency for International Development and created by the Center for Applied Research and Innovation in Supply Chain – Africa (CARISCA), a joint project of Arizona State University and Kwame Nkrumah University of Science and Technology under award number 7200AA20CA00010.

Learn more about CARISCA:

carisca.knust.edu.gh

USAID FROM THE AMERICAN PEOPLE

Arizona State University

KNUST KWAME NKRUMAH UNIVERSITY OF SCIENCE AND TECHNOLOGY