Technical partner paper 13

Private Sector Role in Health Supply Chains:
Review of the Role and Potential for Private Sector
Engagement in Developing Country Health Supply Chains

Dalberg Global Development Advisors
MIT-Zaragoza International Logistics Program

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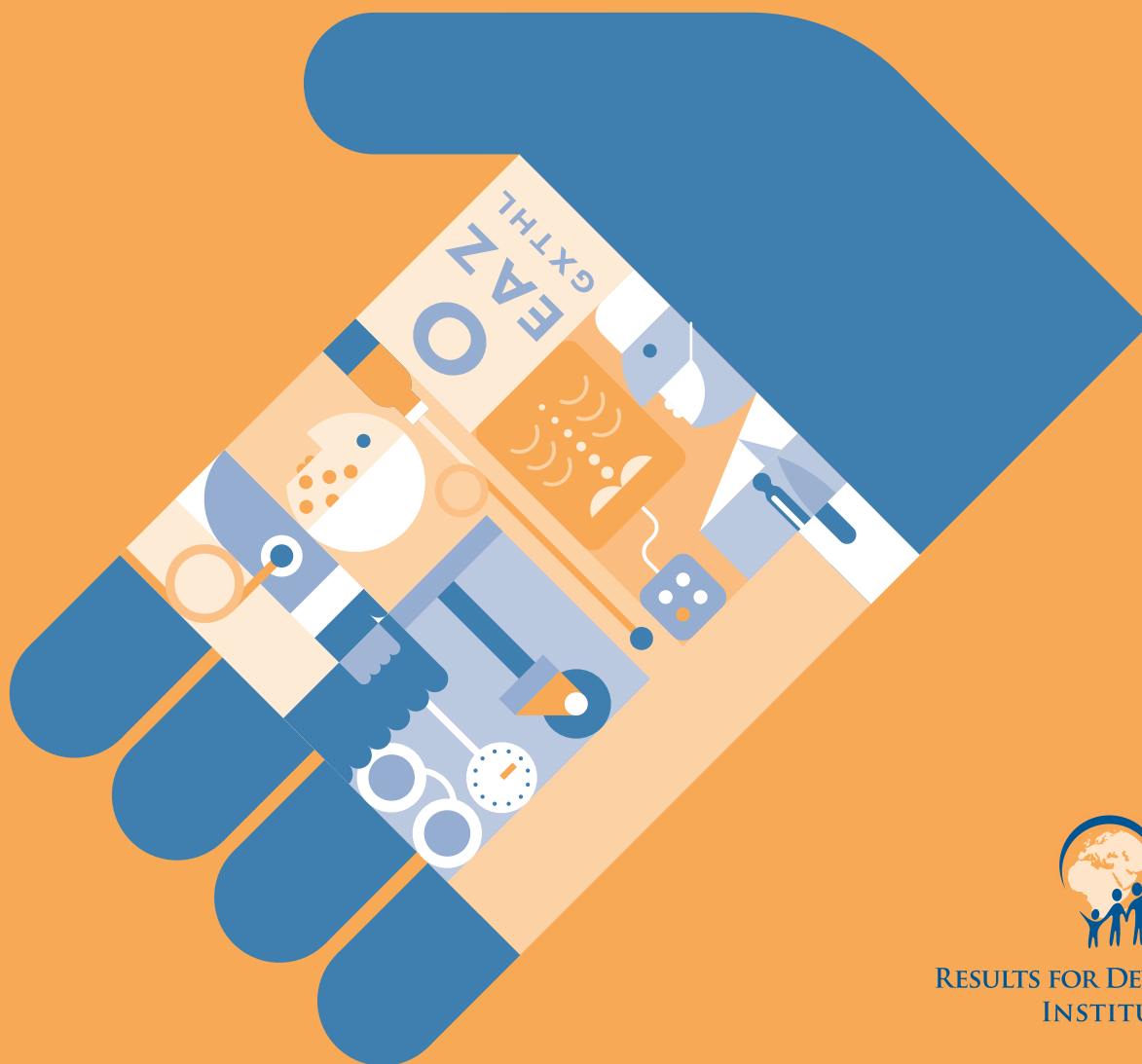
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The Private Sector's Role in Health Supply Chains:

Review of the Role and Potential for Private Sector Engagement in Developing Country Health Supply Chains

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Dalberg Global Development Advisors and the MIT-Zaragoza International Logistics Program

Contents

1. Introduction

Strong supply chains are essential to effective health care delivery in all sectors—public, faith-based, employer-provided, and private. In the countries of the Organisation for Co-operation and Development (OECD), supply chains rely heavily on the private sector for supply, distribution, and provision of key auxiliary services even when the health system itself is largely or exclusively public sector. These supply chains work quite well in ensuring consistent availability of high-quality product. In contrast, health supply chains in many low- and middle-income countries perform poorly and have less private sector involvement. This observation leads us to ask: How might a greater role for the private sector, greater leveraging of private sector supply chain best practices, or a combination of the two improve health supply chains in low- and middle-income countries?

This study has two objectives: (1) to provide an understanding of the current and potential role for the private sector in health supply chains, and (2) to provide recommendations regarding how national governments, policymakers, private investors, international donors, and foundations should think about investment in private sector health care initiatives for low- and middle-income countries. We define "health supply chain" as the network of entities that plan, source, fund, and distribute products and manage associated information and finances from manufacturers through intermediate warehouses and resellers to dispensing and health service delivery points. This paper puts a primary focus on the activities of the for-profit private sector and the deployment of for-profit best practices by other sectors in the health supply chain. It is informed by in-depth case studies of health supply chains in Ghana and Zambia, as well as interviews with more than 40 supply chain and health experts in 12 countries about private sector initiatives in those countries. Over 40 private-sector-oriented initiatives that seek to bring new models to low- and middle-income country supply chains were identified and reviewed. The major findings are as follows.

Supply chains matter

Supply chains are critical in defining the ultimate cost and accessibility of medicines. A well-functioning health supply chain provides broad geographic access to affordable, high-quality products. In addition, good supply chains operate with efficiency, adaptability, and financial integrity. Using product availability as a measure of supply chain performance shows a clear distinction between OECD countries and low- and middle-income countries. Product availability at retail pharmacies in most OECD countries is over 95 percent and the average for the European Union is over 90 percent (European Pharmaceutical Wholesaler Industry 2006). In low- and middle-income countries, product availability is much lower. At public sector health facilities, average availability is roughly 38 percent; and at private outlets, where products are often unaffordable to most of the population, availability is still under 60 percent (WHO/HAI 2008).[1]

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[1] These averages based on medicine price surveys conducted by Health Action International in sub-Saharan Africa. More detail is provided in appendix 1.

A wide range of supply chain activities are required to source, fund, move, and deliver products to dispensing and health service delivery points. These activities are enabled by the availability of market and product information, efficient and timely financial flows, and effective national regulation and enforcement.

Investing in private sector supply chain initiatives can improve health system performance across sectors

Today, health supply chains at the country level face a range of challenges, among them limited geographic reach, lack of information for reliable forecasting and supply chain planning, insufficient scale in warehousing and distribution, and poor access to debt and equity financing. On the whole, they are characterized by antiquated systems that lack the capacity to deliver the increasing volume and complexity of drugs now supported by donor funds, which could reach $10 billion a year by 2011. Investing well in private sector initiatives can contribute to addressing these challenges by increasing supply chain efficiency among actors in all channels, and extending private sector channels to increase access for currently under-served populations.

A diverse set of private sector initiatives were identified; however, a lack of performance data makes it impossible to select a clear "winner" for investment. That said, several models appear to show promise, including initiatives currently under way to build innovative distribution networks (including franchises and multi-product delivery models) and outsourced supply chain services. Several initiatives at the concept stage also showed potential, in particular those focused on increasing the availability of information using mobile phones and other information technologies, and broader access to debt and equity financing across the supply chain.

The importance of country context

Country context plays a critical role in determining appropriate supply chain solutions. Identifying countries with common attributes presents the potential to build scalable models

We created an approach for characterizing individual countries in terms of channel structure, private sector role in supply chains, and supply chain performance. We used the approach to compare Ghana and Zambia, two countries in which the role of the private sector differs markedly. In Ghana, the major supply chain challenges are (1) to improve and formalize private sector supply of product in all channels; (2) to improve financial integrity and reduce indebtedness in all channels; and (3) to improve access to high-quality medicines in remote areas. Private sector initiatives are currently playing a significant role in addressing these challenges. In Zambia, the major supply chain challenges are (1) to improve the performance of the public sector supply chain in support of all channels; and (2) to improve access to high-quality medicines in remote areas. Financial integrity is much less of an issue in Zambia than in Ghana because

medicines are transferred along the public supply chain without money changing hands. As in Ghana, private sector initiatives are focused on the challenges at hand.

The bulk of current investment in private sector supply chain initiatives is country-specific, addressing gaps in the performance of the health supply chain in individual countries. An important area of future work will be to characterize health channels and supply chains in a broader range of countries so that opportunities to leverage private sector initiatives across countries can be identified and pursued.

The various stakeholders each have an important role to play

Private investors as well as social investors and foundations are good candidates to make investment in individual initiatives, particularly in the early stages of innovations. National governments and international donors can play a major role as enablers: improving the availability and transparency of information about supply chain performance and increasing access to financing for supply chain actors. Furthermore, national governments need to take a more strategic approach to defining the regulatory environment for private actors and for actively engaging and contracting with private sector actors to strengthen their own health systems. International donors can support the creation of financing mechanisms that provide greater access to equity and debt capital to private sector initiatives. They can also support national governments in efforts to increase their capacity to regulate and contract with the private sector.

In conclusion, global health supply chains play a critical, if sometimes overlooked, role in increasing access to medicines. Lessons from the OECD tell us that the private sector has a potentially large role to play in the delivery of medicines and can increase the efficiency and reliability of supply chains. Substantially greater investment is required in testing and scaling up private sector supply chain models and building the enabling environment that supports them, and this must be paired with much better information about supply chain performance. With new models, better information, and greater access to a range of grant, debt, and equity financing, the private sector has the potential to positively transform the delivery of medicines in the world's poorest countries.

2. Supply Chains for Health Care

Supply chains underpin the entire health system and are essential for providing consistent availability of affordable, high-quality diagnostic and treatment products in locations that are geographically accessible to the target population. In addition, supply chains carry information about supply and demand for products back to planners and policymakers and handle financial flows so that the system is adequately resourced. A broken supply chain can cripple the health system and undermine positive health outcomes.

In low- and middle-income countries, where a large percentage of the population is impoverished and particularly vulnerable to disease and where over $10 billion in donor-financed health commodities alone are expected to flow through the system by 2011, the stakes for effectively managing the supply chain are particularly high. Yet, supply chains in many low- and middle-income countries underperform. Using product availability as a measure of supply chain performance shows a clear distinction between OECD countries and low- and middle-income countries. Product availability at retail pharmacies in most OECD countries is over 95 percent, and the average for the European Union is over 90 percent (European Pharmaceutical Wholesaler Industry 2006). In low- and middle-income countries, product availability is much lower. At public sector health facilities, the average availability is roughly 38 percent; and at private outlets, where products are often unaffordable to most of the population, availability is still under 60 percent (WHO/HAI 2008).[2] (Appendix 1 compares product availability and affordability in the public and private sectors of low- and middle-income countries).

A stark difference between health supply chains in OECD countries and in low- and middle-income countries is the degree to which the private sector is involved in the different stages of the supply chain. In OECD countries, the private sector is leveraged to achieve greater effectiveness, while in low- and middle-income countries, there seems to be much less involvement of the private sector. This suggests that if properly tapped into, within an appropriate regulatory framework to mitigate the potential downside effects of the profit motive, the private sector can be an important component in improving supply chain effectiveness and thus supporting better health outcomes. (Appendix 2 provides details about supply chain structure in OECD countries).

The four stages of health supply chains

A health supply chain is the network of entities that plan, source, fund, and distribute health products and manage associated information and finances from manufacturers through intermediate warehouses and resellers to dispensing and health service delivery points. There are numerous actors involved in making supply chains work: donors and funders, government policymakers, procurement agents, program managers, regulators, suppliers, distributors, and dispensing staff from the public, private, and faith-based

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[2] The averages are based on medicine price surveys conducted by Health Action International in sub-Saharan Africa. More detail is provided in appendix 1.

sectors. Throughout this process many activities are carried out, including product registration, forecasting, procurement, importation, warehousing, distribution, and retailing. These activities occur at the different stages within the supply chain. Figure 1 below depicts the activities that occur to manage the flow of goods both into and inside the country as well as the supply chain enablers required for a supply chain to function properly.

Figure 1: Activities and enablers required to effectively manage product flow from entry into the country to delivery to the patient

Product Manufacturing	Flow of goods into the country*	Flow of goods inside the country	Retailing and health service delivery to patients
	• Product Registration • Product Selection • Forecasting • Procurement • Importation	• Ordering/ Replenishment • Warehousing • Distribution • Reselling	

Supply chain enablers

• Market and product Information flows
• Financing and money flows
• Regulation and enforcement

*Note: In countries with significant local manufacturing, importation will be smaller in scale, and product manufacturing will obviously occur within, rather than outside, the country.

As indicated in figure 1, the focus of this report is the flow of goods into and within the country, and the enablers that support that flow of goods. Thus, neither manufacturing nor health service delivery are considered explicitly. However, the supply chain implications of manufacturing (local versus international) as well as different models for service delivery provision are taken into consideration.

The supply chain enablers are a critical thread that runs through all activities and stages of the supply chain. Better information ensures better use of resources, which are often in short supply. For example, accurate information about consumption patterns that is captured at the service delivery point and flows back up the chain can be crucial for effective quantification and ordering at all tiers in the supply chain. Proper stock levels at service delivery points should be established to determine replenishment rates at the different levels of the supply chain (e.g., central warehouses and regional stores). Maintaining desired stock levels will limit the probability of both stock-outs and excess

inventory, which often lead to product expiry. Stock information flowing up through the system will, critically, inform upstream decisions about procurement quantities.

Effective financial flows are also crucial for the supply chain and for the health system as a whole to function properly. Timely financial flows between tiers in the supply chain will help ensure an uninterrupted flow of products and a sustainable system that is able to consistently deliver products and services. All too often in low- and middle-income countries, unsynchronized or delayed financial flows limit procurement of products.

Regulation also spans the chain, incorporating product registration, thorough inspection of products at the port of entry, oversight of distribution and resale activities as well as accreditation of pharmacists and technicians, and inspection of pharmacies and drug shops. Without adequate regulation at each step in the supply chain, product integrity can be compromised, leading to unnecessary deaths and the development of drug resistance.

As logistics data become more widely available and more accurate, as financial flows become better managed, and as regulation is made more appropriate and effective (both in terms of oversight and efficiency), the space will be more predictable and open up opportunities for more manufacturers, resellers, and supply chain service providers to enter the pharmaceutical markets in low- and middle-income countries, thus increasing competition and ultimately driving prices down and efficiencies up.

Effective supply chains improve health outcomes

Achieving good health outcomes requires supply chains that provide consistent availability of affordable, high-quality products in a location that is geographically accessible to the target population. Furthermore, supply chains must be adaptable and cost-effective, and have financial integrity to sustain good outcomes. Figure 2 depicts this relationship, defines the four aspects of supply chain performance—(1) geographic access, (2) availability, (3) affordability, and (4) quality—and identifies the key drivers for each aspect.

Figure 2: How good supply chain performance contributes to good health outcomes

Achieving health outcomes

Geographic access	Availability	Affordability	Quality
Able to provide the product at a location within a reasonable distance to the patient	Able to provide consistent availability of the right type and quantity of product	Able to provide products at prices that patients/the system is able to bear and sustain	Able to provide safe, authentic, efficacious and unexpired product
Key Drivers • Location of product dispensing point • Costs and modes of patient and/or product transport	**Key Drivers** • Matching of supply and demand • Access to working capital • Financing gaps, delays, and leakage • Warehousing and transport capacity	**Key Drivers** • Market competition • Free dispensing vs. user fees	**Key Drivers** • Quality product enters supply chain • Product integrity maintained until the point of dispensing • Disincentives for counterfeiting

Supply chains that are *adaptable*, *cost-effective* and have *financial integrity*

Adaptable to changes in product portfolio; good management and use of funds

Supply chains must be robust and sustainable. The adaptability of health supply chains is critical to introduce new drugs and treatments, to effectively carry out product changeovers, and to incorporate innovations such as telemedicine or rapid diagnostic test kits. Similarly, given a resource-constrained environment, sound financial management is necessary to maximize health impact and keep the system functioning.

There is a great deal of interconnectedness among the five aspects of supply chain performance. Improvements made in one area can reinforce and strengthen another area. For example, improving affordability of drugs in licensed facilities will reduce the need for patients to seek cheaper medicines in the gray market and thus limit the incentives for the production and sale of low-quality products. Conversely, improvements in one area can require trade-offs in another. Extending geographical coverage to remote populations often requires leveraging distribution networks or retail platforms that have less supply chain visibility and oversight, making product integrity and quality harder to ensure. The influence diagram in figure 3 illustrates some of the relationships between the various areas and shows how important it is to understand this interconnectedness when deciding on the balance between success indicators.

Figure 3: Influence diagram of supply chain interconnectedness
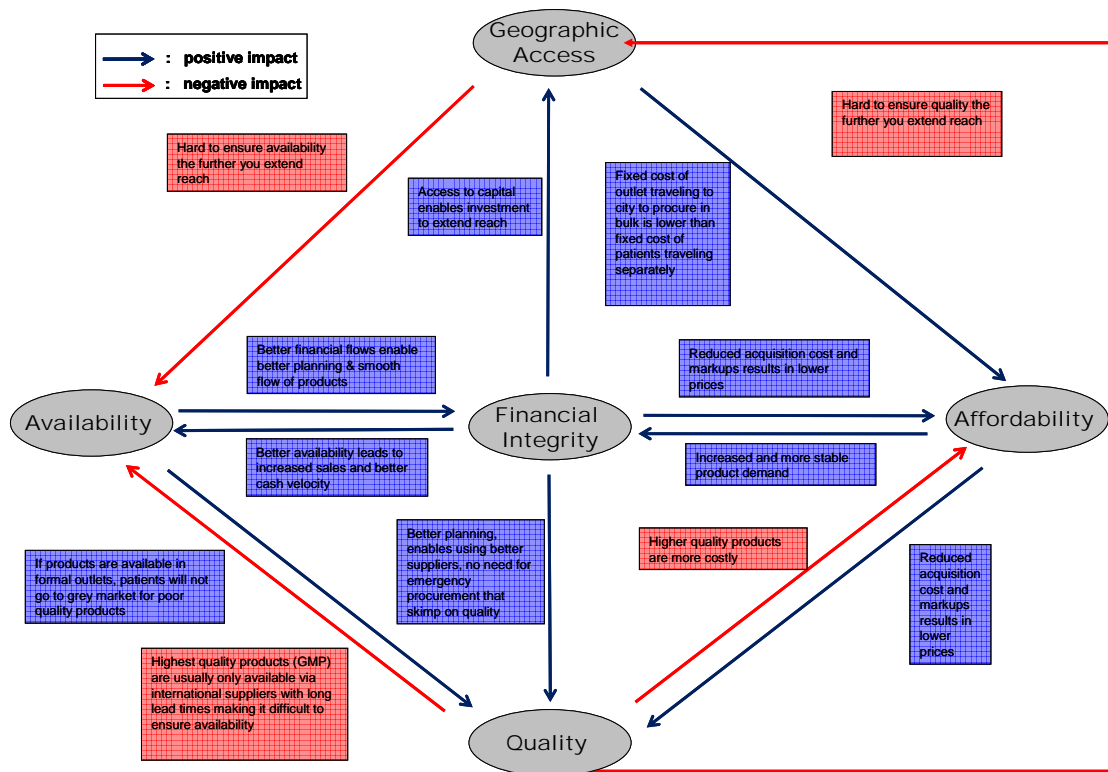
Recommendations for future research

Although supply chains are critical to achieving good health outcomes, little research has been done to assess the performance of supply chains in low- and middle-income countries or to determine how poor performance can negatively impact health care outcomes. For example, it is currently difficult to assemble information on supply chain costs as a percentage of program and health ministry budgets. This lack of information makes it difficult to assess how well supply chains are working in each sector so as to make decisions on where to focus resources to improve supply chain performance.

3. Understanding the Role of the Private Sector

The research team developed a framework for understanding the role of the private sector in a country's health system and then applied the framework to compare two countries—Ghana and Zambia. The two countries differ remarkably in country context, private sector role, and supply chain performance. For investors who are evaluating private sector initiatives in which to invest, this analytical approach provides a way to categorize initiatives based on private sector role and to explore how well a particular initiative might work in a given country context to address opportunities to improve supply chain performance.

A framework for describing the role of the private sector

The current and potential role of the private sector in health supply chains for a given country can be understood using the framework shown in figure 4. The health care system in a low- or middle-income country typically comprises four sectors—public, faith-based, employer-provided, and private—each of which acts as a channel to provide a range of services to the population in the geographic areas in which it operates. The relative share of the four sectors varies by country.

Behind each channel is a supply chain that sources and delivers medicines, supplies, and equipment to dispensing points and service delivery points. Figure 4 suggests that these supply chains are distinct, but depending on the country, there may be a high degree of interconnectedness among the supply chains—the sectors may supply product to one another and perform supply chain activities on behalf of one another. Furthermore, a given sector's supply chains may be further segmented into many specialized or "vertical" supply chains that address the unique needs of particular programs, products, or service delivery points. The degree and nature of segmentation will depend on the country.

Figure 4: Potential role of the private sector in a health care system
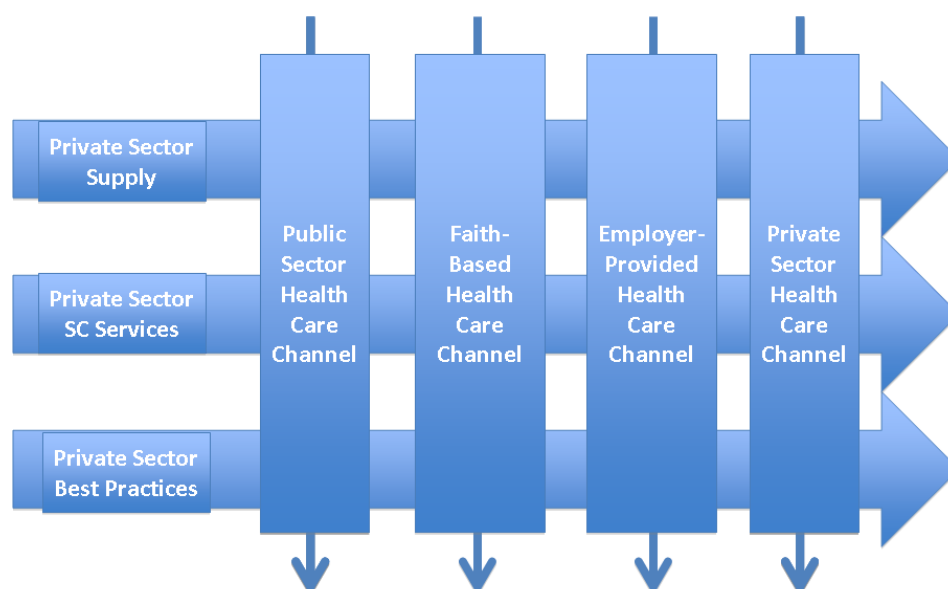
As shown in figure 4, the private sector can play any of four roles in support of one or more channels within the health system:

- Selling medicines, supplies, and equipment to one or more channels (e.g., manufacturers, wholesalers)
- Selling supply chain services, such as procurement, transportation, warehousing, and information and financial services to one or more channels. Services may also be knowledge-intensive, such as supply chain design, needs quantification, or logistics management and information system design.
- Providing a private sector channel with a supply chain behind it (e.g., pharmacy, private health clinic, franchise network)
- Acting as a source of—or assisting in—implementation of supply chain best practices, such as scheduled delivery networks, integrated supply chains, pay-for-performance systems, or cash-to-cash cycle time management approaches, to one or more channels (e.g., consultants, trainers, educators, change agents)

A variety of actors—government policymakers and political bodies, donors, investors, regulating agencies, and consultants—influence the evolution of the private sector's role by creating the legal and regulatory context, setting direction, and providing financing. At the same time, private sector players themselves influence the evolution of the private sector role by making choices about how to compete and how to provide products and services to customers and, eventually, by prospering or failing.

In deciding whether to allow or encourage a particular private sector role, those who wield influence should consider the extent to which market forces will lead private sector players to perform their role well and to what extent oversight or regulation is needed. The most appropriate areas for private sector involvement are those for which the risk of underperformance is low or can be managed through reasonable regulation so that the private sector has a clear advantage over other sectors. As shown in figure 5, supply chain activities can be classified as having high potential for the public sector, high potential for the private sector, or as overlapping where both sectors have a potential role to play.

Figure 5: Roles most appropriate for the public and private sectors

Potential intervention areas of private sector

Overlapping areas

Highest advantage for public sector role

- Product registration and quality oversight
- Market regulation

- Procurement
- Importation
- Retail/health service networks
- Financing
- Market and product information

Highest potential for private sector role

- Physical distribution – warehousing and transporting

Some areas seem to be intrinsically more appropriate for the private sector to play a role: Some of these roles require a careful analysis of the policy environment, regulatory and contract monitoring capacity, and other context-specific factors. That said, there seems to be some low hanging fruit in reinvigorating the public sector supply chains through private sector best practices and management approaches. In addition, the use of private sector capacity for carrying out auxiliary functions or services such as the design of logistics and management information systems and the provision of financial transaction management services does not require a strong contracting or monitoring capacity, and these may be best suited as starting points for a private sector role in supply chains.

A comparison of Ghana and Zambia

The research team used Ghana and Zambia as case studies to validate our approach to describing country context, private sector role, and supply chain performance, and to develop more generalized thinking about how to categorize countries based on their potential for private sector investment. We selected the two countries for study because both are viewed as having relatively well-functioning health systems, yet they differ in terms of country context and the role of the private sector. (The case study of Ghana is presented in appendix 4, and the case study of Zambia is presented in appendix 5.)

Before delving into how the private sectors in Ghana and Zambia differ, it is useful to understand differences in country context that may influence the different private sector roles. Important differences were noted in three areas: demographics, the existence of public health insurance, and business environment.

Demographics. Ghana and Zambia are both relatively stable democracies with similar

per capita gross national income,[3] and both struggle with malaria as a major health issue. However, the two countries are quite different in other respects. Ghana is much more densely populated and has twice the population of Zambia, despite the fact that it covers less than one-third of the surface area. Ghana is also more urbanized than Zambia. In contrast, infant and adult mortality rates are significantly higher and life expectancy much lower in Zambia (41.7 years) than in Ghana (59.7 years). This is partly explained by the fact that the prevalence of HIV/AIDS is roughly eight times higher in Zambia. Lastly, although the two countries have similar per capita gross national income, Zambia has a much larger percentage of its population living below the national poverty line.

Existence of public health insurance. Patient pricing of health care products and services affects not only affordability; it has an indirect effect on financial integrity as well. Pricing in a given channel (public, faith-based, employer-provided, private) may fall into three general categories: free to all; free or highly subsidized to health insurance subscribers, and fee-based.

In Zambia, health care services and medicines are free at public, faith-based, and employer-provided clinics. The mining industry provides health services at almost no cost to employees and eligible dependents, who may constitute up to 5 percent of the national population. Health care, when it is available, is therefore generally affordable. In addition, medicines provided through the public sector are passed along the chain without money changing hands; as a result, warehouses and health facilities downstream of the Central Medical Stores do not need to manage cash. For that reason, there is no risk of becoming indebted due to poor cash management associated with the purchase and resale of medicines.

In Ghana, health care services and medicines are covered by the National Health Insurance Scheme (NHIS), which was launched in 2004 with the goals of providing universal coverage and replacing the "cash and carry" system that had made health care costs prohibitive for a large portion of Ghana's poor. To make coverage available to all, subsidies are provided for children under 18 with both parents enrolled in the NHIS, pensioners, individuals over 70 years old, and individuals classified as indigent. As of 2007, roughly 55 percent of the country was enrolled in the NHIS, and 64 percent of those enrolled were within the subsidized group.

Health care and medicines received under Ghana's NHIS are therefore affordable. However, medicines are sold and resold along the chain in all sectors. The final price received is set by the NHIS. Thus, facilities within the chain face three significant risks that are not present in Zambia.

- Because medicines are purchased and resold, facilities handle cash and must manage their cash well to avoid indebtedness.
- Because prices are fixed at the end of the chain, problems can arise if these prices do not cover the prices paid for medicines and associated logistics.

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[3] 2007 gross national income calculated using the PPP Atlas method.

- If there are delays in reimbursement by the NHIS, working capital for all players in the supply chain—including service delivery points—will increase and can lead to indebtedness that strangles the system.

Business environment. Favorable national laws and regulations in Ghana, although not the only driving factor, have contributed to the development of a larger private sector, particularly in local manufacturing and in retailing. While these parts of the supply chain are not of direct interest to this study, they give an indication of the business climate in the two countries. Furthermore, procurement law in Ghana has been more supportive of wholesaling than in Zambia.

The market for pharmaceuticals in Ghana is larger than that in Zambia, encouraging actors to enter the space. Furthermore, Ghana's trade policy and import duty structure are more favorable to local manufacturers than those of Zambia. As a result, the 35 local manufacturers in Ghana produce roughly 30 percent of total medicines (prescription and over-the-counter), while in Zambia the 6 local manufacturers account for a much smaller fraction of the supply.

Ghana has a more developed retail drug sector, with more than 1,000 private sector pharmacies and more than 10,000 private sector chemical sellers. Chemical sellers, which serve mainly rural areas and are only allowed to sell over-the-counter drugs, are often the first point of contact when a patient is seeking treatment. In contrast, the number of pharmacists in Zambia is very low—fewer than 100—and there are only 59 pharmacies. Similarly, the lack of pharmacy technicians in Zambia keeps the number of drug shops low.

In Ghana, the Procurement Act of 2003 allows public clinics and hospitals to procure from private sector suppliers when products are not available at the public Regional Medical Stores. Similarly, it allows each Regional Medical Store to procure from the private sector if the Central Medical Stores cannot supply the necessary products. Lack of availability at the Central Medical Stores has led to extensive private sector buying. In some regions, as much as 85 percent of all products are purchased from the private sector (Health Supply Chain Practitioners Retreat 2007). Similarly, there is a substantial amount of private sector procurement that occurs at the health facilities, especially larger hospitals. In contrast, Zambian health facilities are dependent the public system for their supplies. Procurement of products is done by the Central Medical Stores and channeled down to the service delivery points.

Channel structure and private sector role

Channel structure and the private sector's role in Ghana and Zambia can be analyzed and compared using the framework shown in figure 4. All four channels exist in both countries, and the public, faith-based, and employer-provided sectors serve similar segments of the population in the two countries, but the private sector channel is more developed in Ghana. The private sector channel has yet to play a significant role in Zambia.

In both countries, the population segments reached by each of the channels tend to be defined by geography and economics. The public sector channel is most active in the more densely populated areas, which are also relatively more affluent. The faith-based channel is an important source of health care for less affluent or poor people in far-flung areas. The employer-provided channel serves employees of copper mines (Zambia), cocoa plantations (Ghana), and gold mines (Ghana) in areas where large-scale employers operate. The private sector channel in Ghana operates both in urban areas (clinics and pharmacies) as well as in more remote rural areas (chemical sellers).

There are several notable similarities and differences between the supply chains and the private sector roles in the two countries:

1. **Public sector distribution structure.** The public sector supply chain in Ghana diverges farther downstream than it does in Zambia. In Ghana, the Central Medical Stores distributes to 10 Regional Medical Stores, which in turn distribute to roughly 2,200 service delivery points. In Zambia, the CMS distributes to 72 district medical stores, which then distribute to roughly 1,500 service delivery points. The presence of a larger number of secondary distribution points in Zambia necessitates stock planning and order management capacity at each of these 72 district medical stores. Given the scarcity of such planning capacity, the less divergent distribution model as seen in Ghana seems to be more suitable for resource-limited settings.

2. **Private sector supply.** Private sector supply plays a greater role in Ghana than in Zambia (see figure 6 below). In Ghana, wholesalers constitute a substantial portion of sales and delivery of medicines to public Regional Medical Stores and hospitals, as well as to faith-based facilities. In Zambia, virtually all of the supply to the public system and much of the supply to faith-based facilities comes from international suppliers and procurement agents and is distributed through the public sector supply chain. While in Ghana, the public sector has acknowledged the extent of private sector buying and is making adjustments to accommodate it, in Zambia there is no intention to increase the use of private sector supply.

3. **Private sector supply chain services.** In both countries, there is limited use of private sector supply chain services for procurement, transportation, warehousing, information, and financial services. An exception is the outsourcing of senior operational management of the CMS in Zambia to Crown Agents, Ltd. Both countries rely on technical assistance, funded by donors, for knowledge-intensive services such as supply chain design, logistics and management information system design, product forecasting, and needs quantification. This technical assistance, however, is provided by international consultants; private sector in-country expertise, to the extent that it exists, has rarely been used.

4. **Implementation of private sector best practices.** Direct implementation of private sector supply chain best practices—e.g., within-country pooled procurement and scheduled delivery—is being pursued in the two countries. While in Ghana the planned scheduled delivery network has yet to be fully implemented (after many years), it is operating successfully in Zambia. In Ghana, pooled procurement approaches are being explored by the public sector through the idea of National Framework Agreements and also by the faith-based sector.

5. **Private sector channel.** In Ghana, the private sector channel is executed through private sector hospitals, pharmacies, and chemical sellers. Chemical sellers serve poor people in both urban and rural areas. Recently, an initiative envisioned and implemented by international consultants has worked to create a franchised chemical seller network of "CareShops," which serve rural areas. The concept of CareShops has been to standardize and improve the service and range of products offered by chemical sellers, and to reduce supply chain costs, through franchising.

Figures 6A and 6B depict in-country product flows within and between supply chains. The thickness of the arrows represents estimates of the relative volume of products flowing between tiers. One clear distinction is that the degree of interconnectedness between sectors is greater in Ghana than in Zambia.

Figure 6A: Supply chain flows in Ghana

Figure 6B: Supply chain flows in Zambia

Supply chain performance and gaps in performance

When the performance of each supply chain is mapped along the dimensions of supply chain performance (affordability, availability, quality, geographic access, and financial integrity), important differences between the two countries are noted. These arise from the differences in country context in both countries and are summarized in figure 7 below.

- In both countries, geographic access for less affluent people in rural areas is a problem with access being limited to the southern part of Ghana and along the rail line in Zambia.
- In Zambia, products are largely available at the CMS but don't quite make it out to the facilities where availability is poor. The inverse applies in Ghana where facilities tend to have good availability because they can buy from private sector directly while the CMS is poorly stocked, creating a self-reinforcing cycle as facilities have to depend on private sector sources.
- As stated above, the NHIS in Ghana offers affordable services to subscribers with exemptions for children, the elderly, and the indigent. Zambia, on the other hand, offers free services in the public facilities, but availability is sporadic. Private sector providers cater to only a small, affluent proportion of the population.
- The quality of products in Zambia tends to be high, given that most products are purchased from suppliers certified in good manufacturing practices, while in Ghana, the local manufacturers are not certified so the 30 percent of medicines bought locally can be of variable quality.
- In Ghana, indebtedness within the supply chain is a significant problem. This arises from a variety of situations, including delays in operating funds released from the government as well as delays in insurance reimbursement by the NHIS to facilities. In Zambia, all products are provided by the CMS and no money travels through the supply chain; consequently, the flow of finances is not an issue at the facility level. It becomes a challenge at the national level where funding shortfalls for procurement of products leads to shortages and stock-outs.

Figure 7: Health supply chain performance in Ghana and Zambia
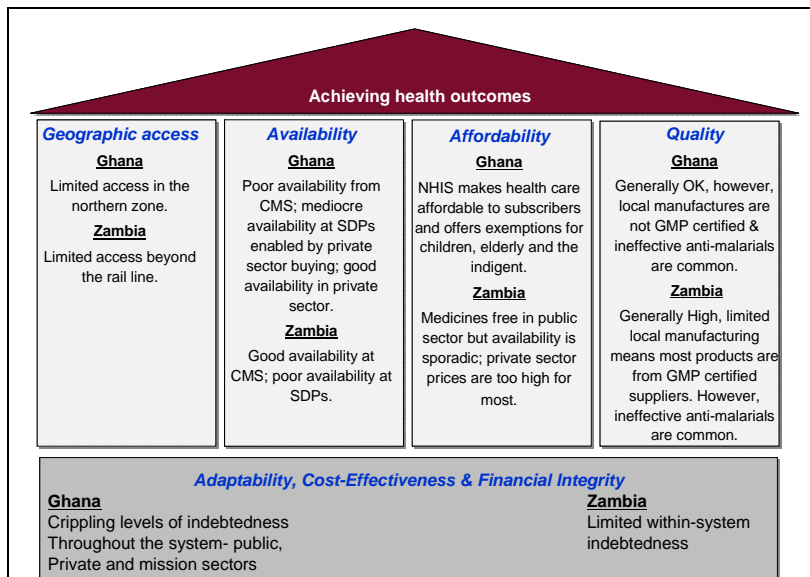
Note: CMS = Central Medical Stores; SDPs = service delivery points; GMP = good manufacturing practices.

Recommendations for future research

The approach presented here works well in describing channel structure, the private sector's role, and gaps in health supply chain performance. The understanding gained is helpful in evaluating the magnitude of the potential impact of current and proposed private sector initiatives.

Although the analysis of Ghana and Zambia suggests several factors that may be useful in categorizing countries, further research in additional countries is required to develop a comprehensive country categorization or segmentation criteria that can be used universally. Developing country segmentations would enable context-specific supply chain strategies to be developed. These strategies could then be used by other countries to inform policy decisions about how to best manage and/or stimulate development of different supply chain channels to improve overall health outcomes.

4. Recent Private Sector Supply Chain Initiatives in Ghana and Zambia

To understand how current private sector supply chain initiatives are shifting the role of the private sector in low- and middle-income countries, the team combined in-depth examinations of initiatives in Ghana and Zambia with a broad scan of notable initiatives across the developing world. While the in-depth cases allowed the team to look closely at both the initiative and that country's context, the broad scan allowed the team to develop a perspective on areas that offer potential space for private sector involvement.

This section presents examples of initiatives from Ghana and Zambia to illustrate the various factors that come into play. For each country, we have chosen private sector initiatives that seem to have high potential for impact—improving performance of the supply chain, and thus of the health care system—in a particular sector. The multi-country scan of initiatives is presented in section 5 and detailed results are given in appendix 6.

Initiatives in Ghana

Ghana has a vibrant private sector with the capacity to supply medicines and auxiliary supply chain services. Despite this capacity, structural bottlenecks have limited the private sector from playing a role in the health supply chain. In this section, we describe recent initiatives that are changing the private sector role in Ghana's health supply chain in significant ways.

National Framework Agreements

An important impediment to the use of the private sector as a source of product supply and of auxiliary supply chain services is that the Ministry of Health lacks the capacity to create contracts that are robust and that can be monitored. This lack of contracting capacity is far more severe at the decentralized level and results in either high prices or poor adherence to delivery terms when the private sector is used as a source for medicines and health commodities. One way to overcome this problem is to use the contracting capacity at the central level to create and negotiate contracts with the private sector for supply or service provision with the actual usage and ordering of products or services occurring at the decentralized level.

The Ghana Health Service is in the process of establishing framework agreements with local private sector suppliers. Two-year agreements will be awarded to Ghanaian companies to supply the 10 Regional Medical Stores with a comprehensive list of products. By aggregating demand for the entire country, the Ghana Health Service will be able to negotiate better prices and favorable contract terms. The suppliers will be required to fulfill orders made by the Regional Medical Stores within the lead time established in the contract and would likely enter into vendor-managed inventory arrangements with the

10 facilities. The NFA initiative exemplifies two roles in the supply chain framework outlined in section 3: adopting private sector best practices and increasing private sector supply.

The initiative addresses two key issues of quality, availability, and affordability. By having standing contracts with suppliers, Regional Medical Stores will be able to obtain products more quickly when there are stock-outs at the Central Medical Stores and, in turn, they will be to provide higher service levels to the hospitals and clinics in their district. Also, the NFA initiative is expected to lead to more favorable prices and solve the problem of different Regional Medical Stores paying vastly different prices for the same product.

The NFA project is led by the Supplies, Stores and Drugs Management Division within the Ghana Health Service, and the project requires relatively small external funding. If successful, the NFA initiative will be a powerful testament to the potential benefits of leveraging the private sector to improve public sector performance. It will shift the dialogue in Ghana about the private sector and could potentially change the way other governments think about sourcing arrangements. A successful NFA will also have implications for how Ghana and other countries with a sufficiently developed local pharmaceutical market think about the role of the Central Medical Stores. It is unclear whether the Central Medical Stores will compete with the NFA initiative by conducting more international competitive bids and improving availability, or whether it will focus its activities on importing products that are not available on the local market.

National Health Insurance Scheme

The existence of health insurance plans directly affects the behavior of health supply chains. Insurance pools the purchasing power of those paying out of pocket for drugs, thus creating a single entity that can contract on behalf of many end users. If executed well, this aggregation leads to significant improvements in the delivery of products by the supply chain. The aggregation means engaging with players who have scale and can thus develop useful scale efficiencies, as well as having more contractual control over them. Similarly, the aggregation can lead to a dramatic improvement in the quality of information gathered on the supply and demand of products moved by the supply chain, one of the key enablers highlighted in section 2. A precondition to achieving these outcomes is that the insurance entity manage its contracts effectively and systematically collect useful market data.

In Ghana, the implementation of the National Health Insurance Scheme has led to a rapid scale-up in health care coverage, which has placed a burden on claims processing. Currently, the reimbursement time for facilities averages three months. This delay has caused problems for public, private, and faith-based facilities and has led to severe indebtedness problems, as noted in section 3. Currently, there are discussions within the National Health Insurance Council (NHIC) about moving claims processing from the district level to the regional level and about outsourcing claims processing to a private enterprise. The NHIC has received bids from three different companies to carry out the

claims processing. The goal of the NHIC is to reduce the reimbursement time from three months to six to eight weeks. The outsourcing of insurance claims processing would be categorized as private sector services that improve the performance of all channels, although the services would be directly supplied to the public sector.

By speeding up the reimbursement process and improving cash flow at the facility level, the initiative is clearly targeted at the financial integrity and sustainability measures of performance for the supply chain. If pursued, it would also be an important indication that the outsourcing of services to the private sector is considered a viable solution to some of the public sector's biggest challenges.

However, concern has been raised about the effect that centralizing claims processing would have on the relationship between the district-level mutuals and health providers. Having the claims processing occur at the district level enables interactions between providers and processors that lead to a greater understanding of treatment behaviors and a lower likelihood of gaming the system. Moving the processing to the regional level would eliminate this important relationship and could lead to an "us versus them" mentality more conducive to cheating. Such a shift would require a higher level of monitoring and oversight (Seiter 2008).

Scheduled delivery

In Ghana, the distribution between tiers is done largely in an ad hoc fashion. Facilities are responsible for obtaining transportation and traveling to the next highest tier to place their orders and collect their products. Advanced ordering is rare, and a great deal of time and money are spent traveling to and from warehousing facilities and waiting for orders to be filled.

Scheduled delivery is primarily intended to reduce costs and increase efficiency and, for that reason, is considered to be a measure that enhances affordability and availability. It can be categorized among private sector best practices being used to improve the public channel, especially if a private firm could be involved in the development of the policy or its actual execution.

In 2002, the DELIVER Project, sponsored by the U.S. Agency for International Development, proposed a system of scheduled deliveries between Regional Medical Stores and service delivery points to address this issue. The proposal was part of a larger effort that included revised requisition forms and a clearly defined role for the Regional Medical Stores that had previously served as stocking points. Although the proposal was embraced by the government of Ghana, the system has yet to become fully operational. Six years since the scheduled delivery policy was put into place, only 3 of the 10 regions (Brong Ahafo, Central, and Western) are implementing it. The remaining regions cite a lack of funding, appropriate trucks, proper procedures, and adequate staff and service levels at the Central Medical Stores for failing to implement the system. It is unclear what is at the root of the problem and whether or not it would be possible to move it forward.

Outsourced procurement for the faith-based sector

The Christian Health Association of Ghana (CHAG), the biggest player in the faith-based sector, caters to 35–40 percent of the population (CHAG 2006), focusing on rural areas. Product for this supply chain has in the past been procured internationally by the Catholic Distribution Center warehouse in Accra and then supplied to four autonomous regional distribution centers that are run by independent dioceses. Lack of capacity in procurement has led in recent years to cash flow problems (lack of funds) that have in turn increased the cost of supply. The problem has been aggravated by late reimbursements by the NHIS and by the dramatic increase in working capital requirements related to the substantial increase in the number of patient visits since the introduction of the NHIS.

The Health Access Network of Ghana (HAN), a nongovernmental organization, has proposed to CHAG that HAN do international procurement for the Catholic Distribution Center and also arrange for distribution of the drugs. HAN intends to apply private sector best practices in the areas of procurement, distribution, and funds management to improve product supply and financial sustainability in the CHAG supply chain. HAN intends to provide these supply chain services on an ongoing basis.

HAN recently completed a pilot, funded by a private foundation in the Netherlands. The pilot involved setting up a small revolving drug fund and running it for a year. At the end of the year, the money was still there, providing a preliminary indication of financial sustainability for this approach. HAN has written a business plan that seeks to scale up this fund, with the intention of approaching donors like the World Bank or the U.S. Agency for International Development for funding. The goal is to demonstrate and create a sustainable system.

Vouchers for insecticide-treated nets

The national malaria control program has formed alliances with private sector players in the distribution of insecticide-treated nets. These are distributed using the distribution strength of the private sector distributor. Discount vouchers are given to pregnant women when they first visit an antenatal clinic. The voucher allows them to buy discounted insecticide-treated nets at a private retail outlet. The retailer removes a "proof-of-purchase" sticker from the insecticide-treated net as it is sold and attaches the sticker to the voucher. The retailer then exchanges the voucher (with the sticker) for cash from a private sector agency that is managing the entire program.

Franchised chemical seller network

Approximately 66 percent of Ghanaians visit a private chemical seller as their first point of care. However, most chemical sellers in Ghana have little or no training in health care or pharmaceutical dispensing. In addition, chemical sellers are small single-owner-run operations with high overheads and poor management capacity leading to high prices for their customers.

A franchise of chemical sellers can ensure the provision of high-quality drugs at lower costs in the rural and peri-urban communities where the reach of licensed pharmacies and public health clinics is poor. The benefits of a franchise model include periodic and coordinated training for the franchisees and scale efficiencies in purchasing and operational management. The Strategies for Enhancing Access to Medicines (SEAM) Program was set up in Ghana in 2002 to improve access to essential medicines and commodities by establishing a franchise of chemical seller shops that provide essential medicines and health supplies and by strengthening the Pharmacy Council's capacity to regulate chemical seller shops in Ghana.[4] A franchise network of chemical sellers—branded as CareShops—was set up first in the Volta Region. A logistically sound distribution network was established by Ghana Social Marketing Foundation Enterprises Limited (GSMFEL) to serve the CareShops. However, operational problems prevented the network from reaching the level of success required for sustainable operation.

More recently, a private company named Curatio has started a similar venture in Ghana to create a new private sector channel of supply. The business plans to leverage the fine-mesh distribution network of Unilever to reduce cost, ensure quality, and extend reach to franchised dispensing points throughout the country. Thus, Curatio intends to address all dimensions of performance—geographic access, affordability, availability, and quality.

The financial viability of the model rests on Curatio's ability to implement best practices from the fast-moving consumer goods industry to reduce logistics costs and to improve the margin mix at the point of purchase. Implicit in the economics of the business plan is a need to have high availability and diligent financial management to ensure that the venture remains profitable. Curatio's current plan is to distribute to over 6,000 outlets by 2010, which represents roughly 50 percent of the current outlets in Ghana. If successful, Curatio could change the landscape of drug retailing in rural areas and have a substantial health impact in Ghana, and then expand into other countries within the ECOWAS region. As such, the potential for impact is even greater.

Curatio, however, faces two major challenges: managing the relationships with the various partners involved in this process and finding sources of financing for the planned rapid expansion.

Initiatives in Zambia

Compared with Ghana, the private for-profit sector in Zambia has a relatively insignificant role in drug distribution or provision of supply chain services. Except for the faith-based organizations and some employer-provided health care, the role of the private sector in health service delivery in general and health supply chains in particular has been relatively minor in Zambia. The reasons cited for limited use of the private sector for any of the roles outlined in the framework presented in section 3 include lack of knowledge about the private sector strengths and capabilities by the policymakers in the Ministry of Health and lack of institutionalized policy instruments for interacting with the private

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[4] The SEAM project also had a component to enhance supply in the mission sector in Ghana.

sector. In some areas, there is a clear absence of significant private sector supply of medicines primarily due to a very a limited market size—a lack of buyers able to pay the prices needed to drive private sector distribution to expand reach. Even for provision of auxiliary supply chain services, the capabilities in the private sector in Zambia are fairly limited—or nonexistent in many cases.

The following are key supply chain initiatives that involve the private sector in the predominantly public-sector-led health supply chain of Zambia.

Quasi-private CMS and leveraging private sector best practices

Typically, managers of government-owned central medical stores confront different challenges in improving operational performance. They have difficulty hiring people with business experience and skills because of poor wages and incentive systems in the public sector. Similarly, the lack of shareholders results in a lack of accountability and thus compromises the ability to remove incompetent workers. In Zambia, the warehousing and distribution of all drugs for the public facilities is carried out by a para-statal agency called Medical Stores Limited (MSL). Although financed by a government budget, MSL is an independent entity with its own management and board. This allows MSL to act like a quasi-private enterprise with the associated benefits that result from it. By making the central medical store a quasi-private entity, Zambia has been able to overcome some of the problems mentioned above. For example, MSL is able to create performance incentive schemes for its staff and workers; retain some of the flexibility of hiring and staff selection typically found in the private sector; and make significant investments in technology (warehouse management systems, fleet tracking through the Global Positioning System, and the like), a practice also typical of the private sector. In addition, the senior operational management of MSL is outsourced to Crown Agents Ltd. under a fixed-term contract to allow private sector practices to be brought into the public health distribution system. The Crown Agents team has the mandate to build local management capacity using global best practices in warehousing, inventory management, and distribution.

This is a clear example of creating governance structures within the public sector supply chain that mimic the best practices from the private sector.

Long-term framework contracting with suppliers

To procure drugs and medical supplies in a coordinated manner, the resources of the Ministry of Health and various donors are pooled into a single drug supply fund called the Drug Supply Budget Line (DSBL). The buying of drugs typically occurs through an international competitive bidding process often supervised by the Zambia National Tender Board. However, the Ministry of Health and the DSBL have recently started creating flexible long-term framework contracts with national suppliers that have not only reduced the lead time for procurement but also led to price stability, especially in cases where emergency procurement has to be carried out. This practice of long-term framework contracts is being extended to other suppliers and would increase the

involvement of the local private sector sources of supply to the Ministry of Health. This policy, if expanded in a careful and transparent manner, will lead to the development of a healthier and stronger private sector role in Zambia's health supply chain.

Health care and medicine provision through employers and faith-based organizations

Some employers in Zambia, particularly the mining companies, run private health plans for employees and their families. Their clinics and hospitals, often referred to as mining hospitals, tend to be concentrated in the Copperbelt Province, where they contribute a large portion of the health care provided. These private hospitals and clinics procure their medicines from large private wholesalers in Lusaka and Ndola which distribute to these health facilities using their own or, in some cases, third-party contracted private transportation. The availability of medicines at these facilities tends to be high, and the prices paid by the buyers are also reasonable because of the large volume that the mining hospitals purchase.

Faith-based organizations like the Churches Health Association of Zambia (CHAZ) are another important source of health care, especially in far-flung areas. These organizations procure their drugs both from the Ministry of Health and private suppliers. A large number of clinics operating under the CHAZ umbrella are recognized as quasi-public clinics under a memorandum of understanding with the Ministry of Health in an example of a public-private partnership for health care and medicine provision. The distribution network of the public sector (namely, Medical Stores Limited) also supplies drugs and health commodities to CHAZ hospitals. In addition, CHAZ operates its alternative distribution network.

Information and communication technology services provided by the private sector

The current information and communication technology network for logistics and financial information for the Ministry of Health is weak and not based on a consolidated central management system. Previous attempts at automating financial and accounts management have not been successful due to the lack of a clear operation and maintenance strategy for the systems. The Ministry of Health is therefore considering outsourcing the provision of basic information and communication technology services to a private third-party agency with the ultimate goal of upgrading to a more sophisticated systems architecture for procurement, distribution, and financial management. The technical committee and the tender board have approved the idea, and final selection of a partner is under way. This is a clear example of borrowing best practices from the private sector and contracting with the private sector to provide auxiliary supply chain services.

Provision of public sector procured drugs in private sector health clinics

Zambia aspires to provide universal access to anti-retroviral therapy using a multi-sectoral approach. Realizing that provision of free or subsidized anti-retroviral therapy only in public hospitals may not be the best strategy to enhance access to anti-retrovirals, the government has started a scheme of providing free anti-retrovirals to certain

accredited or selected private clinics. The model is such that the private sector acts as the point of dispensing and the public sector as the procurement agency. The private clinics are required to provide these drugs to end patients at extremely low predetermined prices and to provide robust proof of dispensing in order to continue being eligible to receive free anti-retrovirals from the public sector. Similar approaches are also being used for TB medicines, although on a smaller scale. Such an approach relies on the national anti-retroviral program's ability to contract with the private clinics and monitor the price and dispensing outcomes frequently.

Summary

The range of examples detailed in this section provides a picture of how recent private sector supply chain initiatives are changing the role of the private sector in health supply chains and strengthening health system performance in Ghana and Zambia. In the public sector, private sector supply is increasing and becoming more formalized in Ghana. The use of private sector supply chain services is increasing slowly in both countries, with best practices coming into the public sector, either through direct implementation by consultants to the public sector or through outsourcing of supply chain services to providers who have implemented private sector best practices. In Ghana, HAN has proposed provision of private sector supply chain services as a means of strengthening the faith-based supply chain; by contrast, in Zambia, the faith-based supply chain is provided by the public sector, and, therefore, a strengthening of the public sector supply chain also strengthens the faith-based sector. In Ghana, a new private sector channel based on drug franchising appears to be a potential path forward to improving health care in rural areas. In both countries, new private sector supply chains are being created to extend reach and product breadth of existing private sector channels.

5. Scan of Current Private Sector Supply Chain Initiatives

In addition to the in-depth assessment of Ghana and Zambia, we also conducted a scan of supply chain initiatives that are currently being implemented in various parts of the world. This scan included a range of initiatives being driven by both the private for-profit sector and the not-for-profit sector, but with an emphasis on deploying innovative models from the for-profit sector. While not exhaustive, the scan aimed to identify key parts of the supply chain that were being targeted and successfully executed by private sector players. These are summarized in table 1 below. More detail on each initiative is available in appendix 6.

Table 1: Summary of supply chain initiatives identified in the scan

Initiative	Brief Summary of Initiative	Geographic Focus
VillageReach	Addresses last-mile issues by building and managing its own supply chain (transportation networks, dedicated fleets, and inventory systems); cross-subsidizes with revenues and infrastructure from a profitable parallel supply chain business.	Mozambique
ITC E-Choupal	Network of rural kiosks that cooperate with the local doctor (in this case, CARE Healthcare Network) through kiosk operators, providing a number of information- and communication-related services for the rural population.	India
Curatio	Combines the reduction of cost of delivery to rural pharmacies by leveraging existing private sector distribution networks, as well as aggregating demand and ensuring quality through a franchising model. Also aims to improve margins by optimizing the mix of generic, branded, and private-labeled products.	Ghana
Equipment-reagent agreements for diagnostic services	Agreements for diagnostic services provided on a per-test basis to the Ministry of Health. This removes the burden of managing the reagent	Mozambique

Initiative	Brief Summary of Initiative	Geographic Focus
(Becton Dickinson)	supply chain and of equipment maintenance from the Ministry of Health.	
Leveraging mobile technology for payments	Enables payments without physical transfer of cash; accelerates cash movement between supply chain players, reducing delays.	Concept stage
Pharmacy-in-a-box	Provides basic training to "bazaar shop" owners on over-the-counter medicines and uses the daily distribution network of bread trucks to "bazaar shops" to deliver a box of self-prescribed drugs in a pre-arranged mix.	Concept stage
Disease monitoring/ control hub	Monitors disease prevalence from a central hub that can identify outbreaks rapidly so as to address them effectively by engaging health care providers and linking with supply chain players to provide relevant drugs and products faster.	Concept stage
Allpay	Increase access by enabling patients to receive products at a private pharmacy that then gets directly reimbursed by the state (and other) health insurance schemes.	South Africa
Sample transportation	Improves logistics efficiency for transportation of samples for early infant HIV diagnosis using DHL for transportation and faxing results rather than moving patients around.	Botswana
Chile Compra e-procurement	Consolidates government contracting into a single, online portal for smooth business contracting between the government and private enterprise.	Chile
Online sharing of information for	An effective and accountable system to jointly procure drugs.	Rwanda

Initiative	Brief Summary of Initiative	Geographic Focus
procurement		
Project Jumpstart (track and trace system)	Enables tracing of products from point of manufacturing, through distribution, to the end consumer using a combination of bar codes, radio frequency identification technology, and Global Positioning System technology.	
Regional distribution centers	State-of-the-art facilities for warehousing and distributing pharmaceuticals and medical equipment for multiple countries; aggregation reduces transaction costs and allows for faster response times to demand; maintains product integrity and limits expiry.	Ghana, Kenya, and South Africa
Roll Back Malaria (RBM) Partnership—ExxonMobil	Initiative to accelerate the introduction and uptake of long-lasting insecticide-treated nets in different countries across Africa.	Africa
Low Cost Standard Therapeutics (LOCOST)	Promotes production and distribution of essential drugs at affordable rates, by countering the market monopoly of brands that are typically beyond the purchasing capacity of the poor.	India
Drug shop franchising (e.g., Mi Farmacita Nacional/CFW shops)	Franchising improves product access, increases quality, and reduces cost of product through demand aggregation.	Mexico, Kenya
NICE Foundation	Supports a health program in public schools, covering more than 60,000 children in Hyderabad, which increases access and reduces supply chain costs by encouraging uptake of generics.	India

Initiative	Brief Summary of Initiative	Geographic Focus
Medicine Shoppe—Sehat (India)	Focused on low-income areas, combines a community outreach program with clinicians who identify and prescribe products, with rebates for clinical services for those who purchase product at Sehat shops. Aggregates demand, reduces self-diagnosis, encourages use of generics, all of which reduce cost.	India
Mission for Essential Drugs and Supplies (MEDS)	Provides drugs and medical supplies to the nongovernmental sector, primarily the not-for-profit (e.g., mission hospitals), but also serves the for-profit private sector.	Kenya
Distance Health Advancement (DISHA) initiative	Public-private sector initiative for providing distance health care, including supplies of drugs and other medical supplies to rural communities that are typically under-served.	India
Social Marketing—PSI Society for Family Health (SFH) project	A comprehensive social marketing program that places emphasis on affordable pricing and extensive branding and marketing.	Nigeria
Micro-insurance: CARE and Allianz/ServiPeru	Health insurance programs that target under-served, poor communities, thus improving access to health services and products.	Southern India, Peru
Health data systems	Programs to build local capacity in data collection, aggregation, reporting, and analysis using electronic technology (e.g., personal digital assistants).	Kenya, Zambia
HealthNet Uganda	Pioneering the use of personal digital assistants in African health care to provide practitioners with real-time access to vital clinical information. The technology also allows for easier consultation, real-time ordering of medicines, and access to	Uganda

Initiative	Brief Summary of Initiative	Geographic Focus
	medical journals.	
Capacity development: DHL/TRANSAID	A capacity development initiative that aims at training public sector actors in supply chain issues.	Zambia, Malawi
Tanzania's private sector initiative	A broad development initiative that focuses on the private sector, including small and medium enterprises in the health supply chain. Large corporations invest capital, expertise, and technology to improve the quality and speed of delivery of local products, as well as act as a market for the products during the early stages of development.	Tanzania, Angola, Malawi

Although the scan was not comprehensive and the available data did not allow for a complete, independent assessment of the impact of each initiative, four initiatives appeared to show particular promise: Curatio, ITC E-Choupal Health, VillageReach, and the equipment-reagent rental agreements by Becton Dickinson. We believe these models deserve further investigation and consideration for investment and scale-up potential. Further details can be found in appendix 6.

To supplement the information gathered through the scan, we also analyzed five unique product supply chains (which can be found in appendix 7), and we interviewed a range of experts and in-country practitioners to further identify opportunities for private sector involvement. These conversations, coupled with the scan above, confirmed that while the exact nature of private sector activity is largely dictated by local conditions, private sector players have the ability to carve unique niches for themselves and can add significant value to supply chain operations on the ground. This becomes important when one considers whether the role of the private sector can and should be scaled up in a meaningful way.

The information gathered also confirms that there is a growing level of innovation in private sector solutions for health supply chains. As is suggested in the framework (figure 4), private sector initiatives are affecting all four sectors (public, faith-based, employer-provided, and private itself) and have the potential to improve supply chains by bringing some new level of capability across the four aspects of performance (geographical access, affordability, availability, and quality).

Implications

In general, and despite all the activity noted in the scan, there tends to be a piecemeal and opportunistic approach to private sector involvement in health supply chains. Very few initiatives have captured significant market share in their respective countries, and it is also unclear whether most have a viable model and the capabilities to scale up significantly and become self-sustaining. Though exact details are unfortunately scant, we learned of previous attempts at establishing similar entities that have failed due to a combination of lack of access to affordable financing, limited business skills of the entrepreneurs, changes in the local competitive environment, as well as changes in regulation.

These factors mirror those heard in conversations about various initiatives on the challenges they faced. At the top of the list is poor access to capital and the prevailing structure of financing being one that leans toward a dependence on grants instead of access to professionally managed debt and equity. In addition, there is a general lack of clear evaluation processes to measure performance. This seems to reinforce the current financing structure because demonstrating results or success to investors is very difficult to do. Similarly, the role of regulation was viewed as both an enabler and as a potential detractor to private sector investment and activity in health supply chains. This underscores the importance of having a good grasp of both the type of model in operation and a thorough understanding of the current local environment and ways in which changes therein could affect one's initiative.

While the initiative scan is inconclusive in terms of which single type yields the greatest impact per dollar invested, it provides a valuable typology of investment areas that have the potential to address some of the significant challenges faced by supply chain actors and investors. Table 2 details these challenges as well as the initiatives observed that are addressing them.

Table 2: Overview of challenges and opportunities

Major Supply Chain Challenges	Initiatives Observed	Other Opportunities Not Observed or in Concept Phase Only	Key Opportunity Characteristics Relevant to Investors
Lack of access to financing and financial services Fragmented financial	Micro-insurance plans (e.g., Care + Allianz)	Capital for distributors to expand and/or diversify their line of services	Main systems already in place, just not targeting the health supply chain market

Major Supply Chain Challenges	Initiatives Observed	Other Opportunities Not Observed or in Concept Phase Only	Key Opportunity Characteristics Relevant to Investors
transactions, especially when serving the poor		Basic financial services offering (bookkeeping, projections, etc.) to supply chain actors Leveraging growing mobile-based payments for financial transactions	
Lack of reliable demand forecasts at the central level General lack of information or poor information flow	Leveraging telecommunication for capturing, disseminating, analyzing supply chain information (e.g., U.N. Foundation + Vodafone Voxiva HealthNet	Development of information systems for monitoring (e.g., Disease Monitoring/Control Hub) Development of services for drug registration (e.g., agent model for product registration)	Both opportunities are currently being discussed for South Africa
Poor product/ service availability at public service delivery points Difficult access to points of service delivery	Integrated product delivery models, including: • Franchised dispensing points (e.g., ITC e-Choupal, Curatio) • Shared product delivery platforms (e.g., Curatio, VillageReach) Equipment-reagent rental agreements (e.g., Becton Dickinson) Sample	Low-cost multiplication of access points (e.g., "Pharmacy-in-a-box" concept) Easy access for chronic patients (e.g., Allpay fingerprint/smart card technology)	Key infrastructure already developed for other services and products

Major Supply Chain Challenges	Initiatives Observed	Other Opportunities Not Observed or in Concept Phase Only	Key Opportunity Characteristics Relevant to Investors
	transportation systems		
Lack of scale and efficiency in warehousing and distribution (e.g., excessive freight and insurance costs, drug leakages/ losses)	Multi-country shipping coordination (e.g., SCMS initiative) Capacity development through rotating fellowships of other supply chain specialists (e.g., DHL + Transaid) Information technology investments for warehouse management (e.g., barcode reader) Outsourcing of distribution (e.g., sample movement by DHL)		Regulatory frameworks and product-handling requirements in each country differ, so it is necessary to have a firm grasp of them
Lack of systems to provide transparency to higher priced suppliers Lack of scale or volume aggregation High cost of contracting	Pooled procurement (e.g., Rwanda, Eastern Caribbean countries)	E-procurement Capacity building on contracting and negotiating effectively	Drug procurement market is extremely attractive in terms of its size; small margins can be offset by large volumes of product

Major Supply Chain Challenges	Initiatives Observed	Other Opportunities Not Observed or in Concept Phase Only	Key Opportunity Characteristics Relevant to Investors
Lack of quality of products and services (e.g., counterfeiting of drugs)	Regulation definition and enforcement Information technology investments for product validation (e.g., Track-and-Trace system that uses radio frequency identification)	Clinical services training and accreditation	

Recommendations for future research

A basic evaluation of the impact of the initiatives, as well as a comparative evaluation of whether a public or private sector entity is best suited to carry out particular functions, is lacking.

Similarly, it would be quite informative to understand why previous attempts at scaling up the role of the private sector in health supply chains have failed. Although there is mention of them, very little to no information is available. Such an understanding would be important to inform current and future attempts and would help to prevent similar failures.

In addition to this, it seems that overall these initiatives are happening in a sort of haphazard way, without being framed within a strategy that is well defined. Countries need a strategy for understanding and engaging the private sector and for including a supply chain perspective in the current planning for health. This strategy should use the results of the evaluation to inform both the health ministry's and the government's policy and action; in fact, a continuous link between the two elements above is needed so that the strategy can be updated based on evaluation through a feedback loop.

6. How Private Sector Supply Chain Investment Can Improve Supply Chain and Health System Performance

Numerous opportunities exist to improve health outcomes through investments in supply chain activities that currently or potentially could employ the private sector. Leveraging the private sector to improve the efficiency and effectiveness of the health supply chain in low- and middle-income countries will require a sustained dialogue within and among the relevant Ministries of Health, international donors, and private sector actors. This dialogue has to be rooted in a deep understanding of how the private sector operates, its incentive structures, and evidence on its core areas of strength. Investments in private sector supply chain initiatives should both strengthen such a dialogue and lead to a better understanding of the private sector's strengths and roles.

As a strategic priority, investments should aim to strengthen the institutional contracting capacity of Ministries of Health to work closely with the private sector to procure drugs and health commodities or to procure auxiliary supply chain services. The prevailing lack of trust between the two sides is counterproductive and does not allow for each to learn and leverage the best of the other. Eradicating distrust will go a long way toward solving the challenges that face health supply chains.

On a more granular level, investments in private-sector-led supply chain initiatives can improve health systems by:
- Increasing the efficiency and effectiveness of supply of products or services
- Fostering adoption of private sector best practices in one or more sectors
- Creating or extending the reach of private sector channels.

Within each of these areas, there is a diversity of potential interventions that vary in size, objective, potential return, target population, and so forth. This is further layered with the local context within which an initiative will exist. For that reason, there are opportunities for many different actors to play a role.

Opportunities for different actors

Private investors. A number of initiatives scanned included ideas that have been implemented in a self-sustained way and that are making a profit, so private investors can obtain a financial return while at the same time contributing to improved health care delivery. Investments in such opportunities also tend to open up new markets and bring efficiency to the system. They thus enhance the potential for profit and well-being in the long term.

Social investors. Depending on the exact goal of the social investor, there is significant potential to transform a critical sector in developing countries that has a direct impact on the well-being of the citizenry, while also encouraging new models of businesses that are self-sustainable.

Foundations and international donors. Foundations and international donors can enable investment by contributing to the development of public goods like policy, financial, and information enablers that are essential for locally effective supply chains. Similarly, given the existence of vertical programs that are largely managed and executed outside the system, critical changes in approach can be made that bring the private sector into them as a starting point of engagement. In addition, alignment between approaches of different sectors should be made with health supply chain actors also being considered for the range of private sector enterprise development programs that are executed. This can be in the form of providing financing, secured orders, and capacity building.

National governments. National governments can benefit from engaging and/or stimulating the private sector in health. The public sector can leverage private sector services in areas where the public sector is weak and where the private sector can be more efficient and generate cost savings for the government. Furthermore, developing a private sector that has strong positive externalities (jobs, income, taxes, and the like) will have wide-ranging benefits. To protect consumers, national governments need to play a strong regulatory and enforcement role that reduces the downside of the private sector's profit motive.

It is important that each of these actors focuses on its areas of comparative advantage over the many other actors involved in the field. Different mechanisms for financing and intervention are better suited for one actor over another based on their financing flexibilities and the risk/return profile they are seeking.

Strategically selecting priorities and types of investment

In trying to define strategic investment priorities, it is important to bear in mind that the performance of health supply chains and the resulting health outcomes will be determined by many factors, a good number of which are locally specific, and so should not be generalized. Thus, a portfolio of investments that vary in nature, size, and financing can provide important insights. Similarly, it would be advantageous to select investments that reinforce each other and lead to greater collaboration with the public sector for supply and service provision.

One way of prioritizing investments is to base it on the currently observed gaps in the level of performance on each of the indicators (access, availability, affordability, quality) influenced by supply chain activities (see figure 2). However, poor performance on a given indicator is often due to a lack of appropriate performance in an upstream or supporting segment as illustrated in the influence diagram (see figure 3). In this case, an investment improving the enabling activity may be necessary before an investment in the worst-performing area results in improved health outcomes.

A variety of different initiatives are highlighted in sections 4 and 5. Depending on the level of implementation and commercial viability, each of these initiatives may be financed through a range of different financing options. The evidence as to which financing option will best maximize efficiency and effectiveness is very limited.

However, it is important to consider that many of the efficiencies of the private sector stem from strong ownership and shareholder return requirements. Thus, private-sector-led models may be more suited to equity and debt financing than conventional grant making. Investing in private sector supply chain initiatives may require a stronger emphasis on additional financing types than are conventionally used in global health. Some may argue that if private sector supply chain models are truly self-sustaining, they should seek financing through the traditional banking system. However, the sustainability of many of the initiatives depends on rapid scale-up. Slow initial access to capital may often limit that scale-up, thus rendering the model unviable thereafter. Similarly, traditional lenders do not have a good grasp of the dynamics of the health supply chains and are therefore hesitant to provide financing. This highlights the need and potential for specialized debt and equity financing that can stimulate a stronger private sector in health supply chains.

In addition, it is important to consider the stage of funding of any given initiative. Depending on the level of implementation and the existence of commercial viability, initiatives can be roughly divided into four segments that will fulfill different roles, as presented in figure 8 below.

Figure 8: Matrix of commercial viability and stage of implementation

Each actor (private investor, social investors, national governments, international donors) should thus consider multiple factors before creating an investment strategy for a private sector role in health supply chains. In the final section, we lay out specific

recommendations about how each actor can contribute to improving health outcomes by engaging the private sector, by investing in the private sector, or by doing both.

7. Recommendations: Making Supply Chains Work Requires Action by National Policymakers, Private Investors, and Donors

Although a full understanding of the performance of the supply chains in low- and middle-income countries is lacking, we can say with certainty that they are not sufficiently serving the needs of patients, nor are they playing the critical enabling role in supporting the achievement of health outcomes.

A wide range of efforts is needed, both to directly support the most promising supply chain models and actors and to provide the enabling environment for the positive evolution of supply chains. We define practical actions for three primary groups of actors: (1) national governments and policymakers; (2) private investors, including foundations, equity/debt providers, and "social impact investors," who seek investments with a mix of social and financial returns; and (3) international donors and foundations.

In summary, these recommendations seek to:
- Increase the overall scale and sophistication of investments in private supply chains
- Create a national policy environment that effectively sets the rules of the game for private actors in the supply chain, while maintaining incentives for their increased provision of service in this area of health delivery
- Improve transparency and quality of information on supply chain performance
- Increase access to financing (including debt and equity) for supply chain actors

National governments and policymakers

National governments and policymakers need to take into consideration the role of the private sector actors in the supply chain, and create an enabling environment that allows for complementarity of their respective skills. As detailed in earlier sections, the private sector can play a direct role in the supply chain, as well as develop and support the enablers with flow of financing and information.

Governments and policymakers should therefore:

1. Develop strategies for using private sector supply chain actors to provide products and services to the public sector
   - Sourcing arrangements
   - Direct delivery of services, in particular, distribution and logistics

2. Develop policies and regulation for private sector actors in supply chains, including but not limited to:
   - Accreditation programs
   - Quality standards
   - Contractual terms between the government and private actors

These should take into consideration the unique in-country distribution channel structure, distribution of population, and the overall health system strategy.

3. Enforce guidelines and regulations for the private sector, while maintaining sufficient incentive for continued engagement. Regulation must find a balance between encouraging positive contributions by private actors and putting in place the necessary standards and terms for their participation. For example, accreditation programs for retail pharmacies can be highly valuable in ensuring quality of distribution; however, they can also put smaller local players out of business if too restrictive.

4. Support efforts to substantially improve the quality and quantity of information available on supply chain performance. Information is essential to enable good decisions on health supply chains (including both government-led and third-party independent); existing monitoring and evaluation systems are weak and have limited capacity to collect, analyze, and disseminate information.

5. Develop forums for greater coordination. Each developing country faces similar challenges in having multiple donors, fragmented implementers, and disjointed funding streams for health products. Coordination then becomes an important aspect that governments and policymakers should invest in.

International donors, foundations, and policymakers

International actors can contribute substantially to the policy, financial, and information enablers essential for locally effective supply chains. Interventions therefore include:

1. Facilitate the building of trust and spur engagement between the public and private sectors in supply chains. The public and private sectors, particularly in health, tend to have little trust between them, a factor that significantly contributes to limited collaboration between the two. Building an environment that supports collaboration is critical for the two sectors to begin working together and thus leverage each other's strengths.

2. Monitor supply chain performance of donor-funded programs with a substantial drug delivery component to determine the role of the private sector and ways it can be increased. Given the discretion inherent in programs that tend to be vertically executed, it is possible to use these opportunities as platforms to develop and support the growth of private sector players in the supply chain. This can be an important precursor to a greater involvement of the private sector in the national supply chain

3. Develop an infomediary[5] to collect and distribute key supply chain performance information—in particular information about price, availability, quality at key service delivery points, as well as stock and inventory levels. Only with this type of information can the effectiveness of money spent on drug delivery be measured; today there is very little data available.

4. Provide funding to supply chain actors. Ultimately, supply chain actors need investment to grow and thrive. Today, this investment is often too costly or simply unavailable through traditional channels, particularly for new innovative models that are not yet commercially viable.

5. Support local entrepreneurs in the supply chain. Support would be provided on a case-by-case basis but could include elements such as training in business and financial management, as well as linkages with experts and other entrepreneurs to share best practices.

6. Support further research and best practice sharing on supply chain performance and innovation. With so little known today about supply chain performance and the potential of new models to address significant supply chain needs, further research is essential. Several areas present particular opportunities:
   • Evaluation of current supply chain performance
   • Examination of innovative distribution models
   • Formulation of appropriate policy frameworks
   • Sharing of best practices and knowledge platforms
   • Understanding the failures of previous initiatives

Private investors investing directly in supply chain models

Direct investments in supply chains will be essential to test new models and enable the best supply chain interventions to grow and increase in sophistication. Private investors—particularly at a local level—will ultimately become the most important source of capital, but international private equity investors, as well as foundations, can play a catalytic role in getting new players and models off the ground. "Impact investors" can play a pivotal role in providing initial lower cost equity investments in innovative models that deliver both social and financial returns.

Opportunity or need for investor engagement exists in the following areas:
   • Early stage and expansion capital (equity) for new/innovative supply chain models
   • Low-cost debt
   • Development of valuation models for supply chain investments

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[5] The concept of an infomediary was first proposed by the Demand Forecasting Working Group (Center for Global Development) to collect detailed product shipment and forecast data to enable effective planning and investment by buyers and suppliers of pharmaceuticals in developing countries.

- Increased sharing of information on supply chain investment performance

In conclusion, global health supply chains play a vital but sometimes overlooked role in increasing access to medicines. Lessons from the OECD tell us that the private sector has a potentially critical role to play in the delivery of medicines, and can increase the efficiency and reliability of health supply chains. Significantly greater investment is required to build out private sector supply chain models and the enabling environment that supports them; however, this must be coupled with better information about supply chain performance. With new models, better information, and greater access to a range of grant, debt, and equity financing, the private sector has the potential to positively transform the delivery of medicines in the world's poorest countries.

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Appendix 1: Public and Private Sector Availability and Affordability of Medicines

in Low- and Middle-Income Countries

The availability of medicines is consistently lower in the public sector in low- and middle-income countries. The average availability was only 34.9 percent in the public sector and 63.2 percent in the private sector.

Figure 1:

Availability of selected medicines in public and private health facilities between 2001 and 2007 (*percentage*)
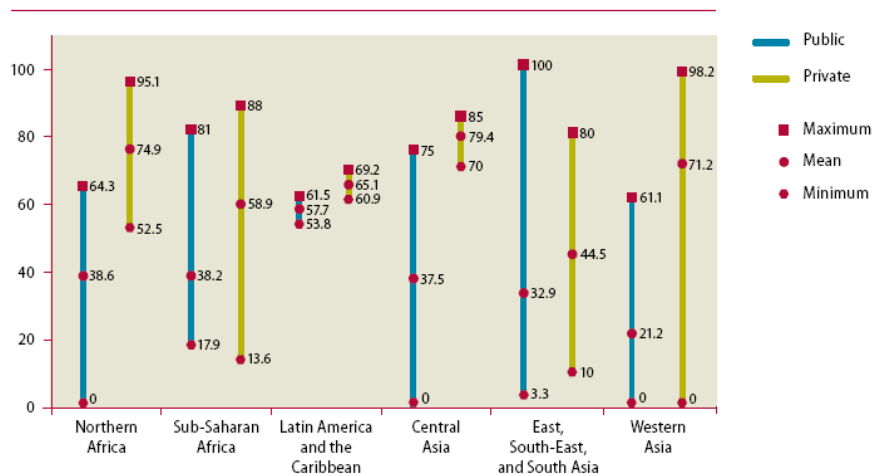
Sources: WHO/HAI 2008; United Nations 2008.

Figure 2: Availability of artemether lumefantrine in Kenya (percentage)
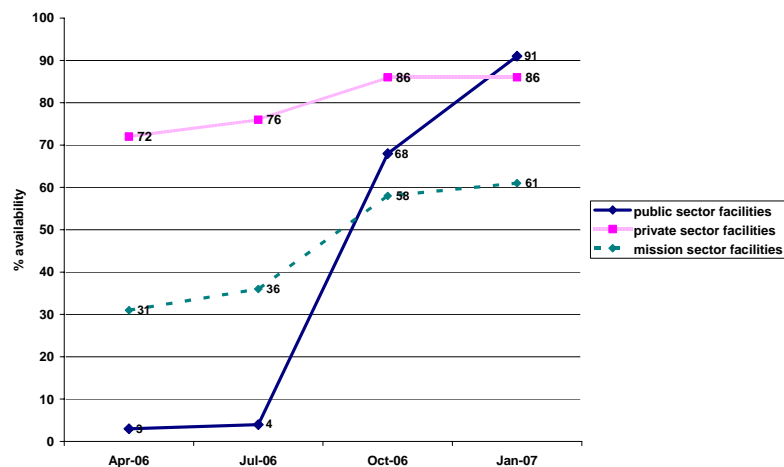
Source: Hogerzeil.

The affordability of medicines is consistently lower in the private sector.

Figure 3:

Ratio of consumer prices to international reference prices (*consumer price ratio*) for selected generic medicines in public and private health facilities
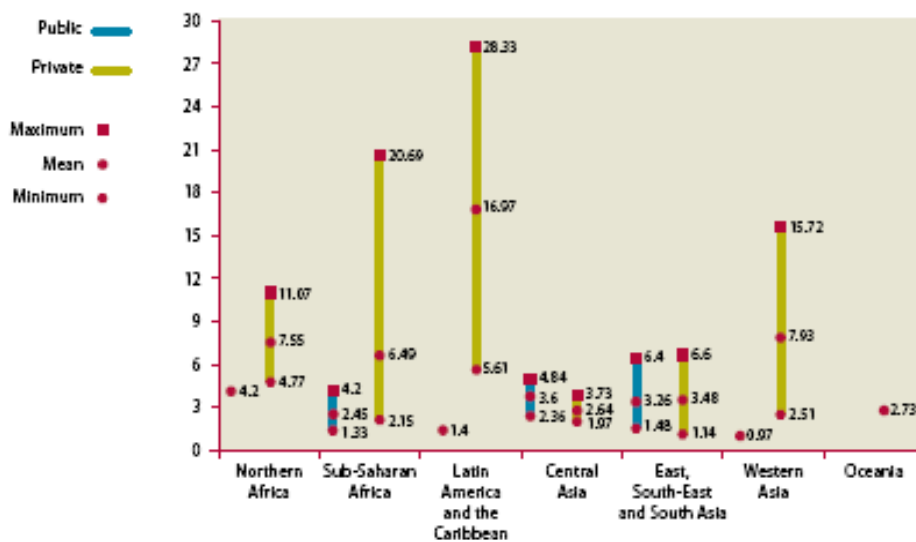
Sources: WHO/HAI 2008; United Nations 2008.

Markups along the supply chain are high in the private sector but are also not insignificant in the public sector.

Figure 4:
Margins between producer and consumer prices in the public and private sectors (percentage)

Country	Public sector markup	Private sector markup
China	24-35	11-33
El Salvador		165-6 894
Ethiopia	79-83	76-148
India		29-694
Malaysia	19-46	65-149
Mali	77-84	87-118
Mongolia	32	68-98
Morocco		53-93
Pakistan		28-35
Uganda	30-66	100-358
United Republic of Tanzania	17	56

Sources: WHO/HAI 2008; United Nations 2008.

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Appendix 2: The Supply Chain Structure in OECD Countries

Figure 1: Physical flows in the U.S. supply chain for medicines
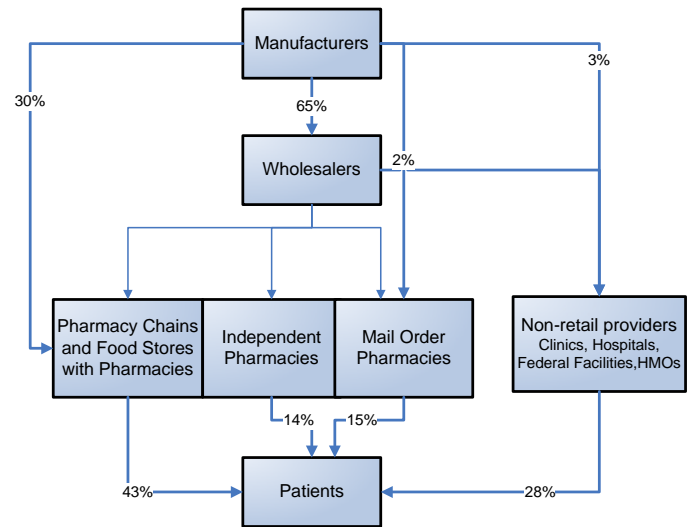
Sources: Prashant Yadav; Kaiser Permanente; U.S. GAO.

Figure 2: Physical flows in the supply chain for medicines in Spain
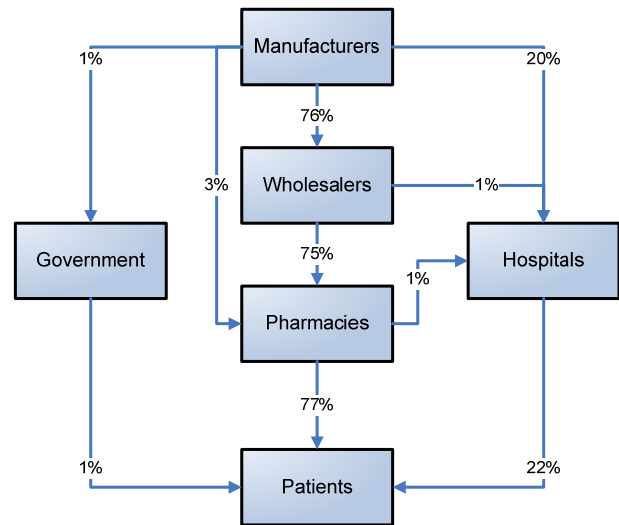
Sources: Prashant Yadav; FarmaIndustria; European Wholesaler's Association.

Key characteristics of the supply chain for medicines in the United Kingdom and the United States

Characteristic	United States	United Kingdom
Health care financing	Largely private or employer-based	Primarily government
Health care service provision	Private + VA	National Health Service + Private
Number of prescriptions dispensed	3.4 billion	800 million
Value of prescriptions dispensed	$275 billion	£6 billion
Number of pharmacies	57,490	12,600
Number of full-line private wholesalers	>100	45
Number of private wholesalers with 85% market share	3	3
Frequency of deliveries to each pharmacy	1–2/day	1–2/day
Average distance traveled by patient to pharmacy	2.36 miles	Unknown

Source : Prashant Yadav + various.

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European Wholesaler's Association.

FarmaIndustria.

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Kaiser Permanente.

U.S. GAO (United States Government Accountability Office).

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Appendix 3: Summary Comparison of Ghana and Zambia

The comparison of Ghana and Zambia in section 3 is based on detailed case studies of the two countries in appendix 4 (Ghana) and appendix 5 (Zambia) The case studies are based on interviews with more than 80 individuals conducted during multiple field visits. A summary comparison of the demographics of the two countries is provided in the table below.

Health and demographic indicators (2006 estimates)

Indicator	Ghana	Zambia
Population (millions)	23.0	11.7
Surface area (thousands of sq. km.)	238.5	752.6
Percentage of population living under the national poverty line	28.5%	68%
Urbanization rate (percentage of population living in urban areas)	49%	35%
Percentage of urban dwellers living below the national poverty line	11%	53%
Percentage of non-urban dwellers living below the national poverty line (calculated)	45%	76%
Gross national income per capita, Atlas method (current US$)	510.0	640.0
Life expectancy at birth (years)	59.7	41.7
Mortality rate, infant (per 1,000 live births)	76.0	102.0
Prevalence of HIV (percentage of population aged 15–49)	2.2	15.6
Percentage of population living with less than $US1 per day	44.8%	63.8%
Percentage of population living with less than $US2 per day	78.5%	87.2%

Sources: World Bank n.d.; UNDP n.d.

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[http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/0,,contentMDK:2
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html].

Appendix 4: Ghana Case Study: Analysis of the Public, Private, and Mission Sector Supply Chains for Essential Drugs in Ghana

1. Overview of the Health Sector in Ghana

Located in West Africa, Ghana is bordered by Côte D'Ivoire to the west, Togo to the east, Burkina Faso to the north, and the Gulf of Guinea to the south. The population of 23.46 million (2007estimate) is spread among 10 regions and 166 districts (as of 2008). The country is divided into three major zones or belts, the northern zone of Upper West, Upper East, and Northern; the central zone of Brong Ahafo, Ashanti, Eastern, and Volta; and the southern zone of Western, Central, and Greater Accra. The population density is highest in the southern and central zones and is lowest in the northern zones.

Despite a per capita gross national income of $590 in 2007 (World Bank 2007), Ghana is on track to meet the Millennium Development Goal of halving poverty by 2015. As of 2005, poverty stood at 28.5 percent, down from 52 percent in 1992. However, this poverty reduction has not been equitably distributed across the county, and in both the Upper East and Upper West regions over 70 percent of the population remain impoverished (World Bank 2008).

Ghanaians have a life expectancy of 59, an under-five mortality rate of 120 per 1,000, and a maternal mortality rate of 210 per 100,000 (UNICEF n.d.), ranking 135th (of 177) in the U.N. Human Development Index and 11th in sub-Saharan Africa (6th if small island nations are not included). Communicable diseases including malaria, tuberculosis, yellow fever, meningococcal meningitis, and upper respiratory tract infections continue to comprise a large share of the total cases treated by health workers. HIV prevalence is under the general epidemic threshold of 5 percent and has been fluctuating between 2.2 percent and 3.6 percent since 2001. With economic development and the life style changes accompanying it, non-communicable diseases like hypertension, diabetes, cancer, mental disease, and drug and alcohol abuse have also been on the rise (WHO n.d.).

Geographic inequity

Economic opportunities are more abundant in the southern regions, and inhabitants of the northern regions tend to be worse off economically and exhibit lower levels of heath than those in the south. Figure 1 illustrates the high poverty levels in the northern zone and shows that much of the progress in reducing poverty over the past 25 years has occurred in the central and southern zones.

Figure 1: Incidence of poverty by region, 1992, 1999, and 2006

Due to the relative isolation and lack of services in the northern regions, employee turnover in public health facilities is very high. The government has put together incentive packages to encourage workers to relocate to these areas, but the problem persists. For that reason, the ratio of public health care workers to the regional population is lower in the north than in the rest of Ghana. This is illustrated in table 1.

Table 1: Ratio of public health workers to population by region

Region	Doctors per 1,000	Nurses per 1,000	Pharmacists per 1,000
Greater Accra	3.00	12.00	2.60
Volta	0.40	6.30	0.10
Central	0.40	5.90	0.20
Western	0.50	4.40	0.20
Southern Average	**1.08**	**7.15**	**0.78**
Eastern	0.50	6.60	0.20
Brong Ahafo	0.40	3.40	0.10
Ashanti	1.00	4.10	0.60
Central Average	**0.63**	**4.70**	**0.30**
Northern	0.10	3.40	0.10
Upper East	0.40	7.10	0.10
Upper West	0.20	5.60	0.03
Northern Average	**0.23**	**5.37**	**0.08**
National Average	**0.69**	**5.88**	**0.42**

In addition, easy access to public health care facilities is lower in the north than in other areas. Figure 2 shows the percentage of households with access to public health care facilities within 30 minutes. On average, only 28.8 percent of people in the northern regions have easy access to a public health facility compared with the average of 61.2 percent in the other regions.

Figure 2: Proximity to health facility by region
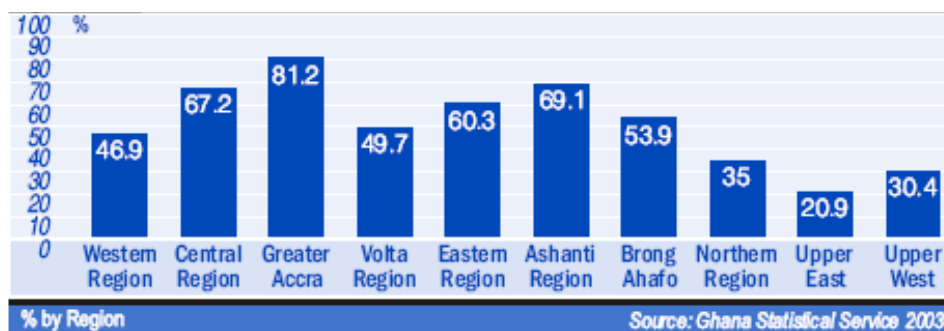
National Health Insurance Scheme

The National Health Insurance Act 650 was passed in 2003, and in 2004 the president launched the National Health Insurance Scheme (NHIS). The NHIS was intended to replace the "cash and carry" system that had made health care costs prohibitive for a large portion of

Ghana's poor. The goal of the NHIS is to provide universal coverage to affordable high-quality health care and ultimately to improve the overall health status. In order to make coverage affordable to all, subsidies are provided for the following groups:

- Individuals employed in the formal sector who contribute to the Social Security and National Insurance Trust
- Children under 18 with both parents enrolled in NHIS
- Individuals over 70 years old
- Pensioners
- Individuals classified as indigent—those having no income and no fixed residence, and who do not live with or receive support from another person

As of 2007, roughly 55 percent of the country was enrolled in the NHIS, but enrollment levels vary a great deal from district to district. A recent study showed that while 64 percent of those enrolled in the NHIS are within the subsidized group, only 2.3 percent of those covered by the NHIS are classified as indigent. In fact, registration with the NHIS is strongly correlated with socioeconomic status. Only 40 percent of those in the lowest quintile were registered with the NHIS, yet roughly 70 percent of those in the highest quintile were enrolled. For that reason, it seems that the NHIS has yet to extend to the poorest of the poor. Furthermore, the large percentage of members covered by subsidies is feared to be threatening the financial viability of the system.

The NHIS has a decentralized structure with claims processing occurring at the district level. The current average processing time between the time a claim is submitted and full payment is received is three months. Forty percent of the claim is paid immediately upon receipt, and the remaining 60 percent after the claim is approved. The delay in receiving the balance of the reimbursement has caused problems at the level of service delivery points and contributed to the problem of facility indebtedness. There have also been reports of facilities no longer accepting NHIS because of the difficulties with timely reimbursement.

Currently, there is discussion within the National Health Insurance Council (NHIC) of moving claims processing from the district to the regional level. The NHIC has also considered outsourcing claims processing to a private enterprise and has received bids from three different companies to carry out the claims processing. The goal of the NHIC is to reduce the reimbursement time from three months to six to eight weeks. This is particularly important for the private sector pharmacies because six to eight weeks is the average cash-to-cash cycle, and a longer reimbursement time causes cash flow problems.

However, concern has been raised about the effect that centralizing claims processing would have on the relationship between the district-level mutuals and health care providers. Having the claims processing occur at the district level enables interaction between providers and processors, which leads to a greater understanding of treatment behaviors and a lower likelihood of gaming the system. Moving the processing to the regional level would eliminate this important relationship and could lead to an "us versus them" mentality more conducive to cheating. Such a shift would require a great deal of monitoring and oversight (Seiter 2007).

Regardless of whether claims continue to be processed at the district level or are moved to the regional level, another option for addressing indebtedness issues is to increase the upfront payment of claims from 40 percent to 80 or 90 percent. This option has reportedly been raised, but it is unclear whether a decision has been made at this time.

Interconnectedness of public, private, and mission sectors

Purchasing between sectors occurs at many different levels. The Ministry of Health has had difficulty conducting international competitive bids, and as a result the Central Medical Stores procures a large percentage of its products on the local market from private sector suppliers. Similarly, up to one-fifth of Central Medical Stores sales are to non-public sector entities. Of these, private hospitals, mission hospitals, and nongovernmental organizations are the biggest customers (Gyimah 2007).

At the facility level, there is a great deal of interaction between the public health facilities and local private sector suppliers. In accordance with the National Procurement Act, health clinics are authorized to purchase directly from private sector suppliers as long as the value is within the established threshold and the product is not available from the public sector supplier. Because service levels at the Regional Medical Stores can be low, health facilities commonly buy directly from the private sector. Similarly, low product availability at the Central Medical Stores leads to high levels of private sector procurement by the Regional Medical Stores. In fact, some Regional Medical Stores procure over 85 percent from the private sector (Health Supply Chain Practitioners Retreat 2007).

Figure 3: Product flows between the private, public, and mission sectors
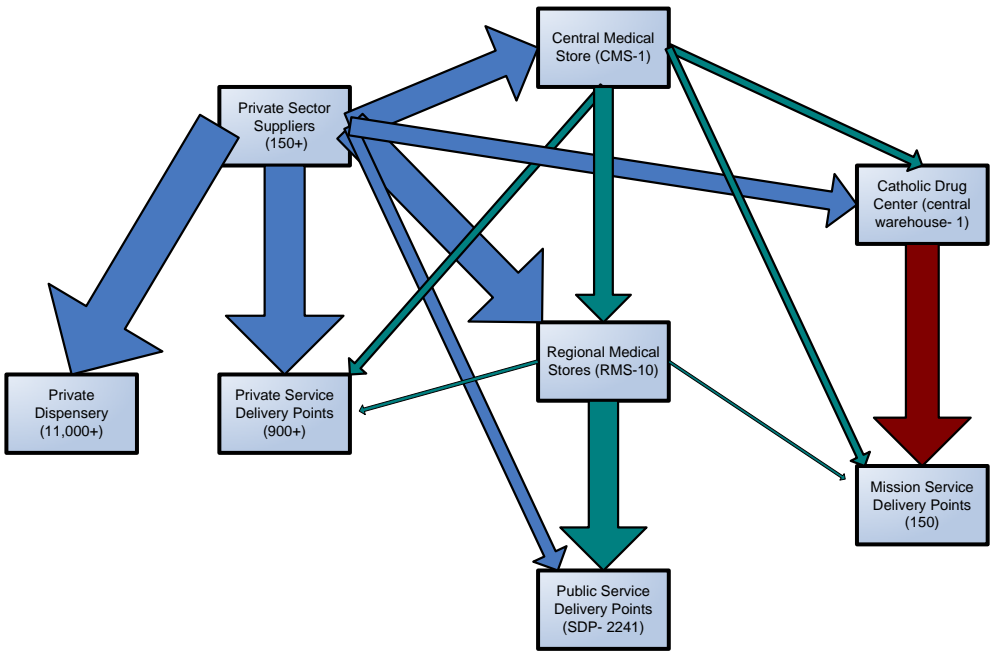
2. Public Sector Supply Chain

The public sector handles about 40 percent of total health services in Ghana. Ghana's 10 regions are divided into 166 districts, and each district is subdivided into 4 to 6 sub-districts that serve a catchment population of 20,000–30,000 people. There is a facility hierarchy (in terms of the sophistication of service provided) consisting of health clinics, district hospitals, regional hospitals, and teaching hospitals. The 2,041 public facilities are served by 10 Regional Medical Stores and the Central Medical Stores located near the capital. Figure 4 below provides an overview of the public health supply chain and highlights some of the key issues.

Figure 4: Overview of the public sector supply chain

Registration	Selection	Procurement	Distribution	Delivery
The Food and Drug Board is responsible for registration, inspection, monitoring imports/exports, and post-market surveillance.	Ghana's Essential Drug List (EDL) is updated by the EDL Review Committee along with input from other qualified professionals.	Under Ghana's Procurement Law, buying authority is decentralized with procurement occurring at all tiers within the system.	The system is a tiered pull system with facilities collecting product from the next facility up in the chain.	The "cash and carry" system is being replaced by the National Health Insurance Scheme, which has no co-payment for services or drugs.
Registration costs are high at $1,000.	The factors considered when evaluating products are safety, efficacy, and cost with preference given to generic products.	When products are not available from the designated public sector supplier, facilities are able to buy directly from the open market.	Scheduled delivery from Regional Medical Stores to service delivery point is currently implemented in 3 of 10 regions.	NHIS coverage is currently roughly 55 percent of population and has led to more patients seeking treatment.
It takes 3-4 months to get a new product registered.	Adherence to EDL guidelines during procurement at the service delivery points is an issue with 46 percent of service delivery points believing that the EDL does not reflect local needs.	Limited product availability at the Central Medical Stores leads to a great deal of private sector buying at lower tiered facilities.	No advanced ordering is available. Orders are placed and filled at the time of arrival at facilities.	Delayed reimbursement of exemptions and NHIS claims has led to indebtedness.
Limited resources prevent the Food and Drug Board from conducting on-site quality inspections.		National Framework Agreements between the Regional Medical Stores and local suppliers are being negotiated and are planned to be implemented in January 2009.	Mismanagement leads to low transportation asset utilization and unnecessary excess costs.	

Registration

The Drug Evaluation and Registration Department of the Food and Drugs Board has a staff of 10 and is responsible for registering all pharmaceutical products. Product registration forms are based on the format recommended by the World Health Organization, and it takes at least three months and sometimes over a year to receive approval. Of applications submitted, 99.99 percent are not approved on the first submission and must be revised before approval (Harper and Gyansa-Lutterodt 2007). The cost is roughly $1,000, and every product must be re-registered (for an additional $1,000) every three years. In addition to registering products from both local and international sources, the Food and Drugs Board's mandate includes (1) inspection and regulation of local pharmaceutical manufacturers; (2) inspection of suppliers and warehouses; (3) monitoring of drug imports and exports; and (4) post-market surveillance. The extent to which the Food and Drugs Board is able to carry out its mandate is unclear.

Selection

Ghana's Essential Drug List (EDL) and corresponding Standard Treatment Guidelines (STG) are two of the basic tools for providing effective health care throughout the country. The EDL and STG are updated based on input from professionals serving on the EDL Review Committee, STG Expert Committee, Regional Directors of Health Services and Health Program Managers as well as staff from teaching hospitals and individuals from appropriate professional associations. The factors considered when evaluating products are safety, efficacy, and cost; preference is given to generic products. At the service delivery point level, procurement decisions are supposed to be informed by the EDL and local morbidity patterns. However, 46 percent of surveyed facilities believed that the EDL does not address local realities and did not adhere to the EDL when making ordering decisions.

Procurement

Procurement is the responsibility of the Ministry of Health's procurement unit. The physical supply of pharmaceuticals is managed by the Central Medical Stores. The Regional Medical Stores and the health facilities are managed by the Ghana Health Service,[6] which also has a procurement unit.

Donor agencies—such as the U.S. President's Emergency Plan for AIDS Relief, U.S. Agency for International Development, United Nations Population Fund, and UNICEF—are involved in the procurement process. Staff from the Ministry of Health and Ghana Health Service repeatedly cited delays by donors and/or supranational procurement agents that

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[6] An exception to this is the four teaching hospitals, which are managed by the Ministry of Health.

lead to major disruptions in supply.[7] The release of funds and delivery of goods are routinely delayed, and often little information is available about the cause of the delay or the projected release date. Funding delays within the government itself have also created challenges. With the move toward basket funding, the Ministry of Health has struggled to receive timely disbursements from the Ministry of Finance and has also complained that it is not receiving the full amount of money that was intended for health.

In 2003, Procurement Act 663 established clear organizational divisions between the various procurement groups within the public health sector. At all levels of this hierarchical structure, clear processes and guidelines were set forth. The act reinforced the policy that Budget and Management Centers should buy from the private sector only when the appropriate Regional Medical Stores or Central Medical Stores cannot supply the necessary products. Clear monetary thresholds were established both for the type of procurement required (international competitive bidding versus national competitive bidding) and the decision-making authority for units at various levels in the system. These thresholds are outlined in figure 5 .

Figure 5: Procurement thresholds and categories
Procurement thresholds under the Procurement Act
(in Ghanaian cedis (GHC))

Procurement Method	Limit (US$)
Pre-Qualification	Over GHC 35 billion
ICB	Over GHC 15.0 billion
NCB	between GHC 200 million and GHC 2.0 billion
Shopping	less than GHC 200 million

Note: ICB = international competitive bidding;
NCB = national competitive bidding.
Source: MoH 2004.

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[7] UNICEF was mentioned specifically as repeatedly delaying shipments.

Budget and Management Center categories

Category	BMC
1	Health Centre
2	District Hospital
	Polyclinic
	District Health Administration
3	Regional Hospital
	Specialised Institutions
	Training Institutions
	Statutory Bodies
	Sub-vented Organisations
	Regional Health Administration
4	Teaching Hospital
	Ghana Health Service Headquarters
	Ministry of Health Headquarters

•

Approval authority thresholds for the Budget and Management Centers Tender Committee (in Ghanaian cedis)

Authority	Limit ($)			
	Category 1	Category 2	Category 3	Category 4
Goods	Up to 5m	5m to 25m	25m to 50m	50m to 1.0b
Works	Up to 25m	25m to 50m	Up to 100m	100m to 2.0b
Technical Services	Up to 5m	5m to 25m	Up to 50m	50m to 1.0b
Consulting Services	Up to 5m	5m to 25m	Up to 50m	50m to 500m

Due to low service levels at the Central Medical Stores, the Regional Medical Stores have been buying a great deal from private sector suppliers. In some regions, as much as 85 percent of all products are purchased from the private sector. While a non-availability certificate stating that the product is out of stock at the Central Medical Stores is supposed to be obtained before buying on the open market, it is unclear how strictly this policy is enforced. Similarly, there is a substantial amount of private sector procurement that occurs at the health facilities, especially larger hospitals.

The Supplies, Stores and Drugs Management unit within the Ghana Health Service is reported to be establishing framework contract agreements with local suppliers. The two-year agreements will be awarded to Ghanaian companies to supply the 10 Regional Medical Stores with a comprehensive list of products. By aggregating demand for the entire country, the Ghana Health Service will be able to negotiate better prices and favorable contract terms. The suppliers will fulfill orders by the Regional Medical Stores within the lead time established in the contract and would likely enter into vendor-

managed inventory arrangements with the 10 facilities. The National Framework Agreements policy has recently been approved and is scheduled for implementation in January 2009.

Distribution

The Central Medical Stores was recently renovated, and the physical infrastructure was significantly upgraded. It is located just outside of Accra in Tema. The facility is within 4 kilometers of the port and 30 kilometers of the airport. On average, Regional Medical Stores place their orders quarterly, and service delivery points place their orders monthly. It is not uncommon, however, for service delivery points to order out of cycle.

Overall, the current distribution scheme is a tiered pull system. The Regional Medical Stores travel to the Central Medical Stores to collect products, and the service delivery points travel to the Regional Medical Stores to pick up products. It is very rare that a facility will place an order in advance; instead, it usually submits the order upon arrival and waits until the order is fulfilled. The structure is very inefficient and very costly.

To address this problem, the Ministry of Health approved a new policy in 2003 to implement scheduled delivery service from every Regional Medical Stores to the service delivery points. Although it has been six years since the scheduled delivery policy was put into place, only 3 of the 10 regions (Brong Ahafo, Central, and Western) have implemented it. The remaining regions cite lack of funding, appropriate trucks, proper procedures, adequate staff, and adequate service levels at the Central Medical Stores for failing to implement the system.

One component of the scheduled delivery policy was the use of a newly designed Requisition, Issue, and Receipt Voucher (RIRV) to simplify ordering, receiving, and invoicing of all products. The form was designed to minimize complexity by replacing the requisition voucher, stores issue voucher, stores receipt advice, and certificate of non-availability. Unfortunately, the RIRVs have not been implemented, and the old forms are still in use.

3. Private Sector Supply Chain

Local manufacturers

There are 35 local manufacturers registered with the Food and Drugs Board (FDB 2008). Of these, 6 are major players and 14 are medium-scale producers (Harper and Gyansa-Lutterodt 2007). Most of the manufacturers focus on antibiotics, vitamins, tonics, analgesics, and anti-malarials. However, two local companies also have plans to begin production of active pharmaceutical ingredients, and one company is producing anti-retrovirals. Among the smaller producers, intermittent production is common with manufacturing ceasing for months at a time before starting up again (Vasu 2007).

Of these local firms, only one or two are considered capable of achieving international certification in good manufacturing practices. There is significant variation within the Food and Drugs Board's classification of good manufacturing practices, and it is said that the leniency granted by the board has led to moral hazard with some companies making concerted efforts to improve processes and others benefiting from the lax enforcement. As a result, the perceived quality of locally manufactured products is lower than that of products that are imported (Harper and Gyansa-Lutterodt 2007, p. 44).

Local production accounts for roughly 30 percent of total drug demand (this estimate includes both prescription products and over-the-counter items) (Harper and Gyansa-Lutterodt 2007, p. 44). Forty-four drugs are protected and are reserved exclusively for local production. Also, 66 of the 200 basic materials required for production are exempt from value added tax (12.5 percent) and the national health insurance levy (2.5 percent). Despite these incentives, local manufacturers face many challenges in competing with imported products on both price and quality. A few of these factors are listed below:

1. The value added tax exemption process is lengthy and complex, and some consider the time and effort required for reimbursement not worth the effort.
2. Limited access to affordable capital severely hampers business operations. Local interest rates are usually over 20 percent, making it very expensive to finance inventory, capital investments, and other day-to-day operations.
3. Long and variable lead times from suppliers (mostly in China and India) create a need to hold a great deal of inventory to satisfy orders.
4. Utilities (water and electricity) are both expensive and unreliable. This makes it very difficult to ensure quality throughout the production process.

A more in-depth assessment of the challenges and opportunities for local manufacturing in Ghana are given in the assessment conducted by Harper and Gyansa-Lutterodt for GTZ (2007).

Importers/Wholesalers

There are 60 importers registered with the Food and Drugs Board. This number includes both manufactures that are licensed to import as well as "pure" importers. Most generics are imported from India and China and innovators from Western Europe.

Products imported into Ghana are subject to the following charges and markups:

Table 2: Pharmaceutical markup structure

Charges and markups	Percentage
Import duty	10%
Value added tax + National health insurance levy	15%
Port inspection	1%
Economic Community of West African States levy	0.5%

Export development levy	0.5%
Network charges	0.5%
Wholesale markup	30–40%
Retail markup	30–40%

Source: HAI 2006.

In addition to importers (who are also wholesalers), there are 150 wholesalers registered with the Ghana Pharmacy Council (Ghana Pharmaceutical Council 2008). The large number of intermediaries limits supply chain visibility and makes it very difficult to ensure product integrity. As a result, many companies have moved toward vertical integration and have organized their own distribution networks.

In addition, most of the wholesalers maintain offices on or around Okaishie Road in central Accra. Pharmacy owners and chemical sellers travel to Accra to stock up on products from the various suppliers, then travel back to their stores.

Illicit cross-border flows of pharmaceuticals are a problem in Ghana. The Food and Drugs Board estimates that between 5 and 10 percent of products available in Ghana are unlicensed, but it is not clear what this estimate is based on. Currently, offices in border towns in the north and in the east are being established by the Food and Drugs Board to prevent these illegal product flows.

Interestingly, the Indigenous Pharmaceutical Business Association has recently petitioned the president of Ghana to intervene in what is perceived as a consolidation of the distribution business by foreign firms. Apparently, Gokals, a Ghanaian-Indian importer/ wholesaler has purchased three local distributors, causing fear of a larger consolidation effort. As of now, the president has vowed to look into the matter, but no legislation has been drafted.

Pharmacies and chemical sellers

The private retail sector has a multitude of players. There are roughly 1,592 licensed pharmacies, 87 percent of which are located in either the Greater Accra or Ashanti regions. Only 20 registered pharmacies operate in the three northernmost regions. Each pharmacy must have a registered superintendent pharmacist assigned to it.

In addition to the pharmacies, there are roughly 10,016 chemical sellers. Chemical sellers are typically smaller than pharmacies, are staffed by sales associates, and by law are allowed to sell only over-the-counter medicines. In addition to these registered chemical sellers, there are reports of unregistered drug peddlers who have little or no pharmacy training buying drugs in large quantities from local suppliers and selling them to unsuspecting patients. The problem has been worsening, and the Ghana National Chemical Sellers Association has made an appeal to the various regulatory agencies to crack down on the practice because it is damaging the reputation of the legitimate chemical sellers (Modern Ghana 2008).

The number of pharmacies and chemical sellers is increasing slowly over time, at a rate of less than 10 percent per year. The Pharmacy Council approves new pharmacies and chemical sellers. Most pharmacies are located within the regional capital areas; new pharmacies also are located in the regional capitals. Unlike pharmacies, chemical sellers are often located in the remote areas; new ones are located in ever-more remote locations. By law, a new pharmacy may not be opened within 400 meters of an exiting pharmacy, and a chemical seller may not set up shop within 1 kilometer of an existing chemical seller.

The Pharmacy Council guarantees the level of pharmaceutical care in the country. It provides continuing training of personnel by region and maintains a staff of regional Inspection Managers with set targets for the number of shops to be inspected each year by region. The target is at least 60 percent of shops. The inspectors do both routine surprise inspections and scheduled formal inspections. They also do investigative inspections in response to complaints.

During monitoring and inspection visits, inspectors examine the shelves for counterfeit products and confiscate any that are found. The underlying assumption is that any box that an inspector picks up may contain counterfeit product. The inspector looks at the brand name and determines whether it is a standard brand name and whether the colors and packaging are standard, and checks for disparities in batch numbers. It is unclear whether the Pharmacy Council is able to achieve its target inspection rate or the degree to which it is able to carry out its mandate.

4. Mission Sector Supply Chain

There are two mission sector organizations in Ghana: the Christian Health Association of Ghana (CHAG) and the Muslim Ahmadiyya Movement. The focus of the missions is on primary and secondary care in rural areas. The Muslim program includes six hospitals in five regions (Upper West, Brong Ahafo, Ashanti, Central, and Western) (Miralles et al. 2003).

CHAG's stated purpose is to serve the marginalized and the poorest of the poor. CHAG represents roughly 152 institutions (56 hospitals, 83 primary health care bodies, and 8 health manpower training centers) catering to 35–40 percent (CHAG 2006) of the population and accounting for roughly 30 percent[8] of health care in Ghana with this fraction being significantly higher in the remote rural areas of Ghana. CHAG treated 40 percent of the 599,000 patients treated at CHAG and government district hospitals in 2005. A comparison of CHAG and government district hospital beds by region is given in table 3.

Table 3: Regional comparison of CHAG and government district hospital beds

Region	Population (millions)	CHAG Beds	Government Beds	CHAG Share	Thousands of people per bed
Greater Accra	2.91	67	683	9.81%	3.88
Ashanti	3.61	1,084	932	116.31%	1.79
Eastern	2.11	930	1,180	78.81%	1.00
Central	1.59	387	678	57.08%	1.49
Western	1.92	474	756	62.70%	1.56
Volta	1.64	967	1,137	85.05%	0.78
Brong Ahafo	1.82	1,119	252	444.05%	1.33
Northern	1.82	324	340	95.29%	2.74
Upper East	0.92	253	575	44.00%	1.11
Upper West	0.58	336	493	68.15%	0.70
Total	**19.87**	**5941**	**7,026**	**84.56%**	**1.53**

Source: CHAG 2006; population figures from Pharmacy Council 2007.

CHAG runs a central warehouse in Accra called the Catholic Distribution Center. In the past, the center's warehouse in Accra procured goods internationally, stocked them, and supplied four autonomous distribution centers in Accra, Kaoshing, Wa (Upper West region), and Tamale. The four distribution centers are run by independent dioceses. The center had been procuring goods internationally, from the International Dispensary Association, but due to financial problems, it is no longer doing so. Currently, the Catholic Distribution Center relies on availability through local suppliers, which is expensive. The center procures through local manufacturers, wholesalers (who import), and ad hoc purchasing. It also buys from the Central Medical Stores, but low availability of products leads to most buying occurring on the open market.

Transportation of product works via a variety of means. Local suppliers may either deliver to the distribution centers or the distribution centers may pick up the goods. The local suppliers also deliver directly to the institutions.

The Catholic Distribution Center and other mission sector institutions have had cash flow problems in recent years as a result of three factors: (1) institutions are not paid on time by the NHIS; (2) the operations are not run in a business-like manner (inflation and devaluation of the cedi have been issues); and (3) the number of patient visits has increased dramatically since the introduction of the NHIS, which has increased working capital requirements. Some mission institutions report that they are unable to pay their employees because funds are lacking. A report by the Strategies for Enhancing Access to Medicines (SEAM) program stated that moneys obtained through reimbursement for the sale of medicines had been used to fund non-medicine expenses, contributing significantly to the cash crunch, and that institutions have taken the attitude that CHAG should give them the medicines, rather than expecting them to pay for them (Miralles et al. 2003).

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Appendix 5: Zambia Case Study: Analysis of the Public, Private, and Mission Sector Supply Chains for Essential Drugs in Zambia

1. Overview of the Health Sector in Zambia

Zambia is classified as a low-income country and has a population of 11.6 million. The public sector is the largest provider of health care in Zambia, followed by institutions that are members of the Churches Health Association of Zambia (CHAZ) and the mine hospitals. The for-profit private sector is relatively small in Zambia as compared with other countries in the region, such as South Africa. Interestingly, Zambia is also one of the most urbanized countries in sub-Saharan Africa, with approximately 38 percent of the population living in urban areas.

Malaria is the primary public health problem in Zambia with an estimated 3.5 million cases in 2004–2005. HIV/AIDS also is another key public health problem with approximately 1.1 million people living with HIV/AIDS, of which only 75,000 are on anti-retroviral therapy.

Table 1: Health and demographic indicators

Indicator	
Population	11.6 million
Per capita government health expenditure (international dollar rate)	$26
Percentage of people living with less than US$2 a day	87.4%
Number of people living with HIV	1.1 million
Provinces	9
Districts	72

Sources: UNAIDS ; MoH 2005.

The Ministry of Health's annual report released in September 2006 lists erratic supply of drugs and inadequate logistics for health service delivery as two of the six main challenges facing the health system. The report also states that the need for pharmaceuticals in Zambia is roughly $21 million.

Health care in Zambia is provided through a network of public sector facilities, complemented by mission facilities in the rural areas, mine hospitals in the Copperbelt Province, and a small but growing private sector, largely in Lusaka and other urban areas.

The public sector

Primary health care in the public sector is provided by primary health centers, each of which serves a catchment population of between 30,000 and 50,000 (in urban areas) or a designated catchment area of 29 kilometers (in rural areas) (Global Fund).

The public sector system consists of one general hospital in each provincial center and a district hospital in each district. There are many primary health centers (typically 20 or more) under each of the district hospitals, but their number varies from region to region. Some areas also have health posts that offer a very limited range of health care. In urban areas, there is a small user fee to access the public health system, but access is free in rural areas. Drugs are dispensed free of charge in both rural and urban centers in the public sector.

Mission and mine hospitals

Mission and church hospitals are usually located in the rural areas of the country. According to estimates, between 20 and 30 percent of health care in Zambia is obtained through the mission hospitals and clinics (this fraction is much higher in the rural areas). The Churches Health Association of Zambia (CHAZ) is an organization that collectively represents these hospitals and health centers (approximately 97 member institutions and 28 nonmember institutions) and does procurement and storage for them. CHAZ works in close partnership with the Ministry of Health and with Zambia National AIDS Network (ZNAN) to procure, store, and distribute drugs to certain public facilities.

In the Copperbelt Province, there is also a strong presence of mine hospitals. These health facilities are for mine employees and are funded by the mining companies. The hospitals often have a quasi-public status, and many of them are supplied drugs by the public system.

In addition, organizations such as Médecins sans Frontières operate their health facilities in the border areas with the Democratic Republic of Congo to cater to the health needs of refugees from Congo. Similar clinics exist around other borders of Zambia and are operated by different nongovernmental organizations.

Private (for-profit) facilities

Private-for-profit health facilities are limited to the urban areas either around Lusaka or in the Copperbelt Province and occasionally in Livingston. Some private clinics also dispense drugs. There is no clear distinction between a private clinic and a private hospital. Patients seeking treatment in the private sector purchase drugs primarily from retail pharmacies, which are concentrated in Lusaka and the Copperbelt, with very few (most respondents said none) in the rural areas. In addition to registered pharmacies, drugs are also sold in drug stores as over-the-counter medicines. There is also a small market for drugs that are sold in non-fixed structure stores that are located either in far-flung rural areas or in the shanty compounds neighboring Lusaka.

In the following sections we provide sector-by-sector maps of the supply chains and analyze the key issues and challenges.

2. Public Sector Supply Chain for Medicines

The public sector contributes over 60 percent of the health care provided in Zambia. An overview of the public sector supply chain in Zambia and its salient characteristics is given in figure 1. Each of the functions is then analyzed in detail.

Figure 1: The public sector supply chain for medicines in Zambia

Registration	*Selection*	*Procurement*	*Distribution*	*Delivery*
The Pharmaceutical Regulatory Authority (PRA) is severely understaffed and has skeletal systems infrastructure to handle distribution. Clear requirements for labelling and marketing are being planned but do not yet exist. Low fees are charged for drug registration. There is little capacity to carry out routine quality testing, pharmaco-vigilance, or other post-marketing surveillance activities. PRA is also to regulate and monitor the private market for pharmaceuticals.	The Essential Drugs List (EDL) is prepared by the pharmacy unit at the Ministry of Health. The EDL is consistent with the WHO's EDL. Budget and cost benefit analysis is used to guide drug selection. Selection (and quantification) is based on resource availability and does not always reflect true needs.	The Ministry of Health is responsible for procurement. A combination of international tenders, restricted tenders, and local purchasing is used GFATM portion of the procurement is done through IDA. DBSL (within the Ministry of Health) carries out the key role of coordinating the funding streams of different cooperating partners with the drug needs and procurement plans. Greater flexibility in procurement options and the use of framework contracts are required.	Medical Stores Ltd. (MSL) carries out this function. Operational management of MSL is outsourced to Crown Agents. MSL has reasonably good storage, demand monitoring, order fulfilment, and inventory tracking capabilities. The challenge lies in managing optimal stock levels because procurement lead times are highly uncertain. Little visibility of distribution from the district level to the primary health facilities. Poor demand monitoring and visibility at lower echelons.	Dispensing of pharmaceuticals is carried out at most health facilities free of charge. The author does not have adequate information to state whether or not adverse drug monitoring and patient compliance information are recorded in a systematic manner at the health facilities and communicated to the district/central levels.

Registration

The Pharmaceutical Regulatory Authority of Zambia is responsible for registering all drugs before they can be imported or sold in Zambia. The authority is still in a state of transition as it was formed in 2004 from the former Pharmacy and Poisons Board. Its responsibilities include product registration, licensing of pharmaceutical establishments, and post-marketing surveillance.

Approximately 500 new drug applications are received every year in Zambia. The fee for registering a new drug is only $150 as compared to $1,000 in some other countries in the region. Despite that, many unregistered drugs can be found on the market. These include drugs whose registrations have expired or drugs that were never registered. In addition, herbal medicines are also found on the market. The Pharmaceutical Regulatory Authority wants to include herbal and traditional medicines within its purview but currently has very little capacity to do that.

The time required to register a new drug can vary significantly, although prioritized registration is carried out in special circumstances. There is no two-tiered system for product registration to differentiate between products that have received regulatory approvals by other regional or global regulatory authorities and those that have not. The variability in the approval time is attributed to a lack of personnel and skills to evaluate the applications. The Pharmaceutical Regulatory Authority relies on quality and safety data provided by the manufacturers and has virtually no capacity to do its own tests and quality checks. It has three quality mini-labs that were provided by the World Health Organization and Management Sciences for Health, and plans to have a medium-sized quality control lab by 2010.

The Pharmaceutical Regulatory Authority currently has very little capacity to carry out its other two roles—licensing pharmaceutical establishments and post-marketing surveillance. There is lack of a fleet for the inspectorate and a lack of inspectors trained in good manufacturing practices and good wholesaling practices to successfully monitor the private pharmaceutical market in Zambia. Also, it is not clear whether policy decisions will mandate the Pharmaceutical Regulatory Authority to be actively involved in regulating or monitoring wholesaler and retailer markups.

Selection

Cost-benefit analysis and other efficacy data are used to update the Essential Drugs List periodically. This activity is carried out primarily by the pharmacy unit within the Ministry of Health. The World Health Organization's recommendations on the Essential Drugs List in resource-constrained setting are used to update the list.

Procurement

Before delving into the procurement function in detail, it is important to understand the financial flows for procurement in Zambia (many of which are typical for low-income countries). The Ministry of Health relies extensively on external donors (cooperating partners) for the national drug needs. The cooperating partners can be categorized into three types:

- Those who buy drugs and provide in-kind assistance with drugs (e.g., Canadian International Development Agency, the U.S. President's Emergency Plan for AIDS Relief)
- Those who bring money in-country to purchase drugs (e.g., the Global Fund to Fight AIDS, Tuberculosis and Malaria)

- Those who provide budgetary support to the Ministry of Health (e.g., the United Kingdom's Department for International Development)

In the past, this led to a coordination problem across programs that were buying drugs. It led to oversupply of some drug and shortages of other drugs as cooperating partners would not purchase a certain drug assuming others were buying it. The shortages led to emergency procurement by the Ministry of Health and at times by the cooperating partners. On various occasions, this resulted in cooperating partners bringing drugs into the country that were not even on the EDL. Those who procured from the country are now asked to contribute to the drug basket (in the Sector-wide Approach, or SWAp), and others who provide drugs in kind now play the role of filling in any gaps or short-tem shortages. The drug supply budget line (DBSL) within the Ministry of Health plays the role of coordinator across multiple cooperating partners and the Ministry of Health's budget and procurement plans.

Figure 2: Coordination role of the DSBL in the Zambia public sector supply chain
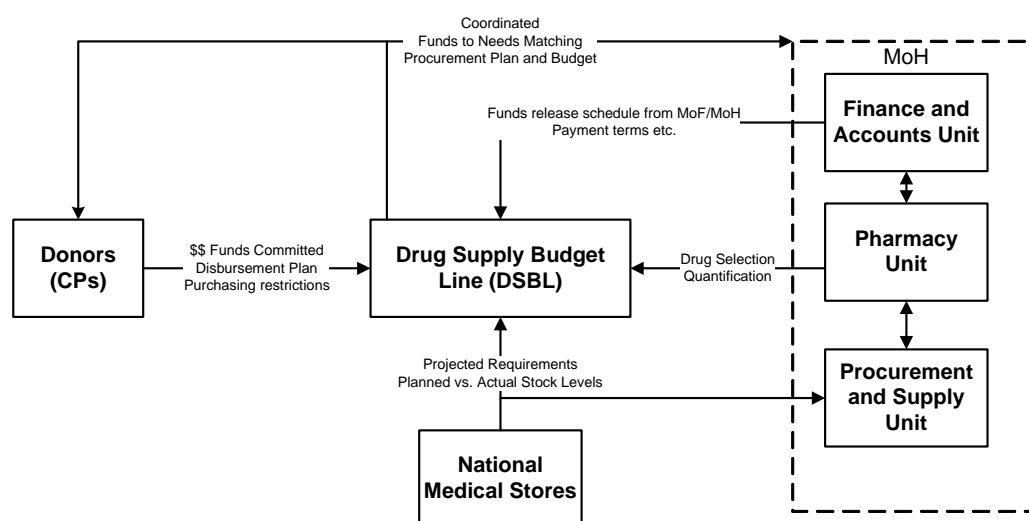
Source: Adapted from a slide by Bonface Fundafunda, head of DSBL (Fundafunda 2007).

The drug procurement function in Zambia requires the involvement of many institutions and can often be a coordination challenge. The Ministry of Health receives funds for health financing from both the Ministry of Finance and the bilateral and multilateral cooperating partners. Some cooperating partners channel their funds directly to the Ministry of Health and others channel it through the Finance Ministry. The Finance Ministry makes the funds available to the Ministry of Health for drug purchasing based on a quarterly/monthly disbursal schedule. This often leads to purchasing in fragmented quantities, some of which are too small to even float an international tender. Thus, the Ministry of Health pays a higher price for drugs that could have been procured more

cheaply if international bulk procurement was carried out. The Finance Ministry often cites poor accountability as the reason for controlled and staggered disbursal of the budgeted funds to the Ministry of Health.

The pharmacy unit at the Ministry of Health carries out quantification and forecasting. The information generated is used, in conjunction with the needs communicated by the national medical stores and the availability of resources, to create a procurement plan. The required quantities are then converted into a dollar value based on international reference prices available from the Management Sciences for Health price survey. If the value of the bid is higher than 2.5 billion Zambian kwachas, the tender is floated by the Zambia National Tender Board. For smaller value bids, the Ministry of Health is authorized to float the tender. In practice, however ,most tenders go through the tender board because the Ministry of Health threshold is very small.

In the event of a stock-out, emergency purchases in smaller quantities are made by the Ministry of Health. Emergency purchases do not follow the process outlined above. Private in-country importers are awarded the contracts for such emergency procurement. In addition, the districts and provincial hospitals are permitted to spend a tiny fraction of their total budget (between 4 and10 percent) for emergency drug purchases when the national medical stores cannot supply them.

In the event of a severe shortage of essential drugs, some cooperating partners tend to support the Ministry of Health by purchasing of the required drugs on an expedited basis. This, however, causes procurement staff at the Ministry of Health not to think of a stock-out as severe, because over a period of time they may have become conditioned to the fact that they can always depend on the cooperating partners as a "measure of last resort" if the delivery or procurement drastically fails.

Figure 3: The Public sector procurement process in Zambia
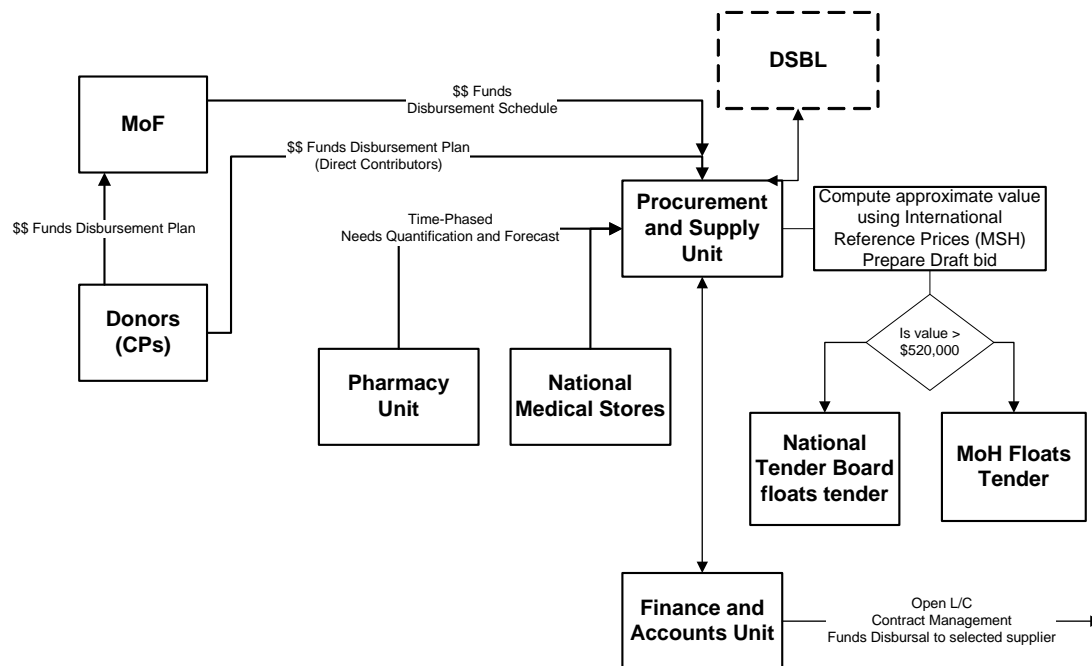
The procurement unit at the Ministry of Health has started to use framework contracts with a few local suppliers to avoid the long lead times (two to eight months) associated with procuring through the regular international open-tender process. Such framework contracts also need to be set up with a few large international suppliers where the price and lead times are established under a long-term contract and quantities to be shipped are communicated periodically. Currently, however, large donors do not permit such arrangements, or various others view it as a competition-limiting measure.[9]

Distribution

Medical Stores Limited (MSL) is the national medical supplier, and it manages the storage and distribution of drugs for the Ministry of Health. The government has contracted out the management of MSL to Crown Agents. The Ministry of Health pays Crown Agents a management fee to run MSL efficiently. Operating expenses are paid directly into the MSL account. Capital investments that were recommended by Crown Agents have been implemented, and better physical infrastructure for storage and

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[9] Purchases made through the Global Fund to Fight AIDS, Tuberculosis and Malaria funding stream have to use a procurement agent (IDA).

distribution now exists at the MSL. MSL currently has a staff of 85, including Crown Agents management personnel.

Each district is served once a month by MSL (some may require additional deliveries) in compliance with a preset schedule. All districts are required to place their orders before a preset date each month (hand delivered or faxed). MSL then prepares and ships the orders, usually within a week if in stock. MSL has a fleet of 14 10-ton trucks for delivery, and fixed route plans for the deliveries are made every year and updated based on any new demand or route information The distribution system follows a "pull" logic in which shipments are based on actual demand off-take (or stock levels) at the districts, and not a centrally developed forecast for each district. However, medicine kits are supplied in a "push" manner, and each district receives a certain number of kits every month.

Over 50 percent of the essential drug lines are usually in stock at MSL. Every month, MSL sends a stock status report to all the districts. In addition, many districts call MSL to confirm availability before placing an order. If an item has been out of stock for a long period of time, panic over-ordering occurs whenever stock becomes available. In such instances, the MSL planners often choose to deflate the order based on their discretion and estimates of more realistic demand levels. Specifying a budget for how much each district can order in a given month can help partially resolve the problem associated with panic over-ordering. On the other hand, because the districts have access to the stock availability report, they choose not to order those items which they know are out of stock. This leads to censored demand information at the MSL, and very rough estimates are then required to quantify the monthly need for those drugs.

Tom Brown at the MSL remarked, "Orders are based on what people think they can get and not what they think they need. If they don't have a chance of getting it, they don't include it in their order."

Upon receipt of drugs and medical supplies, each district or hospital is supposed to send a Goods Received Note. However, this notification is not always received in time, and systems to track this are weak. The districts are required to update their stock-control cards upon receipt. For anti-retrovirals, many facilities are running JSI's inventory and stock-tracking system ,but its design features are suited only for anti-retrovirals.

Figure 4: The public sector distribution chain in Zambia
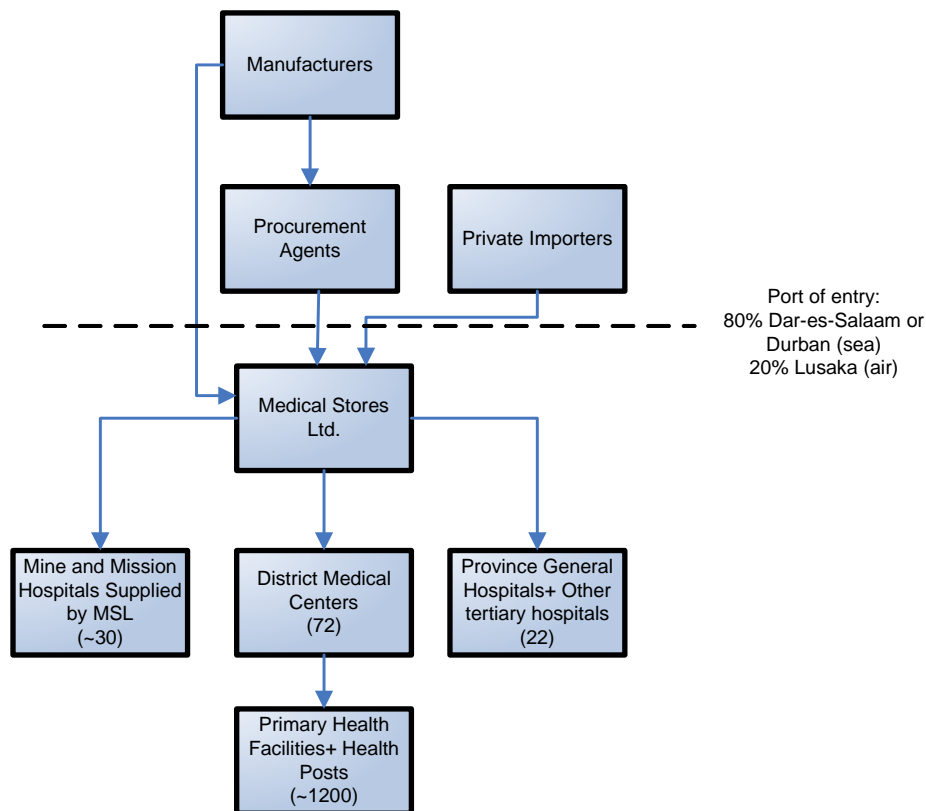
There is poor visibility of the supply chain after the product is delivered to the districts. MSL customer service teams periodically visit the districts; however, field audits on stock availability and product storage and the like are not in the mandate of MSL. Pilferage and wastage are reported to have occurred on many occasions at the district or primary health centers. Expired product does not return to MSL, and there is very little traceability to ensure that it is destroyed.

However, the biggest challenge in managing the distribution chain is that lead times are highly unpredictable and long. The overall lead time to MSL includes the procurement lead time of the Ministry of Health and the delivery lead time of the supplier. High variability in lead time can be buffered only by a holding larger safety stock at MSL. However, budgetary constraints and the mandate for MSL to reduce operating costs prevent MSL from holding higher buffer stocks. The result is a higher frequency of stock-outs of essential drugs.

3. Mission Sector Supply Chain for Medicines

The Churches Health Association of Zambia (CHAZ) represents over 125 health facilities (97 association members and 28 nonmembers) accounting for 20–30 percent[10] of health care in Zambia, but its share is significantly higher in the remote rural areas of Zambia.

CHAZ carries out its own procurement, operates its own central warehouse, and arranges the distribution of its products for its member institutions. Many hospitals and clinics that purchase from CHAZ arrange to transport the drugs themselves from the central CHAZ warehouse in Lusaka.

CHAZ procures its drugs mainly from international nonprofit procurement agencies. It floats restricted tenders to its prequalified suppliers of drugs and medical supplies. Most of the purchases are obtained from either Mission Pharma or International Dispensary Association (IDA).[11] CHAZ does not offer quantity discounts or credits to its buyers. It usually receives a 30-day credit from IDA or Mission Pharma on its purchases.

Figure 5: Mission sector distribution chain in Zambia

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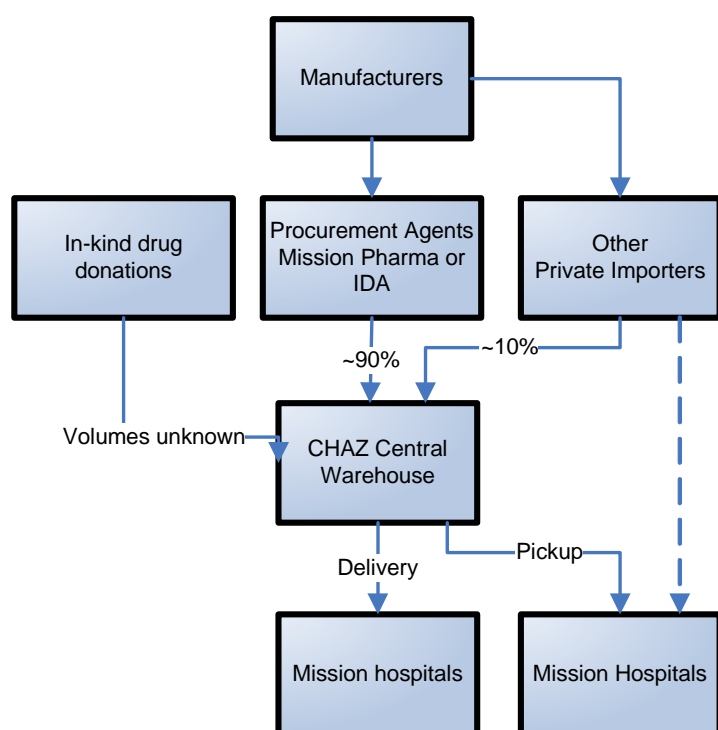
[10] A report published by the World Health Organization (Banda, Ombaka, and Everard 2007) puts this number at 33 percent.

[11] According to the report by Banda, Ombaka, and Everard (2007), CHAZ purchases 98 percent of its supplies internationally and 2 percent locally.

Table 2: CHAZ supply chain figures

Number of member tertiary hospitals served	34
Number of member primary health centers served	58
Number of member health posts	5
Nonmember health facilities	25
Total health facilities served	125
Number of warehouses	1 (in Lusaka)
Number of staff	34
Number of staff in warehousing and distribution	6
Vehicle fleet	4+1 trucks
Variable costs	75%
Staff costs	8%

Sources: FUG 2006; Wehrens 2007; CHAZ.

Table 3: Cost structure of drugs in the mission sector (CHAZ)

Cost Element	Drugs Purchased	Drugs Donated
Landed cost (including handling and freight)	100	0
Service fee (15–30% depending on product)	15–30	30
Transportation (borne by buyer) 3–10% of original	3–10	3–10
Landed cost	125–140	40
Price relative to Management Sciences for Health median price	75%	—

Table 4: CHAZ roles and functions

Activity	Remarks
Supplier selection and price negotiation	CHAZ selects from the two or three different procurement agents. It procures using a restricted tender from its prequalified suppliers.
Credit terms from suppliers	CHAZ receives a 30-day credit from its suppliers.
Credit terms to buyers	No credit provided
Inventory risk	Borne by CHAZ
Exchange rate risk	Passed on to customers
Transportation	Transportation is carried out by buyer
Quality inspection	CHAZ carries out quality inspection

4. Private Sector Supply Chain for Medicines

Between 10 and 30 percent of health care in Zambia is provided by the private sector. Estimates varied considerably from respondent to respondent in the survey we conducted. The structure of the private sector supply chain is similar to that observed in most low-income countries with a few large importers and wholesalers bringing in drugs from international manufacturers or suppliers and selling them to retail pharmacies or drug outlets. In Zambia, all wholesalers, importers, and retail pharmacies must be registered with the Pharmaceutical Regulatory Authority. The author does not have sufficient evidence to comment on whether or not this is strictly adhered to.

Figure 6: The private sector distribution chain in Zambia
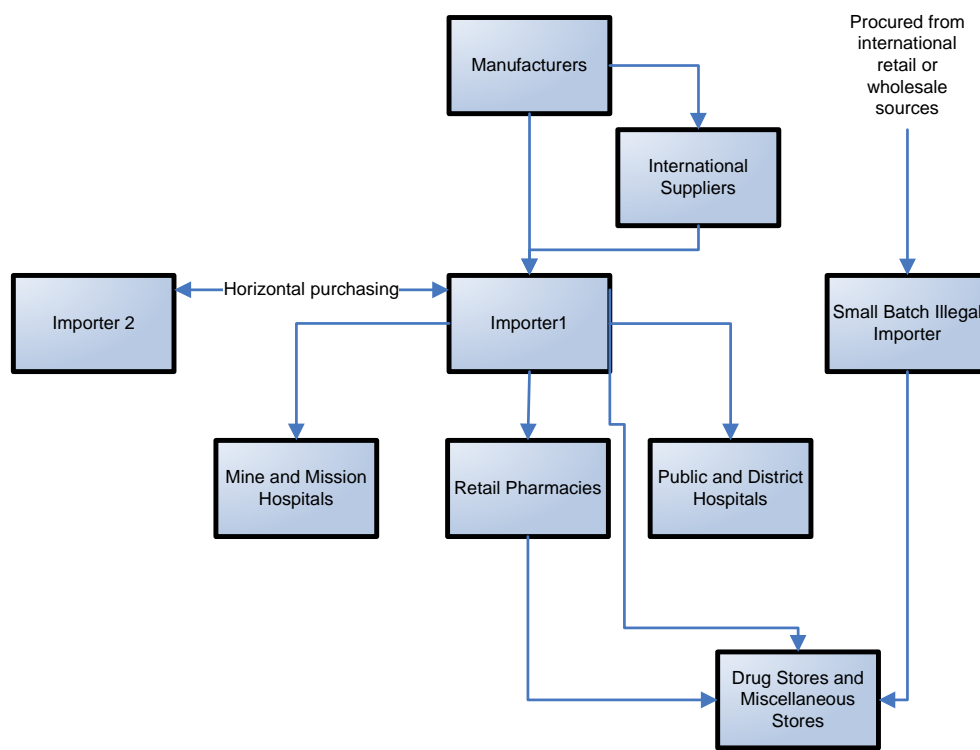
Local manufacturing

There are six bona fide manufacturers in Zambia, one or two of which claim to be in basic compliance with good manufacturing practices. Many of them have encapsulation and tableting capabilities. Finished pharmaceutical products, active pharmaceutical ingredients, and intermediates can be imported into the country duty free, but excipients, inactive materials, and packaging materials such as bottles, containers, and ampoules may carry an import duty of up to 50 percent.

There is also an import duty on machinery and capital equipment. All of these factors lead to a much higher cost for locally manufactured (or locally encapsulated or tableted) products than for imported finished products. The rationale behind the government's import duty policy is that some of the inactive ingredients are also used in the manufacture of non-pharmaceutical products (e.g., lactose is a common inactive ingredient that finds uses in many consumer items) and there is little ability to trace and ensure the flow of a material once it has entered the country. The local manufacturers are under-capitalized and have poor access to working capital to be able to execute large orders. They engage mostly in made-to-order production and work on a cash-to-cash cycle that minimizes working capital needs.

The multinational pharmaceutical companies do not have any manufacturing operations in Zambia. Some of them are represented by local agents who register and distribute their products. Mission Pharma is known to have contracted out some of its manufacturing to a local company.

Importers/Wholesalers

There are about 50 companies[12] that import drugs into the country. Around 80–90 percent of these are wholesalers based in Lusaka that also import pharmaceutical products into Zambia. The remaining 10–20 percent are based in the urban centers of the Copperbelt Province, and some also have operations in Livingston. Many of the large importers are former manufacturers that have turned into importers because of the poor profitability of local manufacturing in Zambia. Although the number of players is large, almost 80 percent of the volume moves through six main importers/wholesalers.

All companies that register with the Pharmaceutical Regulatory Authority as wholesalers and importers of pharmaceutical products are required to have suitable storage facilities in which the products can be stored before distribution. The Pharmaceutical Regulatory Authority's requirements also stipulate that all registered pharmaceutical establishments should have a professionally qualified pharmacist. All pharmaceutical products imported into Zambia must be declared to the Pharmaceutical Regulatory Authority, and an approval of the pro forma invoice is required. The author does not have adequate information to determine whether this is adhered to in entirety or whether the lack of policing and inspection staff at the Pharmaceutical Regulatory Authority leads to inadequate importer facilities, staff, or both; unregistered importers; or products being imported without pro forma invoice approval from the authority.

The majority of the pharmaceuticals imported by the private sector come from India, followed by the United Kingdom,[13] Germany, South Africa, Holland, and Belgium. Oftentimes, the importers trade among each other, which leads to large horizontal flows within the supply chain. For example, a particular importer/wholesaler may have a good relationship with a mission hospital or a mine hospital. All product inquiries originating

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[12] Some survey respondents put this number at 60.
[13] Suppliers from the United Kingdom consist of international distributors of multinational pharmaceutical companies.

from the hospital naturally are routed to the importer/wholesaler with which it has an existing relationship. If this particular importer/wholesaler does not have the product in stock or does not have a relationship with the manufacturer of that product, the importer/wholesaler in turn procures it from the competition and fulfills the order. Similarly, because many importers/wholesalers are also owners of more than one retail pharmacy, they end up buying from each other for different product needs. Most importers have relationships with specific manufacturers for high-volume products (e.g., one importer stocks anti-malarials from Aurobindo Pharma, another from Ajanta Pharma or Novartis). For low-volume therapeutic categories, some importers do not source from a manufacturer but instead buy from another importer in Zambia who may specialize in importing that product category. This leads to purchasing and in-bound logistical efficiencies for low-volume therapeutic categories. Hence, there is no clear differentiation between wholesalers and importers as these roles depend on the product category. Sole distributorship does not work for many products because each distributor may have very unclear relationships with one type of buyer.

Most of the large importers receive at least 30 days (sometimes 45 days) of credit from their suppliers. Some importers stated that they receive credit terms consisting of an upfront payment of 20 percent and 30 days of credit for the remaining portion from their suppliers. One importer/wholesaler (who also owns at least three retail pharmacies) described having a sourcing company established in Mumbai, India, buy on his behalf at local prices and then export the product to Lusaka, Zambia.

The importers/wholesalers make deliveries to retail pharmacies and private hospitals in Lusaka and in the urban centers of the Copperbelt Province. For such deliveries, they bear the transportation costs, and some of them have their own fleets of vehicles, while others use third-party delivery companies. Private hospitals and drug stores from smaller towns go to Lusaka to buy drugs from the private importers/wholesalers. Missionary hospitals go to Lusaka to buy from the CHAZ facility, and many end up buying products that are not in stock at CHAZ (or are not on the CHAZ supply list) from private importers/wholesalers. Some mine hospitals that buy from the importers/wholesalers require delivery, which is often outsourced to a third-party delivery company.

Most importers hold some inventory, either to ensure in-bound logistics efficiency or to have a competitive edge in quoting lead times to fulfill orders from their clients. Large-volume orders, however, require them to purchase from their suppliers because their in-stock inventory is usually very low. About 15–20 percent of the input cost is freight and handing charges. The typical markup in the wholesale/import business varies between 10–40 percent (see figure 8). Markup is highly dependent on the product category (insulin vials versus antibiotic capsules) because the range of services and transportation options depend on that. One survey respondent, albeit not directly involved in the import/wholesale industry, mentioned the existence of cross-subsidies across clients wherein a wholesaler has to supply cheaply to maintain its relationship commitments with one client and compensates for it by charging another client higher markups.

The importers/wholesalers provide 30 days of credit to their large clients. This is often done using the system of post-dated checks. For smaller customers, importers/wholesalers do not offer credit terms and require upfront payments.

The importers/wholesalers do not provide any structured or formally stated quantity discount to the retail pharmacists or hospitals that purchase from them. They claim that the payment records of the retail pharmacists and hospitals are very bad and that they are therefore unable to offer them any form of quantity discount. However, product pricing negotiation is influenced to some extent by the quantity purchased.

Wholesaler/importers can strongly influence the prescribing behavior of the retail pharmacists. One importer cited the example of how it educated doctors about use of new forms of insulin. "Supply capacity is in our hands, so we can undoubtedly influence the retailers," remarked a large importer.

Drugs are also brought into the country in small batches by some who travel frequently to South Asia. These drugs quickly make their way to the retail outlets in the outlying rural areas or peripheral areas of Lusaka. There are also some drugs that enter Zambia from South Africa, Tanzania, and Zimbabwe through one of Zambia's many borders. This parallel market is, however, mostly restricted to cheap over-the-counter drugs and anti-malarials.[14]

Pharmacists and retail chemists

There are around 59 retail pharmacies in Zambia, 40 of which are in Lusaka. Many of these pharmacies are owned by wholesalers/importers, but some continue to be independent pharmacies that purchase from the wholesaler/distributors. These "pure-play retail" pharmacies are at a natural disadvantage (given the vertical integration advantages of their competitors) and try to counter the competition by being more involved in the community and by offering value-added services to their customers.

Apart from retail pharmacists, there are drug stores that are allowed to dispense over-the-counter drugs, but in reality they also dispense various prescription drugs. In addition, some private hospitals and clinics also dispense medicines.

There is no pricing control on drugs, and prices at the retail level are determined by market forces. A markup of 30 percent is minimal at the retail level. Bulk-breaking (for example tablets in a jar) leads to extremely high markups, as high as 300 percent. A few examples of markups are provided in tables 5 and 7. The key determining factors for retail markups are the intensity of competition in the region (e.g., Cairo Road in Lusaka has a higher intensity than peripheral Lusaka) and the origin and quality perception of the drug (drugs manufactured in Asia fetch a lower retail price than drugs manufactured in Europe). A pharmacist in Lusaka remarked, "If the price [of Coartem®] falls too much, after a certain point they [customers] will stop buying it, thinking it is fake."

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[14] Artemesinin combination therapy is technically still a prescription-only drug in Zambia.

Pharmacies employ one or two pharmacy technicians who are salaried employees. This, along with real estate costs, forms the largest portion of the pharmacy's overhead. Except for the price paid to the wholesaler, variable costs are a very small fraction of the cost structure at the pharmacies. A typical pharmacy technician makes anywhere between 1.2 million and 5 million Zambian kwachas a month.

There is some presence of sales representatives from either the pharmaceutical companies (Novartis, Ajanta Pharma, and CIPLA were mentioned more than once) who market products and provide training. Distributors' sales representatives visit the pharmacies when they calculate that the pharmacy might be close to stocking out on their products.

Due to the wide range of products in pharmacies, it was not possible to ask the wholesale source of individual products.

Table 5: Examples of high markups observed in the supply chain

	Product type (antibiotic vial)	Product type (anti-rabies vaccine)
Input price	1,200 kwachas	100,000 kwachas
Wholesaler price	3,000 kwachas	150,000 kwachas
Retail price	7,000–9,000 kwachas	600,000–800,00 kwachas

Table 6: Retail prices of anti-malarials purchased or observed by author

Product	Manufacturer	Retail Price1	Retail Price2	Retail Price3
Coartem® 20/120 AL	Novartis (Beijing, China)	37,000 kwachas	50,000 kwachas	40,000 kwachas
Co-Arinate® (three-day dosage) AS + SP	Dafra Pharma (Belgium)	43,000 kwachas		
Novidar Plus® (three-day dosage) AS + SP	Pharmanova Ltd. (Lusaka, Zambia)			
Pharmadar® SP	Glumex Pharma (India) (marketed by Pharma Plus, Lusaka)	1,000 kwachas		
Artefan® AL	Ajanta Pharma (Mumbai, India)	18,000 kwachas	25,000 kwachas	

Artesunate	Denk Pharma (Germany)	35,000 kwachas		

Figure 7: Volume dependence of costs in the private sector supply chain

Player					
Importer/Wholesaler	Unit FOB Price				■	Manufacturer's FOB price is usually quantity dependent bt higher volumes allow better price negotation
	Sea/Air Freight		■			For medium to small volume shipments freight costs are not strongly dependent upon volume
	Insurance				■	Insurance is on value of shipment
	Duties/VAT				■	Duties and VAT is on value of shipment
	Clearance Fees			■		Fee paid to agent for Port Clearance.
	Administrative Cost	■				Staff involved in negotiation and processing of paperwork
	Transport			■		Transport Costs for Port to Primary Warehouse transport
	Warehousing Costs	■				Rent (including utilities),maintennace, salaries, pilfrage
Pharmacies						
	Taxes and Misc.overheads			■		Activities and cost directly attributable to filling a prescription
	Warehousing Costs	■				Rent (including utilities),maintennace, salaries, pilfrage
	Administrative Costs	■				Costs for staff involved in Negotiation,Ordering, Pricing, Marketing & Stock Mgt

Table 7: Roles and markup assessment for the private sector supply chain

Player	Activities Carried Out	Average markup
Importer/Wholesaler		25%
	Forecasting/Order Consolidation	
	Supplier identification based on lead time, price, brand	
	Price negotiation with suppliers	
	Facilitate product clearance at point of entry	
	Warehousing at primary location	
	Distribution to secondary locations	
	Stock management	
	Pre-financing (pays supplier but does not recieve advance from buyer)	
	Quality control	
	Assume risk of overstock and expired product	
Pharmacies		120%
	Wholesaler Selection (where no fixed contracts or backward integration exists)	
	Develop marketing materials	
	Advise/Prescribe/Dispense appropriate of drugs	
	Inventory levels, stock control (e.g losses)	
	Assumes risk of overstock and expired product	
General Stores		?
	Identify supply source	
	Process order with supply source	
	Transport ACTs to store	
	Credit Terms to Customer	
	Assumes risk of overstock and expired product	

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VillageReach

Overall description:

•VillageReach partners with the Ministry of Health (MoH) and other local organizations to deliver two interconnected parts of the model:

   a) programs to strengthen the logistics and infrastructure support services that expand access and enable healthcare at the last mile and,

   b) social businesses that deliver one or more of those services in a manner beneficial to the health system.

•In Mozambique, the program partners started a propane gas distribution enterprise that provides energy for the cold chain thus enabling the health program to reliably keep temperature-sensitive vaccines cold, and also provide the health centers with lighting for night-time emergencies and propane to sterilize medical equipment. The propane company also serves households and businesses, and is now the largest propane distribution company in northern Mozambique.

•The program portion of the model has translated into a health program encompassing transport and logistics, cold chain, data management, and supportive supervision of health workers for 251 public health centers covering over 5 million people.

•VillageReach is working with the Mozambique Ministry of Health on a national expansion plan to serve the country's remaining 8 provinces, which would raise the total population covered to over 19 million people and has also been engaged by the Government of Malawi as is currently fundraising for this expansion.

Rationale/potential benefits:

- Partially self-sustaining model through VidaGas, its partnering social business
- Improved management, reliability, and quality of medical care by ensuring the timely delivery of essential equipment and medical supplies, supply management and supportive supervision activities
- Emphasizes appropriate system design, rigorous data collection and analysis, and the entrepreneurial drive of the private sector.
- Activities have contributed to a 40% increase in the number of children fully immunized in one province of northern Mozambique.

Factors to consider:

- There has been no external monitoring and impact evaluation of Village Reach's service levels, delivery frequencies, availability and other outcome measures.
- It is difficult to assess how much buy-in they have from the MoH in Malawi. They may find it challenging to work in an environment with multiple local stake-holders, donors and cooperating partners
- There are other initiatives such as government's outsourced distribution of ARVs using a third party logistics company (SDV) in Malawi which may complicate the eco-system

ITC E-choupal Health: Overview of initiative

<u>Overall description:</u>

- ITC's International Business Division has championed the E-Choupal model across the country. It follows a three-p... strategy aimed at engaging local human resource, creating IT networks and operating delivery centres
- E-Choupal is a simple V-Sat linked computer in a villager's ('sanchalak') house used as a rural information centre, catering to roughly five villages. Approximately 40 e-choupals are connected to a single hub called Choupal Sagar...
- The district hub serves as an administrative co-ordination centre for ITC. It is a large building of about 10,000 squa... with all modern amenities, with three rooms earmarked for a clinic, pharmacy and laboratory with a fully-equipped automated lab and pharmacy stocking quality medications
- Village Health Champions (VHCs) located in an E-Choupal area coordinate with the choupal sanchalaks, and deal... community mobilisation, common ailment treatment, household survey, monitoring health profiles, public education... awareness. They are equipped with medicines and first aid, a kit for basic diagnosis, and a bicycle. They are scree... and trained in social skills and communication skills, use of handheld devices, basic clinical services, recording an... reporting protocols and conducting public health intervention either independently or by advocacy, local responsibi... creation and facilitation of government schemes.
- Patient fees and subscriptions/donations from partners and government primarily provide the required inflow of cas... run the program
- The E-choupal initiative results in marginal additional fixed cost, which can be recovered easily by scaling up opera...

Rationale/potential benefits:

- Engages and empowers communities at a grassroots level, enabling trust and buy-in
- The programme aims at designing a solution that uses the power of telemedicine and yet operates on a low cost, uses very low bandwidth, uses rugged hardware and software that is user friendly for semi-literate people and works in local languages .

Factors to consider:

- Focus on programs for training and accreditati... certification for healthcare service in rural area...
- Changes and modifications in the pharmacy regulation.
- Create standards for health data exchange.
- Proper regulation and protocol for leveraging... technology like telemedicine.
- Provide concessions to players contributing in... rural healthcare segments.

Curatio: Overview of initiative

<u>Overall description:</u>

- Curatio's business model is based around reduction in the logistics cost of delivering to rural pharmacies (through leveraging fine-mesh distribution networks) in Ghana and using high control over Point of Purchase (through franch and better margin-mix management (through private label, generic and branded products as used in consumer proc retailing) to gain efficiencies at the point-of-sale.
- Primary distribution from the warehouse (near Accra) will be carried out using a fleet, leased or outsourced, to priva distributors who currently distribute consumer products (i.e. Unilever Ghana); the secondary distribution will be usin distribution capabilities of these private distributors utilizing their fine mesh network to reduce secondary distribution costs.
- The chemical sellers that will be served would be under a franchise arrangement and would require some training.
- Margin mix management within the portfolio of drugs will be effectively used to ensure recovery of fixed and variable costs in different ways.
- Curatio has teamed up with critical partners in the value chain to deliver the right product in the right place, and crea communication at PoPto educate the communities serviced by its franchisees

Rationale/potential benefits:

- Reduction in the distribution cost of delivering to rural pharmacies
- The model is envisaged as being self-sustaining.
- Extensive training and branding activities are carried out for the franchisees

Factors to consider:

- It is unclear how a for-profit model would levera grant and what it would imply for the grant prov (equity, loan, one time fixed cost)
- The role of chemical sellers and second tier pharmaceutical outlets is a contentious issue w ministries of health
- Issues around combining pharmaceuticals with products on the same van/truck (good working practices).

Reagent rental agreements for diagnostic services

Overall description:

- Becton Dickinson, a global medical technology company manufactures and sells a broad range of medical supplies devices, laboratory equipment and diagnostic products, has introduced reagent rental agreements with the MoH i Mozambique
- These agreements include transport, preventative maintenance and upgrading of the laboratory equipment they s well as training of the lab personnel
  As a result, maintenance and transport is no longer a preoccupation of the MoH
- A driving factor behind BD's decision to change their contracting formats was the realization that of the machines work, they don't sell the reagents to the labs
- Provision of this service is done through private sector vendors (exclusive representatives) in countries where BD not have an office; BD trains the vendors in all aspects of maintenance so that the vendors can be competitive usi approach

Rationale/potential benefits:

- Allow laboratories and MoH to avoid the tremendous capital outlay associated with the purchase of new instruments
- With the average contract lasting between 3 and 5 years, it allows laboratories to keep up with the latest advancements in diagnostics technology since when a contract has expired, laboratories get older equipment replaced with new instruments that offer them more updated technology
- Improved health service provision through constant access to well-functioning equipment
- Savings for the laboratory in terms of service/maintenance expenses

Factors to consider:

- Program implementation required push from organizations such as the Clinton Foundation the existing natural incentives for the private s companies to offer it

Capacity development for SC management - BD

Overall description:

- Becton Dickinson, a global medical technology company manufactures and sells a broad range of medical supplies, devi[...] laboratory equipment and diagnostic products, has introduced reagent rental agreements with the MoH in Mozambique
- These agreements include transport, preventative maintenance and upgrading of the laboratory equipment they sell, as [...] training of the lab personnel
  As a result, maintenance and transport is no longer a preoccupation of the MoH
- A driving factor behind BD's decision to change their contracting formats was the realization that of the machines don't [...] don't sell the reagents to the labs
- Provision of this service is done through private sector vendors (exclusive representatives) in countries where BD does [...] office; BD trains the vendors in all aspects of maintenance so that the vendors can be competitive using this approach

Rationale/potential benefits:

- Allow laboratories and MoH to avoid the tremendous capital outlay associated with the purchase of new instruments
- With the average contract lasting between 3 and 5 years, it allows laboratories to keep up with the latest advancements in diagnostics technology since when a contract has expired, laboratories get older equipment replaced with new instruments that offer them more updated technology
- Improved health service provision through constant access to well-functioning equipment
- Savings for the laboratory in terms of service/maintenance expenses

Factors to consider:

- Program implementation required push from o[...] such as the Clinton Foundation, despite the ex[...] incentives for the private sector companies to [...]

Sample movement

Overall description:

- Early infant HIV diagnosis requires complex and expensive tests with significant logistical requirements, such as blood r and transportation. By collecting infant blood on dried blood spots (DBS), samples can be created that are both easy to and stable for relatively long periods without refrigeration.
- Samples were transported by DHL ; testing was done at national HIV reference laboratory (dedicated technician doing a 48samples/day) and results were returned by fax
- Average turnaround time = 9 days from collection to receiving result in clinic
- Nurses, midwives, doctors were trained in DBS collection:
    - 1 day classroom training (review of HIV testing, data collection, infant test counseling, paperwork, new child healt show of DBS collection)
    - Several days hands-on training
    - Providers usually proficient after collecting DBS on 4-5 infants
- Botswana began its national program for prevention of mother-to-child HIV transmission (PMTCT) in 1999; CDC's Globa Program has provided critical technical and financial assistance to the program since its inception.
- Only 930 infant infections occurred in Botswana in 2005, compared to 4650 infections which would have occurred witho program.

Rationale/potential benefits:

- Substantial reduction of rates of HIV infection in infants by enabling them early access to appropriate care and treatment

Factors to consider:

- One-on-one training required for proficiency
- Infants tested often received early therapy, bu high rate of loss to follow up

Interchange of Data Between Administrations (IDA)

<u>Overall description:</u>

- IDA (Interchange of Data Between Administrations) is a European programme using advances in information and communi technology to support electronic exchange of information between public administrations across Europe.
- Its objective is to set-up and manage networks and services enabling administrations in the Member States and at EU leve exchange data electronically in order to implement European policies and legislation.
- By providing essential tools supporting secure communications across Europe, IDA plays a decisive role in the fulfilment of policy objectives and the efficient management of the Internal Market. In particular, IDA is a major contributor to reaching th eGovernment objectives of the eEurope Action Plan.
- IDA is managed by the IDA Unit in the European Commission's Enterprise Directorate General..

Rationale/potential benefits:

- E-procurement offers more transparency as it allows for easy and timely dissemination of contract information and reduces opportunities and incentives for fraud.
- It also improves the quality of government procurement management, including monitoring and decision-making.

Factors to consider:

- Practices for disseminating contract related inform differ among Member States as well as requireme traceability and auditing of e-procurement operatic
- The Public Procurement Network could play an ac exchanging information and practices on those iss

Online sharing of information for procurement

Overall description:

- **RHInterchange;** The RH Interchange is a free, web-based tool that provides accurate information on past, present, and fu
  supply orders and contains information for 144 countries, on contraceptive order and shipment information from the IPPF, U
  and USAID.
- **Global Fund price reporting mechanism;** The Global Fund's purpose is to attract, manage and disburse resources to fig
  TB and malaria. They work with partners in providing important technical assistance during the development of proposals a
  implementation of programs
- **Pooled procurement :** In 2004, the Rwandan Government and its international and implementing partners pioneered an e
  and accountable system to jointly procure antiretroviral drugs (ARVs) for Rwanda. Project partners include the U.S. Gover
  the Global Fund, the World Bank, and others.

Rationale/potential benefits:

- Cheaper prices are available through pooled procurement and money is also saved through lower management costs and reduced transportation costs.
- The coordination also has a clinical benefit: since drugs are packaged with different shapes, quantities and inscriptions, leading to confusion and potential non-adherence, the coordinated procurement program reduces the risk of confusion.
- E-procurement offers more transparency as it allows for easy and timely dissemination of contract information and reduces opportunities and incentives for fraud.

-

Factors to consider:

- Practices for disseminating contract related info
  may differ among Member States as well as req
  for traceability and auditing of e-procurement op

Track-and-Trace system- Project Jumpstart (2004)

Overall description:

- Project Jumpstart was formed in 2004 by Accenture, to promote pilots of RFID technology in the pharmaceutical industry chain. Participants included consumer goods and pharmaceutical manufacturers, distributors, retailers and associations.
- The 8 week trial tracked 13,000 products from multiple manufacturers through 16 business scenarios and the main focus determine how unit-level item serialization could improve supply chain security
- RFID Enables tracing of products from point of manufacturing, through distribution, to the end consumer using a combinat codes, Radio Frequency Identification technology (RFID) and GPS; each product is assigned a unique serial number at in package level and the information is stored in a database enabling the tracing of the product throughout the supply chain

Rationale/potential benefits:

- Enhancing the safety and security of the pharmaceutical supply chain : when used in conjunction with secure printing, increases protection against counterfeiting of drugs and improves efficiencies in product recalls)
- Increasing the efficiency of distribution operations: when used with asset management software can help reduce shrinkage and theft of stock, improves distribution and gives manufacturers control over storage and transportation of their goods

Factors to consider:

- Tags can be counterfeited, resulting in erroneous information
- Significant cost per pill
- A track-and-trace network may not be widespread other stakeholders from taking advantage of the s needed
- RF noise from other RF sources may affect the re

Regional distribution centres - SCMS

Overall description:

- These are state of the art facilities for warehousing and distributing pharmaceuticals and medical equipment
- RDCs are stocked on the basis of anticipated demand from the countries each serve. The inventory plans are based on fo and demand history. SCMS has RDCs located in Ghana, Kenya and South Africa, where they distribute ARVs.
- RDCs pool inventory across region, reducing the quantity that needs to be carried at a time and reducing the risk of produ expiring before they reach the client
- RDCs are also able to supply clients in consolidated, mixed shipments, thereby reducing the number of inbound shipments and the space required to receive and process deliveries at the client's facilities
- RDCs can significantly reduce the lead time for procurement. Items can be delivered within a month versus the three to si it takes to order from a supplier

Rationale/potential benefits:

- Efficiency and cost
- Smaller, regular shipments to protect local systems
- Timely, accurate and safe transport including cold/cool chain
- Delivery of drugs and commodities door-to-door
- Physical security
- Chain of custody from supplier to recipient
- Rapid response to emergency requests

Factors to consider:

- Requires reliable system and technology for fore demand
- Non-availability of records on drug consumption countries hampers the efficiency of RDCs
- Drug leakage distorts information that is fed into

Roll Back Malaria (RBM) Partnership- ExxonMobil

Overall description:

- The Roll Back Malaria (RBM) Partnership, is a partnership between ExxonMobil and Acumen Fund, UNICEF, Sumitomo C (a Japanese chemicals company) and A to Z Textile Mills(an African bed-net manufacturer) to introduce a new mosquito ne technology - the long lasting insecticidal treated net (LLIN)- in different countries across Africa
- Sumitomo Chemical transferred the technology to A to Z royalty free and delivered the raw materials, while Acumen Fund US$325,000 of initial debt financing to fund the technology transfer and invested US$675,000 to establish alternative chan develop a commercial market. ExxonMobil contributed technical and project management assistance, granted US$250,00 UNICEF to support purchase and distribution of the nets, and introduced voucher subsidized bed nets to be distributed at service stations across 4 countries in Africa
- The A to Z plant now has capacity to produce 3 million nets; market driven scale-up to 7 million nets was planned for 2007

Rationale/potential benefits:

- Vouchers reduce cost of nets by US$2.75 to at least US$3
- Currently 1million people have bought the nets

Factors to consider:

- Without adequate monitoring, vouchers could po misused.
- Careful planning and management may overcon obstacles

Low Cost Standard Therapeutics (LOCOST)

Overall description:

- LOCOST is promoting production and distribution of essential drugs at affordable rates, thus countering the market monop
  brands that are typically beyond the purchasing capacity of the poor.
- While LOCOST started by contracting for the use of spare capacity in the drug industry, it moved into direct production so
  provide affordable medicines to some 300 purchasing NGOs.
- Its direct distribution model through NGOs is ideal for carrying out the educational component critical to LOCOST's operati
  awareness-building around the issue of essential drugs and irrational prescriptions.
- As sales volumes climb, LOCOST is expanding its product line, aiming to offer more than 80 percent of India's listed esser
- LOCOST's location at the centre of the pharmaceutical industry gives it a comparative advantage.

Rationale/potential benefits:

- Through its network of client NGOs and by fixing a maximum retail price, LOCOST was able to cut production costs by eliminating highly priced marketing campaigns, fancy packaging and middleman.
- LOCOST holds its profit margin to 10 percent profit, which compares to an industry average of 50 to 60 percent.

Factors to consider:

- The company seems borderline activist against l pharmaceuticals, and the activism may not work favour to keep this sustainable

Drug shop franchising: Mi Farmacita Nacional (Mexico)/ Heathstore (HS) Foundation's CFW shops (Kenya)

Overall description:

- Franchising is a business relationship in which the franchisor assigns to the franchisees the right to market and distribute t franchisor's goods or service, and to use the business name for a fixed period of time.
- In the case of Mi Farmacita and CFW shops, the franchisor provides franchisees with business infrastructure such as bran training, dependable supply of products, a proven business model and ongoing marketing and promotional activities
- Inventory is ordered directly from the franchisor and is identical for every pharmacy; once franchisees are set up they have complete autonomy as to how they run their business
- Mi Farmacita is jointly owned by the owners of a major pharmaceutical distributor in Mexico and a major manufacturer of g medicines; franchisee must provide an upfront franchise fee, annual franchise contributions and capital investment all tota US$50,000; currently 57 outlets nationwide with sales totaling US$2.9million in 2007 and hoping to have 500+ outlets by 2
- The CFW franchise is wholly owned by the HS foundation; franchisee must provide US$2,000 , 88% of which is subsidize HS Foundation ; currently 64 HS shops have served a total of over 750,000patients since inception in 2004 and a network locations will be built by 2008 serving between 1.5 and 2 million patients per year

Rationale/potential benefits:

- Convenient, affordable and high quality primary care to low-income and rural communities (each outlet has a resident physician who sees patients and prescribes medicine)
- Convenient, affordable and high quality generic medicines to low-income and rural communities (pricing is very competitive)

Factors to consider:

- Franchising thrives in areas where health regulat not strongly enforced; strict quality control by fra essential for success of franchise chain (risk of franchisees selling fake drugs which may damag franchise brand)
- Communities must have a population of at least ' people or 2,500 families and outlets should be lo within a one or two kilometer distance from comm
- Difficulty attracting doctors/nurses because incol attractive than private sector
- Lack of affordable financing for potential franchis

Saafwater

Overall description:

- SaafWater is a for-profit social enterprise whose mission is to provide affordable clean water to the urban poor in developing countries
- SaafWater is a water treatment solution. The solution is packaged in small cartridges which contain a dose of dilute liquid ch and are sufficient to treat one family's water for one day.
- Through the SaafWater loyalty program, end users collect the packaging from their daily cartridges and redeem them for ite as bottles for children to carry clean water, towels, or soap.
- This service is provided by SaafWater sales persons who go door-to-door, educating and selling the SaafWater product to th communities

Rationale/potential benefits:

- SaafWater's innovation is in developing a distribution model and selling format that takes this life-saving technology and makes it profitable and rapidly scalable.

Factors to consider:

- Because of their high-touch sales and distribution SaafWater seeks to work in urban settings.

NICE Foundation

Overall description:

- NICEFoundation is a voluntary, non-profit, charity that equips, enhances and partners with NGOs, Community Based Orga... and Civil Society Organisations in India by implementing need-based social care and development projects, training, resea... publication and consultancy services.
- NICE Foundation runs a school health program in public schools in India with clinics in the schools, awareness programs a... everything from outpatient visits to cardiac surgery for $5 per child per year.
- They cover 60,000 children in Hyderabad, are now rolling out the program in Rajasthan and the State's Planning Commiss... now included the program in their national plans.
- They are exploring different models of procurement and distribution of pharmaceuticals and health commodities for their s... clinics.

Rationale/potential benefits:

- NICE would benefit from an independent partner to work on a procurement/supply chain management plan when they are scaling up across the country.

Factors to consider:

- One of the major challenges is dealing with phar... because they want to keep costs of drugs low.
- IT solutions for procurement, leveraging buying... better prices, outsourced distribution with TPL a... elements that need to be built into their PSM str...
- They are afraid that the government will take ov... procurement and distribution of pharmaceuticals... price would increase from $5 per child and year.

Medicine Shoppe - Sehat (India)

Overall description:

- Medicine Shop, an Indian pharmacy chain has developed a new store format called Sehat (meaning Health) for low-incom
- The clinic has a qualified doctor who does check ups for patients at a nominal cost - in case the patient also buys from the gets a doctor fee as rebate on the medicines he bought, there by getting the check up for free; Sehat also has a communit outreach program where health workers visit neighboring households, look for disease symptoms and guide patients to cli medicines prescribed by the Sehat doctor are generic versions of branded drugs, further lowering the cost of medical care consumer
- To build awareness of their products and services at the village level, Medicine Shoppe India hopes to partner with one or ICT network orchestrators
- Medicine Shoppe currently operates over 130 stores in 6 states across India and it has successfully piloted 8 low-cost hea centres that serve poor communities where more than 6,000 people were served in about 9 months; it plans to open close Sehat locations in low-income and rural areas by 2010
- Sehat shops are co-funded by Acumen

Rationale/potential benefits:

- Improved access to primary care and medicines in low-income areas by providing health consultations at nominal cost, and the appropriate medicines at affordable prices
- Partnering with an existing pharmacy chain lowers the barriers for entry since the cost of real estate is a deterrent in setting up medicine shops in cities

Factors to consider:

- Scalability depends in part, on the availability of c are willing to work in the Sehat shops and get pai the private sector
- Medicine shops should be located in a residentia a sufficient market

Distance Health Advancement (DISHA) initiative

Overall description:

- Public-private sector initiative between a government agency (ISRO), the largest healthcare service provider in Asia (Apo the most respected NGOs in the country (DHAN) and a global leader in imaging and medical diagnostics (Philips) for pro distance healthcare to the underserved people
- Philips has custom-built a tele-clinical van complete with diagnostic equipment, including an ultrasound machine, X-ray r defibrillator and an ECG machine. This van, with dedicated doctors and other paramedical staff, will travel to identified lo once a week and it is expected to cover a population of 500,000 in the areas around Theni district
- ISRO is providing the connectivity through VSAT and allocating the required bandwidth on its INSAT satellite free of cost
- The Apollo Specialty Hospitals, Madurai, is the referral hospital for the DISHA mobile tele-clinical van. Apollo will make a Philips the required doctors and paramedical staff in the van, as also train the medical and paramedical manpower.
- DHAN will provide counselling (through domiciliary follow-ups) to the patients on nutrition and hygiene as well as train vo from the villages in counselling.
- Many states are introducing the technology in India

Rationale/potential benefits:

- Cost savings of up to 81%
- Gain access to qualified physicians, high quality diagnostics, and specialized healthcare
- Get faster and reliable diagnosis
- Increase visibility of diagnostic healthcare and referral base
- Facilitate diagnosis, and pre- and post-operative care
- Reduce crowds at hospitals (tertiary care)
- Spread knowledge, educate

Factors to consider:

- Technical issues included diagnostic and conne equipment installation and testing, and guarante necessary maintenance support
- Healthcare regulations and licensing

Social Marketing- PSI Society for Family Health (SFH) project Nigeria

Overall description:

- A comprehensive social marketing program where emphasis is placed on affordable pricing and extensive branding/marke products and services are sold at subsidized prices, (2) effective peer education and behaviour change communication are brand-specific advertising as well as by generic educational campaigns for various reproductive, HIV AIDS and malaria pro
- Following research into country context, PSI establishes an office and distribution system in country of operation and sells products through the wholesale and retail network (using NGOs to distribute products in remote and difficult-to-reach area primarily to lower-income persons; Products and services are branded, attractively packaged, widely marketed, effectively to the poor and selected target groups, and sold at low prices affordable to the poor
- SFH has distributed more than 3.7 million pre-packaged treatments to children under five ; in January 2006, SFH launched social marketed ACT on the commercial sector in Africa and expects to see this pilot program rapidly expand nationwide
- Products are donated to PSI by foundations, multilateral international organizations, or the overseas development agencie governments; alternatively, donors provide funds to PSI, which procures products at favorable rates on the international m

Rationale/potential benefits:

- PSI operates mainly in the private sector, and often has a formal agreement with the host government
- PSI is able to recover a percentage of operating costs through sales revenues, sale of multiple products to spread overhead and high sales volume to reduce per unit cost.
- Products and services are sold at subsidized prices rather than given away in order to motivate commercial sector involvement
- Communications approach improves treatment seeking behavior and compliance

Factors to consider:

- Research into country context is essential for s initiatives
- Social factors act as an access constraints on w and old in many countries

Mission for Essential Drugs and Supplies (MEDS)

Overall description:

- MEDS is a Christian, non-profit making organization based in Nairobi that seeks to provide a reliable supply of essential
  medical supplies at affordable prices, and to improve the quality of patient care through training in all aspects of health a
  management
- It is funded by non-profit NGOs and charities including: Actionaid, Interchurch organization for Development Cooperation
  Netherlands, Cordaid and Ecumenical Pharmaceutical network
- Over 700 different types of essential drugs, medical & surgical supplies, laboratory reagents and publications are stocked
  warehouse

Rationale/potential benefits:

- Includes a 2% mark-up in its prices to cover distribution, and
  strongly recommends to clients that prices should not exceed
  an additional 5% to the health facility
- Provides a training program on clinical management of
  HIV/AIDS

Factors to consider:

- A similar distribution centre , KEMSA, serving
  and public sector, exists in Kenya.

Micro insurance: CARE + Allianz (India)

Overall description:

- CARE international is an aid agency which, together with global insurance company, Allianz , is offering community health i
  in the southern Indian region south of the city of Chinnai
- Packages covering natural catastrophes and accidents will be available for 16 cents a month and are customized according
  needs and requests of local communities who are themselves involved in designing policies
- Villagers pay monthly insurance premiums into a community fund or mutual; the Community fund retains 65 % of the premi
  be used for medical treatment up to an agreed-upon ceiling and the remaining 35% is given to Allianz's India branch, Bajaj
  to be used to cover ceiling excess
- In case of an illness, a doctor appointed by Bajaj Allianz and CARE treats the villagers and, if necessary, sends them to pa
  hospitals in the region; Most medical treatment is covered by the Mutual fund up to a ceiling, agreed in advance by the con
  itself; Bajaj Allianz covers any costs above that amount, such as surgery or other complex procedures
- Within a year, there is an expected market of 200,000 clients between the ages of 18-70 while in the long run market poten
  to 250 million

Rationale/potential benefits:

- Healthcare micro-insurance has the potential to reduce
  malaria morbidity and cost of care through early treatment

Factors to consider:

- Pricing is often focused on what people say they
  rather than being linked to the cost structure of th
- In many countries there is no legal framework for
  funds

Servi Peru

Overall description:

- ServiPeru is a cooperative and insurance brokerage firm in Peru which focuses on two services: funeral services and pre[...] health care for low-income clients who are insured through a separate firm, the ServiPeru insurance brokerage. ServiPer[...] cooperative and its target clients are people who work in the informal economy and insure themselves through the allian[...] ServiPeru insurance brokerage.
- The basic insurance policy is called "Previsión Familiar" [Spanish for Family Foresight]. Clients make monthly payments[...] policies and they or their family members may access funerary services or basic health care at facilities operated by Serv[...]
- The fact that the benefits of the insurance are offered as services rather than as cash payments or reimbursable expense[...] been a factor that has encouraged low-income sectors to buy into the plan.

Rationale/potential benefits:

- This approach overcomes some of the market's inherent aversion to insurance, permits greater control over the quality of services, and helps accommodate specific characteristics of the micro-insurance market.

Factors to consider:

- Setting up a medical center is costly, which has[...] number and variety of medical services the pr[...] and restricts the client base to people who live[...] reasonable distance of the medical facility
- Focusing the policy on people with unstable in[...] frequent policy lapses or cancellations and hig[...] collections and renewal fees

Voxiva

Overall description:

- Voxiva HealthNetTM is an information management system that allows governments, international organizations and NG[O]
  facilitating real time data collection from field workers and health care staff and supporting program monitoring, drug and
  supply tracking, supervision and training, and lab reporting , as well as incorporates an electronic record of patient data
- Initial deployment was implemented to support the Rwandan Government's rapid scale up of its ARV treatment program,
  leadership of the MoH, the Treatment Research and AIDS Centre (TRAC), and the Centers for Disease Control.
- In Rwanda, system was designed to collect, store, retrieve, and disseminate critical program, drug, and patient informati[on]
  to HIV/AIDS care and treatment, and is deployed in all 94 health facilities offering ART in Rwanda (approx. 6,000 individu[al]
  records are monitored)
- More than 200 site level users have been trained to submit monthly program indicator reports and weekly consumables (
  reports
- Most users (more than 90%) access the system via a toll-free telephone interface
- Acumen Fund has an equity investment in the project

Rationale/potential benefits:

- Providing a central repository of HIV/AIDS program
  information
- Delivering real-time information for decision-making ,
  transforming a largely paper-based one way information flow
  that took several weeks, into a bi-directional data exchange
  completed in seconds to support feedback and supervision

Factors to consider:

- Success is dependent on availability and effici[ency]
  Information and Communications Technology i[n the]
  country of operation

Health data systems (Kenya/Zambia)- UN Foundation/ Vodafone Partners

Overall description:

- The Health data system platform consists of handheld PDAs donated by Palm and open-source software called EpiSurvey created by DataDyne that supports unique user-modified surveys. Through training funded by UNF-VGF, this model builds capacity and allows WHO and Ministry of Health officials to adapt the technology to meet their needs
- A total of US$2,084,467 was used to fund the project
- The program was piloted in Kenya and Zambia with the collection of health supervisory data and is being expanded to 10 African countries in 2008.

Rationale/potential benefits:

- In Kenya data collection is now done using an integrated survey that collects data for multiple health applications (e.g. malaria, nutrition, child health) and is overseen by a single cross department champion – a change since program inception

Factors to consider:

- Little capability to conduct analysis in the field an evidence of decision-making that used the data:
- Limited resources for logistics restrict health faci
- Program structure reaches only 10% of possible
- Palm platform increases equipment and training "Important to have it connected to regular GSM" Public Health Official

HealthNet Uganda

Overall description:

- HealthNet Uganda was started in 1998, and is pioneering the use of Personal Digital Assistants (PDAs) in the African h
  sector to provide practitioners with real-time access to vital information. The technology also allows for easier consultat
  ordering of medicines, and access to medical journals - all of which improves the quality of Uganda's health care syster
- HealthNet Uganda's leadership and strategic planning have allowed it to successfully transition from a grant-funded prc
  stand-alone non-profit organization, in part due to its ability to secure support from the Ugandan government.
- By introducing cutting-edge technology within an innovative business model, HealthNet Uganda is successfully working
  the health of millions of citizens.

Rationale/potential benefits:

- PDAs enable the user to increase time efficiency in data
  collection. Customized forms are available on the PDA to
  effectively manage the collection of information
- PDAs allow for instant and constant flow of information
  between health workers

Factors to consider:

- PDAs are very expensive (US$75) especially
  developing countries. This limits the scalabilit
  technology.
- Wireless technology is an enabler of PDAs ar
  available and this is not available in most dev

Capacity Development- DHL/ TRANSAID partnership (Zambia/Malawi)

Overall description:

- Initiative includes provision of professional training to commercial vehicle drivers and development of relevant legislation and Zambia
- In addition to the development of the curriculum Transaid is focusing on training existing trainers and training staff from Road Transport and Safety Agency (RTSA) and Malawian National Road Safety Council (NRSC) to enable them to diss new curriculum to the various training establishments which will be responsible for training the public
- Governments of Zambia and Malawi developed with Transaid a set of professional driving standards to improve the effic driving safety in the transport sector
- Once these mechanisms are in place Transaid will help government authorities create a system to monitor the quality of the driving schools and to set up a registry trained drivers
- Transaid intends to scale up the project and apply these standards across the SADC region
- Funded by the Exel Foundation, which is in turn part-funded by DHL

Rationale/potential benefits:

- More efficient operations of the commercial transport sector and safer roads
- Ultimately, the cost of everyday goods and services will fall and their availability will increase

Factors to consider:

- There are no internationally recognized profes driving standards across Southern African bor

Tanzania's Private Sector Initiative

Overall description:
- Large corporations invest capital, expertise and technology thereby improving the quality and speed of delivery of local products, and then act as a market for products of local SMEs during the early stages of development
- SME linkages transactions doubled in 2 years from US$21m in 2002 to US$45m by 2004
- The PSI is based on a similar program in South Africa, the Small Business Project, which provides links between 80corporations and resulted in the creation of 3000 jobs and investment of over 1billion Rand between 1998 and 2003
- With funding from the UK's Department for International Development Business Linkages Challenge Fund, 8 companies started the PSI Tanzania in 2001
  - 2001-2003: focus in improving budgetary decision-making and supply chain development, investing US$21m in local SMEs
  - 2003-2005: focus on local ownership of the initiative. PSI doubled its membership to 17 corporate members
  - 2005- : creation of a web-enabled intranet-based database inclusive of on-line supplier ratings and recommendations available to members. Each member also adopted one high potential supplier for mentorship
- The project has been rolled out in Angola and Malawi

Rationale/potential benefits:

- Increased technology flows, improved supply chain management capacity and access to markets for smaller firms

Factors to consider:

- Assumption by SMEs that quick monetary support will be provided by the PSI
- Raising awareness of existence and benefits of PSI to other corporations

Cell phone assisted payment: Overview of initiative

Overall description:

Leveraging cell phones for financial payments:
- Cell phone payments have been used in some areas (e.g. Ghana – political party fundraising, lottery, Kenya – M-PEFA), but is still in the conceptual stage in the areas of health supply chains
- Working capital requirements have increased as demand for health services has grown. Cell phone assisted payment is an opportunity for the private sector to enable people or organizations to make local or international payments without having to transport money
- Credit transmitted by phone may either be used as credit or cashed out at a local cash dispensing point; Geographical coverage depends on cell phone coverage and cash point network coverage
- Once a payer sets up an account, he/she may pay any participating organization by dialing their phone number, then entering the amount and a PIN number. The fee for service of 1-2% may be paid by the patient or the pharmacy.
- This could be used between any health care supply chain entities (patients, pharmacies, hospitals, national health insurance, warehouses, government). The payment provider is also able to provide an information system to track transactions.
- Cash points could be bank outlets, microfinance institutions, gas stations, merchants… The cash point must have reasonable security and enough cash on hand.

Leveraging cell phones for information Collection:
- Cellphones can provide information for monitoring and fighting communicable diseases (serving as an early warning system for epidemics) or as tool to send information on levels of stock of drugs.

Rationale/potential benefits:

- Insures that cash is used as intended (e.g. to pay "Mom's" hospital bills;
- Reduces cost and/or effort and improves speed of payment. International payment fees may run as much as 10%;
- Reduces working capital requirements;
- Reduces facility indebtedness;
- Improves discipline and budget management along the supply chain by monitoring and reporting on financial flow timeliness and status. There may also be opportunities to extend credit appropriately.

Factors to consider:

- This is an emerging area
- Highly dependent on regulatory environment
- Dependent on co-operation of banks
- Dependent on infrastructure and technology availability
- This problem is likely to exist in many countries, and may be exacerbated when the country moves to decentralized budget management and multi-echelon payment flows, as is the case when the country establishes a National Health Insurance system
- Indebtedness may limit purchases from both public sector and private sector supply sources

ChileCompra- e-procurement

Overall description:

- As part of its "Digital Agenda", Chile initiated an electronic procurement portal, ChileCompra. It was established in 1999 to consolidate government contracting into a single, online portal for smooth and equitable business contracting between the government and private enterprise.
- The ChileCompra started by mandating that all federal contracts be fulfilled through ChileCompra
- Chile began the digital readiness campaign by building out broadband capacity, promoting digital literacy and encouraging businesses to use ICT for global competitiveness.
- Greater national productivity, social equity and public sector transparency are among the objectives
- ChileCompra is managed by the private sector and handles 18% of public procurement
- By 2006 the portal incorporated the buying power of nearly 900 government agencies, collectively accounting for $3.4 billio contracts and 4000 suppliers were registered in 75 areas
- ChileCompra recently added an electronic catalogue for business to business and government purchases. In 2006 it includ 74,000 products with transactions worth over US$120 million

Rationale/potential benefits:

- Provides list of state providers to public agencies
- An opportunity to access the purchase demands of the state
- Reduction of barriers to access for smaller businesses
- Transparency in the bidding process
- Increase efficiency and reduction in management and mail and courier costs. Taxpayers in Chile are saving approximately $60million a year

Factors to consider:

- Lack of availability of internet systems and compu technology in remote or rural areas limits the scal procurement
- E-procurement is mostly beneficial to larger busir reduce costs by centralizing their procurement pr

Allpay

Overall description:

- Objective is to make drugs for critically ill people more easily accessible, while at the same time decreasing traffic at hospi... generally making the process of treating critically ill people more cost effective
- Currently, critically ill people have to regularly join waiting lines at hospitals to get the prescriptions for their day-to-day drug... solution being considered is to introduce the Allpay system (developed by a PPP between ABSA Bank and South Africa Re... services and currently utilized for the pension payouts) in pharmacies as the system to identify the critically ill patients. Wit... exception of HIV patients, critically ill patients tend to be elderly people, who are also the ones familiar with the pension pa... system. The system uses a fingerprint reader to identify the person (as well as a smart card to where the pension money i... downloaded and can then be used at several ATMs).

Rationale/potential benefits:

- Make process for prescribing drugs for critically ill people more efficient
- Decrease traffic at hospitals
- Improve monitoring of programs for critically ill people (such as distribution of ARVs)

Factors to consider:

- Cost charged by ABSA to operate system (since... have the benefits that the current Allpay system... the form of new banking customers)
- Younger critically ill patients don't have yet their... system

Agent model for product registration

Overall description:

- Objective is to support large pharma companies in starting real scale operations in Africa by assisting them for product regis... abroad
- Solution being considered is for Broadreach to set up an arm to work as a trusted broker/coordinator on the ground for large... companies who don't want/know how to initiate scale operations in Africa.
- First step will focus on product registration (having one person who knows and is regularly in contact with all the regulatory... organizations to contact and builds a relationship with them and can help push through product registration down from 2-3ye... months.
- Second step is to develop into a trusted broker between the pharma company and the local players in terms of distribution ,... while at the same time providing accountability and tracking (e.g., using technology from IBM) for the shipped products so th... don't end up back in the US black market.

Rationale/potential benefits:

- Access to drugs and medical supplies currently not being commercialized in some developing countries
- More efficient management of complex distribution networks

Factors to consider:

- Initial investment in recruiting, training and systems...
- Business model relies heavily on achieving scale p... investment

Disease Monitoring/ Control Hub

Overall description:

- Objective is to identify trends and hot spots for specific diseases to better identify disease breakouts and address them in a more effective manner by engaging both the 50% of private sector health providers in SA as well as the public ones
- Solution being considered is to set up a disease monitoring and control hub ("war room") in South Africa, with centralized intelligence data gathering through an interface that feeds of the different and already existing databases in the country, and with sufficient resource mobilization power to address the trends/outbreaks identified (e.g., will incorporate a health economist to cost the different approaches being discussed, and thus make the necessary funding request to Treasury faster, as well as incorporate an implementation team).
- Idea has strong support from the government and some donors. Set up being planned is for the organism to sit outside of government but linked to government, with a clear mandate and power to consolidate all the players.
- Concept to be piloted in SA and then slowly to be made regional, incorporating the neighboring countries.

Rationale/potential benefits:

- Reduction in healthcare costs associated with lower spread of outbreaks that are caught early on
- Improved quality of health for citizens living in areas likely to be most affected
- More efficient allocation of scarce healthcare resources for monitoring and evaluation
- Systematic learning with regards to what activities and projects work and what doesn't, so that future decisions can build on success

Factors to consider:

- How to engage and link the private sector providers to the Hub so that they play a relevant role

"Pharmacy in-a-box" concept

Overall description:

- Objective is to make self-prescription drugs and knowledge accessible to the poor, in places that are convenient for them (the "bazaar shop" at the taxi rank rather than the pharmacy at the shopping centre), at the same time decreasing the traffic at hospitals and costs for the people who end up going to private practitioners with no real justification. Currently the poor spend money that can't afford going to private practitioners or join waiting lines at hospitals because they don't have the minimum knowledge about simple conditions and self-medication
- Solution being consiered is to give basic training to "bazaar shop" owners with regards to self-medication and use the daily distribution network of bread trucks to the "bazaar shops" to deliver a box of self-prescription drugs (in a pre-arranged mix). D data for the limited number of drugs available in the box would be taken down by the truck driver, who would replenish the stock needed on his daily trips.
- Once the shop owner realizes the value he could be making out of selling drugs, start the "pharmacy in–a-container" concept which the owner allows for a portion of the shop space to be allocated to sell schedule 1 and 2 prescription drugs.
- All players involved have incentives to contribute to the initiative:
    - PHD would distribute more drugs
    - Bread trucks would share their transportation costs
    - Shop owners would make more revenues

Rationale/potential benefits:

- Make self-prescription drugs and knowledge around its use more accessible and convenient
- Decrease traffic at hospitals
- Decrease costs for the people who end up going to private practitioners with no real justification

Factors to consider:

- The idea requires a basic level pharmacist to be th potential solution would be to give a bursaries for th year training

ARV Supply Chain – Kenya
Mapping of players

Private sector	Public sector

```
                          Manufacturers (30)

   Faith based      Procurement        Government         Bilateral
   importer (1)     agents (abroad)(5) agencies (2)       Donor (1)

   Faith based      Private wholesalers    Government wholesalers, regional
   wholesaler (1)   (700)                  and central (4)

   NGO / health     Private
   centre (100+)    vendors                Regional Depots

                    Private clinics        District level distributors

                          Patients
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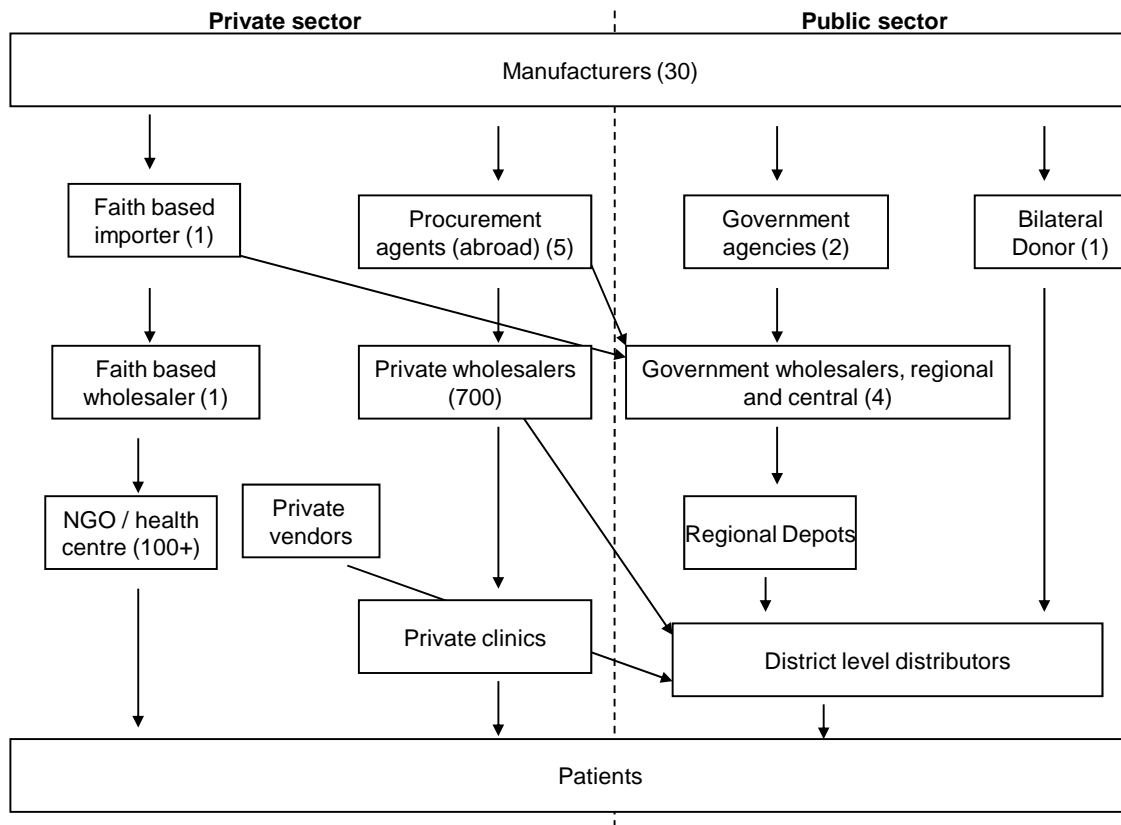
ARV Supply Chain – Kenya
Supply chain characteristics

Supply chain characteristics:
- Complex network of parallel channels, AIDS drugs are expensive due to royalties that should be paid patent holders, and limited research in the field
- Highly competitive

Supply chain structure:

Regulation:
- Companies require licensing to process drugs
- Ministry of Health regulates all Government hospitals and procures drugs on their behalf
- Parallel importation of generic pharmaceutical products
- weak enforcement of regulations

Importer / national wholesaler structure:
- The Kenya Medical Supplies Agency (KEMSA) is the national wholesaler for government hospitals an as well as some private health facilities
- KEMSA purchases about 30% of the drugs in the Kenyan market through an open-tender system
- Local Manufacturers compete with MNCs
- Kenya is the largest producer of pharmaceutical products in the COMESA region, supplying 50% of th region's market. Of the region's 50 recognised pharmaceutical manufacturers, 30 are based in Kenya

Regional wholesalers / shops:
- Pharmaceutical products are channeled through pharmacies, chemists, health facilities and shops
- There are 700 wholesalers and 1,300 retailers
- KEMSA, MEDS (Church-based organisation) and private wholesalers compete as suppliers
- Most private sector suppliers do not reach remote areas due to high distribution costs
- Most NGOs contract transporters to deliver goods to specific destinations where they support progran

Public supply chain:
- Supply to public hospitals based on a 'push' system
- KEMSA has a regular distribution system which covers the entire country and delivers monthly to gov hospitals and quarterly to Gvt rural health facilities. Part of the supplies are distributed using the kit sy

Source: Kenya's Pharmaceutical Industry Report 2005

ARV Supply Chain - Kenya
Enabling environment

Basic information (2007):

- Population: 36.9 million

- GDP/capita: $1,600

- GDP growth Rate: 7%

- Area: 582,650 sq km

- Urban:Rural population: 39%:61%

- Healthcare spending as % of GDP: 4.1%

- Health expenditure/capita: $20.1

- Doctors per 100,000 people: 15

Infrastructure characteristics:

- Public service personnel are poorly remunerated, have poor attitudes toward work and very low morale
- Most health facilities are dilapidated and in need of renovation
- Kenya's road networks consists of 63,000km, 7,500km of which are paved, and most major roads are of mixed quality.
- Networks offer good coverage but some parts are not directly linked

Financing

- Out of pocket e
  accounts for 53
  cost of healthc
  Government, 1
  Social health In
  5% from privat
  plans and 2% f
  profit institution
- The National H
  Insurance Fund
  largest financie
  services apart
  government, w
  hospitals accre
- There are 10 H
  Management C
  that support ab
  medically cove

Regulatory context:

- The patent protection of pharmaceuticals is based on the African Regional Industrial Property Organisation patent system
- The Kenya Industrial Property Bill (2001) allows Kenya to import and produce more affordable drugs
- Pharmacies are accorded a 25% mark up on retail drugs

Disease prevalence:

- Estimated 1.2 million people living with AIDS
- Adult Prevalence rate: 6.7%
- Approximately 140,000 deaths annually
- Approximately 65% of adults living with AIDS are women
- HIV prevalence rates are much higher among urban residents

TB drugs Supply Chain – India
Mapping of players

Private sector | **Public sector**

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                    ┌─────────────────────────────────────────────────────┐
                    │                   Manufacturers                       │
                    └─────────────────────────────────────────────────────┘
                          │              │                    │
                          ▼              │                    ▼
                    ┌──────────────┐     │          ┌──────────────────────┐
                    │  Wholesaler  │     │          │ Procurement agents (2)│
                    └──────────────┘     │          └──────────────────────┘
                          │              │                    
                          ▼              │                    
                    ┌──────────────┐     │          ┌──────────────────────┐
                    │ Stockists    │     │          │ Government Stores (40+)│
                    │ (18000)      │     │          └──────────────────────┘
                    └──────────────┘     │              │            │
              │           │       │      │              ▼            ▼
              ▼           ▼       ▼      ▼
  ┌───────────────┐ ┌─────────┐ ┌──────────┐  ┌───────────────┐ ┌───────────────┐
  │Private Hospital│ │ Retail  │ │NGOs/     │  │RNTCP* affiliated│ │RNTCP affili..│
  │/Clinics (15000)│ │Pharmacies│ │Corporate │  │public facilities│ │public facili.│
  └───────────────┘ └─────────┘ │run facil.│  └───────────────┘ └───────────────┘
        │               │       └──────────┘         │               │
        ▼               ▼            ▼                ▼               ▼
  ┌─────────────────────────────────────────────────────────────────────────────┐
  │                                  Patients                                     │
  └─────────────────────────────────────────────────────────────────────────────┘
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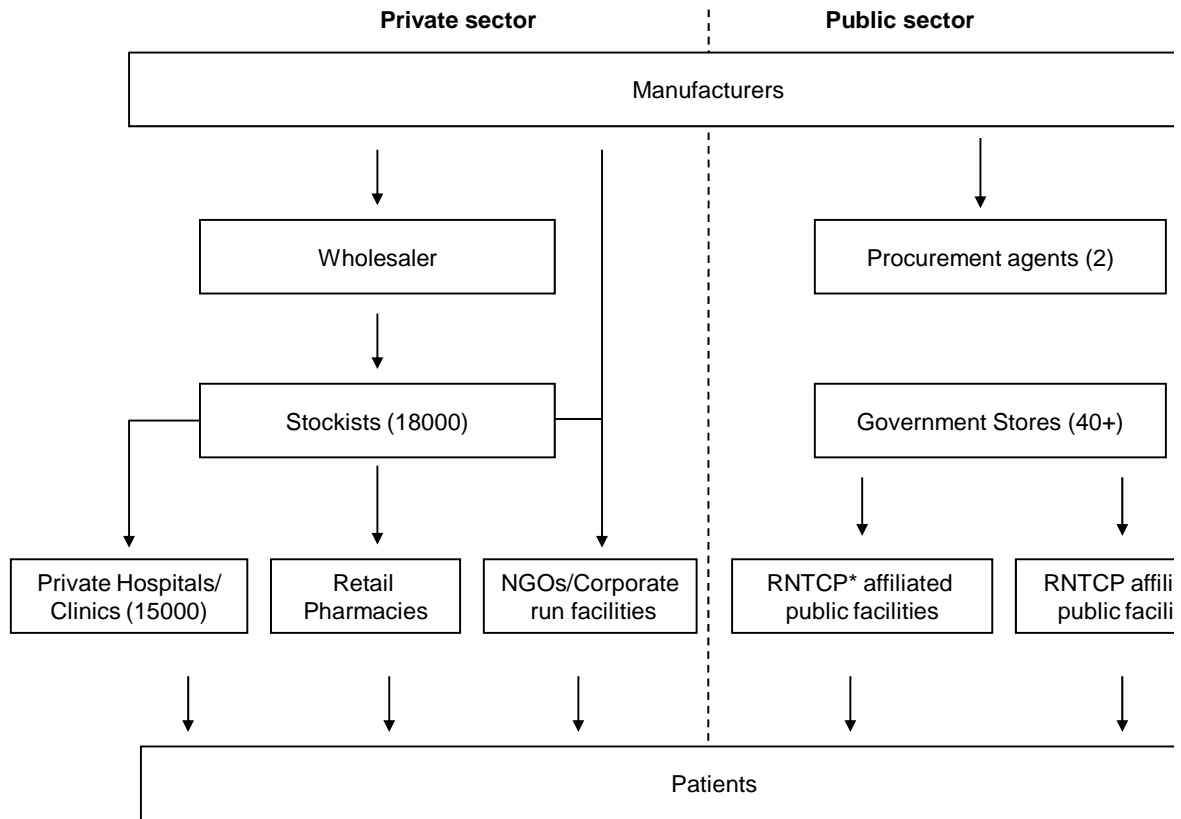
Source: Global Alliance for TB Drug Development, Country specific case study of TB Distribution Channels 2006
*Revised National TB Control Program

TB drugs Supply Chain – India
Supply chain characteristics

Supply chain characteristics:
- Private sector estimated at USD69.7m or 74% of total TB drug market
- Parallel supply chain network
- Small divergence ratio

Supply chain structure:

Regulation:
- Government de-regulated TB drugs as a result causing prices to soar

Importer / national wholesaler structure:
- Private manufacturers work with a series of wholesales who sell drugs at the ex-manufacturing price to private stockists (distributors)
- Government manufacturers are selected via a centrally run bid and tender process

Regional wholesalers / shops:
- Stockists sell at a predetermined marked up price of 8% while retail pharmacies add a mark up of 16%
- The pharmaceutical sector is almost exclusively in the private sector and drug stores are mostly run by pharmacy-qualified individuals.

Public health supply chain
- The government recently launched a National Rural Health Mission to improve the availability of and access to quality health care by the people, especially those residing in rural areas, the poor, women and children. Under this scheme, each village will have a female Accredited Social Health Activist (ASHA) who will be the interface between the community and the public health system
- India has one of the largest private healthcare sectors in the world, with an estimated 8 million private practitioners. In addition, there are a large number of voluntary organizations providing health care.
- Shortage of funds has been primarily responsible for the non-availability of facilities per norms; provision of inputs such as drugs, equipment and facilities remain inadequate.

TB drugs Supply Chain – India
Enabling environment

Basic information (2007):

- Population: 1,130 billion
- GDP/capita: $2,700
- GDP Growth Rate: 9.2%
- Area: 2,973,190 sq km
- Urban:Rural population: 28%:72%
- Healthcare spending as % of GDP: 5%
- Health expenditure/capita: $31.4
- Doctors per 100,000 people: 58

Regulatory context:

- While drugs and pharmaceuticals are regulated by the Ministry of Chemicals and Fertilizers, the standards for new drugs are enforced by the Central Drug Standard Control Organization under the Ministry of Health & Family Welfare.
- A series of policies have been formulated since 2000. Important among them are the revised National Health Policy (2002), National Policy on Indian System of Medicine and Homeopathy (2002), and National Pharmaceutical Policy (2002).

Infrastructure characteristics:

- There is sub optimal utilization of health centres due to inadequate human resources, lack of drugs and laboratory
- Increased urbanization has resulted in increased slums and as such urban health has become an issue of great concern
- Much of the rural population does not have access to common infrastructure like connectivity, electricity, health and drinking water
- Complex characteristics of rural India include inaccessible terrain and geographically dispersed hamlets/villages. (many of whom have populations between 1000-1500)
- Despite many IT initiatives taken up, India stands as 37th among 82 nations with network readiness index (NRI) as 3 (7 Point scale), 70th for ICT infrastructure. This indicates that a lot of improvement is needed in the national scenario.
- Challenges in deploying land-line connectivity in rural areas

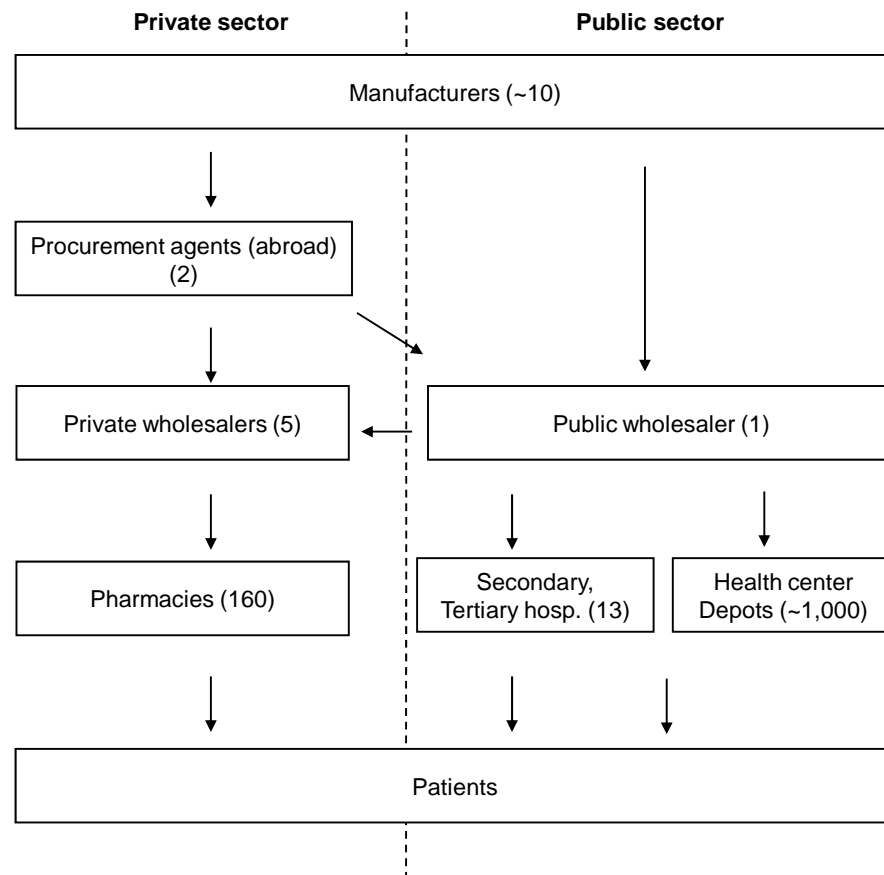**Disease prevalence:**

- Estimated 1.8 million new cases annually
- Approximately 40% of population living with TB
- 370,000 deaths due to TB each year
- Over 1000 deaths a day
- 2 deaths every 3 minutes
- India has the highest TB incidence and accounts for one-fifth of the global incidence

Source: CIA World Factbook; HIV/AIDS policy fact sheet, Kaiser Foundation, www.nationmaster.com, WHO Statistics

ACT Supply Chain – Burkina Faso
Mapping of players

Private sector		**Public sector**

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                    ┌──────────────────────────────────────────────────┐
                    │              Manufacturers (~10)                 │
                    └──────────────────────────────────────────────────┘
                          │                          │
                          ▼                          │
              ┌───────────────────────┐              │
              │ Procurement agents     │             │
              │ (abroad) (2)           │             │
              └───────────────────────┘              │
                    │        ╲                        │
                    ▼         ▼                       ▼
         ┌───────────────────┐   ┌──────────────────────────────┐
         │ Private           │ ◄─│    Public wholesaler (1)     │
         │ wholesalers (5)   │   └──────────────────────────────┘
         └───────────────────┘        │              │
                    │                  ▼              ▼
                    ▼         ┌──────────────┐  ┌──────────────┐
         ┌───────────────────┐│ Secondary,   │  │ Health center│
         │ Pharmacies (160)  ││ Tertiary     │  │ Depots       │
         └───────────────────┘│ hosp. (13)   │  │ (~1,000)     │
                    │         └──────────────┘  └──────────────┘
                    ▼                  ▼              ▼
         ┌──────────────────────────────────────────────────────┐
         │                      Patients                        │
         └──────────────────────────────────────────────────────┘
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Source: Country visit April 2007

ACT Supply Chain – Burkina Faso
Supply chain characteristics

Supply chain characteristics:
- Highly technically regulated
- Low channel choice
- Low number of outlets
- Strong leadership by public sector (e.g. against counterfeits)
- *Francophone 'archetype'*

Supply chain structure:

Regulation:
- Strict mark-up regulation at all levels – government prescribed mark-ups for importers/wholesalers and pharmacie
  (~29%)
- Separate mark-up structure for low cost generics (~75%) at retail level
- Private sector distribution only to private pharmacies and health centers

Importer / national wholesaler structure:
- Approx. 5 national wholesalers – some wholesalers are sister companies of Cameroon wholesalers (regional integ
- Most purchases are through procurement agents abroad (Europe), who integrate orders for wholesalers
- Private wholesalers are also allowed to purchase essential medicines from the central medical store (generics)

Regional wholesalers / shops:
- No regional wholesalers exist, distribution is directly to pharmacies and private health centers
- Few private sector pharmacies, most in urban areas

Public supply chain:
- One central level medical store, with distribution fleet
- Provide medicines to hospitals and health centers – cost of transportation is included in wholesaler mark-up
- Public sector institutions only official distributors of medicines in rural areas – no drug shop format as in TZ

- In addition to the public sector, there is the army's health services system, as well as a private health sector flouris
  urban centres, offering a patchwork of more or less qualified practitioners. As in other countries of this region, the p
  sector is largely made up of the private practice of professionals on the state's payroll, a practice that is technically
  but tolerated.

Source: Country visit April 2007

ACT Supply Chain – Burkina Faso
Enabling environment

Basic information (2007):

- Population: 15,264,735
- GDP/capita: $1,300
- GDP Growth Rate: 4.2%
- Area: 274,200 sq km
- Urban:Rural population: 19%:81%
- Healthcare spending as % of GDP: 5.6%
- Health expenditure/capita: $19
- Doctors per 100,000 people: 6

Infrastructure characteristics:

- Access to clean water: (urban 82%, rural, 44%)
- Access to electricity: (urban 40%, rural 0%)
- Telecommunications - fixed-line connections stand at less than 1 per 100 persons; mobile-cellular usage, fostered by multiple providers, is increasing rapidly from a low base
- Landlocked country
- In 2004 not even one in ten people had access to computers and mobile phones or access to the Internet.

Regulatory context:

- Laws regulating the private sector are not applied, and there are no constraints on who may offer services on the market, nor on the quality or safety of their treatments. The fact that most establishments are not listed anywhere and that no one in authority has an up-to-date listing of providers in the private sector is a good indication of the extent to which the regulatory function has been abandoned and of the extreme disorganization of this sector.

Disease prevalence:

- 43 out of every 100 000 people are infected with malaria
- Only two percent of children under five sleep under treated mosquito nets and only 12 percent of the population uses adequate sanitation facilities
- Estimated deaths (in 1000s) 25.710

Source: CIA World Factbook; World Health Organisation Statistics, International Development Research Center

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Source: CIA World Factbook; World Health Organisation Statistics, International Development Research Center

ACT Supply Chain – Cameroon
Supply chain characteristics

Supply chain characteristics:
- Highly technically regulated
- Limited channel choice
- Low number of outlets
- Weaker public sector role (e.g. illegal imports from Nigeria prevalent)
- *Francophone 'archetype'*

Supply chain structure:

Regulation:
- Strict mark-up regulation at all levels – government prescribed mark-ups for importers/wholesalers and pharmacies (~33%)
- Private sector distribution only to private pharmacies and health centers

Importer / national wholesaler structure:
- Approx. 10 national wholesalers, 3 with large operations
- Most purchases are through procurement agents abroad (Europe), who integrate orders for wholesalers
- Private wholesalers are also allowed to purchase essential medicines from the central medical store (e.g. subsidized ACTs)
- Large share of illegal imports (est. 40% of market)

Regional wholesalers / shops:
- No regional wholesalers exist, distribution is directly to pharmacies and private health centers
- Most pharmacies in urban areas

Public supply chain:
- One central level medical store, 10 regional medical stores distribute to hospitals and public health centers
- Secondary, tertiary hospitals often directly supplied from CMS
- Faith based organizations often have their own supply chain and also access public sector supply chain for essential medicines

ACT Supply Chain – Cameroon
Enabling environment

Basic information (2007):

- Population: 18,467,692
- GDP/capita: $2,100
- GDP growth rate: 3.3%
- Area: 475,440 sq km
- Urban: Rural population: 53%:47%
- Healthcare spending as % of GDP: 5.2%
- Health expenditure/capita: $49
- Doctors per 100,000 people: 19

Infrastructure characteristics:

- Cameroon's road system is partially developed, but many rural roads are heavily eroded and poorly maintained
- Most provincial capitals are accessible through decent roads, but many rural areas are more difficult to reach, while mountainous terrain and annual torrential rains seriously degrade the road system in many areas.
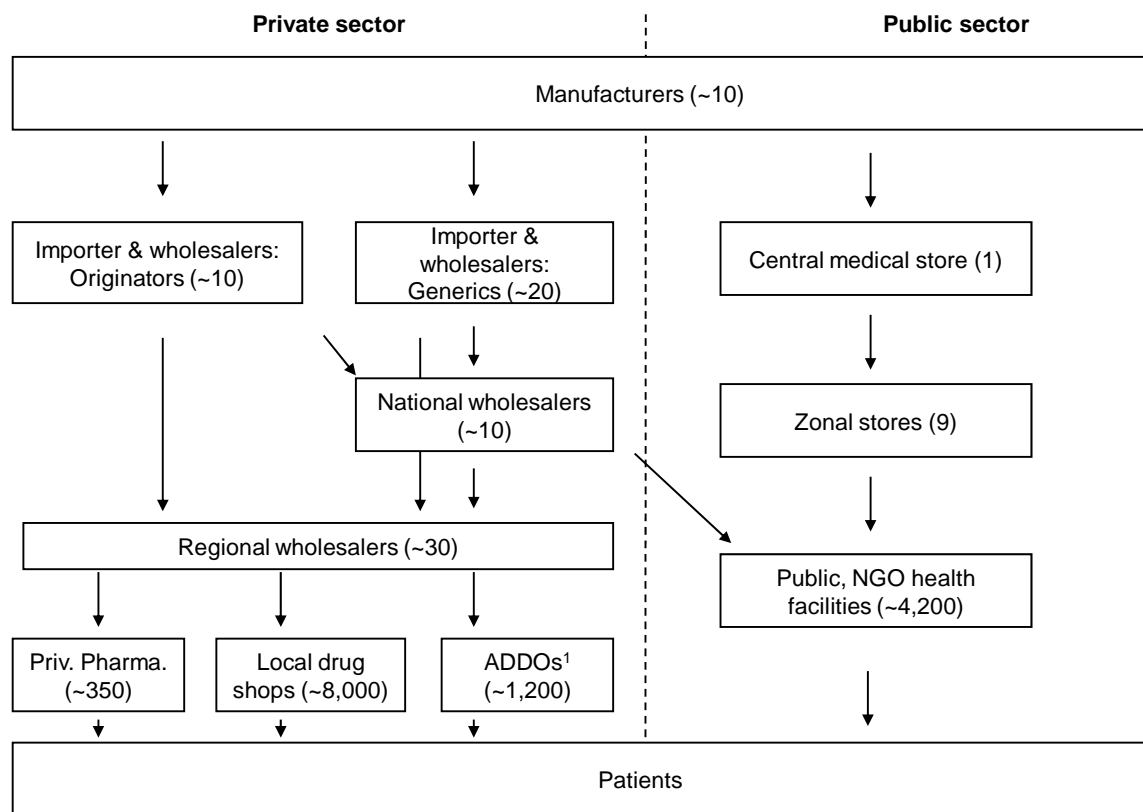
Disease prevalence:

- The estimated number of malaria cases ranges from 14 to 19 million per year, with the number of deaths estimated at between 100,000 and 125,000, of which about 80,000 are children under five.
- There are 179 cases for every 100,000 people
- Malaria accounts for 40 to 45 percent of doctors' visits, 50 percent of morbidity and 40 percent of deaths in children under five, 30 to 40 percent of deaths in health institutions, 26 percent of sick leave absences and consumes 40 percent of the health budget for a household

Source: CIA World Factbook; World Health Organisation Statistics

ACT Supply Chain – Tanzania

Mapping of players

Private sector | **Public sector**

```
                        Manufacturers (~10)
```

| Importer & wholesalers: Originators (~10) | Importer & wholesalers: Generics (~20) | Central medical store (1) |

National wholesalers (~10)

Zonal stores (9)

Regional wholesalers (~30)

Public, NGO health facilities (~4,200)

| Priv. Pharma. (~350) | Local drug shops (~8,000) | ADDOs[1] (~1,200) |

```
                        Patients
```

[1] ADDO: Accredited Drug Dispensing Outlet – in pilot phase in 4 / 21 regions – national scale up planned for 2010

Source: Expert interview April 2008

ACT Supply Chain – Tanzania
Supply chain characteristics

Supply chain characteristics:
- Limited regulation
- Wide variety of channels
- Large number of private sector outlets
- Limited public sector role, focus on market mechanisms
- *'Anglophone archetype'*

Supply chain structure:

Regulation:
- No price or mark-up regulation at any level
- Quality regulation for wholesalers / importers by TFDA
- Regional wholesalers regulated by TFDA or regional health team (varies)
- Recommended retail prices exist for most social marketing (PSI) products

Importer / national wholesaler structure:
- Originator companies tend to work with 1-2 importers exclusively, in total approximately 10 importers work wit
- Approx. 20 companies import generics – less exclusivity
- Importers also act as wholesalers
- Approximately 10 wholesalers do not import, but only distribute
- Only one integrated wholesaler with regional wholesale points

Regional wholesalers / shops:
- At least 1 wholesaler in each of the 21 regions, more in populous regions
- Mostly national wholesalers organize distribution, but regional wholesalers also organize 'pick up'
- Frequently regional wholesalers are also private official pharmacies
- Cross selling between pharmacies and shops is common (small quant.)
- Transport through dedicated full trucks (% of product cost), pre-arranged shipping agent, or through public bu (small quant.)

Public supply chain:
- One central level medical store, 9 zonal stores distribute to public and NGO facilities for essential drugs
- ARVs and ACTs are distributed for free (ACTs for <5), $0.25 for adults
- NGOs buy other products from private wholesalers

Source: Expert interview April 2008

ACT Supply Chain – Tanzania
Enabling environment

Basic information (2007):

- Population: 40,213,162
- GDP/capita: $1,300
- GDP growth rate: 7.3%
- Area: 945,087 sq km
- Urban:Rural population: 38% 62%
- Healthcare spending as % of GDP: 5.1%
- Health expenditure/capita: $17
- Doctors per 100,000 people: 2

Regulatory context:

- The government regulates the provision of health services for profit, but the restrictions have been loosened since 1991

Infrastructure characteristics:

- Critical infrastructure challenges related to the transportation network, secure reliable supplies of energy and access to clean and safe water, have been an obstacle to growth and development
- Unreliable and expensive electricity, poor telecommunications and high transport costs

Disease prevalence:

- 93 percent of the population is at risk for malaria
- This disease is responsible for more than one-third of deaths among children under age 5 and for up to one-fifth of deaths among pregnant women.
- Nationally it accounts for 30 percent of the total disease burden.
- Up to 80 percent of Tanzania's malaria deaths occur among these children
- Growing resistance to first-line anti malaria drugs in recent years has greatly diminished the government's ability to treat the disease