



USAID GLOBAL HEALTH SUPPLY CHAIN PROGRAM
Procurement and Supply Management

Digital Ecosystem for Family Planning Supply Chain

Ghana and Malawi Landscape Analysis

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Acronyms

3PL	third-party logistics
B2C	business to consumer
CDC	Catholic Distribution Centers
CHAI	Clinton Health Access Initiative
CHAG	Christian Health Association of Ghana
CHAM	Christian Health Association of Malawi
CHPS	Community-Based Health Planning and Services
CIP	Costed Implementation Plan
CPT	Commodity Procurement Tables
CMS	central medical store
CMST	Central Medical Stores Trust
CYP	couple years of protection
DHA	district health administration
DHMT	district health management teams
DHS	Demographic and Health Survey
E2E	End to End -in reference to a supply chain
eLMIS	Electronic Logistics Management Information System
FASP	forecasting and supply planning
FDA	Food & Drug Authority
FHD	Family Health Division
FP	family planning
GHS	Ghana Health Services
GHSC-PSM	Global Health Supply Chain-Procurement and Supply Management
GFPVAN	Global Family Planning Virtual Analytics Network
GOG	Government of Ghana
GOM	Government of Malawi
HC	health center
HQ	headquarters
HTSS	Health Technical Support Services
ICC/CS	Interagency Coordinating Committee for Commodity Security
IHS	Imperial Health Sciences
LCS	Licensed Chemical Sellers
LMIS	Logistics Management Information System
LMIC	Low- and Middle-Income Countries
KPI	key performance indicator
mCPR	Modern Contraceptive Prevalence rate
MNCH	maternal, newborn, and child health
MOH	Ministry of Health
NACP	National AIDS Control Program
NEML	National Essential Medicines List
NGO	Non-Governmental Organization
NHIA	National Health Insurance Authority
NHIS	National Health Insurance Scheme
NSCA	National Supply Chain Assessment

NFP	Not-for-profit
PMRA	Pharmacy and Medicines Regulatory Authority
PPAG	Planned Parenthood Association of Ghana
PPA	Public Procurement Authority
RHSC	Reproductive Health Supplies Coalition
RHD	Directorate of Reproductive Health
SCMA	Supply Chain Management Association
SCMP	Supply Chain Master Plan
SDP	Service Delivery Point
SMO	Social Marketing Organization
TCMS	Temporary Central Medical Stores
TFHO	Total Family Health Organization
WAHO	West African Health Organization
WHO	World Health Organization

Executive Summary

This analysis is designed to understand and map the Family Planning (FP) digital supply chain ecosystems of two countries in order to identify the existing level of use of digital platforms, such as the Global Family Planning Visibility and Analytics Network (VAN) and understand how these e-health and digital strategies can advance countries FP2030 commitments and strengthen sustainable country procurement, supply/demand planning, forecasting, and data visibility. This report reflects a landscape analysis of the FP Supply Chain Ecosystem in Malawi and Ghana; this includes mapping key stakeholders throughout the end-to-end supply chain process and their interconnectivity; mapping information/data flows in the supply chain (upstream to suppliers and downstream to service delivery points); and mapping commodity and procurement flows.

This landscape analysis will serve as a foundational summary and reference of the FP digital supply chain ecosystem in Malawi and Ghana. These supply ecosystems are increasingly complex in Low- and Middle-Income Countries (LMICs) due to increased volumes of commodities, decentralization of government services, and lagging supply chain management systems.¹ In order to better harness these disaggregated and parallel supply chains into an optimal integrated supply chain, countries and implementing partners must better understand the full ecosystem of people, data, processes and technology.

This analysis found that Ghana and Malawi have robust, albeit separate Family Planning Supply Chain Ecosystems in the public, private for-profit, and private non-profit sectors; across both countries, there is a systemic lack of integration with the for-profit private sector. This sector is excluded from coordinating bodies, and engagement with the private sector is primarily focused on not-for-profit (NFP) stakeholders. In Ghana, a healthy, albeit fragmented private sector supplements the public sector, providing discrete, easily accessible FP products to Ghanaians. In Malawi, the for-profit private sector is less developed, but the public sector, supplemented by the NFP Christian Health Association of Malawi (CHAM), appears to meet the needs of FP clients, covering almost 80% of demand.

Malawi and Ghana's public sector stakeholders are organized similarly, with Ministry of Health (MOH) agencies, and cross-stakeholder commodity security coordination committees, mandated to ensure the flow of commodities to public facilities and contracted NFP clinics despite the majority of FP commodities flowing through parallel supply chains maintained by international donors. However, Ghana and Malawi's digital ecosystems vary significantly. Ghana has made recent efforts to consolidate data flows through one system, GHiLMIS. The platform accommodates central and regional medical stores as well as Service Delivery Points (SDPs), allowing for integration of data. The extent to which the system serves the needs of its users will be examined in the second part of this analysis. Malawi's digital ecosystem is more fragmented, with multiple data platforms designed to alleviate manual and non-systematized processes. The lack of integration between said platforms, however, remains a critical challenge.

As a networked, global control tower solution, this research seeks to assess the feasibility of using the VAN as a bridge between these distinct ecosystems – public, NFP, and for-profit. The current state of VAN use in Malawi and Ghana diverges due to the two countries' varying digital maturity levels, described above. In Ghana, in-country LMIS platform integration is ongoing enabling VAN permeation beyond the inbound shipment visibility feature. Ghana's public sector stakeholders, as well as the NFP sector, have access to the VAN and integrations to GHiLMIS at a national level are complete, with plans

to integrate downstream in-country data. In comparison, Malawi is at the start of the integration process with the VAN. Malawi's key stakeholders have championed its use and have obtained buy-in to integrate the VAN and in-country systems.

A challenge, and possible opportunity, for VAN permeation at this time is its design for FP commodities only. In both Malawi and Ghana, while there are parallel supply chains for FP commodities, these supply chains also service all other health commodities, making a commodity-specific tool slightly less appealing to a country trying to integrate as much as possible. Where Malawi and Ghana do have FP-specific supply chain processes, notably forecasting and supply planning, the VAN offers significant value. A series of workshops to further discuss the value the VAN can bring to Malawi and Ghana will be hosted following the publication of this research.

A comparison of the key elements in Ghana and Malawi's FP ecosystems is below in Table 1.

Table 1: Malawi and Ghana Family Planning Supply Ecosystem Comparison

Malawi and Ghana Family Planning Supply Ecosystem Comparison		
Ecosystem Element	Ghana	Malawi
Commodity Security	mCPR: 23.2% (2020) ⁱⁱ	mCPR: 48.9% (2020) ⁱⁱⁱ
International Donors	USAID, UNFPA	USAID, Global Fund, and UNFPA (partially funded by DFID, KfW and Norwegian MFA through Health Sector Joint Fund) ^{iv}
Government Procurement Agency	MOH Procurement and Supply Directorate; GOG Public Procurement Authority	Central Medical Stores Trust
Public Sector Entities Conducting Procurements	Central, Regional and Service Levels based on stock conditions	Central Medical Stores Trust
Public/NFP Private Commodity Funding^v	88% Donor Funded 12% GOG Procured (WAHO Funded)	99.2% Donor Funded .8% GOM Funded
Commodity Funding Gap Presence^{vi}	Yes; 90% of the estimated value of the contraceptives needed to be procured for the public sector was procured by any public sector source (2019)	No; 173% of the estimated value of contraceptives needed to be procured for the public sector was procured by any public sector source (2019)
Coordinating Committee^{vii}	ICC/CS – has legal status and develops policies and procedures	RHCS – does not have legal status
Social Marketing Organizations	Yes	Yes
Wholesalers	Hundreds of wholesalers, with thousands of medium-sized retailers classified as	Less than one hundred wholesalers whose participation in the FP market is

	resellers	small
Client Source of Commodities <i>Public: Public-funded service delivery points</i> <i>Private: Non-profit clinics and for-profit pharmacies, hospitals and clinics</i>	65:35 Public Private ratio ^{viii}	80:20 Public Private ratio ^{ix}
Regulatory & Government Challenges	FDA Registration and QC testing delays High Import Tariffs NHIS Reimbursement Delays	Registrations required by the PMRA, but no reports of excessive lead times High Import Tariffs MOH to CHAM Reimbursement Delays
State of Information Management Systems	Integrated for public sector under GhiLMIS	Fragmented for public sector into procurement, inventory, and dispensing platforms

Framework and Methodology

Digital ecosystems—the stakeholders, systems, and enabling environments that together empower people and communities to use digital technology to gain access to services, engage with each other, or pursue economic opportunities.^x

This activity and analysis are part of a broader initiative by USAID focusing on use of digital platforms and strategies to improve health outcomes. USAID’s Digital Strategy has two primary objectives:

- Improve measurable development and humanitarian assistance outcomes through the responsible use of digital technology in USAID’s programming; and
- Strengthen the openness, inclusiveness, and security of country-level digital ecosystems.^{xi}

USAID’s Digital Health Vision further defines the use of technology as a key implementation tactic to achieve sustainable achievements in country and further pursue the journey to self-reliance. It defines “Digital health [as] the systematic application of information and communications technologies, computer science, and data to support informed decision-making by individuals, the health workforce, and health institutions, to strengthen resilience to disease and improve health and wellness for all.”^{xii}

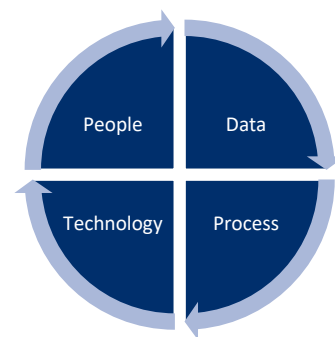
Other GHSC-PSM initiatives and tools, including the Supply Chain Information System Maturity Model (SCISMM) and the National Supply Chain Assessment (NSCA), are designed to systematically assess and evaluate the current state of digital and digital health strategies in countries and make recommendations for targeted interventions to improve systemic gaps and challenges.

This activity focuses on mapping and analyzing the digital ecosystems in Malawi and Ghana, specifically those that enable the FP supply chain. GHSC-PSM has used a people, data, process, technology framework to structure the questions for this three-phased research approach.

Phase 1: People/Data – Which actors and data contribute to the FP supply ecosystem?

Phase 2: Process/Technology – What processes are currently employed by those actors for information sharing and what aspects are digitized?

Phase 3: Design Workshop – Bringing together key stakeholders to use research from Phase 1 and 2 to design recommendations for future country engagement with the VAN.



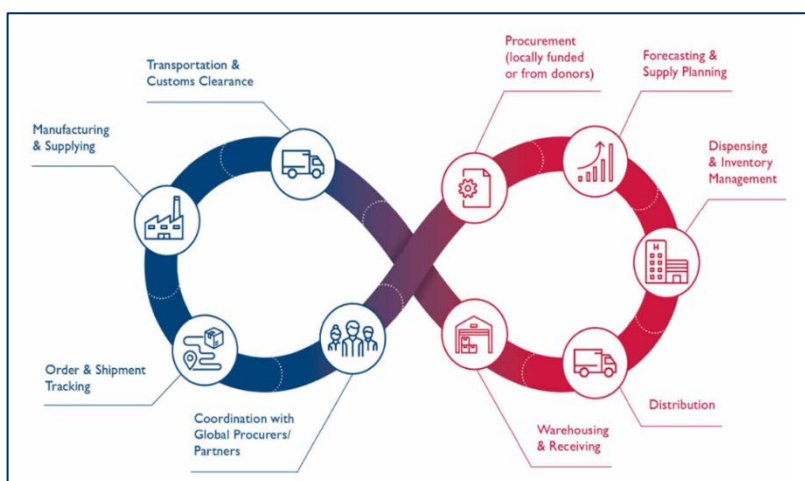
The first phase of research was conducted via a desk review of available literature. It is intended to be a summary analysis of the FP ecosystem in Malawi and Ghana and challenges that arise due to the lack of integration described above. This analysis should supplement and provide context to other resources that conduct in-depth country assessments, surveys, and the like.

The second phase of research was built upon the first, using the research compiled for the *information mapping and flow* analysis to direct and target new inquiries and interviews with key stakeholders across the public and private sector. It is intended to be a summary analysis of the systems, processes,

data, and users who support the FP supply chain ecosystem in Malawi and Ghana as well as challenges that arise in the space. It also analyzes the current state of use of the VAN in Malawi and Ghana and the evolution of its use since its implementation. Both the first and second phases of research are combined into one deliverable analyzing the Digital Ecosystem for FP Supply Chain in Malawi and Ghana. A complete list of key informants interviewed and observed as part of this research is available in Annex A.

The overarching framework for conceptualizing the health supply chain in Ghana and Malawi is based upon the Reproductive Health Supplies Coalition’s (RHSC) “Supply Chain Cycle”, which visualizes the cyclical nature of supply chain and its major process groups (depicted in Figure 1, right).^{xiii} While conducting research on the interconnectivity of the FP supply chain, inclusive of private and public actors, GHSC-PSM adapted the plug, or figure eight, to better represent the feedback loop once commodities are dispensed and inventory data flows back to procurement agents and public buyers through various established and informal information channels. Additionally, activities like local and global collaboration, as well as regulatory action and governance, occur across all supply chain process groups. GHSC-PSM developed a rotating target to demonstrate how these functions impact all supply chain processes, demonstrated in Figure 2. Interspersed throughout the general E2E processes are digital processes, data and information systems that enable FP commodity supply. Therefore, for each process group, we map out the data inputs and outputs, systems, and information users to depict efficiencies, gaps and challenges.

Figure 2: RHSC “Supply Chain Cycle”

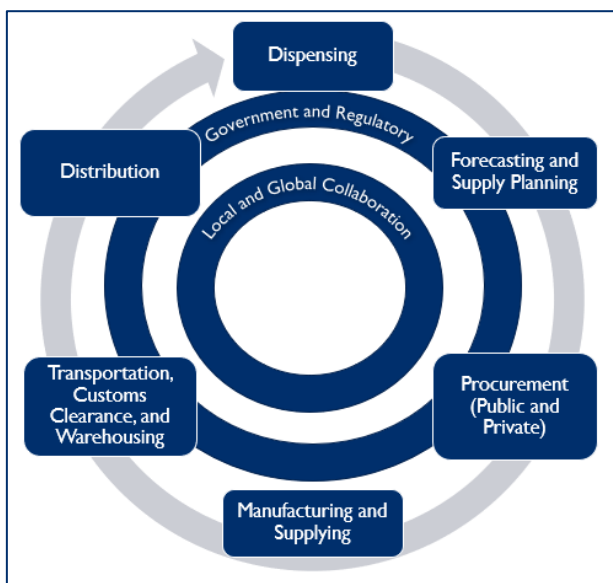


buyers through various established and informal information channels. Additionally, activities like local and global collaboration, as well as regulatory action and governance, occur across all supply chain process groups. GHSC-PSM developed a rotating target to demonstrate how these functions impact all supply chain processes, demonstrated in Figure 2. Interspersed throughout the general E2E processes are digital processes, data and information systems that enable FP commodity supply. Therefore, for each process group, we map out the data inputs and outputs, systems, and information users to depict efficiencies, gaps and challenges.

The top of the rotating target begins with the client. The *Dispensing* process group represents all activities and actors who dispense products directly to clients (Service Delivery Points, SDPs), including hospitals, health clinics, pharmacies, community health workers, and traveling healthcare providers. A number of social entrepreneurial actors also exist in this space, providing application-based services to clients to find pharmaceutical suppliers and services near them and applications to authenticate product quality and origin (track and trace).

From dispensing, public clinicians and their service delivery points are responsible for providing client information and inventory

Figure 1: Framework for Family Planning Supply Ecosystem in Malawi and Ghana



data, respectively, to various reporting modules that are aggregated and shared for *Forecasting and Supply Planning* purposes. A number of social entrepreneurial actors also exist in this space, assisting private service delivery points with inventory management, financing and procurement of goods.

Consumption and inventory data are the inputs for *Procurement*. In the public sector, this process group includes the procurement activities of Ministries of Health and their affiliates as well as global actors. In the private sector, this process group reflects the ordering, negotiations and relationships wholesalers and other private retailers undertake to purchase and import products. In many cases, these private sector procurements may not follow competitive bidding processes.

In the public sector, *Manufacturing* is directed by procurements or pre-established vendor-managed inventory agreements. In the for-profit private sector, wholesalers are the primary source of supply; these actors typically have direct relationships with multiple international manufacturers. In the NFP sector, Social Marketing Organizations (SMOs) have established relationships with manufacturers to produce their own brands of FP products and Condoms. Though local pharmaceutical manufacturing in Ghana and Malawi are growing industries, FP commodities are not yet locally produced.

Once produced, goods go through a *Transportation and Importation process*. Depending on the supply mechanism, FP commodity shipments are managed by manufacturers or by the procurement agent/a third-party logistics agent. The Customs clearance process presents unique challenges to public and private importers, including, financial hurdles for duty-free importation (if commodities are donated), and the burden of import taxes for the private sector. Similarly, quality assurance and control requirements or testing upon import can present challenges for customs clearance. Once cleared, public sector goods are typically transported to central medical stores (CMS), though donated goods may flow through a parallel in-country supply chain established by the donor. Private sector goods can move through a hierarchy of large to small wholesalers or make their way directly to clients through one-stop-shop wholesalers selling directly.

If goods are housed in CMSs, they are transported to regional medical stores (RMS). *Distribution* to district-level facilities should occur based on demand signals from SDPs, like central and district hospitals, as well as health centers and clinics; however, data sharing and demand signals are not always communicated in a timely manner, or goods distributed in a timely manner. In donor's parallel supply chains, distribution can occur direct from private warehouses to public or private. Private sector wholesalers often sell products directly to consumers, or to private hospitals, clinics and pharmacies. Product availability and pricing impacts commodity security and clients' access to critical FP goods.

Though goods and information follow these general flows, interactions and influence among critical stakeholders cross the entire supply chain. Notably, and as mentioned above, two key sectors have cross-process influence: Global/Local Collaborators and Government and Regulatory bodies.

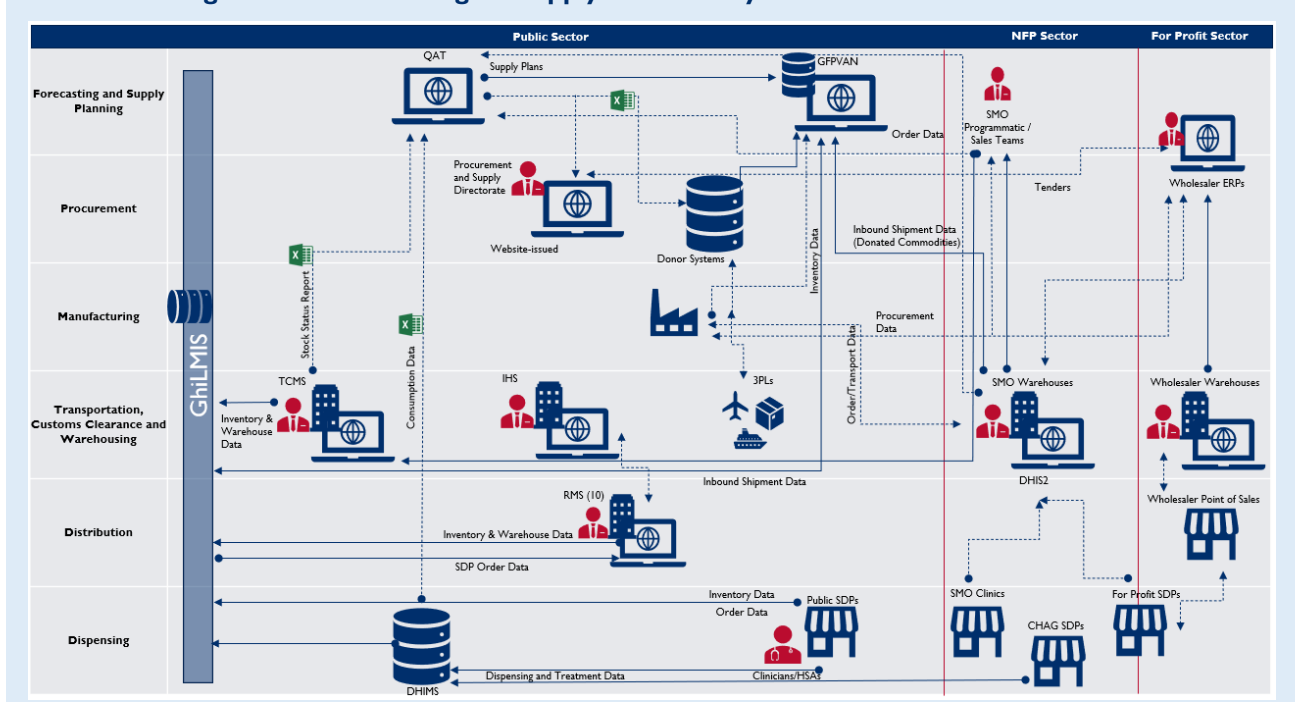
The *Global and Local Collaboration* subgroup includes all local, regional, and global partnerships that play a critical role in FP Commodity Security, and the main process groups (Procurement, Manufacturing, Transportation/Warehousing, Distribution, Dispensing, and Supply Management).

Ghana FP Digital Supply Chain Landscape Analysis

Summary

As of this writing, Ghana is in the midst of a massive digital transformation, in which its entire public health commodity supply chain is being reconfigured and centralized around one logistics management information system, called GhiLMIS. GhiLMIS offers a range of supply chain capabilities (as described in Annex C) and has been a multi-year ongoing implementation across almost all supply chain sectors (see Annex D for a more detailed implementation timeline). GhiLMIS is intended to provide end to end visibility in a supply chain where, historically, most data reporting was either manual and not digitized (at SDPs, for example) or siloed, requiring manual aggregations and validations. As it stands, with the rollout partially completed, many manual processes are still being conducted, such as aggregating data for national quantifications, or integrating data from parallel supply chains, such as USAID's use of IHS for warehousing. Furthermore, upon completion of the rollout of the Full Operating Capability (FOC), the success of user adoption efforts, data compliance, and whether or not full end to end visibility is achieved remains to be seen. Partial implementation has led to users who are managing multiple data platforms and manual datasets to do their jobs. Ghana is also pioneering the integration of a national LMIS with the VAN, in order to streamline data management for FP supplies at the national and subnational levels, a first for the global Control Tower capabilities. This process informs the utility/adaptability of GhiLMIS, as well as the possibilities of VAN integration with countries' digital processes and strategies.

Figure 3: Ghana FP Digital Supply Chain Ecosystem Data and Process Flows



Detailed descriptions of these processes and flows will follow in the process group deep-dives. This analysis has identified several key challenges plaguing the FP digital supply chain ecosystem in Ghana, described below.

Key Challenges

1. Though Ghana has invested in an LMIS solution, GhiLMIS, which centralizes and digitizes its supply chain data, it does not address the root causes of some of the data quality and data timeliness issues that have plagued the supply chain. For example, data timeliness issues arise when SDPs without regular internet connectivity are unable to upload their data on a regular basis. Implementing an all-web based platform, without providing reliable internet connectivity could result in the same issues.
2. The adoption of temporary processes while the GhiLMIS implementation is ongoing is a shared challenge felt by existing E2E process implementors and data aggregators. During the transition, users are validating new data and aggregating and analyzing manual data, while maintaining their existing processes until the implementation is completed. While common in largescale software implementations such as this, clear guidelines and timelines on data validation and process changes for interim use are necessary to prevent delays and stakeholder disengagement.
3. Even with the GhiLMIS implementation, key data sources and components, such as the IHS warehouse and all CHAG facilities, are still excluded from data and reporting streams. Similarly, privately funded commodities, to for-profit and NFP SDPs, which comprise a large amount of consumption are also excluded from public sector data and reporting streams. Further integration and visibility across non-government service providers would provide a greater picture of the total market.

Ghana FP Supply Ecosystem

Contraceptive Security Overview

Contraceptive security means everyone is able to choose, obtain and use a wide range of high-quality and affordable contraceptive methods, when they need them, for FP/RH and the prevention of sexually transmitted diseases.^{xiv}

According to FP2020's Core Indicators, Ghanaians' use of contraceptives has been increasing marginally over the past decade; Ghana's Modern Contraceptive Prevalence rate (mCPR) increased from 16.5% in 2012 to 23.2% in 2020. Corresponding indicators of met and unmet demand have steadily increased and decreased, respectively, from 36.5% (2012) to 48.3% (2020) of met demand and from 36.9% to 31.9% of unmet demand.^{xv} Based on these metrics, Ghana falls into *Stage 2: Growth* of contraceptive security development as defined by Track20; similarly, Track20 assesses Ghana as having a large potential use gap, indicating that without any changes to demand, it can achieve greater met demand.^{xvi}

International donors funded 88% of Public sector FP supply, while the Government of Ghana (GOG), is the procurement agent for the remaining 12% with funding from the West African Health Organization (WAHO). Funding gaps were identified in Ghana's most recent Commodity Security Indicator Survey (2019), though it appears to be due to lack of spending all allocated funds by the GOG. In a survey response regarding progress against its FP2020 goals, Ghana's Family Health Division reported that prioritizing GOG funding for FP commodities has been a challenge.^{xvii} Figure 4 below depicts FP commodity volumes procured by international donors over the past five years; Figure 5 depicts Condom volumes procured by international donors over the past five years; and Figure 6 depicts FP commodity volumes procured broken down by product type.

Figure 4: FP Commodity Volume to Ghana by Donor 2016-2020^{xviii}

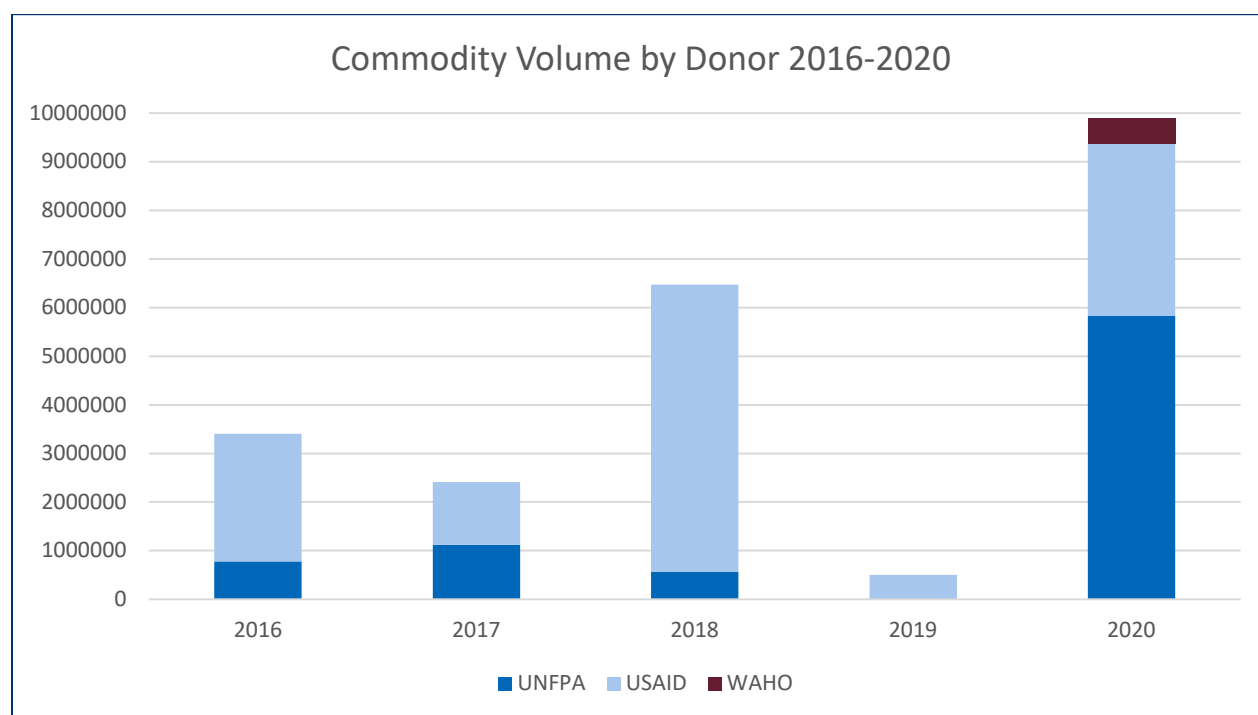


Figure 5: Condom Volume to Ghana by Donor 2016-2020^{xix}

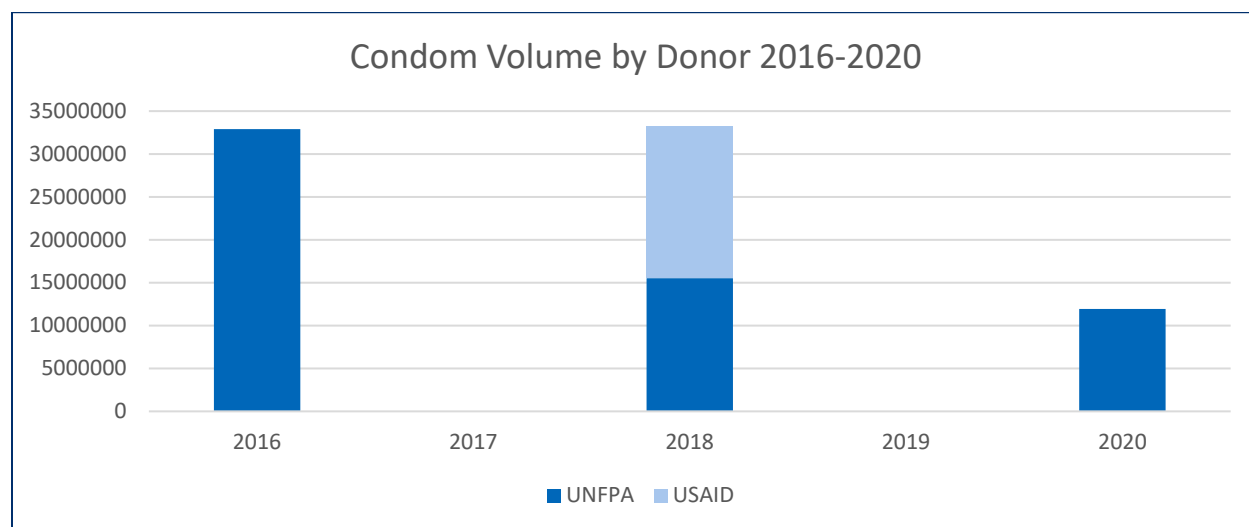
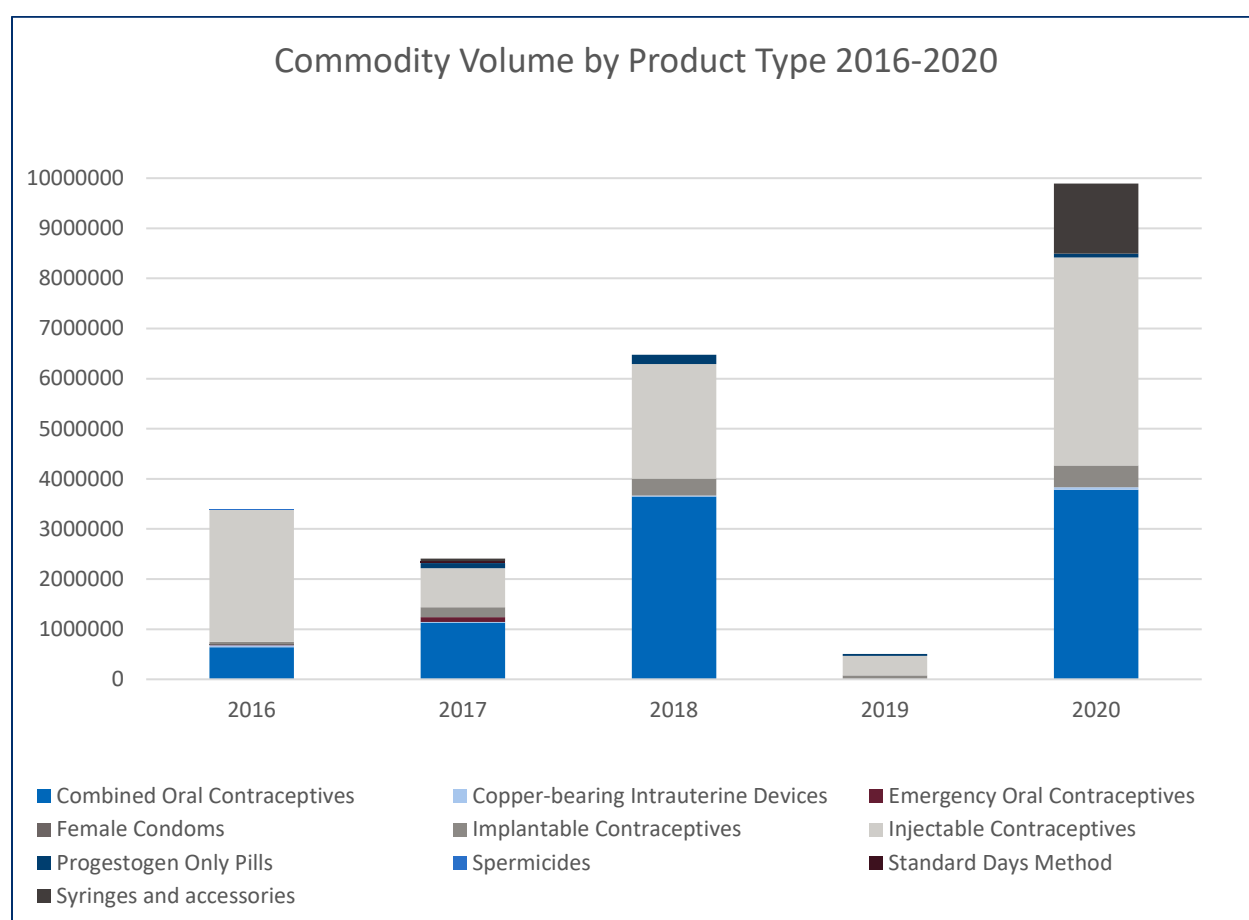


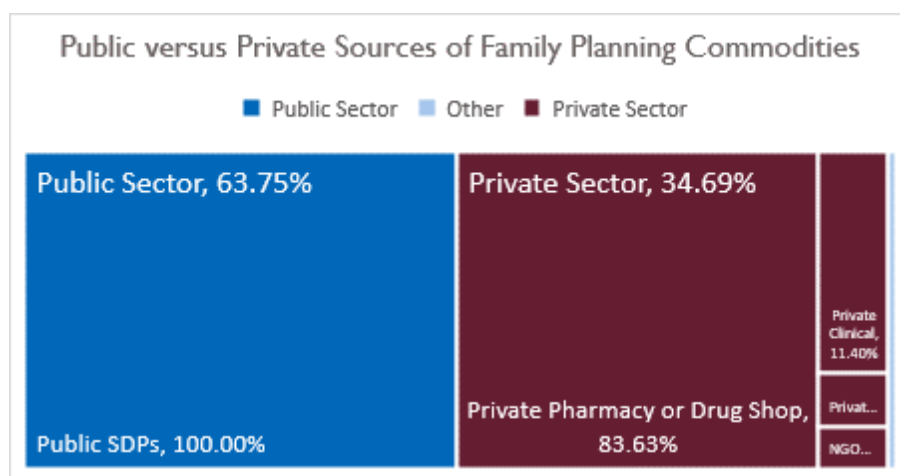
Figure 6: FP Commodity Volume to Ghana by Product Type 2016-2020^{xx}



Family Planning Client Ecosystem

Public vs. Private Provision

Ghana's CIP, published in 2015, indicates public and private provisions of FP commodities are almost equal, 47% public and 46% private;^{xxi} however, just one year earlier, Ghana's Demographic and Health Survey (DHS) from 2014 indicated that the majority of clients (63.75%) receive FP commodities from public sector service providers in Ghana, and fewer (34.69%) obtain these commodities from the private sector.^{xxii} However, where clients require any type of out-client



procedure as part of the product provision (implants, injectables, IUDs), Ghanaians overwhelmingly choose public sector service delivery points (ranging from 84%-94%). For those clients who plan to use over-the-counter pharmaceuticals or condoms, the private sector – chemical or drug sellers, in particular – is the delivery point of choice (82%-89%).^{xxiii}

While this landscape analysis has endeavored to map the entire FP supply ecosystem, the ecosystem of available supply and services from the client's perspective varies significantly based on their demographic, geographic, and socioeconomic situation. In particular, these classifications appear to influence clients' choices between obtaining FP commodities in the public versus private sector. All statistics below come from Ghana's 2014 DHS, as analyzed by the SHOPS Plus Project.^{xxiv}

Clients' access to FP commodities is limited by several factors, described below:

- **Cost:** While most FP commodities can be obtained at no cost in the Public sector, clients opt for the private sector for pills and condoms.^{xxv}
- **Product Type:** For products that can be administered over the counter, such as condoms or contraceptive pills, most clients service choice is the private sector licensed chemical/drug sellers. However, for FP commodities requiring invasive procedures, such as implants, injectables, or IUDs, clients most often choose public sector SDPs.^{xxvi}

Demographics

Only 27% of married clients obtain their contraceptives from the private sector, compared to 52% of unmarried clients.

Older clients prefer to use the public sector to obtain their contraceptives (70%) compared to younger clients (defined as 15-24 years old) who obtain from the private sector (61% and 45% obtain privately). Condoms follow a similar pattern with 40% of younger clients obtaining in the private sector versus 7% of those older than 25 years.

Geographic

29% of Rural clients obtain their contraceptives from the private sector, compared to 41% of Urban clients.

Socioeconomic

The poorest women in Ghana are more likely to obtain contraceptives from the private sector than the wealthiest women in Ghana (27% versus 42%).

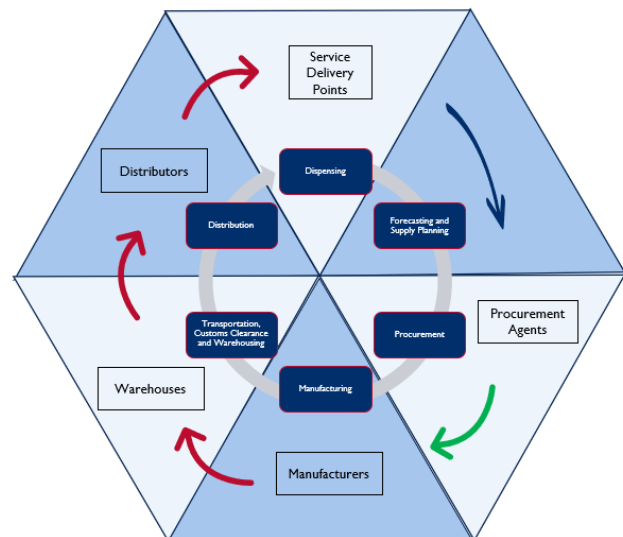
Ghana FP Supply Chain Ecosystem

Family Planning Supply Chain Ecosystem Map

In Figure 7, the entire FP Supply Chain Ecosystem is mapped against six E2E supply chain processes (1. Forecasting and Supply Planning; 2. Procurement; 3. Manufacturing; 4. Transportation, Customs Clearance and Warehousing; 5. Distribution; and 6. Dispensing), described in the Framework and Methodology section, and includes very basic connections between primary groups of stakeholders. These connections are financial, commodity exchanges, information flows, service provisions, and partnerships. In Annex B, the FP Supply Ecosystem map is expanded to include details of individual actors and more distinct relationships. This map is intended to show the breadth of each process groups' interconnectivity.

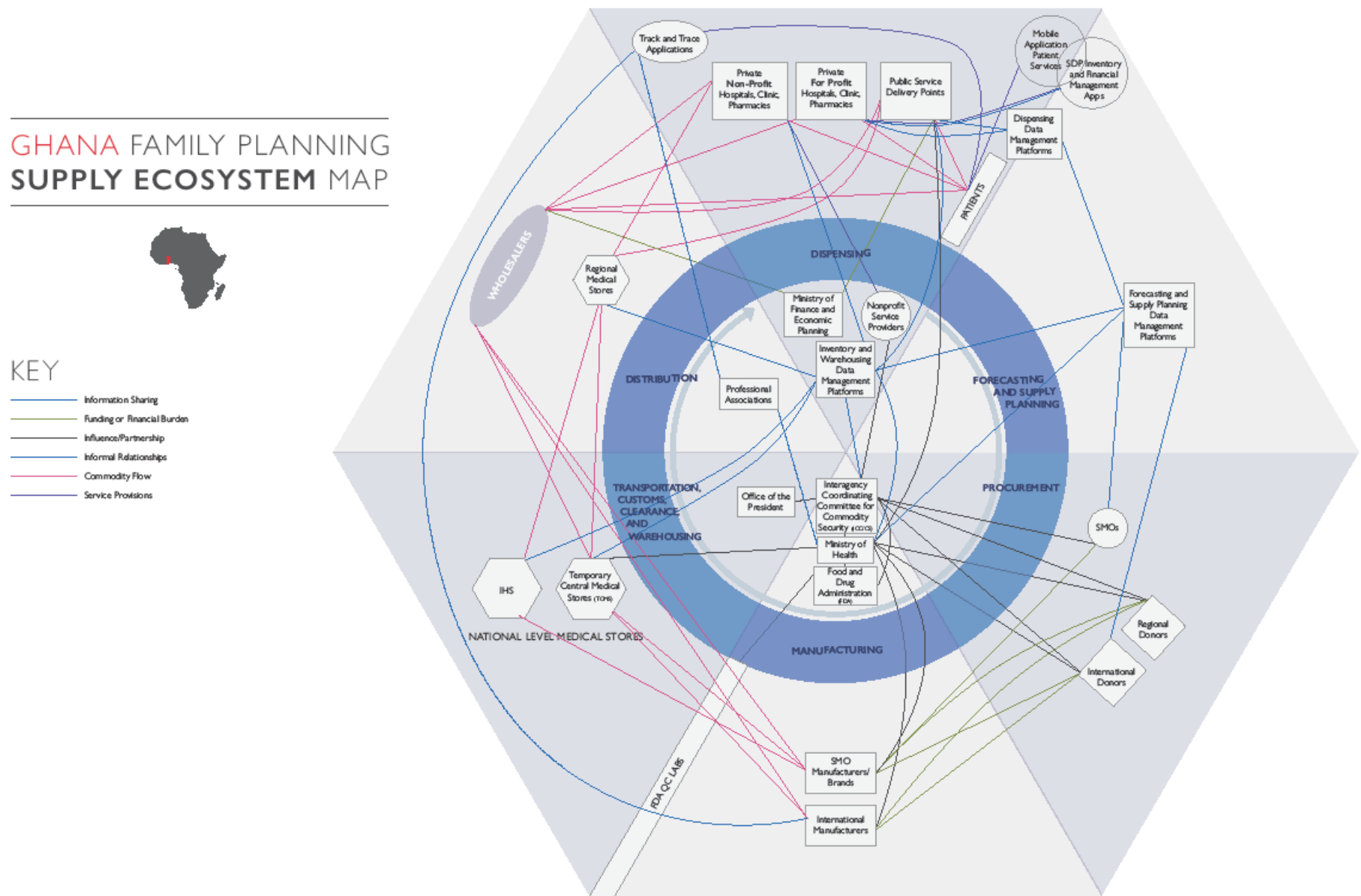
Ghana's Ecosystem Map is robust and filled with hundreds of actors who contribute to planning, procuring and provisioning FP commodities. This ecosystem follows a general trend of interconnectivity in a supply chain (depicted in the diagram to the right):

1. Information flowing (blue) counterclockwise from SDPs to Forecasting and Supply Planning and then to procurement agents for action;
2. Funding flowing (green) from those procurement agents to manufacturers to produce goods;
3. Commodities flowing (red) from manufacturers to public and private importers, distributors and back to SDPs.



However, these flows are not mutually exclusive as commodity flows by nature also elicit information flows, however manual or non-digitized they may be. Ghana's FP supply ecosystem is also unique in that it has a centralized logistics data repository, from which, information collected at various stages of the supply chain are entered, such as government procurements, warehousing/inventory, distribution, and dispensing. This centralization enables a constant feedback loop whereby data could be shared in real-time, even if operational realities prevent it, and used to adjust and course correct as necessary.

Figure 7: Ghana Family Planning Supply Ecosystem Map
(Double-click picture to open in Adobe PDF and zoom in)



Family Planning Supply Chain Key Stakeholders

FP commodities are supplied through four channels: International Donors, Government procurements, Social Marketing Organizations, and Private sector imports. Table 2 summarizes these channels and the funding and regulatory challenges they face.

Table 2: Ghana FP Supply Chain Key Stakeholders

Organization Type	Organizations	Funding Source	Funding Challenges	Regulatory Challenges
International Donors	USAID, UNFPA	Self-funded	N/A	Ghana's Costed Implementation Plan (CIP) indicates registration through the FDA is timely, even for items evaluated under an expedited process. The CIP also notes a lack of coordination with the FDA is at the root of these delays. ^{xxvii}
Government	Procurement and Supply Directorate	West African Health Organization (Contraceptives, Condoms); Government of Ghana (Condoms)	Long lead times to release funds ^{xxviii}	
Not-for-Profit Sector	Social Marketing Organizations (Planned Parenthood Association of Ghana (PPAG); Total Family Health Organization (TFHO); DKT International)	Varies: International Donors, Donations	N/A	
	Christian Health Association of Ghana (CHAG)	International Donors, Donations	Reimbursement from NHIS is a challenge	
Coordinating Committees	ICC/CS	Self-funded	N/A	N/A – The ICC/CS issues commodity security strategies and policies
Wholesalers	Osons Chemist, Ltd., Vicdoris Pharmaceuticals, Gokals-Laborex Ltd., Unichem,	Varies; manufacturing partners, but most often the wholesalers	High import taxes; capital needed to front the cost of imports	Wholesalers act as agents to register products on behalf of international

	Kama Pharma/Aspen Group, East Cantonments Pharmacy	themselves fund their consignments		manufacturers.
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Public Sector Family Planning Supply Chain Process Flow

Public Sector Overview

In 2018, international donors funded 88% of public sector FP supply, while the GOG procures the remaining 12% with funding from WAHO. Funding gaps were identified in Ghana's most recent Commodity Security Indicator Survey (2019), though it appears to be due to lack of spending all allocated funds by the GOG. While the GOG established a Public Procurement Authority (PPA), this office guides procurement of all commodities, not just pharmaceuticals;^{xxix} therefore, procurement of pharmaceuticals is notionally handled by the Procurement and Supply Directorate of the MOH. In reality, contraceptives are funded and procured by WAHO on behalf of the GOG and condoms are funded and procured by GOG.^{xxx} Procurements outside of these main mechanisms do occur, however, when lower level district facilities cannot obtain supply through the public sector and must procure from the private sector; at most, of commodities available at public sector SDPs, up to 80% could have come from the private sector.^{xxxi} Ghana's Supply Chain Master Plan (SCMP) recommended reducing the number of procurement actors in 2015, and limiting this to a yet-to-be-developed Supply Chain Management Agency (SCMA) to improve organizational efficiencies and reduce parallel and uncoordinated activities.^{xxxii}

Procurement is limited to products that have been registered with Ghana's FDA, and stockouts have occurred for FP commodities because the registration process can take so long.^{xxxiii}

While myriad actors touch FP policy and supply in Ghana, those depicted in Figure 8 reflect the stakeholders responsible for utilizing, maintaining, and operating the digital and manual systems to supply FP commodities. These organizations, their operational mandates and the systems they use are listed in Table 3.

Figure 8: Ghana Stakeholders responsible for utilizing, maintaining, and operating the digital systems to supply FP commodities

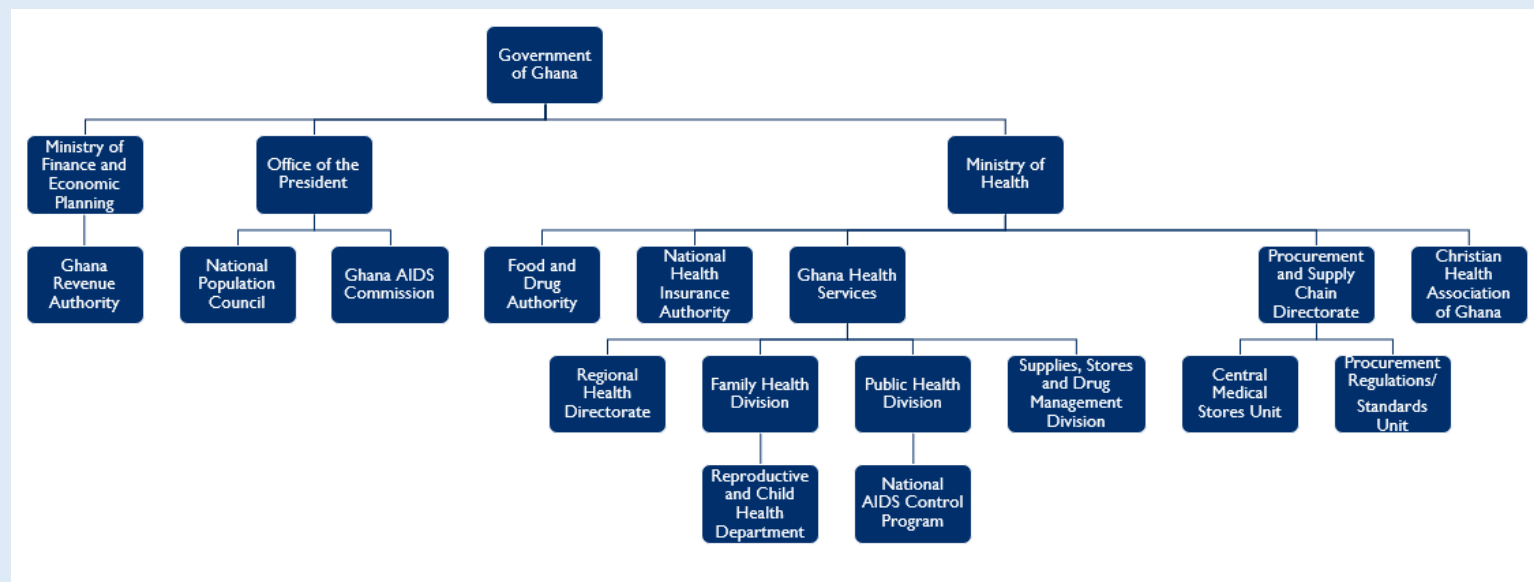


Table 3: Ghana Public Sector Family Planning Stakeholders in the Digital Ecosystem

Public Sector Family Planning Supply Stakeholders (from left to right in Figure 16)		
Agency/Department	Mandate ^{xxxiv}	Systems
National Population Council	• Chair of ICC/CS	N/A
Ghana AIDS Commission	• Provide inputs for the formulation of policies of the Commission. • Provide technical advice on the epidemic and its management. • Collaborate with the Health sector and relevant stakeholders in the development and implementation of HIV and AIDS prevention, treatment, care and support interventions. • Provide technical support in the development and review of guidelines and manuals for the management of the epidemic. • Ensure the planning, design, and implementation of projects of the Commission. • Coordinate the programs and activities of key partners for the harmonize and sustainable national response	N/A
Ghana Health Service	• Ensuring access to health services at the community, sub-district, district and regional levels by providing health services or contracting out service provision to other recognized health care providers - Setting technical guidelines to achieve policy standards set by MOH • Planning, organizing and administering comprehensive health services with special emphasis on primary healthcare • Developing mechanisms for the equitable distribution of health facilities in rural and urban districts • Managing and administering health institutions within the Service • Contracting with teaching hospitals for the treatment of referred patients	GhiLMIS, VAN

	• Promoting health, mode of healthy living and good health habits by people • Establishing effective mechanisms for disease surveillance, disease prevention and control • Promoting the efficiency and advancement of health workers through in-service and continuing education • Managing the assets and properties of the Service to ensure the most effective use • Determining with the approval of the Minister of Health charges for health services rendered by the Service • Performing any other function that is relevant to the promotion, protection and restoration of health.	
Family Health Division (FHD)	• Ensuring the development of comprehensive health policies, sustainable strategic plans, programmes and budgets to cover programmed activities of the Ghana Health Service in the areas of Reproductive and Child Health, Nutrition and Geriatrics at all levels • Undertaking periodic review of programme implementation and activities of the division in collaboration with its stakeholders and partners in the area of public health with emphasis on Reproductive and Child Health, Nutrition and Geriatrics • Catering for the design and application of supportive supervision, mentoring, monitoring and evaluation for purposes of assessing and improving the operational effectiveness of the Ghana Health Service's interventions as it pertains to the mandate of the division • Advocating for support and funding for programmes in the areas of Reproductive and Child Health, Nutrition, Geriatrics and other related fields aimed at promoting and maintaining healthy pregnancies and deliveries and the optimal growth and development of children from birth to 18 years. • Implementing interventions and activities aimed at improving men's, women's, children's and adolescents' health in general and especially, towards reducing maternal morbidity and mortality and infant and child morbidity and mortality with the aim of ensuring universal health coverage	GhiLMIS, VAN
Reproductive and Child Health Department (under FHD)	• Responsible for coordinating the implementation of reproductive and child health strategies and activities at the national level • Providing access to accurate education and information on general reproductive and child health care • Providing access to safe, effective, affordable and acceptable methods of family planning; • Providing access to health information and health services relevant to the age and gender specific needs of adolescents and young people to enable them to make informed decisions	GhiLMIS, VAN
Supplies, Stores and Drug Management Division	• Implementing the annual procurement plans with relevant stakeholders in accordance with the provisions of the Ghana Public Procurement Act (PPA), 663, 2003 as Amended • Providing direction and strategic advice to the corporate arm of GHS in all matters related to procurement and supply chain management. • Coordinating capacity building in supply chain management at the various levels of the health system. • Ensuring commodity security to support Health Service Delivery	GhiLMIS
National AIDS Control Program (under Public Health)	• Prevention and Management of Opportunistic Infections. • Provision of Anti-retroviral therapy to population in need. • Expanding access to HIV Testing and Counselling services.	GhiLMIS

Division)	• Expanding access to Prevention of Mother-To-Child Transmission services. • Syndromic management of Sexually Transmitted Infections. • Condom education and promotion.	
Foods and Drug Authority	• Ensure adequate and effective standards for food, drugs, cosmetics, household chemicals and medical devices; • Monitor through the District Assemblies and any other agency of State compliance with the provisions of Part 6,7 and 8 of the Public Health Act,2012 (ACT 851); • Advise the Minister on measures for the protection of the health of consumers; • Advise the Minister on the preparation of effective Regulations for the implementation of Part 6,7 and 8 of the Public Health Act,2012 (ACT 851); • Approve the initiation and conduct of clinical trials in the country; • Perform any other functions that are ancillary to attaining the objects of the Authority;	N/A
National Health Insurance Authority	• Implement, operate and manage the National Health Insurance Scheme (NHIS) • Determine in consultation with the Minister contributions that should be made by members of the NHIS • Register members of the NHIS • Register and supervise private health insurance schemes • Issue identity cards to members of the National Health Insurance Scheme • Ensure equity in health care coverage • Ensure access by the poor to healthcare services • Ensure protection of the poor and vulnerable against financial risk • Grant credentials to healthcare providers and facilities that provide healthcare services to members of the National Health Insurance Scheme • Manage the National Health Insurance Fund • Provide a decentralized system to receive and resolve complaints by members of the NHIS and healthcare providers • Receive, process and pay claims for services rendered by healthcare providers • Undertake public education on health insurance on its own or in collaboration with other bodies • Make proposals to the Minister for the formulation of policies on health insurance • Undertake programs that further the sustainability of the NHIS • Develop guidelines, processes and manuals for the effective implementation and management of the NHIS • Ensure the efficiency and quality of services under the national and private health insurance schemes • Protect the interest of members of private health insurance schemes • Identify and enroll persons exempt from payment of contribution to. National Health Insurance into the NHIS • Monitor and ensure compliance with this Act and any Regulations, guidelines, policies, processes and manuals made under this Act • Perform any other function conferred on it by this Act or that are ancillary to the object of the Authority.	N/A
Regional Health Directorate	• Ensuring access to health services at the district, sub-district and community levels by providing health services or contracting out service provision to other recognized health care providers in the region	GhiLMIS, DHIMS

- Undertaking effective management and administration of the health resources within the region
 - Promoting healthy lifestyles and good health habits among the public through effective and targeted health education
 - Developing appropriate strategies and setting technical guidelines to achieve national policy goals/objectives
- Implementing and monitoring health policies, strategic plans, protocols, standards and guidelines set up by national in the region
- Planning and delivery of clinical interventions
 - Planning and management of public health programs in the region
 - Establishing effective mechanism for disease surveillance, prevention and control in the region
 - Strengthening public health action to reduce impact of emergencies and disasters on health in the region
 - Supportive supervision, monitoring and evaluation of program implementation
 - Human resource management (including staff welfare)
 - Transport, equipment and estates management
 - Data collection, analysis, reporting and feedback

Procurement and Supply Chain Directorate	1. Procurement Regulations/Standards Unit: The Unit develops and reviews the specific policies for the procurement activities of the Ministry. It designs and develops mechanisms, systems, plans and strategies; and is responsible for: • Maintaining and updating the procurement procedures including standard bidding document. • Executing procurement of goods, services and works of the Ministry. • Managing procurement through procurement Agencies. • Coordinating emergency procurement and donations. • Providing training and capacity building to procurement professionals in the Ministry • Advises on all procurement issues in the Ministry. 2. Central Medical Stores Unit: The Unit is responsible for: • Receiving stores and distributing goods meant for Agencies of the Ministry. • Monitoring the supply chain to ascertain timeliness and quality of goods.	GhanEPS (by PPA),
Christian Health Association of Ghana	• Provides health care to the most vulnerable and underprivileged population groups in all 10 Regions of Ghana, particularly in the most remote areas • Recognized Agency of the Ministry of Health and works within the policies, guidelines and strategies of the Ministry of Health (MOH) • Takes an independent position to advocate and promote improvements in the health sector and to promote the interest of its members and its target beneficiaries	Health Administration Management Information System (HAMS), ELIPSE

Many of these actors play roles across the E2E functional supply chain process groups, as well as across multiple commodity groups, not just FP, these functional and commodity responsibilities are outlined in Table 4. As depicted, most stakeholders and responsible parties across the FP supply chain also act as the procurement, warehousing, distribution, and dispensing agents across other commodities' supply chains in Malawi. Therefore, while Forecasting and Supply Planning responsibilities primarily rest with

the GHS FHD, opportunities to integrate and improve upon other process groups should be considered across commodities.

Table 4: Ghana Family Planning Stakeholder Commodity and Functional Role Summary

Family Planning Public Sector Stakeholders		
Stakeholder	Responsibilities across only FP commodities or integrated across all commodity groups?	Functional E2E Process
National Population Council	Integrated (Family Planning, MNCH)	• Forecasting and Supply Planning
Ghana AIDS Commission	Integrated (Family Planning, HIV/AIDS)	• Forecasting and Supply Planning
Ghana Health Service	Integrated	• Forecasting and Supply Planning • Warehousing • Distribution • Dispensing
Family Health Division (FHD)	Family Planning-specific	• Forecasting and Supply Planning • Warehousing • Distribution • Dispensing
Reproductive and Child Health Department (under FHD)	Family Planning-specific	• Forecasting and Supply Planning • Warehousing • Distribution
Supplies, Stores and Drug Management Division	Integrated	• Forecasting and Supply Planning • Warehousing • Distribution • Dispensing
National AIDS Control Program (under Public Health Division)	HIV/AIDS-specific	• Forecasting and Supply Planning • Warehousing • Distribution • Dispensing
Food and Drug Authority	Integrated	• Customs
National Health Insurance Authority	Integrated	• Dispensing
Regional Health Directorate	Integrated	• Warehousing • Distribution • Dispensing
Procurement and Supply Chain Directorate (TCMS + PPA)	Integrated	• Warehousing • Distribution • Procurement

Christian Health Association of Ghana Integrated

- Warehousing
- Distribution
- Dispensing

International Donors

Integrated

- Procurement
- Transportation, Customs, Warehousing
- Distribution

IHS

Integrated (USAID)

- Warehousing
- Distribution

Private Sector Overview

Private Sector Service Delivery Providers

Ghana's private FP health sector includes both NFP and for-profit service providers. The NFP sector includes hospitals and clinics run by NFP organizations, such as the Christian Health Association of Ghana (CHAG) or Bluestar (a Marie Stopes International (MSI)-funded project), as well as services intended to provide home healthcare in more remote regions in Ghana, such as Healthkeeper's Network or Healthy Entrepreneurs.

The for-profit private sector includes hospitals, health clinics, and retailers (such as pharmacies, chemicals sellers, or retail wholesalers).

Finally, while not commodity-providers, there are a number of mobile applications available to FP clients that ease the provision process, such as Hewale MedRx, No Yawa (another MSI project), or Talamus, which allows users to enter their location and find local retailers with the pharmaceutical product of their choice. Other applications, such as MPedigree, RxAll, and Sproxil allows users to scan app-specific barcodes to validate the quality of their product, enabling client-level track and trace for manufacturer-specific pharmaceuticals that have bought-into the applications' infrastructure. Finally, applications providing inventory and financial management services to private service delivery points are available and appear to provide services that would not traditionally be available to smaller shops.

Private NFP Hospitals, Clinic, Pharmacies, Service Providers

Healthkeeper's Network

Healthy Entrepreneurs

Christian Health Association of Ghana (CHAG)

Bluestar

Private for-Profit Hospitals, Clinic, Pharmacies

Private Hospitals

Licensed Pharmacy Stores and Licensed Chemical Sellers (LCS)

One-Stop-Shop Wholesalers

Social Entrepreneurial Applications (for clients)

Hewale, MedRx, No Yawa, Talamus, and Healthy Entrepreneurs; MPedigree, RxAll, Sproxil

Social Entrepreneurial Applications (for SDPs)

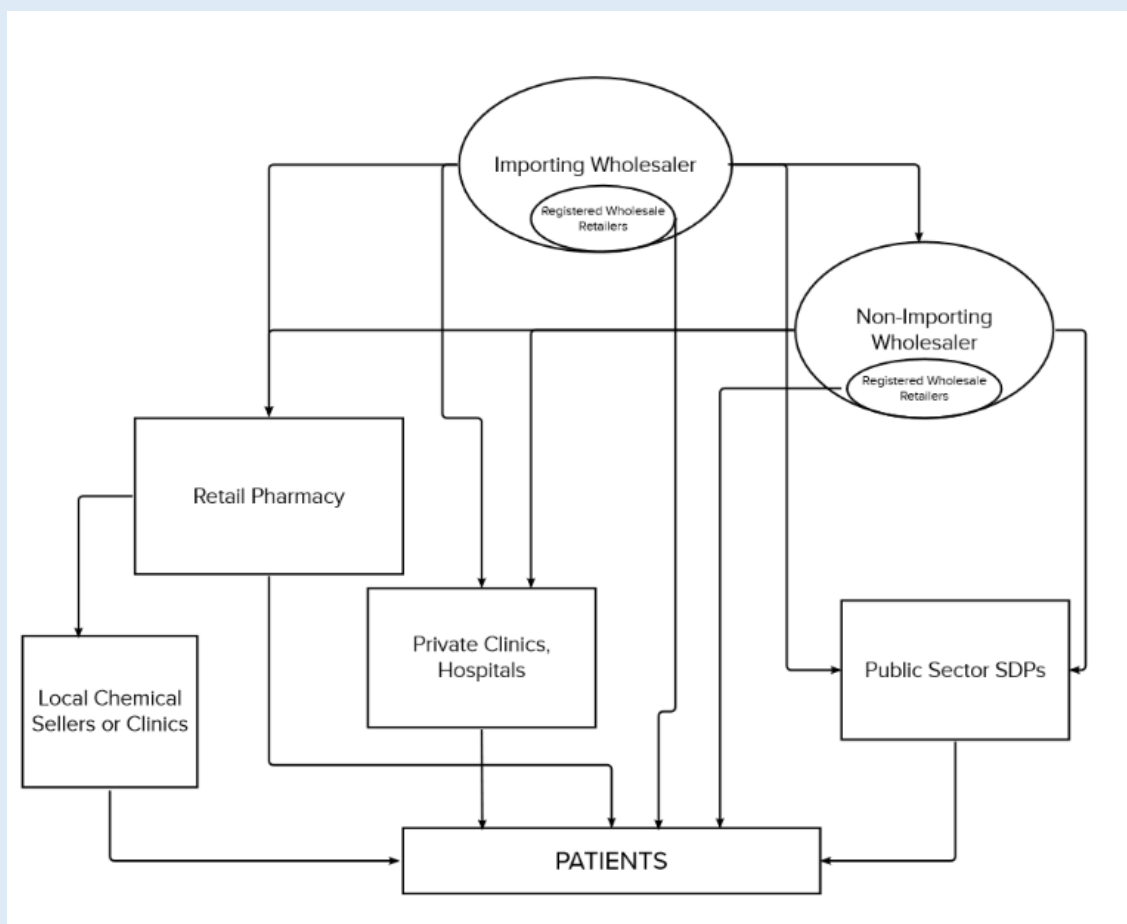
Hewale, Maisha Meds, MedBay, mPharma, Sumundi Ltd, and Zipline

Wholesalers

The wholesale market comprises thousands of actors who buy and sell FP products further downstream in Ghana. As there are no Ghanaian manufacturers of FP products, the farthest upstream Ghanaian wholesalers are those who import products. This small subset of wholesalers either act on behalf of a

manufacturer and/or they procure directly from the manufacturer to import goods. A small number of the importers are also licensed retailers, but most goods will be sold to non-importing wholesalers or retail pharmacies. Retail pharmacies, in turn, might sell to local licensed chemical and drug sellers.^{xxxv} In many cases, wholesalers will vertically integrate and have an import, wholesale, and retail business.^{xxxvi} As described above, many public sector SDPs will also procure direct from wholesalers when they are stocked out, Figure 9 depicts the flow of commercial commodities into Ghana.

Figure 9: Wholesaler Commodity Flow in Ghana



Ghana FP Digital Supply Chain Ecosystem

Public Sector Family Planning Digital Supply Chain Process Flow

Ghana's public sector supply chain is historically entirely paper-based and lacking in a centralized information system for supply chain data. In a robust undertaking, the GOG is conducting a massive overhaul of this manual system and employing a multi-year, phased implementation of a central LMIS, GhiLMIS. While GhiLMIS aims to replace the multiple manual processes and provide data access and visibility unlike ever before, integration across data sources and training is ongoing and the extent to which GhiLMIS is adopted and its functionalities utilized is to be determined.

A Glossary of the systems employed by these key stakeholders is represented in Table 5.

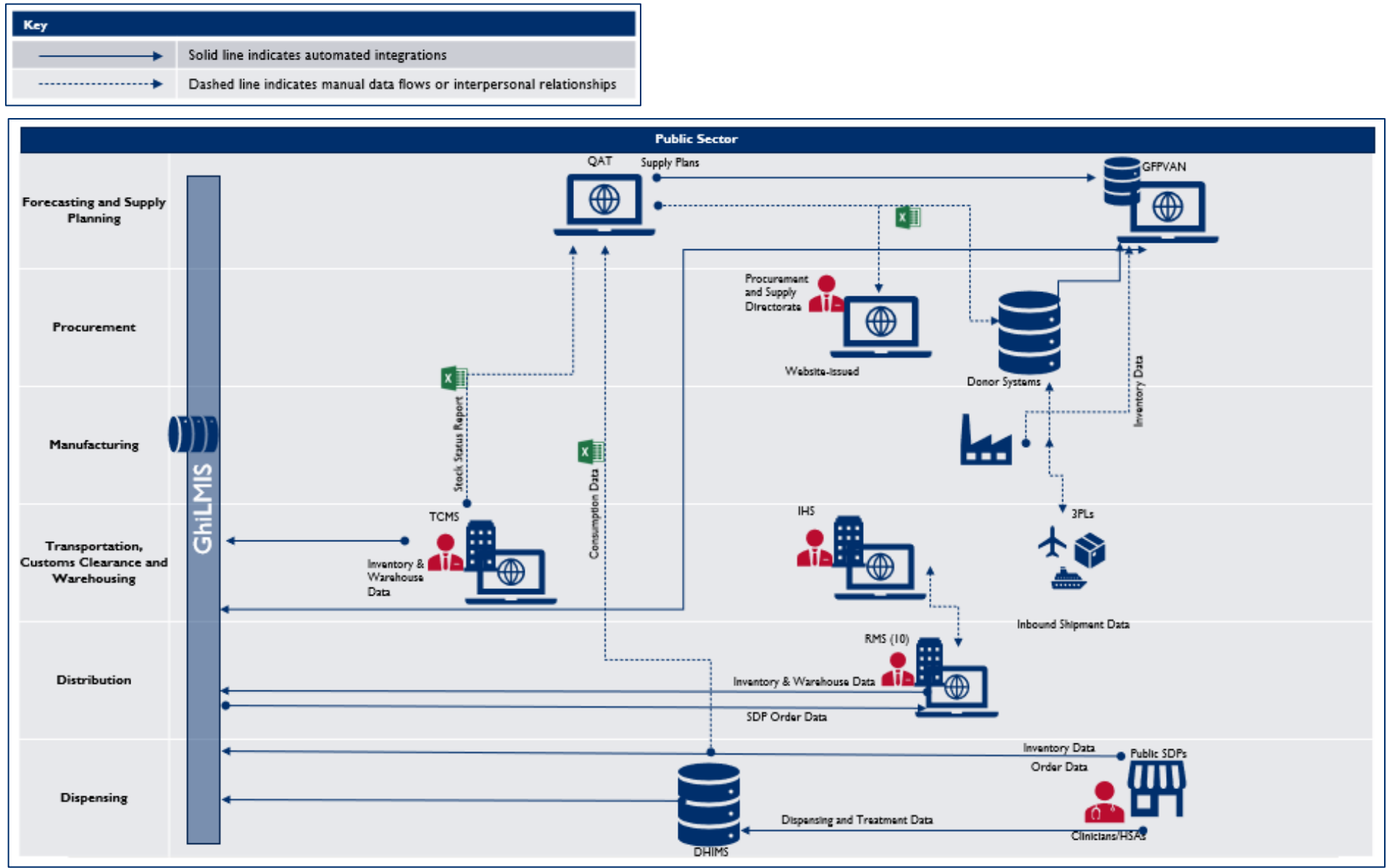
Table 5: Ghana Public Sector Family Planning Supply Information Systems

Public Sector Family Planning Supply Information Systems					
Information System	Description	Functionality	Owner Funder	Data Types	User Organization
GhiLMIS	Centralized government logistics management information system. A list of GhiLMIS-generated reports and capabilities is included in Annex D.	• Demand Sensing • Replenishment Planning • Predictive logic for forecasting inventory and procurement planning • Warehouse Management • Receipt and Put Away • Pick and Pack • Pick List Generation • Stock Taking • Capacity Management • Inventory Management • Lot Management and Tracking • Consumption, Transfers and Adjustments • Quarantine and Recalls • Transportation Management • Receipt and Put Away • Pick and Pack • Pick List Generation • Stock Taking • 3PL Management • Purchase Order Management • Purchase Order Creation • Purchase Order Collaboration • Purchase Order Fulfillment • Reverse Logistics • Visibility and Analytics • End to End Visibility • Track and Trace • Predictive and Historic Analytics • Contracts Management	MOH	• Order Data • Warehouse & Inventory Data • Contract Data • Vendor Data • KPI Data • Transport Data	• TCMS • RMS's • Health Facilities

		- Carrier Contracts - Fleet Management - Invoicing Policies - Rate Determination • In Bound Insights - Procurement Plans - Incoming Shipments - Predictive Analytics			
QAT	Supply Planning for all program products	• Plan optimal procurement and shipment schedules for commodities	GHSC-PSM	• Consumption forecast • Shipment lead time data	GHSC-PSM *QAT is fed into the VAN
VAN	Control Tower operation for global visibility into FP commodity flows	• E2E visibility • Collaboration (supply planning, action and ticketing)	MOH RHSC	• GhiLMIS Inventory and consumption data • QAT Supply Plans, • UNFPA, Global Fund, and USAID order and shipment data	• MOH • TCMS • UNFPA • USAID • SMOs
DHIMS	Patient treatment and health surveillance system	• Local system name for DHIS2 • Configured to capture aggregate data, and has data entered directly at the facility level • Currently available to all health facilities and service delivery points in 216 districts	MOH Global Fund	• Treatment data as consumption data	• SDPs
GHANEPS	Public Procurement Authority e-tendering platform/website	• User registration • Tender notification • Tender preparation and submission, online tender evaluation • Contract awarding • Creation and management of catalogue • Creation and management of framework agreements and auctions and payments	GOG	• Allocations • Vendor Data • Evaluation Criteria • Contract Data • Catalog Data	• PPA
HAMS	Health Administration Management Information System	• Stock and inventory management	CHAG	• Inventory data	• CHAG

These actors and systems have been mapped against the end-to-end supply chain processes in Figure 10.

Figure 10: Ghana Public Sector Digital FP Supply Chain Process and Architecture Swim Lane Diagram



Public Sector Dispensing Process

The dispensing process group in the public sector includes dispensing of FP commodities to clients via public sector SDPs. Upon dispensing treatments and products, clinicians enter treatment data directly into DHIMS. This platform is internet-based, therefore in some instances data is not entered in a timely fashion, if at all, due to poor internet connections.^{xxxvii} Treatment data is aggregated to case management data in the national-level HMIS. This treatment/consumption data becomes an input to the Forecasting and Supply Planning process.

SDPs are also responsible for inputting their inventory data directly into GhiLMIS. As of September 2021, all hospitals and health facilities have been trained in GhiLMIS. Trainings for the remaining CHPS compounds are schedule to begin in early 2022, after which point the FOC will be considered complete. As of September 2021, the GhiLMIS replenishment engine is not operational, and as such, SDPs must also create and enter POs in GhiLMIS in order for RMSs to approve and issue stock to SDPs.

Finally, SDPs are responsible for closing out item/batches received and marking them as dispensed in GhiLMIS. However, GhiLMIS implementors note that this process is not completed on a regular basis. Therefore, items/batches show as received by SDPs, but do not show as dispensed. While GhiLMIS implementors are working with SDPs with compliance issues to improve data recording, real limitations, like internet connectivity, prevent some SDPs from doing so.^{xxxviii}

Dispensing Digital Health Maturity Challenges

1. **Data Timeliness:** Prior to the rollout of GhiLMIS, reports suggested that many SDPs maintained manual logs of dispensations, instead of direct uploads to DHIMS, due to unreliable internet connectivity. Inventory and stockkeeping remained manual until the GhiLMIS implementation. And while GhiLMIS now offers a centralized inventory management platform, connectivity issues persist. A 2018 study of 435 public, for-profit and NFP SDPs in Northeast Ghana suggested that “more than half (226; 52%) of the providers had reliable Internet connectivity, and 176 (41%) used computers or tablets to manage their data.”^{xxxix}
2. **Data Quality:** The manual stockkeeping mentioned above and lack of access to regular reporting has resulted in “information coming from lower levels on stock status [to be] incomplete, unreliable, and delayed,”^{xl} according to Ghana’s CIP. While access to an inventory management platform like GhiLMIS may improve data compliance and fidelity at SDPs, the impact of the GhiLMIS implementation remains to be seen.

Table 6: Ghana Public Sector Dispensing Data and Platforms

Dispensing Data Outputs		
Data	Data Type	Data Enterer
Treatment Data	Raw data input during operations	Clinicians
Consumption Data	Derived in DHIMS from treatment data inputs	Case Managers
Inventory Data	Stock data input	SDPs

Order data	Entered as POs into GhiLMIS	SDPs
Dispensing Platforms		
Platforms	Data Inputs	Users
DHIMS	Treatment data	Clinicians, SDPs
GhiLMIS	Inventory Data	SDPs, MOH
HMIS	Treatment data	Case managers

Public Sector Forecasting and Supply Planning Process

Ghana's Reproductive Health Quantification Subcommittee produces annual quantifications for FP commodities primarily using consumption and inventory data. Given universal use and access to GhiLMIS is still pending, national quantifications are still conducted using manual inputs. Consumption data is pulled from DHIMS and inventory data is provided via excel from TCMS, RMSs and IHS. Supply plans are developed and validated automatically using QAT and are informed by international donor, SMOs and government logistics data on incoming shipments. These aggregations are automated through the VAN, which integrates data from GhiLMIS, QAT, SMOs, UNFPA and USAID. Pending integrations with select contraceptive manufacturers will also supplement data from the VAN.

Forecasting and Supply Planning Digital Health Maturity Challenges

1. **Sub-National Level Capacity:** Reports indicate that while central-level forecasting and supply planning is not a challenge for Ghana, FASP processes further downstream in the supply chain suffer from a lack of capacity and skills in this expertise.^{xli} This is in line with findings from Ghana's NSCA, which demonstrates Ghana's FHD FASP capability score is 68%, while regional and teaching hospitals and RMSs hover around 40-45%.^{xlii}

Table 7: Ghana Public Sector Forecasting and Supply Planning Data and Platforms

Forecasting and Supply Planning Data Inputs			
Data	Data Type	Data Enterer	
Consumption Data	Derived in DHIMS from treatment data inputs	Case Managers	
Inventory Data	Raw data input during operations, Excel	TCMS, RMSs, IHS	
Forecasting and Supply Planning Digital Platforms			
Platforms	Data Inputs	Outputs	Users
DHIMS	Consumption Data	N/A	Clinicians, SDPs
Manual Inventory Statuses	Inventory Data	N/A	National- and regional-level medical stores
QAT	Consumption Data Inventory Data	Validated supply plans; scenario plans	Ghana MOH GHSC-PSM FO

VAN	Supply Plans (QAT); GhLMIS; Procurement Data (Donor, MOH, SMO order integrations)	Global planning	Ghana MOH TCMS GHSC-PSM FO UNFPA
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Contraceptive commodity security is reviewed on a regular basis. The ICC/CS acts as a national-level commodity security body. It includes SMOs, NGOs, International Donors, the Ministry of Health, and the Temporary Central Medical Stores. The committee is both a disseminator of strategy and policy (such as the *National Reproductive Health Commodity Security Strategy*), as well as the body that receives Commodity Procurement Tables (CPTs) and determines financial and commodity requirements for Ghana's short and long-term FP needs.^{xliii} Aside from NFP private sector groups, like SMOs, for-profit private sector members are not a part of this coordinating committee.

Table 8: Ghana Interagency Coordinating Committee for Contraceptive Security Members

Interagency Coordinating Committee for Contraceptive Security Chaired by: National Population Council		
Government of Ghana Entities	Local Organizations and Service Providers	International Donors/Organizations
National Population Council	TFHO	USAID
Family Health Division	DKT	UNFPA
Procurement and Supply Directorate	MSI	Catholic Relief Services
Ghana AIDS Commission	PPAG	
National AIDS Control Program	Muslim Counseling Services	
Office of the Chief Pharmacist	Healthkeeper's Network	

Public Sector Procurement Process

At present, procurements are conducted by the proprietary systems of each donor. While the GOG established a Public Procurement Authority (PPA), this office guides procurement of all commodities, not just pharmaceuticals;^{xliiv} therefore, procurement of pharmaceuticals is notionally handled by the Procurement and Supply Chain Directorate (PSCD) of the MOH. As the GOG does fund and procure a small amount of FP commodities as previously described, these commodities and those funded by WAHO are procured by Ghana's PSCD. Though Ghana's NSCA reports that Procurements outside of these main mechanisms do occur; RMSs and lower-level district facilities obtain supply through the private sector when stockouts occur and at most, of commodities available at public sector SDPs, up to 80% could have come from the private sector.^{xliv} However, Ghana's FHD has confirmed that this is not the case for FP commodities, which are all procured at the central level.^{xlvi}

Ghana's FHD does have access to Donor order data via the VAN; FHD uses this access and data to determine if any adjustments to inbound orders need to be made, such as delaying orders to prevent overstocks, or expediting others where low-stock situations might occur.

Digital Health Maturity Challenges

1. **Decentralized Procurement:** Ghana's Supply Chain Master Plan (SCMP) recommended reducing the number of procurement actors in 2015 and limiting this to a yet-to-be-developed Supply Chain Management Agency (SCMA) to improve organizational efficiencies and reduce parallel and uncoordinated activities.^{xlvii} This has not occurred and procurements across the GOG continue to be carried out by a range of actors. In the public health supply chain space, these actors, including MOH and GHS HQ, which procure FP commodities, as evaluated by the NSCA all scored in the mid-60% range, but none met the 80% recommended threshold.^{xlviii}
2. **Lack of Digital Procurement Platform:** Though the PPA does have a proprietary digital procurement platform, called Ghana Electronic Procurement System (GhanEPS), which offers e-tenders, online evaluations, contract creation, etc., the MOH does not appear to use this system for pharmaceutical procurements.

Table 9: Ghana Public Sector Procurement Data and Platforms

Procurement Data Inputs		
Data	Data Type	Data Enterer
Supply Plans	Allocations	Procurement Agents
Procurement Digital Platforms		
Platforms	Data Inputs	Users
VAN	Donor, MOH, and SMO Order and Shipment Data	FHD, TCMS, UNFPA, USAID, GHSC-PSM FO, PPAG, MSI
GhanEPS	Allocations, Vendor Data, Evaluation Criteria, Catalog Data, Contract Data	GOG PPA (not for pharmaceutical use)

Procurement agents commit funds to a finite number of international manufacturers. While there is a robust local pharmaceutical manufacturing industry in Ghana, FP commodities are not yet produced domestically. The overarching universe of manufacturers who produce FP commodities includes two smaller subsets of manufacturers identified in the Ghanaian market: 1. The brands, and corresponding manufacturers, produced for SMOs and found in NFP private SDPs; and 2. Manufacturers/brands found in Private-sector SDPs as reported by local researchers.^{xlix} Refer to Annex B for the Venn diagram relationship between these manufacturers.

Social Marketing Manufacturers/Brands	Kiss Condoms (DKT), Fiesta Condoms (DKT), Microgynon (PPAG, Bayer) Jadelle (PPAG, Bayer), Norigynon (PPAG, Bayer), Lydia (DKT, Mylan), Protector Plus (PSI), Ebony, <i>under development</i> (TFHO, Suretex)
Manufacturers/Brands	GreenPostinor2 (Gideon Richter),

found in Private Sector SDPs	WhitePostinor4 (Gideon Richter), Depo Provera (Pfizer), Be Safe Condom (Karex)
International Family Planning Manufacturers	Cupid, Incepta Pharma, Techno Drugs, Merck, CR Cizhu, Helm MG, SMB, Female Health Company, PT Tungal, Pregna, Cipla, Shanghai Dahua, Medicines360

Public Sector Transportation, Customs Clearance, and Warehousing Process

Ghana's public-sector FP commodities run through multiple parallel supply chains, as summarized in Table 10 below:

Table 10: Commodity Warehousing and Distribution Parallel Supply Chains in Ghana

Funder	Warehouse	Destination
MOH	TCMS	Public Sector health facilities
USAID	IHS	Public Sector health facilities
USAID	SMO Warehouses	Public and Private health facilities
UNFPA	TCMS	Public Sector health facilities
All	TCMS	CHAG facilities

From manufacturers, commodities are transported by manufacturers themselves, or by the procurement agents through 3PLs to Ghana's national level medical stores. Ghana's FHD has access to inbound shipment data via the VAN.

An important aspect of the importation process is the financial and quality clearance of FP commodities. Three broad challenges have been identified for public-sector procurements:

- **Duty Waivers:** Commodities imported as donations undergo long-lead times to receive duty waiver exemptions from the Ghana Revenue Authority. This can significantly slow the import process.
- **Quality Testing:** While Ghana's FDA maintains random batch testing of pharmaceutical products upon import, condoms are regularly tested. This process can take months to clear the FDA, resulting in excessive storage times prior to distribution.ⁱ
- **Product Registration:** Importers alike have described difficulties obtaining product registration waivers in order to import FP commodities; Ghana's FP CIP outlines how "facilities have faced artificial shortages due to an inability to finish the formal paperwork processes in a timely manner between the start of the process and completion; in some cases, completing paperwork for various processes within FDA has taken up to two years."ⁱⁱ

Upon customs clearance, goods are directed to one of two warehouses, as described in Table 10 above: IHS, where USAID’s donated commodities are delivered, or to TCMS, where GOG-procured, other donors’ and even private sector commodities are delivered. Upon delivery, TCMS uses GhiLMIS as its warehousing and inventory management platform. Goods are received in GhiLMIS and can be promised to various RMSs before being picked and packed based on batch number. This is a new process that accompanied the GhiLMIS implementation, and while TCMS staff initially complained of batch-picking taking longer than the paper-based system, GhiLMIS trainers/implementers state that this best practice is regularly used.^{lii} IHS’s warehouse management system is being integrated with GhiLMIS at the time of writing. Commodities from both TCMS and IHS are distributed to Ghana’s ten RMSs. The RMSs also use GhiLMIS for warehousing and inventory management. GhiLMIS tracks down to the item and batch number, allowing for visibility of commodities from receipt at TCMS through distribution from RMSs.

Digital Health Maturity Challenges:

1. **TCMS Capability Maturity:** Ghana’s TCMS is a “temporary” warehouse, to serve in place of the CMS, which was destroyed in a fire in January 2015. For this reason, the TCMS does not play the role of a typical CMS, as described in Ghana’s NSCA, TCMS’s temporary status has pushed some typical CMS duties to IHS and the RMSs.^{liiii} While the GhiLMIS implementation will replace TCMS’s paper based LMIS, it has not developed new processes that address this misdistribution of roles and responsibilities.

Table 11: Ghana Public Sector Transportation, Customs and Warehousing Data and Platforms

Transportation, Customs Clearance, Warehousing Data			
Process	Data	Data Source	Data Enterer
Transportation, Customs Clearance	Shipment Data and Customs clearance event data	VAN	USAID, UNFPA, Global Fund
Customs Clearance	Customs documentation (paper-based)	Customs Clearing Companies	Customs Clearing Companies
Warehousing	Receiving and Dispatching Data Stock, product, location, expiry, batch number, etc..	GhiLMIS	TCMS
Warehousing	Stock, Product, Picking/Packing Data	TBD	IHS
Transportation, Customs Clearance, Warehousing Platforms			
Platforms	Data Inputs	Users	
GhiLMIS	Receiving and Dispatching Shipment Data; Stock/Inventory Data	TCSMS	
TBD	Inventory, Product, Picking/Packing	IHS	

Data		
VAN	Inbound Shipment Data; Stock/Inventory Data	FHD, TCMS, UNFPA, USAID, GHSC- PSM; PPAG, MSI

Public Sector Distribution Process

Distributions from the central to regional levels were historically delayed frequently resulting in RMSs sending transports to pick up their stock.^{lv} However, USAID and UNFPA began funding bimonthly deliveries from TCMS and IHS in 2019, resulting in more regular and timely mid-level distributions. From these ten RMSs in Ghana, all distributions to public SDPs are made. Given the GhiLMIS implementation, SDPs are responsible for entering orders directly into GhiLMIS in order to receive replenishment orders. GhiLMIS is used by the RMSs to manage scheduled deliveries, which occur on a monthly or bimonthly basis. RMSs may approve or reject the requests by SDPs based on stock minimum/maximum levels, consumption, and product availability. GhiLMIS's replenishment engine will automate this process, deriving orders from SDP inventory levels, upon its rollout.

Last-mile distributions (LMD) to SDPs were also historically plagued by frequent delays due to poor operational and schedule management, but the NSCA reports these have been streamlined and are operating smoothly.^{lv} Further, GHSC-PSM's Costing Study on LMD in Ghana finds that "post-LMD (3PL scheduled delivery) number of stockouts and duration stocked out are 40% and 33% lower than pre-LMD, with significant post-LMD advantage at the CHPS."^{lvi} While this is the case across a sample of commodities across the entire health spectrum, family planning commodities represented in the study did not appear to fair as well, and still showed high-levels of stockouts after LMD implementation. More research to understand these stockouts is underway as well as a long-term understanding of how the GhiLMIS implementation will optimize these scheduled deliveries.^{lvii}

Digital Health Maturity Challenges

1. **GhiLMIS Implementation is Untested:** While many issues related to distribution capabilities, such as lack of system capabilities to track transportation data, PODs, and KPIs,^{lviii} *should* be resolved given the GhiLMIS implementation, the system remains untested in practice. The success of the implementation for basic system training and use for existing supply chain functions and processes, as well as compliance to new processes and data entry remains to be seen.

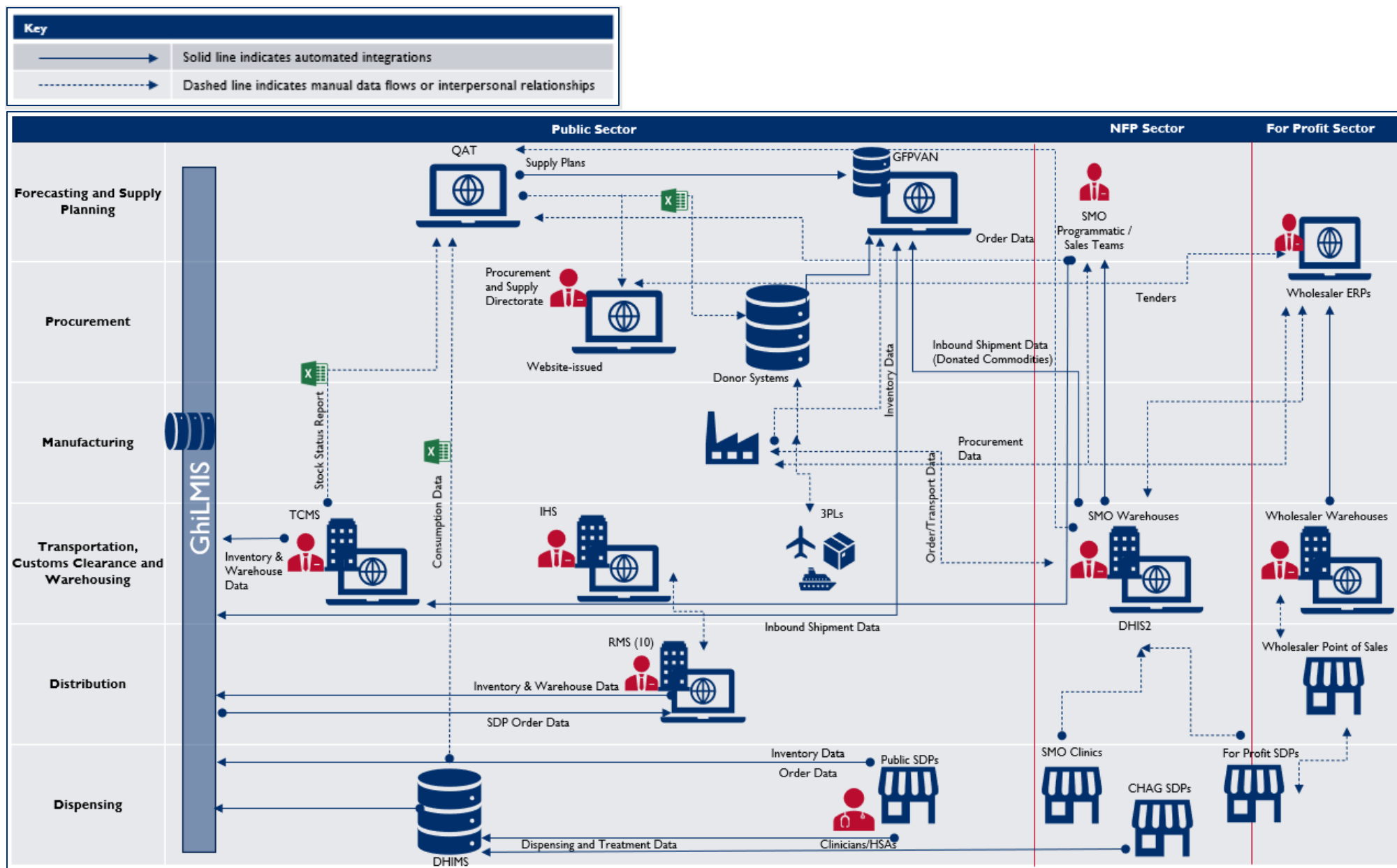
Table 12: Ghana Public Sector Distribution Data and Platforms

Distribution Data Inputs		
Data	Data Type	Data Enterer
Order Data	Purchase orders	SDPs
Distribution Digital Platforms		
Platforms	Data Inputs	Users
GhiLMIS	Order data	SDPs, RMSs

Private Sector Family Planning Digital Supply Chain Process Flow

Private sector members of the FP supply chain ecosystem are broken down into two primary groups: NFP, including SMOs and their respective clinics, as well as CHAG, and For-Profit, namely wholesalers, retail pharmacies, and private clinics/hospitals. As described previously, while the NFP sector plays a critical role in service provision, technical assistance and commodity dispensing, the for-profit sector operates and manages almost entirely separate supply chains. Both NFP and for profit E2E processes are mapped in Figure 11, demonstrating non-uniform information-sharing and integrations between public and private sectors.

Figure 11: Ghana FP Digital Supply Chain Ecosystem Data and Process Flows (current as of September 30, 2021)



Not-for-Profit Sector

The NFP sector in Ghana is comprised of SMOs and CHAG. Both actor groups receive donated commodities from the public sector in addition to conducting their own procurements.

SMO Digital Supply Chain Process

SMOs in Ghana take on one or more of several different roles in the FP ecosystem; they may act as a conduit for donated commodity distribution, or procure and import their own branded commodities, or operate their own SDPs.

Forecasting and Data Sharing

SMOs, whether receiving commodities directly from the public sector or not, are a part of the quantification and biannual supply planning efforts conducted by the MOH. Additionally, some SMOs are providing and receiving supply plans and order/shipment data on commodities where they coordinate with the MOH (MSI and PPAG). Others, like TFHO, provide and receive data on an ad hoc basis and are looking to integrate their own distribution platform (DHIS2) with Ghana's DHIMS to provide regular reporting. TFHO reports that these biannual meetings and ad hoc requests are the only means of visibility they have into public sector demand.

Procurement, Distribution and Dispensing

Depending on these roles, SMOs procure and receive FP commodities through the distribution channels outlined below.

Donor-Funded: During national quantifications, allocations to SMOs are decided and data inputs on SMO consumption are shared with the public sector. Procurement, Transportation and Warehousing are all managed by the donor importing the product, and SMOs are alerted when goods arrive so that they can pick-up product from central warehouses.

Direct Procurement: Most SMOs also conduct their own procurements of FP commodities for private distribution, some of which might be SMO-specific brands. For these instances of direct procurement, SMOs have relationships with manufacturers and handle the importation process themselves. Some SMOs maintain largescale distribution networks responsible for distributing certain volumes of goods to for-profit SDPs over the course of the year. As private SDPs do not report treatment or consumption data into DHIMS, this data is not captured during quantification efforts.

Regardless of funding source, SMOs maintain their own warehouses for distribution and therefore, their own warehousing and inventory management platforms.

CHAG Digital Supply Chain Process

Ghana's MOH describes CHAG as one of its agencies bound by GOG "policies, guidelines and strategies"^{lix}; however, it is independently operated and managed. CHAG manages 344 health facilities, which serve Ghana's poorest population. CHAG receives FP commodities from the public sector,^{lx} and therefore, does not conduct any direct procurements, importations or warehousing. Once commodities are received, a PATH report highlights that "CHAG health facilities manage their inventories using other

digital platforms such as the Health Administration Management Information System (HAMS) or ELIPSE, which do not interoperate with GHiLMIS and have different functionality;^{lxi} however, CHAG facilities are responsible for providing dispensing and treatment data to DHIMS.^{lxii}

For-Profit Sector

Wholesalers

Ghana has a robust wholesale market, which feeds a private sector supplying a significant portion of FP commodities to clients. Importing wholesalers procure directly from international manufacturers and distribute and resell several times over until goods reach consumer retailers. Larger wholesalers act as agents for manufacturers to usher them through the registration and importation processes, while others have less well-established relationships with manufacturers, buy on credit, and experience longer lead times and less competitive pricing.

Wholesalers receive demand signals from their clients, (for example, based on retail sales or stockouts at public sector SDPs), coupled with their own supply challenges (profit margins, import tariffs, distributions costs) to determine how much to procure. Ghanaian wholesalers have traditionally played a smaller role in the FP ecosystem, than other health commodity groups, given the lower profit margins on FP products and their no-cost status in the public sector.

Wholesalers of FP products in Ghana face a number of unique challenges given the import-only status of the products and the highly subsidized public sector.

For-Profit Private Sector Challenges

- Importing wholesalers report high import tariffs and pharmaceutical registration costs make imported medicines prohibitively expensive.^{lxiii}
- FP products are offered at no- or low-costs in the public sector; to compete, wholesalers must employ extremely low profit margins to be competitive.^{lxiv}
- Wholesalers must have capital to fund distribution networks (delivery to their clients and funding their own regional warehouses) to remain competitive.^{lxv}
- Fragmented market share amongst hundreds of wholesalers and thousands of distribution channels makes regulation difficult and quality assurance impossible.
- Wholesalers without deep relationships with international manufacturers must take out expensive lines of credit to fund their procurements.^{lxvi}

On the digital front, Ghanaian wholesalers interact with their private clients, NFP entities (such as SMOs) and the GOM, to conduct demand and supply planning.

- **Private Clients:** Wholesalers garner most data for forecasting and supply planning from historical sales to their clients, which are stored and analyzed using wholesaler-specific ERPs. Most wholesalers procure based on these sales and store product in local warehouses, and then use other importing wholesalers as a source of products if and when clients have demand that exceeds their stock or lead times.
- **MOH/GHS:** Though rare, the MOH and GHS do issue tenders for FP products, to which wholesalers reply. There is little information sharing outside of the tender process itself, so some wholesalers will proactively procure based on historical tenders so that their lead times

can be competitive in the event a tender is issued.^{lxvii} Wholesalers have reported that market prices have to be reduced in order to be cost-competitive in public sector tenders. Additionally, their reports indicate that the MOH/GHS institutions are not prompt in payment after award.^{lxviii}

Wholesaler Digital Health Maturity Challenges

1. **Data Access:** Wholesalers are excluded from public sector information-sharing platforms. Though wholesalers do use inventory management systems, they are unique to the individual actors. Most wholesalers utilize historical sales data to forecast and supply plan. Additionally, large wholesalers could be purchasing market data through services such as IQVIA but are more likely to use their own data based on buying and consumption patterns.
2. **Poor Private SDP Reporting Compliance:** Public sector health facilities are responsible for reporting their inventory data to GHiLMIS and clinicians share their dispensing data (to be aggregated as consumption data) to DHIMS2. Private sector SDPs do not contribute to these public platforms but do use their own systems to manage inventory. Although the country's health information policy requires the capture of private sector, public sector, and community-based data, regions and districts appear not to adhere uniformly to this practice, resulting in incomplete data capture, difficulties in logistics forecasting and procurement, and marked differences in performance recorded by routine data and surveys.

Table 13: Exemplary Wholesaler Datasets and Platforms in Ghana

Wholesaler Data & Platforms		
Data	Data Source	Platform Example
Demand Data	Historical Sales Data and Consumption	Info-Source, Wholesaler ERPs
Demand data from MOH	Public solicitations	MOH/GHS website

Data Sharing Sentiments

Wholesalers generally have broad incentives to seek access to more data (such as public sector consumption, supply plan, or stock data), and have historically engaged in data sharing agreements. One wholesaler noted having shared data with IMS (now IQVIA) in order to receive total market data in exchange, in order to better understand their market position.^{lxix} More research to determine the viability of data sharing partnerships with the public sector should be conducted if there is interest in incorporating for-profit entities into public sector data sharing platforms. Key incentives are listed below:

- **Access to Demand Data:** As wholesalers are entirely excluded from the FP public sector digital supply chain, any access to demand and consumption patterns for private sector entities is valuable. Wholesalers have stated this enables more targeted FP interventions, be they geographic- or product-specific and ensure ready access to FP commodities.
- **Access to Public Sector Policies:** Wholesalers are lacking information regarding public sector policies and resource distribution to understand how the FP commodity market is shifting in

upcoming years. As wholesalers provide a large proportion of OTC oral contraceptives and condoms to FP clients, they also noted being able to offer similar insights into market trends, which may not already be apparent to the public sector.

Social Entrepreneurs

Ghana is unique in that it also has several social entrepreneurial groups that have developed applications intended to share data and services with clients and SDPs. These applications tout that their ability to offer procurement, inventory, and dispensing management capabilities. Finally, Track and Trace mobile applications integrate the client into the information sharing network, by making available pharmaceutical product quality and origin information. However, this data is only available as select manufacturers buy-into the mobile applications' scheme and data flows between manufacturers and the applications themselves are established.

These applications are broken down into three main categories:

Inventory and Financial Management Mobile Applications	Hewale, Maisha Meds, MedBay, mPharma, Sumundi Ltd, and Zipline
Track and Trace Mobile Applications	MPedigree, RxAll, Sproxil

- **Product-Client Mapping Applications:** Clients can search for the pharmaceuticals they need and locate the nearest SDPs where they can find them.
- **Inventory and Finance Management for SDP Applications:** These applications are built for SDPs to search for products to procure, manage their finances and inventory.
- **Track and Trace:** These applications interface with manufacturers to add application-specific barcoded labeling to pharmaceuticals so that clients can scan products upon receipt to determine their quality and validity. Some of these applications have been endorsed by Ghanaian governmental organizations and professional associations.

These applications, in addition to providing services, are also an untapped source of dispensing and procurement data inaccessible to public sector information platforms.

VAN Role in the Current Digital Ecosystem

Background and Adoption

Initial steps to onboard Ghana to the VAN began in September 2019 with a stakeholder meeting with Ghana's MOH; The conversation focused on the VAN's added value in line with the plans for launching GhiLMIS, i.e., how they can complement one another, how Premium membership in the VAN offers the opportunity to integrate FP data in one place, streamlining uploading, analysis and planning. Ghana was a leader in their desire to integrate and harmonize multiple data streams. The MOH agreed to use the VAN for upstream inbound visibility of incoming orders and shipments, sharing of inventory status and collaborative supply planning, while exploring opportunities for a future interface with GhiLMIS. The information provided here reflects feedback from stakeholder discussions and desk research.

The VAN is a supply chain networking platform where members (e.g., country governments, manufacturers, donors, and other trading partners) can assess and prioritize supply needs and act when supply imbalances materialize. Within the platform, members share their order, shipment, inventory and/or supply plan data and can work together to resolve supply chain inaccuracies, answer questions, and make decisions. Currently, there are more than 97 member institutions sharing their contraceptive supply data within the VAN, including 34 LMICs. More information on the VAN can be found at www.rhsupplies.org/gfpvan

Following Ghana's onboarding and training in January 2020, user adoption of the system was successful. The trainings were well attended, use of the VAN prior to trainings happened quickly, and there seemed to be a strong sense of ownership of the VAN from the start. The VAN demonstrated two primary use cases for Ghana at the time:

1. **Increased Donor Visibility and Collaboration:** Use of the VAN and automated data feeds from GHSC-PSM and UNFPA order and shipment data offered an automated mechanism for visibility and collaboration between international donors and in-country stakeholders for the first time. Users agreed that having one source for reliable data upon which planning could occur and decisions be made was vital to improving existing processes.
2. **Digitization of Manual Processes:** Ghana FHD's forecasting and supply planning processes largely incorporated data from a broad swath of in-country actors (MOH, SMOs) and international donors prior to their membership in the VAN; however, data sharing amongst actors was conducted manually, but not necessarily as frequently as some partners might have preferred, and aggregation and validation of the data was done manually. The VAN automated validation and access to donor order and shipment data for FHD. It allowed in-country partners to have access to data without needing to request it, rather than having to wait for the time-consuming manual processes that existed prior. Furthermore, it regularized data reviews prior to uploads of stock data, prompting interventions where necessary.

Though SMOs in Ghana were included in the original stakeholder sessions for VAN adoption, their inclusion in the platform did not come until later in 2020. MSI and PPAG were granted access and began regular data uploads to the VAN in March and June 2021, respectively.

As was intended from its inception in Ghana, the VAN began the process of automating stock data feeds with GhiLMIS, and the integration went live on June 2021. At present, the GhiLMIS integration includes central-level inventory data from TCMS. Data from IHS and subnational levels are still pending integrations to GhiLMIS itself.

User and Functionality Deep Dive

At present, Ghanaian VAN users are engaged in several key functionalities, including validating forecasting and inventory data, scenario planning based on what-if consumption scenarios and reconciling action request tickets. With Ghana's Premium membership in the VAN, users are beginning to review their supply plans, integrate GhiLMIS data, regularly work with the VAN Analyst to streamline their processes and maximize their use of the VAN. A list of Ghana's user groups and their key functionalities in the VAN are in Table 14.

Some *key value propositions* of the VAN in Ghana, as described by users in the Ghana Health Services, are below.^{box} See Annex G for VAN successes in Ghana.

- **Data Visibility:** The VAN provides visibility into inbound shipments and manufacturer delays and enables planners to expedite or delay specific shipments as necessary. As previously described, the VAN brought visibility to sectors of the donor community where data sharing was lacking and consolidated inbound shipments into one view.
- **Data Validation:** Prior to the GhiLMIS integration, GHS users were validating data prior to uploading it into the VAN. This was to ensure accuracy and reduce the likelihood of tickets being raised. Now that GhiLMIS data is automated through an integration, GHS users are validating data that flows on a regular basis as data comes in. While GHS users have noted that Data Validation Requests and Tickets have increased given the integration, this validation is processed within the VAN instead of manually completed. It also ensures the root cause of the data issue is addressed and revised and not just revised in an excel spreadsheet. This has instilled a culture of meticulous data cleansing and accuracy.
- **Insights on and for Country Interventions:** While GHS users primarily use GhiLMIS for specific stock levels at facilities and granular information, they do use the VAN to see an overarching picture of how the country is performing from a contraceptive security perspective. As previously noted, while necessary supply chain interventions (redirects, shipment delays, redistributions) may have been identified using data manually prior to the GhiLMIS integration, these interventions can be identified easily in the VAN's multi-collab view where central-level stock statuses and inbound shipments are aggregated.

Additional Value Propositions:

In-Country Partner Coordination: While Ghana stands out as a country with a high level of partner coordination, led by the MOH, and the success of the integration to date of the VAN largely benefited from this established practice, the VAN has helped streamline coordination further through consolidation of the multiple data sources into one platform for all to see.

Table 14: Ghana VAN User Groups, Features and Adoption

VAN User Groups, Features and Adoption		
User Agency/Department	Description	Use Level
Family Health Division, Ghana Health Services	• Ownership of VAN membership • Expressed desire to champion the VAN in Ghana • Leads in-country processes and activities: Data	High

	- validation. • Respond to Action Request Tickets (ARTs) and Data Validation Tickets (DVTs) • Attends VAN country meetings when scheduled • Coordinate Regularly with VAN Planner	
Central Medical Stores	• Does not use in-system ticketing • Provides monthly stock status reports to the GHS. • Responds to Data consistency issues	Low
UNFPA	• Collaborates with the GHS on supply planning and commodity procurement	Low
GHSC-PSM FO	• Collaborates with the GHS on supply planning and commodity procurement • Supply Plan validation • Data access for quarterly quantification meetings • Supports GHS to respond to Action Request Tickets (ARTs) and Data Validation Tickets (DVTs)	High
MSI, PPAG	• Performs regular data upload of donor-commodity data • Respond to data validation tickets • Attend infrequent meetings with VAN team	High

Existing Opportunities

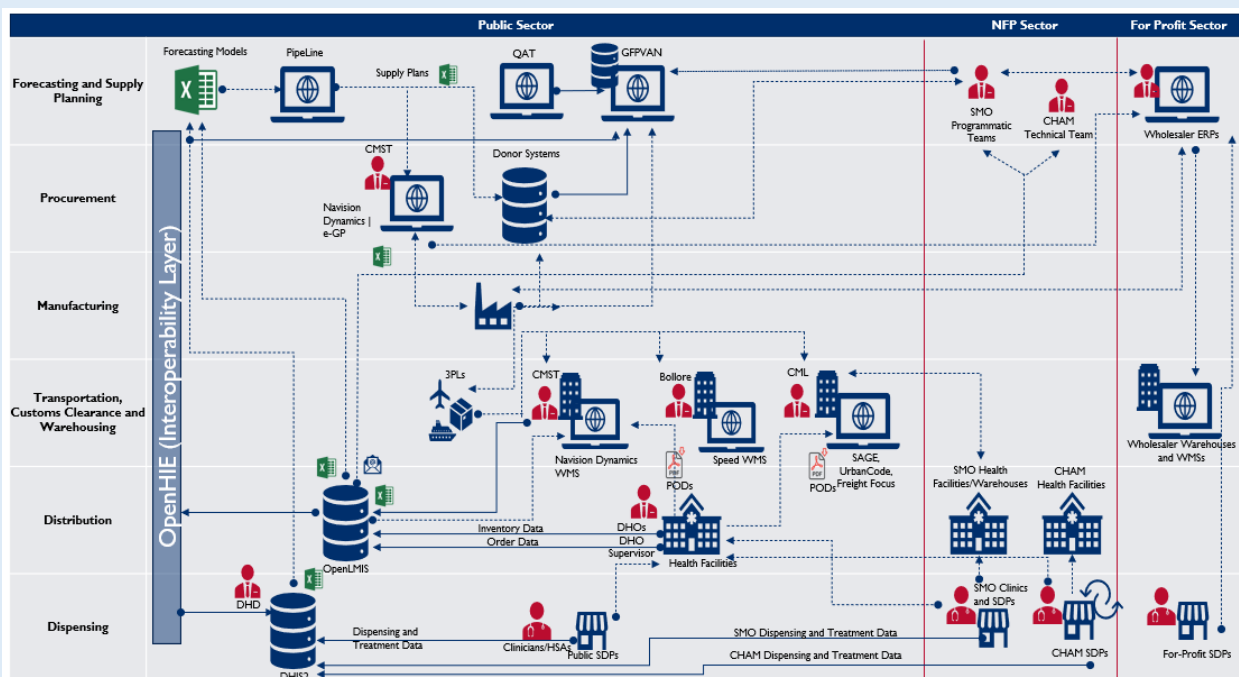
1. **GhiLMIS Implementation Completion:** As the GhiLMIS integration is still new, and the GhiLMIS implementation in country is not fully rolled-out, not all integrations to GhiLMIS from existing systems are established. For example, the IHS warehouse data is not flowing into GhiLMIS, or therefore the VAN, which leaves some critical pieces of data out of the aggregated picture.
2. **Further SMO Integration:** At present, MSI and PPAG are providing and receiving supply plans and order/shipment data on commodities where they coordinate with the MOH. In the VAN, there is transparency between the MOH and SMOs for supply plans, inventory/consumption data, and all order and shipment data for products where the MOH and SMOs coordinate. For other products, procured directly by SMOs and not through the MOH, this data is not shared. Opportunities to include this data, with proper permissions, could be explored in order to understand private sector supply and demand better.

Malawi FP Digital Supply Chain Landscape Analysis

Summary

Malawi's FP digital supply chain ecosystem is 1. **fragmented** across multiple parallel supply chains based on funder (public and private) 2. where data is **siloed** based on the E2E process group in which the data collection process occurs, and 3. many of the data collection processes remain **manual** or non-systematized. Figure 12 below depicts the data flows between all FP stakeholders and systems, digitized and not. Dashed lines represent non-systematized flows where data is downloaded from one system and uploaded into another, or information is shared informally between stakeholders. Data connections between E2E process groups are minimal for in-country systems and non-systematized.

Figure 12: Malawi FP Digital Supply Chain Ecosystem Data and Process Flows



Detailed descriptions of these processes and flows will follow in the process group deep-dives. This analysis has identified several key challenges plaguing the FP digital supply chain ecosystem in Malawi, described below.

Key Challenges

- I. Across almost all E2E supply chain processes, key informants have suggested that **data quality** issues persist and impede effective and efficient FP commodity supply to the facilities that need products most. At the dispensing level, health facilities record their inventory levels and report to associated district manually on their needs. At the distribution level, while health facilities have a means to report their inventory through OpenLMIS, there are indications that inconsistent report and data are an issue, and this lack of data can prevent deliveries of commodities even when facilities are stocked out. At the central and

regional warehouse levels, inventory levels fluctuate regularly, reducing the quality of quantifications and supply plans; key informants suggest these fluctuations are due to product master data discrepancies (such as unit of measure) and manual intake and inventory procedures, partially due to WMS system limitations.

2. Many data quality issues stem, in part, from a lack of **data governance**. Across the supply chain, different product catalogs and master product data is used. There is little integration between systems, despite efforts underway to roll out a National Product Catalog (NPC). Several warehouses are in the process of equipping themselves with barcoding capabilities, to eventually enable GTIN capture and even further down the road, track and trace.
3. Malawi's supply chain information management systems are in a state of transition, with several new systems planned to replace existing ones. However, **key stakeholder awareness and buy-in** to these new initiatives is lacking. Robust implementation initiatives are underway for several critical systems (eHIN, VAN, NPC, etc.), yet some key informants do not have awareness of these tools or cite them as critical systems in their organization or department's infrastructure.
4. **User adoption** challenges are a related concern for stakeholders, who cite the rollout of so many new systems as a risk. An example by a key informant cited, if health facilities are required to report into three different systems, their compliance will be low, and they may only end up using one system in practice.
5. These user adoption issues are the result of a **siloed and fragmented parallel supply chain**. Parallel distribution networks based on funding source, as well as non-integrated information systems lead to process gaps, duplicative work, and data inconsistencies.

Malawi FP Supply Ecosystem

Contraceptive Security Overview

Contraceptive security means everyone is able to choose, obtain and use a wide range of high-quality and affordable contraceptive methods, when they need them, for FP/RH and the prevention of sexually transmitted diseases.^{lxxi}

According to FP2020's Core Indicators, Malawians' use of contraceptives has been increasing steadily over the past decade and is at almost 50% in 2020. Corresponding indicators of met and unmet demand have steadily increased and decreased, respectively, from 65.9% (2012) to 78.9% (2020) of met demand and from 25.5% to 16.7% of unmet demand.^{lxxii} Based on these metrics, Malawi falls into Stage 3: High Prevalence of contraceptive security development as defined by Track20; similarly, Track20 assesses Malawi as having no or a small potential use gap, indicating that targeted interventions are necessary to increase demand and grow mCPR.^{lxxiii} While Malawi's mCPR indicates demand is being met, Malawi's fertility rates have seemingly stagnated, despite increased contraceptive use.^{lxxiv}

International Donors funded 99.2% of Public sector FP supply, while the Government of Malawi (GOM), procures the remaining .8% with internally generated funds. In its most recent contraceptive security review, Malawi did not experience any funding gaps; instead, there were over-expenditures to account for emergency shipments covering delayed orders. Figure 13 below depicts FP commodity volumes procured by International Donors over the past five years; Figure 14 depicts Condom volumes procured by International Donors over the past five years; and Figure 15 depicts FP commodity volumes procured broken down by product type.

Figure 13: FP Commodity Volume to Malawi by Donor 2016-2020^{lxxv}

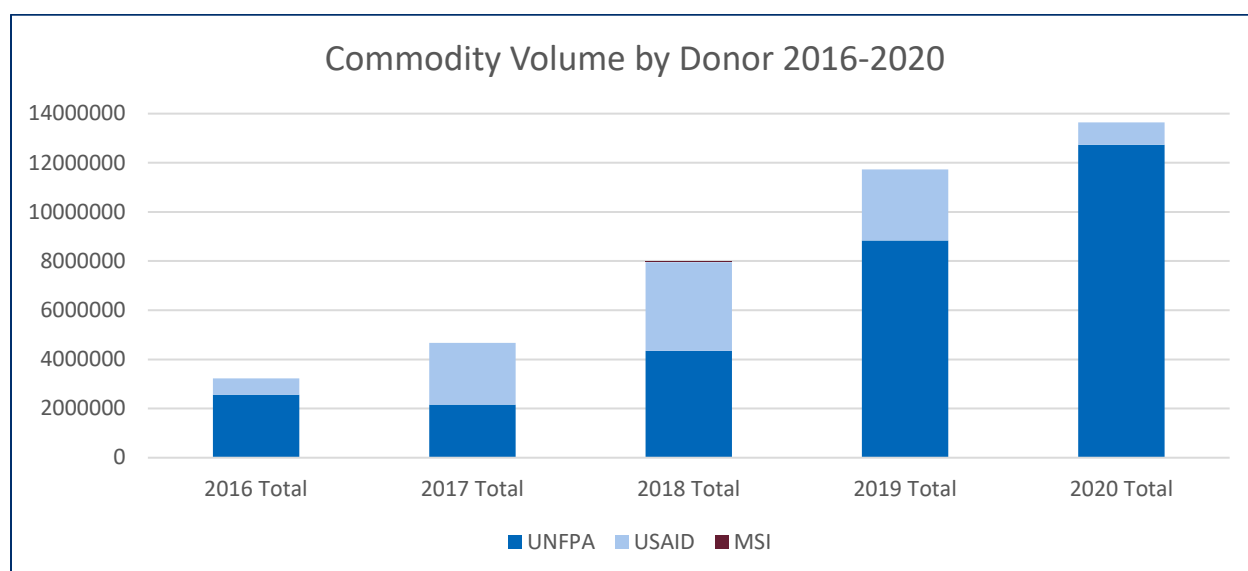


Figure 14: Condom Volume to Malawi by Donor 2016-2020^{lxxvi}

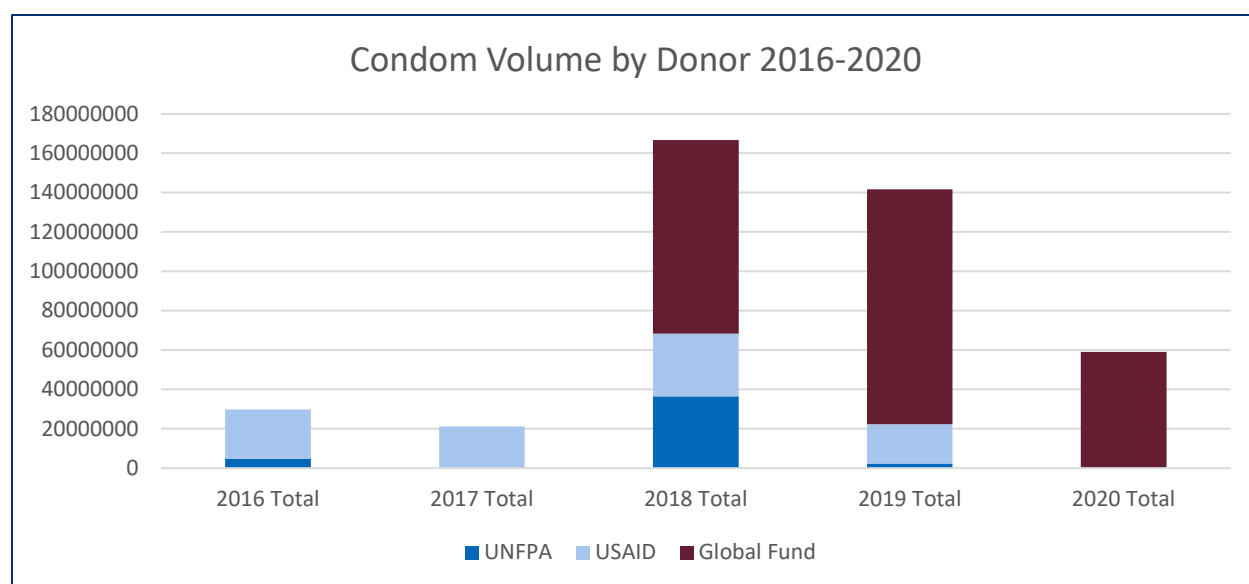
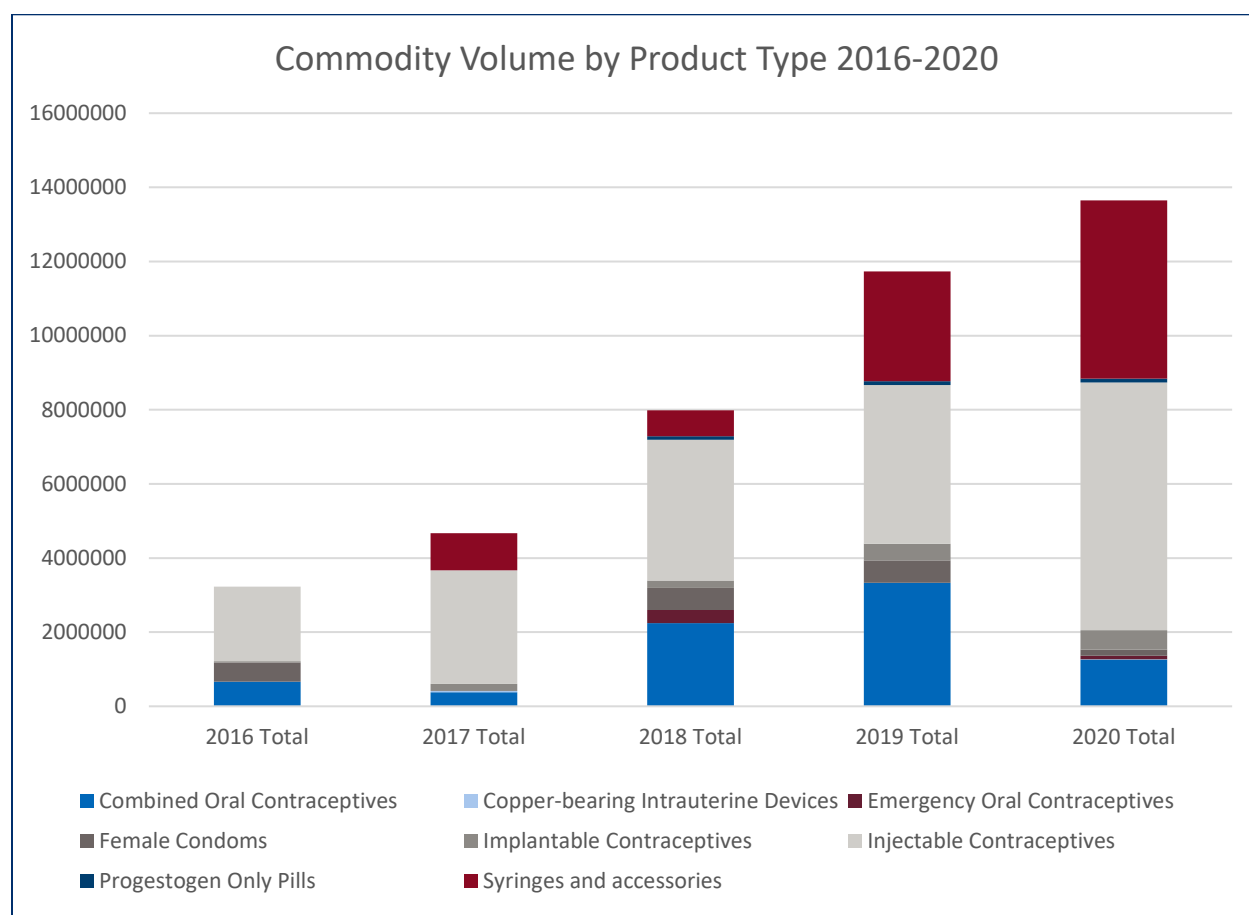


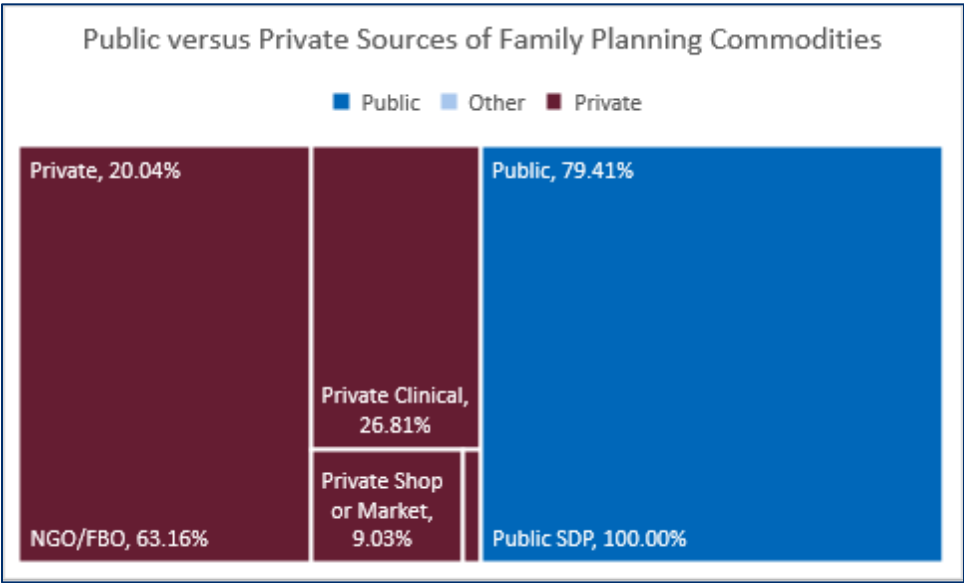
Figure 15: FP Commodity Volume to Malawi by Product Type 2016-2020^{lxxvii}



Family Planning Client Ecosystem

Public vs. Private Supply

Malawi’s Demographic and Health Survey (DHS) from 2014 indicated that the vast majority of clients (79.41%) receive FP commodities from public sector service providers in Malawi, and fewer (20.04%) obtain these commodities from the private sector.^{lxxviii} Within the private sector, most clients (63.16%) obtain products from a NFP clinic (CHAM, BLM, etc.) at little cost. Private retailers only accounted for 10% of private sector use.



Reports suggest an informal sector is growing in Malawi, which include leakages from CMS or low-level public health facilities, or sales of drugs by wholesalers to unlicensed/illegal drug sellers.^{lxxix}

While this landscape analysis has endeavored to map the entire FP supply ecosystem, the ecosystem of available supply and services from the client’s perspective varies significantly based on their demographic, geographic, and socioeconomic situation. In particular, these classifications appear to influence clients’ choices between obtaining FP commodities in the public versus private sector. All statistics below come from Ghana’s 2015-2016 DHS, as analyzed by the SHOPS Plus Project.^{lxxx}

Clients’ access to FP commodities is limited by several factors, described below:

- **Cost:** Given almost 80% of clients obtain FP products from the public sector, and there is a connection between socioeconomic status and source preference (the wealthiest clients are more likely than the poorest to choose the private sector), the cost of goods is a crucial factor when choosing care.^{lxxxi}
- **Product Type:** Given the high rate of public sector utilization, differing product types do not appear to have a significant impact on where clients source their FP products, however, a higher proportion of clients buy condoms from the private sector than any other form of contraceptives (44% from the public sector). This may be due to the higher availability (over-the-counter status) of condoms in the private sector than pharmaceuticals, and the prevalence and popularity of some SMO-branded condoms.^{lxxxii} Additionally, demographically, younger users (under age 25) are more likely to obtain injectable contraceptives than older users (64% compared to 45%).^{lxxxiii}

Demographics

Only 19% of married clients obtain their contraceptives from the private sector, compared to 26% of unmarried clients.

Age does not appear to be a contributing factor to private versus public sector source selection across all methods of contraceptives.

Geographic

Geographic location does not appear to influence private versus public sourcing of FP commodities.

Socioeconomic

The wealthiest women in Malawi are more likely to obtain contraceptives from the private sector than the poorest women in Malawi (28% versus 15%).

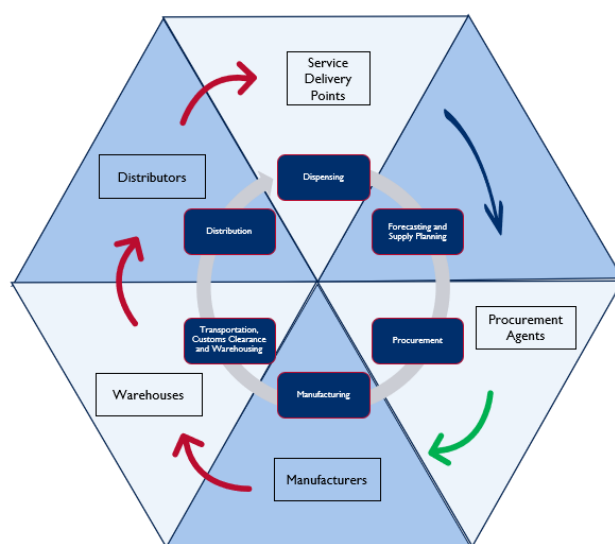
Malawi FP Supply Chain Ecosystem

Family Planning Supply Chain Ecosystem Map

In Figure 16, the entire FP Supply Chain Ecosystem is mapped against six E2E supply chain processes (1. Forecasting and Supply Planning; 2. Procurement; 3. Manufacturing; 4. Transportation, Customs Clearance and Warehousing; 5. Distribution; and 6. Dispensing), described in the Framework and Methodology section, and includes very basic connections between primary groups of stakeholders. These connections are financial, commodity exchanges, information flows, service provisions, and partnerships. In Annex E, the FP Supply Ecosystem map is expanded to include details of individual actors and more distinct relationships. This map is intended to show the breadth of each process groups' interconnectivity.

Malawi's Ecosystem Map is robust and filled with hundreds of actors who contribute to planning, procuring and provisioning FP commodities. This ecosystem follows a general trend of interconnectivity in a supply chain (depicted in the diagram to the right):

- Information flowing (blue) counterclockwise from SDPs to Forecasting and Supply Planning and then to procurement agents for action;
- Funding flowing (green) from those procurement agents to manufacturers to produce goods;
- Commodities flowing (red) from manufacturers to public and private importers, distributors and back to SDPs.



However, these flows are not mutually exclusive as commodity flows by nature also elicit information flows, however manual or non-digitized they may be. These are reflected by siloed information feedback loops moving counterclockwise (in blue) in the diagram below.

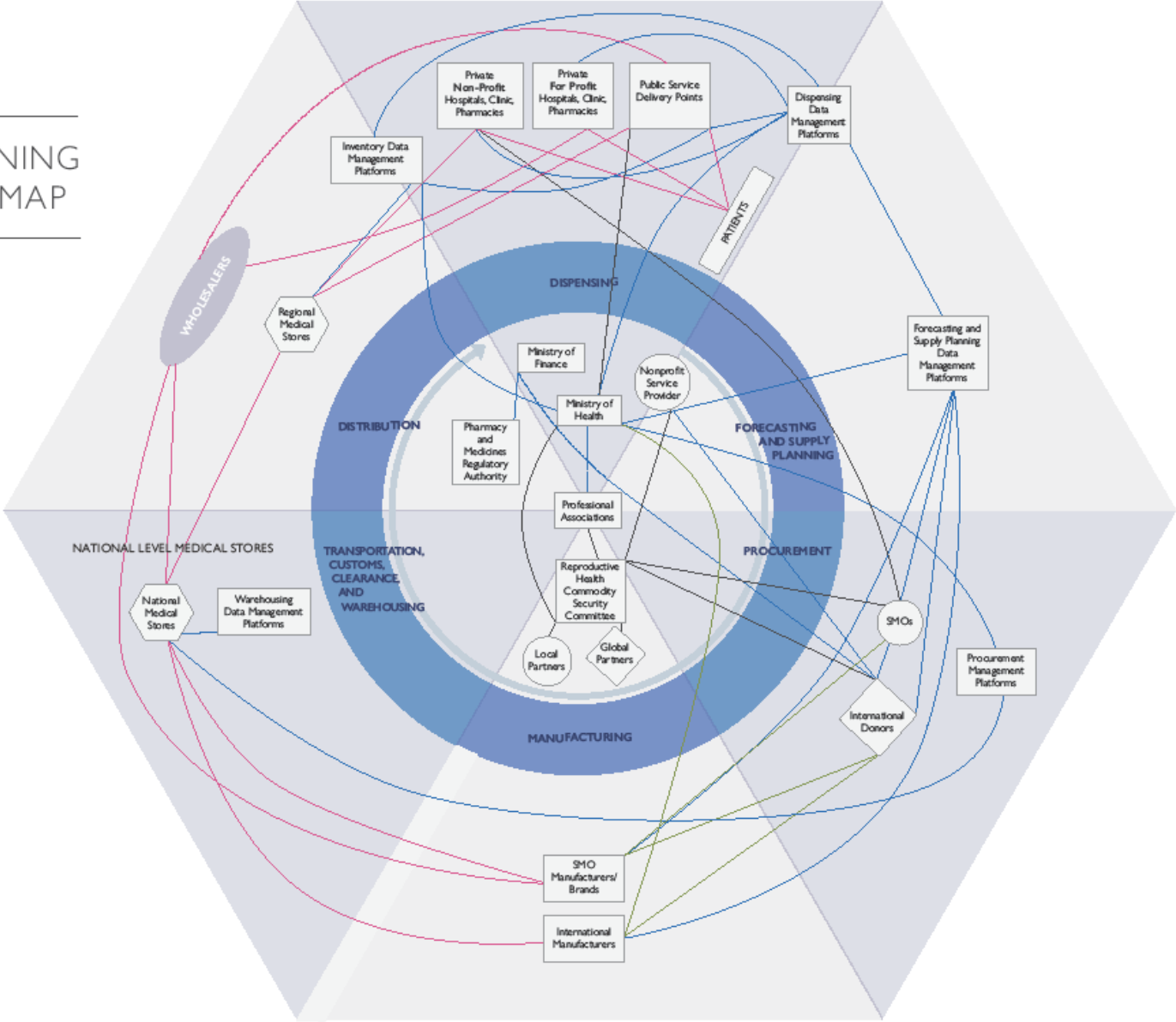
Figure 16: Malawi Family Planning Supply Ecosystem Map
(Double-click picture to open in Adobe PDF and zoom in)

MALAWI FAMILY PLANNING
SUPPLY ECOSYSTEM MAP



KEY

- Information Sharing
- Funding or Financial Burden
- Influences/Partnership
- Informal Relationships
- Commodity Flow
- Service Provisions



Family Planning Supply Chain Key Stakeholders

The ecosystem of FP supply stakeholders in Malawi is composed of five primary organizational buckets: international donors, coordinating committees, government actors, the not-for profit sector, and the for-profit private sector. Table 15 summarizes these channels and the funding and regulatory challenges they face.

Table 15: Malawi FP Supply Chain Key Stakeholders

Organization Type	Organizations	Funding Source	Funding Challenges	Regulatory Challenges
International Donors	USAID, Global Fund, and UNFPA (partially funded by DFID, KfW and Norwegian MFA through Health Sector Joint Fund)	Self-funded	N/A	N/A
Coordinating Committees	Reproductive Health Commodity Security Committee	Meetings are typically donor-funded; ^{lxxxiv} individual participants are funded by their respective organizations	Delays in funding for quarterly meetings have prevented action in some instances. ^{lxxxv}	Though the committee is composed of NGOs, international donors, and government agencies, it does not have any legal status or formal terms of reference and thus has not produced any policies or action plans. It also does not include any for-profit private sector stakeholders.
Government	MOH (RHD, HTSS, DHA, DHD) Central Medical Stores Trust PMRA District Health Offices	Government of Malawi	FP commodity budget line is relatively recent and small, despite RHD efforts to advocate for more funding to address the CIP funding gap analysis	N/A

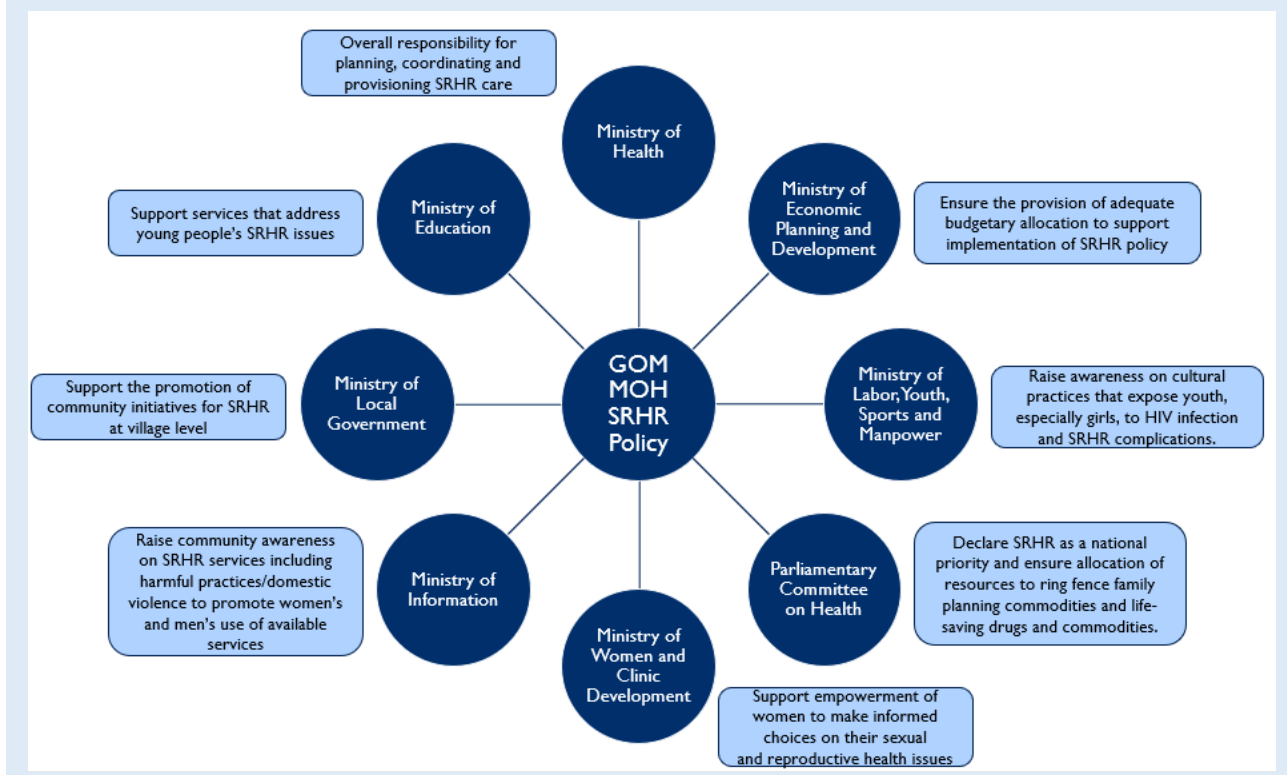
Not-for-Profit Sector	Social Marketing Organizations (BLM, WomanCare Global, PSI)	Varies: International Donors, Self-funded	N/A	N/A
	Christian Health Association of Malawi (CHAM)	Self-funded and GOM-funded through SLAs	Delayed funding can result in reduced service levels	
Wholesalers	Worldwide Pharmaceutical Distributors, Pharmacare Pharmacies, Pharmavet LTD, Action Medeor, Artemis, Sunrise Pharmaceuticals Limited, Intermed	Self-funded or credit extended by manufacturers	Extend credit to clients who are frequently delinquent in payments	Product registration is required for all public-sector tenders, a process that can take months or years; in practice, wholesalers procure unregistered goods on behalf of clients regularly

Public Sector Overview

In 2018, international donors funded 99.2% of public sector FP supply, while the Government of Malawi (GOM), procured the remaining 0.8% with internally generated funds. In its most recent contraceptive security indicator survey, Malawi did not experience any funding gaps; instead, there were over-expenditures to account for emergency shipments covering delayed orders.

While the GOM does not procure a significant portion of public-sector FP commodities, the ecosystem of stakeholders who have a direct or indirect impact on FP policy and supply is significant. In the MOH's *National Sexual and Reproductive Health and Rights (SRHR) Policy* document in effect 2017-2022, it lays out the complex roles and responsibilities across the whole of GOM. Figure 17 depicts the organizations; the SRHR Policy definitions are included in Annex F.^{lxxxvi}

Figure 17: Government of Malawi Sexual and Reproductive Health and Rights Policy Roles and Responsibilities



While myriad actors touch FP policy and supply in Malawi, those depicted in Figure 18 reflect the stakeholders responsible for utilizing, maintaining, and operating the digital systems to supply FP commodities. These organizations, their operational mandates and the systems they use are listed in Table 16.

Figure 18: Malawi Stakeholders responsible for utilizing, maintaining, and operating the digital systems to supply FP commodities

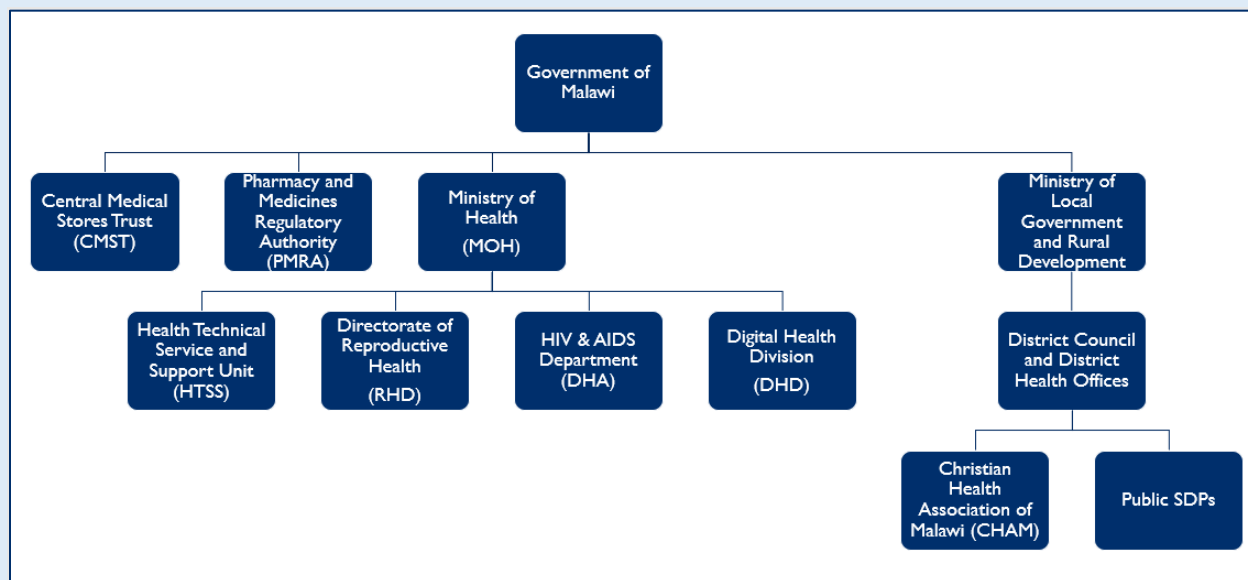


Table 16: Malawi Public Sector Family Planning Stakeholders in the Digital Ecosystem

Public Sector Family Planning Supply Stakeholders (from left to right in Figure 16)		
Agency/Department	Mandate ^{1xxxvii}	Systems
Central Medical Stores Trust	• Procures health commodities, including FP commodities, on behalf of the GOM, charging a handling fee of 18 - 20 percent for FP commodities • Distributes commodities funded by both GOM and some development partners directly to districts and health facilities • Liaises with RHD on FP commodity distribution, and reports to RHD on commodities procured and distributed using GOM resources through the FP commodity budget line and partners' resources • Manages central and regional storage facilities used to store FP and other commodities	• Microsoft Navision (ERP) • MACS-WMS (under development) • OpenLMIS (order management) • Online Ordering Tool (order management) • Excel (forecasting, procurement management, etc.)
Pharmacy and Medicines Regulatory Authority	• Assists in the promotion and improvement of the health of the population of Malawi by registering, regulating, licensing: persons, premises and medicines. • Exercises discipline and control over the professional conduct of all pharmacy persons practicing in Malawi. • Controls and exercises authority affecting the training of persons in pharmacy profession.	Product Catalog Management Tool (PCMT) National Facility List (word document)
Ministry of Health	• Formulates and reviews policies and guidelines, and coordinates FP services design • Provides oversight, strategic leadership, coordination,	All – per specific agency

	resource mobilization, capacity building, quality management, and monitoring and evaluation of FP services • Manages funds and pays for health services i.e., purchases FP commodities using government FP budget line • Coordinates and supervises FP service provision through RHD • Negotiates overall ceilings for the health sector budget with Ministry of Finance, Economic Planning and Development, including allocation to drugs and Other Recurrent Transactions (ORT) for Central Hospitals	
Directorate of Reproductive Health	• Overall steward of national SRHR programs and supervision of FP service provision • Coordinates surveys on availability and accessibility of FP commodities • Provide technical leadership for the quantification of FP commodity needs • Oversees and coordinates FP commodity distribution, in collaboration with the HTSS department of MOH • Coordinates quarterly Reproductive Health Commodities Security committee meetings and other SRHR-related Technical Working Groups • Develops FP commodity procurement and supply plans in liaison with all partners • Approve forecasting and supply planning information for procurement	• OpenLMIS • DHIS2 • GFPVAN
Health Technical Support Services	• Coordinates the quantification of FP commodity needs in collaboration with RHD • Manages the LMIS, which holds data on the level of health commodities at health facilities, on which the FP commodity quantification and distribution lists are based • Second a Logistics Officer to the RHD to develop FP commodity distribution lists that are passed to CMST. The Logistics Officer reports administratively to the RHD, but technically to the HTSS	• OpenLMIS • DHIS2 • GFPVAN
HIV and AIDS Department^{lxxxviii}	• Coordinate the HIV Testing and Counseling program • Oversees and coordinates HIV/AIDS commodity distribution, in coordination with the HTSS department of the MOH • Responsible for coordinating management of STIs and prevention of mother to child transmissions of HIV. • Responsible for coordination implementation of the national VMMC program	DHA-MIS
Digital Health Division	• Manages the national data center to host all national systems and to create a platform for the integrated national supply chain system in country • Building the interoperability layer platform for data exchange among systems	Hosted Systems: • HMIS (DHIS2) • COVID & Vaccine data • DHA-MIS (DHA for HIV) • HR data
Ministry of Local Government and Rural Development	• Coordinates delivery of health services through District Councils, including FP services	N/A

District Councils and District Health Offices	• Responsible for preventive health, curative health, social welfare services and waste disposal • Responsible for health service delivery and planning for primary and secondary care, including FP services through health centers and district hospitals • Contracts with Christian Health Association of Malawi (CHAM) facilities through Service Level Agreements (SLAs) for provision of essential health services, including FP in some cases (i.e., non-Catholic facilities)	OpenLMIS
Christian Health Association of Malawi	• Supports MOH in providing essential primary health services through SLA contracts, reimbursed on a fee-for-service basis • Provides approximately 30 percent of all health services, 20 percent of FP services and 11 percent of deliveries in Malawi⁶ • As of August 2019, 143 of 179 CHAM facilities held an SLA • Accesses FP commodities from District Health Offices	Analog system; pending evaluation and funding for a new LMIS

Many of these actors play roles across the E2E functional supply chain process groups, as well as across multiple commodity groups, not just FP, these functional and commodity responsibilities are outlined in Table 17. As depicted, most stakeholders and responsible parties across the FP supply chain also act as the procurement, warehousing, distribution, and dispensing agents across other commodities' supply chains in Malawi. Therefore, while Forecasting and Supply Planning responsibilities primarily rest with the RHD, opportunities to integrate and improve upon other process groups should be considered across commodities.

Table 17: Family Planning Stakeholder Commodity and Functional Role Summary

Family Planning Supply Stakeholders		
Stakeholder	Responsibilities across only FP commodities or integrated across all commodity groups?	Functional E2E Process
Central Medical Stores Trust	Integrated	• Procurement • Warehousing • Distribution
CML	Integrated (USAID, SMO commodities)	• Warehousing • Distribution
Pharmacy and Medicines Regulatory Authority	Integrated	• Customs • Warehousing
Ministry of Health	Integrated	All – per specific agency
Directorate of Reproductive Health	Family Planning-specific	• Forecasting and Supply Planning • Warehousing • Distribution • Procurement (input from FASP processes)
Health Technical Support	Integrated	• Forecasting and Supply Planning

Services

		• Warehousing • Distribution • Dispensing
HIV and AIDS Department	HIV/AIDS-specific	• Forecasting and Supply Planning • Warehousing • Distribution • Procurement (input from FASP processes)
Digital Health Division	Integrated	• Forecasting and Supply Planning • Warehousing • Distribution • Dispensing
Ministry of Local Government and Rural Development	Integrated	N/A
District Councils and District Health Offices	Integrated	• Warehousing • Distribution • Dispensing
Christian Health Association of Malawi	Integrated	• Warehousing • Distribution • Dispensing
Social Marketing Organizations	Integrated or Family Planning-specific, depending on the organization	• Forecasting and Supply Planning • Dispensing
International Donors	Integrated	• Procurement • Transportation, Customs, Warehousing • Distribution

Private Sector Overview

Malawi's private sector includes both for-profit and NFP SDPs. Of the latter, all NFP SDPs receive FP commodities through public sector channels, whether it is international donor-, GOM-, or SMO-procured. These SDPs are by far the most popular in the private sector.

Given the public sector is dominant in supplying FP commodities, this leaves a decidedly small market for wholesalers in this space. Wholesalers respond to CMST tenders, but these appear to be rare for FP commodities, limiting private suppliers to sell to for-profit private SDPs. Wholesalers have expressed, during research interviews, difficulty in obtaining demand data and given their limitations within the marketplace, have little experiential data on how clients buy FP products.^{lxxxix} Wholesalers have

Private Non-Profit Hospitals, Clinic, Pharmacies
Banja La Mtsogolo
Tunza Clinics
Christian Health Association of Malawi (CHAM)
Family Planning Association of Malawi
Private for-Profit Hospitals, Clinic, Pharmacies
Private Hospitals
Licensed Pharmacy Stores and Licensed Chemical Sellers (LCS)
One-Stop-Shop Wholesalers

relationships with international manufacturers and can obtain FP commodities like contraceptive pills and condoms, but do not see any value in competing with low- and no-cost NFP and public SDPs.^{xc}

While Malawi's CIP highlights strategic priorities to engage with the private sector to increase FP commodity security needs, almost all collaboration is with the NFP private sector, namely CHAM. For this reason, the for-profit private FP sector is underdeveloped.

Private Sector Service Delivery Providers

Malawi's Private FP health sector includes both NFP and for-profit service providers. The NFP sector includes Hospitals and Clinics run by NFP organizations, such as the CHAM, Banja La Mtsogolo (a Marie Stopes International (MSI)-affiliate), or Tunza Clinics (a Planned Parenthood Federation-funded project).

The for-profit private sector includes hospitals, health clinics, and retailers (such as pharmacies, chemicals sellers, or retail wholesalers). However, pharmacists and retail outlets of FP commodities are limited, especially in rural areas. To fill this gap, degrees in Pharmacy have been offered over the past fifteen years and there is a proliferation of health clinics that have been granted dispensing licenses.^{xc}

Wholesalers

The wholesale market in Malawi is small, with only 60 registered wholesalers in 2019.^{xcii} This is a threefold increase from just nine years earlier, suggesting the market is growing.^{xciii} Of these 60 wholesalers, a smaller number comprises those who buy and sell FP products. As there are no Malawian manufacturers of FP products, the farthest upstream wholesalers are those who import FP products. For these wholesalers, CMST solicitations are the primary source of public sector demand data for private sector wholesalers and distributors; however generally, this is a small market for FP commodities as it is dominated by the public sector and international donors provide most FP commodities to the public sector.^{xciv}

Malawi FP Digital Supply Chain Ecosystem

Public Sector Family Planning Digital Supply Chain Process Flow

Across Malawi's Family Planning supply chain, key processes are enabled by digital management information systems and platforms. Malawi's Health Technical Support Services (HTSS) and Digital Health Division (DHD) manage the operation and strategy for these MOH-run digital systems. One critical aspect of this strategy is integration of systems across supply chain functions. This strategy implementation is underway and began with the creation of an interoperability layer (OpenHIE) to integrate data. Over the course of 2019, OpenHIE was developed between DHIS2 and OpenLMIS to connect the two platforms. Though COVID-19 delayed the training of users in the new system in mid-2020, the functionality to access both inventory and health data in DHIS2 exists.^{xv} An integration is also ongoing at present (August 2021) to incorporate VAN data into OpenHIE, with the objective of the VAN pulling stock data for planning purposes. This is to take place at both the central and district levels.

A Glossary of the systems employed by these key stakeholders is represented in Table 18. In-depth descriptions of these processes and use of these digital systems follows.

Table 18: Malawi Public Sector Family Planning Supply Information Systems

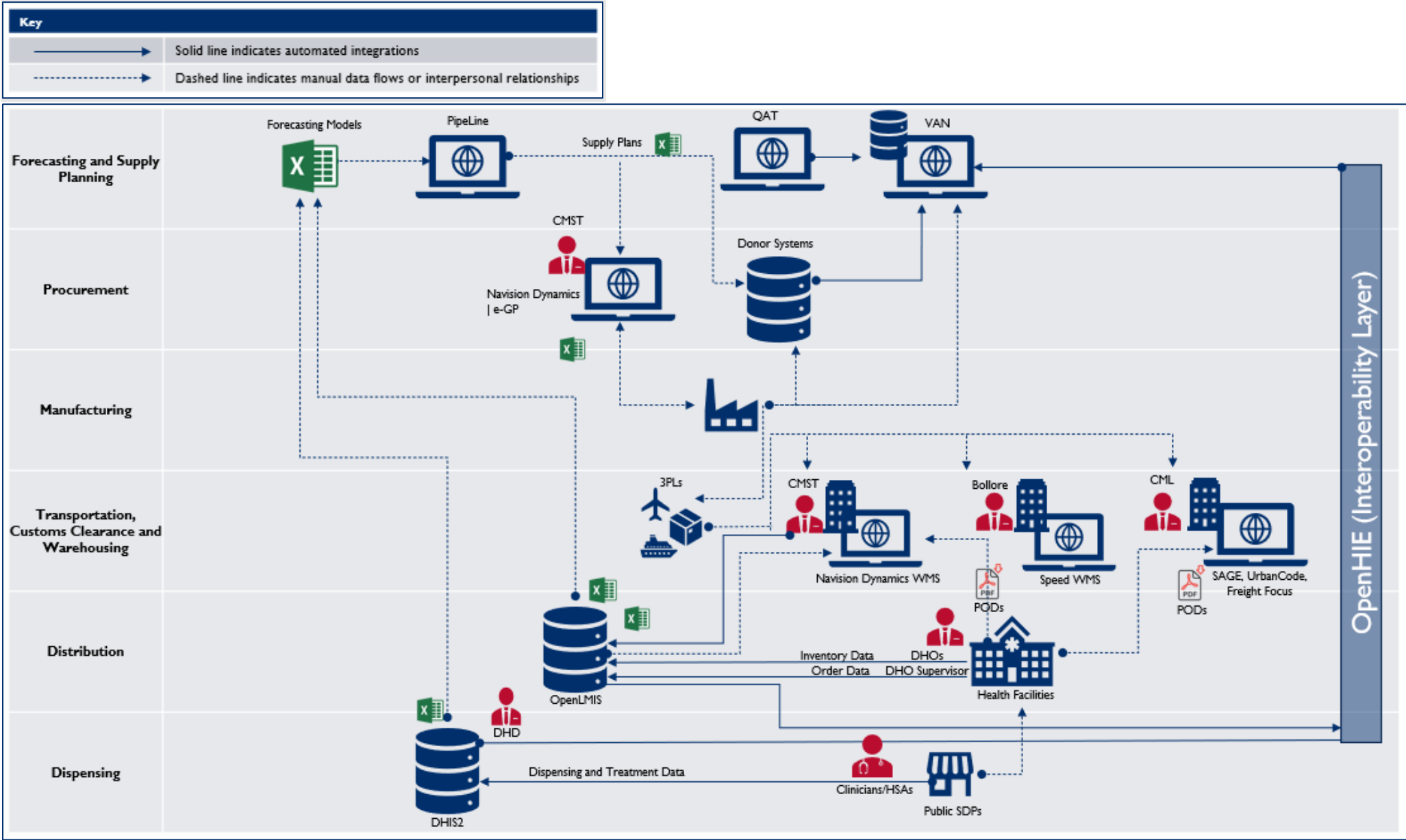
Public Sector Family Planning Supply Information Systems						
Information System	Description	Functionality	Owner Funder	Planned Upgrade	Data Types	User Organization
e-GP	Centralized government procurement system	• Web-based platform • E-tendering • Contract awards • Vendor portal^{xvii}	PPDA (GOM) World Bank	N/A	• Vendor data • Procurement planning and transaction data • Contract and award data	• CMST (future) • Vendors • GOM ministries
DHA-MIS	HIV commodity distribution; use Global Fund's Wambo	• Stock reporting	MOH Global Fund	N/A	• Order data • Inventory data	• Health facilities • DHA
DHIS2	Patient treatment and health surveillance system	• Real-time treatment data collection • KPI and report generation	MOH Global Fund	N/A	• Case/treatment data	• Clinicians (data entry through C-Stock) • HMIS (case management and national-level analysis)
OpenLMIS	Logistics management tool for stock requisition and	• Inventory management (stock statuses, stock	HTSS USAID	eHIN integration through Interoperability	• HF Inventory data • Stock on Hand • Order Data • Pre-defined district	• District Health Officer (stock data entry) • CMST

	reporting	management) • Stock data entry and automatic order creation based SOH/min/max levels from HFs • Reporting Management • Integration with interoperability layer		layer	level stock/consumption criteria	(processing orders for EM) • Donors (processing orders for program commodities)
eHIN	Dispensing model for last mile operation; Stock management and dispensing system	• Mobile compatible • Order creation • Inventory management (stock status, dispensing, etc.)	HTSS UNDP	Planned integration with OpenLMIS through Interoperability layer	• Last mile dispensing data	• Clinicians (data entry) • Health Facilities • SDPs (data entry)
Product Catalog Management Tool	Systems for managing product master data of the National Product Catalog (NPC) program	• Catalog management • Mobile application capability	MOH USAID	Integration with interoperability layer	• Product master data	• GHSC-PSM • CMST (future)
Navision Dynamics	Procurement, accounting, finance and warehouse management – ERP; CMST's product catalog	• Order Management • Financial Management • Warehouse receiving and dispatching • Procurement planning	CMST Global Fund	WMS module to be replaced by MACS ; e-GP to replace procurement module	• Orders downloaded from OpenLMIS into excel • Emergency orders entered into Online ordering System by HFs and manually uploaded by CMST • National Facility Register Data • CMST Product Catalog • Supplier data	• CMST
PipeLine	Supply Planning for all program products	• Plan optimal procurement and shipment schedules for commodities	MOH	QAT	• Consumption forecast • Shipment lead time data	• GHSC-PSM • GF • RHD
VAN	Control Tower operation for global visibility into FP	• E2E visibility • Collaboration (action and ticketing)	MOH RHSC	Future Integration with QAT	• UNFPA, Global Fund, and USAID order and shipment data, Pipeline, MOH	• RHD • GHSC-PSM

	commodity flows	• Supply Planning			Inventory/Consumption Data	
OpenHIE (Interoperability Layer)	Interoperability services layer; currently servicing OpenLMIS data upload to DHIS2/HMIS	• Authentication • Interlinking Service • Entity Mapping	MOH	Future integration with GFPVAN	• Inventory Data • Consumption Data • HMIS Demographic survey data	N/A
Speed Warehouse Management System	WMS system used by Bollere (warehouse manager for Global Fund commodities)	• Warehouse management and tracking: routing, planning for distribution, tracking to final delivery	Bollere	N/A	Global Fund inventory and warehouse data	Bollere

These actors and systems have been mapped against the end-to-end supply chain processes in Figure 19.

Figure 19: Malawi Public Sector Digital FP Supply Chain Process and Architecture Swim Lane Diagram (current as of November 30, 2021)



Public Sector Dispensing Process

The dispensing process group in the public sector includes dispensing of FP commodities to clients via public sector SDPs or mobile Health Surveillance Assistants (HSAs). Upon dispensing treatments and products, clinicians and HSAs enter treatment data directly into DHIS2. Treatment data is aggregated to case management data in the national-level HMIS. This treatment/consumption data becomes an input to the Forecasting and Supply Planning process.

Clinics are also responsible for reporting their inventory data to DHOs via requisition books to indicate existing stock levels and new demand. DHO pharmacists review and approve these requisitions and issue stock to the SDPs.

Dispensing Digital Health Maturity Challenges

1. **Data Input Consistency:** Malawi's CIP highlights that data is not shared on a regular basis, and when it is, the data quality is poor.^{xcvii} Overworked clinicians and little accountability for reporting can contribute to SDP-level stockouts, alongside stockouts at the central level, and poor distribution planning.^{xcviii}^{xcix}
2. **SDP Stock Status Visibility:** Several members of the RHCS committee reported issues obtaining data for service delivery points on stock status. At present SDPs are only reporting treatment data into DHIS2, and inventory data into non-digitized requisition books at DHOs and do not have a digitized mechanism for maintaining stock. Some SDPs in certain regions are beginning to use eHIN for dispensing-level stock reporting, however this is not yet being used for FP commodities.

Table 19: Malawi Public Sector Dispensing Data, Platforms and Challenges

Dispensing Data Outputs		
Data	Data Type	Data Enterer
Treatment Data	Raw data input during operations	Clinicians, HSAs
Consumption Data	Derived in DHIS2 from treatment data inputs	Case Managers
Inventory Data	Raw data input during operations	District Health Officers
Order data	Derived from inventory data inputs	N/A
Dispensing Platforms		
Platforms	Data Inputs	Users
DHIS2	Treatment data, often via C-Stock	Clinicians, HSAs, SDPs
HMIS	Treatment data, via DHIS2	Case managers

Public Sector Forecasting and Supply Planning Process

The national quantification process in Malawi is conducted on an annual basis. The National Quantification workshop is led by HTSS with participation by the relevant commodity partners; in the

case of Family Planning, this group includes those members of Malawi’s Reproductive Health and Commodity Security Committee, listed below, as well as downstream quantification SMEs to provide a ‘district-level perspective’ beginning in 2013.^c The RHCS Committee is a hub for information sharing of government agencies, NGOs, and international donors. This information sharing coordinating body is intended to bring together implementing partners, secure funding for FP commodities and ensure the “uninterrupted flow of reliable information for effective decision making.” Aside from NFP private sector groups, like SMOs, for-profit private sector members are not a part of this coordinating committee.

Table 20: Malawi Reproductive Health Commodity Security Committee Members

Reproductive Health Commodity Security Committee Chaired by: Directorate of Reproductive Health (RHD)		
Government of Malawi Entities	Local Organizations and Service Providers	International Donors/Organizations
Health Technical Support Services (HTSS)	PSI	USAID
HIV & AIDS Department (DHA)	Banja La Mstogolo	UNFPA
Central Medical Stores Trust (CMST)	Christian Health Association of Malawi (CHAM)	UNICEF
Ministry of Finance Planning Department	Association of Private Practitioners (APP)	DFID
	Malawi Health Equity Network	Save the Children
		Clinton Health Access Initiative (CHAI)
		GHSC-PSM

The quantification process takes data collected during the Dispensing stage (consumption data in DHIS2 and inventory data entered into OpenLMIS), as well as Demographic Data, to forecast annual needs. This data is exported from its respective systems and aggregated in an excel forecasting model. The resulting forecast depicts national needs across one year. Supply plans are generated on a quarterly basis by GHSC-PSM using the same demand data sources as the national quantification, combined with shipment data from the VAN. Supply plans are also uploaded to the VAN which support decision-making.

RHD, HTSS and GHSC-PSM FO also use VAN data on a regular basis to review supply plans and incoming shipments and make adjustments to inbound orders and in-country distributions as necessary.

Forecasting and Supply Planning Digital Health Maturity Challenges

The *HCSS Master Plan* reports two key data-related challenges that inhibit the quantification process:

3. **Poor Data Quality** – described as “[data quality] compromised due to a lack of standardized data collection processes and in some cases exacerbated by supply planning tools that are not comprehensive and require a multi-step process to complete the forecast.”^{ci} Key Informant interviews suggest that consistent data quality issues persist during the quantification process

whereby data errors, discovered post-quantification, will revise the quantification shortly after the workshop is completed.^{cii}

4. **Lack of Data Visibility** – defined as “stem[ming] from late data submission, incomplete data collection and data elements required for quantification that are not routinely collected and aggregated,”^{ciii} this challenge has been corroborated by key informant interviews and leads to the quantification team using additional data points to substantiate their work. For example, there is not enough consumption data in DHIS2 alone on which to base the quantification; therefore, it is supplemented with “demographic statistics, health management information system (HMIS) data and morbidity data and factor in population growth and national program targets and changes in treatment guidelines.”^{civ} Though this challenge is defined in the HCSS Master Plan, significant improvements have been made since its publication with increased MOH use of the VAN and subsequent successful data management. The MOH has outlined in detail the extent to which the VAN has improved upstream data visibility in Malawi (see Annex I).

From the annual forecast, quarterly supply plans are developed according to OpenLMIS inventory data and budgetary constraints using the forecasted model output as an input to PipeLine, though PipeLine is not broadly used across all FP commodities. Some staff involved in the quantification process report there are large data discrepancies between the consumption data used for supply planning inferred using OpenLMIS (product quantities distributed to SDPs are considered consumed) versus the consumption data used in quantifications using DHIS2.^{cv}

Table 21: Malawi Public Sector Forecasting and Supply Planning Data, Platforms and Challenges

Forecasting and Supply Planning Data Inputs		
Data	Data Source	Data Enterer
Consumption Data	DHIS2	Case Managers
Inventory Data	OpenLMIS	District Health Officers, health facility staff
Demographic Data	Annual Demographic Survey	National Statistics Department
Forecasting and Supply Planning Platforms		
Platforms	Data Inputs	Users
PipeLine	Forecasts from Excel Model	GHSC-PSM
VAN	Supply Plans (PipeLine); Procurement Data (Donor order integrations) MOH Inventory/Consumption Data MSI/IPPF Data	RHD, GHSC-PSM

Public Sector Procurement Process

Public Sector Procurement is almost exclusively handled by International Donors, USAID, UNFPA and Global Fund. Procurers of FP commodities, public and private, commit funds to a finite number of international manufacturers. While there is a burgeoning local pharmaceutical manufacturing industry in Malawi, FP commodities are not yet produced domestically. The overarching universe of manufacturers who produce FP commodities includes two smaller subsets of manufacturers identified in the Malawian market: 1. The brands, and corresponding manufacturers, produced for SMOs and found in NFP private SDPs; and 2. Manufacturers/brands found in Private-sector SDPs as reported by local researchers.^{cvi} Refer to Annex E for the Venn diagram relationship between these manufacturers.

Social Marketing Manufacturers/Brands	BackUp (MSI), SafePlan (PSI, Pfizer), Chisango Condoms (PSI, Thai Nippon), Whisper Women's Condom (WomanCare Global, Shanghai Dahua), Etherena, Eloira, and Silvercare (WomanCare Global, Pregna)
Manufacturers/Brands found in Private Sector SDPs	Unisure72 (Unosource Pharma), Today Pill (Bliss), Option 2 (Perrigo), Contempo Condoms (Ansell), Yasmin, Diane, Microgynon, Mirena (Bayer), Pregnon (Mylan), Care Women's Condom (Female Health Company), Emily IUD and Moods Condoms (HLL Lifecare LTD), BeSafe and Durex (Karex)
International FP Manufacturers	Cupid, Incepta Pharma, Techno Drugs, Merck, CR Cizhu, Helm MG, SMB, PT Tunggal, Cipla, Medicines360

Though donated and publicly procured product typically flows to public SDPs, and privately procured product typically flows to private SDPs (wholesalers to retailers, and NFP product to NFP SDPs), this is not always the case. There are also anomalous channels of product flow. For example, despite restrictions that limit procurement to the CMST, given the sometimes-high levels of stockouts reported, public sector SDPs utilize back channels to access commercial products in order to remain operational. These district-level agreements/procurements with the private sector are a stopgap measure to ensure product availability.^{cvi}

At present, procurements are conducted by the proprietary systems of each donor; however, the MOH does fund and procure a small amount of FP commodities as previously described and as such, this process is handled by CMST. Though GOM procurement is centralized government-wide, the MOH uses CMST for health commodity procurement; however, the GOM, via the Public Procurement and Disposal of Assets Authority (PPDA), is attempting to bring all procurements under one information system, e-GP. At present, CMST manually generates solicitation documentation. Upon completion of the contract award, the key contract data is entered to the Microsoft Navision to create purchase orders.

Procurement Digital Health Maturity Challenges

- **Solicitation evaluation, award and contracts are manual:** CMST procurement employees cite that Navision is little more than a system used for issuing purchase orders once solicitations are issued, evaluated and awarded manually. The e-GP system to replace Navision is set to systematize many of these processes; however, the integration of CMST procurement process with warehousing will be lost.

Table 22: Malawi Public Sector Procurement Data, Platforms and Challenges

Procurement Data Inputs		
Data	Data Source	Data Enterer
Supply Plan Data	PipeLine	GHSC-PSM
Procurement Platforms		
Platforms	Data Inputs	Users
Microsoft Navision (partial operation)	Supply Plan Data	CMST
e-GP	Supply Plan Data	GOM (future state)

Public Sector Digital Transportation, Customs Clearance, Warehousing Process

Malawi's public-sector FP commodities run through multiple parallel supply chains, as described in Figure 19 below and summarized in Table 23 below:

Table 23: Commodity Warehousing and Distribution Parallel Supply Chains in Malawi

Funder	Warehouse	Distribution Partner	Destination
MOH	CMST	CML	Public Sector health facilities
USAID	CML	CML	SMOs/Public Sector health facilities
TGF	Bollore	Bollore	Public Sector health facilities
UNFPA	CMST	CML	Public Sector health facilities
MOH/UNFPA	CMST	CML	CHAM

Given almost all FP commodities are imported by international donors, shipment and transactional event data as goods are transported, imported and moved to their recipient warehouses is available in the VAN. However, as the system is relatively new, recent reports suggest that the manual process of notifying RHD of shipment arrivals has limitations given the lack of integration between the warehouse-utilized management systems and the RHD-utilized OpenLMIS.^{cviii} Despite the majority of FP commodities being donated, those funded by UNFPA are warehoused and managed by CMST, while USAID and TGF-funded commodities are managed by third-party warehouses. Once goods arrive to their respective warehouses, they are received via various Warehouse Management Systems (WMS), like Navision for CMST, and SAGE for CML.

Transportation, Customs Clearance, Warehousing Digital Health Maturity Challenges

1. **Navision System Limitations** - CMST users note that most warehouse management processes are conducted manually on-paper due to Navision's system limitations. At present, CMST only uses Navision for receiving and dispatching shipments. Implementation of a new WMS, MACS, is planned for operation in late Summer 2021, and will incorporate scanners (already procured) to receive barcodes, put-away, picking and distribution.
2. **Manual Inventory Management** – A subset of the previous challenge, inventory management is conducted manually per quarter, shutting down the entire warehouse.^{cix} These manual processes result in a lack of stock visibility, resulting in high risk of stock expiries and limited storage capacity.^{cx}
3. **Lack of Integration between WMS and Stock Management Tools** – Across all parallel supply chains, there is no integration between the various warehouse management systems and the tools used to manage supply plans and forecasts. Reports suggest shipment deliveries notifications to CMST are manual and do not always get reported in a timely manner.

Table 24: Malawi Public Sector Transportation, Customs, Clearance and Warehousing Data, Platforms and Challenges

Transportation, Customs Clearance, Warehousing Data			
Process	Data	Data Source	Data Enterer
Transportation, Customs Clearance	Shipment Data and Customs clearance event data	VAN	USAID, UNFPA, Global Fund
Customs Clearance	Customs documentation (paper-based)	Customs Clearing Companies	Customs Clearing Companies
Warehousing	Receiving and Dispatching Data Stock, product, location, expiry, batch number, etc..	Navision (future state: MACS)	CMST
Warehousing	Stock, Product, Picking/Packing Data	SAGE, UrbanCode, Freight Focus	CML
Transportation, Customs Clearance, Warehousing Platforms			
Platforms	Data Inputs	Users	
Navision	Receiving and Dispatching Shipment Data	CMST	
SAGE, UrbanCode, Freight Focus	Inventory, Product, Picking/Packing Data	CML	

Public Sector Distribution Digital Process

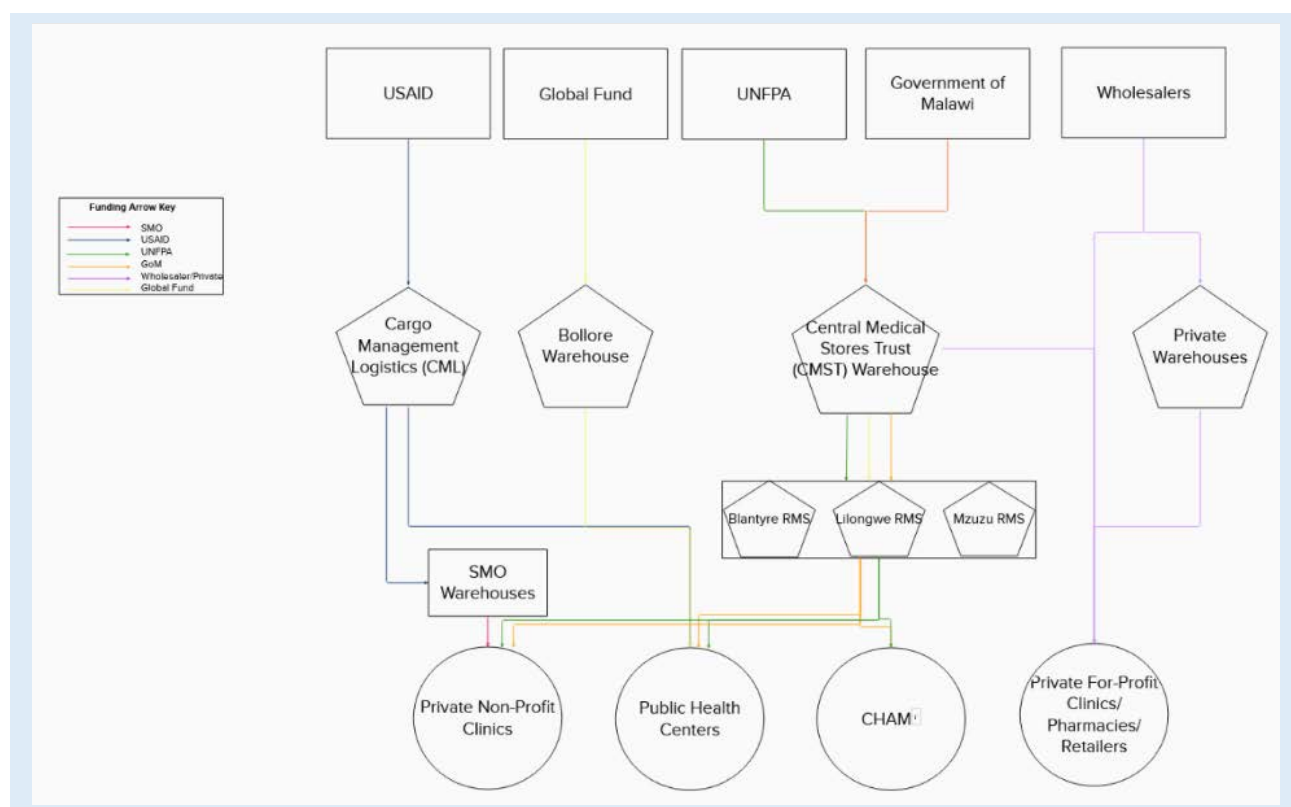
There are three Regional Medical Stores (RMS) in Malawi, from which all CMST distributions to health facilities and CHAM sites are made. Distributions to the RMSs are made by CMST's own fleet, and by CML from the RMSs to the health facilities. The CMST reports that all stock from the Central Warehouse is directed to the RMSs in a 45:35:20 ratio, to Blantyre, Lilongwe and Mzuzu, respectively, based on the number of health facilities each serves.^{cxix} SMO commodities and USAID commodities flow directly from a private sector distribution company, CML.^{cxii} These distribution lanes are mapped in Figure 20. Malawi's CIP indicates that a multitude of parallel supply chains in the FP supply ecosystem leads to "poor coordination and communication between the two sectors about the procurement and distribution of commodities."^{cxiii}

Health facilities are responsible, through their respective District Health Officer(s), to report their inventory statuses to OpenLMIS. This data is input manually and on a monthly cadence. The inventory data subsequently becomes "order" data from the facilities as OpenLMIS is configured to use the min/max levels, consumption and current stock statuses to estimate orders that need to be placed with CMST to maintain optimal stock levels. This inventory data becomes an input to the Forecasting and Supply Planning process as well as an input, in the form of order data, to the CMST Procurement process.

Despite these parallel supply chains, the process of distributing to health facilities is similar.

- **CMST Distribution to Health Facilities:** As described in the Public Sector Supply Mechanisms section, CMST forward positions stock to its regional warehouses based on demographic proportions. CMST receives orders from health facilities via entries into OpenLMIS by District Health Officers. While all orders for distribution should be placed in OpenLMIS, key informant interviews suggest that some emergency orders, or products not found in the OpenLMIS, are entered directly into CMST's own ordering system. Orders entered into OpenLMIS are approved by CMST Branch Managers, downloaded to excel or PDF, and then uploaded manually into Navision. This process applies to the following funding groups:
 - MOH-procured FP commodities – transportation handled by CML
 - UNFPA-procured FP commodities – transportation handled by CML
- **USAID Distribution to Health Facilities:** Though CML does not have access to OpenLMIS, GHSC-PSM creates order requests from OpenLMIS and provides them to CML, which in turn creates distribution lists.

Figure 20: Malawi FP Commodity Funding and Distribution Channels



Distribution Digital Health Maturity Challenges

1. **Separate systems for distribution and ordering** - Key informants complained of the “long” process of converting an order from health facilities in OpenLMIS to an active operation in Navision. The process to download and approve the order and upload it into Navision is semi-automated. Emergency orders subvert this process by using CMST’s Online Ordering System.
2. **Multiple distributions monthly** - Given the parallel nature of Malawi’s FP supply chain, several actors are distributing FP commodities to SDPs monthly (~4.3 distributions monthly). Intaking and conducting inventory on these dispatches is a time-consuming process, as SDPs inventory stock manually, taking away from critical service provision.
3. **Ordering reliant on DHO order entry** - CMST only makes distributions based on orders received in OpenLMIS or the Online Ordering System. The HCSS Master Plan indicates most health facilities do not submit monthly orders in OpenLMIS, despite needing product, resulting in stockouts. The root cause analysis of this issue is yet to be resolved.^{cxiv}

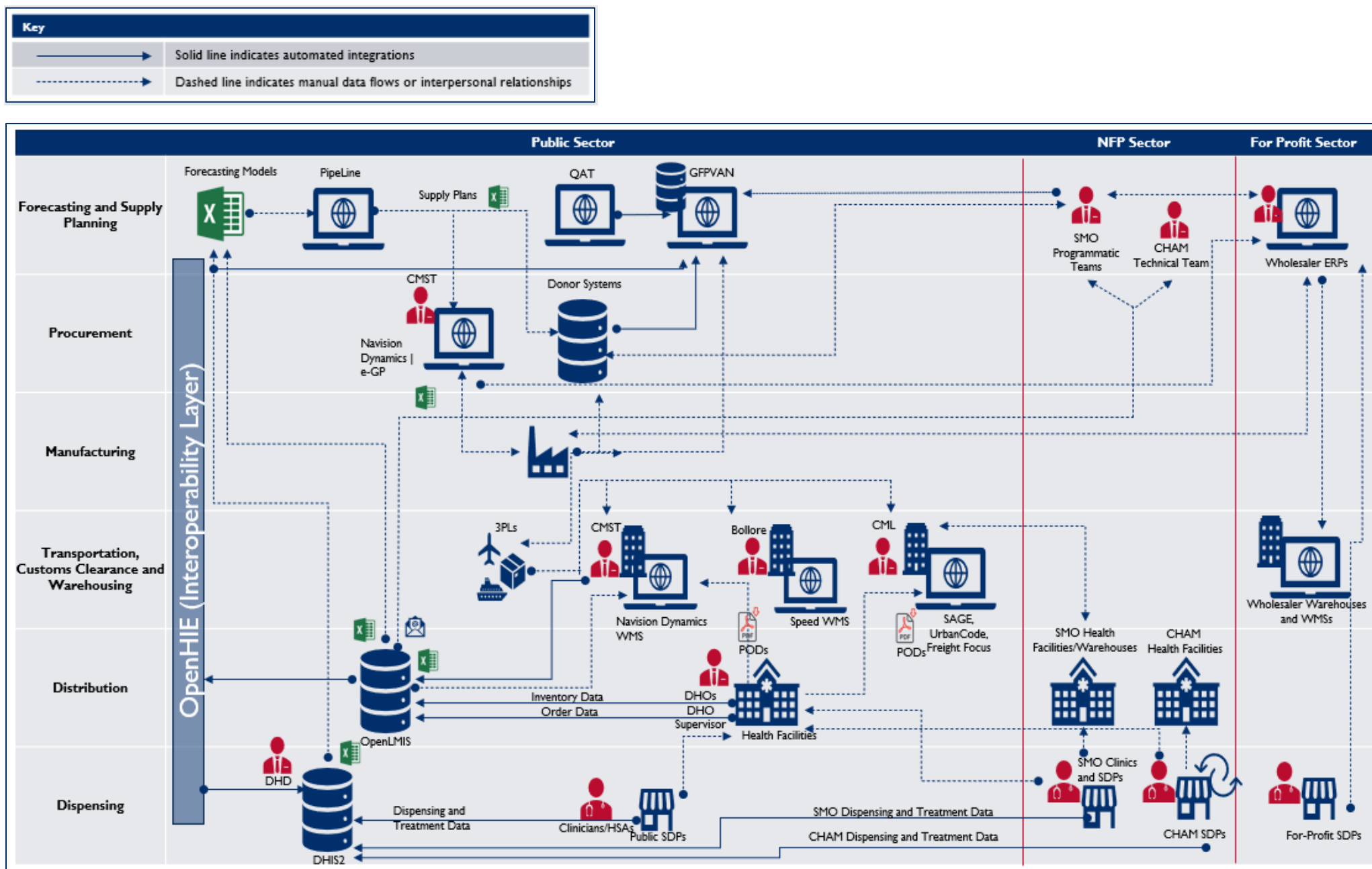
Table 25: Malawi Public Sector Distribution Data, Platforms and Challenges

Distribution Data		
Data	Data Source	Data Enterer
Order Data from health facilities	OpenLMIS (downloaded to Excel), then uploaded into Navision	DHOs
Emergency Order Data from health facilities	CMST Online Ordering System	DHOs
Distribution Platforms		
Platforms	Data Inputs	Users
Navision	Receiving and Dispatching Shipment Data	CMST
OpenLMIS	Health facilities inventory data	DHO
SAGE, UrbanCode, Freight Focus	Inventory, Product, Picking/Packing Data	CML

Private Sector Family Planning Digital Supply Chain Process Flow

Private sector members of the FP supply chain ecosystem are broken down into two primary groups: NFP, including SMOs and their respective clinics, as well as CHAM, and For-Profit, namely wholesalers, retail pharmacies, and private clinics/hospitals. As described previously, while the NFP sector plays a critical role in service provision, technical assistance and commodity dispensing, the for-profit sector operates and manages almost entirely separate supply chains. Both NFP and for profit E2E processes are mapped in Figure 21, demonstrating non-uniform information-sharing and integrations between public and private sectors.

Figure 21: Malawi FP Digital Supply Chain Ecosystem Data and Process Flows (current as of August 31, 2021)



Not-for-Profit Sector

Given the NFP sector is funded almost entirely by the public sector, procurements and transportation into Malawi are largely out of scope for these organizations. As established in Figure 19, SMOs received donated commodities from USAID, while CHAM receives commodities from CMST through their SLAs with District Health Departments.

SMO Digital Supply Chain Process

Depending on their organization, SMOs receive FP commodities through either USAID distribution channels or CMST distribution channels.

USAID-Distributed: SMOs that receive USAID-donated products, like PSI, have reported collaborating with USAID's procurement agent, GHSC-PSM, to determine the appropriate order quantities and budgeting. These processes are conducted offline. Goods are delivered from USAID's warehouse to SMO warehouses. In the case of PSI Malawi, there is one central warehouse, regional warehouses and district warehouses are being established. SMOs stock their own clinics based on monthly inventory reports provided in OpenLMIS, which are obligated to report stock data into it. PSI's district teams conduct quarterly data validations and are regularly moving stock between facilities to account for over and under-stock situations resulting from data quality issues.^{CXV}

CMST-Distributed: SMOs that receive product from CMST, like BLM, have a similar information and reporting structure to Public Sector SDPs. Clinics report their inventory manually on a monthly basis to DHOs who report this data into OpenLMIS, from which monthly distributions are made from DHO facilities and pharmacies. If stockouts occur, SMO HQ pharmacists use OpenLMIS to determine if redistributions at the local or district-level can occur. SMO clinics are also obligated to report treatment and dispensing data to DHIS2. In addition to public-sector systems, BLM also uses spreadsheets to manage stock levels at clinics. Clinics report stock levels and distributions monthly. While there is a possibility of using software to manage this process, users report data is accurate and there is 100% reporting compliance.^{CXVI}

SMO Digital Health Maturity Challenges

As SMOs are fairly integrated into the public sector supply chain, they experience many of the same challenges as public stakeholders, including data quality and reporting compliance. In particular, BLM reported two primary challenges:

1. **Distribution Lead Times:** Prior to 2018, BLM clinics reported inventory data directly to CMST and was able to request orders and pickup their shipments as needed. Following an initiative to fold SMO service delivery under DHOs in 2018, BLM now awaits distributions from health facilities, dependent on their order data being entered by the District team in OpenLMIS. Staff report this indirect process has slowed the distribution process.
2. **Inaccuracies in Demand Data:** As clinics can only report stock data into OpenLMIS and treatment data into DHIS2, there is no opportunity for these teams to report demand that went untreated due to stockouts. BLM staff note

not being able to adjust upward their orders as their inventory tops out at what they were provided the previous month.

CHAM Digital Supply Chain Process

The MOH maintains Service Level Agreements (SLA) with the Christian Health Association of Malawi (CHAM) to provide essential healthcare services, including FP, in geographic regions where there is a gap in public sector coverage, namely rural areas. Reports suggest the Ministry funds 50% of CHAM's income; but the relationship is plagued by financial, policy, and organizational oversight disagreements.^{cxvii}

CHAM receives programmed commodities, like those for FP, through CMST distribution channels (funded by either UNFPA or MOH) as per their SLAs with District Health Departments. As such, these facilities are obligated to provide inventory and consumption data through the same platforms as public SDPs (treatment data via DHIS2 and inventory data entered by DHOs into OpenLMIS). The CHAM Secretariat reports being involved in the Forecasting and Supply Planning processes at a high-level and receiving OpenLMIS monthly emails on distributions but is otherwise siloed.

At present, CHAM does not use any logistics or inventory management platforms, and all data recording and transmission processes are conducted manually. The CHAM Secretariat is in the process of evaluating various LMIS systems; however, constrained budgets re preventing movement in this regard.

For-Profit Sector

The FP For-Profit sector in Malawi is comprised of wholesalers, private hospitals and clinics, and retail pharmacies. Given local manufacturers only produce essential medicines, they do not yet play a role in the FP supply chain. As this research activity was limited in scope, an evaluation of systems and processes used by private hospitals, clinics and pharmacies was not included; therefore, this analysis is focused on wholesalers.

Malawi's wholesaler community is relatively small, and those that deal in FP commodities are an even smaller subset.

Wholesalers	Worldwide Pharmaceutical Distributors Pharmacare Pharmacies Pharmavet LTD Action Medeor Artemis Life Sunrise Pharmaceuticals Limited Intermed
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Forecasting and Supply Planning, Procurement, Distribution Digital Processes

The only demand signals wholesalers receive are in the form of tenders issued by the CMST; in some cases, these are emergency tenders, and if wholesalers have not already stocked products, they are unable to compete.^{cxviii} Malawian FP wholesalers have complained that they have little to no market intelligence regarding FP commodity promotions or client product and cost preferences.^{cxix} Wholesalers

do express Emergency Contraception (EC) as one FP commodity with potential, given that public sector supplies of this product are typically low; however, wholesalers also identified an information gap in how EC is used.^{cxx}

Given so few Malawians obtain FP from the private for-profit sector, Malawi's wholesalers face several market barriers, detailed below.

For-Profit Private Sector Challenges

- FP products are offered at no- or low-costs in the public sector; to compete, wholesalers must employ extremely low profit margins to be competitive. Given the public sector covers most FP needs, the demand in the private sector is of such a low volume that profit margins would have to be significantly higher to cover operating costs.^{cxxi}
- The largest untapped market for Wholesalers is in rural Malawi; however, this requires developed distribution networks, which are not currently part of wholesalers' offerings.
- The information gap between wholesalers and the FP market is wide; Wholesalers do not have a sense for demand, and are reactionary to one of their largest clients, CMST.^{cxxii}

On the digital front, Malawian wholesalers interact with their private clients, NFP entities (such as SMOs) and the GOM, to conduct demand and supply planning.

- **Private Clients:** Wholesalers utilize internal ERP and sales systems to analyze historical sales and estimate demand. However, forecast accuracy remains a challenge as wholesalers procure and warehouse stock in anticipation of purchase orders from private clients, which do not always materialize. These wholesalers frequently buy on credit from international manufacturers and in turn, extend credit to their private clients. These clients are regularly delayed in their payments, making the private sector forecasting and supply process more difficult given the added financial limitations.^{cxxiii}
- **NFP Entities:** Wholesalers report maintaining relationships with SMOs to understand their needs and the quantities consumed across product categories. They note that this information is difficult to obtain and fluctuates significantly based on funding availability. Wholesalers also seek to add value aside from commodity provision, such as redistribution of expiring stock and access to additional consumers and buyers.
- **GOM:** Though rare, CMST does issue tenders for FP products, to which wholesalers reply. There is little information sharing outside of the tender process itself, so some wholesalers will proactively procure in anticipation of emergency tenders so that their lead times can be competitive in the event a tender is issued.^{cxxiv}

Wholesaler Digital Health Maturity Challenges

1. **Forecast Accuracy:** Wholesalers report that NFP and for-profit private sector demand shifts regularly; therefore, historical sales alone are not an accurate indicator for supply planning purposes. While wholesalers do attempt to conduct their own market intelligence through informal conversations with NFP clinics, information is difficult to obtain.

2. **Data Access:** Wholesalers do not directly or indirectly have access to any public sector quantification or supply planning data. Similarly, wholesalers do not have foresight into upcoming tenders. Though not directly supplying a majority of FP products to the public sector, wholesalers have expressed that public sector data can offer insights into critical demand signals that they would otherwise try to impute from their own historical demand.
3. **Data Sharing:** Wholesalers are excluded from public sector information-sharing platforms; as procurers and importers, wholesalers do not have access to public sector health facility inventory levels. Though wholesalers do use inventory management systems, they are unique to the individual actors. For example, by virtue of their relationships with manufacturers and their own clients, wholesalers must manage their supply and demand via closed information networks. If a wholesaler also has a retail license, they would be obligated to provide their data, obtaining this data is difficult due to differences in opinion regarding data access and a fundamental lack of collaboration between the public and private sectors.^{cxxv}

Table 26: Exemplary Wholesaler Datasets and Platforms in Malawi

Wholesaler Data & Platforms		
Data	Data Source	Platform Example
Demand Data	Historical Sales Data, Wholesaler ERPs	MARG, Intersoft
Demand data from SMOs	Informal relationships	Manual
Demand data from CMST	Public solicitations	CMST website

Data Sharing Sentiments

While wholesalers have broad incentives to seek access to more data (such as public sector consumption, supply plan, or stock data), they do have concerns about data security and access. Key incentives and concerns are listed below:

- **Access to more data for forecasting:** Wholesalers have repeatedly expressed not having access to public sector demand data in Malawi prevents them from understanding critical market sentiments about product usage, as well as public sector gaps. In particular, one wholesaler pointed out that data on product expiries in the public sector would assist the private sector in better understanding specific product demand.^{cxxvi}
- **Public sector value to redistribute:** One wholesaler noted that data sharing between the public and private sector also benefits public clients as wholesalers have and can regularly take on expiring stock from public entities. As wholesalers have private clients and agile redistribution means, they can assist in reducing wastage.
- **Build stronger relationships with suppliers:** As wholesalers maintain strong relationships with international manufacturers, they contend that public sector demand data enables them to demonstrate total market demand data for the entire country to their manufacturers, which could build stronger partnerships and result in better performance.

- **Loss of market competitiveness:** Though wholesalers expressed no concerns about accepting public sector data, they did note that sharing their own sales data in a network or data exchange could result in a loss of market competitiveness if that data was shared with other wholesalers.

VAN Role in the Current Digital Ecosystem

Background and Adoption Challenges

Malawi was one of two countries to first pilot the VAN and was instrumental in providing input to the design and functionality of the platform starting in 2018. It was chosen as a pilot country because of its centralized supply chain. It began integration of the VAN with its first sharing of data in February 2019. A formal VAN comprehensive training for multiple in-country stakeholders was held in February 2020, after which Malawi discontinued its use of the PPMR in April 2020. While this training and the prospect of a PPMR to VAN transition were well-regarded following buy-in workshops in Malawi, COVID-19 significantly delayed the progress of on-the-ground adoption of the system. VAN coordinators noted historical underlying challenges associated with parallel planning processes that were in place at the time. Weekly meetings with VAN users were established to help them become more familiar with the VAN and sources of the data, and to work with each other as a team. The information provided here reflects feedback from stakeholder discussions and desk research.

The VAN is a supply chain networking platform where members (e.g., country governments, manufacturers, donors, and other trading partners) can assess and prioritize supply needs and act when supply imbalances materialize. Within the platform, members share their order, shipment, inventory and/or supply plan data and can work together to resolve supply chain inaccuracies, answer questions, and make decisions. Currently, there are more than 97 member institutions sharing their contraceptive supply data within the VAN, including 34 LMICs. More information on the VAN can be found at www.rhsupplies.org/gfpvan

Efforts to scale up use of the VAN focused on two primary areas:

1. **Build trust in VAN data sources:** Sessions to educate users on the sources of data integrated with the VAN, i.e., direct data feeds from donor systems, and user-uploaded datasets from in-country systems, helped establish trust in the system.
2. **Demonstrate VAN value through process improvement:** Early use of the VAN and data inputs demonstrated that a lack of coordination between parallel supply chains was resulting in poor supply planning accuracy and stock levels falling below and exceeding min/max levels, respectively. VAN coordinators were able to show users how the platform could flag these errors and facilitate collaboration to prevent over and understock situations.

As a result, the newly formed group was able to establish an increased level of trust in the VAN and the multiple data sources. This helped to create an environment of increased collaboration by helping to coordinate the previously parallel planning processes. The increased trust that came with familiarization with the VAN and each data source further helped the Malawi supply planning team streamline their processes and improve the overall data quality even more.

User and Functionality Deep Dive

At present, Malawian VAN users are engaged in several key functionalities, including uploading forecasting and inventory data, scenario planning based on what-if consumption scenarios, action request tickets, and data validation activities. Though most users have only recently begun using the VAN on a regular basis, they expressly recognize the value of the VAN at the global and local levels and are invested in ensuring Malawi's use is efficient and data is accurate.^{cxxvii}

Some *key value* demonstrations of the VAN in Malawi, as described by users in the Reproductive Health Department, are below:^{cxxviii} See Annex H for VAN successes in Malawi and Annex I for the full presentation by Malawi's RHD on its use and value of the VAN.

- **Data Visibility:** The VAN provides visibility into inbound shipments and manufacturer delays and enables planners to expedite or delay specific shipments as necessary. In-country planners are aware of shipment delays sooner than before their use of the VAN and are able to proactively conduct commodity re-distributions. Increased visibility through the VAN has also enabled better supply planning, and any funding gaps are more easily identified and acted upon.
- **Trust in Data:** By providing inventory and supply plan data to the VAN, FP stakeholders across Malawi (MOH, SMOs, International Donors) all access the same data; this not only increases visibility into data, but also trust in the data as the VAN becomes a single source of truth for planners.
- **Increased Efficiencies in FASP Processes:** As data is managed and integrated in one platform, decision-making is timelier as planners do not have to request data or conduct data validation reactively but can do so proactively during regular meetings.

Current VAN user groups, key features and functionalities used, and their adoption level are listed in Table 27 below.

Table 27: Malawi VAN User Groups, Features and Adoption

GFPVAN User Groups, Features and Adoption		
User Agency/Department	Description	Use Level
Reproductive Health Directorate (RHD)	• Ownership of VAN membership • Expressed desire to champion the VAN in Malawi and globally • Leads and actions offline users with actions • Respond to Action Request Tickets (ARTs) • Attends biweekly VAN country meetings	High
HTSS	• Attends biweekly VAN country meetings • Act as lead planner if/when RHD is not present	Medium
CMST	• Does not use in-system ticketing • Data consistency issues • Planning refresher training for new users	Low
UNFPA	• Access since June 2021 • Expanding access to more users	Medium
GHSC-PSM Field Office	• Supply plan validation • Data access for quarterly quantification	High

meetings		
Family Planning Association of Malawi (FPAM)	• New User	TBD

Existing Opportunities

1. **Data Discrepancies:** VAN coordinators report there are discrepancies with master product data reported from multiple data sources in Malawi. In particular, CMST-reported inventory levels have inconsistent units of measure (UOM) leading to inaccuracies in supply plan validations and scenario-planning.
2. **Permeation of VAN Value Proposition:** Despite some users' enthusiastic adoption of the VAN, in-country interviews across all functional areas of the supply chain suggest that knowledge of the VAN is limited but growing. The permeation within the supply chain is low as the VAN has yet to be used in-country for non-FASP related processes and most key informants mentioned use of or access to the VAN is not a part of their daily workstreams. However, upon presentation of VAN value propositions to key stakeholders in the RHCS committee meeting in June 2021, several participants expressed their support for the platform and plans to expand the VAN to more in-country supply chain processes (warehousing, inventory, etc.) are underway and have key stakeholder buy-in.

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