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Procurement and Supply Management

Supply Chain Assessment of Maternal, Newborn and Child Health Commodities in Ghana's Private Sector Facilities, Wholesalers, and Retail Pharmacies

Findings from a Mixed-Methods Assessment

March 23, 2022

The USAID Global Health Supply Chain Program-Procurement and Supply Management (GHSC-PSM) project is funded under USAID Contract No. AID-OAA-I-15-0004. GHSC-PSM connects technical solutions and proven commercial processes to promote efficient and cost-effective health supply chains worldwide. Our goal is to ensure uninterrupted supplies of health commodities to save lives and create a healthier future for all. The project purchases and delivers health commodities, offers comprehensive technical assistance to strengthen national supply chain systems, and provides global supply chain leadership.

GHSC-PSM is implemented by Chemonics International, in collaboration with Arbola Inc., Axios International Inc., IDA Foundation, IBM, IntraHealth International, Kuehne + Nagel Inc., McKinsey & Company, Panagora Group, Population Services International, SGS Nederland B.V., and University Research Co., LLC. To learn more, visit ghsupplychain.org

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Acronyms

°C	degrees Celsius
DT	dispersible tablet
EUV	end use verification
FDA	Ghana Food and Drugs Authority
FEFO	first expiry, first out
FWC	framework contract
GH₵	Ghana cedi
GhiLMIS	Ghana Integrated Logistics Management Information System
GHS	Ghana Health Service
GHSC-PSM	USAID Global Health Supply Chain Program-Procurement and Supply Management Project
HDP	hypertensive disorders of pregnancy
LMIC	low- and middle-income countries
MNCH	maternal, newborn and child health
NHIS	National Health Insurance Scheme
ORS	oral rehydration salts
PPH	postpartum hemorrhage
RMS	regional medical stores
SOP	standard operating procedure
UNCoLSC	United Nations Commission on Life-Saving Commodities for Women and Children
USAID	United States Agency for International Development

Executive Summary

Across the globe, millions of mothers, newborns and children suffer severe illness or die from highly-preventable diseases. In Ghana, although maternal, newborn and child mortality rates are declining, the levels remain high and are still above the Family Planning 2020 targets. To address these challenges and drive action towards the Sustainable Development Goals, health facilities in private and public sectors should provide high-quality healthcare without disruptions in services. To facilitate this, critical maternal, newborn and child health (MNCH) products should be consistently available at service delivery points, including private health facilities and retail pharmacies across the country. However, there is a paucity of information on MNCH product availability in the private sector despite its significant contribution to total health care. There is also a lack of contextual information to provide insight into enablers and barriers to MNCH product availability in the private sector.

To this end, the USAID Global Health Supply Chain Program-Procurement and Supply Management (GHSC-PSM) project conducted an assessment to determine how MNCH commodities are managed within the private sector. GHSC-PSM used a mixed-methods approach to assess the supply chain for MNCH commodities in a representative sample of 69 private health facilities, 68 retail pharmacies and 15 wholesalers across four regions in Ghana: Ashanti, Greater Accra, Northern and Upper East. Quantitative data from sampled facilities constituted MNCH product availability, pricing, registration status and cold storage conditions. Qualitative data from 15 wholesalers disclosed factors influencing MNCH commodity supply in private and public sectors.

Assessment results indicate that private health facilities manage a wider range of MNCH products as compared to retail pharmacies and wholesalers. Specifically, management of injectables for maternal and newborn care was low at retail pharmacies and wholesale outlets. This was mainly attributed to low or no client demand, which also has implications on expiries and profitability. For all three facility types, amoxicillin dispersible tablets (DT), chlorhexidine gel and oral rehydration salts (ORS) + zinc co-pack were the least managed due to limited awareness and the availability of substitute products.

Stockout rates for amoxicillin DT, chlorhexidine and ORS + zinc were high across all facility types. Wholesalers and retail pharmacies recorded the highest stockout rates for injectables as compared to private health facilities. To address this challenge, policy makers should explore strategies that seek to encourage management and stocking of injectables in retail pharmacies and wholesale outlets to improve availability and ensure better health outcomes for mothers, newborns and children. Stockout rates for the remaining MNCH commodities were generally low across all three facility types, except for ORS which recorded a stockout rate of 27 percent at wholesale outlets.

Regarding MNCH product sourcing, results indicate that wholesalers are the main suppliers to private health facilities and retail pharmacies. Eleven out of 14 wholesalers involved in this study reported supplying more than 50 percent of their MNCH commodities to the private sector, citing demand predictability and better payment terms as the main reasons for their actions. On the other hand, wholesalers obtain most of their supplies from local manufacturers, which highlights the critical role of local pharmaceutical entities in the manufacture and supply of MNCH products in Ghana.

Registration of medicines and medical devices with the Food and Drugs Authority (FDA) is critical for guaranteeing product quality and safeguarding lives. The majority of facilities involved in the study stocked FDA-registered MNCH products. Additionally, four products (magnesium sulfate, misoprostol, nifedipine, and chlorhexidine) had prevalent brands registered with the FDA.

National Health Insurance Scheme (NHIS) prices for five of the MNCH products were lower than the selling prices at private health facilities or retail pharmacies. This was mainly driven by the stocking of more expensive brands of MNCH commodities at the time of the survey. Since price dynamics can impact dispensing decisions for facilities that offer NHIS services, there is need to conduct regular price reviews for all commodities including MNCH products. Surprisingly, price markups for some products in private health facilities and retail pharmacies were lower than markups recorded at wholesale outlets.

Adherence to standard storage requirements is important for maintaining the quality and efficacy of MNCH products within their established shelf life. For all three facility types, over 90 percent of facilities met at least half of the storage requirements, with the availability and use of storeroom thermometers constituting the lowest-performing areas.

As per standard storage guidelines, oxytocin must be stored within a temperature range of 2–8 degrees to maintain its efficacy. The survey results indicate that at least 90 percent of private health facilities and wholesalers had a working refrigerator, as compared to 65 percent of retail pharmacies. Furthermore, 100 percent of wholesalers and 96 percent of private health facilities were storing oxytocin in a working refrigerator, as opposed to 73 percent of retail pharmacies. These performance levels highlight the need for advocacy and increased action for improving oxytocin storage conditions in retail pharmacies.

Recommendations

- Review policies (National Essential Medicines List, National Treatment Guidelines and National Health Insurance Price List) that guide stocking decisions and administration of health products to include all items identified by the United Nations Commission on Life-Saving Commodities for Women and Children (UNCoLSC) as critical for effective MNCH management. Extensively disseminate these policies to public and private sectors.
- Provide cost incentives that encourage the private sector to offer and improve access to critical MNCH commodities, including amoxicillin DT, ORS + zinc co-pack, and chlorhexidine gel.
- Through cost incentives, encourage retail pharmacies and wholesalers to stock a wider range of MNCH commodities, including oxytocin, gentamicin and magnesium sulfate injection.
- Study current pricing mechanism of the national and private health insurance schemes to inform the establishment of a robust pricing structure for MNCH within the private sector.
- Advocate for global- and national-level budgeting and funding for life-saving MNCH commodities considered to be of little commercial value.
- Introduce mechanisms for pooled procurement based on centralized forecasting to improve demand planning and supply of MNCH commodities in the private sector.
- Intensify monitoring by the FDA to ensure that wholesale and retail outlets stock only FDA-registered commodities. Additionally, FDA should introduce incentives that motivate local manufacturers and international suppliers to register a wider range of MNCH commodities.
- Promote overall improvement in storage conditions, including cold storage of oxytocin, and appropriate temperature monitoring. Relevant regulatory agencies should monitor and supervise storage practices to improve adherence.

Background

Maternal, Newborn and Child Health Status in Ghana

Globally, millions of mothers, newborns and children experience severe illness or die from highly preventable diseases and disorders. Maternal, newborn and child morbidity and mortality disproportionately affect low- and middle-income countries (LMICs), which account for 99 percent of the global burden.[1] In Ghana, maternal, newborn and child mortality remains high despite significant progress that has been made in the past decade. Table 1 presents maternal, newborn and child mortality rates and associated causes of mortality.

Table 1. Maternal, Newborn and Child Mortality Rates and Causes of Mortality in Ghana

Health Area	Mortality Ratios and Rates (2017) [2]	Leading Causes of Mortality[3]
Maternal	310 per 100,00 live births	Postpartum hemorrhage (PPH) Hypertensive disorders of pregnancy (HDP) Sepsis
Newborn	37 per 1,000 live births	Preterm birth complications Intrapartum events, including birth asphyxia Sepsis
Child	52 per 1,000 live births	Malaria Respiratory infections, including pneumonia Diarrhea

Ghana has implemented several interventions aimed at preventing and reducing maternal, newborn and child mortality. These interventions include capacity building for midwives, improving the utilization of health care through the NHIS and implementing a free maternal care program, among many others. While these interventions have improved health-seeking behavior, there are still challenges in ensuring equitable access to quality health care.

To meet health-related Sustainable Development Goals, public and private health sectors in Ghana should be adept to deliver high-quality MNCH services, including the provision of quality health commodities. Table 2 presents a subset of critical MNCH commodities that should always be available where MNCH health care is offered. The UNCoLSC identified these commodities in 2012 for their potential to save the lives of more than six million women and children.[4] Measuring their availability will provide invaluable insight to shape future interventions.

[1] KFF (2021 Jul 28). The U.S. Government and Global Maternal and Child Health Efforts. *KFF Global Health Policy.* Retrieved from https://www.kff.org/global-health-policy/fact-sheet/the-u-s-government-and-global-maternal-and-child-health-efforts/

[2] Ghana Statistical Service - GSS, Ghana Health Service - GHS, and ICF (2018). *Ghana Maternal Health Survey 2017*. Accra, Ghana: GSS, GHS, and ICF. Retrieved from http://dhsprogram.com/pubs/pdf/FR340/FR340.pdf.

[3] Countdown to 2030 (2017). *Countdown to 2030: Ghana Country Profile*. Retrieved from http://countdown2030.org/wp-content/uploads/2018/01/Ghana-CD2030.pdf

[4] United Nations Population Fund (Jan 2012). *UN Commission on Life-Saving Commodities for Women and Children.* Retrieved from https://www.unfpa.org/publications/un-commission-life-saving-commodities-women-and-children

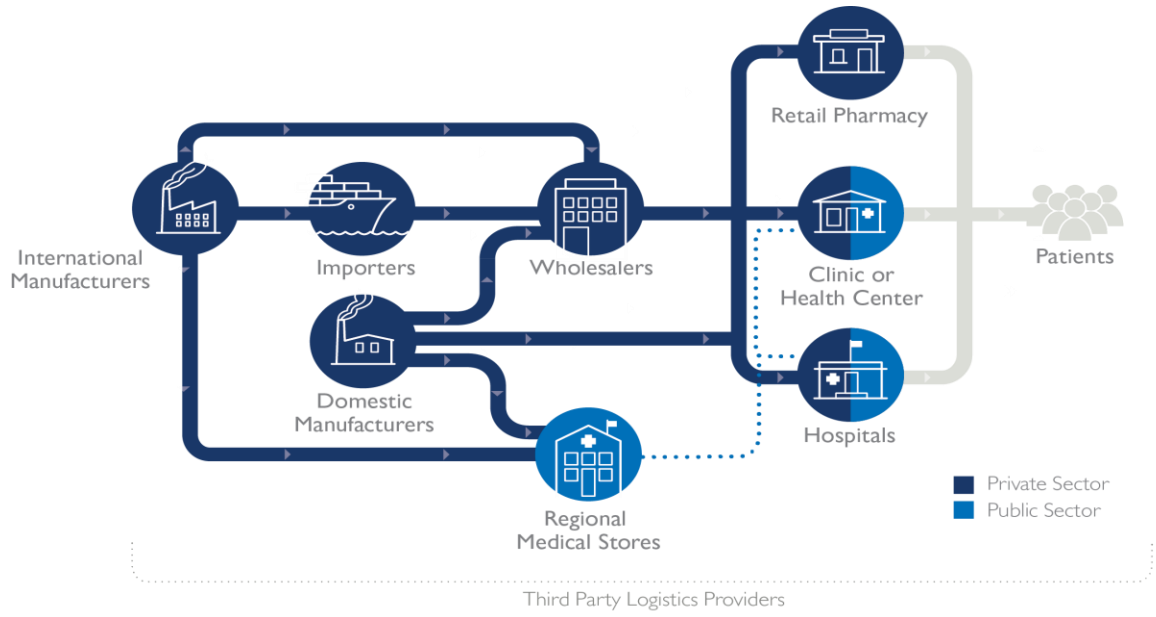
Table 2. MNCH Commodities Identified by the UNCoLSC and Their Target Health Conditions

Health Area	Commodity	Condition
Maternal	Oxytocin Misoprostol Magnesium sulfate	Postpartum hemorrhage Postpartum hemorrhage Preeclampsia/eclampsia
Newborn	Gentamicin Chlorhexidine	Newborn sepsis Umbilical cord care
Child	Amoxicillin DT ORS Zinc	Childhood Pneumonia Childhood Diarrhea Childhood Diarrhea

Role of the Private Sector in the Ghanaian Health System

Improving health outcomes requires the success of the public and private sectors in providing health care and health commodities. The private sector in Ghana accounts for about 33 percent of all physical health facilities including hospitals, clinics, and pharmacies, and it provides 50 percent of health care in the country.[5] Among caregivers who seek sick childcare in Ghana, 40 percent use private sector sources.[6] To ensure that caregivers are receiving effective MNCH services, health commodities must be readily available and accessible in health facilities. Figure 1 illustrates how MNCH commodities typically flow through Ghana's private health sector from the point of manufacture to the client.

Figure 1. Flow of MNCH Commodities in the Private Sector



[5] NHIS (2019). *NHIS Medicines List*. Retrieved from http://www.nhis.gov.gh/medlist.aspx
[6] Ministry of Health, Ghana National Drugs Programme (2017). *Ghana Standard Treatment Guidelines, 7th edition*. Retrieved from https://www.moh.gov.gh/wp-content/uploads/2020/07/GHANA-STG-2017-1.pdf

Ghana has a relatively large pharmaceutical sector, in part due to government policies and incentives favorable towards industry. Private sector domestic wholesalers procure commodities from international and domestic manufacturers, and manage the distribution to private health facilities and retail pharmacies. Wholesalers may work with subnational distributors and smaller wholesalers, referred to as sub-distributors, to ensure products reach the lower levels of the supply chain. Retail pharmacies play an important role in health service provision as care seekers may purchase their medicines directly from these pharmacies, either by prescription or over the counter. Additionally, wholesalers are important sources of health commodities to regional medical stores (RMS) under national framework contracts (FWC). Wholesalers may also provide health commodities directly to public health facilities, including hospitals and health centers, when stock is not available at RMSs.

Assessment Rationale

In Ghana, individuals and families are increasingly seeking MNCH services in the private sector; however, there is limited information on the availability of private-sector MNCH commodities in health facilities and retail pharmacies, as well as a lack of contextual information that can shed light on factors that support or inhibit MNCH commodity availability. In contrast, public-sector information on MNCH commodities, such as stock availability data, is easily obtained through biannual surveys carried out in public-sector facilities and through the newly rolled out Ghana Integrated Logistics Management Information System (GhiLMIS). Given that a significant portion of private-sector users seek care in pharmacies and chemical shops, it is critical to determine how MNCH commodities are managed within the private-sector supply chain in Ghana.

Objectives

The GHSC-PSM project supports USAID priority countries to strengthen national supply chains to ensure the availability of quality-assured MNCH commodities. Given the important role of the private sector and the paucity of information on MNCH commodities, there is a need for additional data collection in Ghana's private-sector facilities. To this end, GHSC-PSM collaborated with the Ghana Health Service (GHS) to carry out an assessment that included a quantitative survey and complementary qualitative interviews to shed light on the availability of MNCH commodity data. The assessment also sought to identify factors that affect availability in private-sector hospitals, clinics, and retail pharmacies in four regions in Ghana. Primary objectives of the quantitative component of the assessment were to:

- Determine the availability of MNCH commodities in private-sector clinics, hospitals, and private retail pharmacies in four regions in Ghana
- Capture information on available MNCH commodity brands, supply sources, and pricing (where possible)
- Understand storage conditions and practices for temperature-sensitive products, such as oxytocin

Additionally, qualitative data collection of domestic wholesalers fulfilled secondary objectives. Wholesalers are a primary source of MNCH commodities for hospitals and clinics in public and private sectors and for retail pharmacies. Through the qualitative component of the assessment, the GHSC-PSM project sought to obtain more information on wholesaler MNCH product offerings, client bases, contracting processes, and barriers associated with supplying public- and private-sector clients. These

wholesaler responses provide insight into why MNCH products may be in- or out-of-stock in private health facilities and retail pharmacies, lending additional context to the quantitative assessment findings.

Annex A provides a list of key questions answered for each MNCH product in line with the objectives of the assessment.

Methods

Overview

A mixed-methods approach captures supply chain-related data on a subset of MNCH commodities in the private sector (refer to Annex B). The sampling strategy included the selection of four regions (Ashanti, Greater Accra, Northern, and Upper East) in Ghana based on their representativeness. Within each region, the number of districts was randomly selected based on probability proportional to size. In the selected districts, data were collected from private health facilities (clinics and hospitals), retail pharmacies, and wholesalers, as they provide the greatest proportion of MNCH commodities within the private sector.

During data collection, a quantitative survey, included in Annex C, was administered through SurveyCTO. Upon completion of the survey, interviews were conducted with wholesalers using a semi-structured interview guide, included in Annex D. In total, the assessment included 69 private health facilities, 68 retail pharmacies and 15 wholesalers.

Quantitative data analysis via Microsoft Excel informed descriptive outputs categorized by research questions. Qualitative data were transcribed and analyzed via Microsoft Excel. Data was thematically analyzed with line-by-line coding of transcripts based on an agreed set of themes and patterns, which helped determine main findings from the interviews.

Detailed information on the methodology and sampling strategy can be found in Annex A.

Study Limitations

- Data collectors could not obtain pricing data for some facilities due to the perceived sensitive nature of this information. These facilities were reluctant to provide data on the cost and selling prices of MNCH commodities, despite being assured of confidentiality in the use of the data.

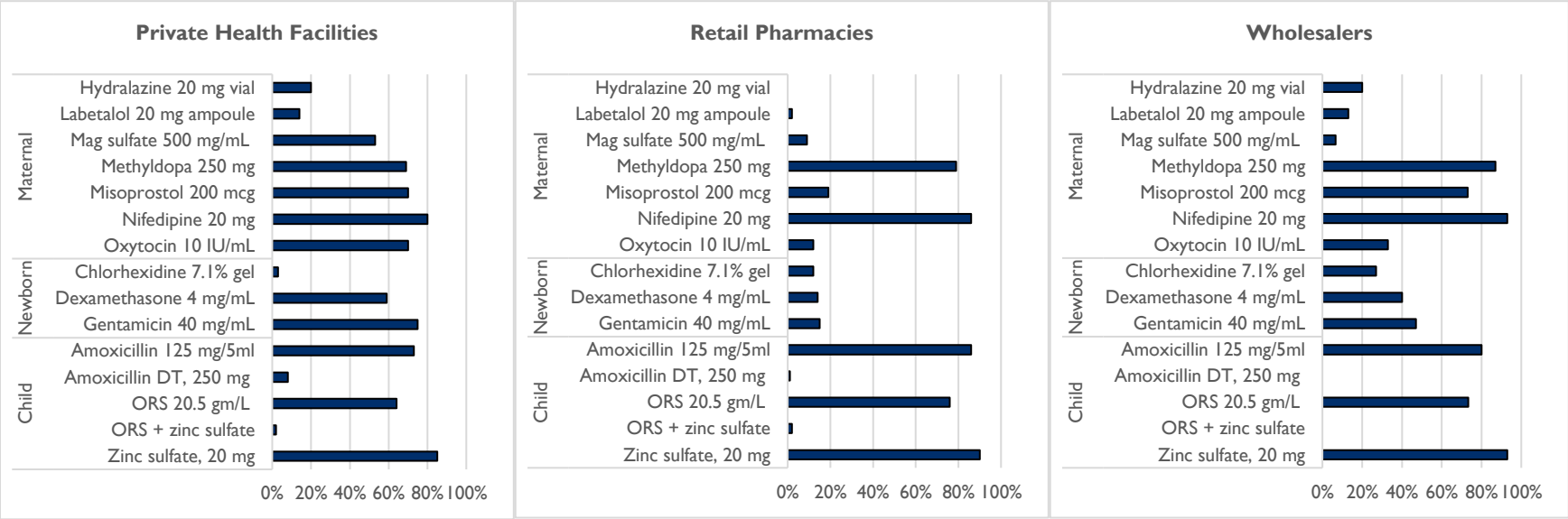
- There were difficulties collecting brand name data because some MNCH products had been labelled using only generic names. This impacted the determination of FDA registration status for these products.

Findings

Product Offerings and Management

The assessment collected data on MNCH product management within each facility type, which is reported in Figure 2. Product management is defined as MNCH products being stocked, received, or ordered within the past year by a given facility.

Figure 2. Percent of Private Health Facilities, Retail Pharmacies, and Wholesalers that Manage MNCH Commodities



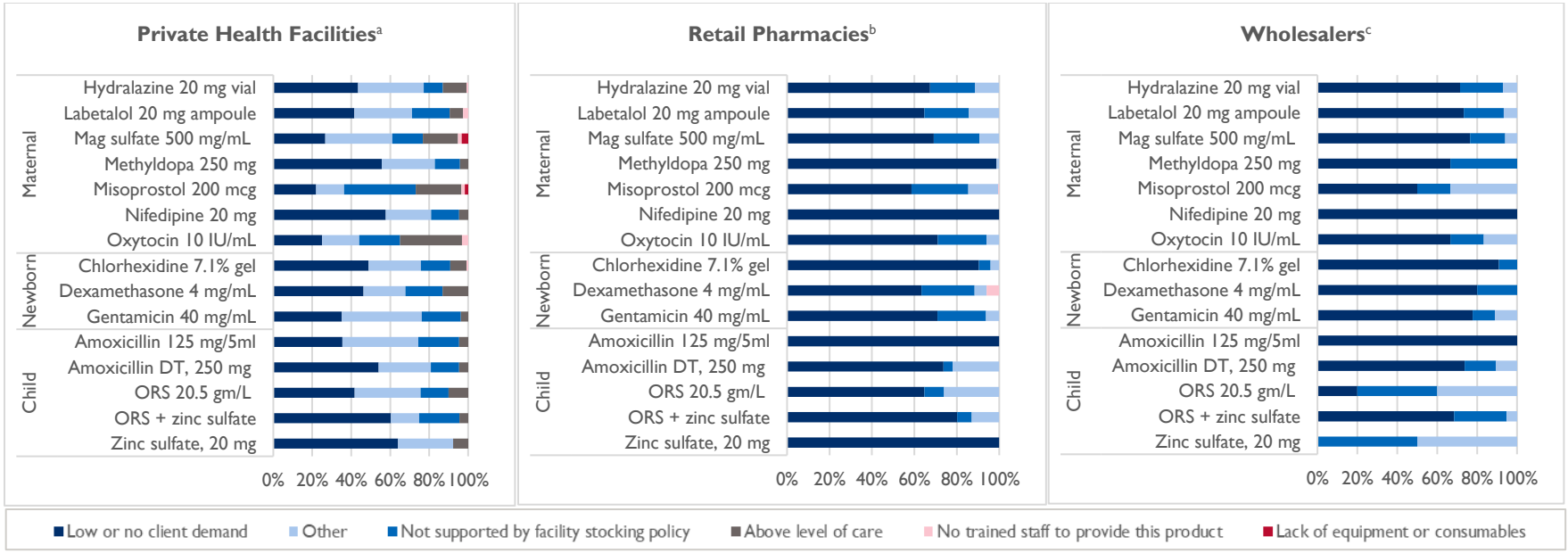
Main Findings

- Private health facilities manage a wider range of MNCH products as compared to retail pharmacies and wholesalers. At all three facility types, amoxicillin DT, chlorhexidine gel and ORS + zinc co-pack were the least managed products.
- Retail pharmacies and wholesalers were less likely to manage injectable products like gentamicin, magnesium sulphate and oxytocin as compared to private health facilities.
- These results highlight a need for retail pharmacies and wholesalers to offer a wider range of injectable products for maternal and newborn care. Additionally, they highlight low patronage of amoxicillin DT, ORS + zinc and chlorhexidine gel, possibly due to limited awareness and the availability of substitute products.

Reasons for Non-Management of MNCH Products

To supplement the product management data provided above, the assessment collected data on the reasons for non-management of MNCH products, as reported in Figure 3. Data include pre-selected reasons for non-management. Footnotes provide reasons considered as "other."

Figure 3. Reasons for Non-Management of Products Reported by Private Health Facilities, Retail Pharmacies, and Wholesalers



[a] *"Other" includes risk of expiry, preference for substitute products, availability of different formulation, lack of availability in the market, lack of profitability, and exclusion from NHIS medicines.*
[b] *"Other" includes risk of expiry, preference for substitute products, availability of different formulation, lack of availability in the market, and lack of profitability.*
[c] *"Other" includes availability of different formulation and lack of availability in the market.*

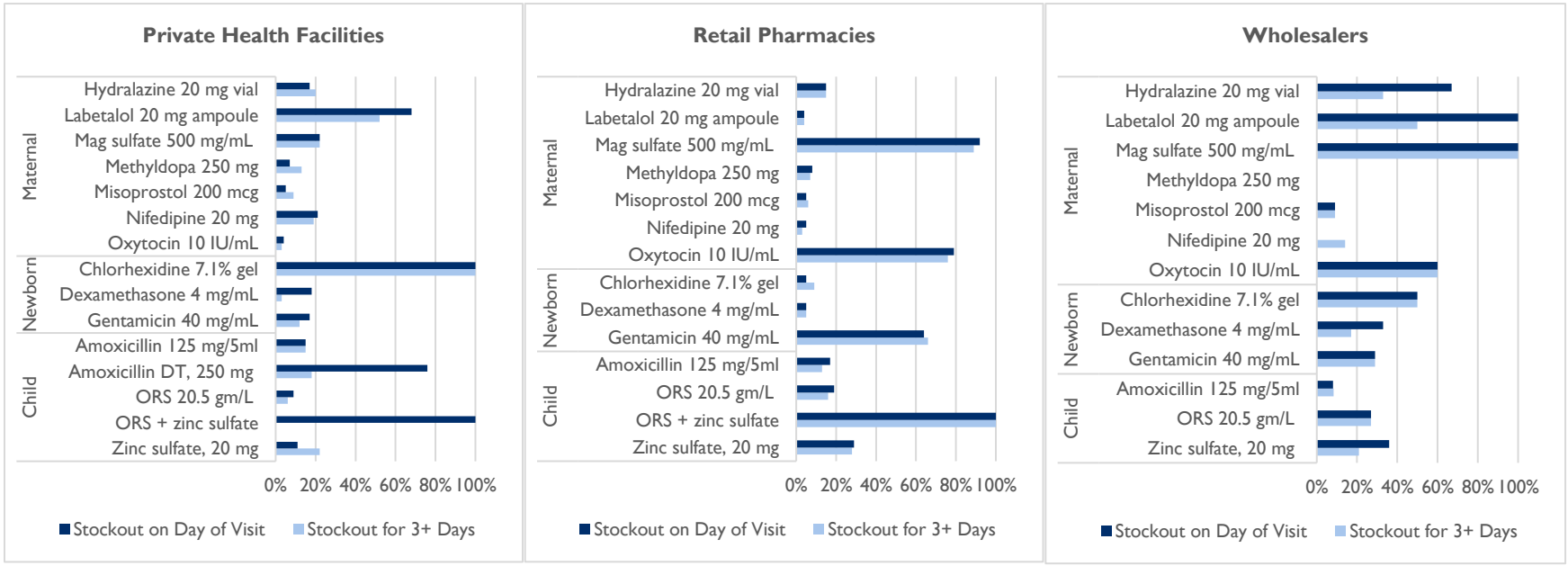
Main Findings

- All three facility types reported "low or no client demand" as the leading reason for non-management.
- At the retail pharmacy level, the response "not supported by facility stocking policy" was also prevalent for non-management of injectable drugs and misoprostol. This is because retail pharmacies may sell injectable drugs but are not allowed to administer them.
- At the private health facility level, a small proportion of respondents (less than 35 percent) listed reasons such as "above level of care" and "no trained staff to provide this product" for non-management of products such as oxytocin, magnesium sulfate, and misoprostol.

Product Availability and Stockouts

To determine whether MNCH products are widely available in the private sector, the assessment collected stockout data within each facility type, as reported in Figure 4. A commodity was considered stocked out if it was managed by a facility that had recorded a stockout in the three months prior to the survey.

Figure 4. Percentage of Private Health Facilities, Retail Pharmacies, and Wholesalers Stocked Out on the Day of Visit and Stocked Out for 3+ Days



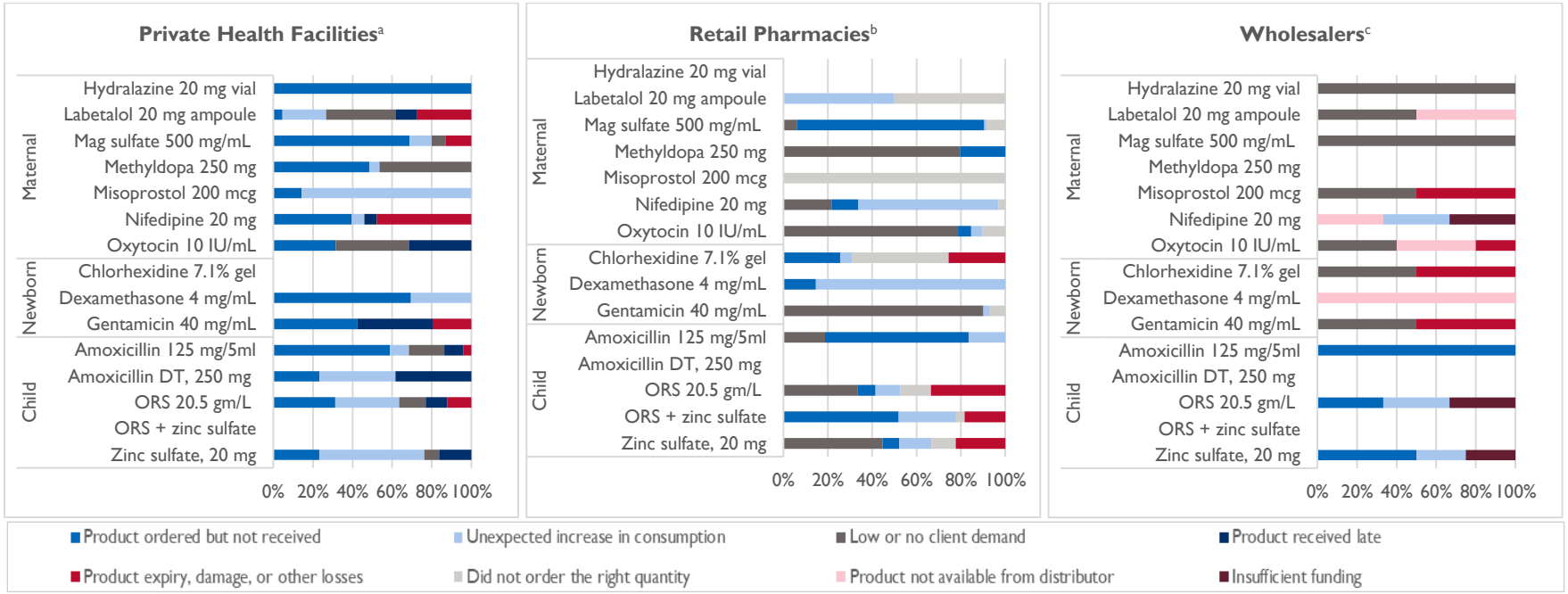
Main Findings

- Most private health facilities did not experience stockouts for MNCH commodities, apart from chlorhexidine, amoxicillin DT, and ORS + zinc co-pack.
- Retail pharmacies and wholesalers had high stockouts of injectable drugs, as well as ORS + zinc co-pack. Wholesalers reported these products as slow moving and less profitable; therefore, they keep limited stock on hand, which can impact product availability at the private health facility level.
- Findings also indicate that in contrast to health facility level data, retail pharmacies and wholesalers have higher stockout rates for oxytocin as compared to misoprostol. This suggests that retail pharmacies and wholesalers may prefer to stock misoprostol due to client demand dynamics.

Reasons for Stockouts

To supplement the stockout data presented above, reasons given for stockouts for each MNCH product are presented in Figure 5. Reasons were pre-selected, and footnotes are included to give insight into products for which data is unavailable.

Figure 5. Reasons for Stockouts of MNCH Products as Reported by Private Health Facilities, Retail Pharmacies, and Wholesaler



[a] Stockout reason for chlorhexidine— "product not available from distributor" —was not included as it was not one of the top 5 reasons for stockout for this commodity. Data for ORS + zinc co-pack not available as it was only managed by one health facility, which did not report stockouts.

[b] Stockout reasons for hydralazine— "ordered but did not receive right quantity" and "insufficient funding" —were not included as they were not one of the top 5 reasons. Data for amoxicillin DT not available as it was only managed by three retail pharmacies, which did not report stockouts.

[c] Data for methyldopa unavailable as stockouts were not reported by wholesalers that managed this product. Data for amoxicillin DT and ORS + zinc co-pack unavailable as they were not managed by any wholesalers included in this assessment.

Main Findings

- While most private health facilities reported "product ordered but not received" and "unexpected increase in consumption" as the leading reasons for product unavailability, retail pharmacies and wholesalers cited "low or no client demand" as a main contributor to stockouts.
- Retail pharmacies and wholesalers also reported supply challenges, such as "product ordered but not received" and "product not available from distributor" for select MNCH commodities, which makes it difficult to meet demand at the health facility level.

Product Quality

Registration Status of Prevalent MNCH Commodity Brands

The FDA oversees rigorous testing, registration, and enforcement prior to product importation and sale. Table 3 provides data on prevalent brands for each MNCH product included in the assessment. To determine if all brands were registered, data were compared with the FDA's product registration database.

Table 3. Prevalent Brands of MNCH Commodities and Their Registration Status in Ghana

Health Area	Product Name	Brand Name	Percentage	Registration Status
Maternal	Hydralazine 20 mg in 1 mL vial	Apresoline	31%	Registered
		Naman 20mg/2ml	23%	Not registered
		Hydraxyl	15%	Not registered
	Labetalol 5 mg in 1 mL ampoule	Switalol	25%	Registered
		Hypobeta	25%	Not registered
		Labet HCL	25%	Not Registered
		Labetalol HCL (Peotech Biosystem Limited)	25%	Not Registered
	Magnesium sulfate 500 mg/mL in 10 mL ampoule	Intramag	65%	Registered
	Methyldopa 250 mg	Dopatab	22%	Registered

		Pharm-Inter Methyldopa	20%	Not registered
		Methyldopa 250mg, Jiangsu Pengyao Pharmaceuticals	18%	Not registered
		Aldomet	17%	Registered
	Misoprostol 200 mcg	Pfizer Cytotec	87%	Registered
		Misoclear	12%	Registered
	Nifedipine 20 mg	Nifedi-Denk	39%	Registered
		Pinek	15%	Registered
		Cardiofin SR	12%	Registered
	Oxytocin 10 IU/mL in 1 mL ampoule	Beltocin	27%	Registered
		Pitons Oxytocin	18%	Not Registered
		Syntocinon 10IU/ml	10%	Registered
		Vernetocin 10IU/ml	10%	Registered
Newborn	Chlorhexidine 7.1% gel,10 gm	Chlorxy-G Gel	100%	Registered
	Dexamethasone 4 mg/mL in 1 mL ampoule	Dexamethasone (Troge)	47%	Not Registered
		Dexamethasone, Jiangsu Pengyao Pharmaceuticals	16%	Expired
		Pharmadex 4mg/1ml	9%	Expired
	Gentamicin 40 mg/mL in 2 mL vial	Gentamicin (Troge)	35%	Registered
		Habigent	19%	Not Registered
		Gentamicin, Grand Pharmaceutical (China) Co. Ltd	13%	Not Registered
Child	Zinc sulfate, 20 mg dispersible tablet	Zintab	81%	Registered
		Novazinc	10%	Not Registered

Note. Registration data were unavailable for amoxicillin DT, amoxicillin 125 mg/5 mL suspension, ORS 20.5 gm/L, and ORS + zinc co-pack.

Main Findings

- Only four products (magnesium sulfate, misoprostol, nifedipine, and chlorhexidine) had all prevalent brands registered with the FDA.
- A majority of MNCH products had at least half of the most prevalent brands registered. In contrast, only one brand of labetalol was registered, as compared with two brands that were unregistered and one brand that had an expired registration. In addition, dexamethasone did not have prevalent brands registered.

Overall Storage Conditions

Following the procurement of MNCH commodities, additional steps should be taken to ensure that they are stored in an appropriate manner to prevent product degradation. To determine whether quality storage guidelines are upheld in the private sector, the assessment captured information on storage conditions for MNCH commodities based on standard operating procedures (SOPs) in Ghana. Findings are presented in Figures 6–8 for all facility types.

Figure 6. Percentage of Private Health Facilities That Met Storage Requirements for MNCH Commodities

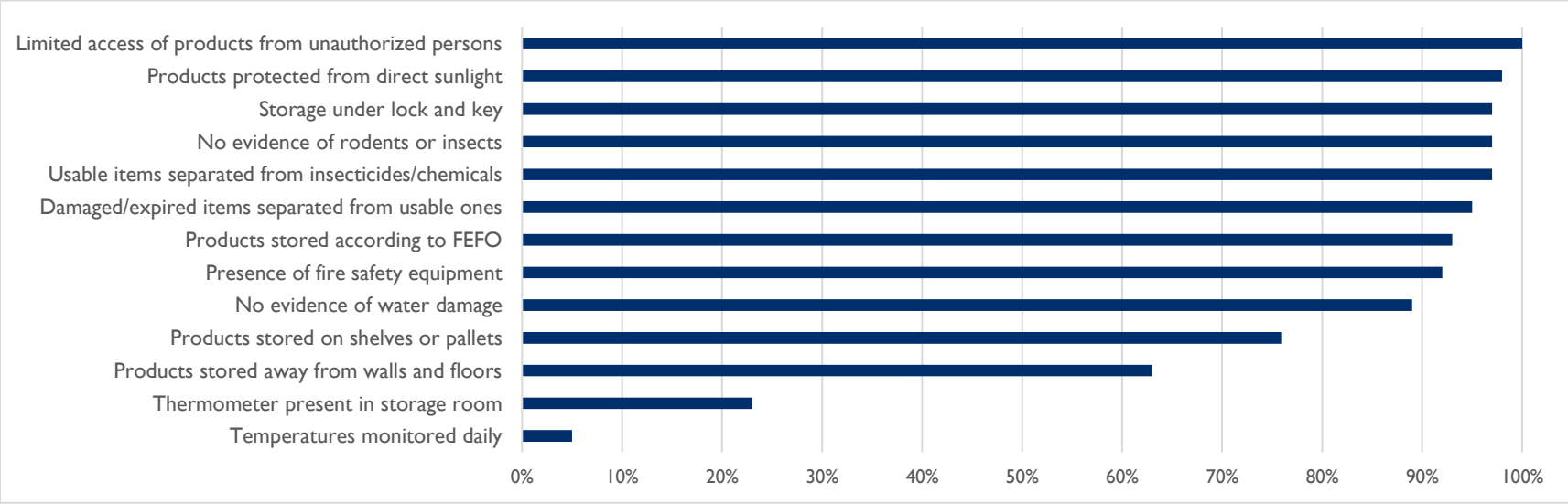


Figure 7. Percentage of Retail Pharmacies That Met Storage Requirement for MNCH Commodities

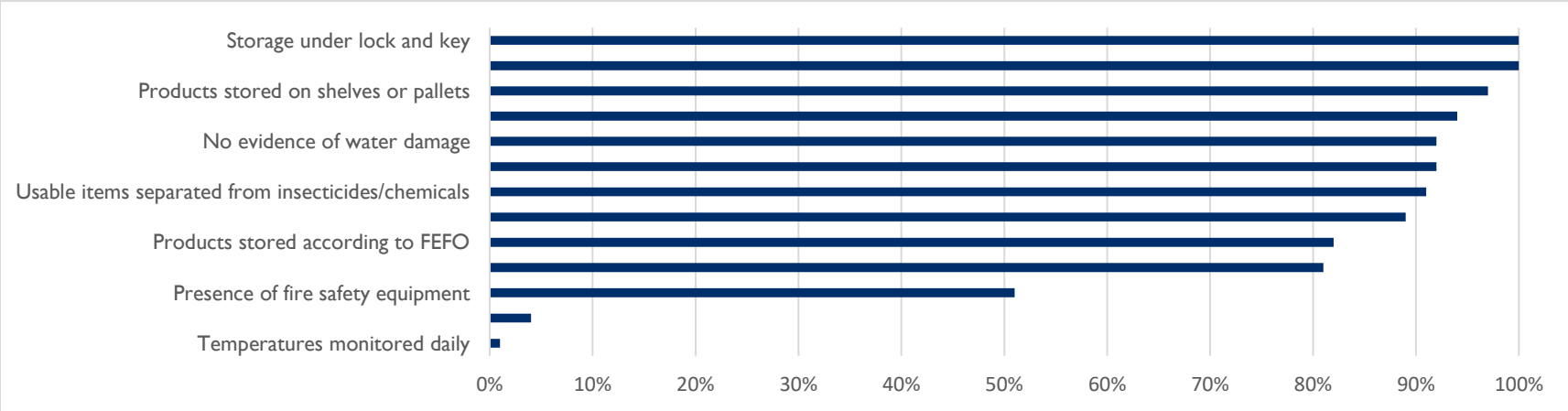
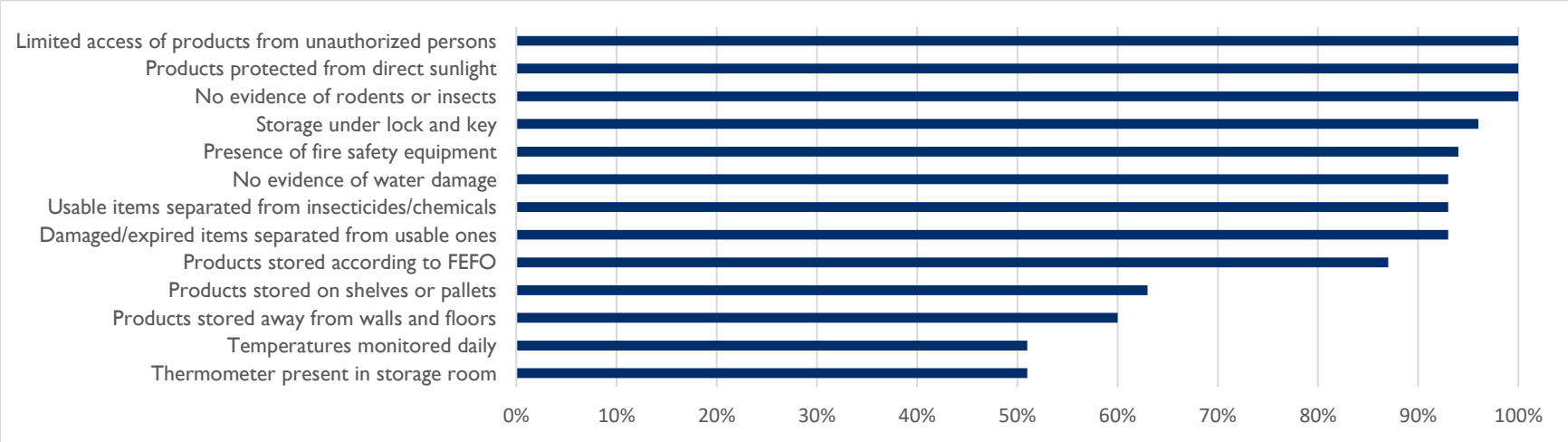


Figure 8. Percentage of Wholesalers That Met Storage Requirement for MNCH Commodities



Main Findings

- At all three levels, over 90 percent of facilities met at least half of the storage requirements.
- At the retail pharmacy and wholesaler levels, two storage indicators had lower adherence: "products stored on shelves or pallets" and "products stored away from walls and floors."

Oxytocin-Related Storage Conditions

In accordance with global guidelines, GHS recommends storage and distribution of oxytocin within a temperature range of 2–8 degrees Celsius (°C). To determine adherence to these recommendations, the assessment collected data on the current state of oxytocin storage in the private sector, as shown in Figures 9 and 10.

Figure 9. Private-Sector Entities with Working Cold Chain Versus Entities That Monitor Cold Chain Temperatures Daily

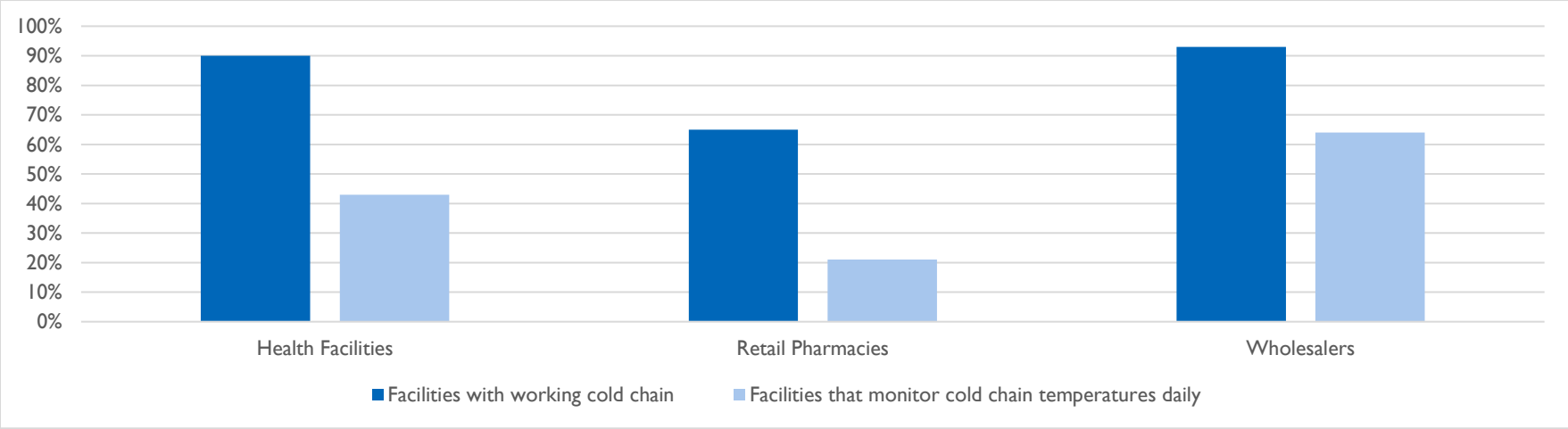


Figure 10. Private-Sector Entities That Store Oxytocin in Working Cold Chain

Main Findings

- Figure 9 shows a significant gap between entities that have cold chain equipment and those that monitor temperatures daily.
- Figure 10 indicates that almost all health facilities and wholesalers stored oxytocin in cold chain. In contrast, almost one-quarter of retail pharmacies did not store the product between 2–8°C.
- Both figures highlight a need for stronger adherence to the appropriate storage and management of oxytocin, particularly at retail pharmacies. Furthermore, all entities should pay attention to daily temperature monitoring to ensure that cold chain equipment does not exceed 2–8°C.

Product Pricing

The ability to pay for MNCH commodities is an essential component of ensuring equitable care for women and children, regardless of socioeconomic status. In Ghana, prices in the public sector are guided by NHIS reimbursement prices. In contrast, the private sector is driven by the free market and there are minimal regulations on pricing and markups. To determine the affordability of MNCH commodities in Ghana's private-sector supply chain, Table 4 depicts median selling prices of MNCH commodities in comparison to NHIS reimbursement rates.[5]

Table 4. Median Selling Prices of MNCH Commodities in Ghana as Compared to Global Prices

Health Area	Product Name	Private Health Facilities GH₵	Retail Pharmacies GH₵	Wholesalers		NHIS (GH₵)
				Minimum Price (GH₵)	Maximum Price (GH₵)	
Maternal Health	Hydralazine 20 mg in 2 mL vial	13	28	10	10	20
	Labetalol 20 mg in 2 mL ampoule	32.5	N/A	1	1.36	67.5
	Magnesium sulfate 500 mg/mL in 10 mL	12	5.9	10	10	8.2
	Methyldopa 250 mg	0.4	0.44	0.38	3.8	0.4
	Misoprostol 200 mcg	2.93	3	2.8	6.15	N/A
	Nifedipine 20 mg	0.15	0.44	0.0824	3.4	0.1
	Oxytocin 10 IU/mL in 1 mL ampoule	4	5.75	3.5	6.84	5.56
Newborn	Chlorhexidine 7.1% gel, 10 gm	N/A	8.87	6	6.5	8.5
	Dexamethasone 4 mg/mL in 1 mL ampoule	1.5	1.22	0.28	1.1	1
	Gentamicin 40 mg/mL in 2 mL vial	0.8	0.72	0.45	1.04	1
Child Health	Amoxicillin 125 mg/5ml suspension	3.63	5.38	1.8	14.62	4
	ORS low osmolality 20.5 gm/L powder	0.55	0.5	0.44	3.5	0.47
	Zinc sulfate, 20 mg dispersible tablet	0.06	0.07	0.043	0.15	0.1

Note. Price information was unavailable for amoxicillin DT and ORS + zinc co-pack. Price information for hydralazine 20 mg/2ml vial and magnesium sulfate 500 mg/mL was obtained from one supplier, which explains why the minimum and maximum values are the same. Median prices cover both generic and innovator brands. Prices for innovator brands were reported for only four products: hydralazine, methyldopa, misoprostol and oxytocin.

Main Findings

- Results indicate lower NHIS prices for products such as hydralazine, methyldopa, nifedipine, oxytocin, and dexamethasone at retail pharmacies and private health facilities.
- While maternal health commodities recorded higher prices at retail pharmacies, newborn health commodities recorded higher prices at private health facilities. Prices for zinc and amoxicillin suspension were higher at retail pharmacies as compared to private health facilities, while prices for ORS were lower at retail pharmacies in comparison with health facilities.
- Generally, wholesaler prices were lower than prices at retail pharmacies and private health facilities. In a few cases, wholesalers had brands which were more expensive than those at private health facilities and retail pharmacies.

Price Markups

While price markups are essential to profit generation, unregulated markups could keep end users from affording essential health products. The assessment analyzed data on price markups for MNCH commodities at all three facility types, which are presented in Table 5. Price markups were calculated using the following formula: (selling price − cost price) / cost price.

Table 5. Price Markups (%) of MNCH Products in the Private Sector

Health Area	Product Name	Health Facility	Retail Pharmacy	Wholesaler
Maternal	Hydralazine 20 mg in 2 mL vial	54%	43%	N/A
	Labetalol 20 mg in 2 mL ampoule	23%	N/A	N/A
	Magnesium sulfate 500 mg/mL in 10 mL ampoule	54%	36%	33%
	Methyldopa 250 mg	83%	48%	23%
	Misoprostol 200 mcg	71%	67%	25%
	Nifedipine 20 mg	153%	36%	25%
	Oxytocin 10 IU/mL in 1 mL ampoule	125%	4%	99%
Newborn	Chlorhexidine 7.1% gel, 10 gm	N/A	35%	14%
	Dexamethasone 4 mg/mL in 1 mL ampoule	233%	64%	11%
	Gentamicin 40 mg/mL in 2 mL vial	525%	178%	11%
Child	Amoxicillin 125 mg/5ml suspension	93%	86%	31%
	ORS low osmolality 20.5 gm/L dispersible powder	82%	100%	15%
	Zinc sulfate, 20 mg dispersible tablet	233%	92%	11%

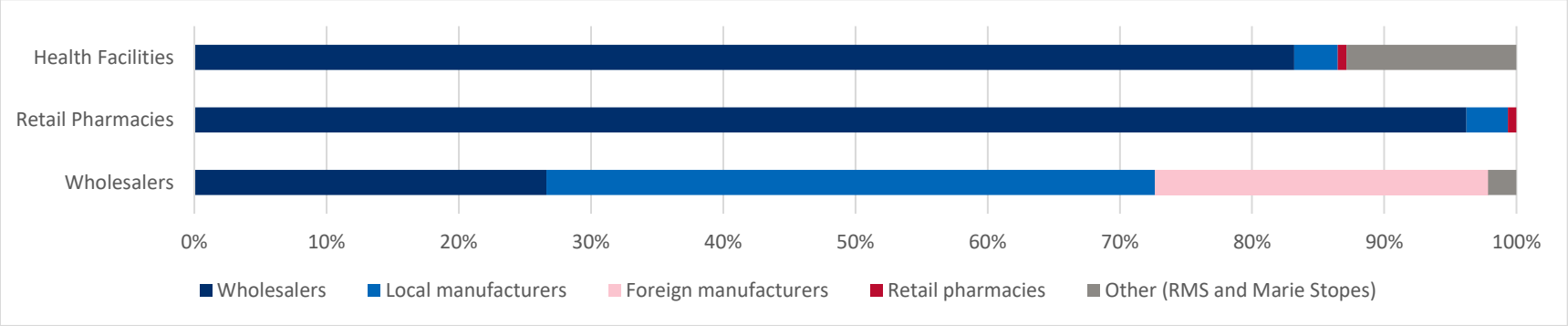
Main Findings

- Price markups were lowest at the wholesaler level, remaining below 34 percent for all MNCH commodities except oxytocin. In contrast, markups at the retail pharmacies and health facilities were significantly higher, ranging from 23 percent to 525 percent.
- Health facilities exhibited the highest markups, especially for injectable drugs such as oxytocin, dexamethasone, and gentamicin. The lowest markup was associated with labetalol injection.
- While markups at retail pharmacies were lower as compared to health facilities, products such as gentamicin, amoxicillin DT, and ORS were marked up over 99 percent.
- Amoxicillin DT and ORS were the only products with the highest markups at the retail pharmacy level, while oxytocin had the lowest markup.

Sources of Supply

The assessment collected data on how MNCH commodities are sourced by private health facilities, retail pharmacies and wholesalers. The analyzed data are presented in Figure 11.

Figure 11. Sources of Supply for MNCH Commodities in the Private Sector



Main Findings

- Wholesalers are the main source of supply for MNCH commodities at the private health facility and retail pharmacy levels.
- Wholesalers depend mostly on local manufacturers and other wholesalers for MNCH commodities.
- This highlights the critical role of local pharmaceutical entities in the manufacture and supply of MNCH commodities in the private sector.

Perceptions of Wholesalers in Supplying MNCH Products to the Private and Public Sectors

Given the role of wholesalers in supplying MNCH commodities, their perceptions and behaviors are of key importance to understanding and improving product availability in the private sector. The assessment gathered qualitative data on the perceptions of 14 private wholesalers in supplying MNCH commodities to the private and public sectors in Ghana.

Main Findings

Eleven out of 14 wholesalers supplied more than 50 percent of their MNCH commodities to the private sector. In comparison, only one out of 13 wholesalers supplied more than 50 percent of their MNCH commodities to the public sector.

The study also assessed the benefits and challenges that private-sector wholesalers face when supplying MNCH commodities to the public and private sectors. When referring to the private health facilities, most respondents readily identified timely payment and demand predictability as common benefits. Some respondents also highlighted a higher potential for profit when conducting business with the private sector.

"We are able to predict [the private sector's] demand because of previous trends in the purchasing behavior of our clients. This helps us to forecast correctly when stocking our supplies and prevents us from over stocking or under stocking. This is particularly helpful in preventing us from incurring losses, especially with expiries."

"The private sector gives you a better return in terms of profit and frequency than the public institution."

Benefits of supplying to public health facilities were associated with guaranteed product volume and demand predictability due to long-term contracts. These factors correspond to a steady flow of income, which can encourage private wholesalers to supply a greater proportion of MNCH commodities.

"With the government, you can easily predict because you have to go through the tenders and all those ones. So, you know when the tenders are coming up and exactly what is expected of you. But then all the other advantages, I mean, the predictability […] so, the more volumes you have the better."

"The benefits we get from them has to do with the volumes and long-term contracts as well."

Overall, respondents did not readily highlight challenges associated with supplying to the private sector. However, of those who provided responses, a majority referred to occasional payment issues, including delays and bounced cheques. Contrary to responses received for the private sector, wholesalers provided a greater number of challenges associated with supplying to the public sector. All respondents noted problems with payment delays when supplying to the public sector in one capacity or another. In addition, some respondents noted that there were lower profits associated with the public sector due to the competitive nature of tenders.

"Okay, so it is a disadvantage to us and an advantage to the public sector because they take between a minimum of 90–120 days [to pay]."

"The disadvantage will have to be the payment. The disadvantage will be the payments with delay."

"You see they make competitive tending so your price needs to be competitive so there are times you will need to reduce your prices and win."

Use of the National FWC in the Private Sector

FWCs are long-term agreements that establish the terms and conditions, including price and quantities, under which repeat purchasing orders may be issued for a defined period. Ghana's FWC currently consists of 65 health commodities, including methyldopa (250 mg), nifedipine (20 mg), ORS, and oxytocin (10 IU). To determine the role of the FWC in the private sector, the assessment gathered data on wholesalers' experiences with the FWC.

Main Findings

- Of the 15 wholesalers that were interviewed, only three had previously supplied under the centralized FWC. One of the facilities that participated in the FWC noted its role in "ensuring product availability in the market."
- Of the 12 facilities that did not supply under the centralized FWC, most of them did not have knowledge of it. Respondents that were aware of the FWC stated that it "involves a lot of bureaucracies," and therefore "there is a lack of interest in such contracts."

Discussion

Overview

The private health sector in Ghana plays a major role in providing MNCH services to individuals and families seeking care. However, there is a dearth of data on how MNCH commodities are procured, managed, and sold in the private sector. This assessment examined Ghana's private-sector supply chain to shed light on factors that hinder the availability and accessibility of critical MNCH commodities.

Product Offerings and Availability

Service readiness, including commodity offerings and availability, is an essential part of providing high-quality and timely health care services. In general, MNCH commodities had moderate availability in Ghana; however, some commodities fared worse than others due to lack of awareness of current guidelines and the continued availability of outdated MNCH formulations. For example, chlorhexidine is consistently not managed and stocked out in private health facilities, retail pharmacies, and wholesalers. While this product is critical for preventing newborn sepsis—a leading cause of newborn mortality—there is low demand for it in Ghana. Instead, many still use substitute products such as methylated spirit, which GHS began phasing out in 2021. Similarly, USAID-recommended amoxicillin DT and ORS + zinc co-pack were not readily offered or managed in the private sector.

Injectable drugs (antihypertensives, oxytocin, magnesium sulfate and gentamicin) were the least managed commodities and exhibited high stockout rates at all three entities. These commodities were reported as having "low or no client demand" and were associated with fear of expiries and loss of profit, as depicted by wholesalers during interviews. While injectables cannot be administered at these facility types, they should be adequately stocked to help improve access and avert potential complications for mothers, newborns and children.

To provide insight into management and availability data, the assessment gathered information on reasons for non-management and reasons for stockouts. Health facilities predominantly reported supply challenges as reasons for stockouts, citing "products ordered but not received" and "unexpected increase in consumption." In contrast, retail pharmacies and wholesalers reported "low or no client demand" as a major reason for stockouts, demonstrating that stocking MNCH commodities is heavily influenced by commission in the private sector. These results may also indicate that entities supplying MNCH commodities to private health facilities are unaware of increased demand and consumption.

An End Use Verification (EUV) survey conducted in September 2021 in public health facilities also showed suboptimal stock levels for MNCH commodities despite an overall improvement in product availability. Average availability for MNCH commodities in this EUV survey was 61 percent, which is comparable to values recorded for private health facilities (67 percent), retail pharmacies (68 percent) and wholesalers (60 percent). Similar to the private sector, MNCH commodities in the public sector are mainly sourced from wholesalers and local manufacturers. By tackling challenges with availability at these supply points, access to MNCH commodities can be improved in both private and public sector facilities.

Product Quality

An important aspect of product availability is product quality, which can be assured through rigorous product registration. Registration data retrieved from the FDA showed that approximately half of the

most prevalent brands for each commodity were unregistered or had an expired registration. Dexamethasone was the only product without registrations for all prevalent brands found in the assessed facility types. These data depict a need for regulators to take action to ensure that only high-quality commodities are available in the market.

To maintain the quality of commodities post-procurement and distribution, storage guidelines must be followed. The assessment found that almost all private health facilities, retail pharmacies, and wholesalers met at least half of the storage requirements found in Ghana's SOP. However, retail pharmacies and wholesalers were challenged with storing commodities away from floors and walls.

Oxytocin, a heat-sensitive drug, has additional storage needs that must be met to prevent product degradation. Almost all health facilities and wholesalers included in this assessment stored oxytocin in working cold chain based on globally-recognized guidance. In the private sector, a greater proportion of entities that have working cold chain equipment available monitor cold chain temperatures daily, ensuring that equipment remains between the recommended temperature of 2–8°C. There is a need for stronger adherence to oxytocin storage-related guidelines, especially at the retail pharmacy level, which showed the weakest data for all three indicators that were examined.

Product Pricing and Markups

Similar to availability and accessibility, product affordability is an essential component of delivering reliable maternal and childcare. Generally, prices for maternal health products at retail pharmacies were higher than those at private health facilities, while lower prices were recorded for newborn health products at retail pharmacies. Price comparisons for child health products were variable across retail pharmacies and private health facilities. Price differences between NHIS and service delivery outlets were mainly driven by the brands of MNCH commodities available at the time of the survey as NHIS prices were within the minimum and maximum price thresholds in these facilities. Since price dynamics can impact dispensing decisions for facilities that offer NHIS services, there is a need to conduct regular price reviews for all commodities, including MNCH products.

In general, there were significant markups at the health facility and retail pharmacy levels, with some products experiencing markups over 99 percent. This was most commonly seen in injectable drugs (oxytocin, gentamicin and dexamethasone) and child health commodities (amoxicillin DT and ORS). These results demonstrate a need for pharmaceutical pricing markup control measures, specifically in retail pharmacies and private health facilities. Without concrete policies or reimbursement schemes in place to lessen the burden of markups, affordability of MNCH commodities could be a major barrier for clients in the private sector.

Role of Wholesalers in the Supply of MNCH Commodities

In accordance with the supply-chain structure in Ghana's private sector, health facilities and retail pharmacies reported wholesalers as their primary source of MNCH commodities. This dependence on wholesalers illustrates the crucial role that they play in meeting the demand of clients for life-saving medicines. Given the strong presence of wholesalers in the supply chain, interviews were conducted to understand their perceptions when supplying MNCH commodities to the private and public sectors. Wholesalers had a clear preference for supplying to the private sector (11 out of 14 supplied more than 50 percent of MNCH products to private entities), citing timely payment and demand predictability as common benefits.

Data from the interviews assessed wholesalers' experiences with the FWC to determine its utilization in the private sector. Overall, only three out of 15 wholesalers supplied through the FWC. Of those who never supplied through the FWC, most were unaware of the FWC. Those who were aware cited "bureaucracies" and "lack of interest" as deterrents to supplying under the FWC.

Conclusion

This assessment provides insights into strengths and weaknesses in the private-sector supply chain for MNCH commodities in Ghana. Findings confirm that the private sector is influenced by commercial factors, which could come at a high cost—in terms of availability, accessibility, and affordability—for individuals and families. Currently, public-sector facilities are the main beneficiaries of interventions aimed at promoting MNCH care in Ghana. However, there is a strong need to target the private sector due to its growing role in the delivery of MNCH commodities and services.

Recommendations

- Review policies (National Essential Medicines List, National Treatment Guidelines and National Health Insurance Price List) that guide stocking decisions and administration of health products to include the range of items identified by the UNCoLSC as critical for the effective management of MNCH conditions. Extensively disseminate these policies in public and private sectors.
- Create a cost incentive that encourages the private sector to offer and improve access to critical MNCH commodities, including amoxicillin DT, ORS + zinc co-pack and chlorhexidine gel. Retail pharmacies and wholesalers in particular should be encouraged to stock a wider range of MNCH products including oxytocin, gentamicin and magnesium sulfate injection.
- Study current pricing mechanisms of the national and private health insurance schemes to inform the establishment of an exceptional pricing structure for MNCH life-saving commodities that are considered to be of low commercial value within the private sector.
- Advocate for global- and national-level budgeting and funding for life-saving MNCH commodities considered to be of little commercial value.
- Introduce mechanisms for pooled procurement based on centralized forecasting to improve demand planning and supply of MNCH commodities in the private sector.
- Intensify FDA monitoring activities to ensure that wholesale and retail outlets stock only FDA-registered products. Additionally, FDA should introduce incentives that motivate local manufacturers and international suppliers to register a wider range of MNCH products.
- Advocate for overall improvement in storage conditions, including cold storage of oxytocin and appropriate temperature monitoring. This should be backed by regular monitoring and supervision by relevant regulatory agencies to improve adherence to standard storage practices.

Annex A. Key Questions and Methodology

Key Questions:

Table 6. List of Key Questions Answered Through the Assessment

Area	Key Questions
Product Offerings	Which MNCH commodities are offered through the private sector?
	What are the sources of supply (manufactures, importers, wholesalers) for the commodities?
	What are the most prevalent brands of MNCH commodities and are they registered?
Availability	What is the availability of MNCH commodities in the private sector, including stock trends?
	How does availability differ among commodities and/or categories of commodities?
	What are the primary reasons for stock challenges?
Price	What are the average prices of the commodities offered?
	How do average prices of commodities compare to global standard prices?
	What are the price mark-ups of the commodities?
Storage conditions	What are the storage conditions for MNCH commodities in the private sector?
	How is oxytocin being stored in private sector facilities, pharmacies, and wholesalers?
	What challenges exist for proper oxytocin storage?
Supplying to the private and public sector	How does the public sector access products from the private sector?
	What challenges do private wholesalers face when supplying private and public facilities?
	What are private wholesalers' experiences with the framework contract and its use?

Sampling Strategy

Geographic Area

There are 16 regions and 260 districts in Ghana. For the purposes of this study, the country was zoned into three geographical areas: northern, middle, and southern. Within each zone, the study utilized regions that are most representative of the population, which included Ashanti (middle zone), Greater Accra (southern zone), Northern, and Upper East (northern zone).

Study Population

In Ghana, the following private-sector facilities offer MNCH commodities: importers, wholesalers, health facilities, maternity homes, retail pharmacies, and over-the-counter medical sellers. The sampling strategy selected the four types of facilities that constitute the greatest proportion of the private

pharmaceutical sector, and therefore provide the greatest proportion of MNCH commodities within the private sector: health facilities (hospitals and clinics), retail pharmacies and wholesalers.

Sample Size Determination and Sampling

To inform the sampling methodology for wholesalers, information on registered domestic wholesalers in Ghana was obtained from the Pharmacy Council in Ghana. To further narrow the list of participants, wholesalers with significant market presence for one or more of the MNCH focus products were selected. To inform the sampling methodology for hospitals, clinics and retail pharmacies, the number of districts was calculated based on the average number of facilities in each district. Districts were randomly selected using probability proportional to size, with the larger the population of facilities in the district, the greater chance of inclusion in the sample. This methodology provides a greater level of representativeness of the sample and contributes to the accuracy of the results. The sampling strategy was not disaggregated by facility type but stratified by facility type to ensure equal representation of all facilities. The sampling methodology used a randomized, two-stage sampling approach. A margin of error of +/- 10 percent and a 90 percent confidence level was applied. Table 7 provides the number of facilities in each region that was selected for the assessment.

Table 7. Number of Private Sector Facilities Included in the Survey

Region		Wholesalers & Distributors	Hospitals	Clinics	Retail Pharmacies
Ashanti	Total:	87	64	138	510
	Selected:	5	8	7	24
Greater Accra	Total:	268	61	221	1358
	Selected:	9	12	27	38
Northern	Total:	18	4	8	40
	Selected:	1	1	0	5
Upper East	Total:	1	2	26	12
	Selected:	0	1	5	0

Selection of MNCH Commodities

The assessment utilized a subset of priority MNCH commodities, including those identified by UNCoLSC. Table 8 provides information on these commodities, including the types of private health facilities where each commodity should be available based on the Standard Treatment Guidelines.[6]

Table 8. MNCH Commodities included in the Assessment

Health Area	Commodity Name	Dosage	Indication	Expected Availability
Maternal	Oxytocin	10 IU/mL in 1 mL ampoule	Prevention and treatment of PPH	Wholesalers, hospitals, clinics
	Misoprostol	200 mcg blister pack tablets	Prevention and treatment of PPH	Wholesalers, hospitals, clinics, retail pharmacies
	Magnesium sulfate	500 mg/mL in 2 mL and 10 mL	Prevention and treatment of eclampsia	Wholesalers, hospitals, clinics

Health Area	Commodity Name	Dosage	Indication	Expected Availability
	Calcium gluconate	100 mg/mL in 10 mL	Treatment of magnesium sulfate toxicity	Wholesalers, hospitals, clinics
	Hydralazine HCl	20 mg in 1 mL vial	Treatment of severe hypertension in pregnancy	Wholesalers, hospitals, clinics
	Hydralazine	25 mg tablet	Treatment of severe hypertension in pregnancy	Wholesalers, hospitals, clinics
	Labetalol HCl	5 mg in 1 mL ampoule	Treatment of severe hypertension in pregnancy	Wholesalers, hospitals, clinics
	Labetalol	50 mg, 100 mg, 200 mg tablet	Treatment of severe hypertension in pregnancy	Wholesalers, hospitals, clinics
	Nifedipine	20 mg (slow release) and 30 mg (GITS)	Treatment of severe hypertension in pregnancy	Wholesalers, hospitals, clinics
	Methyldopa	250 mg tablet	Treatment of hypertension in pregnancy	Wholesalers, hospitals, clinics
Newborn	Chlorhexidine, 7.2% gel	3 gm, 10, gm, and 20 gm	Umbilical cord care	Wholesalers, hospitals, clinics, retail pharmacies
	Chlorhexidine, solution	4% solution	Umbilical cord care	Wholesalers, hospitals, clinics, retail pharmacies
	Dexamethasone	4 mg/mL in 1 mL ampoule	Improve pulmonary function in neonates	Wholesalers, hospitals, clinics
	Gentamicin	40mg/mL in 2 mL ampoule or vial	Treatment of pneumonia and sepsis	Wholesalers, hospitals, clinics
Child	Amoxicillin dispersible tablet (DT)	250 mg	Treatment of pneumonia and other infections	Wholesalers, hospitals, clinics, retail pharmacies
	Amoxicillin powder for suspension	125mg/5ml	Treatment of pneumonia and other infections	Wholesalers, hospitals, clinics, retail pharmacies
	Oral rehydration salts	20.5 gm/L dispersible powder	Treatment of diarrhea	Wholesalers, hospitals, clinics, retail pharmacies
	Oral rehydration salts + zinc	20.5 gm/L dispersible powder + 20 mg tablet	Treatment of diarrhea	Wholesalers, hospitals, clinics, retail pharmacies
	Zinc	20 mg dispersible tablet	Treatment of diarrhea	Wholesalers, hospitals, clinics, retail pharmacies

Data Collection

A mixed-methods approach began with a quantitative survey (refer to Annex C) for each of the selected facilities. The quantitative survey was administered through SurveyCTO, a tablet-based data collection system that increases efficiency and provides automated validation to reduce errors. Upon completion of the survey, key informant interviews were conducted with wholesalers using a semi-structured interview guide (refer to Annex D). In all, 69 private health facilities, 68 retail pharmacies and 15 wholesalers were selected for inclusion in the sample.

Data collectors underwent training on quantitative and qualitative methods, specifically regarding SurveyCTO and interview techniques. Once training was completed, the study instruments were piloted in select facilities. Data collection took place from 08/30/2021 to 09/13/2021. Each participant provided informed consent. The data collectors were responsible for facilitating the surveys and interviews, taking notes and recording the interviews. Two of the 15 wholesalers did not consent to recording, therefore interview notes were used to document responses.

Data Analysis

Quantitative

Quantitative data analysis, including the generation of charts, tables, and graphs, was conducted via Microsoft Excel. The analytical outputs were mainly descriptive and included indicators that can broadly be categorized into four research objectives: product indicators, availability indicators, price indicators and storage indicators.

Qualitative

Open-ended responses from the interviews were transcribed and analyzed using Microsoft Excel. A thematic analysis approach was utilized, whereby two researchers independently reviewed each transcript multiple times. Upon data familiarization, responses were coded line-by-line based on an agreed set of themes and patterns to determine main findings. In addition, direct quotes were used during interpretation to illustrate key opinions and perceptions.

Annex B: Commodities Included in Assessment

Table 9. Maternal Health Commodities Included in Assessment and Their Level of Use

Name and Formulation of Product	Wholesalers	Hospitals	Clinics	Retail Pharmacies
Calcium gluconate injection, 100 mg/mL in 10 ml	X	X	X	
Hydralazine HCl 20 mg powder for injection in 2ml vials	X	X	X	
Hydralazine 25mg tablet	X	X	X	
Labetalol 50mg tablet	X	X	X	
Labetalol 100mg tablet	X	X	X	
Labetalol 200mg tablet	X	X	X	
Labetalol HCl IV solution 20 mg/2 ml ampoule	X	X	X	
Magnesium sulfate injection, 500 mg/mL in 2 mL ampoules	X	X	X	
Magnesium sulfate injection, 500 mg/mL in 10 mL ampoules	X	X	X	
Methyldopa 250 mg tablet	X	X	X	
Misoprostol 200 mcg blister pack tablets	X	X	X	X
Nifedipine 20 mg tablet (slow release)	X	X	X	
Nifedipine 30 mg tablet (GITS)	X	X	X	
Oxytocin 10 IU/mL (1 mL) ampoule	X	X	X	

Table 10. Newborn and Child Health Commodities Included in Assessment and Their Level of Use

Name and Formulation of Product	Wholesalers	Hospitals	Clinics	Retail Pharmacies
Amoxicillin 250 mg dispersible tablets	X	X	X	X
Amoxicillin 125 mg/5ml, powder/ suspension	X	X	X	X
Chlorhexidine di-gluconate 7.1% topical gel, 3 gm	X	X	X	X
Chlorhexidine di-gluconate 7.1% topical gel, 10 gm	X	X	X	X
Chlorhexidine di-gluconate 7.1% topical gel, 20 gm	X	X	X	X
Chlorhexidine gluconate 4% topical solution	X	X	X	X
Dexamethasone 4 mg/mL (1 mL) ampoule	X	X	X	
Gentamicin 40 mg/mL (2 mL) vial or ampoule	X	X	X	
ORS low osmolality 20.25 gm/L dispersible powder	X	X	X	X
ORS low osmolality 20.25 gm/L dispersible powder + zinc sulfate 20 mg tablet	X	X	X	X
Zinc sulfate 10 mg dispersible tablet	X	X	X	X
Zinc sulfate 20 mg dispersible tablet	X	X	X	X

Annex C: Survey Questionnaire

Ghana Private Sector Assessment: Survey Questionnaire

Background information:

Question	Answer
Data collector name	Free text
Region	Select one *region* from list provided
District	Select one *district* from list provided
Facility type	Select one *facility type* from list provided
Facility name	Select one *facility name* from the list provided
Click below to record GPS coordinates	

Quantitative Survey:

Category	Indicator	Question	Answer
Product	% Of facilities that manage product X	Is this product currently available at the facility?	a. Yes b. No
Product	Reasons why a facility does not carry a product	Why do you not stock this product? *(Question relevant when Q1 is "No")*	Select multiple as applicable: ☐ This product is above the level of care of the facility in accordance with national guidelines. ☐ Low or no client demand for the product ☐ No trained staff to provide this product at the facility ☐ Lack of equipment and/or consumables for the provision of this product ☐ Other (include drop down for free text) ☐ Unknown
Product	Brands and manufacturers per product	What is the product brand and manufacturer?	Select from available list of registered products. Include free text option
Price*	Min, max and average price per product	What is the price you pay per unit?	Free text - price

Price*	Min, max and average price per product	What is the price you sell per unit?	Free text - price
Price*	Price determination	How do you determine the sale price?	Free text
Availability*	Sources of supply per product	What is your primary source of supply for these products?	Free text- names of retail pharmacies, manufacturers, wholesalers, distributors etc.
Availability	% of facilities stocked out on day of visit	Is this product in stock? (day of visit)	a. Yes b. No
Availability	% of facilities stocked out for 3+ consecutive days	At any time in the past month, has this product been stocked out for 3 days or more?	a. Yes b. No
Availability	Reasons for stockout	In the past three months, what were some of the reasons for stockouts?	Select multiple as applicable: ☐ Products not available from distributor ☐ Products ordered but not received ☐ Products received late ☐ Did not order right quantities ☐ Unexpected increase in consumption ☐ Insufficient funding ☐ Product expiries, damage, or other loss ☐ Ordered but did not receive the right quantities ☐ Low or no client demand for the product ☐ No trained staff to provide this product at the facility ☐ Lack of equipment and/or consumables for the provision of this product

Storage	% of facilities with cold chain equipment that monitor cold chain temperature at least daily	Do you monitor cold storage temperatures at least once daily? (As reported, not inspected on a monitor sheet) *(Relevant if there is working cold chain equipment)*	a. Yes b. No
Storage	% of facilities that store oxytocin in a working refrigerator	Is all injectable-stored in a working refrigerator? *(Relevant if the facility supplies oxytocin and there is working cold chain equipment)*	a. Yes b. No
Storage	Reasons for not storing oxytocin in a working refrigerator	Why is the oxytocin not stored in a working refrigerator?	Select multiple as applicable: ☐ Products are not labeled for cold chain ☐ Lack of space in working refrigerator

Annex D: Key Informant Interview Guide

Ghana Private Sector Wholesaler Assessment

Key Informant Interview Guide

Demographic information (*to be completed by the interviewer*):

Name of Region	
Facility Name	
Interviewee Role	
Interviewer Name	
Notetaker Name	
Date of Interview	

Introduction and background (*to be read aloud by interviewer*):

Thank you for taking the time to speak with us today about the role of private sector health facilities in Ghana. My name is _____ and assisting me today is _____. We will be conducting this interview with you on behalf of USAID's Global Health Supply Chain Program-Procurement and Management project, which is a United States government-funded project that focuses on improving the availability of and access to life-saving medicines and medicines and supplies.

The purpose of our visit today is to collect data for an assessment that focuses on understanding the availability of key maternal, newborn and child health (MNCH) commodities within the private sector supply chain. From the information that we gather, we will identify key barriers to product availability throughout the private sector supply chain (wholesaler, hospital, clinics, and pharmacies). Additionally, the study seeks to understand the challenges that wholesalers face when supplying MNCH commodities to public and private sector clients and identify opportunities to develop solutions for these challenges.

Before we get started, I would like to go over some important details so that you understand how this discussion will progress. You have been invited to participate in this interview as you have a significant market presence for MNCH products in Ghana, therefore, your insight will be highly valuable for our assessment. This interview will last approximately 20 to 30 minutes during which I will ask you a few questions of interest. Please keep in mind that there are no wrong answers, therefore, please feel free to share your point of view. My colleague will be taking notes during the interview process to ensure that we have collected accurate information. In addition, we are planning to record this interview with your permission as it helps us keep track of any information we may have missed during notetaking.

We ensure that the recording will not be shared outside of the research team. You will remain anonymous, and your responses will remain confidential. During our analysis and reporting process, we will not use any identifiable traits that could be attributed to you. At any point during our conversation, please feel free to let me know if you have any questions or if you would rather not answer any specific question. You may also stop the interview at any time for any reason. Is it okay if I start to record now (*wait for response and if interviewee is not ok with recording, please put the recorder away and proceed with the interview and take detailed notes as you go*). Before we get started, do you have any questions?

Interview Questions (*probes are italicized but remember to probe based on the responses*):

I would like to start off by asking you a few questions to develop a high-level understanding of your organization.

Questions	Notes
1. Please provide a brief description of your organization. • *How long have you been in business?* • *What geographic areas do you serve in Ghana?*	
2. What is the size of your organization? • *Range of products offered* • *Geographic coverage* • *Annual turnover* • *Number of staff (sales, distribution, marketing, etc.)* • *Types of activities conducted (manufacture, importation, distribution, marketing, sales, branding, etc.)*	

In the next section, I would like to ask you a few questions regarding your clientele.

Questions	Notes
1. Do you sell any of the MNCH products on the list provided to the private sector? • *If yes: what percentage would you say you sell to private sector?*	

1. What do you see as the challenges of supplying to these clients? • *Demand predictability* • *Delayed payments (related to late NHIS payments)* • *Hard to make a profit* • *Quality requirements* • *Branding/overbranding requirements*	
2. Have you ever supplied under the centralized framework contract? (*explain what a framework contract is)* • If yes: please describe how the process worked? o *What worked well?* o *What were the challenges?* • If no: why not? Be sure to probe.	

Concluding remarks:

Thank you so much again for participating in our interview. We greatly appreciate your time and input and we will reach out to you if we need further clarifications.

Additional Notes (if any):