MOMENTUM

Integrated Health Resilience

# SUPPLY CHAIN CHALLENGES AND COMMODITY AVAILABILITY AT THE LAST MILE

## Findings from Seven MOMENTUM Integrated Health Resilience Partner Countries

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*This report is one in a series of three products presenting MOMENTUM Integrated Health Resilience experiences with supply chains at the last mile.*

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# ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| BHT | Boma health team |
| BHW | Boma health worker |
| CHD | County health department |
| CHW | Community health worker |
| CSCom | Centres de Santé Communautaires (community health centers) |
| DHIS | District Health Information Software |
| DMPA | Depot-medroxyprogesterone acetate |
| DRC | Democratic Republic of the Congo |
| ECP | Emergency contraceptive pills |
| eLMIS | Electronic logistics management information system |
| EML | Essential medicines list |
| FEFO | First expiry, first out |
| FP | Voluntary family planning |
| HFA | Health facility assessment |
| iCCM | Integrated community case management |
| ILS | Integrated logistics system |
| IUD | Intrauterine device |
| LMS | Logistics management system |
| LMIS | Logistics management information system |
| MIHR | MOMENTUM Integrated Health Resilience |
| MNCH | Maternal, newborn, and child health |
| MOH | Ministry of Health |
| MOU | Memorandum of Understanding |
| NGO | Nongovernmental organization |
| ORS | Oral rehydration salts |
| OSPSANTE | Monitoring tool for health products |
| PHC | Primary health care |
| PHCC | Primary health care center |
| RCom | *Relais communautaire* |
| RH | Reproductive health |
| SOP | Standard operating procedure |
| USAID | United States Agency for International Development |

# EXECUTIVE SUMMARY

Commodity availability for maternal, newborn, and child health (MNCH); voluntary family planning (FP); reproductive health (RH); and nutrition programs is critical to the success of any health project and is often a major barrier to the provision of quality health services at the last mile. Stockouts of essential MNCH, FP, and RH commodities frequently occur in primary health care facilities and at the community level in fragile settings. A well-functioning supply chain system, especially at the last mile, is critical to emergency preparedness and to mitigating the negative impacts of future shocks and stresses on the health commodity supply chain.

Supply chain managers working in a fragile or humanitarian context need to adapt their supply chain management to the current situation to continue to provide services and commodities to their clients. However, the major challenges that health providers, community health workers (CHWs), and clients themselves face in trying to obtain the commodities they need are little understood. MOMENTUM Integrated Health Resilience (MIHR) faces these challenges in its own work in fragile settings and is therefore well-positioned to document and help raise awareness around the challenges that governments, local officials, CHWs, and families themselves have faced and the solutions they have developed to cope with their context.

The goal of this activity was to better understand how countries manage lifesaving commodities at the primary health care (PHC) facility and the community levels, how those commodities are dispensed and tracked, and what are the major bottlenecks to their availability at the health facility or from the CHW. The objectives are to:

- Understand the challenges that health workers and CHWs face around commodity availability.
- Understand policy and operational barriers.
- Explore last-mile supply chain and related commodity issues.
- Identify solutions to work around supply chain and commodity challenges.
- Explore emergency preparedness processes and solutions.

Information was collected through interviews and questionnaires from seven MIHR partner countries: Burkina Faso, the Democratic Republic of the Congo (DRC), Mali, Niger, South Sudan, Sudan, and Tanzania. A desk analysis reviewed health facility assessment reports (from Burkina Faso and Mali) and a community health formative assessment (from South Sudan) for supply chain-related questions.

The findings are grouped into supply chain functions: commodity availability; human resources; infrastructure; funding; transport; data and the logistics management information systems (LMIS); security; and emergency procedures, preparedness, and solutions. Key findings include:

- Among the six countries where oxytocin is managed at the health facility, four (Burkina Faso, DRC, Niger, and South Sudan) noted that oxytocin was frequently stocked out. Three countries experienced frequent stockouts of misoprostol (Mali, Niger, and South Sudan) and folic acid (Burkina Faso, Mali, and Tanzania), while two countries (Burkina Faso and Mali) were often stocked out of magnesium sulphate. A range of different contraceptives are frequently stocked out, including implants, female condoms, and emergency contraceptive pills.

- In all countries, primary health care workers posted at health facilities can provide RH, FP, MNCH, essential medicines, and nutritional commodities to clients.
- Midwives can provide a more limited number of commodities, and most can provide a limited set of RH and MNCH products and contraceptives.
- CHWs in five of the seven countries (Burkina Faso, DRC, Mali, South Sudan, and Tanzania) can provide short-acting contraceptives or can refer clients for long-acting methods to facilities with qualified staff.
- When asked about the biggest supply chain-related challenges, respondents mentioned a lack of storage space, not following good storage practices, poor infrastructure conditions, and lack of electricity and internet access.
- In all but one country, funding was identified as one of the biggest challenges to achieving commodity availability.
- Most countries have either documented standard operating procedures (SOPs) for logistics management (Burkina Faso, Niger, Sudan, and Tanzania) or standard procedures for managing commodities and collecting logistics data (DRC). South Sudan has an SOP for the central medical store.
- While most had either formal or informal emergency procedures for health facility workers, many did not have such procedures for CHWs.
- Several countries defined an emergency order based on the parameters in their logistics management system (LMS) or their respective SOPs, which provide the rules and processes for placing an emergency order.

# OVERVIEW

Commodity availability for maternal, newborn, and child health (MNCH); voluntary family planning (FP); reproductive health (RH); and nutrition programs is critical to the success of any health project and is often a major barrier to the provision of quality health services at the last mile. Stockouts of essential MNCH, FP, and RH commodities frequently occur in primary health care facilities and at the community level in fragile settings. Some of the commodities that are often in short supply include those for integrated community case management (iCCM) of childhood illness, specifically for the treatment of pneumonia, diarrhea, and malnutrition by community health workers (CHWs), as well as chlorhexidine, misoprostol, contraceptives, and malaria test kits.

The supply chain is often one of the first systems to break down and/or be mismanaged in times of crisis. Therefore, a well-functioning supply chain system, especially at the last mile, is critical to emergency preparedness and to mitigating the negative impacts of future shocks and stresses on the health commodity supply chain. To provide continuity of services in fragile settings, lower levels of a health system need support to build redundancy and other simple cost-effective solutions into their commodity management approaches.

Supply chain managers can benefit from learning best practices in both the humanitarian and emergency response contexts, which have many concepts in common. Understanding these concepts will promote a stable system for health care development, and this represents an eventual end goal of resilience (and more particularly, absorptive capacity[1])—that is, to continue to provide services and commodities to clients in the current situation and risk context (JSI, 2020a).

Although many partners work on supply chain strengthening at the central or regional levels, the lowest levels of the health care system in most countries are often neglected. As a result, the major challenges that health providers, CHWs, and clients themselves face in trying to obtain the commodities they need are not well understood. MOMENTUM Integrated Health Resilience (MIHR) faces these challenges in its own work in fragile settings and is therefore well-positioned to document and help raise awareness around the challenges that governments, local officials, CHWs, and clients, face and the solutions that they have developed to cope within their context.

# OBJECTIVES

The goal of this activity was to better understand how countries manage lifesaving commodities at the primary health care (PHC) facility and community levels, how those commodities are dispensed and tracked, and what are the major bottlenecks to their availability at the health facility or from the CHW. The objectives of the activity are to:

- Understand the challenges faced by health workers and CHWs around commodity availability.
- Understand policy and operational barriers.
- Explore last-mile supply chain and related commodity issues.
- Identify solutions to work around supply chain and commodity challenges.

[1] Strengthening the capacity for resilience can take many forms. Absorptive capacity indicates prevention and coping measures taken to avoid permanent, negative impacts from shocks and stresses and to maintain health system stability.

- Explore emergency preparedness processes and solutions.

This report summarizes the primary bottlenecks of commodity availability based on country questionnaire responses at the last mile in MIHR partner countries. It also seeks to raise awareness about the importance of incorporating the last mile into supply-strengthening initiatives and add to the body of knowledge about managing supply chains in fragile settings and making them more resilient.

# METHODOLOGY

Data gathering consisted of a cross-sectional qualitative assessment. An interview questionnaire was developed as a guide to collect information from seven MIHR countries: Burkina Faso, the Democratic Republic of the Congo (DRC), Mali, Niger, South Sudan, Sudan, and Tanzania. Phone calls took place with staff in DRC, Niger, South Sudan, Sudan, and Tanzania. Staff based in the United States conducted Zoom interviews with MIHR staff familiar with their country's supply chain and commodity availability issues. Staff in Burkina Faso completed the questionnaire and returned it via email, and staff in Mali solicited help from the Global Health Supply Chain project to complete the questionnaire.

All interviews were captured using the questionnaire as a guide. After all questionnaires were reviewed, several email exchanges took place to clarify responses and seek additional information from each country. Emails were sent to all country offices immediately after a PowerPoint presentation requesting a review to ensure presentation accuracy, to add any missing information, and to correct information as relevant.

For supply chain-related questions, a desk analysis reviewed health facility assessment (HFA) reports for Burkina Faso and Mali and a community health formative assessment report for South Sudan. Country staff were asked to send essential medicines lists (EMLs), logistics management system (LMS) standard operations procedures (SOPs), and pharmaceutical strategies as part of the desk analysis.

**Limitations**

Budget and time limitations did not allow us the opportunity to conduct a situation analysis in all seven countries. The qualitative information gathered for this activity provides a general overview of the supply chain challenges that each country faces. Although the findings cannot be generalized, they represent similar and comparable challenges not only among the seven MIHR countries, but also in other countries coping with fragile settings. If the opportunity arises, a situation analysis in each country can allow a deeper, more detailed exploration of supply chain bottlenecks around commodity availability. Additionally, because stockouts often start at higher levels of the health system, this activity will not guarantee improved commodity availability. Instead, it seeks to identify and provide more exposure to the issues and the adaptations and solutions that countries have developed to meet client needs so that countries can incorporate these examples into their supply chain management strategies.

# FINDINGS

The findings are grouped into common supply chain challenges by function: commodity availability; human resources; infrastructure; funding; transport; data and logistics management information systems (LMISs); security; and emergency procedures, preparedness, and solutions.

## COMMODITY AVAILABILITY

Most countries noted some type of supply-related issue around commodities that made it a challenge to have sufficient quantities in stock. Supply issues were one of the main reasons for not providing a service or commodity, coupled with insufficient provider training. In Mali, facilities could not provide a full range of FP methods in the previous three months because of supply chain issues (MIHR, 2022a). Having weak skills or limited awareness of the need to forecast (Mali [MIHR, 2022a], Niger) or sending orders late from the health facility (Tanzania), impacted resupply quantities and timeliness. Other challenges were delays along the supply chain (Niger), including stockouts at the national level (Tanzania). In Sudan, international nongovernmental organizations (NGOs) give unsolicited supplies to primary health care centers (PHCCs) that may not need them, taking up space in the health facility. Heavy reliance on donors was noted as one of the major challenges for South Sudan.

### Mali HFA Finding

Supply chain issues resulting in stock rupture for essential medicines and commodities were a primary reason for disruption of FP/RH and MNCH services.

A set of health commodities should be available for health workers to provide or administer to clients at the PHC level. We focused on a set of 13 overlooked lifesaving commodities identified by the UN Commission on Life-Saving Commodities for Women and Children (Table 1) (United Nations, 2012). If these commodities were more widely available, accessed, and properly used, they could save millions of lives and make a significant impact toward achieving the Sustainable Development Goals.

**Table 1. Commodities Endorsed by the UN Commission on Life-Saving Commodities for Women and Children**

| Commodity, by Life Stage | Purpose | Examples of Key Barriers | Potential 5-year Impact |
|---|---|---|---|
| **Maternal health commodities** | | | |
| 1. Oxytocin | Postpartum hemorrhage | Often poor quality | 15,000 maternal lives saved |
| 2. Misoprostol | Postpartum hemorrhage | Not included in national EMLs | |
| 3. Magnesium sulfate | Eclampsia and severe pre-eclampsia | Lack of demand by health workers | 55,000 maternal lives saved |
| **Newborn health commodities** | | | |
| 4. Injectable antibiotics | Newborn sepsis | Poor compliance by health workers | 1.22 million neonatal lives saved |
| 5. Antenatal corticosteroids | Preterm respiratory distress syndrome | Low awareness of product and impact | 466,000 neonatal lives saved |

| Commodity, by Life Stage | Purpose | Examples of Key Barriers | Potential 5-year Impact |
|---|---|---|---|
| 6. Chlorhexidine | Newborn cord care | Limited awareness and demand | 422,000 neonatal lives saved |
| 7. Resuscitation devices | Newborn asphyxia | Requires trained health workers | 336,000 neonatal lives saved |
| **Child health commodities** | | | |
| 8. Amoxicillin | Pneumonia | Limited availability of child-friendly product | 1.56 million lives saved |
| 9. Oral rehydration salts | Diarrhea | Poor understanding of products by mothers/ caregivers | 1.89 million lives saved |
| 10. Zinc | Diarrhea | | |
| **RH commodities** | | | |
| 11. Female condoms | FP/ contraception | Low awareness among women and health workers | Almost 230,000 maternal deaths averted |
| 12. Contraceptive implants | FP/ contraception | High cost | |
| 13. Emergency contraception | FP/ contraception | Low awareness among women | |

The managed products for each country were based on a combination of information from interview or questionnaire responses and an examination of the country-defined EML. Among the six countries where oxytocin is managed at the health facility, four noted that oxytocin was frequently stocked out (Burkina Faso, DRC, Niger, and South Sudan). Staff in three countries mentioned frequent stockouts of misoprostol (Mali, Niger, and South Sudan) and folic acid (Burkina Faso, Mali, and Tanzania), while stockouts of magnesium sulphate were mentioned for two countries (Burkina Faso and Mali). A range of different contraceptives were frequently stocked out, including implants, female condoms, and emergency contraceptive pills (ECPs).

In the Mali HFA, over 25 percent of the health facilities were stocked out of magnesium sulfate, more than 68 percent were stocked out of misoprostol, and 82 percent were stocked out of folic acid (MIHR, 2022a). The reasons given for not providing misoprostol during postabortion care were supply issues in 18 percent of the facilities assessed. Additionally, as the HFA noted, "Supply chain issues resulting in stock rupture for essential medicines and commodities were a primary reason that facilities had not provided specific MNCH, RH, and FP services in the prior three months" (MIHR, 2022a). The HFA included 20 primary health facilities, out of a total of 22 facilities surveyed.

The *South Sudan Community Health Formative Assessment* reviewed 10 facilities—3 hospitals and 7 primary care facilities. The assessment included discussions with boma health workers (BHWs) (the equivalent of CHWs) and key informants, who noted frequent stockouts and irregular supply of essential medicines, supplies, and commodities impacting the health system at the community level. BHWs believed that the stockouts could be attributed to "weak supply chains, long lead times, and limited storage" (MIHR, 2022b). The stockouts have forced health workers to refer clients to other facilities and have discouraged users from seeking care from public health facilities. Depot-medroxyprogesterone acetate (DMPA) was not provided in 30 percent of facilities because of supply issues. Two facilities cited supply issues in the last 3 months as the reason for not providing iron and folic acid.

Although these snapshot findings are based on either interview responses or HFAs, they provide a general overview of the lifesaving drugs that are commonly not available across MIHR partner countries.

## HUMAN RESOURCES

### Supply chain responsibilities and training

Three countries (Burkina Faso, Mali, and Tanzania) listed specific supply chain or logistics tasks in health workers' job descriptions. Job description sheets are displayed at the depot level in Burkina Faso, while the Integrated Logistics System SOP in Tanzania outlines job descriptions by cadre. Supply chain training is mainly provided when there are updates to the logistics system (Mali and Tanzania) or when funds are available. In Sudan, doctors, pharmacists, and staff at larger stores receive priority over PHCC staff, who have fewer training opportunities. In South Sudan, funds for logistics training are not available for health staff. In DRC, staff should receive training every 2–3 years, but as this rarely occurs, they rely on partners to fund and provide training. Training not only health workers but also CHWs in the supply chain is essential since they can help expand health services to underserved communities (Gibson, et al., 2023).

### Dispensing authority, by cadre

*Primary health care workers*

The questionnaire asked if there is a list of approved commodities to be dispensed at the community level and by cadre. These products should be available for the health worker to provide or administer to clients. The information is based on a summary of interview responses and a review of EMLs. All health workers provide at least oral contraceptives, condoms, and implants (except in Sudan, where FP commodities can be provided by midwives but not by PHCs or CHWs). Additionally, provision of misoprostol and oxytocin is restricted to doctors due to fears that these drugs may be used for abortion. Misoprostol can only be administered at hospitals and private medical facilities in the DRC.

*Midwives*

All the countries except DRC utilize midwives to provide health care. Midwives may provide a narrower range of commodities, and most can provide a limited set of RH and MNCH products and contraceptives. Midwives in Mali can provide oxytocin and all contraceptives except intrauterine devices (IUDs). In Tanzania, midwives can provide FP products if they have received training. Otherwise, they can provide only short-acting methods.

*Community health workers*

CHWs cannot provide RH commodities except in Burkina Faso. In 5 out of the 7 countries (Burkina Faso, DRC, Mali, South Sudan, and Tanzania), CHWs can provide short-acting contraceptives or can refer clients to facilities with staff qualified to offer long-acting methods. Many CHWs are able to provide commodities to treat diarrhea, malaria, and pneumonia, as well as amoxicillin, but cannot provide any other MNCH or nutrition products. They can also offer counseling and make referrals to higher levels.

Boma health teams (BHTs) comprise a group of three BHWs, which are the equivalent of CHWs in South Sudan. BHTs live in the smallest geographic and administrative unit, and they are selected by their community and recruited by the Ministry of Health (MOH) to provide community health services. Table 2 shows the medicines that should be available for provision by the BHTs.

**Table 2. Essential Medicines to be Made Available for Boma Health Teams, South Sudan**

| Medicines for BHTs | Dosage Form | Strength |
|---|---|---|
| **ICCM intervention for childhood illnesses** | | |
| Artesunate + amodiaquine | Tablet | 25 mg + 67.5 mg<br>50 mg + 135 mg |
| Artesunate | Suppository | 50 mg |
| Sulphadoxine + pyrimethamine | Tablet | 500 mg + 25 mg |
| Amoxicillin | Tablet, dispersible | 250 mg<br>125 mg |
| Oral rehydration salts | Oral powder for solution | World Health Organization formulation |
| Zinc sulphate | Tablet, dispersible | 20 mg |
| **Neglected tropical diseases** | | |
| Albendazole | Tablet, chewable | 400 mg |
| Mebendazole | Tablet | 100 mg |
| Diethylcarbamazine citrate | Tablet | 50 mg |
| Ivermectin | Tablet | 6 mg |
| Praziquantel | Tablet | 600 mg |
| **Reproductive health, maternal, health, and neonatal health commodities** | | |
| Condoms (male) | Latex | - |
| Condoms (female) | Polyurethane, latex or nitrile | - |
| Ethinyl estradiol + levonorgestrel | Tablet | 30 µg + 150 µg |
| Levonorgestrel (emergency contraception) | Tablet | 1.5 mg |
| Misoprostol | Tablet | 200 µg |
| | Vaginal tablet | 25 µg |
| Ferrous sulphate + folic acid | Tablet, coated | 200 mg (60 mg iron) + 0.4 mg |
| Chlorhexidine digluconate | Gel | 7.1% (equivalent to 4% chlorhexidine), 10 ml tube |
| Tetracycline | Eye ointment | 1% |

## INFRASTRUCTURE

When asked about the biggest supply chain-related challenges they faced, respondents cited a lack of storge space, not following good storage practices, poor infrastructure, and lack of electricity and internet. In Burkina Faso, inventory managers are trained to optimize space by keeping their areas tidy, but cramped storage areas may have led some health facilities to adjust their orders based on available space. As a result, orders for the same product are placed several times within a month, rather than in one larger single order (as per LMIS procedures). Moreover, a lack of night light sources and locks is an issue in DRC. As was the case in many countries, Tanzania noted unreliable electricity and internet as problems. Staff in South Sudan also mentioned that storage is insufficient at both the county health department and the health facility.

DRC and South Sudan noted challenges to maintaining the cold chain. Providers must remember to recycle accumulators for isothermal boxes for oxytocin in DRC; otherwise, the efficacy of the drugs will be compromised. Obtaining ice packs for cold boxes and theft of solar panels for solar refrigerators are issues in South Sudan.

## FUNDING

All but one country mentioned funding as one of the biggest challenges to achieving commodity availability. The availability of funds to distribute commodities to the last mile was either insufficient or lacking in Mali, Niger, South Sudan, and Sudan. In most cases, health facilities needed to pay for transport using their own funds or rely on partners for distribution. In DRC, cost recovery funds held in a specific account were difficult to access for purchasing additional essential medicines. Moreover, clients who cannot afford the fees are still provided services or commodities, which leads to health facilities accruing debt rather than making any profit with which to buy additional products or pay operational costs. Along with the lack of training funds for staff noted above, staff in South Sudan mentioned that funds to return expired or damaged commodities to the county or state level to be properly disposed of have not been factored into budgets.

## TRANSPORT

Staff in every country mentioned transportation as a last-mile issue, which included either insufficient or lack of transportation to the lowest level health facility. (Health facilities must pick up commodities at the next highest level.) This would sometimes lead to lengthy delays before commodities reached their destination. Poor road networks, impassable road conditions, and conditions during the rainy season were common challenges. Additionally, unreliable and inconsistent distribution schedules may lead to deliveries taking several months longer than planned.

In some countries, transport is provided only for products in certain categories (essential medicines or cost recovery). For example, in Mali, profits generated from products funded through cost recovery are used to pick up both cost recovery and "free" commodities, while in Sudan, MNCH products (but not FP products) are delivered to the health facility.

## DATA AND LMIS

Having supply chain SOPs is key for managing health commodities, accounting for inventory, and properly requesting and receiving commodities. An LMIS provides the essential logistics data needed to adequately resupply commodities to health facilities and inform forecasting and quantification and supervision and monitoring activities. A national logistics SOP will have the documented guidance to give health workers step-by-step instructions on how to implement the tasks and procedures to manage commodities. SOPs also contain a standardized set of LMIS forms and tools to record essential logistics data. At a minimum, there should be stock cards, a daily register, and a report-and-request form to capture stock on hand, consumption, losses and adjustments, and days out of stock (JSI, 2020b). The SOP serves as a day-to-day reference for health workers and systematizes practices so that tasks are completed in the same way by each person following a set reporting schedule.

Most countries either had documented SOPs for logistics management (Burkina Faso, Niger, Sudan, and Tanzania) or standard procedures for managing commodities and collecting logistics data (DRC). South Sudan has an SOP for the central medical store. All countries used similar logistics forms to monitor key logistics data, track inventory, and resupply commodities. These include stock cards, daily registers, reporting forms such as report-and-request or purchase order forms, a register for losses, and drug requisition books.

Collecting quality data is part of the supply chain evolution to reach a more organized state and eventually achieve an integrated state where information is easily visible and supply chain managers are conversant in using the information to make informed decisions. Tanzania's supply chain has evolved to an electronic LMIS for all facilities, including remote health facilities.

## SECURITY

Burkina Faso, DRC, Mali, and South Sudan listed insecurity and work in fragile settings as one of their biggest challenges. These countries have areas that are hard to reach because of their security status. Staff in South Sudan must access these places by plane. DRC responses noted that internally displaced people overwhelm and strain the health system, creating competing demands among residents.

## EMERGENCY PROCEDURES, PREPAREDNESS, AND SOLUTIONS

The questionnaire asked what type of preparedness or solutions have been developed to anticipate shocks and disruptions to the supply chain. Established procedures can be put into place during emergencies to facilitate providers' ability to obtain commodities when they are close to running out and to shorten the length of a stockout, giving health workers the ability to serve their clients. A basic LMS will have an established inventory control system to help:

- Determine when stock should be ordered or issued.
- Determine how much stock should be ordered or issued.
- Maintain an appropriate stock level of all products, avoiding shortages and oversupply.

The inventory control system will have maximum and minimum months of stock levels, and it will have an emergency order point based on the set minimum stock levels. For countries that adhere to their inventory control parameters, this is one system of emergency preparedness. Health facility staff who correctly complete their logistics forms will have the ability to detect when stock levels for a particular commodity or commodities are nearing the emergency order point, which will trigger the process to make an emergency order request.

### Emergency order procedures

Several countries defined an emergency order based on the parameters in their LMS, and their respective SOPs provided the rules and processes to place an emergency order. In their questionnaire response, Burkina Faso and Tanzania specifically mentioned following maximum and minimum levels as a preparedness mechanism.

In Burkina Faso, a monthly physical inventory at the health facility and a quarterly inventory at the district depot make it possible to anticipate shortages (MOH, General Secretariat, Directorate General of the Pharmacy, Medicines, and Laboratories, 2017). Health workers responsible for designated "red zone" areas may use their own funds to travel to these zones when they can reach them to provide medicines and health commodities. Burkina Faso's LMIS provides guidance on when regular and emergency orders should be placed (e.g., when there are shortages due to distribution or pick-up delays, a forecasted threat, or a crisis); the factors that trigger such orders; and the quantities to be ordered. The HFA found that 9.8 percent of health facilities have a preparedness and response plan (MIHR, 2022c).

In Tanzania, the MOH developed guidelines for supply chain and emergency preparedness for health care workers and managers. If stock levels go below one month of stock, a specific emergency order form is prepared and taken to the district to be investigated and approved before it is given to the Medical Stores Department. Tanzania's logistics system SOP further states, "If there are frequent stock-outs/shortages that necessitate frequent emergency orders, then try to find out why this is occurring. If a particular cause can be identified, try to address and resolve the issue" (United Republic of Tanzania Ministry of Health, 2018).

Moreover, facility managers and health workers in Tanzania are trained on how to place emergency orders using the electronic logistics management information system (eLMIS) system when stock levels go below two months of supply. Health facilities can redistribute commodities among each other, or district pharmacists can make requests from other districts following the formal guidelines in the SOPs for interzonal, interfacility, and internal district exchanges. Health facilities can place emergency orders to the district pharmacists, or they can buy from private, independent pharmacies contracted by the government through the MOH. Additionally, their integrated logistics system (ILS) monitors all medicines and commodities to track stock status levels to prevent commodity shortages.

Similarly, in Mali, when stock goes below the minimum level, an emergency order is placed with the respective central medical store, depot, or community health center (*centre de santé communautaire* ([CSCom]), or a request is made to transfer stock from a neighboring health structure (MOH, General Secretariat, Directorate General of the Pharmacy, Medicines, and Laboratories. 2017). Mali's "Master Plan for the Supply and Distribution of Essential Medicines and Other Health Products" defines the conditions for an emergency order.

### Adaptations and solutions

In Niger, the lowest level health facility (the CSCom) normally receives a maximum of 2 months of supply, with a monthly delivery. However, in conflict zones, the CSCom maximum stock level is increased to 3–6 months of stock, with deliveries every 3 or 6 months. DRC frequently utilizes supervision by phone to assist health workers when situations do not allow in-person visits but staff still need guidance during difficult periods. Other preparedness solutions include increasing safety stock and contracting with private transporters to do last-mile distribution or involving NGOs to assist (as in Mali). In Mali and Sudan, respondents noted that health facilities have requested commodities from a neighboring health facility.

South Sudan pre-positions stock during the dry season in anticipation of the rainy season, and they collaborate with the county health departments (CHDs) and representatives from the Relief and Rehabilitation Commission to drop kits in hard-to-reach areas affected by conflict/insecurity and disasters such as floods. Additionally, South Sudan's MIHR project includes a resilience component to support CHDs and is developing emergency preparedness plans for certain counties. The plans will ensure continuity of services during a crisis, and components will include, for example, objectives, a risk assessment and monitoring plan, asset assessment and mapping, continuity and response plans, an operational and financial support plan, coordination mechanisms, and emergency preparedness and response teams.

Instead of formal procedures, the system in South Sudan is to turn to the MOH, CHD, or Relief and Rehabilitation Commission for assistance in case of floods or other disasters. Niger has put in place staff dedicated to health product logistics as part of its preparedness efforts. During shortages in Sudan, kits are available at large hospitals but are infrequently used, partly because contents are either expired or not replenished, so the needed commodities are not available.

### Community Health Workers

The questionnaire asked if there are procedures for CHWs to place emergency orders to the health facility and if there is clear guidance for CHWs when there are commodity emergencies or disruptions. Although formal procedures for commodity shortages do not exist for CHWs in any country, informal established processes exist to address the issue when it arises.

In the DRC, during epidemic emergencies, CHWs notify the head nurse and follow very detailed procedures for requesting an emergency order. Alternatively, South Sudan BHWs contact their supervisors for a refill when there is an emergency. Under normal circumstances, BHWs pick up commodities from the nearest health facility, which is usually a long distance for them to travel, and they are given a month's worth of commodities to provide home-based care in their community.

Although not CHWs, PHCC staff (the lowest level health facility in Sudan) will go to another PHCC to find drugs, especially during malaria season, or for medicines for children under five as part of an informal, friendly system. Additionally, some PHCCs use an emergency order form or write a letter to the local health office.

Tanzania noted that it is very rare for a CHW to run out of stock. CHWs should provide stock levels twice a week to their supervisor, and they speak together informally during the week to exchange regular updates. CHWs always secure their commodities at the health facilities, a process that has been facilitated through the provision of mobile phones from a previous project and for those in remote communities. Moreover, partner organizations have provided CHWs with bicycles to reach communities and health facilities and to get around larger villages.

## COUNTRY SOLUTIONS

The questionnaire asked for countries' suggestions, solutions, and ideas to improve the availability of commodities and for coping with supply chain shocks. Responses are summarized below by function.

Countries can utilize these ideas to develop targeted activities and interventions to strengthen the supply chain.

**Table 3. Country Solutions and Suggestions to Address Commodity Availability**

| Function | Solutions, Ideas, and Suggestions |
|---|---|
| **Supply Chain** | *Inventory Control*<br>• Continue to reinforce adherence to logistics guidelines and rational use of drugs:<br>  ○ Have a system in place for health facility accountability to order according to needs using consumption data.<br>  ○ Respect established order frequencies to maintain proper inventory levels (i.e., enforce maximum and minimum stock levels).<br>  ○ Use the LMIS forms.<br>  ○ Follow the first expiry, first out (FEFO) rule.<br>• Create greater transparency: Receive regular national-level stock status updates prior to deliveries in order to anticipate whether commodities are stocked out.<br>*System Design*<br>• Move away from push system to pull system.<br>• Increase safety stock for health facilities located in insecure and hard-to-reach areas.<br>*Commodity Availability*<br>• Set up an essential transitional pharmaceutical depot managed by MIHR, where orders are sent directly from the health centers, to compensate for shortages at the national level.<br>• Manufacture drugs in-country.<br>• Strengthen emergency ordering system for commodities to arrive within 24–72 hours vs. 1–2 weeks. |
| **Infrastructure** | • Classify and store drugs in accordance with storage standards.<br>• Increase cold chain storage.<br>• Increase storage capacity at the primary health facility level. |
| **Human Resources** | • Appoint staff at the district level to strictly monitor the supply chain.<br>• Set specific job descriptions with supply chain tasks by cadres.<br>• Conduct on-the-job training to prevent turnover.<br>• Train stock managers on DHIS2/OSPSANTE.<br>• Train staff to improve order skills.<br>• Conduct regular annual refresher training.<br>• Develop mentorship program.<br>• Build a system to hold health facilities accountable to order using consumption data. |
| **Funding** | • Find funding for medicines from the district to the last mile.<br>• Identify funds for buffer stock procurement and last-mile distribution. |

| Function | Solutions, Ideas, and Suggestions |
|---|---|
| **Distribution** | • Optimize the network by distributing directly from the central level to the primary health facilities.<br>• Outsource with private carriers.<br>• Negotiate MOUs with NGOs to support last-mile distribution.<br>• Adopt a reverse logistics system.<br>• Ensure there are enough vehicles to deliver from the district to health facilities. |

# CONCLUSION

These findings illustrate the variety of issues and barriers around the supply chain and the impact on commodity availability and commodity security at the last mile. Countries have demonstrated that they can adapt and be resourceful to cope with the supply chain issues, both manmade and environmental, that create commodity shortages. Targeted interventions to address each dimension of the supply chain and continued follow-up are needed as part of a country's annual work plan and long-term strategies. For countries with fragile settings, having harmonized emergency guidelines and procedures can provide health workers with the know-how, the steps to follow, and the point person to contact when shortages are detected or anticipated. Along with a supply chain continuity of operations plan, these preparedness plans can curtail shortages and prevent stockouts, allowing clients to have continuous access to the commodities they need. Health workers trained in supply chain practices, a standard logistics system, sufficient transportation, proper storage conditions, and adequate funding to support each of these areas are all needed to have a more resilient supply chain.

A separate document—*Recommendations to Improve Commodity Availability at the Last Mile Through a Stronger Supply Chain*—includes numerous resources and materials for all countries to use to improve commodity availability at the last mile, with guidance on disaster or emergency preparedness. Additionally, a generic strategy template is also available for countries to adapt to strengthen and improve supply chain and commodity security.

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# ANNEX 1. INTERVIEW QUESTIONNAIRE

**Commodity Availability Bottleneck Survey (see French version below)**

**MIHR Stakeholder Interview Questions**

| | |
|---|---|
| **Country** | |
| **Interviewee name(s)** | |
| **Interview date** | |

**Introduction:** MIHR would like to understand the supply chain bottlenecks and challenges taking place at the last mile to develop strategies to increase the availability of essential MNCH/FP/RH/nutrition commodities in fragile settings. We want to better understand the challenges health workers, community health workers (CHW), clients and suppliers face in trying to obtain commodities and the solutions local governments, CHWs, and families have developed to work around supply issues.

We will start with general questions to get a sense of the big picture and then ask more specific questions to understand the details and nuances around commodity availability challenges. Do you agree to participate in this interview?

**Context**

1. Could you describe the largest challenges preventing a reliable stream of commodities at the last mile?
2. Many health facilities are working in fragile settings. What type of preparedness or solutions have been taken to anticipate shocks and disruptions to the supply chain?
3. Are the RH, FP, MNCH and nutrition commodities dispensed at the health facility and community level, on the essential medicines list?
4. Which critical commodities are required at the facility and community level to meet program/MIHR objectives? (we will ask about this in more detail by cadre and level later as well so a more general answer is fine to start off the conversation)
5. Which of these critical commodities are often stocked out?

**LMIS**

6. Is there a logistics management information system?
7. What type of logistics forms are used to manage and track commodities?
    a. Stock cards
    b. Daily register
    c. Report and request form
    d. Other, please describe:

8. Are there established procedures at the health facility for placing emergency orders to the district?
9. Are there procedures for the CHW to place emergency orders to the health facility?

**Supply Chain Skills**

10. Are there written SOPs or logistics management system guidelines at each facility to help staff carry out their logistics responsibilities?
11. How often do health workers and CHWs receive on-the-job or refresher training on these guidelines?
12. Do staff and CHWs who manage or provide commodities have a written job description that includes logistics responsibilities at the service delivery point?
13. Is there clear guidance for health workers and CHWs to take when there are commodity emergencies or disruptions? If not, what would be helpful to manage emergencies when they occur?

**Storage**

14. Are cold chain storage resources (e.g., refrigerator, paraffin/kerosene, and temperature chart) available at all levels of the system, where appropriate?
15. Is the existing storage capacity adequate to handle the current quantities of products at the service delivery points?
    a. If no: How does the program cope with inadequate storage space at the SDP?

**Transport and Distribution**

16. Are all commodities picked up by or delivered to the lowest level facilities or does transport vary by product type (i.e., contraceptives, MNCH, RH)?
    a. If pick up: Is there reliable transportation and funds to pick up commodities
    b. If delivered: Are commodities delivered on a set schedule and do they arrive on time?

**Service Delivery**

17. Is there a list of approved commodities to be dispensed at the community level and by cadre (community midwives or CHWs), i.e., chlorhexidine, misoprostol, amoxicillin DT, ORS, zinc, anti-malarials, contraceptives. [If yes, ask for a copy of the list]
    a. Which commodities can facility health workers dispense or provide?
        i. RH products:
        ii. FP products (i.e., IUDs, implants, injectables):
        iii. MNCH products (i.e., misoprostol):
        iv. Essential medicines:
        v. Nutrition products:
    b. Which products are community midwives allowed to dispense or provide?
        i. RH products:

ii. FP products (i.e., injectables):
iii. MNCH products (i.e., misoprostol):
iv. Essential medicines:
v. Nutrition products:

c. Which products are CHWs allowed to dispense or provide?
i. RH products:
ii. FP products (i.e., injectables):
iii. MNCH products:
iv. Essential medicines:
v. Nutrition products:

18. We would like to hear about any solutions or suggestions you may have to improve the availability of commodities, anticipate or cope with the supply chain shocks you mentioned earlier.

19. A desk review is also part of this activity. Have you (or any partner) conducted a health facility assessment or any other assessment or survey at the lower levels of the system that include questions about the supply chain and/or commodities?

    a. Which assessments did you (or they) conduct?

    b. What questions did you (or they) include about the supply chain or commodities?

    c. Can you please share the report(s) and data of those assessments if the MERL team does not already have them, so we can analyze those data for this activity?

20. We are also speaking to the seven MIHR partner countries to gather their information and will have a virtual stakeholder workshop to share a summary of the findings. A STTA is also planned in Niger and South Sudan to better understand their commodity security challenges at the last mile. There will be a report summarizing all of this work about the primary bottlenecks identified around commodity availability at the last mile. A generic strategy template will also be created that countries can then use and tailor to their context to help address and strengthen their supply chain and commodity security efforts at the last mile.

21. Do you have any questions for us?

**Enquête sur les goulots d'étranglement de la disponibilité des produits**

**Questions d'entrevue avec les intervenants du MIHR**

| | |
|---|---|
| **Pays** | |
| **Nom de la (des) personne(s) interrogée(s)** | |
| **Date de l'entretien** | |

Introduction : Le MIHR aimerait comprendre les goulots d'étranglement et les défis de la chaîne d'approvisionnement qui se produisent au dernier kilomètre afin d'élaborer des stratégies visant à accroître la disponibilité des produits essentiels de MNCH/FP/RH/nutrition dans les milieux fragiles. Nous voulons mieux comprendre les défis auxquels sont confrontés les agents de santé, les agents de santé communautaires (ASC), les clients et les fournisseurs lorsqu'ils tentent d'obtenir des produits et les solutions que les gouvernements locaux, les ASC et les familles ont développées pour contourner les problèmes d'approvisionnement.

Nous commencerons par des questions générales pour avoir une idée de la situation dans son ensemble, puis nous poserons des questions plus spécifiques pour comprendre les détails et les nuances entourant les défis liés à la disponibilité des produits.

**Context**

1. Pourriez-vous décrire les plus grands défis qui empêchent un flux fiable de produits de base au dernier kilomètre ?
2. De nombreux établissements de santé travaillent dans des contextes fragiles. Quels types de préparation ou de solutions ont été prises pour anticiper les chocs et les perturbations de la chaîne d'approvisionnement ?
3. Les produits de santé généalogique, de PF, de SMNE et de nutrition délivrés au niveau des établissements de santé et des communautés figurent-ils sur la liste des médicaments essentiels ?
4. Quels produits essentiels sont nécessaires à l'échelle de l'établissement et de la collectivité pour atteindre les objectifs du programme et des IRSC ? (Nous poserons des questions plus détaillées à ce sujet par cadre et niveau plus tard, donc une réponse plus générale est bonne pour commencer la conversation.)
5. Lesquels de ces produits essentiels sont souvent en rupture de stock ?

**LMIS**

6. Existe-t-il un système d'information de gestion logistique ?
7. Quels types de formulaires logistiques sont utilisés pour gérer et suivre les marchandises ?
    a. Cartes de stock
    b. Registre journalier
    c. Formulaire de rapport et de demande

    d. Autre, veuillez décrire :
8. Existe-t-il des procédures établies dans l'établissement de santé pour passer des commandes d'urgence au district ?
9. Existe-t-il des procédures permettant au ASC de passer des ordres d'urgence à l'établissement de santé ?

**Compétences en chaîne d'approvisionnement**

10. Existe-t-il des POS écrites ou des lignes directrices sur le système de gestion logistique dans chaque installation pour aider le personnel à s'acquitter de ses responsabilités logistiques ?
11. À quelle fréquence les agents de santé et les agents de santé communautaires reçoivent-ils une formation en cours d'emploi ou de recyclage sur ces lignes directrices ?
12. Le personnel et les ASC qui gèrent ou fournissent des produits ont-ils une description de poste écrite qui inclut les responsabilités logistiques au point de prestation de services ?
13. Existe-t-il des directives claires que les agents de santé et les agents de santé communautaires doivent suivre en cas d'urgence ou de perturbation des produits ? Si ce n'est pas le cas, qu'est-ce qui serait utile pour gérer les urgences lorsqu'elles surviennent ?

**Stockage**

14. Les ressources d'entreposage de la chaîne du froid (p. ex. réfrigérateur, paraffine/kérosène et diagramme de température) sont-elles disponibles à tous les niveaux du système, le cas échéant ?
15. La capacité de stockage existante est-elle suffisante pour traiter les quantités actuelles de produits aux points de prestation de services ?
    a. Si non: Comment le programme fait-il face à l'espace d'entreposage inadéquat au SDP ?

**Transport et distribution**

16. Tous les produits sont-ils ramassés ou livrés aux établissements de niveau le plus bas ou le transport varie-t-il selon le type de produit (c.-à-d. contraceptifs, SMNE, RH) ?
    a. En cas de ramassage : Existe-t-il un transport fiable et des fonds pour ramasser les marchandises ?
    b. Si livrées : Les marchandises sont-elles livrées selon un calendrier fixe et arrivent-elles à temps ?

**Prestation de services**

17. Existe-t-il une liste des produits approuvés à distribuer au niveau communautaire et par cadre (sages-femmes communautaires ou ASC), c'est-à-dire chlorhexidine, misoprostol, amoxicilline DT, SRO, zinc, antipaludiques, contraceptifs ? [Si oui, demandez une copie de la liste]
    a. Quels produits les agents de santé des établissements peuvent-ils dispenser ou fournir ?
        i. Produits RH :
        ii. Produits de PF (c.-à-d. DIU, implants, injectables) :
        iii. Produits de SMNE (c.-à-d. misoprostol) :

iv. Médicaments essentiels :
v. Produits nutritionnels :

18. Quels produits les sages-femmes communautaires sont-elles autorisées à dispenser ou à fournir ?
    i. Produits RH :
    ii. Produits de PF (c.-à-d. injectables) :
    iii. Produits de SMNE (c.-à-d. misoprostol) :
    iv. Médicaments essentiels :
    v. Produits nutritionnels :
19. Quels produits les ASC sont-ils autorisés à dispenser ou à fournir ?
    i. Produits RH :
    ii. Produits de PF (c.-à-d. injectables) :
    iii. Produits de SMNE :
    iv. Médicaments essentiels :
    v. Produits nutritionnels :

22. Nous aimerions connaître les solutions ou les suggestions que vous pourriez avoir pour améliorer la disponibilité des produits de base, anticiper ou faire face aux chocs de la chaîne d'approvisionnement que vous avez mentionnés plus tôt.

23. Un examen documentaire fait également partie de cette activité. Avez-vous (ou un partenaire) effectué une évaluation de l'établissement de santé ou toute autre évaluation ou enquête aux niveaux inférieurs du système qui comprend des questions sur la chaîne d'approvisionnement et / ou les produits ?

    a. Quelles évaluations avez-vous (ou ont-ils) effectué ?
    b. Quelles questions avez-vous (ou qu'ils) avez incluses au sujet de la chaîne d'approvisionnement ou des produits de base ?
    c. Pouvez-vous s'il vous plaît partager le(s) rapport(s) et les données de ces évaluations, même si vous n'avez pas encore agrégé ces données, afin que nous puissions analyser ces données pour cette activité ?

20. Nous discutons également avec les sept pays partenaires de l'IRIM pour recueillir leurs informations et organiserons un atelier virtuel avec les parties prenantes pour partager un résumé des résultats. Un STTA est également prévu au Niger et au Soudan du Sud afin de mieux comprendre leurs défis en matière de sécurité des produits de base au dernier kilomètre. Il y aura un rapport résumant tout ce travail sur les principaux goulots d'étranglement identifiés autour de la disponibilité des produits au dernier kilomètre. Un modèle de stratégie générique sera également créé que les pays pourront ensuite utiliser et adapter à leur contexte pour aider à aborder et à renforcer leurs efforts de chaîne d'approvisionnement et de sécurité des produits au dernier kilomètre.

21. Avez-vous des questions à nous poser ?