Guatemala Reproductive Health National Supply Chain Assessment Report

Capability and Performance

March 2023

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Acronyms

CAP	Permanent Care Center
CMM	Capability Maturity Model
CS	Health Center
DAS	Health Area Directorate
DMS	Municipal Health District
DQA	Data Quality Assessment
GHSC-PSM	USAID Global Health Supply Chain Program-Procurement and Supply Management
KPI	Key Performance Indicator
MSPAS	Ministry of Public Health and Social Assistance of Guatemala
NSCA	National Supply Chain Assessment
PNSR	National Reproductive Health Program
SOP	Standard Operating Procedures
UGL	Logistics Management Unit
UNFPA	United Nations Population Fund

Executive Summary

The Ministry of Public Health and Social Assistance (MSPAS), the United States Agency for International Development (USAID), and USAID's Global Health Supply Chain Program – Procurement and Supply Management Project (GHSC-PSM) conducted fieldwork in Guatemala for the National Reproductive Health Supply Chain Assessment from January 16-28, 2023. The NSCA measures the capability, functionality, and performance of supply chain functions at all desired levels of a national health supply chain system. The assessment toolkit collects information through two main methods: the Capability Maturity Model (CMM) questionnaire and the collection of key performance indicators (KPIs). The 11 functional areas of supply chains assessed by the CMM survey are shown in Figure 1.

Figure 1. NSCA 2.0 CMM Functional Areas
1. Strategic Planning and Management
2. Policy and Governance
3. Human Resources
4. Financial Sustainability
5. Forecasting and Supply Planning
6. Procurement and Customs Clearance
7. Warehousing & Storage
8. Distribution
9. Logistics Management Information System (LMIS)
10. Quality and Pharmacovigilance
11. Waste Management

The main objectives of this assessment were the following:

- Analyze and measure the performance, operational capacity, and capability of the national public sector-funded family planning/reproductive health (FP/RH) commodity supply chain.
- Identify performance gaps (bottlenecks, root causes, and opportunities for improvement) to guide system-strengthening investments.
- Provide a broad evidence base to inform on the country's strategic supply chain planning process.

The assessment focused solely on the public sector supply chain, with a specific focus on logistics processes supported by the National Reproductive Health Program (PNSR by its Spanish acronym). The NSCA sampled facilities prioritized by USAID/GHSC-PSM at various levels of the supply chain, including health posts, Permanent Care Centers (CAP), hospitals, Municipal Health Districts (DMS), and Health Area Directorates (DAS). At the central level, the assessment team visited the Central Warehouse and the Logistics Management Unit (UGL) of the MSPAS, as well as the National Reproductive Health Program. A total of 33 sites were assessed. This NSCA evaluation was not

intended to be a nationally representative sample but focused on three specific regions that were a priority for stakeholders.

The results of the assessment are presented below, organized by the 11 technical areas included. Each section contains relevant references to the strategic plans, as well as a discussion of CMM results and indicators, as well as recommendations for improving the system.

Overall, the assessment found widespread capabilities in the 11 technical areas at both national and subnational levels. As is often the case, capabilities tend to be lower at lower levels of the supply chain. Guatemala operates a decentralized supply chain where the DAS is responsible for the execution of the ministerial guidelines generated at the central level. The assessment documented prolonged contraceptive stock-outs at all levels of the supply chain, which is something stakeholders were aware of, and which was one of the main reasons for conducting this assessment. This is the first time in the history of Guatemala's public health system that such an assessment has been conducted in its public health supply chain.

The assessment documented strong capacities in strategic planning and management, policy and governance, and financial sustainability. These are excellent assets that will serve the MSPAS as it plans for supply chain reform and investment going forward. As mentioned, one of the biggest coordination challenges observed is between the central level and the DAS. There is an apparent lack of communication and sustained coordination between these two levels, which is hampering operations and supply chain planning. With each level demonstrating significant capacity, and not always in the same areas; there is an excellent opportunity to introduce strong and sustained collaboration mechanisms to mutually benefit entities, as well as the supply chain in general.

A major challenge documented within this assessment is the recording, management, use, and exchange of logistics data. Information is one of the three fundamental inputs in a supply chain, in addition to commodities and finance. A supply chain cannot operate without timely, high-quality logistics data that can be used to drive decision-making.

The assessment documented significant challenges with health facilities in having consistent and up-to-date information on KARDEX cards and the Daily Record of Actual Demand in a timely and consistent manner. The assessment found that, of the facilities visited, within six months prior to the assessment, only 52% of applicable KARDEX cards were available for review. On average, there was a gap of 104 days between the day of the visit and the last date recorded on a KARDEX card. This indicates that significant improvements should be made for the timely completion of logistics reports. Each DAS is responsible for consolidating its information, which is sent to the central level as part of reporting requirement. The analysis of the data quality data begins with the DAS, and it must communicate the identified gaps to ask for support where it is required but does not currently do so. This has a double effect on the supply chain. The first effect is that it delays the receipt of critical information in the upper levels of the supply chain, delaying the initiation of a response by the central level, if necessary. The second effect is that the central level cannot make accurate decisions about Forecasting and Supply Planning if the data it is using are incomplete and inaccurate. The impact of this materializes when reviewing the performance of forecasting and supply planning for the PNSR. While the MSPAS has very robust processes and demonstrates advanced capabilities in Forecasting and Supply Planning, it acts on the basis of information that is not entirely accurate. This has the ultimate effect of having a low accuracy level in the supply plan and order fulfillment. Addressing these gaps in the logistics data being collected will help correct the problem observed.

The assessment also documented significant challenges with the distribution system. Currently, Guatemala operates a self-collected distribution system in which each facility is responsible for collecting the products from the next level up. This assessment documented the challenges of the logistics process in terms of product availability for users. Health facilities are rarely equipped as a warehouse and therefore struggle to get adequate transportation and, more importantly, fuel to make regular trips to the warehouse. As discussed later in the report, the country has several opportunities to adjust this system to help shift to an active distribution system that would allow a more effective and efficient distribution system. MSPAS authorities should seriously consider an integrated distribution system across different health programs to generate even more cost savings.

Overall, the NSCA 2023 presents a detailed and comprehensive understanding of how the reproductive health supply chain currently works in Guatemala. The MSPAS has demonstrated technical strength in many key areas of leadership, which are important assets it can rely on when deciding how to move forward with investment and supply chain reform. Closer coordination and cooperation among entities within the MSPAS is the catalytic input that can help realize many of the supply chain reforms that will ensure the sustainability of this system for many years to come.

To ensure that the MSPAS can strengthen the supply chain of its health system, it should focus on addressing three key aspects as detailed below:

- Poor adherence to timely updates on KARDEX cards, resulting in poor quality data in logistics reports.
- Failure to register information on unfulfilled demand for products.
- Self-collection distribution system that does not employ an integrated distribution and makes health facilities responsible for their own distribution.

The authors of this report are confident that, with a renewed leadership commitment, a demonstrated willingness to collaborate, and a commitment to continuous improvement, Guatemala can ensure the continued and widespread availability of reproductive health commodities to all its citizens. The MSPAS must define the strategy to guarantee timely supply, taking as a reference the strengths of each of the processes involved in the supply chain to ensure technical and financial sustainability.

Background

Family Planning Context in Guatemala

In Guatemala, there are precarious indices of sexual and reproductive health, finding evidence of early sexual initiation without information, accompanied by outcomes such as pregnancies and sexually transmitted diseases (STDs).

To start putting it in context, young Guatemalans start their sexual life early: 28% of adolescents aged 15–19 have had sex, and 7% had their first relationship before the age of 15. Sexual initiation is very similar in urban and rural areas and by ethnic group. The first sexual intercourse occurs before marital union, on average one year earlier for women (first sexual intercourse at a median age of 18.3 years versus 19.4 years for first union) and 6 years for men (17 years versus 23 years). Among young women, the first relationship occurs with someone older, between five and seven years older, than them.[1]

These and other alarming data place us in the context to urgently address issues of comprehensive sexuality education (CSE), which is an international sexual right for human beings, and which falls within the human rights we should all have access to.

Based on the UNFPA definition, sexual education has three dimensions:

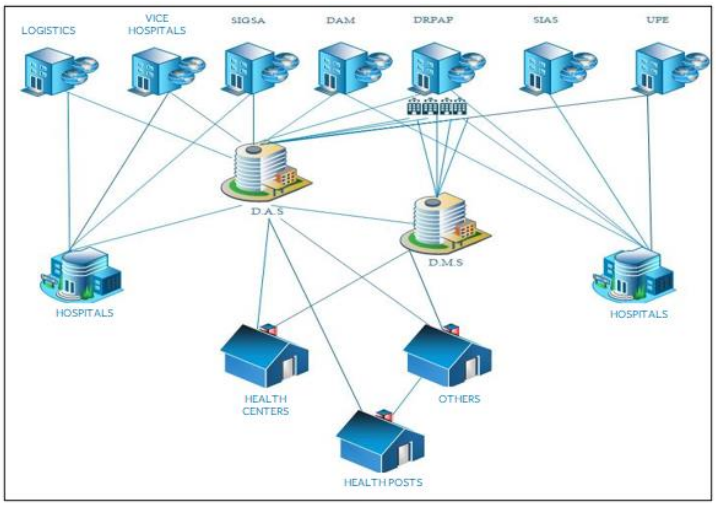
- Acquisition of information on human sexuality
- Human rights and related issues
- Fostering values and attitudes and developing life skills

Guatemala's Reproductive Health Supply Chain

Currently, the supply management system is mixed (centralized and decentralized), vertical, and integrated at the different levels of the system. The centralized management system is made up of medicines and other supplies corresponding to the care programs for people.

Model in supply chain management

[1] Latin American Faculty of Social Sciences (FLACSO)
Ministry of Public Health and Social Assistance (MSPAS)
National Maternal and Child Health Survey



Source: MSPAS Master Plan 2018-2023

The National Reproductive Health Program contributes to improving family health, with emphasis on women and men in their reproductive stage and newborns, through comprehensive interventions, regulated by the central level and implemented by decentralized levels. Its mission is to:

- Support the strengthening of reproductive health with promotion, prevention, care, and recovery actions; with a focus on equity, in our context, with respect to the rights and obligations as responsible fathers and mothers and as a product of sexual and reproductive behavior, through the participation of all the players and sectors involved for an integral approach;
- Motivate and stimulate the participation of men to involve them in the actions of Reproductive Health;
- Influence biological, psychological, social, cultural, economic, political, and legal factors to promote Responsible Fatherhood and Motherhood;
- Design and implement strategies with multidisciplinary and multisectoral participation to promote and comprehensively encourage the exercise of Responsible Fatherhood and Motherhood.

The Ministry of Public Health of Guatemala has Technical Standards that establish the guidelines of tasks in the processes of the logistics cycle of the Supply Chain, in the same way that there is a technical standard for the Logistics of Family Planning Methods for Health Areas and Hospitals. The UGL technical team and the PNSR updated the Manual for the Logistics Management of Family Planning Methods for health areas and hospitals, prepared in 2018, in order to strengthen and standardize the development of logistics processes to facilitate the timely availability of FP methods in the service network at national level. The following are the FP methods the PNSR currently offers to the population: combined oral contraceptives; condom (family planning and sexual prophylaxis); IUD; quarterly, bimonthly, and monthly injectables; subdermal implants, as well as AQV F, AQV M and emergency contraception. In addition, the PNSR promotes natural methods (SDM and LAM). These may vary according to the technical criteria defined by the PNSR.

For each process, this standard includes its definition, objective, guidelines, and description of key procedures to be performed in hospitals, health area directorates, municipal health districts, and services of the first and second level of care. The contents are based on the Technical Standard for the Medicines Management in force, as well as other ministerial agreements and technical guidelines of the PNSR, so this document is considered a reference to implement the processes of logistics management of FP methods. The UGL, in coordination with the PNSR, will offer guidelines on specific issues through official documents.

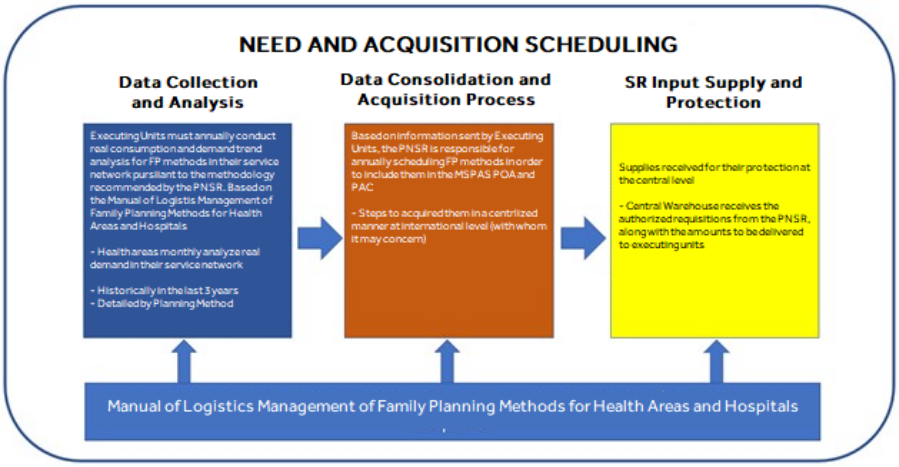
The technical standard of the reproductive health program establishes the main components of the logistics cycle:

1. Selection
2. Scheduling
3. Acquisition
4. Storage
5. Distribution
6. User Support
7. Information System

It is important to mention them, considering that they were part of the variables assessed in this diagnosis, which gives the criteria that there are guidelines that must be met, and that compliance must be guaranteed.

Logistics data are collected through printed formats, electronic spreadsheets, or tools developed in-house for this purpose.

The following table summarizes the need and acquisition scheduling process:



Source: MSPAS Master Plan 2018-2023

The distribution systems of the FP methods that are executed in the MSPAS according to the Manual of Logistics Management of Family Planning Methods for Health Areas and Hospitals, are two:

Distribution by assignment:

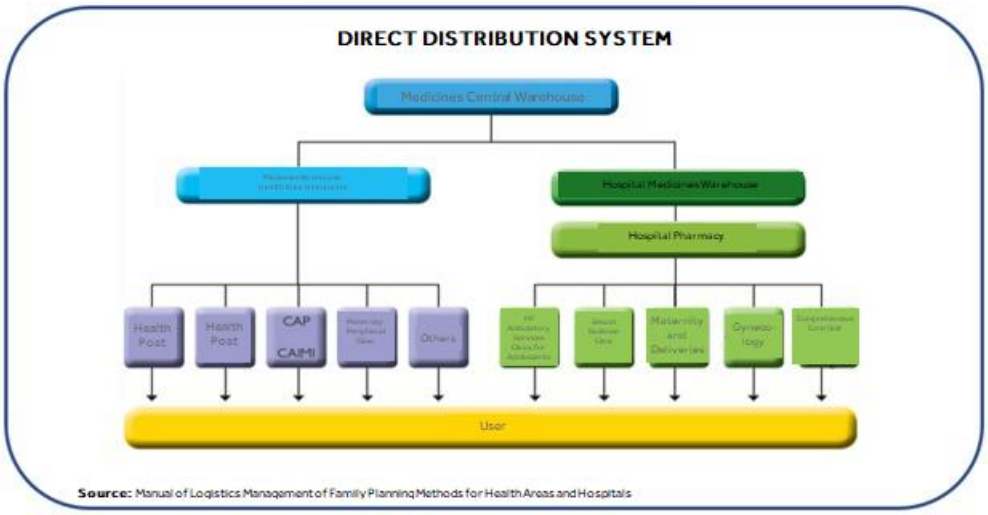
Central and intermediate warehouses decide "the frequency and quantity" of FP methods to be sent to service delivery points, and decisions are made by the upper level. The PNSR uses this distribution mechanism when new FP methods are introduced into the supply.

Distribution by requisition:
The DAS Executing Units and Hospitals are responsible for preparing and managing their requirements in accordance with the PNSR replenishment periods and distribution schedule. This is the distribution mechanism currently used by the PNSR.

Within this mode of Distribution by requisition are the following:

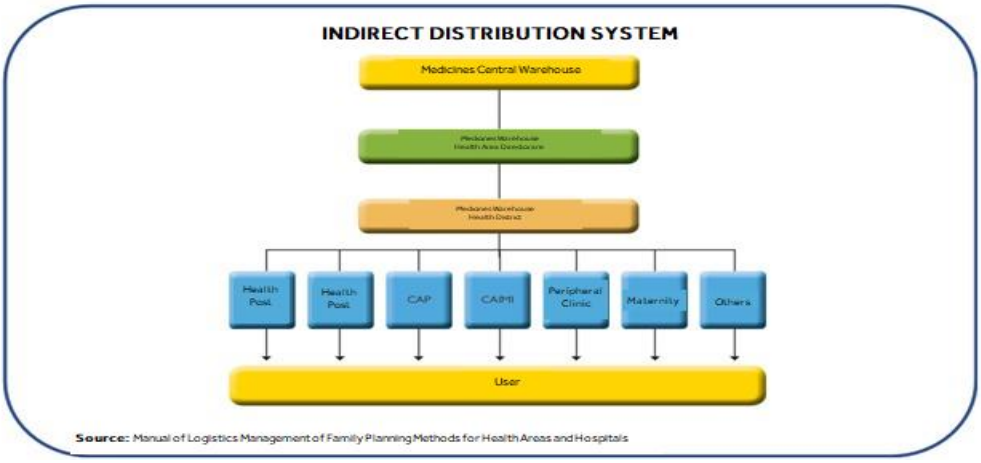
- **Direct Distribution System**

In which the central warehouse of the MSPAS, with authorization from the PNSR, distributes to the warehouse of Hospitals and DAS, and the latter does so directly to its health services.



- **Indirect Distribution System:**

In which the MSPAS central warehouse, with authorization from the PNSR, distributes to the DAS warehouse, and it distributes to the DMS warehouses, which are responsible for coordinating the transport to deliver the FP methods to the health services under their jurisdiction.



Overview of the supply chain assessment activity

Methodology

For seven months, from October 2022 to April 2023, the assessment team engaged relevant country stakeholders to define the scope of work, determine tracer products for the assessment, and assemble and train data collection teams. This approach was simultaneously intended to strengthen acceptance and investment in the effort by the Ministry of Health, the NSCA Steering Committee, USAID, and other key supply chain stakeholders. The team used the NSCA 2.0 toolkit to guide data planning, collection, and analysis. This section describes this process and assessment methodology in more detail.

The National Supply Chain Assessment Toolkit

The NSCA 2.0 is an updated toolkit that measures the capacity, functionality, and performance of supply chain functions at all desired levels of a national health supply chain system. The toolkit includes three main assessment elements: supply chain mapping, the capability maturity model (CMM) tool, and the key performance indicator (KPI) assessment tool (see Figure 2). The toolkit is freely available for download at www.ghsupplychain.org.

Figure 2. Overview of the Three Elements of the NSCA 2.0

ACTIVITY	DESCRIPTION
Supply Chain Mapping	The goal of mapping is to gain an in-depth understanding of the supply chain, including the roles and responsibilities of key supply chain players. This is achieved through facilitated group work to identify similarities and differences among various product groups flowing through the system.
CMM Diagnostic Tool	The CMM diagnostic tool assesses capacities and processes in cross-functional and enabling areas (e.g., human resources, financial sustainability) through interviews and direct observation.
Key Performance Indicators of the Supply Chain	Key performance indicators include a set of indicators that measure supply chain performance in selected functional areas.

The toolkit also includes resources for planning and implementing the assessment activity, and for analyzing and disseminating.

Scope of Work

The scope of work required the assessment team to conduct a comprehensive assessment of Guatemala's reproductive health supply chain at all levels by taking a sample of specific localities in the areas prioritized by the USAID/GHSC-PSM (Huehuetenango, Ixil, and Quiche) at central, departmental, and service delivery levels. In addition, the assessment disaggregates the data into multiple types of facilities: health posts, Permanent Care Center (CAP), hospitals, Municipal Health District (DMS), and Health Area Directorate (DAS). At the central level, the team performed diagnostics in the MSPAS (UGL), PNSR, and Central Warehouse. Annex 2 in the next section lists

all sites where data were collected in January 2023. The full scope of work is attached to this report in the Annex.

Sampling

The NSCA 2.0 was designed to assess supply chain infrastructure at country level, with disaggregation at facility type level. A typical "full-scale" NSCA uses nationally representative sampling to have a broad, but accurate understanding of the current state of the supply chain nationwide. The MSPAS and USAID had a particular interest in three specific Health Area Directorates in Guatemala (Huehuetenango, Ixil, and Quiche). In order to balance the available budget with technical priorities, the decision was made to conduct intentional sampling of a limited set of facilities within the three Health Area Directorates of interest.

In consultation with our MSPAS (UGL) counterparts, it was decided to choose from each DAS: five health posts, two CAPs, one DMS, and one DAS. It does not mean that the final results are representative of the facilities beyond those included in the sample. Rather, these results illustrate the challenges experienced throughout the supply chain. Therefore, the results may differ if a large-scale national sampling were done. However, to address the urgent need for timely results to address critical stock shortages, a simplified sampling approach was proposed. You can see the final sample in Figure 3 below.

Figure 3. MSPAS Levels of Care Framework and NSCA Selected Sample[2]

Facility Type	Health Services	NSCA Sample
Health Post	2,893	16
Permanent Care Center (CAP)	174	6
Hospital	47	3
Municipal Health District (DMS)	344	2
Health Area Directorate (DAS)	29	3
Central Warehouse	1	1
Central Level	2	2
Total	**3,490**	**33**

Team creation and composition

Teams were created and trained at central and field levels to conduct this assessment. Central-level interviews with the MSPAS and officials of the subsidiary departments were led by the GHSC-PSM NSCA lead with support from Guatemala-based GHSC-PSM.

At sub-central sites, nine two-person teams (18 members total) traveled to 30 sites over 6 days to collect data. The data collectors were hired through an outside company. The selection was based on a specific skillset and credentials. All data collectors participated in an intensive five-day training on assessment tools, SurveyCTO, tracer products, and best practices in survey methods. On the fourth day of training, participants conducted pilot assessments of two health facilities in Guatemala

[2] Comprehensive Health Care System-SIAS-SIGSA

City. The pilot served as a hands-on exercise for data collectors, a low-risk opportunity to troubleshoot technology issues, and a final opportunity to provide specific feedback to the evaluation team to further refine the survey to the context of the MSPAS.

Procedures

Four weeks before the start of data collection, letters endorsed by the MSPAS were sent to the departmental administrative units informing them that the facilities of their respective Health Areas had been selected to participate in a national assessment of the health supply chain system. The Health Area Directorates were responsible for communicating the purpose of the exercise to the main points of contact in each health center under their supervision. Data collectors also carried a copy of the notification signed by the MSPAS, in case of communication failure, and were trained to explain or further reinforce the purpose and value of the evaluation upon arrival.

Sub-central data were collected from January 23 to 28. On average, teams spent a full day assessing health posts and health centers, one and a half days in each hospital and two days in each Municipal Health District and each Health Area Directorate. One team member would lead the CMM survey interviews, while the other would collect KPI data. If a team member completed his or her respective interview early, data collectors would support the team member. In some cases, teams included a third member to support KPI data collection on large and predictably difficult sites.

The central-level team collected data from several departmental officials within the MSPAS, including the National Reproductive Health Program (PNSR), the Central Supply Warehouse (UPRISAL), and the Logistics Management Unit (UGL). Access was facilitated with scheduling support from key MSPAS representatives and GHSC-PSM staff and reflected relationships developed throughout the scheduling process with key stakeholders in the MSPAS. Central-level interviews were conducted over a one-week period, January 23-28, 2023. A total of 3 group interviews were conducted with senior central officials in central-level institutions and departments.

Capability Maturity Model

The Capability Maturity Model (CMM) questionnaire measures the level of capability and functionality present in the supply chain in 11 functional areas, including warehousing and storage, distribution, financial sustainability, waste management, and human resources. Only relevant modules were assessed at specific sites, based on the level of their facilities. For example, the capability of health facilities to conduct forecasting and supply planning was not assessed. Relevance was determined through consultations with Guatemalan counterparts to understand what supply chain functions were expected in different types of facilities across the system.

The survey consists primarily of a broad set of binary yes/no questions that establish the presence, or lack thereof, of a set of supply chain capabilities, processes, and best practices. The structure facilitates data collection in a standardized way, reduces the impact of subjectivity on assessments (compared to NSCA 1.0), and improves the comparability of results across countries and times.

Data were collected through a combination of interviews with key respondents, direct observation, and verification through supporting documents. Data collectors were trained to request to speak with the most appropriate facility staff to respond to each module, depending on the respondent's area of operation. For example, when present, a warehouse or inventory manager would be considered best suited to answer questions about warehousing and storage and the Chief Financial Officer or Chief Financial Manager would be considered best suited to answer questions about

financial sustainability. As part of the tool, a subset of respondent responses was matched with structured requests for documentation to verify the response (e.g., logistics reports, standard operating procedures (SOPs), financial records). In the storage module, data collectors were instructed to conduct the interview in the storage space and directly observe capabilities (e.g., packages, generators, safety equipment). Depending on the number of modules completed, the availability of key informers, and how quickly verification documents are obtained, the CMM questionnaire could take many hours to a full day to complete. Data were collected electronically using the SurveyCTO platform on individual tablets.

Figures 4 and 5 provide an overview of the functional areas addressed in the CMM questionnaire by type of facility. A full list of assessed facilities is provided in the annex.

Figure 4. CMM functional area by level in Guatemala's supply chain system: non-central levels

FUNCTIONAL MODULES ASSESSED	Health Post	Permanent Care Center (CAP)	Hospital	Municipal Health District (DMS)	Health Directorate (DAS)
Strategic Planning and Management				✓	✓
Policy and Governance				✓	✓
Human Resources	✓	✓	✓	✓	✓
Financial Sustainability	✓	✓	✓	✓	✓
Forecasting and Supply Planning					
Procurement and Customs Clearance					
Storage	✓	✓	✓	✓	✓
Distribution				✓	✓
Logistics Management Information System (LMIS)	✓	✓	✓	✓	✓
Quality Assurance and Pharmacovigilance	✓	✓	✓	✓	✓
Waste Management	✓	✓	✓	✓	✓

Figure 5. CMM functional area by level in Guatemala's Supply Chain System—Central Level

FUNCTIONAL MODULES ASSESSED	Central Warehouse	UGL	PNSR
Strategic Planning and Management	✓	✓	✓
Policy and Governance	✓	✓	✓
Human Resources	✓	✓	✓
Financial Sustainability	✓	✓	✓
Forecasting and Supply Planning		✓	✓
Procurement and Customs Clearance			
Storage	✓		

Distribution	✓	✓	✓
Logistics Management Information System (LMIS)	✓	✓	✓
Quality Assurance and Pharmacovigilance	✓		✓*
Waste Management	✓		✓*

*Indicates that the functional area belongs to other MSPAS entities not directly interviewed, but the answers were provided by UGL and PNSR

Key Performance Indicators

Key performance indicators are used to measure current supply chain performance. The assessment teams used the indicator assessment tool to collect key quantitative data for a core set of indicators aligned with international standards for health supply chain management. Indicators included stocked according to plan (by product), KARDEX card accuracy, stock-out rate (by product), temperature excursions, and staff turnover rates. The full list of indicators and the facility level at which they were collected are featured in Figure 6.

Data sources for KPIs included KARDEX cards, logistics management information system reports, invoices, orders, delivery note vouchers, temperature control records, and dispatch notes. Retrospective data (six months to one year) were also collected in some cases to better illustrate the consistency of past performance. Depending on the size of the facility, the availability and status of documentation, and the amount of stock on hand, collecting KPI data could be a time-consuming task, requiring a data collector to spend anywhere from several hours to two full days reviewing reports and counting stock. Data was collected on tablets using SurveyCTO.

Figure 6. Indicators by Level in Guatemala's Supply Chain System

Indicators	Health Post	CAP	Hospital	DMS	DAS	Central Warehouse	PNSR	UGL
Stock data	✓	✓	✓	✓	✓	✓		
Delivery data	✓	✓	✓	✓	✓	✓		
Human resources	✓	✓	✓	✓	✓	✓	✓	✓
Facility reporting rates								
Temperature excursions	✓	✓	✓	✓	✓	✓		
Forecast accuracy							✓	
Precision of supply scheduling							✓	
Prices paid							✓	

In collaboration with the NSCA Steering Committee of the Government of Guatemala, the tracer products shown in Figure 7 were selected for the NSCA. Together, they provide a fair representation of the types of reproductive health commodities that can be found in the Guatemalan public health supply chain, account for unique supply chain challenges, are nominally available at the health center level, and provide enough information to inform strategic decision-making.

Figure 7. Tracer Products			
#	Product Name	Dose	Unit
1	Norethisterone Enanthate + Estradiol Valerate	50 + 5mg	Ampoule, 1ml
2	Norethisterone enanthate	200 mg	Ampoule, 1ml
3	Medroxyprogesterone Acetate, 150 mg vial	400/300/300 mg	Bottle
4	Levonorgestrel + ethinyl estradiol (combination tablets)	0.15 + 0.03 mg+75mg	28-tablet blister
5	Intrauterine Device -IUD- (Copper T)	330mg (Copper)	a set Unit
6	Two-rod implant (JADELLE)	Two Rods	a set Unit
7	Latex condom, male	NA	one piece Unit

Data management

Each data collector was provided with an individual tablet programmed with SurveyCTO to collect, enter, and upload data electronically. All completed CMM questionnaires and KPIs were uploaded daily to SurveyCTO's secure data server. After uploading, GHSC-PSM's Monitoring, Evaluation, and Learning Advisor reviewed the submitted data daily to ensure quality. In cases of data anomalies or discrepancies, the advisor followed up directly with the data collection teams (via a QA WhatsApp, supplemented by direct calls from the logistics leader) to confirm data points, resolve issues, and provide future guidance. This structured process served to verify that all responses were coded correctly, and non-response data points were eliminated, facilitating more efficient analysis. In addition, the frequency of this data review (sometimes referred to as "cleaning") allowed us to quickly identify unexpected issues, which were systematically addressed. After this daily review and response process, the M&E team accepted the validated data for inclusion in the final datasets.

SurveyCTO exports data using a comma-separated value format. The data analysis workbooks that are part of the NSCA 2.0 standard toolkits were co-designed in Microsoft Excel to take advantage of this format. This minimized the data transformation process, optimized data cleansing, and significantly increased the automation of KPI Forecast during data analysis. Using coding values that created clear "signal spikes," non-response values were easily identified by values that completed a metric summary page. The data analysis workbooks also produced data tables, graphs, and dashboards to enable top-of-the-line analysis that contributed to field reports for local stakeholders. Results will be discussed by examining both components of data collection: CMM interviews and collected KPI data.

Limitations

Changes to the Schedule for Field Visits

During the planning phase of an NSCA assessment, the implementation team carefully considers all available information to ensure that specific facilities, data collector travel routes, and sequences are in line with realities on the ground. The team goes to great lengths to validate its information and

ensure its plans are realistic and achievable. However, there always are issues emerging during data collection that need to be resolved in real time. During the data collection phase, there were problems in two facilities. The first problem was that an initially selected health post was unreachable, even after a 5-hour drive from a nearby departure point. This facility was eventually replaced by a more accessible health post in the department of Nebaj. The second issue involved a facility labeled as a Municipal Health District, which when visited by our data collectors, was actually found to be operating as a health post and not a DMS. Therefore, we reclassified the collected data as a health post. That is why the reader sees only data for two DMS installations, but three DAS installations, although we intended to visit three of each.

Intentional, non-random sampling

NSCA 2.0 generally uses a two-stage random sampling design to achieve nationally representative results. This allows the country to have a broad, but detailed understanding of the current status of its supply chain. However, this form of sampling has important financial and time implications, which are not always available to all countries interested in conducting an NSCA. In the case of Guatemala, strategic geographical interests, available resources, and timing for the use of information indicated that a more limited sampling approach was most appropriate. The GHSC-PSM NSCA team always advocates for the "right size" approach for the NSCA. More simply, not all implementations need to be a large-scale assessment with national sampling. However, this has some implications for the interpretation of the results. More importantly, readers of this report should understand that the results here illustrate the current situation in Guatemala but are not nationally representative. Therefore, the challenges and operational dynamics observed can be used to diagnose the system and propose interventions to strengthen the supply chain, but it would be inappropriate to say that these results are exactly accurate for facilities that were not included in the sample. If the survey were to be completed again with nationally representative sampling, there is a possibility that the results would look different, given the more precise nature of that approach.

Summary of Results

- Overall, we collected data from 33 sites at all levels of Guatemala's reproductive health supply chain system, including:
- Central level (n = 3), including MSPAS (UGL, PNSR) and Central Warehouse
- Departmental level, including DAS (n = 3) and DMS (n = 2)
- Service delivery points, including health posts (n = 16), CAP (n = 6), and hospitals (n = 3)
- In this section, we provide an overview of the data collected. A general table of CMM results, followed by selected indicators, summarizes the assessment findings. In other sections of the report, results and findings are detailed first for each functional module and then for each service level. Within each module, we present the CMM scores first and then the relevant indicators. Discussion and recommendations specific to that module or service level follow the presentation of findings.

Understanding CMM Results

A review of the CMM results presented below should consider how the score was completed. Capability and processes were assessed based on a maturity model, adapted from private sector

best practices to suit the public health context. To learn more about how international benchmarks were considered in the design of CMM modules, review the NSCA 2.0 toolkit. Within each functional module, each question (or element) assessed is assigned one of four maturity levels, ranging from basic to advanced; the overall CMM score for this module is the sum of the scores at each maturity level. Figure 9 provides an overview of each maturity level, its definition, and its overall contribution to the overall CMM score of the functional area.

This overall functional area CMM score is a composite derived from the results of questions at all maturity levels. Out of a possible total CMM score of 100%, **basic** elements contribute 50%; **intermediate** elements, 30%; **advanced** elements, 15%; and **state of the art** elements, 5%. Scores cannot be interpreted directly (e.g., a score of 50% does not indicate that all core elements are implemented in all facilities). However, the scores are comparable among functional areas. The components that make up the basic level are scored separately from those associated with the intermediate level; scoring is done this way to recognize that even within a function, maturity levels can be mixed. The overall score for a single function is a combination of all basic, intermediate, advanced, and state of the art scores. So, an overall maturity score for the intermediate level does not necessarily indicate that all aspects of that role have reached that level of maturity.

Figure 9. Definitions of Maturity Level and Contribution to the Overall CMM Score

Maturity level	Definition	Maximum contribution to CMM score
Basic	**There must be** policies, structures, processes, procedures, tools, indicators, reports, and resources to operate a supply chain system (e.g., a stock card (KARDEX) as a tool for inventory management).	50%
Intermediate	Not essential, but policies, structures, processes, procedures, tools, and indicators **of intermediate level** (for example, Excel).	30%
Advanced	**It is good to have** policies, structures, processes, procedures, tools, indicators, reports, and resources to operate a supply chain system (e.g., RxSolution, an electronic inventory management tool).	15%
State of the art	Policies, structures, processes, procedures, tools, indicators, reports, and resources that are **State of the art** of a supply chain system (e.g., an enterprise resource planning system for stock management and control).	5%

Benchmarks at the NSCA

The NSCA methodology does not compare scores to a set of standards to indicate that a specific technical area has reached a specific level. As explained above, a combination of levels is expected in the final CMM score. To help provide some structure for the analysis, the report's authors use an 80% benchmark around which to analyze CMM scores. This benchmark has also been used in previous NSCA reports.

The logic behind this 80% benchmark is simple: to achieve such a score, one most score points for almost all questions at basic and intermediate levels to mathematically reach 80%. If your supply chain has demonstrated capacities at the basic and intermediate levels for a particular technical area, chances are you do not need to prioritize this technical area to improve in your next strategic planning process. It is certainly possible to reach 80% without completely filling basic and

intermediate capacities. This gap becomes a recommendation to focus on that technical area. Overall, the primary goal of this benchmark is to help separate technical areas that are relatively more advanced than others and enable pragmatic prioritization to improve the public health supply chain.

Capability Maturity Model: Summary Tables

Figures 10 to 14 present a summary of key data findings for capability maturity metrics in the 11 technical areas and the seven types of facility sampling disaggregation.

Figure 10. Non-central level CMM scores, average and ranges, presented by facility level for each functional module

	Health Posts	CAP	Hospitals	DMS	DAS
N =	16	**6**	**3**	**2**	**3**
Strategic Planning and Management	--	--	--	19% (33–89%)	26% (11–51%)
Policy and Governance	--	--	--	25% (17–34%)	45% (0–68%)
Human Resources	46% (18–65%)	56% (42–77%)	43% (15–60%)	43% (41–45%)	41% (38–47%)
Financial Sustainability	47% (16–66%)	55% (20–73%)	72% (61–84%)	42% (41–44%)	64% (56–74%)
Forecasting and Supply Planning	--	--	--	--	--
Procurement and Customs Clearance	--	--	--	--	--
Warehousing & Storage	33% (13–41%)	43% (29–54%)	44% (34–49%)	31% (28–33%)	46% (43–51%)
Distribution	--	--	--	37% (35-39%)	39% (31-47%)
Logistics Management Information System (LMIS)	53% (0–74%)	39% (0–65%)	72% (67–80%)	67% (54–79%)	79% (63–93%)
Quality Assurance and Pharmacovigilance	32% (0–71%)	39% (0–76%)	53% (25–76%)	35% (28–42%)	39% (16–58%)
Waste Management	17% (0–67%)	25% (4%–60%)	29% (0–64%)	51% (39–63%)	19% (0–29%)

Figure 11. Central-level CMM scores for each functional module

	Central Warehouse	UGL	PNSR
	n = 1	n = 1	n = 1
Strategic Planning and Management	20%	72%	45%
Policy and Governance	21%	79%	71%
Human Resources	37%	36%	43%
Financial Sustainability	50%	66%	77%
Forecasting and Supply Planning	--	--	70%
Procurement and Customs Clearance	--	--	--
Warehousing & Storage	50%	--	--
Distribution	18%	26%	32%
Logistics Management Information System (LMIS)	46%	53%	--

Quality Assurance and Pharmacovigilance	49%	--	68%**
Waste Management	27%	--	51%**

** Indicates that this score is for the MSPAS in general, not specific to the PNSR.

Figure 12. CMM heat map, all levels of facilities

Module	Supply Chain Level							
	Health Post	CAP	Hospitals	DMS	DAS	Central Warehouse	UGL	PNSR
	n = 16	n = 6	n = 3	n = 2	n = 3	n = 1	n = 1	n = 1
Forecasting and Supply Planning								
Procurement and customs clearance								
Warehousing and Storage								
Distribution								
Waste management								
Strategic management and planning								
Human resources								
Financial sustainability								
Policy and Governance								
Quality Assurance and Pharmacovigilance								
Logistic Management Information System								

Blank cells indicate that the data are inapplicable or are unavailable

Low score — 50% — High score

Key Performance Indicators: Summary Tables

Figure 14. Key Performance Indicators, average and ranges arranged by facility level

	Health Posts	CAP	Hospitals	DMS	DAS	Central Warehouse
N=	16	**6**	**3**	**2**	**3**	1
Stocked according to plan (all tracer products)	29% (0–69%)	28% (8%-43%)	37% (0-100%)	55% (17%-100%)	24% (0%-100%)	---***
Stock-out rate on the day of the visit	57%	57%	50%	29%	62%	0%
Average days of stock-out for a period of 183 days*	48.6 days (34%)	27.9 days (41%)	43.8 days (33%)	87.9 days (48%)	19.5 days (23%)	--
Average number of days with shortages per month, given that there were shortages	14.3 days	16.1 days	19.5 days	25.7 days	11 days	--
Stock card accuracy: percentage of installations with 100% accuracy (last recorded balance matches available stock)	64%	60%	67%	64%	69%	100%
Stock card accuracy: 100% average deviation accuracy across all facilities (no deviation = 0) **	58-388%	17-2127%	11-51%	21-550%	23-804%	---
LMIS electronic record accuracy: percentage of installations with 100% accuracy	---	---	---	---	64%	100%
LMIS electronic record accuracy: 100 percent average deviation accuracy across all facilities (no deviation = 0)	---	---	---	---	0%–904%	---
Waste, theft, and expiration: damaged, lost, and expired stock as a percentage of total available stock	0%	0%	0%	0%	0%	0%
Staff turnover ratio	1%	17%	0%	0%	29%	0%

**The first number in this table refers to the average number of days the product was out of stock on average across all facilities during the six months of July 2022 to December 2022. This period included 183 days. The number in parentheses is the percentage of days the product was out of stock, on average. For example, 48.6/183= 34%.*

***This indicator compares the quantity of stock on a stock card and/or inventory management software with the quantity of a physical inventory taken during a site visit. Care should be taken when interpreting this indicator. Results close to zero indicate good relative accuracy, while results away from zero indicate poor relative precision, but do not necessarily imply large inaccuracies in terms of absolute volume.*

This indicator requires the use of minimum and maximum levels of inventory control, which the central warehouse does not use. Therefore, this indicator was not estimated

Analysis, by Functional Module: Capability Maturity and Results of Indicators

This section systematically presents the context, findings, and analysis of each of the 11 technical areas evaluated by the NSCA.

Strategic Planning and Management

Strategic planning and management ensure that supply chain priorities are identified, roles and responsibilities are clarified, objectives are elaborated, and frameworks are established in order to monitor progress and performance. Strategic planning and management are the responsibility of the MSPAS, but all levels of the health system are responsible for understanding their role in strategic plans. The main areas that were taken into account in the score of this CMM module are the existence of strategic plans; appropriate follow-up mechanisms, such as formal oversight committees with broad stakeholder inclusions; and clear plans for private sector engagement (see Figure 15)

Figure 15. Examples of scoring strategic planning and management capacities

Basic	Presence of an approved strategic supply chain plan (or knowledge of it for lower-level entities) Follow-up of the supply chain implementation plan and presence of specific subsections Formal semi-annual supply chain risk assessment
Intermediate	Strategic planning process including a stakeholder mapping exercise Presence of a supply chain implementation plan Semi-annual updates to the supply chain strategic plan or implementation plan Actions to reform the supply chain system included in the strategic plan or implementation plan Coordination or engagement with the private sector to improve the supply chain in the last year
Advanced	Monthly stakeholder group meetings to review supply chain performance Presence of a risk management and mitigation/prevention plan Formal strategy for using public-private partnerships to improve supply chain performance
State of the art	Formal and ongoing assessment of supply chain risks

Note: These are illustrative examples of the types of capabilities qualified in this module, not an exhaustive list. Each module contains many dozens of questions and capabilities. For a complete list, see the NSCA toolkit, available at www.ghsupplychain.org.

The MSPAS Logistics Management Unit has a strategic plan for the period 2021-2025. As stated in the plan, the following is its vision:

"We are the technical unit that provides standards, logistical guidelines, and continuous monitoring of the supply chain for the management of medicines and related products of the Ministry of Public Health and Social Assistance aimed at their timely and permanent availability."

To make this vision a reality, the UGL has organized its planning around four strategic axes, and under each of these strategic axes, there are strategic objectives that it has defined for a specific period of time. They are as follows:

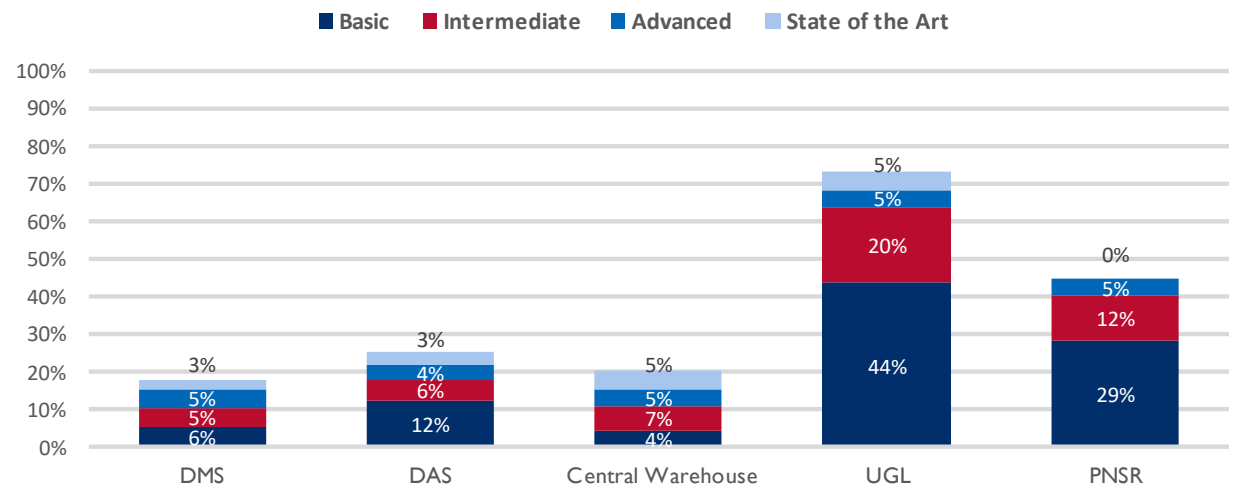
- Management and institutional organization
  - Systemic driving for efficient logistics management
  - Strengthening human resources

- Planning
    - Selection
    - Scheduling and Forecast of requirements
- Operational management
    - Acquisition
    - Inventory, storage, and distribution control
- Monitoring and evaluation
    - Information system
    - Technical assistance
    - User support

These strategic axes and objectives will be used as analytical perspectives for the various components of the NSCA analysis within this report. They will help characterize observed capabilities and help define strategic recommendations for supply chain reform and improvement.

2023 NSCA Results and Analysis

Figure 16. Strategic Planning & Management Capability Scores



Note on interpreting results: Remember that CMM scores are a combination of basic (max. 50%), intermediate (30%), advanced (15%), and at-the-forefront (5%) capabilities assessed. Reported percentages are the scored results averaged across all sites evaluated, for each capability level and facility type. For more information, see the Understanding CMM Results section above.

Strategic planning and management capabilities were assessed in three central-level establishments (UGL, PNSR, and the Central Warehouse) and some lower-level establishments (DMS and DAS). As is often expected, central-level institutions generally scored higher than their subnational counterparts. The average scores for DMS and DAS were 18% and 25%, respectively. Each type of entity, however, had a wide range of scores from sites visited, indicating that there is significant variation in capability from site to site.

For strategic planning and management, the responses of peripheral entities (DMS and DAS) should be interpreted as their knowledge of the existence of these strategic plans, how they fit into those plans, and what their relevant responsibilities are.

Within the MSPAS, the entity with the greatest capacity for strategic planning is undoubtedly the UGL. It has carefully considered many of the important elements that need to be considered when conducting strategic supply chain planning. Its 74% score for this module reflects that reality. Capability maturity scores and some selected answers on key capability questions are detailed in Figures 16 and 17.

Figure 17. Maturity scores of Strategic Planning and Management capabilities and answers to selected questions

	DMS	DAS	Central Warehouse	UGL	PNSR
n =	2	3	1	1	1
Overall maturity score (range)	18% (5–34%)	25% (11-51%)	20%	74%	45%
Presence of an approved strategic supply chain plan	0%	33%	X	✓	✓
Is the supply chain strategic plan updated annually or more frequently?	0%	0%	X	X	X
Stakeholder mapping exercise conducted	33%	X	X	✓	X
Presence of a supply chain implementation plan	0%	33%	X	✓ (1 year or less)	✓ (1 year or less)
Supply chain implementation plan (timeline) is monitored	0%	33% (Semi-annual)	X	✓ (Semi-annual)	✓ (Quarterly)
Supply chain reforms are being implemented	0%	0%	X	✓	X
There is a formal structure in place to monitor supply chain performance at this level.	50%	33%	X	X	✓
Existence of a supply chain performance monitoring plan	0%	33%	✓	✓	X
Existence of a risk management and mitigation/prevention plan	0%	33%	✓	✓	X
Coordination or engagement with private sector companies	0%	0%	X	X	X

Strategic planning and coordination capabilities. Within the MSPAS, both the PNSR and the UGL have demonstrated capabilities in strategic planning, although the UGL has a wider range of demonstrated capabilities. For example, the PNSR does not consider the LMIS, governance, distribution, storage, or monitoring and evaluation in its plan, while the UGL does. However, both entities demonstrate a strong interest in management at the central level and a weakness in services. The UGL claims to have a supply chain performance monitoring plan, but the PNSR is not involved in its review or is unaware of it. Requests from the authors of this assessment to view performance monitoring plan reports were also unmet. What all these inconsistencies simply imply is that the various entities within the supply chain are not coordinating with each other in impactful ways, and this is affecting supply chain performance.

This lack of coordination both at a particular level of the system and among levels is evident when examining module scores for the DMS and the DAS. Respondents within the facilities interviewed at this level had little or no knowledge of strategic plans, their components, or how they factor into those plans. While having a decentralized supply chain may be a contributing factor to this observed dynamic, it is not enough to leave it as it is. Strategic planning for the supply chain from either PNSR's family planning perspective or UGL's holistic view should regularly involve the institutions affected by those plans. Low DMS and DAS scores indicate they are not currently involved at the level they should be.

Public-Private Partnerships. From interviews conducted, documents read, and data reviewed, the public health supply chain in Guatemala does not appear to use public-private partnerships in any form to implement any of its supply chain operations. Since there are questions about how to fill strategic gaps in supply chain capabilities, it would be incumbent on the MSPAS to consider resorting to private sector entities to help achieve its strategic objectives.

Risks in the Supply Chain. At the central level, the UGL and the Central Warehouse reported having a risk mitigation plan, but the PNSR did not. Both the UGL and the Central Warehouse claim to continuously monitor risks. Although the PNSR does not have a formal risk management plan or strategy, it recognized the risks in its supply chain. Figure 18 details the main risks experienced by each of the five types of entities surveyed. As you can see, financial, technological, and operational concerns continue to pose the greatest risks to the supply chain.

Figure 18. Main risks experienced in the supply chain

	DMS	DAS	Central Warehouse	UGL	PNSR
n =	2	3	1	1	1
Financial	50%	67%	X	✓	✓
Human resources	0%	0%	X	✓	✓
Technology	50%	33%	X	✓	✓
Operational	50%	33%	✓	100%	X
Economic	0%	33%	X	0%	X

Recommendations

The MSPAS is fortunate to have strong Strategic Planning and Management capabilities within its system. The important focus in the future will be coordination among the entities of the system. As highlighted in the next section on governance, the family planning supply chain in Guatemala would greatly benefit from more active coordination and broader participation in strategic planning. To this end, the MSPAS shall:

- Establish a coordination mechanism that brings together national disease control programs, LGUs, and DAS supply chain leadership to work together on strategic supply chain planning.

- Consider aligning strategic planning times for the various MSPAS entities, so that they work together in the execution of the strategic supply chain plan to foster broader participation and cooperation.
- When examining current issues and capability gaps within the supply chain, consider developing an engagement strategy for external support to help fill strategic gaps. The MSPAS does not need to develop all the capabilities it lacks, but with internal and external management skills, it can leverage other entities to help achieve its supply chain goals.
- Assess whether it is necessary to update the Logistics Management Manual of Family Planning Methods for Health Areas and Hospitals, considering the identified gaps.

Supplementary figure

Figure 19. SPM: Question distribution and weighting at capability and facility levels

	Basic (50%)		Intermediate (30%)		Advanced (15%)		State of the art (5%)	
Installation	P. No.	Weight	P. No.	Weight	P. No.	Weight	P. No.	Weight
DMS (2)	36	1.4%	13	1.2%	6	2.5%	1	5.0%
DAS (3)	36	1.4%	13	1.2%	6	2.5%	1	5.0%
Central Warehouse (1)	36	1.4%	13	1.2%	6	2.5%	1	5.0%
UGL (1)	36	1.4%	21	1.4%	10	1.5%	1	5.0%
PNSR (1)	36	1.4%	21	1.4%	10	1.5%	1	5.0%

Note that interpretations of the score and discussions about "differences" in scores should recognize that the number of capabilities assessed differs by facility type and module. Therefore, positive answers to individual questions (i.e., reports of current capacities) have different weights, depending on the technical area and type of facility.
Note also that the number and weighting of questions for these modules vary because some conditionally graded questions are included. The figures presented here assume that all conditions are met and that all questions are included.

Policy and Governance

Clear policies, guidelines, and oversight are important to ensure that public health systems procure essential medicines, practice effective medicine, and revise policies to reflect changing best practices and the incorporation of new technologies. For the supply chain, national policies and governance must inform the entire system, from procurement to patient treatment, ensuring that all players operate based on standardized guidance. Figure 20 describes the main areas that were taken into account in the rating of policy and governance capabilities in this assessment, including the existence of a national medicines policy with supply chain components, an active oversight committee with broad representation from all levels of government and civil society, drug registration deadlines, and Standard Treatment Guidelines (STGs).

Figure 20. Examples of scored policies and governance capabilities

Basic	Existence of a national medicines policy that includes objectives for supply chain management Five-year updates of national policies related to supply chain management Existence of national PTEs and a National List of Essential Medicines Existence of a registration process for new medicines, products, and technologies

	Publicly available list of registered medicines and products
Intermediate	Quarterly meetings of a supply chain governance and oversight body to discuss supply chain issues Adaptation of national PTEs from universal clinical guidelines
Advanced	Existence of a formal high-level body that provides oversight and governance for the supply chain
State of the art	Civil society is part of the formal supply chain oversight and governance body

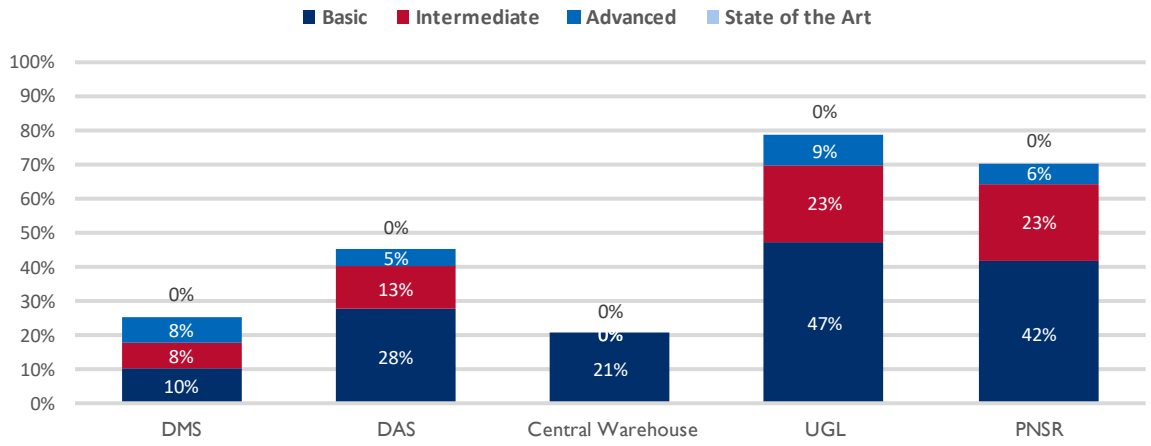
Note: These are illustrative examples of the types of capabilities rated in this module, not an exhaustive list. Each module contains many dozens of questions and capabilities. For a complete list, see the NSCA toolkit, available at www.ghsupplychain.org.

The MSPAS Logistics Management Unit has a strategic plan for the period 2021-2025. Within its strategic axis of institutional direction and organization, there is a strategic objective of systematic operation for efficient logistics management. A critical component of the efficient operation of a supply chain is an understanding that is presented in the policies and principles of governance at all levels and the institutions that operate as part of that supply chain. In this section, the NSCA examines the existence of such policies and regulations at the central level and awareness of them at lower levels of the supply chain.

2023 NSCA Results and Analysis

Figures 21 and 22 show the results of the NSCA, assessing the capabilities observed in policy and governance. The presence of capabilities in this area at the central level is very apparent, considering that the UGL received 79% and the PNSR received 71%. The two scores are very close to the benchmark for the NSCA, which is 80%. However, knowledge of policy and governance at lower levels is considerably less. In the NSCA methodology, this module attempts to understand existing capabilities at the central level, but for lower levels, the questions are trying to assess the *knowledge* of governance policies and regulations they have to comply with. This is done by asking about their understanding of the key policy components of managing a supply chain and also by physical verification of key documents. Figures 21 and 22 indicate a very basic understanding of governance policies and regulations for the reproductive health supply chain. None of the three types of warehouses surveyed received a score higher than 45% in this area.

Figure 21. Policy and Governance Capability Maturity Model Scores



Note on interpreting results: Remember that CMM scores are a combination of basic (max. 50%), intermediate (30%), advanced (15%), and at-the-forefront (5%) capabilities assessed. Reported percentages are the scored results averaged across all sites assessed, for each capability level and facility type. For more information, see the Understanding CMM Results section above.

Figure 22. Policy and governance capability scores and basic elements implemented

	DMS	DAS	Central Warehouse	UGL	PNSR
n =	2	3	1	1	1
Overall maturity score (range)	25% (17–34%)	45% (0–68%)	21%	79%	71%
Percentage of basic items in place (rank)	21% (8–33%)	56% (0–92%)	42%	95%	84%

Figure 23. Key policy and governance capabilities and gaps at central level

Establishment of a National Pharmaceutical Policy	✓
Formal body that provides oversight and governance for the supply chain	✓
Frequency of meetings of the governing body	Quarterly
Existence of national standard treatment guidelines	✓
Adaptation of national standard treatment guidelines from universal clinical guidelines	✓
Frequency of revision of national standard treatment guidelines	Every 4 years
Existence of a registration process for new medicines, products, and technologies	✓
Time it takes to register a new drug on average	Between 3-6 months
Existence of a public list of registered products	✓

Existence of policies and guidelines. The reproductive health supply chain benefits from a broad set of policies that guide how the supply chain should operate. There is a national medicines policy, which includes a national list of essential medicines. There is a unit within the MSPAS responsible for supply chain oversight (UGL). In addition, there are standard treatment guidelines, based on the WHO universal guidelines; however, these guidelines are not updated periodically. If you look at Figure 24, nevertheless, you can see that knowledge of all the components of these policies in various types of key facilities in the health system is quite variable. In addition, if you look at Figure 25, you can see that dissemination and reinforcement of one of the most important policy components -- national standard treatment guidelines -- were not available in all facilities visited during the evaluation.

Figure 24. Available supply chain system SOPs and guidelines

	DMS	DAS	Central Warehouse	UGL	PNSR
n =	2	3	1	1	1
There are guidelines or SOPs for the supply chain system, which cover:	50%	67%	✓	✓	✓
Storage	50%	33%	X	✓	✓
Inventory management	0%	67%	✓	✓	✓
LMIS	50%	67%	X	✓	✓
Quality assurance	50%	67%	X	✓	X
Forecast and quantification	0%	67%	X	✓	✓
Supply scheduling	0%	67%	✓	✓	✓
Waste management	0%	67%	✓	✓	✓
Procurement	0%	67%	✓	✓	✓
Financing	0%	33%	X	✓	✓
Human resources	0%	0%	X	✓	X

Figure 25. Availability of National Standard Treatment Guidelines

	Health Posts	CAP	Hospitals	UGL	PNSR
n =	16	6	3	1	1
National standard treatment guidelines physically verified on-site	44%	33%	33%	✓	✓

Note on policy implementation. A caveat to this section is important. This part of the NSCA policy and governance capabilities was assessed by determining the existence of key elements: policies, laws, and regulations, along with formal institutions and processes to support them. However, this section of the assessment does not attempt to measure the level of implementation or effectiveness of these policies, laws, and planning and governance regulations in Guatemala's reproductive health supply chain. While we measure the existence of these elements, existence cannot automatically be equated with effective implementation.

Recommendations

It is very evident that Guatemala benefits from having a solid foundation of governance at the central level of the supply chain. However, due to the decentralized structure of the health system, not all of that benefit reaches the lower levels of the health system. A common theme that will be raised in this report is the gulf between how the system is intended to work, according to the rules and standards set by the UGL and the PNSR, and how it actually works under the discretion of services provided by the DAS. The recommendations are generated based on the results of the visits in the

areas prioritized for this diagnosis (Huehuetenango, Quiche, Ixil). To address this difference in understanding and perception, the MSPAS should consider the following:

- Develop a coordination mechanism between the central level and DAS supply chain managers. There is a great benefit to be gained in more effective coordination, communication, and orchestration of actions and processes for the supply chain. It is clear that these entities are not communicating enough, as evidenced by the policy and governance scores of the DAS and the DMS.
- Use existing pathways to ensure that standard treatment guidelines, supply chain policies, and SOPs are properly distributed and used within the various levels of the supply chain. Supportive supervision, as discussed in the human resources section, appears to be a promising existing system to use.
- Involve the Central Warehouse in most of the overall supply chain planning and scheduling. Its current level of function has relegated them more to a transit warehouse than to the main warehouse of a national public health supply chain.

Supplementary exhibition

Figure 26. Policy and governance, question distribution and weight allocation at capability and facility levels

Facility	Basic (50%)		Intermediate (30%)		Advanced (15%)		State of the art (5%)	
	P. No.	Weight	P. No.	Weight	P. No.	Weight	P. No.	Weight
DMS (2)	9	5.6%	1	30.0%	1	15.0%	1	5.0%
DAS (3)	9	5.6%	1	30.0%	1	15.0%	1	5.0%
Central Warehouse (1)	9	5.6%	1	30.0%	1	15.0%	1	5.0%
UGL (1)	12	4.2%	4	7.5%	2	7.5%	1	5.0%
PNSR (1)	12	4.2%	4	7.5%	2	7.5%	1	5.0%

Note that interpretations of the score and discussions about "differences" in scores should recognize that the number of capabilities assessed differs by facility type and module. Therefore, positive answers to individual questions (i.e., reports of current capabilities) have different weights, depending on the technical area and type of facility.
Note also that the number and weighting of questions for these modules vary because some conditionally graded questions are included. The figures presented here assume that all conditions are met and that all questions are included.

Human resources

Effective supply chains require significant human resources in a wide range of technical areas, all levels of the health system, and all geographic areas of the country in order to ensure that quality health products are distributed safely and quickly. The NSCA outlines core human resource supply chain capabilities and performance metrics to assess the extent to which facilities have the necessary resources; supply chain functions have formally assigned responsibilities; and staff have the training, knowledge skills, time, and scope necessary to support supply chain operations. The main areas taken into account in the score of this CMM module are the presence of appropriate supply chain functions in job descriptions, regular skill building efforts for staff, and mechanisms for supportive oversight and performance improvement (see Figure 27).

Figure 27. Examples of HR capabilities scored	
Basic	At least two skill building sessions (e.g., LMIS, waste management, reporting) in the last year SOP or training guides/materials
Intermediate	HR workforce plan that projects the future needs of supply chain personnel Unified supply skill building plan Support oversight of supply chain functions in the last year Presence of appropriate supply chain functions in job descriptions
Advanced	Quarterly staff performance reviews The majority (51-99 percent) of staff have participated in skill training in the past two years Follow-up to the database of staff attendance at skill building sessions in supply chain management Advanced supply chain-specific skill building programs available in-country (e.g., e-learning, certificates, diploma programs)
State of the art	Participation of all staff in supply chain skill training in the last two years Bachelor's or master's degree program in supply chain available in the country

Note: These are illustrative examples of the types of capabilities rated in this module, not an exhaustive list. Each module contains many dozens of questions and capabilities. For a complete list, see the NSCA toolkit, available at www.ghsupplychain.org.

Within the 2021-2025 Strategic Plan of the UGL, one of the four strategic axes is the direction and institutional organization. Within this axis, a strategic objective is the strengthening of human resources for the supply chain. The report shall detail the human resource capabilities observed and skill development programs in consideration of this strategic priority.

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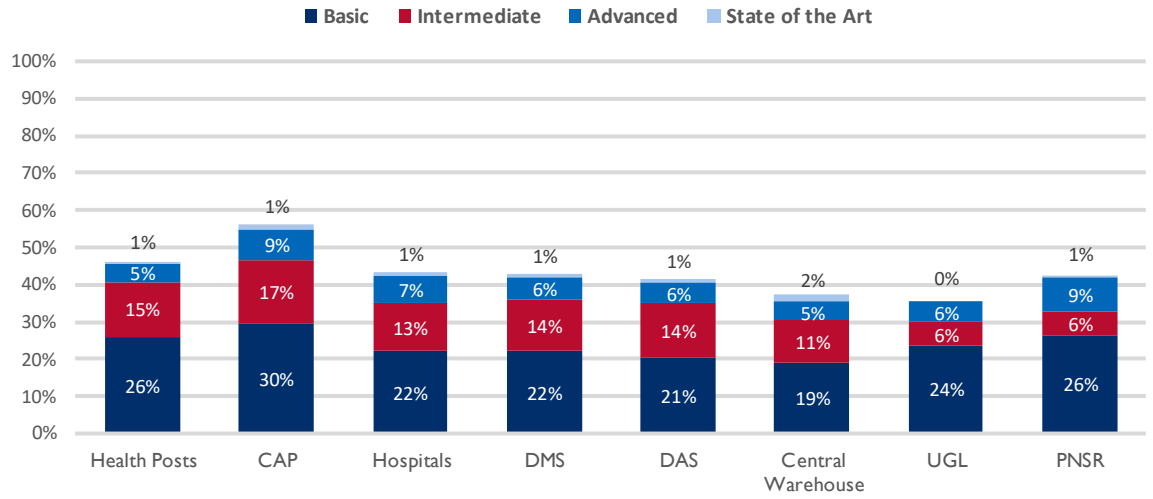
In Guatemala, human resource capabilities did not show much variation among the various central-level institutions or service delivery points. Across all facilities visited, scores ranged only from 36% to 57%, indicating that there is consistency in the HR infrastructure available, even if scores were not very high. Figures 28 and 29 detail HR capability scores, as well as selected indicators. The strongest observed human resource capabilities were at the CAP level.

Figure 28. HR Capability Maturity Model Scores



Note on interpreting results: Remember that CMM scores are a combination of basic (max. 50%), intermediate (30%), advanced (15%), and at-the-forefront (5%) capabilities assessed. Reported percentages are the scored results averaged across all sites evaluated, for each capability level and facility type. For more information, see the Understanding CMM Results section above.

Figure 29. Human resources indicators, maturity score, and existing core capabilities

	Health Posts	CAP	Hospitals	DMS	DAS	Central Warehouse	UGL	PNSR
n =	16	6	3	2	3	1	1	1
Maturity Score (range)	46% (18-65%)	56% (42–77%)	43% (15–60%)	43% (41–45%)	41% (38–47%)	37%	36%	43%
Percentage of basic elements in place (range)	52% (22–72%)	59% (50–78%)	44% (17–61%)	44% (38–50%)	41% (38–46%)	38%	47%	53%
Average number of positions in the supply chain*	3.3	5.0	6.0	8.5	8.5	12.0	22**	6
Staff turnover rate	1%	17%	0%	0%	29%	0%	0%	0%
Percentage of vacancies	8%	17%	25%	0%	0%	0%	**0%**	0%

**Supply chain positions are defined as those that devote 50% or more of their time to supply chain-related activities. At the lower levels of the health system, these are undoubtedly roles combined with service delivery.*

***While the UGL currently has 22 positions in its organizational chart and all are filled, the ministerial decree that established the unit dictated 60 people for the unit, but they cannot obtain that number of personnel.*

Central Level and Central Warehouse. Typically, the strongest capabilities within any technical area are typically found at the central level of the supply chain. However, as a result of the assessment, only one in three of these services can report that the majority of its staff have participated in a skill building session in the last year. For the entity that did so, PNSR, its staff participated in only one such training last year. Encouragingly, staff performance is evaluated annually. However, there is no evidence to suggest that anything is done with the results of these assessments.

Figure 30. Select supply chain HR capabilities at central-level institutions

	Central Warehouse	UGL	PNSR
Existence of a human resources workforce plan that projects the future needs of supply chain personnel	X	X	X
Existence of general personnel selection policies that apply to supply chain personnel	✓	✓	✓
Existence of a unified supply chain skill building plan or staff development plan for current employees	X	X	X
The majority (51-99%) of staff have participated in a skill building session in the past year	X	X	✓

Supply Chain Positions and Functions. The findings of the 2023 NSCA demonstrate that the presence of key supply chain functions within the formal job descriptions of those operating the supply chain remains scarce. Looking at Figure 31, you can see the presence of several key supply chain functions with supply chain job descriptions in the various types of facilities that were visited. None of the most important functions, such as ordering and reporting, inventory management, or LMIS, was found in job descriptions more than 50% of the time, and many occurred much less frequently than that. Official job descriptions also did not contain specific supply chain responsibilities at the central level. This lack of specific responsibilities in job descriptions stems from the way in which the MSPAS transfers functions to each of the assigned post managers. Instead of developing

specific titles, descriptions, and responsibilities for all unique positions, they apply generic titles and labels according to the roles they perform. A fundamental principle of effective supply chain management is that staff, at all levels, are informed of the job responsibilities expected of them. A person cannot be held responsible for work that is not part of their formal job description. In line with UGL's strategic objective, codifying job responsibilities in job descriptions is a critical step in understanding your human resource needs and ensuring effective staffing assignments.

Figure 31. Supply chain functions and job descriptions

Supply chain functions are included in job descriptions for at least one site staff member, including:	*Percentage of establishments reporting:*				
	Health Posts	CAP	Hospitals	DMS	DAS
Forecast and quantification	--	--	--	0%	33%
Orders and reports	25%	33%	0%	50%	33%
Storage and inventory management	25%	50%	33%	50%	33%
LMIS	19%	33%	33%	50%	33%
Waste management	19%	17%	0%	50%	33%
Quality and/or pharmacovigilance	13%	33%	0%	0%	33%

Training in skill building in the supply chain. An effective workforce must have the skills necessary to effectively execute its responsibilities, and workforce leadership must have a strategic understanding of where their workforce's skill gaps are, so that they can actively manage strengthening their workforce against areas of potential risk. Figure 32 details the technical components of the supply chain where several facilities have received skill building opportunities over the past year. It is very encouraging to see that 75% of health posts and 83% of CAPs reported having skill building sessions on orders and reports in the past year. This is one of the most important functions implemented at this level. Inventory management and LMIS trainings were also reported very frequently at that level. The surprising finding in this table is how little skill development has occurred at the hospital level in the last year. The DMS and the DAS also received some training opportunities, but not as often as the facilities they oversee.

Figure 32. Areas covered in skill building sessions in the last year

	Percentage of establishments reporting:				
	Health Posts	CAP	Hospitals	DMS	DAS
Storage and inventory management	63%	67%	0%	0%	33%
LMIS	69%	100%	33%	50%	33%
Orders and reports	75%	83%	0%	0%	67%
Waste management	44%	67%	33%	--	--
Quality control	56%	50%	33%	50%	33%
Treatment guidelines	38%	50%	0%	0%	33%
Quantification and Forecasting	--	--	--	0%	0%
Distribution	--	--	--	50%	67%
None of the above	0%	0%	33%	0%	0%

Looking at Figure 33, we can see the proportions of staff who were able to participate in the offered skill building opportunities. The distribution of staff participation in different types of facilities is quite variable. There is no trend to characterize skill building along the supply chain. However, it is clear

that, in almost every facility visited, more than half of its staff have participated in at least one skill building session of some kind over the past year. Putting this in context, Figure 34 details the critical barriers preventing the skill building session from taking place. The two most overwhelming responses are financial resources and workload. Language was also a topic commonly mentioned. Commitment to staff skill development must start from the highest levels of leadership to ensure that it is also a ubiquitous function at the lowest levels of the supply chain.

Figure 33. Proportion of staff who participated in skill development sessions in the past year

	Percentage of establishments reporting:				
	Health Posts	CAP	Hospitals	DMS	DAS
None	6%	0%	33%	0%	0%
Minimum (1–25%)	31%	17%	0%	0%	0%
Some (26–50%)	31%	33%	0%	50%	33%
Most (51–99%)	19%	50%	33%	0%	67%
All (100%)	13%	0%	33%	50%	0%

Figure 34. Critical barriers to Supply Chain Management skill building programs

	Percentage of establishments reporting:				
	Health Posts	CAP	Hospitals	DMS	DAS
Finance	75%	100%	100%	100%	100%
Workload	69%	83%	100%	100%	100%
Qualified coaches	25%	33%	33%	50%	67%
Language	88%	67%	100%	100%	67%
Materials	19%	17%	33%	0%	33%
Lack of interest	13%	0%	0%	50%	67%
Time	6%	0%	33%	50%	33%

Supervision. Positive reinforcement and technical assistance oversight are critical supporting factors that help ensure the success of the supply chain workforce in fulfilling its mission. Figure 35 indicates the capabilities shown within the Guatemalan supply chain in relation to technical assistance oversight. It is an excellent sign that more than two-thirds of the facilities visited reported receiving supportive supervision over the past year. It also promises that receiving immediate feedback and implementing corrective actions are common occurrences. All of them are excellent signs of a work culture committed to continuous improvement and cooperation among entities. This is present in each of the supervisions and should be leveraged as a tool by the MSPAS in order to ensure the dissemination and reinforcement of key policies and procedures within supply chain operations.

Figure 35. Supportive supervision

	Percentage of establishments reporting:				
	Health Posts	CAP	Hospitals	DMS	DAS

Supply chain staff received supportive supervision in the past year	69%	83%	67%	100%	67%
Staff received immediate feedback after support visits.	69%	33%	67%	100%	67%
Corrective actions are taken following monitoring visits.	69%	83%	67%	100%	67%

Recommendations

While there is encouraging evidence that discrete efforts are being made to develop the skills and capacities of the public health supply chain workforce, there is a lack of strategic efforts on this holistically. To address this and establish a solid foundation for investing in its most critical resource, the MSPAS should consider the following:

- Create a unified skill building plan for all levels of the supply chain and ensure that funds are available to support these efforts at all levels.
- Ensure that job descriptions can reflect the work that is actually being done. Consider the creation of a manual of functions or enforce it, if it exists. This may involve coordinating with other components of the government to provide specific supply chain roles for the workforce.
- Take advantage of the existence of supportive oversight, which is considered fairly common, to ensure dissemination of policies, SOPs, and guidelines to all facilities nationwide, especially because of the decentralized nature of the supply chain.
- Create a process of continuous training in logistics processes in an optimized way to strengthen knowledge.

Supplementary exhibition

Figure 36. Human Resources: Question distribution and weight allocation across capability and facility levels

Facility	Basic (50%)		Intermediate (30%)		Advanced (15%)		State of the art (5%)	
	P. No.	Weight	P. No.	Weight	P. No.	Weight	Weight	P. No.
Health Posts (16)	18	2.8%	14	2.1%	7	2.1%	3	1.7%
CAP (6)	18	2.8%	14	2.1%	7	2.1%	3	1.7%
Hospitals (3)	18	2.8%	14	2.1%	7	2.1%	3	1.7%
DMS (2)	21	2.4%	17	1.8%	8	1.9%	3	1.7%
DAS (3)	21	2.4%	17	1.8%	8	1.9%	3	1.7%
Central Warehouse	23	2.2%	27	1.1%	10	1.5%	6	0.8%
UGL	16	3.1%	24	1.3%	9	1.7%	6	0.8%
PNSR	16	3.1%	24	1.3%	9	1.7%	6	0.8%

Note that interpretations of the score and discussions about "differences" in scores should recognize that the number of capabilities assessed differs by facility type and module. Therefore, positive answers to individual questions (i.e., reports of current capabilities) have different weights, depending on the technical area and type of facility.

Note also that the number and weighting of questions for these modules vary because some conditionally graded questions are included. The figures presented here assume that all conditions are met and that all questions are included.

Financial Sustainability

Effective supply chains require sufficient and predictable financing flows, supported by sound financial management practices. The NSCA assesses financial sustainability at all levels of the health system to ensure that supply chain operations are adequately funded, that facilities practice good financial management techniques, and that financial gaps are identified. The CMM module places greater emphasis and score value on using prudent financial management and understanding operating costs rather than the entity's self-sufficiency to fund itself. While it is difficult to get a high score without having some degree of self-sufficiency, the intent of the module is to understand how facilities manage the funds they receive.

Figure 37. Examples of financial sustainability capabilities scored

Basic	Supply chain costs (e.g., products, warehousing, distribution, personnel, overhead, service delivery) are recorded and records are kept Government or facility revenues/costs contribute minimally to the total supply chain operations/health commodities budget (less than 25%) Budgets are prepared annually The MOH financial unit regularly prepares and submits financial reports/profit and loss statements The MOH financial unit periodically measures liabilities/cash cycle or cash flow/depreciation / conducts capital asset audits/inventory annually There is a process for submitting unbudgeted requests
Intermediate	Facility financing strategy explicitly includes supply chain costs Government or facility revenues are a source of funding for supply chain operations Government or facility revenues/costs contribute in part to the total health commodity/supply chain operations budget (25-50%) The MOH routinely tracks donor support Budget includes lines for miscellaneous funds
Advanced	Government or facility revenue/costs contribute the bulk of the supply chain operations/health commodities budget (51–99%) No commodity budget deficit in the last year Funding can be reallocated at management level
State of the art	Government or facility revenues/costs contribute to the entire supply chain operations/health commodities budget (100 percent)

Note: These are illustrative examples of the types of capabilities scored in this module, not an exhaustive list. Each module contains many dozens of questions and capabilities. For a complete list, see the NSCA toolkit, available at www.ghsupplychain.org.

Within the strategic planning documents that were shared with the assessment team, funding strategies were not included as an explicit goal or objective. Through our interviews and research, it was understood that reproductive health products are guaranteed to be funded from government revenue sources. Specifically, 30% of government tax revenues from the purchase of alcoholic beverages is allocated to the purchase of family planning products. However, this does not cover their associated storage and distribution costs, which is evidenced by the more limited budgets available for those functional areas. Within the analysis on financial sustainability, we will use these two datasets to contextualize the observed results.

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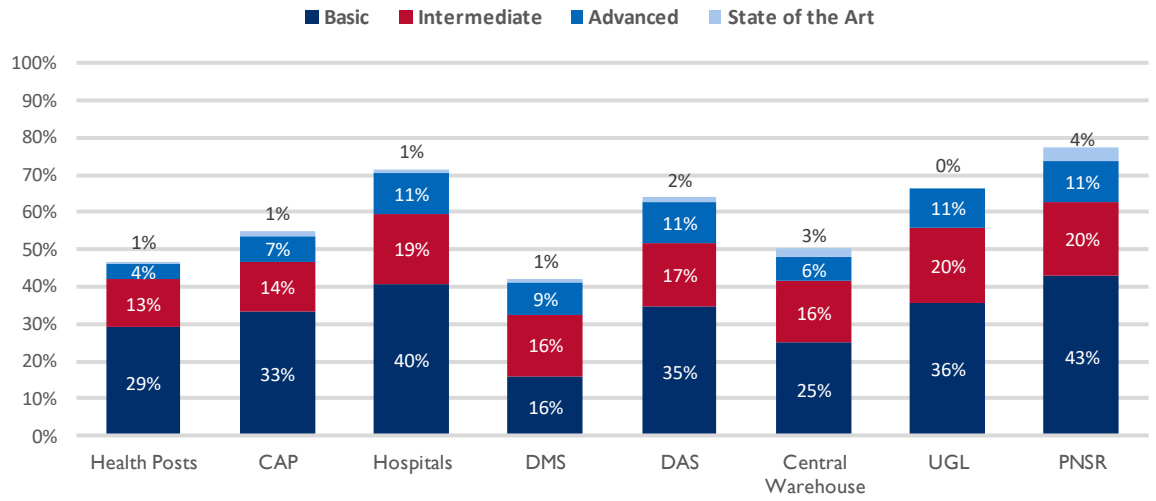
Financial sustainability results for capability maturity model scores and the percentage of facilities reporting key capabilities are shown in Figures 38 and 39. With a capability maturity score of 77%,

the PNSR nearly achieved the NSCA's recommended goal of 80%. Not all central-level entities scored as high as expected. The UGL obtained 66%, while the Central Warehouse obtained 50%.

There was a very high range of scores observed for this module in all types of establishments that were surveyed. Of all the lower-level facility types visited, hospitals scored the highest at 72%. Unsurprisingly, the CAP and Health Posts scored lower, as capabilities tend to decrease as you reach the last mile of the supply chain. However, it is surprising to see that DMS facilities scored even lower than any type of healthcare facility. It has been explained to the assessment team that this can be explained in part because the DAS to which a DMS belongs can take over more financial management tasks to allow them to focus on more operational work.

Before highlighting the key findings, it is important to reiterate that the capability maturity scores in this assessment primarily reflect the presence of financial management tools and best practices with a focus on supply chain activities. Again, it is not a measure of fiscal health or the solvency of the public health supply chain in general. The high percentage of facilities at all levels of the public health system that reported budget deficits for supply chain operations or health commodities suggests rather that financial solvency remains a challenge for Guatemala's public health supply chain system, regardless of the simultaneous presence of key financial management capabilities.

Figure 38. Financial Sustainability Capability Maturity Model Scores



Note on interpreting results: Remember that CMM scores are a combination of basic (max. 50%), intermediate (30%), advanced (15%), and at-the-forefront (5%) capabilities assessed. Reported percentages are the scored results averaged across all sites evaluated, for each capability level and facility type. For more information, see the Understanding CMM Results section above.

Figure 39. Central-Level Financial Sustainability Maturity Score and Percentage of Facilities with Key Financial Capabilities Implemented

	Central Warehouse	UGL	PNSR
n =	1	1	1
Capability Maturity Model score	50%	66%	77%

Percentage of basic components in place	50%	71%	86%
Budgets are prepared or updated annually	✓	✓	✓
Budgets include miscellaneous funds for unexpected issues	X	X	✓
Supply chain costs are explicitly recorded, and records are kept	✓	X	✓
There is a financing strategy that explicitly includes supply chain costs	✓	✓	X
Source of funds for supply chain operations	Government	Government	Government
The proportion of total NEEDs identified was supported by government funds	"All": 100%	"Most": (75-99%)	"All": 100%
Source of funds for health products	Government	Government	Government
Last year, was there a shortfall in the health commodities budget?	No	No	No

Figure 40. Non-central level financial sustainability maturity score and percentage of existing core capabilities

	Health Posts	CAP	Hospitals	DMS	DAS
n =	16	6	3	2	3
Maturity score (range)	47% (16–66%)	55% (20–73%)	72% (61–84%)	42% (41–44%)	64% (56–74%)
Percentage of basic elements in place (range)	58% (14–86%)	67% (29–86%)	81% (71–100%)	32% (29–36%)	69% (57–86%)

Presence of financial management best practices. Figure 39 details the capabilities of the MSPAS understood by the NSCA as key to financial sustainability, including the most basic elements. Budgets are prepared and updated annually, supply chain costs are explicitly recorded, and the government contributes to supply chain costs and health products. The table also points to places where the Guatemalan Government could adopt best practices for supply chain financial management, including budgeting miscellaneous funds for unexpected issues and explicitly incorporating supply chain costs into the broader financing strategy. In the three central-level entities evaluated, all financial capabilities are present, but there is no evidence of specific programming to strengthen the supply chain in services.

Figures 40 and 41 show financial capability maturity scores and select financial capabilities for the lowest levels in the supply chain. The evaluation found that there are significant financial management capabilities at the bottom of the supply chain, except in health posts. For example, budgets are prepared annually, and funds are allocated for miscellaneous expenses. The biggest gap among many institutions in the healthcare system is the systematic recording of supply chain-related costs. Being able to improve the supply chain and finance any reform requires first having a solid understanding of what the costs to operate the supply chain are.

Figure 41. Percentage of facilities with key financial sustainability capabilities implemented

	Health Posts	CAP	Hospitals	DMS	DAS

n =	16	6	3	2	3
Percentage of sites reporting that budgets are prepared or updated annually	63%	83%	100%	100%	100%
Percentage of sites reporting that budgets include miscellaneous funds for unexpected issues	31%	50%	100%	100%	100%
Percentage of sites reporting that supply chain costs are recorded, and records are kept	19%	33%	67%	0%	67%

Sources of funding and funding gap. Figures 42 and 43 show information on the origin of facility funds for supply chain operations and the proportion of financial need for supply chain operation covered by the government, respectively. High proportions of establishments at all levels reported that government funding contributed significantly to their funding sources in these two areas (the question allowed for the selection of multiple sources). The NSCA credits supply chains where the government contributes substantially to the operational and health product costs of the supply chain. While Figure 42 would suggest that the government is responsible for providing most of the funds used by the healthcare system for supply chain costs, Figure 43 demonstrates that the actual financial need is usually much greater than what the government provides. This is an important point to note when analyzing the state of the distribution system and LMIS later in this report. The MSPAS will need to promote further advocacy, based on recorded financial data, to get a bigger share of government funding to support supply chain operations.

Figure 42. Central-level low-level sources of financing for supply chain operations

	Health Posts	CAP	Hospitals	DMS	DAS
n =	16	6	3	2	3
Government budget (central or decentralized level)	94%	100%	100%	100%	100%
Donor/Implementing Partners	31%	17%	33%	0%	0%
Percentage of sites that reported that the government contributed most or all of the supply chain budget last year	31%	50%	100%	100%	100%

Figure 43. The proportion of total financial NEEDs identified for supply chain operations that were supported by funds allocated by the government budget

	Health Post	CAP	Hospitals	DMS	DAS	Central Warehouse	UGL	PNSR
Minimum (less than 25%)	13%	17%	0%	0%	0%	0%	0%	0%
Some (25-50%)	31%	17%	33%	0%	0%	100%	0%	0%
Most (51-99%)	19%	17%	33%	50%	67%	0%	100%	0%
All (100%)	13%	33%	33%	50%	33%	0%	0%	100%

I do not know	19%	17%	0%	0%	0%	0%	0%	0%

Recommendations

This assessment has documented sound financial management practices at many important institutions within the supply chain. However, there are still essential elements that need to be established. To achieve greater financial sustainability, the MSPAS should consider the following:

- Implement a process to ensure that all supply chain-related costs (estimated and actual) are recorded at all levels of the supply chain and that decision makers can access the information.
- Use recorded supply chain operations cost data to correct budget allocations to different facilities to ensure they have the necessary resources.
- Share financial best practices among central-level entities to ensure that all institutions operate to the same standard.

Supplementary exhibition

Figure 44. Financial sustainability: Question distribution and weight allocation across capability and facility levels

Facility	Basic (50%)		Intermediate (30%)		Advanced (15%)		State of the art (5%)	
	P. No.	Weight	P. No.	Weight	P. No.	Weight	P. No.	Weight
Health Posts (16)	7	7.1%	11	2.7%	6	2.5%	4	1.3%
CAP (6)	7	7.1%	11	2.7%	7	2.1%	4	1.3%
Hospitals (3)	7	7.1%	11	2.7%	6	2.5%	4	1.3%
DMS (2)	14	3.6%	11	2.7%	7	2.1%	4	1.3%
DAS (3)	14	3.6%	11	2.7%	7	2.1%	4	1.3%
Central Warehouse	7	7.1%	12	2.5%	7	2.1%	4	1.3%
UGL	7	7.1%	12	2.5%	7	2.1%	4	1.3%

Note that interpretations of the score and discussions about "differences" in scores should recognize that the number of capabilities assessed differs by facility type and module. Therefore, positive answers to individual questions (i.e., reports of current capabilities) have different weights, depending on the technical area and type of facility.
Note also that the number and weighting of questions for these modules vary because some conditionally graded questions are included. The figures presented here assume that all conditions are met and that all questions are included.

Forecasting and Supply Planning

The Forecasting and Supply Planning section examines whether estimates are created using quality data and sound methodologies, are frequently monitored, and are used to inform procurement decisions. Focus areas that were considered in the score of this CMM module include estimates involving multiple stakeholders over multiple year periods, well-established SOPs involving data from multiple sources, active monitoring of the supply plan, and the sharing of supply plans among partners (see Figure 45).

Figure 45. Examples of supply scheduling and estimating capabilities scored

Basic	A dedicated unit within the MSPAS responsible for estimating and scheduling the supply of basic health products The estimates are used to mobilize funds from government sources and donors
Intermediate	Data assumptions documented as part of the supply plan Assessment of the quality of consumption data before its use in Forecast
Advanced	Performance standards or benchmarks against which the accuracy of the estimate is evaluated SOPs for Forecast updated annually or more frequently
State of the art	Use of specialized estimating software using machine learning or advanced algorithms to determine future need Monitoring and continuous or daily updating of the supply plan

Note: These are illustrative examples of the types of capabilities scored in this module, not an exhaustive list. Each module contains many dozens of questions and capabilities. For a complete list, see the NSCA toolkit, available at www.ghsupplychain.org.

In the Guatemalan reproductive health supply chain, the National Reproductive Health Program (PNSR) is responsible for all aspects of quantifying, estimating, and scheduling supply and ultimately procuring the contraceptive commodities it needs to meet its population health goals. With that in mind, the NSCA did not formally evaluate forecasting practices in the Logistics Management Unit (UGL) as it is not part of that process for reproductive health, which is the primary focus of this evaluation.

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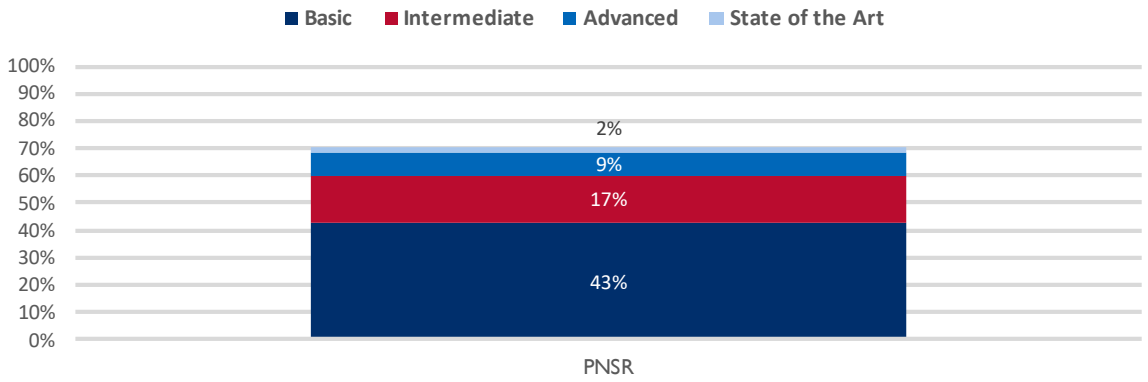
For this assessment (NSCA), the entity of main interest was the PNSR, since it is ultimately responsible for the quality of Forecast developed and the accuracy of the supply scheduling it manages for the health system. Additionally, this section will review distribution quantities as a component of supply scheduling because the Central Warehouse does not estimate or schedule supply of any kind for national disease control programs. Rather, it simply provides logistics reports and receives accurate distribution orders for the DAS and Hospitals.

Within the PNSR, the assessment found strong capabilities for Forecasting and Supply Planning. This is evidenced by the 70 percent score received for this module, which is close to the 80 percent benchmark used for the NSCA. It is clear that the PNSR has many of the capabilities it needs to make estimates.

Figure 46. Forecast capability maturity scores



Note on interpreting results: Remember that CMM scores are a combination of basic (max. 50 percent), intermediate (30 percent), advanced (15 percent), and at-the-forefront (5 percent) capabilities assessed. Reported percentages are the scored results averaged across all sites assessed, for each capability level and facility type. For more information, see the Understanding CMM Results section above.

Figure 47. Forecasting and Supply Planning maturity score and core capabilities implemented

	PNSR
n =	1
Maturity score	70%
Percentage of basic elements in place	86%

Figure 48. Forecast methodology used, identified by respondent, by type of facility

Methodology	PNSR
Morbidity-based	X
Consumption-based	✓
Demographic forecasts	X
Statistics-based service	X
I do not know	X

For reproductive health commodities, the Forecast process is handled exclusively by the PNSR logistics team. The Forecast process is done entirely at the central level with little or no involvement by staff from lower levels of the system. The only entity contributing to the process is the UNFPA. Estimates are generally made for a two-year period and are made at a specific time of the year, while supply plans are made annually, in accordance with UNFPA procurement rules.

Figure 49. Government contribution to recurring Forecasting and Supply Planning costs			
	DMS	DAS	PNSR
Minimum (1–25%)	0%	0%	X
Some (26–50%)	0%	0%	X
Most (51–99%)	50%	0%	X
All (100%)	0%	100%	✓
I do not know	50%	0%	X

Looking more closely at the inputs in the process, there are standard SOPs that guide the Forecast process and that are updated annually. The PNSR indicated that consumption data are the main source of information for its estimates and that consumption is adjusted for loss of demand. However, the assessment team found evidence that logistics forms are not filled out regularly. The inventory control card (KARDEX) at the service delivery level does not have any space to indicate the number of days out of stock. However, the impossibility of complying with a client's request is recorded in the "Daily Record of Actual Demand," and according to guidelines, it must be included in the logistics report sent to the DAS. (The team also found that KARDEX cards were not completed during the months when stock-outs occurred, which will be discussed in more detail in the LMIS module.) It is unclear what level of technical assistance oversight is provided to ensure that these forms are completed correctly. Additionally, there are other sociological demand factors that affect this situation. Users are unwilling to go to the facility to register their contraceptive request if they know the facility is out of stock. The combined effect of all these factors is visible within the accuracy metrics for this technical area. One of the biggest obvious gaps in the process currently implemented is the lack of accuracy in the forecasting or accuracy of the supply plan. During the interview process, the PNSR indicated that these metrics are calculated and tracked, but requests to see those figures have not been fulfilled as of the writing of this report. These metrics are not calculated, and it is unclear how the PNSR team incorporates its experiences (in terms of technical process adjustments) from previous Forecast processes and into the next forecasting process. This is a gap that prevents the PNSR from receiving a higher score (and ultimately reaching the 80% benchmark).

With this observation in mind, Figure 50 details the accuracy of the estimate and the supply schedule, as estimated by the assessment team using source data. Although a PNSR estimate was requested, the document was not received, so two other metrics are shown instead. The first is supply plan accuracy, which measures the difference between the ordered quantity of a specific product by 2022 compared to the "unmet demand-adjusted" annual consumption figure, known as Actual Demand. Values below 100% mean that the quantity in the supply plan was insufficient to meet the country's need. Values above 100% mean that more products were ordered than was needed for the country. The second metric is domestic order fulfillment. It compares the quantity of a product distributed with the annual consumption "adjusted for unmet demand", known as Actual Demand. (Note that the first product in the table did not have a quantity indicated in the 2022 supply plan.) Values of this indicator above 100% mean that more was distributed than what the country needed, while values below 100% indicate that less was distributed than what the country needed.

Using these two indicators as a benchmark, you can see that supply plans are overestimating some products while underestimating others. Looking at the fulfillment of domestic orders, we can see that no product was distributed in the necessary quantity. Intuitively, this makes sense considering

the months-long stock-outs that were observed and mentioned in the storage module. Given these observed performance trends, it is vitally important that the PNSR establish a process to regularly estimate and monitor Forecast and supply scheduling accuracy. Bringing other lower-level entities into the process to react to the metrics and contribute to the process would also strengthen the overall outcome.

Figure 50. Forecast accuracy and supply plan accuracy for all tracer products

Product	Forecast accuracy	Accuracy of the supply plan	National Order Fulfillment Accuracy**
Norethisterone Enanthate + Estradiol Valerate	--*	0%	92%
Norethisterone enanthate	--*	97%	69%
Medroxyprogesterone Acetate, 150 mg vial	--*	91%	1%
Levonorgestrel + ethinyl estradiol (combination tablets)	--*	161%	28%
Intrauterine Device -IUD- (Copper T)	--*	17%	81%
Two-rod implant (JADELLE)	--*	230%	84%
Latex condom, male	--*	0%	85%

**An estimate for all tracer products was requested from the PNSR but not provided, so the accuracy of the estimate cannot be calculated.*

*** During the assessment, the team came to understand that the Central Warehouse is not in charge of organizing order fulfillment. Rather, the PNSR sends distribution orders to the Central Warehouse and then the facility comes to pick up the products. Understanding this demand fulfillment is critical to understanding supply scheduling performance for the PNSR.*

Recommendations

The NSCA has documented a gap between observed capabilities, which are quite strong, and performance, which has room for improvement. To help strengthen the quality and effectiveness of the Forecasting and Supply Planning process, the MSPAS should consider the following:

- The PNSR and the UGL should work closely together to determine how to improve compliance with the process for determining unmet demand for contraceptive products. Poor performance in the current process is producing inaccurate figures to use in supply chain scheduling and is contributing to the observed stock-out issues.
- The PNSR should include more stakeholders in the Forecast process. Global best practices strongly recommend that Forecast be a broadly inclusive and participatory process. The more people from different perspectives can validate or question your assumptions and make the process more accurate, the better the quality of the final product.
- The PNSR needs to develop official metrics for the accuracy of Forecast and supply scheduling and publish those figures annually.

Supplementary exhibition

Figure 51. Forecasting and Supply Planning, question distribution and weight allocation across capability and facility levels

Facility	Basic (50%)		Intermediate (30%)		Advanced (15%)		State of the art (5%)	
	P. No.	Weight	P. No.	Weight	P. No.	Weight	Weight	P. No.
PNSR (1)	21	2.4%	27	1.1%	14	1.1%	3	1.7%

Note that interpretations of the score and discussions about "differences" in scores should recognize that the number of capabilities assessed differs by facility type and module. Therefore, positive answers to individual questions (i.e., reports of current capabilities) have different weights, depending on the technical area and type of facility.
Note also that the number and weighting of questions for these modules vary because some conditionally scored questions were included. The figures presented here assume that all conditions are met and that all questions are included.

Procurement and Customs Clearance

The procurement and customs clearance section seeks to ensure that procurement be conducted in a transparent manner and in accordance with best practices. The main areas taken into account in the score of this CMM module are transparent and auditable procurement systems governed by policies and procedures; active supplier performance management; and well-functioning customs clearance processes. This module was designed taking into account public sector procurement systems.

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In Guatemala's reproductive health supply chain, contraceptive procurement is entirely carried out by UNFPA. The Guatemalan Government has reached a formal agreement to use UNFPA's international procurement process to access stable and competitive prices, ensure supply availability, and also guarantee accountability and transparency throughout the process. Since UNFPA is the supplier of choice for all reproductive health commodities, there is no formal procurement system in the PNSR. In addition, all facilities in the health system receive reproductive health products at no cost because funding is provided by law through the allocation of taxes on alcohol purchases. Therefore, acquisitions are also not made at lower levels. Through discussions with several MSPAS entities, the assessment team determined that the procurement module at NSCA would not be appropriate for use in this context. Therefore, this module has been omitted.

Even with all these considerations in mind, the assessment team felt it was important to report on two elements for the benefit of PNSR: commodity cost analysis and incoterms. Both issues are terms the PNSR must accept with every acquisition executed. Reviewing the available price data from the 2022 procurement with UNFPA, Figure 52 details the prices paid as a percentage of an international reference price. The reference price here is the list price that GHSC-PSM offers to any country wishing to use its purchasing services. As you can see, most products are offered at a very competitive price, but there are some products for which the MSPAS pays a higher premium.

Figure 52. Percentage of international reference price paid by UNFPA for selected products

Product	% of reference price paid

Noresthisterone enanthate, 200mg/ml	112%
Medroxyprogesterone acetate, 150 mg vial	131%
Levonorgestrel + Ethinyl estradiol, 150/30 mcg + Fe 75 mg (one cycle of 28 tablets)	244%
Intrauterine device with copper	293%
Two-rod implant	111%

Recommendations

Because the CMM module has not been implemented for procurement, the assessment team does not have many recommendations for the MSPAS. The only applicable recommendation would be the following:

- In your efforts to improve the distribution of reproductive health products through the supply chain, consider using incoterms to have subnational deliveries of internationally procured products to help alleviate the challenge of distribution at the first level of the health system.

Warehousing and Inventory Management

The Warehousing and Inventory Management section is focused on ensuring that pharmaceutical products are stored using the most appropriate method to confirm their quality for patient use. The main areas that were taken into account in the score of this CMM module are the existence of and compliance with Standard Operating Procedures (SOPs). It is for storage and inventory management, adequate physical infrastructure, and safety equipment for commodity storage, and adequate security and accountability mechanisms in place (see Figure 61). Figures 62 and 63 show the results of warehousing and storage.

Figure 53. Warehousing & Inventory Management examples and storage capabilities

Basic	Incoming shipments are verified for quantity, number of boxes/pallets, and documentation. Inventory cards are used to track and manage inventory. There is a repair and maintenance plan for all equipment and utilities.
Intermediate	Facilities receive the distribution schedule in advance from the warehouse or issuing supplier The different batches of quarantined products are segregated in the quarantine area.
Advanced	Temperature is monitored electronically and linked to audible alarms when temperature is out of range Storage and warehousing data and information are backed up offsite
State of the art	Proof of delivery is maintained through an automated system (such as scanned barcodes) An advanced warehouse management system is used to track and manage inventory

Note: These are illustrative examples of the types of capabilities scored in this module, not an exhaustive list. Each module contains many dozens of questions and capabilities. For a complete list, see the NSCA toolkit, available at www.ghsupplychain.org.

In the strategic plans of both the UGL and the PNSR, the importance of effective and efficient storage and inventory management is emphasized. Recognizing warehousing as a fundamental component of

any supply chain, UGL's strategic plan places "inventory control, warehousing, and distribution" as a strategic objective within the framework of its strategic plan.

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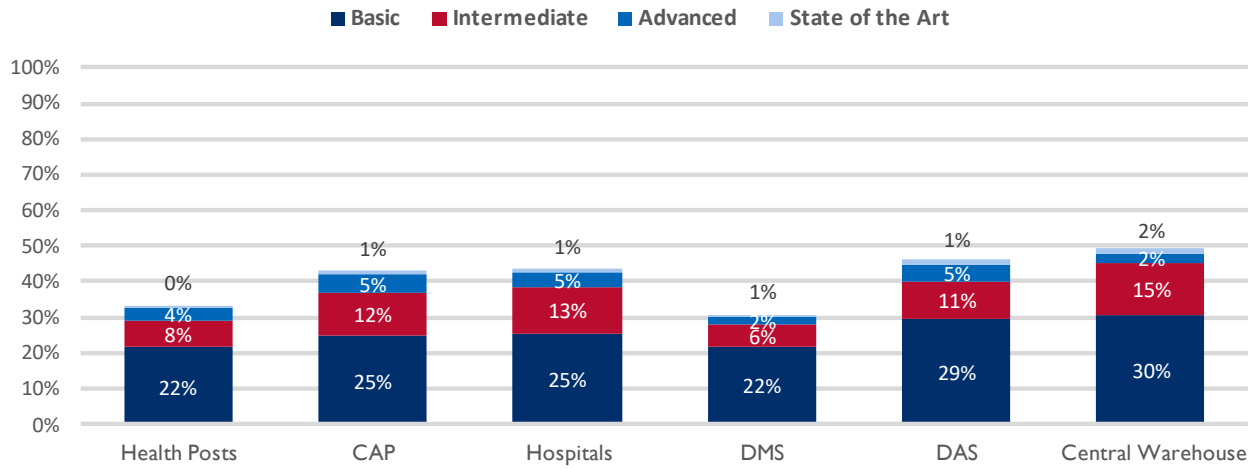
For this module, only service delivery points and warehouses are assessed, as these are the primary locations where these functions are executed. Figure 54 details the storage capability maturity score, as well as the percentage of commodities that are in place, by supply chain level. As usually expected, the highest maturity scores exist at the central level and gradually decline as you go all the way to the last mile (delivery of inputs from services to the end consumer). Although Central Warehouse scored the highest, it only achieved 50% in the module with 61% of the basic elements in place. This indicates that several key components are missing from Central Warehouse. The DAS got 46% with 59% basic items on site, about the same number of basic items as Central Warehouse. Both DAS and DMS have low variations in their score, indicating that many of the warehouses contain the same level of infrastructure and capacity. At the level of service delivery, health posts scored the lowest, with CAP and Hospitals effectively obtaining the same score with 43 and 44%, respectively.

Figure 54. Warehousing & Storage Maturity Score and Core Capabilities Implemented

	Health Posts	CAP	Hospitals	DMS	DAS	Central Warehouse
n =	16	6	3	2	3	1
Maturity score (range)	33% (13–41%)	43% (29–54%)	44% (34–49%)	31% (28–33%)	46% (43–51%)	50%
Percentage of basic items in place (range)	43% (20–60%)	50% (26–64%)	51% (38–58%)	44% (43–44%)	59% (50–65%)	61%

Figure 55. Warehousing & Storage capability maturity scores



Note on interpreting results: Remember that CMM scores are a combination of basic (max. 50%), intermediate (30%), advanced (15%), and at-the-forefront (5%) capabilities assessed. Reported percentages are the scored results averaged across all sites assessed, for each capability level and facility type. For more information, see the Understanding CMM Results section above.

Storage practices and inventory management. UGL has developed and disseminated national SOPs with minimum acceptable standards for inventory management practices and storage conditions. These SOP manuals had a high availability rate in most facilities visited. Health Post and DMS were the only exception that reported the presence of Standard Operating Procedures (SOPs) only by 56% and 50%, respectively. All facility types had 85% or more Standard Operating Procedures (SOPs) available on the day of the visit.

Inventory control levels have been standardized and implemented throughout the supply chain. If you look at Figure 56, you can see that the use of maximum and minimum inventory levels, expressed in months of stock, is the predominant method of reporting the orders. Although there is a small minority of facilities that report having ordered any amount they have previously ordered.

Figure 56. Methodology used to order as reported by facilities

	Health Posts	CAP	Hospitals	DMS	DAS	Central Warehouse
Using the minimum-maximum inventory control guide	75%	83%	100%	100%	67%	X
Order the same amount as the previous consumption	19%	17%	0%	0%	33%	X
Not done	0%	0%	0%	0%	0%	✓

Additionally, good inventory management practices were observed throughout the system. For example, at least 75% of all facilities surveyed verified the quantity, remaining shelf life, and proper documentation of incoming shipments. Another excellent observation was that 100 percent of server delivery points report keeping paper copies of proof of delivery, and most retain records for 12 months or more.

However, the consistency of actions does not persist in the actions taken by facilities when there is a discrepancy in the products received. This may be partly due to the way commodities arrive at facilities, as facilities are responsible for performing self-picking of products from the next level in the supply chain. The two most common responses were notifying the warehouse or rejecting products but filling out a discrepancy form or placing a new order were also popular options. This wide variety of responses indicates that it is not entirely clear what the standard for facilities along the supply chain is.

Use of KARDEX stock cards and inventory tracking. Figures 57a and 57b show the percentage of establishments, by tracer product, which were found to have perfectly accurate stock cards on the day of the visit, meaning that the last recorded balance matched the stock on hand. Products that have experienced prolonged stock-outs tended to perform better than those products that have a more consistent supply and consumption. Performance is strongest at the Central Warehouse and DAS levels with weakest performance in Health Posts and CAP.

Looking at Figure 58, you can see the availability of monthly data, by tracer product by facility type. As discussed later in this section, several products had prolonged stock-outs. Those products had the lowest data availability, indicating that the MSPAS cannot have a real understanding of unmet demand because this data is not being recorded. In addition, it should be noted that it was very common to see stock cards that had not been updated for an extended period of time. The assessment completed a secondary analysis using the data to determine that the average gap between the day of the visit and the last day the balance on the Kardex card was updated ***was 104 days***, demonstrating that the staff do not update Kardex cards when products are not present.

Figure 57a. Percentage of establishments with 100 percent accurate inventory cards, by tracer product

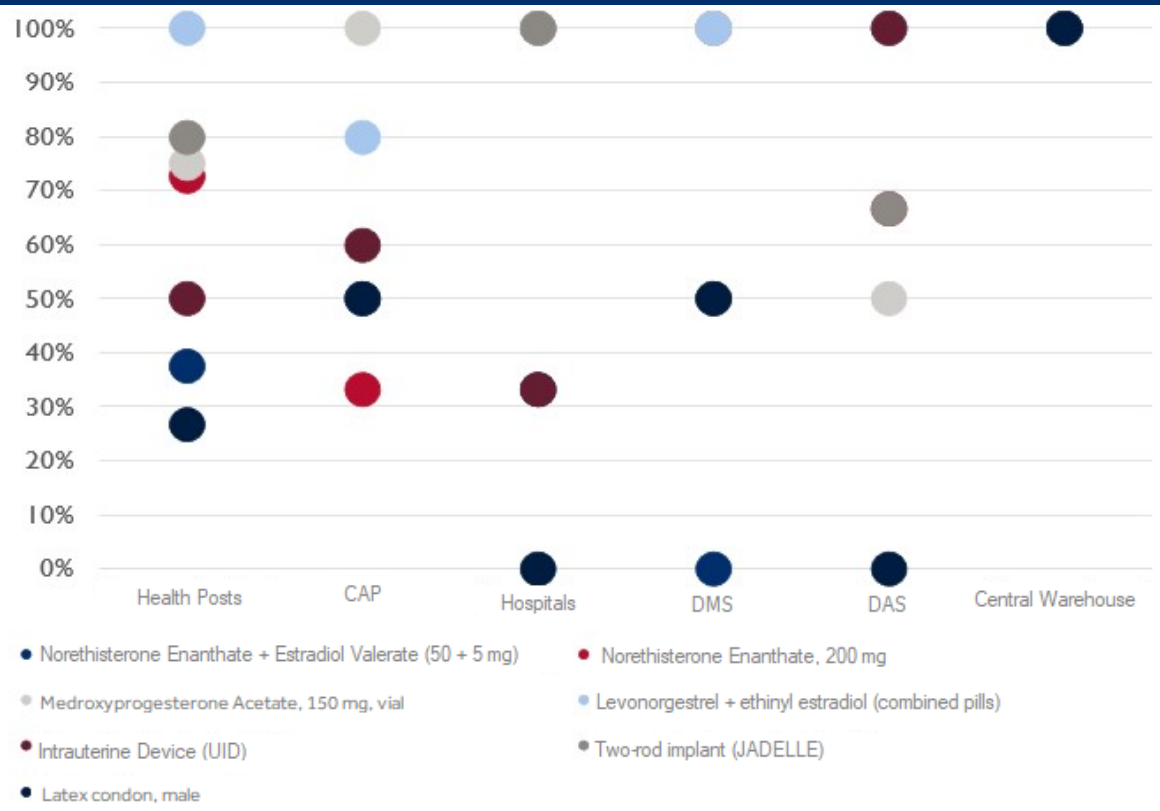


Figure 57b. Percentage of establishments with 100 percent accurate inventory cards, by tracer product

	Health Posts	CAP	Hospitals	DMS	DAS	Central Warehouse
n =	16	6	3	2	3	1
Noresthisterone Enanthate + Estradiol Valerate (50 + 5 mg)	38%	50%	33%	0%	100%	100%
Noresthisterone Enanthate, 200 mg	73%	33%	100%	100%	67%	100%
Medroxyprogesterone Acetate, 150 mg, vial	75%	100%	100%	100%	50%	100%

Levonorgestrel + Ethinyl estradiol, 150/30 mcg + Fe 75 mg (one 28-tablet cycles)	100%	80%	100%	100%	100%	100%
Intrauterine Device (IUD)	50%	60%	33%	50%	100%	100%
Two-rod implant (JADELLE)	80%	50%	100%	50%	67%	100%
Latex condom, male	27%	50%	0%	50%	0%	100%
Average	62%	60%	67%	64%	69%	100%

Figure 58. Percentage of monthly data available over a six-month period, by tracer product, by type of facility.

	Health Posts	CAP	Hospitals	DMS	DAS	Average
n =	16	6	3	2	3	
Noresthisterone Enanthate + Estradiol Valerate (50 + 5 mg)	76%	53%	67%	92%	61%	**70%**
Noresthisterone Enanthate 200mg	30%	50%	56%	50%	67%	**42%**
Medroxyprogesterone Acetate, 150 mg, vial	15%	0%	33%	50%	11%	**16%**
Levonorgestrel + Ethinyl estradiol, 150/30 mcg + Fe 75 mg (one 28-tablet cycle)	18%	8%	33%	50%	0%	**18%**
Intrauterine Device (IUD)	20%	75%	67%	100%	50%	**44%**
Two-rod implant (JADELLE)	15%	61%	56%	100%	61%	**38%**
Latex condom, male	86%	89%	33%	100%	83%	**82%**
Average	**37%**	**48%**	**49%**	**77%**	**48%**	**52%**

Storage conditions. For infrastructure, many of the building blocks are in place throughout the system. Permanent, leak-free roofs in facilities are found almost everywhere in the country, with the lowest percentage being 83% of CAP. Similar but less common findings were observed for adequate ventilation and non-porous floors, with identical figures for DMS and DAS, but at the service delivery level, this was less common with only 56% of health posts with adequate ventilation and 75% with smooth and non-porous floors. There is electric lighting in 100% of facilities throughout the country, with the exception of health posts; 94 percent of the facilities have electric lighting.

Looking at Figure 59, the presence of specialized storage capabilities was less common. For example, having a designated area for hazardous or controlled substances was not very common, except at the DAS level. Even Central Warehouse did not have this capability. It is also very uncommon in the supply chain to have a designated quarantine area for suspicious products of poor quality. This is consistent with findings from the waste management module which reported a similar absence of infrastructure to support the proper management of expired or quarantined products.

Figure 59. Specialized storage capabilities

	Health Posts	CAP	Hospitals	DMS	DAS	Central Warehouse

Percentage of facilities with a cold chain	50%	67%	67%	0%	100%	✓
Percentage of facilities with designated quarantine area	6%	0%	0%	0%	33%	X
Percentage of facilities that have designated storage for hazardous substances	6%	17%	0%	0%	67%	X
Percentage of facilities with designated storage for controlled substances	6%	33%	33%	0%	100%	X

Stock Availability. The NSCA examined stock levels during the six months prior to the assessment by reviewing historical stock records. The period of interest was from July to December 2022. The findings of the stock data review demonstrated significant and prolonged stock-outs in almost all follow-up products. Stock-outs of up to 100% were found in multiple products and facility types. It is evident that the system has been struggling to function without a sufficient supply of goods flowing through it. Figures 60 and 61 detail the percentage of establishments that were out of stock on the day of the visit, disaggregated by tracer product. However, looking back in the period, the results are not much better. Figure 62 details the percentage of days in the six-month reporting period during which there were shortages. This figure should be read in the context of Figure 58 detailing data availability. However, the assessment team has come to understand that facility personnel simply do not complete a KARDEX card when no product is present. So, while data availability is low, it can reasonably be assumed that stock-out figures would be higher if there were complete data for all months during the reporting period.

Figure 60. Percentage of facilities with a stockout on the day of the assessment

	Health Post	CAP	Hospital	DMS	DAS	Central Warehouse
N=	16	6	3	2	3	1
Noresthisterone Enanthate + Estradiol Valerate (50 + 5 mg)	50%	33%	33%	0%	67%	0%
Noresthisterone Enanthate, 200 mg	82%	67%	67%	50%	67%	0%
Medroxyprogesterone Acetate, 150 mg, vial	77%	50%	100%	50%	33%	0%
Levonorgestrel + Ethinyl estradiol, 150/30 mcg + Fe 75 mg (one 28-tablet cycle)	100%	100%	50%	100%	100%	0%
Intrauterine Device (IUD)	20%	50%	33%	0%	100%	0%
Two-rod implant (JADELLE)	57%	83%	67%	0%	67%	0%
Latex condom, male	13%	17%	0%	0%	0%	0%

Figure 61. Percentage of facilities with a stockout on the day of the assessment

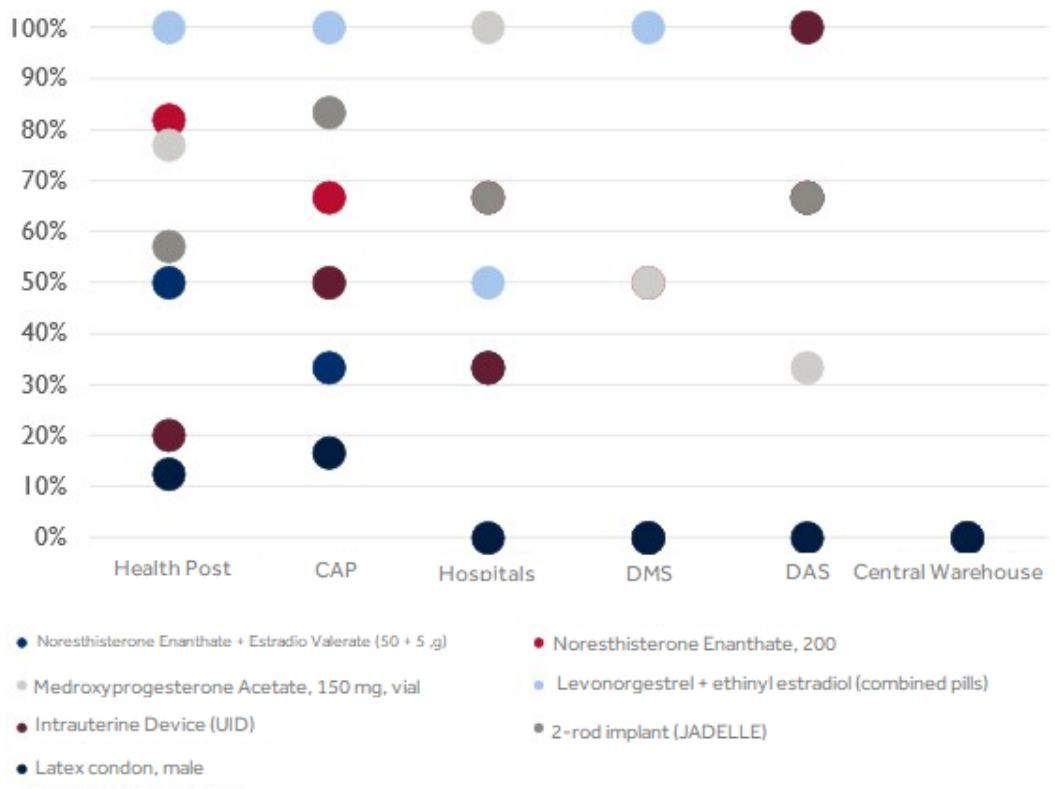


Figure 62. Percentage of days of stockout in the facilities from July to December 2022

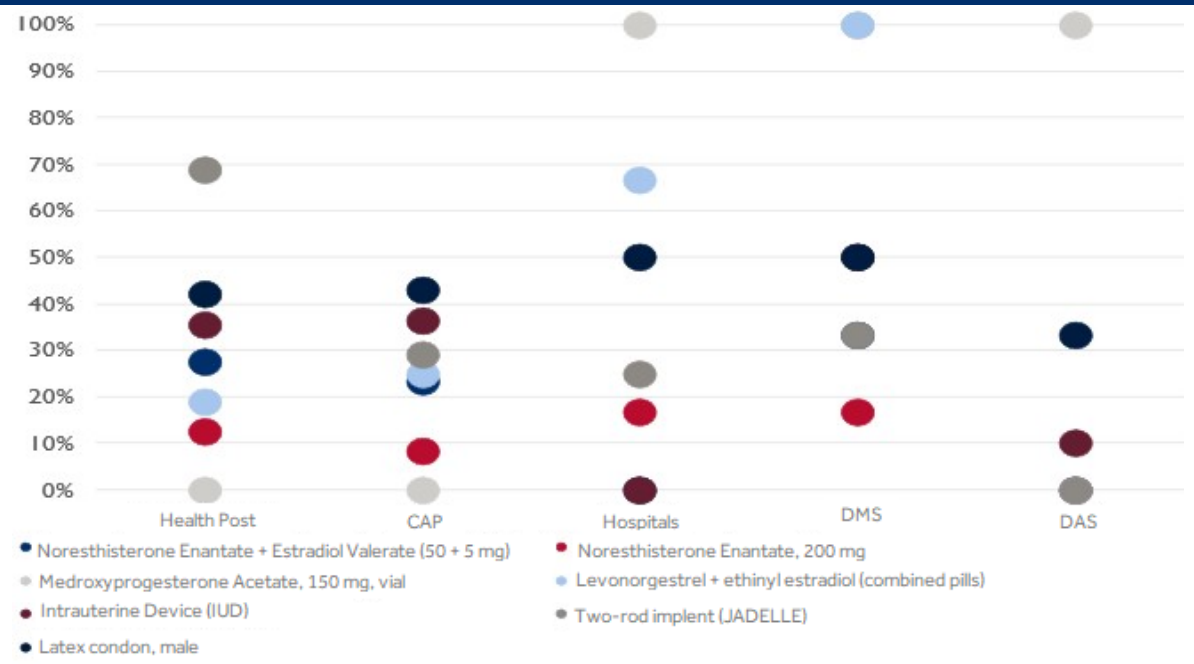
	Health Post	CAP	Hospital	DMS	DAS
N=	11%	18%	12%	10%	3%
Noresthisterone Enanthate + Estradiol Valerate (50 + 5 mg)	43%	22%	36%	67%	18%
Noresthisterone Enanthate, 200 mg	88%	97%	99%	100%	100%
Medroxyprogesterone Acetate, 150 mg, vial	59%	67%	16%	100%	--
Levonorgestrel + Ethinyl estradiol, 150/30 mcg + Fe 75 mg (one 28-tablet cycle)	2%	36%	32%	0%	1%
Intrauterine Device (IUD)	17%	39%	34%	51%	13%
Two-rod implant (JADELLE)	15%	7%	0%	8%	3%
Latex condom, male	11%	18%	12%	10%	3%

Figures 63 and 64 detail an indicator called stocked according to plan. This indicator measures the percentage of months during which recorded available stocks are between the recommended minimum and maximum inventory levels established by the MSPAS. The compliance rate of the plan supplied according to plan was also quite low, demonstrating poor performance, as were the out-of-stock rates at the facility.

Figure 63. Stocked according to plan for all tracer products, by level in the Supply Chain

	Health Post	CAP	Hospital	DMS	DAS
N=	16	6	3	2	3
Noresthisterone Enanthate + Estradiol Valerate (50 + 5 mg)	28%	23%	0%	33%	0%
Noresthisterone Enanthate, 200 mg	13%	8%	17%	17%	0%
Medroxyprogesterone Acetate, 150 mg, vial	0%		100%	100%	100%
Levonorgestrel + Ethinyl estradiol, 150/30 mcg + Fe 75 mg (one 28-tablet cycle)	19%	25%	67%	100%	
Intrauterine Device (IUD)	35%	36%	0%	50%	10%
Two-rod implant (JADELLE)	69%	29%	25%	33%	0%
Latex condom, male	42%	43%	50%	50%	33%

Figure 64. Stocked according to plan for all tracer products, by level in the Supply Chain



Recommendations

The inventory and warehouse management module detailed many encouraging practices that are being implemented throughout the supply chain. However, there are still significant challenges that need to be overcome. To address the challenges described, the MSPAS should consider the following:

- Develop a plan to correct challenges when filling out KARDEX cards, no matter how much inventory is available. Also consider adjusting the logistics form to better capture unmet demand; clearly, it is negatively impacting the system.
- Ensure that part of supportive supervision practices is to train people to update Kardex cards more regularly. The delay in having timely data is also negatively affecting the system.
- Work with all warehouses to develop a plan to create a space to safely quarantine recalled or suspected products and also controlled substances. It is not safe to store all kinds of products together openly.

Supplementary exhibition

Figure 65. Storage: question distribution and weight allocation across capability and facility levels

Facility	Basic (50%)		Intermediate (30%)		Advanced (15%)		State of the art (5%)	
	P. No.	Weight	P. No.	Weight	P. No.	Weight	P. No.	Weight
Health Posts (16)	48	1.0%	29	1.0%	13	1.1%	7	0.7%
CAP (6)	48	1.0%	29	1.0%	13	1.1%	7	0.7%
Hospitals (3)	48	1.0%	29	1.0%	13	1.1%	7	0.7%
DMS (2)	74.7	0.7%	37	0.8%	14	1.1%	5	1.0%
DAS (3)	74.7	0.7%	37	0.8%	14	1.1%	5	1.0%
Central Warehouse	74.7	0.7%	37	0.8%	14	1.1%	5	1.0%

Note that interpretations of the score and discussions about "differences" in scores should recognize that the number of capabilities assessed differs by facility type and module. Therefore, positive answers to individual questions (i.e., reports of current capabilities) have different weights, depending on the technical area and type of facility.
Note also that the number and weighting of questions for these modules vary because some conditionally scored questions were included. The figures presented here assume that all conditions are met and that all questions are included.

Distribution

The safe and efficient distribution of medicines and related products is a critical function of public health supply chains. In this technical area, the NSCA seeks to ensure that distribution plans are structured, implemented, and monitored, so that they achieve timely distribution of products to service delivery points. The main areas that were included in the scoring of this module included the existence of a distribution plan, consideration of appropriate factors to optimize distributions, best practice policies and procedures, active recording and monitoring of costs and transit data, and appropriate mechanisms to ensure the safety and quality of products during transit (see Figure 73).

Figure 66. Examples of scored distribution capabilities

Basic	Existence of an approved distribution plan that defines when products will be delivered to customers Existence of a data management system that captures distribution plans and operations Existence of manual systems for capturing and maintaining transport data Temperature monitoring devices used to track temperature variations during transportation Safety management measures: unannounced inspections/security guards Process for recording loss incidents Manual tracking of goods ownership across the system Manually maintained proof-of-delivery records
Intermediate	Distribution routes are planned/included in communication to health facilities/reviewed annually Existence of policies covering the distribution and transport of goods/aspects of fleet management (list of policy areas/key aspects)

	Documented SOPs to manage transport assets available on-site Existence of electronic systems for capturing and maintaining transport data Collection of distribution cost data/using Excel
Advanced	Products from different programs and partners distributed in an integrated manner where product features allow (most products = an intermediate capacity) Daily or real-time capture of transport data Temperatures recorded in transit Security management measures: video surveillance/two-way radio/barcode scanning
State of the art	Government budget or facility revenues cover 100 percent of recurring distribution costs Safety management measures: radio frequency identification tags

Note: These are illustrative examples of the types of capabilities scored in this module, not an exhaustive list. Each module contains many dozens of questions and capabilities. For a complete list, see the NSCA toolkit, available at www.ghsupplychain.org.

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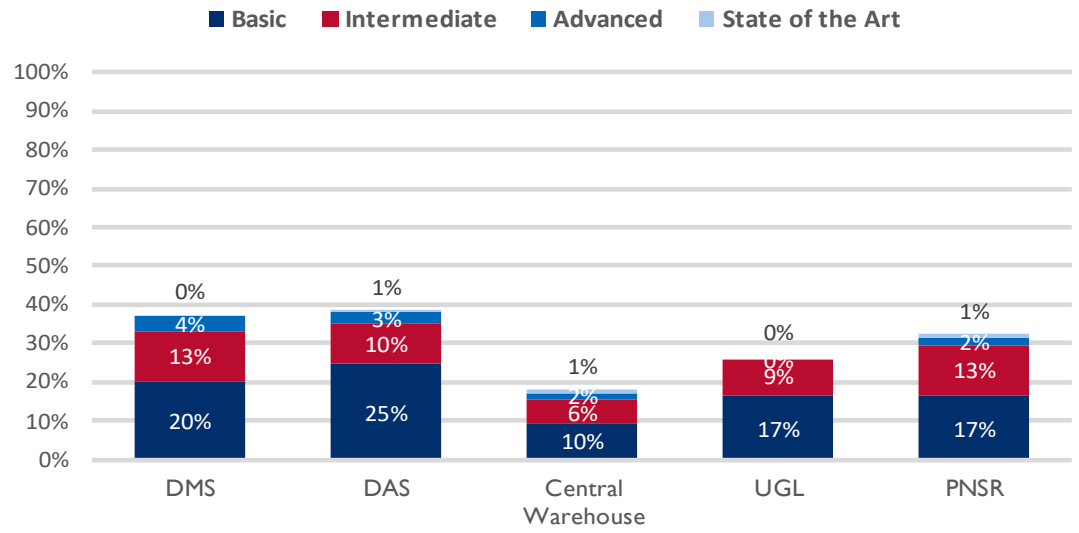
The distribution module in the NSCA asks a variety of questions aimed at understanding the capabilities, infrastructure, and processes that define, guide, and execute distribution processes in the supply chain of medicines and related products. One of the assumptions implicit in the form and perspective of the questions asked in the module is that the country is operating an active distribution system in which facilities receive an incoming truck from a warehouse to receive their shipment of commodities for a defined period of time. This is based on global best practices and empirically proven analyses that active distribution is the most effective and efficient way to ensure the availability of medicines in health facilities. Currently in Guatemala, the distribution system is a passive system in which each facility is required to collect products from the next level. UGL includes in its strategic plan a target for "Inventory Control, Storage, and Distribution," but it is unclear whether specific activities are planned in this area. To the extent that the assessment team knows, PNSR has no activity in its strategic plan regarding distribution.

Figure 67. Distribution capability maturity scores



Note on interpreting results: Remember that CMM scores are a combination of basic (max. 50%), intermediate (30%), advanced (15%), and at-the-forefront (5%) capabilities assessed. Reported percentages are the scored results averaged

across all sites assessed, for each capability level and facility type. For more information, see the Understanding CMM Results section above.

Figure 68. Distribution Maturity Score and Basic items in place

	DMS	DAS	Central Warehouse	UGL	PNSR
n =	2	3	1	1	1
Maturity score (range)	37% (35–39%)	39% (31-47%)	18%	26%	32%
Percentage of basic items in place (rank)	40% (33%–48%)	49% (43-52%)	19%	33%	33%

Figures 67 and 68 demonstrate the scores of the five entities that were assessed in their distribution capacities. At the central level, the UGL, the PNSR, and Central Warehouse were assessed. None of these entities received a capability maturity score higher than 32%. Below the central level, distribution capabilities in DMS and DAS were assessed. Interestingly, both scored higher than all central-level entities, but were still below 40%. As explained in the previous paragraph, the NSCA score places a strong emphasis on an active distribution system. This is one of the reasons why all the entities assessed received such low scores. Many of the basic elements essential for this module were missing from all the facilities visited.

Distribution scheduling. Distribution scheduling does occur, but the extent to which it is effectively coordinated remains unclear. A total of 50% of DMS and 67% of DAS say they have an approved distribution plan and include these plans in communications to health facilities. Central Warehouse does not have an approved distribution plan, nor does it communicate in advance with health facilities. This function is carried out by the PNSR based on the logistics reports sent to them. From the perspective of health facilities, 75% of health posts, 83% of CAPs, and 33% of hospitals say they receive a distribution schedule in advance. But when looking at the biggest challenges facing health facilities, the most common responses are late deliveries and uncertainty about when deliveries will arrive. Therefore, it is unclear what benefit this distribution schedule brings if the responsibility still lies with the health facility, which usually lacks adequate resources to collect the products.

Figure 69. Upstream order performance indicators (July 2022 to December 2022)

	DMS	DAS
Total number of orders (randomly selected over a six-month period)	10	60
Adjusted order percentage	0%	78%
Average deviation from100-percent fulfillment rate	6%	39%
Percentage of orders delivered in full	90%	38%

A total of 100% of DMS and 33% of DAS visited state that distribution routes are pre-planned, but it is unclear how this is implemented or verified, as facilities are not required to follow these routes. In addition, the only thing warehouses take into account when planning is geographical location. The capacity of the trucks or the volumes of products cannot really be considered, as warehouses have no idea what type of vehicle will appear to pick up the products. For example, it is very common to see the transport of medicines and related products in ambulances. The products of different national programs also appear to be distributed independently. All entities at the central level reported that there is no integrated distribution. At the level of DMS and DAS, this is more common, but it seems to be more by chance than by design. In a simplified way, if products from multiple national programs were available and packaged, a facility can collect both at the same time. However, it is much more common for a facility to make multiple trips to the warehouse over the course of the month to obtain products from different programs.

Figure 70. Downstream Delivery Performance Indicators (July 2022 to December 2022)

	Health Posts	CAP	Hospitals	DMS	DAS
n =	16	6	3	2	3
Percentage of orders that are planned*	84%	87%	100%	100%	100%
On-time delivery (as reported by the receiving facility)*	94%	100%	100%	100%	100%

*Planned orders are a difficult item to define in the Guatemalan distribution system. Orders are only planned in the sense that once the top-level warehouse confirms receipt and availability of the products, they allow the facility to place orders.

**On-time delivery is a misnomer in the Guatemalan distribution system. The requisition form that is used to manage the ordering process is usually not completed until the day the warehouse has informed a health facility, so that it can collect its products AND ALSO the establishment has the means of transportation available to collect the products. The time between when an order MUST be placed and when it is actually placed is not recorded.

Order fulfillment. The ordering process in Guatemala is completely manual: a facility will receive a call from their local warehouse informing them that the products are available. The facility, once it has the personnel, vehicle, and fuel available, will organize a trip to the central drug warehouse. (Fuel funding is insufficient and has been reported as a significant impediment.) The request form that the facility uses to order products is usually completed on the same day the products are shipped, as the facility usually does not know when the products will be available. This is evidenced by the indicators in Figure 70. One-time delivery rates are almost 100% across the board because ordered products are shipped the same day the request is received. This also makes scheduling demand at the subnational level quite difficult. Looking at Figure 69, it can be seen that at the DAS level, 78% of orders were adjusted in the last six months, with an average quantity reduction of 39%. Only 38% of orders were delivered in full. All of these metrics are based solely on reproductive health products. It is surprising that this does not also happen at the DMS level, but conversations with respondents indicate that since DMS has fewer facilities in their area of influence, they can often have telephone conversations that precede the completion of the application form, ensuring that facilities only ask for the amounts they know they can receive.

Capture and use of data for distribution. The tracking of orders and shipments is done completely manually. Both the receiver facility manager and the dispatch warehouse manager sign the receipt form. Ensuring the arrival of the dispatched quantities of products is entirely the responsibility of the driver of the health facility's vehicle. Aside from the quantities ordered, the quantities shipped, and the facilities to which the products were shipped, there is little distribution information that is systematically captured in this supply chain. Not a single facility visited for this assessment collects distribution cost data or collects and monitors transportation-related KPIs. This lack of information makes it very difficult for the MSPAS to make any kind of real scheduling or improvement for the distribution system.

Recommendations

The distribution system for reproductive health commodities in Guatemala is in a very basic state of maturity. There are significant structural, financial, and operational challenges that limit its ability to execute the function effectively. There is no doubt that these challenges are directly contributing to the prolonged shortages observed in health facilities in recent months. To improve this situation, the MSPAS should consider the following:

- Implement an active distribution system for the country. If the decentralized system requires the two-tier distribution system, that is fine. However, health facilities are overburdened and lack the necessary resources. They should not be required to also collect commodities.
    - If an active distribution system is implemented, consider using this opportunity as a way for the MSPAS to engage the private sector in third-party logistics contracts. The ministry does not need to have all the in-house capabilities, outsourcing distribution makes logical and financial sense.

- Consider requiring the integrated distribution of all commodities within the public health system. This has the potential to dramatically reduce the total cost of the distribution operation and allows multiple funding streams to contribute, making it easier to achieve financing sustainability. If integrated distribution is not politically possible, consider having international purchases delivered directly to the DAS level to achieve efficiency and reduced costs.

- Implement new rules to require all entities shipping products to record all costs related to transportation and distribution. Understanding the true cost of the national distribution operation is the only way we can implement reforms to reduce those costs.

Supplementary exhibition

Annex 71. Distribution module: Question distribution and weight allocation across capability and facility levels

Facility	Basic (50%)		Intermediate (30%)		Advanced (15%)		State of the art (5%)	
	P. No.	Weight	P. No.	Weight	P. No.	Weight	P. No.	Weight
DMS (2)	21	2.4%	43	0.7%	17	0.9%	7	0.7%
DAS (3)	21	2.4%	43	0.7%	17	0.9%	7	0.7%
Central Warehouse	21	2.4%	43	0.7%	17	0.9%	7	0.7%

UGL	21	2.4%	43	0.7%	17	0.9%	7	0.7%
PNSR	21	2.4%	43	0.7%	17	0.9%	7	0.7%

Note that interpretations of the score and discussions about "differences" in scores should recognize that the number of capabilities assessed differs by facility type and module. Therefore, positive answers to individual questions (i.e., reports of current capabilities) have different weights, depending on the technical area and type of facility.
Note also that the number and weighting of questions for these modules vary because some conditionally scored questions were included. The figures presented here assume that all conditions are met and that all questions are included.

Logistics Management Information System (LMIS)

Accurate and timely data is critical to effective decision-making throughout the public health system. Logistics management information systems are the system of records and reports, paper or electronic, used to aggregate, analyze, validate, and display data in order to inform logistics decisions and manage the supply chain. The main areas that were considered in the assessment of LMIS capabilities and performance in the NSCA included evidence that standardized LMIS tools and practices are used consistently across the system, standardized reporting practices, regular reporting intervals, monitoring of performance in the quality of reports and, ultimately, performance in the accuracy, completeness, and timeliness of the data (see Figure 72).

Figure 72. Examples of Logistics Management Information System capabilities scored

Basic	LMIS tools on paper Frequency of sending quarterly reports Internal data quality assessments
Intermediate	Standardized tools across the supply chain: geographic regions, health programs, and system levels LMIS electronic tools Frequency of sending monthly reports Standard process for reviewing LMIS data Reliable internet
Advanced	Frequency of sending weekly reports Virus protection for computers using electronic LMIS
State of the art	Frequency of sending LMIS reports is daily/real-time

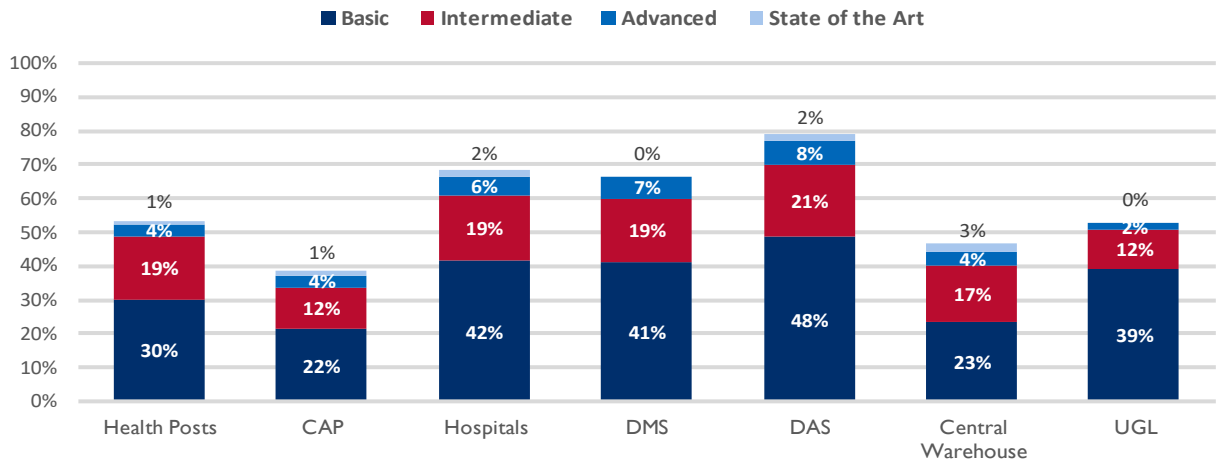
Note: These are illustrative examples of the types of capabilities scored in this module, not an exhaustive list. Each module contains many dozens of questions and capabilities. For a complete list, see the NSCA toolkit, available at www.ghsupplychain.org.

UGL's strategic plan identifies the LMIS as a key objective within its overall strategy. To the best of the assessment team's knowledge, the PNSR has not set a specific objective around the LMIS in its strategic planning.

2023 NSCA Results and Analysis

The LMIS capability and performance results from the NSCA 2023 are presented in Figures 73 to 75. Overall, capability scores were higher in the warehouses of the executing units visited than at the central level. The NSCA revealed a baseline of important core capabilities in the system, such as using LMIS data to inform order management, reporting, and inventory. However, compliance with standard processes and LMIS accuracy remain low. The analysis is included within the subsections of each level of the supply chain.

Annex 73. LMIS maturity scores in all types of facilities surveyed



***Note on interpreting results: Remember that CMM scores are a combination of basic (max. 50 percent), intermediate (30 percent), advanced (15 percent), and at-the-forefront (5 percent) capabilities assessed. Reported percentages are the scored results averaged across all sites evaluated, for each capability level and facility type. For more information, see the Understanding CMM Results section above.*

Figure 74. LMIS Maturity Score and Existing Basic Capacities for lower-level entities

	Health Posts	CAP	Hospitals	DMS	DAS
n =	71	72	17	4	7
Maturity score (range)	53% (0%–74%)	39% (0–65%)	69% (67–80%)	67% (54–79%)	79% (63–93%)
Percentage of basic items in place (range)	60% (0–92%)	43% (0–75%)	83% (67–100%)	82% (65–100%)	97% (73–100%)

Figure 75. LMIS Maturity Score and Existing Core Capabilities for central-level entities

	Central Warehouse	UGL
n =	1	1
Maturity score (range)	46%	53%
Percentage of basic items in place (range)	47%	78%

UGL and Central Warehouse. Figures 73 and 75 show the capability maturity scores for LMIS at the central level. UGL received a score of 53%, while Central Warehouse received a score of 46%. At the central level, the UGL is the main entity responsible for the administration and management of the LMIS. Central Warehouse does not really participate in the reception and validation of consumption reports from other facilities; this is handled by UGL. However, since the system is decentralized, the UGL does not have visibility into logistics reports received at the DAS level; instead, they receive a consolidated logistics report from the DAS and from 49 hospitals they oversee directly for the supply chain. This creates significant challenges to understanding the quality

of the data being received, as the UGL reports that it does not receive data quality assessment reports with logistics data. The assessment team also noted that logistics forms are not completed regularly. And that is why it is very difficult to understand how much demand is being lost. This has become a serious challenge for the PNSR to factor into its Forecasting and Supply Planning, as discussed in that module.

However, despite being decentralized, the UGL still sets the standards, Standard Operating Procedures (SOPs), and guidelines on how the LMIS operates. The assessment team confirmed that formal policies for the LMIS are in place, LMIS tools are standardized throughout the system and, to the extent possible, reporting frequencies are standardized across different programs. However, as detailed later in Figure 79, facilities are still required to fill out individual reports for different programs, creating additional work for a workforce that is no longer well-staffed. While the UGL has standardized inputs into the system, it does not formally track any indicators on LMIS performance or accuracy. This is a huge gap in the capabilities of the institution that needs to be addressed in the future. The UGL is also in a difficult position as it has only 22 of the 60 employees under Ministerial Agreement 6-2015, which they are supposed to have. Operating with such a human resource shortfall will, of course, mean that critical parts of the job will not be completed.

Annex 76. Key Capabilities Implemented in Warehouses for LMIS

	DMS	DAS	Central Warehouse
n =	2	3	1
Percentage of facilities reporting monitoring of timeliness, completeness, and accuracy of reports from lower-level establishments	100%	67%	X
Percentage of facilities reporting on the use of LMIS reports to inform on orders and reports	100%	100%	✓
Percentage of facilities reporting internal data quality assessments	50%	33%	✓
Percentage of facilities reporting a mechanism for users to report system problems	100%	33%	X
Percentage of facilities reporting a help desk mechanism for users to seek assistance	100%	100%	X

DAS and DMS. These warehouses represent the strongest capabilities for the LMIS anywhere in the supply chain. Intuitively, this makes sense, as they are responsible for engaging with all health facilities across the country in their LMIS data. All warehouses visited indicated that they track the indicators of timeliness, completeness, and accuracy of the reports they receive. As discussed below, DAS is responsible for providing capacity building support to health facilities, and most of the facilities visited have received training on the LMIS in the past year. They have also conducted data quality assessments at facilities in their area of influence, making sure to receive feedback and providing suggestions for improving health facility processes. Both DAS and DMS report having a help desk for users with challenges and a mechanism to receive input from health facility staff on the LMIS process and working regularly to make improvements to the process.

However, the difference is that neither DAS nor DMS has received support for capacity building in the LMIS. This is a key opportunity for UGL to develop closer relationships with each DAS by providing more effective support in the LMIS and conducting data quality assessments.

Service delivery points. Capability maturity scores varied significantly at this level, with hospitals getting 69 percent while CAP got 39 percent and Health Posts got 53 percent. While there was

little variation in hospital-level capacity scores, the other two types of facilities had very wide ranges for facility scores, indicating that not all facilities have the same level of capacity and infrastructure. Regarding the availability of Standard Operating Procedures (SOPs), only 44 percent of health posts and 33 percent of CAP had copies available on the day of the visit. A total of 50 percent of health posts also reported a shortage of KARDEX cards in the last year, while 33 percent of CAP reported the same. As the KARDEX card is the only form officially accepted in the system, this creates challenges for the timely recording of consumption data. In terms of data usage, it is good to see that more than two-thirds of the service delivery points visited indicated using LMIS reports to inform their orders and reports. However, this responsibility can be quite challenging as facilities are required to complete many reports each month. As detailed in Figure 77, there is no consistency in the number of reports each facility is expected to complete, with some reports out of over 10 reports to complete monthly. It is almost an even distribution among the answer options presented. This is important feedback for the UGL to consider. Integrating all reports into a single logistics consumption report can significantly reduce the reporting load at this level.

With this in mind, when looking at LMIS performance, Figures 78 and 79 demonstrate that there is room for improvement in the accuracy of LMIS data that are recorded and reported at this level. About 60% of all service delivery points visited had accurate LMIS records, which means that the last balance recorded on the Kardex card reflects the available balance. The assessment team performed a secondary analysis to determine that the average gap between the day of the visit and the last date recorded on the KARDEX card was an average of 104 days late, and this is only for 7 products. This demonstrates a significant delay in completing logistics reports. Figure 78 shows the average deviation between the last recorded balance and the physical count performed on the day of the visit. The analysis revealed that many products are highly inaccurate, creating challenges for using such inaccurate data.

Figure 77. Number of separate supply chain and commodity reports (either electronic or paper) submitted per facility during the reporting cycle

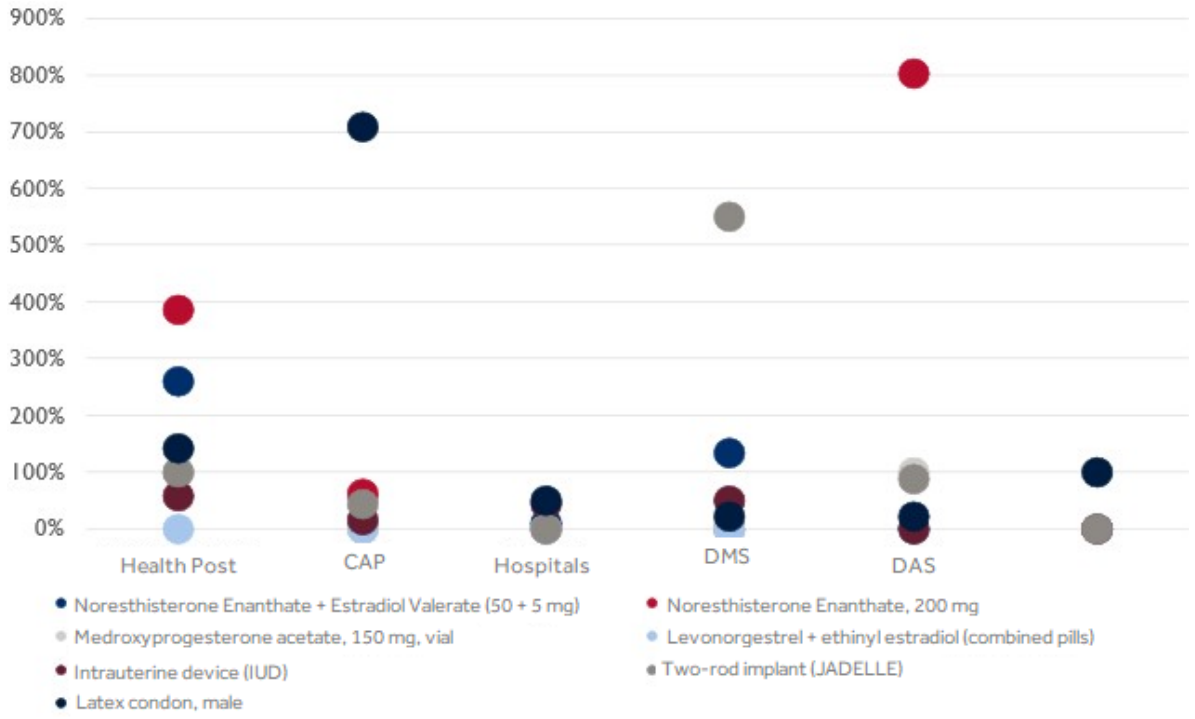
Number of different reports	Health Post	CAP	Hospitals	DMS	DAS	Central Warehouse
1-3	31%	17%	33%	0%	33%	0%
4-6	31%	0%	33%	50%	33%	100%
7-10	19%	33%	33%	0%	0%	0%
>10	6%	17%	0%	50%	33%	0%

While the DAS and the DMS have reported regular engagement with facilities with both supportive oversight and data quality assessments, these performance results suggest that perhaps the form of support should be reviewed to ensure that best practices continue to be encouraged and that more accurate records are needed, staying accurate to LMIS data and, more importantly, sharing them with other parties of the supply chain such as the UGL and the PNSR.

Figure 78. Existing indicators and capabilities— LMIS

	Health Posts	CAP	Hospitals	DMS	DAS
n =	16	6	3	2	3
Percentage of facilities reporting that there is a standard process, such as scheduled periodic meetings, for reviewing LMIS data and reports	88%	50%	100%	100%	67%
Percentage of facilities reporting the presence of LMIS manuals or SOPs on paper	44%	33%	100%	100%	33%
Percentages of facilities reporting the inclusion of paper LMIS in the organization's general budget	38%	33%	33%	0%	0%
Accuracy of paper LMIS registration: percentage of facilities with a 100% accurate stock card, average of tracer products	63%	60%	67%	64%	69%
Paper LMIS Recording Accuracy: 100% Percentage Point Deviation (Range Across Tracer Products)	58-388%	17-2127%	11-51%	21-550%	23-804%

Figure 79. Paper stock cards: average deviation from 100% accuracy across all facilities, by tracer product



Human Resources for the LMIS. While the human resources module has its own section of the report, the assessment team considered it important to discuss the observed HR dynamics related to the LMIS, as the success or failure of the system depends largely on the people entering, analyzing, and using the system's information. Two critical considerations for workforce support capacities are the staff's understanding of their job responsibilities and opportunities for those staff members to grow and update their skills in relation to their job duties. Figure 81 details the prevalence of the LMIS as a formal component of job descriptions and the proportion of staff receiving capacity development opportunities in the LMIS at various service delivery points.

Figure 80. Most frequently cited challenges with paper LMIS					
Type of challenge	Health Post	CAP	Hospitals	DMS	DAS
Tool stock-outs	75%	33%	33%	100%	0%
Data loss	25%	17%	33%	50%	33%
Insufficient training or capacity of human resources	25%	33%	33%	0%	33%
Delayed feedback from higher levels	19%	0%	0%	0%	67%
Using different versions of tools on the same system	19%	33%	0%	0%	0%
Challenges in data analysis	13%	0%	0%	50%	100%
Challenges in data sharing	13%	17%	0%	0%	67%
Insufficient number of staff	13%	17%	33%	50%	0%
Data entry or quality errors	13%	17%	0%	50%	67%
Challenges in data recovery	6%	33%	33%	50%	33%
Tools are not updated or reviewed often enough	6%	17%	0%	0%	33%
None	6%	17%	0%	0%	0%
Difficulties in sending data	0%	17%	0%	50%	0%

Figure 81. Prevalence of LMIS in job descriptions and capacity building opportunities							
	Percentage of facilities reporting:						
	Health Posts	CAP	Hospitals	DMS	DAS	Central Warehouse	UGL
n =	16	6	3	2	3	1	1
LMIS in the formal job descriptions of at least one staff member	19%	33%	33%	50%	33%	83%	✓
The facility reports receiving LMIS training last year	69%	100%	33%	50%	33%	77%	✓

As Figure 81 demonstrates, it is very rare to see the LMIS as a formal part of job responsibilities anywhere in the supply chain. Holding staff accountable for their job responsibilities starts with ensuring that their job description accurately reflects what is expected of them. It is good to see that most facilities visited have received LMIS training in the last year. These will continue to be needed as the MSPAS improves data quality in the LMIS. However, as you can see, there are still significant challenges for users of the system. Figure 80 details the most commonly cited challenges with using the LMIS on paper. Tool shortages, data loss, and insufficient staffing continue to limit its ability to complete this work effectively. As mentioned in the warehouse and storage module, there was a significant lack of KARDEX cards available for the tracer products of this assessment, indicating that staff are unable to complete the work expected of them.

Data Quality Assessments. Data Quality Assessments (DQAs) are a critical component of any well-functioning LMIS system. In Guatemala, data quality assessments are a normal part of supply chain operations. All three types of health facilities visited indicated that they performed internal DQAs and participated in external DQAs conducted by staff from higher-level facilities. All facilities surveyed reported that they regularly received feedback from DQAs, shared that information with other stakeholders, and adjusted internal processes based on the results of a DQA. These are all very positive signs to see, as there are many challenges with logistics data quality in Guatemala, and it will be essential to use these DQAs as a strategy to further improve data quality.

Recommendations

Guatemala has some significant challenges with data quality within its LMIS, but it has strong capabilities present throughout its system that you can rely on to help improve data quality. To address the issues described in this section, the MSPAS should consider the following:

- Create a coordination mechanism for the UGL and all DAS. There is insufficient communication at this level, and it is causing system-wide challenges. It also strengthens UGL supervisory visits to DAS.

- Strengthen training for the correct use of the formats for the registration of Daily Demand, which should include the delivered demand and the undelivered demand. This lack of information is causing problems throughout the supply chain.

- Consider standardizing all reports into a consolidated logistics form. Health facilities already have enough work; this could be an opportunity to reduce the workload and strengthen the quality of data.

- Begin tracking and publishing quarterly LMIS indicators at the national level. Timeliness, completeness, and accuracy are fundamental components of the quality of LMIS data, and its performance must be understood by everyone working with the supply chain.

Supplementary exhibition

Figure 82. LMIS: Question distribution and weight allocation across capability and facility levels

Facility	Basic (50%)		Intermediate (30%)		Advanced (15%)		State of the art (5%)	
	P. No.	Weight	P. No.	Weight	P. No.	Weight	P. No.	Weight
Health Posts (16)	12	4.1%	11	2.7%	5	3%	2	2.5%
CAP (6)	12	4.1%	11	2.7%	5	3%	2	2.5%
Hospitals (3)	12	4.1%	11	2.7%	5	3%	2	2.5%
DMS (2)	20	2.5%	21	1.4%	11	1.4%	2	2.5%
DAS (3)	20	2.5%	21	1.4%	11	1.4%	2	2.5%
Central Warehouse	20	2.5%	21	1.4%	11	1.4%	2	2.5%
UGL	43	1.2%	22	1.4%	12	1.3%	3	1.7%
PNSR	43	1.2%	22	1.4%	12	1.3%	3	1.7%

Quality Assurance and Pharmacovigilance

Ensuring that the health commodities consumed by patients are safe and effective and remain in good quality as they travel through the health system is a critical function of effective supply chains. This section of the NSCA seeks to ensure that there is a well-resourced system in place to ensure the quality of medicines and that facilities at all levels understand and can act on their role in pharmacovigilance of medicines. Figure 92 describes the key capabilities of an effective quality control and pharmacovigilance strategy, including the existence of formal guidelines and SOPs, periodic quality testing, and the availability of data collection tools and processes for pharmacovigilance.

Figure 83. Examples of quality assurance and pharmacovigilance capabilities scored

Basic	Formally approved national product quality assurance strategy or policy Formally approved guidelines or manuals/SOPs
Intermediate	Samples of pharmaceutical products received taken for quality control testing (intermediate capacity in MSPAS, DMS, advanced for healthcare facilities) Quarterly (or more frequent) quality control samples Data collection tools available for pharmacovigilance
Advanced	Dedicated department responsible for implementing the pharmacovigilance strategy All laboratories performing quality control tests accredited by a competent body (e.g., WHO) SOP to quarantine and/or recall the products determined to be compromised Registered certificates of analysis and conformity for all medicinal products received from international sources
State of the art	Action protocols, based on pharmacovigilance results

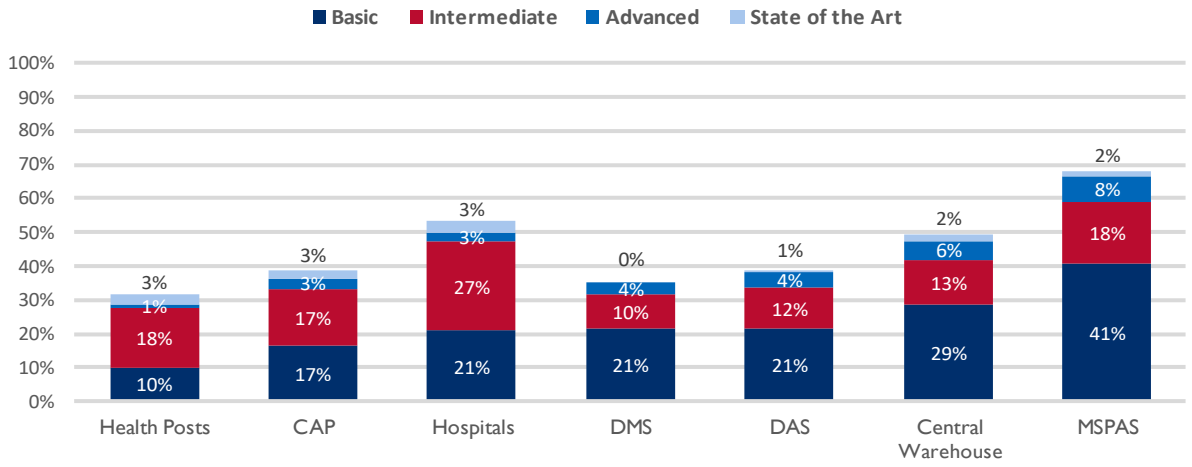
Note: These are illustrative examples of the types of capabilities scored in this module, not an exhaustive list. Each module contains many dozens of questions and capabilities. For a complete list, see the NSCA toolkit, available at www.ghsupplychain.org.

Pharmacovigilance is not listed as a strategic approach in the UGL or PNSR strategic plans. Pharmacovigilance is not the responsibility of any of these entities, but each recognizes its role in understanding the policy framework and ensuring that the tasks envisaged are carried out. Therefore, the score of this module is for the MSPAS in general, not for a specific entity within the Ministry.

2023 NSCA Results and Analysis

Figures 93 and 94 show capability scores, by type of facility, for quality control and pharmacovigilance. The MSPAS scored highest overall in the assessment. However, at 68 percent, the ministry still has some areas for improvement at the central level. Scores typically decrease linearly from the central level to the last mile of the supply chain. Encouragingly, the gap in scores at the lowest levels of the health system is not as severe as it could be. Globally, many countries that have implemented NSCAs find scores for their health facilities in pharmacovigilance in single digits.

Figure 84. Quality assurance and pharmacovigilance capability maturity scores



Note on interpreting results: Remember that CMM scores are a combination of basic (max. 50%), intermediate (30%), advanced (15%), and at-the-forefront (5%) capabilities assessed. Reported percentages are the scored results averaged across all sites assessed, for each capacity level and facility type. For more information, see the Understanding CMM Results section above.

Figure 85. Quality assurance and pharmacovigilance maturity score and existing core capabilities

	Health Posts	CAP	Hospitals	DMS	DAS	Central Warehouse	MSPAS
n =	16	6	3	2	3	1	1
Maturity score (range)	32% (0–71%)	39% (0–76%)	53% (25–76%)	35% (28–42%)	39% (16–58%)	49%	68%
Percentage of basic items in place	20% (0-75%)	33% (0-75%)	42% (0-75%)	43% (29-57%)	43% (14-71%)	57%	82%
Availability of SOPs for pharmacovigilance	25%	33%	33%	--	--	--	✓
Availability of notification forms for pharmacovigilance	69%	50%	100%	--	--	--	✓
SOP availability for product quality control/quality assurance	19%	33%	67%	50%	33%	100%	✓

MSPAS and Warehouses. The results of the assessment show that the MSPAS provides a solid foundation of policies, SOPs, and guidelines that the system uses as a means of operation. There is a pharmacovigilance strategy. Data collection tools for reporting adverse drug reactions are readily available on the Internet for anyone to access, and there are action protocols that are based on pharmacovigilance results. One of the major gaps for the overall supply chain system is the lack of sampling of incoming product shipments and the lack of quality control testing by a laboratory. Currently, there is the National Health Laboratory, LNS, an entity in charge of quality control testing of pharmaceutical products in the MSPAS. The system is also based on external quality assurance provided by UNFPA through its international contraceptive procurement system. The NSCA places a lot of emphasis on the importance of countries conducting their own quality assurance tests, as this is the best way to ensure that whenever they provide pharmaceuticals to their citizens, they are safe and effective. The lack of any kind of testing means that scores are also lower for all warehouses, as this is a key function of warehouses for quality assurance according to international best practice.

Looking more closely at warehouses, it is troubling to see that some of the warehouses visited during this assessment do not have SOPs available to guide how to handle health products whose quality has been determined to be compromised. It would be common to see these types of guides alongside manuals guiding the sampling of products for laboratory testing, so in some ways, it is not surprising that this is missing. However, product quality can be compromised in a number of ways, and clear guidelines on how to handle this need to be in place and disseminated.

Figure 86. Existing key quality assurance and pharmacovigilance capabilities

	Health Posts	CAP	Hospitals	DMS	DAS	Central Warehouse
n =	16	6	3	2	3	1
Facilities reporting samples of products taken for testing	0%	0%	0%	0%	0%	0%
Facilities reporting SOPs for quarantine/recall of suspicious products	0%	17%	0%	0%	0%	0%
Facilities that report the presence of action protocols based on pharmacovigilance results	56%	50%	67%	--	--	--
Reporting facilities that share collected pharmacovigilance data with central-level authorities	69%	50%	100%	--	--	--

Service delivery points. Typically, service delivery points have only some of the basic elements required for a pharmacovigilance system. Scores on the three types of service delivery points assessed did not exceed 53%, with most scores around 30%. In terms of policies and procedures, the existence and knowledge of SOPs for pharmacovigilance rarely exist. SOPs for quality assurance and quality control are less available to the same degree. However, it is encouraging that the availability of notification forms for pharmacovigilance, one of the key functions at this level of the system, is significantly easier to find in health facilities. As mentioned above, the collection of pharmaceutical products for testing is not happening.

As detailed in Figure 86, the SOP for the handling of products that must be quarantined as per Government Agreement No. 509-2001 and 164-2021 is also not very common. Even though these documents are not commonly found, many facilities reported that they know how to regularly report pharmacovigilance data to higher-level authorities, which is an excellent occurrence to find.

Recommendations

- Consider expanding the scope of the National Health Laboratory, LNS, to include pharmaceutical quality testing as well.
- Ensure widespread availability of SOPs, reporting tools, and personnel prepared to complete these reports, without which the pharmacovigilance system cannot function. If the MSPAS wants these forms to be available online and used digitally, it must ensure that all facilities have access to a computer and internet to use them.

Supplementary exhibition

Figure 87. Quality assurance and pharmacovigilance: Question distribution and weight allocation across capability and facility levels

Facility	Basic (50%)		Intermediate (30%)		Advanced (15%)		State of the art (5%)	
	P. No.	Weight	P. No.	Weight	P. No.	Weight	P. No.	Weight
Health Posts (16)	4	12.5%	3	10.0%	4	3.8%	1	5.0%
CAP (6)	4	12.5%	3	10.0%	4	3.8%	1	5.0%
Hospitals (3)	4	12.5%	3	10.0%	4	3.8%	1	5.0%
DMS (2)	7	7.1%	9	3.3%	8	1.9%	3	1.7%
DAS (3)	7	7.1%	9	3.3%	8	1.9%	3	1.7%
Central Warehouse	7	7.1%	9	3.3%	8	1.9%	3	1.7%
MSPAS (1)	11	4.5%	15	2.0%	14	1.1%	3	1.7%

Note that interpretations of the score and discussions about "differences" in scores should recognize that the number of capabilities assessed differs by facility type and module. Therefore, positive answers to individual questions (i.e., reports of current capabilities) have different weights, depending on the technical area and type of facility.
Note also that the number and weighting of questions for these modules vary because some conditionally scored questions are included. The figures presented here assume that all conditions are met and that all questions are included.

Waste Management

Medical waste management is a core operation of effective public health supply chains, ensuring that used, unsafe, or unusable pharmaceuticals are efficiently removed from the supply chain and disposed of properly. The main areas that were taken into account in scoring waste management capabilities and performance included the existence of an approved national waste management plan, the existence of SOPs and guidelines for waste management at all facilities, active control of waste management and disposal, and comprehensive waste records.

Figure 88. Examples of waste management capacities scored

Basic	SOP for waste management and disposal National regulatory agency or department to enforce regulations Unusable pharmaceuticals stored separately Minimum budgetary contribution from the government or waste management facilities
Intermediate	Disposal methods: onsite incineration, inerting, or solidification Authorized and documented waste disposal events Internal waste management audits
Advanced	Disposal supervised and certified by a regulatory authority Unusable pharmaceutical waste sorted by disposal method
State of the art	Waste management system integrated with the LMIS

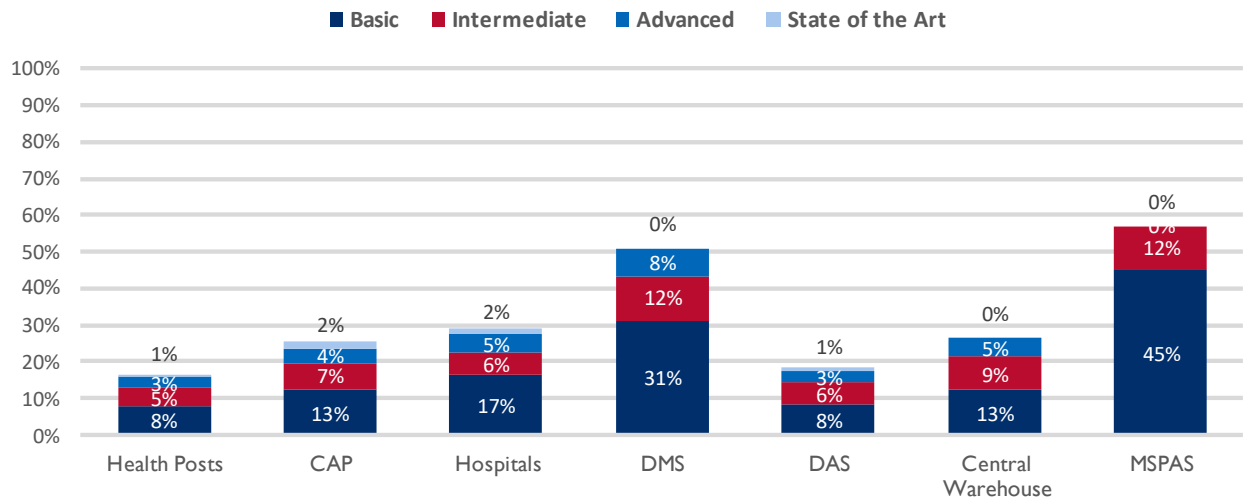
Note: These are illustrative examples of the types of capabilities scored in this module, not an exhaustive list. Each module contains many dozens of questions and capabilities. For a complete list, see the NSCA toolkit, available at www.ghsupplychain.org.

The strategic plans of UGL and PNSR make no explicit mention of pharmaceutical management. However, there are Governmental Agreement No. 509-2001 and 164-2021, which detail exactly how pharmaceutical waste shall be handled, what the acceptable methods of disposal are, and how the MSPAS is expected to document those provisions.

2023 NSCA Results and Analysis

Figures 98 and 99 detail the findings of the waste management module during the NSCA 2023. Overall, waste management capability scores were low system-wide, with the MSPAS scoring highest at 50 percent. The MSPAS has all the right policies and oversight structures in place, such as approved national guidelines for waste management (with all expected components of waste covered), a regulatory authority to enforce guidelines, and approved SOPs for waste management within facilities. The biggest gaps in this module for the MSPAS are related to waste management data management: there is no electronic system to maintain this information, there is no integration with the LMIS, and no indicators are used to monitor waste management activities. However, Central Warehouse is missing many important capabilities. In particular, there is no quarantine space of any kind due to an overstocking situation that obstructs all available space. There is also no system in place to track disposal events. It is encouraging to see waste disposal events monitored by the MSPAS, and an external third party is used for safe disposal.

Figure 89. Waste Management Capability Maturity Model Scores



Note on interpreting results: Remember that CMM scores are a combination of basic (max. 50%), intermediate (30%), advanced (15%), and at-the-forefront (5%) capabilities assessed. Reported percentages are the scored results averaged across all sites evaluated, for each capability level and facility type. For more information, see the Understanding CMM Results section above.

Service delivery points. Waste management practices and capabilities are mostly in very nascent stages in health facilities. Annex 90 details the prevalence of SOPs and compliance with waste management practices at this level. Waste disposal events are rarely documented or authorized by a higher-level authority. These provisions are also rarely reported to higher-level authorities. The staff at these facilities do not seem to understand expectations and appropriate practices. There seems to be a lack of understanding that expired pharmaceuticals must be stored separately (or, alternatively, there is no storage space in any facility to separate expired products). The MSPAS should provide guidance and training to these facilities to ensure they are aware of proper procedures and expectations for waste management.

DAS and DMS Warehouses. By receiving capability scores above 50 percent, the DMS demonstrated the strongest waste management capabilities of any type of facility assessed during the NSCA. As mentioned at the beginning of this report, with such a sample size, this may not reflect reality in other DMSs. Within these facilities, the presence of approved SOPs for waste management, documentation of waste disposal events, and separation of unusable pharmaceuticals are present

half the time. It is worrisome that not even a DAS had these SOPs available during the visit. However, most DAS and DMS had a dedicated quarantine area for expired pharmaceuticals, which is a positive sign. How these facilities track waste disposal events varies widely, with many using paper or not performing the process at all. Some standardization of the MSPAS in this area could be of great benefit in simplifying waste management operations.

Figure 90. Waste management maturity scores and selected capabilities

	Percentage of facilities reporting:						
	Health Posts	CAP	Hospitals	DMS	DAS	Central Warehouse	MSPAS**
n =	71	72	17	4	7	30	1
Maturity score (range)	17% (0–67%)	25% (4–60%)	29% (0–64%)	51% (39–63%)	19% (0–29%)	27%	57%
Percentage of basic items in place (range)	16% (0–75%)	25% (0–75%)	33% (0–75%)	63% (50–75%)	17% (0–25%)	25%	90%
Percentage of facilities demonstrating the presence of SOPs for on-site waste management and disposal	13%	17%	0%	50%	0%	40%	✓
Percentage of facilities reporting that waste disposal events are authorized and documented	6%	17%	33%	100%	67%	✓	--
Percentage of facilities demonstrating that unusable pharmaceuticals are stored separately	13%	50%	33%	50%	67%	X	--
Percentage of facilities reporting disposition supervised or certified by a regulatory authority	50%	50%	33%	50%	67%	✓	--

***The score for waste management is general for the MSPAS in general, as neither the PNSR nor the UGL is responsible for this component, but they know the rules and regulations they must comply with.*

Recommendations

The findings on the current state of pharmaceutical waste management in Guatemala's supply chain system point to opportunities to expand and deepen capacities in this key technical area. The MSPAS should consider the following:

- Ensure that policies and procedures for waste management are fully disseminated throughout all facilities in the country.
- Reinforce the distribution of these policies and practices with training and supervision. Using the high prevalence of supportive supervision to achieve this goal would be a good strategy.
- Standardize the process for documenting and communicating waste disposal events to central-level authorities for all facilities and ensure facilities understand how to comply with them.

Supplementary exhibition

Annex 91. Waste management: Question distribution and weight allocation across capability and facility levels

Facility	Basic (50%)		Intermediate (30%)		Advanced (15%)		State of the art (5%)	
	P. No.	Weight	P. No.	Weight	P. No.	Weight	Weight	P. No.
Health Posts (16)	4	12.5%	7	4.3%	5	3.0%	1	5.0%
CAP (6)	4	12.5%	7	4.3%	5	3.0%	1	5.0%
Hospitals (3)	4	12.5%	7	4.3%	5	3.0%	1	5.0%
DMS (2)	4	12.5%	10	3.0%	6	2.5%	2	2.5%
DAS (3)	4	12.5%	10	3.0%	6	2.5%	2	2.5%
Central Warehouse	4	12.5%	10	3.0%	6	2.5%	2	2.5%
MSPAS (1)	10	5.0%	5	6.0%	3	5.0%	2	2.5%

Note that interpretations of the score and discussions about "differences" in scores should recognize that the number of capabilities assessed differs by facility type and module. Therefore, positive answers to individual questions (i.e., reports of current capabilities) have different weights, depending on the technical area and type of facility.
Note also that the number and weighting of questions for these modules vary because some conditionally scored questions are included. The figures presented here assume that all conditions are met and that all questions are included.

Consolidated recommendations

The NSCA methodology produces specific and actionable recommendations throughout the supply chain. To facilitate scheduling and coordinated actions, recommendations selected from across the report are consolidated here by technical area. To help facilitate prioritization, the authors of this report have created a ranking system for the report's recommendations. Actions to improve the supply chain can be prioritized in three ways:

1. Low-cost/high-performance priorities or relatively small interventions that can be achieved with minimal investment in financial or human resources. They will be labeled as [low cost/high performance]

2. Priorities in the order of time or actions that should be prioritized due to sequencing effects, that is, other future improvements depend on them. They will be labeled as [time order priority]

3. Predominant priorities or actions that are considered important to implement for pressing ethical or efficiency reasons, regardless of time or ease of intervention. They will be labeled as [predominant priority]

To establish how Guatemala might consider prioritizing supply chain interventions and reforms, we selected below two recommendations by technical area that the NSCA assessment team further emphasize as crucial to improving the country's supply chain. The reason for our selection is provided in parentheses after the recommendation, according to the above categorizations. Rather than being a final list, these examples are intended to serve as a guide and encouragement for a critical and inclusive prioritization exercise by the MSPAS. Additional specific recommendations are found at the end of each technical section of this report.

To help address documented issues in the reproductive health supply chain, the MSPAS should consider prioritizing the following recommendations:

Strategic Planning and Management

- Establish a coordination mechanism that brings together national disease control programs, UGL, and DAS supply chain leadership so that they can work together on strategic supply chain planning [time order priority].
- Consider aligning strategic planning times for the various MSPAS entities, so that they work together in the execution of the strategic supply chain plans in order to foster broader participation and cooperation [low cost/high performance].
- When examining current issues and capability gaps within the supply chain, consider developing an engagement strategy for external support to help fill strategic gaps. MSPAS does not need to develop all the capabilities it lacks, but with internal and external management skills, it can leverage other entities to help achieve its supply chain goals.
- Assess whether it is necessary to update the standard of logistic processes of the reproductive health program considering the identified gaps [low cost/high performance].

Policy and Governance

- Develop a coordination mechanism between the central level and DAS supply chain leaders. There is a great benefit to be gained in more effective coordination, communication, and orchestration of actions and processes for the supply chain. It is clear that these entities are not communicating enough, as evidenced by the policy and governance scores of the DAS and DMS [time order priority].
- Use existing pathways to ensure that standard treatment guidelines, supply chain policies, and SOPs are properly distributed and used within the various levels of the supply chain. Supportive supervision, as discussed in the human resources section, appears to be a promising existing system to use [low cost/high performance].
- Involve Central Warehouse in most of the overall supply chain scheduling. Its current operational level has relegated them more to a transit warehouse than to the main warehouse of a national public health supply chain [low cost/high performance].

Human resources

- Create a unified capacity building plan for all levels of the supply chain and ensure that funds are available to support these efforts at all levels [predominant priority].
- Make sure job descriptions can reflect the work that is actually being done. Consider the creation of a manual of functions or enforce its compliance if it exists. This may involve coordinating with other parts of government to provide specific supply chain roles for its workforce [low cost/high performance].
- Take advantage of the existence of supportive oversight, which is considered fairly common, to ensure the dissemination of policies, SOPs, and guidelines to all facilities across the country, especially because of the decentralized nature of the supply chain [low cost/high performance].
- Create a process of continuous training in logistics processes in an optimized manner in order to strengthen knowledge.

Financial Sustainability

- Implement a process to ensure that all supply chain-related costs (estimated and actual) are recorded at all levels of the supply chain and that decision makers can access the information [predominant priority].
- Use recorded supply chain operation cost data to correct budget allocations to different facilities to ensure they have the necessary resources [predominant priority].
- Share financial best practices among central-level entities to ensure that all institutions operate to the same standard [low cost/high performance]

Forecasting and Supply Planning

- PNSR and UGL should work closely together to determine how to improve compliance with the process for determining unmet demand for contraceptive products. Poor performance in the current process is producing inaccurate figures to use in supply chain scheduling and is contributing to the observed stock-out issues [predominant priority].

- The PNSR should include more stakeholders in the Forecast process. Global best practices strongly recommend that Forecast be a broadly inclusive and participatory process. The more people from different perspectives can validate or question its assumptions and make the process more accurate, the better the quality of the final product [low cost/high performance].
- PNSR needs to develop official metrics for Forecast accuracy and supply scheduling accuracy and publish those figures annually [low cost/high performance].

Procurement and Customs Clearance

Because the CMM module for procurement has not been implemented, the assessment team does not have many recommendations for the MSPAS. The only applicable recommendation would be the following:

- In its efforts to improve the distribution of reproductive health products through the supply chain, consider using incoterms to have subnational deliveries of internationally procured products to help alleviate the challenge of distribution at the first level of the health system. *(Such a recommendation would require understanding whether the current legal framework allows such procurement actions and whether subnational warehouses are capable of storing such quantities.)*

Warehousing & Storage

- Develop a plan to correct challenges when completing KARDEX cards, no matter how much inventory is available. Also consider adjusting the logistics form to better capture unmet demand; clearly it is negatively impacting the system [predominant priority].
- Make sure that part of supportive supervision practices is to train people to update inventory cards more regularly. The delay in having timely data is also negatively affecting the system [low cost/high performance].
- Work with all warehouses to develop a plan to create a space to safely quarantine recalled or suspected products, as well as controlled substances. It is not safe to store all kinds of products together openly [low cost/high performance].

Distribution

- Implement an active distribution system for the country. If the decentralized system requires the two-tier distribution system, that is fine. However, health facilities are overburdened and lack the necessary resources. They should not be required to also collect commodities [predominant priority].
    - If an active distribution system is implemented, consider using this opportunity as a way for the MSPAS to engage the private sector in third-party logistics contracts. The ministry does not need to have all the in-house capabilities; outsourcing distribution makes logical and financial sense.

- Consider requiring the integrated distribution of all commodities within the public health system. This has the potential to dramatically reduce the total cost of distribution operation and allows multiple funding streams to contribute, making it easier to achieve financing sustainability [predominant priority].

- Implement new rules to require all entities shipping products to record all costs related to transportation and distribution. Understanding the true cost of the national distribution operation is the only way we can implement reforms to reduce those costs [low cost/high performance].

Logistics Management Information System (LMIS)

- Create a coordination mechanism with the UGL and the entire DAS. Clearly, there is insufficient communication at this level, and it is causing system-wide challenges. Strengthen also UGL supervisory visits to DAS [predominant priority].
- Strengthen training for the correct use of the formats for the recording of Daily Demand, which should include the delivered demand and undelivered demand. This lack of information is causing problems throughout the supply chain [predominant priority].
- Consideration should be given to standardizing all reports in a consolidated logistics form. Health facilities already have enough work; this could be an opportunity to reduce the workload and strengthen the quality of data [low cost/high performance].
- Begin tracking and publishing quarterly LMIS indicators at the national level. Timeliness, completeness, and accuracy are fundamental components of the quality of LMIS data, and its performance must be understood by everyone working with the supply chain [low cost/high performance].

Quality Assurance and Pharmacovigilance

- Consider expanding the scope of the National Health Laboratory, LNS, to include pharmaceutical quality testing as well.

- Ensure widespread availability of SOPs, reporting tools, and personnel prepared to complete these reports, as without these, the pharmacovigilance system cannot operate. If the MSPAS wants these forms to be available online and used digitally, it must ensure that all facilities have access to a computer and internet to use them [low cost/high performance].

Waste Management

- Ensure that policies and procedures for waste management are fully disseminated throughout all facilities in the country [low cost/high performance].
- Reinforce the distribution of these policies and practices with training and supervision. Using the high prevalence of supportive supervision to achieve this goal would be a good strategy [low cost/high performance].
- Standardize the process for documenting and communicating waste disposal events to central-level authorities for all facilities and ensure facilities understand how to comply with them [low cost/high performance].

Conclusions

The NSCA documented the presence of existing capabilities and performance levels in the 11 technical areas included in the NSCA and at all levels within the supply chain. As this is the first time the Government of Guatemala has assessed its public health supply chain, it should be commended for its commitment to continuous improvement within the health system.

As detailed in the report, the assessment found a combination of strong and weak capabilities across the system. Capabilities for many of the technical areas assessed were quite strong at the central level. Specifically, strategic planning and management, policies and governance, and financial management scored very well at the central level. These capabilities will be very useful to the government as it begins to outline its priorities for supply chain reform in the coming months and years. Central-level leadership will be important as these plans develop. Strengths were also found at lower levels of the supply chain, especially in Health Area Directorates (DAS). DAS have demonstrated strong capabilities in financial sustainability and the LMIS. As these are critical functions to be implemented at this level, these are very positive indications.

The report has also included some significant challenges that have been observed within the reproductive health supply chain. One of the biggest concerns is the recording, management, use, and exchange of logistics data. The NSCA revealed significant gaps in the completeness, accuracy, and timeliness of logistics data in the various health facilities visited during the assessment. There were significant accuracy and timeliness gaps when completing KARDEX inventory cards and integrity challenges with recording unmet demand from the "Daily Actual Demand Record." The lack of structured and reliable data for unmet demand is creating problems for supply chain management at all levels, from Forecasting and Supply Planning to order fulfillment. For example, in Forecast, it is difficult to accurately predict the quantity of a product needed if it is not possible to quantify precisely how many products were needed but were not supplied each year. Addressing these concerns with logistics information processes will be critical for the MSPAS to improve supply chain operations.

This assessment also documents the challenges with the distribution system being implemented. Facilities are experiencing significant difficulties with the self-collection system currently implemented. With the lack of integrated distribution and vehicles making one-stop trips instead of multi-stop distribution routes, the funds available for distribution are not used as efficiently as possible. To ensure the future sustainability of the reproductive health supply chain in Guatemala, the MSPAS will need to carefully consider its options on how to improve the distribution system.

From the experiences of the assessment team in implementing this activity, it is very evident that the workforce supporting the supply chain is deeply committed to their work and passionate about ensuring contraceptive safety for the citizens of Guatemala. The authors of this report are confident that, with committed leadership, targeted reform of supply chain system design, and a continued commitment to improvement, Guatemala can ensure that reproductive health commodities are continuously available to all those who want them.