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USAID's Supply Chain Management Strengthening Project

Executive Summary

Preliminary Report on the National Supply Chain Assessment of HIV-Related Commodities in the Dominican Republic

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Brief Description

USAID support for this document was provided through the USAID's Supply Chain Management Strengthening Project, awarded in 2022 to Gestión e Innovación en Salud (GIS, per its acronym in Spanish) Grupo Consultor. The objective of this project is to strengthen the Supply Chain Management (SCM) of HIV-related commodities at the national and sub-national levels to reach epidemic control in the Dominican Republic.

About GIS Grupo Consultor

GIS Grupo Consultor is a private research and consulting firm founded in the year 2016 in the Dominican Republic and registered in the United States, Peru, and Panama. GIS provides technical health assistance with an emphasis on supply chain management. For more information, visit GIS Website

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DISCLAIMER

Acronyms

ART	Antiretroviral therapy
ARV	Antiretrovirals
CMM	Supply Chain Capability Maturity Model
CONAVIHSIDA	National Council for HIV and AIDS
CPN	Primary Health Facility
DAM	Supply and Medicines Division
KPI	Key Performance Indicators
LMIS	Logistics Management Information System
LNSP	Public Health National Laboratory
MoH	Ministry of Health
NGO	Non-Government Organization
NHS	National Health Service
NSCA	National Supply Chain Assessment
PEPFAR	President's Emergency Plan for AIDS Relief
PROMESE-CAL	Essential Medicines Program and Center for Logistic Supply
PSC	Public Health Programs
RHS	Regional Health Service
SALMI	Medicines and Supplies Logistic Administration System
SUGEMI	Unified System of Medicines and Supplies
TB	Tuberculosis
USAID	United States Agency for International Development
WHO	World Health Organization

1. Background

Funded by the President's Emergency Plan for AIDS Relief (PEPFAR), the United States Agency for International Development (USAID), through its Mission in the Dominican Republic (USAID/DR), implements the Supply Chain Management Strengthening Project (SCMS) to improve the supply chain management of HIV-related commodities at the national and sub-national levels and contribute to controlling the HIV epidemic in the country. PEPFAR aims to support the modernization of the supply chain with a focus on the client to increase availability and access to antiretroviral therapy (ART) and other related commodities. Among the activities in the approved work plan for the 2022 fiscal year (FY22) that covers the period from January to September, SCMS is conducting the National Supply Chain Assessment (NSCA), following the methodology and tools developed previously by other USAID implementation mechanisms[1].

2. Objective

To inform and guide the interventions in the supply chain of HIV-related commodities by identifying and prioritizing low-performance areas and monitoring the impact of activities on the supply chain.

3. Methodology

Following the NSCA guidelines, the study covered three components:

1. **Mapping of the public health supply chain,** which provides a visual representation of the country's supply chain.
2. **Supply Chain Capability Maturity Model** (CMM), which measures the general capability, resources, and functionality of the country's supply chain.
3. **Key Performance Indicators** (KPI) of the supply chain at different levels.

A workshop was organized for the supply chain mapping on June 28, 2022, with the participation of representatives from the public health institutions[2] associated with the supply of medicines and healthcare inputs. The work groups reached a consensus to determine the current structure and operation of the supply chain, its strengths, weaknesses, opportunities, and threats.

Information for the CCM and KPI components was gathered between July 5 and 26 through interviews at the central administrative and political level, in the nine (9) Regional Health Services (SRS, per its acronym in Spanish), in the National Health Laboratory and in two decentralized laboratories and a sample of 41 healthcare sites[3]; 52% of which are PEPFAR-supported. Fifteen products were used as tracer commodities including HIV diagnostic tests, antiretrovirals, and medicines to treat HIV/TB co-infections, see table 1. The information was collected by six work teams using e-forms developed on the SurveyCTO data collection platform.

[1] Axios International, Inc. (2018). National Supply Chain Assessment 2.0: Implementation Guide. Submitted to the United States Agency for International Development by Axios International, Inc., under USAID Contract Number: AID-OAA-TO-16-0013 - USAID Global Health Supply Chain – Technical Assistance NSCA Task Order.

[2] The Ministry of Public Health (MoH); National Health service (NHS), Regional Health Services (RHS), the National Council for HIV and AIDS (CONAVIHSIDA), the Essential Medicines Program and Center for Logistic Supply (PROMESE-CAL)

[3] 27 hospitals, or primary-level centers (CPN) and 8 services managed by Non-Governmental Organizations (NGOS). This sample offers a margin of error +/- 10 percent and a confidence level of 95%

Table 1. Tracers HIV related commodities

N°	Products	Description
1	Adult ARV	Atazanavir/ritonavir 300 mg/100 mg tablet
2	Adult ARV	Emtricitabine/ Tenofovir 200 mg/300 mg tablet
3	Adult ARV	Efavirenz/ Lamivudine/ Tenofovir disoproxil fumarate 400/300/300 mg tablet
4	Adult ARV	Tenofovir Alafenamide Emtricitabine/ Dolutegravir 25 mg + 200 mg + 50 mg tablet
5	Adult ARV	Dolutegravir 50mg tablet
6	Adult ARV	Tenofovir disoproxil fumarate /Lamivudine/Dolutegravir 300 mg + 300 mg + 50 mg tablet
7	Pediatric ARV	Nevirapine 50 mg/5ml oral solution 240ml
8	Pediatric ARV	Lopinavir/ritonavir80 mg + 20 mg oral Solution
9	Tuberculosis	Isoniazid 300mg tablet
10	Tuberculosis	Rifapentine 150 tablet
11	Co-infection HIV-Tuberculosis	Sulfamethoxazole + trimethoprim 400 mg +80 mg tablet
12	Rapid test kit	HIV rapid test (Determine HIV-/2/hiv-1/2) kit 100 test
13	Rapid test kit	HIV confirmatory test (Unigold) kit 20 test
14	Immunological follow up test	Viral load test
15	Immunological follow up test	CD4 test

4. Results

4.1. General

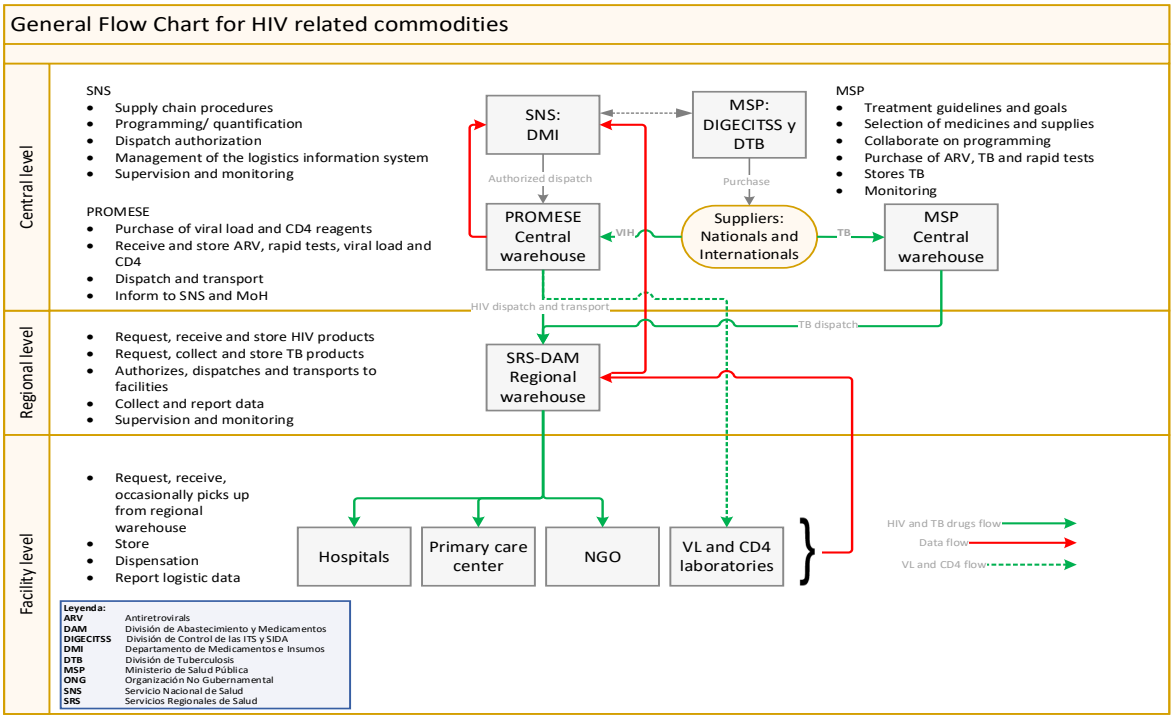
4.1.1. Supply Chain Mapping

Since 2012, the public health system of the Dominican Republic has organized the Unified Medicine and Supply Management System (SUGEMI, per its acronym in Spanish). It operates under standardized procedures and integrates all medicines and health commodities in hospitals and Primary Health Facilities (CPN, per its acronym in Spanish) and the products used by the Public Health Programs (PSC, per its acronym in Spanish) HIV, Tuberculosis (TB) and Family Planning.

For the PSC, medicine selection is an attribution of the Programs themselves. Procurements are programmed employing the consumption or morbidity methods and synchronically with other products procured in the public sector. Procurement is managed by the Ministry of Public Health (MoH), although there are recent initiatives to transfer this assignment to the Essential Medicines and Logistic Support Center (PROMESE-CAL). The products are procured -to a greater extent- through cooperation agencies or international suppliers[4] with MSP funds and customs clearance arrangements and expenses also borne by the latter. The central storage of most commodities is carried out in the central warehouse of the MoH. HIV-related commodities, however, are stored at PROMESE-CAL. From the central warehouse, products are distributed to nine SRS, from where they are further distributed to the CPN and hospitals. Three forms (SUGEMI-1, SUGEMI-2 and CONDUCE) and an e-application standardize the regular requisitions of the sites to the SRS and from these to the central warehouses, and subsequent product dispatches. The requisition and dispatch forms themselves and the e-applications are the sources of the primary data of an information system that regularly records and informs on the consumption and stock available in the entire public network. Figure 1 shows the HIV supply chain general flow chart.

[4] Partnership for Supply Chain Management (PSCM) for HIV and the PAHO Strategic Fund for TB

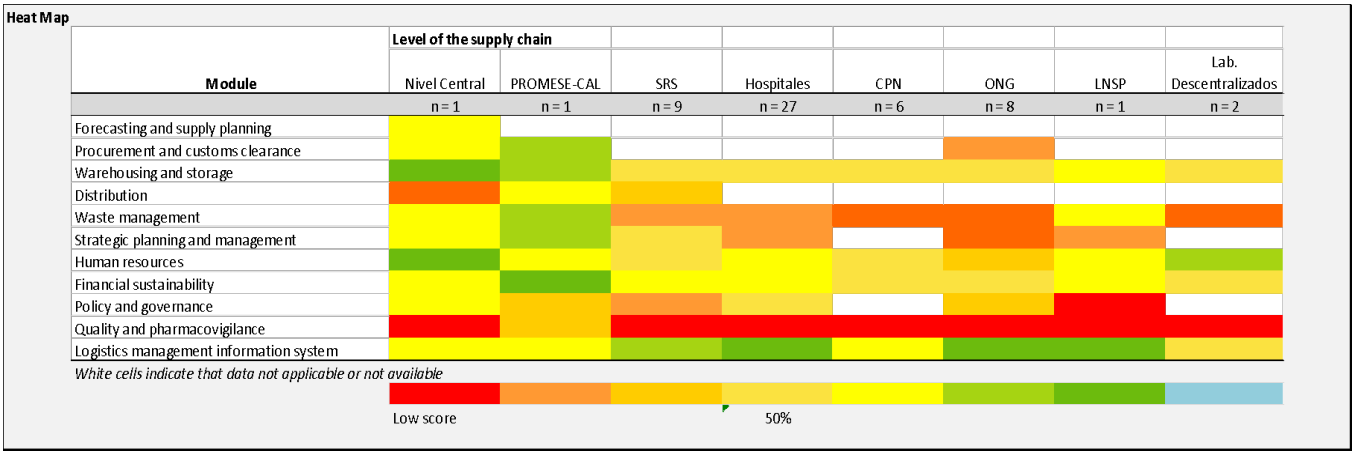
Figure 1. HIV supply chain flowchart



4.1.2. Supply Chain Maturity

Figure 1 shows the result of the scores achieved in the 11 maturity capacity modules by the level and categories of the sites assessed. The forecast modules and the planning of supplies, warehousing, storage, human resources, financial sustainability, and logistics management information systems, on average, show the best scores, yet do not reach optimal levels. The modules dealing with quality control, waste management, and policies and governance achieved the lowest scores. The central level, PROMESE-CAL, and the Public Health National Laboratory (LNSP, per its Spanish acronym) show the best average score. The SRS, CPN, NGOs, and decentralized laboratories show the lowest averages. Figure 2 show the proximity of the scores to the highest (blue) or lowest (red) reference standards.

Figure 2. Average Score Heat Map of the Supply Chain Maturity Model



4.1.3. Supply Chain Key Performance Indicators

Figures 3 and 4 show the results of a selection of a supply chain key performance indicator assessed at the central level, in the warehouses, health sites, and laboratories. This figure shows the performance reached in each KPI according to the NSCA standard.

Figure 3. Key Performance Indicators Selected: Summary Table at the Central Level

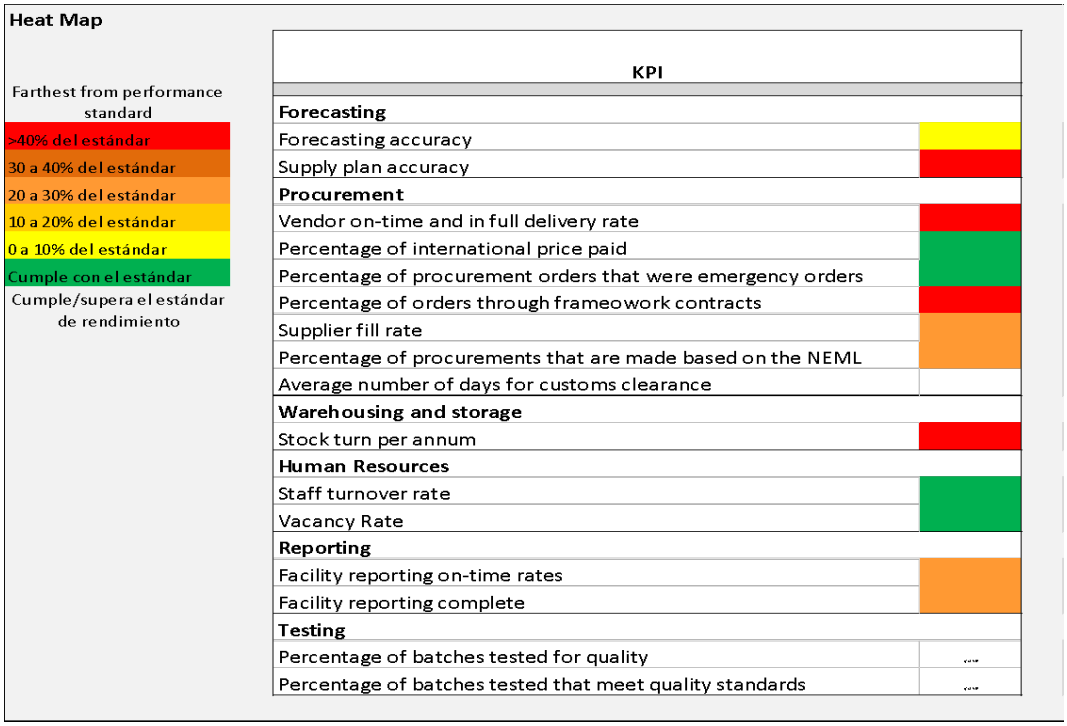
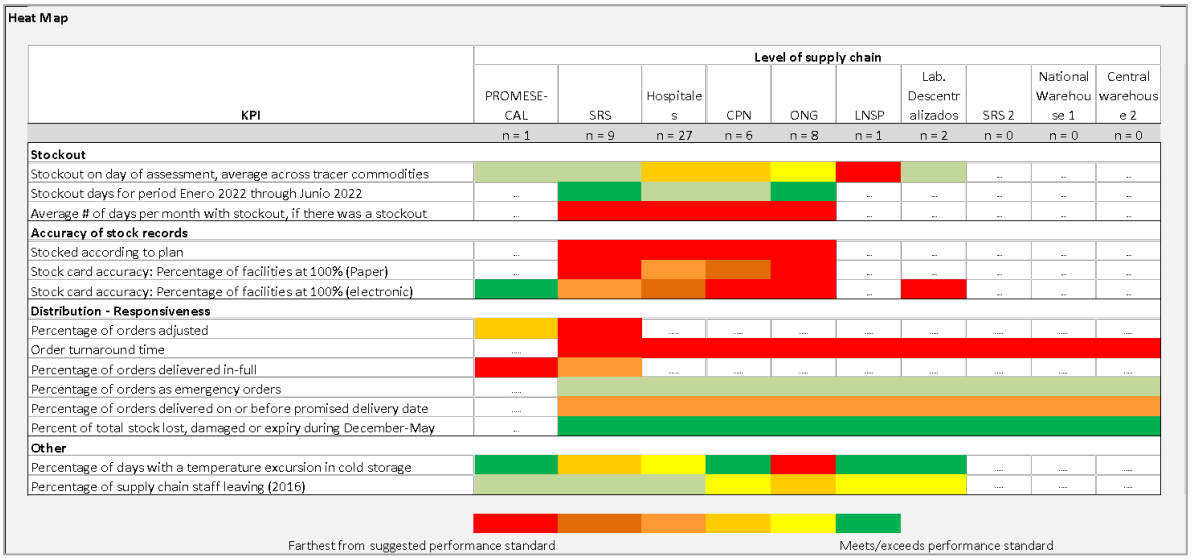


Figure 4. Performance Indicators Selected: Summary Table of Warehouses and Health Sites



4.2. By Modules

4.2.1. Availability of Medicines and Health Commodities

The SNS, through SUGEMI, is responsible for ensuring an ongoing stock of products to 66,814 persons who, at the time of the study, were receiving antiretroviral therapy (ART)[5] in the public service network. Since 2012, this system has contributed to an uninterrupted supply of medicines and commodities associated with HIV control. Since 2018, however, there have been periods of stockouts. At the beginning of 2022, many of these issues were corrected, particularly at the central level. The information offered by the CCM and NSCA's KPI components helped to identify the underlying causes of the remaining issues and to design interventions to solve them. On average, 17% of the SRS, 28% of the hospitals, 10% of CPN, and 15% of the NGOs had product stocks within the normal range. On average, 89% of the SRS, 75% of the hospitals, 76% of CPN, and 82% of NGOs had stocks of all the tracer products at the time of the visits, but many stock levels were below the normal range.

When conducting the NSCA, there were low levels of stock of some of the medicines and tracer products at all supply chain levels. The products most frequently out of stock were Lopinavir/Ritonavir oral suspension, Isoniazid tablets and CD4 Test Kits.

Although the PROMESE-CAL logistic information system was not operational, the study determined that the major stock problems were at the SRS and health facilities. Stocks at the central level have improved since early 2022 as a result of immediate delivery requests to international providers, regularization of the international supply chains after COVID, and the technical assistance provided by the SCMS Project.

4.2.2. Forecast and Planning

The study positively identified the existence of systematic and standardized processes, active monitoring of the supply plan, and the use of outcomes in budgetary and procurement decisions. The metrics used, however, to measure performance reveal differences between the demand forecast and the real demand (13/14 medicines and inputs did not match) and between the items and the amounts included in the procurement plan and what was effectively ordered (11/13 medicines and inputs did not match). This situation could affect the opportunity and quantity of products procured and available for distribution to the health service network.

4.2.3. Procurement Management

Only 33% (3/9) of the ARVs and HIV related commodities orders made by the MoH were delivered on time and completely by the suppliers. The average rate of complete deliveries by suppliers was 75% of the quantities requested with ranges between 23% and 100%. The omission of some accountability and performance standards[6] by suppliers in HIV and TB procurements was identified, as were delays in customs clearance of TB products. Most of these delays are due to the lengthiness of bureaucratic processes and delays in the payment to the custom authority. Most of these non-conformities could be solved through transferring procurement to PROMESE-CAL, which scores better in this process, due the application of explicit procurement procedures.

[5] FAPPS, July 2022 report.

[6] Systematic evaluation and registration of completed and on time deliveries, for instance.

In 2021, 70% (7/10) of the medicines procured were in the Basic Essential Medicines List published in 2018. The three medicines that are not contemplated in this document are included in the WHO guidelines.

4.2.4. Supply Chain Management

The study documented multiple issues that can contribute to both historical and current stockouts in the regional warehouses and sites:

- **Failure to comply with distribution schedules:** 78% (7/9) of the SRS have approved distribution schedules but only 67% (6/9) communicate them to the health sites. Only 61% (5/9) of the SRS, 74% (19/27) of hospitals, and almost half of the CPN, NGOs, and decentralized laboratories received their orders on or before the delivery date scheduled in the distribution schedules. The percentage of total orders delivered in full was 75% in the central warehouse and 47% in the regional warehouse. The average number of days between the issuing of the order and dispatch of the products was greater in the hospitals (21.4) and decentralized warehouses (22.4). This is due to the lack of vehicles at the hospitals to collect the products from the warehouse and at PROMESE-CAL to distribute to the sites and decentralized laboratories.
- **Lack of personnel availability and training**: In addition to the high turnover of personnel (that increases with change of the public administration), the SRS, hospitals, CPN, NGOs, and decentralized laboratories reported vacancies in the supply chain.
- **Lack of inventory management, requisition, and dispatch systems**: Possibly due to lack of training and inputs and materials (e-applications and stock control cards, TCE, per its acronym in Spanish), there is a great discrepancy between primary inventory records and the physical quantities available on the shelves. In the SRS and hospitals, the average match was 63% and 32% in NGOs. These primary records feed SUGEMI 1, which operates simultaneously as a product requisition form and the source of primary data of the information system. Only 60% of the CPN comply with the monthly dispatch of the SUGEMI 1 on the dates established. The lack of forms in the sites -which should be provided by the RHS- contributes to this low ratio.
- **Lack of an automated inventory management system**: The SUGEMI information system collects and reports information on consumption and stocks available but does not have an automated inventory management system in the warehouses and pharmacies. At the time of the study, the central warehouse of the MSP (storing TB products) did not have an application to respond to these purposes and PROMESE-CAL was implementing the Dynamics® application for the HIV-related commodities. From this account, the central warehouse of the MoH and PROMESE-CAL send weekly stock reports to the DAM, however, in non-standardized formats. The SRS warehouses use the *Web-Based Medical Supply Stock Management* application, but the latter does not respond to all its needs. Only 48% of the CPN use an inventory management system in their pharmacies. The SNS is planning to install the Medicine and Input Logistics Administration application (SALMI, per its acronym in Spanish), but there is still no public financing or cooperation funds for these purposes.

Major weaknesses in managing supplies were in product quality control and waste management. PROMESE-CAL carries out quality control, but not for the PSC, whose products have prequalified laboratories and quality control by third parties. Sanitary disposal of expired products is neither systematized nor supervised.

4.2.5. Financing

The procurement of medicines and commodities for HIV control and co-morbidities is wholly financed with public resources. The products are procured at equal or lower prices compared with international reference[7]. During the

[7] 78% (7/9) of the products evaluated have equal or lower to the international reference

mapping workshop, participants mentioned that the budget assigned to procure medicines and health commodities has had no variations over the recent years and does not consider new interventions for the control of the epidemic and/or expansion to attain international goals.

PSC budgets do not include line items for storage and distribution of its products from the central level to the SRS and from the latter to the health facilities. The central level (SNS and PROMESE-CAL), 78% (7/9) of SRS, 56% (15/27) hospitals, 77% (4/6) CPN, and 30% of (2/8) NGOs report they had a budget deficit to cover the HIV-related commodity supply chain operations last year.

Government resources do not cover or are insufficient to finance:

- **The expansion of the PROMESE-CAL transportation fleet**: The current fleet is insufficient to satisfy the current needs, which have increased with the mass distribution of personal protection equipment and the support to other public agencies as part of the COVID-19 pandemic response.
- **The expansion of the SRS transportation fleet**: This is an important factor contributing to the stockouts in the health sites.
- **Procurement of essential inputs and materials to manage the supply chain management.** The study reports the lack of TCE, SUGEMI 1 forms, computers, and internet connection and RHS and sites.
- **Availability of funds for customs clearance**: The study documents a delay in the custom clearance of TB products, between 3 and 4 weeks from arrival to port. The lack of ready-available financial resources form the MoH and the prolonged processes of assessment, auditing, and authorization of payments of customs dues account for this situation.
- **Improvement of storage capacity and conditions**: The storage conditions in the CPN and some warehouses in the SRS are precarious: limited storage space, no ventilation, high temperature due to lack of air conditioning. Although storage conditions in PROMESE-CAL are better, the lack of space is the main reason for not having completed the transfer of TB products, family planning, and other PSC products to this warehouse.

5. Analysis

A medicine and health commodity supply management system aims to ensure continuous availability of products to satisfy the needs of a population. The NSCA evidenced that most of the sites evaluated were stocked at the time of the visit, but occasionally below the normal levels, which indicates that there are still problems in the supply chain. The SCMS Project has contributed to solving urgent and pressing issues, but due to budgetary constraints and the scope of the annual work plan, it has not had a bearing on the root causes and structural problems documented by the NSCA.

The assessment demonstrates that SUGEMI is an efficient system, extended throughout the public network at the national level. To guarantee uninterrupted stocks of HIV-related commodities and other essential medicines, and thus, the attainment of international goals, SUGEMI demands a more comprehensive and holistic approach with greater political support and financial resources for its strengthening, gap closure, and future sustainability.

An increase in the budget allocated from the Ministry of Finance to PROMESE-CAL would allow it to enhance its storage and transportation capacity and assign personnel to manage international purchases and inventories. A budget increase would allow for the transfer of procurement and storage management from the PSCs to PROMESE-CAL and would provide compliance with current legal mandates. In addition, public logistics management would be transferred to an entity -PROMESE-CAL- that does this with greater efficiency, as documented by the NSCA.

The budgetary increase and allocation of budget line items for logistics operations in the SRS would enhance its transportation capacity, shortening delivery times to the health facilities, procuring materials and equipment for the operation of SUGEMI, as well as assigning personnel in charge of logistics tasks.

The introduction of a new e-application to manage inventories linking regional warehouses and hospital/pharmacy warehouses would improve inventory, feeding with more accurate and timely data the SUGEMI's information system. This would improve the accuracy of the annual estimates for procurement, consumption, and availability records (areas that, according to the NSCA, show weaknesses) and the requisition and dispatch system.

In the medium and long term, other areas of weakness identified by the NSCA could be addressed, such as the absence of a standardized quality control system for pharmaceutical and health products, as well as a standard sanitary disposal procedure for expired and deteriorated products, particularly, when stored out of PROMESE-CAL warehouse.

6. Main Recommendations

6.1. Ministry of Public Health

1. **Update the basic essential medicine list:** Using the same methodology applied in 2018. At the same time, establishing a procedure to approve complementary essential medicine lists is required between updating periods.

2. **Transfer procurement and logistics from the PSC to PROMESE-CAL:** This would solve most non-conformities listed in this report and contribute to supply chain maturity. The transfer plan must include:
   - All PSCs
   - Strengthening of the International Procurement Division, by providing personnel, training, and offices.
   - Formal external audits of the procurement system, by the National Comptroller Office.
   - Using metrics to measure procurement performance, such as the number of bidders per product, procurement price compared with international standards, average time from the tender announcement to the award.
   - Appropriation of funds to PROMESE-CAL. Fund currently allocated by the Ministry of Finance to the MoH for the procurement of HIV products must be allocated to PROMESE-CAL.

3. **Include the cost of the operations of PROMESE-CAL and the SRS in the budgets of the PSC**: It is suggested to include budget line items to cover the PSC operations of the supply chain. These budgetary lines must be allocated to PROMESE-CAL and the SRS, based on a cost study.

4. **Include financing of new interventions**[8] to control the HIV epidemic and/or the cost of attaining international goals in the HIV National Strategic Plan (PEN, per its acronym in Spanish).

6.2. For The National Health Service

5. **Include supply chain interventions and activities in strategic and operational plans:** Logistic interventions and not usually included in the MoH and RHS strategic and operational plans. Using this assessment as input, both institutions should explicitly include long term goals (strategic plans), and activities for the following year

[8] index testing, Pre and Post Exposure Prophylaxis and other differentiated interventions for key populations not included in the HIV guidelines.

(operational plans). This will guarantee that the supply chain priorities are identified, functions and responsibilities are clarified, and objectives, reforms, and resources are adequately targeted and allocated. The following are some suggested interventions that can be included in the strategic plan and should later be operationalized in the operating plans:

1. The progressive habilitation[9] of the regional warehouses and hospital pharmaceutical services to comply with the practices regulated by the MSP and recommended by WHO.
2. Establishing pharmacy services in the CPN (currently called "medicine stock") as a service-production unit. This will mobilize the allocation of adequate facilities and sufficient and stable human resources.
3. Implementing effective cost recovery mechanisms for care provided to patients covered by public and private health insurance and earmarking a quota for the purchase of medicines and health commodities and logistic operations.
4. Strengthening of the distribution and transportation network to enable the warehouses to deliver the products in the site facilities promptly and under adequate conditions.
5. Strengthening the rational use of medicines in the health service network as a strategy to optimize the use of resources and avoid adverse effects on users. This activity includes the review of therapeutic guidelines, training of the prescribers, and prescription supervision and auditing.

The implementation and monitoring of the implementation plans must include the supply chain personnel of all levels to enhance their competencies in planning, and strategic management, and to facilitate the implementation and monitoring.

Donor agencies could consider, in their next two-year budgets, the inclusion of the necessary technical assistance to strengthen the initial implementation and monitoring. Public institutions don't usually have the resources to invest in baseline studies, trucks or warehouse conditioning. The financing of these activities may be considered by donor agencies, while the maintenance and recurrence cost should be assumed by the government.

6. **Update the job description manual for the supply chain personnel:** The manual was prepared in 2014 before the creation of the SNS, therefore, its organizational charts and job descriptions must be updated. This document must also include an organizational chart and job descriptions for the pharmacies at the CPN, which will lend greater stability to the personnel and contribute to a better performance of the supply chain.

7. **Implement the cost recovery of services provided to PSC patients covered by social security:** The SNS should establish a cost recovery mechanism for the PSC services provided to patients covered by social security schemes, without including the cost of products already covered by the PSC. This mechanism should include - based on a cost study- an intangible quota for the supply operations.

8. **Develop a costing study for the operations of the supply chain:** No costing study has been carried out for the operations of the public health supply chain of the Dominican Republic. This makes it difficult to estimate the magnitude of the deficit between the costs and the current budget. Consequently, no interventions aimed at closing gaps such as those described above can be supported. The costing study should include an analysis of the most cost-effective models, should be conducted by the SNS, and encompass the operations of PROMESE-CAL, SRS, and health facilities.

[9] The *habilitation* of public institution is conducted by the MoH. The facility should comply with minimum standards to deliver its functions and services. After and inspection, the MoH issues a certification.

9. **Implement a platform to develop supply chain online courses:** Online courses are a low-cost alternative to develop the capacities of the personnel. This reduces the impact of human resource turnover and other barriers identified in the study. Between 2020 and 2021, the SNS developed SUGEMI online training courses that reached 3,649 employees. The courses were executed on private platforms. Considering this background, establishing an office to implement and execute online courses as well as developing or contracting SNS's own platform; will enable establishing ongoing personnel certification mechanisms as part of their performance evaluation.

10. **Incorporate the inspectors of the control office in SUGEMI's inventory control procedure:** These inspectors must take part in the selective counts and total inventories and certify record matches, the software or the TCE, and the stocks counted. To achieve this, the SNS must modify the regional warehouse procedures, those of the hospital warehouses, and the reception and storage of the CPN.

11. **Install new follow-up and support offices of the Logistics Management Information System (LMIS) and strengthen existing ones at regional level:**
    The installation of these offices or the designation of a person within the DAM as responsible for monitoring and supporting the LMIS will contribute to improving the timeliness, accuracy, and completeness of SUGEMI information. This office or person must coordinate with the Information Technology Department of the SNS, the body responsible for the development and support of information systems and data quality. Among other functions, you must perform the following:
    - Monitoring of establishments that do not report or report late.
    - Plan the needs of the information system, for example, physical forms, computers, internet, etc.
    - Resolve incidents with electronic tools.
    - Promote meetings to analyze data and reports.
    - Implementation of quality control routines for the entered data and feedback.
    - Perform data audits.

12. **Install software for inventory management**: Procurement of computers, reproduction of paper forms, an updated connectivity to internet and assignment of data entry and supply management personnel will enable SNS to implement the Medicine and Input Logistics Administration System (SALMI) in the entire public network, starting with the SRS warehouses. The implementation of SALMI can be supported by cooperation agencies, including USAID and UNFPA.

13. **Implement a quality control system for post-delivery products used by the PSC:** This system must encompass the quality surveillance[10] of the overall supply chain due to the existing weaknesses during storage and transportation. Its implementation is feasible considering that PROMESE-CAL has procedures in place to control the quality of products of general use and that LNSP has installed capacities. This system must be designed and implemented by the SNS.

14. **Incorporate waste management and disposal in the procedures of SUGEMI:** This will contribute to eliminating products not fit for safe use for people and the environment. To accomplish this, SNS must modify the regional warehouse and hospital warehouse procedures, incorporating a disposal process in keeping with the national regulation.

[10] The quality of the products must be periodically verified, visually of through pharmacopoeia methods, since the transportation is not optimal, and many warehouses lack air conditioning.