

Guinea National Pharmaceutical Supply system Assessment

February 2017



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SLAPS 
Systems for Improved Access
to Pharmaceuticals and Services

Guinea National Pharmaceutical Management System Assessment

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The goal of the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program is to assure the availability of quality pharmaceutical products and effective pharmaceutical services to achieve desired health outcomes. Toward this end, the SIAPS result areas include improving governance, building capacity for pharmaceutical management and services, addressing information needed for decision-making in the pharmaceutical sector, strengthening financing strategies and mechanisms to improve access to medicines, and increasing quality pharmaceutical services.

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ACRONYMS AND ABBREVIATIONS

ACT	artemisinin-based combination therapy
ADR	adverse drug reaction
DHS	Demographic and Health Survey
AIDS	acquired immunodeficiency syndrome
ARV	antiretroviral
BSD	Bureau de Stratégie et Développement
CHW	community health worker
CNLS	Comité National de Lutte Contre le Sida
CS	<i>centre de santé</i> (health center)
DDS	Direction Départementale de la Santé (health department)
DNPM	National Directorate for Pharmacy and Medicines (Direction Nationale de la Pharmacie, et du Médicament)
DNSFN	Direction Nationale de la Santé Familiale et Nutrition
GoG	Government of Guinea
KPI	key performance indicator
LMIS	logistic management information system
MIS	Management Information Systems
MOH	Ministry of Health
NEML	National Essential Medicine List
NGO	nongovernmental organization
PCG	Pharmacie Centrale de la Guinée
PND	Plan national de développement sanitaire (National Health Development Strategy)
PNLP	Programme National de Lutte contre le Paludisme
PNLAT	Programme National de Lutte Anti Tuberculose
PNLS	Programme National de Lutte contre le SIDA
PNLP	Programme National de Lutte contre le Paludisme
SIAPS	Systems for Improved Access to Pharmaceuticals and Services
SOP	standard operating procedures
USAID	US Agency for International Development
WHO	World Health Organization

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EXECUTIVE SUMMARY

Guinea's National Health Development Strategy (*Plan national de développement sanitaire*, or PNDS) for 2015 - 2024 recognizes the centrality of a reliable supply of medicines and other health products in disease control for attainment of broader health goals such reduction of mortality and morbidity related to communicable and non-communicable diseases, and emergency situations, and to improve health at all stages of life. In fact, the three objectives of the strategy are: (a) strengthen prevention and management of diseases and emergency situations, (b) promote health of mother, child, adolescent and elderly, and (c) strengthen national health system. However, a nationally representative indicator based assessment of public sector pharmaceutical supply management system, which would allow informed planning of system strengthening interventions, has never been conducted. To this end, the [US USAID's](#) Systems for Improved Access to Pharmaceuticals and Services (SIAPS) in collaboration with the National Directorate of Pharmacies and Medicines (DNPM) of the Ministry of Health (MoH) conducted a comprehensive assessment of the Guinea pharmaceutical supply system for the public health sector from September 29th – October 29th 2016.

Overall the capability/maturity levels of the pharmaceutical supply system in Guinea varied by functional area. Capability/maturity ranged from 73 percent (product selection) to 40 percent (laboratory). Regarding the performance of pharmaceutical supply system, order fill rate was as low as 47% between PCG regional depots and health facilities whereas the average stock out rate was 27%.

Results of this assessment also show that 53% of resupply orders placed by health centers at PCG regional warehouses (Dépôts régionaux PCG) in the last 12 months were not met. This situation negatively affects medicine availability at health facility level, as shown by a six-month average stock out rate of 27%. This obviously limits the population's access to medicines, given that regional depots are the principal source of medicines for health facilities. Identified supply chain capability weaknesses, which contribute to limited availability and access to medicines of the population, include poor warehousing and inventory management practices, acute shortage of qualified human resources, and inadequacies in logistics management information. Additional weaknesses include inadequate pharmaceutical system governance and noncompliance with procedures, pharmacovigilance, and regulatory capabilities.

More generally, this assessment found a few supply chain functional areas having satisfactory capability maturity, including medicine selection, quantification of needs, procurement management, and means of transport. In addition, stock cards and logistics management reports are widely available in health facilities. However, the country's supply system reaps little benefit from these capabilities because of limitations attributable to the identified weaknesses.

Table 1: Guinea Supply Chain Assessment Results

Guinea public health supply chain assessment results			
Functional areas	Capability maturity	KPI	
Overall		Availability of stock card	77.0%
		Stock card up-to-date	78.0%
		Stock out rate (over the past 6 months prior to the assessment)	27.0%
		Stock out rate on the day of the visit	22.0%
		Stock accuracy (Regional depots & health facilities)	38.0%
Product selection	73%	National Essential Medicines List availability	84.0%
		Quality testing	100.0%
		% of products tested confirming to quality standards	98.1%
Quantification	58%		
Procurement	66%	Supplier On-Time delivery	64.0%
		Supplier Order Fill rate	99.5%
		% of Products procured on NEML	99.3%
		% variance between prices paid and international reference prices	20%
		Order turnaround time	42.2 days
Storage and Inventory management	47%	Stock accuracy (PCG)	100.0%
		Stock out rate (PCG)	35.0%
		% of quantity ordered as emergency order	10.0%
		Order Fill rate (PCG - Regional depots)	29.0%
		Order Fill rate (Regional depots - health facilities)	47.0%
Transportation	60%		
Waste management	42%		
Laboratory (hospitals)	40%		
LMIS		LMIS reporting rate	65%
		LMIS On-Time Reporting	67%
		LMIS reports' completeness	46%

The assessment demonstrates that low capability maturity at the lower levels of the supply chain significantly decreases the maturity of the system as a whole.

Table 2: Capability Maturity Model by Supply Chain Level

Capability Maturity Model by Supply Chain Level				
Functional area	Peripheral level (health center)	Intermediary level	Central	National
Product selection			73%	73%
Quantification			58%	58%
Procurement			69%	69%
Storage and Inventory management	30%	49%	59%	47%
Transportation			60%	60%
Waste management	20%	29%	59%	42%
Laboratory		40%		40%

Comparing the performance in each functional against the corresponding assessed capabilities, only product selection and procurement were above 70%, highlighting potential areas where supply chain to focus systems improvements.

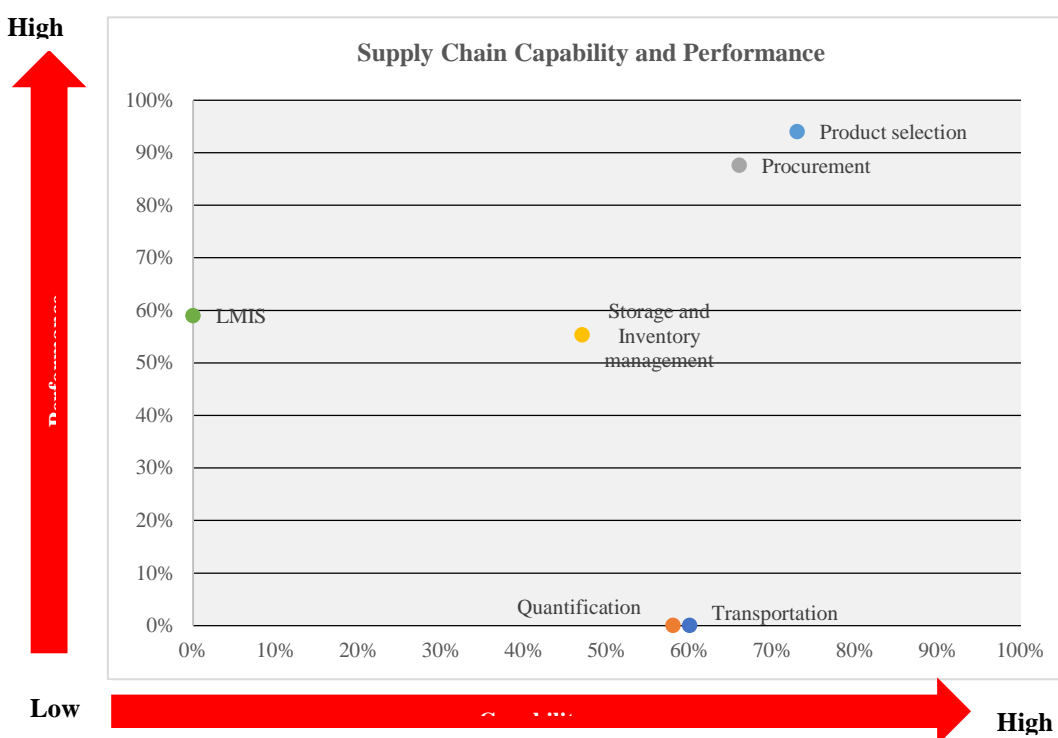


Figure 1: Supply chain Capability & Performance¹

The health supply chain is only a part of a broader pharmaceutical management system that includes effective governance, regulation, pharmacovigilance, financing and logistics functions, which must be in harmony. It is therefore crucial that identified weaknesses are addressed to enable optimal system performance, which will result in sustained availability of safe, efficacious, and affordable medicines at service delivery points and thereby achieve many desired health outcomes.

This report presents information on the capability, maturity, and operational performance of Guinea's pharmaceutical supply system, along with recommended actions to address identified weaknesses to allow reliable supply and use of medicines in the health system.

¹ Some supply chain functions were not evaluated in both capability and performance. Quantification and Transportation were measured on capability only due to a lack of performance measures. LMIS was measured on performance only.

INTRODUCTION

In order to achieve desired health prevention and treatment outcomes, not only must good quality, safe and efficacious medicines and other health products be available at the point of healthcare delivery, they must also be appropriately used. Therefore, existence of resilient medicines management system, a subsystem of the health system in a country, is crucial for achieving health goals.

Cognizant of this, the government of the Republic of Guinea along with its partners has embarked on implementation of activities for strengthening medicines management in the country. In this light, Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program, with funding from USAID, undertook this assessment in close collaboration with and under the leadership of the Ministry of Health (MOH), represented by the DNPM, which is the regulatory entity with responsibility for coordinating efforts by all actors including technical partners involved in pharmaceutical management in the country. Findings from the assessment are expected to (a) show the level of maturity of the country's public sector medicines management system and its operational performance, and (b) highlight areas of weakness that may be targeted by future interventions supported by government and its partners for strengthening the medicines management system.

The assessment was organized in three phases (a) pre-assessment stakeholder consultations and refinement of scope of assessment; (b) data collection and analysis, and (c) stakeholder review of results and formulation of recommendations for medicines management system strengthening. The first two phases were completed in May and November 2016, and the third phase completed in December 2016.

As part of this assessment, the SIAPS team reviewed relevant and recent assessments conducted in the country, along with their recommendations and implementation status. In meetings with government health officials, donors, technical partners, and other key stakeholders, the SIAPS team designed a thorough data collection process based on an agreed methodology; managed and oversaw data collection at the central, regional, district, and community levels; and analyzed, interpreted, and presented the results to stakeholders for validation.

BACKGROUND

The Republic of Guinea is a country located in the south-west of West Africa and has a surface area of 245,857 km² for a current population of 11.77 million inhabitants (UNDP, 2014). Although the country is endowed with significant natural resources, it is one of the poorest countries in the world with human development index ranking of 182nd out of 188 countries (UNDP, 2015). Infrastructure is very weak, for example, total paved roads are 4.35km per 10,000inhabitants (AIDI 2013).² Health allocation represented 2.4% of the total national budget on average over the period 2010-2012. Out-of-pocket health expenditure (% of private expenditure on health) is 88%, against a sub-Saharan average of 34.5% (WHO, 2014).

Between 2005 and 2012, maternal mortality ratio fell from 980 to 724 per 100,000 live births, under-five child mortality declined from 163% to 123% and infant mortality of 91% to 67% (DHS, 2005 and 2012). Despite the observed decreases, maternal mortality and under-five child mortality remains very high. In 2014, the country suffered an Ebola epidemic, which resulted in 1,174 deaths that included health personnel. This overwhelmed the health system and workforce, significantly affecting the quality and supply of healthcare services.

The vision of Guinea's health policy is that of a country where the entire population is healthy, economically and socially productive, with universal access to quality health care and services, including their full participation. The Government, through the implementation of this policy, which is strongly oriented towards universal health coverage, aims to develop an efficient health system, guaranteeing quality care and equity of access to the whole population (PNDS 2015 - 2024).

The health system is organized into 3 levels: central, intermediate (regional) and peripheral (prefectural and community). The central level is responsible for the functions of regulation of the sector, the direction of actions, coordination and allocation of resources. The regional level supports health districts and the prefectural level in the implementation of health policies.

Guinea's public health supply chain

The public health supply chain sub-sector is organized according to this pyramidal health system and consists of the PCG, central, regional and prefectural hospital pharmacies, health facility and community dispensing outlets. Guinea's public health supply chain is partially integrated. Some parallel supply chains are in place for specific programs (for e.g. Immunization program).

² https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/Economic_Brief_-_The_Africa_Infrastructure_Development_Index.pdf

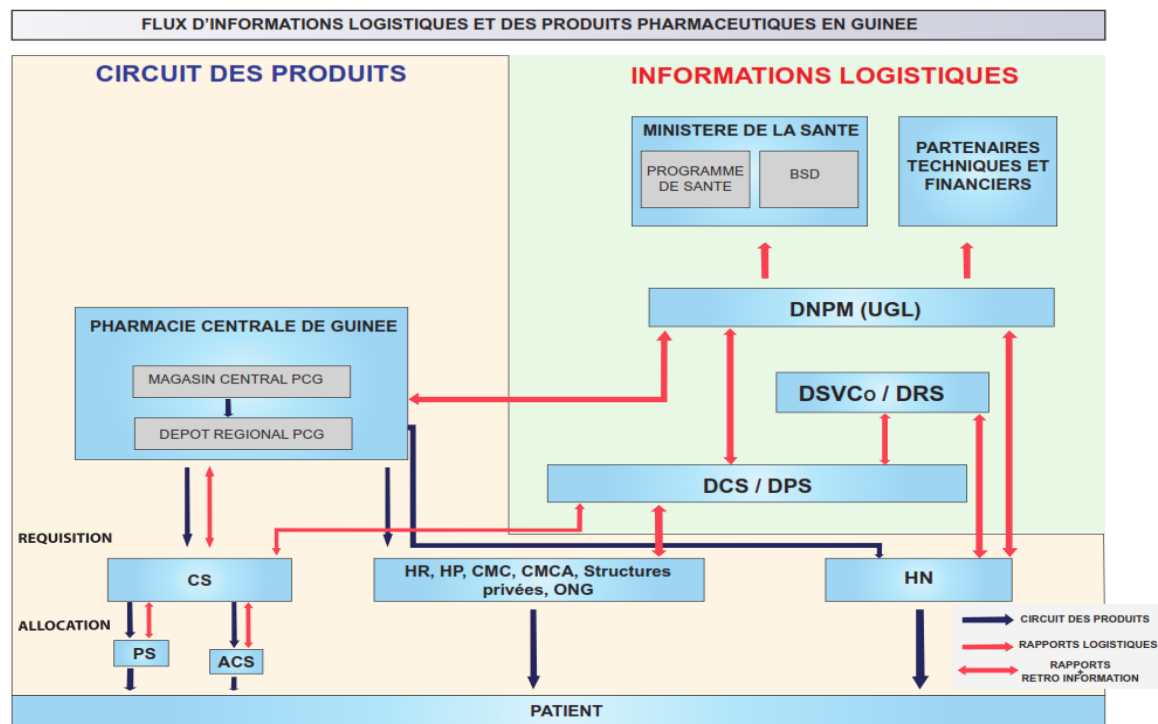


Figure 2: Guinea Public Health Supply chain System

Source : Manuel des Procédures de Gestion Logistique Intégrée des Produits Pharmaceutiques, Ministère de la Santé, Octobre 2016

PCG is a parastatal institution created in 1992. Its mission is to procure and distribute medicines and other health products. Under supervision of the Ministry of health, it enjoys management autonomy. It comprises a central warehouse and six regional depots in Conakry, Boké, Labé, Kankan, Faranah and Nzérékoré. Through an agreement established between the State and PCG, it is supposed to be the preferred quasi-public health products supply entity in the country. However, this agreement has not been fully implemented.

PCG has six regional depots and a central warehouse in Conakry. Each depot serves health facilities in its geographical area, with the exception of guinea maritime and Labé, which also supply Kindia and Mamou respectively. Regional depots purchase products required for all priority health programs from PCG. However, although health facilities (hospitals and health centers) purchase products from linked regional depots, they sometimes purchase products from private sector commercial sources. Health centers supply products to health posts and community health workers (CHWs).

Alongside the public pharmaceutical supply system is one approved pharmaceutical manufacturer (Guinean MOH, 2011). However, the pharmaceutical sector operates in an environment of weak rule of law and regulatory systems, limited public-private partnership track record, and strong tendencies towards constrained pools of skilled labor.³ West African production is very low, on average 10% of the regional pharmaceutical market (Coulibaly, 2010). Therefore, the part of the quality assured pharmaceutical market covered by the lone approved company is negligible.

³<https://www.ifc.org/wps/wcm/connect/c019bf004f4c6ebfbd99ff032730e94e/Mine+Infra+Report+Final+Copy.pdf?MOD=AJPERES>

Consequently, improvement of access to medicines and other health products has been identified as one of the strategic priorities in the country's health development plan for the period 2015 to 2024. Also, the plan includes development of leadership and governance in the health system as a strategic priority.

METHODOLOGY

Achievement of health outcomes relies on high-performing pharmaceutical management systems that ensure access, availability, and affordability of health commodities. Supply chain performance management involves the activities an organization undertakes to ensure product availability, the monitoring of progress toward this goal, and the process for determining course corrections to reach this goal more effectively and efficiently.⁴

Monitoring and assessing supply chain capability maturity and performance provides the information necessary for an evidence-based decision-making process, providing managers, governments, and donors a platform to determine the most appropriate management actions and systems strengthening activities. This process ensures return on investment in terms of value for money and maximum impact on health outcomes.

To understand the current state of a supply chain, it is important to evaluate both capability maturity and performance, which define the ability of a health supply chain to ensure access and availability to health commodities.

Capability maturity: Defines the current state of the infrastructure, processes, technology, and human resources across the functions of a supply chain

Performance: Defines the current performance of a supply chain across supply chain functions, defined by key indicators

The National Supply Chain Assessment provides two tools to assess the current state of a supply chain's capability maturity and performance: the capability maturity model tool and the supply chain key performance indicators (KPIs) assessment.

The capability maturity model is a diagnostic tool that assesses the capability maturity of a supply chain at multiple levels, from the central level to service delivery points, and across the functional areas and cross-cutting organizational elements such as human resources and infrastructure. Capability is benchmarked against five established maturity levels, using a scale of 1–5, with 5 being the most mature (see figure 1). The maturity levels were adapted from private sector best practices to fit the public sector health context.

⁴ McNamara C. 2012. <http://managementhelp.org/organizationalperformance/index.htm>

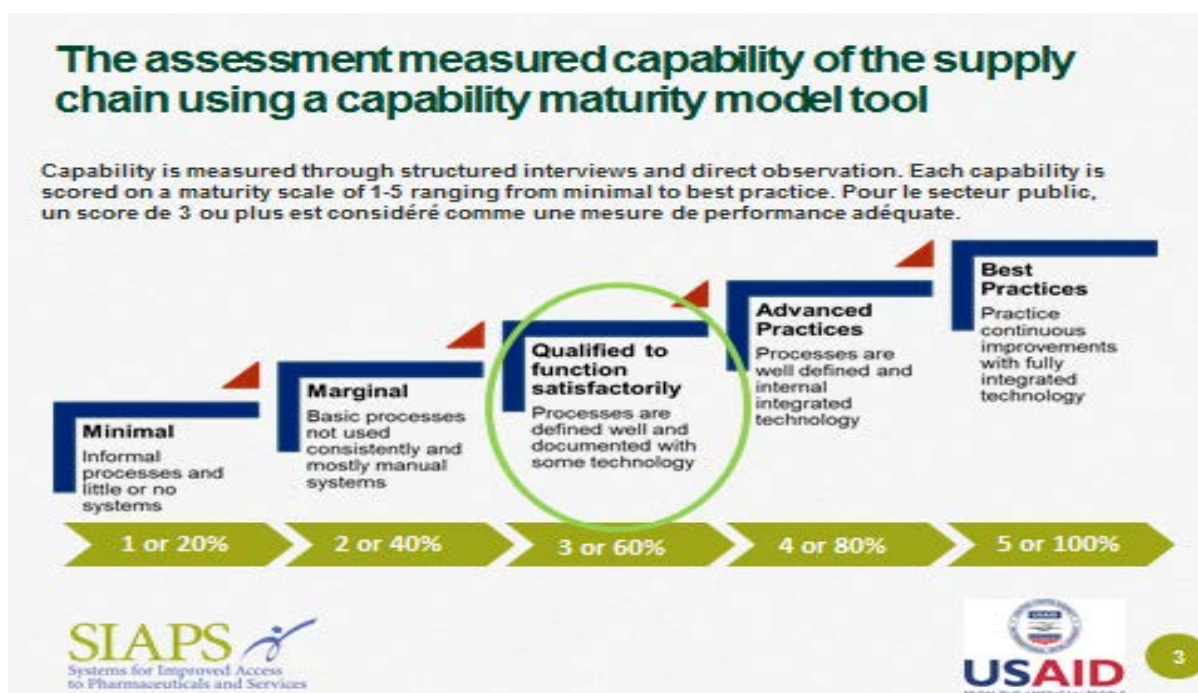


Figure 3: Supply chain capability maturity scale

The supply chain key performance indicators (KPIs) is a set of core indicators that comprehensively measure the performance of a health supply chain, addressing both the overarching performance and the performance of the functional areas.

KPIs were agreed upon by the DNPM and the different Health Programs under the ministry of health and included indicators for most supply chain functions shown in table 1. To assess important aspects identified and prioritized during assessment planning meetings with stakeholders in Guinea, SIAPS supplemented the standard National Supply Chain Assessment questionnaires and forms with a series of new questions, which were shared with and validated by DNPM and associated programs.

In the final analysis of the results, information from other pertinent assessments conducted in Guinea and contained in national health policy and strategic development plan documents collected by the team was leveraged in the development of final results and conclusions.

Table 3: Key Performance Indicators to Measure Performance of the Supply Chain

Supply Chain Function	Key Performance Indicator
Product Selection	Percentage of facilities with copy of essential medicines list
	Percentage of products tested that conform to quality standards
	Percentage of procurements carried out in conformity with the National Essential Medicines List
Information on the facility	Availability of computer, Internet, electricity, water and Electric generator
Procurement	Supplier on-time delivery
	Supplier order fulfilment rate
	Order fulfilment lead time
	Percentage deviation from “International Drug Price Indicator”
Warehousing and Inventory Management	Types of inventory management tools used
	Availability of stock cards
	Average number of months of stock available
	Percentage of orders according to type of order and supplier
	Availability of minimum-maximum stock levels
	Percentage of stock outs (6 month average)
	Percentage of stock out (the day of the visit)
	Percentage stock accuracy
	Order fulfilment rate
	Percentage of orders modified by the supplier (reasons for modifications)
	Percentage of key storage conditions satisfied
Transport	Means of transport utilized
SIGL	Percentage of health facilities in possession of LMIS reports
	Percentage of health facilities that submit LMIS reports on time
	Percentage of health facilities that submit complete LMIS reports

SCOPE OF THE ASSESSMENT

The assessment analyzed the overall operational capacity and performance of the public health pharmaceutical management system, highlighting main gaps and opportunities for improvement.

All functional areas of pharmaceutical management were evaluated, including product selection, forecasting and supply planning (quantification), procurement, warehousing and inventory management, transportation and distribution, waste management, and laboratory issuing. Additional cross-cutting areas assessed included governance and pharmacovigilance.

For each functional area an in-depth assessment was done of enabling factors such as processes and tools, management information systems, infrastructure and equipment, oversight and monitoring and evaluation, and human resources, as applicable. These aspects were evaluated at all levels of the public health pharmaceutical system, particularly in pharmaceutical warehouses and health facilities at the central, regional and peripheral levels, as well as at the level of the community - CHWs.

A broad view of the public pharmaceutical management system for essential medicines was taken in the analysis. For specific indicators of performance, a list of tracer medicines and other health commodities were identified in collaboration with DNMP and MOH priority health programs, including maternal, newborn, and child health, family planning, malaria, HIV and TB medicines and other health commodities.

Sampling

Using the health facilities database from the *Bureau de Stratégie et Développement* (BSD) of MOH, SIAPS worked with the National Institute of Statistics of Guinea to determine and validate the sample size. The assessment used a stratified sample of 144 of publicly supported facilities in Guinea. First the total number of health facilities was partitioned into groups or *strata* per region. This stratification was done in such a way to ensure that the final sample was representative of facility volume in each region. Within each region, all hospitals were selected as they conduct the majority of supply chain activities in their region. Additional health facilities were randomly selected to arrive at the sampled number of health facilities in each specific region. To account for the community level, health posts and Community Health Workers (CHWs) were also added using the ratio of 1 health post and 2 CHWs per two health centers. MOH vertical programs, PCG and national referral hospitals were included as central level health facilities for the assessment.

A 21-item tracer list was selected for use during the assessment and included key public health program commodities and some essential medicines and Ebola Infection and Prevention control commodities. Table 4 shows the tracer items list.

Table 4: Tracer items list

#	Product name	Health program	Level of use			
			Hospital	Health center	Health Post	CHW
1	Ocytocine 10 UI injectable 1ml	Family Planning and Nutrition	X			
2	Phytomenadione (Vitamine K1)10mg/ml injectable	Family Planning and Nutrition	X			
3	Magnésium Sulfate 50% 10ml	Family Planning and Nutrition	X	X		
4	DIU	Family Planning and Nutrition	X	X		
5	Implant	Family Planning and Nutrition	X	X		
6	Microgynon	Family Planning and Nutrition	X	X		
7	CTA pour Petit Enfant (ASAQ ou AL)	Malaria	X	X	X	X
8	Sulfadoxine/Pyrimethamine 500mg/25mg	Malaria	X	X		
9	Test de Diagnostic Rapide	Malaria	X	X	X	X
10	Amoxicilline 500 mg comprimés	Essential medicines	X	X	X	X
11	Paracétamol 500 mg	Essential medicines	X	X	X	X
12	Ampicilline 1 g, poudre préparation injectable	Essential medicines	X			
13	Tenofovir/Emtricitabine/Efavirenz 200/300/600 mg	HIV	X	X		
14	Zidovudine/Lamivudine/Nevirapine 60/30/50 mg	HIV	X	X		
15	Determine, VIH 1/2, Test	HIV	X	X		
16	RH (150 +75) mg comprimé	Tuberculosis				
17	RHE (150 + 75 + 275)mg comprimé	Tuberculosis				
18	RHZE (150 + 75 +400 +275) mg comprimé	Tuberculosis				
19	Gant d'examen (pièce)	Infection Prevention & Control	X	X		
20	Chlore concentré 5%, sol usage ext, flacon de 250ml	Infection Prevention & Control	X	X		
21	Dispositif de lavage de mains (prévention des infections)	Infection Prevention & Control	X	X		

Data collection and analysis

After endorsement of the assessment methodology by INS, BSD and the various health programs, the assessment was carried out from 17-29 October 2016.

Data collection tools were developed and administered at three levels of the health pyramid: Central level questionnaires: Product selection, procurement, quantification, capability maturity, transport, pharmaceutical waste management, governance and pharmacovigilance. Intermediate/regional level: regional depot, regional hospital
Peripheral level questionnaires: prefectural hospital and the laboratory, health facility, health post, community health workers, stock management, downstream and upstream orders, and LMIS.

Table 5: CMM questionnaires administration by Level

Functional area	Central	Regional	Peripheral (hospitals and health centers)	Health Posts and CHWs
Product selection	Yes	No	No	No
Quantification	Yes	No	No	No
Procurement	Yes	No	No	No
Storage and Inventory management	Yes	Yes	Yes	Yes
Transportation	Yes	Yes	Yes	Yes
Waste management	Yes	Yes	Yes	Yes
Laboratory	No	Yes	Yes	No
LMIS	No	Yes	Yes	Yes

SurveyCTO server was used to collect data in an Excel/CSV format using alphanumeric tablets. After collection, data was exported in the same Excel format to SPSS software for cleaning and analysis.

KPI tool

At each site visit data collection teams also collected data for several KPIs. The data sources were collected and evaluated for each indicator with data entered into the Survey CTO server. Similar to the CMM tool, different KPIs were implemented at each supply chain level based on strategic needs and feasibility.

Table 6: KPI assessment by Level

KPI	Central	Regional	Peripheral (hospitals and health centers)	Health Posts and CHWs
Stock out rate	Yes	Yes	Yes	Yes
Stock accuracy	Yes	Yes	Yes	Yes
NEML availability	Yes	Yes	Yes	No
% of Products procured on NEML	Yes	No	No	No
Supplier OTD	Yes	No	No	No
Supplier Order Fill Rate	Yes	No	No	No

KPI	Central	Regional	Peripheral (hospitals and health centers)	Health Posts and CHWs
% of Emergency orders	No	Yes	Yes	Yes
Order Fill Rate	No	Yes	Yes	Yes
LMIS reporting rate	No	Yes	Yes	Yes

Health facilities included in the sample were public hospitals and health centers only. Although the final results of the assessment are disaggregated by supply chain level, comparisons between geographical clusters (for example, between one region and another) should be avoided.

In addition to the entities managing medicines and other health commodities, other key informants (government, partner and community stakeholders) were interviewed as part of the data collection process to obtain additional qualitative information. The final sample of facilities and key informants is shown in detailed in annex B.

FINDINGS – GENERAL INFORMATION

With the exception of hospitals and PCG regional depots, access to health centers is mostly (72%) by untarred roads. This suggests that most health facilities are located in the most hard to reach areas in a wide variety of geographic settings.

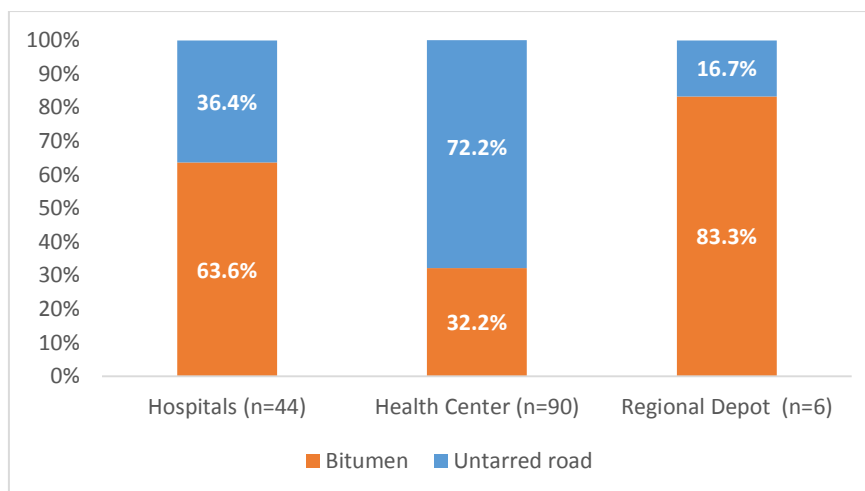


Figure 4: Type of road access by facility types

Access to electricity and water remains very low at health centers as compared to hospitals and regional depots. When analyzed at the disaggregated level, the assessment results show that accessibility to electricity and water decreases downstream in the supply chain system. In fact, accessibility to electricity was 100% for regional depots whereas only 17.8 % of health centers had access to electricity.

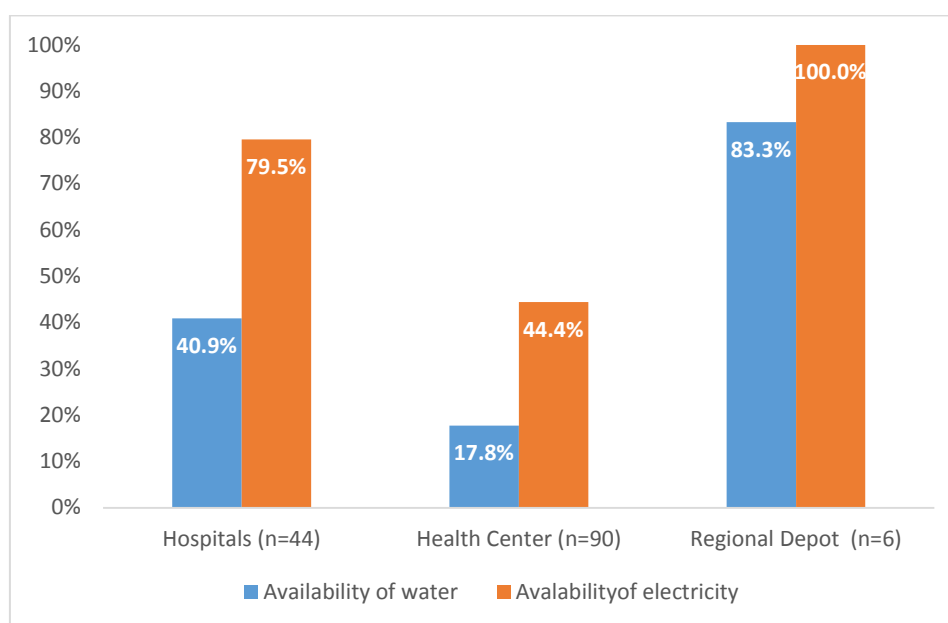


Figure 5: Accessibility of electricity and water by facility types

Information technology (computer and internet in this case) greatly facilitate the work of supply chain managers by enabling faster collection, transmission, and aggregation of data; by reducing human error in calculations; and by allowing for visibility of data up and down the supply chain. Overall availability of computer and internet dedicated to logistics activities is very low. When analyzed at the disaggregated level, the assessment results show that the

availability of computers and internet decreases downstream in the supply chain. Computer availability was higher at the regional depots (100%) and lower for health centers (36.7%). Internet availability followed the same trend i.e. 50% at the regional depot and 7.8% at the health center level.

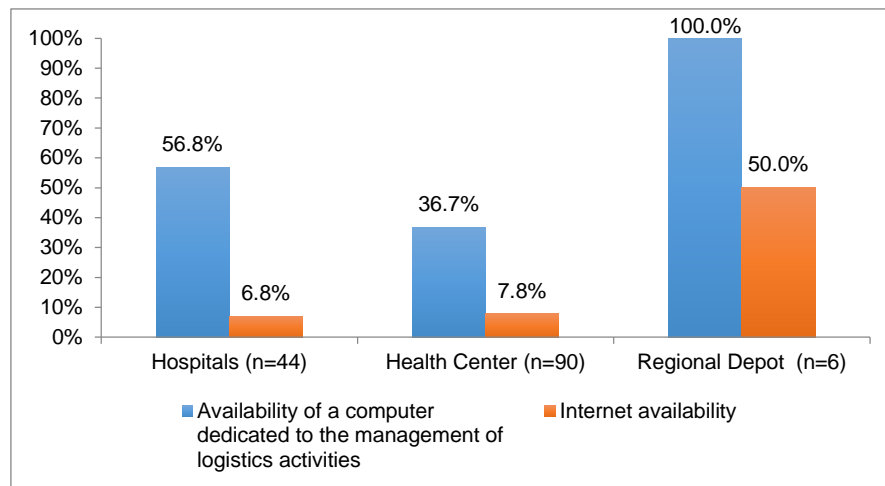


Figure 6: Availability of computer and internet for logistics activities

A logistics system can only work if well-trained and efficient staffs place orders, move boxes, and provide goods to clients. Health programs must be organized to provide the appropriate resources (for example, supervision support and technical knowledge) for completing logistics activities. The assessment results reveal a shortage of human resources for supply management at all levels in the supply network.

Table 7: Human resources for supply chain management (average)

Type of facility	Pharmacist	Pharmaceutical store manager (Storekeeper)	Nurse	Midwife	Health technician
Hospital	2.1	0.5	1.4	0.4	2.3
Health center	0.1	0.6	0.7	0.3	2.4
Regional depot	1.5	0.5	0.0	0.0	0.0

With the exception of the regional depots, there are no designated staffs, nor were competencies indicated for supply chain positions in more than 54% of hospitals and 72% of health centers surveyed (see figure below)

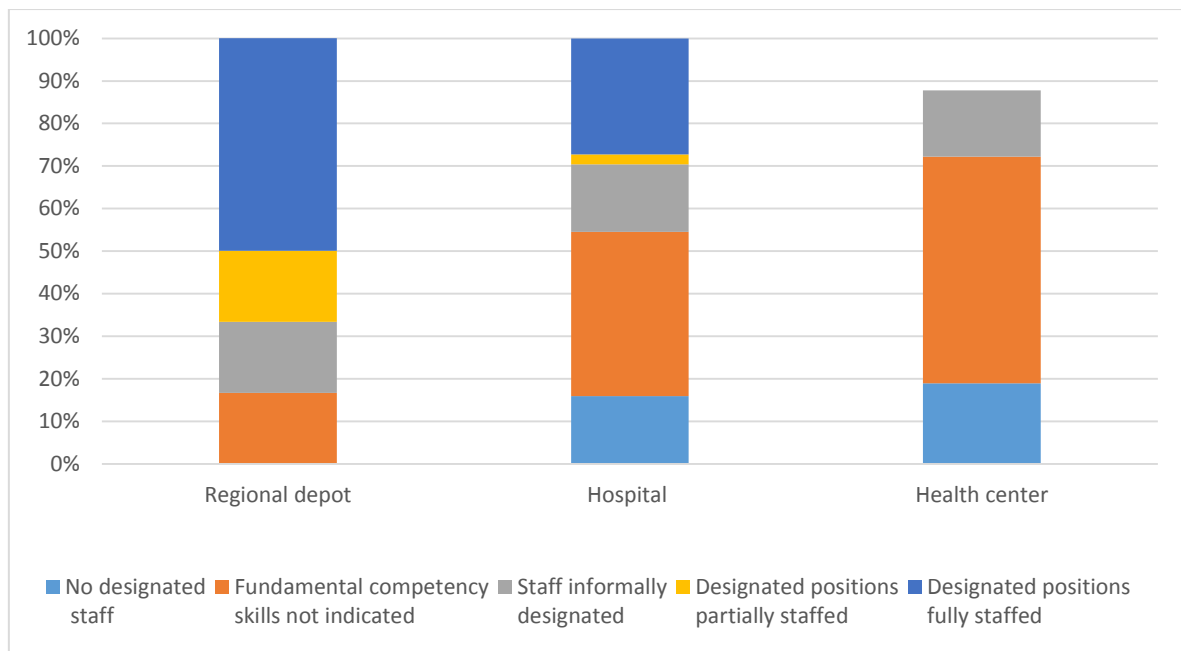


Figure 7: Staffing of supply chain positions in health facilities

Overall most health professionals involved in supply chain management of healthcare commodities at the regional, hospital and health facility level have received training in logistics management and have also benefited from at least one capacity building session (see figure below)

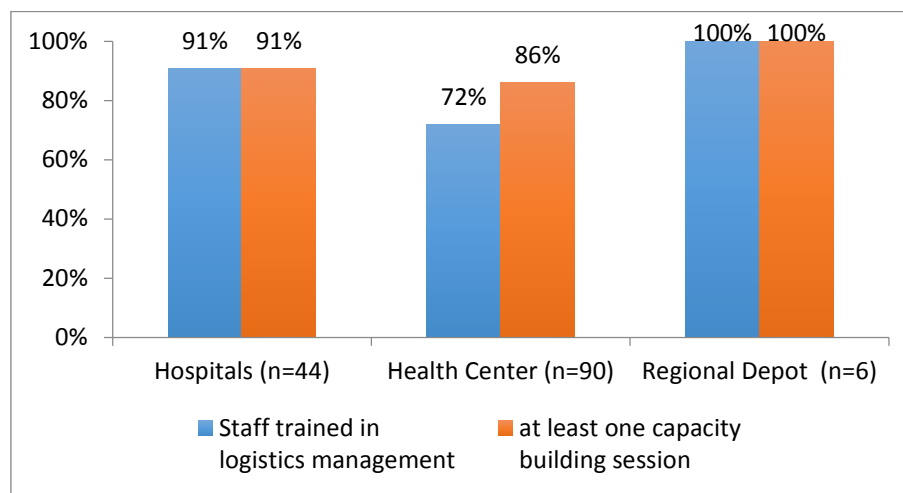


Figure 8: Training of health facility personnel in logistics management

FINDINGS – CAPABILITY MATURITY AND PERFORMANCE

For the purpose of presentation of results, all CMM scores are converted to a 0-100% scale rather than 1-5 scale: 1=20%, 2=40%, 3=60%, 4=80%, and 5=100%

Overall Findings

Overall, the capability maturity levels of the pharmaceutical supply system in Guinea varied by functional area. Capability maturity ranged from 73 percent (product selection) to 40 percent (laboratory). Regarding performance of the pharmaceutical supply system, order fill rate was as low as 47% between PCG regional depots and health facilities whereas the average stock out rate was 27%.

Table 8: Overall findings of the National Pharmaceutical Supply System Assessment

Guinea public sector pharmaceutical supply system assessment results			
Functional area	Capability maturity	Key Performance Indicator	
Overall		Availability of stock card	77.0%
		Stock card up-to-date	78.0%
		Stock out rate (over the past 6 months prior to the assessment)	27.0%
		Stock out rate on the day of the visit	22.0%
		Stock accuracy (Regional depots & health facilities)	38.0%
Product selection	73%	National Essential Medicines List availability	84.0%
		Quality testing	100.0%
		% of products tested confirming to quality standards	98.1%
Quantification	58%		
Procurement	69%	Supplier On-Time delivery	64.0%
		Supplier Order Fill rate	99.5%
		% of Products procured on NEML	99.3%
		% variance between prices paid and international reference prices	20%
		Order turnaround time	42.2 days
Storage and Inventory management	47%	Stock accuracy (PCG)	100.0%
		Stock out rate (PCG)	35.0%
		% of quantity ordered as emergency order	10.0%
		Order Fill rate (PCG - Regional depots)	47.0%
		Order Fill rate (Regional depots - health facilities)	39.3%
Transportation	63%		
Waste management	42%		
Laboratory (hospitals)	40%		
LMIS		LMIS reporting rate	65%
		LMIS On-Time Reporting	67%
		LMIS reports 'completeness	46%

Results reveal two distinct trends across all functional areas in the supply chain:

Strong performance of program product supply chains, while essential medicines supply chain faces challenges. Overall, performance indicators for program products were higher than for essential medicines supply. While stock out rate was higher for essential medicines supply i.e. 49.8%, this was lower for program products (FP: 21%, Malaria: 26%, HIV: 18%, TB: 27%)

Across all functional areas, the capability of the supply chain with regard to processes and tools as well as monitoring & evaluation was weak.

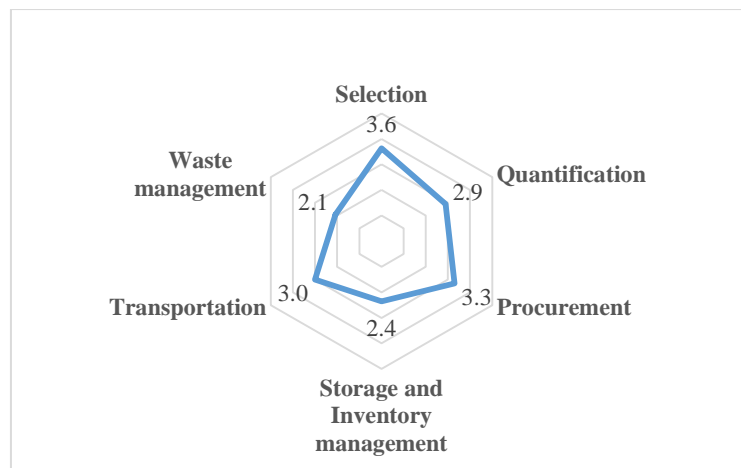


Figure 9: Public Sector Pharmaceutical Supply System Capability

Comparing the performance in each functional area against the assessed capabilities, only product selection was above 70%, highlighting potential areas where supply chain systems improvements may be focused. The lack of sound tools and processes compounded by the weaknesses of monitoring and evaluation systems at the lower levels put the supply chain at risk of poor performance, impacting the performance of quantification, procurement and waste management.

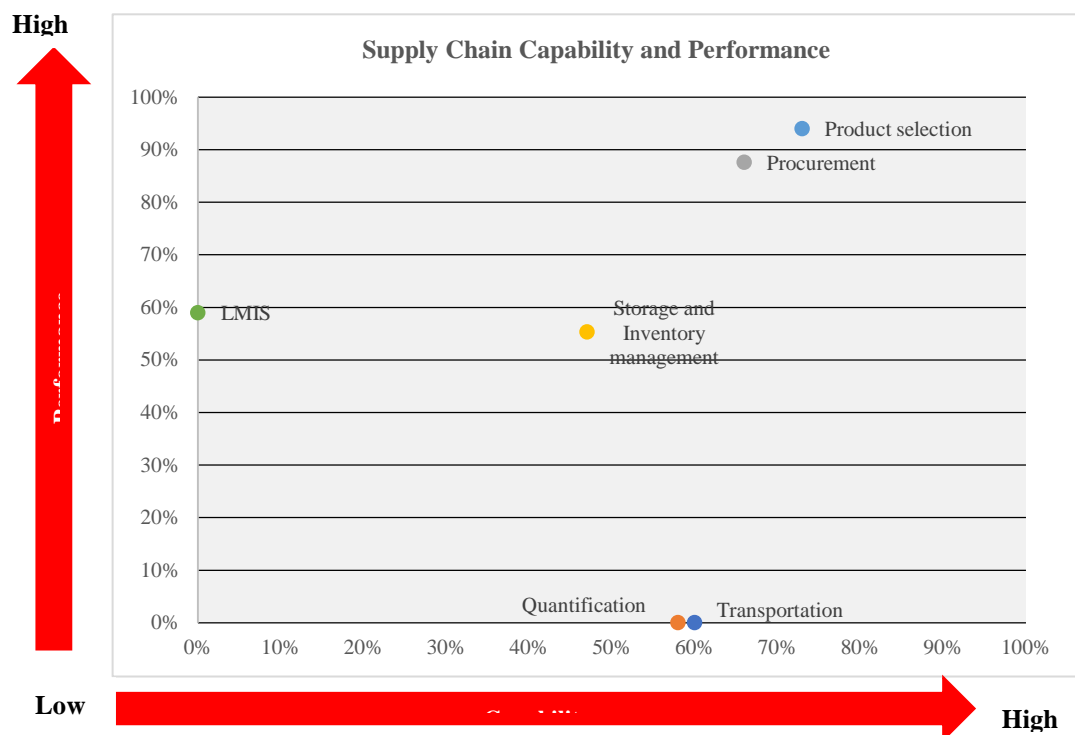


Figure 10: Public Sector Pharmaceutical Supply System Capability and Performance⁵

⁵ Some supply chain functional areas were not evaluated on capability and performance. Quantification and transportation were measured on capability only due to lack of KPIs for these areas. LMIS was measured on performance only.

Regarding KPIs, although stock card availability and recordkeeping practices were good, stock-out rates were high both on the day of visit (22%) and historically (27%). Although a majority of surveyed facilities produce paper-based reports on stock management, LMIS reports, on time, most of these reports (54%) are incomplete. Also, order fulfilment rate was below average, 39.3% at PCG at regional depots. This together with incomplete LMIS reports contributes to the observed high stock out rates.

Governance and product selection

Capability maturity level: 73%

There is a mechanism in place to monitor procurement of health products in the country. This mechanism obeys public procurement code and law. A tender Committee exists under PCG, which is responsible for supplier selection for restricted tendering, and makes decisions about tender contracts. Written transparent procurement procedures, which are publicly available, are in use. These procedures require use of pharmaceutical generic names, compliance with the national list of essential medicines, and the publication of calls for tender. However, there is no system in place to allow the procurement committee to follow up on supplier performance post contract awards. It would be beneficial to apply modern technology in this area.

Product selection capability and performance are high. Overall capability for product selection is high (73%) as the National Essential Medicines List (NEML) and Standard Treatment Guidelines (STG) are in place. MOH adopted the essential drugs concept since the introduction of the primary health care system in 1987 as the foundation of the country's health care. MOH has been operating the essential drugs policy, however NEML and STGs have not been regularly updated as recommended by the World Health Organization (WHO). Clinical guidelines are also developed by PNL, PNL and PNLAT and used to improve prescription and use of program products in the healthcare system.

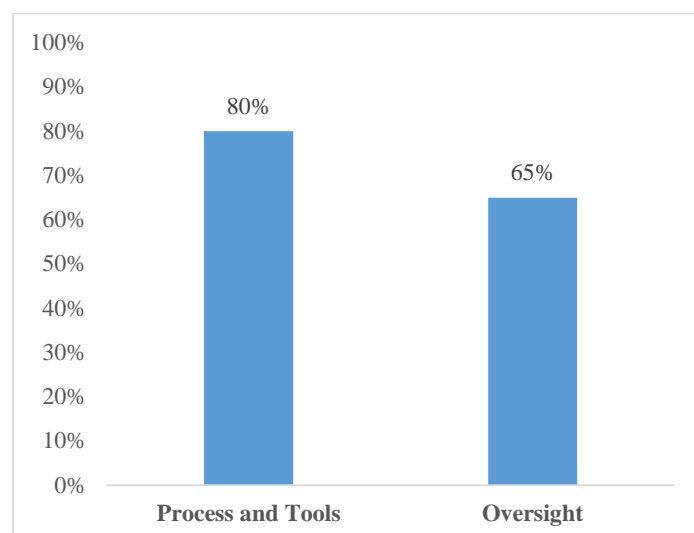


Figure 11: Product selection capability by enabler

% of products procured based on NEML: 99.3%

Of all the functional areas, product selection has the highest maturity and performance levels. Based on 2015 tender run by PCG, it was found that 99.3% of products procured were on the NEML. Out of 136 items procured, only one item could not be found on the NEML. This item was multivitamin tablet. This illustrates that product selection for essential medicines procurement by PCG complies with the essential medicines policy established by the MOH.

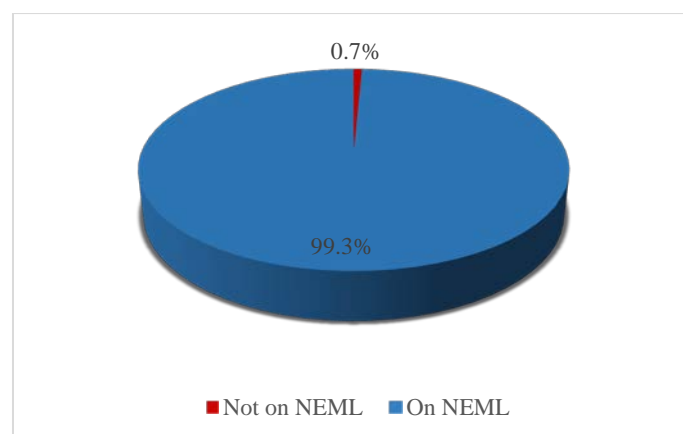


Figure 12: % of procured products on the NEML

Quality Testing Pass Rate (of samples tested): 100%

The percentage of product batches tested that passed the national and international quality control requirements is 100 percent. However, this quality testing pass rate should be interpreted with caution, as this is based on a very small number of batches tested.

Availability of NEML: 84%

The availability of NEML progressively decreased from the central level to the peripheral level, 100% at the central to 63.3% at health facility level.

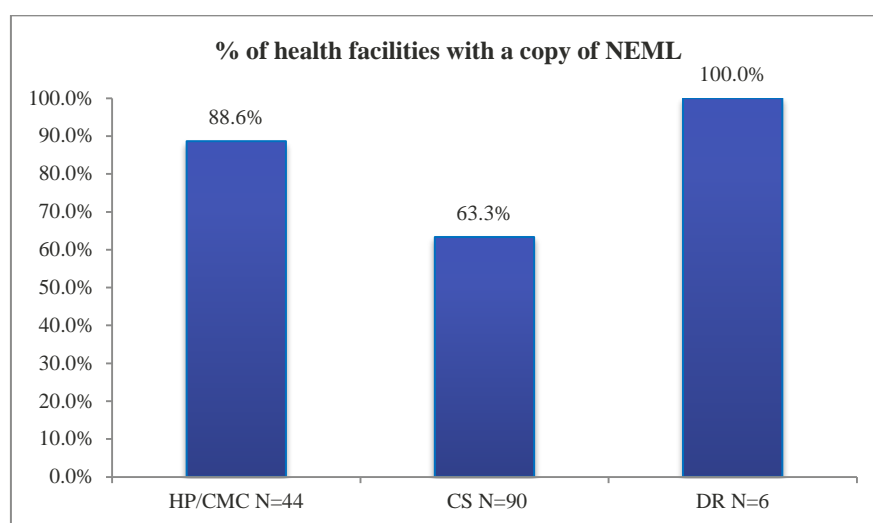


Figure 13: Percentage of health facilities having NEML

Recommendations (governance and selection)

1. Improve efficiency of NEML review and updates: Although processes and structures are in place for the review and update of NEML, the latter has not been regularly updated. MOH and stakeholders should ensure that the NEML commission is adequately resourced to make regular revisions of the NEML, at least every two years.
2. The NEML commission under the leadership of DNPM is in the middle of the process to review and update the NEML version of 2013. The innovation with this review is the involvement of practitioners from the lower levels i.e. doctors, pharmacists, nurses, and midwives from the regional, prefectural, hospital, and health center levels. While it is anticipated that this will increase the health professionals' adherence to the NEML, the

MOH should also enhance the training program for the rollout while implementing a national monitoring and evaluation program to ensure adherence to NEML and STGs.

Pharmacovigilance

There is no national pharmacovigilance center. However, there is a dedicated unit within the DNPM, which reports to WHO Collaborating Centre for International Drug Monitoring in Uppsala, Sweden. This oversees a patient adverse reactions notification system (Vigiflow). Also, there is a national commission on medicines safety and a Subcommittee on pharmacovigilance and traditional pharmacopoeia. This Sub-Commission is responsible among other things, for the study of problems linked to prescribing and use of medicines after marketing (post marketing surveillance of medicines use, including communication in case of risks related to medicines).

Policy, law and regulation

Guinea has a policy document that contains essential statements relating to pharmacovigilance including the revitalization of the pharmacovigilance section at DNPM. Specific legal provisions on pharmacovigilance exist in the national legislation on medicines. Also, laws exist relating to pharmacovigilance or the safety of medicines and their effects.

Systems, Structures, coordination of stakeholders

Designated staffs responsible for safety and pharmacovigilance activities exist in all health centers and hospitals. Also, a national guideline on pharmacovigilance exists however there is no information on when it was last updated. At the national level, a formal mechanism exists to apprise practitioners on medicines adverse reactions and changes to treatment guidelines.

Management data and alerts

A system exists at the central level for coordination and collection of pharmacovigilance data from all sources in the country. It covers most health programs, vaccination, and active surveillance studies. However, a form for reporting problems about quality of products does not exist. This is attributed to lack of distinct national medicines regulatory authority with responsibilities for monitoring problems of quality of the medicines or suspected products.

Risk evaluation

In 2015, thirty-three ADR reports on malaria chemo-prevention were received. However, no interventions in pharmacovigilance were conducted in 2015.

Risk management and communication

There is no local system put in place for monitoring new reports on safety of medicines detected by international sources.

Appropriate medicines use

Appropriate medicines use by prescribers and dispensers

No public educational campaigns on the appropriate use of antimicrobials and antibiotics, and drug resistance, were conducted in 2015 and 2016.

Policy and regulations on appropriate use

1. Standard treatment guidelines

Guinea has standard treatment guidelines (STG) with the development of standards, procedures and prescription tools. Adherence with these guidelines is mandatory as well as the use of recommended medicines.

There is an oversight mechanism to monitor the respect of STGs. However, there is no information on the extent of adherence with STGs by practitioners in the public and private sectors.

2. Committees: Therapeutics, infections prevention, antimicrobial resistance control
There are no national committees or mechanisms that have responsibilities for therapeutics, infections prevention and antimicrobial resistance control.

3. Policy and regulatory framework
A national medicines policy exists, which was adopted in 2014. However, there is no policy on antibiotics and antimicrobial resistance. There is regulation limiting antimicrobial use "issued only on prescription without exception." However, there is no specific process to monitor the execution of this regulation, neither is there data on the level of its implementation.

Guidelines on regulation of promotional activities by pharmaceutical companies exist. However, data on the level of application of the regulation are not available, neither is there data at the national level on the impact of the regulation.

Quantification (Forecasting and Supply Planning)

Capability maturity level: 58%

Results of this assessment reveal that the quantification functional area as a best-practice approach is a new concept to PCG and most health programs. The national capability maturity score was 58%, which is close to qualified state. This indicates that processes are defined and documented and some technology is in use. Human resources, a key quantification capability is high (73%), indicating that core competencies are developed and that staff positions identified in most national programs (including PCG) are partially filled.

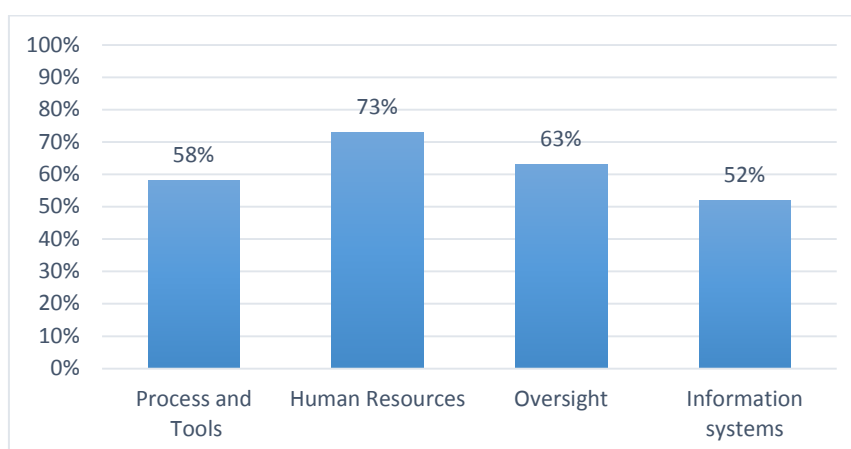


Figure 14: Forecasting and Supply Planning Capability by Enabler

Forecasting and supply planning are primarily functions performed at national-level by health programs. PCG performs this function for essential medicines managed under cost-recovery

system, while vertical programs perform quantification for program-specific products. While PNLN and PNLAT have relatively high quantification capability maturity levels: 72% and 71% respectively, PCG's and CNLS's quantification capabilities are limited (figure 15).

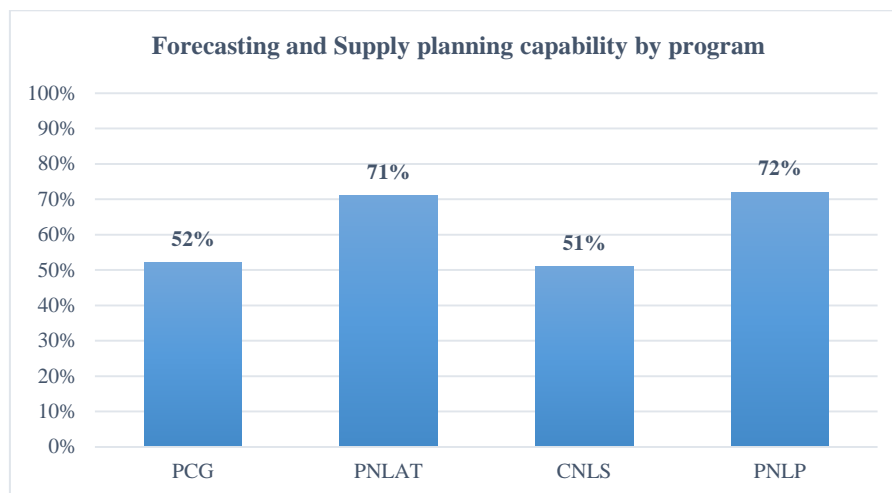


Figure 15: Forecasting and Supply Planning Capability by program

Capability enabler	Findings
Processes & Tools	<p>Financial resources allocated to quantification remain insufficient in relation to the needs. This, along with limited budgets for product procurements, lead to limited capability of the national level to undertake quantification for mid and long-term commodity requirements.</p> <p>Major weaknesses remain the lack of written SOPs, supply plans and measurement of forecast accuracy. This means that the quantification is undertaken as an ad hoc exercise rather than a formal/routine exercise. Additionally, with the exception of PNLN, other programs don't translate forecast results into supply plans to inform subsequent procurement of identified product quantities.</p> <p>With the exception of the PNLN which is using morbidity and consumption data for conducting forecasting, other programs rely on population and service statistics data to quantify commodity requirements. Data required for quantification are not readily available. Overall, the available data are not regularly validated leading to the use of unadjusted / non validated data to estimate commodity requirements. As a result, the projected requirements do not reflect the actual needs of health facilities, which PCG is currently filling at 47% rate only.</p> <p>Quantification processes and tools are not harmonized across all programs and there is no efficient mechanism in place for data sharing</p>
Human Resources	<p>Core competencies are developed and staff positions identified in most national programs (including PCG) are partially filled. However, the available staffs are not fully designated to quantification activities.</p>
Oversight and Performance	<p>While the PNLN has a formal quantification committee in place, PCG, CNLS and PNLAT lack such a committee.</p>

Management	PNLP has made some progress in institutionalizing the quantification process through annual quantification exercise and regular quarterly review/update of supply plans. Central levels of the rest of the programs have not institutionalized the quantification function. Quantification activities solely dependent on donor budgets as there is no GoG budget line for these activities. Also, there is no performance management system in place to measure forecast accuracy at the national level.
Information systems	Overall, there is lack of appropriate software for forecasting and supply planning. Only PNLN is using Quantimed and Pipeline. Unavailability of appropriate quantification software makes the quantification exercise very tedious and increases chances for forecast inaccuracies.

Recommendations

- The MOH has made the establishment of the Logistics Management Unit (LMU) among its top priorities. With technical support from SIAPS, MOH is establishing the LMU at the DNPM. Among other things, the LMU will be responsible for oversight of the quantification activities including conducting forecasting and supply planning, quarterly updates of supply plans, and mobilization of resources for commodity procurement and supply management. This unit will require mid-term support to strengthen leadership and ownership of the quantification capability within the MoH.
- In collaboration with funding partners, the MOH should ensure that proper long-term planning is done, including appropriate budget for forecasting and supply planning activities.
- Working with different supply chain technical partners, DNPM should ensure that adequate capacity building and financial support are planned to allow LMU staff gain knowledge and increase their capacity to manage and coordinate quantification of all health commodities.
- Good quantification relies on having an accurate forecast that is updated regularly with reliable data, and a well-managed supply plan that is continuously monitored and managed. Problems with quantification create gaps in product availability throughout the supply chain. Efforts to improve quantification processes should consider harmonizing capacity and technical expertise, implementing harmonized processes and tools for forecasting and supply planning and expand the use of both morbidity and logistics data for forecasting commodity requirements across all health programs.
- Forecasts are only as good as the data used to inform them. Whether using consumption or morbidity data, missing and/or poor quality data inhibit accuracy and impact of forecasts and supply plans. Through the DNPM, the MOH is implementing a harmonized system for Logistics Management Information (both paper-based and electronic systems). This provides an opportunity to deploy interventions to address delayed, inaccurate and incomplete logistics data which affect quality of forecasts and supply plans. Such interventions should include, but are not limited to:
 - Enforcing via a ministerial instruction a requirement that all health facilities implement supply chain management activities as outlined in the SOP for integrated LMIS
 - Train staff in skills and habits that encourage improved use of data for quantification of health commodity requirements
 - Establish functional feedback mechanisms

- Optimize the use of the e-LMIS to improve quality and use of logistics data to inform supply chain decisions

Procurement

Capability maturity level: 66%

The majority of public health commodity procurement is done by PCG. Therefore, procurement capability maturity and performance were assessed at PCG only. Overall procurement capability is relatively high (66%), which is a qualified state. This means that processes are well defined and transactions documented, and some internally integrated technology in use. With the exception of the information systems, the rest of the enablers scored relatively high (70%, figure 16). The high-ranking enablers were examined by reviewing product specification, prequalification, tendering, contracting, product quality, and SOPs. PCG uses the NEML while determining the products to be procured, as shown in the product selection section of this report.

Although information systems scored the lowest (53%), it is to be noted that with SIAPS's support, PCG deployed the SAGE L100 i7 software to support warehouse management, finance and HR management. Major benefits anticipated from this deployment will include among other things: increased access to procurement information, with consequent shorter lead times and better staff productivity.

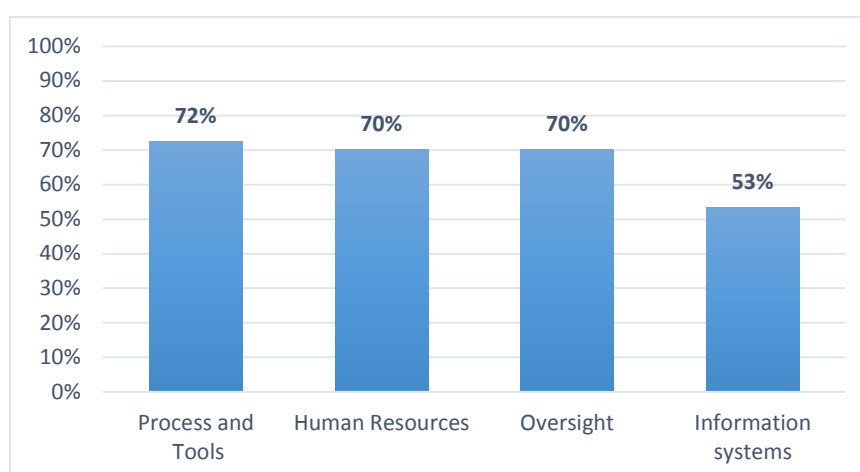


Figure 16: Procurement capability by enabler

Capability enabler	Findings
Processes & Tools	<p>Standard product specifications and products master list are part of enabling factors of a high-functioning procurement system. PCG lacked a “products master list” with complete specifications of products procured. However, with the ongoing implementation of SAGE software, a products master list has been established.</p> <p>SOP for maintenance of the “products master list” has been developed and will be regularly updated</p> <p>A prequalification procedure for suppliers is in place. While this considers supplier’s technical ability, product quality and financial capability; it does not however include past performance and therefore</p>

Capability enabler	Findings
	<p>does not guarantee that best performing vendors are always the ones preselected.</p> <p>Tender documents are written with terms and conditions which comply with the national public procurement law.</p> <p>Transparent and explicit procedures are used for the purchase of pharmaceuticals at PCG. These publicly available procedures describe the internal process to be followed by staff to process bids. Procurement requirements include use of generic names, procurement of products on NEML, and publication of tenders to generate competition.</p>
Oversight and Performance Management	<p>The lack of sufficient budget for procurement activities limits PCG's ability to establish long-term procurement plans. PCG places "one off" orders for recurrent procurement needs based on the level of funding. Hence smart ways of purchasing such as framework agreements are not implemented. These are ideal for a flexible procurement system to enable long-term purchases while optimizing volume purchasing discounts and minimizing repetitive purchasing tasks.</p> <p>There is a tender evaluation committee in place. This committee has the decision-making power to evaluate and select successful vendors for restricted or open tenders.</p> <p>There is no mechanism in place for periodic internal audit of procurement process to ensure purchasing function is performed in accordance with stipulated policies and procedures. Lack of periodic internal audits increases the likelihood of risks associated with purchasing.</p> <p>Despite having a Memorandum of Understanding with the GoG establishing PCG as the sole procurement and distribution agency for public health facilities, PCG has very limited financial resources for procurement of optimal quantities. PCG received the only GoG allocation of \$571 thousand back in 2014. The cost recovery system in place at that time did not allow replenishment of the initial stock, which was crucial to ensure continuous supply of essential pharmaceutical products. Since then, medicine shortages have persisted in the public health supply chain; this can be observed through the low order fill rate (39.3%) for orders placed by health facilities.</p>
Information systems	<p>No MIS is used for procurement processing. This results in more time and resources being expended to complete the procurement cycle, making order and shipment delivery tracking very complex.</p>

Vendor On-Time Delivery (VOTD) performance: 64%

Due to the lack of MIS, all data on procurement and vendor performance was manually collected at PCG for the period January – December 2015. On average, vendors delivered their orders on-time, given that 64% of vendors delivered their orders on or before the promised delivery date. Of the 36% remaining late vendors, 13% delivered their orders within 14 days while 23% delivered their orders after 14 days after the agreed delivery date (figure 17).

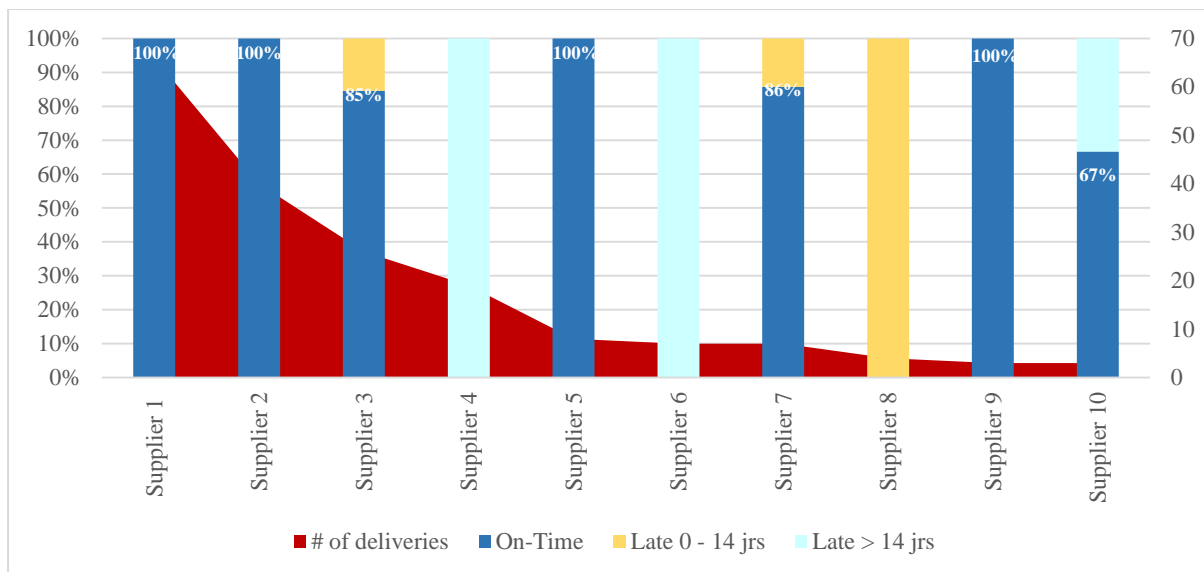


Figure 17: Vendor On-Time Delivery

Disaggregating VOTD to the level of individual suppliers reveals that vendors with relatively larger volumes are the least performant. This poses a concern in the sense that it limits PCG's ability to avail essential products to the clients at the right time and is related to the lower Order Fill Rate of 29% between the Central PCG and its regional depots. The majority of the top 10 PCG suppliers are local suppliers; these account for over 70% of PCG suppliers. Average procurement lead-time for PCG is 42.2 days. This relatively shorter average lead-time can be attributed to the fact that the supplier base for most PCG procurements is limited to the local supplier community.

Supplier order fill rate

Overall the results highlight that PCG orders were filled systematically and accurately by most suppliers (99.5%). Such a high performance for this indicator is indicative of great supplier reliability.

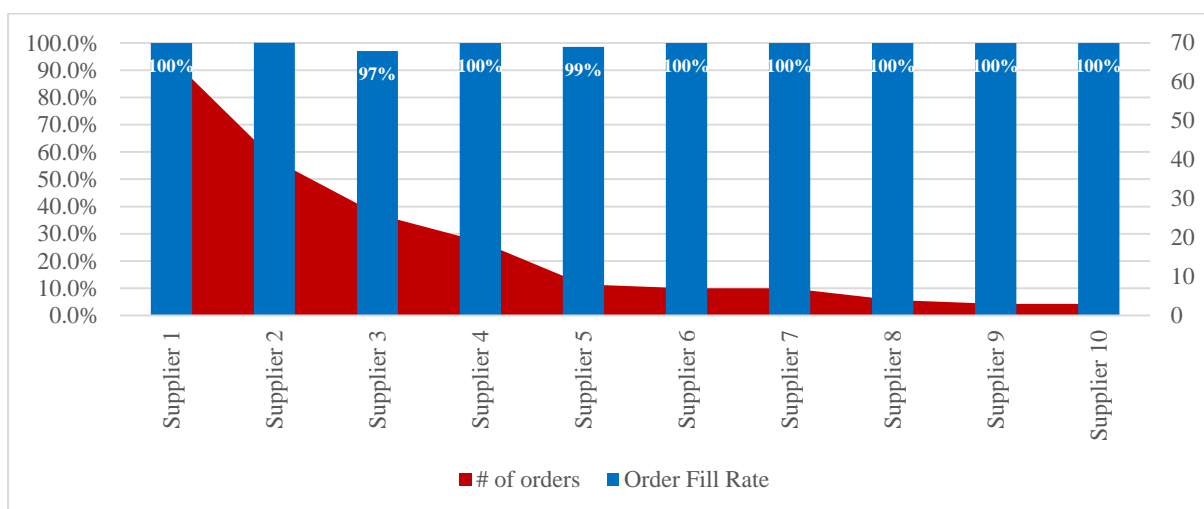


Figure 18: Supplier Order Fill Rate

% of Average International Price Paid: 20%

The percent of international reference price paid reflects a comparison of the prices paid by PCG with the median price paid by international procurement entities. This indicator is the average unit price paid by PCG for products divided by the median international reference prices paid as guided by the MSH International Medical Products Price Guide 2014 (IMPPG).⁶ Data collection was a challenge for the teams, as all files were paper-based. This indicator was only calculated for the medicines with the exception of Ringer Lactate and Oral Rehydration salts. In fact, we could not obtain international reference prices for laboratory reagents and consumables to be able to perform the comparison. On average, PCG procurement prices were 20 percent above the international reference prices. (figure 19).

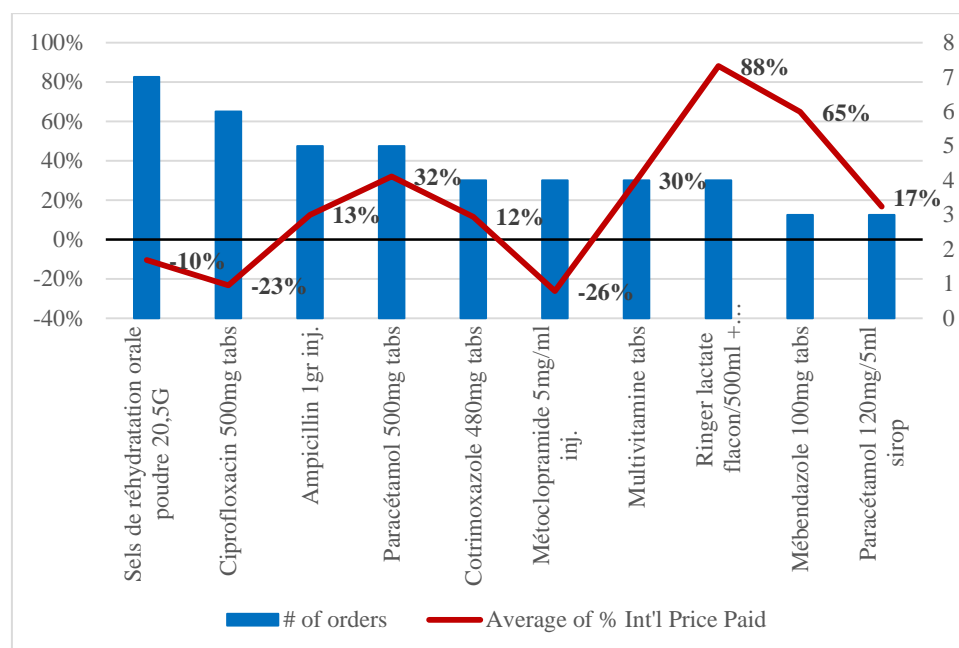


Figure 19: % of International Reference Price paid by PCG in 2015

Recommendations:

- To be able to attain its objectives of ensuring availability of quality pharmaceutical products and improve financial and geographic accessibility, PCG needs additional financial resources dedicated to procurement. With support from the EU/PASA, a procurement process has been initiated that will provide PCG with a stock of pharmaceuticals worth 2.5 million euros. However, additional financial resources will be required to provide PCG with adequate finances. Additionally, working with supply chain technical partners, the MOH should plan adequate technical assistance to PCG that will help develop and sustain a self-sustaining revolving drug fund for essential healthcare products.
- Satisfactory supplier performance is an important component of the procurement process, since unsatisfactory performance by a supplier can jeopardize the objectives of PCG. It is therefore paramount that PCG develops a vendor performance monitoring system with KPIs that will be used to track the supplier performance, including compliance with contract requirements. Supplier past performance data will not only be used to help design improvement measures, but it should also be

⁶ The International Medical Products Price Guide is available at the following [link](#)

incorporated among evaluation criteria when considering the supplier for future awards.

- Once equipped with sufficient financial resources dedicated for procurement of essential pharmaceutical products, PCG should consider implementing best-practices in purchasing including establishment of framework agreements to be able to benefit from the advantages that such procurement tools provide. For example, optimized volume purchasing discounts and minimization of repetitive purchasing tasks.
- To decrease the likelihood of high risks associated with the purchasing function, PCG should institute regular audits. Such audits should focus on procurement policies and procedures, magnitude of potential control weaknesses, and operational effectiveness of the purchasing function.

Storage and Inventory Management

Warehousing and Inventory management capability falls in the middle of the capability maturity scale (47%) with enablers ranging from 44 to 61%. This shows that processes in this functional area nationally, are mostly informal, and some of the basic processes are used inconsistently, and some manual systems are in place. However, looking at the disaggregated results, the capability maturity level is 60% at the central level and higher at the lower level (71%).

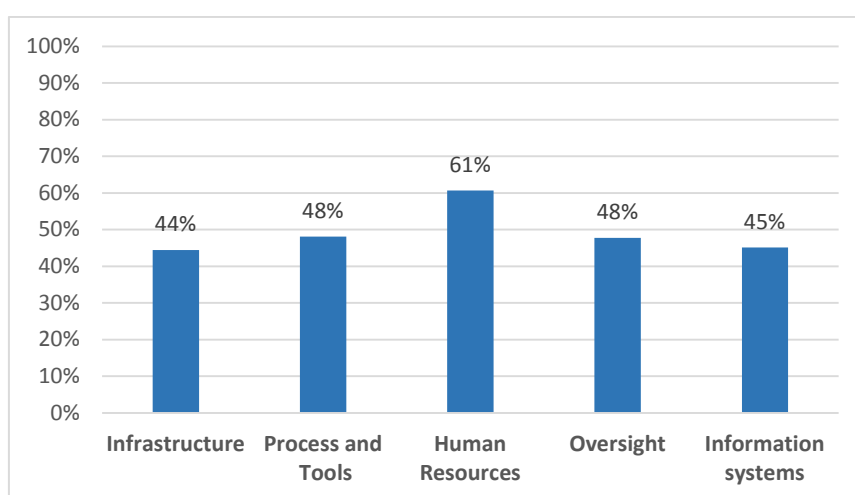


Figure 20: Storage and Inventory Management capability by enabler

Capability enabler	Findings
Process and Tools	<p>In terms of tools and processes, most warehousing and inventory management activities are manual.</p> <p>Receiving documentation is thoroughly checked before goods are received and captured on stock cards</p> <p>When put away, stock is rotated each time following the FEFO principle to avoid expiries</p> <p>Basic documentation for reverse logistics is in place, however the system is not functional.</p> <p>Indicators related to stock accuracy are tracked and used to improve quality of inventory data.</p> <p>Management of expiry dates is done through rigorous application</p>

Capability enabler	Findings
	<p>of the FEFO principle.</p> <p>At PCG, SOPs exist that outline processes for each department and inventory management operation. However, they have not been rolled out by employees training, neither have they been reviewed at least annually nor updated when functional changes occurred. SIAPS is technically supporting PCG to review PCG organogram along with job descriptions for all identified positions. This support extends to reviewing and adapting the existing SOP to the current PCG's business environment with consideration of the automation of warehousing operations (SAGE L100 i7 implementation). There were no SOPs in place to guide storage and inventory management activities at health facility level. However, early this year, DNPM started the roll out of the SOP manual for integrated supply chain down to health facilities. This manual describe the standard procedures for operating various supply chain functions (including storage and inventory management) at all levels of the Guinea's supply chain system.</p>
Infrastructure	<p>Although insufficient, PCG's storage space includes a fully functional cooling system that maintains a constant temperature. Temperatures are recorded manually. The storage space at health facility level is often insufficient with poor storage conditions and put away.</p> <p>At PCG, the storage room has a suitable free-standing refrigerator, and the power supply is regular. The temperature is monitored and recorded using thermometers. However, cold storage capacity is not enough to contain large deliveries.</p> <p>Although cold-chain facilities are in place at health facility level (refrigerators mostly in hospitals), power instability constitutes a great challenge and limits their functionality. The solar panels at the health centers experience recurrent breakdown. Temperature control problems persist in health facilities due to the lack of temperature monitoring equipment and tools.</p> <p>PCG lacks infrastructure such as safe location for the storage of controlled and high value products</p> <p>Though expired pharmaceuticals are stored separately from usable stock, there is no demarcated area or storage facility for expired products.</p> <p>WHO good storage practices at PCG were met at 66.6% whereas the regional depots and health facilities scored 59.2% and 81.5% respectively.</p>
Information systems	<p>At PCG, information was primarily managed through an older version of SAGE software (for PCG-owned stock) and Channel software for program products. These two software systems however were not suitable to enable centralized management of key warehousing tasks such as receiving, inventory tracking, picking and assigned, and recorded locations for product storage. This poses a number of consequences such as poor access to real-time information, increased operations cycle times, lower</p>

Capability enabler	Findings
	<p>productivity and consequently product shortages and overstocking become unavoidable.</p> <p>To successfully set the stage for good warehousing practices, PCG recently started using an Enterprise Resource Planning (SAGE L100 i7) with the aim to boost the organization's performance by optimizing inventory based on real-time information, facilitating the flow of information, increasing productivity and efficiency across all across all functional areas.</p> <p>At health facility level, most health facilities are using a stock ledger for stock recording. Stock transactions (receipts, issues, adjustments, etc.) are recorded using stock cards</p>

Despite the challenges faced with storage capacity, all the tracer commodities assessed at PCG had a stock accuracy of 100%. However, inconsistencies were observed in recording of stock transactions as stock cards were not correctly filled. Thus, only 18 out of 21 assessed tracer commodities had stock cards available. When analyzing this indicator at the disaggregated level, the results of this assessment show that the stock accuracy decreases according to the different levels of the supply chain system. The accuracy of the inventory data was 77.3% at the regional depot and 68.7% at health facility level.

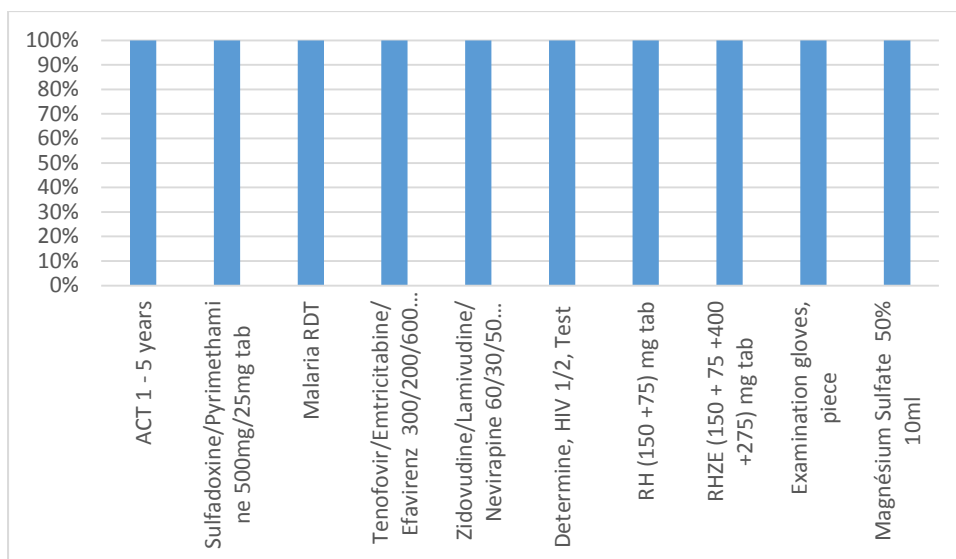


Figure 21: Stock accuracy at PCG

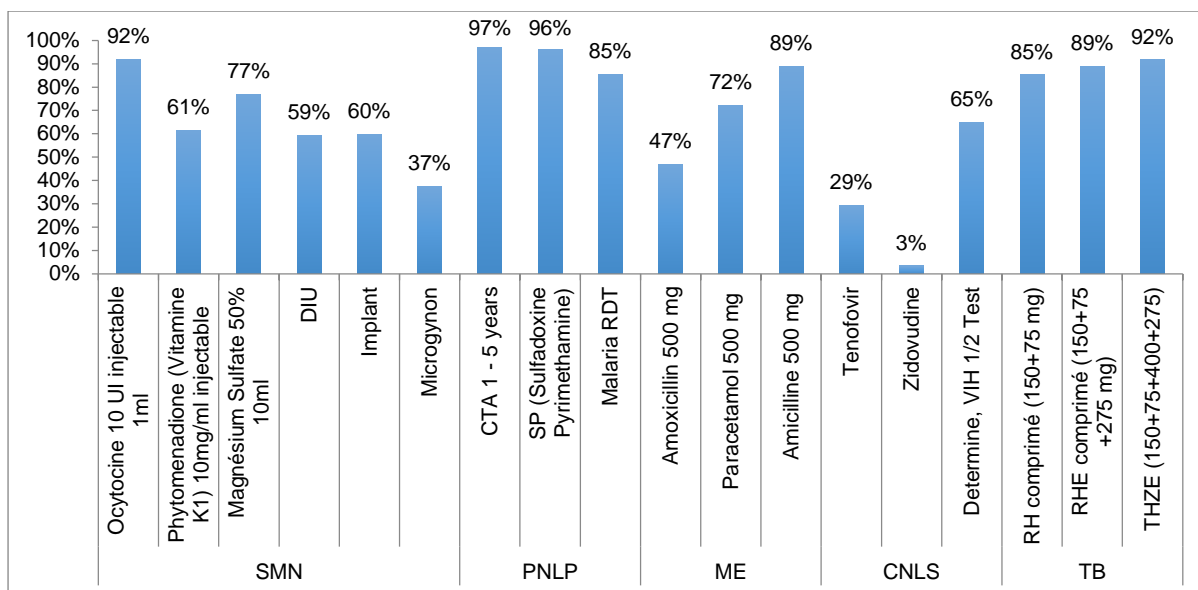


Figure 22: Stock accuracy at health facility level

Order fill rate

To calculate the order fill rate, quantity ordered is compared with quantity received for assessed tracer commodities in the same period. Data available at both the central level (PCG), regional level (depots) and health facilities did not allow calculation of the order fill rate. Therefore, perceptions of health facility staffs about resupply were used to assess order fill rate. Based on the perceived order fill rate, the percentage of orders that are correctly filled (filled in full) was found to be 47% between the PCG in Conakry and the regional depots. The fill rate between the regional depots and health facilities is even lower as less than 23.5% reported receiving their orders in full. As for the reasons why the health facilities were not supplied in full, 66.7% reported that it was due to stock out at the regional depot while 33.3% reported it was due to insufficient stock.

Stock out rate

Stock out rates demonstrate product availability as a key outcome indicator of a high performing supply chain.

Stock-outs of even a small number of health commodities can have far-ranging consequences for the provision of quality health services. Stock-outs are an important measure of health service readiness, and health facilities without consistent and adequate availability of health commodities are inadequately prepared to provide quality health services.

To assess product availability at the regional and health facility level, the assessment collected data on stock on hand on the day of the visit and historical stock out rate over the last six months prior to the assessment.

a) Stock out rate at the regional depot

At the regional depot, stock out rates for Determine HIV ½ and Amoxicillin 500 mg were as high as 100% on the day of the visit. This means that none of the 6 PCG regional depots had the two items in stock on the day of visit.

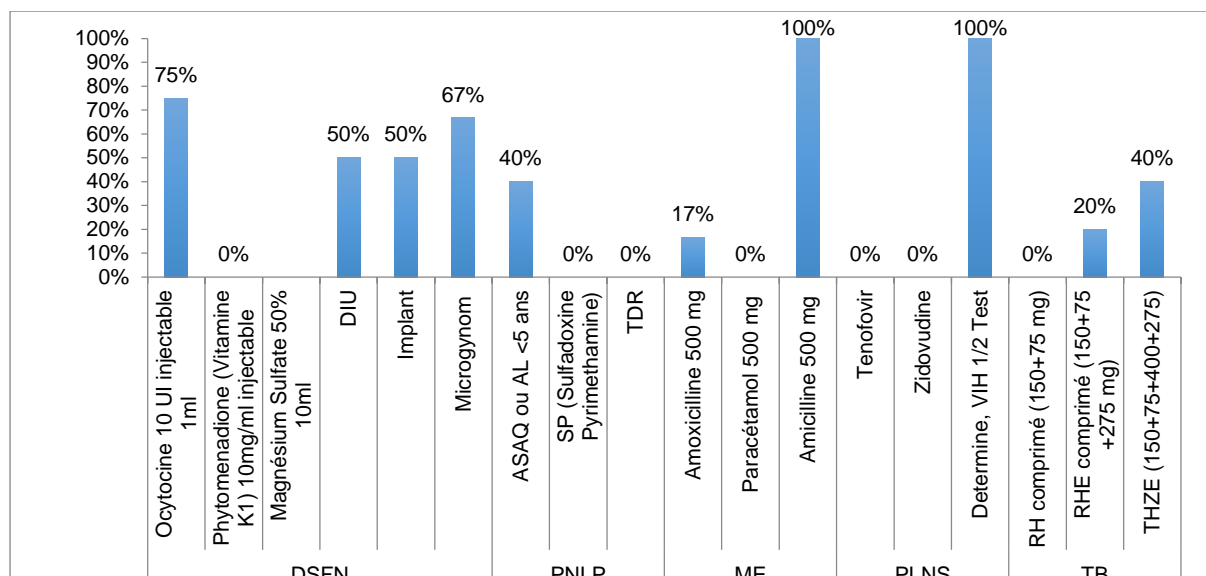


Figure 23: Stock out rate of consecutive 3 days + at the regional depot on the day of the visit

The assessment revealed that the highest historical stock out rate (over the past months prior to the assessment) at the regional depot of 46.7% occurs for TB products. This could be attributed to the fact that management of TB products by PCG regional depots started only recently. Although, previously stored at PCG, TB products used to be distributed by the National TB program directly to treatment sites based on a pre-established distribution plan. One of the contributing factors could be the lack of a defined inventory control system as there is no ordering system in place to guide the regional depots about the right time when to place orders and avoid stock outs. Additionally, there are no minimum and maximum levels to help the regional depots maintain adequate levels of stock. These challenges also exist at the health facility level. However, the Ministry of Health through the DNPM recently redesigned and integrated the logistics system for health commodities, which defines the inventory control parameters and order frequency for regional depots and health facilities. Rollout of the integrated system has started and is expected to improve inventory management at all levels of the supply chain system.

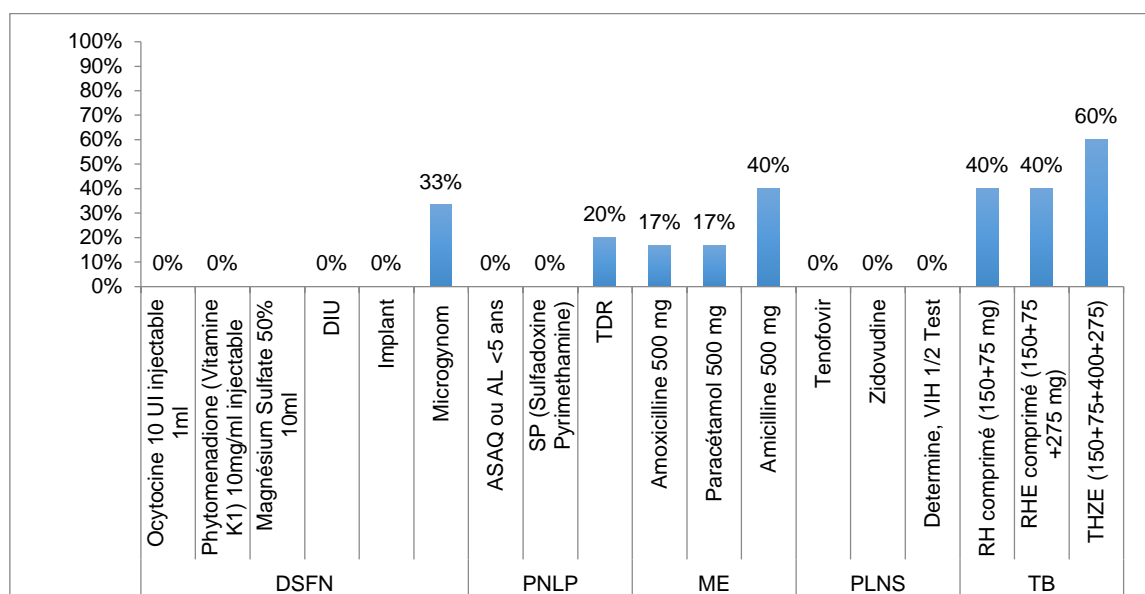


Figure 24: Stock out rate of consecutive 3 days + at the regional depot over the past 6 months prior to the assessment

b) Stock out rate at the health facility level

Average stock out rate on the day of the visit was 21.7% for the 21 tracer commodities assessed. Looking at this indicator at the health facility level, there was little variances across various product categories i.e. products for different health programs. Similar analysis for historical stock out rate (over the past 6 months prior to the assessment) however revealed that stock out was as high as 49.8% for essential medicines while this was lower for HIV products i.e. 17.6%.

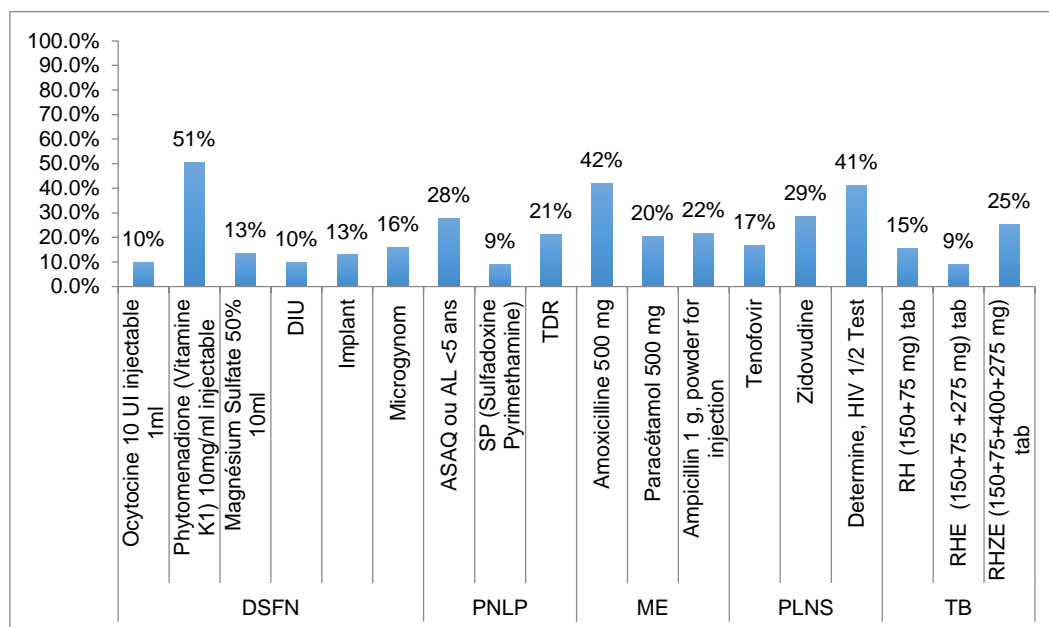


Figure 25: Stock out rate of consecutive 3 days + at the health facility level on the day of the visit

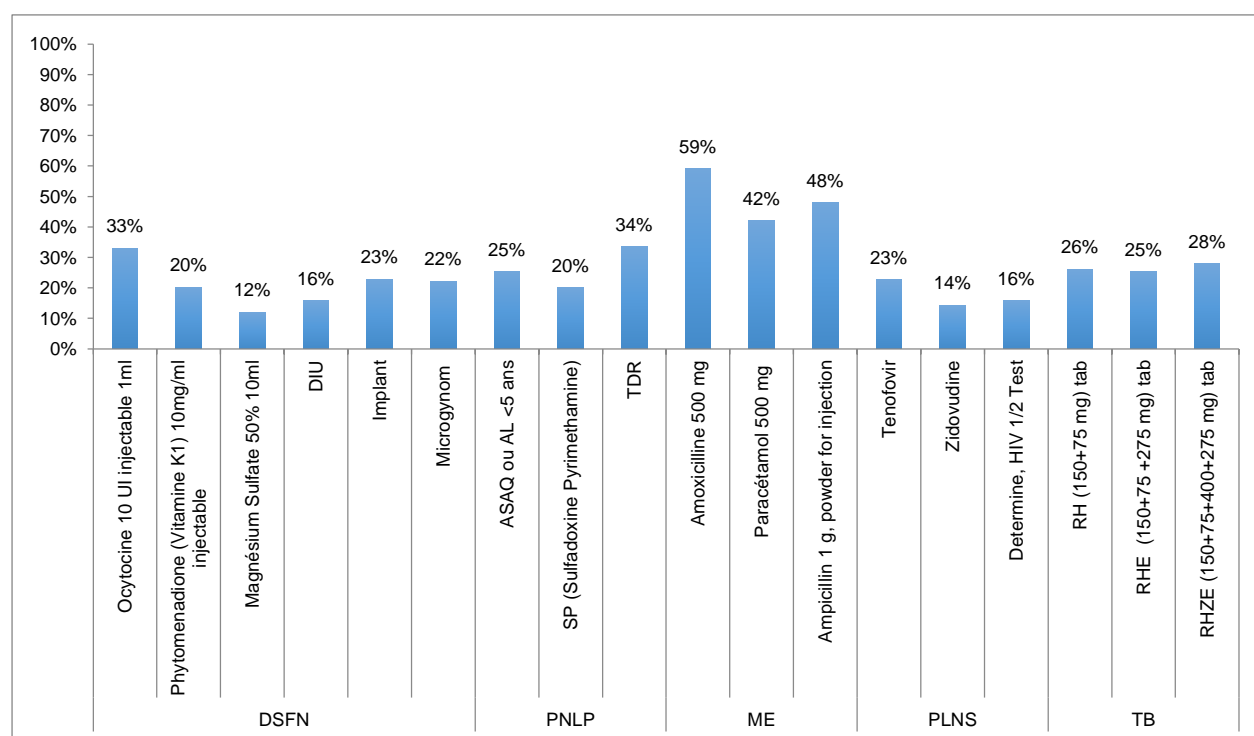


Figure 26: Stock out rate of consecutive 3 days + at the health facility level over the past 6 months prior to the assessment

Consequently, lack of availability of essential medicines at the central medical stores lead the health facilities to turn to the private sector which in most cases is more expensive than the public sector. Results from this assessment revealed that 12% of orders from surveyed health facilities were from the private sector.

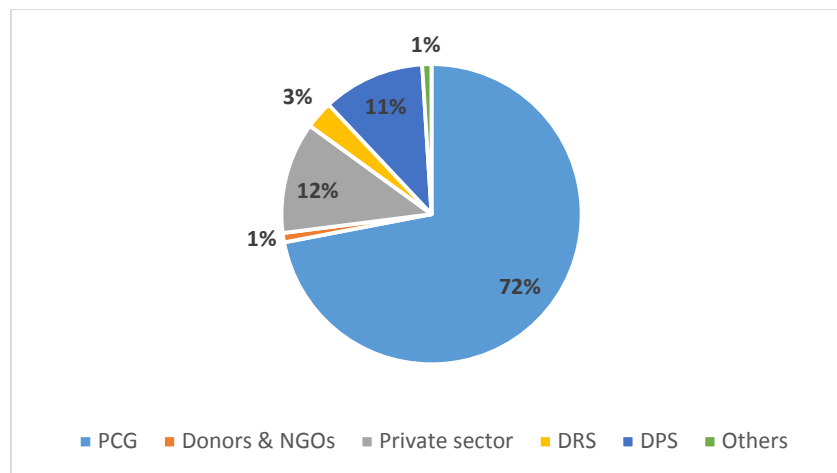


Figure 27: Sources of supply for health facilities

Furthermore, frequent shortages and stock outs of essential commodities often lead to costly emergency orders. Data from this assessment revealed that 9% of orders from health facilities are emergency while 17% are also unplanned.

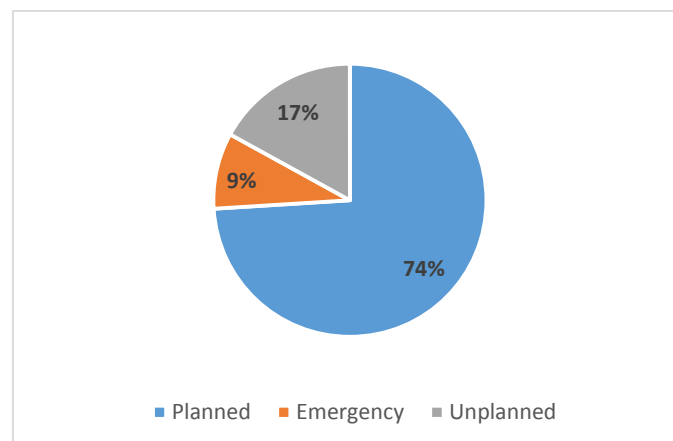


Figure 28: Health Facilities' Order status

Stock management practices

Logistics records are the primary support for every logistics system. The records are intended to capture all transactions that happen in the pipeline: storage, transportation and issuing/consumption. This is important to allow monitoring of product supply management and tracking at all times in the pipeline. The data captured on logistics records are then collated to produce logistics reports, which are used for crucial decision-making about resupply quantities, forecasting, and procurement decisions. Data from this assessment shows that availability of stock cards was high at hospitals (above 85%) compared to the regional depot and health centers. Usage of stock cards was assessed by cross-checking the accuracy of transactions and stock balance on the stock cards on the day of the visit. Usage of stock cards followed the same trend as stock cards' availability. In fact, hospitals have the highest

usage rate i.e. 84.5%. Inconsistent and inaccurate use of stock card may lead to poor inventory management and consequently potential stock outs and expiries.

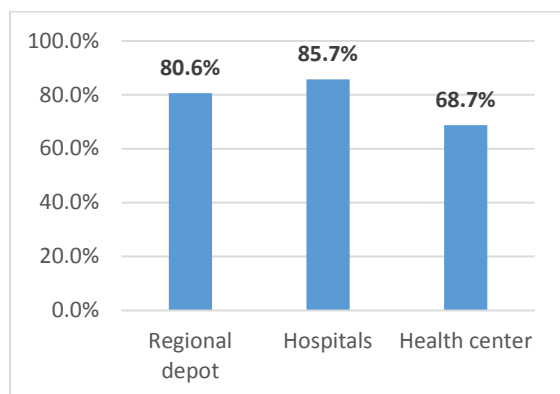


Figure 29: Availability of stock cards

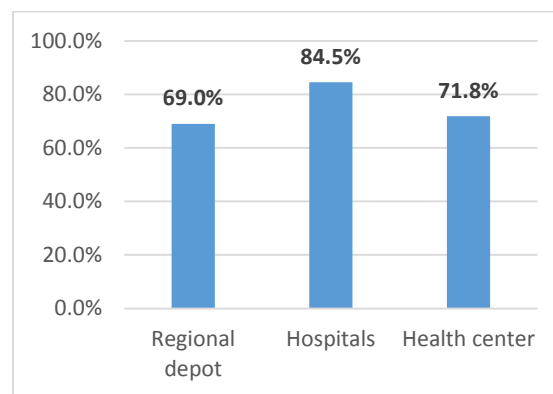


Figure 30: Usage of stock cards

Storage best practices

Maintaining proper storage conditions for health commodities is vital to ensuring their quality. Ideal storage conditions and protecting product quality until their expiration date is important for serving customers and conserving resources⁷. Assessment visits in regional depots and health facilities helped to evaluate the storage conditions in their warehouses and storage rooms. WHO good storage practices at PCG were met at 66.6% whereas the regional depots and health facilities scored 59.2% and 81.5% respectively. While PCG meets most storage conditions, it lacks sufficient storage capacity to accommodate the increasing flow of commodities. On the other hand, regional depots meet storage conditions except that relating to product temperature specifications. While the health facilities respect most storage conditions, products are not stored according to temperature specifications.

Recommendations

- The MOH should ensure adequate storage capacity and improve the storage conditions at the central level (PCG) by building new facilities that meet best warehousing facilities. Best warehousing solutions such as Warehouse-in-a-Box could be considered.
- MOH should conduct a national survey to assess the storage capacity of health facilities across the country and develop optional analysis for future needs.
- Within the efforts to institutionalize best practices within its routine management, PCG should enforce the use of the SOPs by training all personnel, and continue strengthening staff capacity through on-the-job training over the long-term.
- While PCG has embarked on the process to implement a Warehouse Management System (WMS) with the aim to boost the organization's performance, change management should be an integral part to this process, to ensure that all staff are trained and bought into the new system.
- The revised SOP manual for integrated supply chain in Guinea describes standardized procedures for all supply chain functions including inventory management. Specifically, for inventory management, the SOP defines the inventory control parameters (minimum and maximum levels). To maximize the impact of this manual on the personnel's practices, adherence by all health professionals will be key. The

⁷ <http://apps.who.int/medicinedocs/pdf/s4885e/s4885e.pdf>

MOH should therefore issue a Ministerial instruction letter to all health facilities as a means to enforce the use of the SOP manual.

Transportation

Transportation in the Guinea supply chain largely consists of PCG's fleet providing distribution services to most of health facilities. PCG's transport infrastructure is strong with trucks available at the central warehouse in Conakry and all regional depots (Guinee maritime, Boke, Labe, Faranah, Kankan and N'zerekore).

Overall capability for transportation is average at 60%, reflecting that processes are defined relatively well and with some technology in use. Despite the infrastructure strengths, PCG's capacity to meet the demand for cold chain products is limited evidenced by the existence of multiple resupply systems. In fact, health facilities collect their orders at PCG for commercialized health commodities and whereas PCG operates a direct delivery model for program commodities. The assessment results indicate that PCG's capacity to meet the distribution demand is 40% and average fleet management practices are at 50%.

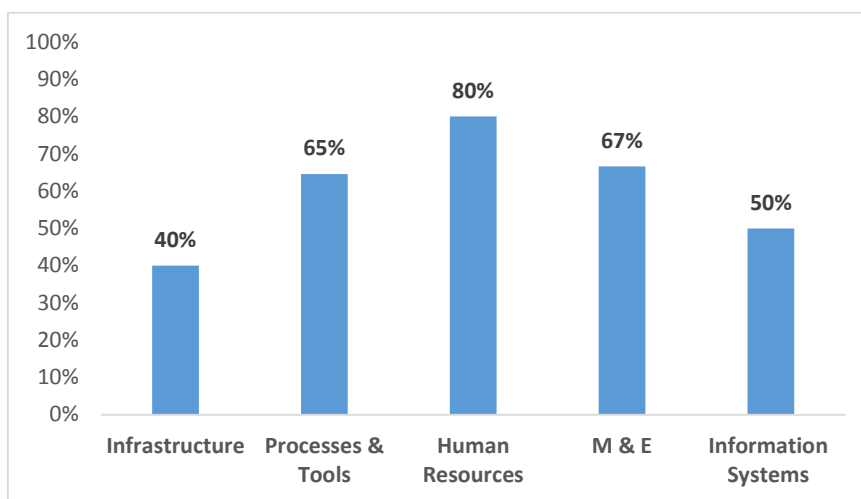


Figure 31: Transport capability by Enabler

Capability enabler	Findings
Process and Tools	<p><i>Outbound shipment visibility (60%):</i> Though this capability is relatively good, shipment tracking is done manually with no technology use</p> <p><i>Fleet management and temperature monitoring across the chain of custody:</i> SOPs lack for proper fleet management; there is no SOP nor tools to monitor temperature along the transport network</p> <p>The existing multiple distribution systems in place do not allow for proper management of the limited fleet.</p>

Recommendations

- In support to the existing efforts to integrate the supply chain system, it is very important that all vertical programs join this initiative to allow PCG implement the integrated distribution of all health commodities

- Conduct a costing exercise to understand the operational costs involved in storing and distributing health commodities in Guinea. Based on the findings from this exercise, develop optimized scenarios to efficiently distribute health commodities to health facilities taking into account the integrated distribution network, the existing and planned fleet capacity and product volume throughput across the supply chain system.
- The MOH should secure additional resources to procure additional cold-chain trucks to allow PCG meet the cold-chain transportation demand.

Waste management

Results from the assessment in the waste management section reveal that this functional area of supply chain management is at the marginal stage, with an overall capability maturity score of 42 percent. This means that most basic processes are used inconsistently and systems are largely manual with some processes documented and some technology present.

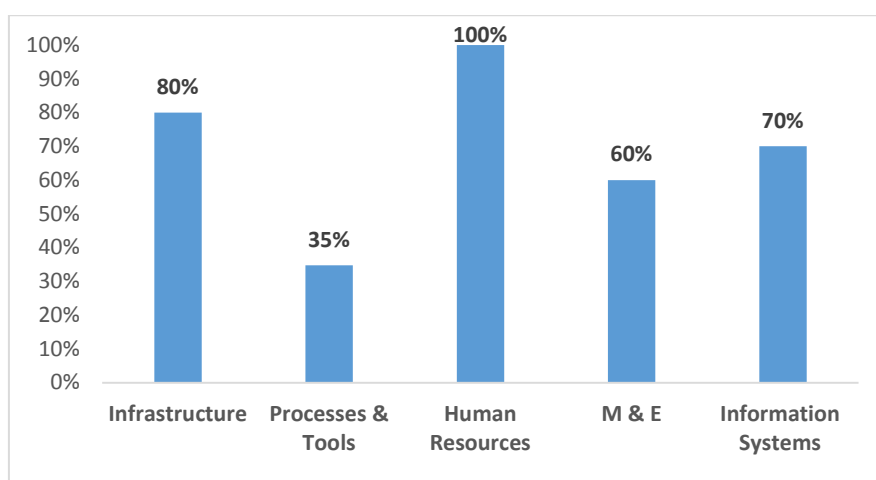


Figure 32: Waste management capability by enabler

Of the five enabling factors evaluated for waste management, process & tools were the least rated. In fact, though a waste management procedure exists at the central level, this has not been disseminated and implemented at the health facility level. In general, hospitals recorded lower waste management capability (22%) compared to both regional depots and health facilities with an average score of 57%. Approximately over than 50% of health facilities visited had no separate storage room for expired products. And where space was available for storage of expired products, this was not clearly demarcated in more than 50% of health facilities assessed as evidence by stockpiling of unusable products in all available places within health facilities. Data from the assessment also revealed that more than 68% of assessed hospitals and 24% of health facilities had an incinerator. Although there is a high availability of incinerators at hospitals and health centers, products are often incinerated below recommended temperatures. Only ten percent (10%) of the health facilities assessed has a preventive maintenance plan in place for their incinerators.

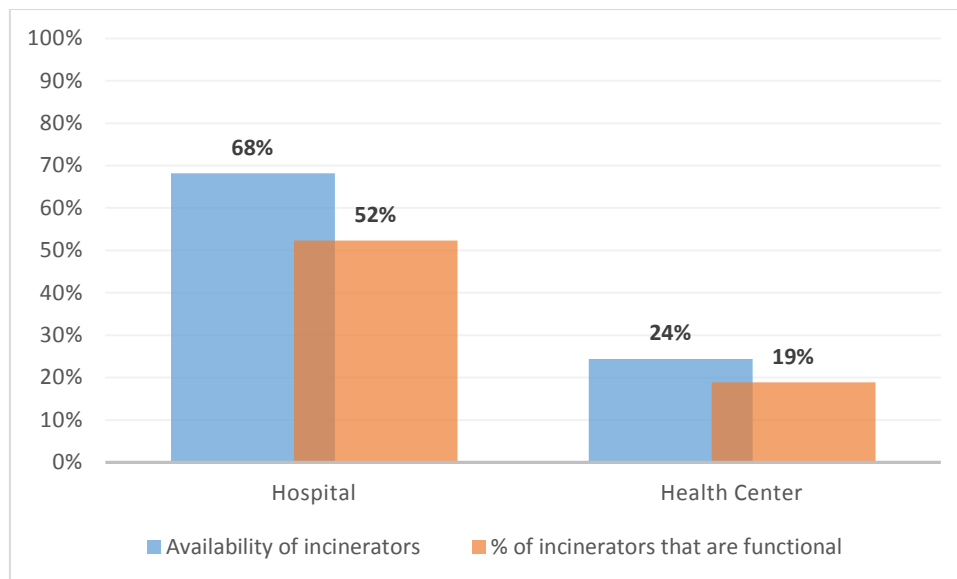


Figure 33: Availability and use of incinerators

Reverse logistics were not in place for expired products, with health facilities expected to transport or dispose of expired products on their own.

Recommendations

- Plan disposal of stockpiled unusable products in all health facilities. Working with the various supply chain stakeholders (SIAPS, CRS), the DNPM and PNLN have launched a countrywide exercise to draw up an inventory of expired commodities. These efforts should continue and lead to reverse logistics and transport of all unusable product quantities up to the district and regional levels. Appropriate budgeting and resource mobilization should be done to secure funding required to dispose of the expired quantities. This will alleviate the space constraints caused by stockpiling of expired products and improve the storage conditions of health facilities.
- Develop a training curricula and conduct trainings of health professionals based on the waste management procedures developed by the Ministry of Health.
- Include waste management aspects in supervision to allow for routine monitoring of adherence to the waste management procedure in place with regard to key waste management functions such as waste generation, segregation, storage, transport and disposal.

Laboratory

At the peripheral level, the laboratory was assessed at the hospital level only. The laboratory capability was assessed looking at various aspects such as temperature control in the laboratory, temperature control for cold chain items, expiration management and MIS. The assessment results for laboratory reveal that this functional area in supply chain management is at a minimal stage approaching marginal. The national capability maturity score is 40 percent (60 percent recommended)—meaning that processes are mostly informal, some basic processes are used inconsistently and some manual systems are in place.

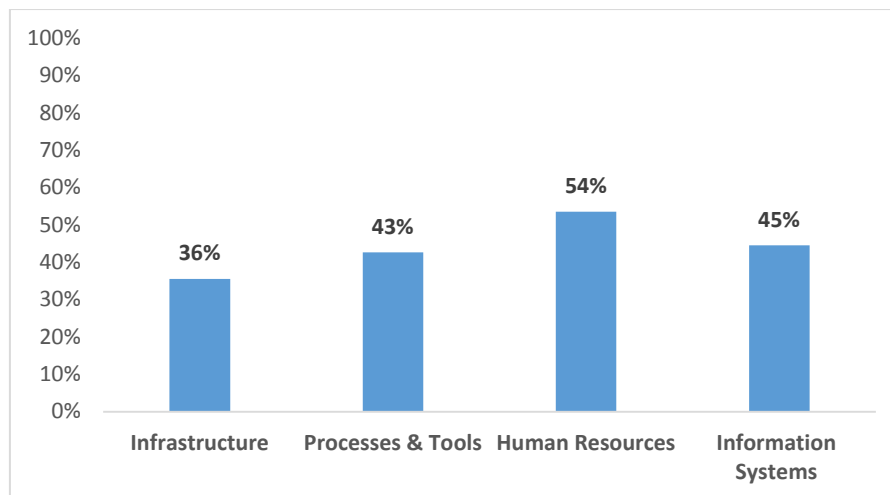


Figure 34: Laboratory capability by enabler

LMIS

The facility reporting performance for the LMIS reports was 64.9% for both hospitals and health centers. Overall health centers had a higher reporting rate than hospitals with the exception of the HIV/AIDS program. Overall, the Malaria program had the highest average reporting rate for June – Aug 2016 i.e. 87.8% compared to the rest of the other programs. This is linked to the fact that PNLP has been operating an LMIS since early 2013 supported with routine supervisions and on-the-job trainings.

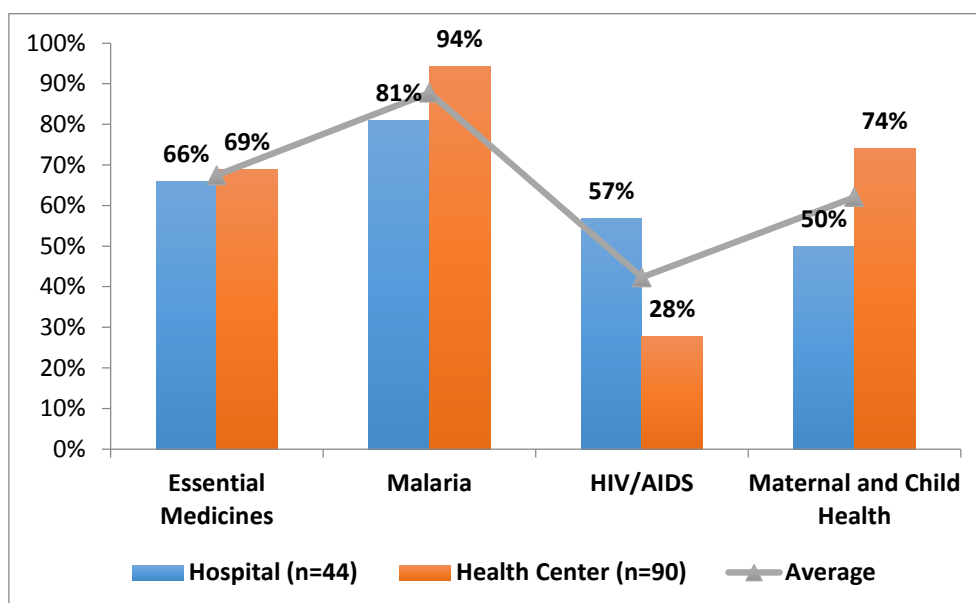


Figure 35: LMIS data reporting

Data from the assessment also revealed that there exists multiple LMIS systems operated by the different vertical programs (HIV/AIDS, malaria, MCH and PNLP).

When analyzing the LMIS reports, there were many gaps with on-time reporting at 66% and data completeness at 46%. This affects the reliability of the reported data and compromises decision-making related to quantification, procurement and resupply. Despite having the lowest number of LMIS reports available, HIV/AIDS program had the highest on-time

reporting. Overall, health centers had a strong on-time reporting performance at 78% compared to 56% for hospitals.

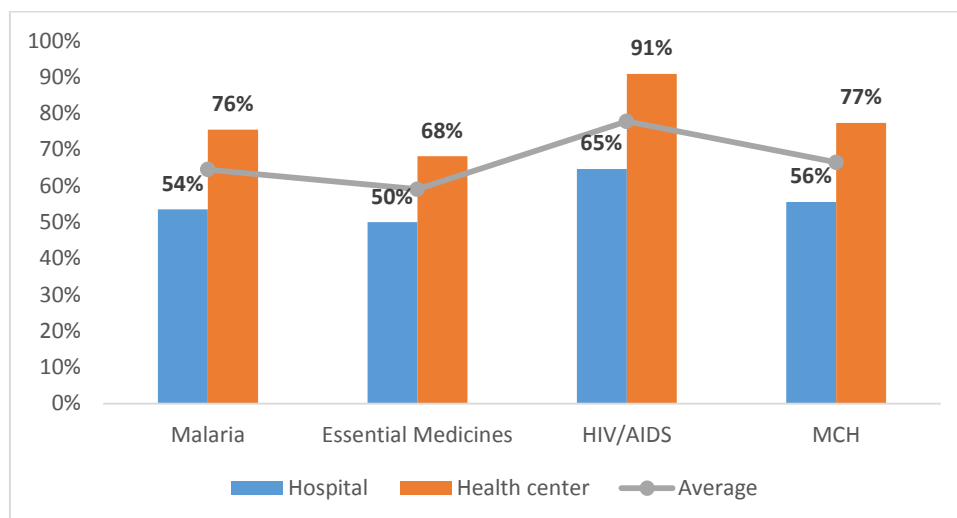


Figure 36: Timeliness of LMIS Data reporting

Malaria program had the highest completeness of the reported logistics data i.e. 67%. Despite having the highest on-time reporting rate, the HIV/AIDS program had the lowest completeness with only 30%. Health centers had more complete data as compared to hospitals i.e. 48% vs. 44% respectively

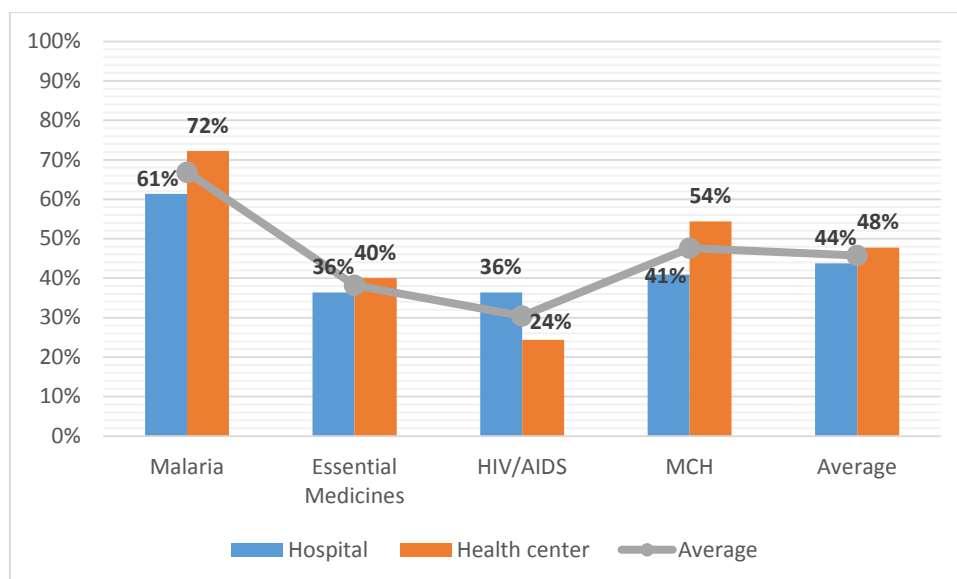


Figure 37: Completeness of LMIS Data reporting

Recommendations

- With support from USAID, the MOH is implementing a comprehensive LMIS for health commodities with the end goal to achieve logistics data visibility and availability of Health Products at all levels of the Guinea supply chain system. The MOH efforts encompass the roll out of a paper-based system, deployment of a most effective technology solution and establishment of a logistics management information unit. Sustained support for LMIS is very critical for achieving the MOH's objectives. Therefore, donor commitment to LMIS support needs to have long-term

horizon and support the MOH in the process to assume full management and financial responsibility. Near-term donor support should consider supporting the construction or refurbishment of government-owned building to host the LMU, and support LMU work plan and operational costs.

- Although supply chain professionals are trained during the LMIS rollout, further support through supervision and on-the-job training will be required for continuous quality monitoring and improvement

Supply management at the community level

Numerous countries around the world have established community health programs as a means to expand access to health services among vulnerable populations and these programs are considered a vital component of reaching the health-related Millennium Development Goals (WHO 2010). Among many drivers for successful community health programs, uninterrupted supply of health commodities to CHWs is a critical component (CORE Group 2010). Securing uninterrupted supply requires strengthening the supply chain that supports CHWs to ensure that the right quantities of the right products are available at the right time, place, and condition and for the right cost (USAID|Deliver 2013).

To gain understanding of the factors that enhance or constrain product availability at the community level, the assessment looked at various factors of the last-mile supply chain of Guinea.

At Community level, the investigators were able to administer questionnaires to 92 health workers (ACS) and 47 health posts (PS) agents to better understand the functioning of the supply chain at Community level. Three tracer products were evaluated at the community level: amoxicillin 500 mg, artemisin-based combination therapy (ACT) pack of 6 tablets, and malaria rapid diagnostic tests (RDT). Less than one third (28.3%) community health workers manage stocks of amoxicillin 500mg (figure 38).

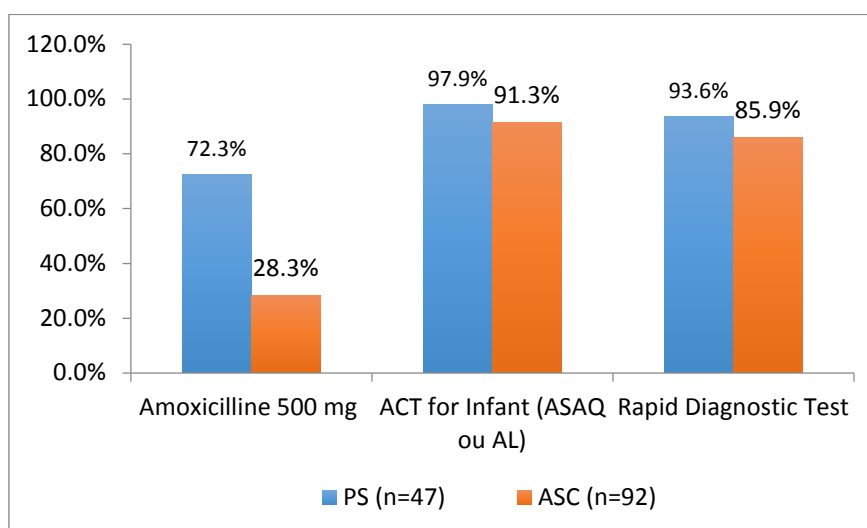


Figure 38: Tracer products managed by community health workers

Maintaining accurate records is crucial to good supply chain management. The stock card remains the main format of keeping stock records. The assessment findings reveal that stock cards availability at the community level is relatively low. In fact, only forty-eight percent (48%) of the health posts and 29% of Community Health Workers (CHWs) surveyed had

stock cards for the 3 health commodities assessed. These data indicate that traceability of stock transactions remains a huge problem at the community level.

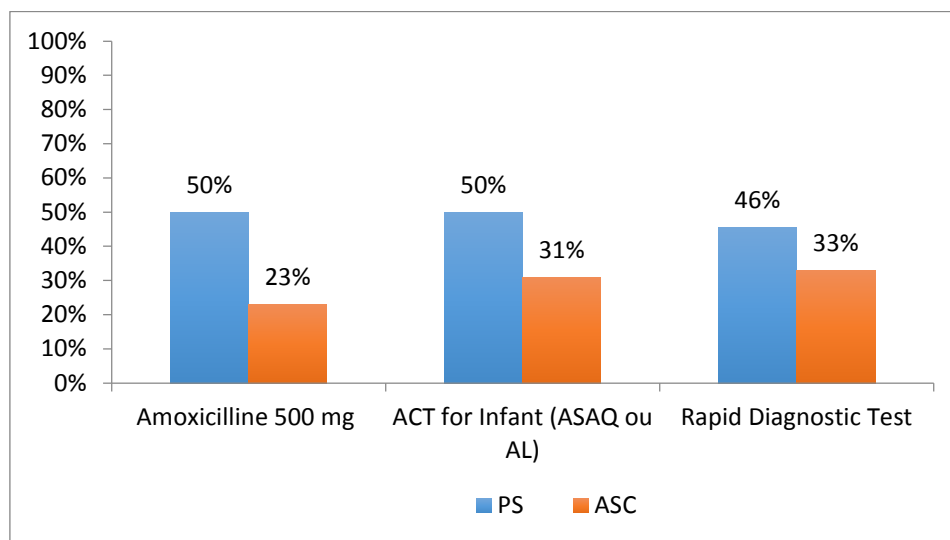


Figure 39: Stock cards availability at the community level (Health posts and CHWs)

Despite the lack of stock cards in most health posts and CHWs, stock outs for the malaria products were relatively lower compared to Amoxicillin distributed through the recovery mechanism. Overall stock out rate was higher at health posts compared to CHWs.

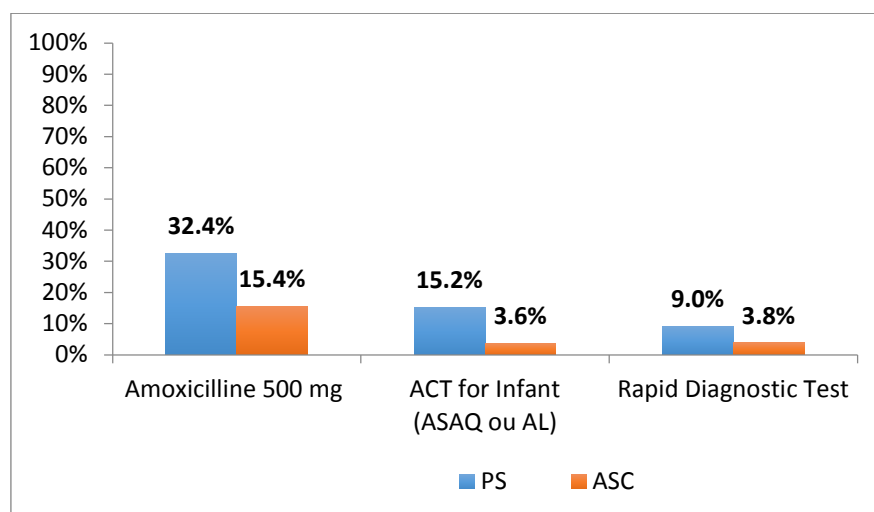


Figure 40: Stock out rates at the community level (health posts and CHWs)

Supervision is an important component to strengthening logistics systems. It helps ensure that personnel have the knowledge and skills required to carry out their responsibilities effectively, and to provide immediate on-the-job training, as needed. Data from this assessment however reveals that supervision is quasi non-existent at CHW level with less than 2.5% of the surveyed CHWs receiving a supervision visit. This suggests that CHWs are not receiving adequate support so that they consistently follow established logistics guidelines and procedures.

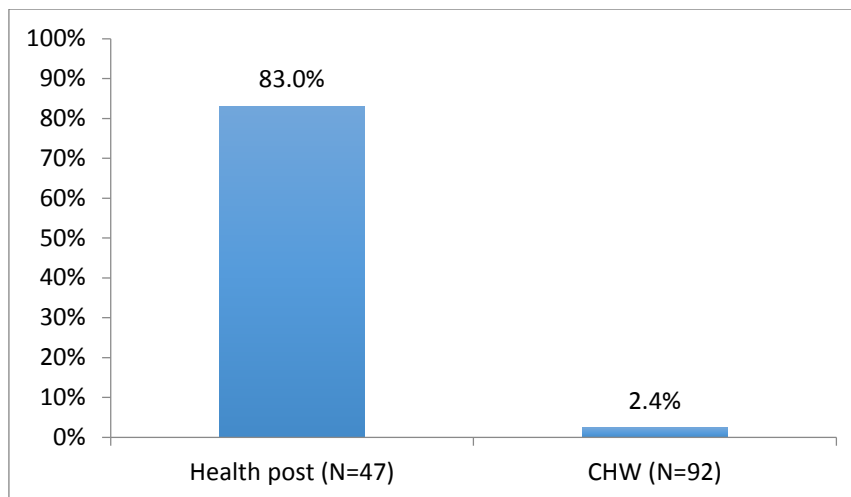


Figure 41: Supervision at the community level (Health post and CHWs)

CHWs are at the “last mile” in health supply chain system and rely on the continuous availability of medicines to the community level. It is therefore paramount that they are supplied with adequate quantities of products needed at the community level. The main source of supply of tracer products at community level is health centers (98%).

Approximately 28% of health and 37% of CHWs had satisfaction with regard to their order fulfillment by the health centers. More than 27% of health posts and 22% of CHWs indicated that their orders are rarely or never filled.

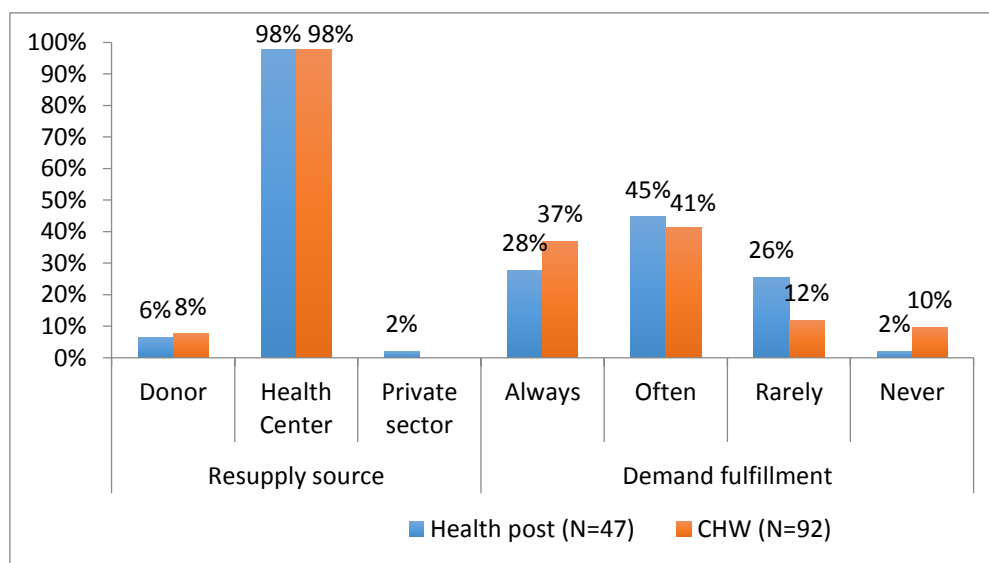


Figure 42: Source of supply and demand fulfillment for health posts and CHWs

Storage is particularly challenging for CHWs as they often work from their homes and in remote places. Health products must always be protected from water, sunlight, heat, humidity, rodents and insects, and kept out of the reach of children. Best storage conditions should ensure the physical integrity as well as quality and safety of products and their packaging. Data from this assessment revealed that more than 78% of health posts and 58% of CHWs had practical storage solutions such as cabinet. Where available the cabinet was protected from heat and direct sunlight in more than 86% health posts and 98% of surveyed CHWs.

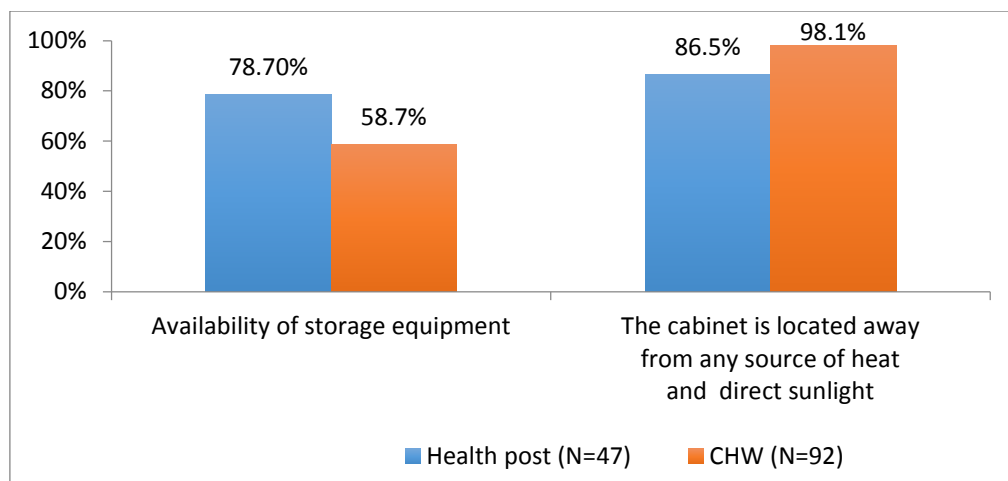


Figure 43: Storage conditions for health posts and CHWs

Recommendations

- CHWs should be provided with practical storage solutions such as lockable and dry wooden boxes
- DPS should develop, implement, and monitor schedules for supervision of health posts and CHWs by health centers' personnel.

SUMMARY OF RECOMMENDATIONS

Short-term

Product Selection

- Improve efficiency of NEML review and updates: Although processes and structures are in place for the review and update of the NEML, the latter has not been regularly updated. MOH and stakeholders should ensure that the NEML commission is adequately resourced to make regular revisions of the NEML at least every two years
- The NEML commission under the leadership of DNPM is in the middle of the process to review and update the NEML version of 2013. The innovation with this review is the involvement of practitioners from the lower levels i.e. doctors, pharmacists, nurses, and midwives from the regional, prefectural, hospital, and health center levels. While it is anticipated that this will increase the health professionals' adherence to the NEML, the MOH should also enhance the training program for the rollout while implementing a national monitoring and evaluation program to ensure adherence to NEML and STGs.

Forecasting

- The MOH has made the establishment of the Logistics Management Unit (LMU) among its top priorities. With technical support from SIAPS, MOH is establishing the LMU at the DNPM. Among other things, the LMU will be responsible for the oversight of the quantification activities including conducting forecasting and supplying, quarterly updates of supply plans, and resources mobilization for commodity funding. This unit will require mid-term support to strengthen leadership and ownership of the quantification capability within the MoH.
- In collaboration with funding partners, the MOH should ensure that proper long-term planning is in such a way to provide for appropriate budget for forecasting and supply planning activities
- Working with different supply chain technical partners, DNPM should ensure that adequate capacity building and financial support are planned to allow LMU staff gain knowledge and increase their capacity to manage and coordinate quantification of all health commodities.
- Quantification relies on having an accurate forecast that is updated regularly with timely data, and a well-managed supply plan that is continuously monitored and managed. Problems with quantification create gaps in product availability throughout the supply chain. Efforts to improve quantification processes should consider harmonizing capacity and technical expertise, implementing harmonized processes and tools for forecasting and supply planning and expand the use of both morbidity and logistics data for forecasting commodity requirements across all health programs.
- Forecasts are only as good as the data used to inform them. Whether using consumption or morbidity data, missing and/or poor quality data inhibit the accuracy and impact of the forecasts and supply plans. Through the DNPM, the MOH is implementing a harmonized system for Logistics Management Information (both paper-based and electronic systems). This provides an opportunity to deploy technical interventions to address delayed, inaccurate and incomplete logistics data which affect quality of forecasts and supply plans. Such interventions should include, but not limited to:
 - o Enforcing via a ministerial instruction a requirement that all health facilities implement supply chain activities as outlined in the SOP for integrated LMIS

- Train staff in skills and habits that encourage improved use of data
- Establish functional feedback mechanisms
- Optimize the use of the e-LMIS to improve quality and use of logistics data to inform supply chain decisions

Procurement

- Supplier performance is an important component of the procurement process, since unsatisfactory performance by a supplier can jeopardize the objectives of PCG. It is therefore paramount that PCG develop a vendor performance monitoring system with KPIs that will be used to track the suppliers' performance in complying with contracts requirements. Suppliers' past performance data will not only be used to help improve their performance but it should also be incorporated among evaluation criteria when considering the supplier for future contracts.
- To decrease the likelihood of high risks associated with the purchasing function, PCG should institute regular audits. Such audits should focus on procurement policies and procedures in place, magnitude of potential control weaknesses, and operational effectiveness of the purchasing function.

Storage and Inventory Management

- MOH should conduct a national survey to assess the storage capacity of health facilities across the country and develop optional analysis for future needs.
- Within the efforts to institutionalize best practices within its routine management, PCG should enforce the use of the SOPs by training all personnel, and continue strengthening staff capacity through on-the-job training over the long-term.
- While PCG has embarked on the process to implement a Warehouse Management System (WMS) with the aim to boost the organization's performance, change management should be an integral part to this process, to ensure that all staff are trained and bought into the new system.
- The revised SOP manual for integrated supply chain in Guinea describes standardized procedures for all supply chain functions including inventory management. Specifically, for inventory management, the SOP defines the inventory control parameters (minimum and maximum levels). To maximize the impact of this manual on the personnel's practices, adherence by all health professionals will be key. The MOH should therefore issue a Ministerial instruction letter to all health facilities as a means to enforce the use of the SOP manual.

Transportation

- In support to the existing efforts to integrate the supply chain system, it is very important that all vertical programs join this initiative to allow PCG implement the integrated distribution of all health commodities
- Conduct a costing exercise to understand the operational costs involved in storing and distributing health commodities in Guinea. Based on the findings from this exercise, develop optimized scenarios to efficiently distribute health commodities to health facilities taking into account the integrated distribution network, the existing and planned fleet capacity and product volume throughput across the supply chain system.
- The MOH should secure additional resources to procure additional cold-chain trucks to allow PCG meet the cold-chain transportation demand.

Waste Management

- Develop a training curricula and conduct trainings of health professionals
- based on the waste management procedures developed by the Ministry of Health.
- Include waste management aspects in supervision to allow for routine monitoring of adherence to the waste management procedure in place with regard to key waste management functions such as waste generation, segregation, storage, transport and disposal.

LMIS

- With support from USAID, the MOH is implementing a comprehensive LMIS for health commodities with the end goal to achieve logistics data visibility and availability of Health Products at all levels of the Guinea supply chain system. The MOH efforts encompass the roll out a paper-based system, deployment of a most effective technology solution and establishment of a logistics management information unit. Sustained support for LMIS is very critical for achieving the MOH's objectives. Therefore, donor commitment to LMIS support needs to have long-term horizon and support the MOH in the process to assume full management and financial responsibility. Near-term donor support should consider supporting the construction or refurbishment of government-owned building to host the LMU, and support LMU work plan and operational costs.
- Although supply chain professionals are trained during the LMIS rollout, further support through supervision and on-the-job training will be required for continuous quality monitoring and improvement.

Supply management at the community level

- CHWs should be provided with practical storage solutions such as lockable and dry wooden boxes
- DPS should develop, implement, and monitor schedules for supervision of health posts and CHWs by health centers' personnel.

Long-term

Procurement

- To be able to attain its objectives of ensuring availability of quality pharmaceutical products and improve financial and geographic accessibility, PCG needs additional financial resources dedicated for procurement of essential pharmaceutical products. With the support from the EU/PASA, a procurement process has been initiated that will provide PCG with a stock of pharmaceuticals worth 2.5 M euros. Additional financial resources will be required to provide PCG with adequate finances. Additionally, working with supply chain technical partners the MOH should plan adequate technical assistance to PCG that will help develop and sustain a self-sustaining revolving drug fund for essential healthcare products.
- Once equipped with sufficient financial resources dedicated for procurement of essential pharmaceutical products, PCG should consider implementing best-practices in purchasing including establishment of framework agreements to be able to benefit from the advantages that such method provides for e.g. optimized volume purchasing discounts and minimization of repetitive purchasing tasks.

Storage and Inventory Management

- The MOH should ensure adequate storage capacity and improve the storage conditions at the central level (PCG) by building new facilities that meet best warehousing facilities. Best warehousing solutions such as Warehouse-in-a-Box could be considered.

Waste Management

- Plan disposal of stockpiled unusable products in all health facilities. Working with the various supply chain stakeholders (SIAPS, CRS), the DNPM and PNLP have launched a countrywide exercise to draw up an inventory of expired commodities. These efforts should continue and lead to reverse logistics and transport of all unusable product quantities up to the district and regional levels. Appropriate budgeting and resource mobilization should be done to secure funding required to dispose of the expired quantities. This will alleviate the space constraints caused by stockpiling of expired products and improve the storage conditions of health facilities.

CONCLUSION

Public Sector Pharmaceutical Supply System Structure and Functioning

The structure of Guinea's public sector pharmaceutical supply system is relatively streamlined when compared to other countries in the region. All priority public health programs channel their products through the national supply system irrespective of the funding sources. Pharmacovigilance processes are partially developed and there is not system in place to regularly update guidelines and processes.

The distribution network consists of the Pharmacie Centrale de la Guinee (PCG) along with its regional warehouses, which supply health service delivery institutions: Hospitals and health centers. Priority public health disease programs, HIV, malaria, tuberculosis and DNSFN commodities are mostly issued free of charge, however, they are managed by PCG and its depots. Therefore, ultimate responsibility for program inventory management resides with PCG. PCG plays a central role in program inventory management, involving warehousing and transportation of these inventories. However, procurement, warehousing and inventory management information is primarily paper based throughout the supply system with significant inadequacies such as incomplete reports and inaccurately filled stock cards at health facility level. This, as well as insufficient funds, can contribute to PCG's inability to satisfy 71% of the orders placed by its regional depots in the last six months preceding this assessment.

Governance and Pharmacovigilance

A clear governance structure exists in Guinea's pharmaceutical supply system though governance capacity is very limited. DNPM, the regulatory authority, supervises PCG and the supply system to ensure governance of pharmaceutical management in the country. DNPM equally doubles has responsibility for pharmacovigilance activities in the country. However, governance procedures, including those for regulation and pharmacovigilance, are still at a very basic stage of development, and an acute shortage of human resources exists at all levels, which significantly contributes to poor performance of key functions, such as medicine registration and marketing authorization, quality control testing, inspection of pharmaceutical establishments, quantification and management of needs, management of adverse medicine use reactions and risks, and related communications.

Procurement, Warehousing, Inventory, Transportation and Pharmaceutical Waste Management

Findings from this assessment show that capability maturity and operational performance in Guinea's public pharmaceutical supply system vary significantly across supply chain management functional areas and among the different echelons of the supply network. Overall, health product selection and procurement reach satisfactory level of capability and performance. However, warehousing, inventory and pharmaceutical waste management capabilities are extremely limited, negatively affecting operations. For example, only 38% of stock cards had accurate information on the day of visit for this assessment, and only 47% of orders placed by health facilities were satisfied by PCG regional depots.

Evidently, these limited capabilities significantly contributed to the 27% six-month average stock-out rate found. Details of the results on capability and performance in each of these supply management functional areas are found in respective subsections of this report.

Human Resources for pharmaceutical supply management

Five categories of staff—pharmacists, store managers, nurse, midwives and health agents — were identified as being involved in pharmaceutical supply management. However, nurses, midwives and health technicians are not involved in supply management in PCG’s regional depots. Hospitals (73%) and all health centers do not have human resources dedicated for supply chain management, and about 53% of people managing medicines at health centers do not have the required competencies.

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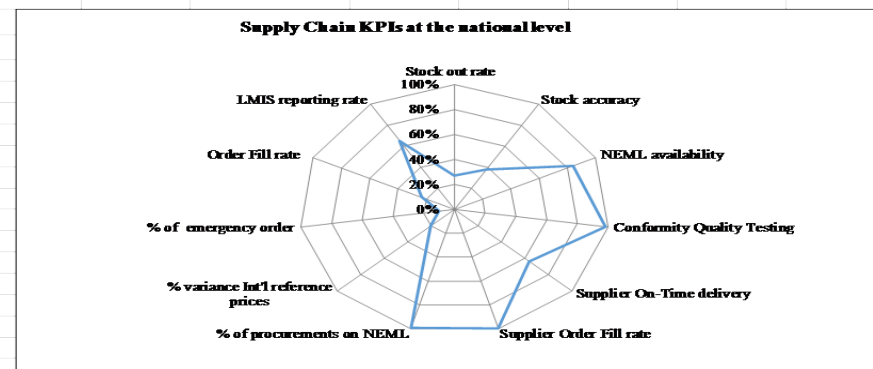
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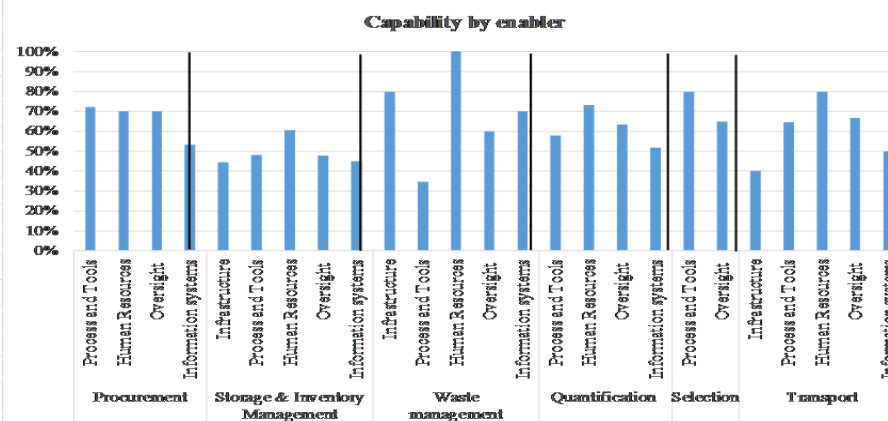
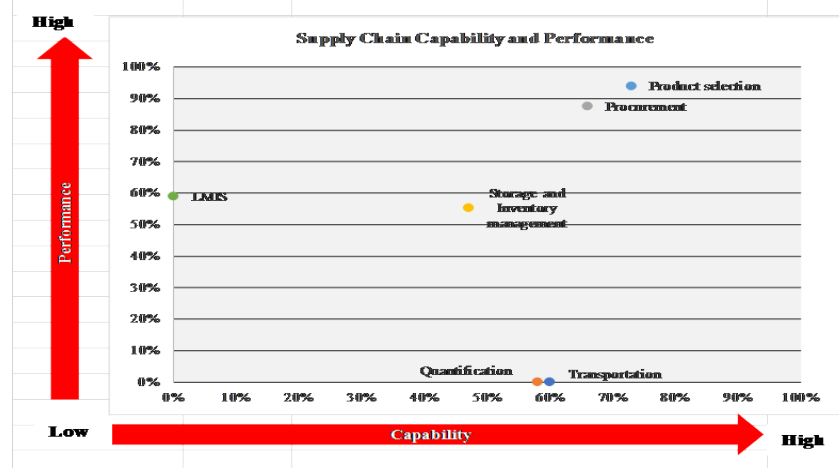
ANNEXES

Annex A: Supply Chain Assessment Results

Guinea public health supply chain assessment results			
Functional areas	Capacity	KPIs	
Overall		Availability of stock card	77.0%
		Stock card up to date	78.0%
		Stock out rate (over the last 6 months)	27.0%
		Stock out rate on the day of the visit	22.0%
		Stock accuracy (Regional depots & health facilities)	38.0%
Product selection	73%	National Essential Medicines List availability	84.0%
		Quality testing	100.0%
		% of products tested conforming to quality standards	98.1%
Quantification	58%		
Procurement	66%	Supplier On-Time delivery	64.0%
		Supplier Order Fill rate	99.5%
		% of Products procured on NEML	99.3%
		% variance between prices paid and international reference prices	20.0%
		Order turnaround time	42.2 days
Storage and Inventory management	47%	Stock accuracy (PCG)	100.0%
		Stock out rate (PCG)	35.0%
		% of quantity ordered as emergency order	10.0%
		Order Fill rate (PCG - Regional depots)	47.0%
		Order Fill rate (Regional depots - health facilities)	39.3%
Transportation	60%		
Waste management	42%		
Laboratory (hospitals)	40%		
LMIS		LMIS reporting rate	65%
		LMIS On-Time Reporting	67%
		LMIS reports' completeness	46%



Capability Maturity Model by Supply Chain Level				
Functional area	Peripheral level	Intermediary level	Central	National
Product selection			73%	73%
Quantification			58%	58%
Procurement			66%	66%
Storage and Inventory	30%	49%	59%	47%
Transportation			63%	63%
Waste management	20%	29%	59%	42%
Laboratory		40%		40%



ANNEX B: Site List

#	Facility name	Facility type	Prefecture	Region	GPS-Latitude	GPS-Longitude
1	HR Kankan	Hopital	Kankan	Kankan	10.4011	-9.3089
2	HP Boffa	Hopital	Boffa	Boké	10.1787	-14.0306
3	HN Kipé	Hopital	Ratoma	Conakry	9.5967	-13.6498
4	HN Donka	Hopital	Dixinn	Conakry	9.5370	-13.6862
5	CMC Sinko	Hopital	Beyla	N'Zérékoré	8.8840	-8.2678
6	CMC Ouendé Kénéma	Hopital	Guéckédou	N'Zérékoré	8.4528	-10.5311
7	CMC Flamboyants	Hopital	Ratoma	Conakry	9.6209	-13.6201
8	HP Mali	Hopital	Mali	Labé	12.0684	-12.2935
9	CMC Matam	Hopital	Matam	Conakry	9.5526	-13.6512
10	HP Kissidougou	Hopital	Kissidougou	Faranah	9.1980	-10.1029
11	HP Koundara	Hopital	Koundara	Boké	12.4907	-13.2955
12	HR Kindia	Hopital	Kindia	Kindia	10.0468	-12.8691
13	HP Dalaba	Hopital	Dalaba	Mamou	10.6918	-12.2494
14	HP Mandiana	Hopital	Mandiana	Kankan	10.6259	-8.6946
15	HR Mamou	Hopital	Mamou	Mamou		
16	HR Labé	Hopital	Labé	Labé	11.3186	-12.2850
17	HR Faranah	Hopital	Faranah	Faranah	10.0412	-10.7397
18	HR Boké	Hopital	Boké	Boké	10.9346	-14.2883
19	HP Yomou	Hopital	Yomou	N'Zérékoré	7.5683	-9.2613
20	HP Tougué	Hopital	Tougué	Labé	11.4400	-11.6632
21	HP Télimélé	Hopital	Télimélé	Kindia	10.9111	-13.0312
22	HP Siguiri	Hopital	Siguiri	Kankan	11.4205	-9.1714
23	HP Pita	Hopital	Pita	Mamou	11.0644	-12.3952
24	HP Macenta	Hopital	Macenta	N'Zérékoré	8.5407	-9.4715
25	HP Lola	Hopital	Lola	N'Zérékoré	7.7998	-8.5314
26	HP Lélouma	Hopital	Lélouma	Labé	11.4300	-12.6835
27	HP Kouroussa	Hopital	Kouroussa	Kankan	10.6502	-9.8734
28	HP Koubia	Hopital	Koubia	Labé	11.5893	-11.8972
29	HP Kérouané	Hopital	Kérouané	Kankan	9.2782	-9.0007
30	HP Gueckédou	Hopital	Guéckédou	N'Zérékoré	8.5593	-10.1352
31	HP Gaoual	Hopital	Gaoual	Boké	11.7621	-13.2004
32	HP Fria	Hopital	Fria	Boké	10.3658	-13.5822
33	HP Forécariah	Hopital	Forécariah	Kindia		
34	HP Dubréka	Hopital	Dubréka	Kindia	9.7904	-13.5258
35	HP Dinguiraye	Hopital	Dinguiraye	Faranah	11.2899	-10.7183
36	HP Dabola	Hopital	Dabola	Faranah	10.7373	-11.1044
37	HP Coyah	Hopital	Coyah	Kindia	9.7074	-13.3910
38	HP Beyla	Hopital	Beyla	N'Zérékoré	8.6879	-8.6454
39	HN Ignace Deen	Hopital	Kaloum	Conakry	9.5072	-13.7051
40	CMC Ratoma	Hopital	Ratoma	Conakry	9.5840	-13.6591
41	CMC Minière	Hopital	Dixinn	Conakry	9.5663	-13.6608
42	CMC Kondéya	Hopital	Dubréka	Kindia		
43	CMC Coléah	Hopital	Matam	Conakry		
44	HR N'Zérékoré	Hopital	N'Zérékoré	N'Zérékoré	7.7489	-8.8226
45	Tondon	Centre de santé	Dubréka	Kindia		
46	Sonfonya	Centre de santé	Ratoma	Conakry		

#	Facility name	Facility type	Prefecture	Region	GPS-Latitude	GPS-Longitude
47	Sannou	Centre de santé	Labé	Labé	11.4151	-12.1127
48	Poudrière	Centre de santé	Mamou	Mamou		
49	Nongoa	Centre de santé	Guéckédou	N'Zérékoré	8.5050	-10.3345
50	Niantania	Centre de santé	Mandiana	Kankan	11.2301	-8.6781
51	Niagara	Centre de santé	Mamou	Mamou		
52	Mitty	Centre de santé	Dalaba	Mamou	10.8032	-12.3097
53	Missira	Centre de santé	Kankan	Kankan	10.3941	-9.3167
54	Missira	Centre de santé	Koubia	Labé	11.4397	-11.9734
55	Malapouyah	Centre de santé	Boké	Boké	10.7135	-14.1747
56	Malanta	Centre de santé	Gaoual	Boké	11.4849	-12.8265
57	Madina Oula	Centre de santé	Kindia	Kindia	9.8821	-12.4482
58	Madina	Centre de santé	Guéckédou	N'Zérékoré	8.5706	-10.1310
59	M' Bonet	Centre de santé	Dinguiraye	Faranah	11.1180	-10.9710
60	Lisso	Centre de santé	Boffa	Boké		
61	Leymiro	Centre de santé	Pita	Mamou	10.9525	-12.8928
62	Koumban	Centre de santé	Kankan	Kankan	10.2119	-9.4712
63	Komola	Centre de santé	Kouroussa	Kankan	11.0474	-10.4002
64	Kobéla	Centre de santé	N'Zérékoré	N'Zérékoré	9.5144	-13.7042
65	Kankalabé	Centre de santé	Dalaba	Mamou	11.1482	-11.9985
66	Kanfarandé	Centre de santé	Boké	Boké	10.6654	-14.5861
67	Hafia	Centre de santé	Dixinn	Conakry		
68	Guingan	Centre de santé	Koundara	Boké	12.3877	-12.9609
69	Foulamori	Centre de santé	Gaoual	Boké	12.1607	-13.8402
70	Fangamadou	Centre de santé	Guéckédou	N'Zérékoré	8.4957	-10.5935
71	Faléssadé	Centre de santé	Dubréka	Kindia		
72	Dinguiraye	Centre de santé	Dinguiraye	Faranah	11.2843	-10.7110
73	Dibia	Centre de santé	Boké	Boké	10.9346	-14.2917
74	Dalaba	Centre de santé	Dalaba	Mamou	10.6870	-12.2478
75	Dabompa	Centre de santé	Matoto	Conakry		
76	Coronthie	Centre de santé	Kaloum	Conakry		
77	Commercial	Centre de santé	N'Zérékoré	N'Zérékoré	7.7515	-8.8155
78	Cisséla	Centre de santé	Kouroussa	Kankan	10.8390	-10.6108
79	Boffa-centre	Centre de santé	Boffa	Boké	10.1829	-14.0414
80	Bantiguel	Centre de santé	Pita	Mamou	11.1090	-12.2985
81	Balizia	Centre de santé	Macenta	N'Zérékoré	8.8054	-9.8085
82	Balandougouba	Centre de santé	Mandiana	Kankan	11.3252	-8.4117
83	Babila	Centre de santé	Kouroussa	Kankan	10.7168	-9.5710
84	Aviation	Centre de santé	Fria	Boké	10.3581	-13.5740
85	Arfamoussaya	Centre de santé	Dabola	Faranah	10.7619	-11.3609
86	Thiaghel Bory	Centre de santé	Lélouma	Labé	11.6343	-12.5357
87	Manda Saran	Centre de santé	Lélouma	Labé		
88	Daralabé	Centre de santé	Labé	Labé	11.2235	-12.3170
89	Banakoro	Centre de santé	Kérouané	Kankan	9.1783	-9.3020
90	Linko	Centre de santé	Kérouané	Kankan	9.3789	-8.8178
91	Kiniéran	Centre de santé	Mandiana	Kankan	11.0804	-8.8344
92	Fodécariah	Centre de santé	Dinguiraye	Faranah	10.9685	-11.0538
93	Garambé	Centre de santé	Labé	Labé	11.2777	-12.3423
94	Tounkarata	Centre de santé	Lola	N'Zérékoré		
95	Madina	Centre de santé	Kissidougou	Faranah	9.1866	-10.0987

#	Facility name	Facility type	Prefecture	Region	GPS-Latitude	GPS-Longitude
96	Firawa	Centre de santé	Kissidougou	Faranah	9.3893	-10.2102
97	Banian	Centre de santé	Faranah	Faranah	9.5992	-10.5358
98	Songoyah	Centre de santé	Faranah	Faranah		
99	Kouramangui	Centre de santé	Labé	Labé	11.5107	-12.4365
100	Banguigny	Centre de santé	Fria	Boké	10.6759	-13.6004
101	Gaya	Centre de santé	Mali	Labé	12.0133	-12.4268
102	Franwalia	Centre de santé	Sigui	Kankan	11.6946	-9.3819
103	Banama	Centre de santé	Kissidougou	Faranah	9.1346	-10.1505
104	Samaya	Centre de santé	Kindia	Kindia	10.0815	-13.0178
105	Wondy	Centre de santé	Kindia	Kindia	10.0424	-12.8589
106	Samana	Centre de santé	Beyla	N'Zérékoré	9.1124	-8.5554
107	Donghel Sigon	Centre de santé	Mali	Labé	11.7770	-12.2113
108	Baténafadji	Centre de santé	Kankan	Kankan	10.4005	-9.3086
109	Kaporo	Centre de santé	Ratoma	Conakry	9.6119	-13.6444
110	Diassodou	Centre de santé	Beyla	N'Zérékoré	9.1088	-8.3374
111	Mohomou	Centre de santé	N'Zérékoré	N'Zérékoré	7.7375	-8.8281
112	Leysaré	Centre de santé	Labé	Labé	11.3132	-12.2810
113	Guéasso	Centre de santé	Lola	N'Zérékoré		
114	Lola	Centre de santé	Lola	N'Zérékoré		
115	Lola	Centre de santé	Lola	N'Zérékoré		
116	Maréla	Centre de santé	Faranah	Faranah	10.0694	-11.1209
117	Dounet	Centre de santé	Mamou	Mamou		
118	Diakolidou	Centre de santé	Beyla	N'Zérékoré	8.6876	-8.6471
119	Fafaya	Centre de santé	Koubia	Labé	11.7077	-11.6926
120	Karala	Centre de santé	Beyla	N'Zérékoré	8.3608	-8.7109
121	Dogomet	Centre de santé	Dabola	Faranah	10.7179	-11.4428
122	Tanènè	Centre de santé	Dubréka	Kindia		
123	Samoe	Centre de santé	N'Zérékoré	N'Zérékoré	7.7937	-8.8095
124	Sabadou Baranama	Centre de santé	Kankan	Kankan	10.3848	-9.3092
125	Panziazou	Centre de santé	Macenta	N'Zérékoré	8.6213	-9.8573
126	Kouriah	Centre de santé	Coyah	Kindia	9.7779	-13.3440
127	Korbé	Centre de santé	Lélouma	Labé	11.4927	-12.5454
128	Kakossa	Centre de santé	Forécariah	Kindia		
129	Fassankoni	Centre de santé	Macenta	N'Zérékoré	8.6593	-9.6912
130	Doumbouya	Centre de santé	Coyah	Kindia	9.6899	-13.3835
131	Damakanya	Centre de santé	Kindia	Kindia	10.0089	-12.8995
132	Benty	Centre de santé	Forécariah	Kindia		
133	Balaya	Centre de santé	Lélouma	Labé		
134	Soyah	Centre de santé	Mamou	Mamou		
135	Dépôt Régional de Kankan	Dépot PCG	Kankan	Kankan	10.3680	-9.3063
136	Dépôt Régional de Faranah	Dépot PCG	Faranah	Faranah	10.0436	-10.7385
137	Dépôt Régional de Boké	Dépot PCG	Boké	Boké	10.9178	-14.2932
138	Dépôt Régional de Labé	Dépot PCG	Labé	Labé	11.3193	-12.2852
139	Dépôt Régional de Nzérékoré	Dépot PCG	N'Zérékoré	N'Zérékoré	7.7513	-8.8231
140	Dépôt Régional de	Dépot PCG	Dixinn	Conakry	9.5475	-13.6672

#	Facility name	Facity type	Prefecture	Region	GPS- Latitude	GPS- Longitude
	Guinée Maritime					