USAID MEDICINES, TECHNOLOGIES, AND PHARMACEUTICAL SERVICES (MTaPS) PROGRAM

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Leveraging Private-Sector Logistics Providers in Supporting Public Health Supply Chains in Nigeria

A political economy, operational capability, and cost-benefit analysis

September 2022

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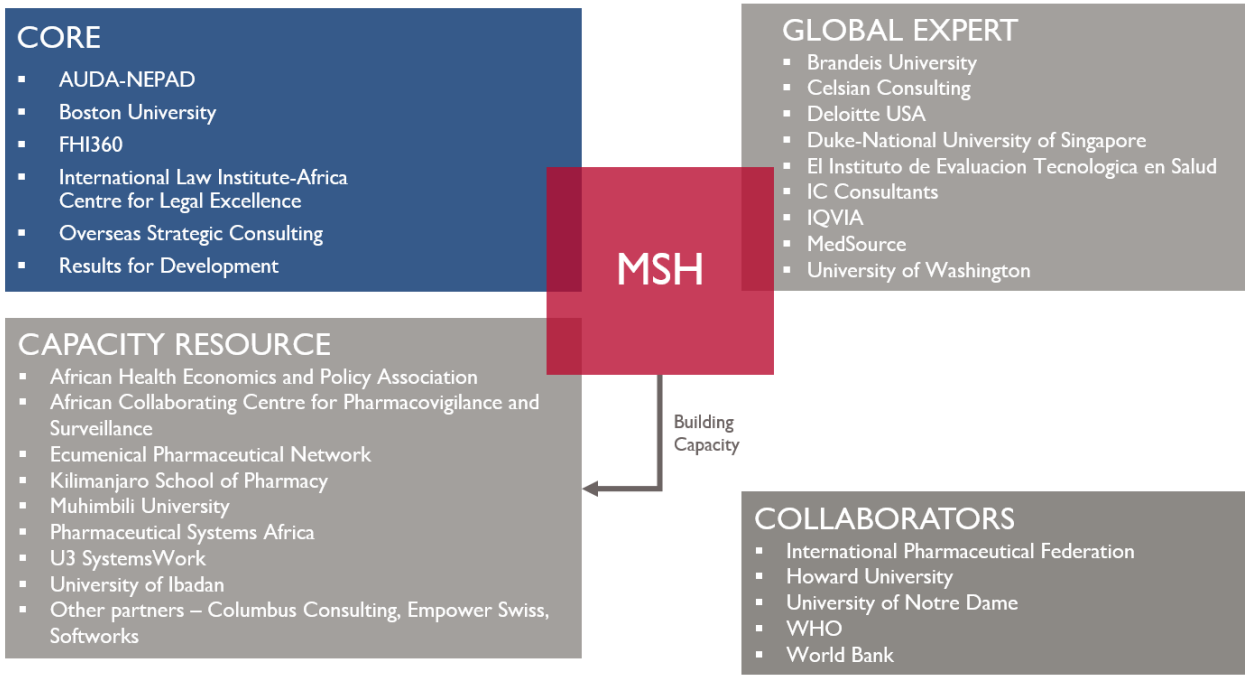
The USAID Medicines, Technologies, and Pharmaceutical Services (MTaPS) Program enables low- and middle-income countries to strengthen their pharmaceutical systems, which is pivotal to higher-performing health systems. MTaPS focuses on improving access to essential medical products and related services and on the appropriate use of medicines to ensure better health outcomes for all populations. The program brings expertise honed over decades of seminal pharmaceutical systems experience across more than 40 countries. The MTaPS approach builds sustainable gains in countries by including all actors in health care—government, civil society, the private sector, and academia. The program is implemented by a consortium of global and local partners and led by Management Sciences for Health (MSH), a global health nonprofit.

The MTaPS Consortium



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ACRONYMS AND ABBREVIATIONS

3PL	third-party logistics
4PL	fourth-party logistics
CCW	central contraceptive warehouse
CMS	central medical store
DCI	Distribution Concepts International
FCT	Federal Capital Territory
FP	family planning
FWA	Framework Analysis
GHSC-PSM	Global Health Supply Chain – Procurement and Supply Management
GPS	global positioning system
KPI	key performance indicator
LGA	local government authority
LLP	lead logistics service provider
LMCU	logistics management coordinating unit
LMD	last mile delivery
LMICs	low- and middle-income countries
LMIS	logistics management information system
MHE	mechanical handling equipment
MOH	Ministry of Health
MTaPS	Medicines, Technologies, and Pharmaceutical Services
NPSCMP	National Product Supply Chain Program
OCAT	operational capability assessment tool
PEA	political economy analysis
POD	proof of delivery
RPEA	rapid political economy analysis
SCM	supply chain management
SDP	service delivery point
SLA	service-level agreement
SOP	standard operating procedures
UNFPA	United Nations Population Fund
USAID	US Agency for International Development

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PROJECT SUMMARY

Program Name:		USAID Medicines, Technologies, and Pharmaceutical Services (MTaPS) Program
Activity Start Date And End Date:		September 20, 2018–September 19, 2023
Name of Prime Implementing Partner:		Management Sciences for Health
Contract Number:		7200AA18C00074
MTaPS Partners	**Core Partners**	Boston University, FHI 360, Overseas Strategic Consulting, Results for Development, International Law Institute-Africa Centre for Legal Excellence, NEPAD
	Global Expert Partners	Brandeis University, Deloitte USA, Duke-National University of Singapore, El Instituto de Evaluacion Technologica en Salud, IC Consultants, Imperial Health Sciences, MedSource, QuintilesIMS, University of Washington
	Capacity Resource Partners	African Health Economics and Policy Association, Ecumenical Pharmaceutical Network, U3 SystemsWork, University of Ibadan, University of Ghana's World Health Organizations (WHO) Pharmacovigilance Collaborating Center, Kilimanjaro School of Pharmacy, Muhimbili University, Pharmaceutical Systems Africa
	Collaborators	International Pharmaceutical Federation, Howard University, University of Notre Dame, WHO, World Bank

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EXECUTIVE SUMMARY

In 2021 and 2022, the US Agency for International Development (USAID) Medicines, Technologies, and Pharmaceutical Services (MTaPS) Program undertook a study relating to the implementation of best practice third-party logistics (3PL) and fourth-party logistics (4PL) service provider relationships in low- and middle-income countries (LMICs). The research was undertaken in Nigeria with both in-country and remote team members.

The dual objectives of the work were to assess:

- The potential for implementing such relationships, not only in Nigeria but in LMICs in general
- The capability of the available logistics service providers with regard to delivering the services required by public-sector health care systems

Although outsourcing strategies are deployed in Nigeria, they are traditional fee-for-service contracts that do not reflect global best practice relationships. Briefly, best practice 3PL and 4PL provider relationships can be defined as follows:

3PL: Usually reserved for organizations offering complete in-country operations that embrace both warehousing and transport. Typically, a 3PL provider would have an integrated IT system that incorporates order processing, warehouse management, and transport planning and enables data analysis and the production of performance measures to be undertaken automatically in a timely manner.

4PL: Defined as a professional logistics company that integrates multiple logistics services (3PLs) to provide clients with an end-to-end strategic view of the supply chain without necessarily deploying any operational assets of its own. It is supported by an IT system that enables transparency and analytical capabilities for proactive monitoring and continuous improvement.

Typically, a best practice 3PL or 4PL provider relationship will undertake standard supply chain activities in a collaborative manner and have the following characteristics:

- Longer contract lengths than traditional fee-for-service arrangements
- Defined contacts between the organizational units of the client and the service provider
- Integration of the IT systems of both organizations
- Scheduled reporting at various levels within the organizations
- Standard operating procedures (SOPs) detailing the methods of working for both the client and the logistics service provider

In Nigeria, to obtain a better understanding of current public-sector supply chain costs and service levels, the operational capability of the public and private sectors, and perceptions and factors that influence decision making in both sectors, the following tools were developed and deployed in Sokoto State, Plateau State, and the Federal Capital Territory (FCT):

- **Rapid political economy analysis** (RPEA) to understand the major political, economic, social, and cultural incentives, motivations, and constraints that impact decision making in both sectors

- **Operational capability assessment** to identify strengths and gaps in the public-sector supply chain and assess the ability of the private sector to provide the required services
- **Cost-benefit analysis** to measure current supply chain spending and service levels

These analyses were components of a larger decision framework that informs the decision to adopt a best practice 3PL or 4PL provider strategy using a systematic approach.

The ***RPEA*** involved structured interviews with representatives from the Ministry of Health (MOH) and private-sector logistics service providers. Many of the private-sector organizations that participated in the analysis had worked previously with some area of government and were willing to engage in an outsourcing capacity. However, hesitations on the part of the private sector included the timeliness of payments and the excessive administrative layers involved in dealing with government institutions. The public sector was largely in favor of the 3PL provider approach but had mixed opinions regarding 4PL provider engagements. Public-sector reservations regarding 4PL provider engagement were a loss of ownership and control, layoffs, and a lack of transparency. Many of these concerns resulted from working with previous or current private-sector service providers that were not reflective of the proposed best practice relationships.

The ***operational capability assessment tool (OCAT)***, which is based on a maturity model technique, required interviewees to score various elements of supply chain activities on a scale of best practice (0 to 4) to assess the location's supply chain operational capability. The interviewees represented a cross-section of supply chain experience and included senior executives, operations managers, and logistics coordinators. While each location had particular issues regarding its operation, the following common areas for improvement were identified:

- Organizational structure and reporting relationships
- Logistics management information systems (LMIS)
- Monitoring and evaluation (M&E) processes
- Technical and physical infrastructure
- Warehousing and distribution activities

The private-sector interviewees included both new entrants to the market and companies that had been in existence for many years. While the recently formed companies could not provide all of the services required by the MOH, several mature organizations could provide a total end-to-end supply chain offering. During the interviews with representatives of private-sector logistics service providers and while researching websites, many of those companies demonstrated considerable experience of working with the public sector recently and in previous years. Further, the research identified that many of the private-sector companies had provided logistics services to clients regarded as leading supply chain practitioners that deployed best practice processes and techniques.

Despite the data gathering difficulties, experienced by the project team, it is clear that there is considerable room for performance improvement in public-sector health care supply chains in the areas of Nigeria that were reviewed. It is also clear that the private-sector logistics service provider market has companies able to provide best practice services to the MOH. The information gained from the study is a valuable starting point for the further, detailed work that will be necessary to progress the 3PL and 4PL provider discussion in Nigeria.

The cost-benefit analysis obtained data from several sources to estimate the overall cost of operating the public-sector supply chain. The estimated annual savings of USD 60m is regarded as an underestimate, given the difficulty in obtaining data from all supply chain stakeholders and implementing partners. Examples of cost savings from the private sector also are likely to involve pre-existing working relationships whose savings had been realized several years ago. Further, while cost savings are an important factor in the decision making process, improved service levels, as a result of deploying the expertise of the logistics service provider, should also be considered.

A decision framework linking the three individual tools was developed to support the MOH as it considered the development of a best practice 3PL or 4PL provider strategy and prepared for the implementation of the strategy should it decides to outsource its supply chain system. The framework facilitates decision making by:

- Evaluating public-sector supply chains
- Determining the potential benefits of a best practice 3PL or 4PL provider strategy
- Assessing the capability of potential private-sector logistics service providers to provide the required services

Although Nigeria has made significant strides in improving the efficiency of its health sector supply chains, fragmentation, lack of end-to-end supply chain visibility, numerous fee-for-service logistics providers, and limited data make outsourcing segments of the supply chain to the private sector in a best practice manner worthy of consideration.

To address concerns around private-sector organizations making a profit from public funds and assess the relative level of the outsourced costs, an in-depth understanding of the in-house costs is essential. The content of a potential service provider's overall offering might include input to improving the supply chain operation, the IT systems that manage the daily operation and provide frequent performance monitoring data, and the communication between the two organizations to draft service-level agreements (SLAs). The benefits of best practice 3PL and 4PL provider partnerships are readily available in the public domain. There is a significantly higher likelihood of meeting cost and schedule objectives with a 3PL or 4PL provider best practice relationship.

Advocacy and learning initiatives should be launched to ensure understanding of the intent, purpose, and organization of best practice 3PL and 4PL provider relationships. It is critical that all stakeholders, especially in the public sector, understand that the objective of 3PL and 4PL provider implementation is actually to increase government ownership and enhance transparency in the supply chain. Anything that reduces operating costs and enables additional expenditure in the areas of pharmaceuticals and medical equipment should be considered seriously. The decision framework provides a structure for doing so.

In conclusion, some outsourcing of a traditional fee-for-service nature has been undertaken in Nigeria to deal with a particular element of the overall supply chain. This has involved several service providers supplying short-term warehouse space or transport services, which has required the management of many contracts. During the workshops and discussion forums, participants indicated that the key reasons for not achieving the anticipated benefits of best practice 3PL or 4PL relationships is the inadequate experience, lack of trust, and loss of control with regard to managing such a relationship. The skills required include having a detailed understanding of the current levels of cost and the required

levels of service, managing logistics service providers via regular review meetings and key performance indicators (KPIs), developing two-way SLAs, and presenting future strategic objectives to the logistics service provider's contract management team. Further issues regarding the use of 3PL and 4PL providers include:

- A lack of ownership of the overall supply chain by MOH staff resulting in a tendency to abdicate responsibility for service delivery to the 3PL or 4PL provider partner despite the fact that overall responsibility remains within the public-sector supply chain team
- The view that the private sector is an expensive strategy and that companies will be making a profit at the expense of taxpayers

Despite the above challenges, the benefits of best practice 3PL or 4PL provider relationships are well documented and include:

- Experienced staff within the logistics service provider's organization who are available to their clients, both on a day-to-day basis operationally and to support strategic planning and performance monitoring activities
- A more agile supply chain that is able to respond to increases in demand for supply chain resources as a result of working with a successful 3PL or 4PL provider with several on-going contracts
- Integrated IT systems that have been developed to meet their demanding clients' requirements cost effectively
- Reduced levels of equipment downtime through routine equipment maintenance and renewal
- Higher levels of delivery fleet utilization as collaboration among different contracts with varied seasonal peaks is facilitated by the 3PL or 4PL provider
- An in-depth knowledge of the local logistics service provider market as a result of having a good understanding of their own cost base and operating profitably over the years
- Regular contingency planning to mitigate risks to the delivery of the agreed level of service; the service provider will be driven by the profit motive, and the contingency plans can be shared with its client for mutual benefit
- The MOH's and State's focus on the core business of providing health services for better health outcomes to the population while the private sector focuses on operating the supply chain

There is a general consensus among many, although not all, of the MOH staff interviewed and those participating in the discussion groups that implementing a 3PL or a 4PL provider relationship has the potential to overcome the shortcomings of public-sector health care supply chains. Typically, a 3PL relationship was a more familiar and more acceptable strategy than that of a 4PL. In broader terms, an enhanced health care supply chain will contribute to improving the overall health of the population, reduce the strain on the national health care system, and potentially enhance the economic growth of the country. However, implementing such relationships requires considerable learning, mentoring, advocacy, and guidance of the MOH supply chain management team to ensure that the benefits are delivered.

INTRODUCTION

In 2020, Nigeria's population was estimated to be around 206m people, of whom just over 50% live in rural areas. However, only 15% of the nation's roads are paved, making both long-haul and last mile distribution (LMD) challenging—a situation made even more difficult in the wet season. The distribution network utilizes a typical hub and spoke distribution network based on central warehouse facilities in Lagos and Abuja, using a combination of in-house and outsourced resources. A best practice relationship involving a 3PL provider managing a government-owned warehouse, governed by a memorandum of understanding, was highlighted during the discussions at one location. Six regional warehouses act as hubs, serving around six states each. The two central warehouses also act as regional hubs for their immediate geographic areas. LMD operations are executed from the regional hubs to the service delivery points (SDPs) in hospitals and clinics.

Supply chain strategy development and implementation is supported by the National Product Supply Chain Management Program (NPSCMP). While not directly managing the health care supply chain, the NPSCMP has made strides to improve public supply chain outcomes by organizing coordinating structures at the federal, state, and local government authority (LGA) levels through integrating donor efforts, setting standards, and defining roles and responsibilities among stakeholders. The successful use of 3PL providers has been a feature of many of the strategic supply chain implementation projects and is expected to feature in the roll-out of the new National Health Products Supply Chain Strategy. However, in common with other LMICs, performance measures obtained by the project team indicated areas for performance improvement.

The 3PL provider sector of the logistics industry in Nigeria is decentralized, with many small private-sector companies serving industries such as fast-moving consumer goods and the telecommunications sector, where the regulations and standards are not as strict as those in the pharmaceutical sector. Other coordinated players, such as General and Health Logistics International Limited and MDS Logistics, are also active in the health sector and have been so for the last decade.[1] However, there is still a deficiency of capacity and expertise in the 3PL sector in Nigeria. During 2021 and 2022, MTaPS undertook a study into the political economy analysis (PEA), operational capability assessment, and cost-benefit analysis of engaging private-sector 4PL and 3PL service providers in supporting the public health supply chain.

Despite a considerable number of supply chain strengthening initiatives in LMICs, many continue to have public-sector health care supply chains that do not perform well. Despite the availability of inventory at central storage locations, the situation regularly results in zero levels of stock of both essential medicines and program pharmaceuticals at the point of care. Consequently, patients cannot always start treatment immediately after a diagnosis has been made, and ongoing treatment due to the nonavailability of the appropriate pharmaceuticals at health facilities can be interrupted. High levels of expired stock

[1] Aigbavboa S, Mbohwa C. (2020). The Headache of Medicines' Supply in Nigeria: an Exploratory Study on the Most Critical Challenges of Pharmaceutical Outbound Value Chains. *Procedia Manufacturing*, 43, pp.336–343.

are experienced at all levels within the supply chain networks, which incurs additional costs in the areas of warehousing, transport, and specialized disposal.

Many of these shortcomings can be overcome by best practice 3PL and/or 4PL providers to execute supply chain activities. As the economies of LMICs have advanced in recent years and manufacturing organizations have adopted best practices from high-income countries, logistics service providers have emerged and provide a range of services, including procurement, international logistics, customs clearance, and in-country distribution offerings such as express courier services.

There are many types of logistics service provider. This report focuses on two:

- **3PL.** In LMICs, the public sector typically uses the term 3PL provider with regard to an organization that offers a single element of the supply chain (e.g., warehousing or transport) and often follows a fee-for-service model. In high-income countries, the title is usually reserved for organizations offering complete in-country operations embracing both warehousing and transport. Having a single organization managing both aspects of operation has operational coordination benefits. Typically, a 3PL provider would have an integrated IT system that includes order processing, warehouse management, and transport planning and enables data analysis and the automatic production of performance measures in a timely manner. In some instances, a single 3PL provider, the lead logistics service provider (LLP), will contract and manage further localized suppliers of warehouse and transport services on behalf of its client to provide a seamless operational network. This reflects a best practice method of operation, with a small number of service providers for the client to manage.
- **4PL.** A 4PL provider relationship is more advanced than a 3PL provider relationship. In this situation, the organization will manage various 3PL providers without necessarily deploying any of its own operational assets. A 4PL provider is a professional logistics company that integrates multiple logistics services to provide clients with an end-to-end strategic view of the supply chain, supported by an IT system that enables transparency and analytics capabilities for proactive monitoring and continuous improvement. The 4PL provider owns few, if any, assets itself; rather, the discrete supply chain functions are carried out by 3PL providers.[2]

In more practical terms, a best practice 3PL provider will be involved in the following supply chain activities:

- Manage ongoing communication to ensure there is an understanding of the client's requirements, such as analyzing and communicating product volumes, new product introductions, costing budgets, health care campaigns that will affect demand, and schedules for both inbound and outbound product movement.
- Receive instructions to ship product to the client's customers. In best practice situations, this is done electronically by transfers between the IT systems of the two organizations. In some instances, the 3PL providers provide the order capture process directly, with the dispatching schedule already developed collaboratively in advance of the receipt of orders, reflecting the client's customers' required levels of service.

[2] MTaPS. (2021). Desk Review on the Global 4PL Landscape and its Application in Global Health Supply Chains.

- Receive inbound sea-freight containers and air-freight shipments based on unloading schedule agreed to with the procurement team and customs clearance organizations.
- Store products from suppliers and returned items from customers: 3PL providers will operate automated warehouse management systems that record detailed product descriptions and inventory transactions and facilitate warehouse business processes such as pallet and batch locations; expiry dates tracking; perpetual inventory counting; picking, packing, and dispatching orders after developing a distribution plan with the client and receiving instructions to proceed; and producing delivery documentation or deploying paperless proof of delivery (POD) processes.
- Implement and maintaining appropriate IT systems and the electronic data exchanges between the two organizations: While the 3PL provider will deploy and update specific warehouse management systems and route planning software internally, there will be a need to interface those systems with the systems of the client.
- Measure and report performance-level achievement: Utilizing the data from within the operational systems and other data collection techniques, the 3PL provider will report progress at the intervals agreed within the SLA. Best practice supply chain operations achieve almost perfect performance in terms of delivery timeliness, stock availability, high stock turns, order completeness, cost budget conformance, and error-free picking and dispatch. Modern paperless warehouse picking systems have helped significantly in this respect.

Recommend improvements: After historical data are gathered, 3PL providers could recommend potential operational improvements that could be introduced to reduce costs and/or increase the levels of service.

A 4PL provider will not manage any supply chain network assets but will contract with and manage a number of 3PL providers on the client's behalf. The 4PL provider will need to implement and maintain appropriate IT interfaces between the client and the various 3PL providers for both operational and performance monitoring purposes.

- The 4PL provider will reduce the client's administrative burden of managing several 3PL providers and enable more in-depth communication relating to strategic and efficient operations and cost reductions. Typically, a 4PL provider will have analytical systems and processes in place that can be used collaboratively, with the client, for strategic, operational, and budget planning.
- 4PL providers take things to the next level and provide their clients with operational analysis and managerial insights. Although rare, there are situations in which the 4PL provider undertakes the procurement activities and in-country physical distribution activities on behalf of their client.
- In terms of performance measurement and appropriate KPIs, it is important to monitor only those aspects of the operation that the logistics service provider can control. For example, the classic all-embracing supply chain KPI is delivery on-time and in-full percentage. Unless the logistics service provider is responsible for forecasting and inventory control, the company will not control the in-full element of the measure. They will be in control of the on-time element and should be measured with regard to that element accordingly. The in-full data should be delivered by the 3PL and 4PL providers' IT system, for use with other members of the supply chain management (SCM) team. The logistics service provider can impact the in-full element of the KPI indirectly, to some extent, and appropriate measures include:

- Stock record accuracy
- Level of stock losses
- Order picking accuracy
- First expiry/first out conformance
- Stock-out rate

Other suitable measures include:

- Planned cost budget variance
- Conformance to inbound unloading schedule
- Inbound goods processing time
- Cold chain breaks
- POD return timeliness

There are many other measures and projections, such as warehouse space utilization, that the logistics service provider can produce to support collaborative planning and the search for operational improvements and cost reduction with their client.

Outsourcing to logistics service providers can be cumbersome for governments to manage because of the unilateral focus of many 3PL providers just on short-term fee-for-service transportation and/or warehousing of health commodities. Implementation of 4PL providers could prove to be an effective solution to streamline traditional piecemeal outsourcing while increasing value for money. An assessment of the global 4PL provider landscape in supply chains and health was explored through a desk review.[3] Country-specific analysis was needed to evaluate the best way to leverage the capabilities of private 4PL providers to improve the availability of products in the public sector. Tools were developed and deployed to obtain a better understanding of the perceptions and factors that influence outsourcing decision making in both the public and private sectors, the operational capability of the public and private sectors, and the current public supply chain costs and service levels. The tools developed and deployed included:

- **RPEA** to understand the major political, economic, social, and cultural incentives, motivations, and constraints that impact decision making in the public and private sectors
- **Operational capability assessment** to identify strengths and gaps in the SCM of the public sector and assess the ability of the private sector to provide required services
- **Cost-benefit analysis** to measure current supply chain spending and benefits and compare them to a future 4PL provider-operated model

These analyses were components of a larger decision framework that addresses the decision to outsource using a systematic approach. The decision framework was utilized for the purposes of this activity and is a valuable resource for any government or supply chain team that aims to evaluate whether implementation of a 3PL or 4PL provider partnership could be beneficial.

An understanding of the Nigeria's ability to solicit, manage, and supervise service delivery contracts was acquired through focus group discussions with public-sector supply chain staff to inform the need for future capacity building if a 4PL provider partnership is considered. Finally, preliminary activity results

[3] Ibid.

were shared and discussed with each country through a dissemination workshop, and an advocacy brief was drafted and submitted to policy makers and key stakeholders in Nigeria.

DATA COLLECTION METHODOLOGY

STAKEHOLDER MAPPING

Data collection was initiated by mapping stakeholders in the health care supply chain space in both the public and private sectors. The public sector was mapped by stratifying stakeholders involved in the supply chain of family planning (FP) and other health commodities at the different tiers of government (e.g., federal, state, LGA) using a 2x2 matrix of influence and power. The private sector was mapped using the same 2x2 matrix.

Table 1. Nigerian stakeholders stratified by sector

PUBLIC SECTOR/GOVERNMENT	PRIVATE SECTOR/NGO
Honorable Minister of Health	United Nations Populations Fund Agency
State Commissioners of Health	USAID
Federal Permanent Secretaries	Marie Stopes (service level)
Reproductive Health	GHSC-PSM
Family Health Department	Pharmaceutical Companies
Director Food and Drugs Services	Society for Family Health
Director Pharmaceutical Services	AIDS Healthcare Foundation
National Product Supply Chain Management Program	John Snow Inc.
State Drug Management Agencies	Nigerian Urban Health Reproductive Initiative 2
State Logistics Management Coordinating Unit (LMCU) Coordinators	Association for the Advancement of Family Planning
Federal Central Medical Stores	CHAI (technical)
	Private 3PL service providers
	Association for Reproductive and Family Health
	Bill and Melinda Gates Foundation

KEY SELECTION CRITERIA FOR FOCUS STATES

To determine geographic areas for study, key selection criteria were developed. The goal was to select areas that had:

- Contracting capacity and/or was already outsourcing some segments of the supply chain
- Political interest/openness at the subnational and local level in using 4PL providers, frustration with managing outsourced contracts to fee-for-service transporters, or not getting desired results despite outsourcing
- Available data and data collection procedures to monitor 4PL provider performance
- A relatively well-developed private sector
- At least partial government funding and management of warehousing and distribution (i.e., not completely dependent on donors)

It was also critical to understand the scope of USAID Mission and MOH support. Supporting documentation was requested to provide additional insight into the geographic area's supply chain, including:

Table 2. Documents requested during initial key selection criteria survey

Overarching topics	Specific documents
Strategic supply chain plan	Supply chain planning meeting minutes/notes
	Copy of contract (if any) with 4PL provider
Overall organization structure (organogram)	Organization charts for individual supply chain elements
	CVs of the senior management team
Supply chain system diagram	Warehouse management system user guides
	Supply chain system training materials
	Sample bin cards
Supply chain operating budget	Budget/actual costs for last 12 months
	Sources of funds (e.g., government, donor, implementing partner)
	Additional warehouse space contract
	Invoices for the rented space
	Warehouse space utilization reports
	Copies of contracts with warehousing companies (fee-for-service transporters and 3PL providers)
Vehicle planning documents	Vehicle routing and scheduling screenshots
	Rate tariff and invoices for a range of hiring arrangements
	Copies of contracts with transport companies (fee-for-service transporters and 3PL providers)
Copies of KPI reports for the last three months	Functional/departmental KPIs
	Customer complaint reports
	Customer survey reports

A communication letter was sent to selected USAID-supported states and national-level stakeholders. Partners from these areas were requested to complete a survey guide that sought information relevant to the key selection criteria. The link was sent to the following states:

- The FCT
- Sokoto State
- Plateau State
- Kebbi
- Ebonyi
- Akwa Ibom
- Nasarawa
- Zamfara
- Benue
- Bauchi

This survey was sent to the respondents via mail. Nasarawa and Akwa Ibom states responded that they were not interested in participating in the activity as they had no interest in outsourcing. Benue state's response was disqualified because all boxes were selected. Responses were cross-referenced with the in-country consultant who had previously performed an audit in Benue state to inform the development of the national strategic plan. After following up, all of the available submissions were reviewed, and three states were selected for interviews based on their data availability, supporting documents they

stated they were able to produce, interest in 4PL providers, maturity of their private sector, and geographic and political suitability. The states selected for inclusion in the activity were:

- The FCT
- Sokoto
- Plateau

Assessment tools

Assessment tools were developed to assist in obtaining the information necessary to evaluate the public-sector supply chain, including KPIs and performance metrics, cost, and service level data as well as perceptions and beliefs about outsourcing practices. Tools were also developed for the private sector to assess the ability to provide needed services for the public sector and its willingness to collaborate with the public sector.

Once the tools were approved, data collectors were recruited and trained by the project coordinator. Interviews were scheduled with both the public and private sectors using Google forms, and data collectors were assigned to each stakeholder/organization. The first interview was attended by the team of data collectors, the in-country consultant, and the project coordinator, after which feedback was given to the team to ensure uniformity of responses.

All interviews were conducted virtually (via Zoom or Google Meet) or in person and were recorded after receiving verbal or written consent from the interviewees. This activity took place during the COVID-19 pandemic, which created substantial boundaries to scheduling and interviewing staff. Lockdowns were frequent, which made regular communication away from the office and reliable internet difficult.

Rapid political economy analysis

Stakeholders in the rapid PEA were defined as individuals with local-, regional-, or national-level expertise and experience in one or more areas of the national pharmaceutical system, including planning, monitoring, evaluation, supply, and procurement. The PEA included stakeholders, also called study participants, working in both the public sector (all levels of public government institutions) and the private sector (all sizes companies and firms working in-country and internationally). These stakeholders were identified through key informants at USAID, relevant policies, institutional documents, or recommendations from already enrolled participants. The stakeholders were invited to participate in the study via email and/or a telephone call.

The semi-structured in-depth interviews were conducted in English. Two interview guides were created, one for public-sector and one for private-sector interviews (see Appendix II and III). Both interview guides consisted of open-ended questions followed by probes and prompts. The interview guides differed in length (number of questions) and focus (public-private partnership vs. 4PL provider integration). The interviews were conducted in person and via a digital platform. They were recorded on handheld audio recorders or via the in-app Zoom platform function. All participants provided oral and written consent for the anonymous publication of their responses as part of the PEA results. The public-sector interviews were longer than the private-sector interviews, lasting 30–110 minutes compared to 15–60 minutes.

Operational capability assessment

Operational capability was assessed in both the public and private sectors using two questionnaires. The aim of the public-sector assessment was to identify areas for improvement and determine where the private sector could add benefit. Stakeholders from the national and subnational levels were surveyed. These stakeholders were identified through the in-country consultant, institutional knowledge or documents, key informants at USAID, relevant policies, or conversations with other interviewees. The stakeholders were invited to participate in the study via email and/or telephone. Operational capability of the private sector was used to determine whether the private sector had the necessary skills to support identified gaps in the public sector. Participants were selected through lists of current or previous government contractors, web searches, conversations with key stakeholders, and institutional knowledge.

Interviewers were performed by Nigerian data collectors who were trained by the project coordinator. Each attribute was described under five levels of performance that were allocated a score from 0 to 4. A total score for each geographic location could be calculated and the potential for improvement identified. Select questions required a yes or no response. A score between 0 and 4 was allocated by the project team based on the respondent's yes or no answer, the comments interviewees made at the time of the interview, and answers to other related questions. The length of interviews varied, with public-sector interviews tending to be much lengthier than those with the private sector.

Cost-benefit analysis

Data used in the evaluation were collected using three main approaches: document review, interviews with selected stakeholders working in the supply chain for FP commodities at the federal and state levels, and formal requests for specific data from the Federal MOH and implementing partners.

Table 3. List of documents requested for review during cost-benefit analysis

Publicly available documents
1. National Family Planning Blueprint 2. Nigeria Demographic and Health Survey (NDHS) 2013 3. National Health Supply Chain Strategy and Implementation Plan 4. Harmonized SOP for logistics management of pharmaceuticals and other healthcare products.
Documents specifically requested from MOH and technical assistance providers
1. Organogram of the logistics/supply chain function 2. Latest distribution plans 3. Health facilities served in the geographic area 4. Budget and actual expenditures for the last 12 months 5. Space utilization reports 6. Warehousing contracts/invoices 7. Transport contracts/rate tariffs and invoices 8. Vehicle routing schedules 9. Volumetric information 10. Department KPIs

Relevant documents were reviewed to gain an understanding of the current public health supply chain and determine the inputs and costs of running the system. Documents reviewed included publicly available documents (e.g., planning documents, reports, SOPs) and documents specifically requested for

this evaluation (e.g., budgets and expenditures, organograms, distribution plans, service contracts, KPIs). Full details of the documents reviewed are given in table 3. The assessment team requested and reviewed the available documents ahead of the interviews. Additional supporting documents and information were requested based on responses provided during the interviews.

In addition to reviewing these documents, the team interviewed key informants identified in the supply chain from the federal, regional, and local government areas to obtain additional information, follow up on documents requested, or validate information already gathered. Interviews with selected stakeholders were performed in English using a structured interview guide that was based on the Rapid Supply Chain Modelling Tool. All interviews were performed online. Additional data were collected directly from MTaPS in-country support teams or through the GHSC-PSM and other development partners such as the Global Fund. Clarifications on data received and follow ups were sought via email or phone. The full details on key informants identified for the interviews are shown in table 4.

Table 4. Stakeholders requested for interview during cost-benefit analysis

Supply chain level	Stakeholders
Federal	■ Deputy Director for NPSCMP ■ PSM Head of Family Planning Program ■ Central Contraceptive Warehouse (CCW) Manager
State	■ Director for Pharmaceutical Services ■ LMCU Coordinator ■ Central Medical Stores (CMS) Manager ■ Family Planning Focal Person
Technical assistance providers	■ GHSC-PSM ■ Global Fund
CCW=central contraceptive warehouse, CMS=central medical stores manager, GHSC-PSM=Global Health Supply Chain Program-Procurement and Supply Management, LMCU=Logistics Management Coordination Unit, NPSCMP=National Product Supply Chain Management Programme, PSM=Procurement and Supply Management	

POLITICAL ECONOMY ANALYSIS

This report summarizes the results of the RPEA conducted between June and December 2021. The PEA aimed to determine stakeholders' understanding and preferences in regard to collaboration between the public and private sectors and the integration of 4PL providers within the pharmaceutical supply chains of Nigeria. This PEA has three specific objectives:

- Explore stakeholder preferences in regard to working with the public and private sectors
- Explore public-sector stakeholders' willingness to partner with 4PL providers
- Identify the factors influencing public-sector stakeholders' decision making in regard to 4PL providers

DATA COLLECTION AND ANALYSIS

Audio recordings were transcribed, stripped of identifying information, and replaced with study-specific identification codes. The transcripts were uploaded into the analysis software NVivo 12 (QSR International). Framework analysis (FWA), a form of thematic analysis, was utilized for qualitative analysis[4]. FWA is useful in applied policy research as it provides a structure for managing information and a systematic model for mapping data. FWA allows interview cases to be compared to facilitate theme generation.[5] It also facilitates large data sets to be organized in tables and matrices, detects patterns, and draws attention to deviations.

The data-driven inductive analysis performed in this study used a seven-stage process:

- Stage 1: Transcription of audio-recorded interviews using the verbatim protocol method
- Stage 2: Familiarization process through listening to audio recordings and reading a subsample of transcripts
- Stage 3: Open free-form coding of a subsample of transcripts to generate the initial coding and analysis frames
- Stage 4: Developing the analytical framework, grouping codes into categories, defining the categories, and building the framework
- Stage 5: Importing all transcripts into NVivo 12 software and applying the framework when coding
- Stage 6: Reducing and summarizing by category with a focus on retaining the essence of the data and selecting illustrative quotes
- Stage 7: Interpreting the data, codes, categories, and themes

RESULTS

The findings of the study are structured according to the three objectives outlined in the introduction. The results stay as close to the data as possible in terms of the participant responses, and the themes are derived from those responses. The quotes presented are unedited and reflect the thoughts,

[4] Srivastava A, Thomson SB. 2009. Framework analysis: a qualitative methodology for applied policy research.
[5] Gale NK, Heath G, Cameron E, Rashid S, Redwood S. 2013. Using the framework method for the analysis of qualitative data in multi-disciplinary health research. BMC Medical Research Methodology, 13, 117.

perceptions, and actions of each stakeholder. These results are not a reflection of USAID values, nor are they endorsed by USAID.

The participants' perceptions, understanding, and willingness are reported descriptively through a narrative approach. Key points are illustrated and supported using selected direct quotes from stakeholders.[6,7] Each participant quote is identified with the participant's country (Nigeria [NG]); the participant's sector of employment (public sector [PU] or private sector [PR]); and the participant's study identification number.

Stakeholder characteristics

For the PEA, 20 participants (18 men, 2 women) were interviewed. The first few minutes of the qualitative interviews served to open the interaction between the interviewer and the participant. This established the context for the conversation and situated the participant within the scope of the subject and the interview to be conducted. The participants in this study were asked introductory questions from the interview guide, such as "*Can you please introduce yourself? What is your official title? Can you tell me about your work/role/the supply chain?*". In answering and expanding on these questions, participants actively introduced themselves, their institutions, the parts of the supply chain they work in, and the aims/purposes of the supply chain from their perspective. This introduction was an important step in participants situating themselves in the supply chain, reflecting its functionality and gaps, and sharing their personal experiences.

Table 5. Characteristics of the interviews conducted

Participants interviewed	20
Interviews conducted	19
Interviews with 1 participant	18
Interviews with 2 or more participants	1
Public-sector interviews	9
Private-sector interviews	10

Table 6. Levels of government at which public sector participants are employed

Public-sector participants at the federal level	2
Public-sector participants at the state level	8
Public-sector participants at the local level	1
Total public sector participants	11

Preferences of public/private-sector partnership

The PEA began with an assessment of stakeholder preferences in regard to partnerships and collaborations. To determine this, participants were asked to discuss their perceptions and preferences in regard to collaborating with the other sector.

[6] Anderson C. 2010. Presenting and Evaluating Qualitative Research. *American Journal of Pharmaceutical Education*, 74, 141.
[7] Sandelowski M. 1994. Focus on qualitative methods. The use of quotes in qualitative research. *Research in Nursing & Health*, 17, 479-482.

Public sector working with the private sector (preferences/reasons)

Stakeholders employed by public-sector institutions and government departments had mixed responses regarding collaboration with the private sector. There was a split among participants, with some opposed to outsourcing segments of the supply chain through private partnerships and others in favor of the idea. Of the public-sector stakeholders who preferred not to engage with the private sector, many had previous experiences working with the private sector in a public-private partnership. They expressed that they preferred not to increase public-private sector collaboration at their level.

The Nigerian public-sector stakeholders who expressed a preference against collaborating with the private sector gave two reasons for their reticence: they believe that the different states in Nigeria **have the necessary capacity** to handle the entire supply chain and there is **no/little added value** in working with the private sector.

> *"We have a strategic plan and it's a no, no for outsourcing, because we have seen that it [working with the private sector] has not yielded much, data quality has never improved in any way, we are always having data quality issues, and it all spans around the kind of mechanism or structure with regards to this bit of supply chain activity, either warehousing or distribution. And we found out that [when working with the private sector] because the staff or government people are not part or carried along in this process, it puts them in the back seat and they just feel they are relegated or are not part of the process. So, for us, it [partnering with the private sector] has never really been a wonderful model. And it's not yielding the needed outcome that we want to see in terms of pharmaceutical management …" (NG_PU_02)*

However, the National Product Supply Chain Strategy provides an approach for partnership with the private sector to deliver supply chain services in all states. The strategy also provides a long-term contract between a private party and a government entity where the government continues to own supply chain assets, such as warehouses, while the private sector brings its systems, processes, people, and quality standards to operate the facilities and provide supply chain service. Such a symbiotic relationship ensures that the government retains control while benefiting the private partner through not having to invest heavily in physical assets to manage the supply chain.[8]

The other stakeholders from the Nigerian public sector showed some openness to the idea of starting or continuing to collaborate with the private sector. They already were or could imagine partnering with the private sector for limited and specific components of the supply chain. This willingness to engage with the private sector was based on the perceived and experienced benefits of **high levels of efficiency and great professionalism in the private sector**. They stated that integrating private-sector partners can be a positive contribution to the public sector.

> *"So the presence of the private sector will make it [the supply chain] be operated more like a business, rather than just normal supply chain where people feel everything is free and they can do as they want with it. With the engagement of the private sector through the public/private partnership, there will not be room for people to mismanage their supply chain system." (NG_PU_03)*

[8] Federal Republic of Nigeria Ministry of Health Department of Food and Drug Services. 2020. National Health Products Supply Chain Strategy and Implementation Plan 2021–2025

It was emphasized that when leveraging best practice 3PL and/or 4PL providers to the private sector, it was important to do so locally, and participants preferred to work with private firms within their specific state because local private-sector organizations have knowledge about the inner workings of the system and an understanding of the local setting and condition.

> *"Locality, we always prefer to do local 3PL than outsiders, because they know the terrain, more than any other companies. Even the multinational companies that have gotten a contract to distribute commodities in the state, sometimes they came and contracted the local 3PL who has more experience on distribution here." (NG_PU_04)*

Private sector working with the public sector (preferences/reasons)

The private-sector participants expressed a strong desire to collaborate with the public sector. In general, stakeholders discussed the concept of public-private collaboration as a win-win. Many private-sector stakeholders in Nigeria emphasized that in public-private collaborations, both parties stand to gain. The private sector offers **capacity building and operational efficiency**, and brings to the table **state-of-the-art facilities, equipment, and machinery** that individual government departments do not own. In return, the private sector gains an opportunity to **diversify its portfolio and network with NGOs/donor organizations**, while the private sector can partake in **extensive contracts** that only the government offers (
figure 1).

> *"Well, the potential benefit is that the private sector can strengthen the capacity of the public sector, by bringing in the expertise and the right equipment. Many government agencies do not have the right equipment. The [private sector] organization I worked with then, actually decided to warehouse in a government facility, to be able to strengthen the staff and to leave some world-class equipment when they leave. So, that's the main benefit of working with the government agencies." (NG_PR_03)*

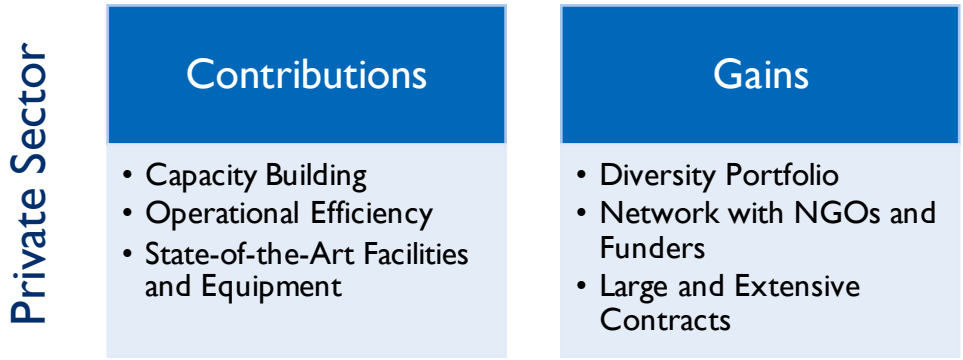

Figure 1. Contributions and gains of 4PL partnership according to private-sector participants

The private-sector participants were overwhelmingly in favor of collaborating with the public sector but described an array of challenges (figure 2). These difficulties, which are linked to one another, include a high level of bureaucracy, high staff turnover, and limited adherence to contract terms. Participants also expressed a desire for strengthened leadership on the public-sector side.

In comparison to private-private partnerships, participants stated they felt a lack of direction and specificity when working with the public sector. Participants also felt that government institutions have a level of poor planning and programming, unrealistic scheduling, and weak decision making.

> *"… with 3PL you can only get good service based on the instructions you are given. And I'll give an example. You [the government] have ordered some things from the UK or you bought some items, and you [the government] needed to clear it. I cleared it, but unfortunately, I did not learn that the items have to be picked up at the ports and delivered to a point, and I don't even know what size the items are, the number of pallets, you[the government] just tells me that I have items to clear. So, I don't have the full information about what is to be cleared, and what I have to pick up at the port... If you work with a private sector company, they've thought through what they want. In the public sector, these processes are not really thought through… If one part of the chain is weak it will affect everybody. So these are the challenges we have which, of course, is a learning process working with them [the government]." (NG_PR_01)*

> *"Coming from the private sector where decisions are made immediately, and then actions are implemented, it takes a little bit of time to be able to get some approval through the government. This can be streamlined, and made more efficient, so that decisions can be made, I mean, the frequency of getting decisions approved can be shortened, this is an area that can be improved upon, and also, the area of communication, sometimes it's difficult to have this seamless communication between government officials and then those working in the private sector. So, I think this also can be improved upon, in the sense that we can make communication easier, and just as I said initially, this would also aid in terms of decision-making, and then approval processes." (NG_PR_10)*

Another difficulty in working with the public sector is the high level of bureaucracy. Administrative processes created a hurdle for private-sector firms wishing to partner with the public sector. These bureaucratic difficulties began with the bidding phase and persisted through the duration of the contract. After the complicated process of bidding for contracts, stakeholders described an extensive learning curve when it comes to understanding the process of government institutions. In addition to being complicated, the government processes were slow, long, and tedious.

According to the stakeholders, there is a high staff turnover rate in government institutions. For the private sector, this often means that the government staff with whom they begin a project and contract will not be the staff with whom they carry out and/or conclude the contract. This turnover creates discontinuity in the workflow and hinders collaboration. Private-sector stakeholders explained that as a result of the turnover, they are unable to create long-term, trusting relationships in their public-sector collaboration. The greatest challenge is when staff turnover is connected with a change in leadership. When leadership staff in the public sector are replaced and the new leadership does not agree with or support the previous leadership's decisions, direction, and contract, the private-sector partner is then left to continue or complete a collaborative agreement without the full support of the public-sector counterpart.

> *"Yes, they have fear of the contract not living its time, its duration of a lifetime. That fear is there, because of political stability or considerations… if not properly managed, there could be issues regarding how revenue is being handled, and shared if you like, depending on how the agreement is. So, there is*

also undue influence, maybe when the project is on course, I can say this not directly from my own organization, but with the current arrangement of managing the national warehouses in Nigeria, we know it's facing some level of such challenge. Where those that initiated work on those agreements are no longer in place, and the new people begin to see it in different lights. So, there's always stress for the private sector that is involved." (NG_PR_07)

Finally, stakeholders shared that throughout their experiences with government collaboration, they have faced the difficulty of **limited adherence to contract terms**. The signed terms in the contract during the project are not adhered to by the government. This creates instability in the working relations and inconsistency in the services the private sector can offer. The private sector may provide structured and standardized offers and rates but not be met with the same structure and consistency by their public-sector counterparts.

"… if there is a change in government or change in person, there's every tendency that commitment to such [public-private] agreement may not be held very strong. What the private sector always want, is a situation where, if they want to go into such collaboration with state governments, they want to do that with the involvement of a facilitator, maybe like the donors, so that it [the agreement] could be binding, and it could also endure [the timeline of the contract agreements]... in some instances, we also have issues where maybe the [current] head of the ministry of health may not be favorable to following the letters of the agreement [signed by the past head]. Sometimes we have those challenges and issues. I think those are the huge concerns that discourage the private sector…" (NG_PR_07)

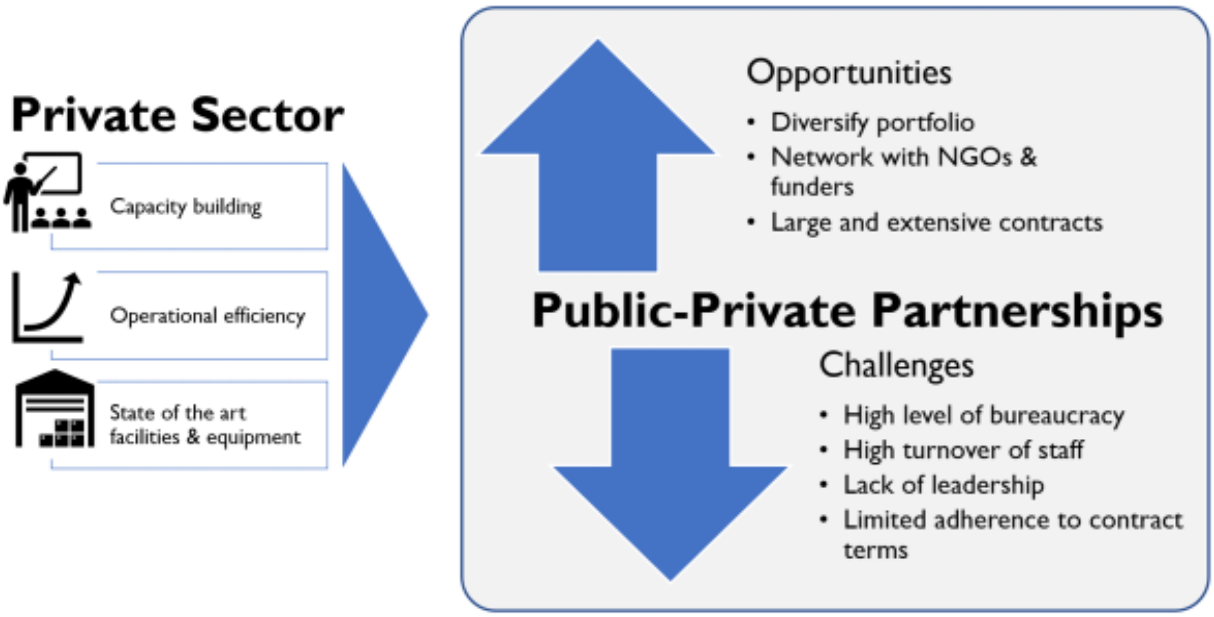

Figure 2. Opportunities and difficulties of 4PL partnership according to private-sector participants

Public-sector willingness to collaborate with 4PL providers

The willingness of public-sector stakeholders to collaborate with a 4PL provider varied. Many stakeholders in the **Nigeria interviews were not willing** to integrate a 4PL provider into the system. Participants touched on a history of Nigerian states pushing to gain control over their individual state

pharmaceutical supply chain systems. The concept of bringing in a 4PL provider to take over some management and oversight of the supply chain was perceived as a step backward in the recent gains states have made toward gaining more control.

> *"…in past engagements of the National Council of health, whereby States agitated for the control of most of supply chain functions, some of which is for them to manage and handle their distribution. So, that is why, when you ask me outsourcing, I'm like, I don't think it's something that the country wants, states have made their stand clear and they said it." (NG_PU_02)*

Public-sector factors influencing decision making on 4PL provider integration

The public-sector stakeholders enumerated the factors that influenced their decision making process in regard to contracting 4PL providers in the public supply chain. These factors, which they considered most important, are summarized under four categories: staff, budget, utility/efficiency, and management (figure 3).

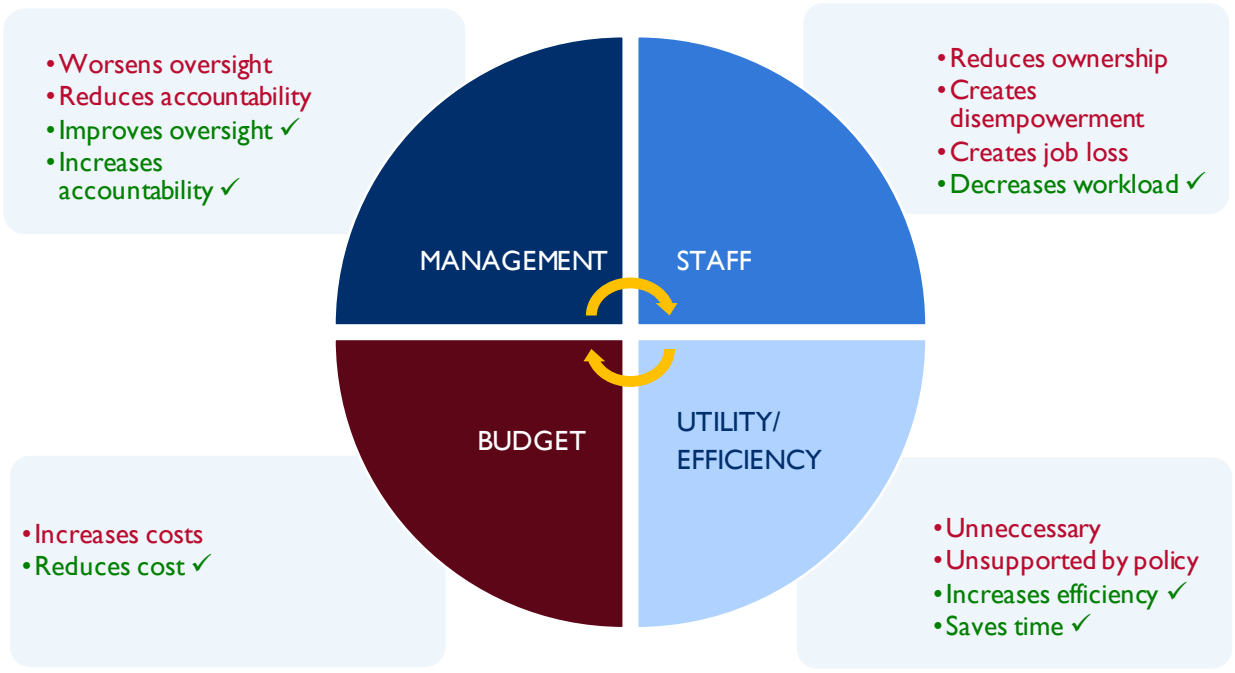

Figure 3. Four important factors considered by stakeholders in leveraging 4PL provider

Note: A breakdown of each segment is divided in green (factors deemed favorable) and in red (factors deemed unfavorable) for leveraging a 4PL provider in the supply chain system.

Public-sector factor against 4PL provider integration in the supply chain system

In their examination of these four components, participants who did not wish to include a 4PL provider in their supply chain system provided five reasons (
figure 4).

Figure 4. The public sector's reasons against leveraging 4PL providers

Stakeholders perceived that 4PL providers would reduce ownership, create disempowerment, and create job loss at the level of their staff. At the level of management, 4PL providers would worsen accountability and oversight. Budgets would suffer due to increasing costs, and the efficiency of the supply chain would decrease overall.

Some stakeholders stated that the integration of a 4PL provider into the supply chain system **will reduce the oversight** of relevant government departments over the activities of the contracted 3PL providers and that the presence of a 4PL provider would hinder and **worsen the government's ability to directly manage** contracted 3PL providers.

> *"Yes, because it's a national program and every aspect, every functional area, government personnel should be in control of decisions to be made and where we do not have the necessary skills or the capacity like transportation, the clearing at point of entry, the procurement aspects that we do not have the necessary economy of scale, those areas we can confidently outsource to those that can do it in the most cost-effective way. But where we have the human capacity to manage, I think we will always go for effective government control and leadership." (NG_PU_01)*

Stakeholders felt that as a result of hiring a 4PL provider, the staff in the public-sector institutions would be **disempowered**. There would be a reduced sense of staff accountability toward the government if government employees were to report to a 4PL provider. The government staff would lose their grasp on the system as their power and leadership shift to the 4PL provider. This shift would result in **disengaged** employees as they **lose ownership** of their work.

Many stakeholders also expressed concerns that hiring a 4PL provider would negatively **impact the job security** of public-sector staff and that some current staff would be **made redundant**. According to stakeholders, with a 4PL provider taking over, the redundant staff on the government side would eventually be eliminated, resulting in **job loss** for public-sector staff.

> *"I think they [government managers and employees] will feel threatened at their jobs, if you do additional outsourcing, some of them might be taken over [by the 4PL] that will take up the additional*

responsibility. So, it may lead to redundancy, they [government managers and employees] may still be working, but that inactivity, that loss of job satisfaction might lead to a number of things …" (NG_PU_01)

Stakeholders expressed concern over the **budgetary implications** of engaging a 4PL provider in the supply chain. Many were of the opinion that the hiring of a 4PL provider was a threat to already tight budgets. They expressed reticence at the idea of the increased spending for their department to cover the costs of 4PL provider services.

"Our expertise will be lost. The aim of government is to conserve money, the aim of government is to increase the efficiency of our personnel. So, why would we go and support redundancy? Because if the private sector takes over the work, we have been rendered, not efficient. The expertise that we have, will be lost. We have pharmacists, we have scientists, we have laboratory scientists that are all on our team. So, their activities we will not be known when we involve 4PL, they will be lost." (NG_PU_06)

Stakeholders (NG_PU_02) and (NG_PU_06) highlighted that hiring a 4PL provider was not supported by their internal policies and or by the law. Participants stated that outsourcing certain parts of the supply chain and management were advised against in their internal policies. An even smaller number of participants cited laws that to their knowledge forbid the outsourcing of certain processes.

"No, those stakeholders at the national, are always the decision-making committee, or the relevant stakeholders that normally meet on issues of the supply chain. And we have policies, we have guidelines that guide our daily operations and how we can manage the supply chain space. So, apart from the normal, enabling legal department you need, Infrastructure Concession Regulatory Commission, if it has something to do with the concession, whatever that took part in the whole process. These are just enabler bodies, but they don't have a say in whether they assenting to outsourcing or not to assent to outsourcing. But like I told you, our policy is our guide, it is our Bible. So, whatever is in the policy is what is being followed because it was approved and signed by the honorable minister himself." (NG_PU_02)

In addition to the above factors, participants thought critically about the **utility and efficiency** of hiring a 4PL provider. Stakeholders stated that hiring a 4PL provider was **unnecessary** and/or **unsupported** by policies because their institution did not suffer from any lack of utility/efficiency that could not be fixed or addressed in-house. These stakeholders insisted that they had the capacity to adequately manage the 3PL providers they work with and that they did not need to hire a 4PL provider. They highlighted that their institution/department was both effective and efficient without a 4PL provider. One stakeholder explained that a 4PL provider would be unnecessary for his institution as they only work with one 3PL provider and an intermediary would serve no purpose.

"…, the main thing is that we are looking at efficiency and effectiveness and the way we carry out the distributions very well to ensure that commodities are valuable and for onward distribution…we scored fairly well there. The other one, is cost-effective, to which I would say yes. We combine most of the human resource services done there is by government-paid employees." (NG_PU_01)

An additional factor that was prominent in the interviews was the concept of **unsustainability**. Stakeholders raised concerns over the long-term sustainability of integrating a 4PL provider in the supply chain, citing past experiences that resulted in a system crumbling upon the withdrawal of a 4PL provider.

"…we have witnessed some form of 3PL/4PL management of commodity distribution, specifically for family planning in the past that took place in a number of States. And as we speak, after the withdrawal of the 3PL/4PL, such approach, those special initiatives died off, none is sustainable up till now. So, is that not a good way of understanding that the involvement of 4PLs in the strategic supply chain management, will always remain unsustainable, it is not something we should consider, particularly where in the long run, the government will be made to take steps towards sustaining such practices. We have seen that they are unsustainable both at the Federal and State levels. And now we're trying to encourage States to even take up last-mile distributions." (NG_PU_06)

The public sector for 4PL provider integration into the supply chain system

The stakeholders who stated that there could be benefits to 4PL providers added that the involvement of such providers could result in better management of activities, closer oversight of staff, and increased accountability at all levels. The study participants also reflected on the workload of civil servants and that they faced increasingly large responsibilities. They hypothesized that employing 4PL providers could **decrease the workload** of public-sector staff, reducing the number of civil servants who are overworked and stretched thin.

"Well, I think it [a 4PL] would really help them, it would be a big deal for them [the government employees], because of the workload… one person is doing the job of about 7, 8 people. So, outsourcing, I think it would really help, at least it would reduce the workload…." (NG_PU_07)

Stakeholders highlighted that working with a 4PL provider could result in **better processes** that would **reduce wastage** and **costs**.

"Yes, personally, I think it [outsourcing] is more cost-effective because there are a lot of structures that you need to put in place as a government, if you want to take on a particular task. And a 3PL/4PL provider probably has the system established already." (NG_PU_05)

Finally, (NG_PU_02) foresaw employing a 4PL provider as a way to potentially **increase the efficiency** of the supply chain system. This would help **optimize productivity** and **shorten administrative processes**, which would **save time**.

"It could be cost-effective in the sense that we could learn from the efficient practices, best practices. It is an opportunity for you to learn best practices and skills based on their efficiency as a private sector. And then you may not have to bother yourself about buying vehicles or controlling the driver if the car is spoilt, you want to maintain and stuff. So that may be the area of benefits…" (NG_PU_02)

Summary of main findings from PEA

The private sector was in favor of public-private partnerships. They displayed a high willingness to collaborate with the public sector to improve capacity building, operational efficiency, state-of-the-art facilities, equipment, and machinery. Using public-private partnerships, the private sector could diversify its portfolio, network with NGOs, and gain the opportunity to bid on large and extensive contracts that only the government offers. In previous public-private partnerships, private-sector participants faced difficulties regarding a high level of bureaucracy in the public sector, high turnover of government staff, unreliable payments timeframes, a lack of leadership from government partners, and limited adherence to contract terms by the public sector.

Public-sectors participants had diverging preferences in regard to engaging with the private sector. Stakeholders who were in favor cited the high levels of efficiency and professionalism of the private sector as reasons to encourage public-private partnerships. Others opposed such collaborations. Their opposition, based on past experiences, was because they saw little or no added value in working with the private sector. These stakeholders stated that the public sector overall had the necessary capacity to carry out the entire supply chain and insisted that all additional effort for the supply chain should be focused on fortifying the public sector's capacities instead of outsourcing.

The public-sector participants identified similar factors influencing their perception and decision making in regard to 4PL provider integration into the national supply chain. Participants thought critically about the effect hiring a 4PL provider would have on the management, staff, and budget and the utility/efficiency they could get. These categories were a point of overlap between participants for and against the integration of 4PL providers. The overlaps indicate that management, staff, budget, and use/utility are the most important and influential factors guiding the acceptance or rejection of 4PL providers in the national system.

Public-sector stakeholders enumerated factors against the integration of a 4PL provider collaboration in the supply chain. They perceived that the integration of 4PL providers could destabilize the staff by reducing ownership, creating disempowerment among employees, and leading to job loss in the public sector. In regard to the impact of 4PL providers on management, they anticipated worsening oversight, reduced accountability, and increasing strain on the institution/department budget. Finally, participants who did not see the integration of 4PL providers favorably thought that they would not contribute significantly to the utility or efficiency of the supply chain. These reasons against 4PL provider integration represent the barriers and hurdles any institution will face when attempting to integrate 4PL providers into the pharmaceutical supply chain. Institutions discussing 4PL provider integration must be sure to carefully address these barriers. The public-sector stakeholders who foresaw utility in integrating a 4PL provider into the supply chain thought it could improve the oversight and accountability of management and decrease the workload of current government staff. They also perceived possibilities to reduce costs in the supply chain due to increasing efficiency through a 4PL provider, leading to reduced waste and time savings. These positive outcomes can help when introducing the concept of 4PL providers.

Stakeholder pathways

This study outlines stakeholders' pathway to formulating an opinion on the integration of 4PL providers into the pharmaceutical supply chain. This pathway included steps stakeholders are taking when considering the introduction of 4PL providers. Each step moved stakeholders forward in the decision making process. This pathway can be broken into seven steps—four before the division line and three after (

figure 55).

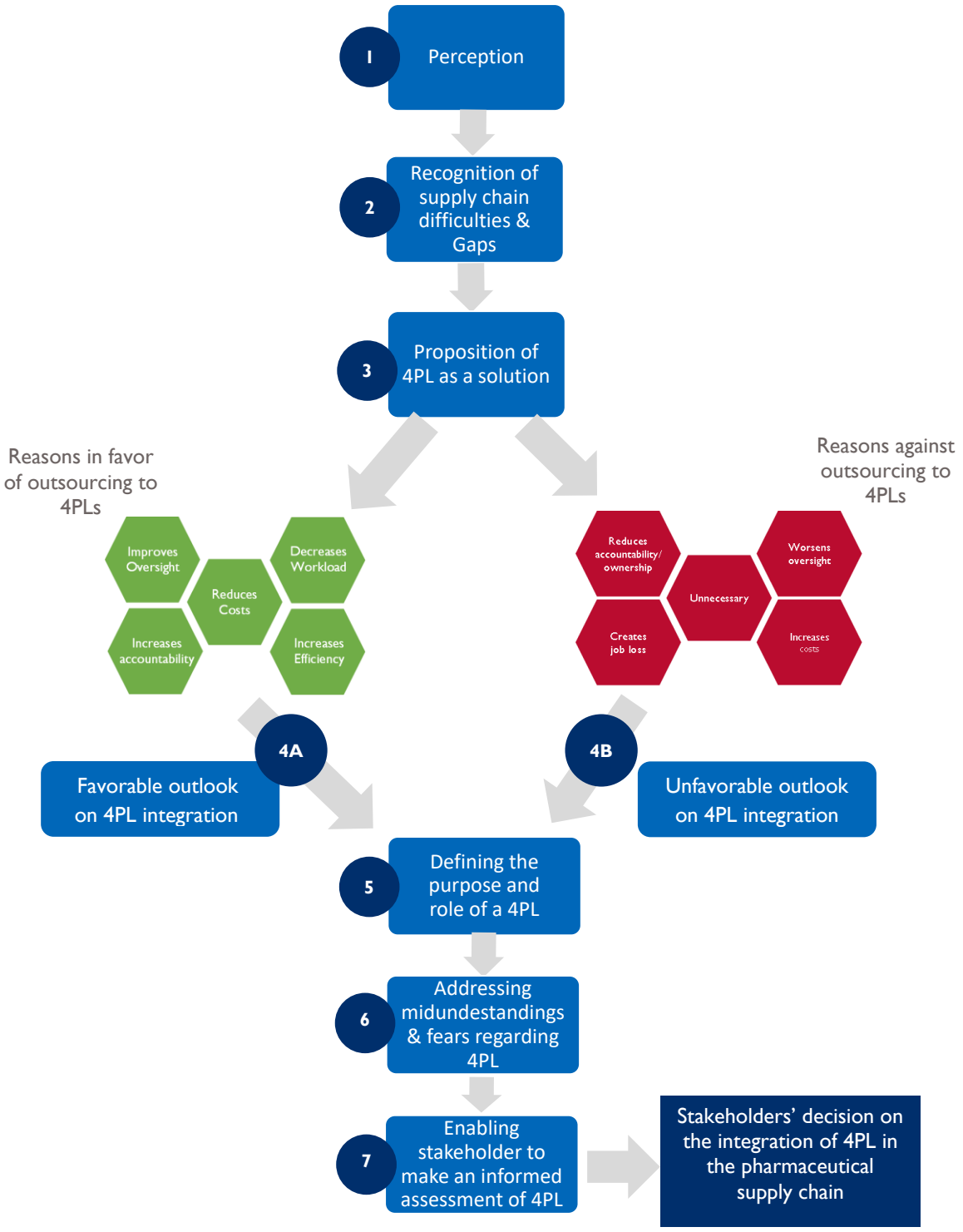

Figure 5. Pathway to understand and decide in leveraging 4PL providers

Note: Steps 1–4 were conducted by participants in this study and are represented through narrative in the results section of this report. Steps 5–7 are recommended by this study for stakeholders to make an informed decision about their preference and willingness to incorporate 4PL providers into the supply chain.

All stakeholders who participated in this study went through the same four steps. They discussed their perception of the current supply chain system (Step 1), which led them to recognize the supply chain problems and gaps (Step 2). This study then proposed the integration of 4PL providers as a solution to the supply chain problems and gaps (Step 3). At that point, participants diverged with either a favorable outlook on the integration of 4PL providers (Step 4A) or an unfavorable outlook (Step 4B).

Participants whose pathways to decision making led them to Step 4B (unfavorable outlook) enumerated five interconnected reasons that formulated barriers and ultimately culminated into one fear: loss of power and control. Public-sector participants feared that the integration of a 4PL provider into the supply chain would result in their department giving up control of the supply chain, which would result in having less power. The envisioned loss of control and power over their current activities was further projected as loss of power to influence the future changes their institution could implement, such as increased investment in government staff (e.g., capacity building, skills growth, skills development, hiring of locals) and increased investment in system sustainability to resolve the identified supply chain problems and gaps. For these participants, integrating a 4PL provider represented a step backward in the efficiency and autonomy of their institution.

The fear of loss of control and power illustrated a lack of clarity with regard to 4PL providers. Participants had no common understanding of the role of a 4PL provider in a partnership. Participants had incorrect notions of how the public sector would work in collaboration with a 4PL provider and what the tasks of the 4PL provider would be. This confusion and misunderstanding is the root of fear, which constitutes the highest barrier to integrating a 4PL provider into the system. Participants' confusion affected their formulated perceptions of working with a 4PL provider and impacted their responses. Stakeholders must be correctly informed to formulate an opinion on 4PL providers to accurately assess the public sector's willingness and preferences to collaborate with 4PL providers.

Recommendations

For stakeholders to make informed decisions on the integration of 4PL providers into the supply chain and for any organization to correctly assess public-sector willingness and preferences on this matter, additional steps must be taken.

The current paths to understanding 4PL provider integration and decision making of stakeholders stop at Step 4A or 4B (

figure 55). This process showed that there are participants who arrive at this point based on an incorrect understanding of 4PLs providers, their potential role in the supply chain, and the possibility for collaboration. This report recommends adding three steps to their process— Step 5: Defining the purpose and role of a 4PL provider; Step 6: Addressing unfounded misunderstanding and fears regarding 4PL providers and Step 7: Enabling stakeholders to make an information-based assessment of 4PL providers.

Through Step 5 and before completion of stakeholders' decision making process, it is essential that they receive a standard and correct definition of the role and purpose of a 4PL provider through learning and advocacy initiatives. This would clarify the specific tasks that a 4PL provider would be allocated in the supply chain, explain how a contract with a 4PL provider would work, and outline the chain of command

in this public-private partnership. Step 5 will serve to ensure that all stakeholders engage on their pathway with the same clear understanding of 4PL providers. In Step 6, the fears of participants should be addressed directly, including how the 4PL provider would impact their institution's management, staff, budget, and utility/efficiency. This ensures that misinformation is not integrated into the participants' decision making process. This leads to Step 7, in which stakeholders can make an informed decision on 4PL providers in public-private partnerships.

Any work regarding the integration of 4PL providers would have to integrate these recommended steps before being able to accurately assess stakeholders' willingness, preferences, and overall view on the integration of 4PL providers into their pharmaceutical supply chain.

Strengths and limitations

The findings should be interpreted with caution based on the following limitations. First, this study was conducted as a rapid PEA with limited resources and a short timetable. As a result, the number of recruited and interviewed participants was small, which can impact the breadth of data collected. Second, a finding of the study was that participants did not have a clear understanding of the interview topic and had formulated their opinions and statements based on their own understanding of 4PL providers, which the study determined to be incorrect in some cases. Since participants answered the interview questions with differing understanding of 4PL provider contracts and services, it is important that this be taken into account when reading their responses.

Third, as with all interviews, there is a risk of social acceptability/desirability bias, which occurs when participants provide responses to questions not based on their thoughts but on either what they believe the interviewer wants to hear or what they believe is the most socially acceptable response. This can also manifest as a reluctance to provide responses that would reflect negatively on the participant or their employer. This bias can stem from a perceived hierarchical difference between the interviewer and the participant. In a situation where the interviewer is hierarchically above the participant, there can be unintentional pressure on the participant to please the interviewer and/or provide more desirable responses. The introduction of this bias was reduced in this study, as the interviewer was not a recognized member of the participant's work/institutional hierarchy. The interviewer, as an external third party, could not directly be hierarchical compared to the participant, reducing pressure and counteracting bias. Although the study did not broach any personal or intimidate subjects, it is important to note that discussing one's employer can be sensitive for participants, causing hesitance and restricting how honest or critical the participant is of their current employer. To put participants at ease, the study team guaranteed participants confidentiality during the interview process and anonymity in regard to the report generated from the interviews.

The gender imbalance of our recruited stakeholders could be considered a limitation. However, women in our study still overrepresent the proportion of women serving in high-level (decision making) positions in the Nigerian pharmaceutical supply chain. In most developing countries, the barriers to women accessing the industry and decision making sphere include their continued restriction to the

domestic sphere, the undereducation of girls and women, and women's lack of resources in terms of networks and finances.[9]

[9] Tiendrébéogo-Kaboret A. 2002. Burkina Faso: Obstacles to Women's Participation in the Legislature. *Women in Parliament*. Stockholm International Institute for Democracy and Electoral Assistance.

OPERATIONAL CAPACITY ASSESSMENT

As part of the process to determine the feasibility of engaging a 3PL or 4PL provider, it is necessary to have a quantitative view of the current supply chain operational capability. The OCAT, an Excel-based data gathering and assessment support tool, was developed with a maturity model methodology to:

- Review the current public-sector supply chain performance in those geographical areas selected for involvement in the project and the potential for improvement by implementing 3PL and/or 4PL provider strategies
- Investigate potential private-sector 3PL and 4PL providers with regard to their ability to engage with the public sector and deliver potential operational improvements

The data gathering methodology has been detailed in a previous section of this report. It should be noted that the project team allocated maturity level scores to questions that had not been answered by the interviewees. These scores were informed by the scores provided to other questions and comments made by the interviewees.

The public-sector operational capability assessment had 34 attributes in eight sections covering:

- Logistics management information systems and organization structure
- Governance
- Human resource management
- Monitoring and evaluation
- Forecasting and quantification
- Infrastructure (technical and physical)
- Procurement activities
- Warehousing and distribution activities

Each attribute was described under five levels of maturity that were allocated a score from 0 to 4. Consequently, a total score for the overall supply chain in each geographic area could be calculated and the potential for improvement identified. A few questions required a yes or a no answer. A score between 0 and 4 was allocated by the project team based on the respondent's yes or no answer, the comments of interviewees made at the time of the interview, and answers to other related questions.

The private-sector operational capability assessment focused upon obtaining data regarding the organization in such areas as:

- The date the organization was established
- The status of the company (e.g., independent company, member of a larger entity)
- The size of the business in terms of the most recent annual turnover
- The scale of the operation in terms of:
  - Number of employees
  - Warehouse space
  - Vehicle fleet size
- The names of major clients
- Operational IT systems

- The nature of the services provided to the supply chain market but not the organization's ability to deliver those services effectively

Although the maturity model approach was deployed to structure discussion, the scoring technique was not deployed as many of the commercially sensitive questions went unanswered and requests for data to support the answers that were received were not fulfilled. However, a qualitative assessment of the various organizations interviewed was undertaken and took into account the interview answers that were provided and an examination of websites in the public domain.

OPERATIONAL CAPABILITY ASSESSMENT FINDINGS

The public sector

As a result of the key selection criteria, detailed in an earlier section of this report, the following geographical areas were selected as project participants:

- Sokoto Region
- Plateau Region
- The FCT

Each of the 34 attributes could score a maximum of 4 points, for a maximum possible score of 136 points. The difference between the scores achieved by each region and the maximum possible score of 136 indicates the overall scope for supply chain maturity improvement.

Sokoto State

The assessment team was able to obtain responses from both a senior member and operation manager of the LMCU team. While the senior member of the team had an overview of the entire end-to-end supply chain, the operations manager had less of an understanding of the strategic attributes, including procurement activity. Consequently, the respondents had differing views with regard to some aspects of the eight sections of the OCAT. These views were taken as an indication that the organization structure was not as integrated as the responses to the question relating to the roles and responsibilities of the SCM unit would suggest. The senior member of the SCM team scored almost all of the attributes at the highest levels of maturity, but the operations manager gave a lower maturity rating in the following areas:

- LMIS and organization structure
- Supply chain mission and vision
- HR management policies and capacity building programs
- Monitoring and Evaluation (M&E) processes and the availability of the results. Given the low score attributed to the LMIS and the indication that it did not embrace all activities of the supply chain, it is not surprising that M&E received a low score regarding the lack of availability of M&E data at local levels.

In the physical distribution area, there were only minor differences among respondents. However, the operations manager scored the attributes relating to the adequacy of the infrastructure lower than the senior member of the SCM team did, which reflected the operations manager's opinion of the LMIS.

There is a close relationship between the infrastructure and distribution questions, with both respondents indicating that the warehouse complied with pharma-grade standards. The scores provided for the sections relating to procurement activities and quantification and forecasting by both respondents are identical.

The overall scores of both respondents and the average of those scores are presented in table 7.

Table 7. The overall operational capability assessment scores: Sokoto State

OCAT SECTION	Senior Supply Chain Manager Score	Operations Manager Score	Average Score
LMIS and organization structure	3.6	2.2	2.9
Governance	2.75	1.75	2.25
Human resource management	3.5	2.67	3.1
Monitoring and evaluation	3.6	1.0	2.3
Forecasting and quantification	3	3	3
Infrastructure (technical and physical)	3.3	3	3.17
Procurement activities	3	3	3
Warehousing and distribution	3.6	3	3.3
Total Score	***114***	***81***	***97.5***
Average maturity level	*3.4*	*2.4*	*2.9*
Percentage of maximum possible score	*84%*	*60%*	*72%*
Potential improvement percentage	*16%*	*40%*	*28%*

The following are the major points from the OCAT analysis from Sokoto State:

- With average attribute scores between 2.4 and 3.4, the analysis indicates that a potential overall level of improvement of between 16% and 40% is possible by either internal programs or engaging with a 3PL provider.
- Although procurement is an essential element of the end-to-end supply chain and has been included in the cost-benefit analysis, it is considered unlikely to be operated by a 3PL provider in the initial stages of adopting a best practice strategy.
- It is essential that the benefits of a best practice 3PL provider relationship is demonstrated prior to engaging a 4PL provider to execute the procurement activity.
- It is recognized that 3PL providers are engaged to some extent by the supply chain teams in each of the states under review, but they are standard traditional fee-for-service contract arrangements and do not reflect the characteristics of a best practice 3PL or 4PL provider model.

Plateau State

Responses were obtained from three members of the SCM team:

- A representative from the LMCU
- A senior member of the SCM team
- A logistics operations manager

Many of the answers obtained presented differences of opinion among the respondents, primarily in the areas of:

- LMIS
- M&E
- The quality and adequacy of supply chain facilities

As previously indicated, differences of opinion among members of the SCM team tend to suggest the lack of an integrated organization structure. The differences were considered when scoring the yes or no questions and other questions that respondents had failed to answer. Typically, a difference of opinion resulted in a low or mid-range score being allocated to enable the analysis to progress. To develop a single score for the region, the individual scores of the three interviewees were averaged. The individual scores and improvement potential, as well as the overall average, are presented in table 88.

Table 8. The overall operational capability assessment scores: Plateau State

OCAT SECTION	LMCU Representative Score	Operations Manager Score	Senior SCM Team Member Score	Average Score
LMIS and organization structure	3	2.4	2.6	2.67
Governance	2.5	1.75	2.75	2.33
Human resource management	2.33	2.5	1.83	2.22
Monitoring and evaluation	3.2	0.4	1.4	1.67
Forecasting and quantification	1	1	1	1
Infrastructure (technical and physical)	1.33	0.67	1.67	1.22
Procurement activities	0.25	1.25	1.5	1.0
Warehousing and distribution	2.4	1.2	2.4	2.0
Total Score	**74**	**51**	**67**	**64**
Average maturity level	***2.2***	***1.5***	***2.0***	***1.9***
Percentage of maximum possible score	***54%***	***38%***	***49%***	***47%***
Potential improvement percentage	***46%***	***62%***	***51%***	***53%***

All three respondents, with minor exceptions, provided low maturity scores, and a large potential percentage for performance improvement of around 50% was generated. The following elements of the supply chain received particularly low scores:

- Forecasting and quantification: An integrated forecasting team was not part of the organization structure. The task was stated as being undertaken by individuals as and when required, which was an indication that an integrated supply chain organization structure does not exist within the state.
- Infrastructure (technical and physical): Despite the differences of opinion regarding the quality and amount of the infrastructure, the general level of maturity was low.
- Monitoring and evaluation: Again, although there were differing views expressed by the respondents, the overall maturity score was low. The lack of an integrated supply chain organization was again suggested by the variance in the maturity levels. Frontline operations management appeared to be unaware of the M&E activities undertaken by the LMCU.

Despite a particularly low average score from the frontline operations manager, the warehousing and distribution category achieved an average maturity level score of 2 as a result of averaging the input from the three respondents. The frontline operations manager's main areas of concern were the management of waste and the distribution activity.

The Federal Capital Territory (FCT)

The key points from the subsequent analysis of the OCAT response can be summarized as follows:

- The scoring mechanism recorded high levels of maturity in the areas of M&E, documented policies and procedures, information systems. and human resource management.
- The overall end-to-end management of the supply chain appears to be fragmented despite the existence of an LMCU that incorporates M&E function. This view is supported by the fact that the respondents chose not to answer the question regarding a high-level reporting line for the management of the supply chain.
- The LMCU coordinates, collaborates, and acts as a repository for data, which indicates an appropriate location for the M&E function. However, despite having the data, the LMCU is not involved in forecasting and quantification, and respondents indicated that operational matters, such as storage, do not involve the LMCU.
- Similar to responses from other regions within Nigeria regarding the warehouse network, there was a difference of opinion regarding the quality and quantity of warehouse facilities. Typically, the quantity was regarded as adequate with room for further expansion. However, a low score was allocated to the response regarding the quality of the facilities in the FCT.
- The respondents indicated that the documented system for distribution is only partially utilized.

The total score and the improvement potential are presented in table 9.

Table 9. The overall operational capability assessment scores: The Federal Capital Territory

OCAT SECTION	Consolidated Score
LMIS and organization Structure	3.2
Governance	2.75
Human resource management	3
Monitoring and evaluation	3.6
Forecasting and quantification	2
Infrastructure (technical and physical)	2.3
Procurement activities	3
Warehousing and distribution	2.4
Total Score	***98***
Average maturity level	***2.9***
Percentage of maximum possible score	***72%***
Potential improvement percentage	***28%***

The overall score generated a maturity level of 2.9 and a potential scope for improvement of 28%. As outlined above, the potential levels of improvement can only be regarded as indicative at this point in time. Definitive conclusions need additional research and input from the other analytical tools deployed by the project team. The indicative qualitative analysis suggests that improvement initiatives should focus on the areas of forecasting activities and the physical distribution infrastructure.

For the public sector as a whole, the overall short- to medium-term objective should be to achieve a score of at least 3 in each attribute under review. The MOH management team must establish the extent to which this can be achieved by strengthening the current processes or by engaging with a 3PL provider. The longer-term aim is to leverage the expertise of 3PL or 4PL providers to achieve a score of 4 in each element of the operational capability assessment Maturity Model. The following paragraphs

explore the extent to which the private sector could provide the expertise to work with the MOH and achieve the required operational improvements.

The private sector

- The assessment team executed the operational capability assessment with several private-sector companies offering logistics services. Some of the companies were providing logistics services to the MOH via traditional contracts that tend to be:
    - The result of a tendering process with little or no input from potential contractors
    - Short duration, making the development of long-term relationships difficult
    - Limited regarding the communication and monitoring processes to be enacted by both client and contractor
    - Primarily cost focused and based on rate schedules rather than reward mechanisms benefiting both parties

The following companies were interviewed during the data gathering activity:

- Akesis Global Health
- CC Outsourcing
- General and Health Logistics International
- Mavela Express Services
- MDS Logistics
- Skylane Logistics and General Services
- Trackhub
- Worldwide Commercial Ventures
- Zenith Carex Nigeria

Table 10 provides a summary of the key findings for each private-sector company included in the operational capability assessment. Comprehensive notes for each company may be found in 0IV.

Table 10. Summary of key OCAT findings from the private-sector engagement

Logistics Service Provider	Business Life	Public-Sector Experience	Range of Services Offered	Best Practice Policies	Information Technology Investment
Akesis Global Health	Since 2000	Significant at both the state and national levels	A wide range of ambient supply chain services	Deployed in the areas of client and HR management	Logistics systems integrated with clients' enterprise resource planning systems
CC Outsourcing	Since 2017	Limited to one state drug management agency	A range of in-country services including cold-chain activities but excluding customs clearance	Performance monitoring is in place and includes performance-based staff incentives	IT systems have been developed in-house with particular regard to operational costing
General and Health Logistics International	Since 2011	Both federal and state experience; operates a	A wide range of services in both ambient and	Included SLAs, designated contract	A considerable investment has been made in IT systems,

Logistics Service Provider	Business Life	Public-Sector Experience	Range of Services Offered	Best Practice Policies	Information Technology Investment
		warehouse via a memorandum of understanding	temperature-controlled conditions	managers, and automated KPI production	including order processing and performance monitoring
Mavela Express Services	Since 2014	Work has been undertaken for the Federal MOH	A small company offering transport services in ambient conditions	Policies and procedures have developed over time informally	Information relating to the investment in IT systems was not available to the project team
MDS Logistics	Since 1965	A wide client base, including public-sector entities	A wide range of supply chain services in both ambient and cold-chain conditions are offered from the extensive assets of the company	Deployed in the areas of HR and client management	Significant investment has been made in IT systems and electronically supported temperature logging and security systems
Skylane Logistics and General Services	Since 2018	Public-sector experience has been gained as a result of a relationship with Riders for Health	The focus is in the area of providing transport services to the health care sector	Information relating to the processes and policies utilized by the experienced management team were not available to the project team	Similarly, information relating to the investment in IT systems was not available to the project team
Trackhub Ventures	Since 2019	The information available to the project team suggests that the company has yet to gain any in-depth public-sector experience	The courier, fast food delivery, and e-Commerce services to date are restricted to the Abuja area	Information relating to the processes and policies utilized by the management team were not available to the project team	The IT systems have been developed in-house to meet the needs of the current business offerings
Worldwide Commercial Ventures	Since 2002	Supply chain services in the areas of cancer management and hepatitis treatment for the Federal MOH	This licensed importer provides a one-stop shop for pharmaceutical supply chain services, including procurement; 90% of transport activities are outsourced	Client relationships are managed using contract managers, SLAs, quarterly reviews, and frequently produced KPIs	Although details regarding IT systems were not available to the project team, the company could not execute the best practice policies without significant investment in operational IT systems
Zenith Carex International	Since 2002	Experience has been gained working for the Federal MOH and the National Malaria Elimination Program	A broad range of services are offered, from customs clearance to LMD in both ambient and cold-chain conditions	In place particularly in the areas of HR and client management	IT systems are key to the organization's effectiveness. A tracking system and e-Commerce platform are important elements of the overall IT infrastructure

Given the service offerings identified from the private-sector operational capability assessment, the

MOH could establish a best practice 3PL provider relationship in the short term and improve the effectiveness of the health care supply chain. However, until considerable further quantitative analysis has been undertaken by the MOH, the nature of any 3PL or 4PL provider relationship cannot be defined in detail. While some of the larger organizations can provide both ambient and temperature-controlled facilities and vehicles, it may be necessary for two organizations to collaborate to provide the temperature ranges required by the pharmaceuticals being stored and transported in those geographic areas in which the larger organizations do not provide a service.

SUMMARY OF OPERATIONAL CAPABILITY ASSESSMENT FINDINGS

The findings of the operational capability assessment relating to both the public and private sectors are summarized below:

- The private sector has several professional logistics organizations that could provide the expertise needed by the MOH to improve the health care supply chain by having:
    - Current and past experience working with public-sector organizations
    - Private-sector clients operating best practice supply chain operations
    - Developed and implemented IT systems providing end-to-end supply chain visibility
    - Integrated operational IT systems with the in-house systems of their clients to provide support for:
        - Day-to-day communications and operational information
        - Forecasting and quantification activities
        - Monitoring and evaluation processes
        - Budgeting for on-going activities, specific projects, and unforeseen events
    - Clear communication and reporting processes by deploying designated contract personnel who deliver the targets of the jointly agreed SLAs
    - An in-depth understanding of the logistics services marketplace in their areas of operation
    - Additional supply chain resources as required
    - Access to financial resources, particularly those companies that are part of a large group, that enable the rapid acquisition of additional distribution infrastructure when required
- The analysis of the public-sector operational capability assessment indicated that there was potential to improve the effectiveness of the health care supply chain in all areas of the operation. Each geographic area had different areas of focus for improvement. Of particular interest was the need to integrate the organization structure of the various elements of the SCM team in all of the geographic areas/states assessed. This is an essential task even if the geographic region decides to implement an in-house improvement plan rather than entering into a best-practice 3PL or 4PL provider relationship to improve internal communications and decision making. Should the decision be made to adopt a 3PL or 4PL provider strategy, the alignment of the organizational structure of the MOH and the selected 3PL or 4PL provider partner will be a prerequisite to delivering the anticipated benefits from the partnership.
- In the event that the public sector could not deliver improvements quickly by an in-house improvement plan, implementing a best practice 3PL provider relationship in the short term, and

possibly a 4PL provider relationship in the medium term, is likely to be the most effective way to deliver potential supply chain benefits, such as increased stock availability and efficiency.

In the absence of quantitative data, the operational capability assessment has provided a useful starting point to assess both the potential for improvement in public-sector health care supply chains and the capabilities of private-sector 3PL and 4PL providers to provide best practice supply chain services. Regardless of the data gathering difficulties experienced by the project team, it is clear that there is considerable room for performance improvement in the public-sector health care supply chains in the areas of Nigeria that were reviewed. It is also clear that the private-sector logistics service provider market has companies able to provide best practice services to the MOH. There are a number of young, growing, and ambitious logistics service providers in Nigeria, which is a promising sign of market vibrancy and growth. The information gained from the study is a valuable starting point for the further, detailed work that will be necessary to progress the 3PL and 4PL provider discussion in Nigeria.

COST-BENEFIT ANALYSIS

The cost-benefit analysis was performed to estimate the total cost of the current public health supply chain in Nigeria. Establishing these baseline costs will allow an incremental cost analysis to assess how these supply chain costs will change with the introduction of 4PL provider-coordinated supply chains. Categories for all relevant supply chain costs were identified from a review of the current supply chain structure, with a particular focus on functions whose costs are likely to change with the introduction of 4PL provider-coordinated supply chains. The analysis evaluated costs associated with procurement, warehousing, distribution, and management/system support functions restricted to the FP commodity supply chain in three states (FCT, Sokoto State, Plateau State) selected based on the key selection criteria. Costs of the FP supply chain were estimated from the central warehouse to the SDPs (health care facilities) in the public health sector.

DATA ANALYSIS

Data provided during interviews and from supporting documents were neither sufficient nor compatible with the rapid supply chain modeling tool's input data template. Several country-specific, simplifying assumptions were made to estimate the procurement, storage, transportation, and management costs.

The FP supply chain

The Nigerian FP supply chain is made up of three main operational tiers through which FP commodities flow: Tier 1 (central level), Tier 2 (regional level), and Tier 3 (SDPs). The central level (Tier 1) represents FP supply chain activities carried out by the Federal MOH, the central contraceptive warehouse (CCW), and implementing partners. Central-level activities included in this analysis are procurement, storage, and distribution. The regional level (Tier 2) represents activities, including storage and distribution, carried out at the six zonal hubs deployed across the six geopolitical regions in the country. Tier 3 represents activities carried out by health care facilities (SDPs). FP commodities are delivered directly to SDPs; therefore, storage is the only Tier 3 activity included in this analysis. The data and assumptions used to estimate costs for the different supply chain functions across these three operational tiers are described below. Data used for this analysis were largely made available from the GHSC-PSM and covered six states—three initially selected based on the key selection criteria (FCT, Sokoto State, Plateau State) and an additional three whose data were made available (Bauchi, Ebonyi, Kebbi).

FP commodity throughput (volumetric data)

Annual throughput for commodities flowing through the Nigerian FP supply chain was estimated using the quantities and the value of FP commodities shipped in 2020 based on data available from the Reproductive Health Supplies Coalition. Commodity volume (m^3) at the national level was estimated by calculating the number of cases per given number of units and applying the volume per case using commodity specifications provided in the USAID Contraceptive and Condom Catalog 2017[10] (figure 66). Similarly, weights (in kg) of commodities were estimated by multiplying the estimated number of cases by the weight per case using commodity specifications from the USAID Contraceptive and Condom

[10] US Agency for International Development (USAID), 2018. Overview of Contraceptive and Condom Shipments, FY 2017. Washington, D.C

Catalog 2017. The volumes of commodities distributed from the CCW to the six states included in this analysis were made available from the GHSC-PSM.

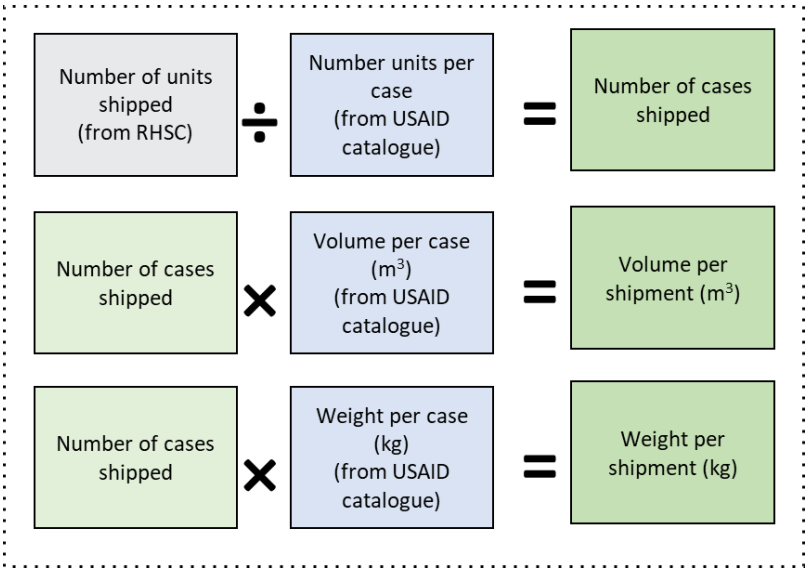

Figure 6. Approaches used to estimate commodity volume and weight

Procurement

The procurement of FP commodities is carried out mainly through the United Nations Population Fund (UNFPA), with funds contributed by the federal government of Nigeria and development partners, including UNFPA, USAID, the UK Department for International Development, and the Canadian International Development Agency. Following a previously published approach,[11] we assumed that an administrative fee of 7% is levied against the value of commodities procured to cover the cost of managing and administering pooled funds and for FP commodity procurement.

Warehousing (storage and handling)

FP commodities procured for the public sector are stored at the CCW (warehouses in Abuja and Lagos serve as the CCW) and six zonal hubs deployed across the country (the two CCWs also serve as zonal hubs) to ensure integrated commodity storage and LMD across programs. Storage capacity for the CCW and zonal hubs in terms of total pallet spaces and pallets occupied by FP commodities was obtained from the GHSC-PSM. Storage costs (fixed warehousing cost) for FP commodities were estimated by applying central- or state-level storage rates (costs) per pallet per month (obtained from the GHSC-PSM) to the number of pallet spaces occupied by FP commodities per month. Information on storage capacity at SDPs was not available. However, the team estimated storage space requirements for the volume of FP commodities delivered at SDPs following guidance described in The Logistics Handbook and applied storage rates (costs) per pallet per month obtained from the GHSC-PSM. For simplicity, it was assumed that one cubic meter ($1m^3$) of commodities could be stacked on a pallet.

[11] Sommerlatte A, Spisak C. 2010. Nigeria: Costing of the Contraceptive Logistics Management System. Arlington, Va.: USAID | DELIVER PROJECT, Task Order 1. Available at: https://www.rhsupplies.org/uploads/tx_rhscpublications/NG_CostContLogi.pdf.

Handling costs (variable warehousing cost) for FP commodities at the CCW and zonal hubs were estimated by applying handling rates (costs) per pallet per month (obtained from the GHSC-PSM) to the number of pallets handled per month (both inbound and outbound).

Transportation

The distribution of FP commodities in Nigeria can be divided into long-haul distribution from the CCW to state zonal hubs and LMD from state zonal hubs directly to SDPs. Long-haul distribution costs were estimated by applying the cost per ton of commodities (obtained from the GHSC-PSM) to the average number of outbound pallets per month at the CCW (assuming each 20 tons contains an average of 25 pallets). The LMD cost per two-month delivery cycle was estimated for the six states providing data by multiplying the number of health facility drops per cycle by the average distribution cost per drop for each state. This figure was extrapolated to an annual level of LMD costs by multiplying by six delivery cycles per year. Information on the derivation of the average distribution cost per drop was not available, and the basis (i.e., volume, weight, or distance) is unclear.

Management

Costs associated with FP SCM activities (e.g., quantification, training, supervision, LMIS reporting, operating costs) were not readily available. A Global Fund expert's opinion estimated lower management costs in developed countries with mature systems (single-digit percentage up to ~12%) but suggested a 30–50% estimate of the total warehousing and distribution costs for LMICs due to the complexity of public health supply chain systems. In addition, a previous FP costing study from Nigeria showed the variable contribution of management costs to the total costs across the different tiers (2% for Tier 1, 42% for Tier 2, 53% for Tier 3, and 17% for Tier 4), reflecting the differences in the type and level of activities. For this analysis, due to the large uncertainty around various estimates, a 12% markup was considered for management costs.

Currency

All data on costs were collected in the local currency, Nigerian Naira, and reported in 2021 US dollar prices (estimated using the average exchange of 412 Nigerian Naira per USD in 2021).

FINDINGS

Nine of the 15 stakeholders working in the public health supply chain in Nigeria were successfully interviewed. These comprised one interview at the federal level, one completed of the three requested interviews in FCT, three completed of the five requested interviews in Plateau State, two completed of the four requested interviews in Sokoto State, and two technical advisor interviews. All MOH stakeholders provided a good overview of the public health supply chain, including FP commodities. However, none of the requested documents were provided to support the cost analysis. Respondents indicated that the FP commodity supply chain was coordinated through the GHSC-PSM, which they advised should be in a position to share the budgets and actual expenditures. In general, the respondents indicated that budgets and actual expenditures for state-sponsored public health supply chain activities were not easily available because the budget is integrated into State MOH budgets. Budgets, actual expenditures, and transportation contracts for state-sponsored public health supply chain activities were said to be available in some cases, but none were made available for this review.

GHSC-PSM Nigeria provided data on warehouse costs, transportation costs, and volumetric information for FP commodities in six USAID-supported states (**Error! Reference source not found.**). Warehousing capacities and costs were made available for five warehouses in Abuja, Lagos, Sokoto, Gombe, and Awka. The Abuja and Lagos warehouses serve as both CCWs and zonal hubs, while the rest serve as zonal hubs. The zonal hubs represent five geopolitical regions with an average of six states per region. Distribution data in terms of the number of health facility drops and estimated cost per drop were provided for six states (Bauchi, Plateau, Ebonyi, FCT, Kebbi, and Sokoto).

Throughput and procurement cost

Data from the Reproductive Health Supplies Coalition indicate that 8,707,738 units of FP commodities across all contraceptive methods with an estimated value of USD 18,656,241 were shipped to Nigeria in 2020. The estimated value, volume, and weight of commodities managed in the FP commodity supply chain at the federal level and six states included in the analysis are shown in table 11.

Table 11. Annual throughput of FP commodities at the national and state levels

State	LGAs	SDPs	Commodity value (USD)	Commodity volume (m^3)	Commodity weight (kg)
Bauchi	21	577	506,577	61	11,010
Ebonyi	13	379	368,976	45	8,019
FCT	6	318	156,211	19	3,395
Kebbi	21	208	204,835	25	4,452
Plateau	17	689	281,054	34	6,109
Sokoto	23	534	311,066	38	6,761
National	774	40,017	18,656,241	2,255	405,483

Total supply chain cost

The estimated annual supply chain cost for the facilities included in the analysis (two CCWs, five zonal warehouses, and six states) was USD 1,956,158, largely driven by the estimated procurement operational cost (USD 1,305,937), which comprised 68% of the total cost. FP commodities are centrally procured in Nigeria, and procurement operation represents the main component of costs (88%) in Tier 1. This analysis assumed that procurement of FP commodities was not undertaken at the lower levels of the supply chain and that costs were not incurred. The share of costs varied widely across tiers, reflecting the different roles and levels of activity of each function at each tier (table 12 and figure 7). For example, management costs, which were estimated using a 12% markup, are much higher for Tier 2 (largely driven by the transportation cost) than Tiers 1 and 3.

Table 12. Estimated supply chain cost for sampled facilities with 12% markup management cost

Function	Estimated cost (USD)			
	Tier 1	Tier 2	Tier 3	Total cost
Procurement*	1,305,937	0	0	1,305,937
Warehousing	111,782	34,225	64,316	210,323
Transportation	38,864	331,367	0	370,231
Management/system support	18,077	43,871	7,718	69,667
Total cost	1,474,660	409,464	72,034	1,956,158
*Procurement cost is estimated as 7% of total FP commodity value (USD 18,656,241).				

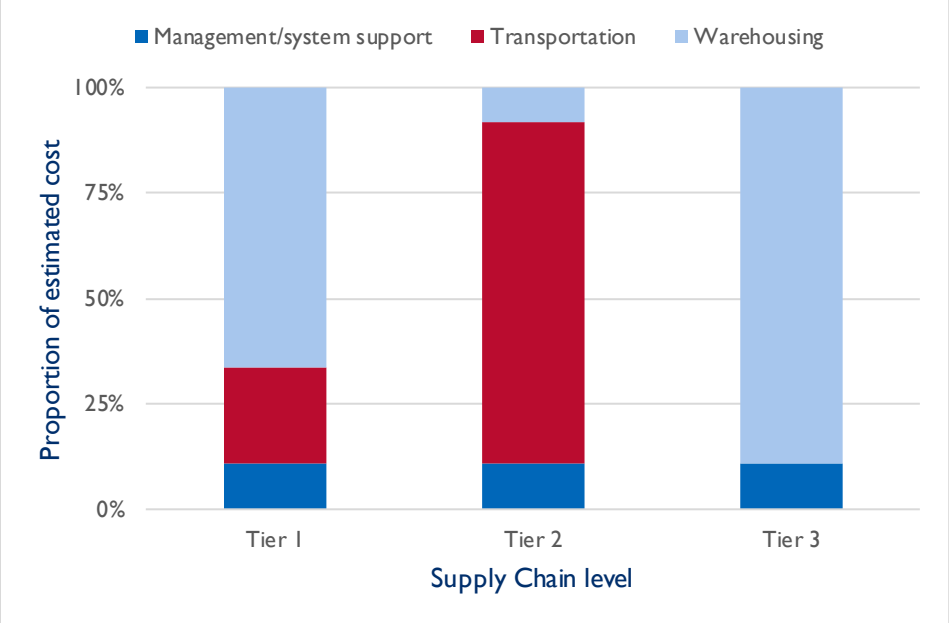

Figure 7. Distribution of FP supply chain costs by function and tier

Note: management costs estimated using a 12% markup. Procurement costs are not shown.

Warehousing costs

The estimated total warehousing cost was USD 210,323. Warehousing costs in Tier 1 are the highest as these relate to storage space and handling requirements for all FP commodities passing through the entire supply chain in the country. Warehousing costs in Tiers 2 and 3 relate to the five zonal hubs and SDPs in the six states included in the analysis, respectively. In this analysis, warehousing costs comprised storage and handling costs (figure 8). The major component of warehousing cost was fixed storage space costs at 98% in Tier 1, 76% in Tier 2, and 100% in Tier 3. Although on average more commodities were handled per month in Tier 1, handling costs in Tier 2 were comparable to Tier 1 due to higher inbound and outbound costs per pallet (14% higher) in Tier 2. Information on storage and handling costs in Tier 3 was not available, so an aggregate cost was estimated.

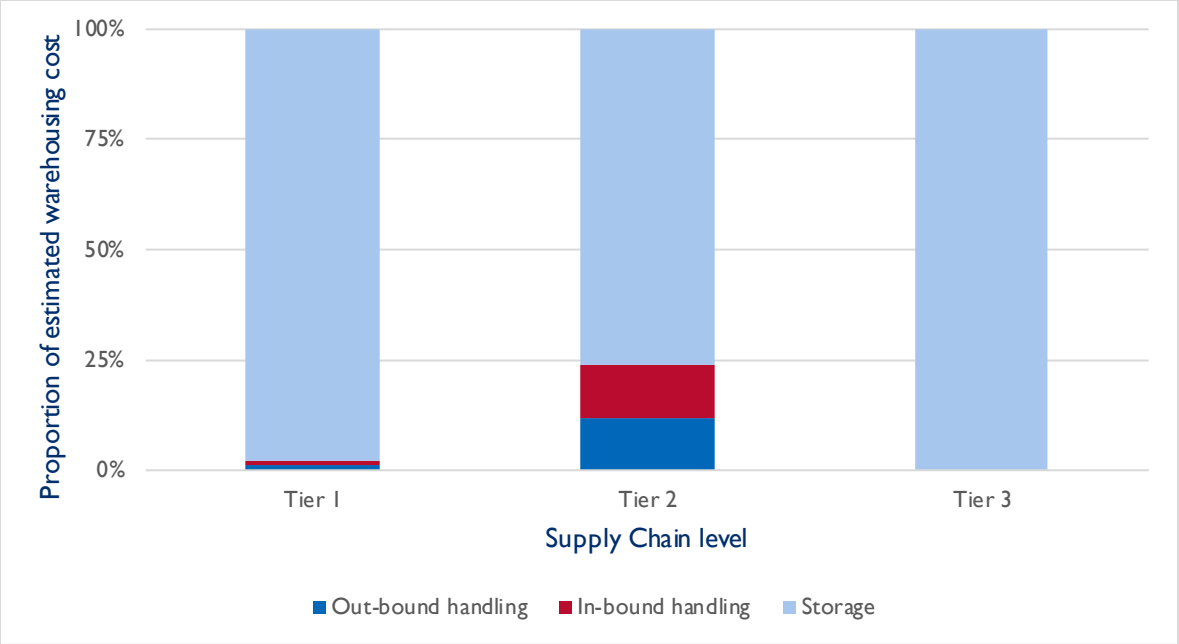

Figure 8. Distribution of FP warehousing costs by tier

Transportation costs

Transportation costs varied between Tier 1 and Tier 2. Transportation costs in Tier 2, covering SDPs in six selected states only, are higher than in Tier 1, which covers distribution to all zonal hubs. Transportation of commodities from Tier 1 to Tier 2 facilities is contracted and charged on a per pallet basis, potentially representing the volume of products transported. However, the transportation of commodities from Tier 2 facilities (zonal hubs) to SDPs is contracted and charged for every health facility drop made using a fixed cost per drop in each state, which potentially increased the cost of transportation at Tier 2 (table 13 and figure 9). Transportation costs in Tier 1 are driven by the volume of commodities transported, and in Tier 2 they are driven by the number of health facilities visited and comprised 89.5% of the total transportation cost. FP commodities were delivered directly to SDPs using contracted distributors managed at the state level. Thus, transportation costs were not incurred in Tier 3.

Table 13. Estimated supply chain costs by tier for sampled facilities

Function	Estimated cost (USD)			
	Tier 1	Tier 2	Tier 3	Total cost
Procurement*	1,305,937	0	0	1,305,937
Warehousing	111,782	34,225	64,316	210,323
Transportation	38,864	331,367	0	370,231
Management/system support	3,013	173,657	10,934	187,603
Total cost	1,459,596	539,249	75,250	2,074,095

*Procurement cost is estimated as 7% of total FP commodity value (USD 18,656,241). *Management costs estimated using differential markup percentages for each tier.*

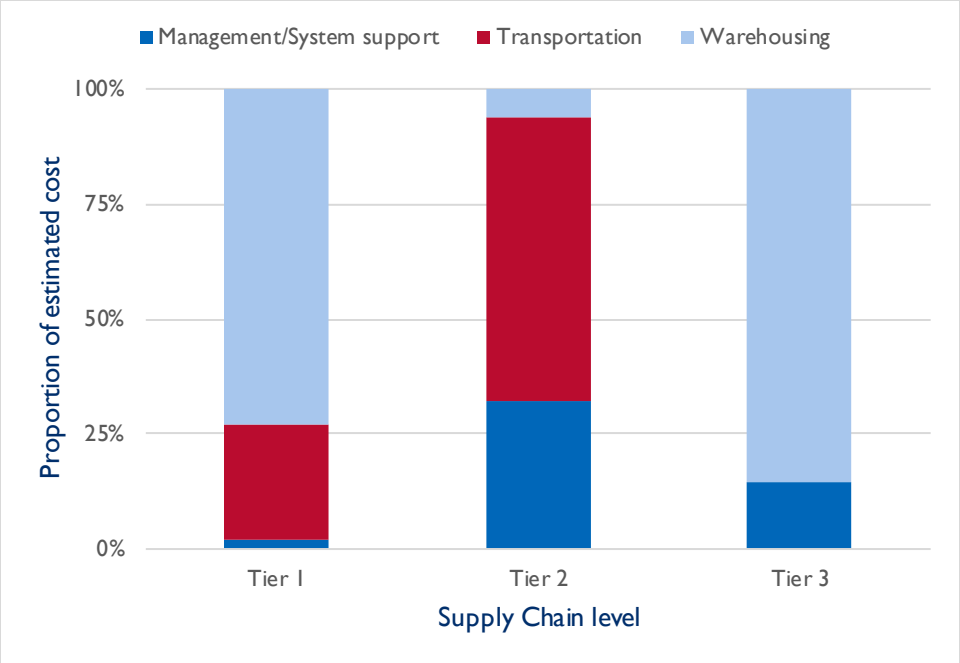

Figure 9. Distribution of supply chain costs by function and tier

Note: management costs estimated using differential markup percentages for each tier. Procurement costs are not shown.

ANALYSIS

A full cost-benefit analysis that measures all of the costs and consequences of the alternative supply chain approaches in monetary terms was not feasible. Measuring all consequences and placing a monetary value on them is very challenging. The potential impact of the 4PL provider-coordinated public health supply chains could be evaluated by comparing resource use and costs to the current systems. However, it was not feasible to perform this analysis because the alternative 4PL provider-coordinated public health supply chain had not been fully proposed or implemented, making it impossible to estimate the associated costs. Basic supply chain cost metrics in terms of cost per USD of annual throughput, cost per m^3 of annual throughput, cost per kg of annual throughput, costs per USD 1,000 of commodities, or per percent point of supply chain performance indicators can be estimated, representing average cost-effectiveness ratios. However, without an appropriate comparator, these metrics do not answer the decision question and are therefore, not presented here.

LIMITATIONS

An understanding of public health supply chain costs is important for informing better decision making on supply chain policy formulation, design, planning, budgeting, and overall system management. Accurate cost estimates can be used as the basis for negotiating best practice 3PL or 4PL provider agreements for functions such as transportation or warehousing.

The estimated supply chain costs in this analysis can serve as a baseline for evaluating 4PL provider-coordinated supply chains; however, the estimates carry several potential limitations that should be

considered. First, the data used in these calculations is limited to six states supported by USAID, which limits the transferability of these estimates to other states in the country. With support from USAID, the FP program in the selected states uses contracted warehousing and distribution functions. USAID's supported supply chains may employ a wide range of staff, including expatriate staff who are paid above the MOH levels and maintain infrastructure well beyond what could be afforded or sustained by the MOH. This is likely to result in high costs of managing the supply chains. The estimated costs are likely to be relatively high and not representative of non-USAID-supported states across the country. Budgets or expenditure data from state MOH-managed supply chains were not available, so an alternative cost estimate could not be established.

Procurement operating cost is particularly high because it is estimated based on total FP commodity value, which is high for Nigeria. Estimation of procurement operating costs using actual measured data is important to accurately quantify this cost.

Calculating management cost as a proportion of total warehousing and distribution is likely to yield an inaccurate answer as this cost varies with the different management/support activities required at each level of the supply chain.

Information on storage capacity and costs at the SDPs was not available. Costs were calculated based on simplifying assumptions, which potentially limited the accuracy of the estimates. Details on wastage through the supply chain system were also not available.

Data collection was very challenging because it was done using online interviews in the middle of the COVID-19 pandemic. Arranging interviews was particularly difficult as stakeholders cited being busy with COVID-19-related issues.

SUMMARY

Detailed comparisons among the current levels of operating costs, the associated levels of service, and future best practice 3PL and 4PL provider relationships are difficult without the involvement of the logistics service provider market. It is essential to understand that the aim is to obtain value for money and enhance the cost and service balance.

In a best practice 3PL provider relationship, the service provider would typically undertake the following activities:

- Selecting additional warehouse and transport service resources beyond those owned and operated by the 3PL provider
- Undertaking rate negotiations and establishing sub-contract arrangements, including SLAs
- Working with the client's team regarding day-to-day operations and resolving operational issues as necessary
- Producing performance data and attending regular reviews
- Gaining an understanding of future order volumes and new customer destinations
- Developing annual budgets and managing communication with the individual management teams involved

- Managing the IT system interfaces with the various supply chain elements (e.g., order processing, warehouse activities, route planning, delivery documentation, truck global positioning system [GPS], performance monitoring)

3PL provider benefits could come from rationalizing a multi-contract situation with a single logistics service level provider offering a range of coordinated services. Engaging a single 3PL provider with a larger contract could reduce costs. In addition, service-level improvements could be facilitated as a result of the public-sector management team focusing collaboratively on a single service provider. The activities undertaken by a 4PL provider in a best practice relationship build on those undertaken by a 3PL provider, as follows:

- Selecting, as a non-asset owner, warehouse and transport service providers to meet the operational needs of the client
- Undertaking rate negotiations and establishing contractual arrangements, including SLAs
- Managing integrated IT systems to ensure that data are available for analysis
- Developing revised procedures and operational techniques based on the data analysis
- Working with the client's team and teams of the various 3PL providers regarding day-to-day operations
- Reviewing the performance of the 3PL providers and developing summary reports for the client's senior management team
- Establishing the future needs of the client in terms of product details, order volumes, additional geographic destinations, additional service requirements, and storage and distribution conditions

Initially, a 4PL provider relationship may result in slightly higher costs but improved performance levels, as the fixed costs associated with the 4PL provider management team are incurred before the team commences rationalizing contracts, making use of its knowledge of the market, and enhancing buying power. While some organizations use a percentage of costs to determine a management fee, a fixed sum reflecting the size of the team, systems, and overhead is a more equable method. Once the 4PL provider has collected and analyzed operational data, it will be able to recommend changes that will reduce costs and increase service levels. The 4PL provider needs to be incentivized to identify potential cost reductions in a long-term relationship for the mutual benefit of all parties involved. Targets need to be incorporated into the supply chain strategy and the documents relating to SLAs.

A small 4PL provider team is likely to increase the level of costs in the short-term only marginally. However, the longer-term benefits could be significant. Although initial quick wins may generate 5–10% cost savings, it will take a collaborative effort over a period of years to generate further cost savings and performance improvements. It is important to understand that the best practice relationships are two-way in nature. The client needs to commit to working with the service provider in a collaborative manner to provide the agreed inputs, resources, and information to enable the service provider to deliver the target benefits.

The costs and benefits of maintaining the status quo, pursuing a best practice 3PL provider relationship, and implementing a 4PL provider strategy are presented in figure 10.

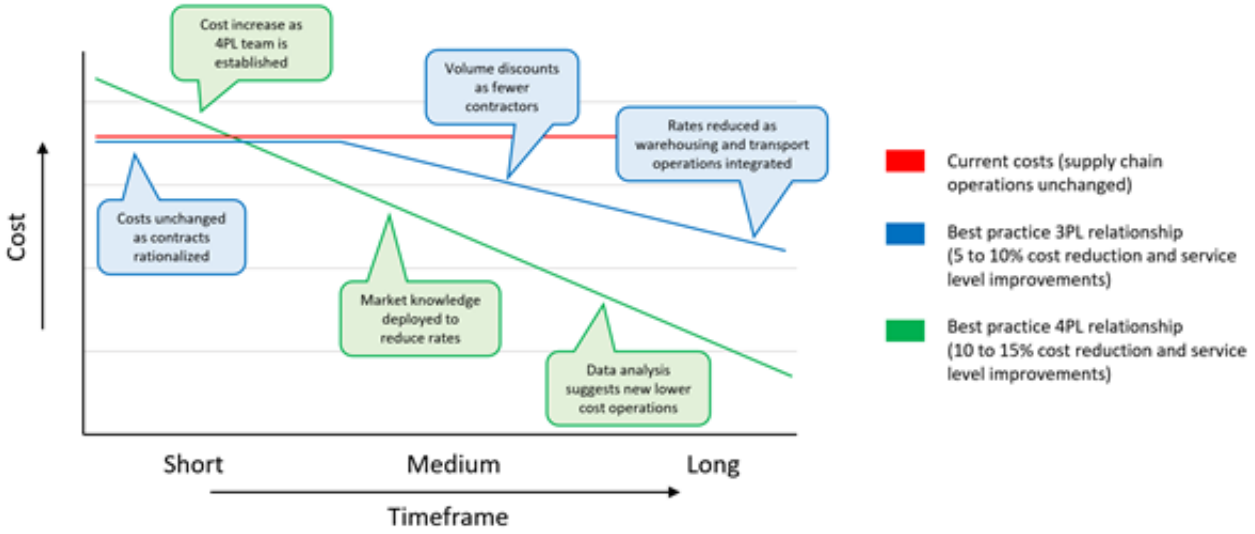

Figure 10. Projected 3PL and 4PL provider cost curves

Any potential savings and service level improvements will be determined by the starting point regarding these two key aspects of SCM and the extent to which the national supply chain has been the focus of senior management's activities in recent years.

While the project team was unable to develop a costed comparison of current and potential future operational models, there are examples from the private sector in the public domain:

- Hospital groups in the southwest and northeast United States worked with Distribution Concepts International (DCI) in a 4PL provider capacity to reduce costs by 15–20%.[12]
    - In the southwest, the group incurred freight costs of USD 3.2 million per year. DCI utilized its in-depth knowledge of the 3PL provider marketplace to find its client a different service provider and generate savings of USD 500,000 per year.
    - The group in the northeast had historically managed several 3PL providers in an informal manner, incurring annual costs of USD 2.5 million. After reviewing the current costs and service levels, DCI helped its client achieve savings of US 350,000 per year by introducing a more effective outsourcing strategy.
- Penske Logistics, a leading 4PL provider in the US, has collaborated with many clients in the health care sector to lower costs, improve service levels, and reduce the administrative burden, which benefits both its clients and their patients.
    - Its clients' customers (health care facilities) indicated that inventory required storage space that could be better deployed as patient treatment areas. Penske introduced more frequent deliveries, supported by monitoring technology to ensure the reliability of the new schedules, to facilitate the conversion of storage space to clinical areas.

[12] https://www.dci4pl.com/case-studies

- Cost reductions were made possible by introducing dedicated vehicle fleets, supported as needed by vehicles and drivers from other contracts and Penske's rental fleet. Technology investment enabled increased operational visibility, route optimization, and backhaul opportunities.
- Through its strategic supply chain support, it can reduce clients' supply chain costs by 8 to 12%.[13]

- In the UK, Wincanton, a leading supply chain partner for UK businesses, has recently been awarded a five-year contract with fashion retailer Primark to provide transport services to its 200 UK stores.[14] The Wincanton and Primark teams will work together to deliver a successful transformation of Primark's transport operations.

  - Both teams are committed to working together to introduce a number of operational improvements, including a 15% reduction in the distance traveled by the distribution fleet.
  - While the associated reduction of total supply chain costs is welcomed, the key driver is the need to reduce carbon emissions and support the environmental aspirations of both Wincanton and Primark.

- The automotive sector, which has long been regarded as a leader in the area of SCM, has deployed the 4PL provider concept over many years.[15] For example, in Europe, Opel, a General Motors company, engages collaboratively with GEFCO, a 4PL provider organization focusing upon the automotive sector:

  - 220 individual 3PL providers are managed by GEFCO's 4PL provider division for both inbound and outbound movements. The scope of activities includes purchasing, tendering, contracting, and invoicing.
  - Unique tools are available to the 4PL provider division to enable data analysis to be undertaken in support of supplier rationalization, network planning, and routing optimization.
  - The relationship has existed for many years, and the current four-year contract is expected to continue generating annual savings of 5–7% by achieving further efficiencies in manufacturing, logistics, and purchasing.

Private-sector companies would not adopt the technique unless it benefits their businesses. It is not always related directly to cost reduction. A modest increase in cost may be needed to generate service level improvements such as continuous availability of FP commodities through effective supply chain management, which subsequently adds more category of products to satisfy demand and optimize costs through economy of scale while increasing revenue. A primary health care-level drug revolving fund is a promising scheme that could leverage a 4PL or best practice 3PL provider to improve effective

[13] Penske. "Lead Logistics Provider." https://www.penskelogistics.com/solutions/supply-chain-management/lead-logistics-provider
[14] https://www.wincanton.co.uk/news-and-media/press-releases/wincanton-transform-primarks-uk-supply-chain/
[15] https://www.automotivelogistics.media/opel-tasks-gefco-with-further-cost-reduction/21778.article: Marcus Williams, Automotive Logistics, October 2018.

management and a cost-recovery mechanism for sustainable financing of essential medicines and supply chain management.

Although a supply chain strategy has been developed and is supported by a team reporting at the highest level within the MOH, the implementation of the strategy is optional within the various geographic levels of government. Many of the supply chain issues identified by the assessment team and confirmed during the focus group discussions could be addressed by the introduction of best practice 3PL providers and eventually 4PL provider relationships. Current supply chain costs, excluding the cost of the procured pharmaceuticals and medical supplies, is estimated to be around USD 30 million per year for all commodity management. Therefore, even a modest cost reduction would generate savings for investment in other health care services. In addition, service-level and managerial enhancements would occur to benefit both the SCM team and the patients it serves.

PUBLIC-SECTOR CONTRACT MANAGEMENT FOCUS GROUP DISCUSSION

After analyzing the results from the assessment tools, it was evident that additional information was needed to understand the capability of the public sector to engage, manage, and oversee private-sector outsourced logistics providers. Contract management is critical to establishing and maintaining a best practice 3PL or 4PL provider relationship where the public sector and the contractor interact on a regular basis to continually improve and refine the collaborative process, troubleshoot issues, and monitor KPIs. Individuals who participated in earlier assessment interviews were invited to attend. The following high-level topics were discussed:

- Capability of understanding public-sector needs and resources
- Availability of standard procedures and guidelines in procuring services from start to end, including bid preparation, selection, evaluation, evaluation, awarding, and communication
- Service provider selection, evaluation and review capability, availability of 3PL and 4PL provider selection, and contract management capability
- Challenges and strengths in service contract management

The NPSCMP's mandate is to address poor supply planning, avoid waste and expiries, and ensure close monitoring of donor efforts. It has a five-year supply chain strategy (2021–2025) that states can opt to use to aid in sustaining their supply chain. If a state decides to utilize the strategy, the NPSCMP accepts responsibility for the outcome. The NPSCMP is placing a large focus on increasing state ownership of its supply chain while private sectors bring their system, processes, competent people, and standards to operate and provide the supply chain services.

Potential outsource logistics providers must meet certain criteria to be eligible for the contract. Contracts are managed through bimonthly meetings to monitor progress, sign off on necessary times, evaluate best performance, and review proxy deliveries. Participants explained that relationships with current 3PL providers make them hesitant to engage in additional partnership due to a lack of transparency regarding KPIs, costing, and management approaches.

DISCUSSION

The results presented explore whether private 4PL providers are able to present a more efficient and effective alternative to current practices that can be more easily managed by the Nigerian MOH through an understanding of:

- Public- and private-sector supply chain capabilities
- Interests and underlying drivers
- Motivations and constraints
- Public-sector costs and corresponding service levels

Where this report identifies gaps, a deeper dive focused on identifying root causes is recommended so that targeted fixes and operational improvement programs can be implemented.

Public-sector supply chains aim to fulfill deliveries and maintain stock while simultaneously trying to decrease delivery costs.[16] Best practice 3PL and/or 4PL providers allow for governments to focus their technical expertise on core activities while reprioritizing other non-core skills and functions with the goal of creating a more agile and efficient supply chain by reducing costs and increasing service levels, expertise, and innovation.[17] A well-functioning public-sector supply chain system should have easily accessible KPIs; frequent and routine communication with any outsourced providers; satisfactory customer service; efficient inventory and warehouse management systems with limited stock loss, sufficient storage space, and operable equipment; an intact cold chain that adheres to global standards and guidelines; functional and reliable distribution vehicles; and competent staff with limited turnover.

There are many reasons for the gaps in performance of the public-sector health care supply chain, including:

- **Inadequate communication between the staff** undertaking procurement activities and the logistics specialists within the overall SCM team, which can result in large volumes of incoming products arriving in a short span of time. The objective of attempting to achieve low unit purchasing costs by buying in bulk often results in additional operating costs as a result of the need to acquire extra warehouse space on short notice and at premium rates and/or demurrage charges for delaying the unloading of incoming containers.
- **Payment systems, particularly those related to distribution vehicle drivers, do not support an efficient operation.** The payment of daily allowances while away from the operating base encourage drivers to negotiate trip times that are potentially longer than required to undertake the trips safely.
- **Organizational structures that do not enable integrated management of the end-to-end supply chain.** The various elements of the supply chain are often partitioned across several units of the MOH. Procurement is often undertaken within the finance function or conducted by donors and/or implementing partners. In many instances, the inbound and outbound logistics are managed

[16] Wright M, Forster G, Beale J. (2017). Improving iSC performance through outsourcing–Considerations for using third-party service providers to increase innovation, capacity and efficiency. Vaccine, 35(17), 2195-2197.
[17] Ibid.

by different entities within the overall health system. This segmentation can result in uncoordinated decision making with centralized conflict resolution at the most senior level within the organization.

- **Infrequent distribution cycles resulting in low levels of transport asset utilization.** Undertaking only a few distribution cycles per year can result in vehicles standing idle between those cycles. While this enables maintenance without impacting vehicle operational availability, it does not make the best use of the asset or the drivers' time. It also results in peaks in the demand for warehouse staff, which can either make poor use of full-time employees' time or create a demand for the use of unskilled temporary staff.
- **Limited IT systems and inefficient business processes.** In many cases, the IT systems that have been implemented are not integrated and reflect cumbersome business processes. The lack of integration requires manual intervention to transfer data among the various systems. A lack of confidence in the systems often results in paper-based systems being maintained in parallel as a backup.
- **Warehouse facilities that have not grown in size as both product ranges and product volumes increase.** Warehouse space utilization is often reported to be in excess of 100%. Such a situation results in an inefficient working environment, causing delays to schedules, errors, and poor product rotation. Full warehouses do not necessarily mean that more warehouse capacity is required. A review of the inventory management and procurement processes may highlight ways of flowing product through the storage facilities rather than holding large quantities of product for long periods of time. Bulk buying creating a few large deliveries may be a false economy resulting in additional avoidable operating costs. This shortcoming is further compounded by the reluctance of management teams to write-off and dispose of expired product.
- **Low prioritization of maintenance.** Maintenance is generally done in-house by a generic maintenance unit with many clients and few resources. Usually, there is no specific budget line for the maintenance of delivery vehicles and mechanical handling equipment (MHE), which requires the release of funds from several sources. This can result in slow payments to maintenance service providers, a reluctance to provide a service to the public sector, and the irregular servicing of mechanical equipment of all kinds.
- **Limited experience on supply chain dynamics.** There is very little private-sector best practice experiences within MOH SCM teams.
- **Performance monitoring is an underexploited management tool.** Performance monitoring using KPIs tends to be undertaken infrequently and often with inadequate data input. Consequently, the SCM teams are not able to identify the root causes of their problems and use the information to support decision making and appropriate remedial actions.

Many of these difficulties can be overcome by engaging best practice 3PL or 4PL providers. As the economies of countries are advancing in recent years and manufacturing organizations have adopted best practices from high-income countries, logistics service providers have emerged to provide a range of services, including procurement; international logistics; customs clearance; and in-country distribution offerings, including express courier services.

Nigeria has made strides to improve public supply chain outcomes by organizing coordinating structures at the federal, state, and LGA levels to advance the synchronization of public health supply chain interventions through integrating donor efforts, setting standards, and defining roles and responsibilities

among stakeholders. The NPSCMP intends to manage the nation's vertical supply chains and in the process of integration, set up the state and LGA LMCUs to manage all public health interventions at their level. Nigeria aims to continue the momentum forward with the rollout of the new national health product supply chain strategy, which is framed by four pillars: improving the NPSCMP's engagement; increasing state ownership and capacity; integrating warehouses and last-mile delivery; and optimizing supply chain performance through strengthening selection, procurement, and inventory and demand management practices.[18]

The process of evaluating public sector supply chains to determine the prospective benefits from engaging private-sector 3PL or 4PL providers for their capability to optimize identified needs is reflected in the decision framework (figure 12).

The actions required to develop an initial best practice relationship and start to gain benefit can be summarized as follows:

- Select a particular flow of all products from the ports of entry via the central storage facilities in Abuja and Lagos to a significant geographical area of usage with the aim to identify a pilot supply chain with stakeholders that have shown a positive attitude to best practice outsourcing. Given they responded positively to the interview process conducted by the project team, it may be appropriate to consider either Sokoto or Plateau, rather than FCT, in this respect
- Develop a policy document outlining the way forward considering any of the relevant points of the latest national health product supply chain strategy
- Although this activity has already been highlighted as essential, it is worth repeating that developing a detailed dossier of the current situation, in terms of shipment volumes, operating costs, service levels delivered, IT systems, organization structures, and network assets of the pilot supply chain is a key initial task
- Identify the key areas for improvement by undertaking a gap analysis vis-à-vis a best practice supply chain. The results will highlight the areas of the supply chain that a 3PL provider might be needed to support, such as limited SCM expertise within the MOH team, inadequate storage facilities, unreliable mechanical handling equipment and delivery vehicles, high levels of stock-outs and expired stock, poor IT systems, lengthy internal communications due to the existence of organizational silos, an inability to adhere to budget expenditure levels, and warehouse inaccuracies in terms of picking quality and stock accuracy
- Review the current contracts with particular reference to the number of logistics service providers involved and the termination dates of those contracts. Explore whether a potential LLP is among the current logistics service providers and the remaining time to complete the contracts.
- Review the current organization structure(s) with the aim of identifying the key entity in the MOH that will be the focal point of contact with the selected 3PL providers. Restructure the roles, responsibilities, and reporting lines to facilitate more direct communication between the MOH and the 3PL.

[18] National Product Supply Chain Management Programmes (NPSCMP). (2020). National Health Products Supply Chain Strategy and implementation Plan 2021–2025.

- Identify skills gaps and training/coaching/mentoring needs of MOH personnel identified as leading the contract management of the selected 3PL provider. Initiate the educational resources needed to close the identified gaps and organize the various types of educational input.
- Develop draft contracts, SOPs, and SLAs for circulation to short-listed potential service providers
- Engage with potential 3PLs/LLPs with the aim of assessing their ability and willingness to work with the MOH in a more collaborative manner and make decision regarding the holding of individual meetings or a potential supplier conference
- Move to more formal discussions and input from potential 3PL providers. Issue confidentiality agreement documents and detailed quantified services to potential 3PL providers to enable them to demonstrate their understanding of the concept and associated level of expertise.
- Develop a list of potential service providers and undertake steps to start engagement through such as a formal request for proposal for selection, negotiation, and partnership. A framework to guide the decision for 4PL and/or best practice 3PL providers is described in the following section.

DECISION FRAMEWORK

A decision framework (figure 12) was created to outline the process for evaluating whether the integration of 3PL and/or 4PLs providers could benefit governments and the MOH based on the results of these analyses. There are five components to the decision framework to gather information and explore country-specific contexts to assist in determining whether a 3PL and/or 4PL provider partnership should be adopted:

- Understand the supply chain network and gather information
- Evaluate current costs and service levels
- Evaluate current operational capability
- Evaluate political economy landscape
- Act and review

The following sections provide a general description of how to apply the decision framework in any context.

Understand the supply chain network and gather information

The first step to understanding the supply chain network in a country is to review the supply chain strategy, which is a formal plan that directs the flow of information and products in a supply chain using identified priorities to guide practical application at all levels of the supply chain. If a supply chain strategy doesn't exist, one should be developed before continuing to the next step. Nigeria's National Health Products Supply Chain Strategy 2021–2025 governs SCM and outlines a clear strategic vision for the country. The supply chain strategy was reviewed prior to tool development to gain an understanding of Nigeria's priorities.

The second step requires an analysis of the gaps between the supply chain strategy and the current operational performance of the supply chain in terms of cost, service levels, and value for money. This high-level analysis should review current performance levels through KPIs, current costs for each key element of the operation, customer satisfaction, and overall supply chain efficiency to aid in identifying potential areas for improvement that an outsourced partner would be able to add value to. A detailed

exploration of gaps during the information gathering phase will allow for deeper dives into targeted areas once evaluation tools are deployed and can provide a better jumping off point for conversations about needs with potential outsourced providers, but a preliminary understanding of the current supply chain maturity can help set the scene before moving to the more detailed aspects of the framework.

Evaluate current costs and service levels

The first two questions within the cost and service level evaluation are also applicable to operational capability. Ideally, this information is obtained by both tools (OCAT and cost-benefit analysis) to validate responses. The initial question builds off the previous information-gathering section and requires governments to possess an in-depth understanding of the supply chain (e.g., SWOT, KPIs, assets' inventory, networks, costs, system resources, level of outsourcing, service levels). If cost, performance, and capacity data are not known or readily available, a formal report should be compiled to guide further exploration of needs and evaluation of costs compared to current service levels.

The second question that is encapsulated by evaluation of costs, service levels, and operational capability aims to better determine whether the current operation of in-house resources and fee-for-service outsourcing can be improved solely by increasing funding and developing capacity. If a country or segment of the supply chain is able to generate significant improvements internally, then the country should explore whether significant investment, such as more warehouse networks, vehicle fleets, infrastructure, and staff capacity building, is required to realize the supply chain vision. This is an unlikely scenario for most supply chains as capacity building efforts have usually been implemented previously and investments are often insufficient and lack flexibility to increase funding. Likely, a more efficient use of current resources will allow expenditures to fluctuate minimally while incorporating private-sector expertise.

If a significant investment in infrastructure (e.g., warehouses, vehicle fleet, IT systems) and human resources is required to achieve the strategic objectives, a cost-benefit analysis should be conducted to understand whether either the 3PL/4PL provider engagement or the public-sector in-house intervention generates value for money. If the best practice 3PL or 4PL engagement provides value for money, then consider entering a best-practice 3PL or 4PL provider partnership/contract. If significant investment is not required and the public sector provides better value for money, a change management plan should be developed and implemented to achieve the strategic vision and increase cost effectiveness. If funding is not available and resources are constrained, then outsourcing to a 3PL or 4PL provider is the best solution to maximize efficiency with current resources. Based on conversations with in-country staff in Nigeria, it does not appear that sufficient additional funding is available to augment the current supply chain, and thus, a best practice 3PL or 4PL provider relationship should be considered.

Evaluate current operational capability

Overlapping with the evaluation of current costs and service levels as well as current public-sector operational capability, an in-depth understanding of private-sector capability should be obtained concurrently to ensure it meets the needs of the public sector. A formal questionnaire should be developed to assess private-sector capability and reviewed along with organization profiles and discussions with partners and previous clients to supplement industry knowledge. If this information is already known or the operational capability assessment has been completed, the evaluation of the

political economy landscape should be reviewed. If this information has not been collected, then an in-depth analysis of the 3PL and 4PL provider marketplace should proceed, followed by an evaluation of the political economy landscape.

Once the political economy landscape is well understood, potential 3PL and/or 4PL provider partners can be identified in the applicable geographic areas and/or supply chain segments. Specific organizations can be contacted to learn more about their respective areas of expertise and capabilities. Once an organization is selected, contract management ability of the public sector should be explored. If capacity isn't sufficient, advocacy discussions with policy makers, stakeholders, and donors should commence to explore mechanisms to increase training and capacity building efforts. If capacity exists, the solicitation and tender process can begin. Nine companies from the Nigerian private sector were interviewed, some of which were deemed capable of performing the necessary functions to support the identified gaps in the public sector supply chains based on their IT systems, warehousing, fleets, communication, and customer satisfaction metrics. Although all of the organizations interviewed could provide some of the supply chain elements in need of improvement, the challenge will be to find a single service provider capable of delivering an overall end-to-end integrated supply chain offering.

Evaluate the political economy landscape

Individual and organizational motivations, constraints, opinions, beliefs, and culture can have a tremendous impact on the willingness to implement novel strategies and programs. When considering adoption of a 4PL provider outsourcing approach, the perspectives of all parties involved must be considered. A rapid PEA or, if funding allows, a comprehensive PEA should be performed to better understand the public and private sectors' willingness to engage in long-term best practice 3PL or 4PL provider relationships.

Hesitations for the private sector might include timeliness of payments or the number of official channels presented when dealing with government institutions. In Nigeria, many private-sector organizations contacted to participate in the PEA had worked previously with some area of government and were willing to engage in an outsourcing partnership.

The public sector was largely in favor of 3PL provider outsourcing and had mixed opinions regarding 4PL provider engagement. Public-sector reservations for 4PL provider engagement were a loss of ownership and control, layoffs, and a lack of transparency. Many of these concerns resulted from relationships with previous or current outsourcing providers, which is not reflective of the proposed best practice relationships suggested in this report. Advocacy and learning initiatives should be launched to ensure understanding of the intent, purpose, and organization of best practice 3PL and 4PL provider partnership. It is critical that all stakeholders, especially in the public sector, understand that the objective of 3PL and 4PL provider implementation is actually to increase government ownership and enhance transparency in the supply chain.

Act and review

Once it has been determined whether use of best practice 3PL or 4PL provider will be beneficial at the national or state level, solicitation of 3PL and/or 4PL provider bids should be developed, and the tender process should commence. For this process to be effective, it is crucial that there is a clear

understanding of the goals and objectives of outsourcing and that they are well documented and communicated to the potential best practice 3PL or 4PL provider.

After the tender process is complete, the selected contractor will enter into formal contract negotiation. The contracting process should be collaborative and solution orientated. Unlike fee-for-service contractors, the 3PL or 4PL provider should be encouraged to propose innovative solutions to target identified issues. Continuous review of supply chain costs relative to benefits and public health outcomes should be revised on a regular basis using best practice and preidentified metrics, including KPIs and customer satisfaction. Data use agreements, SLAs, and terms and conditions should be discussed during the negotiation phase.

Overall, moving through this decision framework offers a systematic approach to identifying gaps, evaluating costs and service levels, reviewing operational capability from the public and private sectors, and assessing the political economy landscape for determining whether to outsource. This framework was designed to be applicable to a diverse array of country and supply chain contexts.

3PL VS 4PL PROVIDER

Determining when to implement a best practice 3PL or 4PL provider is based on the maturity of the supply chain. When considering best practice 3PL or 4PL provider implementation, an understanding of the cost reductions and benefits that occur over time is useful (figure 11). In the short term, the focus should be developing regular KPIs and establishing baseline data for future cost, service level, and efficiency outcomes. In the medium term, best practice 3PL provider relationships should be formed that are more than just fee-for-service transporters or warehousers. There should be regular communication aimed at monitoring performance, customer satisfaction, and troubleshooting issues as they arise. This type of relationship allows for more frequent deliveries and improves service while decreasing costs. In the long term, implementation of a 4PL provider can maximize the end-to-end efficiency of the public-sector supply chain while increasing transparency and visibility and lowering costs. Population-level impacts such as lower mortality rates due to fewer stock-outs will likely be observed.

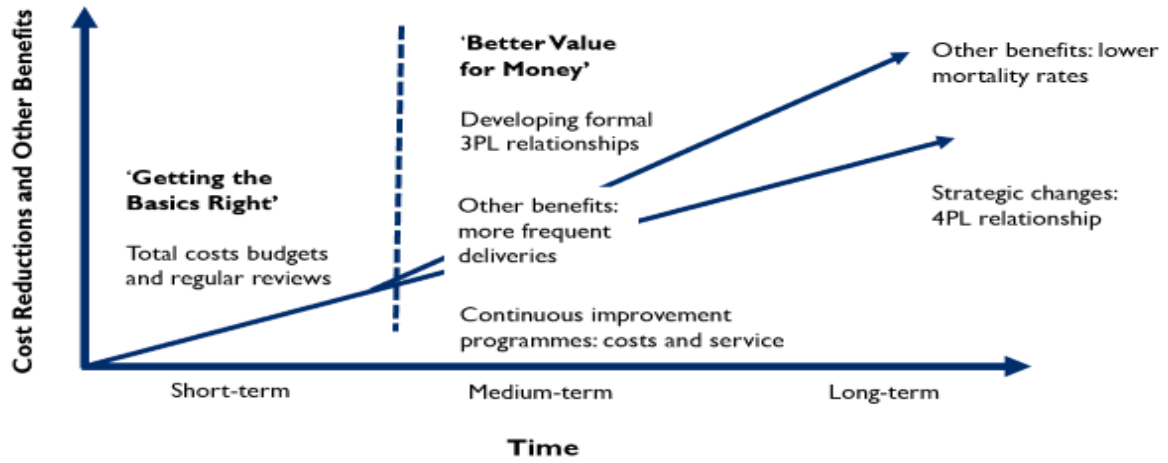

Figure 11. Benefits versus time of 3PL and 4PL providers

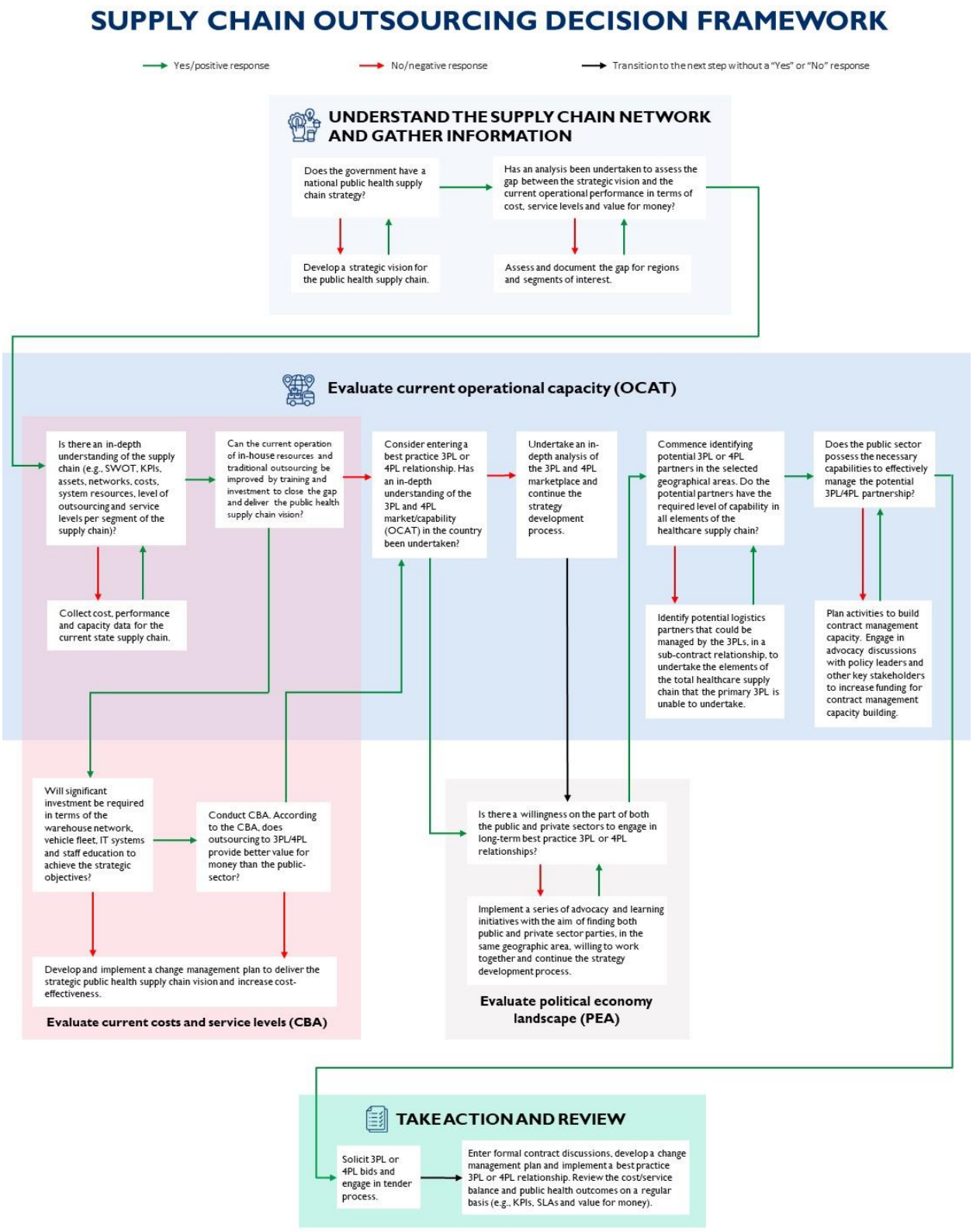

Figure 12. Supply chain outsourcing decision framework

CONCLUSION AND KEY CONSIDERATIONS FOR IMPLEMENTATION

Nigeria has made significant strides in improving the efficiency of its health sector supply chains, but organizational fragmentation, a lack of end-to-end supply chain visibility, numerous fee-for-service logistics providers, and limited data make engaging best practice 3PL or 4PL providers to support the public health supply chain worthy of consideration. Concerns from the public sector regarding obtaining additional capacity and enhanced capability from the private sector were highlighted for several reasons:

- **Lack of ownership**. The public-sector SCM team will still own the operation and have responsibility for delivering the required level of service to clinicians. There will need to be considerable mentoring and technical support for the public-sector SCM teams to obtain the maximum benefit from any private-sector involvement. To ensure effective and efficient collaborative communication between the MOH SCM team and the 3PL or 4PL provider, the restructuring of the overall public-sector supply chain team organization is of particular importance. Designated points of contact at all levels within the two organizations (4PL provider and MOH or state) are essential for both clear and timely communication. The current fragmented organization structure needs to adopt an end-to-end policy with a wide span of control. To minimize the risks associated with the transfer of ownership of supply chain assets, such as warehouses, to private-sector companies, arrangements should be entered into in which the public sector retains ownership of the assets and the private-sector organization manages them on behalf of the public sector.
- **Sustainability**. As economies grow, the need for the current type of donor support will decrease. The relationship between the public and private sectors will have matured, and the profit motive will support the increased investment by the private sector in supply chain assets. Sustainability will be the result of increases in government expenditure as economies expand and private-sector investment as confidence in economic stability grows.

While not directly cited by in-country staff, the total supply chain costs are not well understood or monitored. To address concerns around private-sector organizations making a profit from public funds and assess the relative level of the outsourced costs, an in-depth understanding of the in-house costs is essential. Given that the current costs are not closely monitored, experience tends to suggest that cost levels can be reduced by a more rigorous approach to cost monitoring. Thus, it is not unreasonable to assume that the public-sector costs are higher than those incurred by the private sector. While market rates for warehouse rental and transport activities could be used to assess any potential service providers' cost estimates, non-financial qualitative benefits may be needed to offset the lack of in-house cost data. The content of a potential service provider's offering might include input to improving the operation, IT systems that manage the daily operation and provide frequent performance monitoring data, the communication method between the two organizations, and draft SLAs.

The benefits of public-private partnerships are well documented in supply chains, and there is a significantly higher likelihood of meeting cost and schedule objectives with public-private partnerships than with traditional public-sector project delivery where a project is owned, managed, and financed by

the government.[19] The benefits of engaging a best practice 3PL or 4PL provider can be applied to the public sector in Nigeria and include:

- **Access to capital**. Mature service providers that can demonstrate financial success over a period of several years will be able to quickly finance increases in their asset base to respond to the needs of their clients. In the Nigerian context, this is particularly important given the negative views shared by the MOH interviewees regarding the technical and physical infrastructure of the public-sector health care supply chains.
- **Experienced staff.** Private-sector organizations will have been able to develop and retain staff to provide their clients with a level of expertise that they have not been able to retain within their own organization. This experience will be available to their clients on a day-to-day basis operationally and to support the more strategic planning and performance monitoring activities. Not only will this experience deliver more effective supply chains, it also will also support any other supply chain-related capacity building initiatives provided for public-sector staff. In turn, this situation will hopefully reduce the public-sector staff turnover rates highlighted as an issue by many private-sector interviewees.
- **Increased levels of service.** As a result of involvement with the private sector, service levels will improve, which will enhance the MOH's reputation and ability to meet health commodity needs. Consequently, other compatible health care business that would otherwise be executed via a parallel supply chain could be gained by the MOH, which could reduce the overall level of unit cost as higher shipment volumes are handled by the same level of essentially fixed resources. The increased revenues/profits can be reinvested to improve the quality of the warehouse facilities, MHE, distribution assets. and IT systems. The overall aim of the health care supply chain is to have the appropriate products and equipment at all health facilities when needed. Although order completeness was excellent, in the sample service level data made available, issues around delivery timeliness were highlighted at the planning, execution, and reporting stages of the transport activity.
- **Integrated IT systems.** To meet their demanding clients' requirements cost effectively, the leading logistics service providers will have implemented integrated IT systems and business processes that embrace the end-to-end supply chain. Those systems and processes will have been tried and tested in the commercial world of the private sector. The public-sector health care supply chains in LMICs will benefit from those systems and processes as they are deployed by logistics service providers in the areas of inventory management, customer service responsiveness, distribution planning, vehicle fleet management, performance monitoring, medium-term planning, and cost monitoring. In Nigeria, the 3PLs researched by the project team had invested significantly in IT systems often integrating their operational systems with their client's ERP software. The LMIS was identified as an area that needed further development. Developing a best practice 3PL provider relationship would facilitate the implementation of enhancements to the public sector's LMIS.
- **Routine equipment maintenance and renewal.** To minimize downtime and ensure high levels of operational efficiency, the leading logistics service providers will ensure that all of their equipment is maintained regularly. The MHE and delivery vehicles will be replaced using accepted policies reflecting their age and condition. Adopting best practice in this area will avoid the issues arising

[19] Della Rocca M. (2017). The rising advantage of public-private partnerships. McKinsey & Company. https://www.mckinsey.com/industries/private-equity-and-principal-investors/our-insights/the-rising-advantage-of-public-private-partnerships#.

from the irregular funding of equipment procurement and preventative maintenance. Being able to plan routine maintenance confidently will enhance the reliability of schedule conformance and avoid the need to amend plans as a result of defective equipment.

- **Higher levels of delivery fleet utilization**. The infrequent distribution cycles tend to result in periods of time in which the vehicles are underutilized. Logistics service providers that have a large client base with different seasonal peaks may be able to deploy their vehicle fleet across several contracts. This sharing of assets will result in lower costs for clients and increased profitability for the provider. 3PL and 4PL providers use vehicle scheduling systems and GPS to plan and monitor deliveries. These techniques will not only enhance utilization but also support the aims of improving customer service levels and increasing collaboration between the logistics service providers and the MOH.
- **Easily accessible data**. Regardless of the pricing method agreed with the 3PL and/or 4PL provider, the private sector will have an in-depth understanding of its own cost base and market rates. Thus, the MOH will be able to budget accurately and monitor any variances utilizing the data provided by the 3PL or 4PL provider. Consequently, a no-surprise environment will be created that will provide the basis for strengthening the SCM team's reputation with the treasury and donors. This in-depth knowledge will also enable the 3PL or 4PL provider to sub-contract, as required, at economic rates on behalf of the MOH. In addition to enhancing operational effectiveness through the collaborative use of M&E data, handheld technology, often deployed by leading 3PL and 4PL providers, could be used in the warehouse environment and at the point of delivery. Not only would warehouse operations be more efficient, but the use of electronic POD would eliminate many of the issues currently experienced with the monitoring and archiving of POD.

Implementing a best practice 3PL or 4PL provider relationship has the potential to overcome the difficulties of public-sector health care supply chains. In broader terms, an enhanced health care supply chain will improve the overall health of the population, reduce the strain on the national health care system, and potentially enhance the economic growth of the country. However, implementing such relationships will require considerable training, mentoring, and guidance of the MOH or state supply chain team to ensure that the benefits are delivered. In addition, it is essential that all of the current actors understand and accept their obligations to the service provider and the need to accept the discipline of communicating through the agreed reporting lines between the two organizations. There is an opportunity to improve public-sector health care supply chains by implementing best practice 3PL or 4PL providers for some or all of the supply chain elements. However, there is a considerable amount of capacity building needed to change the working methodology to deliver the benefits of a best practice 3PL and/or 4PL provider. Given Nigeria's previous experience with other outsourced logistics providers that are based on fee-for-service, not reflective of the proposed 3PL and/or 4PL provider best practice, it is critical that advocacy and capacity building be central to any future activities.

The following are best practice 3PL or 4PL provider relationships to consider during for implementation:

- Longer contract lengths than traditional fee-for-service arrangements. To develop a collaborative relationship and generate sustainable benefits in terms of cost reductions and service level improvements longer contracts will be necessary. This is particularly the case if investment in new warehouse facilities is required by the logistics service provider.

- Defined contacts between the MOH or state supply chain units and the 3PL or 4PL provider. To achieve effective communication between the two parties, nominated points of contact between the two parties will be designated. Senior points of contact would be high-level executives in each parties. Day-to-day operational matters would be handled by nominated contacts within the NPSCP's or state's logistics team and the logistics service provider's operations team. An escalation protocol will be defined for handling issues that cannot be resolved by the nominated contacts.
- Integration of the IT systems of both parties. While the logistics service provider will have implemented various systems to support its business, such as a warehouse management system and vehicle load planning software, there will be a need to integrate those systems with MOH's order processing and procurement systems or eLMIS. The available data will be used for managing the operations, measuring performances, and identifying potential cost savings and service benefits.
- Scheduled reporting at various levels within the organizations. Daily reporting of activities is a feature of best practice relationships. While the daily report will be at a summary level, other periodic reports will be of a more detailed nature reflecting the SLA's KPIs.
- SOPs detailing the methods of working for both the MOH and the logistics service provider. The collaborative relationship is two-way in nature. For the logistics service provider to perform effectively, MOH must provide information and make decisions in a timely manner. The SOPs will detail the obligations that both parties have to each other. For example:
    - The MOH will advise the logistics service provider with details of products four weeks prior to their arrival at the warehouse.
    - The logistics service provider will provide POD within three days of making the delivery.

APPENDICES

APPENDIX I. PEA PUBLIC- AND PRIVATE-SECTOR PARTICIPANTS LIST

	Participant Code	Participant Workplace
Public-Sector Participants	NG_PU_01	Family Planning Division
	NG_PU_02	National Product Supply Chain Management Program
	NG_PU_03	State Ministry of Health, Sokoto state
	NG_PU_04	Logistics Management Coordinating Unit-State Ministry of Health, Sokoto state
	NG_PU_05	Central Medical Stores Manager- State Ministry of Health, Sokoto state
	NG_PU_06	Director Pharmaceutical Services- Plateau State Ministry of Health
	NG_PU_07	Logistics Management Coordinating Unit-State Ministry of Health, Plateau state
	NG_PU_08	Central Medical Stores Manager-State Ministry of Health, Plateau state
	NG_PU_09	Family planning coordinator Jos South LGA-State Ministry of Health, Plateau state
Private-Sector Participants	NG_PR_01	GHLIL
	NG_PR_02	Worldwide Commercial Ventures (WWCV)
	NG_PR_03	Skylane Logistics
	NG_PR_04	Mavela Ventures
	NG_PR_05	CC Outsourcing
	NG_PR_06	Riders for Health
	NG_PR_07	Akesis Health
	NG_PR_08	Zenith Carex
	NG_PR_09	Trackhub Logistics
	NG_PR_10	MDS Logistics

APPENDIX II. INTERVIEW GUIDE FOR PUBLIC-SECTOR PEA

Topic	Question
Introductions	1. What is your official title? a. Can you tell me about your role?
Introductions	2. What department are you in? a. What are the objectives of your department?
Formal institutions	3. How are supply chains organized in the country at a national level? a. At a state level? b. Locally?
Ownership	4. Who has the authority to make decisions in the public sector supply chain on a national level? State level? Local level? a. Who is their supervisor? b. Who do they supervise? c. How are they held accountable for their performance?
Cost	5. How much domestic financial investment has been utilized to fund the public health supply chain (excluding the costs of the products themselves) over the last three years?
Cost	6. How much financial support has the country received from international agencies to fund supply chains over the last three years?
Cost	7. In the most recent budget, is there a budget line item for contracting supply chain services? a. If no: are there budget line items for warehousing? i. Transportation? ii. Distribution?
Formal institutions	8. What is the formal approval process for outsourcing supply chain services? a. How many formal approvals are required? b. Who is responsible within the Ministries for final approval?

Topic	Question
	c. How are contracts executed? d. Does the formal approval process ever discourage outsourcing?
Formal institutions	9. Outside the formal approval process you described, are there other officials who are involved in the decision-making for outsourcing? a. If yes: who are these officials? i. How much influence do these officials have in decisions to outsource? b. How do officials provide feedback on outsourcing practices?
Decision-making	10. What are the key factors you consider when outsourcing services? a. What type of supply chain services do you outsource? Why? b. What type of services remain in-house? Why? c. Who makes the decisions about what gets outsourced and what stays in-house? i. Who influences those decisions?
Decision-making	11. What key criteria do you consider when selecting a provider for outsourcing? a. Who makes the decisions about which logistics providers are chosen (ie. solely MOH or other key stakeholders)? b. Who influences those decisions? c. What are your evaluation criteria for public procurements of services?
Decision-making	12. When outsourcing, what aspects of the supply chain operation are important for you to maintain visibility into and why?
Sustainability	13. What do you think would make your supply chain outsourcing sustainable?
Sustainability	14. Tell me about your 3PL contracts. a. Who are your current contractors? i. If more than four: why are so many service/resource providers used? b. How were these contractors chosen? c. What were some of the key criteria for selection? d. Which stakeholders were involved in the selection decision-making process? e. How are terms and conditions negotiated? f. How do you determine the length of contracts? i. What is the process that occurs when a 3PL contract ends? ii. What is difficult in handovers between contracts? g. What areas do you believe should be outsourced?
Sustainability	15. Who manages contracts with 3PLs? a. What are some of the challenges with managing these contracts?
Cost	16. Is there a cost to managing each of the outsourced contracts individually? a. If yes: what are they?
Sustainability	17. Is there anyone tasked with improving the supply chain contracting process? a. If yes: who?
Sustainability	18. What KPIs are collected for contracts? a. Are there any other relevant data collected regarding these contracts or outsourcing in general? b. Please describe the data collection process. i. Is data collection performance or results-oriented? ii. What information is most necessary from a political perspective? iii. Are tracking output indicators across various private sector contracts burdensome? If yes: what would ease this burden? c. Is data collection difficult? i. If yes: why? ii. If no: what processes have you implemented that make the process easier? d. Do you have credible indicators of 3PL performance (ie. time from warehouse to delivery, on schedule, on time/in full, proxy deliveries, stock rate) outsourcing that has been published in the last 12 months? 24 months?
Ownership	19. Do you think outsourcing supply chain operations increases or decreases ownership over supply chain management? How?
Sustainability	20. In your opinion, what are the most critical challenges in outsourcing and awarding public health supply chain contracts? a. In your opinion, how frequently are extra payments, gifts or favors used to influence the awarding of contracts? b. Are you aware of any officials who influence the award of public health supply chain contracts to friends or relatives in the private sector?

Topic	Question
Sustainability	21. In your opinion, how frequent are corrupt practices? a. Are there mechanisms or attempts to address such issues?
Sustainability	22. Are there any concerns in regards to fraud? a. If yes: what are they? b. How are risks managed?
Ownership	23. Besides fraud and corruption, do you have any other major concerns regarding outsourcing?
Beliefs	24. Are there areas of supply chain management outsourcing that you think would benefit from increased oversight?
Ownership	25. What aspects of the supply chain are important for you to have control over? a. Please tell me more about why that is.
Cost	26. Do you believe that outsourcing activities to 3PLs is cost-effective? a. How do you think cost-effectiveness would change with the introduction of a 4PL?
Beliefs	27. When thinking about implementing a 4PL to manage and oversee 3PLs, what supply chain operations would benefit most from 4PL management? Why? a. Least?
Motivations and constraints	28. What are the biggest constraints you foresee that prevent outsourcing to 4PLs?
Informal institutions	29. Are there any reasons that would discourage you or other decision makers from using the private sector as a 3PL? a. What about using the private sector as a 4PL? b. Why or why not?
Motivations and constraints	30. What benefits and challenges could arise from private sector engagement in the public health supply chain?
Beliefs	31. How do you think current employees working in the supply chain - such as managers, warehouse workers, truck drivers - would feel about additional outsourcing? a. What advantages might they see? b. What might concern them?

APPENDIX III. INTERVIEW GUIDE FOR PRIVATE-SECTOR PEA

Topic	Question
Introductions	1. What company do you work for?
Introductions	2. What is your official title? a. Can you tell me about your role?
Introductions	3. What department are you in? a. What are the objectives of your department?
Formal institutions	4. How is the supply chain for your company organized?
Motivations and constraints	5. What are the opportunities for the private sector to engage in the public health supply chain?
Sustainability	6. Have you previously collaborated with the public sector? Why or why not? a. If yes: what was your experience? i. Did you experience challenges with the public sector's management of the agreement? ii. If yes: what were those challenges?
Motivations and constraints	7. What are the potential benefits that could result from public sector collaboration?
Motivations and constraints	8. Are there any reservations about engaging in the public sector? a. If yes: what are they? i. Are there any others? b. If no: why hasn't engagement occurred yet? c. How do you think the public sector feels about working with the private sector in public health supply chain services? i. Do you think public procurement of supply chain services is fair? Why or why not?
Motivations and constraints	9. Please describe an ideal public-private sector partnership. a. What are barriers to achieving this ideal partnership? b. What can be done to help attain that ideal?

Topic	Question
Sustainability	10. Have you had any contact with the public sector contracting officials or their intermediaries in the last 12 months regarding a public health supply chain contract? a. If yes: was there any occasion where you were asked to give extra money, gift or favor (besides any official fees)? i. If yes: could you describe the situation? 1. Did you provide the money, gift or favor? a. If yes: please quantify the amount or describe the gift or favor. 2. Are there mechanisms you are aware of for reporting such bribery incidents? a. If yes: did you report it? i. If yes: what was the outcome? ii. In your opinion, how frequent are such instances in public health supply chain contracting?

APPENDIX IV. OCAT SUMMARY FINDINGS FOR PRIVATE-SECTOR SERVICE PROVIDERS

Akensis Global Health

- The organization was formed 21 years ago and is registered as a not-for-profit organization in Nigeria. Until recently it operated under the name of The Axios Foundation.
- Considerable public-sector experience has been gained working with individual states and:
  - NPSCMP
  - National Agency for the Control of Aids
  - National Malaria Elimination Program
  - UK Department for International Development
  - MNCH Program
- The overall operation is managed by an integrated board of three directors responsible for:
  - Country management
  - Supply chain and quality
  - Finance and administration
- The organization has 46 staff who are managed by comprehensive HR processes and policies.
- The following services are offered for products that can be stored and transported in ambient conditions:
  - Forecasting product needs
  - Procuring additional logistics assets (primary contractor); a vendor process is in place to support this activity
  - Arranging inbound transport from local and international suppliers
  - Customs clearance
  - Warehousing in bulk, including inventory management
  - Order processing and picking
  - Distribution planning, including primary transport to depots/regional warehouses
  - Multidrop distribution of picked orders (LMD)
- All transport resources are outsourced.
- Significant investment has been made in the area of IT systems. The warehouse management system, mSupply, connects to the clients' ERP systems and the National Healthcare Logistics Management Information System.
- Activity-based costing has been introduced for warehouse activities. Plans exist for extending the accounting software.
- Best practice client management processes are in place, including:
  - Designated client relationship managers
  - Regular performance reports (KPIs)
  - Regular face-to-face reporting and planning meetings
  - Agreed SLAs that are reviewed as market conditions change. These are two-way relationships in which the obligations of both the company and the client are described.
- The organization places a particular emphasis on the importance of the quality management and performance monitoring processes.

CC Outsourcing

- A four-year-old company with limited public-sector experience offering a wide range of supply chain services, excluding customs clearance.
- The procurement offering is restricted to obtaining additional supply chain resources.
- The website highlights temperature-controlled experience, bespoke 3PL providers, LMD, and full-scale fleet management.
- The company operates with 56 employees and recruits additional staff as needed.
- Public-sector experience has been obtained by providing services to the Yobe State Drug Management Agency.
- A performance monitoring plan is in place and includes performance-based staff incentives.
- In-house IT systems have been developed, particularly in the area of operational costing.

General and Health Logistics International

- A company with experienced senior executives that has been operating in Nigeria since 2011.
- The integrated organization structure offers a wide range of logistics services and has gained public-sector experience at both the federal and state levels. In at least one location, the company collaborates in the operation of a warehouse with the state government via a memorandum of understanding. Further experience was gained as a result of partnering with Chemonics for the distribution of long-lasting impregnated nets.
- Employs 150 people, 10% of whom are regarded as administrative personnel. Professional HR practices are in place.
- Ambient and temperature-controlled services include:
  - Procuring additional logistics assets as needed for clients
  - Inbound logistics
  - Warehousing and inventory management
  - Order processing and picking
  - Primary distribution to regional warehouses and depots
  - Multidrop LMD
  - Reverse logistics and waste disposal
- High-quality warehouses operating to Good Warehouse Practices and Good Distribution Practices standards are located in six towns. Resources are available for further expansion, if required, particularly in those areas with limited barriers to entry.
- A considerable investment has been made in IT systems.
- The warehouses are currently operated at 75% storage capacity utilization, which makes for an efficient handling operation.
- The company operates 60 vehicles and hires additional trucks when necessary.
- Best practice client management processes have been introduced, including:
  - Designated contract managers
  - SLAs
  - Automated KPI production
  - Formal monitoring processes
- ISO 9001:2015 accreditation has been achieved.

Mavela Express Services

- A relatively small transport undertaking that has been in business since 2014.
- A senior staff of 13 have significant logistics experience.
- Although the policies and procedures have developed over time informally, the board meets formally every quarter.
- Ten staff are involved in transport activities, operating the organization's five vehicles and outsourcing a similar additional number of vehicles.
- While some public-sector experience has been gained working for the Federal MOH, key clients include other organizations offering express transport and courier services, such as Konga Express and TD Express. The organization is used to working in a sub-contracting environment.
- The company does not offer temperature-controlled transport services.
- Staff financial incentives are a key driver of delivering prompt and secure services to clients.

MDS Logistics

- MDS Logistics was established in1965 and is now jointly owned by Imperial Logistics (57%) and the United Africa Company of Nigeria (43%). Both owners are long-standing companies quoted on their respective stock exchanges.
- The company has more than 500 employees and owns and operates 265 trucks from 46 locations throughout Nigeria. The total warehouse space, including temperature-controlled facilities, is approximately 120,000 sq. m.
- The client base of 90 companies includes food producers, telecommunication companies, and pharmaceutical manufacturers.
- MDS demonstrates a professional approach to HR management with a management development program and a management trainee scheme.
- Specifically related to the logistics of pharmaceuticals, MDS highlights:
    - Temperature logging of temperature-controlled warehouses and vehicles
    - Dust-free warehouse floors and insulated roofing
    - Two national distribution centers in Lagos, six regional hubs, and eight satellite distribution centers
    - Security systems, including CCTV and electronically controlled access
    - Standby power supply for the refrigeration equipment

Skylane Logistics and General Services

- The company is relatively young, established in 2018, and offers transport services to the health care sector.
- The four permanent employees engage up to 40 staff when required to drive their own and rented vehicles.
- Although only limited supply chain services are offered, health care experience has been gained by providing transport services to Riders for Health.
- Senior management have several years of experience in the logistics sector and have identified the potential for supplying third-party distribution services to the health care sector.

Trackhub Ventures

- Formed in 2019 as part of the Devstork Enterprises Group, the company offers courier services, fast food delivery, and e-Commerce services using motorcycle riders in the Abuja area.
- The company is still in the early phases of development, and the service offering and geographical coverage is limited. Similarly, the IT systems have been developed in-house to meet the current scale of the business.
- The staff consists of five administrators and six operational staff.
- While the business has been launched successfully in the Abuja area and the organization is looking to expand its reach, it will be some time before it can offer anything more than local services to the MOH.

Worldwide Commercial Ventures

- A licensed importer of pharmaceuticals regarded as a one-stop shop for pharmaceutical supply chain services.
- The company first entered the market in Nigeria in 2003 and became part of Imperial Logistics in 2014.
- The provision of end-to-end supply chain services by around 1,000 employees generates an annual turnover of approximately USD 180m.
- Given the organization is an importer, significant experience has been gained with regard to the procurement of pharmaceuticals.
- Membership of the Imperial Logistics Group provides access to additional storage and transport assets and an understanding of market distribution rates.
- The company has provided the Federal MOH with supply chain services in the areas of cancer management and the diagnosis and treatment of hepatitis. Other clients include best practice supply chain practitioners within the oil industry. Although the company manages the warehouse network activities in-house, including temperature-controlled facilities, 90% of transport resources are outsourced.
- Client relationships are managed following best practice techniques involving designated contract managers, SLAs, quarterly reviews, and adherence to National Agency for Food and Drug Administration quality standards. KPIs are produced on a regular basis to support the achievement of the agreed SLAs.

Zenith Carex International

- The operation in Nigeria is part of a global company, formed 20 years ago, specializing in customs clearance. The activities in Nigeria are much wider than just customs clearance and include:
  - Warehousing in both ambient and cold chain temperature regimes at three locations in Nigeria
  - Order processing, picking, and dispatch
  - Primary transport to depots and regional warehouses
  - Multidrop distribution (last-mile delivery)
- Public-sector health care experience has been gained with both the Federal MOH and the National Malaria Elimination Program. In addition, further experience has been gained supporting several UN agencies operating in Nigeria.

- The company employs around 400 people, 60% of whom are engaged in transport activities of various types.
- Professional HR processes are in place with employee appraisals on a quarterly basis.
- An Excel-based monitoring system has been developed and implemented as part of a best practice approach to client management.
- Transport activities are managed through 75 branches, enabling nationwide last-mile deliveries to 774 LGAs.
- IT systems are key to the organization's effectiveness. A tracking system and an e-Commerce platform are important elements of the overall IT infrastructure.

APPENDIX V. COST-BENEFIT ANALYSIS KEY INFORMANT INTERVIEWS PERFORMED

State/organization	Date of interview	Respondents	Remarks
Federal	21/08/2021	Deputy director NPSCMP	Provided an overview of the public health supply chain in the country. None of the requested documents were provided to support the cost analysis. Interviewers were referred to GHSC-PSM for FP commodities cost data.
FCT	26/11/2021	CMS manager	Provided an overview of the public health supply chain in the FCT state. None of the requested documents were provided to support the cost analysis, and a special request needed.
		LMCU coordinator Family planning focal person	Not interviewed.
Plateau	07/09/2021	Director for pharmaceutical services CMS manager	Provided an overview of the public health supply chain, including FP commodities, in the Plateau State. None of the requested documents were provided to support the cost analysis. Budgets, actual expenditures, and transportation contracts for state-sponsored public health supply chain activities were said to be available but were not shared.
	15/09/2021	Director for pharmaceutical services HMB	
		LMCU coordinator Family planning focal person	Not interviewed.
Sokoto	06/09/2021	Director for pharmaceutical services CMS manager	Provided an overview of the public health supply chain, including FP commodities, in the Sokoto State. None of the requested documents were provided to support the cost analysis. Interviewers were referred to GHSC-PSM for FP commodities cost data. Budget and actual expenditures for state-sponsored public health supply chain activities are not easily available because the budget is integrated into the State MOH budget.
		LMCU coordinator Family planning focal person	Not interviewed.
Global Fund	29/09/2021	Supply chain specialist	Provided an overview of the public health supply chain and the role of technical assistance providers. Provided some cost estimates.
GHSC-PSM	09/11/2021	Director of distribution and warehousing	Provided clarification on cost and operational data received.

APPENDIX VI: ESTIMATED STORAGE AND DISTRIBUTION COST PER DISTRIBUTION CYCLE (BIMONTHLY)

State	Number of facility drops	Est. distribution cost (NGN)	Warehouse location	Est. storage cost (NGN)	Average distribution cost per drop (NGN)
Bauchi	579	5,562,803	Gombe	2,583,071	9,608
Plateau	693	6,248,013	Gombe	2,583,071	9,016
Ebonyi	380	2,330,858	Awka	643,411	6,134
FCT	319	2,104,354	Abuja	1,950,663	6,597
Kebbi	209	1,919,883	Sokoto	727,320	9,186
Sokoto	534	2,834,814	Sokoto	727,320	5,309

APPENDIX VII: WAREHOUSE CAPACITY FOR CENTRAL WAREHOUSE AND ZONAL HUBS

Warehouse location	Pallet capacity	Average monthly pallets		
		Inbound	Outbound	Occupied by FP
Abuja	3,240	1,800	1,000	350
Lagos	3,454	1,300	950	55
Sokoto	1,200	650	450	20
Gombe	1,550	500	400	30
Awka	700	600	350	20
Abuja and Lagos warehouses serve both as the central contraceptive warehouse and zonal hubs				

APPENDIX VIII: WAREHOUSE AND STORAGE HANDLING COSTS FOR CENTRAL WAREHOUSE AND ZONAL HUBS

Warehouse location	Costs (2020, Nigerian Naira)		
	Storage (per pallet per month)	Inbound handling (per pallet)	Outbound handling (per pallet)
Abuja	8,528	261	261
Lagos	8,528	261	261
Sokoto	11,808	3,633	4,801
Gombe	11,808	3,633	4,801
Awka	11,808	3,633	4,801

APPENDIX IX: FP COMMODITY SPECIFICATION FROM USAID CONTRACEPTIVE AND CONDOM CATALOG 2017

Method type	Package	Unit	Units/ package	Volume per package (m3)	Weight per package (kg)
Male condom	case	Pieces	3,000	0.052	10.520
Female condom	case	Pieces	1,000	0.066	12.500
Copper TCu380A	case	Units	300	0.046	4.590

Method type	Package	Unit	Units/ package	Volume per package (m3)	Weight per package (kg)
Depot (IM) medroxyprogesterone acetate 150 mg/mL (1 mL) vial	case	Vials	400	0.040	7.000
Depot (SC) medroxyprogesterone acetate 104 mg/0.65 mL, pre-filled injection device, 1 syringe	case	Devices	200	0.015	1.042
0.15 mg levonorgestrel + 0.03 mg ethinyl estradiol, 75 mg ferrous fumarate	case	Cycles	1,000	0.054	12.590
0.15 mg levonorgestrel + 0.03 mg ethinyl estradiol, 75 mg ferrous fumarate	case	Cycles	720	0.054	6.675
0.03 levonorgestrel, monophasic	case	Cycles	720	0.053	5.600
Etonogestrel 68 mg implant, 1 rod implant	case	Sets	72	0.028	4.500
Levonorgestrel 75mg/rod, 2 rods	case	Sets	100	0.014	2.170
Color-coded plastic beads, 1 each	case	Units	500	102.000	23.000

APPENDIX X: A SUGGESTED 4PL PROVIDER TEAM STRUCTURE

The 4PL provider management team is a relatively small group of staff reporting to a senior member of the 4PL provider's executive team. Typically, that senior person is not heavily involved in the day-to-day operations unless serious issues have been identified by the 4PL provider team that require their attention or are escalated by the client's head of supply chain. Both of these senior staff members will attend quarterly review meetings and the annual planning and budgeting events.

The 4PL provider management team should be kept as small as possible to facilitate effective communication among parties. However, the scale of the operation and complexity of the in-country distribution network will inform the size of the overall team. Regardless of the size of the team, it will have the following general structure:

- The operations group. possibly split between:
    - Inbound team (port of entry to central medical stores)
    - Outbound team (central medical stores to health facility), including any reverse logistics activity

Both teams will report to an operations manager to ensure operational coordination. In addition, some members of the team will be required to have procurement experience in the areas of engaging and managing 3PL providers who undertake warehousing and transport activities. They will manage the day-to-day communications among the various 3PL providers involved and review performance vis-à-vis the SLAs detailed at the time of the engagement of the 3PL providers.

The operations group will communicate with the MOH supply chain group regarding in-bound flows and volumes and with the 3PL providers regarding the warehousing and distribution of these volumes. The information will be available electronically through the procurement plan, advanced shipping notes, picking lists, and distribution schedules. However, operational issues relating to the electronic information need to be resolved by communication between the MOH supply chain group and the 4PL

provider operations group, followed by communication between the 4PL provider operations group and the 3PL provider management teams. The MOH supply chain group will undertake communication with stakeholders (e.g., donors) and within the MOH as required.

- The administration group could be split among:
    - A finance team to deal with the administration of payments to 3PL providers, invoices to the MOH, and POD. While most of this work will be supported by IT systems, there will at times be the need to initiate communication among the parties involved (e.g., MOH supply chain team and 3PL provider management teams).
    - An inventory team to check that the electronic records are maintained accurately and that the best practice processes (e.g., perpetual inventory, order picking) are executed effectively.
    - A performance measurement team to collect data, circulate results, and support performance reviews with the MOH and 3PL providers. Again, much of this work will be supported by IT systems.

In a relatively small operation, separate teams may not be appropriate. In this case, a small number of individuals should execute the tasks and report directly to the administration manager.

- The IT group could be split among:
    - A system maintenance team to manage day-to-day availability of critical operational systems and the interfaces among them.
    - A data analysis team, which could be part of the performance measurement team in a small operation, to collate information to support decision making relating to changes to working methods.

The group will communicate with the other groups within the 4PL provider and other entities, such as the MOH and 3PL providers, that have systems integrated with those of the 4PL provider.

Given that the public sector already engages in considerable outsourcing, this may seem to be a considerable overhead burden, as the tasks should already be undertaken by the various elements of the public-sector SCM group. However, research indicates that public-sector SCM groups do not follow best practices when managing the relationships. Furthermore, many of the tasks outlined above are not undertaken rigorously, and the benefits of a professional outsourcing arrangement are not realized. In the event that a 4PL provider strategy is not adopted, the MOH SCM group needs to undertake all of the above activities with both in-house operations and the selected 3PL providers. The current situation is characterized by many 3PL providers being managed by various elements within the overall MOH supply chain. The adoption of a few best practice 3PL provider relationships, in which the 3PL providers subcontract some activities to other logistics companies, would ease the managerial burden on the MOH supply chain group and help realize the benefits of outsourcing as an interim step to implementing a 4PL provider strategy.

APPENDIX XI: OPERATIONAL CAPABILITY ASSESSMENT TOOL (PUBLIC SECTOR)

1. Logistic Management Information Systems							
The objective of this section is to assess the maturity and capacity of the logistic management information systems, including ability to manage health commodities for continuous availability of such commodities at service delivery points.							
	Capacity Element/Scores	0	1	2	3	4	
1.1	Do you have a Logistic Management Unit?						Yes
1.2	Are there written roles and responsibilities of Logistic Management Unit members? If so, how are they used? How often, if ever, are expectations of members reviewed?	No clearly documented roles and responsibilities of members in the Logistic Management Unit.	Roles and responsibilities of members in the Logistic Management Unit at varying levels are being developed.	Clearly documented roles and responsibilities of members in the Logistic Management Unit at varying levels are in place but not functional.	Clearly documented roles and responsibilities of members in the Logistic Management Unit exist for all positions, but the unit is not responsible for all the supply chain management activities (e.g., forecasting, procurement, selection, inventory management, distribution, storage, waste management).	Clearly documented roles and responsibilities of members in the Logistic Management Unit exist and performance expectations of members are reviewed regularly. The unit is responsible for all supply chain management activities (e.g., forecasting, procurement, selection, inventory management, distribution, storage, waste management).	
1.3	Is there a logistic management Information system (LMIS)?						Yes
1.4	Which methods are used for the LMIS?	Paper-based LMIS are developed on an as needed basis. There is no standardized system.	Standardized, paper-based LMIS.	Electronic LMIS that is not linked to the National Health (NHLMIS) with a paper-based back up.	Electronic LMIS that is linked to the NHLMIS with a paper-based back up (e.g., limited proprietary software is deployed but not integrated with LMIS).	The NHLMIS is being used with a paper-based back up (e.g., proprietary software is deployed and integrated with LMIS).	

1.5	Are there written policies, guidelines, and standards of operations for LMIS? If so, how are they used? What activities, if any, are informed by LMIS reports and data? How frequently, if ever, does training occur?	No policy is in place to guide the supply chain activities and method of LMIS.	Policy and guidelines for the supply chain activities and method of LMIS are being developed.	Policy and guidelines for the supply chain activities and method of LMIS are developed but not fully functional. Training plans are yet to be developed.	Policies are in place to guide the method of LMIS and the tools are standardized for the supply chain and health product system. LMIS indicators are tracked regularly. Not all supply chain management activities are informed by LMIS reports/data. SOPs are available for the method of LMIS but are rarely updated. Initial training is rarely updated.	Policies are in place to guide the method of LMIS, and the tools are standardized for the supply chain and health product system. There are standardized processes for reviewing LMIS data and reports. A frequent feedback system is in place. Supply chain management activities (e.g., forecasting, procurement, selection, inventory management, distribution, storage, waste management) are informed by LMIS report/data. SOPs are available for the method of LMIS and are revised annually. Regular training is provided.	
2. Governance							
The objective of this section is to assess the clarity of the organization's motivation, purpose, and stability by reviewing its guiding principles, structure, and oversight mechanisms.							
	Capacity Element/Scores	0	1	2	3	4	
2.1	Is there a written vision, mission, and values of the organization? If so, how are they used?	No vision, mission, and values have been developed.	One out of vision, mission, and values has been developed but is not known to staff.	Vision, mission, and values are developed and are known by a few staff but are not regularly informing strategies.	Vision, mission, and values are developed, are known by some staff and are sometimes used to develop strategies.	Clear statement of vision, mission, and values in place, known, and understood by all staff and stakeholders. All strategies and decision making are aligned to the mission and values.	

2.2	Leadership, accountability, and succession plan. Is there a written organizational chart? If so, what does it contain? How is it used?	No available documents showing the current lines of authority and communication. No organizational chart.	Organizational chart that defines lines of authority and communication is in the process of being developed.	An approved organizational chart showing lines of authority and communication is included in the organization's manual of policies and procedures but it is not clearly followed.	An approved organizational chart that defines lines of authority and communication is included in the organization's manual of policies and procedures and is mostly followed (e.g., regular oversight meetings, business alignment meetings, use of KPIs, external/internal audit for decision making processes). The approved organizational chart is used to clarify lines of authority and accountability and to evaluate performance.	An approved organizational chart defines lines of authority and accountability, is included in the organization's manual of policies and procedures, and is followed rigidly without contestation.	
2.3	Does an advisory board/committee exist? If so, what is the structure? What is the average level of experience? Are there any written management roles and responsibilities? If so, how are they used? How often does the board meet?	No functioning governing committee or advisory board that provides oversight and governance for the supply chain.	The board membership is small and static and there are no formal documents that clearly defined terms of reference (TOR) that detail primary duties of board and management. The board has held no meeting after its inauguration.	The board membership is small, and formal documents that clearly define TOR that detail primary duties of board and management are in the process of being defined. The board has held at least three meetings after its inauguration.	A committed board/committee is in place but lacks relevant experience. Meetings are held periodically, and there is an inconsistent level of involvement in the supply chain.	There is a strong diverse board/committee comprising members with relevant experience. Regular and well documented meetings are held. Action points are followed up promptly. There is consistent oversight the of supply chain according to board/committee TOR.	
2.4	Are there formal written supply chain policies, strategies, and guidelines? If so, what do they include? How are they used?	There are no formally documented management policies or guidelines for the supply chain system covering inventory management, quality assurance, warehousing, procurement, forecasting, quantification, and LMIS.	Documented management policies or guidelines for the supply chain system are under development.	Some documented management policies or guidelines for the supply chain system exist and are aligned with the MOH objectives but are not used consistently.	Most documented management policies or guidelines for the supply chain system exist, are aligned with the MOH objectives, and are used regularly.	All formally documented management policies or guidelines for the supply chain system that cover inventory management, quality assurance, warehousing, procurement, forecasting, quantification, and LMIS exist, are aligned with the MOH objectives, and are used regularly.	

3. Human Resources							
The objective of this section is to assess the organization's ability to maintain a satisfied and skilled staff/volunteer workforce and to manage operations and staff time to implement quality programs.							
	Capacity Element/Scores	0	1	2	3	4	
3.1	Is there a written recruitment policy? If so, how is it used? Is there a written staffing plan? If so, how is it used? Who is responsible for human resource activities? What is the frequency of staff turnover?	There is no documented recruitment policy or staffing plan. Human resource functions are shared among several members, and no staff have been designated to complete specific activities.	Recruitment/retention policy and/or staffing plans are still being developed. Limited staff are available to complete activities. Core competencies are not outlined or required to complete job functions (i.e., understands necessary processes, required data, and tools)	Recruitment/retention policy and/or staffing plans exist but are not in use. Staff have been informally designated to complete activities (where identified) in addition to other roles. Core competencies are under development and may not be linked to organizational structure.	Recruitment/retention policy and/or staffing plans exist but are used inconsistently. Staff positions designated in the organizational structure are partially filled. Staff are trained and functional and turnover is moderate.	Recruitment/retention policy and/or staffing plans exist and are followed consistently. Human resources staff are trained and functional. Staff turnover is minimal.	
3.2	Are there written job descriptions? If so, how are they used? What, if any, communication mechanisms for sharing information like this exist?	Job descriptions with appropriate qualification and communication mechanisms for sharing information across organizational units and among staff at different levels do not exist.	Job descriptions with appropriate qualification and communication mechanisms for sharing information across organizational units and among staff at different levels are being developed.	Clear job descriptions with appropriate qualification and communication mechanisms for sharing information across organizational units and among staff at different levels are in place but are used with irregular frequency.	Clear job descriptions with appropriate qualification exist for all positions but are used inconsistently and are not used to manage performance expectations of staff. Communication mechanisms for sharing information across organizational units and among staff at different levels are in place but are ineffective.	Clear job descriptions with appropriate qualification exist for all position, are used consistently to manage performance expectations of staff, and are reviewed regularly. Communication mechanisms for sharing information across organizational units and among staff at different levels are used consistently and are effective.	
3.3	Do written policies and procedures exist? If so, are they provided to staff? How often, if ever, are they reviewed and updated?	Comprehensive policies and procedures are absent.	Comprehensive policies and procedures are in the process of development.	Comprehensive policies and procedures exist and are sometimes used during recruitment. Staff-related policies and procedures are given to all staff.	Comprehensive policies and procedures exist and are given to all staff.	Comprehensive policies and procedures exist and are given to all staff. Policies and procedures are reviewed and updated regularly.	

3.4	How is compensation (salary and benefits) determined? How are pay increases determined? Are benefits uniform?	There is no transparent system for determining salary or distributing benefits.	Salary and benefits guidance are defined and utilized.	Salary and benefits guidance are defined and utilized, but benefits are not equitably applied. Pay increments are not linked to performance appraisals and reviews.	Salary and benefits guidance are defined and utilized and benefits are equitably applied. Pay increments are not linked to performance appraisals and reviews.	Pay grades are updated annually. Pay increases occur in accordance with performance reviews. Benefits are known and criteria for distribution exists. Salary and benefits guidance are defined and utilized. Benefits are equitably applied.	
3.5	Is there a supply chain line item in the budget? Is there a line item for supply chain workforce? If so, is it broken down into specific costs for procurement, distribution and storage? Are funds allocated for capacity building, training, and infrastructure and technology upgrades?	Supply chain budget is only one line item with no breakdown of costs.	No budget line item for supply chain workforce.	Supply chain workforce line item exists.	Supply chain workforce line item exists, and costs can be broken down into procurement, distribution, and storage.	Supply chain workforce line item exists, and costs can be broken down into supply chain segments and administrative and support staff, with additional funds allocated for capacity building, routine training, infrastructure upgrades, and novel technology.	
3.6	How often, if ever, does capacity building occur? If it does, what is the format? How are participants evaluated? Are records of participant involvement maintained? Capacity building programs can be defined as in-house training that does not provide any formal degree or certification, mentorship, coaching, structured on-the-job training (OJT), e-learning programs, certificate programs, diploma programs, and masters programs.	No capacity building program available for staff in-country.	Capacity building programs are available for staff in the form of unstructured OJT.	Capacity building programs are available for staff in the form of some structured OJT and in-house training.	Structured capacity building programs are available for staff in-country, but outcomes of capacity building are not evaluated and there is no record of staff that have had capacity building.	Capacity building programs are available for staff in-country, outcomes of capacity building are evaluated, and records of capacity building are kept.	
4. Monitoring and Evaluation							

	Capacity Element/Scores	0	1	2	3	4	
4.1	Do you have a Monitoring and Evaluation (M&E) Unit?						Yes
4.2	Please describe the quality improvement system, if one exists.	No quality improvement program exists.	There is a quality improvement program and trained staff, but the system is not in use.	There is an established, ongoing system for assessing and improving the quality of services. Adequately trained staff are available but not fully engaging in this system.	There is an established, ongoing system for assessing and improving the quality of services. Adequately trained staff are available and use the system regularly. Quality improvement is regularly reported.	There is an established, ongoing system for assessing and improving the quality of services. Adequately trained staff are available and use the system regularly. Quality improvement is regularly reported and is a stated core function of the chief executive.	
4.3	What, if any, software is used for M&E data collection? How often are M&E data collected? How is that information utilized?	No routine collection of M&E data.	No appropriate software for M&E data collection. Data are collected when it is convenient and are not used or analyzed.	Software for M&E data and report collection is available. Data and reports are collected routinely but are not analyzed regularly.	Software for M&E data and report collection is available. Data and reports are collected periodically, analyzed, and discussed but are not used to support decision making or performance improvement.	Software for M&E data and report collection is available. Data and reports are collected regularly, analyzed, discussed, and used to guide decision making and performance improvement.	
4.4	Is there an M&E plan in place? Are KPIs included? If so, how are they used?	No M&E plan.	M&E plan is being developed.	M&E plan is available with limited indicators and some data collection elements.	M&E plan is fully developed, and a few elements are being implemented. KPIs are regularly produced and circulated.	There is a robust M&E plan with data collection tools, indicators, analysis, and data quality management. KPIs are regularly reviewed with management team and customers.	
4.5	Are best practices documented? If so, how are they utilized?	No records are kept of best practices.	Records of best practices are documented but not compiled into reports or disseminated.	Best practices are documented and reported but not shared.	Best practices are documented, reported, and shared only within the unit.	Best practices are documented, reported, and shared with a wide range of stakeholders.	

5. Forecasting and Quantification							
	Capacity Element/Scores	0	1	2	3	4	
5.1	Is there a team/group responsible for demand forecasting? If so, what is their approach?	There is no forecasting team, and individuals are responsible for forecasting when it needs to be completed.	There is no core forecasting team, and an ad-hoc team is constituted when forecasting needs to be done.	There is a core forecasting team that carries out its assignment using a naive forecasting method.	There is a core forecasting team that carries out its tasks using established guidelines and historic data but does not perform periodic forecast reviews and assessments. Standalone spreadsheets are used by the core team.	There is a core forecast team that carries out its tasks using established processes and caries out performance reviews such as forecast accuracy, periodic assessment of consumption data, and supply plan reviews. A documented methodology, assumptions, and data sources are used for forecasting, and proprietary software is deployed in the process.	
5.2	What is the government contribution to recurring forecasting and supply planning costs?						
6. Infrastructure							
	Capacity Element/Scores	0	1	2	3	4	
6.1	Do you have adequate facilities for supply chain operations (dedicated warehouse space, office/admin blocks, steady power supply, source of water, WMIS, established governance structure)?						Yes
6.2	Please describe the physical and technology infrastructure. How does infrastructure affect performance?	Inadequate physical and technological infrastructure/tools that result in a loss of effectiveness and efficiency.	Non-functional physical and technological infrastructure/tools.	Physical and technology infrastructure/tools are sufficient to suit the most important and immediate needs.	There are adequate physical and technology infrastructure/tools based on current needs. Infrastructure does not impede effectiveness and efficiency.	Physical infrastructure and technology/tools are well-tailored to current and anticipated future needs, well-designed, and regularly maintained to enhance efficiency and effectiveness.	

6.3	Please describe the current warehouse structure.	Not fit for purpose (e.g., using a building not designed as a warehouse for storage).	Fit for purpose (e.g., using a building designed as a warehouse for the purpose of product storage).	Fit for purpose with space for expansion.	Pharma-grade structure with appropriate storage equipment (e.g., pallet racking).	Pharma-grade with appropriate storage equipment and room for expansion.	
7. Procurement							
	Capacity Element/Scores	0	1	2	3	4	
7.1	Is there a procurement plan in place? If so, who is responsible for its execution? Are there dedicated procurement staff?	There is no procurement document/plan available.	There is a procurement plan available, but the system employed does not align with the set plan and there are no dedicated procurement staff.	There is a procurement plan available, but the system employed does not align with the set plan and dedicated procurement staff are not trained.	There is a procurement plan available, but the system employed does not align with the set plan. Dedicated procurement staff have been given OJT to ensure that purchases are made in accordance with systems and procedures.	There is a procurement plan available, the system employed aligns completely with the set plan, and dedicated procurement staff have been properly trained to ensure that purchases are made in accordance with systems and procedures.	
7.2	Is there anyone responsible for contracting within procurement? If so, what type of training, if any, do they receive? What are their roles and responsibilities?	Little or no contracting capability within the procurement function of the organization.	Standard terms and conditions are included in the tendering process documents. Limited contract management activity relies on the legal clauses in the tender terms and conditions. This is particularly the case regarding the contracting of supply chain resources.	Contracting capability has been developed over time by the procurement team, primarily by on-the-job experience.	Contracting is not seen as a distinct capability but an element of the overall procurement activity. However, the procurement team has received formal contracting and contract management training.	Contracting and contract management is seen as a specific competence within the organization. The activities of tendering, contracting, and contract management are handled by different functional elements within the organization.	
7.3	Does pipeline monitoring occur? If so, how? What determine usage rates?	Once purchase orders (POs) are issued, the organization does not monitor production and shipping activities until it becomes aware of a late delivery or an out of stock.	Progress chasing is undertaken based on the predicted shipping dates provided at the time of contracting and PO issuing.	A procurement system is in place that monitors delivery due dates and receipts. Late deliveries are highlighted, and the organization undertakes progress chasing as appropriate.	Usage rates are monitored based on inventory management data. Discussions with suppliers are undertaken regarding the potential to bring forward or delay shipment dates as appropriate.	A system/process is in place that communicates with suppliers requesting information regarding the progress of manufacture, pre-dispatch documents, and shipping dates. The overall aim of the activity is the mitigation of the impact of delays within the pipeline.	

7.4	Does the organization have a functional procurement unit?						Yes
8. Warehousing and Distribution							
	Capacity Element/Scores	0	1	2	3	4	
8.1	Are there written warehouse guidelines and SOPs? If so, have these been implemented?	There are no guidelines or SOPs for the handling and storage of health commodities.	Guidelines or SOPs for the handling and storage of health commodities are under development.	The National Warehousing Guidelines or SOPs for the handling and storage of health commodities are being adapted.	The National Warehousing Guidelines and SOPs for the handling and storage of health commodities have been adopted in principle but are only partially implemented.	The National Warehousing Guidelines and SOPs for the handling and storage of health commodities are available and adhered to in the warehouse.	
8.2	Do waste management and/or disposal protocols exist? If so, how is adherence measured?	There are no available waste management and disposal protocols.	Waste management and disposal protocol use is not documented or formally approved by any regulatory body.	Waste management and disposal protocols are under development.	Waste management and disposal protocols exist but are not comprehensive and/or are not regularly followed.	Well documented and approved waste management and disposal protocols are comprehensive, include all waste categories, and are adhered to regularly.	
8.3	Is there a schedule to manage distribution? If so, how is it utilized? How often are schedules reviewed?	No policies or systems exist that outline distribution practices.	A fixed schedule has been developed with health facilities reflecting any seasonal needs.	A documented system for distribution is available, but it is only partially utilized.	A fixed schedule has been developed with health facilities reflecting any seasonal needs.	There is a clearly defined and documented distribution system that allows for timely and efficient distribution. Schedules are regularly reviewed with customers, and adherence to the schedule is monitored and reported.	
8.4	What level of ISO accreditation has the organization achieved/is in the process of achieving (e.g., ISO 9000/9004)?	The ISO certification status of the suppliers and manufacturers is not considered during procurement.	Only products and equipment from ISO-certified manufacturers are procured.	Only products and equipment from ISO-certified manufacturers are procured, and the warehouse relevant ISO certification is in progress.	Only products and equipment from ISO-certified manufacturers are procured and at least ISO 9001 QMS has been obtained while others are still in progress.	Only products and equipment from ISO-certified manufacturers are procured and the warehouse has all relevant ISO certifications (i.e., 9001, 27001, 45001).	

8.5	Does the available storage area meet the minimum acceptable design, layout, and construction requirements for storage using the national warehousing standards (e.g., minimum of 1,500 euro pallet capacity, temperature control, power and access control)?						Yes
9. Storage and Transport Capability							
	Capability Element/Scores	0	1	2	3	4	
9.1	Do you use mechanical handling equipment?						
9.2	What storage methods and mechanical handling methods are deployed?						
9.3	Are the facilities owned or rented/leased by the company?						
9.4	If rented/leased, what is the length of the current renting/leasing arrangements?						
9.5	How many facilities are owned/rented/leased by the company and where are they located?						
9.6	What is the capacity of each facility (pallet size or volume)?						
9.7	What is the percentage utility of each facility?						

9.8	Please describe the storage and warehousing facilities.	Basic warehouse facilities. Sound buildings with minimal security features. Limited storage methods and mechanical handling equipment (MHE) assistance. Ambient storage facilities only.	Secure and sound facilities. Different operational areas clearly delineated. Some racking and shelving to suit the product characteristics and demand volumes. Appropriate MHE available.	A range of warehouse/storage types in terms of temperature regimes, storage methods, and MHE are available. All staff are trained appropriately for their areas of operation.	A wide range of storage techniques are available to suit product types and demand profiles. There is clear segregation of hazardous products and items requiring additional security. Back up/stand-by equipment is on site to support the main electricity supply.	Sophisticated storage systems and MHE equipment installed, such as narrow aisle racking, storage carousels, and conveyor systems. CCTV security is installed and monitored on a regular basis. Planned acquisition of additional space to suit clients' needs.	
9.9	What fraction of the transportation fleet is outsourced?						
9.10	How many trucks are operated by the organization (please provide an analysis of the total number of trucks, by size, if possible)?	The organization operates open trucks in a range of sizes. A replacement policy, on the basis of age/kms run, has not been developed and implemented.	The organization operates several types and sizes of truck to suit the needs of the clients' products. The organization does not operate refrigerated trucks.	The organization operates trucks in a range of types, sizes, and temperature regimes. A replacement policy has been implemented, and all vehicles are maintained as advised by the vehicle manufacturers.	A range of transport management techniques are in use to maximize the efficiency of the vehicle fleet, including fuel consumption monitoring, safe driving rewards, driver debriefs, and vehicle defect reporting processes. Vehicles are procured to suit the needs of the goods being carried, and drivers receive appropriate training regarding any equipment unique to particular vehicles (i.e., load restraining equipment, tail lifts, refrigeration systems).	Vehicles are monitored by GPS. Alerts regarding engine condition and refrigeration equipment performance are incorporated into the vehicles' communication system. Vehicles are made available at short notice to meet the requirements of new customers. Vehicle trials are undertaken prior to placing purchase orders for new vehicles.	

APPENDIX XII: OPERATIONAL CAPABILITY ASSESSMENT TOOL (PRIVATE SECTOR)

1. Company Age and Stability							
	Capability Element/Scores	0	1	2	3	4	
1.1	What is the trading name of the company?						
1.2	What is the registered name of the company?						
1.3	Is the company a member of a group?						Yes
1.4	If YES to question 1.3, what is the registered name of the group?						
1.5	What year was the company founded?						
1.6	What is the legal status of the company?	No registration or legal right to operate in the country available.	Registration and legal status in the country are available.	Legal registration is available, but written constitution is in the process of development.	Legal registrations are available, but written constitution and code of conduct are not always complied with.	Legal registrations are available, and there is compliance with the written constitution and code of conduct.	
1.7	What is the advisory board/committee structure? Management roles and responsibilities?	No functioning governing committee or advisory board to provide oversight or governance for the supply chain.	The board membership is small and static and there are no formal documents that clearly define TOR that detail primary duties of board and management. The board has held no meeting after its inauguration.	The board membership is small, and formal documents that clearly define TOR that detail primary duties of board and management are in the process of being defined. The board has held at least three meetings after its inauguration.	A committed board is in place with some relevant experience. Meetings are held periodically, and there is a consistent level of involvement in the supply chain. While the Board of Directors may have relevant experience, the company lacks the financial strength to provide a large client with required resources.	A strong, diverse board comprises members with relevant experience. Regular and well documented meetings are held. Action points are followed up promptly. There is consistent oversight of the supply chain according to the board TOR.	
1.8	How old is the organization?						
1.9	What was the annual turnover for 2020?						

1.10	How many years of experience in Nigeria?						
1.11	How stable is the company?	The company has recently formed. Directors have very limited experience of running a logistics/supply chain organization.	Recently formed company that has limited operational coverage in terms of both the service offering and geographical reach.	A company that has many years of trading profitably but lacks the vision and financial strength to grow. In many cases, the service offering relies on several operational partners. While this could form the basis of a 3PL/LLP relationship, managing the partners in a growth scenario might be problematic.	A sizeable company in terms of the offerings it provides and the geographic areas it serves. The Board of Directors has significant operational and commercial experience. Growth has, in many cases, been the result of acquiring other long-standing successful companies (e.g., Imperial Logistics Founded in 1975 with an annual turnover of USD 3 billion).	A sizeable company that is part of a large international group that has been in existence for more than 10 years with extremely large turnover (e.g. Deutsche Post DHL €70 billion; Kuehne & Nagel 25 billion CHF; XPO Logistics USD 17 billion).	
2. Financial Reporting							
The anticipated responses do not fit the maturity model methodology. These questions could be used as prompts/subsequent questions while discussing Question 1, Company Age and Stability.							
	Capability Element/Scores	0	1	2	3	4	
2.1	Is the organization part of a group of companies?						
2.2	Are separate annual accounts prepared and submitted to the authorities (e.g., stakeholders, annual general meetings, Federal Inland Revenue Services)?						Yes
2.3	If YES to 2.1, please provide a copy of the annual reports for the last two years (e.g., annual general meeting reports).						
2.4	If NO to 2.1, is the financial performance of the company consolidated into the group's annual report?						Yes

2.5	What is the average turnover of the company over the past two years?						
2.6	How many transactions has the organization had with the government at any level in the past five years?						Yes
2.7	If ANY NUMBER GREATER THAN ONE for 2.6, please state clearly which ministries, departments, and agencies; levels of government; and duration of engagement (e.g., federal, state, local government area, health facility).						
3. Governance/Organizational Structure/Board of Directors							
	Capability Element/Scores	0	1	2	3	4	
3.1	Please provide an organogram detailing the title of each of the directors of the company.						
3.2	For each director, please indicate the number of years of logistics experience.						

3.3	How is the Board of Directors structured and what is its level of experience?	New company with a young Board of Directors. Although the directors may have some limited operational experience, their credentials are mainly educational qualifications.	The Board of Directors is structured in a traditional manner with procurement reporting to the Finance Director.	The Board of Directors is a blend of young and experienced executives. Each main element of the supply chain is allocated a director. While this high-level representation reflects the importance of SCM within the organization, it does mean that all key decision making needs the involvement of the CEO.	The Board of Directors is a blend of young and experienced executives. The number of directors managing the supply chain is narrowed into broad categories (e.g., Director Technical and Director of Operations). For example: forecasting and procurement activities, if they are offered as a service, are managed by one director, and the operational aspects of the supply chain and logistics are managed by another director. While there are fewer directors involved than in the level two scenario, all major decisions require the involvement of the CEO.	A mature company where the Board of Directors is all experienced executives. All of the functions of the supply chain are represented at board level by one senior executive. Their responsibilities embrace a wide span of control from forecasting to LMD gained from many years of executive experience. Once strategy has been agreed to by the Board of Directors, and the Operations Director is responsible for implementing the strategy effectively.	
3.4	What is the organizational structure of the organization? What is the succession plan of the organization?	No available documents showing the current lines of authority and communication. No organization chart.	Organizational chart that defines lines of authority and communication is in the process of being developed.	An approved organizational chart showing lines of authority and communication is included in the organization's manual of policies and procedures, but it is not clearly followed (e.g., in many instances, order processing and inventory management report to an administrative function and thus, warehouse management can be split between operations and administrative managers). Coordinating inbound and outbound movements of goods under these circumstances is difficult.	An approved organizational chart defining lines of authority and communication is included in the organization's manual of policies and procedures and is mostly followed. The approved organizational chart is used to clarify lines of authority and accountability and to evaluate performance.	An approved organizational chart defining lines of authority and accountability is included in the organization's manual of policies and procedures and is followed.	

4. Human Resources							
	Capability Element/Scores	0	1	2	3	4	
4.1	How many people are employed by the company?						
4.2	Within the overall total, how many people are employed in: i. Managerial and office activities (including contract management) ii. Warehouse operations iii. Transport (both primary and secondary movements)						i. ii. iii.
4.3	What is the composition of the workforce (e.g., part-time/full-time employees)? How often does training of employees occur? Is mechanical handling equipment available? PPE? What is the percentage of staff turnover each year?	Unplanned operations and lack of adequate mechanical material equipment result in high levels of casual labor hiring, part-time workers, and overtime payments. The lack of a stable work force tends to result in high levels of staff turnover (greater than 15% per year).	Modest amounts of mechanical handling equipment are available, and some operations are planned to reduce the physical stress of operational activities. However, most operations are unscheduled. Staff are provided with basic PPE, and staff attrition is about 15%.	An adequate amount of mechanical handling equipment is available, and all operations are planned to reduce the physical stress of many of the operational activities. Staff are provided with PPE required for their level of operation. SOPs have been developed, and staff have been trained in their use. Visual aids and signage, where appropriate, are posted throughout the organization's facilities to reinforce the training. Staff attrition is between 10 and 14%.	Staff are provided with PPE required for their level of operation. SOPs have been developed, and staff have been trained in their use. There is a satisfied work force with a low level of staff turnover. Staff forums have been introduced to enable two-way communication between management and staff. Payment schemes have been introduced based on both corporate and individual goals. Staff attrition is less than 10%.	A highly trained and motivated work force is committed to the organization's goals and ideals. Individual personal development plans are developed, and time is made available for individuals to undertake the training. A succession plan has been developed to mitigate the risk associated with the loss of key individuals. There is a staff attrition rate of less than 5% per year.	

4.4	What, if any, job descriptions are written and available? How are the job descriptions utilized? How specialized are staff? What, if any, efforts are made to ensure equal opportunities for all?	Job descriptions with appropriate qualification across organizational units and among staff at different levels do not exist.	Job descriptions with appropriate qualification across organizational units and among staff at different levels are being developed.	Clear job descriptions with appropriate qualification across organizational units and among staff at different levels are in place but used with irregular frequency. Organization has some specialized staff.	Clear job descriptions with appropriate qualification exist for all position but are used inconsistently and are not used to manage performance expectations of staff. There are some efforts to ensure that women and vulnerable groups have equal recruitment opportunities. Organization has staff that represent a fairly wide range of knowledge and expertise (e.g., finance, admin, supply chain).	Clear job descriptions with appropriate qualification exist for all position, are used consistently to manage performance expectations of staff, and are reviewed regularly. Efforts have been made to ensure that women and vulnerable groups have equal recruitment opportunities and are represented at all levels within the organization. Organization has staff that represent the full range of knowledge and expertise (e.g., finance, admin, M&E, supply chain, logistic expert).	
4.5	What is the mechanism for staff communication?	Communication mechanisms for sharing information across organizational units and among staff at different levels do not exist.	Communication mechanisms for sharing information across organizational units and among staff at different levels are being developed.	Communication mechanisms for sharing information across organizational units and among staff at different levels are in place but infrequently used.	Communication mechanisms for sharing information across organizational units and among staff at different levels have been developed and are in place but are ineffective.	Communication mechanisms for sharing information across organizational units and among staff at different levels are used consistently and are effective.	
4.6	What, if any, human resource policies and procedures exist? How are the policies and procedures utilized?	Comprehensive policies and procedures are absent.	Comprehensive policies and procedures are in the process of development.	Comprehensive policies and procedures exist and are sometimes used during recruitment. Staff-related policies and procedures are given to key staff.	Comprehensive policies and procedures exist and are used during staff recruitment. All staff-related policies and procedures are given to all staff.		
4.7	How are staff evaluated against accountability metrics? What, if any, is the mechanism for performance evaluation?	Staff have not been allocated areas of accountability with deliverables, and there is no system for reviewing staff performance.	Staff are occasionally informally evaluated against broad areas of accountability.	There is a formal staff performance evaluation system that is sometimes followed. Performance evaluations are conducted against areas of accountability and deliverables but not consistently for all staff at all levels.	There is a formal staff performance evaluation system that is usually followed. Staff are formally evaluated against KPIs, and a written record is placed in their staff file. Staff performance evaluations have been conducted within the last two years.	There is a formal staff performance evaluation system that is always followed. All staff are formally evaluated annually against KPIs, and reference is made to the previous year's performance evaluation. Staff development plans are formulated based on performance evaluations, and the performance evaluation may be linked to salary increments/bonuses.	

5. Services Offered							
	Capability Element/Scores	0	1	2	3	4	
5.1	Please list the logistics services offered by the company. For example: i. Forecasting product needs ii. Procuring finished items and/or components for manufacturing purposes iii. Procuring additional logistics assets and acting as the main in sub-contracted relationships iv. Arranging inbound transport from local and international suppliers v. Customs clearance vi. Warehousing in bulk, including inventory management vii. Order processing and picking viii. Distribution planning, including primary transport to depots/regional warehouses ix. Multi-drop distribution of picked orders (LMD) x. Waste disposal						

5.2	What services are offered by the organization?	An offering of a single element of the end-to-end supply chain (e.g., customs clearance).	Very limited range of services offered, on a small scale, relating to one or two elements of the end-to-end supply chain (e.g., bulk warehousing and primary distribution).	A wide range of physical distribution services on a regional basis within the country (e.g., receipt and storage of imported products, detailed order picking, and LMD within a geographic operational area).	An offering embracing the end-to-end supply chain, to some extent, nationally. The procurement function could relate to procuring additional distribution resources, as needed, and products based on call-off contracts and inventory management techniques.	The company offers in-depth services in all elements of the supply chain, both nationally and internationally. The procurement processes include tendering and contract management. The IT systems in place support vendor-managed inventory should the client wish to implement the strategy.	
5.3	Is there willingness to expand services outside of current geographic areas?	Organization has no interest in expanding to other regions.	Organization is open to discussion regarding expansion to a limited number of new regions near current service delivery sites.	Organization is open to discussion regarding expansion to a limited number of new regions near current service delivery sites and has capacity and resources to drive expansion.	Organization has willingness to expand to new regions that pose minimal barriers to entry.	Organization has willingness to expand to any regions requested by MOH/DOH, including regions that pose significant difficulty due to geographic, political, or other constraints.	
5.4	Is there capacity to expand services outside of current geographic areas?	Organization has no capacity to expand to other regions.	There is limited capacity and resources to drive expansion.	Organization is open to discussion regarding expansion to a limited number of new regions near current service delivery sites and has capacity and resources to drive expansion.	Organization has capacity to expand to new regions that pose minimal barriers to entry.	Organization has capacity to expand to any regions requested by MOH/DOH, including regions that pose significant difficulty due to geographic, political, or other constraints.	
6. Client Management							
	Capability Element/Scores	0	1	2	3	4	
6.1	Please list the names of your major clients (industry sector names are acceptable to maintain commercial confidentiality).						

6.2	How is the relationship with each major client managed? Potential responses include: i. A single named client relationship manager ii. Regular performance reports (KPIs) iii. Face-to-face planning reporting and planning meetings on a regular basis iv. Agreed SLAs that are reviewed as market conditions change v. A two-way relationship in which the obligations of the company and the client are documented						
6.3	How are client relationships managed?	The relationship is essentially transactional (rate tariff driven), and the company responds to requests for resources from the client base on an ad hoc basis.	Individual elements of the organization maintain contact with members of the client team. Typically, this is done in an uncoordinated manner, resulting in poor quality communications.	Within the organization, a member of the business development team has responsibility for managing the relationship with the client. Often, the contact is the result of the need to resolve an operational issue and does not facilitate the development of an excellent relationship between the organizations. Standard performance measures are produced and circulated.	A number of specific nominated contacts are identified in both the client and logistics service provider for day-to-day operational communication. SLAs have been formally agreed and documented. An escalation process is in place should day-to-day contacts fail to resolve issues.	An overall client relationship executive is nominated to conduct regular performance reviews, typically monthly, and annual planning/budgeting processes. IT systems generate and/or enable the client to produce tailored reports from the organization's operational data.	

6.4	Please describe the quality improvement system, if one exists.	No quality improvement program exists.	There is a quality improvement program and trained staff, but the system is not in use.	There is an established, ongoing system for assessing and improving the quality of services. Adequately trained staff are available but not fully engaging in this system.	There is an established, ongoing system for assessing and improving the quality of services. Adequately trained staff are available and use the system regularly. Quality improvement is regularly reported.	There is an established, ongoing system for assessing and improving the quality of services. Adequately trained staff are available and use the system regularly. Quality improvement is regularly reported and is a stated core function of the chief executive.	
6.5	Is there an M&E plan in place?						
6.6	What, if any, software is used for M&E data collection? How often are M&E data collected? How is that information utilized?	No routine collection of M&E data.	No appropriate software for M&E data collection. Data are collected when it is convenient and is not used or analyzed.	Software for M&E data and report collection is available. Data and reports are collected routinely but are not analyzed regularly.	Software for M&E data and report collection is available. Data and reports are collected periodically, analyzed, and discussed but are not used to support decision making or performance improvement.	Software for M&E data and report collection is available. Data and reports are collected regularly, analyzed, discussed, and used to guide decision making and performance improvement.	
6.7	Do written quality standards for service delivery exist? Are community/beneficiary needs considered? Is there adherence to national standards? Are beneficiaries satisfied with service delivery?	Quality standards for service delivery do not exist. Organization's service delivery is not monitored.	Quality standards for service delivery exist only informally OR are outdated OR were developed only at donor behest and are not monitored. Organization often falls short, and beneficiaries are dissatisfied with service delivery.	Written quality standards exist for some aspects of service delivery but not all. They are not entirely clear and are not monitored regularly. Organization is believed to be making a positive difference but is unable to demonstrate concrete results. Beneficiaries are somewhat satisfied with service delivery.	Written quality standards exist for most aspects of service delivery. These take community/beneficiary needs into account and are mostly in line with national standards. Organization is monitored against quality standards. Beneficiaries are satisfied with service delivery.	Written quality standards exist for all aspects of service delivery, which take community/beneficiary needs into account and fully adhere to national standards. Organization is monitored regularly against quality standards. Beneficiaries are consistently satisfied with service delivery.	
6.8	Are best practices documented? If so, how are they utilized?	No records are kept of best practices.	Records of best practices are documented but not compiled into reports or disseminated.	Best practices are documented and reported but not shared.	Best practices are documented, reported, and shared only within the unit.	Best practices are documented, reported, and shared with a wide range of stakeholders.	

7. Storage and Transport Capability							
	Capability Element/Scores	0	1	2	3	4	
7.1	Do you use mechanical handling equipment?						
7.2	What storage methods and mechanical handling methods are deployed?						
7.3	Are the facilities owned or rented/leased by the company?						
7.4	If rented/leased, what is the length of the current renting/leasing arrangements?						
7.5	How many facilities are owned/rented/leased by the company? Where are they located?						
7.6	What is the capacity of each facility (pallet size or volume)?						
7.7	What is the percentage utility of each facility?						
7.7	Please describe the storage and warehousing facilities.	Basic warehouse facilities. Sound buildings with minimal security features. Limited storage methods and MHE assistance. Ambient storage facilities only.	Secure and sound facilities. Different operational areas clearly delineated. Some racking and shelving to suit the product characteristics and demand volumes. Appropriate MHE available.	A range of warehouse/storage types in terms of temperature regimes, storage methods, and MHE are available. All staff are trained appropriately for their areas of operation.	A wide range of storage techniques are available to suit product types and demand profiles. There is clear segregation of hazardous products and items requiring additional security. Back up/stand-by equipment on site to support the main electricity supply.	Sophisticated storage systems and MHE equipment installed, such as narrow aisle racking, storage carousels, and conveyor systems. CCTV security is installed and monitored on a regular basis. Planned acquisition of additional space to suit clients' needs.	
7.8	What fraction of the transportation fleet is outsourced?						

7.9	How many trucks are operated by the company (please provide an analysis of the total number of trucks, by size, if possible)?	The company operates open trucks in a range of sizes. A replacement policy, on the basis of age/kms run, has not been developed and implemented.	The company operates several types and sizes of truck to suit the needs of the clients' products. The company does not operate refrigerated trucks.	The company operates trucks in a range of types, sizes, and temperature regimes. A replacement policy has been implemented, and all vehicles are maintained as advised by the vehicle manufacturers.	A range of transport management techniques are in use to maximize the efficiency of the vehicle fleet, including fuel consumption monitoring, safe driving rewards, driver debriefs, and vehicle defect reporting processes. Vehicles are procured to suit the needs of the goods being carried, and drivers receive appropriate training regarding any equipment unique to particular vehicles (i.e., load restraining equipment, tail lifts, refrigeration systems).	Vehicles are monitored by GPS. Alerts regarding engine condition and refrigeration equipment performance are incorporated into the vehicles' communication system. Vehicles are made available at short-notice to meet the requirements of new customers. Vehicle trials are undertaken prior to placing purchase orders for new vehicles.	

8. Information Systems							
	Capability Element/Scores	0	1	2	3	4	
8.1	What type of information systems are utilized by the company?	The information systems within the company, with the exception of the financial information, are manual.	In-house developed spreadsheet-based systems used for decision making regarding procurement, stock replenishment within the network nodes, and vehicle planning. The individual systems are typically, standalone and require considerable manual support. Considerable manual intervention is required to produce the financial reports.	A range of software systems have been implemented for the main elements of the supply chain: forecasting, procurement, WMS, vehicle scheduling, and performance measurement.	A range of software systems have been implemented for the main elements of the supply chain: forecasting, procurement, WMS, vehicle scheduling, and performance measurement. The various software packages are integrated with the organization's financial/enterprise resource planning systems with an output of robust visual analytics. The organization's information systems are integrated with those of the customer base. The systems have the functionality to calculate both the weight and volume of individual orders.	Control tower technology is in place enabling total visibility of the end-to-end supply chain. The best-in-class software is fully integrated, minimizing the need for manual intervention. Both standard and customized visualized reports can be produced by the integrated systems. Procurement alerts can be generated as a result of the WMS inventory management functionality.	

9. Quality Systems							
	Capability Element/Scores	0	1	2	3	4	
9.1	What level of ISO accreditation has the organization achieved/is in the process of achieving (e.g., ISO 9000/9004)?	Formal quality systems have not been introduced. Management responds to individual customer complaints as and when they occur, typically defensively.	Staff training is undertaken by supervisors and performance is reviewed on a regular basis. Operational demand fluctuations tend to result in the use of part-time and casual labor, making the achievement of a consistent level of performance challenging.	SOPs are in place for all operational activities. Initial training is supplemented as needed by supervision. The philosophy is more quality control (QC) than quality assurance (QA) (i.e., introducing additional checking of picked orders due to an increase in picking errors being detected).	Operating manuals have been developed to support the SOPs. Regular staff performance reviews aim at improving the quality of the offering rather than seeking to blame staff for errors. A formal customer complaints handling process has been introduced, including regular feedback to customers. ISO accreditation is an objective, and initial steps have been taken to achieve the objective.	ISO accreditation has been achieved and ongoing compliance is audited. Customer surveys and focus groups inform management decision making regarding the quality standards needed. Staff involvement at all levels is an integral part of maintaining and improving the overall quality of the service offering.	
9.2	Do the processes introduced by the company meet WHO standards in the area of good warehouse practice and good distribution practice for pharmaceuticals?						
10. Logistics Processes							
	Capability Element/Scores	0	1	2	3	4	
10.1	What types of costing/pricing processes are used with clients to ensure value for money and a sustainable operation?						
10.2	What processes are in place to ensure that clients receive the level of service that they require as detailed in the SLAs?						

10.3	Are SLAs used with each contract? How are operational parameters established? How is costing decided (e.g., actual cost + percentage management fee, established jointly) How often, if ever, do reviews occur?	The management team does not have a formalized process embracing the end-to-end supply chain. Each sub-team reacts to the needs of its own objectives individually. This can lead to conflicting actions among team members (e.g., the procurement team buys in bulk to obtain a lower buying price, causing the warehouse team to rent additional warehouse space as a consequence).	Contracts are of a confrontational rather than collaborative nature, reflecting penalties rather than mutual benefits. The service provided will tend to be charged at actual costs plus a percentage management fee based on the actual costs. This situation does not give the service provider any incentive to reduce costs and maintains the operational status quo.	Agreed SLAs are in place. Operational parameters and resource levels are established to jointly develop an operating budget. Any deviations from those operational parameters are agreed prior to implementing the changes (e.g., a change in the procurement intake volume per day).	KPIs reflecting the SLAs will be reported regularly, typically monthly. Operational reports, in an agreed format, will be circulated at an agreed time each day. Monthly formal reviews will take place to discuss potential changes to plans (e.g., the acceleration of the introduction of a new product). Further logistics processes will include inventory monitoring to ensure inventory accuracy and minimize the level of stock wastage. Payment and costing methods are developed to incentivize the service provider to make improvements in costs and/or service levels.	Client reviews to consider future plans and different costing/pricing methods to reflect the client's objectives at agreed points within the overall contract timeframe. With longer contracts becoming the norm, the review process is extremely important, particularly in the event that the 3PL/4PL has invested in infrastructure to deliver the service.	