

PVAC–NMEP Stakeholders Workshop- Enhancing Local Manufacturing and Supply Chain for Malaria Health Commodities in Nigeria

Workshop Report



October 2025

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1.0 Introduction

The three-day national workshop on *Enhancing Local Manufacturing and Supply Chain for Malaria Health Commodities* was jointly convened by the Presidential Initiative for Unlocking the Healthcare Value Chain (PVAC) and the National Malaria Elimination Programme (NMEP) with funding support from the World Bank Immunization Plus and Malaria Progress by Accelerating Coverage and Transforming Services (WB-IMPACT) Project. The workshop provided a strategic platform for stakeholders from government, academia, regulatory agencies, industry, and development partners to review and validate findings from the assessments conducted across the various workstreams of the project as well as to deliberate on how to strengthen Nigeria's capacity to locally produce, distribute, and effectively regulate the health commodities ecosystem with a focus on malaria-related health commodities...

The event was held from 9:00 am daily over 3 days (8th to 10th of October, 2025) at the Bolton White Hotel, Abuja, and was attended by a total of 122 participants (please see the meeting agenda and participants list in the appendix section)

2.0 Workshop Objectives

The workshop aimed to:

1. Review the current capacity for local production of malaria health commodities.
2. Identify barriers to scaling local manufacturing of APIs, ACTs, RDTs, LLINs, and vaccines.
3. Explore opportunities for harmonizing regulatory and clinical research frameworks.
4. Strengthen procurement systems for malaria supply chain efficiency and sustainability.
5. Develop a strategic roadmap for enhancing local manufacturing and research capacity in Nigeria.

3.0 Opening Session

The workshop commenced with participant registration, the singing of the national anthem, and a welcome address by Dr Abdu Mukhtar, the National Coordinator of PVAC. He emphasized the importance of building a resilient local pharmaceutical ecosystem that aligns with Nigeria's industrialization agenda and global malaria control targets.

Dr Nnenna Ogbulafor, National Coordinator of NMEP, who was ably represented by Dr Aminu Umar, NMEP's Head of Programme Management, delivered the opening remarks, highlighting the critical need for work between malaria program implementation and local production. Professor Mojisola Adeyeye, Director-General of the National Agency for Food and Drug Administration and Control (NAFDAC), and Dr Obi Peter Adigwe, the Director-General of the National Institute for Pharmaceutical Research and Development (NIPRID), delivered goodwill messages.

4.0 Technical Presentations – Day 1

The first day featured a series of technical presentations on assessments conducted by different consultants across the project's various workstreams to enhance local manufacturing capacity for malaria health commodities in Nigeria. The summary of the presentations is presented below:

4.1 Current Capacity for Active Pharmaceutical Ingredients (APIs) Manufacturing in Nigeria

The presentation by Mopa Esuga of the United States Pharmacopoeia (USP) provided a detailed overview of Nigeria's API manufacturing landscape, revealing that although the country produces more than 5 billion antimalarial finished doses annually, it remains 90-99% dependent on imported APIs, primarily from India and China. This high dependency exposes Nigeria to global supply chain shocks, foreign exchange volatility, and price instability, issues that became particularly evident during the COVID-19 pandemic. Despite the scale of finished product production, the assessment confirmed that no meaningful domestic API synthesis capacity currently exists, and manufacturers rely almost entirely on imported raw materials. Key constraints identified include limited access to affordable financing, high energy costs, foreign exchange shortages, and heavy taxation, which collectively hinder investment in API production infrastructure. Additionally, there is a major technical skills gap, especially in process chemistry, chemical engineering, and quality control, which are core competencies needed to initiate and sustain local API manufacturing. While Nigeria has strong policy instruments, such as the PVAC initiative (2023) and recent Executive Orders (2024), aimed at prioritizing local pharmaceutical manufacturing, manufacturers noted that these policies have not yet translated into practical, accessible incentives or procurement commitments that would justify large-scale investment. The presentation also emphasized the importance of the NAFDAC 2027 API Sourcing Mandate, which requires manufacturers to use APIs from WHO-prequalified, European Pharmacopoeia, or other Stringent Regulatory Authority-compliant sources. This mandate supports quality assurance but also buttresses the urgency of developing local production aligned with these regulatory standards.

USP proposed several strategic actions, including establishing API manufacturing parks with shared utilities to reduce operational costs, providing single-digit interest financing, enforcing local API procurement preferences, and strengthening industry/academia partnerships to build a skilled workforce. The need for targeted technical assistance in API synthesis and WHO prequalification readiness was also emphasized.

During the discussion, senior stakeholders, including NAFDAC DG Prof. Mojisola Adeyeye, USP's Dr Jude Nwokike, and Prof. Joseph Fortunak, highlighted the need for policy consistency, stronger incentives, and structured technology transfer as Nigeria aims to locally produce 10–20% of API demand in the medium term.

4.2 Current Capacity for Long-Lasting Insecticide-Treated Nets (LLINs) Manufacturing in Nigeria

The assessment of Nigeria's Long-Lasting Insecticide-Treated Nets (LLINs) manufacturing capacity presented by Mathew Attah highlighted the country's strategic importance as the world's largest malaria market, accounting for roughly a quarter of global malaria

cases. Nigeria also remains one of the largest recipients of LLINs globally, with procurement heavily financed by the Global Fund, PMI/USAID, state governments, and philanthropic organizations. Between 2021 and 2025, an estimated US\$447 million was invested in LLIN procurement and delivery, resulting in the acquisition of approximately 140 million nets, representing 12% of global LLIN distribution during that period. The vast majority (about 92%) of these nets were supplied through donor-financed mass campaigns across 25 states, reflecting both the country's heavy dependence on external funding and the scale of potential local demand.

The assessment found that Nigeria has partial upstream manufacturing capacity, particularly in polyester and polyethylene production, although a techno-economic assessment is required to validate its competitiveness. Critical gaps exist in core processes such as yarn extrusion, knitting, dyeing, and stenting, which remain limited or inconsistently available. While some manufacturers source these processes locally, others rely on imports due to quality or cost considerations. Most local production capacity is centred on insecticide coating rather than impregnation, and downstream processes such as cutting, sewing, and packaging vary from fully manual to partially automated, depending on the manufacturer. Regulatory compliance and quality assurance systems are evolving. Two manufacturers hold Corporate Affairs Commission (CAC) registrations, and one has completed NAFDAC and SON registrations; the others are still in process. WHO Prequalification (PQ) efforts are underway but remain in early stages. Although manufacturers generally adhere to WHO PQ specifications, formal acceptability still requires clarification, and significant strengthening of quality management systems (QMSs) is needed for at least 2 firms.

Key constraints identified include limited capacity for dual-active ingredient (dual-AI) nets, reliance on imported raw materials, high automation costs, and the absence of a national entomological testing laboratory capable of validating insecticides and bioefficacy. Downstream capacity is nearly nonexistent due to donor-managed distribution systems.

Recommendations focused on product selection guidance, technology transfer for dual-AI nets, concessional financing, ECOWAS market harmonization, value-chain localization starting with polymer inputs, workforce development, supply-chain optimization, and regulatory navigation support to accelerate WHO-PQ readiness.

4.3 Current Capacity for Artemisinin-based Combination Therapies (ACTs) Manufacturing in Nigeria

The assessment presented by Pharm. Femi Ogunkoya offered a comprehensive review of Nigeria's institutional capacity for producing Artemisinin-based Combination Therapies (ACTs), combining quantitative data, qualitative analysis, and on-site visits to manufacturers across the country. Although Nigeria is one of the largest consumers of ACTs globally, the assessment found that ACT manufacturing is heavily concentrated in the Southwest, with 64.7% of companies located in the region and 35% clustered in Ogun State alone. Lagos, Oyo, Enugu, Kwara, Imo, Delta, and Ondo also host manufacturers, but the geographic concentration in the Southwest underscores opportunities for targeted infrastructure development, shared utilities, and localized industrial support.

Manufacturers reported persistent structural challenges that constrain production efficiency and limit expansion. These include limited access to foreign exchange, which affects the procurement of APIs, excipients, and packaging materials; weak quality assurance systems that require significant strengthening to meet WHO Prequalification and other stringent regulatory standards; and inadequate financing, particularly the absence of sustainable, affordable capital for facility upgrades, production scale-up, and technology acquisition. Supply chain vulnerabilities were also highlighted, particularly the reliance on imported raw materials and the rising costs of logistics and importation. Workforce gaps, particularly in regulatory affairs, quality control, and pharmaceutical engineering, further contribute to operational inefficiencies.

Despite these challenges, the assessment concluded that Nigeria has a strong foundation for ACT self-sufficiency, with several manufacturers demonstrating the capacity for scalable production and compliance with national regulatory requirements. With coordinated support, Nigeria could evolve into a regional ACT manufacturing hub, supplying West Africa and beyond.

Strategic recommendations from the study include the establishment of a dedicated pharmaceutical intervention fund to address financing barriers, the creation of a "Buy Nigerian" public procurement policy to provide predictable demand and incentivize local production, and the formation of a technical assistance consortium to pool expertise and reduce the cost of accessing WHO Prequalification-level support. Such a consortium would offer shared resources in business analytics, investment planning, technology acquisition, and regulatory compliance, areas where individual firms face considerable constraints.

The session ended with an interactive discussion among participants, focusing on financing mechanisms, regulatory reforms, and opportunities for industry-wide collaboration. Stakeholders emphasized that achieving ACT self-sufficiency will require sustained policy coherence, improved access to forex, strong quality systems, and a coordinated national strategy that aligns government, industry, and development partners.

4.4 Current Capacity for Malaria Rapid Diagnostic Test (RDT) Kits Manufacturing in Nigeria

The assessment presented by Dr Bola Keshinro provided a comprehensive review of Nigeria's current and emerging capacity for local production of Rapid Diagnostic Test (RDT) kits. The study was designed to evaluate manufacturers' institutional readiness using a mixed-methods approach that combined structured questionnaires, facility inspections, and technical verification of installed and underutilized capacity. Seven manufacturers were initially shortlisted, out of which four completed the full assessment process, and three were confirmed to possess functional manufacturing facilities capable of supporting commercial-scale production. Two of these facilities are already NAFDAC-registered, maintain ISO 13485:2016-compliant Quality Management Systems, and are either undergoing or preparing for WHO Prequalification (PQ). A third facility holds the

WHO Expert Review Panel for Diagnostics (ERPD) certification, demonstrating alignment with stringent regulatory expectations.

Despite this regulatory progress, the assessment highlighted significant dependence on imported raw and packaging materials, specifically uncut/cut sheets, cassettes, buffer bottles, sterile lancets, desiccant bags, and associated inserts. Only leaflets, boxes, cartons, and, in some cases, alcohol swabs are sourced locally. This reliance underscores the urgent need for backward integration, especially in the production of uncut sheets and other key components, to reduce costs, improve supply chain resilience, and enhance Nigeria's competitiveness in the global diagnostics market.

Installed capacity projections indicate that by January-Q1 2026, the three leading manufacturers will achieve full commercial operations, collectively offering up to 477 million tests per annum, though with 30–90% unutilized capacity, depending on firm-specific constraints. These constraints include limited access to concessional financing, the absence of automated end-to-end production lines, and continued reliance on imported inputs. Nevertheless, product portfolios across assessed firms are expanding beyond malaria diagnostics to include HIV, hepatitis, tuberculosis, pregnancy tests, and emerging pathogens, reflecting growing technical versatility.

Key recommendations emphasized the inclusion of RDTs in the NAFDAC 5+5 policy to drive demand for locally manufactured products, progressive increases in import duties to protect domestic manufacturers, and donor-funded procurement incentives to support locally certified producers. Additional strategic actions include facilitating access to affordable financing for automation, strengthening QMS and WHO-PQ readiness, and promoting R&D collaboration for future expansion. These recommendations reflect the broader opportunity for Nigeria to build a competitive diagnostics manufacturing ecosystem capable of serving domestic and regional markets.

The session concluded with a discussion on aligning policy, financing mechanisms, and regulatory facilitation to unlock Nigeria's full diagnostic manufacturing potential.

4.5 Current Capacity for Vaccine Production and Clinical Research in Nigeria

The assessment, presented by Prof. Muktar Gadanya of Numora Integrated Services Ltd, examined Nigeria's current capabilities in biomedical research, clinical trials, and vaccine development across several institutions. The review combined interviews, document analysis, and physical visits to six facilities between June and September 2025, offering one of the most detailed national snapshots of the sector to date. The central finding was that Nigeria has a sizeable pool of skilled scientists and several institutes with strong technical infrastructure. Still, these strengths are undermined by systemic barriers that prevent institutions from operating at full capacity. Among the most significant challenges is the lengthy regulatory timeline, with ethics and protocol approvals often taking 18–36 weeks. These delays stem from multiple layers of review, limited coordination among regulatory bodies, and inadequate staffing within research ethics structures. The presentation also revealed major gaps in the ethics framework: about half of the institutions assessed lack a functional Institutional Review Board (IRB), and many

of the existing committees operate without community representation, consistent training, or standard operating procedures.

Infrastructure gaps were also pronounced. Nigeria currently has only one ISO-certified research laboratory, Innovative Biotech, which operates to international quality standards. At the same time, most public institutions lack harmonized quality systems, stable power, and modern equipment needed for advanced biomedical research. This is compounded by weaknesses in supply chain management, including recurrent delays at customs, unreliable cold chain, and the high cost of importing essential materials.

Funding constraints featured prominently. Institutions struggle with inconsistent funding cycles, inflationary pressures, and limited access to long-term financing, problems worsened by policy discontinuity, where four-year political cycles clash with the multi-year timelines required for vaccine development, technology transfer, and clinical trial programmes. Despite these constraints, the assessment highlighted important progress from the private sector. One biotech company has invested over US\$100 million in modular research and manufacturing infrastructure and is advancing a diverse pipeline of vaccine candidates. This demonstrates what is possible when financing, governance, and technical capacity are aligned.

Key recommendations included establishing functional IRBs across relevant research institutions, expanding ISO certification, strengthening regulatory coordination, and improving long-term funding commitment to create an environment that supports sustained R&D growth. The session ended with extensive discussions on harmonizing regulatory processes and expanding public-private partnerships to position Nigeria as a future regional hub for vaccine research and clinical trials.

4.6 Addressing Industry Capacity Gaps through Digital Training and Self-Regulation

The presentation by Washington Dengu of Empower Swiss examined how digital training tools and a strengthened self-regulatory framework can help close persistent capacity and compliance gaps in Nigeria's pharmaceutical manufacturing sector. Building on the gaps already documented within PMG-MAN, the assessment highlighted several longstanding challenges, including limited access to continuous training, inconsistent application of quality systems, and uneven regulatory compliance, which collectively weaken the reliability and competitiveness of locally produced medicines.

Drawing on PMG-MAN's internal audit processes, the presentation noted the association's strong governance culture. PMG-MAN has a well-documented constitution, scheduled elections, active subcommittees, and real-time communication mechanisms that allow members to flag emerging issues quickly. Their voluntary audit programme, built around a detailed cGMP-aligned checklist, has improved internal oversight and reduced the circulation of substandard products. However, gaps remain, especially in formal documentation, standardized training, and harmonized regulatory interpretation. Many manufacturers still struggle with fragmented guidance from different agencies, inconsistent audit expectations, and limited access to updated technical information.

Digital training was presented as a practical solution to these issues. Unlike traditional training, which is often costly and limited in reach, digital platforms can deliver standardized learning modules, ensure routine updates, and promote staff development across the entire industry. A proposed Digital Learning Centre of Excellence would host core modules on regulatory compliance, quality assurance, production processes, and digital literacy. Such a platform would also help create a culture of continuous improvement, where learning feeds directly into better practices, audits, and product quality.

Self-regulation was positioned as the second key pillar. The presentation recommended expanding PMG-MAN's existing programme to include third-party ISO-accredited audits whose outcomes can be formally recognized by NAFDAC. This would support a more structured partnership between industry and regulators while reducing compliance bottlenecks. Additional recommendations included stronger advocacy for policy harmonization, concessional financing for quality upgrades, improved data systems within companies, and specific support for building digital and technical skills among workers.

Overall, the presentation highlighted that strengthened self-regulation, backed by modern digital learning tools, can help Nigeria build a more reliable, responsive, and competitive pharmaceutical manufacturing sector. The session ended with contributions on how these proposals could complement NAFDAC oversight, streamline audits, and enhance PMG-MAN's support to its members.

4.7 Using Technology to Streamline and Strengthen Regulatory Submissions

The presentation by Irene Nwaukwa of Infinity Health Africa, delivered in partnership with PVAC and PMG-MAN, introduced the Document Compliance Engine (DCE), a purpose-built digital system designed to address longstanding challenges in regulatory dossier preparation within Nigeria's pharmaceutical manufacturing sector. The assessment highlighted the persistent issues manufacturers face: fragmented internal processes, incomplete submissions, inconsistent documentation standards, and prolonged approval delays. These gaps contribute to high rejection rates and slow market access, undermining the competitiveness of local manufacturers and delaying the availability of essential medicines. The DCE was developed as a practical response to these challenges. Built on Infinity Health Africa's broader ONBOARD compliance platform, the tool guides manufacturers through a structured, efficient approach to preparing Common Technical Documents (CTDs). The platform brings together three key modules: the Validator, which checks document completeness and alignment with regulatory expectations; the CTD Builder, which organizes and formats information according to required templates; and the Document Management System, which centralizes files, version histories, and supporting evidence. All modules operate within a security-by-design framework that prioritizes data protection, confidentiality, audit trails, and user-level access controls.

Through earlier workshops with PMG-MAN, the DCE team identified recurring industry-wide problems—poor documentation habits, inconsistent templates, and limited

understanding of regulator expectations. These insights informed how the platform was customized for Nigeria, with built-in prompts to reduce errors, improve accuracy, and ensure that dossiers conform to NAFDAC's structure before submission. By catching gaps early, the platform aims to reduce rejection rates, shorten approval timelines, and promote predictable, transparent compliance processes.

Implementation is already well advanced. The first three phases, systems assessment, design, and integration, have been completed, and structured user testing is underway with five manufacturers. After this testing cycle, a formal validation study will be carried out with PMG-MAN members to evaluate real-world performance and refine scoring thresholds and workflow features. The long-term objective is to position the DCE as a shared compliance tool for Nigeria and, eventually, other African countries seeking harmonized dossier formats and faster regulatory reviews.

The session concluded with discussions focused on data security, system access protocols, and regulatory acceptance, particularly how the tool could complement NAFDAC's review processes and support regional harmonization. Participants also emphasized the importance of sustainability planning, user training, and strong governance to ensure the DCE becomes a reliable component of Nigeria's regulatory environment.

4.8 Conclusion of assessment validation sessions 1

Discussions buttressed Nigeria's significant progress in local production infrastructure with notable points on the role of access to finance and harmonized regulation.

5.0 Technical Presentations – Day 2

Day two started with a recap of Day 1's activities by the compère, followed by presentations from the responsible consultants focused on strengthening the regulatory and procurement systems that underpin local manufacturing.

5.1 Regulatory Ecosystem Capacity and Recommendations for Short- and Medium-Term Strengthening

The assessment presented by Dr. Farouq Jega examined the roles, strengths, and capacity gaps of Nigeria's key regulatory bodies involved in the health-commodity value chain. The review covered four major institutions, the Standards Organisation of Nigeria (SON), the Pharmacy Council of Nigeria (PCN), the National Institute for Pharmaceutical Research and Development (NIPRD), and the Nigeria Customs Service (NCS). Using an evidence-based Organizational Capacity Assessment (OCA) tool, the study rated each institution across governance, technical operations, human resources, data systems, technology use, and resource mobilization. The objective was to identify areas where regulatory duplication, infrastructure weaknesses, and operational delays reduce efficiency and affect the quality of malaria-related commodities.

Findings revealed that all agencies have clear mandates and strong legal backing, and each plays an essential role in quality assurance, professional standards, product testing, and import regulation. NIPRD, for instance, is internationally recognized, with ISO/IEC 17025:2017 accreditation and testing certificates accepted in over 120 countries. PCN

maintains robust professional and facility-licensing systems nationwide, while SON operates comprehensive conformity-assessment schemes for both locally manufactured and imported products. The Nigeria Customs Service also remains central to controlling the quality of imported pharmaceutical commodities.

However, the assessment identified several cross-cutting constraints. Many agencies still rely heavily on manual systems, weak IT infrastructure, and fragmented data-management processes, making coordination and information sharing difficult. Laboratory infrastructure across agencies, especially PCN and SON, faces longstanding challenges, including inadequate equipment, unstable power supply, and limited maintenance funding. Centralized operations further slow decision-making and contribute to long turnaround times for inspections, certification, and testing. Funding limitations were a recurring theme, with most agencies unable to sustain capital investments or expand their operational reach. Despite these constraints, the agencies showed considerable technical strength and willingness to collaborate. Stakeholders consistently highlighted the potential of digital tools, mobile laboratories, and more flexible operating models to improve regulatory coverage, especially in underserved areas.

The recommendations emphasized greater inter-agency coordination, harmonized regulatory processes, and the digitalization of core services, including licensing, laboratory information management, certification, and data reporting. Additional priorities included exploring alternative power sources, upgrading laboratory facilities, decentralizing regulatory functions to reduce bottlenecks, and improving resource mobilization to support long-term sustainability.

The session ended with an active discussion on how these reforms could be practically implemented, especially through structured collaboration among agencies, modernized IT systems, and more predictable funding arrangements, to strengthen Nigeria's regulatory environment.

5.2 Harmonizing Clinical Research Standards in Nigeria

Lynn Sase presented the study from Green Fountain. The study highlighted fragmented ethics systems. The assessment by Lynn Sase of Green Fountain examined Nigeria's clinical research ecosystem, focusing on ethics governance, regulatory coordination, data systems, and oversight structures. The study highlighted that Nigeria's growing disease burden and increasing interest from global research sponsors contrast sharply with a regulatory environment that remains fragmented, largely manual, and unpredictable. These challenges slow down research activation, deter investment, and weaken confidence in the national oversight system.

A central finding was the inconsistency and fragmentation of ethics review processes. While the National Health Research Ethics Committee (NHREC) provides national standards, implementation varies widely across Institutional Review Boards (IRBs). Many IRBs lack clear standard operating procedures, have irregular meeting schedules, or operate without dedicated administrative support. The assessment noted that although

several IRBs hold NHREC accreditation, the re-accreditation process is often unclear and poorly communicated, contributing to limited transparency and uneven quality. Duplicate ethics reviews, especially for multi-site studies, were identified as one of the most persistent operational bottlenecks. Approval timelines remain unpredictable across institutions, creating uncertainty for both local and international sponsors. The study also highlighted significant gaps in clinical trial data governance. Safety reporting is inconsistent, trial registration is split across multiple global platforms, and Nigeria lacks a unified national registry. Data accessibility is limited, and reporting procedures differ from one institution to another. Infrastructure challenges compound these problems, including inadequate clinical trial laboratories, limited inspection capacity, and weak digital systems to support monitoring and documentation.

To address these issues, the assessment proposed a harmonized national framework built on coordinated regulatory functions, standardized guidelines, and digital tools. Key recommendations included establishing a centralized electronic submission portal, implementing a lead-IRB model for multi-site studies (with local IRBs providing contextual input), creating a national IRB registry, and setting clear national SOPs and timeline benchmarks. Mandatory Good Clinical Practice (GCP) certification for investigators, monitors, and research staff was strongly emphasized. The presentation outlined a five-phase implementation roadmap, beginning with governance and policy reforms and progressing toward national roll-out, consolidation, and pursuit of international recognition. Success indicators include shorter approval timelines, full compliance with trial registration requirements, increased numbers of accredited IRBs, improved safety-reporting performance, and greater institutional satisfaction among sponsors and investigators.

Participants concluded the session with questions on coordination mechanisms, data transparency, and the practical steps required to integrate digital systems across NAFDAC, NHREC, IRBs, and research institutions.

5.3 Strengthening Procurement Systems for Malaria Supply Chain Efficiency and Demand Generation

The assessment presented by Precious Nwadike of Health Systems Consult Limited (HSCL) examined the operational capacity of Drug Management Agencies (DMAs) and Departments of Pharmaceutical Services (DPS) across Nigeria's states, with a focus on strengthening pooled procurement and supply chain systems for malaria commodities. The study was conducted under the PVAC initiative in collaboration with the National Malaria Elimination Programme (NMEP) and the World Bank, and covered six thematic areas: governance, financing, supply chain operations, warehousing and distribution, human resources, and quality assurance.

Findings showed that most states operate within strong governance and policy frameworks, supported by instruments such as the National Drug Distribution Guidelines (2012) and the National Health Products Supply Chain Strategy (2021–2025). Many states also maintain operational Drug Revolving Fund (DRF) mechanisms and oversight committees that provide structure for pharmaceutical services. However, the level of

functionality varies significantly, with some states maintaining robust governance systems while others struggle with weak coordination, outdated processes, and inconsistent implementation. On financing, the assessment found that while the DRF model is widely recognized as a sustainable mechanism, actual financing still relies heavily on donor support. States continue to face challenges with capital adequacy, delayed stock replenishment, and limited autonomy in financial decision-making.

The supply chain review identified several operational gaps. Facility-level data remain largely manual, resulting in limited end-to-end visibility and limiting the accuracy of forecasting and distribution planning. The national system depends on a hybrid inventory model that connects digital tools at central levels to paper-based reporting at health facilities. Warehousing capacity is another major concern, with many states lacking pharma-grade storage infrastructure that meets Good Distribution Practices (GDP) standards. Weak temperature control, inconsistent monitoring, and limited investments in specialized storage pose risks to commodity quality. Human resources capacity also remains uneven. Only 13 states reported staffing levels that meet operational requirements, while most others face shortages, high attrition, and reliance on ad hoc staff. Training is irregular and largely donor-funded, with few states having structured development plans or continuous professional development systems. Based on these gaps, the assessment recommended digitizing the Logistics Management Information System (LMIS), expanding pooled procurement mechanisms, investing in GDP-compliant warehousing, and strengthening quality assurance structures. Additional priorities included reforming DRF operations, increasing state funding, improving governance arrangements, and building staff capacity through targeted training and succession planning.

The session concluded with contributions from participants focusing on the feasibility of financing reforms, infrastructure investments, and strategies to strengthen governance and accountability across states.

5.4 Conclusion of assessment validation session 2

Day Two concluded with a technical briefing led by Dr Nnenna Mba-Oduwusi, the Program Implementation Lead at PVAC, who provided an overview of the Terms of Reference (ToR) and the expected deliverables that would guide the stakeholder roadmap sessions. Her presentation outlined the purpose of the exercise: to translate the extensive findings from Day One into a practical, sequenced roadmap for advancing local manufacturing and improving supply-chain efficiency for malaria commodities in Nigeria. She emphasized that the roadmap would serve as a jointly owned document to support coordinated implementation across government, industry, and development partners.

Participants were then organized into three technical groups, each representing a thematic area within the value chain. The groups were instructed to identify the top priority issues that must be unlocked to enable progress in their assigned domains. Dr Mba-Oduwusi provided a structured analytical framework that each group was required to use to document their outputs.

For every issue identified, participants were asked to specify the following clearly:

1. **Decision Ownership** – the agency, institution, or stakeholder with the authority to make or validate the required change.
2. **Influencers** – actors with the technical expertise, political leverage, or institutional positioning to shape decisions or accelerate progress.
3. **Legwork Responsibilities** – the teams or institutions expected to carry out the technical, administrative, or operational tasks needed to achieve the desired outcome.
4. **Timeline for Unlocking the Issue** – a realistic period within which the issue could be resolved, considering interdependencies, regulatory processes, and resource constraints.
5. **Challenges and Mitigation Strategies** – anticipated risks (such as funding delays, policy bottlenecks, regulatory complexity, or capacity gaps) and practical strategies to address them.

The session was designed to ensure that each group moved beyond general aspirations to specific, actionable, and time-bound commitments. By combining decision pathways with practical risk-mitigation plans, the exercise aimed to generate a roadmap that is both ambitious and grounded in operational reality.

The outputs from the three groups formed the basis for the consolidated roadmap presented at the closing plenary and will inform PVAC's implementation priorities going forward.

5.4.1 Strategic Roadmap Development (Group Sessions)

Participants were split into three technical working groups:

- **Group 1:** Roadmap for Improved Manufacturing of Malaria Commodities (ACTs, APIs, RDTs, LLINs, Vaccines).
Chairperson: Prof. Joseph Fortunak
- **Facilitators:** Mr Matthew Attah, Mr Mopa Esuga, Dr Bola Keshinro, Mr Ibrahim Al-Hassan, Mr Femi Ogunkoya
- **Group 2:** Roadmap for Strengthened Regulatory Landscape for Manufacturing and Clinical Research.
Chairperson: Pharm. Uche Sonny-Afoekelu (NAFDAC)
Facilitators: David Washington, Irene Nwaukwa, Dr Farouk Jega, Mrs Olasubomi Temitope Chukwu
- **Group 3:** Roadmap for Strengthened Procurement Systems for Malaria Supply Chain Efficiency and Demand Generation.
Chairperson: Dr Jude Nwokike (USP)
Facilitators: Precious Nwadike, Neimatu Adjabui

All the groups identified issues hindering the progress of the local pharmaceutical manufacturing landscape and suggested ways to address them. The outputs from this session will feed into the overall implementation roadmap.

6.0 Presentation and Agreement on Next Steps - Day 3

Each group from the previous roadmap development sessions presented its roadmap to the plenary for collective review and harmonization. Consensus was reached on the following key next steps:

6.1 Summary of Group 1 - Manufacturing of Malaria Commodities

The group identified investment, guaranteed demand, and access to affordable capital as the top enablers Group 1 focused on the manufacturing pillar of the malaria value chain and identified investment, guaranteed multi-year demand, and access to affordable capital as the three most important enablers for expanding local production of malaria commodities. Participants emphasized that without predictable uptake and access to long-term financing, manufacturers cannot justify major upgrades in technology, quality systems, or production capacity. The group outlined three priority areas to strengthen the domestic manufacturing ecosystem. The first is the establishment of a national API testing and quality laboratory capable of verifying the identity, potency, purity, and physicochemical properties of APIs—whether locally produced or imported. Such a facility, which is not excessively expensive to set up, would reduce a major risk to current and future production and support manufacturers preparing for WHO Prequalification. The second priority area is the development of a central research, development, and training laboratory that would provide industry-wide access to equipment and expertise that individual companies cannot afford on their own. This shared facility would support process development, troubleshooting, staff training, and the development of new manufacturing technologies. The third is the creation of a pilot plant to support API scale-up, engineering optimization, and the production of small batches of potent APIs. This capacity would help seed multiple API programs across Nigerian manufacturers and reduce dependence on imports.

Across product categories: diagnostics, treatments, and prevention, the group recommended a phased approach to backward integration. For RDTs, a 12-month target was set for in-country assembly using imported key starting materials (KSMs), with 24-month goals for local KSM production and WHO Prequalification. For APIs, the group proposed validating synthesis for four priority APIs within 12 months, completing registration batches, and achieving WHO PQ readiness within 24 months. Similar timelines were proposed for LLINs, with in-country assembly targeted for 12 months and backward integration and WHO PQ readiness expected within 24–36 months.

Participants also raised broader concerns affecting manufacturing, including the cost and reliability of power, transport, customs processes, taxation, and access to industrial land. They stressed the need for technology transfer agreements, fiscal incentives, duty exemptions, and support for the implementation of the PVAC Executive Order to create an enabling environment for scale-up. Finally, the group noted the importance of revisiting earlier decisions on R21 vaccine manufacturing, creating shared infrastructure to support SMEs, and ensuring that all products ultimately meet WHO PQ standards.

6.2 Summary of Group 2 - Regulatory and Clinical Research Technical Working Group

Group 2 examined the regulatory and clinical research landscape and identified four major constraints that must be resolved to strengthen oversight, improve efficiency, and create an enabling environment for local manufacturing and clinical research. The discussion centred on regulatory overlap, high compliance costs, inefficiencies in product registration, and concerns about the quality of LLINs circulating in the market.

The first issue identified was the overlapping mandates among key regulatory agencies, including NAFDAC, SON, PCN, MLSCN, and NIPRD. Manufacturers, particularly in diagnostics, described the burden of registering the same product with multiple agencies, each assigning a separate certification number. This duplication leads to delays, unpredictability, and additional costs. SON clarified during the discussion that its role is to set and certify standards for engineering-related medical devices, not to regulate pharmaceuticals directly, indicating that misinterpretations of agency roles also contribute to the problem. Proposed solutions included high-level ministerial coordination, clear policy directives to decompartmentalize agency roles, and a long-term legislative review to harmonize enabling Acts. A realistic timeline of 3 months was suggested for immediate policy clarification, with 12 months for legislative harmonization.

The second issue was the high cost and complexity of regulatory compliance. Manufacturers noted burdensome expenses associated with upgrading equipment, meeting facility standards, implementing serialization systems, and conducting required bioequivalence (BE) studies costs that are especially unmanageable for SMEs. The lack of advanced analytical equipment, such as LCMS, in Nigeria forces companies to outsource BE studies abroad at high cost. Proposed mitigation measures included establishing financing mechanisms, supporting partnerships for shared analytical infrastructure, and improving access to concessional credit through BOI and other institutions.

The third issue concerned inefficient and unclear registration processes. Stakeholders highlighted long, unpredictable approval timelines and limited transparency in digital submission platforms. Participants recommended a unified digital portal, synchronized multi-agency review sessions, and stronger collaboration between regulators and industry groups to streamline processes.

The fourth issue addressed was the poor quality and usability concerns of LLINs. Reports included pungent smells, discomfort in poorly ventilated spaces, and widespread pyrethroid resistance. Recommended actions included improved certification procedures, stronger post-market surveillance, and enhanced community awareness and training on proper use.

Across all issues, participants emphasized the importance of political will, financing, digital infrastructure, and capacity-building for both regulators and manufacturers. The session concluded with a call for coordinated reforms to strengthen Nigeria's regulatory environment and clinical research ecosystem.

6.3 Summary of Group 3 - Procurement and Supply Chain Technical Working Group

Group 3 focused on market access, pooled procurement, and supply chain strengthening as critical levers to expand the uptake of locally manufactured malaria commodities. The group highlighted that although Nigeria has growing domestic production capacity for ACTs, RDTs, and LLINs, limited market access and fragmented procurement systems continue to constrain scale-up. Participants agreed that without deliberate policy alignment and structured demand guarantees, manufacturers, particularly SMEs, cannot plan production efficiently or invest in quality upgrades.

The group discussion centred on three timelines: short-term (0–12 months), medium-term (12–24 months), and long-term (24–36 months). In the short term, the most urgent priority identified was the activation and strengthening of state-level procurement mechanisms to ensure that DMAs and DPS can purchase locally manufactured commodities in a predictable, transparent manner. Achieving this requires improved capacity for state procurement units, better coordination between national and state actors, and the enforcement of existing policies supporting local sourcing. A second short-term priority was improving data transparency and visibility across procurement and supply chain systems. Many states operate manual or semi-digital processes, making it difficult to consolidate demand, track consumption, or plan procurement cycles.

In the medium term, the group emphasized the need to standardize warehousing practices and to ensure that state storage facilities move toward compliance with Good Distribution Practices (GDP). This also includes investments in temperature control, racking, tracking tools, and routine quality checks. A second medium-term action is the digitalization of the Logistics Management Information System (LMIS) to facilitate end-to-end visibility, reduce reporting delays, and support more accurate quantification.

Participants also highlighted the importance of strengthening quality assurance systems to ensure that locally manufactured commodities meet required standards throughout the distribution chain. Long-term strategies focused on integration into regional and global supply networks, positioning Nigeria's manufacturers as reliable suppliers to neighbouring countries and donor programmes. Achieving this would require donor policy reforms that encourage or mandate local sourcing where feasible, alongside predictable off-take agreements and mechanisms that reduce procurement fragmentation across states.

Throughout the discussion, participants emphasized that financing reforms, DRF efficiency, and public–private partnerships are essential enablers. Without improved state financing, reliable DRF systems, and structured collaboration with the private sector, procurement and supply chain reforms would not achieve the desired scale.

The session concluded with reflections on practical next steps to strengthen governance, improve procurement transparency, and create a more supportive market environment for locally produced malaria commodities.

7.0 Closing Session

Dr Ogbulafor, the National Coordinator of NMEP, delivered the closing remarks. She appreciated the active participation and the technical depth of discussions. She reaffirmed PVAC's commitment to working with PVAC and partners to translate the roadmap into tangible manufacturing and regulatory outcomes. Acknowledgement was given to every dignitary present.

Annexes

Annex 1: Workshop Agenda

Stakeholder Workshop – Enhancing Local Manufacturing and Supply Chain for Malaria Health Commodities.

Bolton White Hotel. October 8-10, 2025.

Agenda

Time	Activities	Responsible Parties
Day One (Wednesday, 8th October 2025)		
8:45 am - 9:00 am	Registration (In-person and virtual participants)	All participants
9:00 am - 9:15 am	Welcome Address	Dr. Abdu Mukhtar: National Coordinator PVAC
	Opening Remarks	Dr. Nnenna Ogbulafor: National Coordinator – NMEP
	Goodwill messages	Professor Mojisola Adeyeye: DG-NAFDAC Dr. Mathew A. Verghis: Country Director-World Bank (Nigeria Country Office)
9:15 am - 9:30 am	Workshop objectives and deliverables	Dr. Philip Okoko: Director/Program Manager – NMEP IMPACT
9:30 am - 10:00 am	Current Capacity for Active Pharmaceutical Ingredients (APIs) Manufacturing in Nigeria	Mr. Mopa Esuga
10:00 am - 10:30 am	Reflections on findings from the API assessment	Professor Adeyeye, Dr Jude Nwokike, and Joseph Fortunak
10:30 am - 11:00 am	Q & A, brief comments.	
11:00 am - 11:30 am	Tea Break	
11:30 am - 12:00 pm	Current Capacity for Long-Lasting Insecticide-Treated Nets (LLINs) Manufacturing in Nigeria	Mr. Babatunji Odelola
12:00 pm - 12:30 pm	Current Capacity for Artemisinin-based Combination Therapies (ACTs) Manufacturing in Nigeria	Pharm. Femi Ogunkoya
12:30 pm - 1:00 pm	Q & A, brief comments on LLIN and ACT presentations	

Time	Activities	Responsible Parties
1:00 pm - 1:30 pm	Current Capacity for Malaria Rapid Diagnostic Test Kits (RDT) Manufacturing in Nigeria	Dr. Bola Keshinro
1:30 pm - 2:00 pm	Current Capacity for Vaccine Production and Clinical Research in Nigeria	Prof. Muktar Gadanya
2:00 pm - 2:30 pm	Q & A, brief comments on RDT and Vaccine Production & Clinical research	
2:30 pm - 3:20 pm	Lunch break	
3:20 pm - 3:50 pm	Addressing Industry Capacity Gaps through Digital Training and Self-Regulation	Sakhile Dube
3:50 pm - 4:20 pm	Using Technology to Streamline and Strengthen Regulatory Submissions	Irene Nwaukwa
4:20 pm - 4:50 pm	Q & A, brief comments.	
4:50 pm - 5:00 pm	Closing remarks for Day 1.	
Day Two (Thursday, 9th October 2025)		
8:45 am - 9.00 am	Welcome and review of Day 1	Rapporteur
9:00 am - 9:30 am	Current Regulatory Ecosystem Capacity and Recommendations for Short- and medium-term strengthening.	Dr. Farouk Jega
9:30 am - 10:00 am	Harmonizing Manufacturing Standards for Malaria Commodities in Nigeria	Dr. Chibuikwe Ogbonnaya
10:00 am - 10:30 am	Q & A, brief comments	
10:30 am - 11:00 am	Tea Break	
11:00 am - 11:30 am	Harmonizing Clinical Research Standards in Nigeria	Lynn Sase
11:30 am - 12:00 pm	Strengthening Procurement Systems for Malaria Supply Chain Efficiency and Demand Generation	Precious Nwadire
12:00 pm - 12:30 pm	Q & A, brief comments	All

Time	Activities	Responsible Parties
12:30 pm – 1:00 pm	General comments and discussions	All
Core Technical Sessions: Strategic Roadmap for Enhancing Local Manufacturing and Supply Chain Management for Health Commodities and Supplies in Nigeria		
1:00 pm – 1:15 pm	Overview of ToR and deliverables for the technical session	Dr. Nnenna Mba-Oduwusi: Program Implementation Lead – PVAC.
1:15 pm – 3:15 pm	<p><u>Technical Group 1:</u> Roadmap for Improved Manufacturing of Malaria Commodities (ACT, API, RDTs, LLINs, and vaccines).</p> <p>Chairperson: Dr. Joseph Fortunak, Professor of Chemistry and Pharmaceutical Sciences, Howard University.</p> <p>Facilitators: Mr. Matthew Attah, Mr. Mopa Esuga, Dr. Bola Keshinro, Mr. Ibrahim Al-Hassan, and Mr. Femi Ogunkoya</p> <p><u>Technical Group 2:</u> Roadmap for strengthened regulatory landscape for the manufacturing of malaria health commodities and clinical research.</p> <p>Chairperson: Pharm. Mrs. Uche Sonny-Afoekelu, Director, Drug Registration and Regulatory Affairs, NAFDAC.</p> <p>Facilitators: Sakhile Dube, Irene Nwaukwa, Dr. Farouk Jega, Dr. Chibuike Ogbonnaya, Mrs. Olasubomi Temitope Chukwu.</p> <p><u>Technical Group 3:</u> Roadmap for strengthened procurement systems for malaria supply chain efficiency and demand generation.</p>	All participants

Time	Activities	Responsible Parties
	<p>Chairpersons: Dr Jude Nwokike, VP, Supply Chain Resilience, USP.</p> <p>Facilitators: Precious Nwadire and Neimatu Adjabui</p>	
3:15 pm - 4:15 pm	Lunch break	
4:15 pm - 4:30 pm	Closing remarks for Day 2	Dr. Nnenna Mba-Oduwusi: PVAC
Day Three (Friday, 10th October 2025)		
8:45 am - 9:00 am	Welcome and review of Day 2	Rapporteur
9:00 am - 10:30 am	Continuation of strategic roadmap development	All
10:30 am - 11:00 am	Tea Break	
11:00 am - 1:30 pm	Presentation and joint review of plans from all groups	All
1:30 pm - 2:30 pm	Lunch Break	
2:30 pm - 3:00 pm	Agreement on next steps	PVAC and NMEP
3:00 pm - 3:30 pm	Closing remarks and vote of thanks	Dr. Philip Okoko: Director/Program Manager – NMEP

Annex 2: Attendance

S/N	Name of Participant	Organization
1	Abiola Tomisin	Access-Centric Foundation
2	Linus Odoemele	Africa Resource Centre for Excellence in Supply Chain Management (ARC-ESM)
3	Dr. Abiodun Oyenuga	Africa Resource Centre for Excellence in Supply Chain Management (ARC-ESM)
4	Emmanuelle Owolabi	Access-centric and Sustainability Foundation (ASF)
5	Matthew Attah	Access-centric and Sustainability Foundation (ASF)
6	Everest Okeakpu	Bio-vaccines Nigeria Limited (BVNL)
7	Dr. Isa Adamu	Capacity Connect Limited (CCL)
8	Yakubu Jibrin	Capacity Connect Limited (CCL)
9	Fatima Mai	Capacity Connect Limited (CCL)
10	Dr. Ojukwu Maria	Capacity Connect Limited (CCL)
11	Amina Baba Manu	Capacity Connect Limited (CCL)
12	Farouk Jega	Capacity Connect Limited (CCL)
13	Tasallah Chibok	Capacity Connect Limited (CCL)
14	Ibrahim Tajudeen O.	Country Coordination Mechanism (CCM)- Global Fund
15	Taiwo Olubayode	Country Coordination Mechanism (CCM)- Global Fund
16	Malid Hamza	Centre for Democratic Research- Bayero University, Kano (CDR-BUK)
17	Dozie Nwafor	Clinton Health Access Initiative (CHAI)
18	Enitan Odeyemi	CODIX Group
19	Pharm. Karo Otuorimuo	CODIX Group
20	Kim Johkim	CODIX Group
21	Dr. Bola Olatunbosun	Consultant
22	Pharm. Kim Jerimba	Plateau State Drug Management Agency (DMA)
23	Washington Dengu	Empower Swiss
24	Omole Josiah	Empower Swiss
25	Sunday Agameh	Emzor Pharmaceutical Industries Limited
26	Onude Emmanuel Chinonso	Federal Ministry of Industry, Trade & Investment (FMITI)
27	Mayellanus Tamiya	Federal Ministry of Industry, Trade & Investment (FMITI)
28	Yakubu Bulama	Federal Ministry of Health and Social Welfare – Food and Drugs Services Department (FMoH / FDS)
29	Dr. Leke Ojewale	Federal Ministry of Health and Social Welfare / Sector Wide Approach Coordination Office (FMoH / SWAP)
30	Sani Bello	Forum of Health Commissioners
31	Lynn Sase	Green Fountain Limited
32	Halim Linda	HAFUAC
33	Martins Awofisayo	Harvestfield Industries Limited
34	Dr. Joseph Fortunak	Howard University

35	Amarachi Okeke	Health Systems Consult Limited (HSCL)
36	Dr. Kitan Bilajone	Health Systems Consult Limited (HSCL)
37	Vera Niniola	Health Systems Consult Limited (HSCL)
38	Uchenna Aja	Health Systems Consult Limited (HSCL)
38	Obih Onyinyechi	Health Systems Consult Limited (HSCL)
40	Precious Nwadire	Health Systems Consult Limited (HSCL)
41	Prince Azu-Okeke	Health Systems Consult Limited (HSCL)
42	Ebowe Blessing	Health Systems Consult Limited (HSCL)
43	Eunice Dam	Health Systems Consult Limited (HSCL)
44	Chiagozie Mgbemena	Institute of Human Virology Nigeria (IHVN)
45	Babatunde Oladele	Institute of Human Virology Nigeria (IHVN)
46	Deborah Tommy	Infinity Health Africa
47	Moses Asuquo	Infinity Health Africa
48	Irene Nwaukwa	Infinity Health Africa
49	Aisha Adam Abdullahi	Kano Independent Research Centre Trust (KIRCT)
50	Hamisu Salihu	Kano Independent Research Centre Trust (KIRCT)
51	Imran Nasir Tukur	Kano Independent Research Centre Trust (KIRCT)
52	Abu James	Malaria Consortium
53	Femi Ogunkoya	MedRealm Pharmaceuticals and Consulting Limited
54	Babatunde Fagbemi	MedRealm Pharmaceuticals and Consulting Limited
55	Atsen Nyam	MedRealm Pharmaceuticals and Consulting Limited
56	Dr. Timothy Bamgboye	National Agency for Food and Drug Administration and Control (NAFDAC)
57	Kalat Musa	National Agency for Food and Drug Administration and Control (NAFDAC)
58	Bankole Ezebuilo	Association of Industrial Pharmacists Nigeria (NAIP)
59	Bachi Kirum	National Agency for Science and Engineering Infrastructure (NASENI)
60	Victoria Anumele	New Vale
61	Yabalu Abacha	The Nigeria Governors Forum (NGF) Secretariat.
62	Dr. Sabdat Ekama	Nigerian Institute of Medical Research (NIMR)
63	Dr. Mercy Aboh	National Institute for Pharmaceutical Research and Development (NIPRD)
64	Dr. Olayemi O.J.	National Institute for Pharmaceutical Research and Development (NIPRD)
65	Dr. M. Ekpenyong	National Institute for Pharmaceutical Research and Development (NIPRD)
66	Pharm. Alhassan Ibrahim	Numora Integrated Services Limited (NISL),
67	Prof Muktar Gadanya	Numora Integrated Services Limited (NISL),
68	Dr. Aminu Muhammad Haruna	National Malaria Elimination Programme (NMEP)
69	Bolaji Aduagba	National Malaria Elimination Programme (NMEP)
70	Dorothy Ezeokpube	National Malaria Elimination Programme (NMEP)

71	Nnenna Ogbulafor	National Malaria Elimination Programme (NMEP)
72	Mkoyo Ogar	National Malaria Elimination Programme (NMEP)
73	Anita Oyadongha	National Malaria Elimination Programme (NMEP)
74	Celine Onuoaloro	National Product Supply Chain Management Programme (NPSCMP)
75	Danielle C.	Program for Appropriate Technology in Health (PATH)
76	Lisa Smith	Program for Appropriate Technology in Health (PATH)
77	Ekpeme Obi	Program for Appropriate Technology in Health (PATH)
78	Rabiat H. Ahmed	Program for Appropriate Technology in Health (PATH) MACEPA
79	Tari Lawson	Program for Appropriate Technology in Health (PATH)/MACEPA
80	Molade Osekafore	Pharmacy Council of Nigeria (PCN)
81	Nakris A. Ishaku	Pharmacy Council of Nigeria (PCN)
82	Mimidoo Amaze	Purpose-Africa
83	Abdul Muktar	Presidential Initiative for Unlocking the Healthcare Value Chain (PVAC)
84	Babani Garba	Presidential Initiative for Unlocking the Healthcare Value Chain (PVAC)
85	Muhammad Ghali	Presidential Initiative for Unlocking the Healthcare Value Chain (PVAC)
86	Chinemerem Chukwukere	Presidential Initiative for Unlocking the Healthcare Value Chain (PVAC)
87	Dorcas Igonor	Presidential Initiative for Unlocking the Healthcare Value Chain (PVAC)
88	Oranfe Lamba	Presidential Initiative for Unlocking the Healthcare Value Chain (PVAC)
89	Augustine Odah	Presidential Initiative for Unlocking the Healthcare Value Chain (PVAC)
90	Stephen Adebayo	Presidential Initiative for Unlocking the Healthcare Value Chain (PVAC)
91	Muhammad Balarabe	Presidential Initiative for Unlocking the Healthcare Value Chain (PVAC)
92	Dr Nnenna Mba-Oduwusi	Presidential Initiative for Unlocking the Healthcare Value Chain (PVAC)
93	Olufunke Falade	Presidential Initiative for Unlocking the Healthcare Value Chain (PVAC)
94	Maryam Modibo	Presidential Initiative for Unlocking the Healthcare Value Chain (PVAC)
95	Felix Obi	Research 4 Development (R4D)
96	Ama Abdulsalam	Research 4 Development (R4D)
97	Dr. Bola Keshinro	Consultant
98	Kizito Obilom	Swiss Pharmaceuticals Limited (SWIPHA)
99	Abba Umar J	Standards Organization of Nigeria (SON)

100	Dr. Chidi Ogham	Standards Organization of Nigeria (SON)
101	Professor Kunle Olabayo	Standards Organization of Nigeria (SON)
102	Nurudeen Abubakar	Sproxil
103	Samson Fasoyo	Sector-Wide Approach (SWAP) Coordination Office
104	Rahina Lamido	The Capacity Connect Limited
105	Terhemba Daka	The Guardian Newspaper
106	Ibrahim Malami	Usman Dan Fodio University Sokoto State (UDUS)
107	Dr. Ochuwa A. Bibah	Centre for Clinical Trials and Implementation Science - University of Lagos (CCTRIIS-UNILAG)
108	Neimatu D. Adjabui	United States Pharmacopeia (USP)
109	Jude Nwokike	United States Pharmacopeia (USP)
110	Mopa Esuga	United States Pharmacopeia (USP)
111	Olukayode Odegbami	Vestergaard
112	Onoriode Ezire	The World Bank (WB)
113	Dr. Francis Ukwuije	World Health Organization (WHO)
114	Osundayo Hagi	World Health Organization (WHO)
115	Lynda Ozor	World Health Organization (WHO)
116	Magdalene Juna	Private participant
117	Bolaji Akala	InSight Health Group
118	Mubarak Ahmed	InSight Health Group
119	Tochukwu Osuji	InSight Health Group
120	Charles Adeniyi	InSight Health Group
121	Tosin Adeniyi	InSight Health Group
122	Christian Ezeh	InSight Health Group
123	Angel Nduluo	InSight Health Group

Annex 3: Workshop in Pictures

Day One in Pictures



Day Two in Pictures



Day Three in Pictures

