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Review Article

Strengthening Nigeria's Vaccine And Therapeutics Industry: The Role Of Leadership, Policy Alignment, Good Governance, And Industrial Incentives In Advancing Sustainable Development

Charity Anoke[1]*

[1]*Ebonyi State University, Abakaliki Bright C. Orji Texila University*

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ABSTRACT

Nigeria's heavy reliance on imported vaccines and medicines exposes weaknesses in governance, strategic planning, and manufacturing capacity, increasing the vulnerability to pandemics and disease outbreaks. More than 70% of pharmaceuticals and almost all vaccines used nationally are sourced from abroad, creating risks to security and resilience, demonstrated the COVID-19 pandemic and Lassa fever outbreaks. Although the country hosts over 170 pharmaceutical manufacturing facilities with market value of USD 1.84 billion in 2025 and a projected growth rate of 6.4% through 2030, production remains constrained by fragmented systems, weak coordination, and research investment of 0.02% of GDP. This study examines the disconnect between policy commitments and implementation using institutional mapping, policy review, and evidence from India, Senegal, Brazil, and South Africa. The analysis identifies fragmentation, inadequate coordination across institutions, limited access to foreign exchange, weak investment incentives, and operating environment as constraints to industry growth. Despite more than 170 registered manufacturers, largely medium-sized firms supplying about 30% of the domestic market, production capacity remains inadequate, while difficult macroeconomic conditions have contributed to the withdrawal of multinational pharmaceutical companies. The study presents an integrated governance framework consistent with the African Union's vaccine manufacturing agenda and the WHO roadmap for local production. It proposes coordinated fiscal, regulatory reforms, innovation ecosystems, blended financing mechanisms, and stronger policy alignment. By aligning health, industrial, and investment policies, the framework provides a pathway to reduce import dependence, strengthen pharmaceutical resilience, stimulate economic development, and advance the African Union's target of producing 60% of vaccines locally by 2040.

***Corresponding Author:** Charity Anoke
Address: *Ebonyi State University, Abakaliki Bright C. Orji Texila University*
Email ✉: charity2ifeyinwa@gmailcom

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INTRODUCTION

Nigeria's continued dependence on imported vaccines and therapeutics, despite its sizable domestic market, policy commitments, and industrial footprint, exemplifies broader failures in leadership continuity, regulatory cohesion, and institutional governance. The COVID-19 pandemic highlighted deep inequities in vaccine access, with less than 10% coverage in Africa compared to over 85% in high-income countries (Africa CDC, 2021). Nigeria's response capacity was limited by fragmented regulatory system and poor intersectoral integration, despite over 170 licensed pharmaceutical manufacturers with about 30% market share. These limitations stem not only from resource constraints but from non-convergent governance structures. While national strategies like the National Drug Policy (2016), National Vaccine Policy (2017), and the National Development Plan (2021–2025) express ambitions for self-reliance, they remain disconnected from practical implementation mechanisms, institutional mandates, and fiscal frameworks.

This study investigates Nigeria's prospects for achieving pharmaceutical sovereignty by exploring the interplay between leadership reform, governance innovation, and sustainable industrial development. Grounded in policy coherence theory and comparative analysis, it aims to articulate a nationally contextualized framework for public–private collaboration, innovation system alignment, and strategic incentive reengineering. The study creates pathways for academic think tanks (e.g., NIPRD, NESG) and international bodies (e.g., UNIDO, AUDA-NEPAD) to collaborate on targeted industrial diagnostics and performance reforms. *See list of Acronyms*

Objectives of the Study

1. To interrogate international models of pharmaceutical manufacturing that demonstrate effective political leadership, regulatory harmonization, and inclusive industrial policy.
2. To critically assess Nigeria's institutional fragmentation and propose governance mechanisms for intersectoral integration.
3. To evaluate fiscal and non-fiscal incentives through a governance lens and recommend strategic reforms that encourage private sector engagement.
4. To identify and map innovation ecosystems with an emphasis on leadership capacity, institutional networks, and sustainable development outcomes.

This research introduces an applied governance, industry and health nexus model, useful for academic curriculum development in public policy and global health. It carries strategic relevance for policymakers, development partners, and scholars. From a governance perspective, it addresses structural inefficiencies inhibiting Nigeria's vaccine production and proposes reforms to enhance transparency, coordination, and stakeholder accountability. The study advances national goals for epidemic preparedness and contributes to the African Union's objective of manufacturing 60% of vaccines locally by 2040. Industrially, it presents a coherent roadmap for diversifying Nigeria's economy, reducing the ₦1.5 trillion annual import bill on pharmaceuticals, and enabling sustainable job creation through technology-driven manufacturing. Academically, it introduces a holistic framework that combines leadership theory, innovation systems, and policy coherence, offering new directions for implementation research and comparative health governance.

The review highlights the disconnect between development spending and local manufacturing outcomes. Empirical and policy literature widely acknowledges Nigeria's underperformance in pharmaceutical manufacturing, attributing it to high production costs, poor infrastructure, and regulatory inefficiencies (Uzochukwu et al., 2018; Olugbenga et al., 2017) and lack of government support. While strategic policies such as the National Drug Policy (2021) propose ambitious targets, their actualization is impaired by budgetary inconsistencies and fractured leadership mandates. According to the OECD's framework for policy coherence (2018), integrated planning and accountable leadership are prerequisites for successful sectoral reform. Donor-centric procurement standards and exclusionary regulatory practices have marginalized local producers, undermining long-term sustainability (PATH, 2021; WHO, 2019). By examining successful models from India and Brazil, this study emphasizes the centrality of visionary leadership and inter-agency coordination in driving innovation and scaling production. Moreover, literature gaps persist regarding Nigeria's incentive architecture and its role in attracting private investment; this research addresses that by proposing scalable, governance-friendly reform measures. The absence of inclusive governance involving academia, manufacturers, and regulatory bodies is highlighted as a barrier to biopharma innovation and self-reliance.

Synthesized reviews from most of the authors above affirm that policy coherence and strategic stewardship are prerequisites for scale. This literature gap informs the study's call for governance reforms that incentivize academia, manufacturers, and regulators to co-create sustainable production pipelines.

Materials and Method

This study utilizes a synthesis review method, combining policy analysis and cross-sectoral institutional mapping to uncover governance dynamics and strategic misalignments in Nigeria's pharmaceutical landscape. Best practices from India, Senegal, Brazil, and South Africa are examined through a comparative governance lens to construct a contextual implementation framework. Data sources include validated reports, policy instruments, and stakeholder feedback, evaluated for consistency, alignment, and sustainability impact. The approach emphasizes governance principles such as accountability, responsiveness, and institutional integration, contextualized within the recommended African Union's PAVM roadmap and WHO's 2025–2035 framework for vaccine self-reliance.

Results and Discussions

The results are discussed based on the objectives of the study.

Objective 1: To interrogate international models of pharmaceutical manufacturing that demonstrate effective political leadership, regulatory harmonization, and inclusive industrial policy.

Table 1: Nigeria vs. Peer Models in Pharma Manufacturing

Country	Governance Model	Policy Coherence	Incentive Alignment	GMP Certification Rate	Key Strengths
Nigeria	Fragmented inter-ministerial setup	Low	Inconsistent	3.3% (5/150 firms)	Large market, strong private sector
India	Centralized policy coordination	High	Robust fiscal & R&D	>70%	Export scale, R&D institutions
Senegal	Public–private vaccine initiative	Moderate–High	Donor-backed	Prequalified facility	mRNA investment, AUDA–NEPAD support
South Africa	Strategic PPPs with WHO & Aspen	High	Industrial–health link	WHO recognized hubs	Fill-finish capacity, policy clarity

International models of pharmaceutical manufacturing reveal distinct patterns of success when grounded in visionary political leadership, regulatory coherence, and inclusive industrial policy. India’s Serum Institute, a globally recognized vaccine producer, benefited from robust government support, targeted subsidies, and centralized coordination between public R&D institutions and industrial stakeholders (Chaturvedi et al., 2016; WHO, 2022). The Indian government’s facilitation of WHO prequalification processes and investment in public procurement frameworks underscores the role of leadership in shaping sustainable pharmaceutical ecosystems.

Senegal's Institut Pasteur de Dakar demonstrates the effectiveness of intergovernmental partnerships and donor alignment. Supported by Gavi and CEPI, Senegal operationalized coherent industrial-health policy linkages through mRNA platform deployment and rapid vaccine fill-and-finish capacity (Sarr, 2024; Africa CDC, 2021). In contrast, Nigeria's fragmented and poorly synchronized regulatory landscape has hampered its transition from policy ambition to manufacturing reality (UNIDO, 2011).

South Africa's Aspen Pharmacare emerged as a COVID-19 response hub via coordinated leadership between the government and the private sector, illustrating the importance of regulatory harmonization and procurement guarantees (Kaplan & Pegus, 2021). These models contrast with Nigeria’s experience, where the closure of the Federal Vaccine Laboratory in the 1990s and the sluggish rollout of Biovaccines Nigeria Ltd. reflect leadership discontinuity and a lack of strategic policy convergence (Health Policy Watch, 2021).

This implies that Nigeria must develop a governance framework that embeds leadership accountability, regulatory streamlining, and industrial integration to replicate the successes of India, Senegal, and South Africa. Without coordinated policy stewardship, industrial aspirations will continue to falter.

Objective 2: To critically assess Nigeria's institutional fragmentation and propose governance mechanisms for intersectoral integration.

Empirical studies reveal that Nigeria's pharmaceutical policy architecture operates in silos, with limited inter-ministerial coordination among the Federal Ministry of Health (FMOH), Ministry of Industry, Trade and Investment (FMITI), and Ministry of Science, Technology and Innovation (FMSTI). As Onwujekwe et al. (2022) and Eze et al. (2023) note, fragmented institutional mandates dilute accountability and obstruct implementation efficiency. While regulatory bodies like NAFDAC, SON, and PCN aim to support drug quality, they lack shared governance protocols and digital integration platforms.

In 2025, Development Research and Projects Centre (dRPC) further identifies delays in disbursement under the BHCPF and procurement practices that exclude local manufacturers, accentuating policy incoherence and governance misalignment. Comparative analysis with Brazil's Fiocruz model, where academia, industry, and regulators function under a unified public governance umbrella, highlights the absence of systemic synergy in Nigeria (Ussai et al., 2022).

Akinbami and Bello (2021) argue that Nigeria's health policies rarely engage industrial counterparts during formulation, resulting in misaligned incentives and duplication of efforts. The lack of a central coordinating entity exacerbates institutional drift and weakens long-term planning.

The implication of these results is that the establishment of a National Pharmaceutical Coordination Council (NPCC), as recommended in this study, would enable integrated leadership, policy coherence, and operational transparency, elements necessary for achieving pharmaceutical sovereignty and sustainable development.

Objective 3: To evaluate fiscal and non-fiscal incentives through a governance lens and recommend strategic reforms that encourage private sector engagement.

Nigeria's fiscal and non-fiscal incentive landscape remains under-optimized for stimulating private sector investment. While the 2024 Executive Order removed tariffs on pharmaceutical inputs, the country still grapples with high interest rates (26%+) and limited access to FX liquidity (Stren & Blan, 2024). Obukohwo et al. (2018) show that most Nigerian firms operate under decreasing returns to scale due to poor capital productivity and constrained innovation funding. ACPN (2023) stresses the need for deliberate regulatory support to help manufacturers achieve GMP certification.

Despite the creation of a ₦100 billion pharmaceutical fund, policy opacity and bureaucratic hurdles have dissuaded private investors. Adigwe (2021) highlights that nearly half of surveyed industry stakeholders perceive Nigeria's policy environment as hostile to pharmaceutical growth, citing unclear tax structures and unsynchronized procurement strategies.

In contrast, UNDP India report in 2021 and WHO (2024) document how targeted grants, export subsidies, and blended financing initiatives in India have catalyzed the growth of MSMEs in pharma manufacturing. Nigeria lacks similar instruments, particularly for early-stage firms. To these points, Nigeria must restructure its incentive architecture with transparent benchmarks, regulatory predictability, and linked performance outcomes. Integrated procurement reforms and public–private dialogue forums should be institutionalized to ensure inclusive governance and sustainable market expansion.

Objective 4: To identify and map innovation ecosystems with an emphasis on leadership capacity, institutional networks, and sustainable development outcomes.

The innovation ecosystem in Nigeria's biopharmaceutical landscape is fragmented and lacks centralized leadership. Universities, research centers (NIPRD, NBRDA), and industry actors (PMG-MAN, Biovaccines Ltd.) operate in parallel without a shared R&D governance model (Pharmanews Online, 2012). UNESCO (2023) reports that Nigeria allocates only 0.02% of GDP to research and innovation, significantly below LMIC benchmarks. The WHO mRNA transfer hub recognizes Nigeria as a spoke country, but readiness deficits in IP protection and skilled workforce development persist (WHO, 2024).

Comparative evidence from India's biotech parks and Brazil's biosimilar clusters show that co-location models and shared infrastructure foster rapid technology transfer and innovation scale-up (McKinsey & Company, 2021). Nigeria's PVAC initiative to train 2,000 professionals annually represents progress yet lacks comprehensive innovation pipeline funding and governance oversight. Ekström et al. (2021) emphasize the importance of stakeholder inclusivity and leadership stewardship in sustaining innovation systems. Nigeria's absence of innovation incubators and sector-wide curricula alignment impedes its ability to produce, adapt, and commercialize essential biotherapeutics.

To the above, for innovation to catalyze sustainable local production, Nigeria must institutionalize leadership-driven innovation hubs, formalize inter-sector R&D partnerships, and align STI policy with industrial development goals. Blended financing, research grants, and academic integration are vital levers to transform Nigeria's ecosystem into a globally competitive landscape.

CONCLUSION AND RECOMMENDATION

The theory of change for this study asserts that if Nigeria reforms institutional leadership, harmonizes regulation, and invests in innovation hubs, then it can scale local vaccine and therapeutics production, improve health equity, and reduce foreign dependency, because institutional coherence, strategic incentives, and public–private collaboration unlock production capacity, quality assurance, and innovation diffusion.

The findings affirm that Nigeria's local pharmaceutical production is inhibited not by lack of ambition or infrastructure alone, but by misaligned governance structures and strategic incoherence. Comparative evidence from countries like India and Brazil illustrates that when leadership is directive, policy is unified, and institutions operate synergistically, domestic vaccine production accelerates. In Nigeria's context, poor interagency collaboration, opaque incentive disbursement, and fragmented regulatory mandates have stifled scale-up

opportunities and discouraged investor confidence.

The implications are wide-ranging: first, without targeted governance reforms, Nigeria will remain vulnerable to global supply chain shocks and unable to respond effectively to future epidemics. Second, the poor response to the demands of pharmaceutical coordinated body undermines fiscal efficiency, while disjointed procurement policies deter domestic producers. Third, Nigeria's minimal investment in innovation systems, just 0.02% of GDP versus a global average of 2.23% (UNESCO, 2023), means sustainable development through pharmaceutical sovereignty is unattainable under current conditions.

Therefore, the study recommends an integrated national framework featuring a leadership-led coordination council, blended financing instruments, harmonized regulatory processes, stakeholder-driven innovation hubs and embed transparent benchmarks, ensuring regulatory predictability, and aligning incentives with measurable performance outcomes. These measures are essential for Nigeria to transition from import reliance to regional pharmaceutical leadership, boost industrial output, and enhance health security in line with the goals to ensure healthy lives and promote well-being for all at all ages (SDG 3) and build resilient infrastructure, promote inclusive and sustainable industrialization, and foster innovation (SDG 9).

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