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Toward Pharmaceutical Sovereignty in Africa: Regulatory Transformation, Industrial Development and Regional Integration

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Graphical Abstract

Africa's Transition from Pharmaceutical Dependence to Pharmaceutical Sovereignty

Conceptual Flow

Global pharmaceutical dependence



Supply chain vulnerability and multinational exit



Regulatory strengthening (NAFDAC, WHO benchmarking, ICH alignment)



Expansion of domestic pharmaceutical manufacturing



Regional integration through the African Continental Free Trade Area



Emergence of African pharmaceutical champions



Improved medicine security and health system resilience

Strengthened regulatory institutions, expanding domestic manufacturing capacity and continental market integration are collectively enabling Africa's transition from pharmaceutical import dependence toward medicine security and industrial competitiveness.

ABSTRACT

Africa's pharmaceutical sector is undergoing a significant structural transition as governments, regulators and domestic manufacturers seek to reduce reliance on imported medicines and strengthen local production capacity. Historically, pharmaceutical markets across the continent were largely shaped by multinational manufacturers, while indigenous firms faced constraints due to regulatory uncertainty, limited access to capital and fragmented industrial policy frameworks. Recent market changes-including the partial withdrawal or restructuring of multinational operations in several African countries between 2022 and 2024-have created both supply concerns and strategic opportunities for domestic industry expansion.

This study analyses the evolving pharmaceutical landscape across Africa, with Nigeria serving as an illustrative case. Drawing on policy analysis, market trend evaluation and literature synthesis covering the period 2024-2026, the paper examines how regulatory strengthening, industrial investment and regional trade integration are influencing the continent's pharmaceutical trajectory. Particular attention is given to the evolving roles of regulatory institutions such as the National Agency for Food and Drug Administration and Control (NAFDAC) and the Pharmacists Council of Nigeria (PCN) in reinforcing quality assurance systems and supporting domestic manufacturing growth.

The analysis suggests that credible regulatory governance, coordinated industrial policy and expanded regional trade through the African Continental Free Trade Area (AfCFTA) may enable Africa to transition toward pharmaceutical sovereignty gradually. If sustained, these developments could foster the emergence of regionally competitive pharmaceutical manufacturers while strengthening medicine security and health system resilience.

Keywords: Pharmaceutical sovereignty, Local pharmaceutical manufacturing, Regulatory governance, AfCFTA, Medicine security, African pharmaceutical industry

1. Introduction

Reliable access to safe, effective and affordable medicines is fundamental to the functioning of modern health systems. Across Africa, however, pharmaceutical supply chains have historically relied heavily on imported products manufactured outside the continent. International pharmaceutical corporations have traditionally dominated market share, distribution networks and brand recognition in many African countries¹.

This structural dependence creates multiple vulnerabilities. External disruptions in global pharmaceutical production or logistics can quickly translate into medicine shortages within African healthcare systems. Currency fluctuations and geopolitical tensions can also significantly affect the affordability and availability of medicine².

The COVID-19 pandemic highlighted these vulnerabilities with particular clarity. Interruptions in global pharmaceutical supply chains exposed weaknesses in Africa's medicine procurement systems and underscored the strategic importance of strengthening domestic pharmaceutical production³.

At the same time, Africa's pharmaceutical market is expanding rapidly. Population growth, urbanisation and the rising burden of chronic diseases are driving increased demand for pharmaceutical products. Estimates place the value of the African pharmaceutical market at approximately USD 27-30 billion in 2024, with projections suggesting continued growth in the coming decade^{4,5}.

Recent developments suggest that the continent may be entering a new phase in pharmaceutical development. Between 2022 and 2024, several multinational pharmaceutical firms scaled back or withdrew from certain African markets. While these developments initially raised concerns about the continuity of medicine supply, they have also created opportunities for domestic pharmaceutical manufacturers to expand their roles in regional supply chains.

This article explores the evolving shift from pharmaceutical import dependence toward pharmaceutical sovereignty in Africa.

2. Literature Review

Pharmaceutical sovereignty has increasingly emerged as an important concept within global health policy discussions. It refers to a country's or region's capacity to ensure reliable access to essential medicines through resilient supply chains, domestic production capabilities and credible regulatory systems¹.

Researchers and development institutions argue that strengthening local pharmaceutical manufacturing can enhance supply resilience, improve access to medicines and support broader industrial development^{2,6}.

Despite growing interest in local production, pharmaceutical manufacturing across Africa remains unevenly distributed. Only a small number of countries host substantial pharmaceutical production infrastructure, while many others rely heavily on imports².

Nevertheless, policy initiatives are beginning to reshape this landscape. Regulatory harmonisation programmes, industrial development strategies and continental trade integration initiatives are creating conditions that may support expanded pharmaceutical manufacturing across the continent⁷.

3. Methodology

This article adopts a qualitative policy analysis supported by a targeted secondary data review.

The research proceeded through three analytical stages.

3.1. Literature synthesis

Academic publications, institutional reports and industry analyses related to pharmaceutical manufacturing, regulatory governance and access to medicine in Africa were systematically reviewed. Sources included publications from international

organisations such as the World Health Organisation and UNCTAD.

3.2. Market trend assessment

Recent pharmaceutical market data covering the period 2023–2026 were examined to identify emerging patterns in demand growth, manufacturing investment and pharmaceutical industry expansion across Africa.

3.3. Nigeria-focused interpretive case analysis

Nigeria was used as an anchor case due to its relatively large pharmaceutical market, evolving regulatory institutions and expanding domestic pharmaceutical industry. The analysis examines how regulatory reforms, industrial policy and regional integration dynamics interact to shape pharmaceutical sector development.

4. Results

This section presents the empirical insights derived from the policy analysis, market trend assessment and case-based evaluation conducted in this study. The results are organised around four analytical themes: pharmaceutical market expansion, import dependence, regulatory strengthening and domestic manufacturing growth.

4.1. Growth of the african pharmaceutical market

Recent industry projections indicate that Africa’s pharmaceutical sector is experiencing sustained growth driven by demographic expansion, rising disease burdens and increasing healthcare expenditure. Market intelligence reports estimate that the African pharmaceutical market reached approximately USD 27–30 billion in 2024, with projected annual growth rates of 6-10% over the next decade^{4,5}.

If these projections hold, the continental pharmaceutical market could reach USD 45–65 billion by 2032, depending on regulatory progress, manufacturing expansion and regional trade integration.

The primary drivers of market growth include:

- Rapid population growth across African economies
- Increasing urbanisation and middle-class expansion
- Rising prevalence of chronic diseases
- Improvements in healthcare access and insurance coverage

(Figure 1) illustrates the projected growth trajectory of the African pharmaceutical market between 2024 and 2032.

Projected expansion of the African pharmaceutical market driven by demographic growth, rising chronic disease burden, regulatory strengthening and regional integration.

The upward trajectory reflects both demographic trends and the increasing demand for chronic disease therapies (Table 1). Non-communicable diseases such as hypertension and diabetes are expected to account for a growing share of pharmaceutical consumption across the continent⁸.

4.2. Pharmaceutical import dependence

Despite market growth, Africa remains heavily dependent on imported medicines. Current estimates indicate that over 70% of medicines consumed across the continent are imported, primarily from India, China and Europe².

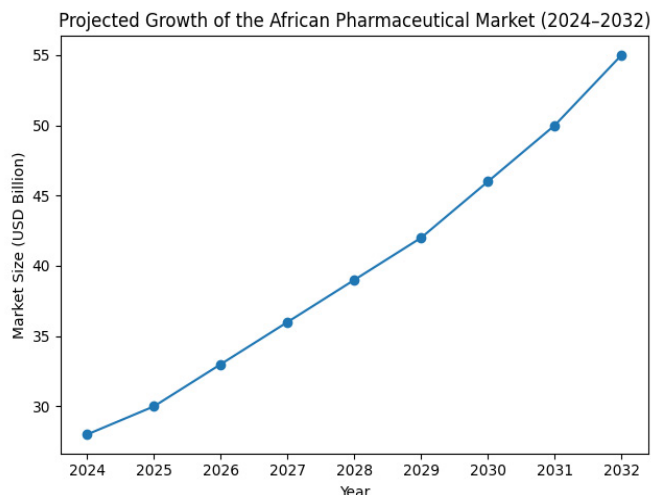


Figure 1: Projected growth of the African pharmaceutical market (2024-2032).

Table 1: Key Drivers of Pharmaceutical Manufacturing Growth in Africa.

Driver	Description	Impact
Demographic growth	Rapid population expansion	Increased pharmaceutical demand
Chronic diseases	Rising NCD prevalence	Long-term treatment demand
Regulatory strengthening	Improved quality assurance	Increased market confidence
Industrial policy	Government incentives	Manufacturing investment
Regional trade integration	AfCFTA market access	Export opportunities

Sources: WHO¹; Persistence Market Research⁹; Grand View Research⁴

This import dependence creates several structural vulnerabilities:

- Supply chain disruptions during global crises
- Currency volatility affecting medicine affordability
- Exposure to geopolitical trade disruptions
- Limited domestic industrial capacity

(Table 2) summarises the estimated distribution of pharmaceutical sourcing in Africa.

Table 2: Estimated pharmaceutical sourcing patterns in Africa.

Source of Medicines	Estimated Share	Strategic Implication
Imported finished medicines	~70–80%	High supply chain exposure
Local manufacturing	~20–30%	Emerging but limited production base
Active pharmaceutical ingredients produced locally	<5%	Heavy dependence on external API supply

Source: UNCTAD²; WHO¹

These results indicate that although domestic pharmaceutical production is growing, significant gaps remain across the pharmaceutical value chain, particularly in active pharmaceutical ingredient manufacturing.

4.3. Regulatory strengthening across african markets

Regulatory systems have historically been a critical bottleneck to the development of the pharmaceutical sector in

Africa. Weak regulatory oversight often undermined prescribers' confidence and limited the growth of domestic pharmaceutical manufacturers.

However, several African regulatory agencies have recently strengthened their systems through institutional reforms and international benchmarking programmes. The WHO Global Benchmarking Tool has played an important role in assessing national regulatory systems and promoting alignment with international standards¹⁰.

Nigeria provides a notable example. In recent years, regulatory authorities such as the National Agency for Food and Drug Administration and Control have strengthened Good Manufacturing Practice inspections, improved product registration procedures and enhanced post-market surveillance mechanisms.

These improvements have contributed to increased confidence in locally manufactured medicines and improved market transparency.

4.4. Expansion of domestic pharmaceutical manufacturing

The results of this analysis suggest that domestic pharmaceutical manufacturing capacity is gradually expanding across several African countries.

Manufacturing hubs are emerging in countries such as:

- Nigeria
- South Africa
- Egypt
- Morocco
- Kenya
- Tunisia
- Ghana
- Ethiopia

(Figure 2) illustrates the geographic distribution of major pharmaceutical manufacturing hubs across Africa.



Figure 2: Map of African pharmaceutical manufacturing hubs.

The emergence of these hubs reflects a combination of regulatory improvements, industrial policy support and increasing domestic demand.

Nigeria is one of the largest pharmaceutical markets in Africa and hosts a growing number of pharmaceutical manufacturers producing finished formulations, including tablets, capsules, syrups and injectables.

However, most African pharmaceutical manufacturing still focuses primarily on formulation rather than active pharmaceutical ingredient production, indicating that further investment in upstream pharmaceutical manufacturing capabilities will be necessary.

4.5. Pharmaceutical value chain development

The African pharmaceutical ecosystem spans multiple interconnected stages, beginning with raw materials and active pharmaceutical ingredients (APIs), followed by drug formulation and manufacturing, regulatory quality assurance, distribution and logistics systems, healthcare delivery through pharmacies and hospitals and ultimately patient access and health outcomes. Strengthening each stage of this value chain is essential for achieving pharmaceutical sovereignty and improving medicine security across Africa.

The results also highlight the importance of strengthening the entire pharmaceutical value chain rather than focusing exclusively on manufacturing plants.

(Figure 3) illustrates the interconnected stages of the pharmaceutical value chain, which include:

- Raw materials and active pharmaceutical ingredients
- Drug formulation and manufacturing
- Quality assurance and regulatory oversight
- Distribution and logistics systems
- Pharmacy and hospital dispensing
- Patient access and health outcomes

African Pharmaceutical Value Chain



Figure 3: African Pharmaceutical Value Chain.

4.5.1. Structure of the diagram: The figure contains six sequential stages of the pharmaceutical ecosystem:

- Raw Materials & APIs
 - Chemical precursors
 - Active pharmaceutical ingredients
 - Biotech inputs
- Drug Formulation & Manufacturing
 - Pharmaceutical production plants
 - Tableting, capsules, injectables
 - Biopharmaceutical manufacturing
- Quality Control & Regulation
 - National regulatory authorities (e.g., NAFDAC)
 - GMP inspections
 - WHO regulatory benchmarking
- Distribution & Logistics
 - Wholesale pharmaceutical distribution

- Cold-chain logistics
- National medicine supply systems
- Pharmacies & Hospitals
 - Community pharmacies
 - Hospital pharmacies
 - Clinical prescribing systems
- Patients & Health Outcomes
 - Access to medicines
 - Treatment adherence

- Improved health outcomes

Arrows connecting each stage illustrate the continuous pharmaceutical supply chain.

Weakness in any of these stages can compromise the reliability of pharmaceutical supply systems. Strengthening the entire value chain is therefore essential for achieving pharmaceutical sovereignty.

4.6. Leading pharmaceutical manufacturing firms in africa

Domestic pharmaceutical manufacturing across Africa remains concentrated in a limited number of countries. However, several companies have emerged as key producers supplying both domestic and regional markets (Table 3).

Table 3: Selected Leading Pharmaceutical Manufacturers in Africa.

Company	Country	Core Production Focus	Strategic Significance
Aspen Pharmacare	South Africa	Generics, vaccines, injectables	Largest pharmaceutical manufacturer in Africa
Cipla Medpro	South Africa	Generic medicines and respiratory products	Major regional supplier
Fidson Healthcare Plc	Nigeria	Oral formulations and injectables	Leading Nigerian pharmaceutical manufacturer
May & Baker Nigeria Plc	Nigeria	Generic medicines and vaccines	One of Nigeria's oldest pharmaceutical firms
Codix Group	Nigeria	Cardiometabolic therapies	Rapidly expanding regional supplier
Pharco Pharmaceuticals	Egypt	Branded generics	Major Middle East and African exporter
Hikma Pharmaceuticals	Tunisia/Jordan	Injectables and generics	Global pharmaceutical company with African footprint
Cooper Pharma	Morocco	Generic medicines	Expanding manufacturing capacity in North Africa
Universal Corporation Ltd	Kenya	Generic medicines	Important East African manufacturer
Kinapharma	Ghana	Generic medicines	Key West African pharmaceutical producer

Source: Industry reports (IQVIA, 2024; Frost & Sullivan, 2024; Deloitte, 2024)

These companies represent the nucleus of Africa's emerging pharmaceutical manufacturing ecosystem. Their continued expansion is expected to play a crucial role in strengthening pharmaceutical supply resilience across the continent.

5. Quantitative Policy Impact Model

The relationship between regulatory strength, industrial investment and pharmaceutical manufacturing capacity can be conceptualised through the following regression-style model:

$$PS = \beta_0 + \beta_1 RS + \beta_2 II + \beta_3 RT + \beta_4 HC + \varepsilon$$

Where:

PS = Pharmaceutical sovereignty index

RS = Regulatory strength (measured through WHO benchmarking levels)

II = Industrial investment in pharmaceutical manufacturing

RT = Regional trade integration (AfCFTA participation and regulatory harmonisation)

HC = Healthcare demand (disease burden and population growth)

ε = Error term

5.1. Interpretation

The model suggests that a combination of regulatory capacity, industrial investment, regional trade integration and healthcare demand dynamics influences pharmaceutical sovereignty.

In empirical applications, indicators such as regulatory maturity levels, manufacturing output, intra-African pharmaceutical trade volumes and disease burden metrics could be used to estimate these relationships.

Although this article does not conduct econometric estimation, the framework provides a basis for future quantitative studies examining pharmaceutical industrialisation in Africa.

The regression model supports the conceptual pathway illustrated in Figure 1, in which regulatory strengthening and industrial investment serve as enabling inputs for pharmaceutical sovereignty outcomes.

6. Structural Characteristics of African Pharmaceutical Markets

Several structural characteristics shape pharmaceutical markets across Africa.

African pharmaceutical markets display several structural features that influence both supply and policy design.

First, demand for medicines continues to rise rapidly due to both communicable and non-communicable diseases. Chronic conditions such as hypertension, diabetes and cardiovascular disease are increasing across African populations, creating sustained demand for long-term pharmaceutical therapy⁸.

Second, healthcare financing across many African countries relies heavily on out-of-pocket expenditure. In some countries, households finance the majority of pharmaceutical costs directly, placing strong emphasis on affordability and availability¹¹.

Third, African pharmaceutical supply chains remain heavily dependent on imports. More than 70 per cent of medicines consumed on the continent are imported, largely from Asia and Europe.

Finally, pharmaceutical manufacturing capacity within Africa remains unevenly distributed. Only a limited number

of countries host significant production infrastructure and approximately eight countries account for the majority of the continent’s pharmaceutical manufacturing facilities².

These structural conditions create both vulnerability and opportunity. Supply chains that depend heavily on foreign manufacturers are exposed to disruptions, but they also provide strong incentives for domestic production and industrial policy innovation (Table 4).

Table 4: Structural Characteristics of African Pharmaceutical Markets.

Indicator	Current Trend	Strategic Implication
Medicine imports	>70% of medicines imported	Supply chain vulnerability
NCD burden	Rising hypertension and diabetes	Long-term pharmaceutical demand
Healthcare financing	High out-of-pocket spending	Demand for affordable generics
Manufacturing capacity	Limited number of production hubs	Opportunity for industrial expansion
Regulatory systems	Strengthening in several countries	Potential for regulatory-driven industry growth

Sources: WHO (2023); UNCTAD (2025); World Bank (2024)

7. Regulatory Transformation and Market Confidence

Effective regulatory systems are essential for ensuring pharmaceutical product quality and building investor confidence. Regulatory institutions play a critical role not only in protecting patients but also in creating stable environments for industrial development.

In Nigeria, regulatory bodies such as NAFDAC and the Pharmacists Council of Nigeria have implemented reforms to strengthen pharmaceutical governance. These reforms include enhanced Good Manufacturing Practice inspections, improved product registration systems, strengthened post-market surveillance and stronger oversight of pharmaceutical distribution networks.

International regulatory benchmarking frameworks further reinforce these improvements (Table 5). The WHO Global Benchmarking Tool evaluates regulatory systems and promotes alignment with international quality standards¹⁰.

Table 5: Key drivers supporting pharmaceutical manufacturing growth in Africa.

Growth Driver	Explanation	Expected Effect
Population expansion	Increasing number of medicine users	Expanding pharmaceutical market
Chronic disease burden	Long-term therapeutic demand	Stable demand for pharmaceuticals
Regulatory strengthening	Improved quality assurance systems	Increased market confidence
Industrial policy	Government support for manufacturing	Investment in production capacity
Regional integration	Expanded markets through AfCFTA	Export opportunities

Source: WHO¹; Grand View Research⁴; Persistence Market Research⁹

8. Conceptual Pathway toward Pharmaceutical Sovereignty in Africa

Regulatory strengthening, expansion of local pharmaceutical

manufacturing and regional trade integration under the African Continental Free Trade Area (AfCFTA) collectively support the emergence of African pharmaceutical champions and improved medicine security (Table 6).

Table 6:

Input factors	Regulatory strengthening
	Industrial investment
	Regional trade integration
Transformation Mechanisms	Local pharmaceutical manufacturing expansion
	Regulatory harmonisation
	Value chain localisation
Strategic Outcomes	Reduced medicine import dependence
	Improved medicine security
	Emergence of African pharmaceutical champions

This table illustrates the conceptual pathway through which regulatory reform, industrial investment and regional trade integration contribute to the development of pharmaceutical sovereignty in Africa.

The conceptual framework identifies three stages in Africa’s pharmaceutical transformation.

Input factors include regulatory strengthening, industrial investment and regional trade integration. These factors stimulate transformation mechanisms such as manufacturing expansion, regulatory harmonisation and value-chain localisation. The resulting outcomes include reduced import dependence, improved medicine security and the emergence of competitive African pharmaceutical firms.

(Figure 4) Pathway to Pharmaceutical Sovereignty in Africa.

Conceptual framework illustrating how regulatory strengthening, industrial investment and regional trade integration interact to drive pharmaceutical manufacturing expansion, reduce import dependence and improve medicine security.



Figure 4: Pathway to pharmaceutical sovereignty in Africa

9. Industrial Expansion and Emerging Pharmaceutical Producers

Domestic pharmaceutical manufacturing is gradually expanding in several African countries. Local pharmaceutical firms are investing in production capacity, quality assurance systems and product development.

This growth is partly driven by rising demand associated with chronic disease management, which generates predictable pharmaceutical consumption patterns.

Market forecasts indicate that Africa's pharmaceutical sector may expand significantly between 2025 and 2032 as healthcare expenditure increases and regulatory systems continue to mature^{5,9}.

10. Regional Integration and the Role of AfCFTA

Regional integration will play a central role in shaping the future of Africa's pharmaceutical industry.

The African Continental Free Trade Area seeks to reduce trade barriers and encourage intra-African trade, enabling pharmaceutical producers to access larger regional markets⁷.

Achieving this objective requires further regulatory harmonisation, expanded manufacturing capacity and localisation of pharmaceutical supply chains.

11. Discussion

The findings presented in this study indicate that Africa's pharmaceutical sector is undergoing a gradual yet consequential transformation. The central challenge facing the continent is not merely the limited scale of pharmaceutical production. Rather, it reflects a broader systemic configuration involving regulatory capability, industrial investment, market dynamics and regional economic integration.

A critical insight emerging from the analysis is the pivotal role of regulatory institutions. Strengthened regulatory frameworks do more than ensure the safety and efficacy of medicines; they also function as catalysts for industrial development. When regulatory systems demonstrate credibility, consistency and alignment with international standards, they increase confidence among healthcare professionals, patients and investors. Such confidence is essential for expanding domestic pharmaceutical manufacturing and attracting both local and foreign investment into the sector.

At the same time, demographic and epidemiological transitions across Africa are reshaping pharmaceutical demand. The growing prevalence of non-communicable diseases—including hypertension, diabetes and cardiovascular conditions—requires long-term and continuous pharmacological treatment. These chronic therapeutic needs create predictable demand patterns, which are particularly conducive to sustainable pharmaceutical manufacturing. As a result, domestic manufacturers are increasingly well-positioned to supply medicines for long-duration treatment regimens, which account for a significant share of pharmaceutical consumption across the continent.

Regional integration also emerges as a decisive factor in the long-term viability of Africa's pharmaceutical industry. Many individual African markets are relatively small and fragmented, limiting their capacity to support large-scale pharmaceutical manufacturing independently. In this context, the African Continental Free Trade Area offers an important platform for consolidating regional markets, facilitating cross-border pharmaceutical trade and enabling economies of scale. By reducing trade barriers and encouraging regulatory harmonisation, AfCFTA has the potential to support the

emergence of regional pharmaceutical production hubs capable of serving multiple African markets.

Taken together, these developments suggest that Africa's pharmaceutical transformation must be understood as a systems-level evolution. Regulatory strengthening, industrial expansion and regional market integration are mutually reinforcing processes. When effectively coordinated, they can collectively support the emergence of a resilient and competitive pharmaceutical sector capable of improving medicine security across the continent¹².

12. Conclusion

Africa's pharmaceutical sector is undergoing a gradual yet important transformation. Regulatory strengthening, industrial investment and regional integration are collectively reshaping the continent's pharmaceutical ecosystem.

Nigeria's experience demonstrates that credible regulatory institutions and coordinated industrial strategies can stimulate domestic pharmaceutical manufacturing while maintaining high standards of medicine quality.

If these developments continue across the continent, Africa may progressively reduce its reliance on imported medicines and cultivate competitive pharmaceutical industries capable of serving both regional and global markets.

13. References

1. World Health Organisation. Local Production and Access to Medicines, 2023.
2. UNCTAD. Building the Case for Investment in Local Pharmaceutical Production in Africa, 2025.
3. World Health Organisation. World Local Production Forum, 2025.
4. Grand View Research. Africa Pharmaceutical Market Size and Trends Analysis Report, 2024.
5. Credence Research. Africa Pharmaceutical Market Growth Forecast, 2025.
6. African Development Bank. Industrialisation and Health Systems Report, 2024.
7. AfCFTA Secretariat. Agreement Establishing the African Continental Free Trade Area. Accra, 2021.
8. Institute for Health Metrics and Evaluation. Global Health Data Exchange, 2023.
9. Persistence Market Research. Africa Pharmaceuticals Market Forecast 2025–2032, 2025.
10. World Health Organisation. Global Benchmarking Tool for Evaluation of National Regulatory Systems, 2022.
11. World Bank. World Development Indicators, 2024.
12. ICH. International Council for Harmonisation Membership and Regulatory Harmonisation, 2024.