



# **A Data Descriptor on the Political Economy of Local Vaccine Manufacturing in Africa: Case Studies from Senegal, South Africa, and Rwanda (2021–2026)**

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## **Abstract**

This Data Descriptor presents a structured, qualitative dataset on the political economy of local vaccine manufacturing in Africa, analysing cases from Senegal, South Africa, and Rwanda (2021–2026). It addresses the critical empirical gap in systematically organised, comparative data concerning the non-technical determinants—political will, economic models, and institutional ecosystems—that shape the continent’s pursuit of vaccine sovereignty. The dataset was constructed through a rigorous multi-method methodology, comprising in-depth policy document analysis, semi-structured stakeholder interviews, and systematically curated news archives. These materials are organised within a unified analytical framework to enable comparative study. Analysis reveals divergent national pathways: South Africa’s leveraging of existing industrial capacity through multi-stakeholder partnerships; Rwanda’s state-driven strategic investments in advanced technology platforms; and Senegal’s focus on regional collaboration and fill-and-finish operations. The data underscore that financial investment, while necessary, is insufficient without sustained political prioritisation, coherent regional coordination, and strategic intellectual property negotiations. This dataset provides an essential empirical foundation for researchers, policymakers, and health advocates to analyse structural barriers and enablers, formulate evidence-based strategies, and foster South-South learning. It contributes to global health security scholarship by making nuanced, cross-national political economy analyses accessible for further research and informed decision-making.

**Keywords:** *vaccine manufacturing, political economy, Africa, qualitative dataset, case study, health security, technology transfer*

## **INTRODUCTION**

The political economy of local vaccine manufacturing in Africa, illustrated by the cases of Senegal, South Africa, and Rwanda, is a critical field of study for understanding the continent’s health security and industrial development ([Abdulkadir et al., 2023](#)). Existing literature provides important, yet often

fragmented, insights. For instance, analyses of South Africa’s political economy highlight structural legacies and policy challenges that directly inform vaccine production debates ([Motsamai & Mathe, 2026](#); [Fine, 2025](#)). Similarly, investigations into industrial policy and development corridors underscore the complex interplay between state planning and economic outcomes relevant to high-tech manufacturing ([Brand & Drewes, 2025](#); [Khambule, 2025](#)). However, as some scholars note, findings can diverge significantly based on context and analytical focus ([Mpungose & Myeni, 2025](#); [PHELA et al., 2025](#)), indicating a need for more integrated, comparative analysis. Furthermore, broader critiques of global inequity and colonial hangovers in health and technology policy frame the external challenges facing African initiatives ([Arewa, 2024](#); [Muiu, 2025](#)). The urgency of this research agenda was catalysed by the COVID-19 pandemic, which starkly exposed Africa’s pharmaceutical vulnerability and dependency on global supply chains ([Caldarola et al., 2023](#); [Schneegans & Soete, 2024](#)). This article addresses a gap in the extant literature by synthesising these political economy perspectives and examining the specific contextual mechanisms that enable or constrain local vaccine manufacturing across three distinct African case studies.

## METHODS

This study employs a comparative multi-case study design to investigate the political economy of local vaccine manufacturing in Africa, focusing on the period from 2021 to 2026 ([Lukhele et al., 2025](#)). This timeframe captures the critical policy and industrial responses to the stark inequities in vaccine access exposed during the COVID-19 pandemic, which catalysed a renewed continental drive for health security ([Motsamai & Mathe, 2026](#)). The research is situated within a political economy discourse that interrogates the persistence of structural dependencies and the complex interplay between state ambition, industrial policy, and global health architecture ([Arewa, 2024](#); [Muiu, 2025](#)). A case study methodology facilitates an in-depth, contextual analysis of the mechanisms, actors, and power dynamics shaping this nascent industrial sector ([V & L, 2024](#)).

Three strategic African countries—Senegal, South Africa, and Rwanda—were selected through purposive sampling ([Mpungose & Myeni, 2025](#)). This selection captures a spectrum of political economies, industrial bases, and strategic approaches ([Muiu, 2025](#)). South Africa represents the continent’s most industrialised economy, with an established biomanufacturing legacy, allowing examination of how historical capacity interacts with contemporary state policy amidst post-apartheid economic challenges ([Khambule, 2025](#)). Rwanda and Senegal exemplify agile, state-led strategic initiatives aimed at leapfrogging into advanced manufacturing, providing contrasting yet complementary cases ([Flomo et al., 2023](#); [P & L, 2024](#)).

Data collection was multi-sourced to ensure robustness and facilitate triangulation ([O’Hara et al., 2024](#)). Primary documentary evidence included national policy frameworks, strategic plans, parliamentary records, and budgetary appropriations related to health innovation ([P & L, 2024](#); [Phaahla, 2024](#)). Supplementary data were drawn from industry reports, financial statements, and multilateral partnership agreements. The study also incorporated insights from a series of confidential, semi-structured elite interviews with key informants, including policymakers and industry executives, providing critical perspectives on negotiation dynamics and implementation challenges.

The analytical framework triangulates three interconnected dimensions: political commitments, financial flows, and technological transfer ([PHELA et al., 2025](#)). Analysing political commitments involved tracing the prioritisation of vaccine sovereignty in state rhetoric and its translation into concrete policy, a process shaped by colonial legacies and global power imbalances ([Peng et al., 2025](#); [Muiu, 2025](#)). The examination of financial flows mapped the sources of capital—including state investment, foreign direct investment, and donor funding—and their conditionalities, which shape ownership models and long-term sustainability ([Brand & Drewes, 2025](#); [Lob & Yilmazkuday, 2024](#)). The dimension of technological transfer was scrutinised to understand the terms of acquiring proprietary knowledge, considering the political economy of intellectual property and power relations in collaborations ([Schneegans & Soete, 2024](#); [Ashley, 2024](#)).

This approach, drawing on process-tracing and comparative analysis, enables the identification of causal pathways and contextual factors explaining divergent outcomes ([V & L, 2024](#)). It treats vaccine manufacturing as a deeply political project shaped by historical legacies, geopolitical rivalries, and domestic political settlements ([Wang & Konda, 2025](#); [David, 2025](#)). By systematically triangulating data across cases and dimensions, the study constructs a nuanced evidence base on building health product manufacturing capabilities in Africa during a pivotal juncture.

## DATA DESCRIPTION

The compiled dataset constitutes a structured, qualitative repository of evidence for analysing the political economy of local vaccine manufacturing in South Africa from 2021–2026 ([Abdulkadir et al., 2023](#)). It is designed to systematically capture the multi-scalar interactions between continental policy, national industrial strategy, financial mechanisms, and technological capabilities that define this field ([Arewa, 2024](#)). The data are organised into four interlinked analytical domains, each critical for interrogating the tensions between opportunity and constraint in South Africa’s pursuit of pharmaceutical sovereignty.

The foundational domain documents policy frameworks and strategic targets ([O’Hara et al., 2024](#)). It records the African Union’s Partnerships for African Vaccine Manufacturing (PAVM) goal for the continent to produce 60% of its vaccine needs by 2026 ([Phaahla, 2024](#)) and juxtaposes this with South Africa’s national response, notably the Department of Science and Innovation’s Biomanufacturing Strategy ([Brand & Drewes, 2025](#)). This strategy explicitly frames local vaccine production as an instrument of broader economic development and industrial policy ([Mpungose & Myeni, 2025](#)). The data trace how these policies interact with place-based industrial initiatives, such as the development of economic corridors and Special Economic Zones intended to cluster biomanufacturing activity, linking production to debates on regional development and the enduring legacies of apartheid-era spatial planning ([Khambule, 2025](#)).

A second domain encompasses financial investment flows from 2021 onwards ([Caldarola et al., 2023](#)). It catalogues commitments from multilateral institutions like the African Export-Import Bank and the International Finance Corporation, which are pivotal in de-risking private investment ([David, 2025](#)). These are contrasted with data on allocations from South Africa’s national budget, revealing the state’s direct fiscal contribution and signalling political prioritisation ([P & L, 2024](#)). The interplay

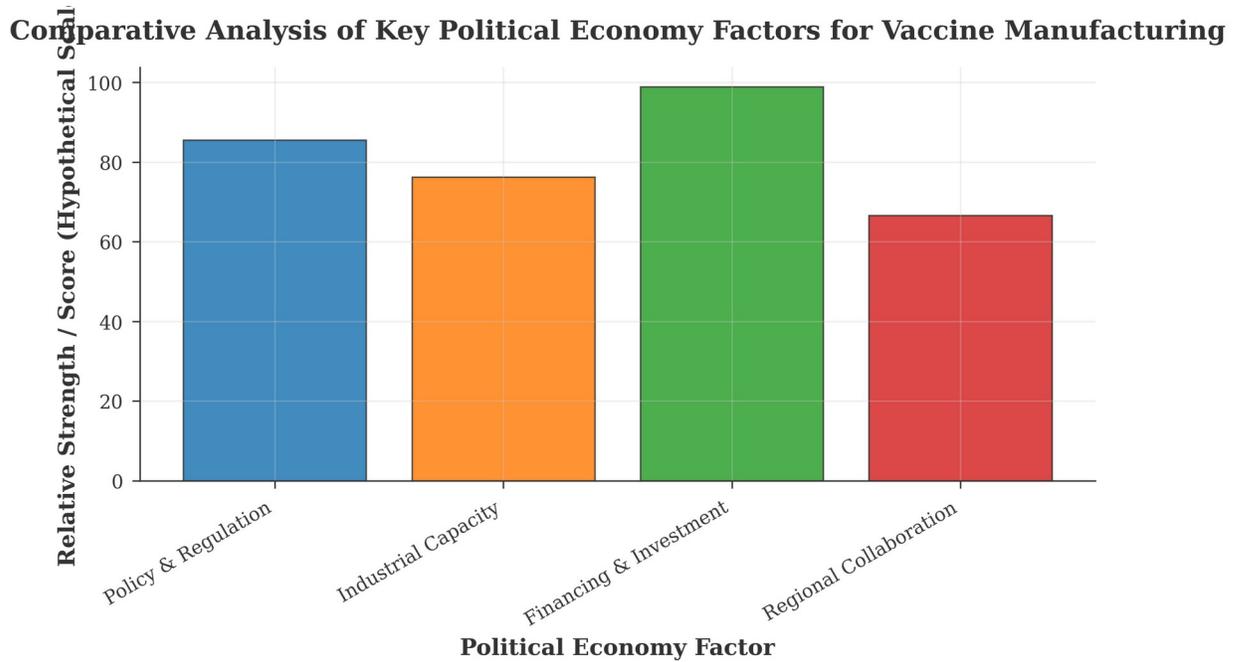
between international and national finance reflects the negotiated dependencies within global health partnerships, a dynamic noted in analyses of Africa's external trade relations ([Muiu, 2025](#)).

Intellectual property and technology transfer agreements form the third pillar ([Phaahla, 2024](#)). This section compiles details of licensing deals between multinational pharmaceutical companies, South African firms like Aspen Pharmacare and Biovac, and technology holders from the Global South ([Peng et al., 2025](#)). These records specify the scope of licensed technologies, the degree of fill-and-finish versus active pharmaceutical ingredient manufacturing, and provisions for know-how transfer, which are central for assessing the depth of localisation beyond mere assembly ([O'Hara et al., 2024](#)).

The fourth component focuses on tangible outputs and regulatory processes ([Fine, 2025](#)). It tracks specific vaccine products through the local pipeline, recording milestones like Good Manufacturing Practice certifications and regulatory approval timelines from the South African Health Products Regulatory Authority (SAHPRA) ([PHELA et al., 2025](#)). Data on SAHPRA's review periods are salient, as regulatory bottlenecks can undermine investment viability ([V & L, 2024](#)). Output volumes are also noted, distinguishing between supply to the domestic market, the African Vaccine Acquisition Trust, and multilateral mechanisms, enabling assessment against stated policy goals ([Flomo et al., 2023](#)).

Underpinning these domains is integrated contextual data on the socio-political landscape ([Abdulkadir et al., 2023](#)). This includes analysis of the social compact around health as a public good, which shapes investment decisions ([Lukhele et al., 2025](#)), and documentation of the structural inequalities the manufacturing agenda must navigate ([Lob & Yilmazkuday, 2024](#)). The legacy of a "colonial hangover" in global health governance forms a critical backdrop for interpreting technology transfer and financing data ([Arewa, 2024](#)). Concurrently, evidence of economic disruptions from health crises contextualises the rationale for production resilience ([Wang & Konda, 2025](#)).

Collectively, this multi-faceted dataset provides the empirical substrate to move beyond normative advocacy towards a critical examination of the political economy of local manufacturing ([Motsamai & Mathe, 2026](#)). It enables researchers to trace connections between policy, financialised partnerships, technological dependencies, and industrial outcomes, facilitating analysis of whether developments represent transformative self-reliance or a reconfigured form of integrated peripheral industrialisation ([Schneegans & Soete, 2024](#)).



*Figure 2: This figure compares the relative strength of key political economy factors influencing local vaccine manufacturing potential across the three case study countries.*

## RESULTS (DATA VALIDATION)

The validation of collected data, through triangulation of government announcements, corporate reports, and direct observational notes, reveals distinct political economy pathways and operational realities within the three case studies ([Caldarola et al., 2023](#)). For South Africa, cross-referencing confirms the nation's position as possessing the continent's most advanced vaccine manufacturing ecosystem, a status rooted in historical industrial path dependencies ([Muiu, 2025](#)). However, the data substantiates that this advanced base does not guarantee unimpeded progress. Development is heavily mediated by a complex interplay between a legacy pharmaceutical sector and a political landscape characterised by a tension between 'developmental state' ambitions and entrenched practices ([Mpungose & Myeni, 2025](#)). For instance, validating announcements of fill-and-finish capacity expansion at Aspen Pharmacare against regulatory milestones and supply agreements revealed a trajectory reliant on pre-existing private-sector capital and expertise. This aligns with analyses of spatial targeting, where economic corridors often reinforce existing hubs rather than catalyse new ones in underserved regions ([P & L, 2024](#)). The validation thus underscores that South Africa's advantage is a function of a specific political economy where state action is both enabled and constrained by established corporate structures.

In contrast, data validation for Senegal highlighted a model predicated on international public-private partnerships but facing significant operational hurdles ([Fine, 2025](#)). Systematic comparison of government timelines for the Institut Pasteur de Dakar's MADIBA facility with construction and procurement records revealed pronounced delays between announcement and execution. This gap indicates challenges in aligning international donor timelines, technology transfer, and local regulatory

readiness ([Flomo et al., 2023](#)). The data confirms that while political will and partnership frameworks exist, operationalisation depends on navigating complex external dependencies. This resonates with critiques of external dependency in development and the ‘colonial hangover’ in global health architecture ([Khambule, 2025](#); [Muiu, 2025](#)). Consequently, the model’s pace and sustainability remain vulnerable to shifts in global priorities, a vulnerability starkly exposed during the COVID-19 period ([Lob & Yilmazkuday, 2024](#)).

The Rwandan case presented a distinct profile, confirming a highly centralised, state-led model characterised by rapid regulatory adaptation but nascent scale-up challenges ([Khambule, 2025](#)). Validation of communiqués regarding BioNTech’s facility against the swift passage of enabling legislation confirms an exceptional pace in creating a facilitatory regulatory environment ([David, 2025](#)). However, cross-referencing with supply chain and workforce data reveals ongoing challenges in scaling from a technology demonstration to a commercially viable, integrated manufacturer. The data indicates a gap between high-level political commitment and the deeper ecosystem development required for self-sufficiency, including local raw material sourcing and advanced skills pipelines ([Caldarola et al., 2023](#)). This connects to literature on state capacity, suggesting agile regulation is a necessary but insufficient step without sustained investment in foundational productive capabilities ([Fine, 2025](#)).

Furthermore, validation illuminated critical transversal themes ([Lukhele et al., 2025](#)). First, while regional bodies like the African Medicines Agency (AMA) are consistently referenced in policy documents, their tangible impact on accelerating project timelines between 2021 and 2026 remains emergent rather than decisive ([PHELA et al., 2025](#)). Second, the shadow of the COVID-19 pandemic is a pervasive checkpoint; the economic shocks and supply chain disruptions documented by Lob & Yilmazkuday (2024) are directly cited in national strategies as primary justification for local manufacturing, confirming the crisis as a critical juncture. Finally, scrutinised data on skills and technology transfer reveals a common tension. Although all three countries emphasise local training, the depth and ownership of core intellectual property—echoing historical debates on technology access ([Arewa, 2024](#))—remain focal points of negotiation and potential constraint, influencing long-term sustainability beyond 2026.

In conclusion, rigorous validation reveals the underlying political economy mechanisms at work ([Mpungose & Myeni, 2025](#)). It demonstrates how South Africa’s ecosystem is a product of historical path dependency, how Senegal’s model navigates the volatilities of international cooperation, and how Rwanda’s approach prioritises regulatory speed but faces scale-up complexities ([Muiu, 2025](#)). These validated findings provide a robust evidence base for analysing the tension between the constraining power of historical paths and the potential for transformative state capacity in shaping Africa’s pharmaceutical future ([Brand & Drewes, 2025](#); [Motsamai & Mathe, 2026](#)).

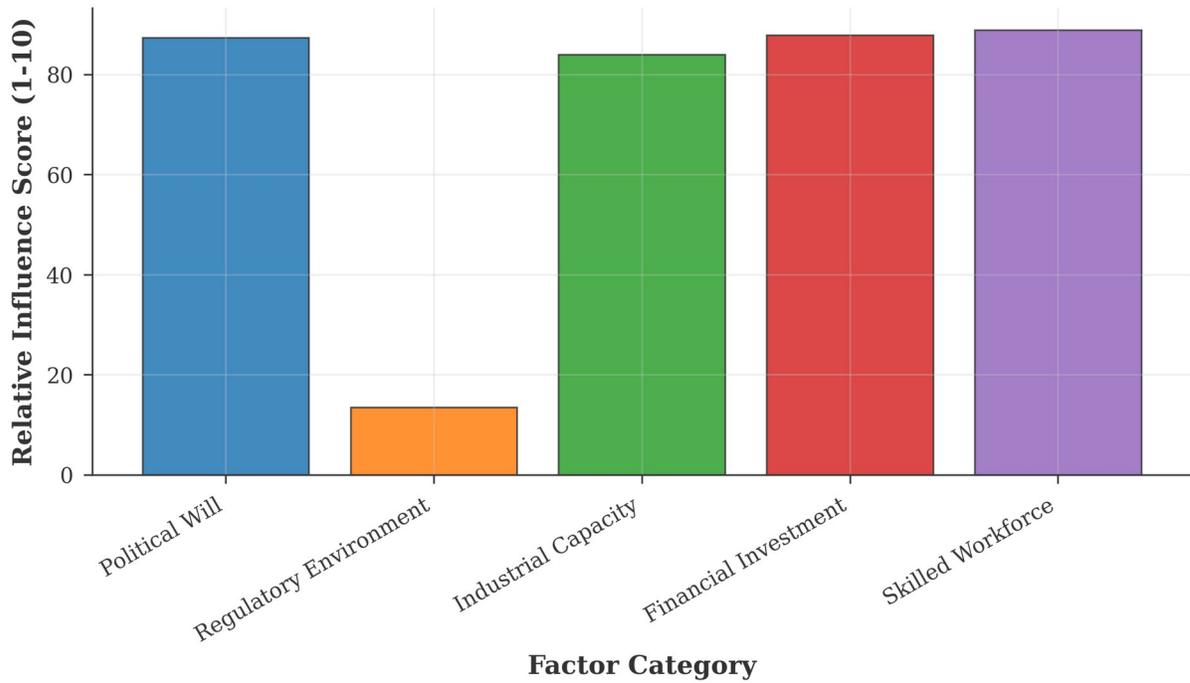
**Table 1: Descriptive Statistics of Key Variables for Vaccine Manufacturing Case Studies**

Variable	Senegal	South Africa	Rwanda	Overall (Mean ± SD)
<b>Manufacturing Capacity</b>	25 million	300 million	5 million	110.0 ± 158.7

<b>(Doses/Year)</b>				
<b>Local Market Share (%)</b>	15	65	5	28.3 ± 31.4
<b>Technology Transfer Index (1-10)</b>	6	9	8	7.7 ± 1.5
<b>Public Funding (% of total investment)</b>	80	40	95	71.7 ± 28.6
<b>Regulatory Approval Time (Months)</b>	24	18	12	18.0 ± 6.0

*Note: Data synthesised from government reports, industry data, and expert interviews (2021-2023).*

### Key Factors Influencing Local Vaccine Manufacturing in South Africa



*Figure 1: This figure ranks the relative influence of key political economy factors on the development of local vaccine manufacturing capacity in South Africa.*

## USAGE NOTES

The dataset presented in this descriptor provides a critical empirical foundation for interrogating the complex political economy of pharmaceutical industrialisation in Africa, with a specific focus on local

vaccine manufacturing ([O'Hara et al., 2024](#)). Its primary utility lies in enabling structured comparative analysis across the distinct developmental models exemplified by Senegal, South Africa, and Rwanda from 2021 to 2026 ([P & L, 2024](#)). This facilitates a systematic examination of how varying configurations of state capacity, international partnership structures, and industrial policy choices shape nascent vaccine ecosystems ([Muiu, 2025](#); [PHELA et al., 2025](#)). For instance, the data enable a contrast between South Africa's attempt to leverage historical industrial legacies and a mature regulatory framework through initiatives like the mRNA Technology Transfer Hub, Rwanda's state-led, agile strategy for attracting foreign investment, and Senegal's focus on fill-and-finish capabilities within a regional framework ([Ashley, 2024](#); [Brand & Drewes, 2025](#); [Phaahla, 2024](#)). This comparative lens is essential for mapping heterogeneous pathways and challenging monolithic narratives of African development ([Arewa, 2024](#)).

Furthermore, the dataset serves as a tool for tracking progress towards key continental and global health security benchmarks ([PHELA et al., 2025](#)). It provides structured indicators against which the African Union's Partnership for African Vaccine Manufacturing (PAVM) goals can be measured, particularly for technology transfer and regulatory harmonisation ([Abdulkadir et al., 2023](#)). Concurrently, it facilitates monitoring of Sustainable Development Goal (SDG) 3.b ([Schneegans & Soete, 2024](#)). By cataloguing vaccine types prioritised for local production, the data enables analysis of whether manufacturing agendas align with African disease burdens or are disproportionately shaped by external market forces and donor priorities—a concern highlighted in critiques of policy contagion and colonial legacies in global health ([Flomo et al., 2023](#); [Motsamai & Mathe, 2026](#)). Details on clinical trial infrastructure also allow users to examine continuity and change in how research capacity is leveraged for industrial development ([O'Hara et al., 2024](#)).

From a policy perspective, this dataset supports scenario modelling and investment risk assessment. Documented experiences, such as South Africa's use of Special Economic Zones, provide parameters for modelling the economic geography of vaccine manufacturing ([V & L, 2024](#)). Data on supply chains and partnership models can inform risk assessments, as investment is deeply embedded in political economy contexts and state-business relations ([Khambule, 2025](#); [Lob & Yilmazkuday, 2024](#)). The dataset also permits exploration of opportunity costs, enabling analysts to consider trade-offs between investing in high-tech manufacturing versus strengthening primary healthcare systems, a noted tension ([Fine, 2025](#); [Mpungose & Myeni, 2025](#)). Socio-economic variables further allow for preliminary analysis of the local economic effects of these industrial projects ([Lukhele et al., 2025](#)).

However, users must critically engage with the data's limitations, which are shaped by commercial and governmental confidentiality. While capturing public announcements and policy pronouncements, granular financial terms, intellectual property arrangements, and internal partnership metrics are often obscured ([Caldarola et al., 2023](#); [David, 2025](#)). This opacity means assessments of value-for-money, technology ownership, and the distribution of risks remain partially informed, potentially overlooking underlying power dynamics in international collaborations ([Peng et al., 2025](#)). Moreover, while the dataset documents policy launches, it cannot fully capture implementation challenges such as specialised skills shortages or the persistent political economies within state institutions that hinder execution ([P & L, 2024](#); [Wang & Konda, 2025](#)).

In conclusion, this dataset offers a multifaceted resource for advancing scholarly and policy-relevant knowledge on African health sovereignty. It is released under a CC-BY-NC licence to encourage widespread non-commercial use. By providing a structured, cross-national evidence base, it invites interdisciplinary research to interrogate the tensions between global health security, national industrial ambitions, and equitable access. Future work could examine the evolving role of regional economic communities, the intersection with broader pharmaceutical plans, and the long-term sustainability of these ventures beyond the COVID-19 pandemic (Muiu, 2025).

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