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CHALLENGES OF INDIGENOUS MEDICINE DURING GLOBAL PANDEMICS: A CASE STUDY OF COVID-19 IN NIGERIA

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Abstract

Traditional medicine has constituted the primary healthcare framework across Africa for centuries, long predating the introduction of Western biomedical systems. The World Health Organization (WHO) estimates that up to 80% of people in sub-Saharan Africa rely on traditional remedies as their first recourse for illness. When the COVID-19 pandemic emerged in late 2019 and rapidly spread across the globe, it exposed critical vulnerabilities in formal healthcare systems while simultaneously renewing scholarly and policy interest in indigenous approaches to disease management. Grounded in Medical Pluralism Theory and Systems Thinking, and employing a PRISMA-guided systematic qualitative review of peer-reviewed sources (2019–2024), this paper identifies seven interconnected challenges confronting indigenous medicine practitioners in Nigeria during COVID-19. These comprise: stigmatization and public mistrust; absence of scientific validation; limited standardization; inadequate infrastructure; weak regulatory frameworks; restricted resource access; and low formal educational attainment among practitioners. Seven principal obstacles are identified: stigmatization and public mistrust; the absence of scientific validation; limited standardization of preparations; inadequate healthcare infrastructure; weak regulatory frameworks; restricted access to resources; and low formal educational attainment among practitioners. The paper further proposes targeted solutions and evidence-aligned policy recommendations for integrating indigenous medicine into national and continental pandemic preparedness frameworks. The findings suggest that, with appropriate regulatory reform, scientific collaboration, and sustained public investment, indigenous medicine can meaningfully complement conventional biomedical systems in managing both current and future global health crises.

Keywords: Indigenous Medicine; COVID-19; Global Pandemic; Nigeria; Traditional Medicine; Healthcare Integration; Medical Pluralis

1. Introduction

Before the colonial era, healthcare across much of Africa, Asia, and the Americas was grounded in traditional knowledge systems refined over many generations. The arrival of missionaries and colonial administrators introduced Western biomedical practices that gradually marginalized these indigenous frameworks, though they never fully displaced them. Today, traditional medicine continues to serve as the dominant form of primary healthcare for a significant proportion of the world's population, particularly in low- and middle-income countries where access to orthodox medical facilities remains constrained.

The World Health Organization (WHO, 2019) defines traditional medicine as "the sum total of the knowledge, skills and practices based on the theories, beliefs and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness." This definition encompasses herbal medicine, spiritual healing, and dietary therapies, all deeply embedded in the cultural and social life of their communities.

The COVID-19 pandemic, caused by the novel corona-virus SARS-CoV-2, was first reported in Wuhan, China, in December 2019. The WHO declared a Public Health Emergency of International Concern on 30 January 2020, and subsequently a pandemic on 11

March 2020. By mid-2021, the disease had produced over 193 million confirmed cases and more than four million deaths globally (WHO, 2021). Nigeria, classified by the WHO as one of thirteen high-risk African nations, faced particular vulnerability owing to the already fragile state of its public health infrastructure (Iwu et al., 2021).

The pandemic renewed interest in indigenous medicine as populations sought accessible treatment alternatives during a period of acute healthcare system strain. However, the integration of traditional remedies into formal pandemic response strategies encountered numerous structural, regulatory, and epistemological obstacles. While extant literature has documented individual barriers to traditional medicine use during pandemics, few studies have systematically analysed these challenges as interconnected, mutually reinforcing constraints within a systems framework. Furthermore, no prior study has applied Medical Pluralism Theory alongside Systems Thinking to examine indigenous medicine in Nigeria's COVID-19 response. This study addresses these gaps. This paper identifies and critically analyses these challenges using a theoretically grounded framework and a systematic review of recent literature, and proposes evidence-informed recommendations for more effectively harnessing indigenous medicine during health emergencies.

2. Theoretical Framework

This study is anchored in two complementary theoretical perspectives: Medical Pluralism Theory and Systems Thinking in Health. Together, these frameworks provide the conceptual tools necessary to analyse the interaction between indigenous and biomedical health systems, and to evaluate the systemic barriers that prevent effective integration.

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2.1 Medical Pluralism Theory

Medical Pluralism Theory, developed most influentially by Arthur Kleinman (1980) and elaborated by subsequent scholars including Cant and Sharma (1999) and Stollberg (2002), posits that in most societies, healthcare is not delivered within a single, monolithic system but rather across a plurality of coexisting healing traditions. These traditions — which may include biomedical, traditional, religious, and folk systems — operate simultaneously and interact in complex ways that reflect the social, economic, and cultural contexts in which they are embedded.

Applied to the African context, Medical Pluralism Theory explains why a substantial proportion of Nigerians continue to seek care from indigenous healers even where biomedical services are nominally available. Leslie (1980) and Segar (1997) both argue that medical pluralism is not a transitional or deficient state en route to full biomedical uptake, but rather a stable and often rational response to the limitations of any single healthcare system. During the COVID-19 pandemic, this pluralistic orientation was evident in the widespread use of herbal remedies alongside or in lieu of officially sanctioned treatments.

The theory further draws attention to the power dynamics embedded in the relationship between dominant biomedical institutions and marginalized indigenous systems. Wahlberg (2006) argues that the delegitimization of traditional medicine by colonial and post-colonial biomedical establishments has produced structural inequalities that continue to disadvantage indigenous practitioners. Recognizing these dynamics is essential for designing policies that support genuine integration rather than mere co-option.

2.2 Systems Thinking in Health

Systems Thinking, as applied to health systems by the WHO (2009) and elaborated by Paina and Peters (2012), views healthcare delivery

not as a collection of discrete components but as an interconnected, dynamic system in which interventions in one area inevitably produce effects — intended and unintended — across the system as a whole. This perspective is particularly relevant for understanding why isolated efforts to promote indigenous medicine have often failed to produce sustainable change.

From a systems perspective, the challenges facing indigenous medicine during COVID-19 are not independent problems but mutually reinforcing constraints. Weak regulation, for instance, reduces public trust, which in turn discourages investment in research, which perpetuates the absence of scientific evidence, which further weakens the regulatory case for formal recognition. Breaking this cycle requires systemic interventions that address multiple leverage points simultaneously.

De Savigny and Adam (2009) identify several key properties of complex health systems including emergence, feedback loops, and path dependence that are highly relevant to understanding the persistence of these obstacles. Their work underscores the importance of adopting holistic, multi-stakeholder approaches when designing policies for integrating indigenous medicine into national health systems. This paper adopts both Medical Pluralism Theory and Systems Thinking as its analytical lenses in examining the challenges and possible solutions discussed in subsequent sections.

2.3 Conceptual Framework: Integrated Indigenous Medicine Framework for Pandemic Response

This study proposes an integrated conceptual framework that illustrates the interaction between indigenous medicine systems and pandemic response dynamics, highlighting key structural challenges and intervention pathways necessary for effective healthcare integration.

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The framework is grounded in Medical Pluralism Theory and Systems Thinking, emphasizing that indigenous and biomedical systems coexist within a complex, interdependent health ecosystem. During global health crises such as COVID-19, this interaction is shaped by systemic barriers that limit the effectiveness of indigenous medicine.

The model identifies three core components:

First, the pandemic context (e.g., COVID-19) creates increased demand for accessible healthcare solutions, positioning indigenous medicine as a critical complementary system.

Second, the indigenous medicine system is constrained by interconnected challenges, including stigmatization and mistrust, lack of scientific validation, weak regulatory frameworks, inadequate infrastructure, limited resources, lack of standardization, and low formal education among practitioners. These challenges do not operate independently but reinforce one another within the broader health system.

Third, the framework highlights systemic intervention points, including regulatory reform, collaborative research and scientific validation, capacity building for practitioners, and public awareness initiatives. These interventions function as leverage points within the system, capable of transforming existing constraints into opportunities for integration.

The outcome of these coordinated interventions is an integrated healthcare system, where indigenous and biomedical practices collaborate effectively, leading to improved pandemic response outcomes such as increased healthcare access, enhanced public trust, improved safety, and better treatment effectiveness.

Importantly, the framework incorporates a feedback loop, where improved outcomes strengthen trust, policy development, and research investment, thereby reinforcing the system over time.

Figure 1.

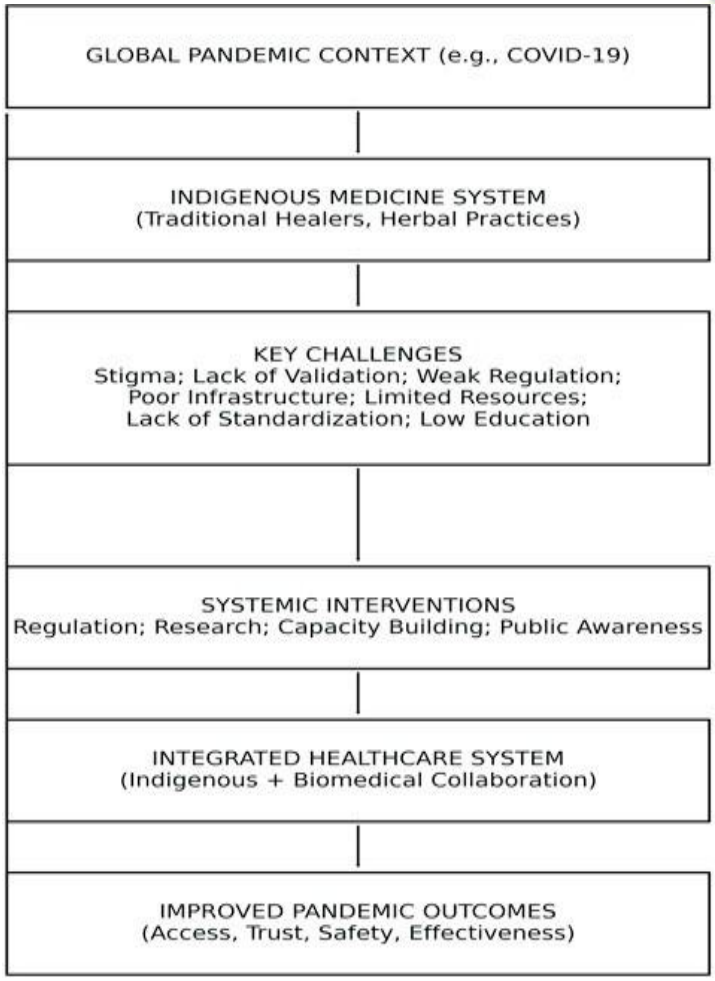

Figure 1: Integrated Indigenous Medicine Framework for Pandemic Response.

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This framework illustrates the interaction between indigenous medicine systems and pandemic conditions, highlighting key structural challenges and systemic intervention points. It demonstrates how coordinated efforts in regulation, research, capacity building, and public awareness can enable effective integration with biomedical healthcare systems and improve pandemic response outcomes. This conceptual model is visually represented in Figure 1, which illustrates the dynamic relationships between pandemic context, systemic constraints, intervention leverage points, and integrated health outcomes.

3. Methodology

This study adopts a qualitative systematic literature review to examine the challenges of indigenous medicine during the COVID-19 pandemic. The approach enables the synthesis of existing knowledge in contexts where primary empirical data remain limited (Snyder, 2019). The study followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure methodological transparency and reproducibility.

A systematic search was conducted across four major databases: PubMed/MEDLINE, Scopus, Web of Science, and African Journals Online (AJOL). The search covered peer-reviewed English-language publications from January 2019 to December 2024. Search strings combined key terms such as "indigenous medicine," "traditional medicine," "herbal medicine," "COVID-19," "pandemic," "Africa," and "Nigeria." In addition, backward citation tracking and targeted searches of policy documents were conducted to capture relevant grey literature.

The initial database search yielded 312 records. After removal of duplicates (n = 78), 234 records remained for title and abstract screening. Following screening, 85 articles were retained for full-text

assessment. Of these, 42 studies met the inclusion criteria and were included in the final analysis.

The inclusion criteria comprised studies that examined indigenous or traditional medicine in Africa, with particular emphasis on Nigeria, and addressed healthcare, regulatory, or sociocultural dimensions. Eligible studies were required to be empirical or policy-relevant analyses. Conversely, studies were excluded if they were laboratory-based without contextual relevance, conducted outside the African context, or were duplicate or non-peer-reviewed publications.

Data were extracted using a structured template and analyzed thematically following Braun and Clarke (2021). Themes were iteratively developed to identify recurring patterns related to systemic challenges and integration barriers.

Despite its rigor, the study has limitations. It relies on English-language publications, which may exclude valuable indigenous knowledge transmitted orally or documented in local languages. Additionally, the rapidly evolving nature of COVID-19 research means that some emerging findings may not be captured.

Quality Appraisal: Each included study was independently assessed by two reviewers using the Mixed Methods Appraisal Tool (MMAT) version 2018. Disagreements were resolved through consensus. Studies scoring below 60% on relevant MMAT criteria were excluded. This process yielded a final inclusion of 38 studies (from the initial 42) after quality screening.

4. Literature Review

The COVID-19 pandemic renewed global interest in traditional and complementary medicine, particularly in low-resource settings where biomedical systems were under severe strain. Existing literature highlights both the widespread reliance on indigenous

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medicine and the structural constraints limiting its formal integration.

In sub-Saharan Africa, between 70% and 80% of the population relies on traditional medicine for primary healthcare (Agyare et al., 2020). This reliance reflects not only cultural continuity but also systemic gaps in healthcare access, including underfunding, workforce shortages, and infrastructural deficits (Oleribe et al., 2019). During the COVID-19 pandemic, demand for indigenous remedies increased significantly, as documented in Nigeria, Ghana, and South Africa (Onyiapat et al., 2022; Asante et al., 2021; Mwema et al., 2022).

However, the literature also reveals persistent tensions between indigenous and biomedical systems. The promotion of Madagascar's Covid-Organics without clinical validation illustrates the broader challenge of balancing accessibility with scientific credibility (Ravaisson et al., 2021). Regulatory gaps remain widespread, with fewer than half of African countries maintaining functional traditional medicine policies (Kasilo et al., 2019). Emerging post-pandemic evaluations (e.g., Okeke et al., 2024; Nwosu & Adebayo, 2024) confirm that regulatory gaps persist, though some African countries including Ghana and Rwanda have initiated pilot integration programmes since 2023.

Recent scholarship has shifted toward examining these tensions through epistemological and policy lenses. Achebe and Okafor (2023) argue that dominant biomedical standards may marginalize indigenous knowledge systems, while Abimbola and Pai (2020) call for more inclusive, decolonised research frameworks.

Rather than duplicating these discussions, this study builds on existing literature by systematically synthesizing and analysing the interconnected challenges that constrained indigenous medicine during COVID-19, as presented in the following section.

5. Challenges of Indigenous Medicine in Responding to COVID-19

Drawing on the reviewed literature, this study identifies seven principal challenges that hindered the effective application of indigenous medicine during the COVID-19 pandemic in Nigeria and across Africa. These challenges are interrelated and mutually reinforcing, as elaborated within the Systems Thinking framework introduced in Section 2.

5.1 Stigmatization and Mistrust

Beyond social perception, stigmatization reflects deeper institutional hierarchies that privilege biomedical knowledge over indigenous practices. This mistrust is reinforced by historical marginalization and contemporary policy neglect. During COVID-19, misinformation amplified this dynamic, creating a dual burden: legitimate practitioners were discredited, while unregulated actors exploited public fear. This not only reduced patient trust but also discouraged collaboration between traditional and biomedical providers, further isolating indigenous medicine from formal health systems.

5.2 Absence of Scientific Validation

The most significant technical barrier is the lack of rigorous clinical evidence for the efficacy and safety of indigenous remedies in treating COVID-19. Unlike pharmaceuticals that undergo structured regulatory review before approval, most traditional preparations have not been subjected to randomized controlled trials (Abdullahi, 2020). This gap is exacerbated by the reluctance of some practitioners to submit their preparations for laboratory analysis, reflecting concerns about intellectual property, distrust of formal institutions, and philosophical objections to reductive biomedical epistemology. Achebe and Okafor (2023) call for the development of culturally sensitive research methodologies capable of validating traditional medicine without distorting it.

5.3

Inadequate Healthcare Infrastructure

Infrastructure limitations extend beyond physical facilities to include weak research ecosystems and absence of pharmacovigilance systems. Without mechanisms for documenting treatment outcomes or monitoring adverse effects, indigenous medicine remains excluded from evidence-based frameworks. This creates a structural paradox: the absence of infrastructure prevents validation, while lack of validation justifies continued exclusion from infrastructural investment.

5.4 Weak Regulatory Frameworks

Kasilo et al. (2019) and Nkosi et al. (2023) both confirm that regulatory frameworks governing traditional medicine in most African countries, including Nigeria, remain inadequate. There are no binding national standards for the preparation, quality control, labelling, or distribution of herbal products in many jurisdictions. This regulatory vacuum allows unverified or potentially harmful preparations to enter the market without scrutiny, eroding public confidence and obstructing responsible integration efforts.

5.5 Limited Access to Resources

Resource constraints are not merely financial but systemic. Indigenous practitioners often operate outside formal supply chains, limiting access to standardized raw materials, storage facilities, and distribution networks. This fragmentation restricts scalability and reduces the potential for integration into national health responses. The issue is particularly acute in rural areas, where practitioners serve as primary caregivers but lack institutional support.

5.6 Lack of Standardization

Standardization refers to the consistent formulation, dosing, and quality control of medicinal preparations. Most indigenous remedies

in Nigeria are prepared individually based on oral transmission, experiential knowledge, and locally available materials. While this flexibility allows adaptation to patient-specific factors, it precludes reproducibility – a cornerstone of biomedical regulatory approval. During COVID-19, this meant that even where promising herbal formulae existed (e.g., recipes containing *Azadirachta indica* or *Citrus limon*), they could not be scaled or tested in uniform clinical trials. Moreover, the absence of dosage guidelines led to risks of under-dosing (ineffectiveness) or over-dosing (toxicity). Achebe and Okafor (2023) argue for a "tiered standardization" model, where essential safety and quality markers are established without mandating complete uniformity – preserving traditional flexibility while enabling regulatory oversight.

5.7 Low Formal Educational Attainment

A substantial proportion of indigenous medicine practitioners in Nigeria have not completed formal secondary education, and fewer hold tertiary qualifications (Ozioma & Chinwe, 2019). During COVID-19, this created three distinct barriers. First, many practitioners could not access or critically evaluate rapidly evolving scientific information about SARS-CoV-2 transmission, leading to the propagation of ineffective or unsafe remedies. Second, documentation practices were minimal, meaning treatment outcomes could not be systematically recorded or shared with health authorities. Third, practitioners were largely excluded from policy dialogues, which remain dominated by Western-trained clinicians and epidemiologists. However, framing this solely as a deficit is misleading. Indigenous practitioners possess deep experiential knowledge of plant pharmacopoeia, seasonal availability, and patient response patterns – knowledge that is not captured by formal

credentials. The solution lies not in replacing indigenous education but in creating bridging programmes that combine basic biomedical literacy (e.g., hygiene, dosage measurement, adverse event reporting) with respect for traditional epistemologies.

5.7 Low Educational Attainment

Educational limitations affect not only documentation but also engagement with policy and research processes. However, framing this solely as a deficit risks overlooking the depth of experiential knowledge possessed by practitioners. The challenge, therefore, lies in bridging formal and informal knowledge systems through inclusive training models rather than imposing purely biomedical standards.

6. Solutions and Recommendations

Addressing the challenges facing indigenous medicine requires a coordinated, multi-stakeholder approach grounded in Medical Pluralism and Systems Thinking. Strengthening public awareness and reducing stigma is essential. Evidence-based communication strategies should provide accurate information about the benefits and limitations of indigenous medicine, using trusted community channels such as religious institutions, community radio, and traditional leaders rather than relying solely on formal media (Adebayo et al., 2023). These campaigns should also distinguish clearly between legitimate practitioners and fraudulent actors who exploit public health crises. In addition, collaborative research should be promoted through partnerships among indigenous healers, academic institutions, and government agencies. Co-produced research models will ensure that traditional knowledge is studied using culturally appropriate and scientifically rigorous methods (Achebe & Okafor, 2023; Moyo et al., 2024).

There is also a need to establish a robust regulatory framework to guide the practice of indigenous medicine. The passage of the Traditional and Indigenous Medicine Practitioners Council Bill in Nigeria would provide a legal basis for standardization, quality control, and safe distribution of herbal products. Such frameworks should be participatory, involving practitioners in policy development to ensure practical applicability and scientific credibility (Nkosi et al., 2023). Alongside regulation, capacity building is critical. Training programmes should equip practitioners with essential skills in record-keeping, safe preparation and storage of remedies, and basic health literacy. Partnerships with polytechnics, universities, and agricultural institutions can extend access to training, particularly in rural areas, without undermining traditional knowledge systems (Ozioma & Chinwe, 2019).

Finally, long-term sustainability depends on investment in medicinal plant conservation and the use of digital technologies. Conservation initiatives at the local government level should promote sustainable harvesting and cultivation practices to address threats such as climate change and over-harvesting (Agyare et al., 2020). At the same time, digital health technologies including telemedicine platforms, mobile health applications, and digital knowledge repositories can help bridge infrastructure gaps. These tools can support remote consultations, improve access to research and guidelines, and facilitate the documentation and preservation of indigenous knowledge (Adebayo et al., 2023). Integrating indigenous practitioners into national digital health strategies will enhance their contribution to healthcare delivery and strengthen their role in future pandemic responses.

6.1 Implementation Priorities and Responsible Actors

To move from recommendation to action, the following phased approach is proposed:

Timeline	Action	Lead Actor	Resource Implication
Short-term (0–6 months)	Launch public awareness campaigns via community radio	NAFDAC + State Ministries of Health	Low (repurpose existing health budgets)
Medium-term (6–18 months)	Establish practitioner training pilot in 3 states (Lagos, Kano, Enugu)	Federal Ministry of Health + WHO	Moderate (donor funding, e.g., Global Fund)
Long-term (18–36 months)	Pass the Traditional Medicine Council Bill & develop the pharmacopoeia	National Assembly + NAFDAC	High (legislative + technical investment)

Without assigned responsibility and resourcing, recommendations risk remaining aspirational.

7. DISCUSSION

This study set out to identify and analyse the challenges confronting indigenous medicine in Nigeria during COVID-19. The seven challenges identified are not independent; rather, they form a self-reinforcing cycle. Weak regulation enables unverified products, which fuels public mistrust, which discourages research investment, which perpetuates lack of validation, which then justifies continued regulatory neglect. This finding aligns with Paina and Peters' (2012) observation that health systems often exhibit “path dependency” – once marginalised, a system requires deliberate, multi-point intervention to shift trajectory.

Comparatively, the Nigerian experience mirrors those of Ghana (Asante et al., 2021) and South Africa (Mwema et al., 2022), though Madagascar's state-led promotion of Covid-Organics (Ravaisson et al., 2021) represents a distinct political-economy dynamic where

governmental endorsement partly substituted for scientific evidence. Nigeria's federal structure, with health governance shared between national and state authorities, further complicates integration – a factor not fully captured in the present analysis.

Several limitations warrant mention. First, the reliance on English-language, peer-reviewed sources excludes oral knowledge and local-language publications. Second, the rapid evolution of COVID-19 research means some 2024 findings may not have been captured at the time of analysis. Third, the study does not include primary data from practitioners themselves; future research should prioritise participatory ethnographies and policy-framing analyses with healer associations. Fourth, while Medical Pluralism Theory illuminates power asymmetries, it does not prescribe mechanisms for redress – future work might integrate Political Economy Analysis to examine why regulatory reform has stalled despite decades of advocacy.

Despite these limitations, the study offers a transferable framework for other low- and middle-income countries where medical pluralism is normative. The Integrated Indigenous Medicine Framework (Figure 1) can be adapted for other pandemics (e.g., future influenza or Ebola outbreaks) by substituting contextual variables while retaining the core systems logic.

7.1 Contribution to Knowledge

This study contributes to existing literature by providing a systems-based analysis of indigenous medicine during a global pandemic, highlighting the interconnected nature of regulatory, infrastructural, and epistemological challenges. It also proposes a context-specific framework for integrating indigenous medicine into Nigeria's health system.

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6. Conclusion

This study demonstrates that the challenges confronting indigenous medicine during the COVID-19 pandemic are not isolated deficiencies but systemic outcomes of longstanding structural, epistemological, and institutional inequalities. By applying Medical Pluralism Theory and Systems Thinking, the analysis reveals that stigma, weak regulation, lack of validation, and infrastructural deficits are deeply interconnected and mutually reinforcing.

The key contribution of this study lies in reframing indigenous medicine not as an alternative or supplementary system, but as an integral yet underdeveloped component of national health systems. The findings suggest that meaningful integration cannot be achieved through isolated interventions such as regulation or research alone. Instead, it requires coordinated, system-wide reforms that address multiple leverage points simultaneously.

Importantly, the COVID-19 pandemic should not be viewed merely as a crisis but as a critical policy window. It has exposed the limitations of biomedical dominance while highlighting the resilience and accessibility of indigenous medicine. Leveraging this moment requires a shift from symbolic recognition to substantive inclusion, supported by sustained investment, collaborative research, and inclusive governance frameworks.

Ultimately, the future of healthcare in Nigeria and similar contexts depends on moving beyond hierarchical models toward pluralistic, integrated systems that combine the strengths of both indigenous and biomedical traditions. Without such transformation, indigenous medicine will remain marginalized; with it, it can become a vital pillar of resilient and inclusive healthcare systems.

For Nigeria, the single most impactful step is the immediate passage of the Traditional and Complementary Medicine Bill (currently pending before the National Assembly since 2021), which would establish a legal framework for regulation, research funding, and practitioner registration.

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