

Review Article

Establishing childhood immunization programme in community pharmacies in Nigeria for improved child health statistics

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Sent for review: 24 March 2026

Revised accepted: 19 September 2026

Abstract

Childhood immunization is one of the foremost and most efficient public health programs globally. However, Nigeria is still plagued with recurrent outbreaks of vaccine-preventable diseases. Experiences have shown that community pharmacies have the potential to complement existing primary healthcare services and expand access to vaccines. In this review, we focused on the possibility and potential impact of integrating community pharmacies into childhood immunization services in Nigeria. We conducted a narrative synthesis and drew vital information from published articles and literature on pharmacy-based immunization. The analysis focused on five important domains: current immunization practice in Nigeria, the role of the community pharmacies, challenges to immunization coverage, policy considerations, and expected impact on child health. Evidence from many countries has shown that pharmacies can effectively deliver vaccines when integrated into broader immunization programs. Community pharmacies can serve as an important extension of primary healthcare in childhood immunization in Nigeria. However, successful implementation requires robust policy design and training of pharmacists in pediatric vaccination.

Keywords: Community pharmacies, Health policy, Immunization, Nigeria, Vaccine

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INTRODUCTION

The introduction of vaccination programs into rural and urban communities has reduced the burden of infectious diseases greatly. This has offered protection to the communities through herd immunity. Despite this global success, Nigeria has yet to reach global targets for immunization. For example, diphtheria-tetanus-

pertussis (DTP3) vaccine is widely used for childhood immunization. Yet, the coverage for the third dose of the vaccine was 62% in 2023. This is well below 84%, which is the global average [1]. Up to now, the country continues to record low turnout for routine immunization. One of the obvious impacts of this failure is the emergence and recurring outbreaks of vaccine-preventable diseases. Such outbreaks could

threaten the overall health of the children, which in turn puts additional pressure on the weak healthcare system [2]. There are demand-side and supply-side challenges that determine vaccine uptake. The supply side involves weak cold-chain system and vaccine stock-outs. Both of them are responsible for the inconsistent access to vaccines. The demand side involves long travel distances to access vaccines, misinformation, and other competing daily priorities [3].

In Nigeria, community pharmacies are the most accessible healthcare facilities for millions of households. Besides their strategic locations, they normally operate from morning till night. Their workforce is largely trained professionals who are skilled in drug handling and patient counseling [4]. In many countries of the world, community pharmacists are already participating in their national vaccine delivery. For example, in Australia, Canada, and the UK, pharmacists administer influenza vaccines. In Canada, Portugal, and the US, they provide hepatitis B (HBV) vaccination services [5]. All these indicate that pharmacies can efficiently deliver vaccines in Nigeria if properly supported. Their wide geographical distribution and frequent contact with caregivers position them to help close the gaps in childhood immunization. The barriers to vaccine uptake will shrink if pharmacists are integrated into childhood immunization practices [6]. However, several key challenges must be addressed to fully harness these benefits. The unreliable power supply in most parts of the country means that there are currently no reliable cold-chain systems across pharmacy outlets. Presently, the national immunization registries are fragmented. Therefore, strong reporting mechanisms must be established and made accessible to all participating pharmacies. This will involve referral pathways for managing adverse events following immunization (AEFI) [7]. In addition, private pharmacies must be managed properly to ensure that vaccination services remain focused on public health goals other than profit-making. Gleaning from other countries, these challenges are surmountable in Nigeria if guided by a standard regulatory framework [8]. Therefore, this paper argues that integrating community pharmacies into childhood immunization in Nigeria could serve as a scalable strategy to improve child health in the country.

METHOD

This is a narrative review drawn from existing evidence on childhood immunization coverage in Nigeria. In order to improve transparency and

rigor, the PRISMA-ScR framework was adopted throughout the review process. A comprehensive literature search was conducted across multiple databases. These include Embase, Google Scholar, PubMed, Scopus, Web of Science, and the WHO Global Index Medicus. It covers publications from 2013 to 2026. Relevant data from popular literature sources such as reports from the National Primary Health Care Development Agency (NPHCDA) and WHO/UNICEF Estimates of National Immunization Coverage (WUENIC) were also obtained. The search strategy used key terms such as “childhood immunization,” “Community pharmacies,” “DTP3,” “Health policy,” “Nigeria,” and “Vaccine,” using Boolean operators to refine the search. Titles and abstracts were initially screened for relevance, then full texts were reviewed to identify studies that provided data on immunization coverage in Nigeria.

Criteria for eligibility included studies that reported quantitative or qualitative data on childhood vaccine coverage in Nigeria, or focused on routine immunization or factors affecting DTP3, or peer-reviewed articles or credible and official public health reports.

Studies that focused exclusively on adult populations and those without verifiable data were excluded from the review. Only the information containing vaccine coverage estimates and disparities among states of the federation was considered relevant. Due to heterogeneity in study designs, a narrative thematic synthesis approach was used rather than a meta-analysis. Findings were organized under key themes such as national coverage trends, zero-dose burden, urban-rural disparities, supply-chain constraints, demand-side barriers, and gaps in routine immunization delivery. Full-text articles were reviewed to evaluate their eligibility. Studies that were excluded included those that did not focus on Nigeria, community pharmacy vaccination, or that lacked adequate methodological detail. Overall, 1,092 records were initially identified, with 874 remaining after duplicates were removed. After evaluating the titles and abstracts, 136 articles were selected for full-text assessment. Of these, 59 met the inclusion criteria and were included in the final analysis. The findings were then arranged in key thematic areas for a structured synthesis.

Current landscape of childhood immunization in Nigeria

Nigeria's routine immunization system is fragile and uneven. Despite the clear benefits of routine immunization, Nigeria still falls short of global

immunization targets. For example, nationwide coverage of the third dose of DTP3 was as low as 15% in 1995, and 33% by 1999 [9]. According to 2022 estimates, DTP3 coverage in Nigeria improved to roughly 56%. However, this number remains well below the 90% target set by Immunization Agenda 2030 (IA2030). Moreover, childhood immunization remains incomplete. A 2021–2023 survey showed that only 36% of Nigerian children aged 12–23 months had received all recommended vaccines. This contrasts with IA2030's goal of 90% coverage for essential childhood vaccines. Consequently, Nigeria also ranks among the countries with the largest zero-dose populations. As of 2024, Nigeria still accounted for almost 15% of the global zero-dose infants [10]. The World Health Organization and UNICEF (WUENIC) estimated that coverage for several infant vaccines has improved since the year 2010. However, there are still gaps that exist between administrative reports and independent survey findings [11]. These disparities within the country are also captured in available national data. Although some urban areas have achieved comparably high coverage for most vaccines, many rural communities are still lagging. Data from the Nigeria Demographic and Health Survey (NDHS) have shown consistent wide variation in DTP3 and measles vaccine coverage across all 36 states and the Federal Capital Territory (FCT). In many states, coverage is far below the national average. In some other cases, many children have not received any routine vaccinations at all [12,13]. These are gaps with troubling public health consequences. One of them is the recurring outbreaks of measles and meningitis in the country. Nigeria is also at risk of circulating vaccine-derived poliovirus despite the fact that the wild type has been eliminated [14].

Challenges limiting universal immunization coverage

There has been a significant global investment in universal childhood immunization and Nigeria is a big beneficiary. However, achieving the global target for immunization among children is still a big challenge. This difficulty is driven by many interconnected factors. Data pulled from national immunization averages sometimes mask deep geographic inequalities. For example, while some urban areas report high coverage for some key vaccines, many rural communities are still under-immunized. These groups of under-vaccinated children are mostly responsible for the recorded outbreaks [15,16]. In addition, Nigeria operates primary healthcare centres largely staffed with community health extension workers. Many of these centres across the states

are grossly understaffed. This ranges from limited availability of trained vaccinators to unavailability of skilled facilitators. The prevalence of poverty in most areas also plays a major role. Families facing economic crisis often prioritize immediate daily food over healthcare [17]. This challenge is even more common in rural areas, where the cost of transportation undermines access to vaccination services. Besides financial challenges, mistrust and misinformation also affect vaccine uptake. Vaccine hesitancy is often driven by cultural beliefs and false information [18].

The first point of contact for caregivers in many urban and rural areas is community pharmacies. Yet, they have not been formally integrated into the childhood immunization system. They represent a promising and strategic platform for achieving global immunization targets in Nigeria. Many pharmacy outlets are eager to participate in vaccination efforts, but are inhibited by the current policies and regulations. A policy reform that allows community pharmacies to participate in childhood immunization will inevitably expand access to vaccines [19]. Challenges associated with operation are also significant. These include unreliable electricity and limited refrigeration time. They can make maintaining the vaccine cold chain both difficult and expensive. The challenge of poor road networks further delays distribution of vaccines. It also increases the risk of vaccine wastage. Additionally, public confidence in vaccines is further dampened by the presence of substandard medical products in the Nigerian markets [20]. Demand-side challenges are equally worsening the situation that already existed. They include the systems for detecting and responding to adverse events following immunization (AEFI). When such events are not properly accounted for, rumours can spread and discourage vaccination compliance [21]. Table 1 shows the barriers limiting childhood immunization coverage in Nigeria.

The untapped potential of community pharmacies

The most strategic healthcare points to expand childhood immunization are community pharmacies. Their presence across major areas in Nigeria makes them suitable for this purpose. They offer the capacity to address persistent barriers to timely vaccination [25]. Unlike many primary healthcare centres, community pharmacies are often located along busy streets and residential communities. This makes them a common first point of contact for caregivers seeking treatment or health advice.

Table 1: Barriers limiting childhood immunization coverage in Nigeria

Barrier	Description
Poor data	There are disparities in data reporting [10].
National inequities	There are large gaps between rural and urban clusters [15].
Fragile supply chain	Unreliable cold chain and poor transportation network [16].
Shortage of Vaccinators	There are few trained vaccinators in most centres [17].
Economic barriers	High cost of transportation deters immunization attendance [20].
Vaccine hesitancy	Demand for vaccines is reduced by misinformation [21].
Weak financing	Vaccination depends heavily on donors [22].
Conflict	Insecurity across the country disrupts immunization services [23].
Pandemic shocks	COVID-19 pandemic disrupted the workforce and resources [24].
Weak AEFI response	Community fears increase with poor AEFI surveillance [21].
Continuous financing challenge	Childhood immunization is competing with other health priorities and resources are limited [22].

Therefore, integrating childhood immunization into these frequent interactions could help turn everyday healthcare visits into opportunities for immunization [26]. Despite this potential, community pharmacies remain underutilized within Nigeria's immunization system. Expanding their role could help reduce these barriers and complement existing immunization centres. This is particularly important given challenges associated with cold-chain disruptions and vaccine stock-outs. All these factors limit the ability to track immunization coverage and ensure timely vaccination [27]. The lack of interoperable digital registries also contributes to missed opportunities during routine healthcare visits. Evidence suggests that strengthening supply chains and improving data systems can significantly increase coverage [28]. However, such improvements have yet to be implemented in childhood immunization.

Community pharmacists also bring practical and operational advantages. They have the requisite training and experience in handling temperature-sensitive products. Adding this to quality standards maintenance skills, community pharmacies have most of the essential factors for vaccine storage and delivery [29]. Vaccine acceptance also comes with trust from caregivers and these professionals are often trusted members of the community. This puts them in a good position to provide vaccine education and counselling. In order to improve vaccine availability, the private sector's procurement systems could be aligned with national supply chains [30]. The need for the participation of community pharmacies in vaccine programmes goes beyond vaccine delivery. They can also participate in data collection and surveillance. With the right training and resource materials, they can document vaccinations

properly. This will strengthen immunization records and improve access to knowledge of AEFI [31]. All underserved children living in urban and rural areas will benefit from this initiative. Even communities that have shortage of trained vaccinators will benefit if pharmacists can safely administer vaccines [32].

Global precedents for pharmacy-based immunization

Since pharmacy-based immunization is thriving in many parts of the world, it offers some useful lessons to Nigeria. They are not competing with the existing immunization infrastructure. Rather, they can effectively complement the existing services if meticulously integrated into national immunization programmes [33,34]. In the US during the outbreak of COVID-19, community pharmacies helped in delivering COVID-19 vaccines to their host communities. They achieved that through the Federal Retail Pharmacy Program. Hundreds of millions of COVID-19 vaccine doses were administered through this programme during the pandemic [35]. Gleaning from this experience, many countries have now added community pharmacists to include vaccination efforts.

For many years in the UK, community pharmacies have been involved in providing adult vaccines. They have now integrated into childhood influenza vaccination [36]. Other advanced countries have made similar progress for universal vaccine coverage. Both Canada and Australia have expanded pharmacists' responsibilities to include routine immunization for adolescents and adults [37,38]. All these are clear indications that pharmacy-based vaccination strengthens immunization coverage. This expansion is not limited to developed

countries alone. Many developing nations in Latin America have started institutionalizing pharmacy vaccination. Across Brazil, Colombia, Argentina, Chile, and Mexico, there is a considerable diversity in operational practices. Nevertheless, the recognition of pharmacies as viable partners for expanding immunization reach is a common trend [39,40,41]. The momentum toward pharmacies' participation is building in Africa too. There is growing recognition that accredited pharmacies can enhance vaccine accessibility significantly. For example, professional and academic discussions have explored the potential role of pharmacists in childhood vaccination in South Africa. [42]. Table 2 summarizes the international precedents for pharmacy-based vaccination.

Policy and regulatory considerations

There must be a well-defined regulatory framework for a successful establishment of childhood immunization services within community pharmacies. The framework must allow pharmacies to administer vaccines to the targeted paediatric population [43]. The policy environment in Nigeria must include strong regulatory oversight of the community pharmacies enrolled in the vaccination programme. The first part is to establish clear legal authority and scope of practice. The law must explicitly recognize pharmacists as competent providers of childhood immunization [5]. Furthermore, the regulations should clearly specify which vaccines may be administered within pharmacies and the age categories eligible to participate. Therefore, participating pharmacies must be accredited after meeting the basic requirements and monitored as an integral component of national immunization [33, 44].

New regulations that allow community pharmacies to participate in childhood immunization are not the only thing necessary for effective implementation. Professional competence and workforce capacity are also necessary. Therefore, structured training and certification are essential. This begins with a rollout of a standard national curriculum to equip pharmacists with the skills required to take part in pediatric vaccination. Continuous competency evaluations will also be needed to maintain consistency in professional service delivery [45]. Vaccines are cold-chain products and their management is equally critical. Therefore, participating pharmacies must be equipped with WHO-approved refrigerators and solar-powered electricity to ensure that vaccines are always safely stored [46].

Since community pharmacies are driven by commercial interests, the financial aspects of pharmacy-based immunization need meticulous planning. Transparent pricing will secure the confidence and trust of caregivers. In a situation where the government pays for the cost, clear reimbursement mechanisms must be established to prevent the transfer of charges to caregivers [47]. In addition, the issue of accountability by participating pharmacies is a big factor. Their roles and responsibilities must be clearly defined and the influence of key regulatory bodies equally stated. The existing regulatory bodies include the Pharmacy Council of Nigeria (PCN), National Agency for Food and Drug Administration and Control (NAFDAC), and National Primary Health Care Development Agency (NPHCDA). Defining their clear mandates will ensure effective coordination between regulation and effective implementation [48].

Table 2: Global precedents for pharmacy-based immunization

Country	Policy Model	Achievements
United States	FRPP and state-level pharmacist authority	Delivered hundreds of millions of COVID-19 and influenza doses [35].
United Kingdom	NHS-commissioned pharmacy services for influenza and pediatric vaccines	Increased convenience and uptake [36].
Canada	Provincial authorization for pharmacist-administered vaccines	Improved access and uptake of adolescent vaccines [37]
Australia	Phased expansion from influenza to adolescent vaccines	Demonstrated safe scale-up [38]
Brazil, Mexico, Chile	Some allow limited pharmacy vaccination, others pilot services	Surveys reveal heterogeneity [39,40,41]
South Africa	Discussions and pilots on pharmacist roles in childhood vaccination	Pharmacists identified as potential immunizers [42]

The potential impact of integration with primary healthcare

Community pharmacies are an obvious need in Nigeria's childhood immunization programme to improve equitable access to vaccines. Their role is clearly to complement the existing health services in childhood immunization, which is grossly ineffective. For efficient integration, national reporting systems must be standardized. Such systems will ensure that there is better coordination between vaccinators at the pharmacies and the public health authorities [49,50]. Therefore, this approach will ensure that the immunization effort is both continuous and visible. There should be a central database to ensure that vaccines administered in pharmacies are recorded alongside those given in clinics. This is necessary since childhood vaccination involves multiple doses over time. This requires consistent and standardized reporting across all states and local government areas of the country [51].

Expanding immunization services through pharmacies can significantly improve child health. Pharmacies can help bridge coverage gaps in underserved urban and rural communities. Their proximity to households offers caregivers more convenient and flexible opportunities to vaccinate their children. This can reduce missed or incomplete vaccinations. In turn, increased coverage would lower disease incidence and reduce the risk of outbreaks [52,53]. Pharmacy-based immunization could also strengthen the broader health system. This includes preventing vaccine-preventable

diseases. It can reduce hospital admissions and help limit the inappropriate use of antibiotics [54].

Possible barriers and recommendations

If childhood immunization services are integrated into community pharmacies, they will raise important legal and ethical considerations. At the moment, existing regulations do not clearly permit pharmacists to administer vaccines to children. This has created a gap that needs to be addressed. Therefore, explicit laws and regulations are necessary to authorize and incorporate them into national immunization programmes [55,56].

To support this transition, pilot schemes should be tested in selected urban and rural areas. These pilot programmes would help assess feasibility and operational challenges before wider implementation [57]. These pilots must be rigorously evaluated using measurable parameters to determine their readiness. Technical and operational readiness are central to immunization success. Pharmacies must meet strict accreditation criteria to be included in the programme [58]. Other recommendations are captured in Table 3 below.

CONCLUSION

Community pharmacies can offer a powerful opportunity to close coverage gaps and strengthen Nigeria's public health system. However, this approach will only succeed with deliberate and well-structured planning. Clear legal frameworks and alignment with existing primary healthcare services are essential.

Table 3: Key issues and implementation priorities for pharmacy-based childhood immunization

Domain	Key Issues	Recommended Actions	Expectations
Policy Framework	Ambiguity in authorization	Amend public health laws	Clear authorization [53]
Evaluation	Lack of tested operational models	Conduct phased pilots with measurable parameters	Evidence-based expansion [57]
Accreditation	Inadequate training	Implement accreditation standards	Safe service delivery [48]
Cold Chain	Power instability	Provide WHO-standard refrigeration	Reliable vaccine potency [20]
Data Integration	Fragmented reporting	Link pharmacy reporting to national record	Accurate, real-time data [51]
Financing	Risk of exclusion due to user fees	Reimburse pharmacies	Free access for all children [47]
AEFI	Weak emergency preparedness	Maintain emergency kits	Improved response [31]
Community Engagement	Vaccine hesitancy and misinformation	Design communication with caregivers	Increased acceptance [18,30]
Sustainability	Donor dependency	Embed costs into domestic budgets	Long-term operational stability [59]

DECLARATIONS

Acknowledgement/Funding

None.

Conflict of interest

No conflict of interest is associated with this work.

Contribution of authors

We declare that this work was done by the author(s) named in this article, and all liabilities pertaining to claims relating to the content of this article will be borne by the authors.

Ethical approval

Not required.

Use of Artificial Intelligence/Large language models

We also declare that we did not use Generative artificial intelligence (AI) and AI-assisted technologies in writing the manuscript.

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