

## Structures and processes for adult vaccination services in community pharmacies in Nigeria

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### ABSTRACT

**Background:** Community pharmacists are highly accessible health professionals. This accessibility positions pharmacies as logical settings to deliver routine adult vaccinations, accelerate uptake, and decongest other health facilities. To realise this potential, however, pharmacy-based vaccination must be underpinned by clear structures and robust processes.

**Objectives:** This study aimed to identify the structures available for adult vaccination services and the processes followed for community pharmacy services in Nigeria.

**Methods:** This was a descriptive, cross-sectional study. The study population consisted of registered community pharmacies in one state from each of the six geopolitical zones of Nigeria, including Lagos State and the Federal Capital Territory (FCT). Data were collated and entered into Statistical Package for Social Sciences (SPSS) version 25.

**Results:** Most community pharmacies (348,97.2 %) had adequate space for vaccine consultation, facilities for hand washing (311,86.9 %), and sharps disposal (348,97.2 %). Most of the community pharmacists (299,83.5 %) always follow standard operating procedures in administering and handling vaccines.

**Conclusion:** Community pharmacies in Nigeria have relatively adequate structures in place, and mostly follow standardized processes in rendering adult vaccination services.

**Keywords:** Structure, Process, Vaccination services, Community Pharmacy, Nigeria

## Structures et processus des services de vaccination des adultes dans les pharmacies communautaires au Nigéria

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### RÉSUMÉ

**Contexte:** Les pharmaciens communautaires sont des professionnels de santé hautement accessibles. Cette accessibilité fait des pharmacies des lieux appropriés pour la prestation des vaccinations de routine chez les adultes, permettant d'en accroître la couverture et de désengorger les autres structures de santé. Toutefois, pour concrétiser ce potentiel, la vaccination en pharmacie doit reposer sur des structures clairement définies et des processus solides.

**Objectifs:** Cette étude visait à identifier les structures disponibles pour les services de vaccination des adultes et les processus suivis par les services de pharmacie communautaire au Nigéria.

**Méthodes:** Il s'agit d'une étude descriptive transversale. La population étudiée était composée de pharmacies communautaires agréées situées dans un État de chacune des six zones géopolitiques du Nigéria, y compris l'État de Lagos et le Territoire de la capitale fédérale (FCT). Les données ont été recueillies et saisies dans le logiciel SPSS (Statistical Package for Social Sciences), version 25.

**Résultats:** La plupart des pharmacies communautaires (348, soit 97.2 %) disposaient d'un espace adéquat pour la consultation vaccinale, d'installations pour le lavage des mains (311, soit 86.9 %) et de dispositifs d'élimination des objets piquants et tranchants (348, soit 97.2 %). La majorité des pharmaciens communautaires (299, soit 83.5 %) respectaient systématiquement les procédures opératoires normalisées pour l'administration et la manipulation des vaccins.

**Conclusion:** Les pharmacies communautaires au Nigéria disposent de structures relativement adéquates et suivent, dans l'ensemble, des processus standardisés pour la prestation de services de vaccination des adultes.

**Mots-clés:** Structure, processus, services de vaccination, pharmacie communautaire, Nigéria

## INTRODUCTION

Vaccination remains one of the most cost-effective public-health interventions for preventing infectious diseases and reducing morbidity and mortality across age groups.<sup>1</sup> Historically, vaccination programmes in Nigeria have been delivered largely through government primary-care channels and mass campaigns. However, the COVID-19 pandemic exposed gaps in access and highlighted the potential of non-traditional sites such as community pharmacies to expand adult vaccination coverage.<sup>2-4</sup> Community pharmacists are highly accessible health professionals who routinely interact with adults for medicines, chronic-disease care, and health promotion. This accessibility positions pharmacies as logical settings to deliver routine adult vaccinations, accelerate uptake, and relieve congestion at other health facilities.<sup>5</sup>

To realise this potential, however, pharmacy-based vaccination must be underpinned by clear structures and robust processes. Structures are the enabling architecture that affect the context in which care is delivered and include equipment, personnel, physical environment, record-keeping, cost of care, hours of availability, and all that physically exists to enable delivery of vaccination services.<sup>6-8</sup>

Processes describe the operational workflows that translate structure into safe, reliable service. For community-pharmacy vaccination services, these processes include standard operating procedures, training, patient screening and consent, vaccine storage, vaccine administration, cold-chain monitoring, adverse-event reporting, waste disposal, infection-prevention procedures, and interprofessional referral pathways.<sup>7-10</sup> Evidence from recent Nigerian studies shows variation in these processes across community pharmacies, with many outlets willing to provide vaccination but demonstrating gaps in formal training, infrastructure (for example, vaccine refrigerators and temperature monitoring), and a lack of electronic reporting link to national vaccination information systems.<sup>11,12</sup> These process gaps risk inconsistent service quality and complicate integration with national vaccination strategies unless addressed through targeted implementation measures.

Where national policy recognises pharmacy contributions to vaccination, countries have introduced competency standards, defined scopes of practice, and mechanisms for reimbursement or remuneration, which

affect how widely and safely pharmacy vaccination services can be implemented.<sup>13</sup>

International experience offers a toolkit of practical measures Nigeria can adapt. The FIP vaccination guidance and subsequent knowledge-and-skills frameworks outline minimum competency domains (clinical assessment, injection technique, emergency-response for anaphylaxis, cold-chain management, documentation and communication), suggested pharmacy layout and equipment, and templates for SOPs and quality-assurance.<sup>5,14</sup> Countries that successfully integrated pharmacy vaccination combined legal authorisation with accredited training, integration of pharmacy records into national vaccination registries, and defined reporting and reimbursement pathways, thereby improving adult vaccine coverage while maintaining safety and surveillance standards.<sup>5</sup>

Nigeria's policy environment offers both opportunities and constraints. The 2021 Nigeria Vaccine Policy emphasises broader vaccination goals, but implementation guidance specific to pharmacy practice remains quite limited.<sup>3</sup> Stakeholder research in Nigeria suggests that while pharmacists, professional bodies, and some policymakers recognise the public-health benefits of pharmacy involvement, legal enablement, formal training curricula, standard operating procedures (SOPs), and data-sharing arrangements are required before nationwide scale-up is feasible. Policy endorsement must be accompanied by operational standards and governance that allow pharmacists to deliver vaccinations safely and accountably.<sup>2,12,15</sup>

In Nigeria, scaling up pharmacy-based adult vaccination will depend on policy and regulatory clarifications that define the pharmacist's scope and liability, accredited training and continuing professional development tied to credentialling, investment in cold-chain infrastructure, temperature monitoring, waste management, record systems, mandatory reporting into national vaccine registries, clear SOPs, and clinical governance frameworks to manage safety and adverse events. Early pilot implementations during the COVID-19 response illustrated both the feasibility and the operational challenges, lessons that should inform phased roll-out, quality metrics, and stakeholder engagement to ensure equity, safety, and sustainability.<sup>2,12</sup> To the best of our knowledge, no single study has examined the structures and processes available in community pharmacies for carrying out adult vaccination services in Nigeria. This

study aimed to identify the structures available for community pharmacy adult vaccination services and to identify the processes followed for rendering these services in community pharmacies in Nigeria.

## METHODS

### Study design and study population

This was a descriptive, cross-sectional study. The study population consisted of registered community pharmacies in one state from each of the six geopolitical zones of Nigeria, including Lagos State and the Federal Capital Territory (FCT), who gave their consent. From the North-West zone, Kaduna State, the North-East zone, Gombe State, the North-Central zone, Plateau State, the South-West zone, Ekiti State, the South-East zone, Enugu State, and the South-South zone, Rivers State.

### Sample size determination, sampling, and data collection

The study sample size was determined using the formula for determining sample size when conducting a cross-sectional study.<sup>16</sup>

$$\left\{ n = \frac{z^2 p q}{d^2} \right\}$$

Where n = the desired sample size, z = the standard normal deviate = 1.96, p = Proportion of community pharmacists involved in vaccination services in Nigeria. Using the Cochran formula is assumed to be 50% (0.5) to obtain maximum variability because no similar studies were found, q = 1-p = 1-0.5=0.5, d = absolute precision or accuracy = 0.05. Allowing for an estimated 20% non-response, the sample size for the study was 463, and including an estimated 200 pharmacies from Lagos State and 100 pharmacies from FCT, the final sample size for the study was 763.

The study included community pharmacies registered with the Pharmacy Council of Nigeria in the chosen States of the six geopolitical zones in Nigeria and excluded community pharmacies without a superintendent pharmacist.

Data were collected both physically and online via a Google Form using the following link: <https://forms.gle/fAt9QbgLKhT3zfWy8> between January 2025 to July 2025. The researcher and eight (8) trained research assistants collected the data. A stratified sampling technique was adopted based on the number of community pharmacies per state chosen from the six geopolitical zones. Based on data from the

Pharmacy Council of Nigeria 2023 register<sup>17</sup>, the total number of community pharmacies in Kaduna was one hundred and sixty-nine (169), Gombe State, thirty-eight (38), Plateau State, one hundred and forty-two (142), Ekiti, eighteen (18), Enugu State, two hundred and ten (210), Rivers State five hundred and thirty (530). Respondents were chosen as shown below:

Total number of community pharmacies in Kaduna State (North-West) 169/1,107 X 463=71  
 Gombe State (North- East) 38/1,107 X 463 =16  
 Plateau State (North- Central) 142/1,107 X 463 =59  
 Ekiti State (South-West) 18/1,107 X 463 =8  
 Enugu State (South- East) 210/1,107 X 463 =88  
 Rivers State (South -South) 530/1,107 X 463 =221  
 Lagos State (South-West) - 200  
 Federal Capital Territory (FCT)-100

Data were collected with the aid of a structured, self-administered questionnaire. The questionnaire was adapted from literature.<sup>18,19</sup> The questionnaires were administered to the respondents by research assistants. The questionnaire had three sections: -Section A: Socio-demographic data of respondents, Section B: Structures for community pharmacy adult vaccination services in Nigeria, Section C: Processes followed for adult vaccination services in community pharmacies in Nigeria.

To ensure that the instrument actually measured what was desired, content validity was employed. Questions were rated based on Relevance, Clarity, Simplicity, and Comprehension.

For face validity, the questionnaire was pretested among five (5) experts in the field to enable the language, structure, and sequencing of the questions to be examined and to make modifications where necessary. A pilot study was conducted among 50 community pharmacists in Plateau State. Reliability of the instrument was determined, and a Cronbach alpha score of 0.801 was obtained.

### Data grading, scoring, and analysis

Data were analysed using descriptive statistics, and results presented as frequency and percentage.

### Ethical considerations

Ethical approval was obtained from the Jos University Teaching Hospital Human Ethics Research Committee. Ethical approval number is JUTH/DCS/IREC/127/XXXI/2818). An informed consent form was given to respondents explaining the purpose of

the study, clarifying questions and concerns, and respondents were allowed to decline participation in the study. All data was entered into a password-protected computer. Anonymity and confidentiality were ensured. The study instrument was anonymous, respondents were asked to write only their initials to avoid tracking, and no code was used to identify respondents.

## RESULTS

Out of a sample size of seven hundred and sixty-three (763), five hundred and forty-nine (549) questionnaires were filled out and returned by community pharmacists

around Nigeria. Giving a percentage response rate of 72%. Only 358 community pharmacies who offered vaccination services answered questions regarding structures and processes

### Demographic characteristics

An assessment of the demographic characteristics of the respondents showed that the majority of respondents (240,43.7 %) were aged between 30 and 39 years. and (291,53.0 %) held a Bachelor of Pharmacy (B. Pharm) as their highest degree (Table 1).

**Table 1: Demographic characteristics of respondents (n = 549)**

Variable	Sub-Group	Frequency	Percent (%)
Age	20-29	18	3.3
	30-39	240	43.7
	40-49	187	34.0
	50-59	86	15.7
	≥60	18	3.3
Gender	Male	311	56.6
	Female	238	43.4
Employment Status	Employed Superintendent Pharmacist	220	40.1
	Owner Superintendent Pharmacist	211	38.4
	Owner non- Superintendent Pharmacist	25	4.6
	Locum Pharmacist	93	16.9
Years of practice as a community pharmacist	0-9	223	40.6
	10-19	302	55.0
	20-29	18	3.3
	≥30	6	1.1
Educational qualification	B. Pharm	291	53.0
	Pharm. D	109	19.9
	WAPCP	72	13.1
	M.SC.	74	13.5
	PhD	3	0.5

%; percent, n: number of respondents

### Structures available for community pharmacist adult vaccination services in Nigeria

Table 2 summarises the structures available for community pharmacist adult vaccination services in Nigeria. Of the 358 that engaged in vaccination services,

the most frequently available equipment (326,91.0 %) was a generator or an alternate source of electricity, the majority (319,89.1 %) had a deep freezer dedicated to vaccines, (315, 88.0 %) of respondents had WHO-specified refrigerators for vaccines.

**Table 2: Structures available for community pharmacist adult vaccination services in Nigeria (n=358)**

Structures	Yes (%)	No (%)
<b>Equipment</b>		
The pharmacy has a generator or an alternate source of electricity	326(91.0)	0 (0.0)
The pharmacy has a deep freezer dedicated to vaccines	319(89.1)	21(5.9)
The pharmacy has WHO-specified refrigerator for vaccines	315(88.0)	23(6.4)
The pharmacy has vaccine carriers	303(84.6)	23(6.4)
The pharmacy has ice packs for vaccine storage	324(90.5)	16(4.5)
The pharmacy refrigerator is maintained at +2 to +8 degrees Celsius	334(94.1)	12(3.4)
The pharmacy has adequate systems to monitor the temperatures of vaccine refrigerators	298(83.2)	17(4.7)
<b>Premises</b>		
The pharmacy has adequate space for vaccine consultation	348(97.2)	3(0.8)
The pharmacy has chairs for clients to wait and be observed post-vaccination	348(97.2)	3(0.8)
The pharmacy has facilities for hand washing	311(86.9)	5(1.4)
The pharmacy has a sharps disposal bin	348(97.2)	3(0.8)
The pharmacy has security for vaccines	348(97.2)	4(1.1)
<b>Vaccination records</b>		
The pharmacy has immunisation cards for clients	316(88.3)	29(8.1)
The pharmacy has booklets for the records of vaccinated patients	329(91.9)	19(5.3)
<b>Personnel</b>		
The pharmacy has nurses to support adult vaccination	117(32.7)	237(66.2)
The pharmacy has CHEWS to support adult vaccination	168(46.9)	186(52.0)
The pharmacy has other personnel to support adult vaccination	71(19.8)	283(79.1)
The pharmacy has a link to hospitals or centres for referral	18(5.0)	16(4.0)
The pharmacy has a formal MOU with referral centres	218(60.9)	31(8.7)
The pharmacy has an informal MOU with referral centres	336(93.9)	13(3.6)
Personnel trained for vaccination	39(10.9)	309(86.3)

%; percent, n: number of respondents, cumulative percentage less than 100% due to non-response

### Processes followed for adult vaccination services in community pharmacies in Nigeria

Table 3 showed the processes followed for community pharmacist adult vaccination services in community pharmacies within Nigeria. Most of the community pharmacists (299,83.5 %) always follow standard operating procedures in administering and handling

(308,86.0 %) vaccines. The majority (314,87.7 %) always obtained consent from clients before administering vaccines, inquired about contraindications (310,86.6 %), educated clients on possible adverse event following vaccine administration (309,86.3 %), and (311,86.9 %) stocked adrenaline and hydrocortisone in case of anaphylaxis reactions.

**Table 3: Processes followed for community pharmacist adult vaccination services in Nigeria (n=358)**

S/N	Variable	Never n (%)	Rarely n (%)	Sometimes n (%)	Often n (%)	Always n (%)
1.	We follow the SOPs for vaccine administration in the pharmacy	4(1.1)	7(2.0)	18(5.0)	17(4.7)	299(83.5)
2.	We follow SOPs for vaccine handling	3(0.8)	10(2.8)	10(2.8)	14(3.9)	308(86.0)
3.	Vaccine records are adequately updated	4(1.1)	13(3.6)	12(3.4)	12 (3.4)	307(85.8)
4.	Training and refresher courses are available for staff	7(2.0)	12(3.4)	12(3.4)	18(5.0)	299(83.5)
5.	Do you store your vaccine with other thermolabile?	2(0.6)	6(1.7)	10(2.8)	22(6.1)	308(86.0)
6.	I assure clients regarding the safety of vaccines	1(0.3)	3(0.8)	10(2.8)	25(7.0)	309(86.9)
7.	I obtain oral consent from the client before administering the vaccine	2(0.6)	3(0.8)	6(1.7)	23(6.4)	314(87.7)
8.	I enquire about contraindications to any vaccine before administration	2(0.6)	4(1.1)	15(4.2)	18(5.0)	310(86.6)
9.	I educate clients on possible adverse events following vaccine administration (AEFIs)	2(0.6)	5(1.4)	14(3.9)	18(5.0)	309(86.3)
10.	The pharmacy ensures adrenaline and hydrocortisone in case of anaphylaxis reactions	2(0.6)	4(1.1)	10(2.8)	21(5.9)	311(86.9)
11.	AEFIs are referred to health care facilities after stabilisation at the pharmacy	2(0.6)	41(11.5)	10(2.8)	19(5.3)	274(76.5)

## DISCUSSION

This study showed that regarding equipment to carry out vaccination services, basically all the community pharmacies had generators or alternate power sources, adequate space for consultation, facilities for hand washing, and disposal of sharps. These findings are similar to a study carried out in Edo State, Nigeria.<sup>20</sup> This finding is also similar to a study in Lagos State, Nigeria, where the major equipment available for vaccination services was a generator.<sup>19</sup> Pharmacies having an alternate source of power, as this present study showed, is not surprising. The CDC and WHO<sup>10,21</sup> recommend having an on-site generator and advocate for solar-powered vaccine refrigerators for vaccine storage. Community pharmacists are making efforts to maintain the cold chain through alternate power sources to support inconsistencies in power supply from national sources.<sup>22</sup> This implies that such pharmacies are likely to preserve cold chain, thereby maintaining the potency of the vaccines they administer.

Regarding personnel, most of the pharmacies did not have Community Health Extension Workers (CHEWS) or Nurses to carry out vaccination services. This possibly shows that community pharmacists consider themselves competent enough to carry out these services. Nigeria does not have a standalone national guideline specifically tailored for community pharmacists on vaccination, but general immunisation guidelines still inform the expected personnel norms and standards. The National Primary Health Care Development Agency (NPHCDA) standards for Primary Health Care facilities in Nigeria require at least one Community Health Officer (CHO), a CHEW, and a Nurse/midwife within Primary Health Care facilities.<sup>23</sup>

The WHO Service Availability and Readiness Assessment (SARA)<sup>24</sup> sets indicators for basic equipment, personnel, infrastructure, and essential medicine that must be available to render a particular service. General-service readiness refers to the overall capacity of health facilities to provide general health services and is measured by the availability of components such as basic amenities, basic equipment, standard precautions for infection prevention, diagnostic capacity, and essential medicines. Service-specific readiness, meanwhile, refers to the presence of items that are particularly important for offering a specific service.<sup>25</sup> The findings highlight community pharmacies in Nigeria as having service-specific readiness.

It is essential to determine the structures available to carry out adult vaccination services as a vital tool for improving quality and accessibility. While they might not all immediately meet standards, consistent implementation and monitoring can contribute to

stronger and better-equipped community pharmacies that render adult vaccination services. This study showed that most pharmacies had relatively adequate structures in place to carry out vaccination services, making them capable to administer vaccines and should be utilised for vaccination programs to increase coverage.

From the study, community pharmacists follow standard operating procedures in vaccine administration, most of which were developed by the pharmacist themselves. The CDC vaccine storage and handling toolkit<sup>10</sup> recommends that facilities develop and maintain written, detailed and up to date storage and handling standard operating procedures (SOPs) to help stay organised and to serve as a reference and training tool to ensure proper vaccine management. The findings align with this recommendation.

The informal training offered by most of the community pharmacies could also be attributed to the recent pandemic, which has enabled a sensitisation on vaccines in general for community pharmacists. Pharmacists might be unaware of current trainings available for vaccinators as the majority of the respondents graduated at a time when the Bachelor of Pharmacy (B. Pharm.) curriculum did not include vaccination by community pharmacists, hence the need for continuous sensitisation within pharmacy technical groups on current trends within the pharmacy practice.

In this study, one of the processes followed by the pharmacies involved educating clients on possible adverse events following vaccine administration (AEFIs) and ensuring they stocked adrenaline and hydrocortisone in case of anaphylactic reactions. Preparedness for adverse events following immunisation (AEFI) is a vital aspect of vaccination safety and lines up with global best practices. Studies and policy documents.<sup>13,26,27</sup> underscore the need for emergency supplies such as adrenaline (1:1000), oxygen supply (where feasible), syringes for emergency use, stethoscopes, blood pressure monitors, and first aid kits. Availability of such equipment ensures prompt management of anaphylactic reactions or other medical emergencies that may arise post-vaccination and is vital for community pharmacies that offer adult vaccination services.

## CONCLUSION

This study shows that community pharmacies in Nigeria have relatively adequate structures in place, and mostly follow standardized processes in rendering adult vaccination services. However, there is a need for standardized guidelines for carrying out community pharmacy vaccination services across Nigeria.

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