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Nigerian Journal of Community Pharmacy (NJCP)

Volume 4

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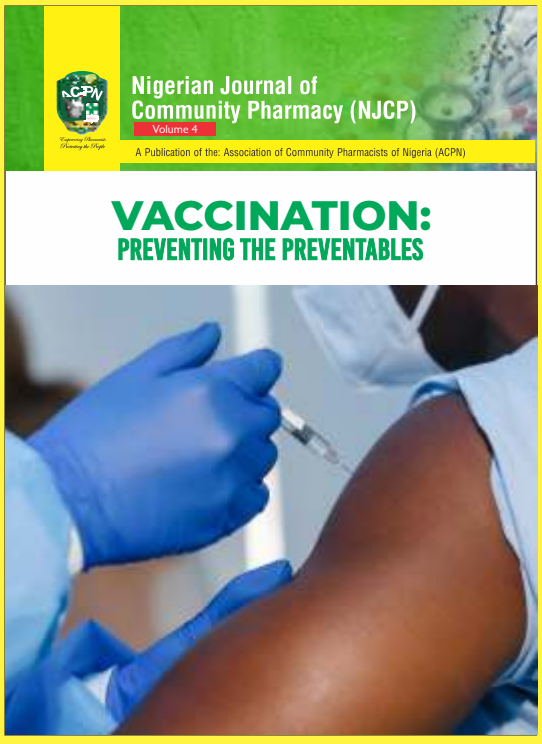

Nigerian Journal of Community Pharmacy (NJCP)

The Nigerian Journal of Community Pharmacy is the official Journal of the Association of Community Pharmacists of Nigeria and began in 1999 as The Drug Bulletin. The Drug Bulletin enjoys the readership of Community Pharmacists and other healthcare providers across the states in Nigeria and it is produced one or two times a year.

In our 41st Annual National Scientific Conference, held in Lagos (2022), the Association launched the presentation of scientific papers in our Conferences. This follows the decision to engender the culture of Research in Community Practice in consonance with the vision of the International Pharmaceutical Federation (FIP). This necessarily transforms the ACPN Drug Bulletin into the Nigerian Journal of Community Pharmacy and the restructuring of the ACPN Drug Information Centre into the Research and Development Unit.

Scope: To cultivate, accentuate and incentivize the culture of research in Community Pharmacy practice. To keep the readers in touch with the latest development in pharmacy practice and healthcare space, improve global health by providing professional article reviews and advanced treatment plans for common health problems.

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Inside this Issue

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EDITOR'S NOTE

The role of community pharmacists is rapidly evolving, driven by advances in technology and the shift toward personalised care. Tools like electronic health records, telepharmacy, AI, and automated dispensing are transforming how pharmacists deliver services, while personalised approaches, such as pharmacogenomics and chronic disease management, are improving patient outcomes.

This evolution marks a transition from traditional dispensing to proactive, outcome-focused care. Empowered by data and digital tools, pharmacists are becoming key players in multidisciplinary healthcare teams. Research remains a vital, evidence-based tool for performance recognition and practice development.

Theme for 2025: VACCINATION
Sub-themes:

- Childhood Routine Immunization
- Malaria Vaccines
- Vaccine Hesitancy
- Adult Immunization

With lessons from the COVID-19 pandemic, Nigerian community pharmacists are increasingly involved in public education and advocacy. Policy reforms, training, and strategic partnerships can further expand their role, especially in improving vaccine access in underserved communities.

We invite you to explore this edition, which highlights the expanding scope of pharmacy practice and its growing impact on community health. We appreciate all contributions from our writers, researchers, and editorial team.

Thank you.

Pharm. Samira Abubakar Umar, *FPCPharm, MAW, DCPharm*
National Editor-in-Chief

ATTITUDE OF MOTHERS TOWARDS IMMUNIZATION OF CHILDREN AGAINST KNOWN KILLER DISEASES IN KADUNA NORTH LOCAL GOVERNMENT AREA

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Abstract

Background: Immunization is a critical public health tool for preventing illness, disability, and death, especially in children. The world Health Organization estimates that global vaccine coverage and immunization against diphtheria, Measles, Pertussis, Pneumonia, Poliomyelitis, Rotavirus, Rubella and Tetanus currently averts up to 2-3 million deaths annually. "However, epidemiological data shows that more than ... children under 5 in resource-limited countries die from vaccine-preventable diseases yearly, due to negative attitude of parents towards immunization

Objective: This study was aimed to assess the awareness and attitude of mothers towards the immunization of their under-five children in Kaduna North Local Government Area.

Method: This was a descriptive cross sectional study involving 200 mothers who visited Badarawa Health Care Centre, General Hospital Kawo and Barau Dikko Teaching Hospital in Kaduna North between June and November 2023. A stratified random sampling was used, and data were collected using an interviewer-administered 22-item questionnaire. A separate questionnaire was administered to health workers to assess their level of experience and workplace constraints.

Results: A total of 200 mothers were interviewed. Among them, 49%, aged 21–30 were more in attendance. More than three quarters (80%) of the mothers reported learning about immunization through antenatal/postnatal clinics. Additionally, 45% of those living close to health facilities showed high attendance. Inferential statistics using Chi-square analysis The study revealed that 75% of mothers had a positive attitude toward immunization. There was no significant association between mothers' attitudes and variables such as age, education, occupation, or the place of the child's birth ($p < 0.05$).

Conclusion – This study showed that majority of mothers in Kaduna North Local Government Area have positive attitude towards child immunization and age, educational qualification, religions belief are factors significantly associated with their positive disposition

PHARMACISTS' ROLE IN THE EFFECTIVE MANAGEMENT OF HIV/AIDS IN KADUNA STATE NIGERIA

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Abstract

Background: Human immunodeficiency virus (HIV) / acquired immune deficiency syndrome (AIDS) is a major public health problem worldwide with substantial prevalence in sub-Saharan Africa. The clinical management of HIV/AIDS requires a multidisciplinary approach and pharmacists play a key but often underreported role in ensuring effective therapy, improving adherence and reducing HIV related morbidity. Pharmacists' role and involvement in the effective management of HIV patients remains underexplored, especially in resource-limited countries like Nigeria.

Aim: This study was carried out to assess pharmacists' knowledge, degree of involvement and counselling practices in effective management of HIV amongst people living with HIV (PLWH) in Kaduna metropolis.

Method: A cross sectional survey was conducted among 45 hospital pharmacists across selected hospitals in Kaduna metropolis. Data was collected using self-administered questionnaires and analysed using Statistical Package for Social Science version 21.0. Results were presented as frequencies and percentages.

Results: More female pharmacists, 32(71.1%) participated in the study, 42.2 % were 20 to 29 years of age, 30% had practiced as pharmacist for 1 and 5years. More than half (60%) knew about and have dispensed drugs for antiretroviral therapy and opportunistic infections. Similarly, 60% have participated in drug therapy monitoring, prescription screening for drug interactions. Nearly half (49.0%) of pharmacists have received formal training on HIV/AIDS management, 75% engaged in patient counselling with regards to drug side effects, drug interactions, nutrition, and family planning. In addition, 31(70%) were involved in adherence monitoring, patient care meetings, drug information services and interprofessional collaboration.

Conclusion: Pharmacist contributes meaningfully to the effective management of HIV/AIDS by offering medication counselling, monitoring adherence of antiretroviral therapy and collaborating with the healthcare team. Expanding targeted HIV training for pharmacists could enhance overall patient outcome and quality of care.

Keywords: Pharmacists' role, Effective management, HIV/AIDS, Kaduna state, Nigeria

PREVALENCE OF HYPERTENSION AND ITS ASSOCIATION WITH BODY MASS INDEX IN A SEMI-URBAN NIGERIAN COMMUNITY: A RETROSPECTIVE CROSS-SECTIONAL STUDY

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Abstract

Background: Hypertension is a major public health challenge worldwide with greater impact in resource-limited settings like Nigeria, where rising obesity rates exacerbate cardiovascular risks. Community Pharmacists (CPs) are the most accessible healthcare professional with good knowledge of point of care tests including blood pressure measurement. They help to ensure early detection of hypertension and prompt initiation of management to prevent cardiovascular complications and mortality. Despite the benefits, there is paucity of data on CPs involvement in blood pressure control in Rivers State.

Objective: To estimate the prevalence of hypertension and assess its association with BMI among adults in Rumuokoro and Rukpakulusi communities, Rivers State, Nigeria.

Methods: This retrospective cross-sectional study analyzed anonymized data from 126 adults collected during the 2024 World Health Day Outreach, by CPs in Rumuokoro Zone. Data collected include age, gender, BMI (categorized as underweight [<18.5 kg/m^2], normal weight [18.5–24.9 kg/m^2], overweight [25–29.9 kg/m^2], obesity classes I–III [≥30 kg/m^2]), and blood pressure (controlled: <140/90 mmHg; uncontrolled: ≥140/90 mmHg). Chi-square tests assessed associations between blood pressure measurement and demographic factors and BMI while One-way ANOVA evaluated the relationship between BMI and systolic blood pressure.

Results: Of 126 participants, 67 (53.2%) were female, 40 (31.7%) had high blood pressure. Chi-square tests revealed significant associations between blood pressure control and gender (X^2 = 4.095, p = 0.043), with females (59.3%, n = 51) more likely to have controlled blood pressure than males (40.7%, n = 35), and age (X^2 = 26.174, p < 0.001), with younger participants (<24 years: 14.0%, n = 12) showing higher control rates than older groups (e.g., 55–64 years: 1.2%, n = 1. No significant association was found between BMI and blood pressure control (X^2 = 6.374, p = 0.273), however BMI significantly predicted systolic blood pressure (p = 0.026).

Conclusion: This study demonstrates a relatively low prevalence of hypertension in Rumuokoro and Rukpakulusi communities, with significant associations between control status and gender and age. While BMI did not significantly influence blood pressure control, its impact on systolic blood pressure underscores its role in hypertension risk. These findings highlight the value of community-based health outreach programs in improving hypertension awareness and control. Community-based screenings and weight management programs are recommended.

Keywords: hypertension, blood pressure control, body mass index, semi-urban, Nigeria

COMMUNITY PHARMACISTS' VALUE-BASED APPROACH TO CHRONIC DISEASE MANAGEMENT USING TELEMEDICINE: A REVIEW

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Ifeyinwa Nwauche-Chijioke (University of Port-Harcourt)

Abstract

To generate transferable knowledge about telemedicine, it's use in the management of chronic disease, especially high blood pressure and diabetes mellitus (DM), both of which are significant responsible for the high burden cardiovascular disease and mortality worldwide. More than 1.4 billion people currently live with hypertension, and 537 million adults have DM globally (World Health Organization, 2024). In 2021, noncommunicable diseases (NCDs) claimed the lives of at least 43 million people worldwide, accounting for 75% of all deaths not attributable to pandemics. Of these deaths, 73% occurred in low- and middle-income countries. These conditions have to be monitored, medications have to be taken, and lifestyle changes have to be practiced. Community pharmacists are readily accessible healthcare practitioners who provide critical disease management services, but their involvement in the management of chronic diseases using value-based approach and telemedicine is underreported

Objective: To use the program theory to develop evidence-informed recommendations integrated by Community pharmacists as an updated and user friendly telemedicine model.

Methods: We carried out a detailed literature review of a hundred and fifty seven(157) original articles via internet search on words such as Telemedicine, chronic disease management, community pharmacy, intervention, outcome and quality of life, on pubmed, medline, google scholar, web MD and scopus for articles published or any probable link.

Result: Community pharmacists have adopted the use of telemedicine models in the management of chronic diseases. The models integrated globally in developing various electronic telemedicine applications include: flologpharma, TeleDoc App, Doctor on demand, mDoccompleteHealth. The features of the applications include: Virtual self-care, health metrics, health coaching, chat with pharmacist in 1 minute, order medications to the patients doorstep, in-app chat and video support, schedule physical appointment. Second, several studies noted that patient receptivity to the interventions evaluated was mixed. However, our findings suggest that the evidence supporting the effectiveness of pharmacist- provided direct patient care services for chronic diseases management using telemedicine is more limited because most patients do not expect clinical services to be offered at community pharmacies (Worley et al., 2007)

Conclusion: The integration of telemedicine into the regular practice of community pharmacists is a new type of approach: innovative, based on value, and aimed at care for chronic disease patients. Using digital tools, community pharmacists can help patients to take their medication on time, which will lead to better patient outcomes and lower healthcare costs. As health care becomes more and more diverse, this value that community pharmacists provide using telemedicine will be very important to make sure that patient-focused treatment is accessible to people everywhere.

DIGITAL HEALTH RECORDS IN COMMUNITY PHARMACY

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Abstract

Background
Digital Health Records (DHRs) are electronic systems for collecting, storing, and managing patients' medical and medication histories. The adoption of DHRs in community pharmacies has the potential to enhance and ensure patient care. However, benefits and challenges associated with DHRs require systematic evaluation.

Aim
To synthesize existing literature on the benefits and challenges of DHRs in community pharmacies, exploring their impact on patient care and pharmacy operations, and identify solutions to recognized challenges.

Methodology
A comprehensive search of major databases was conducted, including PubMed, Scopus, and Web of Science, accessed online via my institution's subscription. Studies in English between 2015 and 2025 focusing on DHRs in community pharmacies were included. For transparent approach and quality evaluation, standardized tools were employed: Covidence, to screen titles, abstracts, and freely accessible full-text articles for inclusion; Quality assessment of outcomes of interest was done with the Newcastle-Ottawa Scale.

Results
53 articles were identified and screened based on titles and abstracts, with 28 eligible for the final analysis.

16 articles discussed benefits of DHRs in enhancing medication management. 8 highlighted increased efficiency gains, e.g. streamlined workflows. 4 discussed roles of DHRs in better patient engagement and 2 explored DHRs' potential to provide data-driven insights for quality improvement.

Regarding challenges, 24 articles discussed technical challenges, including interoperability. 20 highlighted importance of organizational context including staff training and workflow integration. 5 examined implementation challenges including healthcare professionals' resistance.

Conclusion
The benefits of DHRs are enhanced patient care, safety, comprehensive Medication Therapy Management, improved clinical decision-making, improved medication adherence, enhanced patient engagement, expanded clinical roles, streamlined workflow operational efficiency, etc. DHRs encourage interprofessional collaboration by facilitating optimal communication between healthcare providers and enabling real-time information sharing.

Identified challenges were data access, quality, incomplete/fragmented records, limited health information access, data privacy, security, patient trust, interoperability, resistance to change, training, compatibility with existing systems and high implementation costs.

To realize DHRs' full potentials, Pharmacists should collaborate with policymakers, healthcare providers to ensure DHRs' seamless integration for optimized healthcare services.

Capacity building and strategic planning is required to overcome technical and financial hurdles.

Keywords: digital health records, electronic records, health information technology, pharmacy informatics.

VACCINE UPTAKE IN A PRIVATE COMMUNITY VACCINATION CENTRE IN LAGOS: A RETROSPECTIVE STUDY

Lawal F.O., Ajayi T.O., Adesina A., Emmanuel-Ogah O., Mesagan E.O., Adeboga E.O., Olatunji-Wilson O.A., Oni P.A. Onanusi O.A., Ozota G.O., Okwori M.J

Affiliations: ACPN Lagos Ethics Committee

Background

Immunisation is an important public health intervention which constitutes a cost-effective strategy to reduce both the morbidity and mortality from infectious diseases.

According to WHO, immunisation coverage is a key measure of immunisation system performance. Life-course immunisation is of significant benefit to population health by reducing the burden of vaccine-preventable disease (VPD). VPDs are major contributors to disease burden in Sub-Saharan Africa.

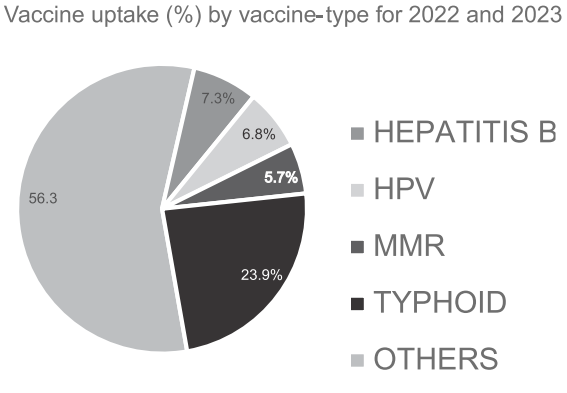
The study aimed to evaluate vaccine uptake in a private community vaccination centre in Lagos for two years (2022 and 2023).

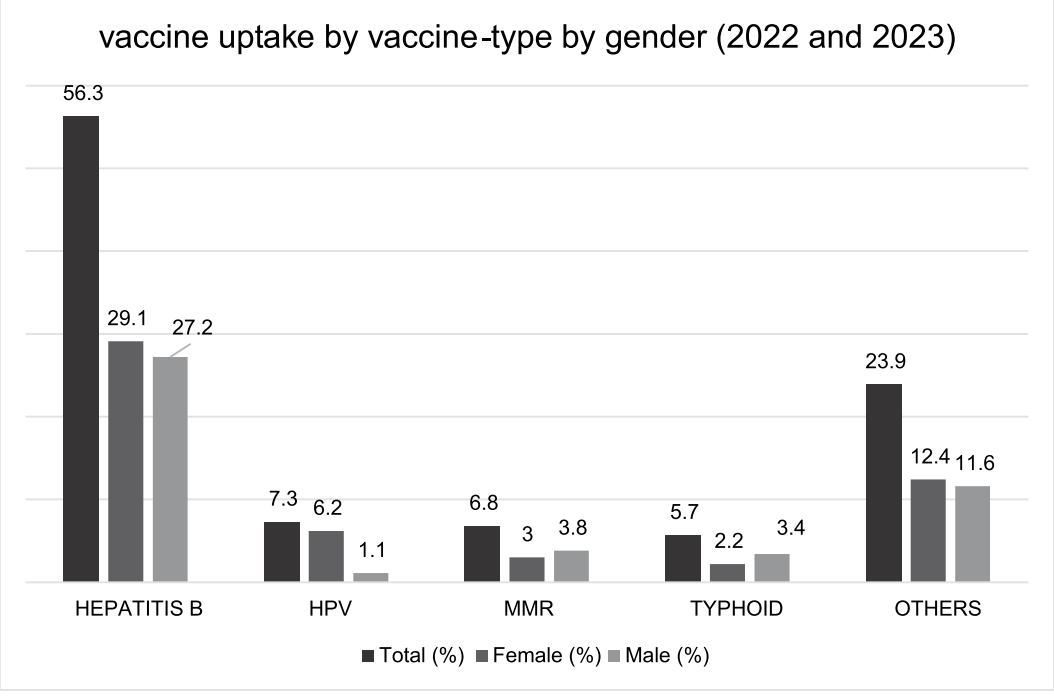
METHOD

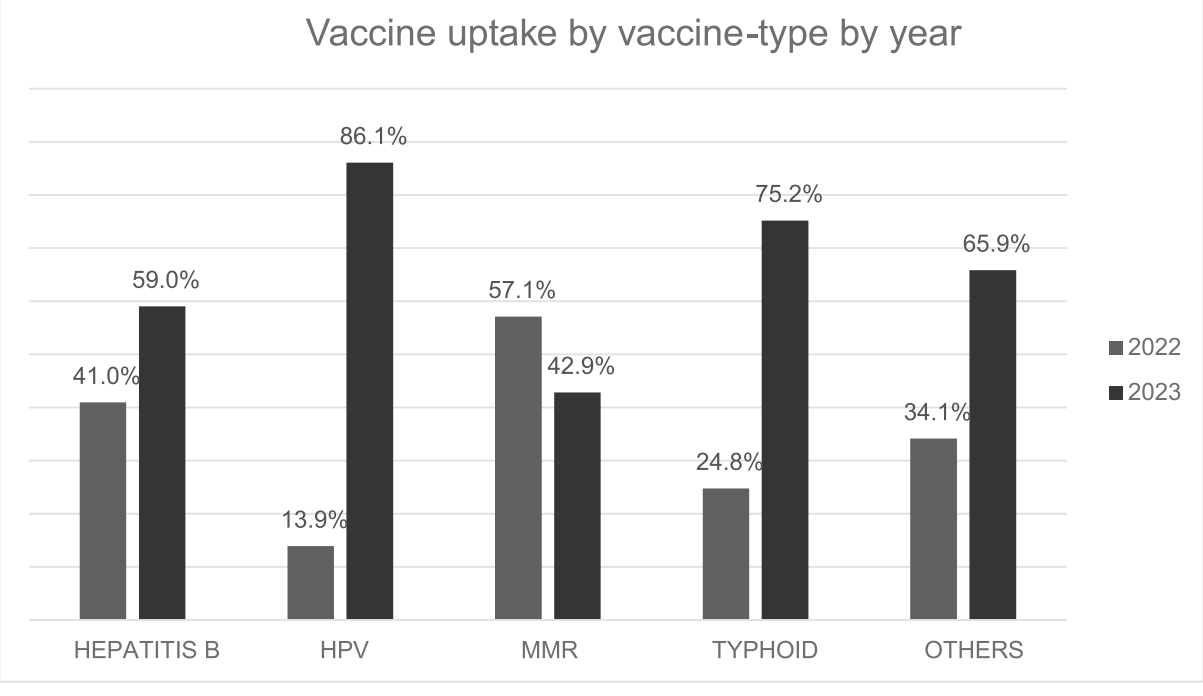
We carried out a retrospective study at a stand-alone clinic, Victory Vaccine Clinic. Vaccine uptake data (2022 and 2023) from the database were reviewed. Data from active vaccination campaign were anonymously extracted from participants' vaccination history records by two independent reviewers in July 2024. Disagreements in the extracted data were resolved through discussion with an impartial arbiter and comparison with the manual record. The variables extracted from each record include: "Type of vaccine" and "Gender", Data were extracted using Microsoft excel, percentages of vaccine types and uptake by gender (males and females) were calculated.

RESULTS

Out of a total of 2063 clients, 1162 (56.3%) took hepatitis B vaccine, 150 (7.3%) HPV, 140 (6.8%) MMR, 117 (5.7%) Typhoid and 494 other vaccines. More females 600 (51.6%) took hepatitis B vaccine than males 562 (48.4%). HPV vaccine uptake among young females was 127 (84.7%) while for males 23 (15.3%). For MMR 79 (56.4%) uptake was recorded among males while for females 61 (43.6%). Typhoid vaccine, 71 (60.7%) males and 46 (39.3%) females.







CONCLUSION

Providing vaccination in private community center could increase the vaccination coverage and reduce the workload of the public healthcare system.

Keywords: Vaccine uptake, vaccine-preventable-diseases, private community vaccination center, ACPN ethics committee, Victory vaccine clinic.

COMMUNITY PHARMACY WORKFORCE WILLINGNESS, READINESS, AND INFRASTRUCTURAL CAPACITY TO DELIVER VACCINATION SERVICES: A CROSS-SECTIONAL STUDY IN NIGERIA

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Abstract

Background: There is a growing need for community pharmacists to contribute to universal health coverage through vaccination services due to their being one of the most accessible healthcare professionals and low vaccination coverage. In some Nigerian states, community pharmacists were trained in vaccination, but there are concerns about their capacity to enroll as vaccination service providers. This study evaluated the community pharmacy workforce's willingness, readiness, and infrastructural capacity to deliver vaccination services in Nigeria.

Methods: We conducted a descriptive cross-sectional study using a self-administered structured questionnaire among community pharmacists in Nigeria through online platforms. Descriptive statistics was performed on the collected data using SPSS statistical software, version 21.

Results: Of the 414 community pharmacists sampled, 395(response rate = 95.4%) were retrieved and included in the final analysis. Although most community pharmacists did not currently practice vaccine administration in their pharmacies (n = 295, 74.9%), most were willing to start administering vaccines (n = 359, 91.3%), participate in routine and supplemental immunization services(n = 373, 95.4%), receive training related to vaccination (n = 374, 95.2%), and encourage patients to get vaccinated in their pharmacies (n = 367, 93.6%). Tetanus vaccine was the most common (n = 158, 40%) among the vaccines administered by the respondents. Infrastructure was inadequate in many critical areas; vaccine-specific refrigerators(n=222, 57.1%), temperature monitoring equipment (n = 263, 67.8%), safety boxes (n = 216, 55.7%), medical waste bins (n = 178, 45.8%), portable vaccine refrigerators in case of power failures(n= 218, 56.1%), anaphylaxis response kit (n = 340, 87.4%), and anaphylaxis management guidance (n = 346, 88.9%). Barriers to the pharmacists' willingness to deliver vaccination services were inadequate funds to procure appropriate storage equipment (n = 269, 70.0%), inadequate training (n = 265, 69.1%), conflicts with other professionals (n=246, 64.4%), concerns about patient safety (n = 185, 47.7%) and handling vaccines and disposal of sharps (n = 182, 47.4%).

Conclusions: Community pharmacists are willing to embrace the advanced role of vaccine administration. The government and other healthcare stakeholders should address the infrastructural gaps and other barriers highlighted in the study to help improve vaccine access and availability.

Keywords: Vaccination; Community Pharmacists; Willingness; Infrastructure; Nigeria

INTRODUCTION

Nigeria is grappling with another vaccine-preventable disease outbreak. In June 2024, the World Health Organisation (WHO) reported 1094 new cases of cholera outbreak posing a threat to Nigeria's healthcare system[1]. Globally, vaccine development has undeniably improved health outcomes (Rodrigues & Plotkin, 2020). The World Health Organisation estimates that vaccines prevent 3.5 million to 5 million deaths annually[2]. Despite this, immunization coverage in Nigeria remains poor[3,4], with only 23% of children fully immunized and more than 2300 childhood deaths occurring daily from vaccine-preventable diseases. To mitigate the danger of infectious diseases and enhance vaccination acceptance, numerous countries have broadened the responsibilities of community pharmacists to include administering vaccines[5]. In addition, the International Pharmaceutical Federation (FIP) published a comprehensive worldwide report on the influence of pharmacists on immunization services. The report revealed that out of the 45 countries examined, 13 countries were authorized to administer vaccines in community settings. These countries include Argentina, Australia, Canada, Costa Rica, Denmark, Ireland, New Zealand, Philippines, Portugal, South Africa, Switzerland, the U.K., and the USA.[6]

In recent years, there has been growing recognition of community pharmacists' role in improving vaccination coverage.[7-8] As one of the most accessible and frequently consulted healthcare providers, community pharmacists are well-positioned to ensure increased vaccination uptake in communities.[9] The U.S. statistics by the Center for Disease Control (CDC) show that adults who received influenza vaccines in 2016 increased in 2017 from 23% to 28%.[10] However, community pharmacists' involvement in vaccine administration in Nigeria remains suboptimal.[9,11] The question remains: are pharmacists willing and ready to embrace its new role in vaccine uptake?

Some of the barriers to Nigerian pharmacists' involvement in vaccination delivery services include inadequate policies[12], insufficient training[11], and supply chain problems.[13] Nevertheless, most importantly, pharmacists can only practice vaccination/immunization in a suitably equipped community pharmacy with the necessary vaccination-specific infrastructure.[14] In response, several studies have assessed the preparedness of community pharmacies for vaccination services in other countries,[5,15] but similar research has not been conducted in Nigeria. This study therefore sought to fill this literature gap by assessing community pharmacists' readiness and preparedness for vaccination delivery services in Nigeria. It assessed community pharmacists' current vaccination practices, willingness to act as pharmacist–vaccinators,and their pharmacies' suitability for vaccination/immunization services. It also identified barriers to community pharmacists' involvement in vaccination and recommended how best to promote the practice among pharmacists in Nigeria.

METHODS

Study Design

This study employed an internet-based cross-sectional survey conducted anonymously among community pharmacists in Nigeria using a snowballing sampling procedure and a semi-structured questionnaire to survey a representative sample of Community Pharmacists(CPs) from the 36 states and Nigeria's Federal Capital Territory (FCT).

Study Population: The study population comprises community pharmacists practising in Nigeria. As of December 31, 2022, the Register Pharmacists and Pharmaceutical Premises of the Pharmacy Council of Nigeria recorded 5,538 licensed community pharmacists in Nigeria.

Sample Size: A sample size calculation was conducted using Taro Yamane's method, as described in Adam's (2021) study. The calculation was based on the total number of registered community pharmacists in Nigeria as of December 2022, which was 5,538 (n = 5,538).
The formula used was n = N / (1 + N(e)^2).
N denotes the target population.
The sample size (n) was calculated from this number as 373, with an expected 0.05 degree of error. An acceptable level of statistical analysis was achieved by using a margin of error of 5% and a confidence level of 95%.

Exclusion criteria: the study excluded pharmacists practicing in other areas outside the community pharmacy setting, retired CPs, Nigeran pharmacists who practice abroad, and those who were not actively practicing. Pharmacists who could not be contacted because their contact information had changed and those who declined to participate in the study were also not included.
Instrument for data collection

The questionnaire was designed based on a comprehensive review of literature on community pharmacy, vaccination delivery services, health workforce, and infrastructural capacity. The draft questionnaire was subjected to review by eight subject matter experts, after which it was pretested for clarity and reliability among 20 community pharmacists who did not participate in the data collection. Revisions were made before commencement of data collection. The reliability of the questionnaire was assessed using Cronbach's alpha.

The study's introduction page provided a concise overview of the background, the survey's purpose, directions for completing the questionnaire, and a statement of informed consent.

The questionnaire was divided into six domains. The first domain consisted of 8-item questions about demographics such as age, work experience, highest level of education, religion, type of pharmacy, position, pharmacy location, and gender. The second domain contained questions to assess community pharmacists' willingness to provide vaccination delivery services. Multiple-choice answers were provided for the queries, and CPs had to select their responses to 'yes,' 'no,' or 'not sure' questions. The third domain contained questions to assess the type of vaccination services pharmacists are willing to provide, with seven questions requiring 'yes,' 'no,' or 'not sure' answers. The fourth domain evaluated the technical capacity to deliver vaccination services, including training.

In contrast, the fifth domain accessed the infrastructural capacity to provide vaccination services with 'yes,' 'no,' or 'I don't know' questions. The sixth domain addresses the type of vaccines the community pharmacists were administering. In contrast, the seventh domain addressed the barriers affecting community pharmacists' willingness to provide immunization services using a 5-point Likert scale, which indicates their degree of agreement or disagreement with statements regarding their barriers, with 1 = Strongly disagree, 2 = Disagree, 0 = Neutral, 3 = Agree, and 4 = Strongly agree.

Data Collection: A Google form was distributed to community pharmacists via WhatsApp to gather responses for an anonymous online questionnaire. The questionnaire was shared on all CPs' WhatsApp chatrooms in the 36 states plus the FCT of Nigeria through their respective ACPN chairmen and State Officers of the Pharmacy Council of Nigeria. We also broadcasted WhatsApp messages through the phones of all team members, with requests for the recipients to forward the survey link to all CPs in their contact list. Periodic reminders continued as long as the data collection period lasted.

Ethical considerations: We adhered to the scientific requirements and research protocols outlined in the Declaration of Helsinki for recruiting human participants for this study. Ethical Approval was received from the Research Ethical Review Committee of the College of Medicine, University of Lagos, with the reference number CMUL/HREC/05/24/1457. Before each survey, informed consent was sought from every participant, and this consent was documented with a Yes/No question.

Statistical Analysis: Data from the survey were inputted into a specially designed Excel database and then processed by the primary author to remove any errors or inconsistencies. After this, the data was transferred to SPSS version 21. Descriptive statistics were employed to present the respondents' demographic characteristics and responses to the survey questions. Continuous variables were reported as means and standard deviations (± S.D.) for variables that followed a normal distribution. The categorical variables were displayed as frequencies and percentages. The statistical analyses were conducted using SPSS statistical software for Windows version 21 (SPSS Inc., Chicago, USA).

Table 1: Demographic characteristics of participants

Variable	Category	Frequency (Percent)
Age	Less than 30 years	32 (8.1)
	30 - 40 years	125 (31.1)
	above 40 years	236 (60.8)
Gender	Male	230 (58.4)
	Female	164 (41.6)
Work experience	Less than 5 years	53 (13.5)
	5-10 years	105 (26.7)
	Above 10 years	235 (59.8)
Highest educational qualification	B.Pharm	225 (57.1)
	PharmD	28 (7.1)
	Masters	99 (25.1)
	FPCPharm	35 (8.9)
	PhD	7 (1.8)
Position	Pharmacist Director	241 (61.3)
	Superintendent Pharmacist	134 (34.1)
	Full-time Pharmacist employee	18 (4.6)
Type of Pharmacy	Chain(At least 5 branches)	33 (8.5)
	Independent(less than 5 branches)	354 (91.5)
Pharmacy location	Urban	178 (45.4)
	Semi-Urban	110 (28.1)
	Capital City	86 (21.9)
	Rural	18 (4.6)

State of Practice

The highest participation rates were recorded for Lagos (n = 111, 28.1%). Rivers, Delta, and Edo States had the second-highest participation rate (n = 31, 7.8%). States with the lowest participation rate were Bayelsa, Jigawa, and Zamfara (n = 1, 0.3%). Table 2.

Table 2: State of Practice

		FREQUENCY	PERCENT
VALID		2	.5
	Abia	2	.5
	Abuja	19	4.8
	Adamawa	4	1.0
	Akwaibom	2	.5
	Anambra	8	2.0
	Bauchi	6	1.5
	Bayelsa	1	.3
	Benue	11	2.8
	Cross river	3	.8
	Delta	31	7.8
	Ebonyi	7	1.8
	Edo	31	7.8
	Ekiti	3	.8
	Enugu	12	3.0
	Gombe	5	1.3
	Imo	3	.8
	Jigawa	1	.3
	Kaduna	10	2.5
	Kano	4	1.0
	Katsina	4	1.0
	Kogi	4	1.0
	Kwara	6	1.5
	Lagos	111	28.1
	Nassarawa	8	2.0
	Niger	5	1.3
	Ogun	13	3.3
	Ondo	7	1.8
	Osun	12	3.0
	Oyo	21	5.3
	Plateau	3	.8
	Rivers	31	7.8
	Taraba	2	.5
	Yobe	2	.5
	Zamfara	1	.3
	Total	395	100.0

Willingness to Vaccinate

Although most community pharmacists did not currently practice vaccine administration in their pharmacies (n = 295, 74.9%), the majority were willing to start administering vaccines (n = 359, 91.3%), receive training related to vaccination (n = 374, 95.2%), and encourage patients to get vaccinated in their pharmacies (n = 367, 93.6%). Most of the community pharmacists also indicated willingness to participate in routine and supplemental immunization services (n = 373, 95.4%), Table 3.

	Yes	No	Not sure
Do you currently practice vaccine administration in your pharmacy?	96 (24.4)	295(74.9)	3 (0.8)
Do you wish to start/continue administering vaccines?	359(91.3)	16 (4.1)	18 (4.6)
Will you encourage patients to get vaccinated in your community pharmacy?	367(93.6)	10 (2.6)	15 (3.8)
Will you wish to get first aid training for vaccination?	366(93.1)	12 (3.1)	15 (3.8)
Will you wish to get training related to vaccination?	374(95.2)	11 (2.8)	8 (2.0)
Will you wish to get Cardiopulmonary Resuscitation (CPR) training?	375(95.9)	7 (1.8)	9 (2.3)
Will you wish to get an anaphylactic shock kit?	370(94.4)	7 (1.8)	15 (3.8)
Will you ask for an administrative fee if the vaccines are free (already paid for, by the government or NGO)?	204(52.2)	123(31.5)	64(16.4)
Will you wish to have a private place for vaccination within your pharmacy?	357(91.1)	18 (4.6)	17 (4.3)
Will you wish to have an appointment system for vaccination services?	356(91.0)	22 (5.7)	13 (3.3)
As a community pharmacy owner, would you be willing to pay for appropriate vaccine handling and storage facilities from the professional association if made available at a discounted price and/or installment payment?	305(78.2)	26 (6.7)	59(15.1)
Participate in routine and supplemental immunization services	373(95.4)	8 (2.0)	10 (2.6)
Distribution of vaccines for pharmaceutical companies	232(60.4)	93 (24.2)	59(15.4)
Referring clients to other immunization centres outside your pharmacy	254 (66)	80 (20.8)	51(13.2)
Engaging in campaign on immunization	359(91.6)	9 (2.3)	24 (6.1)
Administering vaccines to clients	364(92.9)	14 (3.6)	14 (3.6)
Educating Clients on immunization	385(98.0)	4 (1.0)	4 (1.0)
Retailing of vaccines to end users	331(85.1)	33 (8.5)	25 (6.4)

Training on vaccination and vaccine management

Most community pharmacists (n = 222, 56.6%) received no training on vaccination delivery services. Among those who received training (n = 170, 43.4%), the training duration was mostly less than three days (n = 94, 52.8%). Among the various types of training required for vaccination delivery, most community pharmacists had received first aid training (n = 219, 56.6%), and most had not received vaccine adverse event handling and documentation training (n = 226, 57.7%). Professional associations (n = 144, 39.6%) took the lead among the organizations that coordinated training for community pharmacists, Table 4.

Table 4: Questions on Vaccination Training

Variable	Yes (%)	No (%)
Have you received any training on vaccination delivery services?	170 (43.4)	222 (56.6)
If yes, how many days was the training?		
<3 days	94 (52.8)	
3-5 days	56 (31.5)	
>5 days	28 (15.7)	
Training received		
First aid	219 (56.6)	168 (43.4)
Cardiopulmonary Resuscitation (CPR)	175 (44.5)	218 (55.5)
Vaccine storage and handling	196 (49.9)	197 (50.1)
Vaccine administration	173 (44.0)	220 (56.0)
Vaccine adverse event handling and documentation	166 (42.3)	226 (57.7)
Which organization coordinated your training?		
Professional associations	144 (39.6)	
NGOs	65 (17.9)	
Webinars	34 (9.3)	
National Primary Health Care Development Agency (NPHCDA)	43 (11.8)	
Educational institutions	78 (21.4)	

Infrastructural Capacity to deliver vaccination services

While more than half of the community pharmacists indicated having a vaccination room in their pharmacy (n = 196, 50.5%), medical waste bin (n = 206, 53.0%), and materials for hand sanitation and surface cleaning (n = 306, 78.7%), most did not have other infrastructures like refrigerators specific for vaccines (n = 222, 57.1%), temperature monitoring equipment (n = 263, 67.8%), portable refrigerators in case of power failure (n = 218, 56.1%), anaphylaxis response kits (n = 340, 87.4%), anaphylaxis management posters/guidance (n = 346, 88.9%), safety boxes (n = 216, 55.7%), and records for vaccinated patients (n = 280, 72.4%), Table 5.

Table 5: Infrastructural Capacity to deliver vaccination services

	Yes	No	I don't know
Vaccination specific place/room	196 (50.5)	162 (41.8)	30 (7.7)
Refrigerator specific for vaccines	155 (39.8)	222 (57.1)	12 (3.1)
Temperature monitoring equipment	116 (29.9)	263 (67.8)	9 (2.3)
Portable refrigerator in case of power failure	167 (42.9)	218 (56.1)	4 (1.0)
Anaphylaxis response kit	46 (11.8)	340 (87.4)	3 (0.8)
Anaphylaxis management poster/guidance	38 (9.8)	346 (88.9)	5 (1.3)
Safety box	165 (42.5)	216 (55.7)	7 (1.8)
Medical waste bin	206 (53.0)	178 (45.8)	5 (1.3)
Materials for hand sanitisation and surface cleaning	306 (78.7)	80 (20.6)	3 (0.8)
Vaccinated patients record	101 (26.1)	280 (72.4)	6 (1.6)

Type of vaccines being administered by community pharmacists

The tetanus toxoid vaccine was the most commonly administered in community pharmacies (n = 158), and the rabies vaccine was the second most commonly administered vaccine (n = 72). Bacille-Calmette Guerin (BCG) was the least common vaccine administered by community pharmacists (n = 3), Table 6.

Table 6: If you are already administering vaccines in your pharmacy, what type of vaccines are you administering? Select all that apply

Type of Vaccines	**Number of persons administering the vaccines**
Flu	9
Hepatitis A	15
Hepatitis B	61
Chickenpox	10
Meningitis	10
Pneumonia	6
Tetanus	158
Rotavirus	14
Rabies	72

Measles, Mumps, and Rubella (MMR)	14
Human Papilloma Virus (HPV)	20
Oral Polio Virus	8
Bacille-Calmette Guerin (BCG)	3
Others	21 - Antisnake(1), Covid(13), Typhoid(6), Malaria(1)

Barriers affecting community pharmacists' willingness to provide immunization services

The most highlighted barriers to the pharmacists' willingness to deliver vaccination services were inadequate funds to procure appropriate storage equipment (n = 269, 70.0%), inadequate training (n = 265, 69.1%), conflicts with other professionals (n=246, 64.4%), concerns about patient safety (n = 185, 47.7%) and handling vaccines and disposal of sharps (n = 182, 47.4%), Table 7

Table 7: Barriers affecting community pharmacists' willingness to provide immunization services

	SA	A	N	D	SD	Mean
Pharmacists are busy and they have no time to provide immunization services	17 (4.4)	30 (7.8)	118 (30.6)	113 (29.4)	107 (27.8)	3.68
The pharmacies are not designed to accommodate such services	18 (4.7)	53 (13.8)	110 (28.6)	107 (27.9)	96 (25.0)	3.55
Inadequate funds to set up a designated space and/or procure and appropriate storage facility by the community pharmacist	117 (30.4)	152 (39.5)	55 (14.3)	41 (10.6)	20 (5.2)	2.21
Patient safety is a concern and serious advents beyond the capacity of the pharmacy may occur	48 (12.4)	137 (35.3)	90 (23.2)	79 (20.4)	34 (8.8)	2.78
Lack of adequate training	97 (25.3)	168 (43.8)	60 (15.6)	34 (8.9)	25 (6.5)	2.28
Pharmacists are less trusted by patients to provide such service	19 (5.0)	37 (9.7)	123 (32.5)	80 (21.0)	122 (32.0)	3.65
Conflicts with other professionals who are currently empowered by the Law to vaccinate	82 (21.5)	164 (42.9)	69 (18.1)	38 (9.9)	29 (7.6)	2.39
Concerns about handling vaccines, storage, and disposal of sharps	59 (15.4)	123 (32.0)	88 (22.9)	58 (15.1)	56 (14.6)	2.82
Pharmacists are not comfortable using needles	15 (4.0)	44 (11.6)	123 (32.5)	91 (24.1)	105 (27.8)	3.60

Discussion

Community pharmacists are a significant first-line contact for many healthcare consumers and intermediaries between physicians and patients, making them indispensable in modern healthcare delivery. Despite this daunting task, pharmacists are still an underutilized resource in achieving universal health coverage and implementing many healthcare policies. There have been calls for pharmacists in Nigeria to take up their emerging roles in vaccine management and administration. At the same time, there is no legislation mandating pharmacists to engage in vaccination, no law also prevents them from doing so.[16] The COVID-19 pandemic was an eye-opener about the shortage of healthcare practitioners, and CPs have the workforce to help make healthcare services readily available. To augment their career, pharmacists have initiated a process of self-reinvention by seeking ways to expand their responsibilities in community pharmacy.[12] Therefore, this study sought to explore the willingness of community pharmacists in Nigeria to engage in vaccination programmes and highlight the challenges community pharmacists face in setting up appropriate vaccine storage facilities and administration in their pharmacies.

The findings of this study indicate that community pharmacists in Nigeria demonstrate a high level of willingness to administer and dispense vaccines, as seen by 91.3% (n = 359) of respondents expressing their support for this practice. However, the effective deployment of a pharmacist-provided vaccination service is contingent upon proper training, logistics availability, and patient acceptance, which are highly significant considerations. The cost-effectiveness of vaccination services offered by pharmacists varies depending on the healthcare systems and reimbursement mechanisms in place.[17] Several studies have suggested that pharmacist participation in vaccination programmes can be economically advantageous, particularly in cases where pharmacists can charge for their services. Moreover, data indicates that immunizations delivered via community pharmacies are more economically efficient than those administered in medical settings.[18,19] This forestalls the urgent need for the government to put systems and structures in place to empower community pharmacists to provide vaccination services.

The results also show that most community pharmacists do not practice vaccine services. This can be attributed to the fact that although many pharmacists were willing to proceed, they felt inadequately prepared due to insufficient education and infrastructural capacity to incorporate vaccination into their practice. They believed that formal certification should be a requirement to do so. Still, they all demonstrated zeal in engaging in these training and certifications that will equip them with the requisite knowledge to practice these services. This study is among the first to assess Nigerian community pharmacists' willingness and readiness to provide vaccination services. The result is similar to studies in Lebanon[20] and Saudi Arabia[21,] where pharmacists strongly desire vaccination. In both studies, it was observed that there is a deficiency in the knowledge gap in handling possible adverse effects from vaccines; this occurrence is evident in our study, where pharmacists show higher training in vaccine handling than in vaccine adverse event handling and documentation. Therefore, it is equally crucial to have a proficient healthcare system with competent routine immunization service providers who can administer and oversee these vaccines and have them themselves to achieve the necessary level of immunization coverage. It has been posited that "conducting training in little clusters or batches over a while is more likely to be impactful as compared to a situation where a large number of service providers are trained at the same time." [22] An important factor contributing to high immunization rates in many developing nations is the presence of enough well-trained healthcare workers capable of efficiently administering vaccines to children within healthcare facilities and during outreach programs[23] In our study, most pharmacists were trained by their professional society and this shows a dire desire by professional leaders to improve accessibility.

It was observed that CPs frequently encounter common infrastructure obstacles while establishing vaccine services, precisely the absence of appropriate vaccine storage equipment, temperature monitoring equipment, anaphylaxis management posters/guidance, and

safety boxes. The enduring nature of certain obstacles might impact the behavioral aspects of individuals when it comes to accepting pharmacist-administered vaccinations, as it fosters a sense of distrust and portrays pharmacists as lacking competence. Studies have shown the effect of infrastructural defects on vaccine uptake, efficacy, and safety.[24,25] Hence, there is a need for interventional support for pharmacists who indicate interest in establishing vaccine services.

Although pharmacist-provided vaccination programmes have achieved universal popularity and have had a favorable impact, numerous barriers remain. Our study highlighted inadequate funds to set up a designated space or procure an appropriate storage facility by the community pharmacist as the significant barrier encountered by CPs followed by a lack of training and conflicts with other professionals currently empowered by the Law to vaccinate. Most barriers CPs face are systemic, which often does not lie within the means of pharmacists alone to solve. A study conducted in Canada among traditional vaccinators revealed only moderate support for pharmacists delivering vaccines. The survey reported that 32% of nurses and 46% of physicians disapproved of this practice.[26] Similarly, fewer than 50% of the questioned nurses and physicians would recommend their patients to a pharmacist for vaccine administration; the reasons for this hesitation and lack of support were mainly concerns regarding the adequacy and effectiveness of pharmacists' training in handling adverse effects that may arise from vaccination administration[26;] this lack of support should be reproved knowing that CPs who administer vaccines do not seek to engage in a conflict over payment or infringe upon other healthcare practitioners' professional responsibilities, but instead, pharmacist as healthcare professionals have been equipped with the proper knowledge and can engage in vaccination to improve Universal Health Coverage as common with other nations where evidence exist of improved coverage of immunization by the pharmacist. Instead, the crucial aspect is to engage in collaborative efforts as members of an integrated healthcare team to facilitate patients' seamless access to this critical healthcare service. To overcome the multiple hurdles and barriers to pharmacist-led vaccines, a collaborative effort from all members of the healthcare team and policymakers is necessary. Efforts like the collaborative practice agreement in the United States, where the pharmacist's role has been advanced, should be emulated.[27] Limitations

This study is not without limitation, firstly it was designed as a cross-sectional study "The primary limitation of the cross-sectional study design is that because the exposure and outcome are simultaneously assessed, there is generally no evidence of a temporal relationship between exposure and outcome." [28.] Hence, establishing a genuine cause-and-effect link is unattainable without longitudinal data. It is recommended that further studies such as longitudinal studies be conducted to provide more evidence for this result.

Conclusion

Despite the inadequacies in infrastructural capacity, community pharmacists have positioned themselves as advocates, educators, facilitators, and qualified providers of vaccinations. The importance of pharmacists as vaccinators in improving community vaccination rates through increased accessibility should be recognized. Pharmacists have the potential to expand their role in delivering public health services by safely and effectively administering injectable medications and managing adverse drug reactions with the proper training and legislation. This study emphasizes that when CPs are empowered, they are willing to advance in vaccine administration and handling. Targeted interventions are needed to enhance their capacity to deliver effective vaccination services.

VACCINATION: THE VINTAGE INVENTION

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Introduction

The world population is currently estimated at 8.2 billion (Worldometer 2025). This is a clear landmark achievement for the world! It is particularly interesting when you recall that just 70 years ago, the world population hovered around 4 billion people, and at the dawn of the 20th century in 1900, the world population was estimated at 1.6 billion. This is despite the 'twin evils' – World War I (1914 -1918) and the Spanish Influenza pandemic (1918) that significantly decimated the gains of many years at the onset of the century. Comparing this growth rate back to the previous centuries, we actually deserve a resounding commendation. So, what have we done differently, what catalysed such an astronomical shift?

It has been established that the explosion of the world population aligns with the advancements in medicine, public health, and nutrition, which have lowered death rates and increased life expectancy. At the heart of the medicine advancement is the innovation and integration of vaccination into the world's healthcare system. (Bonanni P., 1999).

For example, in 1980, the World Health Organisation (WHO) declared the world free of smallpox, a highly virulent and devastating variola virus that was responsible for the death of hundreds of millions of people (an estimate of half a billion people between 1877 and 1977 alone). (James H., 2024). This success story followed a "Smallpox Eradication Programme in 1959, in which the WHO Member States stepped up their collaboration effort on global vaccination, and an "Intensified Smallpox Eradication Programme" between 1967 and 1977.

Definition and Types of Immuinization/Vaccination

Immunization/Vaccination involves the induction or administration of antibodies and other natural defence mechanisms to protect against specific pathogens (National Library of Medicine). Immunization is the greatest 'health miracle' that man has ever invented, and has proven to be the safest, cheapest, and most efficient means of preventing diseases and disabilities in humans.

There are two types of immunization: Active and Passive

Active immunization involves the administration of a modified pathogenic agent, or a component of a pathogen, to stimulate the recipient's immune mechanisms to produce long-lasting protection without causing the clinical manifestations or other consequences of disease.

Three major types of preparations are employed to produce active immunity. The first consists of vaccines made from whole, inactivated (killed) pathogens or components of a pathogen. Examples of whole, inactivated vaccines include currently licensed pertussis vaccines, influenza vaccines, and the Salk poliovirus vaccine. The pneumococcal, meningococcal, and hepatitis B vaccines are among those that contain the immunity-producing fraction of the pathogen.

Toxoids are the second type of active immunogens. The diphtheria and tetanus vaccines are good examples. Toxoids are toxins that have been treated by physical or chemical means until they no longer produce clinical disease, but retain the capacity to induce immunity.

Attenuated infectious vaccines are the third type. Virus vaccines in this group are derived from the offending organism after it has undergone repeated passages in the laboratory in culture; it remains infectious for man but loses the ability to induce clinical disease. Examples include the oral (Sabin) poliovirus, the measles, mumps, rubella (MMR), and yellow fever vaccines. Other examples of this type of vaccine contain live organisms or agents that are related to but different from the species that causes the disease. These vaccines produce "cross-

reacting" immunity. Examples include the BCG (Bacillus Calmette-Guerin) vaccine, which is used in some countries for immunization against tuberculosis, and the vaccinia virus vaccine used to prevent smallpox.

Passive immunization is accomplished by transferring antibodies against a given disease from an immune person or animal to a nonimmune individual, usually by injection of serum (antisera) or some partially purified serum extract. Examples are diphtheria and tetanus antitoxins, and immune serum globulin for the prevention of hepatitis. In some diseases, such as diphtheria, passive immunization is effective not only as a preventive measure but also as a treatment. Immunity acquired in this way is transient. However, it usually requires recognition or anticipation of exposure and is not infrequently associated with untoward side effects such as serum sickness, manifested by transient fever and arthritis resulting from hypersensitivity to animal sera.

History of Vaccination

The rich history of vaccination is a long walk and has its source in smallpox, which was the deadliest disease for many centuries, resulting in various pandemics across the world with severe morbidities and disabilities. Below is the sequential brief history of vaccination as highlighted by the World Health Organization (WHO):

1400s to 1700s

From at least the 15th century, people in different parts of the world have attempted to prevent illness by intentionally exposing healthy people to smallpox– a practice known as variolation (after a name for smallpox, 'la variole'). Some sources suggest these practices were taking place as early as 200 BCE

In 1721, Lady Mary Wortley Montagu brought smallpox inoculation to Europe by asking that her two daughters be inoculated against smallpox as she had observed the practice in Turkey.

In 1774, Benjamin Jesty made a breakthrough. Testing his hypothesis that infection with cowpox – a bovine virus which can spread to humans – could protect a person from smallpox

In May 1796, English physician Edward Jenner expanded this discovery and inoculated 8-year-old James Phipps with matter collected from a cowpox sore on the hand of a milkmaid. Despite suffering a local reaction and feeling unwell for several days, Phipps made a full recovery.

Two months later, in July 1796, Jenner inoculated Phipps with matter from a human smallpox sore in order to test Phipps' resistance. Phipps remained in perfect health and became the first human to be vaccinated against smallpox. The term 'vaccine' was later coined, taken from the Latin word for cow, vacca.

The 1800s

In 1872, Louis Pasteur created the first laboratory-produced vaccine: the vaccine for fowl cholera in chickens.

In 1885, Louis Pasteur successfully prevented rabies through post-exposure vaccination. The treatment is controversial. Pasteur had unsuccessfully attempted to use the vaccine on humans twice before, and injecting a human with a disease agent was a new and uncertain method.

Pasteur was not a medical doctor. But, despite the risk, he began a course of 13 injections with patient Joseph Meister, each containing a stronger dose of the rabies virus. Meister survived and later became the caretaker of Pasteur's tomb in Paris.

In 1894, Dr Anna Wessels Williams isolated a strain of diphtheria bacteria that was crucial in the development of an antitoxin for the disease.

The 1900s

From 1918 to 1919, the Spanish Flu pandemic killed an estimated 20–50 million people worldwide, including 1 in 67 United States soldiers, making an influenza vaccine a US military priority. Early experiments with influenza vaccines were carried out: the US Army Medical School tested 2 million doses in 1918, but the results were inconclusive.

In 1937, Max Theiler, Hugh Smith, and Eugen Haagen developed the 17D vaccine against yellow fever. The vaccine was approved in 1938, and over a million people received it that year. Theiler was awarded the Nobel Prize.

In 1939, bacteriologists Pearl Kendrick and Grace

Eldering demonstrated the efficacy of the pertussis (whooping cough) vaccine. The scientists showed that vaccination reduced the rates at which children got sick from 15.1 per 100 children to 2.3 per 100.

By 1945, the first influenza vaccine was approved for military use, followed in 1946 by an approval for civilian use. The research was led by doctors Thomas Francis Jr and Jonas Salk, who both went on to be closely associated with the polio vaccine
From 1952 to 1955, the first effective polio vaccine was developed by Jonas Salk, and trials began. Salk tested the vaccine on himself and his family the following year, and mass trials involving over 1.3 million children took place in 1954.

By 1960, a second type of polio vaccine, developed by Albert Sabin, was approved for use. Sabin's vaccine was live-attenuated (using the virus in weakened form) and could be given orally, as drops or on a sugar cube. The oral polio vaccine (OPV) was first tested and produced in the Soviet Union and Eastern Europe. Czechoslovakia became the first country in the world to eliminate polio.

In 1967, the World Health Organization announced the Intensified Smallpox Eradication Programme, which aimed to eradicate smallpox in more than 30 countries through surveillance and vaccination. Eradication means more than the elimination of a disease in a single area – WHO defines it as the "permanent reduction to zero of a specific pathogen, as a result of deliberate efforts, with no more risk of reintroduction".

In 1969, Dr Baruch Blumberg discovered the hepatitis B virus. He worked with microbiologist Irving Millman to develop the first hepatitis B vaccine, using a heat-treated form of the virus.

A plasma-derived inactivated vaccine was approved for commercial use from 1981 to 1990, and a genetically engineered (or DNA recombinant) vaccine, developed in 1986, is still in use today.

In 1971, the measles vaccine (1963) was combined with recently developed vaccines against mumps (1967) and rubella (1969) into a single vaccination (MMR) by Dr Maurice Hilleman.

In 1974, the Expanded Programme on Immunization (EPI, now the Essential Programme on Immunization) was established by WHO to develop immunization programmes throughout the world. The first diseases targeted by the EPI are diphtheria, measles, polio, tetanus, tuberculosis, and whooping cough.

In 1978, a polysaccharide vaccine that protects against 14 different strains of pneumococcal pneumonia was licensed, and in 1983 it was expanded to protect against 23 strains

In 1985, the first vaccine against diseases caused by Haemophilus influenzae type b (Hib) was licensed, after David H Smith founded a company to produce it. Smith and Porter W Anderson Jr had been working together on a vaccination since 1968.
In 1988, following the eradication of smallpox, WHO set its sights on poliomyelitis, launching a Global Polio Eradication Initiative. In the late 1980s, polio was endemic in 125 countries, and the initiative aimed to achieve its eradication by the year 2000.

By 1994, polio was eradicated from the Americas, followed by Europe in 2002, and by 2003, the disease was endemic in just 6 countries. The effort continued.

In 1995, Anne Szarewski led a team that outlined the role of human papillomavirus (HPV) in cervical cancer detection and screening, and researchers began work on an HPV vaccine.

In 1999, the first vaccine against rotavirus, the most common cause of severe diarrhoeal disease in young children, was withdrawn only a year after it was approved, due to concerns about the risk of intestinal problems. A lower-risk version of the vaccine was introduced in 2006. It took until 2019 for it to be in use in over 100 countries.

In 2006, the first vaccine for Human Papillomavirus (HPV) was approved. HPV vaccination goes on to become a key part of the effort to eliminate cervical cancer.

In 2019, the malaria vaccine pilot implementation was launched in Ghana, Malawi, and Kenya. The RTS/S vaccine is the first vaccine that can significantly reduce the deadliest and most prevalent strain of malaria in young children, the group at highest risk of dying from the disease.

WHO prequalifies an Ebola vaccine for use in countries at high risk, as part of a broader set of tools in response to the disease. In 2021, a global vaccine stockpile was established to ensure outbreak response.

A third-generation smallpox vaccine is approved for the prevention of monkeypox, thus becoming the first monkeypox vaccine.

On 30 January 2020, the WHO Director General declared novel coronavirus 2019 (SARS-CoV-2) to be a Public Health Emergency of International Concern. On 11 March, the WHO confirmed that COVID-19 was a pandemic.

Effective COVID-19 vaccines are developed, produced, and distributed with unprecedented speed, some using new mRNA technology. In December 2020, just 1 year after the first case of COVID-19 was detected, the first COVID-19 vaccine doses were administered.

Challenges of Vaccination

Despite the infinite and demonstrable advantages of immunization, it has been met with myriads of challenges, ranging from mere scepticism, refusal, to absolute resistance and rejection. The recent COVID-19 pandemic offered us just a snippet of what the pioneers of vaccination faced a few decades ago. Interestingly, education and civilization alone are not sufficient to win the non-believers.

The global vaccination coverage for most children's Routine Immunization (EPI) around the world continues to fall below expectations. According to the WHO report, in 2023, about 14.3 million children across the world missed out (had zero doses) on any form of vaccination, while about 16 per cent of those who started the diphtheria, tetanus, and pertussis (DTP3) vaccine didn't complete the third dose.

And despite several efforts, the global coverage for the Human Papillomavirus (HPV) vaccine and Yellow fever vaccines remains at 27 and 50 per cent, respectively, as of the end of 2023

Apart from the acceptability and accessibility of vaccines, another key challenge remains the shortage of the workforce or vaccinators. The increase in the world population is not without its attendant challenges; happily, most of them are surmountable by the blessing of human capacity. The method and personnel involved in the administration of vaccines have evolved over the years. In Nigeria, vaccination is usually carried out in primary healthcare facilities by Nurses and Community Health Workers (CHEW) and other trained personnel by the National Primary Healthcare Development Agency (NPHCDA). The advent of COVID-19 changed the dynamics of the workforce for vaccination around the world. Many countries have now become receptive to the inclusion of other healthcare teams as vaccinators. In the United States, the government had to modify its existing National Emergency Act to include pharmacists, dentists, midwives, and podiatrists. Adrianna et al. (2021).

As stated by the Pharmaceutical Group of the European Union (PGEU), "Many countries worldwide are moving towards expanding the scope of practice of pharmacists, namely through implementing pharmacist-led vaccination programmes.

Currently, pharmacists can vaccinate in their pharmacies in 15 European countries (Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Latvia, Luxembourg, Poland, Portugal, Norway, Romania, Switzerland, and the United Kingdom), for influenza and/or COVID-19.

In 9 of these countries (Denmark, France, Greece, Ireland, Italy, Norway, Portugal, Switzerland, and the United Kingdom) pharmacists are able to administer other vaccines and medicines such as Pneumococcal, Travel vaccines, Herpes Zoster (shingles), Cholera, Diphtheria, Tetanus and Pertussis, Anti-Tetanus Serum injection, Meningococcal, Tick-borne Encephalitis, Typhoid Fever and Hepatitis A, Japanese-Encephalitis, Hepatitis A, Hepatitis B, Human Papillomavirus (HPV), Rabies, Human rotavirus, and Varicella."

Following the roll out of Covid-19 vaccines In 2021, the leadership of the Association of Community Pharmacists of Nigeria (ACPN) led an altruistic visit to the Executive Director of the National Primary Healthcare Development Agency (NPHCDA); this consultation led to the signing of Memorandum of Partnership, MOP (published in the 2023 Edition of this Journal, available at www.njcp.com.ng) between the Community Pharmacists and

NPHCDA in January 2023, resulting in the administration of about 80 thousand doses of Covid-19 vaccine in community pharmacies across the states in Nigeria within the first 8 months of the same year. Part of the intention of the Memorandum of Partnership was to ensure review and expansion of the NPHCDA-ACPN engagement beyond the COVID-19 vaccine to include other PHC services, this has remained in limbo.

Unfortunately, trackers by the World Health Organization and the Nigerian Bureau of Statistics continue to reveal a huge gap in vaccine coverage in Nigeria. As of 2024, reports indicate that the coverage for DTP3 (Diphtheria, Tetanus toxoid, and Pertussis) vaccination in Nigeria was only 62% (Ghana 95 %), with wide variations among different geopolitical zones. The coverage for measles vaccination among children 9-11 months stood at 78.2% (Ghana 95%), with significant variation between urban and rural settlements. (NBS).

The most worrisome is that Nigeria remains one of the highest proportions of zero-dose children (who have not taken any vaccine) globally. In its periodic observation report, the WHO reiterates that "Nigeria faces a particularly alarming situation, with over 2.2 million estimated zero-dose children in 2021" (MICS/NICS) Report, 2021). And globally, out of about 14.3 million zero-dose children estimated for 2019, Nigeria is leading the five countries (others are India, the Democratic Republic of Congo, Pakistan, and Ethiopia) that account for two-thirds of the number. (New Incentives Report 2021).

Consequently, the infant mortality rate in Nigeria consistently remains among the highest in the world. According to the United Nations Children's Fund (UNICEF), "over the past five years, infant and under-five mortality rates have remained steady in Nigeria, at 74 and 117 deaths per 1,000 live births, respectively. At these mortality levels, one Nigerian child of every 13 born dies before reaching age 1, and one in every eight does not survive to their fifth birthday."

As of 2023, the mortality rate of infants aged under one-year-old in Nigeria was measured at 55.17 (Ghana 28.2). This means that there were about 55 deaths of children under the age of one year per 1,000 live births.

According to a study conducted by Osita Kingsley Ezeh and colleagues in 2015,
The leading causes of high infant mortality in Nigeria include a lack of access to quality healthcare and infectious diseases like malaria, diarrhea, and pneumonia.

Due to the disequilibrium spread of primary healthcare centres across different geopolitical zones in Nigeria, accessibility and lack of flexibility in timing remain some of the focal challenges of vaccination.

The recent study to assess the readiness, willingness, and infrastructure capacity of Community Pharmacists in Nigeria to undertake vaccination reveals positive feedback (published in this journal and other international journals). The report observed that most community pharmacists in Nigeria (91.3%) indicated their readiness and willingness to undertake vaccinations, including the children's routine immunization. While infrastructural capacity and training will be needed to fully utilize this ready workforce, there is no gainsaying of the enormous advantages that this will offer our nation at this very critical stage.

On May 2nd, 2025, the National Primary Healthcare Development Agency (NPHCDA) launched GAVI Alliance Health Systems Strengthening 3(HSS3), an initiative that is aimed at improving immunization coverage and achieving health security and equity for all Nigerians. This is an addition to several initiatives and collaborations with different agencies and development partners, including the Immunization Recovery Plan of 2022 in partnership with WHO and UNICEF, which has the primary goal of strategically targeting the zero-dose children across the nation between 2022 and 2025.

While commending all these astute efforts, the NPHCDA should also work across the aisles to ensure a cross-sectoral approach for the expansion of the vaccine workforce, which is one of the sticking points needed for the orientation, reorientation, flexible accessibility, education, and reduction in vaccine hesitancy among the teeming Nigerians.

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CHILDHOOD ROUTINE IMMUNIZATION IN NIGERIA: A CALL TO ACTION FOR COMMUNITY PHARMACISTS

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Introduction

Childhood routine immunization is a cornerstone of public health, significantly reducing morbidity and mortality from vaccine-preventable diseases (VPDs). In Nigeria, the National Programme on Immunization (NPI) aims to provide equitable access to life-saving vaccines for children under five. Despite progress, Nigeria faces persistent challenges, including low coverage rates, logistical barriers, and socio-cultural resistance, resulting in suboptimal protection against VPDs. This article examines the current state of childhood immunization in Nigeria, presents the routine immunization schedule, and explores barriers and strategies for improvement, drawing on recent scientific literature (2015–2025). Recommendations include strengthening health systems, enhancing community engagement, and leveraging technology to improve vaccine delivery.

The Importance of Immunization in Public Health

Vaccination is one of the most cost-effective public health interventions, preventing approximately six million deaths annually from diseases such as measles, polio, and pneumococcal infections (World Health Organization [WHO], 2025). In Nigeria, the Expanded Programme on Immunization (EPI), adopted in 1978, forms the backbone of the NPI, targeting diseases including tuberculosis, diphtheria, pertussis, tetanus, poliomyelitis, and measles. The latest (2021) immunization rate of 76.4% falls below the IA2030 target, and certain socio-economic and sociodemographic factors such as maternal education and geopolitical zone were significantly associated with lower odds of childhood immunization. (Olufadewa et al., 2024). This underscores the urgent need to assess and improve the immunization framework in Nigeria.

Routine Immunization Schedule in Nigeria

The current NPI schedule, aligned with WHO's EPI, targets children from birth to 18 months and includes recently introduced vaccines such as the pneumococcal conjugate vaccine (PCV) and rotavirus vaccine. The schedule is designed to provide timely protection against 12 vaccine-preventable diseases.

Table 1: Routine Immunization Schedule for Children in Nigeria

AGE	VACCINES ADMINISTERED	ROUTE	TARGET DISEASE(S)
AT BIRTH	BCG, Hepatitis B (HepB-0), Oral Polio Vaccine (OPV-0)	Intramuscular, Oral	Tuberculosis, Hepatitis B, Poliomyelitis
6 WEEKS	Pentavalent (DTP-HepB-Hib), PCV-1, Rotavirus-1, OPV-1	Intramuscular, Oral	Diphtheria, Tetanus, Pertussis, Hepatitis B, Haemophilus influenzae type b, Pneumococcal disease, Rotavirus, Poliomyelitis
10 WEEKS	Pentavalent-2, PCV-2, Rotavirus-2, OPV-2	Intramuscular, Oral	Same as 6 weeks

14 WEEKS	Pentavalent-3, PCV-3, OPV-3, Inactivated Polio Vaccine (IPV)	Intramuscular, Oral	Same as 6 weeks, Poliomyelitis
6 MONTHS	Vitamin A (first dose)	Oral	Vitamin A deficiency
9 MONTHS	Measles-1, Yellow Fever, Meningococcal A (MenA)	Intramuscular	Measles, Yellow Fever, Meningitis
12 MONTHS	Vitamin A (second dose)	Oral	Vitamin A deficiency
15–18 MONTHS	Measles-2	Intramuscular	Measles

Adapted from Paediatric Association of Nigeria (2020) and WHO (2023).

Current Coverage and Regional Disparities

Recent studies reveal significant coverage gaps and low rates of timely vaccination. A 2025 cross-sectional study in Ebonyi State reported that only 47.2% of children aged 5–11 months had received all vaccines by 14 weeks, and just 8.6% received them on time (Omale et al., 2025). Nationwide, the figure remains low at 34.4%, with stark disparities: South-South region reports 51.5% coverage while the North-West lags at just 9.5% (Davies et al., 2017).

Barriers to Effective Immunization
Several factors hinder optimal vaccine coverage in Nigeria:

- **Health System Challenges:** Inadequate vaccine supply, frequent stockouts, weak cold chain systems, and insufficient funding and workforce are major issues (Paediatric Association of Nigeria, 2020).

- **Socio-Cultural Resistance:** Misconceptions, including beliefs that vaccines cause infertility or are unnecessary after polio immunization, are widespread in certain regions. In Kano State, 9.2% of mothers expressed vaccine hesitancy (Ophori et al., 2023).

- **Access and Equity:** Rural and underserved communities face logistical challenges, while low maternal education and poverty further impede immunization.

- **Security Issues:** Insurgency in the North-East disrupts immunization efforts, leaving millions of children unvaccinated (Davies et al., 2017).

Infant Mortality Rates: Nigeria vs. Countries with Pharmacist-Led Vaccination
Nigeria's IMR is notably high at 59.1 per 1,000 live births, driven by low vaccination coverage (34.4%), weak healthcare infrastructure, and socioeconomic barriers (Adeniji & Oyeyemi, 2020). In contrast, high-income countries with pharmacist-led vaccination programs report significantly lower IMR:

- **United States:** IMR of 5.6 per 1,000, supported by widespread pharmacist-administered vaccines and >90% coverage (Emanuel et al., 2020).

- **United Kingdom:** IMR of 3.9 per 1,000, with pharmacists delivering flu and other vaccines, contributing to robust systems (Adeniji & Oyeyemi, 2020).

- **France:** IMR of 3.8 per 1,000, driven by comprehensive child health programs (Dutton, 2021).

- In low- and middle-income settings, India's Empowered Action Group (EAG) states report IMR of 40–50 per 1,000, reduced through

targeted interventions (Roy, 2021). Brazil's Amazon region has an IMR of 16.6, impacted by environmental and access challenges (Lima et al., 2023).

Pathways to Improvement

Despite these challenges, the introduction of PCV and rotavirus vaccines has significantly reduced related morbidity. However, the WHO's target of 90% national coverage remains unmet. Addressing the issues of coverage and timeliness requires multi-faceted strategies:

- **Strengthening Health Systems:** Investments in infrastructure, timely procurement, health worker training, and implementation of strategies like Reaching Every District (RED) have shown promise (Davies et al., 2017).

- **Community Engagement:** Effective educational campaigns, particularly involving religious and traditional leaders, can improve vaccine acceptance. Community dialogues in northern Nigeria have yielded positive outcomes (Ophori et al., 2023).

- **Role of Community Pharmacists:** Community pharmacists, often trusted and accessible providers, can play a critical role by offering vaccine education, addressing parental concerns, and serving as referral points. A 2016 study in Lagos found 84.2% of community pharmacies stocked and sold vaccines and possessed necessary storage facilities (Oluwadamilola et al., 2016). Training pharmacists to administer vaccines, as seen in other countries, could improve access, especially in underserved regions.

- **Technology and Innovation:** Tools like SMS reminders and mobile apps have improved schedule adherence in urban centers (Omale et al., 2025).

- **Policy and Advocacy:** Enhanced government commitment, strategic partnerships with global health organizations, and policy reforms are essential to bridge funding and operational gaps (WHO, 2025).

Conclusion

Childhood routine immunization in Nigeria remains a critical public health challenge. The current NPI schedule targets major VPDs but suffers from low coverage and poor timeliness. Addressing these issues requires health system reforms, community mobilization, technological support, and the inclusion of community pharmacists in immunization delivery. With strategic planning and collective effort, Nigeria can achieve universal immunization coverage and significantly reduce childhood mortality.

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MALARIA VACCINE: A MILESTONE IN GLOBAL HEALTH

Pharm. Samira Abubakar Umar, *BPharm, FPCPharm, DCPharm*

Introduction to Malaria

Malaria is a serious and sometimes fatal disease caused by parasites of the genus Plasmodium, which are transmitted to people through the bites of infected female Anopheles mosquitoes. The most dangerous of these parasites is Plasmodium falciparum, responsible for the vast majority of deaths. Other species, such as P. vivax, P. ovale, and P. malariae, also cause malaria, with P. vivax being widespread outside Africa.

Malaria remains a major global health challenge. According to the World Health Organization (WHO), there were an estimated 249 million cases of malaria and over 600,000 deaths worldwide in 2022, with more than 95% of cases occurring in sub-Saharan Africa. Children under the age of five and pregnant women are particularly vulnerable.

Nigeria currently bears the highest malaria burden in the world. According to the 2024 World Malaria Report, Nigeria accounted for approximately 27 % of global malaria cases and 31 % of malaria deaths in 2022. In 2023 alone, it represented about 30.9 % of global malaria deaths. The African region continues to carry the vast majority of the global malaria burden, with 94 % of cases and 95 % of deaths in 2023 alone. Among these, just a few countries— including Nigeria, the Democratic Republic of the Congo, Niger, and Tanzania—account for over half of all malaria deaths

History and Importance of Vaccine Development
For decades, the fight against malaria has relied primarily on preventative tools such as insecticide-treated bed nets, indoor residual spraying, and antimalarial medications. However, these methods alone have not been sufficient to eliminate the disease, especially in high-transmission areas.

Efforts to develop a malaria vaccine have spanned over 50 years, due to the parasite's complex life cycle and ability to evade the human immune system. A successful vaccine could significantly reduce transmission, lower the disease burden, and save hundreds of thousands of lives every year.

Key Malaria Vaccines

1. **RTS,S/AS01 (RTS,S) (Mosquirix)**
   - **Developer:** GlaxoSmithKline (GSK) in partnership with PATH and supported by the Bill & Melinda Gates Foundation.
   - **Approval:** WHO recommended it in 2021 for broader use in children living in regions with moderate to high malaria transmission.
   - **Target Parasite:** Plasmodium falciparum.
   - **Mechanism:** It targets the circumsporozoite protein (CSP), a protein on the surface of the parasite in its early stages.
   - **Efficacy:** Provides partial protection, reducing clinical malaria by about 30–50% over a few years, especially when combined with other interventions.
   - **Implementation:** Pilot programs in Ghana, Kenya, and Malawi demonstrated that the vaccine is safe, feasible to deliver, and has the potential to significantly reduce severe malaria and hospitalizations.

2. **R21/Matrix-M**
   - **Developer:** University of Oxford, in collaboration with the Serum Institute of India and Novavax.
   - **Approval:** WHO approved it for use in 2023.
   - **Efficacy:** Clinical trials have shown efficacy of up to 75%, a major improvement over RTS,S.
   - **Advantages:**
     - Lower cost per dose.

- Greater scalability due to high manufacturing capacity.
- Strong immune response with fewer doses.

- **Outlook:** Expected to play a major role in mass vaccination campaigns in Africa and beyond.

Implementation Challenges

Despite the breakthroughs, implementing malaria vaccination programs faces several challenges:

- **Logistics:** Delivering multi-dose vaccines in rural and remote areas requires strong health infrastructure.

- **Funding:** Sustained financial support is needed to ensure vaccine availability and accessibility.

- **Public Awareness:** Education campaigns are necessary to inform communities about the benefits and limitations of vaccination.

- **Integration:** Vaccines must complement, not replace, existing malaria prevention and treatment efforts.

Global and Regional Impact

Initial rollouts have shown that malaria vaccines can reduce the incidence of both uncomplicated and severe malaria. In pilot regions, hospital admissions and deaths from malaria have decreased. Over time, widespread use of vaccines could contribute to significant declines in child mortality in endemic countries.

Nigeria has initiated a significant public health intervention by introducing the R21/Matrix-M™ malaria vaccine, developed by the University of Oxford and produced by the Serum Institute of India. This vaccine, recommended by the World Health Organization (WHO) in October 2023, has shown high efficacy and a favorable safety profile, making it a promising addition to the country's malaria control strategies.

Key Details of Nigeria's Malaria Vaccine Rollout

- **Vaccine Introduction:** The rollout commenced in December 2024, starting with Bayelsa and Kebbi states, which have high malaria burdens
- **Dosing Schedule:** The vaccine is administered in four doses: at 5, 6, 7, and 15 months of age, with flexibility for latecomers.

- **Coverage and Distribution:** Nigeria has received one million doses, with 846,200 provided by Gavi and 153,800 procured by the Nigerian government.

- **Implementation Phases:**
  - **Phase 1**: Pilot programs in Bayelsa and Kebbi states.
  - **Phase 2:** Expansion to 19 additional states and the Federal Capital Territory (FCT).
  - **Phase 3:** Nationwide rollout to all remaining states.

Public Response and Challenges

The introduction of the R21 vaccine has been met with optimism, particularly among caregivers in the pilot states. For instance, in Bayelsa, a mother expressed relief, stating, "This is a relief for mothers like me," highlighting the vaccine's potential to alleviate the burden of malaria on families

However, challenges remain, including ensuring equitable distribution, maintaining vaccine potency through an effective cold chain, and addressing public awareness and acceptance. Studies indicate that while willingness to accept the vaccine is high, particularly among caregivers of children under five, concerns about safety and side effects persist, underscoring the need for robust community engagement and education.

Strategic Importance

Malaria continues to be a leading cause of morbidity and mortality in Nigeria, with the country accounting for approximately 27% of the global malaria burden. The R21 vaccine complements existing preventive measures such as insecticide-treated nets and seasonal malaria chemoprevention, forming a comprehensive approach to combat the disease. Additionally, the vaccine's affordability, priced at under $4 per dose, facilitates its integration into national health

programs.

In summary, Nigeria's adoption of the R21 malaria vaccine represents a pivotal step toward reducing malaria-related deaths and achieving broader public health objectives. Continued efforts in vaccine distribution, public education, and healthcare infrastructure will be crucial to the success of this initiative.

Global Future Prospects

The approval and deployment of malaria vaccines represent a major milestone in the fight against infectious diseases. However, ongoing research aims to improve vaccine efficacy, simplify dosing schedules, and develop new formulations that protect against multiple Plasmodium species.

Additionally, scientists are exploring mRNA-based malaria vaccines, similar to COVID-19 vaccines, which could offer faster and more adaptable solutions in the future.

Conclusion

The introduction of malaria vaccines marks a turning point in global health. While not a cure or a standalone solution, these vaccines provide an essential new tool in the global strategy to control and eventually eradicate malaria. With continued investment, innovation, and collaboration, the dream of a malaria-free world is closer than ever.

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ADULT IMMUNIZATION

By Pharm Nonye Mary Ezim-Ochi, *DCPharm*

Immunization is one of the most effective public health interventions, preventing millions of deaths annually. By stimulating the body's immune system to recognize and combat pathogens, immunization protects individuals and communities from infectious diseases. This article explores the definition, types, and critical role of adult immunization.

Definition of Immunization

Immunization refers to the process of inducing immunity to a specific disease, typically through vaccination. It enables the immune system to recognize and neutralize pathogens like viruses or bacteria upon future exposure. While natural immunity can result from infection, immunization focuses on artificially acquired immunity via vaccines, ensuring protection without the risks of the disease itself. The World Health Organization (WHO) emphasizes the importance of adult immunization as part of global health strategies. Here are some key points about what the WHO wants regarding adult immunization:

WHO's Stance on Adult Immunization

- Global Health Success Story: Immunization is considered a global health success story, saving millions of lives every year by reducing the risk of getting diseases and working with the body's natural defenses to build protection.

- Key to Primary Health Care: Immunization is key to primary health care and an indisputable human right, making it one of the best health investments.

- Disease Prevention: Vaccines protect against over 30 life-threatening diseases and infections, helping people of all ages live longer, healthier lives[1].

WHO's Immunization Agenda 2030

- Global Vision and Strategy: The Immunization Agenda 2030 (IA2030) sets an ambitious global vision and strategy for vaccines and immunization for the decade 2021-2030.

- Leaving No One Behind: IA2030 aims to inspire and align activities of community, national, regional, and global stakeholders towards achieving a world where everyone, everywhere, fully benefits from vaccines for good health and well-being[1].

In Nigeria, adult immunization is primarily supported, The National Primary Health Care Development Agency (NPHCDA) manages the routine immunization program, while the WHO provides technical support and collaborates on national immunization strategies, according to the WHO. But unfortunately, these areas have not been actualized.

Vaccination is not exclusive to children. Adults require ongoing protection due to waning immunity, age-related risks, and lifestyle factors.
But unfortunately, not much is happening about adult vaccination in Nigeria.

Types of Immunization

Immunization strategies are categorized into active and passive methods, differing in how immunity is conferred.

1. Active Immunization*

This approach stimulates the body to produce its own antibodies. Vaccines contain antigens that mimic pathogens, training the immune system to respond effectively. Types include:

Live Attenuated Vaccines: Use weakened pathogens (e.g., MMR, chickenpox). They elicit strong, long-lasting immunity but are unsuitable for immunocompromised individuals.

Inactivated Vaccines: Contain killed pathogens (e.g., polio, hepatitis B). Safer for vulnerable groups but may require boosters.

Subunit/Conjugate Vaccines: Include parts of pathogens (e.g., HPV, pneumococcal). Minimize side effects by targeting specific antigens.

Toxoid Vaccines: Target toxins produced by pathogens (e.g., tetanus, diphtheria).

mRNA/Viral Vector Vaccines: Use genetic material to trigger antigen production (e.g., COVID-19 vaccines).

2. Passive Immunization
Provides temporary immunity by administering pre-formed antibodies:

Natural: Maternal antibodies- these are transferred via the placenta or breast milk.

Artificial: Antibody-rich products like immunoglobulins (e.g., rabies treatment, monoclonal antibodies for RSV).

Combination Vaccines (e.g., DTaP) merge multiple antigens to simplify vaccination schedules.
Recommended Vaccines for Adults*

Influenza: Annual vaccination to combat evolving strains.
- **Tdap/Td**: Tetanus, diphtheria, and pertussis boosters. (booster every 10 years)

- **Shingles (Shingrix)***: Recommended for adults 50 or immunocompromised >19.

- **Pneumococcal**: Protects against pneumonia (PCV20 or PCV15/PPSV23 for >65).

- **HPV**: Up to age 45 to prevent certain cancers.

COVID-19/RSV: Updated boosters and age-specific recommendations (e.g., RSV for >60).

Hepatitis B: For adults 19-59 and 60 and above who are at risk of hepatitis B infection, and healthcare workers.

Typhoid vaccine: For food handlers and at-risk individuals

Challenges
- **Low Awareness**: Many adults underestimate vaccine needs, while some are not aware of them.

- **Access Barriers**: Limited healthcare access or insurance coverage, both on the part of patients and some healthcare providers.

- **Myths:** Misinformation fuels hesitancy; education is key

Cost: Most adults who are aware shy away from vaccines because of their high cost.

Emerging Threats:
Pandemics (e.g., COVID-19) and travel-related exposures necessitate updated protection.

Importance
- **Immunity Gaps** Childhood immunity fades (e.g., tetanus boosters needed every 10 years).

- **Age-Specific Risks**: Older adults face higher susceptibility to diseases like shingles or pneumonia.

Key Organizations Involved:
NPHCDA:
The primary agency responsible for coordinating and implementing the routine immunization programme in Nigeria, including adult immunization.

WHO:
Provides technical support, guidance, and collaborates with the NPHCDA on immunization strategies and programmes.

SDG3 GAP partners:
These partners, along with the government, work on sustainable funding mechanisms and address immunization gaps.

UNICEF:
Supports immunization efforts in Nigeria, including monitoring vaccine safety and effectiveness.
Routine vs. Special Immunizations:

Routine Immunizations:
The NPHCDA provides free routine vaccines against common diseases like polio, measles, yellow fever, and TB, among others.

Special Immunizations:
These are targeted vaccinations for specific diseases or outbreaks, like the new 5-in-1 meningitis vaccine introduced in Nigeria.

Conclusion
Immunization is a lifelong shield against preventable diseases. From active vaccines that train our immune system to passive antibodies offering immediate defense, each method plays a vital role. Adult immunization, often overlooked, is crucial for maintaining individual and community health. By addressing barriers and promoting awareness, we can harness the full potential of vaccines across all ages, ensuring a healthier global population. Community pharmacies are healthcare providers who are strategically positioned to bridge the gap in adult immunizations.

This could be achieved through collaborations with the key organizations involved and proper awareness.

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HESITANCY TO IMMUNIZATION IN NIGERIA

By Pharm Charles Akinsete, *FPSN*
Clinical Pharmacist

BACKGROUND

Despite significant investments in the immunization program, Nigeria's vaccination coverage has remained below predetermined levels.

Immunization hesitancy—defined by the World Health Organization (WHO) as the delay in acceptance or refusal of vaccines despite availability of vaccination services—has become a growing global public health concern. Its consequences are particularly severe in the context of child mortality, especially in low- and middle-income countries (LMICs).

Some Key Impacts of Vaccine Hesitancy on Child Mortality

1. **Increased Incidence of Vaccine-Preventable Diseases (VPDs)**
   Diseases such as measles, diphtheria, pertussis (whooping cough), and polio have seen resurgences in areas with low vaccination coverage.
   Measles, for example, remains one of the leading causes of death among young children, even though it is preventable with two doses of a safe vaccine.

2. **Outbreaks and Epidemics**
   Clusters of unvaccinated children create pockets of susceptibility, allowing outbreaks to spread more quickly and with greater severity.
   These outbreaks increase the overall burden on health systems and can lead to preventable deaths, especially in regions with limited healthcare access.

3. **Disruption of Herd Immunity**
   Herd immunity protects those who cannot be vaccinated (e.g., immunocompromised children, newborns).
   Vaccine hesitancy erodes herd immunity, placing vulnerable children at higher risk of exposure and mortality.

4. **Delays in Response to Emerging Diseases**
   In situations like the COVID-19 pandemic, vaccine hesitancy delays the adoption of new vaccines, extending disease transmission and death among children.

Data and Global Trends

According to WHO and UNICEF, measles deaths increased by 50% between 2016 and 2019, in part due to vaccine refusal and system weaknesses.

In 2022, approximately 25 million children missed at least one routine vaccine, the largest sustained decline in childhood vaccinations in nearly 30 years.

Vaccine-preventable diseases account for 1.5 million deaths annually in children under 5, most of which are avoidable.

Factors Contributing to Vaccine Hesitancy

Misinformation: Social media myths about vaccine safety
Cultural/Religious Beliefs: Opposition based on beliefs or doctrines
Trust Issues: Distrust in health systems or governments
Access Barriers: Lack of transportation, time, or availability
Fear of Side Effects: Misunderstanding rare adverse effects

Nigeria Overview:

To protect child health and reduce preventable

deaths, tackling immunization hesitancy must remain a top global health priority.

Lack of political will and commitment, a lack of funding, low community involvement, and restricted scaling up of cost-effective interventions are a few of the difficulties.

Hesitance to immunization or vaccination in Nigeria is a significant public health challenge.
It is influenced by a mix of cultural, religious, socioeconomic, and systemic factors.

Research conducted in Oyo State, located in southern Nigeria, revealed that vaccination hesitancy was linked to low health literacy and a lack of confidence in healthcare practitioners.

This association was observed even among those who shared the same language as their healthcare providers (Fatiregun & Okoro, 2012).

1. **Historical Context**
   Polio vaccine boycotts (2003-2004) in Northern Nigeria, particularly in Kano State, created a strong distrust of vaccines due to rumours of contamination and infertility.
   Legacy mistrust from colonial and post-colonial government actions also plays a role

2. **Religious and Cultural Beliefs**
   Some religious leaders have discouraged vaccination, citing divine protection or conspiracy theories. Cultural practices and norms in certain communities prioritize traditional medicine over Western medical practices.

3. **Misinformation and Rumors**
   Social media and word of mouth spread misinformation about vaccine side effects, infertility, or Western plots to harm African populations. Low health literacy amplifies the impact of fake news.

4. **Access and Infrastructure Issues**
   Inadequate healthcare infrastructure, especially in rural areas, leads to missed immunization opportunities. Logistical issues such as cold chain problems or vaccine stockouts reduce confidence in the health system.

5. **Distrust of Government and Foreign Interventions**
   Suspicion of government motives or foreign aid programs can lead to skepticism about immunization campaigns. Some communities view health campaigns as politically motivated rather than for the public good.

6. **Low Risk Perception**
   People may underestimate the severity or likelihood of contracting vaccine-preventable diseases, especially if there are few recent outbreaks in their area.

7. **Socioeconomic Factors**
   Poverty, lack of education, and daily survival struggles make immunization a low priority for some families.

EFFORTS TO ADDRESS VACCINE HESITANCY

Community Engagement: Involving local and religious leaders, healthcare workers, to advocate for vaccines.
Education Campaigns: Using mass media and community outreach to combat misinformation.
Health System Strengthening: Improving access, cold chain logistics, and training for health workers. Collaboration with private primary healthcare workers.
Incentives and Integration: Offering incentives or integrating immunization with other essential services.

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VACCINE BELIEFS AND MYTHS: A CROSS-SECTIONAL SURVEY AMONG CORPS MEMBERS SERVING IN IKEJA AREA OF LAGOS STATE.

By Ejemai, Gloria Osawumese and Ogunleye, Temiloluwa Esther
Serving NYSC Members at ACPN National Secretariat

INTRODUCTION

Vaccines are among the most effective innovations of the modern era. Vaccines have been surrounded by dangerous myths since the development of the smallpox vaccine in the 18th century. During that era, anti-vaccine activists claimed that the smallpox vaccine would end up causing deformities in a child. Since it was derived from cowpox, parents also feared that the smallpox would turn their children into cows or cow-like creatures (Offit, 2011). Today, many parents are unfamiliar with the severity of diseases that vaccines can prevent, which has led to increasing skepticism about their necessity. This doubt is further fueled by the fact that no vaccine is 100% free, or without side effects. Over the past few decades, vaccine hesitancy has emerged as a major public health problem, leading to outbreaks of communicable infections such as measles. The reasons for vaccine refusal are complex and differ according to geographical and cultural context. However, concerns about vaccine safety remain one of the most common factors behind low vaccine uptake (Larson, Leask, & Paterson, 2014).

DEFINITION OF TERMS

1. **Myth**
   A myth is a widely held but false belief or idea that persists within societies over time. Myths often arise from cultural, religious, or emotional narratives and are resistant to evidence-based corrections (Barrett & Nyhof, 2001).

2. **Vaccination**
   Vaccination is a medical process in which a person is made immune or resistant to an infectious disease, typically through the administration of a vaccine. Vaccines stimulate the body's own immune system to protect the person against subsequent infection or disease (Andre et al., 2008; MacDonald, 2015).

3. **Myths of Vaccination**
   Myths of vaccination refer to commonly circulated false beliefs and misconceptions about vaccines, including their content, effects, and purpose. These myths may include fears of infertility, population control, or the idea that vaccines cause diseases they aim to prevent (Adebisi, 2021; Kata, 2010).

COMMON MYTHS OF VACCINATION IN NIGERIA

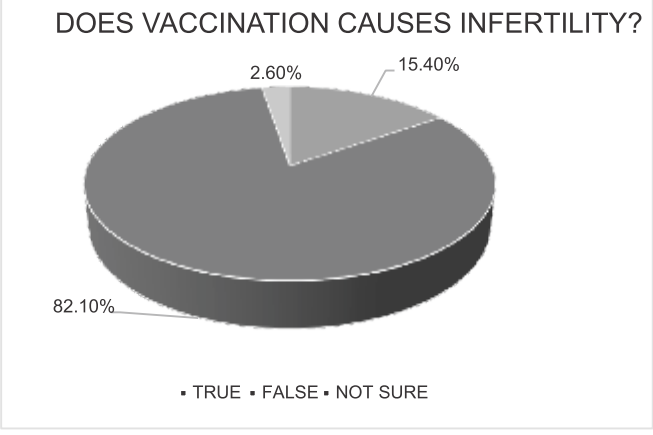
A cross-sectional survey was conducted in the Ikeja Local Government Area of Lagos State, targeting National Youth Service Corps (NYSC) members. The participants responded to a structured questionnaire designed to assess their perception of common vaccination myths. Similar studies have highlighted that even among educated populations, vaccine-related misinformation is widespread (Hornsey, Harris, & Fielding, 2018).

1. **Vaccine Causes Infertility**
   According to the survey findings in the pie chart below, 15.4% of the respondents believed that vaccines cause infertility. This belief is particularly associated with the Human Papillomavirus (HPV) and COVID-19 vaccines. Among women of reproductive age, this myth can significantly affect vaccine acceptance, leading to lower coverage and a rise in preventable conditions like cervical cancer (Williams, 2014; Voysey et al., 2021).

   Causes: Misinformation, fear of sterilization, and rumours tied to population control agendas.

   Implications:
   - Mistrust in reproductive health services.
   - Reluctance among young women to get vaccinated.
   - Increased risk of HPV-related diseases.

FIGURE 1: VACCINATION CAUSES INFERTILITY



2. Vaccine Is a Method of Population Control

This myth was believed by 28.2% of respondents in the survey, viewing the table below. It is rooted in the misconception that vaccines are a tool used by foreign entities or governments to reduce the African population. This fear was amplified in 2003 during the Northern Nigeria polio vaccine boycott (Adebisi, 2021; Okuhara et al., 2022).

Causes: Religious distrust, historical skepticism toward Western medicine, and politically motivated misinformation.

Implications:

- Suspicion toward national immunization programs.
- Resistance to international health interventions.
- Slowed progress in eradicating vaccine-preventable diseases.

TABLE 2 : VACCINE IS A METHOD OF POPULATION CONTROL

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	True	11	28.2	28.2	28.2
	False	28	71.8	71.8	100.0
	Total	39	100.0	100.0	

3. COVID-19 Vaccines Contain Microchips

20.5% of participants in the table below, believed that COVID-19 vaccines contained microchips for tracking and surveillance purposes. This myth gained popularity through social media platforms (Kata, 2010; Bonnevie et al., 2021). This belief probably accounts for the low acceptance of COVID-19 vaccines among Nigerians; interestingly, about 65% of the corps members who participated in this survey confessed that they didn't take the COVID-19 vaccine due to this fear.

Causes: Technological paranoia, conspiracy theories, and digital misinformation.

Implications:

- Fear of technological control.
- Refusal to participate in COVID-19 vaccination programs.

TABLE 3 : COVID-19 CONTAINS MICROCHIPS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	True	8	20.5	20.5	20.5
	False	31	79.5	79.5	100.0
	Total	39	100.0	100.0	

4. Natural Immunity Is Better Than Vaccine-Induced Immunity

A staggering 61.5% of the respondents held this belief in the table below. Many individuals assume that acquiring immunity through infection is safer or more effective. However, research has shown that natural immunity often comes with a higher risk of severe illness and long-term complications (Brewer et al., 2017; Altarawneh et al., 2022).

Causes: Misinterpretation of immune science, belief in alternative medicine, and general vaccine fatigue.

Implications:

- Increased risk of severe disease or death.
- Higher transmission rates of infectious diseases.

TABLE 4: NATURAL IMMUNITY IS BETTER

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	True	24	61.5	61.5	61.5
	False	15	38.5	38.5	100.0
	Total	39	100.0	100.0	

5. Vaccines Can Cause Diseases

41.0% of the participants in the study, as shown in the table below, believed vaccines could give them the diseases they are designed to prevent. This myth is commonly associated with misunderstanding how live-attenuated vaccines work (Dubé et al., 2013; Chung et al., 2022; Zhou et al., 2005).

Causes: Misunderstanding of vaccine ingredients and function, anecdotal reports of side effects, and lack of education.

Implications:

- Reduced trust in medical advice.
- Vaccine hesitancy leading to disease outbreaks.

TABLE 5: VACCINE CAN CAUSES DISEASES

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	True	16	41.0	41.0	41.0
	False	23	59.0	59.0	100.0
	Total	39	100.0	100.0	

IMPLICATIONS AND RECOMMENDATIONS

The widespread belief in vaccination myths contributes to low vaccine uptake, increased disease outbreaks, and heightened public distrust in health systems. Left unchecked, these misconceptions can reverse public health progress and prolong pandemics (Nyhan et al., 2014).

Recommendations:

- Public Sensitization Campaigns: Utilize community radio, local influencers, and healthcare providers to dispel myths (Leask et al., 2010).
- **Healthcare Worker Training:** Equip providers with up-to-date, evidence-based information to counter misinformation (Smith et al., 2011).
- **School-based Health Education:** Introduce curriculum elements that teach students the science and safety of vaccines.
- **Digital Literacy Programs**: Train citizens to identify and challenge misinformation online (Betsch et al., 2015).
- **Community Engagement:** Involve traditional and religious leaders in vaccine advocacy (Freed et al., 2010).

CONCLUSION

This study highlights the persistence of vaccine-related myths among educated Nigerian youth. These myths, though false, continue to shape behavior, delay vaccine uptake, and increase susceptibility to preventable diseases. A sustained and evidence-based public health response is required to counter this trend and rebuild vaccine confidence (Plotkin, Orenstein, & Offit, 2018).

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THE COMMUNIQUE OF THE 43RD ANNUAL INTERNATIONAL SCIENTIFIC CONFERENCE OF T HE ASSOCIATION OF COMMUNITY PHARMACISTS OF NIGERIA (ACPN) HELD BETWEEN JULY 22ND AND JULY 27TH, 2024, AT THE UNIVERSITY OF IBADAN INTERNATIONAL CONFERENCE (ICC) IBADAN, OYO STATE

The Association of Community Pharmacists of Nigeria (ACPN) held its 43rd Annual International Scientific Conference at the University of Ibadan International Conference Centre, Ibadan. The Conference attracted the Executive Governor of Oyo State, His Excellency Engr. Seyi Makinde, FNSE, who was ably represented by the Deputy Governor His Excellency Barr. Bayo Lawal. Other dignitaries in attendance were the Chief Judge of Oyo State, Justice Iyabo Yerima, the Hon. Commissioner for Health, Dr. Oluwaserimi Ajetumobi, the President Pharmaceutical Society of Nigeria (PSN), Prof. Cyril Usifoh, *FPSN*, Past President and Chairman BOT of the ACPN Dr. U. N. O. Uwaga, *FPSN,* Past Presidents Azubike Okwor FPSN and Pharm Olumide Akintayo, *FPSN*, Past National Chairmen of the ACPN including Sir Deji Osinoiki *FPSN*, *FPSN, DCPharm*, Pharm (Dr.) Ejiro Foyibo, *FPSN, DCPharm*, Pharm Olufemi Adebayo, *FPSN, DCPharm*, Pharm Albert Alkali, *FPSN, DCPharm*, and Pharm (Dr.) Samuel Adekola, *DSA, DCPharm.*

The Director General of the National Agency for Food and Drug Administration and Control NAFDAC, Prof Mojisola Adeyeye, *FPSN* presided as Chairman at the Opening Ceremony, while Pharm Remi Adeseun, *FPSN*, delivered a keynote address on the theme of the Conference tagged ''Advancing Community Pharmacy Practice through Innovation and Collaboration'' The Conference was declared open by HE the Executive Governor of Oyo State ably represented by the Deputy Governor, HE Barr. Adebayo Lawal. After a careful evaluation of all the papers, memorandum, and motions at the AGM, the Conference adopted the reflected resolutions:

1. The Conference acknowledged that Community Pharmacies (CP) are best suited to provide healthcare services to the largest segment of the population in every clime which is why Governments, donors, partners, and other stakeholders should identify Community Pharmacists (CPs) as strategic executors in service delivery in the quest to attain Universal Health Coverage.

   The conference identified a need for policy shifts that will boost innovations and collaborations in Community Pharmacy practice in methodologies that compel effective service delivery, research and documentation which ultimately enhance professionalism.

2. The Conference echoed the global expositions and norms that recognize Community Pharmacies as Primary Healthcare Centers and reinforced the reality that the National Health Act – 2014 validates the status of Pharmacies as Health facilities in Nigeria.

   The conference declared that the Government must show more commitment to unlocking the Pharma-sector value chain by overcoming a plethora of challenges including fragmented coordination of the sector, checkmating the high incidence of unqualified and untrained hands who dabble into the professional terrain, prevalence of fake and counterfeit medicines because of a glaring inadequacy in the implementation mode of the National Drug Distribution Guidelines (NDDG), dearth of inculcation of technology, poor access to capital and infrastructures which are below par.

3. The Conference canvassed effective regulatory controls in the quest for Good Pharmacy Practice (GPP). The conference welcomed legislative action in key areas like the establishment of the Federal and State Task Forces on fake and counterfeit drugs as the

inherent weaknesses in the Pharmacy and Drug statutes encourage criminal elements and merchants of death to get away with impunity in the Pharma Sector.

4. The Conference called for proper funding of the National Agency for Food and Drug Administration and Control (NAFDAC) and Pharmacy Council of Nigeria (PCN) to enable these agencies to meet the expectations of consumers of health while also encouraging these agencies to abrogate some of the tariffs which have become burdensome on Pharma manufacturers as well as importers particularlyat a time the escalating cost of drugs cannot be left solely to the vagaries of the impressive Executive order on the Pharma Sector to crush drug prices.

5. Community Pharmacists under the aegis of ACPN reminded the Government at all levels that quality drugs are germane to the attainment of Universal Health Coverage (UHC).

   The Conference strongly recommended the effective coordination of the series of ongoing efforts to catalyze improved coordination of the supply chain through innovations and technology-backed collaborations with regulatory agencies.

6. The Conference sued for the encouragement of the expansion of Community Pharmacy to cover rural areas in Nigeria.
   Further to these expansionist needs, the Conference urged the NEC of ACPN to integrate the online-driven drug distribution platform (P2P) concept and the digital toolbox for effective documentation and inventory management.
   The conference implored the ACPN to optimize and leverage strategic partnerships for the growth of Cps.

7. The Conference charged NEC with setting up an ACPN Innovation Committee with the mandate to oversee ongoing projects. The conference pushed for continuity and progress of all initiatives that are on course.

   The Conference conveyed its appreciation for the development of an ACPN aggregator platform - ACPN pharmacies.ng. The platform allows members of the ACPN to establish an online presence, manage their own dashboards, and facilitate direct transactions with clients.

8. The Conference applauded the concept of Pharma-Care centre in under-served areas of the country.
   The conference called for the establishment of a Pharma-Care Centre in every local Government area in Nigeria.
   The conference endorsed the maiden Pharma-Care Centre located in Afijio LGA of Oyo State while also adopting the recommendation that each State branch of the ACPN should set up at least one Centre in their State.

9. The Conference directed through its AGM that Past Chairmen of the ACPN shall no longer be eligible for appointments as CEOs of ACPN subsidiaries because of the propensity to generate entropy between incumbent Chairmen and Past Chairmen.
   The conference further highlighted the significance of this resolution by insisting the resolution be implemented with immediate effect.

10. The Conference reviewed recent developments at NHIA and called on the Chairman and NEC to immediately explore necessary legal action to compel the implementation of the NHIA Act as amended and the PCN Act 2022 as it relates to the appropriate dispensing of drugs in social health insurance endeavors in Nigeria bearing in mind that over N1Trillion of drugs have been dispensed since 2006 by persons who have not aligned with the necessary provisions of law.

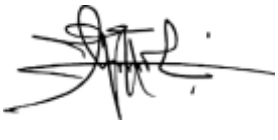
11. The Conference commended the FMoH for resuscitating the National Prescription Policy (NPP) which was brought to front burners in 2013 by the PSN leadership.
    The conference appreciated the trajectory of the NPP committee but stressed the need to appoint a Pharmaceutical Consultant who must be a Registered Pharmacist within the purview of the PCN Act and a Medical

Consultant who must be a Registered Medical Doctor within the ambit of the MDCN Act.

12. The conference conveyed its gratitude to HE Engr. Seyi Makinde, Governor of Oyo State, Chief Judge, Oyo State Government, and the good people of Oyo State for hosting and creating a conducive environment for the successful Annual National Conference of the ACPN.

13. At the end of the Conference, the following people were elected into the NEC for the 2024/25 year. They include:

National Chairman	Pharm. Ambrose Igwekamma Ezeh, *MAW,DCPharm*
National Vice-Chairman	Pharm. Adegboyega Oguntoye *MAW, DCPharm*
National Secretary	Pharm. (Mrs) Omokhafe Ashore *FPSN, DCPharm*
National Assistant Secretary	Dr. Samuel Iyen. *MAW,*
National Treasurer	Pharm. Babatunde Samuel, *FPSN.*
National Financial Secretary	Pharm. (Mrs) Obiageri Ikwu.
National Publicity Secretary	Pharm. Chukwudi Mekwunyei
National Editor-In-Chief	Pharm (Hajia) Samira Abubakar Umar, *FPCPharm, DCPharm*
National Internal Auditor	Pharm. Luke Atang Bokynyam
Immediate Past National Chairman	Pharm Adewale Oladigbolu, *FPSN*



Pharm. Ambrose Igwekamma Ezeh, MAW

National Chairman

Pharm. (Mrs) Omokhafe Ashore MAW, DCPharm

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7. Ogunleye, Temiloluwa Esther

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The congress is structured around three subthemes, each addressing key facets of this overarching theme.

The subtheme **Making it sustainable** focuses on enhancing global health through sustainable resource use, innovative health solutions, and robust policy frameworks.

Making the system work emphasises pharmacists roles in enhancing healthcare efficiency through integrated care, patient safety and innovations like telepharmacy and AI.

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PHARMACY

The Pharmacy Emblem, a property registered with Corporate Affairs Commission(CAC) (with Reg. No. RT M 63583) belongs to the Pharmaceutical Society of Nigeria (PSN).

The PSN entrusted the Association of Community Pharmacists of Nigeria (ACPN)With power of attorney to manage the Pharmacy Emblem often referred to as the"Green Cross" or the "Rx Sign"

The Emblem made its debut in 1976, and till date, functions as a mark of identification for Registered and Pharmacists' owned Pharmaceutical Premises(Retails).

The Rx sign is a symbol with which the PSN guarantees the general public where to source for quality products and excellent professional pharmaceutical care and services.

The Council of PCN has resolved that the Pharmacy Council of Nigeria (PCN) shall henceforth enforce the Pharmacy Emblem and the Registrar has so been mandated.

The general public should therefore watch out for the Green Cross with Rx sign before patronizing any drug or medicine shops because the Pharmacy Emblem guarantees:

- Genuine and Quality Drugs/Medicines
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- Health Education and Drug Information
- Conselling and Proper use of drugs

ACPN RESEARCH AND DEVELOPMENT UNIT

...Advancing Community Pharmacy Practice

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