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COMMENTARY

Pandemic planning and preparedness in Nigeria: A search for entry points to integrate adult vaccinations into the health system

Aanuoluwapo A. Afolabi[1,2*], Gbemisola Ishola[3], Olayinka S. Ilesanmi [2,4]

[1]Technical Services Directorate, MSI Nigeria Reproductive Choices, Abuja.

[2]Plus-Circle Community Health Advancement Organization, Nigeria.

[3]Canadian Association for Black Health & Safety Professionals, Edmonton, Alberta, Canada.

[4]Department of Community Medicine, College of Medicine, University of Ibadan, Ibadan, Nigeria

Abstract

This commentary aimed to describe entry points to integrate adult vaccinations into the health system in Nigeria towards pandemic planning and preparedness. To enhance pandemic preparedness, leveraging established platforms can significantly increase vaccination coverage and community acceptance. Immunization clinics, which already play a crucial role in maternal health, can be optimized to include pandemic-related vaccinations for mothers, ensuring they are protected and informed. Targeting men in car parks and community halls taps into gathering points where health interventions are less frequent but could have a substantial impact, especially in engaging this often-underrepresented demographic. Advocacy to religious and traditional rulers is essential, as their influence can drive widespread acceptance and mobilization within communities, making them key allies in vaccination efforts.

Mass communication platforms, including social media, radio, and television, can amplify outreach, disseminating accurate information quickly and reaching diverse audiences. By integrating these strategies, a robust, multi-faceted approach can be developed that enhances community-based vaccination efforts. This not only strengthens immediate pandemic response but also builds long-term resilience, ensuring that communities are better prepared for future public health challenges

Keywords

Health systems, vaccination, Nigeria

Introduction

Vaccination is celebrated as one of the most impactful and affordable health interventions ever developed, reducing the spread of infectious diseases, and saving countless lives (1, 2). Despite its proven success, resistance to vaccination has been a recurring challenge, with opposition arising in various forms throughout history (2, 3, 4, 5). Vaccine hesitancy in Nigeria stemmed from misconceptions and doubts about vaccine efficacy, compounded by vaccine distribution primarily through child-focused clinics (3, 4, 5, 6). Vaccine acceptance is heavily reliant on the strength and effectiveness of the overall health system (7). A robust health system ensures the availability and accessibility of vaccines, comprehensive health education, communication, and trust-building efforts necessary to encourage vaccine uptake (7, 8, 9). This includes having well-trained healthcare professionals, reliable supply chains, adequate infrastructure, and a coordinated effort to address misinformation and cultural sensitivities (8, 9). In such a system, many people will trust the safety and efficacy of vaccines, leading to higher acceptance rates and successful immunization programs (8, 9). This commentary aimed to describe potential entry points to integrate adult vaccinations into the Nigerian health system towards promoting pandemic planning and preparedness.

The Nigerian health system

The Nigerian health system operates on three distinct tiers: primary, secondary, and tertiary levels, all overseen by the Ministry of Health and other governmental health agencies, collectively playing pivotal roles in healthcare delivery (10). Routine childhood immunization in Nigeria is comprehensive and systematically integrated across federal, state, and local levels to ensure wide coverage (11). Key vaccines include the DTwP-HepB-Hib vaccine given to infants at six, 10, and 14 weeks; the measles vaccine at nine and 15 months; and the meningococcal A conjugate vaccine at nine months (12, 13). Infants also receive

the pneumococcal conjugate vaccine (14), oral and inactivated polio vaccines, and the rotavirus vaccine at six, 10, and 14 weeks (15, 16). Additionally, the BCG vaccine is administered at birth, Vitamin A at six months, yellow fever at nine months, and HPV vaccine to females aged nine years (12). The COVID-19 vaccine is provided to everyone aged 18 and older, including pregnant and lactating women (16, 17, 18).

At the federal level, government health agencies and organizations plan, coordinate, and implement immunization programs (20). This involves formulating policies and guidelines and managing the procurement and distribution of vaccines (21). The National Primary Health Care Development Agency assumes a central role in coordinating nationwide immunization efforts, ensuring the equitable distribution of vaccines throughout the healthcare system (22). Tertiary healthcare is provided by facilities such as Federal Medical Centers and University Teaching Hospitals, offering specialized medical services, advanced diagnostics, and medical education (23). While immunizations may not be the primary focus at this level, immunization clinics exist where both adults and children receive vaccines (24).

The secondary healthcare level encompasses general and teaching hospitals that offer specialized care, diagnostic services, and referrals, acting as a bridge between primary and tertiary healthcare (25). These facilities, including general hospitals and district health centers, contribute to the delivery of vaccination services, providing a broader range of healthcare services compared to primary healthcare centers (25).

The primary health care level serves as the foundational and initial point of contact for patients where essential healthcare services, including immunization, maternal and child health, and health education, are provided (26). Local government health authorities oversee the supply of vaccines to service delivery points, with central cold rooms in each locality receiving and distributing vaccines to healthcare centers and hospitals across all levels (26). Primary healthcare facilities also act as the primary point for individuals seeking immunization services, administering routine immunizations like those in the expanded program on immunization (26, 27). Community-based initiatives are critical at this level, with community health workers and volunteers conducting awareness campaigns, mobilizing communities, and facilitating vaccine administration during campaigns (26)

Disease prevention through vaccination and immunization

Nigeria has a history of immunization programs that have been pivotal in controlling vaccine-preventable diseases, including routine immunization and supplementary immunization activities such as those for polio and other vaccines (28). These initiatives have involved various entry points, including routine clinics, house-to-house visits, and school-based immunization campaigns (28, 29). Routine immunization programs in Nigeria have historically been focused on children below 1 year, with vaccination coverage rates for diseases being consistently low (28, 29). According to the 2018 Nigeria Demographic Health Survey report, the rates of complete, incomplete, and non-immunization of childhood vaccinations in 2013 were 25%, 54%, and 21%, respectively (30). By 2018, these figures had shifted to 31%, 49.9%, and 19% (30). While these trends show some progress, they still fall significantly short of the sustainable development goal 3 target, which aims for over 90% coverage of all basic vaccinations among children aged 12–23 months (31).The coverage of DTP-3 (62%), BCG (74%), Hib-3 (62%), Hepatitis B vaccine (62%), Measles-containing vaccine (60%), Polio-3 (38%), PCV (62%) and Rotavirus vaccine (60%) have remained stagnant between 2020 and 2022 (Table 1) (31).

Research conducted in African countries and other parts of the world has revealed a range of factors that affect childhood immunization rates. These factors include socio-demographic elements such as the mother's age, educational level of both parents, marital status, occupation, family income, wealth status, and ethnicity (32, 33, 34). A case-control study conducted in Ethiopia, involving 548 children aged 12 to 23 months, identified maternal age as a significant factor in childhood immunization uptake (35). The study found that mothers over the age of 19 were nearly 10 times more likely to have their children fully immunized compared to mothers under 19 years old (35). This disparity may be attributed to the greater knowledge and awareness that older mothers have regarding the importance of immunization, along with an understanding of the potential negative consequences of not vaccinating their children.

Parents with low education and low socioeconomic status demonstrate higher levels of uncertainty towards vaccine uptake (36). In Mozambique, religious beliefs were found to significantly impact childhood immunization rates. Mothers who believed that immunization was contrary to their religious practices were less likely to fully immunize their children compared to those who did not hold such beliefs (37, 38).

In Nigeria, cultural beliefs opposing immunization have been identified as significant barriers to childhood immunization uptake (39, 40). These beliefs are often fueled by the spread of misinformation through family and religious networks, such as the false notion that vaccines contain anti-fertility drugs that could harm the reproductive health of females (40). Given the high respect and trust placed in traditional and religious leaders, who are seen as guardians of cultural values, their active participation in immunization campaigns could significantly boost community acceptance and increase immunization rates.

In Tanzania, the quality of the relationship between vaccine providers and clients was identified as a key factor influencing childhood immunization rates among 380 participants (41). Mothers who had a positive view of the interaction with vaccine providers were twice as likely to fully immunize their children compared to those who had a negative perception of this relationship (41).

In Nigeria, the lack of vaccine availability when needed has been identified as a significant reason for lapses in childhood immunization (40, 42). Many mothers, after spending considerable resources to access healthcare multiple times, often found that vaccines were unavailable (40, 42). This inconsistency led to frustration and discouragement, causing some mothers to abandon their children's immunization schedules before completion (42). Obstetric factors, including the frequency of antenatal and postnatal care visits, the interval between births, and the location of childbirth, also influence immunization uptake (40, 42).

In Nigeria, the current vaccination focal points, primarily housed within primary healthcare centers, form the bedrock of routine childhood immunization initiatives (43). These centers deliver scheduled vaccinations and orchestrate supplementary immunization activities like national immunization days, specifically targeting children across diverse settings such as homes, schools, and communities to fortify vaccination coverage (44). Moreover, outreach programs are pivotal by extending immunization services to underserved regions, ensuring equitable vaccine access beyond traditional healthcare facilities (44). This strategy has proven effective for childhood immunizations in Hoima district, Uganda, helping to immunize 87.4% children aged 10-23 months from a cluster survey of 476 households, largely owing to the convenience of outreach sessions, and community mobilization prior to outreach schedule (45). Yet, while this approach has succeeded for childhood vaccinations, its feasibility for large-scale adult vaccination campaigns, appears limited.

Opportunities for Nigeria: Learning from vaccination entry points in other countries

Pharmacy clinics have served as vaccination entry points in many countries, benefiting from frequent interactions with the adult population targeted for vaccination (42). In countries such as Australia and Canada, the laws and regulations governing which vaccines pharmacists can administer vary by region. For example, in Queensland, Australia, pharmacists are authorized to vaccinate individuals aged 16 and over against influenza, dTpa, and Measles Mumps Rubella (MMR) (46). In Australia, pharmacists can administer influenza and meningococcal vaccines to individuals aged 10 and over (47). Pharmacists administer vaccinations in 9 of the 13 provinces and territories in Canada (48). Ontario has recently expanded the scope of pharmacist vaccination authorization to include 13 vaccine-preventable diseases, in addition to the influenza vaccine (48). In the USA, the percentage of influenza vaccinations administered in community pharmacies rose from 18% in 2011 to 25% in 2017 (49). Patients primarily chose community pharmacies for vaccination services due to their convenience, such as the absence of appointment requirements or additional fees (49). A study also highlighted the pharmacist's crucial role in improving vaccination rates during a pandemic, showing a significant increase in vaccination capacity and a faster achievement of national vaccination coverage (49). Another study that assessed the collaboration between community pharmacies and public health programs in pandemic preparedness found that over 85% of public health programs included pharmacies in their vaccine distribution plans, and 45% actively recruited pharmacists to serve as vaccine providers (50).

In the United Kingdom, the potential to improve national vaccination rates through pharmacists in community pharmacies was recognized due to the convenience and easy access these pharmacies provide (51, 52). The accessibility and extended operating hours of pharmacies align with the convenience preferences of adults, contributing to the success of this approach (52). Findings from a community-based qualitative study in Nigeria reported pharmacy-based immunization as an untapped resource that could be leveraged to increase the typhoid conjugate vaccine in Nigeria vaccine coverage in Nigeria (53). There is no documented explicit restriction on Nigerian pharmacists administering vaccines, though there is no established policy supporting it and most vaccination programs are yet to adopt using pharmacists to administer vaccines to the public (42).

Tertiary institutions in Nigeria, especially during active academic sessions, house a substantial adult population engaged in diverse roles such as teaching, administration, support, and various businesses that cater to the university community (54). Many of these institutions provide on-campus accommodations, essentially functioning as complete communities with residents spanning all age groups (54). Staff clinics and hospitals within these institutions offer healthcare services to staff members and the broader university community, presenting an opportune setting for adult vaccinations.

Employing educational institutions as vaccination centers, inspired by successful models in the United States, has proven effective (55, 56). By targeting students, teachers, and staff at convenient centralized locations, vaccination outreach opportunities are maximized. Collaborating with these institutions to integrate vaccine information into wellness packages and occupational health programs can yield significant benefits due to their controlled environments (54, 55). Similarly, establishing on-site vaccination clinics in workplaces, akin to educational institutions, is advantageous (55). This approach

enhances accessibility for working adults and showcases corporate social responsibility. Government partnerships with workplaces having established health clinics can streamline the process, though it may incur additional costs for some employers. Effective leadership is essential for coordinating diverse employers, as smaller establishments might be disadvantaged. Supplementing vaccination access with alternative sites can mitigate this issue, ensuring equitable vaccine distribution.

Creating vaccination centers in community halls and easily accessible venues emerges as a convenient strategy for engaging adults. Drawing inspiration from initiatives in India and South Africa, implementing vaccination centers in community hubs fosters community engagement and increases accessibility (55, 56). This decentralized approach brings vaccination services closer to individuals in their residential and occupational spaces, eliminating potential barriers or stigma associated with seeking care in a hospital setting (57). While this community-centric approach aligns with cultural considerations, it may necessitate additional resources for setup and maintenance, introducing logistical challenges in ensuring the seamless flow of services in a decentralized environment.

Conclusion

To enhance pandemic preparedness, leveraging established platforms can significantly increase vaccination coverage and community acceptance. Immunization clinics, which already play a crucial role in maternal health, can be optimized to include pandemic-related vaccinations for mothers, ensuring they are protected and informed. Targeting men in car parks and community halls taps into gathering points where health interventions are less frequent but could have a substantial impact, especially in engaging this often-underrepresented demographic. Advocacy to religious and traditional rulers is essential, as their influence can drive widespread acceptance and mobilization within communities, making them key allies in vaccination efforts.

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Authors' contributions

OSI and AAA conceptualized the research. AAA, OSI, and GI developed the manuscript. AAA and OSI reviewed the manuscript after receiving peer-review reports. All authors reviewed the manuscript for critical intellectual content and approved the final version of the manuscript.

Competing interest

None declared.

Data Accessibility statement

All data are publicly available.

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