

Vaccine Hesitancy and Immunization Inequity in Nigeria: Public Health Determinants, Misinformation Dynamics, and Health System Strategies for Improved Uptake

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Abstract

Vaccine hesitancy and immunization inequity remain major public health challenges in Nigeria, where limited access, uneven service delivery, and weak confidence in vaccines continue to constrain progress toward universal immunization coverage. This narrative review examined the public health determinants of vaccine hesitancy, the role of misinformation in shaping vaccine decisions, and the health system strategies that may improve equitable uptake. The literature search period spanned 2008 to 2026, drawing on evidence from biomedical, public health, behavioral, and policy studies to capture both routine childhood immunization and vaccine acceptance in the COVID 19 era. The reviewed evidence shows that vaccine hesitancy in Nigeria is not driven by a single factor, but by a combination of structural and social influences. Low coverage is closely linked to poverty, rural residence, distance to health facilities, insecurity, weak primary care, poor antenatal contact, and geographical inequities that leave many children zero dose or under immunized. Hesitancy is also shaped by low trust in health authorities, fear of side effects, doubts about vaccine effectiveness, religious interpretation, gendered decision making, and limited health literacy. In parallel, misinformation has become a powerful driver of resistance, especially through social media and video platforms where conspiracy narratives, fear-based content, and doubts about government intentions amplify uncertainty and reduce confidence. The review also indicates that uptake improves when interventions go beyond information sharing and address the realities of access and trust. Community engagement, trusted local communication, mobile reminders, stronger primary

health care delivery, women centered empowerment strategies, and culturally responsive outreach were repeatedly associated with better uptake and stronger acceptance. Overall, the evidence suggests that reducing vaccine hesitancy in Nigeria requires an integrated response that combines reliable service delivery, misinformation control, community partnership, and equity focused policy action. Such an approach is essential for improving immunization coverage, reducing the burden of zero dose children, and advancing the country's broader public health goals.

Keywords: *Vaccine hesitancy; immunization inequity; Nigeria; misinformation; routine immunization; vaccine uptake; public health; health system strengthening; zero dose children*

Section 1. Introduction

Immunization remains one of the most cost effective public health interventions because it prevents avoidable illness, disability, and death, yet the newest global evidence shows that routine childhood vaccination has not advanced evenly across countries, with updated estimates from 204 countries indicating that coverage gains have slowed and that zero dose gaps still persist after the COVID 19 period (GBD 2023 Vaccine Coverage Collaborators, 2025). In Nigeria, the challenge is more severe: a recent scoping review estimated more than 2.1 million zero dose children and showed that the main barriers are not limited to personal choice, but also include distance to services, insecurity, weak primary care, cost pressures, and uneven delivery across regions (Mohammed *et al.*, 2024). National trend analyses also suggest that while full immunization coverage has improved across time, it still falls short of equitable reach, and newer ecological evidence points to widening differences in DTP coverage and zero dose prevalence across Nigeria's six geopolitical zones, confirming that place of residence continues to shape vaccine access in a major way (Olufadewa *et al.*, 2024; Umar *et al.*, 2025).

Vaccine hesitancy adds another layer to this access problem. A systematic review of adults in Nigeria found that acceptance remains uneven and is shaped by safety concerns, low confidence, and distrust of the vaccine process, showing that availability alone does not guarantee uptake (Babatope *et al.*, 2023). Digital media has intensified that fragility: analysis of Nigerian YouTube videos found that conspiracy themes, religious framing, and doubts about government intentions were central to antivaccine narratives, while a Nigeria focused brief report likewise linked hesitancy to worries about vaccine efficacy, fear of side effects, disbelief in disease severity, and mistrust of government (Sato, 2022; Sadiq *et al.*, 2023). A 2025 scoping review of Nigerian access studies further shows that these barriers are not only psychological but structural, because location, gender, misinformation, poor access, and limited trust in institutions repeatedly appear across the evidence base as drivers of low uptake (Ifeanyi *et al.*, 2025). Taken together, the literature suggests that Nigeria's immunization gap is being shaped by the interaction of weak service delivery, social mistrust, digital misinformation, and unequal access, with the burden falling hardest on communities already underserved by the health system (Mohammed *et al.*, 2024; Umar *et al.*, 2025). Against this backdrop, this review examines the public health determinants of vaccine hesitancy, the pathways through which misinformation shapes vaccine decisions, and the health system strategies that can improve equitable uptake and strengthen Nigeria's Universal Health Coverage goals.

2. Methods

2.1 Review Approach and Evidence Synthesis

This review adopted a comprehensive narrative approach to examine vaccine hesitancy and immunization inequity in Nigeria from both historical and contemporary perspectives. The approach integrated evidence from epidemiological, behavioral, sociocultural, and health-system research to reflect the multiple and interconnected factors that influence vaccination uptake in real-world settings (Bangura *et al.*, 2020; Mahachi *et al.*, 2022; Adesina *et al.*, 2023).

Literature published between 2008 and 2026 was considered, with greater emphasis placed on studies published from 2020 onward because the COVID-19 pandemic brought renewed attention to vaccine confidence, misinformation, service disruptions, and inequalities in access. Evidence was drawn from peer-reviewed studies and relevant health and immunization reports addressing vaccine hesitancy, vaccination uptake, routine immunization, zero-dose children, misinformation, vaccine confidence, social determinants, and barriers to equitable access (Bangura *et al.*, 2020; Mahachi *et al.*, 2022; Adesina *et al.*, 2023).

The evidence was interpreted thematically rather than quantitatively because the available literature varied considerably in study design, population, setting, and outcome measures. Findings were organized around five interconnected areas: the epidemiology of vaccine hesitancy and immunization gaps; sociocultural and behavioral influences; misinformation and digital media; structural and health-system barriers; and strategies for improving vaccine confidence and immunization coverage. This thematic approach recognizes that vaccine uptake is rarely determined by a single factor but instead reflects the interaction of individual beliefs, social conditions, information environments, and the accessibility and reliability of health services (Bangura *et al.*, 2020; Mahachi *et al.*, 2022; Adesina *et al.*, 2023).

Importantly, the review distinguished vaccine hesitancy from broader immunization inequity. While hesitancy involves uncertainty, delay, or reluctance to accept vaccination, inequity also includes situations in which individuals are willing to vaccinate but face geographic, financial, informational, or health-system barriers. This distinction provides a more balanced understanding of Nigeria's immunization challenges and helps explain why improving coverage requires attention to both demand-side and supply-side determinants (Bangura *et al.*, 2020; Mahachi *et al.*, 2022; Adesina *et al.*, 2023).

Table 1 shows the main databases and evidence sources used to gather studies for the review. It also explains the type of literature each source contributed and why each source mattered to the topic.

Table 1. Databases and Search Sources Used in the Review

Database/Source	Type of literature retrieved	Relevance to review	Citation(s)
PubMed/MEDLINE	Peer reviewed biomedical studies	Vaccine uptake, epidemiology, and immunization inequity	(Bangura <i>et al.</i> , 2020; Mahachi <i>et al.</i> , 2022; Adesina <i>et al.</i> , 2023)
Scopus	Multidisciplinary research	Public health, behavioral, and policy studies	(Bangura <i>et al.</i> , 2020; Mahachi <i>et al.</i> , 2022; Adesina <i>et al.</i> , 2023)
Web of Science	Citation indexed articles	Global vaccine hesitancy and immunization trends	(Bangura <i>et al.</i> , 2020; Mahachi <i>et al.</i> , 2022; Adesina <i>et al.</i> , 2023)

Database/Source	Type of literature retrieved	Relevance to review	Citation(s)
AJOL	African regional literature	Nigeria specific and West African evidence	(Bangura <i>et al.</i> , 2020; Mahachi <i>et al.</i> , 2022; Adesina <i>et al.</i> , 2023)
WHO related evidence repositories	Global health syntheses	Immunization policy and coverage context	(Bangura <i>et al.</i> , 2020; Mahachi <i>et al.</i> , 2022; Adesina <i>et al.</i> , 2023)
UNICEF and Nigerian health reports	Child health statistics	Coverage gaps and inequity mapping	(Bangura <i>et al.</i> , 2020; Mahachi <i>et al.</i> , 2022; Adesina <i>et al.</i> , 2023)

Database names are listed exactly as used in the review source list, with literature type and relevance kept brief for clarity. Abbreviations: MEDLINE, Medical Literature Analysis and Retrieval System Online; AJOL, African Journals Online; WHO, World Health Organization; UNICEF, United Nations Children's Fund.

2.2 Epidemiology of Vaccine Hesitancy and Immunization Coverage in Nigeria

Nigeria's immunization picture is defined by a persistent gap between national ambition and real world coverage. Recent global estimates place Nigeria among the countries carrying a large share of the world's zero dose burden, and Nigerian focused analyses show that basic vaccination coverage remains far below target, especially among children living in poor households, rural settlements, and disadvantaged regions (Mohammed *et al.*, 2024; Olufadewa *et al.*, 2024; GBD 2023 Vaccine Coverage Collaborators, 2025). A recent study of rural mothers found that age, geographic region, educational attainment, wealth, and the number of antenatal care visits were major determinants of whether children completed immunization, which means that vaccine uptake is tied not only to vaccine availability but also to maternal life course, household resources, and contact with the health system (Adesina *et al.*, 2023). In parallel, a systematic review and equity analysis showed that the strongest predictors of low coverage were household wealth, religion, ethnicity, region, place of residence, maternal education, antenatal care, and place of delivery, while the pooled estimate for basic vaccination among Nigerian children aged 12 to 23 months was only 31 percent, with 19 percent classified as zero dose children (Williams *et al.*, 2024). These findings are important because they show that immunization inequity in Nigeria is patterned and predictable rather than random, and that the same social gradients keep reappearing across datasets and study designs (Adesina *et al.*, 2023; Williams *et al.*, 2024). The current evidence also suggests that Nigeria's national coverage trend should be read as uneven improvement rather than steady progress. The 2025 ecological trend analysis showed widening geographical inequities in DTP coverage, dropout, and zero dose prevalence across the six geopolitical zones between 2018 and 2024, confirming that recent gains have not been equally distributed (Umar *et al.*, 2025). This matter because DTP and related routine vaccines are often used as core indicators of service reach, and variation in these indicators usually reflects deeper differences in primary healthcare access, caregiver mobility, and trust in local services. When viewed alongside the systematic review evidence, the pattern becomes clear: children in the poorest households, those born outside facilities, and those living in underserved regions are the most likely to be missed, while older and better educated mothers are more likely to complete schedules for their children (Adesina *et al.*, 2023; Williams *et al.*, 2024). The epidemiology therefore points to a health system that is reaching some populations

consistently, but not yet reaching the populations that carry the highest risk of being left behind (Adesina *et al.*, 2023; Williams *et al.*, 2024).

From a comparative perspective, the Nigerian pattern aligns with wider low and middle income country evidence showing that immunization inequity is shaped by wealth, maternal education, geographic access, birth setting, and continuity of contact with antenatal and delivery services (Bangura *et al.*, 2020; Adesina *et al.*, 2023; Williams *et al.*, 2024). The Nigeria specific value of this literature is that it reveals how these global mechanisms become sharper in contexts where insecurity, distance, poverty, and uneven state capacity are present together. In other words, the epidemiology is not just about coverage percentages. It is about who is excluded, where exclusion is concentrated, and which parts of the health system repeatedly fail to convert program intent into completed vaccination (Mahachi *et al.*, 2022; Adesina *et al.*, 2023; Williams *et al.*, 2024). This interpretation also helps explain why zero dose children remain such a visible marker of inequity in Nigeria: they are the outcome of cumulative disadvantage across household, community, and service delivery levels (Mahachi *et al.*, 2022; Adesina *et al.*, 2023; Williams *et al.*, 2024).

Table 2 summarizes the overall direction of major vaccination coverage indicators in Nigeria. It highlights where progress is visible and where persistent barriers still keep coverage uneven.

Table 2. Trends in Major Vaccine Coverage Indicators in Nigeria

Vaccine/Indicator	Coverage trend	Major challenges	Citation(s)
Basic childhood vaccination	Low and uneven	Poverty, maternal education gaps, poor ANC contact	(Adesina <i>et al.</i> , 2023; Williams <i>et al.</i> , 2024)
DTP coverage	Improving but geographically unequal	Dropout, access gaps, weak local delivery	(Olufadewa <i>et al.</i> , 2024; Umar <i>et al.</i> , 2025)
Polio vaccine completion	Better than some indicators but still uneven	Regional inequity, missed children, service gaps	(Olufadewa <i>et al.</i> , 2024; Umar <i>et al.</i> , 2025)
Measles related coverage	Inconsistent and below target	Rural disadvantage, low card retention, poor outreach	(Adesina <i>et al.</i> , 2023; Williams <i>et al.</i> , 2024)

The table focuses on broad vaccination trends and the main obstacles behind those trends, rather than detailed statistics. Abbreviations: DTP, diphtheria tetanus pertussis; ANC, antenatal care.

2.3 Sociocultural and Behavioral Determinants of Vaccine Hesitancy

The sociocultural literature in Nigeria shows that vaccine hesitancy is rarely the product of a single belief. It usually develops from a cluster of influences that includes low confidence in health authorities, fear of side effects, doubts about vaccine effectiveness, religious interpretation, social pressure, and a general sense that vaccination is not urgent or necessary (Fagbule *et al.*, 2020; Babatope *et al.*, 2023; Yusuf *et al.*, 2024). In the Nigerian systematic review of adult hesitancy, the most common barriers were socio demographic factors, perceived risk, safety and efficacy concerns, political mistrust, conspiracy theories, and cost, while more than half of the reviewed studies reported acceptance rates below 60 percent (Babatope *et al.*, 2023). That finding is important because it shows that hesitancy is not simply a refusal to believe in science; it is often a response to uncertainty, competing information, and distrust in the

institutions expected to deliver protection (Babatope *et al.*, 2023).

Among adolescents and families, the same themes appear in a different form. The CHANCE study on HPV awareness among senior secondary school students found that knowledge of HPV and HPV vaccine was very poor, and that religion, gender, school composition, family background, and state of residence were associated with knowledge levels (Fagbule *et al.*, 2020). The study also showed that media and internet were the dominant information sources, but that students who were exposed to such channels often lacked adequate understanding, suggesting that access to information does not automatically translate into accurate knowledge (Fagbule *et al.*, 2020). This is especially relevant in Nigeria because it means that educational exposure, although helpful, can be undermined when the content being encountered is incomplete, misleading, or framed in emotionally persuasive but scientifically weak ways. In practical terms, the study supports the idea that health literacy is not only about formal schooling. It also depends on whether people can judge the credibility of what they hear and share (Fagbule *et al.*, 2020).

The HPV hesitancy study among parents and caregivers in Northern Nigeria deepens this picture by showing how parental decision making is shaped by awareness, trust, gender roles, and perceived need. The study found substantial hesitancy, low awareness of HPV, and strong links between low knowledge and reluctance to vaccinate children, while also pointing to the importance of cultural sensitivity and community engagement in any successful intervention (Yusuf *et al.*, 2024). Read together, these studies suggest that Nigerian hesitancy is influenced by more than just biomedical concerns; it is embedded in social identity, family structure, gendered authority, and local interpretations of risk (Fagbule *et al.*, 2020; Babatope *et al.*, 2023; Yusuf *et al.*, 2024). The implication is that public health messages must do more than repeat vaccine facts. They must speak to how families make decisions, who has authority in the household, which community voices are trusted, and how fear can be replaced with meaningful reassurance (Fagbule *et al.*, 2020; Babatope *et al.*, 2023; Yusuf *et al.*, 2024).

Psychologically, the Nigerian evidence is consistent with broader models of vaccine acceptance that emphasize confidence, complacency, and convenience. Confidence refers to trust in vaccines, the system that delivers them, and the professionals who recommend them. Complacency reflects the belief that the disease is not serious or not personally relevant. Convenience captures the practical ease of getting vaccinated. The adult hesitancy review shows that these three forces are all visible in Nigeria, because people who doubt safety, underestimate risk, or face cost barriers are less likely to vaccinate (Fagbule *et al.*, 2020; Babatope *et al.*, 2023; Yusuf *et al.*, 2024). The HPV studies reinforce the same logic by showing that poor knowledge, social role expectations, and information quality shape willingness to accept vaccination (Fagbule *et al.*, 2020; Babatope *et al.*, 2023; Yusuf *et al.*, 2024). Taken together, the evidence suggests that hesitancy in Nigeria is best understood as a behavioral and social phenomenon rather than a simple information deficit (Fagbule *et al.*, 2020; Babatope *et al.*, 2023; Yusuf *et al.*, 2024).

Table 3 presents the main sociocultural drivers of vaccine hesitancy and how they influence decision making. It also shows the public health effect of each determinant on vaccine uptake.

Table 3. Sociocultural Drivers of Vaccine Hesitancy in Nigeria

Determinant	Mechanism of influence	Public health impact	Citation(s)
Religious beliefs	Shapes trust and legitimacy judgments	Delayed uptake or refusal	(Fagbule <i>et al.</i> , 2020; Babatope <i>et al.</i> , 2023; Yusuf <i>et al.</i> , 2024)
Low literacy and poor health literacy	Weak understanding of vaccine benefits and safety	Increased misinformation vulnerability	(Fagbule <i>et al.</i> , 2020; Babatope <i>et al.</i> , 2023; Yusuf <i>et al.</i> , 2024)
Poverty	Limits transport, service access, and follow through	Missed vaccination opportunities	(Adesina <i>et al.</i> , 2023; Babatope <i>et al.</i> , 2023; Williams <i>et al.</i> , 2024)
Fear of adverse effects	Raises perceived personal risk	Reduced coverage and delayed decisions	(Babatope <i>et al.</i> , 2023; Ibekwe <i>et al.</i> , 2024; Yusuf <i>et al.</i> , 2024)

This table focuses on the social and behavioral forces that shape acceptance, delay, or refusal of vaccines. It shows how beliefs, literacy, poverty, and fear translate into lower uptake.

2.4 Misinformation Dynamics and Digital Media Influence

The digital information environment has become one of the strongest accelerants of vaccine doubt in Nigeria. The Nigerian YouTube content analysis found that anti vaccine material frequently relied on conspiracy framing, fear-based storytelling, and distrustful claims about vaccine safety and legitimacy, which can be especially persuasive because video content combines visual authority with emotionally charged messaging (Ekezie & Bosah, 2021; Sadiq *et al.*, 2023). In parallel, the study on demographic representation of COVID 19 social media and information engagement showed that Nigerians across demographic groups relied heavily on social media for pandemic information, and it explicitly argued that more meaningful social media engagement is required to reduce harmful misinformation, particularly around vaccination (Ekezie & Bosah, 2021). These findings matter because they show that misinformation is not a marginal issue. It is built into the routine channels through which many people now consume health information (Ekezie & Bosah, 2021; Sadiq *et al.*, 2023).

The same pattern is visible in post pandemic public perception work. The study of Nigerians' attitudes and perceptions toward vaccine acceptance during and after the COVID 19 pandemic reported that misinformation on social media, doubts about vaccine safety and efficacy, and falling trust in government were central features of the vaccine environment during the pandemic period, although the authors also observed signs of recovery in vaccine acceptance after the most intense phase of the crisis (Ibekwe *et al.*, 2024). This is an important nuance because it suggests that misinformation does not always produce permanent distrust; rather, it can create a wave of suspicion that later softens when trusted communication, lived experience, and social normalization begin to rebuild confidence. Even so, the damage can last long enough to depress uptake at the exact time when rapid vaccine adoption is most needed (Ibekwe *et al.*, 2024).

Taken together, these studies show that online misinformation works through several linked pathways. First, it increases emotional salience by making rare side effects or unverified claims feel more immediate than the disease itself. Second, it amplifies uncertainty by presenting contradictions as proof that experts are hiding the truth. Third, it spreads social proof by making fearful claims appear widely shared and therefore credible. Fourth, it can widen distrust in

institutions by connecting vaccination to politics, coercion, or hidden motives (Ekezie & Bosah, 2021; Sato, 2022; Wonodi *et al.*, 2022; Sadiq *et al.*, 2023; Ibekwe *et al.*, 2024). These processes are especially powerful when digital health literacy is low, when people rely on family and peer networks for interpretation, and when official communication is delayed or inconsistent (Ekezie & Bosah, 2021; Sato, 2022; Wonodi *et al.*, 2022; Sadiq *et al.*, 2023; Ibekwe *et al.*, 2024). The Nigerian evidence does not mean that every user is equally vulnerable, but it does show that the current information ecosystem can turn uncertainty into resistance much faster than traditional health education can correct it (Ekezie & Bosah, 2021; Sato, 2022; Wonodi *et al.*, 2022; Sadiq *et al.*, 2023; Ibekwe *et al.*, 2024).

The implication for public health practice is straightforward. Counter misinformation work has to be proactive, not only reactive. It should be delivered in plain language, through trusted messengers, and in formats that compete successfully with the speed and style of online rumor. The evidence from Nigeria suggests that social media itself is not the problem; rather, the problem is the imbalance between high volume misleading content and the relatively slower spread of reliable, culturally resonant information (Ekezie & Bosah, 2021; Sato, 2022; Wonodi *et al.*, 2022; Sadiq *et al.*, 2023; Ibekwe *et al.*, 2024). That is why digital engagement, media literacy, and community-based correction strategies have to be built into immunization communication rather than treated as optional extras (Ekezie & Bosah, 2021; Sato, 2022; Wonodi *et al.*, 2022; Sadiq *et al.*, 2023; Ibekwe *et al.*, 2024).

Table 4 outlines the most common misinformation narratives surrounding vaccines in Nigeria. It links each false claim to its likely public health consequence.

Table 4. Common Vaccine Misinformation Narratives and Their Public Health Consequences

Misinformation theme	Associated claim	Public health consequence	Citation(s)
Safety misinformation	Vaccines are unsafe	Hesitancy and refusal	(Ekezie & Bosah, 2021; Sato, 2022; Wonodi <i>et al.</i> , 2022; Sadiq <i>et al.</i> , 2023; Ibekwe <i>et al.</i> , 2024)
Conspiracy framing	Vaccines hide a political or social agenda	Public distrust and delay	(Ekezie & Bosah, 2021; Sato, 2022; Wonodi <i>et al.</i> , 2022; Sadiq <i>et al.</i> , 2023; Ibekwe <i>et al.</i> , 2024)
Religious misrepresentation	Vaccination conflicts with faith	Community resistance	(Ekezie & Bosah, 2021; Sato, 2022; Wonodi <i>et al.</i> , 2022; Sadiq <i>et al.</i> , 2023; Ibekwe <i>et al.</i> , 2024)
Efficacy doubts	Vaccines do not work or are unnecessary	Lower perceived value of vaccination	(Sato, 2022; Sadiq <i>et al.</i> , 2023; Ibekwe <i>et al.</i> , 2024)

The table highlights the most repeated misinformation themes and the effect each one has on vaccine confidence. It is centered on the content of the message, the false claim being made, and the public health harm that follows.

2.5 Health System Challenges and Policy Responses

The Nigerian literature makes it clear that vaccine hesitancy cannot be separated from system weakness. The scoping review of routine immunization in Nigeria showed that the major barriers extend across regional inequities, access problems, poor proximity to services, and uneven delivery of routine vaccination, while also emphasizing that implementation evidence is still thin relative to the scale of the problem (Mohammed *et al.*, 2024). In practical terms, this means that a mother may be willing to vaccinate her child and still fail to do so because the clinic is distant, the service is irregular, the session is poorly organized, or the family cannot afford transport and time costs. The review also highlights that sustainable improvement requires more than campaigns alone; it requires routine delivery systems that can repeatedly reach children before they become zero dose or remain under immunized (Mohammed *et al.*, 2024).

The national household survey of COVID 19 vaccine uptake among Nigerians adds an important policy lens. It found that uptake was higher among older adults, the insured, the more educated, urban residents, and those who received information from health workers, government channels, and mass media (Ojo *et al.*, 2023). That pattern is highly relevant for immunization policy beyond COVID 19 because it shows that trustable communication channels and financial protection matter for vaccine uptake. It also suggests that health system responses must be designed around who is being missed, not just around national averages. People in the North West and those without formal education were less likely to be vaccinated, which indicates that geography, information access, and system reach are all part of the same problem (Ojo *et al.*, 2023). A more recent human centered design study on women's empowerment and immunization uptake provides a useful route forward. The formative research identified four interconnected barriers to routine immunization: vaccine hesitancy linked to safety concerns and inconsistent messaging, gender-based decision-making constraints, financial barriers related to transport and medical costs, and unequal access to healthcare caused by geographic disparities (Aina *et al.*, 2025). The intervention response was redesigned to include peer support groups, financial empowerment, and culturally tailored community education, showing that effective policy response should not rely on information alone. It should also address the social and economic conditions that shape whether a caregiver can act on that information (Aina *et al.*, 2025). This is particularly important in Nigeria, where women often carry the practical responsibility for childhood vaccination but may not control transport, money, or household permission (Aina *et al.*, 2025). Taken together, these studies support a policy direction that combines stronger primary healthcare delivery with better communication, community trust building, and practical access support. Inference from the evidence suggests that mobile outreach, school linked delivery, trusted community health workers, and digital tracking can be useful only when they are attached to a reliable local service platform and accompanied by consistent messaging. The same evidence also implies that gender sensitive design is not a side issue. It is central to immunization improvement because it affects both who decides and who can physically reach services (Ojo *et al.*, 2023; Mohammed *et al.*, 2024; Aina *et al.*, 2025). For Nigeria, the most credible path forward is therefore a blended one: improve routine service reliability, reduce financial and geographic barriers, use trusted channels for information, and design programs around the real lives of caregivers rather than around idealized assumptions about access (Ojo *et al.*, 2023; Mohammed *et al.*, 2024; Aina *et al.*, 2025).

Table 5 captures the major health system barriers that weaken vaccine uptake and the responses needed to address them. It shows how service access, trust, money, and household decision making shape immunization outcomes.

Table 5. Health System Barriers and Strategic Interventions for Improving Vaccine Uptake

Health system challenge	Impact on immunization	Strategic response	Citation(s)
Geographic and service access gaps	Missed populations and zero dose children	Mobile outreach, closer service delivery, stronger primary care	(Ojo <i>et al.</i> , 2023; Mohammed <i>et al.</i> , 2024; Aina <i>et al.</i> , 2025)
Weak trust and inconsistent communication	Lower acceptance and delayed decisions	Trusted health worker messaging and community education	(Babatope <i>et al.</i> , 2023; Ojo <i>et al.</i> , 2023; Aina <i>et al.</i> , 2025)
Financial constraints	Deferred or foregone vaccination	Transport support and economic empowerment	(Ojo <i>et al.</i> , 2023; Mohammed <i>et al.</i> , 2024; Aina <i>et al.</i> , 2025)
Gender based decision barriers	Delayed maternal action on child health	Women centered and household sensitive program design	(Aina <i>et al.</i> , 2025)

This table summarizes system level barriers and the practical responses suggested by the literature. It emphasizes that access, trust, affordability, and gender dynamics all affect whether vaccination actually happens.

3. Results and Discussion

3.1 Burden and Distribution of Vaccine Hesitancy in Nigeria

Recent evidence shows that vaccine hesitancy in Nigeria is not a uniform national problem but a deeply uneven pattern shaped by geography, social position, health service access, and local trust relations. A recent scoping review of routine immunization in Nigeria found that the country still carries a very large share of Africa's zero dose burden, with more than 2.1 million unvaccinated children, and it emphasized that the barriers are not only logistic but also regional, cultural, and structural (Mahachi *et al.*, 2022; Mohammed *et al.*, 2024). In the same direction, a broader scoping review of zero and missed dose children estimated that about 3.1 million Nigerian children fall into this category, and it showed that the most frequently reported drivers of low uptake were maternal education, access to antenatal and postnatal care, distance to services, awareness about immunization, and community level disadvantage (Mahachi *et al.*, 2022; Mohammed *et al.*, 2024). What makes this burden especially important is that the distribution is clustered. It is not simply a matter of one region having slightly lower coverage than another; rather, there are repeated pockets of disadvantage that reinforce themselves over time. The North East and North West continue to show the strongest concentration of access barriers, especially where conflict, insecurity, displacement, and weak health infrastructure interrupt service delivery and reduce the regular presence of vaccinators. The scoping review by Mohammed and colleagues showed that regional factors differ across the six geopolitical zones, but the recurring themes are low health literacy, poor access to facilities, weak trust, and community specific barriers that make one size fits all interventions ineffective (Mahachi *et al.*, 2022; Mohammed *et al.*, 2024). The zero-dose review by Mahachi and colleagues also showed that the burden is repeatedly linked to poverty, conflict, and poor access to basic health services, which means that

immunization gaps are usually signs of broader social exclusion rather than isolated parental refusal (Mahachi *et al.*, 2022). The newest trend analysis deepens this picture further. Umar and colleagues reported widening geographical inequities in diphtheria tetanus pertussis coverage and zero dose prevalence across Nigeria from 2018 to 2024, indicating that the distance between better served and poorly served zones has grown rather than narrowed (Umar *et al.*, 2025). This finding matters because it shows that the problem is not automatically corrected by time or by the mere existence of a national immunization program. Coverage can improve in selected urban or more stable settings while lagging areas fall further behind, which creates the illusion of progress even when large groups of children remain unreached. In practical terms, this means that vaccine hesitancy in Nigeria should be understood together with immunization inequity, because the people most likely to appear hesitant are often also the people who are hardest to reach, least served, or least consistently engaged by the health system (Mahachi *et al.*, 2022; Mohammed *et al.*, 2024; Umar *et al.*, 2025).

These patterns have direct implications for disease outbreaks. When a region accumulates large numbers of zero dose and missed dose children, the risk of outbreaks of measles, diphtheria, pertussis, and other vaccine preventable diseases rises sharply because herd protection becomes fragmented. The problem is especially serious in rural communities, in peri urban settlements with weak infrastructure, and in locations affected by insecurity or repeated interruptions in service delivery. What emerges from the current evidence is a simple but important public health message: Nigeria's burden of hesitancy is not only about refusal, it is also about unmet access, uneven opportunity, and long-standing structural disadvantage (Mahachi *et al.*, 2022; Umar *et al.*, 2025). Figure 1 summarizes the structural and geographical pathways described in subsection 3.1, showing how regional disparities, socioeconomic disadvantage, insecurity, and health-system and household barriers interact to reduce immunization opportunity and uptake in Nigeria. It illustrates the progression from reduced access to missed-dose and under-immunized children, zero-dose children, increased vulnerability to vaccine-preventable disease outbreaks, and persistent regional immunization inequity, consistent with the subsection's emphasis that hesitancy is not synonymous with deliberate refusal.

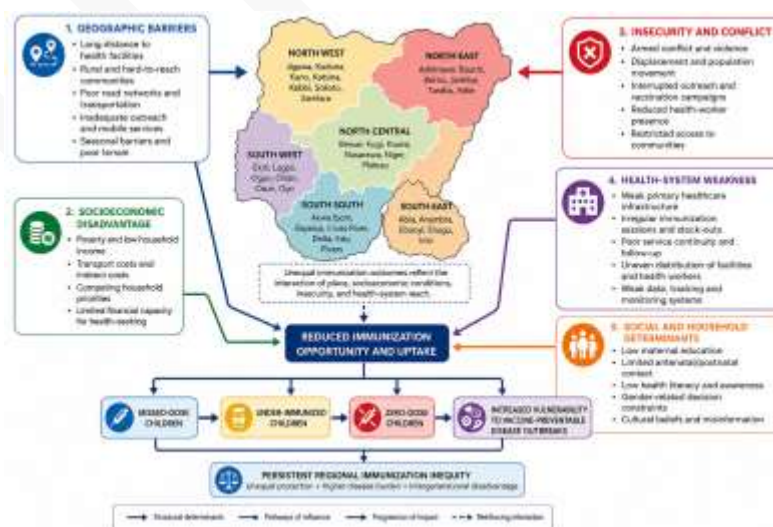


Figure 1. Structural and Geographical Pathways Driving Immunization Inequity and Zero-Dose Burden in Nigeria (Mahachi *et al.*, 2022; Mohammed *et al.*, 2024; Umar *et al.*, 2025). Conceptual pathway linking geographic barriers, socioeconomic disadvantage, insecurity and

conflict, health-system weakness, and social/household determinants to reduced immunization opportunity and uptake, followed by missed-dose, under-immunized, and zero-dose children and increased vulnerability to vaccine-preventable disease outbreaks; DTP, diphtheria-tetanus-pertussis.

Table 6 describes how vaccine hesitancy and immunization gaps are distributed across regions and settings in Nigeria. It makes clear that the burden is shaped by conflict, access problems, and weak service continuity.

Table 6. Regional Distribution of Vaccine Hesitancy and Immunization Gaps in Nigeria

Region	Dominant Challenge	Public Health Consequence	Citation(s)
North West	Religious distrust and repeated exposure to weak service confidence	Low coverage and delayed uptake	(Mahachi <i>et al.</i> , 2022; Mohammed <i>et al.</i> , 2024; Umar <i>et al.</i> , 2025)
North East	Conflict, insecurity, and interrupted outreach	Missed immunization and accumulation of zero dose children	(Mahachi <i>et al.</i> , 2022; Mohammed <i>et al.</i> , 2024; Umar <i>et al.</i> , 2025)
South South	Access barriers and uneven service contact	Inconsistent uptake across communities	(Mahachi <i>et al.</i> , 2022; Mohammed <i>et al.</i> , 2024; Umar <i>et al.</i> , 2025)
Rural communities	Poor infrastructure, distance, and weak service continuity	High zero dose burden and persistent vulnerability	(Mahachi <i>et al.</i> , 2022; Adesina <i>et al.</i> , 2023; Umar <i>et al.</i> , 2025)

The table presents regions and settings where immunization gaps are most visible, along with the main challenge in each case. It also shows the likely public health effect of those localized barriers.

3.2 Influence of Misinformation and Digital Communication on Vaccine Decisions

The role of misinformation in Nigeria has evolved from a side issue into one of the central forces shaping vaccine decisions. A landmark qualitative study of conspiracy theories and misinformation about COVID 19 in Nigeria showed that vaccine hesitancy was closely tied to narratives about hidden motives, distrust of authorities, concerns about fertility and biotechnology, and a broader suspicion that vaccines might be used for social control (Wonodi *et al.*, 2022). The study is especially important because it demonstrates that misinformation is not merely the presence of false claims. It is a whole communication environment in which fear, rumor, religious framing, political distrust, and peer reinforcement all strengthen each other (Wonodi *et al.*, 2022). A content analysis of Nigerian YouTube videos reached a similar conclusion from a digital communication perspective. Sadiq and colleagues found that although many videos carried a positive tone, a substantial share of the content was negative, and user comments showed a meaningful presence of skepticism and rejection. Their analysis also identified lack of trust in government and vaccine conspiracy themes tied mainly to religion and biotechnology as major drivers of hesitancy online (Sadiq *et al.*, 2023). That matters because YouTube, unlike a closed community conversation, creates a long-lasting public record of vaccine narratives that can be repeatedly accessed, shared, and amplified. For many people, this kind of content becomes part of the background knowledge that shapes what they believe before they ever speak to a health worker.

Trust is the bridge between information and action, and in Nigeria that bridge has often been fragile. Sato's analysis of trust in government and vaccine hesitancy in Nigeria showed that distrust in government was strongly associated with vaccine refusal and uncertainty, and that concerns about safety and side effects were also connected to weaker trust (Sato, 2022). This is a key point for understanding digital misinformation because online rumors become more persuasive when they fit existing doubts about institutions. In such a setting, a misleading post does not need to prove itself true. It only needs to sound consistent with what people already fear. Once that happens, fear-based messaging can travel quickly through social media, family networks, churches, local associations, and workplace groups.

The comparison between online and offline misinformation is also useful. Offline rumor can be powerful, but online misinformation has speed, scale, and repetition on its side. A message shared on a phone can reach someone in a village, a city, or a diaspora network within minutes. It can be copied into voice notes, screenshots, short videos, and community group chats, which makes correction difficult. This is why the most effective digital counter strategies are not simply fact dumps. They have to be short, local, trusted, and emotionally intelligent. The evidence from Nigeria suggests that communication should be framed around credibility, empathy, and social relevance, not only technical accuracy (Sato, 2022; Wonodi *et al.*, 2022; Sadiq *et al.*, 2023).

Figure 3 illustrates the pathway through which digital information exposure and vaccine misinformation in Nigeria are amplified through emotional salience, uncertainty, social proof, institutional distrust, and peer/community reinforcement, shaping psychological responses and subsequent vaccination behaviour. This framework directly complements Section 3.2, which describes how social media platforms amplify fear, conspiracy narratives, distrust, and uncertainty, ultimately influencing vaccine decisions and highlighting the need for trusted, rapid, culturally appropriate counter-communication.

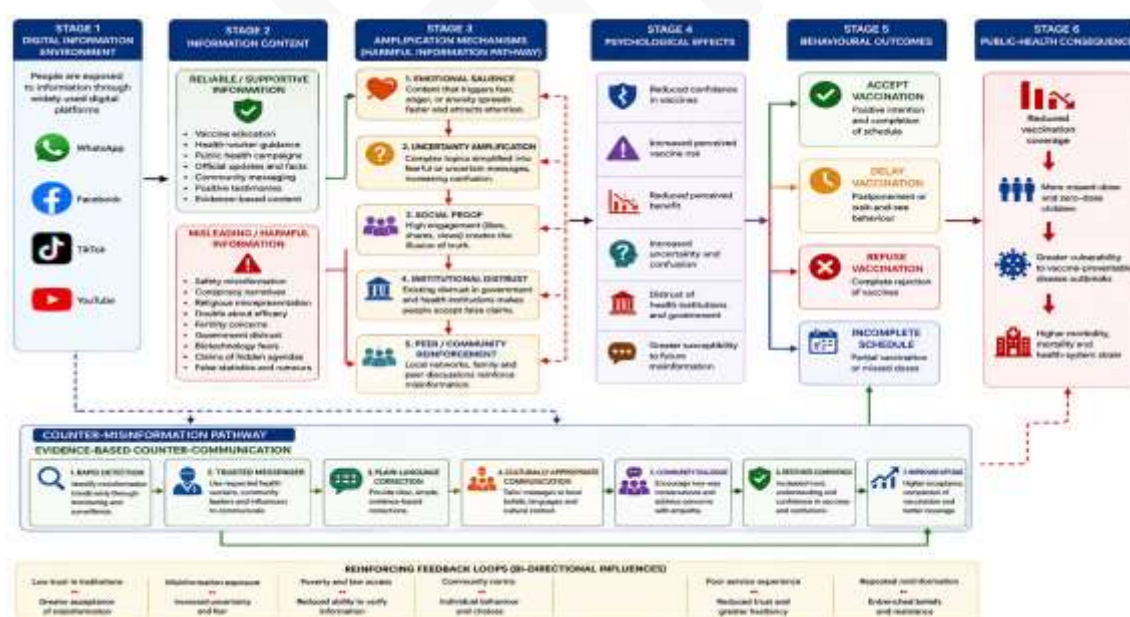


Figure 2. Digital Misinformation Pathway and Its Influence on Vaccine Decision-Making and Immunization Outcomes in Nigeria (Sato, 2022; Wonodi *et al.*, 2022; Sadiq *et al.*, 2023).

Digital misinformation pathway, behavioural effects, and counter-misinformation strategies influencing vaccination uptake. The figure depicts the progression from digital information exposure through harmful information amplification, psychological effects, vaccination

behaviours, and public-health consequences, alongside an evidence-based counter-misinformation pathway and reinforcing feedback loops.

Table 7 explains the role of major digital platforms in spreading vaccine information. It shows both the helpful uses of each platform and the ways they can also amplify misinformation.

Table 7. Major Digital Platforms and Their Roles in Vaccine Information Dissemination

Platform	Positive Role	Negative Role	Citation(s)
WhatsApp	Rapid health messaging and peer sharing	Viral misinformation and voice note rumors	(Ekezie & Bosah, 2021; Sato, 2022; Wonodi <i>et al.</i> , 2022; Sadiq <i>et al.</i> , 2023; Ibekwe <i>et al.</i> , 2024)
Facebook	Public awareness campaigns and community pages	Anti vaccine groups and recycled false claims	(Ekezie & Bosah, 2021; Sato, 2022; Wonodi <i>et al.</i> , 2022; Sadiq <i>et al.</i> , 2023; Ibekwe <i>et al.</i> , 2024)
TikTok	Youth engagement and short educational clips	Short form misinformation and emotional persuasion	(Ekezie & Bosah, 2021; Sato, 2022; Wonodi <i>et al.</i> , 2022; Sadiq <i>et al.</i> , 2023; Ibekwe <i>et al.</i> , 2024)
YouTube	Educational videos and public explanation of vaccines	Conspiracy amplification and distrust narratives	(Ekezie & Bosah, 2021; Sato, 2022; Wonodi <i>et al.</i> , 2022; Sadiq <i>et al.</i> , 2023; Ibekwe <i>et al.</i> , 2024)

This table compares the positive and negative functions of major digital platforms in vaccine communication. It shows how the same platform can support education while also carrying rumors and fear-based content.

3.3 Sociodemographic and Behavioral Predictors of Immunization Uptake

The current literature makes it clear that vaccine uptake in Nigeria is shaped by more than one demographic variable. Education remains one of the most consistent positive predictors. In an online survey of Nigerian adults, Chutiyami and colleagues found that educational level and socioeconomic status were strongly related to vaccine acceptance, while misconceptions and subjective worries about vaccine safety also played a major role in hesitancy (Chutiyami *et al.*, 2022). Their findings reinforce a pattern that is seen repeatedly across low uptake settings: people with more schooling are often more exposed to health information, more able to interpret public guidance, and more likely to navigate health systems confidently. At the same time, lower income groups are more vulnerable to delays, lost opportunities, and competing daily pressures that make immunization a lower priority even when it is valued (Chutiyami *et al.*, 2022).

The Benue State study by Itodo and colleagues adds a useful layer because it shows that vaccine acceptance is not determined by age alone. In that study, age and ethnicity were not the strongest differentiators, but gender, marital status, occupation, study site, and educational qualification were more closely connected to vaccine reception (Itodo *et al.*, 2025). The authors also reported

that many respondents acknowledged the existence and infectivity of COVID 19, yet a large proportion remained unvaccinated and many were uncertain whether vaccination actually protected them from disease (Itodo *et al.*, 2025). That combination is important. It shows that knowledge of a disease does not automatically translate into confidence in a vaccine. People may understand the threat and still remain hesitant if they are unsure about safety, if they fear side effects, or if they have had negative experiences with health services. Trust in healthcare providers is another major behavioral predictor. Recent qualitative work among Nigerian healthcare workers found that confidence tends to be stronger for vaccines that are familiar than for newer vaccines, and the study highlights how uncertainty, incomplete knowledge, and professional skepticism can influence the people who are supposed to reassure the public first (Bakare *et al.*, 2025). This matter because healthcare workers do not just deliver vaccines; they also interpret them for families, answer questions, and indirectly shape community expectations. If providers are hesitant, unsure, or poorly informed, that uncertainty can move outward into the community and become a new layer of resistance. Taken together, these findings suggest that vaccine uptake in Nigeria is best understood as a behavior shaped by layered influences. Education, income, gender roles, marital status, occupation, trust, and prior experiences with the health system all matter, but they matter together rather than in isolation (Chutiyami *et al.*, 2022; Ojo *et al.*, 2023; Bakare *et al.*, 2025; Itodo *et al.*, 2025). The pattern fits well with behavioral models such as the Health Belief Model and the Theory of Planned Behavior because people weigh perceived risk, perceived benefits, social expectations, and confidence in the system before deciding whether to vaccinate. In practical terms, this means that messaging alone is not enough. Communication must be matched with credible service delivery, respectful counseling, and visible evidence that vaccines are safe, available, and worth the effort (Chutiyami *et al.*, 2022; Ojo *et al.*, 2023; Bakare *et al.*, 2025; Itodo *et al.*, 2025).

Figure 3 synthesizes the multilevel sociodemographic and behavioral determinants of vaccination decisions discussed in Section 3.3, showing how individual, household, community, and health-system factors interact to shape vaccine acceptance, delay, refusal, or incomplete vaccination. It further integrates confidence, complacency, and convenience as key pathways linking these determinants to overall vaccine uptake in Nigeria.

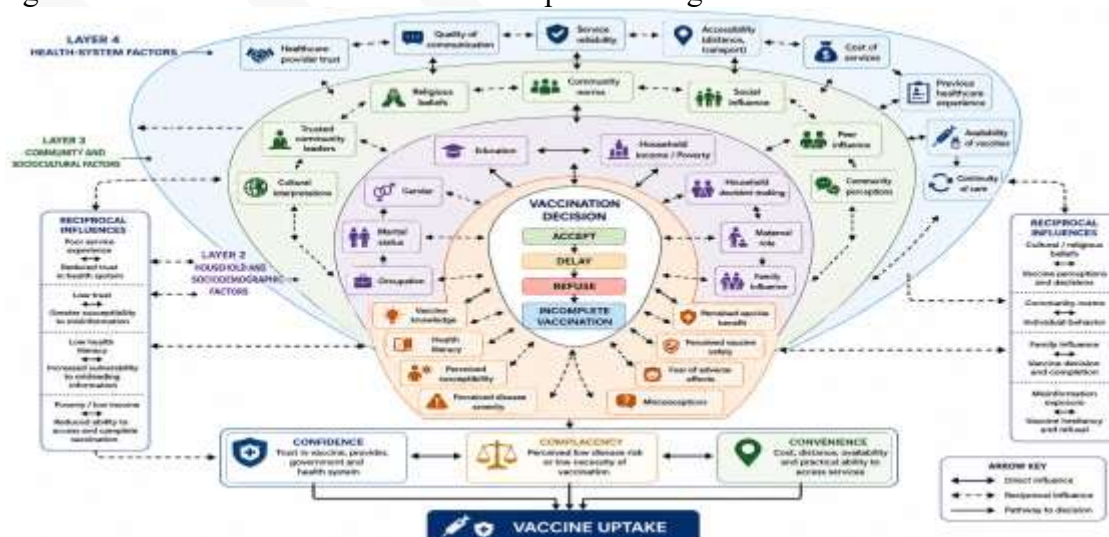


Figure 3. Multilevel Sociodemographic, Behavioral, and Health-System Determinants of Vaccine Uptake in Nigeria (Chutiyami *et al.*, 2022; Ojo *et al.*, 2023; Bakare *et al.*, 2025; Itodo *et al.*, 2025).

Multilevel framework illustrating individual, household/sociodemographic, community/sociocultural, and health-system influences on vaccination decisions, with reciprocal interactions among trust, health literacy, socioeconomic conditions, social influences, service experiences, and access factors leading to vaccine uptake. HPV, human papillomavirus; COVID-19, coronavirus disease 2019.

Table 8 presents the main sociodemographic predictors of vaccine uptake in Nigeria. It compares factors that support acceptance with those that reduce willingness or ability to vaccinate

Table 8. Sociodemographic Predictors of Vaccine Uptake in Nigeria

Predictor	Association with Uptake	Observed Trend	Citation(s)
Higher education	Positive	Increased acceptance and better comprehension of vaccine information	(Chutiyami <i>et al.</i> , 2022; Ojo <i>et al.</i> , 2023; Bakare <i>et al.</i> , 2025; Itodo <i>et al.</i> , 2025)
Poverty	Negative	Reduced uptake because of competing priorities and access pressure	(Chutiyami <i>et al.</i> , 2022; Ojo <i>et al.</i> , 2023; Bakare <i>et al.</i> , 2025; Itodo <i>et al.</i> , 2025)
Urban residence	Positive	Better access to services and stronger exposure to health information	(Chutiyami <i>et al.</i> , 2022; Ojo <i>et al.</i> , 2023; Bakare <i>et al.</i> , 2025; Itodo <i>et al.</i> , 2025)
Healthcare trust	Positive	Improved compliance and stronger willingness to vaccinate	(Chutiyami <i>et al.</i> , 2022; Ojo <i>et al.</i> , 2023; Bakare <i>et al.</i> , 2025; Itodo <i>et al.</i> , 2025)

The table lists key predictors of vaccine uptake and the direction of their influence. It shows how education, poverty, residence, and trust shape acceptance patterns.

3.4 Evaluation of Health System and Policy Interventions

The intervention literature in Nigeria suggests that vaccine hesitancy can be reduced when communities are treated as partners rather than passive recipients. A study of community engagement in Nigeria's polio eradication initiative found that local participation, trust building, and the work of community structures were central to implementation success (Akinyemi *et al.*, 2021). This is an important lesson because it shows that campaigns work better when they are embedded in local relationships. People are more likely to respond positively when messages come through familiar actors, when rumors are answered early, and when communities can see that the program is listening rather than merely instructing. In this sense, community engagement is not a soft add on; it is a core delivery strategy (Akinyemi *et al.*, 2021).

Mobile and digital reminder systems offer another clear point of evidence. In rural Nigeria, reminder text messages to mothers improved routine immunization completion, especially for timely receipt of scheduled doses (Oladebo *et al.*, 2021). A second Nigerian study in Kano showed that mobile phone text messages and follow up calls improved completion of the pentavalent series, with higher completion rates in the reminder group than in the control group (Yunusa *et al.*, 2024). The strength of these interventions is that they work with everyday behavior. They do not assume that caregivers are unwilling. Instead, they recognize that many families forget dates, misplace cards, face transport pressure, or simply need a timely nudge. In other words, the intervention is practical, respectful, and feasible in many routine service contexts (Oladebo *et al.*, 2021; Yunusa *et al.*, 2024).

The broader policy lesson is that interventions are strongest when they combine demand side and supply side actions. Community mobilization increases trust, but it must be followed by reliable service availability. Digital reminders improve attendance, but they only matter if the child can actually receive the vaccine on arrival. Similarly, campaign style approaches can generate short term gains, but they may not solve the underlying inequities that keep zero dose children out of the system. Nigeria's experience therefore supports a blended model of intervention: one that combines social engagement, appointment systems, local leadership, and flexible service delivery rather than relying on a single strategy (Akinyemi *et al.*, 2021; Oladepo *et al.*, 2021; Yunusa *et al.*, 2024).

Table 9 lists the major immunization interventions discussed in the review and the outcomes linked to them. It shows which strategies improved awareness, access, compliance, and trust.

Table 9. Major Immunization Interventions and Outcomes in Nigeria

Intervention	Target Population	Reported Outcome	Citation(s)
Community mobilization	Rural households and community groups	Improved awareness and stronger participation	(Akinyemi <i>et al.</i> , 2021; Ibraheem <i>et al.</i> , 2021; Obi-Jeff <i>et al.</i> , 2021; Oladepo <i>et al.</i> , 2021; Oyo-Ita <i>et al.</i> , 2021; Obi-Jeff <i>et al.</i> , 2022; Yunusa <i>et al.</i> , 2024)
Mobile outreach	Hard to reach communities	Increased access and better attendance	(Akinyemi <i>et al.</i> , 2021; Oladepo <i>et al.</i> , 2021; Oyo-Ita <i>et al.</i> , 2021; Yunusa <i>et al.</i> , 2024)
Digital reminders	Urban and peri urban caregivers	Better compliance and timelier vaccination	(Ibraheem <i>et al.</i> , 2021; Oladepo <i>et al.</i> , 2021; Obi-Jeff <i>et al.</i> , 2022; Yunusa <i>et al.</i> , 2024)
Religious leader engagement	Hesitant communities	Improved trust and community buy in	(Oyo-Ita <i>et al.</i> , 2021)

This table focuses on interventions that were reported to improve vaccine uptake in different Nigerian settings. It highlights the populations reached and the kinds of improvements observed after implementation.

3.5 Future Directions for Equitable Vaccine Uptake in Nigeria

The future of equitable vaccination in Nigeria depends on whether the country can move from episodic campaigns to sustained confidence building. A recent qualitative study of healthcare workers' vaccine confidence in Nigeria suggests that provider confidence is uneven, especially when vaccines are newer or less familiar, which means that future programs must include continuing education for frontline workers, not only public messaging for caregivers (Bakare *et al.*, 2025). The most useful lesson here is that health workers themselves are part of the confidence ecosystem. When they are well informed, supported, and confident, they become better messengers. When they are uncertain, they can unintentionally amplify hesitation. Strengthening provider training, supportive supervision, and vaccine literacy among health workers should therefore be a central pillar of future planning (Bakare *et al.*, 2025).

The ward health system work on HPV vaccination in Nigeria points in the same direction. Elemuwa and colleagues argue that ward development structures can be used to deepen trust, mobilize communities, and create a more local and responsive channel for vaccine acceptance (Eze & Okojie, 2016). That is highly relevant for future immunization planning because it suggests that durable confidence is built where communities feel ownership. This is especially important for adolescents, caregivers, and socially hesitant groups who respond better to trusted local leadership than to broad national slogans. In practical terms, the next phase of immunization programming should not treat community engagement as a temporary campaign tactic. It should become part of the architecture of routine service delivery (Eze & Okojie, 2016). A third direction is more explicitly equity focused. The qualitative study in high zero dose communities in Kano and Lagos showed that barriers include gender skewed decision making, misconceptions, competing socioeconomic needs, and negative past experiences with services (Bolarinwa *et al.*, 2025). Those findings suggest that future policy should be targeted, locally adapted, and sensitive to household power relations. In the Nigerian context, that means designing interventions for fathers as well as mothers, for rural and peri urban households as well as urban families, and for communities whose distrust comes from repeated disappointment rather than a single rumor. The future of immunization equity will depend on whether programs are willing to face the real social conditions that shape uptake rather than relying on generic messages (Bolarinwa *et al.*, 2025). Looking ahead, a reasonable inference from this evidence is that Nigeria would benefit from an integrated package that includes digital health literacy, real time monitoring of misinformation, stronger primary health care contact, and sustained community partnership. AI assisted social listening could help public health teams identify fast moving rumors earlier, but only if it is linked to trusted human response structures in wards, facilities, and local associations. Similarly, sustainable financing and dependable vaccine supply will matter because confidence grows when communities repeatedly see that the system works. Local manufacturing and multi sector collaboration should therefore be treated not as isolated industrial goals, but as part of a wider trust building agenda that makes vaccines feel available, reliable, and nationally owned (Eze & Okojie, 2016; Ibraheem *et al.*, 2021; Iba *et al.*, 2025). Figure 4 synthesizes the forward-looking strategies presented in Section 3.5 by showing how strengthened primary healthcare, trusted communication, community partnership, gender-responsive interventions, financial and geographic access, and sustainable governance can work together to improve equitable vaccine uptake in Nigeria. The integrated framework links these intervention pillars to higher vaccine confidence, timely vaccination and completion, fewer missed/zero-dose children, reduced immunization inequity, and improved protection against vaccine-preventable diseases.

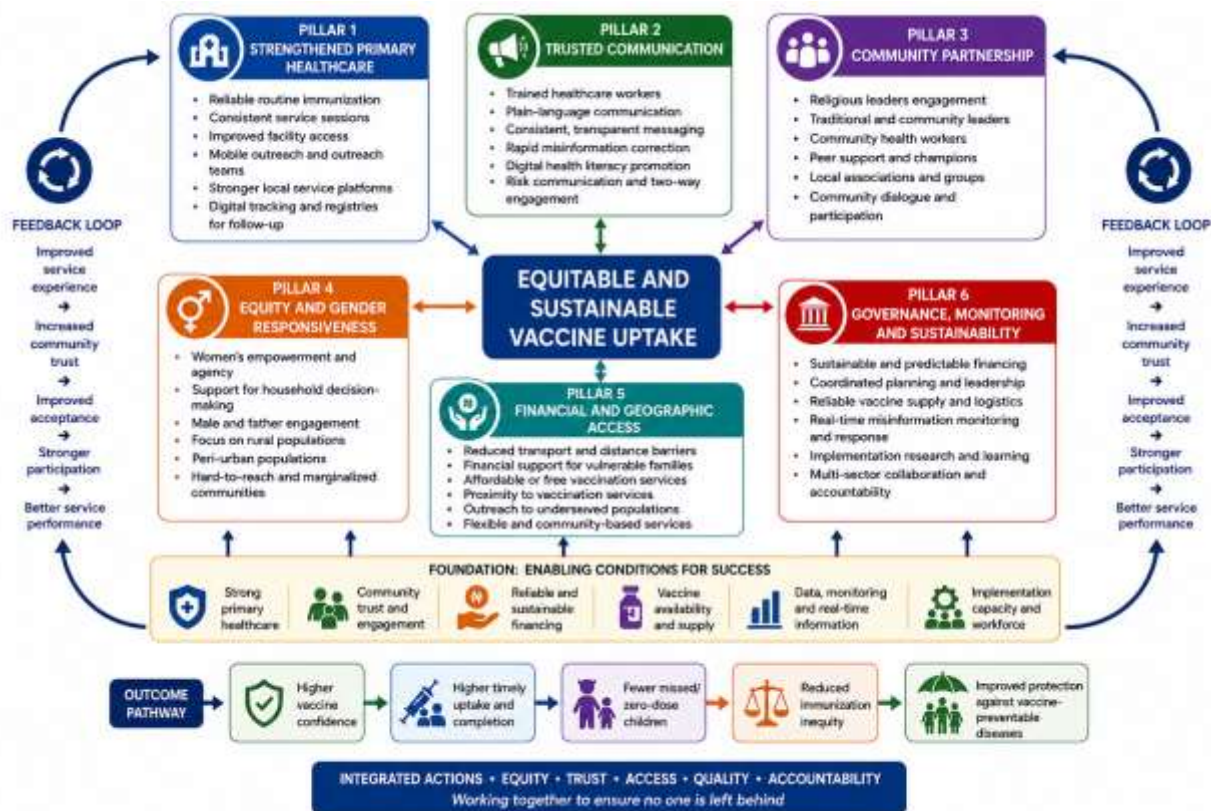


Figure 4. Integrated Framework for Sustainable and Equitable Vaccine Uptake in Nigeria (Eze & Okojie, 2016; Ibraheem *et al.*, 2021; Iba *et al.*, 2025).

Integrated framework showing six mutually reinforcing intervention pillars, enabling system conditions, feedback between service experience and community trust, and the pathway from strengthened interventions to equitable and sustainable vaccine uptake and improved disease protection. No abbreviations are used in the figure.

Table 10 brings together the key strategies recommended to reduce vaccine hesitancy and improve immunization equity. It links each strategic area to the expected public health benefit.

Table 10. Recommended Strategies for Reducing Vaccine Hesitancy and Improving Immunization Equity

Strategic Area	Recommended Action	Expected Outcome	Citation(s)
Health communication	Counter misinformation with trusted local messages and provider training	Increased confidence	(Bakare <i>et al.</i> , 2025)
Health systems	Improve primary health care reach and continuity	Better accessibility	(Eze & Okojie, 2016; Bolarinwa <i>et al.</i> , 2025; Iba <i>et al.</i> , 2025)

Strategic Area	Recommended Action	Expected Outcome	Citation(s)
Community engagement	Strengthen religious and community partnerships	Greater trust	(Oyo-Ita <i>et al.</i> , 2021; Aina <i>et al.</i> , 2025)
Policy reforms	Support sustainable immunization financing and coordinated planning	Long term coverage gains	(Mohammed <i>et al.</i> , 2024; Bolarinwa <i>et al.</i> , 2025; Iba <i>et al.</i> , 2025)

The table brings together the main strategic actions proposed to strengthen routine vaccination and reduce hesitancy. It focuses on communication, health systems, community partnerships, and policy support.

Conclusion

Nigeria's vaccine hesitancy and immunization inequity remain a pressing public health challenge that reflects not only individual doubt, but also deeper structural gaps in access, trust, and service delivery. The evidence reviewed shows that coverage is still uneven, with zero dose and missed dose children disproportionately concentrated in underserved, rural, and conflict affected communities. Sociocultural factors such as low health literacy, religious interpretation, fear of adverse effects, and mistrust of authorities continue to shape vaccine decisions in meaningful ways. At the same time, digital misinformation has amplified uncertainty and weakened confidence by circulating fear-based narratives through social media and other online platforms. The review also makes clear that vaccination behavior is strongly influenced by education, income, gender roles, household decision making, and the quality of communication from health workers and government institutions. Health system weaknesses, including poor outreach, long distances to services, financial barriers, and inconsistent primary healthcare delivery, further deepen the problem. Encouragingly, the studies suggest that community engagement, trusted local messaging, mobile reminders, and culturally sensitive interventions can improve uptake when they are properly sustained. Future research should examine which combinations of communication and service delivery strategies work best across Nigeria's diverse regions and population groups. There is also a need for more longitudinal and implementation focused studies that can measure how misinformation, trust building, and digital health literacy change vaccine behavior over time. Ultimately, reducing vaccine hesitancy in Nigeria will require a coordinated response that strengthens health systems, respects community realities, and makes equitable immunization a practical reality for every child and family.

Significant Statement

This manuscript shows that vaccine hesitancy in Nigeria is not simply a matter of personal refusal, but a wider public health problem shaped by inequitable access, weak service delivery, and persistent mistrust in health institutions. It also highlights how misinformation, social media narratives, and sociocultural pressures influence vaccine decisions, especially in communities already burdened by poverty, low health literacy, and limited healthcare reach. Overall, the review argues for integrated responses that combine trusted communication, stronger primary healthcare, community engagement, and equity driven policy, while future research should test

which locally adapted interventions best improve confidence and immunization uptake over time.

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Conflicts of Interest

The authors declare that there are no conflicts of interest associated with this manuscript. All views expressed in this review are presented solely for academic and scholarly purposes.

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