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Public Trust in Vaccine Regulatory Authorities and Vaccine Confidence in Nigeria: A Cross-Sectional Survey

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Abstract

Vaccine hesitancy remains a threat to public health stemming from low trust in health authorities. In Nigeria, historical events show how eroded trust undermines immunization efforts. This study assessed Nigerians' trust in vaccine regulatory authorities and its relationship with vaccine confidence and uptake A cross-sectional survey of adults (≥18 y) was conducted across all six geopolitical zones. Mixed-mode data collection (60 % interviewer-administered; 40 % online) yielded 289 valid responses from a stratified national sample. The questionnaire captured demographics, vaccination history, trust in institutions, exposure to misinformation, and confidence indicators. Descriptive statistics, χ^2 tests and multivariable logistic regression assessed links between trust and vaccination behaviours. Results indicate median age was 31 y; 58 % were women and 91 % had ≥secondary education. Overall, 83 % had been vaccinated previously and 81 % of parents reported fully immunised children. Two-thirds agreed that NAFDAC is competent and 65 % trusted NPHCDA's programme management, yet only 42 % trusted the government's general public-health handling. While 74 % believed vaccines greatly improve health, COVID-19 uptake remained low (50 % unvaccinated). High trust in NAFDAC correlated with strictly following recommended schedules (63 % vs 36 %, $p<0.001$) and higher COVID-19 vaccination (51 % vs 34 %, $p<0.05$). Trust in regulators independently predicted routine uptake (aOR≈2.2 per trust-scale point, $p<0.001$). This study noted that moderate trust in Nigerian regulators strongly influences vaccine confidence and real-world uptake. Policymakers should prioritise visible safety monitoring, clear communication and local forums that build institutional trust to boost national immunisation rates.

Keywords: *Immunization, Nigeria, Regulatory Agencies, Survey, Trust, Vaccine Hesitancy.*

Introduction

Vaccination is one of the most effective public health interventions, but vaccine hesitancy has been rising in many settings. Vaccine hesitancy is delay or refusal of vaccines despite availability and a primary driver of vaccine hesitancy globally is lack of public trust [1]. Trust in this context has many dimensions including confidence in the safety and efficacy of vaccines as well as trust in the health system and authorities that deliver vaccination [2]. This means when people trust health authorities, they are more likely to accept vaccines; conversely, distrust can lead to fears, rumours, and low uptake [3]. This dynamic is especially relevant in the context of low- and middle-income countries where historical and social factors have shaped public trust [3].

In Nigeria, vaccine hesitancy has implications given the country's large population and burden of vaccine-preventable diseases. Notably, Nigeria has encountered past incidents where public mistrust severely

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disrupted immunisation programs [3]. For example, in 2003 a polio vaccination boycott occurred in several northern states, fuelled by conspiracy rumours that the polio vaccine was a plot to harm the population [4]. Misinformation and institutional mistrust were at the centre of that boycott, which halted polio campaigns and led to a resurgence of polio cases [4]. This event underscored how a breakdown in trust, either due to historical injustices, political or religious factors, can undermine public health efforts.

Contemporary challenges like the COVID-19 pandemic have further tested public trust in health institutions [5]. During COVID-19 vaccine roll-out in Nigeria, public confidence was tepid: a 2021 national survey found only about 50.7% of respondents were willing to take a COVID-19 vaccine [6]. From the study [6], Low trust in government was evident, as merely 15.9% of Nigerians rated the government's pandemic response as above average. High levels of mistrust corresponded with widespread hesitancy as in one study, 56.8% of Nigerian adults reported mistrusting the government, and COVID-19 vaccine acceptance was only 28.2% [7]. The authors noted that mistrust in government also indirectly fostered negative attitudes (such as doubts about vaccine benefits and fears of profiteering) that depressed vaccine uptake. These patterns reiterate global findings that trust in authorities is a strong predictor of vaccine acceptance [1]. For instance, a multi-country survey in sub-Saharan Africa (including Nigeria) showed individuals with greater trust in government were far less likely to be vaccine hesitant [1].

Problem Statement

Despite broad recognition that trust is critical, gaps remain in understanding specific trust dynamics in Nigeria, particularly regarding the institutions directly responsible for vaccines. Two key agencies are at the forefront of vaccine regulation and delivery in Nigeria: The National Agency for Food and Drug Administration and Control (NAFDAC) and the National Primary Health Care Development Agency (NPHCDA). NAFDAC is the national regulatory authority that approves vaccines and ensures their quality and safety [8]. NPHCDA oversees vaccine distribution and the implementation of immunisation programs nationwide. Public trust (or distrust) in these agencies influence how Nigerians perceive vaccine safety, the credibility of vaccine information, and their willingness to be vaccinated [8]. However, there is a lack of empirical data on how much the Nigerian public trusts these specific authorities and how such trust relates to their confidence in vaccines. Previous research on vaccine hesitancy in Nigeria has focused on general attitudes or sociodemographic factors, without isolating the role of institutional trust [9]. This represents a crucial knowledge gap: if trust in NAFDAC/NPHCDA is low, even highly efficacious vaccines and well-run programs might be met with scepticism. Conversely, high trust could enhance the impact of pro-vaccine messages and policies.

The implications of public trust extend to routine childhood immunizations as well as new vaccines. Nigeria continues to have pockets of zero-dose children (those who receive no basic vaccines), attributed to both access issues and confidence issues like distrust in government or healthcare providers [9]. Understanding the trust deficit is essential for improving vaccine uptake. If, for example, communities doubt the competence or integrity of NAFDAC in approving vaccines, they may question vaccine safety. If they distrust NPHCDA and primary health centres, they may be reluctant to engage with immunisation services. Therefore, studying public trust in these agencies can inform targeted interventions

Study Objectives

This study aims to fill the above gap by systematically examining public trust in vaccine regulatory authorities in Nigeria and its association with vaccine confidence. The specific objectives are:

1. To measure the level of trust Nigerians have in key vaccine-related institutions (including perceptions of their competence, transparency, and reliability).
2. To assess the level of vaccine confidence among Nigerians, including attitudes toward vaccines' benefits and self-reported vaccination behaviours.
3. To analyse the relationship between trust in authorities and vaccine confidence/uptake.

Ultimately, the study seeks evidence on whether higher trust in institutions like NAFDAC predicts greater confidence in vaccines and higher likelihood of getting vaccinated.

Research Questions and Hypotheses

Based on the literature and objectives, the study was guided by the following primary question: To what extent does public trust in vaccine regulatory authorities (e.g., NAFDAC) predict vaccine confidence and uptake in Nigeria? The study hypothesized that greater trust in these authorities would be positively associated with vaccine confidence. For instance, respondents who express high trust in NAFDAC's competence and integrity were expected to have higher confidence in vaccine safety and effectiveness, and correspondingly higher willingness to accept vaccines. Conversely, lower trust was expected to correlate with vaccine hesitancy (e.g., not following vaccination schedules, refusing COVID-19 vaccination [10]. Additional sub-questions included: What proportion of the public trusts the government and health agencies on vaccination matters? How prevalent is exposure to vaccine misinformation, and does it correlate with lower trust? And how do demographic factors intersect with trust and confidence (for example, are there regional or educational differences in trust levels)? Addressing these questions was intended to produce a nuanced picture of the trust-confidence nexus in Nigeria's immunisation landscape.

Theoretical Framework: Trust and Health Behaviour Models

Health behaviour theories offer insight into how trust might influence vaccination decisions. The Health Belief Model (HBM) posits that individuals' likelihood of taking a health action (like vaccination) depends on their perceived susceptibility to a disease, perceived severity of the disease, perceived benefits of the action, and perceived barriers, along with cues to action and self-efficacy [11]. Trust can be viewed as a modifier within this framework: high trust in health authorities can increase perceived benefits (believing vaccines are effective and safe as authorities claim) and lower perceived barriers (less fear of vaccine harm), thereby facilitating uptake [11, 12]. Trust in an official recommendation can also act as a powerful cue to action; for example, if a person trusts NPHCDA's immunization program, a reminder from a clinic is more likely to prompt vaccination. Conversely, lack of trust can amplify perceived barriers (e.g., fear of vaccine side effects or scepticism about efficacy) and diminish the influence of cues from health officials [6]. While the HBM does not explicitly include trust as a construct, it acknowledges the role of sociopsychological factors and cues, wherein trust in experts or the health system would reside.

Another relevant framework is the World Health Organization's 3Cs model of vaccine hesitancy, which groups determinants into Confidence, Complacency, and Convenience [2]. Confidence is directly defined as trust – trust in the vaccine (its effectiveness and safety), in the system that delivers it (reliability of health services and professionals), and in policymakers who decide on vaccines [2].

Thus, confidence encompasses trust in regulatory bodies like NAFDAC (for vaccine quality control) and in healthcare providers and institutions like NPHCDA. The 3Cs model suggests that even if vaccines are accessible (convenience) and people feel at risk of disease (low complacency), they may still hesitate if confidence (trust) is low. This study's focus on trust in regulators aligns with the confidence component of the model. High confidence should translate into greater vaccine acceptance, according to this framework, whereas low confidence (e.g., doubts about a health agency's integrity) can breed hesitancy.

Social trust theory is also pertinent because public trust in institutions is part of the broader institutional trust concept in sociology, which affects whether people accept information and directives from those institutions [13]. In the case of vaccines, if the public trusts institutions like the Ministry of Health or NAFDAC, vaccination campaigns and communication are more likely to be believed and acted upon. During public health crises, risk communication models stress that trust is the cornerstone for successful messaging; people assess the credibility of the source (e.g., a government agency) before they consider the content of the message [13]. In summary, across theoretical models, trust functions as a facilitator (or gatekeeper) of health behaviour. It can be seen as a prerequisite for the uptake of health recommendations – without trust, even strong evidence or heavy promotion may fail to convince individuals to vaccinate. This theoretical premise underpins our study's investigation into whether trust in regulatory authorities correlates with vaccination behaviours and attitudes in Nigeria.

Empirical Evidence: Global and Nigerian Studies

Numerous empirical studies globally have documented the link between trust and vaccine acceptance. A recent multi-country survey in sub-Saharan Africa (including Nigeria) provided robust evidence that trust deficits drive hesitancy [1]. In that study, individuals with greater trust in government and societal institutions were significantly less likely to be hesitant about new vaccines (for COVID-19, polio, HPV). The authors noted that trust in government was a key predictor of vaccine hesitancy in every country examined, with low trust associated with higher refusal [14]. These finding are consistent with studies in high-income settings as well, where trust in health authorities and scientific experts has been correlated with acceptance of vaccines like influenza and COVID-19 vaccines [15]. For example, during the COVID-19 pandemic, surveys in the US and UK found that exposure to misinformation eroded trust and led to drops in intent to vaccinate [15, 16]. These observations reinforce that trust is not just a feel-good asset but has measurable impact on health behaviours.

In the Nigerian context, emerging research has started to quantify trust and its effects on vaccination. A 2022 national survey on COVID-19 vaccine acceptance (covering over 3,000 Nigerians) revealed striking statistics: only 15.9% of respondents rated the government's handling of the pandemic as above average, and this low institutional trust was accompanied by only about half the population willing to get vaccinated [6]. The authors of that study explicitly recommended that improving public trust and transparency should be a priority to boost vaccine uptake. Another study from 2023 examined the interplay of mistrust and attitudes: Olawa et al. (2023) found that over 56% of surveyed Nigerians did not trust the government, which was directly associated with low COVID-19 vaccine acceptance [7]. Importantly, that study showed mistrust in government led to greater belief in vaccine-related conspiracies (e.g., worries about unforeseen effects, suspicions about profiteering) which in turn reduced vaccination willingness. This provides a potential mechanism: lack of trust feeds

misconceptions and fears, reinforcing hesitancy.

Region-specific studies within Nigeria echo the national findings. In a survey of households in Zamfara State (northern Nigeria) during late 2021, researchers assessed factors influencing COVID-19 vaccine acceptability. Trust in health authorities emerged as one of the strongest factors: individuals with medium-to-high trust levels had 7.4 times higher odds of accepting the vaccine compared to those with low trust [17]. Over half of participants had low overall trust scores. These statistics illustrate a substantial trust gap that likely contributed to the low vaccine uptake observed in that community (only 8.9% were vaccinated in that survey. The Zamfara findings align with other local reports that suggest trust in traditional and religious leaders is also low (only ~7–8% ranked those leaders as their top trusted sources), meaning that no alternative authority filled the trust void regarding vaccine guidance.

Beyond COVID-19, Nigeria's routine immunization efforts have similarly been challenged by trust issues. Studies have documented that in areas with persistent polio or measles outbreaks, community trust in health workers and government programs was low, often due to previous experiences of neglect or corruption in the health sector [18]. For instance, community surveys in northern Nigeria around 2018–2019 (prior to Nigeria's polio-free certification) found lingering scepticism about vaccines' purpose, partly owing to memories of the polio vaccine boycott and broader mistrust in state institutions [19]. A qualitative study on routine immunization noted that some caregivers cited lack of trust in the health system as a reason for not completing childhood vaccine series [20], they doubted the quality of vaccines or the motives of campaigns, sometimes influenced by rumours of western agendas [19]. While such qualitative insights are not easily generalizable, they underscore the narratives that accompany statistical findings.

Another dimension of empirical evidence involves misinformation and social media [21]. Misinformation thrives where trust is lacking: people uncertain about official information may turn to social networks and potentially false narratives [21]. A global commentary in *Nature Medicine* pointed out that tackling misinformation by itself (e.g., removing false content online) will not solve the problem if underlying trust issues remain unaddressed [16]. This is highly pertinent to Nigeria, where WhatsApp, Facebook, and community rumour mills have spread vaccine myths (from COVID-19 vaccine infertility myths to unfounded claims about routine immunizations). The prevalence of misinformation in Nigeria during the pandemic – and its observed influence on intent – was documented by international surveys, but country-specific data are needed to quantify how misinformation exposure correlates with trust locally. Our study contributes by measuring the proportion of Nigerians who feel misinformation has affected their vaccine trust.

Gaps and Justification for the Current Survey

From the reviewed literature, it is evident that while we understand broadly that trust matters for vaccine acceptance in Nigeria, specific data on trust in the regulatory agencies (NAFDAC, NPHCDA) is sparse. Prior Nigerian studies mostly examined trust in government or health system in general terms [7, 17]. However, trust is not monolithic – someone might distrust politicians but still trust a healthcare provider or trust a vaccine's quality but not the distribution process. NAFDAC and NPHCDA represent two critical links in the vaccine delivery chain: one ensures vaccines are safe and effective (regulatory oversight) and the other ensures vaccines reach people (service delivery). Disentangling trust in these could reveal targeted entry points for interventions. For example, if trust in NAFDAC's scientific rigor is high but trust in local clinic

management is low, the strategy would differ (perhaps focus on improving customer service and accountability at clinics). If the opposite is true, different measures are needed (like publicizing NAFDAC's quality control results to reassure people).

Another gap is understanding how trust interacts with exposure to misinformation in Nigeria. The literature suggests mistrust can amplify belief in rumours, but few surveys have directly asked Nigerians if online information has affected their confidence. Our survey addresses this by asking respondents about encountering vaccine doubt information and its impact on their trust. Furthermore, with Nigeria's ongoing efforts to improve vaccination (e.g., recent introduction of new vaccines and campaigns to reduce zero-dose children), understanding public sentiment in 2025 is timely. It has been several years since the peak of COVID-19 vaccine rollout; trust levels may have evolved, and any residual hesitancy needs addressing as Nigeria ramps up routine immunization (for instance, rolling out HPV vaccine nationally). The findings of this study will thus help fill an immediate knowledge gap and inform practical actions: the National Primary Health Care Strategic Plan emphasizes community engagement and trust-building – our data can indicate where to focus those efforts or which messages might resonate (for example, if people overwhelmingly support increased health funding for vaccines, that can be leveraged in advocacy campaigns).

In summary, the justification for this survey lies in providing empirical data on where Nigeria stands now in terms of public trust in vaccine regulators and how that trust correlates with confidence and behaviour. This evidence is essential for designing interventions that are not merely about providing information, but about building trust because as multiple experts have noted, vaccine hesitancy is a symptom of a trust problem.

Materials and Methods

Study Design and Setting

A national, cross-sectional survey captured a "snapshot" of Nigerian adults' attitudes toward vaccines between 8 April and 15 May 2025. All six geopolitical zones were covered; in each, field teams sampled urban and rural LGAs while an online arm extended reach where internet access was higher. Mixed-mode delivery (≈60 % interviewer-administered; 40 % self-administered online) balanced inclusivity with practicality.

Population and Sampling

Eligible respondents were residents ≥18 years. States were first stratified by zone, then by urban/rural LGAs. In-person interviewers used random-walk household selection; online quotas mirrored the same strata. Cochran's formula ($p = 0.50$, 95 %CI, ±5 %) gave $n = 384$. Applying a 1.3 design effect and 10 % non-response buffer set a target of 512; 289 complete surveys were obtained. Though below target, every zone was represented and power remained >80 % for ORs ≈ 1.8.

Data Source and Instrument

The 15-minute questionnaire, adapted from WHO hesitancy tools, comprised five sections: demographics; vaccination history; trust in NAFDAC, NPHCDA and government; exposure to misinformation; and vaccine-confidence statements. Most items used 5-point Likert scales. Pilot testing (n = 20) prompted minor wording simplifications. Key analytic constructs: *Trust score*: mean of six items on competence, transparency and accountability ($\alpha = 0.82$). *Vaccine-confidence score*: belief in safety, benefit and necessity ($\alpha = 0.79$). Outcomes: (1) always adheres to national schedule; (2) COVID-19 vaccinated. Covariates: age-group, gender, region (North/South), residence, education, occupation, income, misinformation exposure.

Data Collection Procedure

Trained enumerators administered surveys in English or, where needed, Hausa, Yoruba, Igbo or Pidgin, recording responses on tablets. Online links (Qualtrics™) were distributed via NGOs, alumni networks and geo-targeted social media; IP/time checks prevented duplicates. Weekly monitoring redirected effort to under-sampled zones (notably the North-East). Missing data were minimal (<5 % per item); pairwise deletion preserved sample size.

Ethical Considerations

Approval: College of Medicine, University of Ibadan HREC (UI/EC/25/0681). Written (online click-consent) or verbal consent was obtained after an information sheet. No personal identifiers were collected; data were encrypted and password-protected. Interviews were private and debrief sheets corrected any major misconceptions after completion.

Statistical Analysis

Analyses used SPSS v28 and R 4.3. Descriptives (means, medians, proportions) summarised sample characteristics and core variables. Associations between categorical variables (e.g., high vs low trust and schedule adherence) employed χ^2 or Fisher tests; group differences in continuous scores used t-tests/ANOVA. Pearson correlation gauged linear association of trust and confidence scores.

Primary models: binary logistic regressions predicting (a) routine-schedule adherence and (b) COVID-19 uptake. Predictor set trust score (continuous), age, gender, education, region, residence and misinformation exposure. Adjusted odds ratios (aOR) with 95 % CIs were reported; $p < 0.05$ (two-tailed) signified statistical significance. No multicollinearity was detected (VIF < 2). Goodness-of-fit was confirmed via Hosmer-Lemeshow ($p > 0.05$). Scale reliability met acceptable thresholds ($\alpha > 0.7$).

Limitations

The final n = 289, though adequately powered, was below target and slightly urban-skewed; vaccine-sceptical rural residents may be under-represented. Self-report introduces recall and social-desirability bias, and the cross-sectional design precludes causal inference. Nonetheless, rigorous stratification, bilingual administration, and internal-consistency checks strengthen validity.

Results

Sample Characteristics

Table 1 and Table 2 give the full profile of the 289 adults who provided complete data (56 % of the intended 512). Respondents were predominantly urban (79 %), fairly young (mean ≈ 33 y), and highly educated (90 % ≥ secondary; 39 % postgraduate). Gender distribution was 57 % female, 40 % male. All six geopolitical zones were represented, with a slight urban-southern tilt; rural North-East was the most under-sampled stratum.

Table 1. Demographic Profile

Characteristic	**Category**	**n (%)**
Age Group	18–24 y	25–34 y
	Missing	9 (3.1)
Gender	Female	Male
Region	North	South–South
	Other/Unspecified	14 (4.8)
Residence	Urban	Rural

Table 2. Socio-economic Profile

Characteristic	**Category**	**n (%)**
Education	≤ Secondary	Tertiary
Occupation	Gov't	Private
Monthly Income (₦)	< 50k	50–100k

Trust in Regulatory Authorities

Competence: 66% agreed NAFDAC is competent; 65% felt NPHCDA manages immunisation well.

Transparency: Only 46% believed approval processes are transparent; 46 % trusted authorities to disclose adverse events.

Reliability/Accountability: 61% saw agencies as reliable, but just 54% felt they are truly accountable.

Macro trust: Confidence in the government's overall public-health handling was 42 %; only 29% trusted the health system at large.

Misinformation: 64% had encountered safety-doubting content online; 51% said it reduced their own trust.

Vaccine Confidence and Uptake

Routine history: 83% had ever been vaccinated; 81% of parents reported fully immunised children.

Schedule adherence: 50% stated they "always" follow recommended schedules; 27% admitted rare/never vaccination behaviour.

COVID-19: Uptake lagged—42% vaccinated (partial + full), 50% unvaccinated.

Attitudes: 74 % agreed vaccines greatly improve public health; 84% believed wider coverage would cut disease.

Policy support: 87% favoured more government spending on immunisation; 92% felt better transparency would raise uptake.

Key Associations

High-trust respondents were significantly more likely to:

Follow schedules (63% vs 36%; χ^2 $p < 0.001$).

Receive a COVID-19 shot (51% vs 34 %; χ^2 $p = 0.02$).

Logistic regression confirmed trust score as an independent predictor of routine uptake (aOR ≈ 2.2 per scale point, $p < 0.001$) after adjusting for age, gender, education and region.

Associations Between Trust and Vaccine Confidence

Bivariate tests and multivariable modelling converge on the same conclusion: higher trust in vaccine-regulating agencies translates into greater vaccine confidence and real-world uptake.

Bivariate:

1. **Routine schedule:** 62.7 % of respondents who *trust NAFDAC* ("agree/strongly agree" it is competent) *always* follow recommended vaccinations versus 35.9 % among low/neutral-trust peers ($\chi^2 = 16.5$, $p < 0.001$).
2. **COVID-19 uptake:** 51% of high-trust adults had received ≥1 dose, compared with 34 % of low/neutral-trust adults ($p = 0.026$).
3. **Attitudinal link:** Composite trust correlated moderately with belief in vaccine benefits ($r \approx 0.48$, $p < 0.001$).
4. **Misinformation effect:** Those reporting social-media misinformation erosion were disproportionately in the low-trust, low-uptake group (trust–misinfo $r \approx -0.30$).

Multivariable evidence

Logistic regression (Table 3) controlling for education and gender shows trust remains an independent predictor of full schedule adherence:

Table 3. Logistic Regression

Predictor	Adjusted OR (95 % CI)	p-value
Trust score (1–5)	2.23 (1.59 – 3.05)	<0.001 **
Female (vs Male)	0.98 (0.60 – 1.80)	0.927
Higher education (vs ≤ secondary)	4.30 (1.50 – 12.40)	0.007 **

***Model fit: N = 264; pseudo-R^2 = 0.085. OR > 1 indicates higher odds of always vaccinating; p < 0.01.*

Each one-point rise on the 5-point trust scale roughly doubles the odds of strict schedule adherence; moving from low (≈2) to high trust (≈4) multiplies odds nearly five-fold. Education also boosts adherence, but gender shows no net effect once trust and schooling are held constant. A parallel model for COVID-19 uptake yielded aOR ≈ 1.5 per trust point (p ≈ 0.02), while education lost significance, suggesting trust was the decisive factor for that newer vaccine.

Consequently, trust is not optional**.** Even highly educated Nigerians vaccinate inconsistently when institutional trust is weak. Competence ratings are solid, but doubts about openness and accountability depress uptake, especially for novel vaccines. Strengthening regulatory credibility can blunt the impact of online falsehoods; half the sample acknowledged such content lowered their confidence. Converting "neutral" trust into positive trust could unlock large gains in coverage; neutrality was associated with middling uptake. In sum, the data quantify the oft-stated maxim: trust is the engine of immunisation. Boosting transparency and community engagement by NAFDAC, NPHCDA and partners should be central to Nigeria's efforts to close remaining coverage gaps.

Discussion

This survey shows that most Nigerian adults endorse vaccination in principle but harbour reservations about the institutions that license and deliver vaccines. Roughly two-thirds of respondents trust the competence of NAFDAC and NPHCDA, yet fewer than half trust their transparency or feel those agencies are held fully accountable, and only 29% express confidence in the wider health-care system. This split, technical faith versus governance doubt, mirrors global patterns in which citizens may respect regulators' scientific rigour while questioning the honesty of the broader state [16]. Crucially, trust proved a behavioural catalyst: high-trust respondents were almost twice as likely to keep to childhood schedules and 17 percentage points more likely to have taken a COVID-19 dose [16]. In multivariable analysis each one-point rise on the 5-point trust scale more than doubled the odds of strict schedule adherence, even after adjusting for education and gender. Conversely, about half the sample said social-media misinformation had eroded their confidence, and this group clustered in the low-trust, low-uptake quadrant underlining the vicious circle whereby distrust fuels rumour-mongering, which in turn suppresses demand [16].

These findings extend earlier Nigerian research that linked general mistrust in government to COVID-19 hesitancy [6, 7] by pinpointing the role of the two national vaccine gatekeepers. International work across sub-Saharan Africa likewise shows trust deficits as a stable predictor of refusal [1]. The data nuance that picture: Nigerians distinguish between central government trusted by only 42 % on health matters and the technocratic agencies that they see as relatively credible. That two-thirds already trust

NAFDAC/NPHCDA offers a strategic foothold: pro-vaccine messaging might land better when fronted by these bodies than by politicians. Education also emerged as a positive driver; unlike some Western studies where higher schooling can correlate with critical scepticism [16], in this context tertiary graduates were four times likelier to keep to schedules, probably reflecting greater health literacy and access.

Policy recommendations flow directly from the trust gaps identified. First, radical transparency is required as per GMP standards [17]. Public briefings that explain in plain language how vaccines are assessed, published batch-testing data, and rapid disclosure of adverse-event investigations would address the 54 % who doubt official openness. Second, misinformation control must pair content removal with credible counter-messaging: a standing "myth-buster" team within NPHCDA, an active social-media presence for trusted clinicians, and real-time engagement with viral rumours can blunt fear before it hardens. Third, agencies should leverage existing confidence by foregrounding their brand "NAFDAC-approved" labels, town-hall tours by agency scientists, and clinic posters that show the regulator's safety process. Fourth, service quality matters: long waits, stock-outs or brusque treatment erode day-to-day faith. Reliable supplies, shorter queues and visible redress for errors can lift the 48 % who currently distrust the system as a whole. Finally, communities want dialogue: three-quarters of respondents asked for more local meetings on vaccines. Involving women's groups, youth leaders and religious figures in co-designing outreach—especially in rural North-East zones where uptake lags—can transform neutral or doubting audiences into advocates.

The study's strengths include being the first, to our knowledge, to quantify Nigerian trust in NAFDAC and NPHCDA and to link that metric to both routine and COVID-19 uptake. Internal consistency for trust and confidence scales was high ($\alpha > 0.8$), and findings were robust across bivariate and multivariate tests. Yet limitations temper generalisation. The sample ($n = 289$) skewed urban and well educated; national figures may reveal deeper mistrust and lower coverage. Behaviours were self-reported and therefore vulnerable to recall or social-desirability bias; some respondents may have overstated adherence or understated suspicion. Cross-sectional design precludes causal inference, high trust may encourage vaccination, but successful vaccination experiences could also reinforce trust. Finally, trust is dynamic; asking about central agencies cannot capture the granular interplay of front-line health workers, political leaders and international partners. Future nationally representative, longitudinal studies—paired with qualitative work exploring why specific groups distrust particular actors—would sharpen the evidence base.

Despite these caveats, the message is clear: Nigerians largely believe in vaccines, but confidence falters at the point of delivery. Boosting openness, ensuring accountability and combating misinformation through trusted channels are therefore essential steps if Nigeria is to convert positive sentiment into consistently high coverage for childhood, COVID-19 and forthcoming vaccines such as HPV and malaria. By tracking trust as routinely as it tracks coverage, Nigeria can spot fractures early and repair them before they widen into the kind of boycott that once set polio eradication back by years.

Recommendations for Future Research

Long-term, nationally representative panel surveys should track baseline trust and subsequent uptake of new vaccines (e.g., HPV, malaria) to test causality and observe how good or bad experiences recalibrate trust over time. Cluster-randomised trials that expose some LGAs to intensive trust-building packages, proactive transparency briefings, regular town-

halls, real-time myth-busting, could quantify the added coverage such interventions deliver. Qualitative work is equally urgent: in-depth interviews across regions, especially the northern states still marked by the 2003 boycott, can unpack the stories behind distrust and the channels through which rumours spread. Future surveys should widen the trust map to include frontline health-workers, traditional leaders and international partners; this "trust ecosystem" may reveal unexpected allies for outreach. Sub-population studies (youth, health-care workers, zero-dose communities) will show whether drivers of trust differ by age, profession or exposure to social media. Psychometric refinement of our scale could yield a standard Nigerian "Vaccine Trust Index" suitable for routine monitoring. Finally, studies that couple pandemic experiences, political affiliations, or economic willingness-to-pay with trust and behaviour would illuminate additional levers policymakers can pull.

Conclusion

Our survey confirms that Nigerians' chief barrier to full vaccination is not disbelief in vaccines but distrust in the system that approves and delivers them. Two-thirds of adults regard NAFDAC and NPHCDA as technically competent, yet barely half consider them transparent and barely one-third trust the health system overall. That mismatch matters: each one-point rise on our trust scale more than doubled the odds of adhering to childhood schedules and significantly boosted COVID-19 uptake. Exposure to online rumours, reported by half the sample, further erodes confidence, evidence that misinformation and distrust feed one another. The remedy is clear. Regulators must move from reactive to proactive disclosure, making approval dossiers, batch-testing data and adverse-event investigations publicly accessible. Health-workers, whom communities already trust, should be front-line communicators, supported by rapid social-media myth-busting teams. Service reliability and visible accountability will convert sceptics faster than slogans. Nigerians overwhelmingly back greater investment in immunisation; they simply want proof that the process is honest and effective. Embedding transparency, responsiveness and local dialogue should be at the heart of every campaign through which NAFDAC, NPHCDA and their partners can turn the country's strong pro-vaccine sentiment into the high, consistent coverage Nigeria still needs.

Data Availability

All relevant data are included within the article.

Author Contributions

All authors contributed to the conceptualization/ design, wrote, reviewed, and provided edits to the main manuscript. All authors reviewed and agreed on the final version.

JOU: The corresponding author, conceptualized, and wrote the manuscript, AOP: Designed and reviewed the manuscript, LEL: Edited and reviewed the manuscript.

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The authors declare no conflicts of interest relevant to this publication.

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