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Public Health, Vaccine Hesitancy and Covid-19 in Nigeria: A Review Study

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Abstract

The COVID-19 pandemic prompted global efforts to develop vaccines, but vaccine acceptance in Nigeria was low, primarily due to hesitancy. This study examines the factors contributing to COVID-19 vaccine hesitancy in Nigeria, focusing on challenges such as misinformation, fear and religious beliefs. Using qualitative phenomenological approach, primary data were collected through in-depth interviews with participants across the five geo-political zones. That was complemented by secondary data from books, journals and online sources. The findings of the study reveal that misinformation, particularly on social media, played a significant role in shaping public perception, with conspiracy theories

and unverified claims about vaccines gaining traction. Also, religious beliefs, including the idea of divine protection, further contributed to vaccine refusal. In addition, Nigeria's reliance on external support for vaccines, compounded by systemic healthcare inequalities, exacerbated the problem, with only 17.7% of the population fully vaccinated by October 2022. The study recommended targeted public health campaigns to counter misinformation, increased engagement with religious and community leaders and efforts to ensure equitable vaccine distribution to address the vaccine hesitancy crisis in any time of future pandemic. These interventions are essential for improving vaccine acceptance and achieving higher immunisation rates in Nigeria.

Keywords: *COVID-19, Hesitancy, Nigeria, Public Health & Vaccine*

Introduction

COVID-19 remains a critical global public health challenge. Since its emergence in late 2019, the virus has significantly disrupted global health systems, socio-economic structures, and political landscapes (Struckmann, 2022). Recognizing the severity of the disease, the World Health Organization (WHO) declared COVID-19 a pandemic on March 11, 2020, categorizing it as a public health emergency of international concern (Olawale & Idris, 2022). As of 2022, the pandemic has affected approximately 611 million individuals and resulted in 6.5 million deaths across 224 countries (WHO, 2022). In Africa, the virus has led to 12,216,748 confirmed cases and 256,542 fatalities (Africa Centre for Disease Control and Prevention, n.d.). In Nigeria, the Nigeria Centre for Disease Control (NCDC) reported 265,090 confirmed cases and 3,155 deaths as of September 24, 2022. In response to the pandemic, governments and international organizations implemented various public health measures to curb transmission, including non-pharmaceutical interventions such as international travel restrictions, mandatory face masks, frequent handwashing, social distancing, and lockdowns (Idris & Thompson, 2023). Additionally, social protection programs were introduced to mitigate the socio-economic impact of the crisis (Olawale & Idris, 2022). However, despite these efforts, public adherence to preventive measures remained inconsistent in many regions, including Nigeria, where a significant proportion of the population disregarded COVID-19 safety guidelines (Nnama-Okechukwu, Chukwu, & Nkechukwu, 2020).

The introduction of COVID-19 vaccines marked a significant milestone in global efforts to combat the pandemic. International health organizations, including the WHO, emphasized vaccination as one of the most effective, safe, and cost-efficient strategies for achieving immunity and controlling the virus's spread (Iorfa Ottu, Oguntayo, Ayandele, Kolawole, Gandi, & Olapegba, 2020; WHO, 2020b; Lamot & Kirbi, 2020). However, vaccine hesitancy—a reluctance or refusal to receive vaccines despite their availability—emerged as a major challenge in Nigeria. Factors contributing to vaccine hesitancy include widespread misinformation, religious beliefs, distrust in government institutions, and concerns about vaccine safety (Iwuagwu, Rayner, Ngwu & Kalu, 2024). Vaccine hesitancy is not unique to COVID-19 but has been a long-standing global health issue. In 2019, the WHO identified vaccine hesitancy as one of the top ten threats to global health, underscoring its impact on infectious disease control (Shacham, Greenblatt-Kimron, Hamama-Raz, Martin, Peleg, Ben-Ezra, & Mijiritsky, 2021). Despite the availability of COVID-19 vaccines, vaccine uptake in Nigeria has remained relatively low. Data from the National Primary Health Care Development Agency (NPHCDA) indicated that as of September 22, 2022, only 37,907,493 Nigerians—representing 17.7% of the population—had been fully vaccinated. By October 9, 2022, 80,602,232 vaccine doses had been administered nationwide (NPHCDA, 2022; WHO, 2022).

The persistence of vaccine hesitancy in Nigeria presented significant public health risks, as it undermined efforts to achieve herd immunity and prolongs the pandemic's socio-economic and health consequences. Key drivers of vaccine hesitancy in Nigeria include political distrust, religious influences, and misinformation propagated via social media (Agbede, Emezirinwune, Adedokun, & Idowu-Collins, 2024). Despite extensive vaccination campaigns, hesitancy hinders widespread vaccine acceptance, posing a barrier to effective disease control. Given these challenges, it is imperative to examine the sociocultural, political and informational factors contributing to vaccine hesitancy in Nigeria to inform targeted interventions that promote vaccine uptake and enhance public health outcomes.

Data Sampling and Collection Process

The researchers employed purposive sampling to select 19 participants based on their accessibility, availability, and awareness of vaccines, COVID-19, and vaccine hesitancy issues. Interviews took place between

March 18 and August 12, 2022, using semi-structured questions developed by the researchers. The five-month data collection period allowed respondents adequate time to answer the interview questions and accounted for delayed responses from some participants. Eleven (11) Christians and eight (8) Muslims from seven states were interviewed: Oyo, Kwara, Kaduna, Kano, Niger, Rivers and Imo. Religious consideration in essential informant selection was used to broaden the scope of conversations and interviews to include religious-based topics.
All COVID-19 protocol guidelines were followed by the researchers who conducted the field investigation. The interview was conducted in both English and Hausa languages, an indigenous language spoken by the Hausa people in the northern geo-political zone of Nigeria. A translator with extensive experience translating Hausa into English was hired for the study. A phone recorder was used to record the in-depth interviews. After identifying themes evoked from the respondents' interviews, a thorough research of the interview information was presented thematically in subsequent sessions through content analysis. While respondents were willing to disclose their identities, the study ethics committee labeled data from key informant interviews (KII) for confidentiality. Content analysis was employed to examine the interview materials and personal observations, involving careful transcription of audio recordings and systematic review of the transcripts to analyze data and validate respondents' perspectives. Table 1 presents the demographic information of the respondents.

Table 1: Description and Demography of the Respondents

S/N	Key Informant	Age/Gender	Religion	Location	Date	Geo-political Zone
1	KII A	45/ Female	Christian	Oyo	18/03/2022	South-West,
2	KIIB	28/ Male	Christian	Rivers	21/06/2022	South-South
3	KIIC	29/ Male	Christian	Kaduna	09/04/2022	North-West
4	KIID	38/Female	Christian	Rivers	26/06/2022	South-South
5	KIIE	46/ Female	Muslim	Oyo	21/06/2022	South West
6	KIIF	23/Female	Christian	Imo	12/08/2022	South-East

7	KIIG	26/Female	Muslim	Niger	11/07/2022	North-Central
8	KIIH	24/ Female	Muslim	Kwara	19/05/2022	North-Central
9	KIII	33/ Male	Christian	Kaduna	29/04/2022	North-West
10	KIIJ	38/Female	Muslim	Kwara	06/05/2022	North-Central
11	KIIK	32/Male	Christian	Oyo	29/06/2022	South-West
12	KIIL	27/Male	Muslim	Kano	17/04/2022	North-West
13	KIIM	26/Female	Christian	Imo	06/08/2022	South-East
14	KIIN	33/Male	Muslim	Kwara	21/05/2022	North-Central
15	KIIO	28/Male	Christian	Rivers	19/06/2022	South-South
16	KIIP	29/Male	Christian	Kaduna	13/04/2022	North-West
17	KIIQ	43/Female	Christian	Imo	11/08/2022	South-East
18	KIIR	29/Male	Muslim	Kano	16/04/2022	North-West
19	KIIS	28/Female	Muslim	Niger	13/07/2022	North-Central

Source: Compiled by the authors

Nigeria, COVID-19-Cure and Vaccine Quest

Given the deadly nature and spread of the COVID-19 pandemic, there was a widespread and global quest for vaccinations and remedies to address the issue. Aside from worldwide efforts, there are local and national efforts in several nations afflicted by COVID-19 to cure the pandemic. Well-known "Self-Proclaimed" individuals pushed the cases of treatments and vaccinations. However, these statements are unverified because COVID-19 is a new viral strain. Nigerians immediately accepted it because they were anxious for a treatment or a cure and would accept anything that came their way. In this vaccine/remedy quest, social media significantly impacted Nigerians' collective perspectives, knowledge, and attitudes regarding the vaccine and remedy quest. Social media promotes false alarms, spreads anxiety, offers unscientific remedies, and dismisses medical advice. Nigerians were provided with correct and inaccurate statements, which has indirectly fueled widespread worry and terror. Several authorities, including the Ooni of Ife, Oba Enitan Ogunwusi

Ojaja, Ondo State Governor Oluwarotimi Akeredolu, Lagos State Governor Babajide Sanwolu, and former Anambra State Governor Chukwemeka Ezeifa, advocated and encouraged traditional medicine practitioners to find a herbal cure for the COVID-19 virus.

As information spread about COVID-19, the rumor of a cure circulated swiftly in Nigeria. Ginger, alone or in conjunction with other vitamin C-rich plants like bitter kola, garlic, giloy, turmeric, and lime, could be used to control and cure COVID-19 symptoms or as a home remedy. This assertion was confirmed in Obeta research on anti-COVID-19 properties, which suggested that ginger has antioxidant effects by inhibiting superoxide production, anti-inflammatory and analgesic activities with better effects against swine flu (H1N1) and human respiratory syncytial virus in human respiratory tract cell lines, thereby demonstrating antiretroviral nature as well as bronchodilatory effects that could prevent severe damage to the lungs due to inflammation. In addition, a video claimed to cure COVID-19 uploaded on Facebook, which stated is a tonic comprised of onions, ginger, garlic, lemon and hot water claimed to cure COVID-19 (*Daily Trust,* 2021).

In addition, another video named "Coronavirus solution-potent Yoruba herbs to aid" claimed to have discovered the COVID-19 remedy locally. On March 30, 2020, this video became viral on Twitter, and on April 14, 2020, it was released on Facebook, stating that a combination of African herbs, roots, and leaves could cure cancer. Bitter leaves (Vernonia amygdalina), 'Aidan' fruits (Tetrapleura Tetraptera), Ethiopian pepper (Xylopia Aethipica), and onions were mentioned in the video's narration (Allium Cepa). Oni Adeyeye Enitan Bàbátunde Ognwusi jàjà II, Ooni of Ife, announced his official Twitter handle. Furthermore, pharmacologist Professor Maurice Iwu met with the Nigerian Ministers of Science, Technology, and Health, but none of these assertions were verified. Similarly, countless local news reports and online posts have been professing to cure or prevent COVID-19, particularly on YouTube and Twitter. In a Channels TV news segment posted to the station's YouTube account on July 20, 2020, Ayowande Adalemo, a "techpreneur" and COVID-19 survivor, claimed that he was cured of the condition after consuming "herbs, fruits, and vegetables, including ginger." According to the interview, he treated the infection with neem, avocado leaves, lime, turmeric, ginger, garlic, beetroot, pineapple, and oranges.

Many African countries, including Nigeria, Ghana, Madagascar, and Tanzania, have pushed herbal remedies as COVID-19 countermeasures, but none have received the necessary validation and authorization. The septuagenarian Margaret Bolarinwa claimed the coronavirus epidemic made her sick after eating garlic. During the lockdown in April 2020, she received a WhatsApp message claiming that garlic treats and shields against viral infection. According to the World Health Organization (WHO), there is no proof that ginger, garlic, and other herbs can be used to treat or prevent coronavirus infection (Ayodeji 2021). The Presidential Task Force on COVID-19 prioritized rumor surveillance during the epidemic. Daily press conferences delivered by the Presidential Task Force gave the public an overview of the broader situation and provided important warnings against misinformation. Rumors spreading across social media were swiftly disproven.

Since the virus first appeared, countries across the globe have made significant investments in scientific research, raising concerns in society regarding the pace of vaccine development. In addition to local treatments and cures, there was an international undertaking to develop successful COVID-19 vaccines. There are 138 COVID-19 vaccine candidates in development as of August 13, 2021, with 21 of them having international emergency use authorization (Mijanur, Habib, Shah, Talukder, 2022). At least 21 distinct vaccines have been authorized for use in emergencies worldwide through August 13, 2021 (Mijanur et al., 2022). Since the FDA approved the BNT162b2 vaccine on August 23, 2021, the race for COVID-19 vaccines has advanced remarkably (Mijanur et al., 2022).

At least 202 nations and territories had started COVID-19 immunization campaigns as of August 14,2021, and more than 4.62 billion vaccine doses had been distributed globally, immunizing roughly 16% of the world's population. On December 14, 2020, the first vaccination was delivered in the United States. In comparison, the BNT162b2 vaccine has been distributed in 112 countries, the mRNA-1273 vaccine in 66, the ChAdOx1 nCoV-19 vaccine in 184, the Gam-COVID-Vac vaccine in 49, the CoronaVac vaccine in 38, and the Ad26.COV2 vaccine in 64. S vaccination is available in 43 nations through August 14, 2021. Only two nations have recently licensed Sinopharm-Wuhan and Ad5-nCoV vaccines, but six nations have licensed BBV152, and two nations have licensed EpiVacCorona (Vector Institute) and ZF2001 (Mijanur et al., 2022). While QazVac and Sinopharm/HayatVax are currently being used in Kazakhstan and the UAE, the Abdala and Soberna 02 have been added to Cuba's vaccination

program (Mijanur et al., 2022). Some of the approved COVID-19 vaccines developed by developed countries' pharmaceutical industries through rigorous research are presented below:

Table 2: Shows various COVID-19 Vaccine Manufacturers

COVID-19 Vaccine	
BNT162b2	Developed and manufactured by BioNTech and Pfizer. It is also known as Pfizer-BioNTech/COMIRNATY/ Tozinameran (INN)
mRNA-1273 (Moderna)	Developed by the National Institutes of Health and Moderna
Ad26.COV2. S (adenovirus serotype 26)	The Janssen Pharmaceuticals Company of Johnson & Johnson
ChAdOx1 nCoV-19 vaccine (chimpanzee adenoviral vector ChAdOx1) also known as AZD1222	Developed by the University of Oxford and pharmaceutical company AstraZeneca
Gam-COVID-Vac (Sputnik V).	Gamaleya National Research Centre for Epidemiology and Microbiology
BBIBP-CorV	The Beijing Institute of Biological Products
BBV152 vaccine.	The Bharat Biotech, Indian Council of Medical Research, and National Institute of Virology, India.
Ad5-nCoV vaccine (trade name: Convidecia)	The CanSino Biologics and the Institute of Biology
CoronaVac (formerly PiCoVacc)	Developed and manufactured by Sinovac Life Sciences, a Chinese biotech company
ZF2001	Anhui Zhifei Longcom Biopharmaceutical
Sinopharm-Wuhan	Wuhan Institute of Biological Products (WIBP)
EpiVacCorona	The Vektor State Research Center of Virology and Biotechnology
The CoviVac	Developed by the Chumakov Center at the Russian Academy of Sciences.

Source: Mijanur et. al (2022).

Many countries have yet to recover from the pandemic and are still under its grip. As a result of vaccine deployment, countries such as the United States and countries that made up the European Union are recovering quickly. The vast majority of people in the United States, China, and across the European Union are immunized. However, this is not the case in the rest of the world, particularly in Africa, where many nations continue to face vaccine shortages (Africa CDC, 2022). Africa

has continued to rely on developed-country assistance in the manufacture of vaccinations. This problem has been referred to as vaccine allocation inequality in numerous works of literature (Bengy, 2022; Sina, 2021; Suarez, 2022). Inequality in vaccine allocation shows the African health sector's underdevelopment and a lack of vaccine manufacturing plants on the African continent. Beyond the debate over vaccine disparities in general was the founding of COVAX (April 2020). The COVAX program, a collaborative effort of the World Health Organization, Gavi (formerly the Global Alliance for Vaccines and Immunization), the Coalition for Epidemic Preparedness Innovations, and other non-profits, and funded mainly by the European Union, failed to deliver more than half of the promised doses of the COVID-19 vaccine to developing countries. This is primarily due to vaccine stockpiling in Western countries, which has hindered African countries from placing vaccination orders (Amnesty International, 2021; Watkins, 2021).

According to Ahmad Murad, Baig, & Hui, (2021), developed countries have fully vaccinated 49-61 per cent of their population. In contrast, Sub-Saharan African low-and-middle-income (LMIC) countries have only immunized 0.7 percent (in Nigeria) to 5.7 per cent (in South Africa). As a result, to achieve the same vaccination rate as high-income nations, low-income countries will need to improve their GDP estimate by USD 38 billion by 2021. (Ahmad et al. 2021) The COVID vaccine facility was established by the World Health Organization (WHO), the Global Alliance for Vaccines and Immunizations (GAVI), and the Coalition for Epidemic Preparedness Innovations (CEPI) to address the issue of equitable global vaccine access, particularly in low- and middle-income countries (LMICs) (COVAX). COVAX received 2 billion COVID-19 vaccinations from several pharmaceutical companies and distributed them regularly to 92 low- and middle-income countries, including Nigeria. Furthermore, due to bilateral ties, several countries provide COVID-19 vaccines to low-income countries like Nigeria. By the beginning of September 2021, however, just 243 million doses had been given to underdeveloped countries. The disparities in vaccination distribution between developed and developing countries are striking. Although more than three billion doses of the COVID-19 vaccine had been provided globally by mid-2021, the vast majority had gone to wealthy nations such as the United States, EU members, and Israel, which account for only 14 per cent of the world's population. Vaccine disparity has been linked to a purposeful global unfairness architecture (Soulé, 2022).

On March 2, 2021, Nigeria received its first COVID-19 vaccine (4 million doses of the Oxford-AstraZeneca vaccine) from the COVAX facility. Following vaccination, Nigeria prioritized frontline healthcare personnel and elderly people over 60 years of age. The first wave of vaccinations concluded on July 22, with 2,534,205 Nigerians receiving a first dose and 1,404,205 receiving a second dose. As a result, only 0.66 per cent of Nigerians have received complete immunization. As a result, Nigeria currently has one of Sub-Saharan Africa's lowest COVID-19 vaccination rates (Ahmad et al. 2021).

Nigeria received 4 million doses of the Moderna vaccine as a contribution from the United States on August 1, 2021, in addition to the 4 million doses of the Oxford-AstraZeneca vaccine that were used. Nigeria depends on foreign donations from high-income countries and the COVAX facility to give COVID-19 vaccinations to its inhabitants, making it difficult to meet the required vaccination coverage rate. According to Dr. Faisal Shuaibu, Executive Director of the National Primary Health Care Agency (NPHCDA) stated that:

COVID-19 vaccine from COVAX and 29,850,000 doses from Johnson & Johnson. Nigeria anticipates an increase in COVID-19 vaccine supplies as well. These are 3,924,000 doses of the Oxford-AstraZeneca vaccine from the COVAX facility and 3,930,910 doses of the Pfizer-Bio-N Tech vaccine from the Pfizer-Bio-N Tech facility. The US government delivered the COVID-19 vaccination through the COVAX facility. Pfizer-Bio-N Tech will also be distributed to Nigeria in an extra 3.5 million doses. The African Union Commission will distribute the COVID-19 vaccine in stages.

However, Nigeria has yet to meet the immunization rate, and vaccines are needed to increase the COVID-19 vaccination rate and ensure Nigerians receive the requisite doses of the vaccine. The lack of vaccines has aggravated the virus's mortality and morbidity. COVID-19 vaccine coverage is heavily influenced by early vaccine procurement and acceptance. However, evidence suggests widespread vaccination acceptance is essential for optimal immunization coverage. Due to vaccine scarcity, hesitation about COVID-19 vaccinations was not the most major programmatic barrier to the broad adoption of COVID-19 vaccines in Nigeria until recently (Wonodi et al., 2021). The initial part of the vaccination was rolled out and aimed at strategic leaders such as legislators, traditional rulers, healthcare personnel, and other frontline employees. In stages 2, 3, and 4, eligible individuals aged 18 and up were

sought for vaccination. The availability was used as a benchmark across phases because most vaccines are donated (Emeka, Edu, Ekpenyong, Getachew, Chabo, Abdurhaman, & Ekpenyong, 2022).

Table 3: Common COVID-19 Vaccine available in Nigeria

Name	Required Doses	Interval between Doses
Pfizer (BNT162b2)	Two	21 days
Moderna (mRNA-1273)	Two	28 days
AstraZeneca/Oxford (ChAdOx1 nCoV-19)	Two	4 to 12 weeks
Johnson & Johnson (Ad26.COV2.S)	One	6 weeks
Sputnik V (Gam-COVID-Vac)	Two	21 Days
Sinovac (CoronaVac)	Two	28 days
Novavax (NVXCoV2373)	Two	16 days

Source: Olu-Abiodun, et al. (2022).

COVID-19 Vaccinophobia and Vaccine Hesitance Related Factors in Nigeria

Vaccine hesitancy is described by the World Health Organization (WHO) as a "delay in acceptance or refusal of immunization notwithstanding the availability of vaccination services." (MacDonald, 2015) Vaccine apprehension is complex, context-dependent, and varies with time, place, and vaccine" (Samier, 2022). COVID-19 apprehension is not limited to African countries. According to the study from Murphy and colleagues (2021) on COVID-19 vaccine hesitancy in Ireland and the U K, both countries had similar rates of vaccine hesitancy (26 per cent and 25 per cent) and resistance (9 per cent and 6 per cent), with only 65 per cent of the Irish and 69 per cent of the UK populations fully willing to accept a COVID-19 vaccine, respectively. In addition, Malik, McFadden, Elharake, Ome, (2020) conducted a study in the United States and found that 33% of the population expressed vaccine hesitancy or resistance. According to the World Health Organization, people over the age of 18 are eligible for the COVID-19 vaccine. The vaccination is also appropriate for individuals who have hypertension, diabetes, asthma, as well as lung, liver, and renal disorders (WHO, 2022). Low COVID-19 vaccine acceptance rates have been recorded widely throughout the population, jeopardizing the world's ability to contain the COVID-19 pandemic, regardless of vaccination status. The first, second, and third waves of the COVID-19 pandemic have all hit Nigeria. During these pandemic waves, the prevalence of COVID-19 cases and deaths was

high in Nigeria, with approximately 265,741 cases as of October 10, 2022 (NCDC, 2022), and Nigeria has only been able to vaccinate 17.7 per cent of the Nigerian population (NDCPA, 2022).

The presence of vaccine hesitancy could explain the low vaccination rate to a great extent. It is vital to emphasize that, despite public efforts, many people do not believe COVID-19 exists, while others consider vaccination a political corruption tool. Despite the availability of the COVID-19 vaccine in Nigeria, Nigerians' opinions of the virus have influenced its acceptability. Aside from the assumption that vaccines are political, many individuals in Nigeria have phobias of injection pain and consulted misinformed online platforms like social media such as Facebook, Twitter, and Instagram. The vaccine has been labeled as the "mark of the beast" among Christians (Ogunrayi, 2022; Thomas and Zhang, 2020). As a result of unfavorable experiences and a loss of public trust, this has dealt with very disruptive vaccine hesitation and refusal.

Vaccine apprehension has been a critical impediment to combating the pandemic. Rumors inspired vaccine fear that vaccines were dangerous and designed to regulate a religious sect's sterility. Furthermore, most Nigerian community members were concerned about the efficacy and safety of the COVID-19 vaccine, according to the Wonodi et al. (2021) study, due to documented side effects and worries regarding the vaccine's short development period.

Conclusion

This article makes a significant contribution to two main viewpoints in COVID-19 research: the global development of vaccines and the growing vaccine hesitancy, particularly in Nigeria. While vaccine development represents a monumental achievement in public health, particularly in the fight against infectious diseases such as COVID-19, The acceptance and use of the vaccine have sparked considerable debate and conflict, leading to widespread hesitancy. In Nigeria, this hesitancy has severely hindered the effectiveness of the COVID-19 vacination programme, with skepticism fueled by misinformation on the internet and religious beliefs. The implication of this hesitancy are profound, as it undermines national effort to achieve herd immunity, prolongs the combat of the pandemic, strains the health healthcare system and exacerbates socio-economic challenges. The study recommends targeted public health campaigns to counter misinformation, increased

engagement with religious and community leaders and efforts to ensure equitable vaccine distribution to address the vaccine hesitancy crisis.

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