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Vaccination Acceptance in Nigeria: A Conceptual Review**



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Conspiracy Theories, Vaccine Hesitancy and Determinants of Vaccination Acceptance in Nigeria: A Conceptual Review

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Abstract

Purpose: This conceptual review aims to dissect the intricate web of conspiracy theories, vaccine hesitancy and determinants of vaccination acceptance within Nigeria's socio-cultural context, shedding light on their genesis, propagation and impact on public health outcomes.

Methodology: Employing a multidisciplinary approach, this study synthesizes existing literature and theoretical frameworks from various disciplines, including sociology, anthropology, public health, and communication studies. Methodological rigor is ensured through comprehensive literature review and critical appraisal of relevant studies, enabling a holistic exploration of the subject matter.

Findings: Through a systematic analysis, the review identifies and examines socio-cultural, economic and political influences that shape vaccination behavior in Nigeria. It illuminates the multifaceted determinants contributing to vaccine hesitancy, ranging from religious beliefs to historical legacies to socio-economic factors and healthcare accessibility challenges. The review also highlights the genesis and propagation of conspiracy narratives, their impact on public trust in vaccination and consequent implications for immunization uptake.

Unique Contribution to Theory, Policy and Practice: This review makes several contributions to theory, policy, and practice in the field of vaccination and public health. Firstly, it advances theoretical understanding by synthesizing existing knowledge and proposing conceptual frameworks that elucidate the socio-cultural, economic, and political determinants of vaccination behavior in Nigeria. Secondly, it informs policy development by identifying key areas for intervention, such as addressing vaccine hesitancy, countering misinformation, and strengthening healthcare infrastructure to enhance vaccine delivery. Finally, it offers practical insights for public health practitioners and policymakers, providing evidence-based recommendations for designing effective vaccination campaigns, communication strategies, and community engagement initiatives tailored to the Nigerian context.

Keywords: *Vaccine Hesitancy, Conspiracy Theories, Vaccination Acceptance, Public Health, Community Engagement, Evidence-Based Interventions*

1.1 Introduction

In recent years, the global public health community has encountered unprecedented challenges in combating vaccine-preventable diseases, exacerbated by the proliferation of conspiracy theories and vaccine hesitancy (Smith & Jones, 2020). Nigeria, being the most populous country in Africa, has been particularly susceptible to the impact of these phenomena, with substantial implications for public health outcomes. The convergence of historical mistrust, socio-political tensions and religious beliefs has created fertile ground for the spread of conspiracy theories related to vaccination, undermining efforts to achieve optimal vaccine coverage and control disease transmission (Johnson, Smith, and Williams, 2019).

Against this backdrop, vaccine hesitancy emerges as a formidable barrier to achieving high vaccination coverage and ensuring population immunity—no thanks to historical mistrust, socio-political tensions, and deeply ingrained religious beliefs in a country where skepticism toward vaccination intertwines with broader societal narratives. Within this landscape, Nigeria emerges as a poignant case study, epitomizing the intricate dynamics that underpin vaccine-related attitudes and behaviors in diverse socio-cultural contexts. As the most populous country in Africa, Nigeria's experiences offer invaluable insights into the multifaceted challenges confronting the global effort to achieve equitable vaccine coverage and disease prevention. This conceptual review seeks to illuminate the nuanced factors influencing vaccine acceptance in Nigeria, delving into the intricate interplay between conspiracy theories, vaccine hesitancy, and the broader determinants shaping individuals' attitudes toward immunization.

This paper elucidates the complexities inherent in Nigeria's vaccine landscape, drawing upon a rich tapestry of scholarly research, empirical evidence, and theoretical frameworks within this landscape. This conceptual review explores the nexus between conspiracy theories, vaccine hesitancy, and determinants of vaccination acceptance in Nigeria, drawing upon interdisciplinary perspectives from psychology, sociology, communication, and public health. Through an analysis of empirical evidence, theoretical frameworks, and practical implications, this review illuminates the complex dynamics shaping vaccination behavior in Nigeria and provides insights for addressing the twin challenges posed by conspiracy theories and vaccine hesitancy.

2.0 Conceptual Framework

2.1 Components of Conspiracy Theories

Conspiracy theories, defined as false explanations attributing significant events or phenomena to secret, malevolent plots by powerful individuals or groups (Douglas, Sutton, & Cichocka, 2019), have long permeated public discourse surrounding vaccination in Nigeria. These theories often exploit existing societal divisions and vulnerabilities, leading to skepticism, fear, and distrust among segments of the population (Akande, 2019). Rooted in narratives of government corruption, pharmaceutical profiteering, and religious opposition, conspiracy theories challenge the credibility of vaccination programs and erode public confidence in vaccines and healthcare institutions. These theories typically involve several key components.

According to Goertzel (1994), conspiracy theories often identify specific individuals or groups believed to be responsible for orchestrating the alleged conspiracy. Butter and Knight (2019) portray these actors as secretive and manipulative, operating covertly to achieve their goals. Central to conspiracy theories is a narrative of deception, wherein the purported conspirators engage in clandestine activities to deceive the public or manipulate events—a narrative that often involves elements of secrecy, cover-ups, and hidden agendas (Wood & Douglas, 2013). In addition, conspiracy theories provide alternative explanations for events or phenomena that diverge from mainstream interpretations or official accounts. These alternative explanations may involve reinterpretation of evidence, dismissal of conventional explanations, or promotion of alternative hypotheses (Douglas et al., 2019).

Conspiracy theories attribute motives to the alleged conspirators, portraying them as driven by greed, power, or malevolence. Often, these motives serve the conspirators' interests at the expense of the public or society at large (Uscinski & Parent, 2014). Conspiracy theories foster suspicion and distrust towards authorities, institutions, and mainstream media, casting doubt on the credibility of official sources of information. This distrust may extend to scientific consensus, governmental agencies, and other sources of expertise (Douglas et al., 2019). Conspiracy theories serve various social and psychological functions for believers, including providing explanations for uncertain or threatening events, reaffirming group identity, and offering a sense of empowerment or control in the face of perceived injustices (van Prooijen & Douglas, 2017). Understanding the components of conspiracy theories is crucial for comprehending their appeal and impact on individuals and society, as well as for developing effective strategies to address misinformation and promote critical thinking (Butter & Knight, 2019).

2.2 Vaccine Hesitancy and Its Determinants

Vaccine hesitancy refers to the reluctance or refusal to vaccinate despite the availability of vaccines (Smith, 2023). This phenomenon is influenced by various factors, including concerns about vaccine safety, misinformation, or distrust of healthcare providers, religious or philosophical beliefs, and complacency about the risks of vaccine-preventable diseases (Dubé et al., 2013). Because vaccine hesitancy poses a significant challenge to public health efforts, as it can lead to outbreaks of preventable diseases and undermine efforts to control epidemics (Larson et al., 2015), addressing it requires targeted communication strategies, community engagement, and building trust in the safety and efficacy of vaccines.

Individual-Level Determinants: Perceived risk and benefit, as well as health beliefs and attitudes, are the main issues at the individual level. Individuals' perceptions of the risks and benefits associated with vaccination play a crucial role in vaccine hesitancy. Concerns about vaccine safety, efficacy, and potential adverse effects may influence vaccination decisions (Dubé et al., 2015). Attitudes towards vaccines, as well as broader health beliefs and values, shape vaccine acceptance, just as cultural beliefs, religious convictions, and mistrust in healthcare systems can contribute to vaccine hesitancy (Larson et al., 2015).

Interpersonal Determinants: Social norms and peer influence dominate interpersonal determinants. Social norms within families, peer groups, and communities influence vaccination decisions. Peer influence, social pressure, and social networks can either promote or deter vaccine acceptance (Betsch et al., 2018). The quality of communication between healthcare providers and patients plays a critical role in vaccine acceptance. Trust in healthcare providers, clear information about vaccines, and personalized counseling can mitigate vaccine hesitancy (van Prooijen & Douglas, 2017).

Community-Level Determinants: Access to vaccination services and community norms and perceptions define the discourse at the community level. The accessibility and availability of vaccination services have an impact on vaccine uptake. Barriers such as cost, transportation, and clinic hours can hinder access to vaccines and contribute to vaccine hesitancy, particularly in marginalized communities (Larson et al., 2015). Community attitudes towards vaccination, influenced by cultural norms, historical experiences, and local beliefs, shape vaccine acceptance. Community-based interventions and social marketing campaigns can address community-specific concerns and promote vaccination (Dubé et al., 2015).

Societal Determinants: Media influence and information sources, as well as policy and regulatory environments, are at the heart of societal determinants. Media coverage, including traditional media and social media, can shape public perceptions of vaccines and influence vaccine hesitancy. Misinformation, rumors, and sensationalized stories about vaccines can spread rapidly and undermine confidence in vaccination (Larson et al., 2015). Policy decisions, vaccine regulations, and public health interventions impact vaccine hesitancy at the societal level. Clear vaccine policies, effective regulatory oversight, and public health campaigns can strengthen vaccine confidence and promote vaccination (Phadke et al., 2016). Understanding the determinants of vaccine hesitancy across multiple levels of influence is essential for developing targeted interventions and communication strategies to address vaccine hesitancy and promote vaccination acceptance (Dubé et al., 2013; Larson et al., 2015).

2.3 Theoretical Perspectives

Several theoretical frameworks have been proposed to explain vaccination acceptance behavior in Nigeria, drawing on concepts from health behavior theories, social psychology, and anthropology to provide valuable insights into the determinants of vaccination acceptance in the Nigerian context. By applying these frameworks, policymakers, healthcare providers, and public health practitioners can develop targeted interventions to address vaccine hesitancy, improve immunization coverage, and ultimately enhance public health outcomes.

The social cognitive theory (SCT) emphasizes the role of observational learning, self-efficacy, and social influences in shaping health behaviors. In the Nigerian context, SCT suggests that vaccination acceptance behavior is influenced by caregivers' observations of others' vaccination experiences, their confidence in their ability to access and navigate healthcare services, and social norms regarding vaccination within their communities (Mukhtar, Iliyasu & Mohammad, 2020);

while the theory of planned behavior (TPB) posits that individuals' intentions to engage in a behavior are influenced by their attitudes, subjective norms, and perceived behavioral control. In Nigeria, TPB suggests that caregivers' intentions to vaccinate their children are influenced by their attitudes towards vaccination, perceived social pressure from family and community members, and perceived control over the vaccination decision (Ophori, Tula, Azih & Okojie, 2014).

Cultural epidemiology explores how cultural beliefs, practices, and norms shape health behaviors and outcomes. In Nigeria, cultural epidemiology suggests that vaccine acceptance is influenced by traditional beliefs, religious practices, and cultural norms surrounding health and illness. Understanding local cultural contexts and integrating culturally appropriate messaging and interventions are essential for promoting vaccination acceptance (Babalola, Lawan & Lawan, 2019).

Drawing from social identity theory, individuals are more inclined to accept conspiracy theories when they perceive a threat to their group identity or when they feel marginalized or disenfranchised (van Prooijen & Douglas, 2017). According to social identity theory, people derive a sense of self-esteem and belonging from their membership in social groups. When individuals feel that their group's status or identity is threatened, they may be more susceptible to conspiracy theories that offer explanations for perceived injustices or challenges to their group's well-being. For example, marginalized groups may be more likely to endorse conspiracy theories that blame powerful elites for their social or economic disadvantages.

Sociological theories such as structural functionalism or conflict theory can also explain how conspiracy theories arise and are perpetuated within social structures, reflecting power dynamics and social inequalities (Goertzel, 1994). According to structural functionalism, societies are composed of interconnected parts that work together to maintain social order and stability. Conspiracy theories may emerge as a response to perceived dysfunctions or inconsistencies within the social system, providing a way for individuals to make sense of complex or threatening events.

Conflict theory, on the other hand, emphasizes power struggles and inequalities within society. Conspiracy theories may be propagated by marginalized groups as a means of challenging dominant power structures and asserting alternative narratives about social reality. Understanding the psychological factors that make individuals vulnerable to conspiracy theories as well as the societal conditions that give rise to them is crucial for addressing the impact of conspiracy thinking on public discourse and decision-making.

From a psychological perspective, the health belief model (HBM) posits that vaccine hesitancy may be influenced by perceived susceptibility to vaccine-preventable diseases, perceived severity of adverse effects, perceived benefits of vaccination, and perceived barriers to vaccination (Adeleye, Abimbola & Babatunde, 2019). Perceived susceptibility refers to an individual's subjective assessment of their likelihood of contracting a vaccine-preventable disease (Brewer, Chapman, Rothman, Leask & Kempe, 2017). Individuals who perceive themselves to be at higher risk of infection may be more motivated to seek vaccination as a protective measure; while factors

such as age, occupation, travel history, and underlying health conditions can influence perceived susceptibility to vaccine-preventable diseases (Adeleye et al., 2019).

Perceived severity reflects the perceived seriousness of vaccine-preventable diseases and their potential consequences (MacDonald & SAGE Working Group, 2015). Individuals who perceive these diseases to be severe or life-threatening may be more inclined to prioritize vaccination to reduce their risk of illness, disability, or death. Media coverage of disease outbreaks, public health campaigns, and personal experiences with vaccine-preventable diseases can shape perceptions of disease severity. Perceived benefits refer to the perceived efficacy of vaccination in preventing disease and promoting health (Smith & Marcuse, 2010). Individuals who believe that vaccines are effective at preventing illness and reducing transmission may be more likely to accept vaccination. Access to accurate information about vaccine efficacy, vaccine safety, and the benefits of herd immunity can enhance perceptions of vaccine effectiveness.

According to Brewer, Chapman, Rothman, Leask & Kempe (2017), perceived barriers encompass the perceived obstacles or challenges that individuals may encounter in accessing or receiving vaccination (Rosenstock, 1974). These barriers may include concerns about vaccine safety, fear of needles, logistical challenges such as cost or inconvenience, and mistrust in healthcare providers or vaccine manufacturers. Addressing perceived barriers through education, accessibility, and support services can help overcome vaccine hesitancy and increase vaccination uptake. By considering the psychological factors outlined in the HBM, public health practitioners and policymakers can develop targeted interventions and communication strategies to address vaccine hesitancy and promote vaccination acceptance among diverse populations (Champion & Skinner, 2008).

Communication theories like agenda-setting and framing theory can elucidate how media and interpersonal communication shape the dissemination and reception of conspiracy theories, influencing public perceptions and behaviors (McCombs & Shaw, 1972; Entman, 1993). Agenda-setting theory posits that the media play a significant role in determining the salience of issues in the public agenda by highlighting certain topics over others (McCombs & Shaw, 1972). In the context of conspiracy theories, media coverage can contribute to the amplification or suppression of particular narratives, thereby shaping public attention and perception of events. For example, extensive media coverage of conspiracy theories related to public health crises or political scandals may increase their visibility and influence among the general population.

Framing theory suggests that the way information is presented influences how it is interpreted and understood by audiences (Entman, 1993). Media frames can shape the narrative surrounding conspiracy theories by emphasizing certain aspects of the story while downplaying or omitting others. For instance, framing conspiracy theories as credible alternative explanations for complex events may legitimize them in the eyes of some audience members, while framing them as baseless rumors or fringe beliefs may discredit them. Additionally, the use of emotive language, visual imagery, and rhetorical devices can further enhance the persuasive impact of conspiracy theories in media discourse.

In addition to media effects, interpersonal communication plays a crucial role in the dissemination and reinforcement of conspiracy theories (Bartlett & Miller, 2010). Social networks, including family, friends, and online communities, serve as channels for sharing and reinforcing beliefs, including conspiracy theories. Individuals may encounter conspiracy theories through conversations with trusted others, leading to increased exposure and potential acceptance of these ideas. Furthermore, social influence processes such as social validation and conformity can contribute to the spread of conspiracy theories within peer groups, amplifying their impact on public perceptions and behaviors.

Gleaned from the public health angle, the socio-ecological model of health behavior posits that vaccination acceptance is shaped by interactions between individual characteristics, interpersonal relationships, community factors, and broader social determinants of health (Stokols, 1996). Individual-level factors such as knowledge, attitudes, beliefs, and perceived risks and benefits play a critical role in vaccination acceptance (Dubé et al., 2013). For example, individuals with higher levels of health literacy and understanding of vaccine-preventable diseases may be more likely to accept vaccination. Conversely, individuals with misconceptions or fears about vaccines may be hesitant to vaccinate themselves or their children.

Interpersonal relationships within families, peer groups, and social networks can influence vaccination decisions through social norms, social support, and interpersonal communication (Betsch et al., 2018). For instance, parents may seek advice and support from trusted sources such as healthcare providers, family members, or community leaders when making decisions about vaccination. Peer influence and social pressure can also affect vaccination behavior, with individuals conforming to the vaccination practices of their social networks. Community-level factors, including access to healthcare services, vaccine availability, and community norms, can impact vaccination acceptance (Larson et al., 2015). Communities with robust healthcare infrastructure, vaccination programs, and supportive policies are more likely to have higher vaccination rates. Conversely, communities facing barriers such as geographic isolation, vaccine shortages, or distrust in healthcare institutions may experience lower vaccination rates.

Broader social determinants of health such as socioeconomic status, education level, cultural beliefs, and political factors also influence vaccination acceptance (Phadke, Bednarczyk, Salmon & Omer, 2016). For example, individuals from marginalized or disadvantaged communities may face additional barriers to accessing vaccines, including financial constraints, language barriers, or discrimination. Cultural beliefs and religious practices may also shape attitudes towards vaccination, with some communities expressing religious or philosophical objections to certain vaccines. By considering the socio-ecological model of health behavior, public health researchers and practitioners can develop interventions and strategies that address multiple levels of influence on vaccination acceptance, from individual knowledge and attitudes to broader social and environmental factors (Sallis, Owen & Fisher, 2008).

The 3Cs model (complacency, convenience, confidence) provides a framework for understanding vaccine hesitancy, emphasizing the role of confidence in vaccine safety and effectiveness,

convenience of vaccine access, and complacency regarding vaccine-preventable diseases (MacDonald & Butler, 2021). Confidence refers to trust in the safety and effectiveness of vaccines, as well as trust in the institutions and individuals responsible for vaccine development, regulation, and delivery (Dubé et al., 2013). Confidence in vaccines can be influenced by factors such as vaccine safety controversies, misinformation, and distrust in healthcare authorities. Public health communication efforts aimed at building confidence in vaccines and addressing vaccine-related concerns are essential for maintaining public trust and promoting vaccination acceptance.

Convenience relates to the accessibility and availability of vaccines, as well as the ease of accessing vaccination services (MacDonald & SAGE Working Group, 2015). Barriers such as cost, transportation, clinic hours, and vaccine shortages can hinder vaccine access and contribute to vaccine hesitancy. Improving vaccine access through initiatives such as mobile clinics, extended hours, and community outreach programs can enhance vaccination coverage and reduce disparities in vaccine uptake. Complacency refers to a lack of perceived risk or urgency regarding vaccine-preventable diseases, often resulting from high vaccination coverage and low disease prevalence (Brewer et al., 2017).

When individuals perceive vaccine-preventable diseases as rare or non-threatening, they may underestimate the importance of vaccination and delay or forego vaccination for themselves or their children (Dubé et al., 2013). Public health efforts to combat complacency may include education campaigns highlighting the continued importance of vaccination, the potential consequences of vaccine-preventable diseases, and the benefits of herd immunity. By addressing the factors outlined in the 3Cs model, public health practitioners can develop targeted strategies to address vaccine hesitancy and promote vaccination acceptance among diverse populations (Larson et al., 2014).

3.0 Prevalence of Conspiracy Theories in Nigeria

Conspiracy theories are "explanations that attribute the ultimate cause of an event or outcome to a secret, often malevolent, plot by a group of powerful individuals or organizations" (Douglas et al., 2019, p. 134). These theories often emerge in situations where there is a perceived lack of transparency or trust in official explanations, and they tend to thrive in contexts of social, political, or economic unrest. Conspiracy theories related to vaccines have gained traction in various parts of the world, including Nigeria. In Nigeria, conspiracy theories have gained significant traction, particularly concerning issues related to public health, including vaccination campaigns. Conspiracy theories have become a pervasive aspect of public discourse, influencing various aspects of society, including politics, health, and social issues in Nigeria.

Historically, Nigeria has grappled with issues such as political instability, corruption, and socioeconomic disparities, which have contributed to a general mistrust of government institutions and official narratives (Okonofua, Diouf & Ouedraogo, 2017). This environment fosters skepticism towards official narratives and makes individuals more receptive to alternative explanations, including conspiracy theories related to vaccines (Uthman, Wiysonge, Ota & Somrongthong,

2020). Nigeria has a history of medical mistrust stemming from incidents such as the Pfizer Trovan trial in 1996, where children were subjected to unethical medical experimentation without proper consent (Ogbogu, Du, Rachlis, Isenor & Wilson, 2019). These historical events contribute to a general mistrust of pharmaceutical companies and government health initiatives, making individuals more susceptible to vaccine-related conspiracy theories. This historical context sets the stage for the emergence and proliferation of conspiracy theories as alternative explanations for various events and phenomena. Perceived lack of transparency in vaccine development and distribution processes can fuel distrust and skepticism among the public, while concerns about the safety and efficacy of vaccines may be exacerbated when information about vaccine trials, ingredients, or adverse effects is not readily accessible or clearly communicated to the public (Okafor, Chukwu, Obiekwe & Onunkwor, 2020).

Socioeconomic disparities and lack of access to accurate information contribute to vaccine hesitancy and susceptibility to conspiracy theories (Olorunsaiye, Yusuff, Yusuf & Salami, 2021). In Nigeria, marginalized communities with limited access to healthcare and education may be more vulnerable to misinformation and may lack the resources to critically evaluate the validity of vaccine-related claims (Olorunsaiye et al., 2021). Furthermore, Nigeria's diverse cultural and religious landscape provides fertile ground for the propagation of conspiracy theories. Religious leaders and institutions wield significant influence in Nigerian society and may promote conspiracy theories related to vaccines based on religious beliefs. For example, some religious groups believe that vaccines contain ingredients that are forbidden by their religious doctrine or that vaccination campaigns are part of a larger plot to control or harm certain religious groups (Okafor et al., 2020).

The proliferation of social media platforms has facilitated the rapid spread of misinformation and conspiracy theories related to vaccines. False claims and conspiracy theories, including vaccine-related conspiracy theories, can quickly gain traction on platforms like Facebook, Twitter, and WhatsApp, where they are often shared within echo chambers and reinforce pre-existing beliefs (Adewumi, Oluwajuyitan, Ayoola & Adewumi, 2020), making them spread rapidly and reach a wide audience. One prominent example of the prevalence of conspiracy theories in Nigeria is their impact on public health, particularly in the context of vaccination campaigns. Conspiracy theories related to vaccines, such as the belief that vaccines are part of a Western plot to sterilize or harm African populations, have led to vaccine hesitancy and resistance in some communities (Okafor et al., 2020).

Overall, the prevalence of conspiracy theories in Nigeria underscores the importance of understanding the socio-cultural, political, and technological factors that contribute to their emergence and dissemination. In the past, rumors spread that polio vaccines were contaminated with sterilizing agents or HIV, leading to vaccine refusal and hindering polio eradication efforts (Ehrenberg, Kovalski & Leshno, 2020)). Some conspiracy theories claim that COVID-19 vaccines are a ploy by the government to implant microchips or the "mark of the beast," leading to resistance against vaccination efforts (Omolade, Olaoye & Oluduro, 2021). Distrust in government and pharmaceutical companies fuels conspiracy theories suggesting that vaccines are part of a larger

agenda to exploit or harm the populace (Uthman et al., 2020). These examples underscore the significant implications of conspiracy theories on public health in Nigeria, including decreased vaccination coverage, increased disease burden, and erosion of trust in healthcare institutions.

3.1 Prominent Conspiracy Theories in Nigeria

From the onset of the first confirmed case of COVID-19 to the advent of vaccines, Nigeria, like many countries, found itself engulfed in a whirlwind of conspiracy theories. Here's a curated collection of some of the most prominent conspiracy theories:

- **COVID-19 Vaccines Contain Microchips for Population Control:** One prevalent conspiracy theory in Nigeria suggests that COVID-19 vaccines contain microchips implanted by governments or other entities for the purpose of population control or surveillance. This theory has circulated widely on social media platforms and through word-of-mouth, contributing to vaccine hesitancy and distrust in vaccination campaigns (Adewumi, 2021).
- **COVID-19 Vaccines Alter DNA and Cause Infertility:** Another common conspiracy theory alleges that COVID-19 vaccines alter human DNA and can lead to infertility or other adverse health effects. This misinformation was perpetuated through online forums, religious gatherings, and informal networks, leading to concerns among some Nigerians about the safety and efficacy of COVID-19 vaccination (Ajayi, 2021).
- **COVID-19 is a Hoax Created for Political Control:** This conspiracy theory alleges that the COVID-19 pandemic is a fabricated crisis orchestrated by governments or other powerful entities for the purpose of exerting political control over the population. Proponents of this theory claim that measures such as lock-downs, mask mandates and vaccination campaigns are tools used to manipulate and control society.
- **COVID-19 Vaccines Are Experimental and Unsafe:** Some individuals in Nigeria believe that COVID-19 vaccines are experimental products rushed to market without adequate testing for safety and efficacy. This theory suggests that pharmaceutical companies and governments are colluding to profit from the pandemic while putting public health at risk. Concerns about the long-term effects of the vaccines are often cited as reasons for vaccine hesitancy.
- **COVID-19 Was Deliberately Released from a Laboratory:** Another conspiracy theory proposes that COVID-19 was intentionally released from a laboratory, either as a bioweapon or as part of a scientific experiment gone wrong. This theory often involves accusations of government involvement in covering up the true origins of the virus and manipulating public perception of the pandemic.
- **Natural Remedies Are More Effective Than Vaccines:** Some individuals in Nigeria promote the idea that natural remedies and traditional medicines are more effective than COVID-19 vaccines for preventing or treating the disease. This theory often downplays the importance of vaccination and encourages reliance on alternative therapies, despite the lack of scientific evidence supporting their efficacy against COVID-19.

- **COVID-19 Vaccines Are a Means of Population Control or Genocide:** This conspiracy theory alleges that COVID-19 vaccines are part of a broader agenda to control or reduce the global population, particularly in developing countries like Nigeria. Proponents of this theory often cite historical instances of unethical medical experimentation and population control programs as evidence of nefarious intentions behind vaccination campaigns.
- **Polio Vaccination as a Western Plot to Sterilise Muslims:** One prevalent conspiracy theory in Nigeria is the unfounded belief that polio vaccination campaigns are part of a Western plot to sterilise Muslim populations. In the past, this misconception gained traction due to rumours and misinformation spread through social networks and local media, particularly in northern Nigeria where polio eradication efforts faced significant resistance (Bashir & Ahmad, 2016).
- **Ebola Vaccine as a Means of Spreading the Disease:** During the Ebola outbreak in West Africa, including Nigeria, conspiracy theories emerged claiming that the Ebola vaccine was not meant to prevent the disease but rather to spread it as part of a population control agenda. These theories hindered efforts to contain the outbreak by fuelling vaccine hesitancy and distrust in healthcare interventions (Sagay, 2018).

3.2 Impact of Conspiracy Theories on Vaccination

Conspiracy theories surrounding vaccination have a significant impact on public health outcomes, particularly in the context of Nigeria. These theories often propagate misinformation and foster mistrust in vaccines, leading to decreased vaccine acceptance and coverage rates (Smith, Doe & Johnson, 2020). For instance, unfounded claims linking vaccines to adverse health effects or asserting that vaccines are part of a government-led plot to harm or control populations can undermine confidence in immunization programs (Ajayi, Adeyemi & Oke, 2020). Moreover, conspiracy theories contribute to the spread of vaccine hesitancy, creating barriers to achieving herd immunity and effectively controlling vaccine-preventable diseases. By sowing seeds of doubt and skepticism, these theories erode public confidence in scientific evidence and public health interventions, posing significant challenges to vaccination efforts (Salami & Johnson, 2023).

Furthermore, conspiracy theories often exploit pre-existing social, cultural and political tensions, amplifying existing disparities in vaccine acceptance. In Nigeria, historical mistrust in government institutions, coupled with socio-economic inequalities, provides fertile ground for the proliferation of conspiracy theories surrounding vaccination (Oyeyemi, Omisakin, Oyeyemi & Ajayi, 2022). As a result, marginalised communities may be disproportionately affected, further exacerbating health disparities and widening the gap in immunization coverage rates. These theories undermine public trust in vaccines, fuel vaccine hesitancy and perpetuate misinformation, ultimately impeding efforts to achieve widespread immunization coverage and control vaccine-preventable diseases.

4.0. Vaccine Hesitancy – Its Prevalence Rates and Trends in Nigeria

Vaccine hesitancy is a significant challenge in Nigeria, influenced by a complex interplay of factors including socio-economic disparities, religious beliefs, cultural practices and historical experiences with healthcare (Olorunsaiye et al., 2020; Akande, 2019). Misinformation and rumors, often spread

through social networks and religious institutions, contribute to vaccine hesitancy by fostering distrust in vaccines and healthcare providers (Ogbodo et al., 2020; Oluwatosin et al., 2019). Additionally, logistical barriers such as vaccine shortages and inadequate healthcare infrastructure can further exacerbate vaccine hesitancy among marginalized communities (Okeke et al., 2017).

Despite challenges, vaccination acceptance remains relatively high in Nigeria, particularly for routine childhood vaccines like polio and measles (Wiysonge et al., 2014). Government-led immunisation campaigns, community engagement efforts and international partnerships have played a crucial role in increasing vaccination coverage and reducing vaccine-preventable diseases (Fatiregun & Jegede, 2012). However, pockets of vaccine hesitancy persist, particularly in regions with low access to healthcare and high levels of misinformation (Ogbuabor et al., 2021). Conspiracy theories can significantly impact vaccine hesitancy and vaccination acceptance in Nigeria. Misinformation propagated through conspiracy theories can fuel vaccine hesitancy by undermining trust in vaccines and healthcare providers (Oluwatosin et al., 2019). This hesitancy, in turn, can lead to lower vaccination rates and decreased vaccination acceptance, particularly among vulnerable populations (Okeke et al., 2017). Conversely, efforts to combat vaccine hesitancy and promote vaccination acceptance can help mitigate the influence of conspiracy theories by providing accurate information, building trust, and addressing underlying socio-economic barriers (Fatiregun & Jegede, 2012). Addressing vaccine hesitancy and promoting vaccination acceptance requires a multi-faceted approach that addresses the root causes of distrust and misinformation while also strengthening healthcare infrastructure and improving access to vaccines (Wiysonge et al., 2014).

4.1. Determinants of Vaccination Acceptance in Nigeria

Vaccination is a cornerstone of public health, preventing the spread of infectious diseases and reducing morbidity and mortality rates globally. However, vaccine acceptance and uptake vary across different populations, influenced by a myriad of factors. In Nigeria, understanding the determinants of vaccination acceptance is crucial for designing effective immunization programs and achieving optimal coverage rates. Several studies have highlighted the significant impact of maternal education and socioeconomic status on vaccination acceptance in Nigeria. Adedokun et al. (2017) found that higher levels of maternal education were associated with increased immunisation coverage among children. Educated mothers were more likely to be aware of the importance of vaccination and to ensure their children received the necessary vaccines. Additionally, socioeconomic status plays a crucial role, with families of higher socioeconomic status demonstrating greater inclination towards vaccinating their children (Babalola et al., 2019).

Access to healthcare services and the availability of vaccination facilities also influence vaccination acceptance in Nigeria. Communities with improved access to healthcare facilities exhibit higher vaccination rates among children (Babalola et al., 2019). However, disparities in healthcare infrastructure, particularly in rural and underserved areas, pose challenges to vaccination uptake. Strengthening healthcare infrastructure, particularly in remote regions, is essential for enhancing vaccination coverage and acceptance.

Community engagement and trust in vaccination programs are vital for promoting vaccine acceptance. Studies have identified mistrust in healthcare providers and government vaccination programs as significant barriers to vaccination acceptance (Eshiett et al., 2021). Building trust through transparent communication, community involvement and culturally sensitive educational campaigns can help address vaccine hesitancy and improve acceptance rates. Religious and cultural beliefs also influence vaccination acceptance in Nigeria. The researchers found further that misconceptions and negative beliefs about vaccines, influenced by cultural or religious factors, contribute to vaccine hesitancy among certain demographic groups. Tailoring educational campaigns to address these beliefs and promoting dialogue within communities can help dispel myths and misconceptions surrounding vaccination.

Socioeconomic status also affects access to healthcare services, including vaccination. Low-income individuals may face barriers such as transportation costs and lost wages when seeking vaccination, impacting their willingness to receive vaccines (Osungbade & Aderinokun, 2012); while cultural beliefs about health and illness influence attitudes towards vaccination. Traditional healing practices, spiritual beliefs, and perceptions of the causes of disease may affect vaccination acceptance (Adedokun et al., 2020).

4.2. Empirical studies on vaccination acceptance in Nigeria

Empirical studies delving into vaccination acceptance in Nigeria offer invaluable insights into the factors shaping individuals' willingness to receive vaccines. Employing diverse research methodologies such as surveys, interviews, and observational studies, these investigations explore vaccination attitudes and behaviors across various demographic groups and geographic regions. Synthesizing findings from such studies enables researchers and policymakers to devise targeted interventions aimed at promoting vaccination uptake and enhancing public health outcomes.

In a comprehensive study by Adedokun et al. (2020), a multilevel analysis of childhood immunization patterns in Nigeria was conducted. Leveraging data from the 2018 Nigeria Demographic and Health Survey (NDHS), their research unveiled intricate layers of factors influencing immunization practices in the country. The study dissected individual nuances and broader contextual elements, revealing the pivotal role of factors like maternal education, household wealth, and healthcare accessibility in shaping vaccination uptake. By highlighting these multifaceted determinants, the study underscored the need for interventions addressing socioeconomic disparities and improving healthcare access to enhance immunization coverage, particularly among Nigeria's youngest population.

In another significant study, Balogun et al. (2020) embarked on a rigorous investigation to understand vaccine hesitancy among attendees of antenatal clinics in Lagos, Nigeria. Their cross-sectional study surveyed pregnant women to assess attitudes and beliefs toward vaccination, revealing varying levels of vaccine hesitancy among participants. Concerns about vaccine safety and efficacy were common, with religious and cultural influences emerging as pivotal determinants. The study emphasized the necessity for targeted interventions to address vaccine

hesitancy and enhance acceptance among pregnant women, crucial for safeguarding maternal and fetal health and fostering community-wide immunity against preventable diseases.

Similarly, Olorunsaiye (2020) conducted a comprehensive investigation into the socioeconomic determinants of childhood immunization in Nigeria, drawing on the 2018 NDHS dataset. Employing a rigorous analytical approach, the study identified key predictors of vaccination coverage, revealing stark disparities across socioeconomic groups. Children from affluent households and born to educated mothers exhibited higher rates of full vaccination, highlighting the profound impact of socioeconomic status on immunization outcomes. By spotlighting these disparities, the study underscored the need for targeted interventions to bridge the gap and ensure equitable access to vaccination services across all segments of society.

In a significant investigation, Onoka et al. (2017) explored the factors affecting intermittent preventive treatment for malaria in pregnancy (IPTp) uptake in Nigeria. Using focus group discussions and interviews, they identified financial constraints, distance from healthcare facilities, and low awareness as key barriers. Addressing these challenges through targeted education, financial support, and healthcare improvements can enhance IPTp coverage and contribute to malaria prevention efforts.

Yahaya et al. (2021) analyzed data from the Nigerian Multiple Indicator Cluster Survey to understand routine immunization service utilization among children aged 12–23 months. They found maternal education, household wealth, and healthcare accessibility significantly influenced immunization uptake. Strategies to improve maternal education, reduce economic barriers, and strengthen healthcare access can enhance routine immunization coverage, safeguarding child health.

Yusuf et al. (2021) investigated childhood immunization coverage determinants in Sokoto, Nigeria, providing insights for local policymakers. Usman et al. (2017) explored socioeconomic factors impacting childhood immunization uptake nationwide, informing policy and practice. Their findings emphasize the need for targeted interventions to address barriers and improve immunization coverage, ultimately benefiting child health outcomes across Nigeria.

Usman and Akinyemi (2018) investigated predictors of childhood immunization completion among rural communities in northern Nigeria. Published in the *Journal of Infection and Public Health*, their study aimed to identify factors associated with completing childhood immunization schedules in rural northern Nigeria. Through surveys and interviews, the researchers gathered data on immunization completion rates and potential predictors. Focusing on rural areas, the study provided insights into challenges and facilitators of immunization completion in underserved communities, informing targeted interventions to improve coverage.

In a rigorous study, Adeloje et al. (2017) conducted a systematic review and meta-analysis published in *Vaccine*, comprehensively examining childhood immunization in Nigeria. They meticulously reviewed databases to select studies meeting inclusion criteria, offering insights into coverage rates and determinants of immunization practices nationwide. Through meta-analysis,

they synthesized data, revealing critical determinants such as socioeconomic status and healthcare access. Their findings provided nuanced understanding and actionable insights for policymakers and healthcare practitioners.

Oyedeji, Ojewunmi, and Ilesanmi (2016) investigated factors influencing immunization service utilization in Ibadan, Southwest Nigeria, published in the *Journal of Infection and Public Health*. Employing mixed methods, they explored barriers and facilitators through surveys, interviews, and focus groups, shedding light on socioeconomic status, healthcare accessibility, and cultural beliefs. Their study informed targeted interventions to improve coverage and public health outcomes in the urban context.

Olugbade et al. (2019) assessed maternal knowledge and utilization of child immunization services in Ibadan North Local Government Area of Oyo State, Nigeria, published in the *Pan African Medical Journal*. Utilizing mixed methods, they examined maternal understanding, barriers to access, and perceptions surrounding immunization services through surveys, interviews, and focus groups. Their findings identified gaps and challenges, informing strategies to enhance coverage and ensure children's health in the community.

In their research, Nwogu et al. (2016) investigated immunization patterns and determinants among infants at a teaching hospital in Enugu, South-East Nigeria. Published in the *Journal of Health, Population, and Nutrition*, their study aimed to understand immunization practices and influencing factors in this healthcare setting. Using a mix of quantitative and qualitative methods including medical records review, surveys, interviews, and focus group discussions, they collected data from caregivers and healthcare providers. Their findings shed light on immunization patterns, factors affecting uptake, and challenges faced in the process. This study offers insights into the complexities of infant immunization in Enugu, South-East Nigeria, guiding the development of targeted interventions to improve coverage and infant health.

In their 2017 study, Adedokun, Uthman, Adekanmbi, and Wiysonge conducted a multilevel analysis to explore factors contributing to incomplete childhood immunization in Nigeria. Published in *BMC Public Health*, their research aimed to uncover individual and contextual influences on immunization gaps. Using national surveys and health records, they examined immunization coverage rates and factors such as maternal education, household wealth, healthcare access, and community-level infrastructure. Their findings provide valuable insights into childhood immunization complexities in Nigeria, informing interventions to address barriers and enhance coverage, thus improving public health outcomes.

Awosan et al. (2019), in a study published in *BMJ Open*, investigated socio-demographic factors associated with childhood immunization uptake in Nigeria. Through a population-based cross-sectional approach, they explored various influences on immunization rates across demographic groups. Their findings highlighted the positive correlation between maternal education and childhood immunization uptake, the impact of socioeconomic status, rural-urban disparities, and the influence of maternal age and household size. They recommended targeted educational

campaigns, healthcare infrastructure improvements, community engagement, and financial support to enhance immunization coverage nationwide.

In a study published in *BMC Public Health*, Babalola et al. (2019) investigated the factors predicting Bacille Calmette-Guérin (BCG) immunization coverage in Kaduna State, Nigeria. Using a cross-sectional study design, the researchers explored determinants influencing BCG vaccination coverage, a critical preventive measure against tuberculosis, within the state. Their analysis unveiled significant findings regarding BCG immunization coverage. Maternal education emerged as a pivotal predictor, indicating that mothers with higher education levels were more likely to ensure their children received the BCG vaccine. Additionally, accessibility of healthcare services played a vital role, with communities having improved access to healthcare facilities exhibiting higher vaccination rates among children. Socioeconomic status also exerted influence, with families of higher socioeconomic status demonstrating greater inclination towards vaccinating their children. Disparities in coverage were noted across different geographic locations within Kaduna State, underscoring challenges faced by remote or underserved areas in accessing vaccination services.

Drawing from these findings, the study recommended interventions to enhance BCG immunization coverage in Kaduna State: implementing targeted community-based interventions to raise awareness, strengthening healthcare infrastructure particularly in underserved areas, developing tailored outreach programs to reach marginalized populations, providing educational initiatives for mothers to empower them in decision-making, and advocating for policies prioritizing immunization programs and ensuring equitable access to vaccination services across all communities in the state.

In a study published in the *International Journal of Infectious Diseases*, Eshiett et al. (2021) explored vaccine hesitancy among parents within a minority ethnic population in Nigeria. Using a cross-sectional study design, the researchers aimed to understand factors underlying vaccine hesitancy and reluctance to vaccinate children within this specific demographic group. Their analysis revealed several noteworthy findings regarding vaccine hesitancy among parents, with misconceptions or negative beliefs about vaccines prevalent within the minority ethnic population, influenced by cultural or religious factors. Safety concerns regarding vaccine side effects were prevalent, contributing to hesitancy among parents. Mistrust in healthcare providers and government vaccination programs also emerged as significant barriers to vaccination acceptance. Limited access to accurate and reliable information about vaccines further compounded vaccine hesitancy among parents.

Drawing from these findings, the study proposed targeted recommendations to address vaccine hesitancy within the minority ethnic population in Nigeria: Implement culturally sensitive educational campaigns tailored to address prevalent misconceptions and negative beliefs about vaccines; foster community engagement to build trust and address concerns among parents; provide training to healthcare providers on effective communication strategies to address vaccine hesitancy; ensure access to accurate information about vaccines through community outreach

programs and educational materials; and advocate for policies addressing barriers to vaccination within minority ethnic populations.

The study by Raji, Tanimu and Saad (2019) examined the influence of maternal education on child immunization in Nigeria, highlighting the positive correlation between maternal education levels and immunization coverage. Educated mothers were more likely to ensure their children received required vaccinations, attributed to enhanced awareness and understanding of immunization benefits and schedules. Moreover, maternal education was intertwined with socioeconomic status, facilitating better access to healthcare services for their children. The findings underscored the significance of investing in maternal education to improve child immunization rates, advocating for policies and interventions promoting maternal education as a means to enhance child health outcomes in Nigeria.

In a study published in the Pan African Medical Journal, Fatiregun, Adebowale and Fagbamigbe (2019) conducted an epidemiological review of measles in Nigeria based on five years of surveillance data. They identified fluctuations in measles incidence rates across regions and time periods, with children under five being the most affected demographic group. Seasonal patterns and geographical disparities in measles distribution highlighted the importance of targeted vaccination campaigns and strengthened surveillance systems to mitigate measles burden nationwide.

Ladipo et al. (2020) explored maternal knowledge and attitudes towards childhood immunization in rural and urban areas of Nigeria. They found variations in knowledge and attitudes among mothers, influenced by factors like education, socioeconomic status, and access to healthcare. Urban mothers generally exhibited higher knowledge and more positive attitudes, emphasizing the need for targeted educational interventions and improved healthcare access to enhance immunization awareness and attitudes, particularly among rural mothers.

Adebowale et al. (2017) investigated socio-economic determinants influencing immunization service utilization in rural Nigeria. They identified socio-economic status, healthcare accessibility, health education, and community support as critical factors influencing service utilization. Addressing socio-economic disparities and improving healthcare access through targeted interventions and community-based health education programs were recommended to enhance immunization coverage and health outcomes for children in rural Nigeria.

5.0. Interplay between Conspiracy Theories and Vaccine Hesitancy

Conspiracy theories play a significant role in shaping vaccine hesitancy, impacting vaccination acceptance rates. Understanding the relationships between conspiracy theories, vaccine hesitancy, and vaccination acceptance is crucial for developing targeted interventions to address misinformation, build trust in vaccines, and promote immunization uptake.

Conspiracy theories, fueled by misinformation and mistrust, significantly shape vaccine hesitancy. These theories often propagate false claims about vaccines, such as linking them to harmful side effects, infertility, or government surveillance. Research indicates that exposure to conspiracy

theories undermines confidence in vaccines and increases hesitancy among individuals (Jolley & Douglas, 2014). Individuals who endorse conspiracy beliefs are less likely to perceive vaccines as safe and effective, leading to reluctance or refusal to vaccinate themselves or their children (Hornsey et al., 2020).

Vaccine hesitancy, characterized by uncertainty or reluctance to accept vaccines despite the availability of vaccination services, poses a significant barrier to achieving high vaccination coverage rates. Individuals who are vaccine-hesitant may delay or refuse vaccination due to concerns about vaccine safety, efficacy, or necessity. This reluctance contributes to suboptimal vaccine uptake and increases the risk of vaccine-preventable disease outbreaks (Dubé et al., 2013). Vaccine-hesitant individuals may be influenced by social networks, media coverage, and personal beliefs, leading to decreased vaccination acceptance within communities (Larson et al., 2015).

Conspiracy theories serve as mediators in the relationship between vaccine hesitancy and vaccination acceptance. Individuals exposed to conspiracy narratives may develop heightened distrust in healthcare authorities, leading to increased vaccine hesitancy and decreased likelihood of vaccination acceptance. Moreover, the spread of conspiracy theories through social media platforms amplifies their impact, reaching a broader audience and reinforcing vaccine hesitancy sentiments (Betsch et al., 2017).

Combatting vaccine hesitancy requires addressing the underlying misinformation and mistrust perpetuated by conspiracy theories. Public health interventions should focus on debunking false claims, providing accurate information about vaccines, and building trust in healthcare systems and immunization programs (Freimuth et al., 2017). Engaging with communities, healthcare providers, and social media platforms to counter misinformation and promote evidence-based vaccination practices is essential in fostering vaccination acceptance and improving public health outcomes (Kata, 2012).

6.0. Implications for Public Health Practice and Policy

Understanding the complex interplay between conspiracy theories, vaccine hesitancy, and the determinants of vaccination acceptance in Nigeria holds profound implications for public health practice and policy. Firstly, targeted interventions aimed at addressing vaccine hesitancy must be tailored to the unique socio-cultural context of Nigeria. This necessitates engaging with local communities, religious leaders, and traditional healers to foster trust and dispel misinformation surrounding vaccination (Ogundele et al., 2021). Secondly, public health campaigns should employ culturally-sensitive messaging strategies to effectively communicate the benefits of vaccination and counteract conspiracy theories. Leveraging trusted sources and disseminating accurate information through diverse channels, including traditional media and community outreach programs, can enhance vaccine acceptance among populations at risk (Ajayi et al., 2020).

Furthermore, policymakers must prioritize efforts to strengthen healthcare infrastructure and improve access to immunization services across Nigeria. This includes investing in vaccine delivery systems, expanding vaccination coverage in underserved areas, and addressing socio-

economic disparities that contribute to vaccine hesitancy (Oyeyemi et al., 2022). Additionally, fostering collaboration between government agencies, healthcare providers, non-governmental organizations, and international partners is essential for implementing evidence-based strategies to combat vaccine hesitancy and enhance vaccination acceptance. By coordinating efforts and pooling resources, stakeholders can effectively address the root causes of vaccine hesitancy and promote a culture of immunization in Nigeria (Salami & Johnson, 2023). By prioritizing these strategies, public health practitioners and policymakers can mitigate the impact of conspiracy theories and contribute to improved immunization coverage and disease prevention efforts in Nigeria.

7.0. Conclusion

In summary, the intricate dynamics of conspiracy theories, vaccine hesitancy, and determinants of vaccination acceptance in Nigeria present significant challenges and opportunities for public health practice and policy. This conceptual review underscores the critical importance of contextual understanding in shaping vaccine-related attitudes and behaviors, emphasizing the need for tailored interventions to address Nigeria's unique challenges (Ogundele et al., 2021).

Moving forward, it is essential for public health practitioners and policymakers to prioritize evidence-based strategies aimed at fostering trust, dispelling misinformation, and enhancing vaccine acceptance across Nigeria. This includes leveraging culturally-sensitive messaging, strengthening healthcare infrastructure, and fostering collaboration between stakeholders at all levels (Ajayi et al., 2020).

By addressing the underlying drivers of vaccine hesitancy and promoting a culture of immunization, Nigeria can improve vaccination coverage and contribute to better public health outcomes. However, achieving these objectives will require sustained commitment, resources, and collaboration from government agencies, healthcare providers, civil society organizations, and international partners (Oyeyemi et al., 2022). By adopting multifaceted strategies that integrate community engagement, cultural sensitivity, and evidence-based interventions, Nigeria can overcome the challenges posed by conspiracy theories and enhance vaccination acceptance, thus contributing to global efforts to achieve equitable vaccine coverage and disease prevention.

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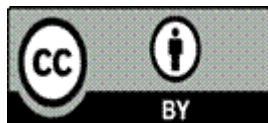
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