Religious Belief, Reference Group and Ethnicity as Determinants of COVID-19 Vaccine Hesitancy in Port Harcourt Nigeria

BY

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This thesis entitled **"Religious Belief, Reference Group and Ethnicity as Determinants Of**

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Dedication

This project is dedicated to God almighty and CHARLES-AKPUNNE family.

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I am grateful to the Almighty God for giving me the gift of life and the ability to work on and finish this project. The glory belongs to him alone. I want to express my gratitude to Lead City University's administration for giving me the chance to accomplish this goal. I owe a great deal of gratitude to numerous individuals who, in one way or another, helped with the successful completion of this work. First and foremost, I would want to express my profound gratitude to the head of department, my supervisor, Dr. Jr. Adebusuyi, and Dr. Falashe. I am grateful for their patience and thoroughness throughout this research journey. Prof A.i Odebiyi, Dr. R Akingbade, Dr. Ayodele, Dr. A Ojo, Dr. N Eleje, Dr B Adesanya, and the supportive lecturers in the Department of Psychology, Sociology, and Criminology; and Mr. L Morakinyo, who gave this work crucial and enough attention despite their busy schedules. I am truly grateful to every one of you. The unwavering support of Prof Omolara Campbell, Dean Faculty of Management and Social Sciences, Lead City University, from the beginning to the end of this project is noteworthy. Thank you very much. Mrs. B Elaturoti of the Liberay Department, of Lead City University Thank you very much. Thank you for your encouragement, Tomi, and Michelle. Thank you to my uncle Dr Bede Prasie Akpunne for his assistance at the beginning of my research. I am grateful to my parents, Pastor Charles Akpunne and Modupe Charles Akpunne, for their prayers, encouragement, and help with my study; I am privileged to have you. Thank you for all the great memories, Covenant, Deborah, David, Chinaza, Chigozie, Ngozie, and Baby Rejoice.

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Abstract

This study examines religious beliefs, reference group influence, and ethnicity as determinants of COVID-19 vaccine hesitancy among residents of Port-Harcourt. The study investigates how religious beliefs influence COVID-19 vaccine acceptance among Port Harcourt residents, how reference groups influence COVID-19 vaccine hesitancy among Port Harcourt residents, and whether ethnicity influences COVID-19 vaccine hesitancy among Port Harcourt residents. To further explain, the diffusion of innovation theory was applied. The population was taken from three communities in the Obio-Akpor LGA, and an ex post facto research design was adopted. Using a multi-stage sampling technique, the Slovin formula $n=N\%\ (1 + Ne^2)$ was used to get a sample size of 400, of which 380 were eventually responded to and returned. Data were collected using a standardized survey instrument developed by the SAGE working group with a Cronbach's alpha coefficient of 0.90. Three hypotheses were evaluated at the 0.05 level of significance and analysed using linear regression statistical analysis. The findings revealed that religious belief does not significantly predict COVID-19 vaccine hesitancy [F (1,366) =.686, P >.05]. There is no significant influence of the reference group on COVID-19 vaccine hesitancy [F (1,367) =.000, P>.05], and ethnicity does not significantly determine COVID-19 vaccine hesitancy [F (1,366) =.858, P>.055]. Vaccine hesitancy can become harmful to society if it is not controlled. Hence, governments and health organizations should work together to combat vaccine disinformation and misinformation through health campaigns.

Keywords: COVID-19, Vaccine Hesitancy, Religious Beliefs, Reference Group and Ethnicity. Word Count: **230**

Chapter One

Introduction

1.1 Background to the Study

The corona virus (COVID-19) was discovered in Wuhan, China, and has subsequently spread through person-to-person contact[1]. Coronaviruses are a kind of virus that may infect both animals and humans. A coronavirus is the virus strain known as SARS-CoV that causes severe acute respiratory syndrome (SARS). Severe acute respiratory syndrome coronavirus 2 is the name of the new coronavirus strain (SARS-CoV-2). The virus, according to specialists, causes coronavirus disease 19 (COVID-19)[1].

However, in recent years, the global health concern has changed from the rise of COVID-19 to the development of a COVID-19 vaccine. This comes after years of study in the health and medical professions to discover a long-term solution to the deadly illness that has plagued the planet. With a short period, the COVID-19 vaccine released in late January 2021 and expected to give procured defence against the serious intense respiratory condition COVID2 (SARs-CoV-2) that causes COVID-19 was developed[1]. Now that the vaccine is out, and purchased by countries, what remains significant, is the acceptability rate of taking the vaccine across countries, particularly, in Africa.

Vaccine hesitancy is the refusal to take vaccination despite the availability of the vaccine[12]. Specifically, COVID-19 vaccine hesitancy denotes a situation whereby individuals refuse to vaccinate despite the COVID-19 vaccination, this attributes to factors revealed. Vaccine hesitancy varies across countries and communities,

and it prevents communities from reaching vaccine thresholds, thus increasing the spread of the virus. Delay in vaccination is not new in Nigeria[2]. For instance, polio vaccination suffered a setback in Northern Nigeria when rumours circulated that the vaccine is designed to harm Northern women's fertility to reduce the North's birth rate. This sparked opposition to the vaccine and protested it, forcing the Northern government to halt vaccination for some time, which led to the propagation of the virus in the North, extending into neighbouring countries[3]. This misinformation led to widespread distrust of the Nigerian government and vaccination providers.

Vaccine hesitancy determinants suggested by WHO, are complacency, confidence, and convenience. Hence, factors like complacency eventually influence hesitancy, as people weigh the risks of vaccination against the risks of the disease that vaccines prevent. The extent to which complacency determines reluctance is also influenced by self-efficacy (a person's perceived or actual ability to perform the act of being immunised)[12]. In Nigeria, people's attitudes toward the intake of COVID-19 vaccine are affected by many factors. These factors are mostly socio-cultural beliefs that go beyond medical reasons and include religion, ethnicity, education, and attitudes, among others. The focus of this research seeks to find out the reason people are reluctant to take the vaccination or are hesitant about the outcome of the vaccine, if accepted.

Statistically, reports on categories of people, groups and religious bodies that have accepted and taken the COVID-19 vaccine have been documented[4]. Older

adults ranging from 50-75 years of age are accepting the COVID-19 vaccine rapidly by 80-95%. While 60-75% of young adults between the age of 18-25 years are taking the COVID-19 vaccine[5] This is because they fear that they are more at risk of dying of the virus[5]. Regarding the acceptance of the COVID19 vaccine by gender, men are slightly less likely to respond positively than women, with 95% of men responding positively to women[6]. In Nigeria, female is 37% more likely than men (26.1%) to accept the COVID-19 vaccination if recommended by health personnel.

Also. by religion, Christians are 36.2% more likely to take the COVID-19 vaccination if recommended than 16.9% of Muslims who are less accepting of the vaccination. Observing by tribe, Igbos are 40.9% more likely than Yorubas to accept the COVID-19 vaccination if health officials recommend it, while Yorubas are 29.4% acceptive. by region, the west is 36.2% acceptive, the east 43.1% acceptive, and the north 19.2 % acceptive if recommended by health officials[8] In the United States of America, Hispanic Catholics have increased the greatest in vaccine acceptability, from 56% in March to 80 % in June, according to a US survey on religion and culture. Vaccine acceptors now account for eight out of ten white Catholics (79%), up from (68%) in March. Other Protestants of Colour (69%) grew by a comparable margin from March's 45%. Other non-Christians (78%) are above the 70% mark, as are other Christians (77%), religiously unaffiliated (75%) and white mainline Protestants (74%) with increases of 11 to 15 percentage points in each group. Black Protestants (66%) and Latter-Day Saints (Mormons) (65%) both have had similar increases since March 8 Although

Hispanic Protestants and white evangelical Protestants are still the least likely religious groups to accept vaccines (both at 56%), both groups have seen double-digit increases in acceptance since March these are some of the socio-cultural statistics that will be reviewed in this research[7 8].

The reasons for COVID-19 acceptance and hesitancy, are necessary to understand some of the determinants of COVID-19 vaccine hesitancy in Nigeria. This study intends to examine religion, reference groups and ethnicity as predictors of COVID-19 vaccine hesitancy in selected communities in Port Harcourt, River State, Nigeria. Port Harcourt is the largest city in River State. It is the fifth most populous state in Nigeria [21]. It becomes imperative to use Port Harcourt as the study area because some residents in the state are reluctant to be vaccinated, despite the availability of the COVID-19 vaccine. This is attributed to some socio-cultural beliefs that the COVID-19 virus does not exist, while others are fearful of reacting to the vaccine because of those that have taken and experienced swollen arms and develop some other ailments[9]. What is important in this research is the socio-cultural factors that are crucial in understanding 'why' many people in Port Harcourt have refused to accept and take the vaccine. Specifically, factors such as religion, reference groups and ethnicity have a significant role in influencing COVID-19 acceptance and understanding these variables will help give a clear picture of the reason for COVID-19 vaccine hesitancy among Nigerians. To this end, this study examines religion, reference groups and ethnicity as predictive factors of COVID-19 vaccine hesitancy in selected communities in Port Harcourt, Nigeria.

1.2 Statement of the Problem

Refusal and fear to take COVID-19 vaccine has become a major concern in Nigeria. COVID19 vaccine hesitancy is attributed to various factors that go beyond political reasons. Other factors such as socio-cultural and religious factors remain significant. The speedy production of COVID-19 vaccine, as compared to vaccine for cancers and HIV/AIDS, happens to be one of the reasons for vaccine hesitancy[10]. What also contributes to COVID-19 vaccine hesitancy in Nigeria is the concerns about not receiving daily available polio vaccinations before the COVID-19 pandemic[11]. People embraced the COVID-19 vaccine, according to recent studies, mostly for personal safety reasons and others are cautious because they are anxious about the possibility of negative consequences[12]. Many Africans also contemplate the COVID-19 vaccine's safety and effectiveness, while deciding whether to use it or not[13].

One of the factors that are serving as obstacles to the acceptance of COVID-19 vaccine is the notion that the virus came from China and everything that comes from China does not last [14]. This assumption on the ephemerality about things or products that come from China, brings up the concept of *Chinco* in Nigeria[15]. *Chinco* products, are often interchangeably taken as fake products, which do not last for long. So, without taking the vaccine, there are beliefs that the virus will not last since it originated from China. Again, various conspiracy theories that fuelled the internet space during the pandemic contribute immensely to the non-acceptability of COVID-19 vaccine in Nigeria. The most notable among these comments, is the information that the vaccines are developed to exterminate

Africans[16]. These various information and news further discourage most Nigerians and contribute immensely to the COVID-19 vaccine hesitancy.

Yet, reasons abound that account for people's rejection of COVID-19 vaccine. Even with the involvement of the federal and state governments to sensitise the entire populace on the advantages of the vaccinations, including the prohibition of some government workers into parastatals, many Nigerians, are holding on to their beliefs, which are unconnected to political and/or medical factors. These beliefs, which remain unknown, serve as significant factors to COVID-19 vaccine hesitancy. Hence, understanding these factors is necessary to assist the government, health practitioners and policymakers to unravel reasons for vaccine hesitancy.

Several studies have been conducted on COVID-19 vaccine hesitancy. These studies have found out certain factors that are responsible for vaccine hesitancy. For instance, it has been found that vaccine fear contributes to low turnout rate of people that want to get vaccinated in Nigeria, while vaccination reluctance may also be attributed to many factors that are demographic, cultural, socio-economical, and religious in nature[17]. In Africa and Nigeria particularly, studies have also been carried on COVID-19 vaccine hesitancy, which shows that Africans remain sceptical on the emergence and the possibly end-result of the virus. Hence, Africans have become highly resistant to the production and intake of the vaccine due to various conspiracy theories that surround it[18]. Another reason for the COVID-19 vaccine hesitancy has been the creation of a massive socio-economic disruption emanating from social media platforms[19]. However,

what is negligible is that most of the reasons that were perceived as factors contributing to COVID-19 vaccine hesitancy in Nigeria, are largely hearsay and not empirically proven. This study intends to empirically examine factors that contribute to COVID-19 vaccine hesitancy in Nigeria. Specifically, the study examines religious belief, reference groups and ethnicity as determinants of COVID-19 vaccine hesitancy in Port Harcourt, Nigeria.

1.3 Aim and Objectives of the Study

The aim of this study is to examine religion, reference groups and ethnicity as predictive factors of COVID-19 vaccine hesitancy in Port Harcourt, Nigeria.

The objectives are to:

i. examine the influence of religious belief on the acceptance of COVID-19 vaccine amongst residents Port Harcourt.
ii. find out how reference groups influence COVID-19 vaccine hesitancy amongst residents Port-Harcourt.
iii. investigate if ethnicity influences COVID-19 vaccine hesitancy amongst residents of Port-Harcourt

1.4 Research Questions

i. How does, religious beliefs influence the acceptance of COVID-19 vaccine amongst Port Harcourt residents?

ii. To what extent does reference groups influence COVID-19 vaccine hesitancy amongst Port Harcourt residents?

iii. In what way does ethnicity play a significant role on the acceptance of COVID-

19 vaccines amongst residents in Port Harcourt?

1.5 Hypotheses

i. Religious beliefs will have significant influence on the COVID-19 vaccine hesitancy amongst Port-Harcourt residents.

ii. Reference group will significantly influence COVID-19 vaccine hesitancy amongst residents in Port-Harcourt.

iii. Ethnicity will have significant influence on COVID-19 vaccine hesitancy amongst residents in Port-Harcourt.

1.6 Significance of the Study

As the threat of COVID-19 grows, people have a variety of socio-cultural reasons to refuse vaccination which is connected to religion, reference groups and ethnicity. Particularly in Nigeria, where people do not believe that COVID-19 exists or is a fraud used by the government to commit fraud. This study provides insight into Nigerians' perceptions of COVID-19 vaccination and vaccine hesitancy. The study will aid the researcher in determining why residents of Port Harcourt and other residents in another region or state are unconcerned about vaccination, even though vaccination of the Nigerian population would reduce

COVID19 spread. The information gathered through this project has the potential to be used to raise awareness of COVID-19 vaccine hesitancy in Nigeria, as well as to provide information to the Nigerian government, policy makers, health and medical practitioners and health agencies in terms of developing solutions and improving vaccine hesitancy prevention plans and awareness.

1.7 Scope of the Study

The scope of the study focuses on religion, reference groups and ethnicity as determinates factors of COVID-19 Vaccine Hesitancy in Port Harcourt, Nigeria. The study is limited to residents of selected local government areas of Port Harcourt, Rivers State, Nigeria.

1.8 Limitations of the Study

1. Since participants are more available on Sundays and Saturdays, the researcher was only able to administer questionnaires during certain times and days due to some gated estates and household restrictions.
2. It was challenging to deliver questionnaires to certain genders since they would focus on the other sex rather than their own.
3. As some participants were hesitant to return their questionnaires, it was difficult for the researcher to gather them.

1.9 Operational Definition of Term

COVID-19: a coronavirus-caused acute sickness in humans that is marked by fever and cough and can escalate to severe symptoms and, in rare cases, death,

especially in the elderly and those with underlying health issues. It was first discovered in China in 2019 and was declared pandemic in 2020.

Ethnicity: the quality or fact of belonging to a population group or subgroup made up of people who share a common cultural background or descendant.

Religious Beliefs: a personal set or institutionalized system of religious attitudes, beliefs, and practices.

Reference Group: In this study, reference group refers to a group used or perceived as sources of inspiration influencing individuals' opinions, beliefs, attitudes, and behaviours. They could be the family (parents), friends, relatives, and people seen as role models.

Vaccine: a material generated from the causal agent of a disease, its products, or a synthetic alternative, processed to function as an antigen without generating the disease, used to develop a new generation of antibodies and offer immunity against one or more diseases.

Vaccine Hesitancy: This is defined as a delay in accepting or refusing immunizations despite vaccine services being available.

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Chapter Two

Literature Review

2.1 Conceptual review

2.1.1 Vaccine Hesitancy

Infectious diseases can cause serious and widespread increases in morbidity and death as well as significant and considerable economic losses, with the mortality impact being greater in low- and middle-income nations. The best way to prevent infectious diseases from taking life is through vaccination. Smallpox has been eradicated since the middle of the 20th century through vaccination initiatives, which have also reduced anxiety about other deadly infectious illnesses like polio, measles, and invasive pneumococcal disease[21]. People's reservations about a specific vaccine or immunization in general can pose a threat to achieving appropriate vaccine coverage. Vaccine hesitancy is the term for these worries. Vaccination hesitancy has existed since the invention of vaccines [22] and is a continuing threat to global health.

Research found that Over 430 million COVID-19 cases and approximately 6 million COVID-19-related deaths were recorded globally by the start of 2022 [23]. This has the potential to reduce vaccination rates in two ways: directly by lowering antibody uptake and indirectly by acting aggressively against essential vaccination techniques [24] [25]. Reduced vaccination rates have contributed to the increased prevalence of

avoidable deaths and the re-emergence of formerly eradicated diseases such as polio and measles[23]. Vaccination aversion has been named one of the top ten threats to global health[26].

Vaccination hesitation has been an extremely prominent issue in recent years. Only 4% of Nigeria's 200 million population, which is 8,145,416 people, have been completely vaccinated against the virus two years after the first confirmed COVID-19 pandemic and one year after the first dose of the vaccine was provided. Unfortunately, this outcome has affected Nigeria and most developing nations were unable to meet the World Health Organization's (WHO) aim of vaccinating 10% of their people by the end of September 2021 due to disparity in vaccine distribution [27].

Given the serious seriousness of hesitancy, the study will be focusing on finding out how religious beliefs, reference group and ethnicity influence vaccine hesitancy and how other major factors are associated to these variables. factors attributed to increased vaccination reluctance can be grouped into three categories: convenience, complacency, and confidence. One element influencing vaccine reluctance is convenience with which vaccines can be obtained[28]. The convenience of getting vaccinated, as well as the affordability and availability of vaccines, are important factors when it comes to physical and mental health, as well as the willingness of people to pay for the vaccines. The quality of the service provided, as well as the ease and convenience of getting vaccinated, can affect a person's decision to get vaccinated. This could

lead to vaccine hesitancy. Vaccines, for example, may be difficult to obtain in rural areas or in locations far from hospitals, clinics, or other providers Vaccination can also be uncomfortable if it is financially expensive; In this scenario, systems with expensive health insurance, expensive medical treatment, or other similar concerns can increase vaccine reluctance, particularly among the poor and disadvantaged[29 30].

Concerns about the safety, effectiveness and validity of vaccines show complacency and confidence. Vaccine complacency exists where people perceive low risks from vaccine-preventable diseases and do not see vaccination as a necessary preventive measure. Complacency about a vaccine in general is influenced by factors, including life threating and health responsibilities that may be taking up a person's time and energy at that point in time. Paradoxically, the success of immunization programmes can lead to complacency and to hesitation, because one can weigh the risk of vaccination against the risk of disease with a specific vaccine, which is no longer common. Complacency includes issues related to relevance, for example, Individuals may not feel a sense of despair or recognize harm from a vaccine is provided to prevent disease Also, during the pandemic, a lot of Americans underestimated the threat of COVID-19, resulting in reduced compliance with CDC guidelines for reducing the risk of spread[31].

According to another study, as Americans have become more aware of the disease, their views about the threat have diminished[32].Because of

this indifference to the pandemic, as well as misconceptions about COVID-19, vaccine reluctance has grown over time[32].Vaccine confidence, trust in the effectiveness and safety of vaccines, the reliability and competence of health services and health professionals, and the motivations of policymakers who decide on needed vaccines are all important factors of confidence. Vaccination confidence is depended on protection from harm and, to an extent, adaptability concerns. Individuals commonly express fears concerning reactions, harmful "substances," or illegality, and trust that information regarding these potential risks is concealed or overlooked[28 32]. Individuals' worries are aggravated when they lack trust in various professionals and groups, such as physicians, scientists, and the pharmaceutical enterprise[30 33]. Research conducted investigated COVID-19 vaccination reluctance and confidence in government in Nigeria. They combined two publicly available home surveys based on respondents' geographic areas. They discovered that the more people distrusted the government, the less likely they were to receive the COVID-19 vaccine (vaccine hesitancy). The likelihood that persons were unsure about taking the COVID-19 vaccine (vaccine indecisiveness) was similarly positively connected with distrust of government, but the correlation was less than the correlation between distrust of government and vaccine reluctance[34].

They also found that person was consistently less likely to be opposed receiving a COVID-19 vaccine and to be uncertain about it if they had

high levels of trust in the government. These findings suggest that vaccine reluctance is significantly predicted by mistrust of the government. With a few exceptions, this conclusion is consistent with several findings in the literature, particularly in industrialized nations. Similar findings have also been made in more international scenarios. However, those who rejected the COVID-19 vaccine were more likely to think that it is ineffective and that their chance of catching the disease was low if they had significant faith in the government[35]. On the other hand, they were less likely to worry about possible negative outcomes and more likely to think the vaccine was safe. These results on the relationship between trust in government and vaccine hesitancy show that hesitant people who distrust the government refuse vaccines because they believe that vaccines are bad for them; they tend to believe that vaccines are not safe; they are worried about side effects; but not because they believe that vaccines do not work; or because they believe that the government is to blame[36]. It was discovered that the major findings addressing the association between trust and vaccine reluctance were applicable in rural settings but not in urban ones. This is an intriguing discovery, but it was outside the study's purview to determine the causes of the divergent outcomes. The potential causes of this divergence should be investigated in a future study. Hence, vaccine hesitation is a complicated issue that varies by time, region, and vaccine.

Even though vaccine hesitancy is not a new phenomenon, the spread of false information against vaccination through social media has given it new significance in the context of public health emergencies like the coronavirus pandemic and hopes for the quick discovery of a vaccine[37]. The hesitation to be vaccinated may be worsened by misinformation. Although social media platforms allow individuals to freely communicate and exchange knowledge, the emergence of extreme viewpoints, false information, and disinformation also spread quickly, undermine public confidence, and amplify vaccine scepticism[37]. More people are becoming suspicious of vaccination in particular because of the expansion of antivaccination organisations[38]. Social media can be a source of the misinformation that makes people hesitate, but it also allows for two-way communication with target audiences and individuals, increases the availability, accessibility, and appropriateness of the information, and offers a platform for highly effective and inexpensive policy advocacy opportunities. It may present a once-in-a-lifetime chance to address public health concerns directly, making it a valuable instrument for health promotion and behaviour change[39]. Additionally, in the context of vaccine hesitancy, public health advocates have been urged to use social media more frequently, to respond to vaccination scares in a proactive rather than reactive manner[40], to understand the information spread by antivaccination through social media, to use network analysis and social

computing methods, and to support the creation and implementation of social media interventions[40].

Vaccine hesitancy is the reluctance or refusal to accept a vaccination despite the availability of the vaccination and vaccine providers. There are few people who do not like some vaccines but agree to take it, and there are also people who want to get vaccinated but are afraid and sceptical because of so many reasons [41]. In this way, the term "hesitancy" is used to describe the transition between people who accept all vaccines without fear and people who do not accept at all. Safety concerns can be a reason for people to be afraid of vaccines, but they are just one of the things that can make people hesitant to get vaccinated. Also, some people are afraid of vaccines because of myths, misinformation, distrust in health care professionals, and more other things that make people afraid of vaccines are cost, geography, and vaccine safety. Because this model is thought to be the easiest way to understand vaccine hesitancy these models will be used to understand how Religion, Ethnicity and Reference group are predictors of vaccine hesitancy [42].

2.1.2 Religious Beliefs

Religion is defined as people's relationship with what they see as sacred, holy, absolute, spiritual, divine, or worthy of particular attention. Which is widely used to explore people's emotions and enlighten them about their existence and afterlife. This relationship is expressed in traditions

based on one's relationship to or attitude toward God, gods, or spirits, which are expressed in a more humanistic or naturalistic forms[43]. Religion regard sacred scripture as having divine importance, with some persons seen as having spiritual or moral authority to explain the meaning of this writings. Believers and worshipers participate in devotional or reflective practises like prayers, meditations, or special rites, and are typically encouraged to do so. Worship, moral behaviour, correct belief, and participation in religious institutions are all essential components of religious life[44]. There are various types of religion around the world which are African religion; Anatolian religion; ancient Iranian religion; Arabian religion; Baltic religion; Buddhism; Calvinism; Celtic religion; Christianity; Confucianism; Daoism; Eastern Orthodoxy; Eastern rite church; Eastern Orthodoxy; Egyptian religion; Finno-Ugric religion; Germanic religion and mythology; Greek religion; Hellenistic religion; Hinduism; Islam; Jainism; Judaism; Mesopotamian religion; Middle Eastern religion and many more.

Nigeria is a multi-religious society, which is people are free to adopt and practise any religion they like, if that faith does not involve any illegal conduct or mischief that might disrupt national peace and security. Nigeria is known to practices three main religions which are the Christian, Islam, and African traditional religion. Each of these religions also has different diversities based on its doctrines, practises, and beliefs[45].

Nigeria has approximately 70 million Christians with Roman Catholic and Anglicans reported to have over 18.9 million members each and Protestant churches also reporting many memberships as well, including the Nigerian Baptist church reporting to have a membership of about 6 million worshipers. Also, Presbyterians, Assemblies of God, Methodists, the Evangelical Reformed Church of Christ, what are known as the Aladura churches with a population of about 12 million explained to have emerged from Pentecostal and Spiritualist independent churches[46]. The ethnic groups with the most Christians and various Christian membership are southern Igboland, Catholics and Methodists predominate, while Anglicans and other Protestants (Including Aladura Christians) maintain a large presence in southwestern Yorubaland.

Evangelical and Pentecostal Christians have experienced the most rapid increase in Nigerian Christianity in recent decades (either as members of newer movements or denominations, or as charismatic versions of Roman Catholicism or Protestantism). Nigeria's Muslim population is growing. It is estimated that 80-85 million Nigerians identify as Muslim, with majority being Sunni of over 60 million members. It has also been estimated that 4-10 million Nigerians are Shia, most of whom live in Sokoto, with sizeable number of them being Lebanese. Hence, the Hausa ethnic group are Muslims [45] [47]. However, In the country's core region, known as the Middle Belt, as well as areas of the Southwest, where the

major ethnic group, the Yoruba, is made up of both Muslims and Christians, both Muslims and Christians are more evenly distributed[46].

Lastly, African Traditional Religion (ATR) is referred to as “African" since it is "Indigenous, Aboriginal, and fundamental or passed down from generation to generation". Religion has always been the foundation to any African society as religion creates morality, justices and brings an understanding of what is good and evil to every African. Traditional religion arose from the sustaining faith held by the ancestors of today's Africans, it is estimated that over a one hundred million people practice the African traditional religion as Africans often combined traditional practices with the Abrahamitic religions[49].

Since Nigerians value religion so much, it is of no surprise that they value the opinion and guidelines of their religious leaders. Religious people seek the face of God, sometimes through their religious leaders (Priests and Pastors, Imams, Chief Priests, or Herbalists) for interpretation of scriptures and spiritual advice before they take any decision in their daily lives. Sometimes the opinion of what a religious leader says influences the choices of its members since they may believe that a supernatural benign has spoken through these selected individuals. Religious leaders do not only guide members spiritually, but they also influence members in terms of political, socio economic and health views.

Religious Beliefs

A religion must also have practises and cultural rituals in which its followers participate. religious beliefs are theistic, agnostic, or atheistic assumption, presumption, or position, or a religious doctrine, dogma, or practise. Religious beliefs also include information for, against, or in conjunction with such beliefs[49]. Religious beliefs, on the other hand, are the core components of religions because they heavily influence the worldview and values of members of a given religion. Religious beliefs are distinct from other types of knowledge, such as factual knowledge. They are faith-based beliefs that usually involve some supernatural element. Being religious means believing that a religion provides an accurate and acceptable way of understanding the world. Many people's religious beliefs influence how they live their lives[49].

Christian beliefs: Christian's belief in only one God and that this God is the one who made the heavens and the earth. The Holy Spirit, Jesus Christ, and God the Father make up this triune being known as the Godhead. They belief in life after death and the Christian doctrine regarding the resurrection of Jesus. Christians hold that God sent his son, the Messiah, Jesus, into the world to save it. They hold that three days after his death, Jesus was raised from the dead and then ascended to heaven, having been crucified on a cross to offer sins'

Forgiveness[50].

According to Christians, Jesus will make a second appearance on earth during the Second Coming. Christian's belief in the holy bible as a guide

to their day-to-day activities while on earth. The Holy Bible contains significant verses that describe the teachings of Jesus, the lives and teachings of significant prophets and disciples, it is believed that Jesus died on the cross hence that cross symbolise peace, grace, and mercy[50].

The two most significant Christian holidays are Christmas and Easter, which commemorate the birth of Jesus (which commemorates the resurrection of Jesus). Baptism, the Eucharist (Holy Communion or the Lord's Supper), prayer (including the Lord's Prayer), confession, confirmation, burial rites, marriage rites, and the religious education of children are just a few examples of Christian belief and practises that vary depending on the Christian denomination. Regular communal worship services are led by ordained clergy in many denominations[51].

Muslim (Islam) beliefs: Muslims are monotheists who believe in a single, all-powerful deity known as Allah in Arabic. Muslims strive to live a life of total submission to Allah. They hold that although humans have free will, nothing can occur without Allah's approval.

According to Islamic teaching, the angel Gabriel gave the prophet Muhammad access to Allah's word. Muslims hold that Allah sent several prophets to transmit His law[52]. They hold Abraham, Moses, Noah, and Jesus in the same regard as Jews and Christians do. Muhammad, according to Muslims, was the last prophet. Muslims are monotheists who believe in a single, all-powerful deity known as Allah in Arabic. Muslims strive to live a life of total submission to Allah[53].

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Allah's word. Muslims hold that Allah sent several prophets to transmit His law. They hold Abraham, Moses, Noah, and Jesus in the same regard as Jews and Christians do. Muhammad, according to Muslims, was the last prophet. Muslims, practice the five pillars, profession of faith (shahada), prayer (salat), alms (zakat), fasting (sawn) and pilgrimage (haji)[54].

African Traditional Beliefs: African traditional beliefs and practises are extremely diverse, encompassing many different ethnic religions, these traditions are typically oral rather than written, handed down through folklore, songs, and festivals from one generation to the next. They include veneration of the dead, belief in spirits, worship of a variety of higher and lower gods, as well as traditional African medicine[55]. Most religions are animistic with various polytheistic and pantheistic elements. Most people believe that humanity's role is to balance the natural world with supernatural forces[56]. All traditional African religions share more similarities than distinctions. Offering libations or making sacrifices is how the gods and spirits are honoured (of animals, vegetables, cooked food, flowers, semi-precious stones, and precious metals). The believer also seeks the guidance of the gods or spirits by consulting with divinities or using divination. Traditional African religions honour natural

occurrences like the tides, the moon's cycles, rainy and dry seasons, and the rhythmic patterns of agriculture[57].

2.1.3 Reference Group

According to Sociologist's reference group is a group to which an individual behaviours and attitude can be compared or judged, they are groups people relate to when evaluating their own traits, situations, attitudes, beliefs, and actions[58]. Reference groups are used to measure and determine the nature of person's or another group's traits and sociological qualities. It is the group to which the person mentally relates or seeks to relate. It serves as the individual's frame of reference and source for organising their own experiences, perceptions, cognition, and self-concepts. It is crucial in shaping one's self-identity, views, and social relationships. It serves as a point of reference for establishing comparisons or contrasts, as well as when evaluating one's look and performance[58].

Reference groups offer the standards and contrast required for group and personal attributes comparison and evaluation. Individuals, according to Robert K. Merton, compare themselves to groups of persons who occupy the social role to which the individual aspires. [58] [59] built on the ideas of in-group and out-group and established a theory of the reference group (i.e., the group to which individuals compare themselves, which is not necessarily the group to which those individuals belong). There are always

other groups of individuals that any group of people looks up to and aspires to be like[60].

Reference group have several functions, they can serve as a point of reference for people to analyse their attitudes and beliefs, they can be used to set a standard of measurement that helps people to identify their self-identity and behaviour in a social setting. Serve as a source of inspiration or goal for others to strive for; mould values in terms of what someone believes is right or bad by allowing someone to choose which values to mimic and which to reject and to allow individuals to immerse themselves in an unfamiliar environment by providing them with a standard to adhere to for them to integrate more effectively [61]. People who aim to be members of positive reference groups are individuals who typically respect a group's socialisation, behavioural patterns, and attitudes and seek to replicate them. Individuals who disapprove of negative reference groups use their patterns of conduct, ideas, and attitudes as a guideline to avoid them. Hence reference group is essential in a society as its guides a person's thought process[59]. A reference group is a group of people who we use as a standard of comparison for ourselves, regardless of whether we belong to that group [62]. We use reference groups to understand social norms that shape our values, ideas, behaviour, and appearance. This means we use them to assess the relative worth, desirability, or appropriateness of these things. Sociologists believe that our interactions with others and with society as a whole shape our thoughts and behaviours. The way we relate in a reference

group is central to how social groups and society exert social power over us as individuals [53].

2.1.4 Ethnicity

An ethnicity is a grouping of people who identify with one another based on shared characteristics that set them apart from other groups. These characteristics can include shared sets of traditions, ancestry, language, history, society, culture, nation, religion, or social treatment in their community[49]. Ethnicity can be viewed as either a genetically determined or a 'socially imposed construct. Ethnic membership is typically defined by ancestry, origin myth, history, homeland, language or dialect, symbolic systems such as religion, mythology, and ritual, cuisine, dressing style, art, or physical appearance are also part of a person's ethnic heritage. Ethnic groups may have a narrow or broad genetic ancestry spectrum, depending on group identification, with many groups having mixed genetic ancestry[50].

Ethnic Groups: Ethnic groups frequently continue to speak related languages. Individuals or groups may shift from one group to another over time through language shift, indoctrination, adaptation, and spiritual conversion. Ethnic groups are further subdivided into subgroups or tribes, which may eventually become separate ethnic groups due to kinship ties or physical isolation from the parent group. Previously separate ethnicities, on the other hand, can merge to form a pan-ethnicity, which will eventually merge into a single ethnicity. referred to as ethnogenesis which

is the formation of a distinct ethnic identity, whether through division or amalgamation[58]. Speaking of amalgamation, Nigeria was formed as a British colony in 1859, and its borders were drawn to serve commercial interests, with little regard for Indigenous peoples' territorial claims. As a result, Nigeria's population is made up of approximately three hundred ethnic groups and having three well known ethnic group with the others becoming a minority group in terms of population size and political power. Hence, Nigeria, ethnic group emerge by constant fusions between the ethnic groups brought about by intermarriage, intermingling, and integration. The groups that make up such fusions retain some degree of individual identity[59]. Some of this groups are the Hausas/Fulani, the Igbos and the Yorubas.

The Hausa are a combination of Sudanese ethnic groups that were long ago integrated into the people living in what is now known as Hausa land. They adhere to the Islamic faith. Legends has it that they may have come from Canaan, Palestine, Libya, Mecca, and Baghdad, but ethnologists believe they originated in the Southern Sahara or the Chad Basin. They gained notoriety for founding seven tiny states centred on "Birni," or walled cities, once they arrived in Hausa land[66]. The Hausa developed effective governance methods in these states, including an accurately planned economic system and a highly educated judiciary, earning them a reputation for integrity and competence in the implementation of Islamic law. Muslim immigrants known as the Fulani first made their way to the

Hausa states of northern Africa in the 13th century, where they eventually intermarried. They think they are related to gipsies, Roman soldiers, or an extinct Israelite tribe. Some Fulani chose to maintain their animist beliefs and nomadic lifestyle to remain "pure." The Fulani are most famous for a disagreement they had with the Gobir King, who was their local ruler[66].

The Igbo are a synthesis of smaller ethnic groups, like the Hausa-Fulani. They claim to be from about 19 separate places, but their true origins are completely unknown. In the region to the east of the Niger Valley, in a forest belt, they continue to maintain an "indigenous home." The village served as their primary social unit, and each extended family ran its affairs independently without outside supervision[57].

Like the other two, the Yoruba, the third ethnic dominant group, is made up of various smaller groups of individuals. People who identify as Yoruba believe they belong to the Oyo, Egba, Ijebu, Ife, Ilesha, Ekiti, or Owu peoples. However, the shared Yoruba belief that Ife is where they came from and that the Oni of Ife is their spiritual head binds them together. In accordance with their mythology, "Oduduwa" created the earth; the current royal families of the Yoruba kingdoms may trace their origins to "Oduduwa," while the Yoruba people claim to be derived from his sons. Lastly, these three categories account for just 57% of Nigeria's population. The remaining population are members of ethnic minority groups, which include the Kanuri, Nupe, and Tiv in the north, the Efik/Ibibio, Ejaw, and Ekoi in the east, and the Edo and Urhobo/Isoko in the west, among

hundreds of other groups that differ in language, culture, and even physicality[68]. It is well known that where a person is from affect their believe system and how they adapt to change, therefore a person's ethnic group has a strong influence on an individual's life choices[69].

2.2 Theoretical Framework

2.2 1 Behavioural change models/ Models

Theories of behavioural change try to explain why human behaviours change. Environmental, personal, and behavioural traits are cited as key contributors in behavioural determination in these theories. In recent years, there has been a surge of interest in the application of these ideas in the fields of health, education, criminology, energy, and international development, with the goal that better understanding behavioural change will enhance the services provided in these fields. Some researchers have lately established a difference between behavioural models and change theories[70]. Whereas behavioural models are more diagnostic and targeted at understanding the psychological elements that explain or predict a certain behaviour, theories of change are more process-oriented and typically directed at modifying a given behaviour. Thus, from this vantage point, understanding and modifying behaviour are two distinct but complimentary paths of scientific inquiry.

Each behavioural change theory or model attempts to explain behavioural change by focusing on a different aspect. The most common include learning theories, social cognitive theory, theories of reasoned action and planned behaviour, the transtheoretical model of behaviour modification,

the health action process approach, and the BJ Fogg model of behaviour change. Specific parts of these theories, such as self-efficacy, which is shared by several of them, have also been studied[70].

Out of all this theories, diffusion of innovation theory DOI and transtheoretical model of behaviour will be used to explain COVID-19 vaccine hesitancy.

2.2.2 The Diffusion of Innovation Theory

This study is anchored on 'Diffusion of Innovation Theory' (DOI). This theory explains some of the intricacies that surround the COVID-19 vaccine hesitancy in Nigeria. DOI was propagated by Everett Rogers, an American sociologist in 1962 to explain how information passes, spreads and get adopted by individuals [71] [72]. It centres on the rate of absorption and spread of innovative ideas and technology, which make them decide, whether to adopt it or not. The most reliable channels are through the mass media and personal communication. The diffusion framework recognised and categorised the numbers of people in a population willing to decide on the adoption of innovative ideas and technology into five: The Innovators, Early Adopters, Early Majority, Late Majority, and Laggards.

The Innovators: People in this category represents 2.5% of the total population and are likely to accept a new product that would attract the interest of innovators. These categories of people are of a high-ranked profile or are population influencers. Therefore, innovators tend to be risktakers because they are the first to adopt any new product into a market

or community What also classifies this group of people as innovators is their age and social class, their great financial power and their closeness and exposure to scientific ideas and interaction in connection with other innovators[73].

Early Adopters: They are the second category and fastest individuals that adopt an innovation. They have the highest degree of opinion leadership among others, younger in age and possess a higher social status. They have more financial lucidity and are more discrete in their acceptance of technology than innovators. Early adopters are seen as localists and as individuals having a legitimate interest in the community; they are outspoken leaders in the social system who provide direction and information to people all over the globe [73].

Early Majority: Individuals regarded as early majority adopts an innovation after some period. Early majorities are slower in the process of adoption and have above average social status. contact with early adopters, and seldom hold positions of opinion leadership in a system. The time of adoption and acceptance of modern technology is usually longer than the innovators and the early adopters. The category of people here, embrace modern technology because of its recommendation by the early adopters. However, before these people accept the idea, they must be convinced that it is effective [73].

The Late Majority: Individuals in the late majority group adopts an innovation after the average member of the society. People in this category are more resistant to change, have below average social status and have little financial power and of little opinion leadership [73].

The Laggards: These are the last people to adopt an innovation. People in this group are less concerned about opinion leadership and avert change agents and seem to be advanced in age. In most cases, laggards are oldest adopters who hold on to traditions, possess the lowest social status and financial fluidity and only interact with family and close friends.

The DOI theory is used in the study to explain factors accounting for the acceptance and rejection of COVID-19 vaccine in Nigeria. Rogers frequently used the words "technology" and "innovation" interchangeably, noting that technology is a design for instrumental measures that limit the uncertainty in the casual interaction involved in achieving an intended goal; it is composed of two-part which are the creation of the vaccine and hesitancy also, about what people are dealing with and scepticism of the COVID vaccine[73].

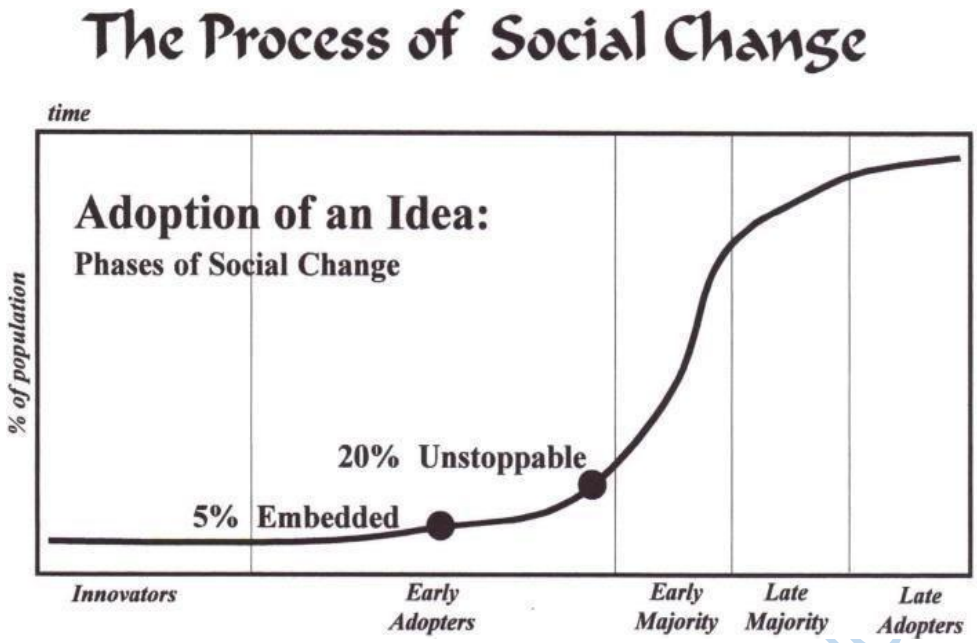


Figure 2.1 The Process of Social Change and the S-curve:

Source: Sanson-Fisher (2004)

The innovators are usually a small and first group of people who are always quick in adopting or accepting a vaccine. The amount of inventive behaviour and exposure serve as the first characteristics of the innovators. Individuals, regarded as innovators are brave, adaptive to change and get attracted to innovative ideas and technology. For the COVID-19 vaccine, they are usually not scared of the side effect of the vaccine and are mostly interested in the feeling it brings to be the first to accept the vaccination. Mostly this group of people are usually used as test subject to evaluate the vaccine for side effect by health care providers before its given to a larger population[73].

People's positions of power determine the extent they will accept the COVID-19 vaccine. Likewise, influential people such as celebrities and elites believe in the COVID-19 vaccination and have taken the vaccine. The fact that most individuals are careful in taking risks means that they wait until a product or service, in this case, the COVID-19 vaccine, has been evaluated or used by a trusted peer[120].

Yet, the theory explains the categories of individuals who will either refuse to take the vaccination or will do so, only if it is mandatory. They are often conservative, and cautious to accept modern technologies and are sceptical of the vaccination. Also, these are people who take interest and spread fake and false information about COVID-19 vaccines, in mass and social media platforms such as Facebook and WhatsApp, among other things. One of the disadvantages is that these group of people are rigid in their decisions on taking the vaccine and believe so much in conspiracy theories surrounding the manufacturing of the vaccine. They may be difficult to convince about the advantages of vaccination, even though they are continuously presented with several well-established facts. However, it would take years before they received the immunisation, with a possibility of never receiving it at all, except there is a draconian law from the government that ensure the acceptability of the vaccine[73].

Apart from the fact that diffusion of COVID-19 vaccine takes place within the social system, which is the society, there are some factors that influence such diffusion and therefore, responsible for its acceptability

and/or rejection in the system. These factors can be structural in nature, social, political, and economic factors and even, geographical factors. The structure of the society, however, affects individual's behaviour towards the COVID-19 vaccine innovation. What is also important is that while this may operate at a macro level, other social and cultural factors that affect individuals' response towards the acceptability of COVID-19 vaccine operate in the system. Religious belief, ethnicity, and reference groups are crucial sociocultural factors that influence how people react to COVID-19 vaccine. Innovators and early majority with elevated level of exposure and education, as well as higher social class, may not be totally controlled by these factors. However, the late majority and the laggards, mostly fall into the categories of people where these socio-cultural factors may serve as major determinants to COVID-19 vaccine hesitancy in Nigeria.

2.2.3 The Transtheoretical Model

The Transtheoretical Model (also known as the Stages of Change Model), developed by Prochaska and DiClemente in the late 1970s, evolved through studies comparing the experiences of smokers who quit on their own with those who needed additional treatment to understand why some people could quit on their own. It was decided that individuals should only quit smoking if they were ready to do so. As a result, the Transtheoretical Model (TTM) focuses on individual decision-making and is a model of purposeful transformation. The TTM assumes that people do not alter their

behaviours fast and decisively. Rather, behavioural change, particularly habitual behaviour, occurs continually through a cyclical process. The TTM is a model, not a theory; multiple behavioural theories and constructs can be applied at different stages of the model where they may be most successful[74].

Individuals, according to the TTM, go through six stages of change: precontemplation, contemplation, preparation, action, maintenance, and termination. Termination was not included in the original model and is now utilised less frequently in the application of phases of change for health-related behaviours. Different intervention tactics are most successful in moving the person to the next stage of change and then through the model to maintenance, the optimal level of behaviour, for each stage of change.

Precontemplation - At this stage, people do not plan to act in the near future (defined as within the next six months). People are frequently ignorant that their actions are harmful or have bad repercussions. People at this stage frequently overestimate the benefits of altering behaviour and overestimate the disadvantages of changing behaviour.

People in the Precontemplation stage have no plans to have the COVID-19 vaccination in the near future, which is commonly defined as the next six months. This may have an impact on their health since they are uneducated or underinformed about the implications of their actions, which may lead

them to be in the Precontemplation stage for a very long time. Multiple fruitless attempts in changing this behaviour might lead to a loss of confidence in the vaccine and distrust in vaccine institutions. Other theories sometimes characterise PR contemplators as resistive, uninspired, or nonadherent and traditional programmes, in reality, were not prepared for such persons and were not meant to satisfy their requirements[74].

Contemplation - At this stage, people aim to begin healthy behaviour in the near future (defined as within the next six months). People recognise that their behaviour may be troublesome, and a more serious and realistic examination of the benefits and drawbacks of modifying the behaviour occurs, with equal weight put on both. Even with this knowledge, people may be hesitant to change their behaviour[74].

Contemplation is the stage at which people expect to modify their behaviour during the following six months. This suggests that those who were hesitant to receive the COVID-19 vaccinations are reconsidering their decision. They are more aware of the benefits of changing and the advantages of receiving the COVID-19 vaccination, but they are also acutely aware of the disadvantages of receiving the vaccine. People in this stage spend time weighing the importance of the costs and advantages of change which can result in significant confusion, causing people to remain in this stage for extended periods of time. This behaviour is sometimes referred to as chronic contemplation. Individuals at the Contemplation

stage are not prepared for standard action-oriented programmes in which participants are expected to respond immediately[75].

Preparation (Determination) - People in this stage are ready to act within the next 30 days. People begin to take little efforts towards behaviour modification, believing that modifying their behaviour would lead to a healthier existence[75].

Preparation is the stage at which people aim to take action in the near future, i.e., persons who were refusing to take the COVID-19 vaccine are starting to take practical efforts to take the immunisation, generally within the next month. In most cases, people have already taken some steps towards action in the previous year (for example, learning more about COVID-19 or receiving the first dose of the immunisation). These people have a plan of action, such as going to a health centre to register, contacting a counsellor, or speaking with their doctor. These are the folks who should be targeted for participation in action-oriented programmes[75].

Action - People in this stage have recently modified their behaviour (defined as within the previous 6 months) and want to maintain that behaviour change. People can demonstrate this by changing their problem behaviour or learning new healthy behaviours.

Action is the stage at which people have made certain observable changes in their lifestyles during the last six months, i.e., they have received all of the COVID-19 doses and are willing to take all possible steps to obtain the

vaccination. Because action can be observed, the total process of changing behaviour is frequently associated with action. However, Action is merely one of five phases of the TTM. Typically, not all behavioural changes are considered Action. In most cases, persons must meet a condition that scientists and experts feel is adequate to lower illness risk. While minimising the number of resistant persons is a significant step in the cessation process, absolute agreement is the criterion for being in Action[75].

Maintenance - At this stage, persons have maintained their behaviour change for a long time (defined as more than 6 months) and aim to continue doing so. People in this stage try hard to avoid relapsing into earlier stages.

Maintenance is the stage at which people have made and sustained a specific behaviour change over an extended period of time, usually at least 6 months. While they continue to attempt to avoid relapse, they do not use change processes as frequently as those in Action. Individuals in the Maintenance stage are less likely to relapse and are growing more confident in their ability to maintain their improvements[75].

Termination - People in this stage have no desire to return to their harmful behaviours and are confident that they will not relapse. Because this stage is seldom reached and people tend to stay in the maintenance stage, it is sometimes overlooked in health promotion programmes[75].

Janis and Mann conceptualised decision making as a decisional "balance sheet" containing relative prospective rewards and costs. The pros and cons are two components of decisional balancing that have become essential notions in the Transtheoretical Model. Individuals' decisional balance varies significantly as they proceed through the phases of transformation. When a person is in the Precontemplation stage, the benefits of changing behaviour exceed the disadvantages of change. In the Contemplation stage, both advantages and disadvantages tend to have equal weight, leaving the individual uncertain regarding change. However, if the decisional balance shifts such that the benefits of changing outweigh the disadvantages of continuing the harmful behaviour, many people go to the Preparation or even Action stage. As individuals approach the Maintenance stage, the benefits of preserving the behaviour change exceed the disadvantages of maintaining the change.

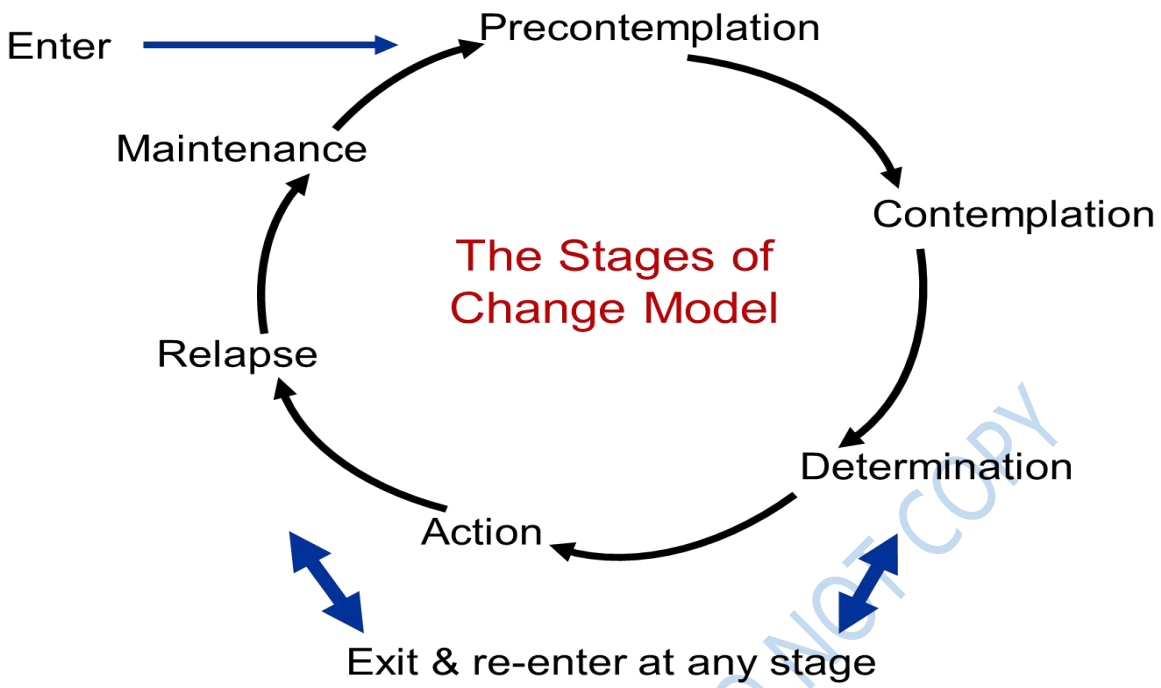


Figure 2.2 Shows the Stages of Change Model

People use cognitive, emotional, and evaluative processes to go through the phases of transformation. Ten change processes have been identified, with certain processes being more relevant to a particular stage of change than others. These processes produce solutions that assist people in implementing and maintaining change[74].

Raising Consciousness – Increasing awareness of good behaviour.

Dramatic Relief - Emotional arousal over the health behaviour, whether favourable or bad.

Self-Re-evaluation - entails reappraising oneself to recognise that healthy behaviour is a part of who they wish to be.

Environmental Re-evaluation - A social reconsideration of one's bad behaviour in order to recognise how it impacts others.

Social Liberation - Environmental possibilities that exist to demonstrate that society supports healthy behaviour.

Connections That Help - Identifying helpful connections that inspire the desired transformation. Substituting good behaviours and thoughts for harmful behaviours and beliefs is known as counterconditioning.

Reinforcement Management - is rewarding positive behaviour while decreasing the benefits associated with undesirable behaviour.

Stimulus Control - is redesigning the environment to include reminders and signals that support and promote healthy behaviour while eliminating those that encourage harmful behaviour.

The Transtheoretical Model proposes techniques for public health interventions aimed at people at various levels of decision-making. This can lead to interventions that are both personalised and successful (i.e., a message or programme component has been specially crafted for a target population's level of knowledge and motivation). The TTM enables people to examine their present state of development and accounts for relapse in their decision-making process.

2.3 Review of Empirical Studies

2.3.1 Religion and COVID-19 Vaccine Hesitancy

Hesitation of science, or the unjustified rejection of science, can have a negative effect on one's health this has increased over the years with the recent fast spread of the new coronavirus (SARS-CoV-2), which causes coronavirus illness (COVID-19), one form of science doubt known as vaccine hesitancy (i.e., the delay or reluctance to get vaccinated), has gained international attention. It has been demonstrated that vaccinations can stop the transmission of COVID-19 and are regarded as a successful management strategy[76]. There is vaccination scepticism despite their efficacy. One element that this research predicts for vaccination reluctance is religious beliefs. Spirituality (individual, intuition-driven belief) and religiosity (institutionalised belief) appear to be strong contenders.

Regarding religion, several religious figures have participated in the continuing COVID-19 worldwide epidemic. For instance, prominent Greek priests have participated in anti-vaccine demonstrations in Greece. Greek clergy have said that visiting church offers protection since "God does not allow you to be infected" even though attendance at churches has been associated to greater COVID-19 transmission[77]. Legal actions against measures intended to safeguard individuals during the epidemic have involved religious freedom. As an illustration, legal challenges against mandated vaccines and restrictions on church services have been made in

Canada, where it is claimed that these actions partially infringe people's rights to freedom of religion which has amplified the theory that the vaccine is created to stop religion.

The research found that a region's level of religiosity is linked to both higher mobility and slower mobility drops for stay-at-home orders connected to the pandemic, which can impact transmission rates. In terms of spirituality, recent studies have revealed that vaccination scepticism among better educated Dutch parents is largely anchored in an intuitive epistemology, with respondents in qualitative interviews emphasising the fundamental importance of the individual in defining what truth is. Indeed, although religiosity largely relies on an institutionalised system of ideas, post-Christian spirituality is typically defined as an individual collection of beliefs that heavily relies on subjective experience and intuitive epistemology[78]. In a nutshell, spirituality is more individualised and subjective. Despite these differences, both religiosity and spirituality have been linked to vaccination scepticism, with spirituality being a better predictor on an individual basis. When combined, religion and spirituality are likely to hinder attempts to stop the COVID-19 pandemic, of which vaccination hesitancy is a significant component. The conversation about connection between immunisations, spirituality, and religion continues[79].

Research on the variables influencing vaccination reluctance frequently concentrates on a specific area, usually a country. For instance, in the Netherlands, higher spirituality and lower science literacy are both

associated with higher vaccine scepticism among participants, whereas in the United States, higher religiosity among participants predicted vaccine scepticism. Additionally, qualitative research indicates that boycotts of the polio vaccination programme in northern Nigeria are influenced by religion, with religious leaders assisting in boycott planning. Recent research in the United States indicated that a variety of factors, including participants' lower levels of education and wealth, are predictive of COVID-19 vaccine reluctance. Social media posts on COVID-19 vaccine reluctance in Canada imply that safety worries and mistrust of the vaccine/pandemic are root causes. Younger age, lower income, and stronger religious convictions are all linked to COVID-19 vaccination hesitation in both Ireland and the UK[80].

Additionally, in Australia, reluctance to receive the COVID-19 vaccination is linked to a stronger sense of religion and populism. Although these studies provide useful information for the specific location, they do not evaluate wider cultural factors that exist at the regional level. A different degree of analysis than the individual level is analysed by incorporating region-level predictors, which might provide unique insights. Individual-level predictors might not immediately translate onto region-level predictors (and vice versa), which is rather surprising. And a typical occurrence in psychology science, this is also known as Simpson's paradox or an ecological fallacy[81]. The impact of vaccination rates in various

regions of the world should thus be evaluated at both the regional and individual levels, in addition to the individual level.

Vaccination attitudes have been evaluated in a small number of research that span different nations. One rather constant finding of a research conducted in 24 nations was that conspiracy theorists were more likely to have anti-vaccine sentiments. More recent international research evaluated scientific scepticism about many topics, including vaccine scepticism. While religion was a less reliable predictor but still prevalent in several of the included nations, spirituality and science literacy were the most accurate predictors of vaccination scepticism across cultures[79]. It is unclear, however, whether these factors apply to continuing COVID-19 immunisation efforts. For example, vaccine scepticism was tested using the idea that vaccines cause autism, which is unrelated to aversion to COVID-19 vaccinations. Indeed, psychological research indicates that attitudes best predict behaviour when they closely match the behaviour[82]. It is also unclear if survey results prior to the current COVID-19 pandemic would generalise to behavioural consequences during the existing epidemic. Empirical research on behavioural measurements is required.

The current study seeks to determine the role of spirituality and religion as region-level determinants of current COVID-19 immunisation rates worldwide. Because vaccine availability is likely to have an influence on immunisation rates and is a worldwide issue, many attempts were made to adjust for it. immunisation availability was accounted for in three ways:

applying a 20% cut off to immunisation rates, considering GDP as a predictor, and looking for impacts over different dates. The 20% requirement is justified by the fact that low vaccination rates may indicate a lack of availability rather than vaccine scepticism. The 20% criteria exclude nations that fundamentally lack access while simultaneously allowing for those that may have access. However, because placing a threshold reduces sample size, alternative approaches for accounting for vaccination availability were also used. GDP represents a region's relative wealth and can discriminate between richer and poorer regions. Vaccine availability is expected to be impacted by area affluence, with affluent nations having more access to vaccines than impoverished ones. In other words, nations with bigger GDPs are more likely to have better access. Thus, incorporating GDP in analysis can assist determine whether impacts are attributable to vaccination accessibility.

Finally, the literature suggests that examining the impacts on several dates predicts that older availability would be scarce in comparison to more current time periods. That is because vaccine manufacturing and availability should rise as nations improve their ability to organise and acquire vaccines, reducing availability worries and allowing other variables (such as spirituality and religiosity) to have a greater effect. In other words, spirituality and religiosity should have a stronger impact on contemporary immunisation rates than older ones, when supply concerns were higher.

The study added that collectivism was studied that as well is, individuals from collectivistic cultures (such as Japan and Ecuador) tend to see themselves as related to others and place more value on group aims than individual goals than individuals from individualistic cultures (such as the United States and Australia;). through being less likely to transmit COVID-19, such as through fostering herd or community immunity, vaccination not only offers protection for the person who receives it but also for others they deal with. Because of this, collectivistic societies may have greater immunisation rates[83]. Collectivism has been observed to have an impact on mask use during the ongoing COVID-19 epidemic, which is in line with this prediction. Measures of vaccination history and vaccine scepticism were also included. A history of immunisations may indicate a person's willingness to receive the COVID-19 vaccine. In fact, a thorough analysis of the literature revealed that in several nations, having had a vaccine before was linked to a higher desire to receive one during a pandemic.

According to studies, vaccine scepticism has been proven to affect at-risk populations' real immunisation rates, such as the elderly and nurses. Lastly but not least, the relative age of a population might affect vaccination rates because many areas provide immunisations to elderly people first and age is a risk factor for the virus[84]. For these reasons, we adjusted all the published analyses for population age. The literature reviewed examined whether persistent COVID-19 immunisation rates are

correlated with spirituality and religiosity at the regional (i.e., national or state). They found that both spirituality and religiosity were independently correlated with vaccination rates, with the association being that vaccination rates decreased with increasing spirituality and religiosity. Both the 20% vaccine criterion and the assessment of immunisation rates over time produced the same results when used to account for vaccine supply constraints. Both spirituality and religion yielded comparable results. They also found that there was a substantial negative correlation between religion and vaccination rates. Even after adjusting for general vaccine scepticism, prior vaccination experience, collectivism, GDP, and area age, the impact persisted. Contrary to earlier studies that showed that vaccination rates at any time were not reliably correlated with prior inoculation histories, which raises the possibility that the present pandemic is having a different impact on a specific region's residents than it did previously[84].

One explanation for this variation is that the novelty of the COVID-19 immunisations may be causing an increase in tension and worry, which may not have been a significant effect with earlier vaccinations. It's also feasible that receiving a pandemic immunisation has less unknowns linked with it than receiving "regular" vaccinations with a longer vaccination history. However, there was a correlation between COVID-19 vaccination rates and overall vaccine scepticism at both time points, indicating that this is what is affecting COVID-19 vaccination rates rather than prior

vaccination habits. These findings, when combined with the religiosity effect, imply that religiosity at the regional level is associated with real-world behaviour in the form of vaccination rates above and beyond the general level of vaccine scepticism of a region, and that the level of prior immunisations is, in this instance, weakly associated with COVID-19 vaccination rates[79].

In the last examination they found that there was a strong correlation between spirituality and religion and COVID-19 immunisation rates on an individual basis. In spite of collectivism, GDP, and area age, the effects of spirituality and religion were still significant. Only religiosity, however, was connected to vaccination rates when both spirituality and religiosity were accounted for in the same model. Contrary to earlier study, this result shows that religiosity, rather than spirituality, is more significantly correlated with vaccination rates. It is unclear why this difference developed in this case, but until they are replicated, these findings should be interpreted with caution given the current challenges associated with measuring spirituality at this level of analysis (discussed further below). According to earlier studies, spirituality appears to be a more significant effect at the person level but may not be at the regional level. These results should be more closely replicated in subsequent studies[79].

Diverse confounding cultural characteristics that are present in the worldwide samples of Studies 1 and 2 are less likely to be present in the USA sample of Study 3 since it included diverse areas within a single

nation (i.e., the USA). For instance, even though each U.S. state has a distinct culture, the states are probably more like one another than they are to nations like Tajikistan, Greece, Jordan, or Japan. Thus, the inclusion of Study 3 lessens but does not eliminate concerns about confounding cultural factors. This is a crucial topic because, although numerous cultural variances may possibly affect cross-cultural comparisons, many of them are considered when examining one nation.

The fact that the current study used vaccination rates to gauge real-world behaviour is a significant addition. Most of the previous research on vaccine scepticism has been on attitudes measured through surveys. According to the findings of Study 2, religion may account for more variation in vaccination rates than do general vaccination views. The behavioural information from the current study, however, converges with studies examining spirituality and religious attitudes to imply that spirituality and religiosity, taken separately, predict vaccination behaviour. The data is more convincing that spirituality and religion are reliable indicators because of this convergence.

It is important to note that the results have a correlational basis. Individually, spirituality and religion are linked to COVID-19 immunisation rates. Nevertheless, despite the correlational nature of the link, it makes logical sense that spirituality and religion are the cause of decreased vaccination rates. First, it appears doubtful that scepticism about or rejection of COVID-19 immunisation is driving individuals to become

less religious or spiritual because religiosity may change during the lifespan, but it often takes years to do so[85]. Less vaccines against COVID-19 are being driven by religious and spiritual convictions, which makes far more sense. Third factors may perhaps be contributing to this connection, too. One such third variable would be political conservativism, which we discuss in more detail later. Although it is conceivable that the association between religion/spirituality and COVID-19 vaccines is causative, this conclusion should be drawn with caution because causation has not yet been shown. Future studies are required to establish the causal relationship and investigate potential third factors that might be responsible for this correlation.

Despite the fact that the current study did not examine the relationship between spirituality and religion and COVID-19 immunisation rates, it might make further assumptions based on what was mentioned in the introduction. The fact that the results were universal shows that no specific religious or spiritual belief is responsible for the phenomenon. Spiritual beliefs are extremely individualised; therefore, each person's spiritual views are probably somewhat distinct[78]. Instead, it appears that some aspects of these beliefs in general are contributing to lower COVID-19 vaccination rates (for example, a misalignment between these beliefs' strong reliance on intuition and subjective experience and the contrary nature of vaccination, as well as perceptions of vaccination as unnatural that conflict with a strong preference for naturalness this is just conjecture,

as the evidence implies an association rather than a causal relationship. Although few faiths genuinely prohibit vaccines religion has traditionally been used as an excuse to avoid vaccinations, dating back to the first vaccine in 1796. The contrast between religions not officially prohibiting vaccinations and religion being used as a basis to be excused from them deserves additional investigation, although it appears to be a widespread impact connected to many spiritual and religious concepts.

Another concern is how to support the promotion of COVID-19 vaccinations given their favourable impact on health. One potential tactic is to customise messages to appeal to those who are more spiritual and religious. In fact, when the vaccine proponent is a member of their own religion, religious people are more inclined to support vaccinations[86]. According to the top official of the Greek Orthodox Church in America, "Today the Holy Eparchial Synod declared that there is no religious exemption from any vaccine, including the COVID19 vaccine". Several other religious authorities have stated their support for the COVID-19 vaccine. Despite the fact that it is clear that other religious leaders have not made the same types of assertions and frequently encourage vaccine scepticism, this could have the unintended consequence of encouraging such scepticism[86].

It's important to note that the ecological fallacy contends that information gathered at one level of analysis shouldn't be used arbitrarily to another. Applying the results to individuals may not be suitable because

the current research was done at the region-level (i.e., nations and states). However, given that our findings somewhat agree with those of earlier studies conducted at the individual level, which indicated that spirituality and religion are related to COVID-19 vaccination rates at both levels of analysis, efforts made at the individual level (such as tailoring messages to specific beliefs) may also have an impact at the regional level. The fact that this is still conjecture means that additional study will be necessary to evaluate this subject.

It's vital to note a few restrictions. First off, it's challenging to evaluate vaccination rates at this time since they are probably impacted by a number of ongoing events, such as supply problems and challenging vaccine rollouts. Confounding variables could still be present despite efforts to adjust for supply concerns, such as the inclusion of a criterion of at least 20% vaccination rates (Study 1), GDP as a predictor (Studies 2 and 3), and comparison of previous vaccine rates to more current ones (Studies 1-3). Disparities in the way vaccines were given out may still exist, but they are less likely to do so in Study 3 because it only considered one country with a countrywide distribution of COVID-19 immunisations. Nonetheless, the current nature of the data limits what conclusions can be drawn.

Furthermore, it is unclear how effectively spirituality and religiosity can predict COVID-19 immunisation rates once the different worldwide vaccination initiatives have virtually come to an end because vaccination programmes are still in progress. The results generally indicate that

spirituality and religion are reliable indicators of outcomes later in the pandemic on a global scale, but views and behaviour may alter once fears have subsided, and societal constraints have been relaxed. However, in the U.S. sample, spirituality and religiosity were not necessarily better predictors of subsequent outcomes, which implies that the environment may affect the time in which spirituality and religiosity had the greatest influence. Ongoing analyses of the influence of spirituality and religion on immunisations are required.

Finally, the way spirituality was quantified had its limitations. In Study 1, spirituality was assessed most directly, but Study 3's spirituality measure was operationalized slightly differently by evaluating spiritual experiences. Results converged despite these discrepancies, suggesting that spirituality is a somewhat reliable predictor. Despite being harder to get than religious data, global spirituality appears to be a significant and underutilised indicator. A worldwide spirituality index is required, analogous to initiatives to gauge religion internationally. Together, regional spirituality (whether people identify as spiritual or have had spiritual experiences) and vaccination rates predict future vaccination rates[86].

However, conservatism's impacts on vaccination acceptance have not been shown in prior studies on individual-level determinants. For instance, in repeated regression studies, adjusting for conservatism did not change the impacts of religion, spirituality and science literacy. Politics and ideology have been demonstrated to have a negligible impact on vaccine

acceptance, even when evaluating COVID-19-related vaccination acceptance. Therefore, while conservatism does not appear to be a predictor of vaccination acceptance on an individual basis it may still be a more significant predictor on a collective level. Thus, we think that its inclusion would be a fruitful field for future study[87].

A study Concerning the effectiveness and safety of COVID-19 vaccinations in Africa, found that a remarkable quantity of false information is being spread in Malawi. Rumours abound that the COVID-19 vaccinations are cursed, will alter human DNA, or are being deployed to wipe off Africa's population. Some assert that COVID-19 vaccinations are prohibited by Islamic law. Conspiracy theories and false information about vaccines work together to undermine public health efforts, especially vaccination uptake. The researchers expressed that they the “leaders of faith” have contributed to the low acceptance of vaccines among their followers," by Cecilia Mambo, a 59-year-old religious figure in northern Malawi. "We have misled people and stoked their fear[87]."

The Johns Hopkins Centre for Communication Programs-led Breakthrough ACTION project has been working in Malawi to engage religious leaders, educate them, and help them use what they learn to help their congregants understand the value of vaccination and other COVID-prevention methods. This is because there is a great need to share the most recent information through reliable sources. As the COVID epidemic enters its third year, CCP is collaborating with religious leaders in Liberia, Nigeria, and other

nations in addition to Malawi to help put a stop to it. According to CCP's Vitima Ndovi, the senior programme officer in charge of the COVID-19 work in Malawi, "Religion is an important part of the social and cultural fabric of many communities where we work." Therefore, religious authorities have the authority to hinder or promote the use of COVID-19 vaccinations. Interventions that use clerics as change agents for forming beliefs and changing behaviours linked to COVID are essential for boosting vaccination uptake because of their high degree of influence.

Breakthrough ACTION assisted the Ministry of Health in Malawi in providing orientations on COVID-19 prevention and immunisation to 144 Christian and Muslim leaders (top leaders, women, and youth). They include exercises and discussion ideas for religious leaders that are continuously updated depending on frequently asked topics and new issues. The community members are being made aware of safety issues by the leaders, who are also executing measures to create demand for vaccines. The leaders discussed and put into practise various strategies, such as spreading messages at regular religious gatherings, via social media, and in already established face-to-face religious forums. Some people have even planned to have COVID-19 screenings and vaccinations delivered straight to their churches or mosques. The government of Nigeria, which has 216 million citizens, set a March 2022 deadline for immunising 50% of those who qualify in each state. The Nigerian government reports that as of mid-March, 16.4% of eligible Nigerians had gotten at least one immunisation

dosage and 9.8% were totally protected. Only 14% of Sokoto state's eligible population has gotten a dose of the vaccination. Given that Sokoto state has only officially reported 817 cases and 28 fatalities since the start of the pandemic, CCP has discovered that the low adoption of the COVID-19 vaccine in that state is mostly attributable to distrust of vaccinations and the whole COVID-19 response[87].

According to Islamic scholar Mustapha Sidi Attahiru, PhD, "Traditional and religious leaders as well as healthcare professionals have particularly poor knowledge of the disease and the benefits of the vaccine, leaving many people wondering whom to trust." Attahiru is a part of Breakthrough ACTION-Nigeria's Social Behaviour Change Advocacy Core Group, which was established to include traditional and religious leaders in behaviour change initiatives[87]. In addition, Breakthrough ACTION-Nigeria worked with state and local health officials to organise a two-day forum with traditional and religious leaders. The forum's objectives included identifying the causes of vaccine hesitancy, dispelling myths, filling in information gaps, and developing key messages that the leaders could then use in their communities. Following a sluggish start to COVID-19 vaccine shipments in Liberia in 2021, vaccine supply and demand started to outperform each other in the second part of the year. Breakthrough ACTION wants to raise demand for Covid-19 vaccinations. The Ministry of Health and Liberia's government joined forces to launch the vaccination ambassador’s programme. Through them, the vaccine ambassadors aimed

to ultimately increase COVID-19 vaccination in each community. These influential community members included chiefs, commissioners, religious leaders, facility, and community-based health workers, as well as women and youth leaders[87].

According to preliminary data, Liberia's 86 vaccination ambassadors have so far organised 425 community engagement activities, leading to the immunisation of close to 1,800 individuals in three counties (Bomi, Grand Cape Mount, and Maryland). In addition to participating in radio talk programmes, vaccination ambassadors have spoken to thousands of Liberians about the need of being vaccinated while sharing their own personal experiences. The Liberia team offers the following advice: "Do not assume that all of the individuals you nominate to serve as vaccination ambassadors would desire to get the COVID-19 vaccine. Despite the ambassadors' willingness to participate in the programme, Breakthrough ACTION still had to spend time gaining their faith in the vaccination. However, after extensive discussion, all ambassadors received vaccinations and turned into ardent supporters[87].

Religious objections to vaccinations have an unavoidable impact on vaccination coverage. Using an HPV vaccine hesitancy research conducted by in the United States, it was shown that 38% of participants had only gotten one dose of HPV vaccine, while 33% had finished the recommended three doses[88]. This coverage fell short of the national

projections for HPV vaccine initiation rates provided by the CDC (48-65%). The same study also found that, flu vaccine uptake among American Muslim women was found to be higher (71.98% vs. 39-44%) than annual adult estimates for a comparable cohort in the nation. Another research conducted, examining children's full immunisation status revealed that religious groups had higher coverage than the general population. In three other studies conducted among, religious and non-religious populations in Ghana, Uganda, and Zimbabwe they found that children reared in Christian and Muslim homes had higher vaccination coverage than children raised in non-religious families. Similarly, in Uganda, full immunisation status was found to be greater in the Christian population (73.8%) than in the non-Christian group (69.2%) (17). Finally, research done in Zimbabwe found that all basic immunisations were received by children aged 12-23 months of who were either Apostolic, Roman Catholic, Protestant or Pentecostal/charismatic, Traditionalist, and Muslim Christians during the 2010-2011 school year. All these groups exhibited higher vaccination coverage than non-religious participants[89].

These concerns highlight that individual decisions to vaccinate or not vaccinate among religious groups are not only influenced by religious connections, since positive trends may be detected within these communities despite established barriers to vaccination. With these encouraging vaccination coverage results, the researchers believe that communicating with certain demographics is essential and that a more

thorough evaluation of these interventions is needed. There are many instances of this type of communication technique being used. For instance, a social mobilisation effort to connect with parents and community health professionals was started in Pakistan as part of the Expanded Programme on Immunisation (EPI)[90]. Reaffirming the government's commitment to vaccine provision and harmonising national standards, objectives, and message about immunisation were the goals of this initiative. Local religious influencers were involved in this effort through announcements in Mosques about immunisation sessions and the mention of immunisation relevance during periodic religious sermons.

Another study conducted stated that delivering HPV information and providing free vaccines were part of a preventive approach in Malaysia to reduce the incidence of cervical cancer among women who had received vaccinations. Examining HPV awareness and barriers involved a survey of 13-year-old Malaysian girls. Because more females (2.3%) indicated that their religion opposes the HPV vaccine owing to its associated with sexual promiscuity (20), the author noticed that public knowledge of the HPV vaccination remained low even after the intervention. In the United States, the Intermountain West HPV Vaccination Coalition (IWHC) was established by 10 states and 300 diverse community members to promote HPV vaccination among boys and girls and to suggest creative strategies to combat HPV. This was another communication strategy focused on HPV vaccination. The top five reasons given by IWHC members for their

experiences between 2014 and 2016 in surveys and focus groups of selected IWHC members are as follows: a strong doctor's recommendation, improved information on the HPV vaccine, more family support, a focus on cancer prevention, and more school immunisation initiatives[91]. This research conducted on HPV vaccine hesitancy has given an insight as to what healthcare workers would face in giving out COVID-19 vaccinations and how vaccine hesitancy may be harmful to the society. Therefore, controlling the COVID-19 pandemic depends on the effective development and use of COVID-19 vaccinations.

Vaccine reluctance is a serious barrier to attaining broad immunisation, despite the COVID-19 vaccine being available since late 2020, 17% of Americans in the United States still said they had no plans to get immunised as of April 2022. The World Health Organisation (WHO) currently sees vaccine hesitation as a significant danger to global health as a result of the sharp increase in vaccine reluctance[92]. A literature reviewed expressed that one of the groups that has so far shown a greater reluctance to get the COVID-19 vaccination in the United States is those who identify as Evangelical Christians. White Evangelical Christians make up over a third of the country's unvaccinated adults as of May 2022. The COVID-19 vaccines were created too rapidly and are not safe, as well as needle anxiety, are frequently cited causes for general vaccination reluctance.

Concerns about vaccinations interfering with divine providence and the use of aborted stem cells in vaccine development and production are

frequent grounds for vaccine hesitation, especially among Evangelical Christian. Evangelicals are also slightly more likely to say that science occasionally contradicts with their own personal convictions than people of other religious affiliations. Importantly, research show that religious leaders and shared religious identities can significantly influence vaccination decisions, including whether or not to vaccinate[93]. Understanding the reasons behind the Evangelical Americans' reluctance to receive the COVID-19 vaccination, who make up 29% of Americans, is crucial to putting an end to the epidemic. Understanding COVID-19 vaccine uptake behaviour is helped by the Health Belief Model, which has been utilised for understanding vaccination behaviours for a long time is important as well. In relation to COVID-19 and COVID-19 vaccinations, its dimensions include perceived COVID-19 severity and susceptibility, perceived advantages of and obstacles to receiving a COVID-19 vaccine, self-efficacy to overcome vaccination obstacles, and cues to action to receive a COVID-19 vaccine. The same study after analysing their data found that, Older Evangelical Christians and those who resided in suburbs had higher rates of COVID-19 vaccination than their peers in rural regions. This is similar with flu vaccination trials, in which individuals who were older and who lived in rural regions received the vaccine less frequently, respectively[95].

The findings also showed that respondents who had no children or who had no children under the age of 18 living at their house were more

likely to have had their vaccinations than those who did. The study also discovered that parents who had not immunised their children were adamantly opposed to them receiving the COVID-19 vaccine. The fact that 22% (74 million) of the population of the United States is under the age of 18 and that there is evidence to suggest that children and adolescents are involved in the transmission of COVID-19 make this study worrying. For instance, outbreaks in high schools have been documented all over the world, and modest social events, particularly birthday parties for children, have been linked to an increase in COVID-19 infections in families [96].

Higher levels of formal education were associated with a greater likelihood of being hesitant to be vaccinated when compared to individuals who were either going to get vaccinated or were unsure[96]. This suggests that lower-educated Evangelicals who have not received the COVID-19 vaccination may be another group who may decide to do so in the future. Findings provide light on Evangelical Christians' attitudes towards health. In line with the HBM, those reporting a high level of benefits related to the COVID-19 vaccine as well as those reporting a low level of barriers to getting the COVID-19 vaccine were more likely to be immunised. This was true even after controlling for numerous variables, including education, gender, age, race, health insurance, and rural status. There were no reliable indicators of COVID-19 vaccination uptake status for reported COVID-19 severity or perceived vulnerability to COVID-19. The study suggests that communication efforts should concentrate on both enhancing perceived

vaccination advantages and effectively resolving perceived vaccine hurdles[97].

According to another research conducted in Ghana, it was found that the population of Ghana is becoming more reluctant to receive vaccines. When compared to all categories of prioritised groups sampled for the study, it was observed that religious leaders had a high hesitation rate. A sampling of 57 percent of religious leaders rejected the immunisation. Their reluctance to receive the vaccination was cited because of their suspicion of the vaccine's creation, their mistrust of the political leadership overseeing the battle against the epidemic, or their ignorance about the development of vaccines. In the research, a charismatic leader lamented his scepticism of the President's initial COVID-19 vaccination. "I have my doubts as to whether what he (the President) received was the vaccine or something else," he was reported as adding. Politicians are not truthful. In Ghana, there is no truth. It's possible that the President had a different injection altogether, rather than the COVID-19 vaccination, or perhaps simply water[98].

Another poll found that among the reasons respondents were reluctant to obtain the vaccination in Ghana included worries about fertility, side effects, conspiracy theories, and the vaccine's efficiency. According to Dr. Yaw Bediako, a Research Fellow at the West African Centre for Cell Biology of Infectious Pathogens (WACCBIP), COVID-19 conspiracy theories and false information have easily spread from anti-vaccination

movements in other continents to Africa with the aid of social media. He claims that people of all educational levels are now susceptible to this false information. He claimed that due to false information propagated by foreign media, Ghanaians are afraid of the negative effects of the COVID-19 vaccine for adults rather than of immunising their children against illnesses that affect youngster's[98].

He stated that a strong research ecosystem should be established likewise improving public funding for research in order to react to new threats more swiftly. If we only concentrate on producing vaccines without understanding the necessity for a whole research ecosystem, we will be missing the purpose. Although there are those who have been highly pro-vaccine, he also expressed that a few religious leaders haven't helped the matter. People should be careful to avoid making broad generalisations and blaming all religious leaders for resistance[98].

When the epidemic first started, religious beliefs helped stop its spread because preachers started using biblical texts about purifications in their sermons. for years Christians has always preached and practiced a phrase that "cleanses are next to godliness," with the practice of hand and feet washing from (Exodus 30:17–21; 38:8) being a spiritual routine of purification in Christendom[99]. Christians do not just practice hand and feet washing alone, but also practiced by Muslims, as it is a mandatory routine before prayers.

This practice has always been in many religious faiths but preached during sermons for Christians and khutbah for Muslims to be taken more seriously during this pandemic. However, the pandemics has always been tied to a spiritual cause for centuries, as many religions believe that the COVID pandemic is GOD (gods) judgement on earth, that the sins of man have angered Go[99]. Many, believe that the COVID-19 pandemic is a sign of the end time (the end of the word, the apocalypse) according to the bible in the book of Revelations the pandemic and all pandemics past and present is a sign of Christ coming. Though, this believes is not what is stopping people from taking the COVID-19 vaccination but conspiracy theories that the COVID-19 vaccination is a propaganda by world government to change the DNA of its citizens in other to control their minds, many religious people are against being controlled as this is seen as a move of the anti-Christ in the Christian faith or Al-Masih ad-Dajjal in the Muslim faith, hence, the refusal to accept the COVID-19 vaccinations for example, Muslims were found to believe in a divine fate or a destiny[100]. These implied that a person's illness was God's will and that nothing, including a vaccine, should be done to prevent it. The use of aborted foetal cells for vaccine production among Amish and Catholic communities including during the COVID-19 outbreak where frowned up on when Senior Catholic leaders from the US and Canada raised ethical objections to vaccines produced using cells derived from aborted foetuses. Another study showed that people tend to evaluate themselves less in societies with

a greater number of believers and a lower level of scientific trust. The authors pointed to religious fundamentalism and internal religiosity as indicators of a lower level of tests. Related results regarding mask use were suggested. The study discovered that trifling wearing a nose mask is linked to conservatism both religious and political[101].

Therefore, it is likely that religion has a negative impact on people's willingness to follow COVID-19 safety precautions. Religious people are less likely to receive vaccinations than non-religious people, according to prior studies on vaccination against various diseases[101].

Researchers proposed that religious people tend to believe in information and data sources that contradict scientific facts as the explanation for the negative relationship between religiosity and compliance with protective behaviours and willingness to receive the COVID19 vaccine. However, other studies have demonstrated that religion has no distinct impact on whether people accept the COVID-19 vaccine, and if it has any impact at all. The study found that Orthodox Jews are less likely to receive vaccinations than nonbelievers. However, there was no correlation between overall COVID-19 attitude and religious attitude. Therefore, it is unclear whether religion and COVID-19 vaccination are related[102].

Though, a contradictory finding explained how researchers used a variety of COVID-19 vaccination indicators (such as intention to vaccinate, acceptance of vaccination, or vaccination hesitancy), to measure the relationship between religious belief and COVID-19 vaccination was

primarily researched in a small number of countries. This could have restricted the conclusions regarding the sociocultural traits of specific nations. Based on religious practices majority of Christian denominations are either not in favour of vaccination or, at the very least, not against it[103].

Still, leaders of the Catholic, Protestant, and Orthodox churches have stated that vaccination against COVID-19 is ethically acceptable and even well-suited with their respective ideals[104]. Although, the possibility that some vaccines might be made from aborted foetus tissue, which goes against the Christian perspective on abortion, has led some Christians and clergy members to oppose the COVID-19 vaccination. An illustration of this is the way some leaders of the Roman Catholic Church in the USA have criticised the Johnson and Johnson COVID-19 vaccine, calling it "morally compromised" even though the vaccine's producer has tried to prove otherwise[104]. This vaccine reluctance is not new for Christian dominations such as the Amish, Church of Christ, Scientists, Dutch Reformed congregations, Jehovah's Witnesses, and the Church of the First Born as it has always been a doctrine for generations. This domination of Christians believed that vaccinations were incompatible with the human body, hence the body is a “Temple.” From research it has been found that Christian nationalists, a group of fervently conservative believers, are one of the nation's most antivaccine and anti-scientific bodies[105]. Same study found that the Islamic faith are more acceptive towards the COVID-19 vaccine. The study shows that Islamic leaders who did not agree with the

applicability of COVID-19 or the necessity of precautionary measures such as vaccinations, have changed their minds. As majority of imams and Muslim groups have urged their followers to get vaccinated against COVID-19. Islam does not forbid vaccination or consider it to be against the law. Receiving a COVID-19 vaccination is compliant with Sharia law because protecting life is connected to protecting religion[106]. And various imams and Muslim groups still urge the faithful to receive a COVID-19 vaccination.

Many Islamic leaders released religious edicts describing how vaccination is in line with Islamic principles even before the COVID-19 pandemic[107]. However, the COVID-19 vaccine reluctance amongst Muslim groups is caused by mistrust, and this has worsened over the years with the spread of false or true news by social media, hence whatever solution or modern technology being developed by this political and rich elites is regarded a mysterious agenda. This believes and propaganda has spread in Nigeria through Religious beliefs and leaders increasing the reluctance of Nigerians towards the (COVID-19 vaccine)[108]. Nigeria having three main religion which are Islam, Christianity, and traditionalist the spread of Misinformation and a lack of access to proper information are the primary causes of low vaccination trust amongst religious groups. The ease and speed with which incorrect and misleading information is spread through the media has enhanced misinformation's power amongst religious

organizations which constitutes a step backward to anti-vaccination movement[111, 112'113, 114].

The Internet and social media have been essential in spreading anti-vaccination efforts and influencing choices in developed countries, but it is not the same in developing countries, as social media has added in the spread of false news and rumours which has increased the reluctance amongst individuals in these countries[114]. For example, rumours began circulating that the vaccinations administered in Europe and America were different from those used in Africa. Again, as data has emerged, it is now evident that the COVID-19 vaccinations used in Europe, America, and other parts of the world are the same as those used in Nigeria and other African countries[115]. The conspiracy theorists have since dropped their argument, claiming that everyone who receives the vaccination would die after two years this creates misunderstanding and reluctance amongst religious groups for example, Muslims believe that their lives must obey the will of Shariah an (Islamic law) based on the Islamic book of the Holy Qur'an and the sayings and actions of the Prophet Muhammad Muslims seek counsel from Islamic scholars, they provide an interpretation of God's will through the Islamic legal system known as Fiqh (Islamic jurisprudence) [116]. While Sharia law is God's decree, Fiqh is achieved through the analysis of Al-Quran and Al-Hadith with this factors, Muslim people grow resistant to vaccinations due to some of the components that is said to be used in producing the COVID-19 vaccine. for this reason, the

presence of porcine or non-halal components in vaccines is viewed as the primary obstacle to COVID-19 vaccination[117,118]. During the Ramadan and the fasting month, Muslims reject vaccination for the reason being that they are not to eat, drink, perfume, or participate in sexual activities from sunrise to sunset.

Vaccination is thus prohibited during Ramadan, as nothing should enter or exit the body. One of the most prominent reasons for refusing is that vaccination may cause the fast to be broken[119]. Political conflict between government and religious leaders also fosters vaccine hesitation or refusal across a social system (religious group), as government authorities would like the people, they serve to get vaccinated thus to decrease the spread of the virus, religious leaders became one of the key causes of hesitation as they constantly speak against vaccination because they feel it is not safe and that God's will should take precedence over science[120]. Vaccination hesitant people are those who are undecided about whether to get a vaccine. They feel that these pastors, imams, priests, and herbalists have their own interests at hand, but the government's aim is more about making money than the welfare of the people.

In 2003, the political and religious authorities of Kano, Zamfara, and Kaduna states in northern Nigeria banned vaccination following a campaign by parents and women who refused to allow their children to be vaccinated. With the claim that the vaccination might be tainted with antifertility agents (oestrogen hormone), HIV, and cancerous agents, all of

which would be far more damaging to the body than polio. Ibrahim Shekarau, the governor of Kano state, justified the 11-month boycott, claiming that the decision was made after the federal government investigated the test findings and was dissatisfied with them[121].

However, in the Christian faith, may believe that with the grace of the holy sprite and blood of Christ, they will not contract the virus, some Christians believe that the corona virus is a judgment from God to weed out the Good people from the bad people, some Christians also feel that it is the devil at work since churches had to be lock down for a while and few people had to go to church at a specific time given. These ideas and believe is not only among members of churches but the propaganda is also supported by notable clergy's like, Minister Chris Oyakhilome, the founder of Christ Embassy, who scolded his preachers that advocated for members to take the COVID-19 vaccination[122]. He expressed his surprise that gospel ministers consider an antibody to be the solution to the world's problems. Many members under him agreed to his understanding and analysis of this COVID-19 situation to be an agenda for world government to have power over the church, his ideologies have caused a reluctance amongst his members and amongst worldwide Christians who hold him on a pedestal[123].

Misinformation and lack of transparency in government have created mistrust and low confidence amongst Nigerians, as Nigerians are not able to filter which story is true or false. It was reported that Bill Gates had bribed the Nigerian government $10 million to enact a bill that would

allow children to be used to test COVID-19 immunisation, according to stories that spread fear and impacted reluctant views amongst Nigerians. This type of false information flourishes because it takes advantage of the fact that many Nigerians now have severe reservations about experts. One of the reasons for this concern originated from a history of questionable activities by some pharmaceutical companies. In 1996, Pfizer, the company behind one of the world's most well-known Covid19 antibodies, conducted a pharmacological experiment on 11 Nigerian children, 11 of whom died, and a handful of others were left crippled[124]. Pfizer compensated the family, but it has been suggested that the business conducted payoffs some delegate to avoid criminal charges. Rumours that an unidentified, immensely rich individual and unidentified pharmaceutical corporations are attempting to hurt the populace with the agreement of their government and no oversight have enraged the public.

Nigeria is a religious country with a substantial Christian and Muslim population and a small percentage of people of other religions, religious institutions are one of the finest approaches to educating a huge group of people, therefore the best way to stop vaccine hesitancy is to teach members of religious groups the advantages of the taking the COVID vaccine and for religious leaders to use their positions to reduce reluctance amongst populace [125].

2.3.2 Reference Group and COVID-19 Vaccine Hesitancy

In August 2020, a small study of adults in Canada found that 20% and 12% of the population, respectively, would not receive the COVID-19 vaccine or were unsure if they would. A nationwide online survey conducted in the U.S. in June 2020 found that 23% of adults were unsure and 15% of adults said they were unlikely to get vaccinated. Though, Young people claim that they are more likely to accept a potential COVID-19 vaccine[94 95]. In the fall of 2020, 80% of respondents from a public university in Canada said they were willing to be vaccinated, and 76% of youths in China who were surveyed from November 2020 to March 2021 indicated their acceptance of COVID-19 vaccine in the future. The likelihood of receiving the COVID-19 vaccine among adolescents under the age of 18 is most influenced by the attitudes of their parents[126 127].

According to a study conducted in Italy, parents of children under the age of 18 are in favour of vaccination, with 60% saying they would do so. In April 2020, 73% of American adults said they would be willing to vaccinate their children, while 75% said they would be willing to vaccinate themselves[127]. Most recently, statistics from surveys presented at the Advisory Committee on Immunization Practices (ACIP) by the Centres for Disease Control and Prevention (CDC) in May 2021 showed that 46-60% of parents intend to vaccinate their teenagers, with parents reporting a similar or slightly lower intention to vaccinate their children versus vaccinate themselves. 51% of adolescents aged 13 to 17 and 55% of

parents of children aged 12 to 17 said they would or get vaccinated or he their adolescent get vaccinated, respectively, according to a survey on parents and adolescents conducted by the CDC and the University of Iowa in April 2021[128] [129]. Despite the long survey done by the research, parents' attitude did not change toward the vaccine, instead excuses were made increasing the reluctance amongst parents and family members[130].

In another study conducted by UCLA 75,000 people over 10 months were concerned about the COVID-19 vaccination where, 38%-34% of respondents were disturbed about the vaccine's side effects and did not believe it was safe. In addition, one in every four registered voters in the US said they do not intend to get a coronavirus vaccine[131]. However, according to a Pew Research Centre poll, half of those who said they were unlikely to get vaccinated were willing to change their minds if more information became available or if other people like their friends were vaccinated first. It is not a surprise to the researcher that Some people will wait until others have taken it before taking it." When modern technology is released, there are early adopters and those who wait to see how it performs[132]. The study believes that vaccination efforts will progress in a comparable manner. However, it may take a lot of persuasion for a wide community willingness to push that effort forward. Also, according to the Survey Centre on American Life, Americans whose direct friend's group was entirely vaccinated were far more likely to have gotten the vaccine themselves than those with fewer vaccinated friends. aside reports of

higher rates of vaccine hesitancy overall, this was also true among Republican Americans. Ninety-three percent of Republicans who had at least partially vaccinated friends had also been vaccinated. In contrast, only 19 percent of Republicans with few or no friends who were partially vaccinated said they had received the vaccine[133].

Therefore, our reference group has a strong effect on how we accept vaccination, and vaccine hesitancy varied depending on an individual close friend or family member who was infected with COVID-19 and had refused vaccination. The reference group has two types, which are the primary and secondary groups[134]. A primary group is also known as a close community specifically structured with a clear mission that involves face-to-face interactions [128]. Primary groups are distinguished by mutual interest, shared activities and culture, and extended periods spent together. They are psychologically reassuring and have a profound effect on the development of personal identity.

Primary groups include families, close friends, and kin. The goal of primary groups is to foster relationships rather than to achieve some other goal [135]. Family has a massive impact on an individual decision to accept a vaccine. The more attached one is to family, the more likely it is that the individual will want to share vaccine uptake decision with them. also, the stronger a family tie, the more likely it is that one will take the vaccination together. However, even if one is not close with family, sharing decisions can be effective if they feel like they are part of one big community. A

family is a group of individuals who are linked by marriage, blood, or adoption and form a single home, interacting with one another in their different social roles, which are commonly those of spouses, parents, children, and kin.

A family may include guests and roommates sharing the same house but is also distinguished from an individual's bloodline because they might be divided into several families[136]. Family has a large effect on how members accept the COVID-19 vaccination, whenever it comes to health and medicine parents have a huge influence on the acceptance of vaccination on their children despite the age. Decisions regarding getting a new vaccine, going to the doctor, and eating habits are frequently made in the context of a family.

The family, as a key consumer unit, is also a primary target for the marketing of numerous products and services like the COVID-19 vaccine. What influences reluctance among family, is complacency and complacency are cause by fear: Complacency is when people are comfortable not being vaccinated, even with the dangers of contracting the virus, this creates a barrier in vaccination. Many behavioural or psychological variables, such as vaccination attitudes, community norms, and scientific trust, are associated with vaccine fear, vaccine fear and complacency amongst families causes mistrust in researchers and the vaccines itself which was a commonly reported reason for vaccine hesitancy [137], peers and friends have a very strong impact on an individual

perception towards taking a vaccine, peers and friends tend to spread rumours among members about a vaccine, they tell stories about what they have heard seen or experience which affect the decision of other members, Having a friend who gets vaccinated increases one's chances of getting vaccinated by 18.9 percentage points. If one is concerned about vaccine safety, side effects and lives within proximity of a health clinic, the influence of friends' vaccination decisions on one's vaccine take-up decreases significantly [138, 153].

A study found that those who did not know anyone with a COVID-19 virus were 24%, those hospitalised were also 24%, and those who died had a statistically significant higher tendency to refuse vaccination than those who did know someone with a COVID-19 infection [138]. Participants who did not have a friend or family member infected, hospitalised, or died because of COVID-19 virus were at least twice as likely to refuse vaccines as those who did have a friend or family member infected, hospitalised, or died because of COVID-19 infection[139].

However, there is a greater chance that vaccine-preventable diseases will come up and have an impact on herd immunity, as well as a decrease in faith in the ability of healthcare institutions to protect people. Parents are an elite group they function as decision-makers for their children who are unable to make their judgments[140]. Parents find vaccination decisions particularly relevant and exciting since vaccination is a socially enforced decision that influences a child's health. This highly involved rate may

allow families to overemphasise possible vaccine-related side effects, and by reinforcing them, families may focus more on the potential consequences of vaccination-related decisions, leading to a specific pattern of consequences bias. Previous research has found that parents are typically more sceptical about immunizations than nonparents. To see if this trend holds for the COVID-19 vaccine, researchers analysed a large agent test of 19,789 people between February 5 and March 1, 2021. Vaccine hesitancy varies across families and peers, there are different factor that causes hesitancy among individuals and family and peer influence is one of them [141].

In research conducted about parents' attitudes, and acceptability of the COVID-19 vaccination for children in India were examined. The researchers found several correlations between vaccination acceptability and sociodemographic traits that were linked to vaccine hesitation or low acceptance of the COVID-19 vaccine for youngsters. Before COVID-19 vaccine was introduced in India, policymakers tried to find solutions to lessen vaccination reluctance after the COVID-19 vaccine was made accessible, they discovered that 85% of parents will vaccinate their kids. This was backed up by a study that found that 73% of parents approved of giving their kids the COVID-19 vaccination. In general, parents whose kids had received standard vaccinations were open to having their kids get the COVID-19 vaccine similar research discovered this link, reporting that parents who had a high level of seasonal flu vaccine acceptance were also

open to vaccinating their kids against COVID-19[146]. The study also discovered that women were more likely than dads to believe that their children will be safe after receiving the COVID-19 immunisation and to be ready to give it to them[142]. To continue, it was found that Mothers had a more positive attitude towards immunisation in children than men did. Additionally, it was observed that parents of kids who received vaccinations regularly expressed a readiness to vaccinate their kids against COVID-19. Similar relationships were observed by individuals who had the seasonal influenza vaccination noted that they were more likely to take COVID-19 shots[143]. In a prior study, it was discovered that medical professionals reported a high degree of readiness to have their kids receive the COVID-19 vaccine even though working in the healthcare industry was not shown to be notably linked with vaccination uptake contrary to this conclusion. Despite the fact that parents in previous studies will vaccinate their children, Parents in three studies expressed a lack of willingness to vaccinate their children, the first study reported that only 36.3% of the population under study were willing to do so, the second reported a 44% willingness, and the third reported a 53.7% willingness[144]. Several important links between specific sociodemographic characteristics and vaccination reluctance or poor readiness to immunise children against COVID-19 have been found. Respondents with chronic or lifestyle-related disorders and low levels of education thought that vaccinations would have unanticipated side effects in the future, which contributed to vaccine

hesitation. Participants over the age of 40 indicated concern about potential vaccination side effects and held the view that vaccines were profitable for pharmaceutical firms but not for the public. The researchers also observed that participants older than 35 years old were less likely to receive the COVID-19 vaccination, further supporting this link between age and vaccine hesitation. 59% of those who responded to our survey expressed concern about potential vaccine-related side effects in the future. These issues have been discovered in previous research, and policymakers ought to address them[125]. According to this research scepticism are the disadvantages of vaccines and unrecognised side effects were the most important predictors of hesitation and doubt[147] another study found that 69% of parents declined vaccinations because of a lack of safety knowledge, and 60.5% did so out of concern about potential negative effects. In fact, most parents (81%) in this poll agreed that vaccines should be required for children, though a different study did not agree with this majority. Only 40.4% of parents, thought vaccinations should be required. Despite these impressions, the COVID-19 pandemic has had an influence on every facet of life. The COVID-19 outbreak significantly increased mortality and morbidity while also upsetting the global economy[148].

Another research assessed the overall Asadabad population's approval of the COVID-19 immunisation and found that substantially influenced vaccination acceptance were the death of a family member from COVID-19, confidence in medical professionals, faith in already available vaccines,

recommendations to family members to acquire the COVID-19 vaccine, and dread of COVID-19. Acceptance of vaccination is a behavioural outcome of a complicated decision-making process that is possibly influenced by a variety of circumstances. 42.3% of participants in the current trial were hesitant to get the COVID-19 vaccination. The researcher stated that it is possible to see all vaccine attitudes, from outright acceptance to active demand. A diverse group in the centre of the continuum, vaccination hesitators often take certain immunisations but reject others. These individuals are more dubious about more recent immunisations, this is due to the lack of documented previous experience which makes individuals appear to be sceptical about new vaccinations as a novel technology and may account for their low level of acceptability. Another factor could be the speediness with which vaccinations were developed and reg Those who trusted medical professionals were twice as likely to receive vaccinations. According to research conducted in Saudi Arabia, 64.7% of the population was eager to receive vaccinations, and those who trusted the healthcare system were three times more likely to do so. People who trusted the medical personnel had 2.7 times greater probabilities of taking the vaccination in 2021. Additionally, COVID-19 phobia increased the likelihood of vaccination. 62% of the participants in the trial conducted in Pakistan expressed a willingness to take the COVID-19 vaccination. Acceptance of the COVID-19 vaccination and fear of COVID-19 were significantly correlated[150].

The likelihood of receiving the COVID-19 vaccination was almost four times higher among those who trusted the vaccine. This result makes logical because vaccination acceptance is influenced by vaccine confidence. Additionally, those who urged their family to have the vaccination had a 7.6 times higher likelihood of receiving it than non-encouraging individuals. A person who has faith in the efficacy of the existing vaccinations will urge his family to receive the shot, and he will do the same. The findings showed that persons with a history of COVID-19 infection had reduced likelihood of accepting the vaccination because they could believe that previous illness has given them protection.

People who have a family history of COVID-19 infection are more likely to take the vaccination since they may have witnessed their loved ones suffer as a result of COVID-19 infection. The reduced likelihood of vaccination uptake in persons who had lost a family member to COVID-19 was one of the study's unusual results. This conclusion may be attributable to the fact that people use an immature technique to try to deal with their guilt by punishing themselves after losing a loved one. Additionally, if the suffering is severe, the individual can lose interest in life and choose to succumb to the illness and its effects.

Herd immunity can occasionally exceed 85%, depending on the nation and the prevalence of illness, and requires that a new vaccine be accepted by at least 70% of the populace[151]. Herd immunity might be put at danger by widespread vaccine rejection. On the other hand, widespread acceptance of

local vaccine refusal can have a negative impact on community safety because those who choose not to be vaccinated may unnecessarily raise the vaccination coverage needed to attain herd safety[151].

In this study, a sizable cohort of 341,326 parents and 272,914 teenagers were examined to determine the acceptability of the COVID-19 vaccination in adolescents aged 12 to 17 years. We discovered that teenagers (69.1%) and parents (72.2%) both had a comparatively high level of support for the COVID-19 vaccine among adolescents.

Perceptions of vaccination safety, efficacy, and risk-benefit were shown to be the factors most strongly correlated with vaccine adoption. Student grade (age), recent vaccination history, risk perception, and illness severity were also linked to parents' and teenagers' intentions to vaccinate their children. According to reports, one of the most crucial factors determining vaccination is one's perception of safety[152].

Interestingly, vaccination reluctance was correlated with self-reported perceived knowledge of the COVID-19 vaccine. This conclusion differs from other studies where perceived knowledge gaps were linked to widespread vaccination reluctance. This may reflect the informational environment in which parents now find themselves. People who believe they have more knowledge but just know false information about the COVID-19 immunisation may be more reluctant to be vaccinated[152].

For COVID-19 immunisation in children and adolescents, ongoing risk-benefit evaluations, risk communication, and constant monitoring of

vaccine safety and effectiveness are crucial due to the COVID-19 vaccine's extensive development timetable. Based on the findings of this study and other reports, vaccine acceptance is influenced by prior beliefs regarding childhood immunisation individual differences in priorities, and disparities in personal experiences during the COVID-19 outbreak, such as infection or exposure. Although not evaluated in this study, additional variables such as social media peer, and parental norms and trust in the child's doctor have been found to be related to teenagers' willingness to receive COVID-19 immunisations. Previous research among South Korean adults found that factors such as employment status stability, declining family income, deteriorating health, and government trust were predictors of vaccination hesitation[148].

The acceptance rate for the COVID-19 vaccine in adolescents in this survey was higher than reports from other countries. In a survey performed from February to March 2021 in the United States that 46% of the 1,745 parents of 3,759 kids said they were "likely or very likely" to vaccinate their kids. The difference in acceptability may be related to the age of the kid (0-18 years vs. 12-17 years) and the timing of the poll in the United States (before emergency permission of teenagers aged less than 12 years). According to research conducted in Italy, many parents and guardians (60.4%) were inclined to vaccinate their children, followed by 29.6% who were contemplating the option, and 9.9% who were apprehensive. Female parents or guardians of children aged 6 to 10 years, people under the age of

29, people with poor educational levels, those who rely on information from the internet or social media, and people who dislike obligatory vaccination laws showed hesitation[152].

The high acceptance rate for other vaccinations among Korean children and adolescents may be connected to the comparatively low reluctance regarding the COVID-19 inoculation. The government provides all of the immunisations that are a part of the national immunisation programme, and elementary and middle school entrance requirements include proof of immunisation. These elements, together with the National Vaccine Injury Compensation Programme, have also helped to raise the immunisation rate among Korean children to as high as 95.9% to 100%[151].

Because of the effects COVID-19 has had on our lives and our desire to resume living a healthy and normal life, there has been relatively little hesitation. 36.1% of parents and 30.1% of teenagers cited this as one of the most crucial justifications for immunisation. In addition, adult immunisation rates have been rising everywhere, including in Korea. Vaccination recommendations for adolescents have also begun in nations like the United States, Israel, the United Kingdom (high-risk groups), Japan, and more nations are expanding these recommendations, like Germany, which initially only recommended vaccination for high-risk groups but now advises vaccination for all kids between the ages of 12 and 17. The vaccination rate (≥1 dose) in the United States among children aged 12–17 years was 42.4% as of July 31, 2021 . These factors may have

influenced the acceptance rate of vaccination in adolescents in Korea Changes in epidemiology and public health regulations like vaccine passes have also significantly impacted vaccination rates, in addition to vaccine reluctance and acceptance. After vaccines were introduced in South Korea for adolescents 12 to 17 years old in October 2021, the country's initial vaccination rates were low, at 37.1% and 10.7% for one dose and two doses, respectively. However, due to the country's significant rise in COVID-19 cases, the introduction of new variants, and plans to begin vaccine passes in this population, as of February 19, 2022, the vaccination rate for one dose and two doses among adolescents 13 to 18 years old was higher. The vaccination rate for adults 20 years and over for one dose, two doses and three doses are 97.0%, 96.1% and 68.9%, respectively[151, 154].

According to this study, parents' perceptions of the likelihood of an illness in children were 6.7% and teenagers' perceptions of the severity of an infection were 69.1% and 67.4%, respectively. This is intriguing because research suggests that symptoms in kids and teenagers are often less severe than in adults. Reports of morbidity and death in adults and high-risk groups may have a significant impact on the comparatively high perceived severity of COVID-19 for adolescents. However, in addition to the illness itself, this may also represent how COVID-19 is seen by teenagers as being a threat to or burden on their social life and relationships in light of the aggressive public health measures used to limit COVID-19 (such as closing schools). The relatively high acceptance of the vaccination

suggests a wish to avoid not only the actual illness but also future social harm and a return to everyday life as usual[155].

This research has several restrictions. First, the perception of vaccination safety and infection hazard may have altered during the poll, which was done between June 29 and July 8, 2021. The cross-sectional design might not account for recent developments, such as the appearance of the delta-variant and fresh vaccination safety information. Second, because the poll was carried out online, it might not have reached disadvantaged populations that are unable to access the questionnaires. Finally, the fact that this study was carried out in South Korea amid exceptionally effective containment and contact tracking efforts may have an impact on how broadly the findings may be applied. Despite these drawbacks, our study included a sizable nationwide sample of 341,326 parents and 272,914 teenagers. Prior to the beginning of a vaccination campaign aimed at the adolescent group, the results give a baseline profile on attitude and acceptability for the COVID-19 vaccine among parents and adolescents[156].

The COVID-19 vaccination acceptance rate and potential causes of the vaccine's hesitation among health care workers in Africa were investigated by a systematic review and meta-analysis. The findings showed a significant lack of COVID-19 vaccination resistance among HCWs in Africa as well as a generally low level of vaccine uptake. The vaccine's adverse effects, worries about its efficiency and safety, the briefness of

clinical trials, COVID-19 infections, a lack of knowledge, and societal trust were some of the potential explanations.

The COVID-19 vaccination's total acceptance percentage was 46% (95% CI: 37%-54%). This is greater than the 36% reported in observational research conducted in the US and equivalent to a recent systematic review and meta-analysis from the west that included 51% of participants[158]. Our estimate, however, is less than those of other observational studies carried out in China (86.2%), France (76.1%), Saudi Arabia (64.9%), Canada (80.9%), Germany (91.7%), and the United Kingdom (59%). The poor incidence of COVID-19 vaccination acceptance may be caused by a variety of variables, including low trust in the vaccine, media disinformation invasion, conspiracy theories, infodemic, religious views, and maybe prior vaccine hesitation in the continent. The study also showed that the healthcare students accepted the COVID-19 immunisation at an estimated rate of 34% (95% CI: 29%-39%). The projected value is less than earlier research from Italy (91.1%), the US (53.3%), and France (58%), respectively. Complacency made worse by the low danger of sickness, and the low fatality rate on the continent since the pandemic started may have contributed to this group of participants[151].

COVID-19 vaccine hesitancy throughout the continent appeared to have certain common barriers to the COVID-19 vaccine's uptake. These included lack of social trust (i.e., insufficient trust in the vaccine's source, lack of trust from the manufacturers, and lack of trust from governments)

and side effects of vaccines, vaccine safety, efficacy and effectiveness of the vaccines, brief clinical trials, the possibility of contracting COVID-19 infection from vaccines, a lack of information on the vaccines, and the possibility of contracting COVID-19 infection from vaccines. The main cause of vaccine hesitancy is the spread of false information, particularly via social media platforms and with the aid of anti-vaccination organisations[152].

In general, convincing those who are anti-vaccine to alter their minds can be challenging, especially on a continent where anti-vaccine sentiments have a long history. However, it is preferable to focus on communicating accurate and positive information about vaccines while simultaneously boosting healthcare personnel' resilience to false information. A viable strategy to encourage COVID-19 immunisation uptake in Africa is through policies that make the vaccine readily available and required. Encouragement of vaccine manufacturing inside Africa and comparison of these vaccines to those produced outside the continent should increase African healthcare professionals' trust in the security and effectiveness of vaccinations. To undertake clinical trials and produce vaccines, this would need isolating local strains of the virus. This will also assist in dispelling adverse myths regarding the purposes driving vaccine manufacturing and dismiss some of the myths propagated by conspiracy theorists[158].

2.3.3 Ethnicity and COVID-19 Vaccine Hesitancy

We live in historically significant times. The unique coronavirus illness (COVID-19), which first appeared in Wuhan, China in 2019, is still posing problems in every aspect of our lives and has had a detrimental effect on the health systems and economics of practically all countries worldwide[159]. About 275 million cases and 5.4 million fatalities had been documented as of December 21, 2021, even worse, despite the epidemic having lasted for over two years and counting, a solution is still unattainable. While the world rushed to produce a vaccine, non-pharmaceutical therapies served as the mainstay of prophylaxis up until recently. As part of the preventative alternatives since the fourth quarter of 2020, many candidate vaccines have emerged, however not without difficulties. Vaccine hesitation (VH) is among the most significant obstacles[160]. Vaccine hesitancy has long been a challenge for public health[160]. It is therefore not unexpected that the development of a COVID-19 vaccine was faced with opposition, scepticism, and reluctance despite the extraordinary event that followed the COVID-19 epidemic, the enormous loss of life, and the long-term sequela consequent on this illness.

For a vaccine deployment programme to be successful, there has to be a well-organized supply and distribution system as well as effective vaccination of the end users. Over time, vaccine reluctance has grown to be a significant barrier to end-user vaccination uptake[161]. Vaccine hesitancy is caused by a variety of complicated, context-specific elements

that change with time, location, and vaccinations. These factors are often impacted by complacency, convenience, and confidence-related factors[162]. To discourage individuals from getting vaccinations, various VH organisations frequently misrepresent scientific facts and some false information in the US and Europe[163]. Due to widespread internet connectivity, the COVID-19 pandemic has occurred at a time when information is exploding at an unprecedented rate. Social media has been a significant source of information about this atypical epidemic. While this has made it easier to comprehend and track the worldwide pandemic trend, it has also presented some difficulties when inaccurate information is disseminated, particularly through social media platforms. The World Health Organisation (WHO) and the United Nations (UN) have adopted the word "infodemic" to describe this situation[162]. Many people were suspicious of the COVID-19 because of its history and the circumstances surrounding it. Some speculated that it may have been a bioweapon created in a botched lab experiment[162]. The creation of a successful vaccination has become more urgent with the arrival of COVID-19, leading to the use of innovative, cutting-edge technologies, such as mRNA, and shorter clinical trial stages. These elements have sparked worries about vaccination safety and the possibility that they may alter the genetic composition of people. Thus, the COVID-19 epidemic has been followed by a period of rumours, doubts, false information, and disinformation all of which are ingredients for VH and tools for VH proponents[164].

Nigeria ranks seventh in the globe and is the most populated nation in Africa in terms of cases and deaths, the COVID-19 epidemic in Nigeria ranks sixth in Africa the nation tried to procure the COVID-19 vaccinations for its citizens, but given its history and VH-related experiences, little is known about the possible scope of VH among the target groups and the potential contributing variables. Studies have investigated the causes of vaccine hesitancy in Nigeria[164, 165]. There have been reports of causes causing vaccine hesitancy, including unwillingness to pay for vaccinations, worries about vaccine safety, and logistical difficulties with receiving the immunisations. In the literature studied the researcher investigated vaccine hesitancy in the six geopolitical zones of Nigeria, this study aimed to assess the incidence of vaccination hesitancy among medical professionals, college students, and the general adult population, as well as related variables. The risk of vaccine hesitancy was found to be greater among nurses, chemists, Christians, and members of Igbo or other minority groups in Nigeria's northwest and northeast geopolitical zones. When compared to most of the research from Nigeria and Africa, the rate of vaccination hesitancy in the study reviewed was high[166, 167].

However, reports of a relatively lower frequency of vaccine hesitancy have come from the United States, China, Italy, the United Kingdom, and other Asian nations [25-31]. The quickness with which the vaccinations were created, safety concerns, and widespread scepticism of government-led

health efforts have all been put out as explanations for the observed vaccine hesitancy[169]. Additionally, compared to other regions of the nation, these geographical regions are known to have poorer coverage rates for regular children's immunisations. These might be a sign of people in these geographical areas generally using conventional healthcare facilities less frequently. Therefore, just as was done in the past with routine childhood immunisation and especially during rejection of polio eradication vaccination campaigns it is essential that traditional and religious leaders in these zones be engaged to facilitate uptake of the COVID-19 vaccine in these areas[169]. The Northeast and Northwest geographical zones in particular may have higher rates of VH due to their historical homogeneity and a history of resistance to vaccination campaigns, most notably the struggle to eradicate polio.

Many people around the world think their lives have meaning and purpose because of their ethnicity[170]. Where a person is from has a huge impact on how they view the COVID-19 vaccination a Lancet investigation found people are hesitant to take the COVID-19 vaccine because of the fear of deportation when enrolling for vaccine. Same research found that fertility has been noted elsewhere as a cause for COVID-19 vaccination hesitation; for example, one participant in Bradford-based research of twenty individuals indicated infertility as a reason for not getting the vaccine[171]**.** When evaluating Covid-19 vaccine reluctance in general in the UK, a nationally representative poll revealed the following common reasons for

refusal: being anti-vaccination, worries about vaccine safety, believing that COVID-19 was harmless, and overall lack of confidence[172]**.** Infertility was discovered to be a common topic among ethnic minorities in this investigation. The study's inclusion of both vaccinated and unvaccinated subjects allowed researchers to gain a better grasp of the wide range of infertility-related vaccination reluctance among women, which included worries about period abnormalities and nursing. To dispel myths and misunderstandings about fertility and COVID-19 vaccines, a study was undertaken that found the Pfizer-BioNTech COVID-19 immunisation had no detrimental effect on a woman's fertility[173]. When asked which COVID-19 vaccination brand they preferred, practically all participants chose Pfizer over Astra Zeneca or Moderna. Participants reported reasons such as the Pfizer vaccination's higher effectiveness, worries about the Astra Zeneca vaccine's danger of blood clots, and hearing from friends and relatives that the Pfizer vaccine has milder side effects. COVID-19 immunisations and their adverse effects continue to garner substantial media coverage, which may have been exacerbated by contradictory signals from government agencies. Due to reports of thromboembolic events with fatal results among persons who had been vaccinated, numerous European nations suspended the use of Oxford-AstraZeneca immunisation against COVID-19 in early March 2021[174]. The European Medicines Agency reviewed these events and declared that, despite the possibility of a link to rare blood clots, the benefits of this vaccination

outweighed the risks, prompting many countries to reinstate their vaccine programmes but these concerns persisted among our study participants. Although this article has not yet been peer-reviewed, a Spanish cohort study recently discovered that rates of thromboembolic events in those who received the Pfizer vaccination were no different from those who received the Astra Zeneca vaccine[175].

A study conducted in Nigeria found that some communities are having a lot of problems because they think the government and the healthcare system are wrongfully handling them, some communities are not informed or well educated about the COVID-19 virus or the vaccination, some tribes that are reluctant to the vaccination believes that herbal substances will build their immune system to fight the virus [176].

Ethnicity has shown a profound influence in the uptake of health program including vaccination. The largest ethnic groups in Nigeria include Hausa/Fulani, Igbo, and Yoruba, and their distinct sociocultural beliefs and practises affect vaccination outcomes. According to the 2006 census, Nigeria has a population of 200 million people; of this population, 15 million Nigerians have received at least one dose of COVID-19 vaccinations, according to national daily call-in statistics from the National Primary Health Care Development Agency (NPHCDA). The government stated that the first dosage reached 10,813,596 of the total eligible people targeted for COVID-19 vaccination [178].

In addition, 4,590,263 people were reached with the second dosage (fully vaccinated), accounting for just 8% of the Nigerian population. It was also discovered that 81,284 persons across the country had their COVID-19 booster dosages administered. Five states, however, have yet to begin administering COVID-19 vaccination doses which include Abia, Kogi, Kwara, Niger, and Sokoto. Other states with the highest vaccination rates are unlikely to halt the spread of COVID, and the vaccination rate cannot be compared to that of other Western nations. For example, Nasarawa State has vaccinated the most people in the country, at 45.88 %. Jigawa is closely followed by Ogun at 18.17 %, Oyo at 14.73 %, Zamfara at 13.27 %, and Rivers State at 3%. Unfortunately, Ebonyi, Sokoto, Abia, Imo, Akwa Ibom, and Bayelsa are the states with the lowest vaccination rates [179].

However, some of the reasons ethnic groups in Nigeria are hesitant are as follows: One of the reasons for reluctance is tribal mistrust of the medical system[180], as well as a lack of transparency from the government on clinical trials[181]. Speaking of clinical trial, utilisation of conventional health-care services in Nigeria's northern region have always been low. For example, in 1990, the comparative utilisation rates of southern Nigeria versus northern Nigeria were 50% versus 18% (i.e., half of the people in the south used orthodox health services, compared to less than one-fifth in the north), 60% versus 11% in 1999, and 64% versus 8% in 2003. Another study found that Population and fertility control was one of the main factors that contributed to the polio vaccination boycott (vaccine

hesitancy). Historically it was found that President Babangida's administration implemented a population policy that limited women to four children. Some people then associated this population control campaign with vaccinations, believing that vaccination was one method by which the government could reduce the population[182].

This belief was not limited to northern Nigeria; similar views were also expressed in some southern Nigerian communities. For instance, a male adult participant in an anthropological study conducted in Nigeria said that "people do carry rumour that vaccination is a secret way of controlling population." Some people claim that vaccination is one of the methods used to determine how many children a woman can have, according to a young female participant. The researcher of the study went on to explain how forceful and mass vaccination efforts in a nation where access to basic health care is not always easy to come by and how this has played a key role in the polio vaccine boycott[183]. The study explained that vigorous door to door mass vaccination campaigns has reduced polio infections worldwide but has also raise concerns amongst Nigerian populace. The research gave a scenario of how it will look like if a stranger's go door to door in America handing out $100 cash strikes and how suspicious that would be. hence, Nigerians mixed feelings about being offered free medicine. The scepticism among many ethnic groups in Nigeria is on the fact that most vaccines distributed to its people have not been well tested, resulting in a significant risk of adverse effects requiring costly medical

treatment. As a result, it makes little sense in a country where individuals are unable to obtain even the most basic medical treatment and pharmaceuticals[184].

Also, vaccine's quick approval is one that has raised questions about whether regulatory norms designed to protect vulnerable populations were sacrificed for convenience. people in an ethnic group who have previously experienced an unexpected outcome of the pandemic may be more hesitant of new vaccinations, especially given the current lack of understanding and potential side effect of the vaccine. Nigerian ethnic group believe strongly herbal medications and western medications, some Nigerians will first consult an herbalist before taking any western medication[184, 185].

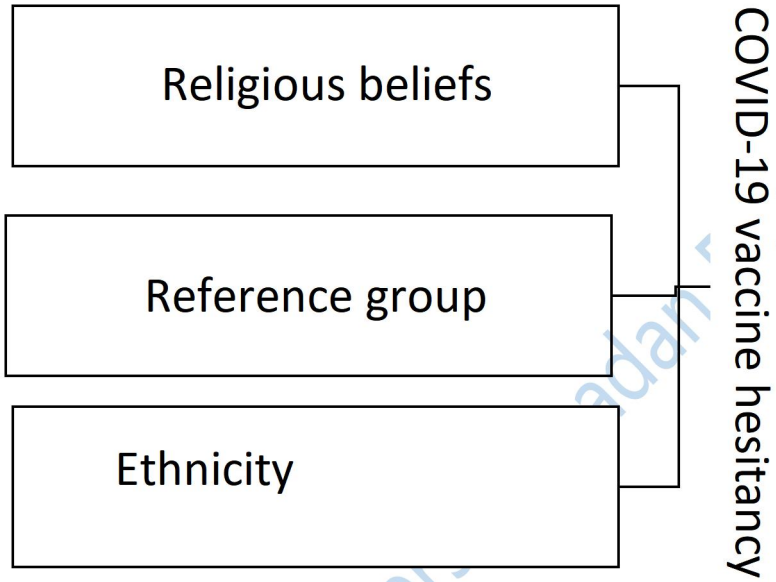
Traditional herbal treatments are finding its way not only back onto the market, but also back into the hearts of many Nigerians who believe the word of their local herbalist than medical personnel, they refuse their healthcare and prefer raw source of nature. Herbal medicine has a long history in Nigeria as this has always been part of local health customs of medieval Africa[185]. Nigeria is rich in traditional medicine due to its unique culture and customs, with recognised traditional healers active in caring for its overwhelming and sick people. Traditional medical practises in Nigeria provide a living for many people who rely on them as their primary source of income.

Nigerians have turned to more economical health care due to the country's high population growth rate of 2.8 % for every year, poverty, and depleting

economic reserves[185]. To continue, some Nigerians believe more in herbal medication to fight COVID-19 that the vaccination itself, because of the fear of side effect, convivences of sticking to what they know and lack of trust towards the government is one factor for reluctance. Hence, ethnic groups and minorities do not trust the COVID-19 vaccine which has caused life-threatening hesitation among groups.

2.4 Conceptual Framework

Figure 2.3 showing the influence of religious belief, reference group and ethnicity of COVID-19 vaccine hesitancy.



Source Field Data 2022:

Figure 2.3, in the scoping review provides a conceptual framework for the variables that influence vaccine acceptance and reluctance. To put a successful intervention into place, it is imperative to understand the barriers and drivers to vaccination. However, this research discovered that socio-demographic factors such as (religious beliefs, and reference group, ethnicity) reviewed in this study are not significantly related to vaccine

acceptability among various backgrounds. However, Personal, and behavioural attitudes like fear of the vaccine, mistrust of the government, and many others were linked to reduced vaccine acceptance.

2.5 Summary of Literature Review

Despite the development of the COVID-19 vaccine and its availability for human consumption to curb the spread of this dreadful virus by instilling strong immune resistance in the population. People were hesitant and distrustful of the vaccine's intentions suddenly. According to the research reviewed, some of the factors of the change are conspiracy theories, which are the fact that the vaccine is fake; these beliefs are primarily among Nigerians; the belief that the vaccine is tested on the Nigerian population; the belief that the vaccine will change the DNA of some; and the belief that the vaccine may turn out to be deadly in the long run. This belief has contributed to an increase in anxiety throughout the years, as well as vaccination reluctance. According to the study, Nigerians may be hesitant owing to their religious views, reference group, and ethnicity. Several research indicated that these variables impact hesitation in Nigeria; for example, studies suggest that people may not take the COVID-19 vaccination because their friends and relatives have refused to take it. That is, the reference group has a significant effect on people's decisions to accept or reject the vaccination. Certain religious leaders, according to religion, are opposed to the vaccine's goals. Some religious folks believe that getting unwell is God's will and will refuse to receive the vaccine. The study revealed, however, that religion, reference group, and ethnicity are

not the major drivers of COVID-19 vaccine aversion in Nigeria. As a result, there are underlying reasons that influence vaccine aversion.

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Chapter Three

Methodology

3.1 Research Design

The research design for this study is ex-post facto research design. The ex-post facto design explains the relationship between the dependent and independent variables[1]. It allows data to be collected from the respondents of the study at a single point in time, which is after the fact, not before. The ex-post facto design only examines how the independent variables, that is, the socio-cultural factors (religious beliefs, reference group and ethnicity) affect the acceptance of COVID-19 vaccine, which is the dependent variable. The design only explains the relationship and does not change the variables.

3.2 Population of the Study

This research was conducted in Port-Harcourt. Port-Harcourt is the capital and largest city of River State. It is in the Niger Delta, and it is along the Bonny River. It is an urban area that is made up historic European quarters known as the old GRA and the new plan area (Port Harcourt metropolises)[2]. Also, Port Harcourt is an urban area that is divided into eight Local Government Areas: Okrika, Obio-Akpor, Ikwere, Oyibo, Ogu-Dolo, Etche, Eleme and Port Harcourt. As of 2009, its total population was expected to be 2,000,000, making it one of Rivers State's major metropolitan regions and the only urban area in River state. Specifically, Obio Akpor Local Government Area (LGA) was chosen to be the study

area in Port Harcourt[3]. The reason for choosing Obio-Akpor Local Government is because it is the largest urban Local Government with a population of 649,600 according to 2016 census projection and constitutes a centre of attraction for many visitors, amongst other regions. The population was drawn from three settlements in Obio-Akpor (LGA) local government: Elelenwo, Woji, and Rumuomasi.

3.3 Sample and Sampling Technique

The sample size for the study is 400 using a multistage sampling technique: **Stage 1:** all the wards in Obio-Akpor local government were listed first and are 17 in number Choba (ward),Elelenwo (3b), Oro-Igwe (ward), Ozuoba-Ogbogoro, Rukpokwu (ward), Rumueme

(7a), Rumueme (7b), Rumueme (7c), Rumuigbo (8a), Rumukwuta (8b), Rumuodara (ward), Rumuodomaya (3a), Rumuokoro (ward), Rumuokwu (2b), Rumuolumeni (ward), Rumuomasi (ward), Woji (ward), then a sampling random sample method was used to select 3 wards out of these 17 wards. **Stage 2:** a systematic random sampling method was used to select every third house in each ward. **Stage 3:** An accidental sampling technique was used to select participants in each third household Finally, a Slovin's formula was used to get the sample size for this study[4]. Slovin's Formula provides the sample size (n) using the known population size (N) and the acceptable error value (e). Fill the N and e values into the formula $n = N \div (1 + Ne^2)$. The resulting value of n equals the sample size to be used. The known population size is 464789 $n = N \div (1 + Ne^2)$

$649600/1+649600\times 0.05^2$

= 649600/ 1+649600× .0025

= 649600/ 1+ 1624 = 649600/1625 = 399.76
n=400

3.4 Description of Research Instrument

The demographic factors of the participants contain 11 variables that delve into the personal data of the individuals. Sex, age, ethnic group, marital status, religion, highest educational qualification, family type, family size, occupation, average monthly income, and place of residence are all factors to consider. For example, for Gender, participants were asked to mark whether they were male=1 or female=2. Participants were asked to check the age category under 16=1, 18-30=2, 31-40=3, 41-50=4, 51-60=5, 61-70=6, and above 70=7 for

Age. Participants were asked to tick the ethnic groupings they identified with for Ethnic Groups: Igbo=1, Yoruba=2, Hausa/Fulani=3, and Others=4, with Others denoting the ethnic group not specified in the survey. For Marital Status participants were asked to tick either they were single=1, married=2 or divorced=3. For Religion participants were to tick either Christianity=1, Islam=2, Traditional=3 or Others=4, others meaning religion not mentioned in the survey. Participants were asked to select one of the following options for Highest Educational Qualification: Primary=1, Secondary=2, and Tertiary=3. Participants were asked to select either Monogamous=1 or Polygamous=2 as their Family Type. Participants were asked to tick the category they identified for Family Size: Under 5=1,

510=3, Above 10=3. Participants were asked to tick either Student=1, Civil Servant=2, Self Employed=3, Private Employed=4, Housewife=5, or Unemployed=6 for Occupation. Participants were asked to tick the category they identified for Average Monthly Income: under 20,000=1, 20,000-50,000=2, 51,000-70,000=3, 71,000-100,000=4, and over 100,000=5. Finally, participants were requested to put their address=1. The DV vaccine hesitancy was also measured, whereby participants were to tick a yes and no question. The questions are, have you done a COVID-19 test Yes=1, No=2, have you taken the COVID-19 vaccine Yes=1, No=2. And further question asked to be more specific, if yes, how many shots have you taken First Shot=1, Second Shot=2 and Booster=3. Who convinced you to take the vaccine, Health Professional=1, My Friend=2, My Family=3, Work Colleague=4, Pastor=5, Imam=6, Chief Priest=7, Information Media=8 Others=9. Influence of religious beliefs on vaccine hesitancy was measured using a 6-item scale developed to measure if religious belief influence, participants decision to receive the COVID-19 vaccination. The scale measures on a 4 Likert scale ranging from 1=(Agree), 2= (Strongly Agree), 3=(Disagree), 4= (Strongly Disagree) and summed to provide a single score. All items are positively worded and cover both religious belief and vaccine hesitancy. Example of the items in this scale includes, my religion does not support the COVID-19 vaccination, religious leaders (pastor, imams, chief priest) teaching has affected my decision to accept or not to accept the COVID-19 vaccine, I

will only take the COVID-19 vaccine if many people in my religion as me has taken it. In the present study the internal consistency of the scale was analysed and a Cronbach alpha coefficient of 0.85 was found.

Reference group influence on vaccine hesitancy was measured using a 10-item scale developed to measure if the reference group participants identify aids them to accept or reject the COVID-19 vaccine. The scale measures on a 4 Likert scale ranging from 1=(Agree), 2= (Strongly Agree), 3=(Disagree), 4= (Strongly Disagree) and summed to provide a single score. All items are positively worded and cover both reference group influence and vaccine hesitancy. Example My relative's point of view about the COVID-19 vaccine affects my decisions in accepting or not accepting the vaccine, Close friends, and point of view about the COVID-19 vaccine affects my decisions in accepting or not accepting the vaccine, I will only take the COVID-19 vaccine if someone I know has taken it, Vaccines are important for the health of others in my community. In the present study the internal consistency of the scale was analysed and a Cronbach alpha coefficient of 0.82 was found.

influence ethnicity on vaccine hesitancy was measured using a 9-item scale developed to measure if the ethnic beliefs of a participants influence their decision towards the COVID-19 vaccine. The scale measures on a 4 Likert scale ranging from 1=(Agree), 2= (Strongly Agree), 3=(Disagree), 4= (Strongly Disagree) and summed to provide a single score. All items are positively worded and cover both ethnicity and vaccine hesitancy.

Example, Where I come from (ethnic group) affects my decision to accept the COVID-19 vaccine, Where I come from (ethnic group) does not affect my decision to accept the COVID-19 vaccine, My ethnic group is ignorant of the COVID-19 vaccine, I will take the COVID-19 vaccination if suggested by my ethnic leaders, People from my ethnicity do not trust the COVID-19 vaccination the government has provided, My community has refused vaccination in the past. In the present study the internal consistency of the scale was analysed and a Cronbach alpha coefficient of 0.80 was found.

3.5 Validity of Research Instrument

The study variables were measured using a standardised instrument developed by the SAGE working group and validated by the author[5]. However, the instrument was still validated by field experts (two professors, a doctor, and a statistician). As a result, content validity was used to validate the research instrument, ensuring that it measures what it was designed to measure. The instrument's internal validity is high, with no evidence of confounding variables. Each variable to be tested was judged by experts, and the instrument was adjusted to make it more compact for the Nigerian population.

3.6 Reliability of the Research Instrument

Sage Working Group survey question on vaccine hesitancy reported Cronbach's alpha reliability coefficient of 0.90[5]. The Cronbach's alpha

reliability to measure the internal consistency of the instrument in this study is reported. The study reported the following Cronbach alpha of each variables analysed. Respondent who participated in the independent variables about the influence of religious beliefs on vaccine hesitancy recorded an acceptable reliability with Cronbach's Alpha of 0.85. Respondent who participated in the independent variables about reference group influence on vaccine hesitancy recorded an acceptable reliability with Cronbach's Alpha of 0.82. Respondent who participated in the independent variables about influence of Ethnicity on vaccine hesitancy on and recorded an acceptable reliability with Cronbach's Alpha of 0.80.

3.7 Administration of Research Instrument and Method of Data Collection

After the approval of the research topic and research instrument. The researcher began conducting the survey in Port Harcourt, Rivers State. A total of 400 questionnaires were printed out for administration. The researcher went to each ward that has been selected from Obio-Akpor local government area which were Elelenwo, Woji and Rumumasi. The research on went further to each Street counting down every third residence, for any residents that answers 2 to 5 questionnaires will be given to each willing participant at the gate this was for safety reasons. the researchers chose to go for questionnaire administration every Saturday and Sunday it is expected that those days are when people are free and around.

Before data collection, each participant was informed about the nature and purpose of the research study. Each participant was reminded that their participation was voluntary, and that that they had the option to participate or not, and their decision would be respected.

Most of the questionnaires distributed to each participant were monitored and obtained immediately after they were completed. Some other participants required the researcher to return for the questionnaire. The research instruments were administered personally by three research assistants who had been specially trained for this task. The self-administration was designed to ensure a high rate of retrieval while also allowing participants to ask for or obtain clarification if necessary. It took a month to collect the data and a total of 380 out of 400 questionnaires were retrieved and later subjected to data analysis.

3.8 Method of Data Analysis

Demographics such as age, gender, education, qualifications, and other socio-demographic status was examined using linear regression. For quantitative parameters, the mean, standard deviation, median, and quartile range was computed. For this research, data collected was analysed using IBM Statistical Packages for Social Sciences (SPSS) 24 software.

3.9 Ethical Approval

The department of psychology, sociology, and criminology provided ethical approval for this research. The participants in the study gave their complete agreement while completing the questionnaires, and the

information gathered was used for this research as well as research from other studies that have been published elsewhere.

Endnote

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4. SAGE Working Group, ELSERVIER. “Measuring Vaccine Hesitancy: The Development of a Survey Tool.” Measuring vaccine hesitancy: The development of a survey tool - ScienceDirect, April 18, 2015. https://www.sciencedirect.com/science/article/pii/S0264410X15005010.

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Chapter Four

Results and Discussion of Findings

The results and analyses are discussed in accordance with the objectives of the study. The major goal of this study was to find out whether a person's reluctance to get the COVID-19 vaccination was influenced by their ethnicity, reference groups, or religious beliefs.

4.1 Demographic Data Analysis

Participants in the COVID-19 vaccine hesitancy research from the Obio-Akpor local government in Port Harcourt who were willing to provide the pertinent study information were included in this study. 400 questionnaires were administered, and 380 questionnaires were properly filled and returned. Thus, data obtained from the 380 questionnaires return were analysis.

Table 1: 4.1.1 Socio-Demographic Information of Respondents.

Variables	*Category*	*Frequency*	*Percentage*
Sex	Male	200	52.7
	Female	180	47.3
	Total	380	100.0
Age	Under 16	22	5.8
	17-30	152	39.8
	31-40	85	22.3
	41-50	57	14.9
	51-60	45	11.8
	61-70	17	5
	Above 70	2	4
	Total	380	100
Ethnic group	Igbo	180	48
	Yoruba	63	17
	Hausa/Fulani	49	12
	Others	88	23
	Total	380	100

Marital status	Single	154	41
	Married	196	52
	Separated	11	2
	Divorced	10	2
	Widowed	11	3
	Total	380	100
Religion	Christianity Islam	286	75.2
	Traditional	74	19.5
	Others	17	4.5
	Total	3	.8
		380	100
Highest educational qualification	Primary	43	11.4
	Secondary	90	23.6
	Tertiary	247	65.6
	Total	380	100
Family type	Monogamy	300	79
	Polygamy	80	21
	Total	380	100
Family size	Under 5	199	53
	5-10	141	37
	Above 10	42	10
	Total	380	100
Occupation	Student	77	20.2
	Civil servant	62	16.2
	Self-employed	135	36
	Private employed	66	17.3
	Stay-at-home spouse	18	4.7
	Unemployed	22	5.8
	Total	380	100
Average monthly income	20,000	103	27.1
	20,000-50,000	110	28.9
	51,000-70,000	45	11.8
	71,000-100,000	45	11.8
	Above 100,000	83	20.2
	Total	380	100.0
Place of residence	Port Harcourt	380	100.0

Source Field Data 2022:

Sex: 200 male participants, which represents 52.7% of the sample, and 180 of them were female, which represents 47.3%. Male participated more in the study than female. This is because male participants where more available and willing to participate in the survey.

Age: Respondents aged 18-30 (152 (39.8%) engaged more in the study, as did respondents aged 31-40 (85 (22.3%). This is because they had the

most interest and time to connect with the researcher, since they were generally the ones available at home.

Ethnic group: Igbos had the largest number of 180 (48%) since Port Harcourt is mostly populated by Igbos and is also home to indigenous groups with Igbo roots. Other groups came in second with a score of 88 (23%); these groups include Akwaibom, Calabari, Ogoni, Eleme, and many more; Port Harcourt is multi-ethnic. Yoruba and Hausa/Fulani each received a score of 49 (12%) and 63 (17%), respectively, since they are non-indigens of the state who are largely visitors.

Marital status: 154 participants, that is (41%) likewise participants who were single with a total number of 196 (52%) participated more, this is because both married and single respondents owned the apartments and most likely around. The researcher had low chance of meeting does who were widowed 11, divorced 10, separated 2% which had the lowest outcome in the research.

Religion: In this study, 286 Christians made up 75.2% of the total sample this is because majority of Port Harcourt residence practice this believe. while Muslims made up 19.5%, this set of participants are non-indigens of the local a few of them were visitors. traditionalists had a total sample of 17 making up 4.5% these participants are indigens of that community, they keep the local traditions and belief alive. and other religion had 8%, these religions are Buddhism practised by Chinese foreigners and Hinduism practiced by Indians foreigners, who came to work.

Highest Educational Qualification: A minority of participants (11.4%) had a primary education certificate, compared to 23.6% who had a secondary education certificate and 56% who had a tertiary education certificate. As a result, respondents with secondary and higher education were more than those with only primary education. Most respondents had tertiary education, suggests that they had the credentials to competently respond to inquiries about the influence of religious beliefs on vaccine hesitancy, the influence of reference groups on vaccine hesitancy, and finally the influence of ethnicity on vaccine hesitancy.

Family Type and Size: 300 participants making a total of 79% were coming from a monogamous family while 80 (21) of the total sample were from polygamous families. 53% of the sample's respondents came from families with fewer than five members, 37% from families with five to ten members, and 10% from families with more than ten members. making a family of five the largest in the entire sample.

Occupation: Students made up about 77 of all participants, or 20.2% of the entire sample, civil servants made up 62, or 16.2% of the sample, self-employed people made up 36% of the sample, private employees made up 66, or 17.3% of the sample, and stay-at-home mom made up 4.7% of participants, or 18 in total. Finally, 22 respondents, or 5.8% of the sample, were unemployed.

Average Monthly Income: Participants with an average monthly income of N20,000 accounted for 103; these are participants with blue collar jobs or skilled work, while 110 participants with an income between N20,000

and N50,000 accounted for 28.9%, and 11.8% of participants with an income between N51,000 and N70,000 worked for a private firm, internship, or as schoolteachers. Respondents earning between N71,000 and N100,000 or $100,000 and above ran their own businesses, mostly in oil and gas, restaurants, boutiques, supermarkets, and other industries.

Place of Residence: With a sample size of 380 (100.0%), all respondents in this sample were from Port Harcourt.

4.2 Presentation of Data

4.2.1 Presentation of Data Based on Research Question

Research Question One

How does, religious beliefs influence the acceptance of COVID-19 vaccine amongst Port Harcourt residents?

Table 2: 4.2.1 Influence of Religious Belief on The Acceptance Of COVID-19 Vaccine Amongst Residents Port Harcourt.

s/n	Statement	Agree	S/Agree	Disagree	S/Disagree
1	My religion does not support the COVID-19 vaccination	66 (17.3%)	24 (6.3%)	175(45.8%)	115(30.1%
2	Religious leaders (Pastor, Imams, Chief Priest) teachings have affected my decisions to accept or not to accept the COVID-19 vaccine	67 (17.5%)	34 (8.9%)	174(45.5%)	105(27.8%
3	I will take the COVID-19 vaccine when my religious leader (Pastor, Imam, Chief Priest) has been vaccinated	57 (14.9%)	49 (12.8%)	169(44.2%)	105(27.6%
4	I will not take the COVID-19 vaccine since I believe in a supreme being (God/Jesus, Allah, others)	54 (14.1%)	44 (11.5%)	194(50.8%)	88(23.1%)
5	I will only receive the COVID-19 vaccine from a health care professional who is in the same religion as me.	66 (17.3%)	56 (14.75)	172(45.1%)	86(22.6%)
6	I will only take the COVID-19 vaccination if many people in my religion as me has taken it.	63 (16.5%)	53 (13.9%)	162(42.5%)	102(26.8%

Source Field Data 2022:

The result in table 4.2.1.1 shows the descriptive statistics of religious beliefs as an influence of COVID-19 Vaccine hesitancy among residence

in Port Harcourt. As shown, 67 (17.5%) of the respondents agree that religious beliefs influence COVID-19 Vaccine hesitancy among Port Harcourt residence, 56 (14.7%) of respondents strongly agree that religious beliefs influence COVID-19 vaccine hesitancy. whereas respondents with the highest numbers in the finding being 194 (50.8%) disagrees that religious beliefs influence COVID-19 vaccine hesitancy, while 115 (30.1%) of respondents strongly disagree that religious beliefs influence COVID-19 vaccine hesitancy.

Research Question Two

To what extent does reference groups influence COVID-19 vaccine hesitancy amongst Port Harcourt residents?

Table 3: 4.2.1 Reference Groups Influence COVID-19 Vaccine Hesitancy Amongst Residents Port-Harcourt.

s/n	Statement	Agree	S/Agree	Disagree	S/Disagree
7	My relative's point of view about the COVID-19 vaccine affects my decisions in accepting or not accepting the vaccine.	89 (23.3%)	45 (11.8%)	158(41.5%)	39(23.4%)
8	Close friends and point of view about the COVID-19 vaccine affects my decisions in accepting or not accepting the vaccine	93 (24.4%)	40 (10.6%)	160(42.1%)	87 (22.8%)
9	Neighbours' point of view about the COVID-19 vaccine affects my decisions in accepting or not accepting the vaccine.	74 (19.4%)	38 (10.0%)	166(43.6%)	102(27.0%)
10	Work colleagues' point of view about the COVID-19 vaccine affects my decisions in accepting or not accepting the vaccine.	76 (20%)	39 (10.3%)	175(46.0%)	90 (23.7%)
11	Stories of people I know had a bad reaction to previous vaccines or the COVID-19 vaccine has made me reluctant to vaccinate.	103(27.1%)	60 (15.8%)	151(39.6%)	66 (17.4%)
12	No one in my family has taken the COVID-19 vaccine	93 (24.4%)	74 (19.4%)	143(37.5%)	70 (18.5%)

13	I will only take the COVID-19 vaccine if someone I know has taken it.	81 (21.3%)	64 (16.8%)	144(37.8%)	91 (23.9%)
14	Vaccines are important for the health of others in my community.	142(37.4%)	111(29.2%)	85(22.4%)	42 (11.0%)
15	I will take the COVID-19 vaccination if mandatory at my workplace.	138 (36.3)	74 (19.5)	98(25.8%)	70 (18.4%)
16	I share information about the COVID-19 vaccine on my social media platform	111 (29.2)	73 (19.2)	128(33.6%)	68 (17.8%)

Source Field Data 2022:

The result in table 4.2.1a shows the descriptive statistics of Reference group as an Influence of COVID-19 Vaccine hesitancy amongst residents of Port Harcourt. As shown, 143 (37.5%) of the respondents agree that reference group influences COVID-19 Vaccine hesitancy among Port Harcourt residence, 111 (29.2%) of respondents strongly agree that reference group influences COVID-19 vaccine hesitancy. While 175 (46.0%) disagrees that reference group influences COVID-19 vaccine hesitancy. Also 103 (27.1%) of respondents strongly disagree that reference group influences COVID-19 vaccine hesitancy amongst residence in Port Harcourt.

Research Question Three

In what way does ethnicity play a significant role on the acceptance of COVID-19 vaccine amongst residents in Port Harcourt?

Table 4: 4.2.1[c] Influence of Ethnicity on COVID-19 Vaccine Hesitancy Amongst Residents of Port-Harcourt.

s/n	Statement	Agree	S/Agree	Disagree	S/Disagree
17	Where I come from (ethnic group) affects my decision to accept the COVID-19 vaccine.	61 (16.0%)	22 (6.0%)	177(46.5%)	120(31.5%)
18	Where I come from (ethnic group) does not affect my decision to accept the COVID-19 vaccine.	144 (37.8%)	76 (19.9%)	80 (21.3%)	80(21.0%)
19	My ethnic group is ignorant of the COVID-19 vaccine.	65 (17.1%)	43 (11.3%)	165(43.4%)	107(28.2%)
20	I will take the COVID-19 vaccination if suggested by my ethnic leaders.	60 (15.7%)	58 (15.2%)	146(38.5%)	116(30.4%)
21	People from my ethnic group do not trust the COVID-19 vaccination the government has provided	89 (23.4%)	50 (13.2%)	150(39.4%)	92(24%)
22	My community has refused vaccination in the past.	59 (15.4%)	42 (11.0%)	162(42.4%)	117(30.6%)

23	My community has not seen the need to introduce this COVID-19 vaccination.	85 (22.3%)	50 (13.1%)	173(45.6%)	72(19.0%)
24	People in my community are not well informed about the COVID-19 vaccination.	90 (23.6%)	56 (14.8%)	169(44.5%)	65(17.1%)
25	I believe people in my community will take the COVID-19 vaccination if it is proven to be safe.	200 (52.6%)	91(23.9%)	52(13.7%)	37(9.8%)

Source Field Data 2022:

The outcome in table 4.2.1[c] displays the descriptive statistics of ethnicity as a factor in Port Harcourt residents' reluctance to receive the COVID-19 vaccine. As seen, many respondents 201, or 52.6% agree that ethnicity have an influence, and they only consent to vaccinations when they are known to be safe. 76 respondents (19.0%) strongly agree that hesitation to receive the COVID-19 vaccine is influenced by ethnicity. While 120 (31.5%) of respondents strongly disagree that ethnicity influence COVID-19 vaccination hesitation among residents of Port Harcourt, 173 (46.6%) of respondents do not believe that ethnicity have an impact on vaccine hesitancy.

4.2.2 Presentation of Data Based on Hypothesis

This present the result of the data statistical analysis of the hypotheses that were stated in chapter two to either confirm or reject them. The study investigated religious beliefs, refence group influence and ethnicity as determinants of COVID-19 vaccine hesitancy in Port Harcourt. Three hypotheses were tested using linear regression and all the hypotheses were not significant.

Hypotheses One

Religious beliefs will have significant influence on the COVID-19 vaccine hesitancy amongst

Port-Harcourt residents

Table 5: 4.2.2 Model Summary of Influence of Religious Belief on Vaccine Hesitancy

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.043[a]	.002	-.001	.94989

Source Field Data 2022:

Predictors: (Constant), participation in Influence of Religious Belief. Dependent variable: Vaccine Hesitancy. Based on the table above, it shows that the value of correlation coefficient (R-value) is 0.043 which indicates that religious belief could explain or predict 43.0% of the variation in the COVID-19 vaccine hesitancy. However, it still left 57.0% unexplained study.

Table 6: 4.2.2[a] ANOVA on Influence of Religious Beliefs On COVID-19 Vaccine

Hesitancy

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	.619	1	.619	.686	.408[b]
Residual	330.240	366	.902		
Total	330.859	367			

Source field 2022:

Predictors: (Constant), Religious Beliefs. Dependent Variable: Vaccine Hesitancy

Above shows that P value (sig.408[b]) is less than alpha value 0.05. the alternative hypothesis of one independent variable (religion) if significant explains the variance of influence of religious beliefs on vaccine hesitancy.

Table 7: 4.2.2b Summary of Linear Regression Analysis showing the independent prediction of Religion Influence on Vaccine Hesitancy.

Hypothesis	Regression weights	Beta coefficient	**t- value**	p- value	Hypotheses supported
H1	VH-RB	.043	.828	>.05	No

Source Field Data 2022:

Note: p<0.05. VH: Vaccine Hesitancy, RB: Religious Beliefs The table shows the summary of the findings.

The hypothesis test if religious beliefs will significantly influence COVID-19 vaccine hesitancy. The dependent variable COVID-19 Vaccine hesitancy was regressed on predicting the independent variable religious beliefs to test hypotheses H_1. Religious belief does not significantly predict COVID-19 vaccine hesitancy, F (1,366) =.686, P>.05, which designate thus, religious beliefs do not necessarily play a significant role on vaccination intake, it does not cause COVID-19 vaccine hesitancy (b=.043, P>.05) these result clearly directs negative conclusion of vaccine hesitancy, moreover, R_2=.002 this prove that the model describes

2.00% of variance in religious belief.

Hypotheses two

Reference group will significantly influence COVID-19 vaccine hesitancy amongst residents in Port-Harcourt.

Table 8: 4.2.2[c] Model Summary of Reference group influence on vaccine hesitancy

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.000[a]	.000	-.003	.95227

Source Field Data 2022:

Predictors: (Constant), participation in Reference group influence.

Dependent variable: Vaccine Hesitancy.

Based on the table above, it shows that the value of correlation coefficient (R-value) is 0.000 which indicates that independent variable could explain or predict 0.00% of the variation in the dependent variable. However, it still left 100% unexplained study.

Table 9: 4.2.2[d] ANOVA On Reference Group Influence on Vaccine Hesitancy

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	.000	1	.000	.000	.996[b]
Residual	332.802	367	.907		
Total	332.802	368			

Source Field Data 2022:

Predictors: (Constant), participation in Reference group influence.

Dependent variable: Vaccine Hesitancy

Above shows that P value (sig.996[b]) is less than alpha value 0.05. the alternative hypothesis of one independent variable (reference group) if significant explains the variance of influence of reference group on vaccine hesitancy.

Table 10: 4.2.2[e] Summary of Linear Regression Analysis Showing the independent
Prediction of Reference Group Influence on Vaccine Hesitancy

Hypothesis	Regression weights	Beta coefficient	**t- value**	p- value	Hypotheses supported

H1	VH-RG	.000	-.004	>.05	No

Source Field Data 2022:

Note: p<0.05. VH: Vaccine Hesitancy, RG: Reference Group

The hypothesis test if reference group will significantly influence COVID-19 vaccine hesitancy. The dependent variable COVID-19 Vaccine hesitancy was regressed on predicting the independent variable reference group to test hypothesis H_1. Reference group do not significantly predict COVID-19 vaccine hesitancy, F (1,367) =.000, P>.05, which designate that reference group do not necessarily play a significant role on vaccination intake, it does not cause COVID-19 vaccine hesitancy (b=.000, P>.05) these result clearly directs negative conclusion of vaccine hesitancy, furthermore, R_2=.000 prove that the model describes 0.00% of variance in reference groups.

Hypothesis Three

Ethnicity will have significant influence on COVID-19 vaccine hesitancy amongst residents in Port-Harcourt.

Table 11: 4.2.2[f] Model Summary [b] On Influence Ethnicity on Vaccine Hesitancy

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.048[a]	.002	.000	.95155

Source Field Data 2022:

Predictors: (Constant), Participation in Ethnic Influence. Dependent Variable: Vaccine Hesitancy.

Based on the table above, it shows that the value of correlation coefficient (R-value) is 0.048 which indicates that independent variable could explain or predict 0.48% of the variation in the dependent variable. However, it still left 99.5% unexplained study.

Table 12: 4.2.2[g] ANOVA On Influence of Ethnicity on Vaccine Hesitancy

Model	Sum of Squares	Df	Mean Square	F	Sig.
Regression	.777	1	.777	.858	.355[b]
Residual	331.394	366	.905		
Total	332.171	367			

Source Field Data 2022:

Predictors: (Constant), Participation in Ethnic Influence. Dependent Variable: Vaccine Hesitancy

Above shows that P value (sig.355[b]) is less than alpha value 0.05. the alternative hypothesis of one independent variable (Ethnicity) if significant explains the variance of influence of ethnic beliefs on vaccine hesitancy.

Table 13: 4.2.2[h] Summary of Linear Regression Showing the Independent Prediction

Influence of Ethnicity on Vaccine Hesitancy

Hypothesis	Regression weights	Beta coefficient	**t- value**	p- value	Hypotheses supported
H1	VH-ET	.000	-.926	>.05	No

Source Field Data 2022:

Note: p<0.05. VH: Vaccine Hesitancy, ET: Ethnicity

The hypothesis test if Ethnicity will significantly influence COVID-19 vaccine hesitancy. The dependent variable COVID-19 Vaccine hesitancy was regressed on predicting the independent variable ethnic beliefs to test hypothesis H_1. Ethnicity do not significantly predict COVID-19 vaccine hesitancy, F (1,366) =.858, P>.05, which designate those

Ethnicity do not necessarily play a significant role on vaccination intake, it does not cause COVID-19 vaccine hesitancy (b=-.048, P>.05) these result clearly directs negative conclusion of vaccine hesitancy, furthermore, R_2=.002 prove that the model describes 2.00% of variance in Ethnicity.

4.3 Discussion of Findings

The researcher examined religious belief, reference group and Ethnicity as influencers of COVID-19 vaccine hesitancy, three hypotheses were evaluated. However, none of the hypothesis was significant as it was revealed that neither religious beliefs, reference group nor ethnic belief influences COVID-19 vaccine hesitancy in Port Harcourt.

First hypothesis evaluated states that religious belief will have significant influence on COVID-19 vaccine hesitancy among Port Harcourt residents. This hypothesis is backed up by specific number of scholars in the literature, found that religious belief and leaders have influenced the decision of people towards the acceptance of COVID-19 vaccine hesitancy in the society[110]. However, this study contradicts that claim. It was found that religious beliefs and leaders do not affect participants decision to take vaccination with 45.8 % disagreeing that their religion does not support the acceptance of COVID-19 vaccine and 45.5% also disagreeing that religious leader do not influence their decision to either take the vaccination or refuse the COVID-vaccine. The finding contradicts the previous literature that has suggested that religion is a strong significant of COVID-19 vaccine hesitancy.

Another study found that Muslims will not take the COVID-19 vaccine because it is believed to have specific component that is against their faith[119]. While others believe that taking the vaccination during the Ramadan season will make them break their fast[120]. Yet, a few Muslims also refused to take the COVID-19 vaccine because of history they might have had with the polio vaccination of 2003 "the believe that the polio vaccine was intended to control.

fertility"[121].

In the Christian faith, few Christians believe the Holy Spirit and blood of Christ will save them from contracting the virus[122]. While other Christians will not take the vaccination because they believe it is a propaganda that the

West wants to have power over the church[123]. Findings show that participants that are Christians will not take the vaccination at all whether they believe or do not believe in a supreme being with 50.8% of participants disagreeing, meaning that religious belief among Christians does not play a significant role in influencing COVID-19 vaccine hesitancy. Other studies went on to explain how Muslim groups believe that people going down with illnesses is the will of God and would be wrong if anything is done to stop it[101]. As a result, they believe that vaccination can alter the plans (destiny) God has already made for them.

A study conducted among Christians in Canada found that the fear COVID-19 vaccine being made from an aborted foetus is one cause of vaccine hesitancy as this act abortion is against their faith[102]. The research found that few participants do not dime it necessary to take it since other people are taking the vaccine, means they will be safe. Another group believe that it is only those traveling that should take the vaccine since its “Oyibo” white people’s sickness.

Far from religion and religious beliefs participant explained that if people adhere to the COVID-19 preventions such as (wearing of face mask, using sanitizers, and washing of hands) then they will be protected. others believe that the vaccination is not well evaluated by the Nigerian government and rumours of loved one’s death and health complication from history to previous vaccine will not allow them to take the COVID-19 vaccine. This type of people can be described as late majority from the DOI definition of

innovation theory stated in this study. Late majority are those individuals in the society that will only adopt an innovation when an average member of the society has adopted it[71,72]. This innovation is the COVID-19 vaccines, and participants are reluctant to take the vaccination because of so many reasons like, complacency, believing it is not necessary to take the vaccine, lack of proper sensitisation of the dangers of the virus, fear of side effects of the vaccine, history of vaccination and the believe that just adhering to percussion will save them from the vaccine are some of the factors that cause vaccine hesitancy.

Late majorities are more resistant to change because they have little social status and have little financial power. They will not take a vaccine they are not sure of, since they do not have the financial capacity to solve any medical complication that may arise after taking the vaccination. Examples of late majority in this research are those that will not take the vaccine because they are not traveling out, those that will adhere to the safety precautions believing is enough to protected them from the virus. With the results on religious belief on COVID-19 vaccine hesitancy it contradicts previous findings that explains that religion and religious belief influence vaccine hesitancy. This is in line with one of the objectives of the study, which is to examine the influence of religious belief on acceptance of COVID-19 vaccine hesitancy.

The second hypothesis evaluated in this study states that reference group will significantly influence COVID-19 vaccine hesitancy among residents in Port Harcourt. More literatures were reviewed to support this prediction, and it

was found that reference group has a strong effect on how people accept vaccination, while vaccine hesitancy depends on an individual close friend or family member who was infected with the virus and has refused to vaccinate[104]. The study found that relatives do not influence their decision towards vaccination as 41.5% of participant disagree that their relative's point of view do not affect their decision towards accepting the COVID vaccination. Another study also reviewed, contradicts this claim by stating that the more attached one is to family the more likely it is that an individual will want to share vaccine uptake with them[135]. In other word, attachment to one's family influences vaccine acceptance. This study found that attachment to one's family does not influence the decision of participants to take a vaccination and refusal a family member to take a vaccination can cause a conflict within members of the family who thinks otherwise. A stronger family tie does not influence vaccine hesitancy countering the previous prediction.

Reference group includes peer and friends. Studies found that peers and friends have a strong impact on an individual's perception towards taking the COVID-19 vaccine[138.] Peers and friends tend to spread rumours among members about the vaccination and tell detailed stories about what they have heard, seen or experienced, which affect the decisions of all the members. Consequently, having a friend who gets vaccinated increases once chance of getting vaccinated by 18.9%.

When asked if peers or friends decision or acceptance of COVID-19 vaccine affects their decision to take the vaccine or not, it was found that friends and

peers do not influence vaccine hesitancy amongst participants with 42.0% of participant disagreeing to this question. Although another study found that participants who did not have friends or family members infected, hospitalised, or died because of the corona virus is at least twice as likely to refuse the vaccine as those who did have friends or family members infected, hospitalised, or died because of COVID-19 infection[139]. Participants explained that peers and friends could influence them to do anything, but not to take a vaccine. Another participant explained that they have friends that have taken the vaccination and have convinced them to take but they are not have an optimistic attitude towards the vaccine.

The study also probes further to elicit information if the vaccine is made mandatory at work, church or in the public sphere some about 36.3% stated that they would take the vaccination to keep their jobs, whereas 25.8% disagrees with the statement and 18.9% strongly disagreeing, this is because one should not be forced or blackmailed to take something that concerns the health of people. Some participants the researcher interacted with said that the COVID-19 vaccine was mandatory at some organisations and private offices but the Staff of this company's raised petitions against mandatory vaccination of workers backed up by some corporate lawyers forcing this organisation to reverse their demands. Some expressed their fear that making vaccination mandatory for workers without their agreement is unethical and disregards their human right.

However, the set of people that participated in this survey and findings can be referred to as late majority [74]. They are more resistance to change and find it hard to accept innovation, in this case, the COVID 19 vaccination. They have so many reasons not to take the vaccination, and some of these reasons are agreeable. It was found that vaccination fear is one of the causes of vaccine hesitancy among participants, another reason for vaccine fear is when this vaccine is made mandatory. Mandatory vaccination causes suspicions amongst members of the society, which creates lack of trust for vaccine providers and health institutions. As members believe that they are being used for scientific research. While, hypothesis states that reference group will significantly influence COVID-19 hesitancy, this study has otherwise.

The Third hypothesis states that ethnicity will have a significant influence on COVID-19 vaccine hesitancy among residents in Port Harcourt. Few studies reviewed showed that ethnicity has a huge impact on how COVID-19 vaccine is accepted or rejected in the community [176,177]. Another study reviewed proposed that some communities are not informed or well educated about the COVID-19 vaccination, but this study found that ethnicity does not influence the acceptance or refusal of COVID-19 vaccine with 46.5% of participants disagreeing and 44.4% of participants also disagree that their community are not aware of the COVID-19 vaccine. Further research found that population fertility control rumoured, was one reason that caused polio vaccine hesitancy among Northern women which reduced the trust people had on the government. However, the study found that 39.3% of participants disagree

that distrust in government influence their decision, instead members will take herbal and local medication than the vaccine. Example Igbo land had 3553 cases out of 53,021 cases recorded in Nigeria with the lowest case fatality of 8.32% the author observed that the Igbos used indigenous plants like bitter kola, garlic, and Gilroy to protect them from contracting the virus, as this herb is believed to build their immune system against the virus[185]. Hence, a lot of communities in Nigeria have their own local remedies to fight this virus.

To continue, participants will take traditional and herbal medications as many Nigerians are accustomed to using traditional medicines and having confidence in their sources, it is obvious that this has nothing to do with ethnicity but a natural custom among Nigerians [185]. Interactions with few senior participants, they indicated that they had declined the vaccination and said that after receiving a door-to-door immunization, they experienced high blood pressure and a long-term illness that they had never experienced weeks later. And said to have advised younger women they meet to avoid immunizations they do not understand.

Interaction with certain Igbo participant gave further incite to why people are reluctant, they explained that a lot of his people are hesitant to take the vaccination because they do not trust the vaccine that the government gives, they believe the West gives third world countries vaccines that has not been well tested, they view that nations in the far south are used for experimentations and western nations take advantage of these corrupt countries. However, when asked if they would take the vaccine, participant

expressed that they would take the vaccine if administered by private institution that can be easily healed accountable.

Late majority and laggards from the DOI theory can be used to describe participants in this study. They are very reluctant to accept the COVID-19 vaccine and they will also spread provocative propaganda and create conspiracy around the vaccine to stop and influence others from receiving the vaccine, they can be very convincing if listened to and very conservative, for example, senior participants that has refused to take the COVID-19 vaccine because of past health complications from previous vaccination and will advise others not to take the vaccine. Another set of participants found in this study are the Early majority they are slow to take innovation and always sceptical about an innovation, in this context they will want to take the covid-19 vaccination but are fearful about the side effect. For instance, participants that will take the vaccine if administered by private hospitals.

CHAPTER FIVE

5.1 Summary of Findings

Several studies on vaccine hesitancy have been conducted in Nigeria over the years, ranging from polio vaccine hesitancy in the northern part of the country to the recent COVID-19 virus, also known as the coronavirus. Despite all publications, news reports, and media awareness about the deadly virus, the researcher observed that Nigerians appeared very hesitant and complacent about the newly produced COVID-19 vaccine, which was produced in early 2021. The vaccine was developed to reduce the spread and mortality rate of this virus. However, Nigerians did not appear to care for a variety of reasons, prompting this study.

According to this study, religious beliefs and the influence of religious leaders may have made many people hesitant to take the vaccine. The researcher also predicted that an individual's choice to accept or reject vaccination is influenced by reference groups (family, friends, and colleagues). Finally, Ethnicity were predicted to influence COVID vaccine hesitancy. A review of the literature suggests that religion, reference groups, and ethnicity all influence vaccine hesitancy.

This study, on the other hand, investigated and hypothesized that religious beliefs would have a significant impact on COVID-19 vaccine hesitancy amongst residence in Port Harcourt then analysis revealed that religious belief is not a significant predictor of COVID19 vaccine hesitancy, which is in

direct opposition to earlier studies' claims that religion and religious beliefs have an impact on vaccine hesitancy.

The study then proceeded to analyse the hypothesis that predicts that reference groups will significantly influence COVID-19 vaccine hesitancy amongst residence in Port-Harcourt; however, after analysing the data, the results revealed that reference groups do not significantly cause vaccine hesitancy, yielding a negative result that debunks the previous finding discussed in chapter two.

Finally, the study hypothesised that ethnicity would have a significant influence on COVID19 vaccine hesitancy among Port-Harcourt residents. It was discovered that ethnicity has no significant influence on COVID-19 vaccine hesitancy, which contradicts previous studies' claims that ethnicity influences vaccine hesitancy.

5.2 Conclusion

The following conclusion was made based on the outcome of the present study.

Religious beliefs do not always cause COVID-19 vaccine hesitancy, and reference groups have no influence on vaccine hesitancy. Furthermore, ethnicity does not influence vaccine hesitancy. Beyond these variables, there is a need to investigate other factors that may influence COVID-19 vaccine hesitancy. As a result, there are additional underlying factors that make Nigerians suspicious of vaccination. To better understand this reluctance, research team must look beyond religious beliefs, reference group, and

ethnicity influences and look at the social and psychological attitudes toward vaccines in general over time.

5.3 Recommendations

The following are recommendations based on the conclusion of the study.

1. Increase awareness, knowledge, and the dissemination of accurate vaccination information while expanding community-level vaccination access through a variety of services.
2. Governments and health organizations should collaborate to combat conspiracy theories e.g., that the virus is a new bioweapon, false information surrounding the vaccine, and disinformation about the vaccine through persistent public health campaigns that debunk myths.
3. Create communication strategies that draw on personal experiences and emphasize the "why" of vaccination to increase vaccination acceptance among populations that are hesitant to receive shots.
4. Nigeria should spend money on scientific and pharmaceutical research facilities so that it can produce its own vaccines in case of a pandemic in the future.
5. Government to endeavour to promote a sense of community and belonging associated with vaccination.

5.4 Contribution to Knowledge

The study adds to the body of knowledge about vaccine hesitancy and COVID-19 vaccine hesitancy in Nigeria. By investigating religious beliefs, reference groups, and ethnic beliefs as predictors of vaccine hesitancy, the

study broadens the knowledge of other researchers. Since the study discovered that the factors mentioned above do not directly cause vaccine hesitancy, the findings will help other researchers investigate other underlying factors that may cause vaccine hesitancy. The study provides a few solutions to the factors that contribute to vaccine hesitancy and will assist the government in finding solutions.

5.5 Suggested Area of Further Research

Many studies have been conducted on social variables such as religion and ethnic group with the belief that they influence vaccine hesitancy; however, according to this research finding, there are other variables that may influence vaccine hesitancy; therefore, more studies should be conducted to investigate the relationship that individual attitudes have on vaccine hesitancy. Because this study only used a survey method to evaluate hypotheses, it was determined that it was insufficient to answer detailed questions about why people were reluctant to take the vaccination. As a result, future studies should employ both qualitative and quantitative methods to gain more actionable insights from the research.

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Appendix

LEAD CITY UNIVERSITY Faculty of Management and Social Sciences Department of Sociology, Ibadan, Oyo State.

Questionnaire

Instruction: My name is Onyinyechi Charles-Akpunne. I am a student of the Department of Sociology, Lead City University, Ibadan. I am conducting a study on 'Religious belief, Reference Group Influence and Ethnicity as Determinates of COVID-19 Vaccine Hesitancy in Port-Harcourt, Nigeria'. I seek for your consent and cooperation in filling this questionnaire. Information received will be strictly used for academic purpose and will be treated with absolute confidentiality. This is not a test so there are no right or wrong answers. Please do not omit any item.

Section A Demographic Data

Please carefully go through each item and tick (√) as appropriate.

1. Sex: Male ( ) Female ( )
2. Age: under 16 ( ) 17-30 ( ) 31-40 ( ) 41-50 ( ) 51-60 ( ) 61-70 ( ) above 70 ( )
3. Ethnic group: Igbo ( ) Yoruba ( ) Hausa/Fulani ( ) Others Please specify.....
4. Marital status: Single ( ) Married ( ) Separated ( ) Divorced ( ) Widowed ( )
5. Religion: Christianity ( ) Islam ( ) Traditional ( ) Others please specify.....
6. Highest Educational Qualification: Primary ( ) Secondary ( ) Tertiary ( )
7. Family type: Monogamous ( ) Polygamous ( )
8. Family size: under 5 ( ) 5-10 ( ) above 10 ( )
9. Occupation: Student ( ) Civil Servant ( ) Self Employed ( ) Private Employment ( ) House Wife ( ) Unemployed ( )
10. Average monthly Income: under 20,000 ( ) 20,000-50,000 ( ) 51,000-70,000 ( ) 71,000-100,000 ( ) above 100,000 ( )
11. Place of residence.....
12. Have you done a COVID-19 test: Yes ( ) No ( )
13. Have you taken COVID-19 vaccine: Yes ( ) No ( )
14. If yes, how many shots have you taken: First Shot ( ), Second Shot ( ) Booster ( )
15. Who convinced you to take the vaccine: Health Professionals ( ) My Friends ( ) My Family ( ) Colleagues ( ) Pastor ( ) Imams ( ) Chief Priest ( ) Information Media ( ) others p specify.....

Section B

Directions: Below are statements concerning your attitude towards COVID -19 Vaccination.

Carefully read each statement and respond to them. Select Agree, Strongly Agree, Disagree, or Strongly Disagree as your response to each question.

Please do not omit any question.

S/N	**Influence Of Religious Beliefs on Vaccine Hesitancy:** To what extent do you Agree/Disagree to the following?	Agree	Strongly Agree	Disagree	Strongly Disagree
1	My religion does not support the COVID-19 vaccination.				
2	Religious leaders (Pastor, Imams, Chief Priest) teachings have affected my decisions to accept or not to accept the COVID-19 vaccine				
3	I will take the COVID-19 vaccine when my religious leader (Pastor, Imam, Chief Priest) has been vaccinated.				
4	I will not take the COVID-19 vaccine since I believe in a supreme being (God/Jesus, Allah, others)				
5	I will only receive the COVID-19 vaccine from a health care professional who is in the same religion as me.				
6	I will only take the COVID-19 vaccination if many people in my religion as me has taken it.				
	Reference Group Influence on Vaccine Hesitancy: To what extent do you Agree/Disagree to the following?				
7	My relative's point of view about the COVID-19 vaccine affects my decisions in accepting or not accepting the vaccine.				
8	Close friends and point of view about the COVID-19 vaccine affects my decisions in accepting or not accepting the vaccine.				
9	Neighbours 'point of view about the COVID-19 vaccine affects my decisions in accepting or not accepting the vaccine.				
10	Work colleagues' point of view about the COVID-19 vaccine affects my decisions in accepting or not accepting the vaccine.				
11	Stories of people I know had a bad reaction to previous vaccines or the COVID-19 vaccine has made me reluctant to vaccinate.				
12	No one in my family has taken the COVID-19 vaccine.				
13	I will only take the COVID-19 vaccine if someone I know has taken it.				

14	Vaccines are important for the health of others in my community.				
15	I will take the COVID-19 vaccination if mandatory at my workplace.				
16	I share information about the COVID-19 vaccine on my social media platform.				

	Influence Of Ethnic Beliefs on Vaccine Hesitancy: To what extent do you Agree/ Disagree to the following?				
17	Where I come from (ethnic group) affects my decision to accept the COVID-19 vaccine.				
18	Where I come from (ethnic group) does not affect my decision to accept the COVID-19 vaccine.				
19	My ethnic group is ignorant of the COVID-19 vaccine.				
20	I will take the COVID-19 vaccination if suggested by my ethnic leaders.				
21	People from my ethnic group do not trust the COVID-19 vaccination the government has provided.				
22	My community has refused vaccination in the past.				
23	My community has not seen the need to introduce this COVID-19 vaccination.				
24	People in my community are not well informed about the COVID-19 vaccination.				
25	I believe people in my community will take the COVID-19 vaccination if it is proven to be safe.				

Bio-Data

A. Personal Data

Full Name: Onyinyechi CHARLES-AKPUNNE JesuFeranmi

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Phone number: 08109371933

Address: Plot 10, Eliminigwe Housing Estate Elelenwo Port Harcourt.

Date of Birth April 30th

Place of Birth: Port Harcourt

Nationality: Nigerian

Marital Status: Single

Sex: Female

B. Education Background: Educational Institution Attended with Dates and Qualifications

- Higher Institution
  - Redeemers University: 2015-2018
  - BS.c. Sociology: 2018
- Secondary School Education
  - Arch Deacon Crowther Memorial Girls School Elelenwo Port Harcourt: 2009-2014
  - Senior School Certificate: 2014 (SSCE)
- Primary School:
  - Surway Montessori School Nursery and Primary School Elelenwo 2003- 2008
  - Primary School leaving Certificate

C. Work Experience with Dates

- Value Prime Solution Services
  - Personal Assistant (Intern)August 2016-Nov. 2016

- ADVANGARD MANAGEMENT SERVICES
  - Hr intern August 17- September 2014

The University Compliance Certification

This is to certify that the thesis by Onyinyechi CHARLES-AKPUNNE JesuFeranmi (LCU/PG/001465) in the Department of Sociology, Faculty of Management and Social Sciences, Lead City University, Ibadan is in full compliance with the approved university format and style.

…… ……..……
…….....

Signature Date