

FACTORS INFLUENCING COVID-19 VACCINE UPTAKE AMONG COMMUNITY MEMBERS IN ONDO STATE

Author's Name: ¹Dr. Oluwagbemi EBUN, ¹Professor Adebimpe Wasiu Olalekan

Affiliation: School of Public Health, University of Medical Sciences, Ondo, Ondo State, Nigeria

Email: lekanadebimpe@unimed.edu.ng

DOI No. – 08.2020-25662434

Abstract

This study examined the factors influencing COVID-19 vaccine uptake among community members in Ondo state of Nigeria. The descriptive research design of the survey type was employed. The population consisted of all Male and Female households from the 18 local governments in Ondo states of Nigeria. A representative sample of 600 respondents was randomly selected from the six Local Governments and six major towns in Ondo State using questionnaire instrument. Test-retest method was used to ascertain the reliability of the instrument. Data collection was carried out by the researcher. The four postulated Null hypotheses were tested using the descriptive statistics of chi-square at 0.05 alpha level of significance. Information was obtained on the factors influencing the uptake of COVID-19 vaccine among community members in the state. The findings of the study revealed that the major barriers to vaccine uptake includes; low perception of risk to COVID-19 vaccines, low confidence in the vaccine, misinformation on the vaccine and side effects following vaccination. Based on the findings of this study, it was recommended that the On-going community engagement is essential as health messages and vaccine distribution strategies must be sensitive to local communities. Interventions should include ongoing open dialogue with communities to reassure people about the safety and efficacy of COVID-19 vaccines and to increase awareness and understanding and to address different religious and cultural concerns within families.

Keywords: Coronavirus, Epidemics, misinformation, herd immunity, perception and vaccination.

BACKGROUND TO THE STUDY

INTRODUCTION

Epidemics of emerging and re-emerging infectious diseases are on the increase, with devastating health, social and economic consequences, especially in the developing countries. The Novel coronavirus outbreak has been declared by the World Health Organization as the sixth public health emergency of international concern (WHO, 2020). The data indicated that Nigeria's total infection from pandemic currently stands at 201,630 while the total fatality toll increased to 2,654. According to the disease center, a total of 190,288 Nigerians has been discharged nationwide (NCDC, 2021).

COVID-19 is an acute respiratory pneumonia, it is a severe acute respiratory syndrome caused by coronavirus and development of COVID-19 vaccines has been a major undertaking in fighting the disease. (Jackson, 2020). For COVID-19 vaccines to be successful they need to not only be proven safe and effective, but also widely accepted (Forster, 2016). Widespread acceptance of a vaccine for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) will be the next major step in mitigating the impact of coronavirus (COVID-19) pandemic. It is estimated that a novel COVID-19 vaccine will need to be accepted by at least 55% of the population to provide herd immunity, with estimates reaching as high as 85% depending on country and infection rate (Larson, 2021).

Reaching these required vaccination levels should not be assumed but requires urgent attention of both the policymakers, every stake holder and the community members (Bell, 2019).

Vaccine hesitancy across the world is often fueled by online and offline misinformation surrounding the importance, safety or effectiveness of vaccines (Pennycook, 2020). Attitude seems to be another major factor influencing decisions through shaping perceptions about immunization. Beliefs and biological differences may affect individuals' perceived susceptibility to disease and to vaccine side effects, and religion and language related factors (Forster et al., 2016). Existing factors can influence trust, confidence and belief in vaccine efficacy, and structural and access barriers may also influence vaccine uptake among community members in given unique circumstances (Pennycook, 2020).

There has been widely circulating false information about the pandemic on social media platforms, such as that 5G mobile networks are linked with the virus, that vaccine trial participants have died after taking a candidate COVID-19 vaccine, and that the vaccine is a conspiracy or a bioweapon and free genocide that was linked with the number 666 to be the mark of the Biblical antichrist that equally signifies some form of compulsory identification, such as a tattoo or an implanted microchip with a digital code that identifies the person as a servant of the beast. (Pennycook, 2020). Such information can build on pre-existing fears, sending doubt and cynicism over new vaccines, and threatens to limit public uptake of COVID-19 vaccines (Hotherball, 2012). While large-scale vaccine rejection threatens herd immunity goals, large-scale acceptance with local vaccine rejection can also have negative consequences for community (herd) immunity (Wilto, 2020).

Health-related behaviors are also a function of perceived barriers to taking action in relation to COVID-19 vaccine. Perceived barriers refer to an individual's assessment of the obstacles to behavioral change. Even if an individual perceives a form of treatment as threatening and believes that a particular action will effectively reduce the threat, barriers may prevent engagement in the health-promoting behaviour. In other words, the perceived benefits must outweigh the perceived barriers in order for behaviour change to occur. (Peterson, 2019). Perceived barriers to taking action include the perceived risk, danger (side effects of a medical procedure) and discomfort (pain, emotional upset) involved in engaging in the behaviour (Greenfield, 2015). For instance, the perception that COVID-19 vaccine may cause significant pain or death may act as barriers to receiving the vaccine. Perceived susceptibility refers to subjective assessment of risk of developing a health problem due to adverse effect after vaccination (Peterson, 2019). The health belief model predicts that individuals who perceived that they are at risk to a particular medication may engage in behaviour that will reduce their risk of developing the health problem (Irwin Rosenstock, 1950^s). The outcome of this theory may be linked to why many people believed that coronal virus is never a disease of the tropical region, they argue that coronal virus may not survive well in hot weather. Conversely, it may survive well and may be predominant in the temperate region due to favorable weather. The forgoing assumptions may be accounted for the high new index cases of coronavirus victims in these regions. The public's willingness to accept a vaccine is therefore not static; it is highly responsive to current information and sentiment around COVID-19 vaccine, as well as the state of the epidemic and perceived risk of contracting the disease. Under these current plausible COVID-19 vaccine acceptance rates, possible levels of existing protective immunity—though it is unclear whether post-infection immunity confers long-term immunity (Burki, 2019) and the rapidly evolving nature of misinformation surrounding the pandemic is unclear whether

vaccination will reach the levels required for herd immunity.

Many people have localized symptoms Vaccine side-effect and SAR-COV-2 infection after vaccination in users such as pain, redness, warmth, swelling, itching, vomiting and or bruising, which usually improve in a few days. If the clinical symptoms do not improve in this period, a shoulder injury related to vaccine administration (SIRVA) should be ruled out (Jenkins, 2021). The most common cause of a SIRVA is an improper injection technique. Herein, the researcher reported the first case of combined subacromial-sub deltoid bursitis and supraspinatus tendon tear following a second dose of the Oxford-AstraZeneca COVID -19 Vaccine which was apparently caused by an improper COVID-19 vaccination technique. To reduce the chance of SIRVA, the healthcare worker giving the injection should pay careful attention to find the appropriate land mark, and assuring the correct needle length and direction of the injection. (Alio, 2014) Following the development and rollout of COVID-19 vaccine in late2020, researchers, policymakers, and community leaders expressed concern about the low levels of confidence in COVID-19 vaccines among the population. People are still vaccinated at lower rates compared with other advanced countries (Bell, 2019) The authors found that vaccine-related mistrust and lack of confidence in the vaccine is a multifaceted construct that includes distrust of health care and health care providers to be equitable, the government to provide truthful information and the vaccine itself to be safe and effective (Jackson, 2020). The national discussion of confidence issues has masked access problems. Although there has been considerable attention paid to the issue of mistrust and vaccine confidence among the community members, increasing confidence has shifted the spotlight to barriers to access as a reason for persistently lower vaccination rates. (Jackson, 2020).

Several studies have also shown lower vaccine uptake among population in areas with a higher of minority ethnic groups in Nigeria. However, very few studies have examined actual factors associated with vaccine uptake. To fill this gap, the researcher therefore wants to examine factors influencing COVID-19 vaccine uptake among the community members in Ondo State. In addition to assessing how misinformation might induce changes in vaccination intent, a further aim of this study is to determine the extent of the fear of injection adverse effect following immunization on the vaccine uptake among the community members and also to investigate the relationship between the perception of risk of contracting coronavirus disease and the uptake of the vaccine among the community members. Finally, the researcher aims to determine the influence of low confidence in the vaccine and its uptake among community members in Ondo State. The findings will be interpreted in the light of vaccination levels required for herd immunity, and the messaging strategies that may mitigate or counter the impact of online vaccine misinformation will be discussed. Throughout this study, misinformation refers to false or misleading information which is considered incorrect based on the best available evidence from relevant expert at the time. Conversely, factual information refers to information that is considered correct based on the available evidence from relevant experts at the time.

HYPOTHESIS

The following hypothesis have been formulated for the study;

1. There is no significant impact of misinformation relating to COVID-19 vaccine on the intent to accept the vaccine among the community members in Ondo State.

- 2 There is no significant influence of the fear of injection adverse effect following immunization of COVID-19 vaccine and the uptake of the vaccine among the community members in Ondo State
- 3 There is no significant relationship between the perception of risk of contracting coronavirus disease and the uptake of COVID-19 vaccine among the community members in Ondo State.
4. There is no significant influence of low confidence in the COVID-19 vaccine and the uptake of the vaccine among community members in Ondo State.

METHODOLOGY

The descriptive research design of survey type was adopted in this study. The population consists of all male and female’s community members in Ondo State. Data were gathered by interviewing the participants and by using a predesigned questionnaire. A multistage sampling technique was used for the study. Simple random sampling technique was used to select six hundred respondents for the study. Random sampling technique was used to select six LGAs from three senatorial districts; one community were randomly selected from each LGA, making six communities that were used for the study. One hundred respondents were randomly selected from each community to make six hundred (600) respondents that were randomly selected for the study. The instrument for data collection was a well-structured validated questionnaire developed by the researcher. The process of data collection involved face-to-face administration by the research assistant supervised by the researcher. To ascertain the validity of this instrument, the researcher gave three copies to three experts in the relevant fields, the comments and suggestions were used to improve the quality of the instrument. To determine the reliability of the instrument, the researcher adopted a test-retest method to twenty (60) respondents outside the study area at two weeks interval. Both results were compared using Pearson product moment correlation (PPMC) statistical analysis. A reliability coefficient 0.75 was obtained which was considered high enough for the study. The data for this study was collected, sorted, coded and subjected to appropriate descriptive statistical analysis and inferential statistical method. Chi-square (χ^2) was used to analyse the stated hypothesis at 0.05 alpha level of significant

DATA ANALYSIS

The data collected from the field survey were analyzed. Relevant statistical tools were used in the presentation and analysis of data derived from the questionnaire (frequency distribution table and chi square (χ^2) were used to analyze the data

Table1; X_1 analysis showing relationship between response to interventions and the spread of coronavirus disease in Nigeria

S/N	ITEMS N=600	SA	A	D	SD	N	DF	X	0.05	DECISION
1	Majority of people still reject COVID-19 vaccine due to the fear of Injection Adverse Effect Following Immunization	120 (480)	140 (420)	140 (280)	160 (160)	600	2	2.2	2.5	Sig
2	Majority of people still reject COVID-19 vaccine due to misinformation	110 (440)	120 (360)	190 (380)	180 (180)	600	2	2.3	2.5	significant
3	Majority of people still reject COVID-19 vaccine because they do not perceive the risk of contracting coronavirus	102 (408)	108 (324)	198 (396)	192 (192)	600	2	2.2	2.5	significant
4	Majority of people still reject COVID-19 vaccine due to low confidence in the vaccine	102 (408)	108 (324)	198 (396)	192 (192)	600	2	2.2	2.5	Significant

$X^2_{cal} 8.9 < X^2_{table} (10)$

Table1 Analysis showing relationship between rejection of COVID-19 vaccine due to fear of injection adverse effect following vaccination.

The result presented in table 1 shows that t calculated (2.3) is lesser than the t -table (2.5). Thus, the null hypothesis is rejected, meaning that there is a significant influence of fear of injection adverse effect following vaccination on the COVID-19 vaccine uptake among community members in Ondo State. This is in line with the study conducted by (Jenkins,2020) who asserted that many people have localized symptoms Vaccine side-effect and SAR-COV-2 infection after vaccination in users such as pain, redness, warmth, swelling, itching and/ or bruising, which usually improve in a few days. If the clinical symptoms do not improve in this period, a shoulder injury related to vaccine administration (SIRVA) should be ruled out, the most common cause of a SIRVA is an improper injection technique. Herein, the researcher reported the first case of combined subacromial-sub deltoid bursitis and supraspinatus tendon tear following a second dose of the Oxford-AstraZeneca COVID -19 Vaccine which was apparently caused by an improper COVID-19 vaccination technique.

Table2. Analysis showing relationship between rejection of COVID-19 vaccine due to fear of misinformation about COVID-19 vaccine.

The result presented in table 2 shows that t calculated (2.2) is lesser than the t -table (2.5). Thus, the null hypothesis is rejected, meaning that there is a significant influence of misinformation about COVID-19 vaccine and the low uptake of COVID-19 vaccine among the community members in Ondo State. From this analysis, it can be concluded that wrong and false information about COVID-19 vaccine can scare people away from taking the vaccine. This agrees with the findings of (Pennycook, 2020) who stated that there has been widely circulating false information about the vaccine on social media platforms, such as that 5G mobile networks are linked with the virus, that vaccine trial participants have died after taking a candidate COVID-19 vaccine, and that the vaccine is a conspiracy or a bioweapon and free genocide that was linked with the mark of 666 mentioned in the Revelation account of the Bible (Pennycook e-tal 2020). Such information can build on pre-existing fears, seeding doubt and cynicism over new vaccines, and threatens to limit public uptake of COVID-19 vaccines (Hotherball,2010).

Table3. Analysis showing relationship between rejection of COVID-19 vaccine due to low perception of risk towards COVID-19 vaccine.

The result presented in table 3 shows that t calculated (2.2) is lesser than the t -table (2.5). Thus, the null hypothesis is rejected, meaning that there is a significant influence of low perception of risk towards COVID-19 vaccine and the uptake of the vaccine among the community members in Ondo State. In the study conducted by Rosenstock, 1950, he asserted that Perceived barriers to taking action include the perceived inconvenience, expense, danger (side effects of a medical procedure) and discomfort (pain, emotional upset) involved in engaging in the behaviour. For instance, the perception that COVID-19 vaccine may cause significant pain may act as barriers to receiving the vaccine. Perceived susceptibility refers to subjective assessment of risk of developing a health problem due to adverse effect after vaccination. The health belief model predicts that individuals who perceived that they are at risk to a particular medication may engage in behaviour that will reduce their risk of developing the health problem (Irwin Rosenstock, 1950^s).

Table4. Analysis showing relationship between rejection of COVID-19 vaccine due to low confidence and mistrust towards COVID-19 vaccine.

The result presented in table4 shows that t calculated (2.2) is lesser than the t -table (2.5). Thus, the null hypothesis is rejected, meaning that there is a significant influence of lack of confidence and mistrust on the uptake of COVID-19 vaccine. This is in line with the study conducted by (Peterson, 2019) who asserted that vaccine-related mistrust and lack of confidence in the vaccine is a multifaceted construct that includes distrust of health care and health care providers to be equitable, the government to provide truthful information and the vaccine itself to be safe and effective, researchers, policy makers, and community leaders expressed concern about the low levels of confidence in COVID-19 vaccines among the population. People still vaccinated at lower rates compared with other advanced countries (Hothersall, 2020) The authors found that vaccine-related mistrust and lack of confidence in the vaccine is a multifaceted construct that includes distrust of health care and health care providers, to be equitable, the government to provide truthful information and the vaccine itself to be safe and effective. The national discussion of confidence issues has masked access problems. Although there has been considerable attention paid to the issue of mistrust and vaccine confidence among the community members, increasing confidence has shifted the spotlight to barriers to access as a reason for persistently lower vaccination rates. (Irwin, 2020)

SUMMARY

Based on the findings of the study, on the factors influencing COVID-19 vaccine uptake among community members in Ondo State, it is concluded that barriers to vaccine uptake is a multifaceted construct that included barriers of low perception of risk of contracting COVID-19, low confidence and mistrust on the vaccine, wrong and false information about COVID-19 vaccine, distrust of health care and health care providers and the policy makers not to provide truthful information about vaccination.

RECOMMENDATIONS

- On-going community engagement is essential as health messages and vaccine distribution strategies must be sensitive to local communities. Interventions should include ongoing open dialogue with communities to reassure people about the safety and efficacy of COVID-19 vaccines. It will be important to involve Community leaders to facilitate community engagement and specific decision makers within families should be identified for particular social groups.
- Community forums should include engagement with trusted sources such as healthcare workers, opinion, religious and political leaders in particular, from within the target community to respond to concerns about vaccine safety and efficacy. This will increase confidence, trust, knowledge, acceptability, and uptake among community members. Approaches should acknowledge the historical issues in healthcare research to address mistrust towards government and healthcare services experienced in communities in relation to vaccination.
- Credible sources from within target communities should be visible at all levels, including grassroots organisations, healthcare services and policy teams, as authentic representation at each of these levels is likely to increase trust and facilitate a cohesive national and local strategy.
- Tailored communication shared by trusted sources can increase perceptions of risk for COVID-19 and perceived need of vaccination. Communication by healthcare workers, community and faith leaders, and community champions is essential to increase trust and confidence in the vaccination programme.

- Information about vaccines should be available in various languages in both written and visual/video recorded formats to enable people from all ethnic backgrounds to make fully informed choices about vaccination without being forced (Irwin, 2020).
- A consistent evidence-based approach to messaging about all aspects of vaccines, aligned across organisations will be important for public confidence.
- Governance systems should be established and used to ensure that all organisations delivering messages to the public on the vaccination programme are consistent and do not share mixed or conflicting messages.
- Consideration of the "whole communication journey" for vaccine rollout, from current implementation to highest risk groups, to the potential need for repeat vaccination, is important for confidence among community members, to ensure practice of broader COVID-19 measures and protective behaviours between and after vaccinations. Messaging should be continuously reviewed, aligned and amended as new evidence and practical details emerge.
- Local delivery of vaccination, particularly within primary care, should be prioritised. The NHS should work collaboratively with local authorities who can help to identify the approaches and locations for vaccination based on local knowledge, community trust and ability to reach individuals who may not be registered locally within primary care.
- Place-based priorities could be considered for the delivery of vaccines in the second phase (such as in trusted community settings and occupation-based settings, to reach groups who may not be registered within primary care).
- Training is required for all healthcare staff, community leaders and community champions to recognise the importance of their role as a trusted source of health information for minority ethnic groups. Training which includes strategies to initiate discussions about vaccinations and how-to tailor conversations to address vaccine beliefs is likely to result in more meaningful dialogue.
- Interventions that address vaccine hesitancy in healthcare workers from community leaders is particularly important as they are influential credible sources that some community members are more responsive to than other healthcare workers.
- Monitoring and evaluation will provide openness and transparency through regular reporting of progress on the vaccination offer, uptake and coverage by time, place and person and will help to build confidence in the fairness of offer – as will updates on the actions being taken to address access or uptake that are identified.

REFERENCES

1. Alio, A. P., Lewis, C. A., Bunce, C. A., Wakefield, S., (2014) Capacity building among African American faith leaders to promote HIV prevention and vaccine research. Progress in community health partnerships: research, education, and action. 8(3). 305-16 <https://pubmed.ncbi.nlm.nih.gov>
2. Bell, S., Edelstein, M., Zatoński, M., Ramsay, (2019) 'I don't think anybody explained to me how it works': qualitative study exploring vaccination and primary health service access and uptake amongst Polish and Romanian communities in England. BMJ Open. 9(7). e028228. <https://journals.plos.org>
3. Hothersall, E. J., de Bellis-Ayres, S. and Jordan, R., (2012) Factors associated with uptake of pandemic influenza vaccine among general practitioners and practice nurses in Shropshire, UK. Prim Care Respir J. 21. pp302–7. <https://www.nature.com>

4. Robinson et al., (2020) International estimates of intended uptake and refusal of COVID-19 vaccines: A rapid systematic review and meta-analysis of large nationally representative samples
[online]. MedRxiv. [Viewed 14/12/2020]. Available from:<https://www.medrxiv.org/content/10.1101/2020.12.01.20241729v1> Roya
5. Pennycook, G., McPhetres, J., Zhang, Y., Lu, J. G. (2020). Fighting COVID-19 misinformation on social media: experimental evidence for a scalable accuracy-nudge intervention. *Psychol. Sci.* 31, 770–780; <https://www.researchgate.net>
6. WHO (2020)? Director-General's opening remarks at the media briefing on COVID-19 <https://www.who.int/> Nature Human Behaviour | VOL 5 | March 2021 | 337–348
7. Burki, T. *Lancet* (2019). Vaccine misinformation and social media.20. Lo, N. C. & Hotez, P. J. Public health and economic consequences of vaccine: <https://www.scienceopen.com>
8. Geldsetzer, P. (2020). Knowledge and perceptions of COVID-19 among the general public in the United States and the United Kingdom: a cross-sectional online survey. *Ann. Intern. Med.* 173, 157–160. <https://www.ncbi.nlm.nih.gov>
9. Larson H., (2021). Measuring the impact of COVID-19 vaccine misinformation intent in the UK and USA. *Nature human behaviour*; vol 5. pp337-348 <https://www.nature.com/nathumbeh>
10. Wong, L. P. and Sam I.-C., (2010) Factors influencing the uptake of 2009 H1N1 influenza vaccine in a multi-ethnic Asian population. *Vaccine.* 28. pp4499–505. <https://assets.publishing.service.gov.uk>
11. Irwin J. Mansdof (2020). Enforcing compliance with COVID-19 pandemic restrictions: psychological aspect of national security threat. <https://reliefweb.intvol,20,no3> originally published, 18 Mar, 2020
12. NCDC (2021). An update of COVID- 19 outbreak in Nigeria, <https://ncdc.gov.ng.www.africanews.com>
13. NCDC, (2005). Emerging infectious disease control and prevention: emerging infectious disease journal CDC volume, November 4, 2005: <https://www.ncdcgoveidarticle.ISSN.1080-6059>
14. NCDC (2020). An update of COVID-19 report; <https://www.covid-19.ncdc.gov.ng> wednesday, 13th may 2020
15. Irwin M. Rosenstock, (1988). Historical Origin of the Health Belief Model, School of Public Health University of Michigan. *Health Education & Behaviour Monographs*, 2(4) 328-335
16. Greenfield, L. S., Page, L. C., Kay, M., Li-Vollmer, M., Breuner, C. C., Duchin, J. S., (2015) Strategies for increasing adolescent immunizations in diverse ethnic communities. *Journal of Adolescent Health.* 56(5). 47-53
17. Jenkins., Zach (2021). Don't worry, how to manage all your vaccine side effect; <https://digitalcommns.cdarville.edu>
18. Jackson, L. A. et al. (2020) An mRNA vaccine against SARS-CoV-2—preliminary report. *N. Engl. J. Med.* 383, 1920–1931.
19. Forster et al., (2016) Ethnicity-specific factors influencing childhood immunization decisions among Black and Asian Minority Ethnic groups in the UK: a systematic review of qualitative research. *J Epidemiol Community Health.* 71(6). 544-549.
20. Peterson, P., McNabb, P., Maddali, S. R., Heath, J., Santibañez, S., (2019) Engaging communities to reach immigrant and minority populations: the Minnesota Immunization Networking Initiative (MINI), 2006-2017. *Public Health Reports.* 134(3). 241

