

## **Availability and Accessibility as Determinant Factors for Uptake of COVID-19 Vaccines among National Certificate of Education Students in Bauchi State, Nigeria**

**Abdullahi Yunusa Giade M Sc.**

**Sani Buba Ph. D,**

**Aminu Yusuf Ph. D**

**Mohammed Hassan B Sc**

**Shehu Salihu PhD,**

**Kabiru Adamu M Ed**

Department of Physical and Health Education, School of Science, Aminu Saleh College of Education, Azare, Bauchi State

doi: <https://doi.org/10.37745/bjesr.2013/vol11n22634>

Published June 10 2023

---

**Citation:** Giade A.Y., Buba S., Yusuf A., Hassan M., and Salihu S. (2023) Kabiru Adamu M Ed Availability and Accessibility as Determinant Factors for Uptake of COVID-19 Vaccines among National Certificate of Education Students in Bauchi State, Nigeria, *British Journal of Earth Sciences Research*, 11 (2),26-34

---

**ABSTRACT:** *Uptake of vaccines is a long term preventive measures against any infectious disease, however it was observed that there was a low patronage of COVID-19 vaccines among the youth in Bauchi State. Therefore, the study assessed availability of Covid-19 vaccines and evaluates its accessibility as determinants of uptake among NCE Students in Bauchi State, Nigeria. Descriptive research design of survey type was used as research design, the population of the study comprised of 8,947 NCE students from the four public Colleges of Education in Bauchi State, Nigeria; the sample for the study was 650 NCE students selected through multi-stage sampling procedure of cluster sampling, simple random sampling, proportionate and convenience sampling techniques. The instrument used for data collection was a researcher developed questionnaire on 4points Likert scale, the instrument was validated by three experts in the field of Health Education for face and content validity; in the same vein, the reliability of the instrument was ascertained through a pilot study using test re-test method with 30 respondents, the result obtained was subjected to Pearson Product Moment Correlation, were a coefficient of .82 was obtained. Consent of the respondents was sought before the data collection; the data collected were analysed using one sample t-test. Findings of the study revealed that availability ( $p=.000$ ) and accessibility ( $p=.000$ ) were significant determinants of Covid-19 vaccine uptake among NCE students in Bauchi State. It was concluded that availability and accessibility to COVID-19 vaccines were very essential factors in determining the vaccine uptake. It was recommended that the vaccines should be made available in the College clinics of the State for easy access to students and other College community; this will go a long way in motivating them to patronise and use the vaccines.*

**KEYWORDS:** availability, accessibility determinant factors, covid-19 vaccines, national certificate, education students, Bauchi State, Nigeria

---

## INTRODUCTION

The whole world has been plagued with a lot of endemic and pandemic diseases from time immemorial and that is the case even in the present 21<sup>st</sup> century with the issue of Corona Virus. Corona Virus Disease (COVID-19) is an illness caused by a novel corona virus called Severe Acute Respiratory Syndrome Corona Virus 2 (SARS-CoV-2; formerly called 2019-nCoV), which was first identified amid an outbreak of respiratory illness cases in Wuhan City, Hubei Province, China (Centre for Disease Control, (CDC) 2019). Similarly, Corona virus (COVID-19) is an acute respiratory illness in humans caused by a virus known as corona virus which is capable of producing symptoms and in some cases death, especially in older people and those with underline health conditions. On January 30, 2020, WHO declared the COVID-19 outbreak a global health emergency (Gallegos, 2020). Similarly, on March 11, 2020, WHO declared COVID-19 a global pandemic, its first with such designation since declaring H1N1 influenza a pandemic in the year 2009 (WHO, 2020).

The principal mode by which people are infected with COVID-19 is through exposure to respiratory droplets carrying infectious virus, generally within a space of 6 feet. Additional modes of transmission include contact transmission through shaking hands and airborne transmission of droplets that linger in the air over long distances, usually greater than 6 feet (CDC, 2020). Furthermore, the common clinical symptoms of COVID-19 as pointed out by Tong, et al. (2020), to include fever, fatigue, dry cough, shortness of breath, pneumonia, anosmia and ageusia.

Countries around the world in a quest to slow the spread of Covid-19 infection have implemented different control measures, these include; social distancing, lockdowns, closing of schools and businesses, and use of face masks when moving in public. Although such measures have helped in flattening the epidemic curve, however, there is still urgent need for long-term preventive measures such as vaccines and education (Devi, 2020). Vaccines have been a key strategy for improving health outcomes and life expectancy by controlling and preventing infectious diseases, such as smallpox, polio, and plague (Harrison, & Wu, 2020). Given the increase in morbidity and mortality rates associated with COVID-19, the development of a safe and effective COVID-19 vaccine became necessary in order to halt the pandemic.

Preventive measures inform of vaccines and education is very essential to aid in the control the spread and elimination of risk of future occurrence of the disease. It has been proven over years that vaccines are more cost effective than treatment which reduce morbidity and mortality. With vastly improved supply of Covid-19 vaccines, the world no longer has a global vaccine supply problem however; it has a vaccine equity and delivery problem. More than 80 per cent of the world's vaccines have gone to G20 countries while millions of people, including healthcare workers, in low-income countries are still unprotected. The ground strategy followed by most countries around the world was to reduce the transmissibility of COVID-19 disease, often by non-

---

Publication of the European Centre for Research Training and Development -UK

pharmaceutical interventions (NPIs), including enforcing masks policy, hands sanitization, social distancing, travel restrictions, schools' closures, and partial or complete lockdowns (Nicola et al., 2020).

Significant progress has been made regarding COVID-19 vaccination, 12 billion doses have been administered worldwide which led to the massive reduction in the hospitalization and death due to COVID-19. However, serious disparities in the deployment and utilization of vaccines exist worldwide most especially among the developing countries (WHO, 2022). Various safe and effective options regarding COVID-19 have guaranteed due to massive development and distribution of multiple effective COVID-19 vaccines. However, the effort continues to confront with challenges including new strains of the virus, global competition over limited doses and finally public hesitancy about the vaccines (Klobucista, 2022). In the same vein, European Economic Area (EEA) indicated that most EEA countries intended to utilize existing vaccination infrastructure. However, many of the jurisdiction infrastructure and supplies may not be adequate to ensure a swift vaccination campaign particularly taking into consideration the transport and storage requirement of certain vaccines (OECD, 2021). To ensure availability and accessibility to COVID-19 vaccines in the USA, the federal government stood up programmes to reach high-risk communities directly and quickly. The health centre COVID-19 vaccines programmes allocate doses directly to community-based health centres who will administer to the general population. Similarly, the rural health clinics COVID-19 distribution programmes give out doses directly to the health clinics in medically underserved communities (USDHHS, 2022).

WHO is working tirelessly with partners to develop, manufacture and deploy safe and effective vaccines against COVID-19, however, the various views about vaccines ranging from those advocating for or demanding COVID-19 vaccines to those reject and a small group of anti-vaccine activists who oppose it (WHO, 2020), which adversely affects the uptake of the vaccines in Nigeria. Nigeria received about 4 million doses of COVID-19 vaccine, shipped via the COVAX Facility, a partnership between Cepi, Gavi, UNICEF and WHO. The arrival marked a historic step towards the goal to ensure equitable distribution of COVID-19 vaccines globally, in what was the largest vaccine procurement and supply operation in history; this is to ensure the uptake of safe and effective COVID-19 vaccines (WHO, 2020). As at 31st August 2021 a total of 4,432,282 vaccine doses have been administered in Nigeria, it has been observed that rapid distribution and immunization of large population have been vital strategy in the reduction, control and curbing the spread of COVID-19, however, this have been hampered by issues pertaining to availability, accessibility and vaccine hesitancy (Orok, Ndem & Daniel, 2022). In the same vein, the Centre for Disease Control and Prevention revealed that vaccines are not distributed uniformly around the world and many countries are failing to keep with the immunization efforts (Rashedi et al., 2021), this seriously affects availability and accessibility of the vaccines to many people.

Despite several government efforts to minimize its re-occurrence; COVID-19 still remains a public health problem across the world and in Nigeria. It has been observed that many people have

Publication of the European Centre for Research Training and Development -UK

misconceptions regarding the safety of the vaccine with many believed that it is a plan to depopulate the whole world and some says it is harmful to health. This as such has resulted to the increase in the number of individuals rejecting the vaccination across the country. Furthermore, despite the effort of many international organizations to see that vaccines delivery continues, the public acceptance of the Covid-19 vaccine is still critical (Wibawa, 2021; Reiter, Pennell, & Katz, 2020). It was also observed by the researcher that despite the increase in awareness campaigns across the federation through print and mass media houses a lot of individuals are yet to patronise the COVID-19 vaccines.

A study revealed that several youths in the study were non-vaccine confident due to mistrust in health care system, lack of information, side effects, accessibility and availability of the vaccines (Abramovich, Pang, & Pinto, 2022). Similarly, a study revealed that several issues affecting the uptake of Covid-19 revolve around accessibility, affordability and acceptability at an individual level. In the same vein, there are numerous issues associated with distribution and acceptance of Covid-19 vaccines, the vaccines are available in developed countries as they can afford but there are issues of hesitancy. However, the low income countries Nigeria inclusive, lack the capacity to have adequate vaccines due to economic problems, corruption and population pressure. A small village in Iceland may have access to an effective vaccine, but a big city in developing country may face huge challenges regarding availability and access to it.

Result of a study reveals that among 575 participants, 80.8% were vaccinated while 19.2% were not vaccinated; among those received the vaccination majority were vaccinated at the public health facilities while the minority of the respondents received their vaccination at the private health facilities. The findings further revealed that 32% of the respondents encountered accessibility issues while 24% had availability issues. The study further shows that vaccines are provided free of charge in public health facilities while the cost in private clinics is skyrocketing due to lack of regulatory framework in place to keep them under check which could compromise affordability, availability and accessibility (Ayappan et al., 2022). It is against this background the researcher investigated availability and accessibility as determinant factors for uptake of COVID-19 vaccines among National Certificate of Education Students in Bauchi State, Nigeria.

### **Objectives of the Study**

The purpose of this study was to assess the determinants of COVID-19 vaccines uptake among NCE students in Bauchi State, Nigeria. The specific objectives of the study were to:

1. Assess availability of COVID-19 vaccines as a determinant of utilization among NCE Students in Bauchi state, Nigeria.
2. Determine accessibility of COVID-19 vaccine as a determinant of utilization among NCE Students in Bauchi state, Nigeria.

### **Research Hypotheses**

The following hypotheses were postulated and tested in the study:

---

Publication of the European Centre for Research Training and Development -UK

1. Availability is not significant determinant of COVID-19 vaccine uptake among NCE Students in Bauchi state, Nigeria.
2. Accessibility is not a significant determinant of COVID-19 vaccine uptake among NCE Students in Bauchi state, Nigeria.

## **METHODOLOGY**

Descriptive research design of survey type was used as research design. The population of the study comprised of 8,947 NCE students from the four public Colleges of Education in Bauchi state Nigeria; this was compiled according to National Commission of Colleges of Education Abuja. The Colleges were Aminu Saleh College Azare, Adamu Tafawa Balewa College of Education Kangere, ,A.D., Rufai College of Education Legal and General studies Misau, and Abubakar Tatari Ali Polytechnic.

The sample size for the study was 650 NCE students which were adequate as supported by Research Advisor (2006) where it was reported that for a study population of 8,947 the sample size should not be less than 384. The sample were selected through multi-stage sampling procedure of cluster sampling technique, simple random sampling technique proportionate and convenience sampling technique. Cluster sampling technique was used to group all the Local Government Areas (LGAs) in each of the senatorial zone to a cluster, where Bauchi South was regarded as cluster one, Bauchi Central cluster two and Bauchi North cluster three. Simple random sampling technique was used to select three LGAs from the seven LGAs in cluster one, three from the six LGAs in cluster two, three from the seven LGAs in cluster three. Proportionate sampling technique was use to allocate respondents to each of the selected LGAs in the study, where 6.5% of the total population of each of the selected area was used. Convenience sampling method was used to select respondents from each of the selected area of study; the instrument was administered to those present at the time data collection.

The instrument used for data collection was a researcher developed questionnaire on 4points Likert scale, with 1 as Strongly Disagree (SD), 2 Disagree (D), 3 Agree (A) and 4 was regarded as Strongly Agree (SA). The instrument was validated by three experts in the field of Health Education for Face and content validity; their corrections were incorporated into the final draft of the instrument. The reliability of the instrument was ascertaining through a pilot study using test re-test method with 30 respondents, the first administration was correlated with the second administration, the result obtained was subjected to Pearson Product Moment Correlation, were a coefficient of .82 was obtained. Consent of the respondents was sought before the data collection; the data collected were analysed using one sample t-test.

**RESULTS**

The result of the study was based on the data retrieved from 523 respondents for the study; the results were presented as follows:

**Hypothesis 1: Availability is not significant determinant of utilization of COVID-19 vaccine among NCE Students in Bauchi state, Nigeria.**

**Table 1.1: Descriptive Analysis on the Availability of COVID-19 Vaccines among NCE Students in Bauchi State, Nigeria**

|              | N   | Mean   | Std. Deviation | Std. Error Mean |
|--------------|-----|--------|----------------|-----------------|
| Availability | 523 | 9.5717 | 1.88362        | .08236          |

Table 1.1 shows that the mean was 9.57 greater than the test value mean of 2.5.

**Table 1.2: Result of Analysis of One-sample t-test**

|              | Test Value = 2.5 |     |                 |                 |   |        |
|--------------|------------------|-----|-----------------|-----------------|---|--------|
|              | T                | df  | Sig. (2-tailed) | Mean Difference | 95% Confidence Interval of the Difference |        |
|              |                  |     |                 |                 | Lower                                     | Upper  |
| Availability | 85.858           | 522 | .000            | 7.07170         | 6.9099                                    | 7.2335 |

Table 1.2 presented the result of one sample t-test analysis on the availability of COVID-19 vaccine as determinant factor in the uptake of the vaccine among NCE students in Bauchi State, Nigeria. The table shows that the calculated t-cal was 85.85 with the calculated P-value of .000. This shows that availability of the vaccines is a determinant of uptake.

**Hypothesis 2: Accessibility is not significant determinant of utilization of COVID-19 vaccines among NCE Students in Bauchi state, Nigeria.**

**Table 2.1: Descriptive Analysis on the Accessibility to COVID-19 Vaccines among NCE Students in Bauchi State, Nigeria**

|               | N   | Mean   | Std. Deviation | Std. Error Mean |
|---------------|-----|--------|----------------|-----------------|
| Accessibility | 523 | 6.8776 | 1.76826        | .07732          |

Table 2.1 shows that the mean was 6.87 greater than the test value mean of 2.5.



**Table 2.2: Analysis of One-sample t-test on the access to COVID-19 Vaccines among NCE Students in Bauchi State, Nigeria**

|               | Test Value = 2.5 |     |                 |                 |   |        |
|---------------|------------------|-----|-----------------|-----------------|---|--------|
|               | T                | df  | Sig. (2-tailed) | Mean Difference | 95% Confidence Interval of the Difference |        |
|               |                  |     |                 |                 | Lower                                     | Upper  |
| Accessibility | 56.616           | 522 | .000            | 4.37763         | 4.2257                                    | 4.5295 |

Table 2.2 presented the result of one sample t-test analysis on the access to COVID-19 vaccine as determinant factor in the uptake of the vaccine among NCE students in Bauchi State, Nigeria. The table shows that the calculated t-cal was 56.61 with the calculated P-value of .000. This shows that access to vaccines is a determinant of uptake among NCE students in Bauchi State.

## DISCUSSION OF FINDINGS

The finding of the tested hypotheses revealed that availability and accessibility are significant determinants of Covid-19 vaccines uptake among NCE students in Bauchi State. The findings were corroborated by the finding of the study of Klobucitsa (2022) where it was reported that effort to provide adequate Covid-19 vaccine continues to confront with challenges including new strains of the virus, global competition over limited doses and finally public hesitancy about the vaccines. In the same vein, Orok, Ndem & Daniel (2022) reported that the effort to make Covid-19 vaccines available and accessible have been hampered by issues pertaining to availability, accessibility and vaccine hesitancy. In support of findings of the study it was also revealed from the study of Rashedi et al. (2021) that Covid-19 vaccines are not distributed uniformly around the world and many countries are failing to keep with the immunization efforts, thereby affect availability and accessibility of the vaccines. The finding of this study was further supported by the study of Abramovich, Pang, and Pinto (2022) where it was reported that several youth in the study were non-vaccine confident due to mistrust in health care system, lack of information, side effects, accessibility and availability of the vaccines. Similarly, the study further stressed that several issues affecting the uptake of Covid-19 revolve around accessibility, affordability and acceptability at an individual level. The finding was in line with that of Ayappan et al., (2022). Where it was reported that among 575 participants, 80.8% were vaccinated while 19.2% were not vaccinated; among those received the vaccination majority were vaccinated at the public health facilities while the minority of the respondents received their vaccination at the private health facilities. The findings further revealed that 32% of the respondents encountered accessibility issues while 24% had availability issues. The study further shows that vaccines are provided free of charge in public health facilities while the cost in private clinics is skyrocketing due to lack of regulatory framework in place to keep them under check which could compromise affordability, availability and accessibility.

## CONCLUSION

Based on the findings of the study, it was concluded that availability and accessibility to Covid-19 vaccines were significant factors determining the uptake of the vaccines among NCE students in Bauchi State.

## Recommendation

It was recommended based on the conclusion drawn for the study that Covid-19 vaccines should be made available in the College clinics in the State for easy access to students and other College community members, this will go a long way in motivating them to patronise and use the vaccines.

## REFERENCES

- Abramovich, A., Pang, N. & Pinto, A. D. (2022). Examining covid-19 vaccine uptake and attitude among 2SLGBTQ youth experiencing homeless. *BMC Public Health*, 22, 122
- Ayapam, A., Padhi, B. K., Ananthesh, L., Chaudhary, R. K., Mateti, U. V., Kellarai, A., Umikrishnana, M. K., Dsouza, J. D. Parsa, A. D., Kabir, R. & Sah, R. (2022). Perception of availability, accessibility and affordability of covid-19 vaccines and hesitancy: A cross-sectional study in India. *Vaccines*; 10(12):1-10
- Centre for Disease Control and Prevention, CDC (2019). 2019 Novel Corona virus, Wuhan, China: Symptoms. CDC. Available at <https://www.cdc.gov/coronavirus/2019-ncov/about/symptoms.html>. January 26, 2020; Accessed: May 27, 2021.
- Centre for Disease Control and Prevention, CDC (2021). Underlying medical conditions associated with high risk for severe COVID-19: Information for healthcare providers. Centers for Disease Control and Prevention, Available at <https://www.cdc.gov/coronavirus/2019-ncov/hcp/clinical-care/underlyingconditions.html>. 2021 Mar 29; Accessed: March 31, 2021
- Devi, S. (2020). COVID-19 resurgence in Iran. *Lancet* (London, England), 395(10241), 1896.
- Gallegos, A. (2020). WHO Declares Public Health Emergency for Novel Coronavirus. *Medscape Medical News*. Available at <https://www.medscape.com/viewarticle/924596>. January 30, 2020; Accessed: January 31, 2020.
- Harrison, E. A., & Wu, J. W. (2020). Vaccine confidence in the time of COVID-19. *European journal of epidemiology*, 35(4), 325-330.
- Klobucista (2022). A guide to Covid-19 vaccine efforts. Retrieved from [www.cfv.org/background/guide-global-covid-19-vaccine-efforts](http://www.cfv.org/background/guide-global-covid-19-vaccine-efforts)
- Nicola, M., Alsafi, Z., Sohrabi, C., Kerwan, A., Al-Jabir, A., Iosifidis, C., ... & Agha, R. (2020). The socio-economic implications of the coronavirus pandemic (COVID-19): A review. *International journal of surgery*, 78, 185-193.
- OECD (2021). Enhancing public trust in covid-19 vaccination: The role of government. [www.oecd.org/coronavirus/policy-responses/enhancing-public-trust-in-covid-19-vaccination-the-role-of-government-eaeoec5a](http://www.oecd.org/coronavirus/policy-responses/enhancing-public-trust-in-covid-19-vaccination-the-role-of-government-eaeoec5a)



---

Publication of the European Centre for Research Training and Development -UK

- Orok, E., Ndem, E., & Daniel, E. (2022). Knowledge, attitude and perception of medical students on Covid-19 vaccines: A study carried out in Nigerian University. <https://doi.org/10.3389/fpbh.2022-942283>
- Rashedi, R., Samieefar, N., & Masoumi, N. (2021). Covid-19 vaccines mix-and match: the concept, the efficacy and the doubt. *Journal of Medical*; 94: 1294-1299
- Reiter, P. L., Pennell, M. L., & Katz, M. L. (2020). Acceptability of a COVID-19 vaccine among adults in the United States: How many people would get vaccinated. *Vaccine*, 38(42), 6500-6507.
- Tong, J. Y., Wong, A., Zhu, D., Fastenberg, J. H., & Tham, T. (2020). The prevalence of olfactory and gustatory dysfunction in COVID-19 patients: a systematic review and meta-analysis. *Otolaryngology–Head and Neck Surgery*, 163(1), 3-11.
- USDHHS (2022). Covid-19 vaccines. Retrieved from [www.hhs.gov/coronavirus/covid-19-vaccines/index\\_html](http://www.hhs.gov/coronavirus/covid-19-vaccines/index_html)
- WHO (2022). Interim statement on Covid-19 vaccination for children. Retrieved from [www.who.int/new/item](http://www.who.int/new/item) on 20/05/2023
- Wibawa, T. (2021). COVID-19 vaccine research and development: ethical issues. *Tropical Medicine & International Health*, 26(1), 14-19.
- WHO (2020). Transmission of SARS-CoV-2: implications for infection prevention precautions. World Health Organization. Available at <https://www.who.int/news-room/commentaries/detail/transmission-of-sars-cov-2-implications-for-infection-prevention-precautions>. July 9, 2020; Accessed: July 13, 2020.