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A Review of the Coronavirus Epidemic in Nigeria

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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Review Article

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ABSTRACT

Nigeria has experienced serious difficulties as a result of the COVID-19 epidemic, which has affected the entire world. With a focus on public health response, socioeconomic effects, and epidemiology, this thorough review aims to offer an in-depth review of the COVID-19 pandemic in Nigeria. The epidemiological overview examines the COVID-19 pandemic's spread in Nigeria. This research aims to provide an in-depth review of Nigeria's techniques and efforts in fighting COVID-19, focusing on what contributes to Nigeria's low COVID-19 mortality toll compared to other nations. In summary, the review concludes with recommendations for future approaches to managing the COVID-19 pandemic in Nigeria, highlighting the significance of ongoing public health initiatives, fair vaccination programs, and international cooperation. It emphasizes how adaptive techniques are necessary to deal with changing issues and guarantee that the nation is ready for future health emergencies. This comprehensive review, in its entirety, provides insightful information about the COVID-19 pandemic in Nigeria, laying the groundwork for well-informed policy development, research projects, and decision-making targeted at halting the pandemic and preserving public health in the country.

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1. INTRODUCTION

Huanan Seafood Market in Wuhan, China, is thought to be the source of the coronavirus. According to reports from the Chinese Health Authority, as of December 31, 2019, there existed a sort of pneumonia that was inexplicable. The state and federal governments ordered everyone to stay at home, and the Federal School of Medical Laboratory Technology in Jos is also required to follow suit, bringing all operations in Nigeria to a complete halt [1]. Nigeria became the third country in Africa to identify an imported COVID-19 case on February 27, 2020, when the Federal Ministry of Health verified the first case in Ogun State. Egypt and Algeria had already recognized COVID-19 cases. For a 14-day follow-up, 216 contacts in Lagos and Ogun States—including the passengers on the aircraft on February 24 were discovered; 40 of these interactions were deemed high-risk. Eleven days later, the second COVID-19 case in the country was identified as an asymptomatic contact of the index case in Ogun State [2]. This study attempts to give a solution for preventing, managing, and treating the pandemic for the Federal School, State, Nigeria, and the globe. The Federal School, as a training and research institution, organizes a committee to evaluate the coronavirus (COVID-19). The coronavirus is as ancient as the overall virus. Identical to other viruses, coronaviruses are encased in a lipid envelope that serves as a means of binding to target cells' plasma membranes by attachment to certain proteins on their surfaces [3]. The start of the COVID-19 pandemic has resulted in a sharp decline in the number of deaths worldwide and presented an enormous challenge to food security, public health, and the economy. The socio-economic impact has been catastrophic, with over 13.3 billion individuals in the global workforce at risk of losing their jobs and tens of millions of people at risk of falling into extreme poverty. Disruptions to blood transfusion services, the medical supply chain, and the identification and treatment of chronic illnesses are among the public health effects. African Region is the sixth most affected region as reported by the World Health Organization (WHO), behind the Region of Americas, Europe, South East Asia, Eastern Mediterranean, and Western Pacific, according to the global epidemiological indices as of August 26, 2021, which showed 213,752,662 confirmed cases. Nigeria has seen the effects of the epidemic to a similar extent as other African nations. As of August 26, 2021, Nigeria had 2,288 fatalities and 188,880 confirmed cases, according to epidemiological indices. The epidemic and the accompanying border closure and lockdown in Nigeria had negative effects on poverty, the food system, and economic activities. Nigeria had a decline in export demand and remittance inflows: the country's GDP shrank by 23% during the lockdown, and the agricultural food system shrank by 11% as a result of limitations on food services. But since the discovery of the first case, which was announced on February 27, 2020, Nigeria has taken action and taken precautions to stop the pandemic. Hundreds of millions of people worldwide have been infected with COVID-19. The pandemic has also severely damaged regional and international political systems, to the point that governments must reconsider their justifications. The impact on the world economy is also unprecedented, especially in Nigeria, because lockdowns affected the transportation, services, and retail sectors among others, drastically disrupting the flow of people and products [4]. COVID-19 has a lot of negative impacts on Nigeria’s economy, and carrying out a comprehensive review of COVID-19 will enable us to know the updated prevalence of it. Therefore, this study aims to give an in-depth study of Nigeria's strategies and actions in the fight against COVID-19, with an emphasis on the factors that lead to the nation's comparatively low death rates when compared to other countries. It will provide an extensive overview of Nigeria's response to the pandemic and its lessons for global health governance by utilizing epidemiological data, government reports, healthcare statistics, and qualitative observations from community stakeholders.

2. THE GLOBAL BURDEN AND EPIDEMIOLOGICAL OVERVIEW

In December 2019, a case of pneumonia brought on by an infection with the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) was reported in Wuhan City, Hubei Province, China. The World Health Organization (WHO) formally designated the illness brought on by a SARS-CoV-2 infection as coronavirus disease 2019 (COVID-19) on February 11, 2020. A range of clinical symptoms, including fever, dry cough, and exhaustion, are commonly associated with COVID-19, frequently with pulmonary involvement. Because SARS-CoV-2 is so infectious, most people in the general community

are at risk of contracting the virus. Currently, the primary sources of the disease, which is spread by respiratory droplets and direct contact, are sick individuals and wild animal hosts. Following the outbreak, the Chinese government and scientific community moved quickly to determine the cause of the illness, released the viral DNA sequence, and implemented containment measures. Important facets of the biology and pathogenesis of SARS-CoV-2 have been unveiled recently; additional research has concentrated on the disease's epidemiology, clinical characteristics, diagnosis, treatment, and vaccine and medication development [5]. A total of 1,202,320 COVID-19 instances have been confirmed worldwide; these cases are distributed across the continents as follows: 51.2% of confirmed cases are in Europe, 27.7% in North America, 17.9% in Asia, and 1.96%) in South America. The percentage of confirmed cases in Africa and Australia is lower, at 0.8% and 0.5%, respectively. However, during the review period, there was a notable increase in the number of confirmed COVID-19 cases, with an increase of 109,555 in Asia, 8,658 in Africa, 332,866 in North America, 20,269 in South America, 568,894 in Europe, 5,051 in Australia, and 1,045,403 worldwide, excluding Antarctica [6]. All 47 of the African region's member states experienced the effects of the COVID-19 pandemic, which started in China and is causing hitherto unheard-of socio-economic disturbances. Over 2.4 million deaths and over 111.7 million laboratory-confirmed cases had been reported worldwide as of February 25, 2021, from over 190 countries, areas, or territories. With a case fatality rate of 2.6%, all 47 countries in the WHO African Region reported a total of 2,789,965 confirmed cases and 71,204 deaths. More than fifty thousand cases have been confirmed in South Africa (1,507,448), Ethiopia (155,234), Nigeria (153,842), Algeria (112,461), Kenya (104,780), Ghana (81,245), Zambia (76,484), and Mozambique (56,920). Since the COVID-19 pandemic entered the Region, 2,473,939 patients have recovered, yielding an average recovery rate of 88.7% across the region [7]. There has been an exponential rise in the number of infections among healthcare professionals, with numbers rising from 307 on April 24, 2020, to 95,587 on February 25, 2021.

3. THE EMERGENCE OF COVID-19 IN NIGERIA

Nigeria is estimated to be populated by 170 million people. The health care system is poor. The health system has been plagued for decades by problems such as lack of supply and policy compliance, poor logistics, insufficient technology, and unjust distribution of human resources.

The world must take a keen interest in the global spread of the COVID-19 virus when it emerges in Nigeria due to the country's inadequate health system. The Nigerian Center for Disease Control (NCDC) (39) states that the first case was recorded in Nigeria on February 27, 2020.

NCDC has documented 407 confirmed cases in total as of this writing, along with 12 fatalities. Nigeria's case-fatality rate of 3.0% is comparable to that of China (3.9) and Italy (12.7). There have been reports that other nations, like Italy, have seen an exponential rise in the number of new cases, suggesting that the diseases are spreading more slowly in Nigeria than in China and Italy [8]. On February 27, 2020, news circulated that Nigeria's first case of COVID-19, an infection caused by the coronavirus, was an Italian national. The person arrived at the Lagos airport two days prior, having taken a trip from northern Italy. From Lagos, he proceeded to Ogun State, in the west of Nigeria, where he fell sick and was later placed under isolation. In a Lagos hospital, he received treatment for minor COVID-19 symptoms. As soon as the index case was identified, National Emergency Operations Centers were triggered to track down his contacts. Across five states (Edo, Lagos, Ogun, Federal Capital Territory, and Kano), 27 suspected cases were identified by March 9, 2020; two of these were confirmed to be positive (i.e., the index case and a contact) [9]. No deaths were reported, and 216 contacts were connected to the index case, 136 of whom are currently being followed up on.

4. REVIEW OF COVID-19 CASES IN NIGERIA

The COVID-19 epidemic poses previously unknown difficulties in several countries across the world. Nigeria and the people there are not uncommon. More than ever, Nigerians want leadership that can inspire unity and spur collective action. As it has in the past, Nigeria is being challenged now, and it has the chance and capacity to inspire its people to turn the tide against the coronavirus. However, little time is left, so immediate and firm action is required [10].

As of November 30, 2020, figures on COVID-19 morbidities, deaths, and recoveries in Nigeria and globally are shown in Fig. 1. The graph shows that,in comparison to the global trend, the COVID-19 outbreak in Nigeria is milder [11].

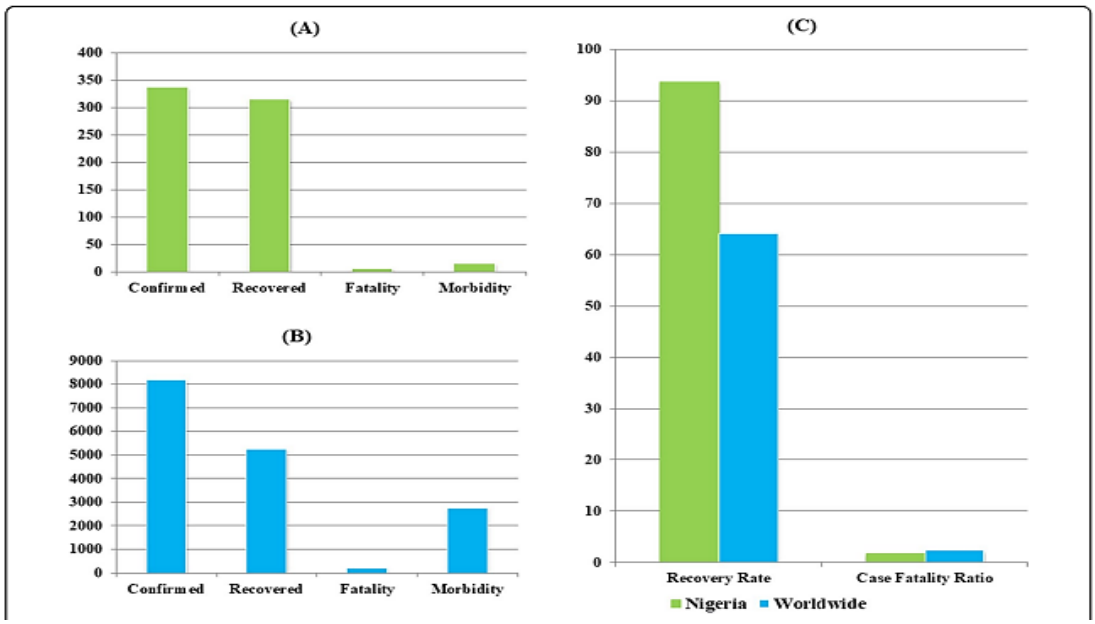

Fig. 1. COVID-19 in Nigeria (NCDC 2020a) and worldwide (odometer 2020) [11]

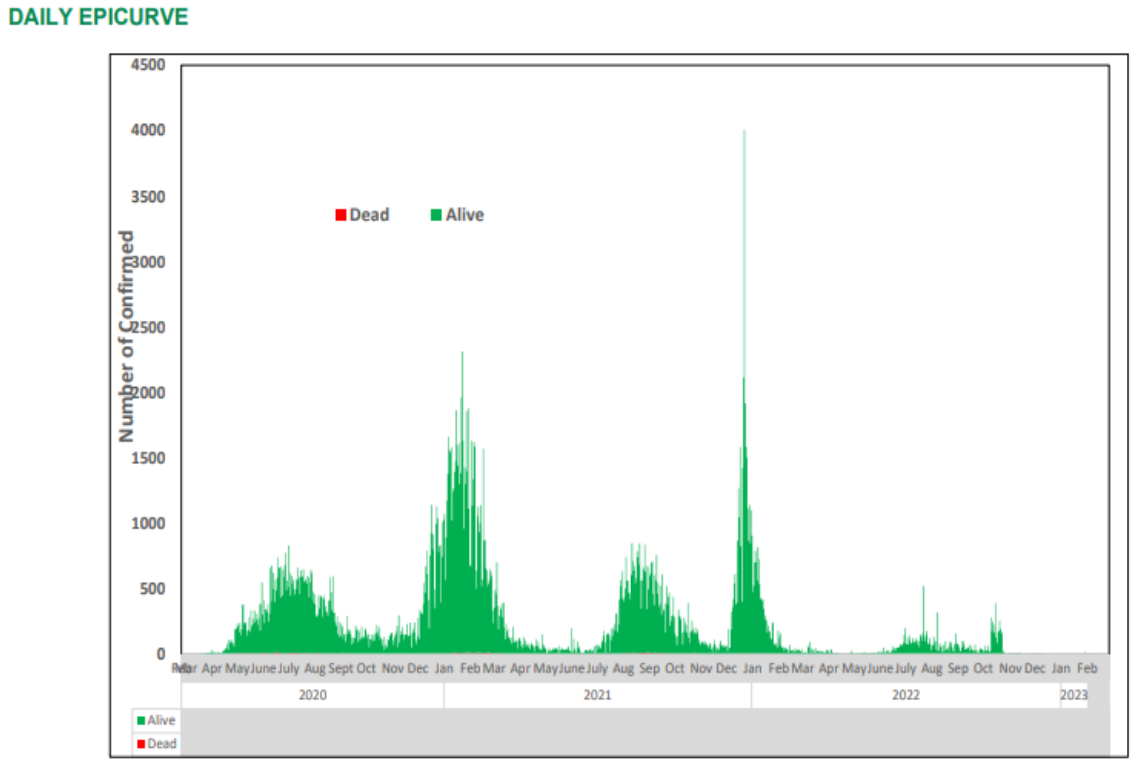

Fig. 2. shows the daily epidemic curve of reported confirmed cases as of 26th February 2023 [12]

Public Health Implication of COVID-19 Epidemic in Nigeria:

✓ **Significant Pressure on the Health Care System**

The COVID-19 pandemic has prompted concerns about Nigeria's healthcare system's capacity to deal with a large COVID-19 outbreak [13]. The system, already under strain from underinvestment, failed to cope with an anticipated rise in patients. According to experts, approximately one in every five COVID-19 cases may necessitate hospitalization, with an even higher percentage requiring intensive care (7.5%). Unfortunately, Nigeria lacks the resources required to handle such a crisis.

✓ **The Impact of COVID-19 on the Education System.**

During the COVID-19 pandemic, universities and institutions shut down to enable students to learn online instead of traditional methods. However, distance education has several disadvantages, such as limited access to low-income schools, technophobia, and a lack of parental supervision, making learning more difficult for students who struggle to adapt [14]. Poor internet connectivity also impedes communication between teachers and students, particularly among those who have limited access to online learning devices.

✓ **The Socioeconomic Impact of COVID-19**

The global health catastrophe of COVID-19 has imposed social isolation, with residents of various countries being barred from going out and carrying out their normal activities, harming the global economic situation. The effects of the abruptly imposed health limitations include the decline in tourist activity, the weakening of industrial productivity, the drop in demand from outside, the firing of individuals, and the loss of the human budget [15]. The pandemic not only imposed an extraordinary burden on the healthcare sector, with cases increasing by the day, but it also had negative social and psychological consequences for people, particularly those from economically disadvantaged backgrounds, as well as the loss of lives and jobs.

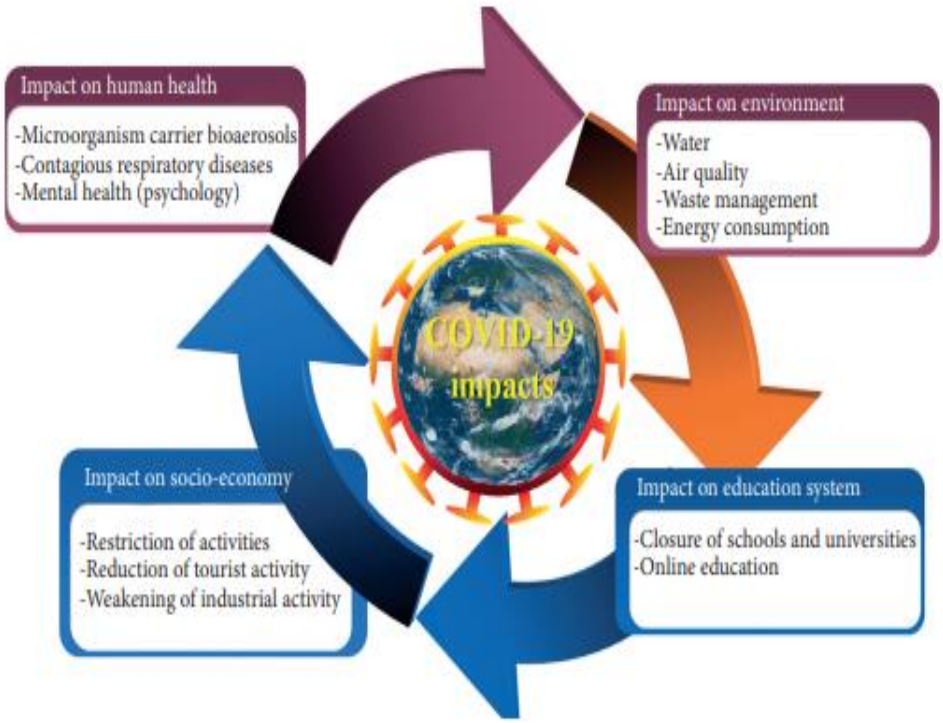

Fig. 3. Public health implication of COVID-19 on Human health, environment, education systems, and economy [17]

- ✓ **The impact of COVID-19 on Nigeria's financial institutions, small enterprises, and micro-entrepreneurs**

The impact of COVID-19 on Nigeria's financial institutions, small enterprises, and micro-entrepreneurs. Covid-19 has hurt small enterprises and micro-entrepreneurs due to lockdown measures implemented to prevent the virus from spreading [16]. It indicates that the lockdown measures influenced Nigerian economic activity and banking, but the Nigerian capital market was unaffected. It also emphasizes the necessity for monetary, fiscal, public, and human control measures to mitigate the pandemic's effects.

- ✓ **The impact of COVID-19 on the Environment and Water Quality**

Countries around the world have concerns about protecting freshwater resources from shortage or pollution. The COVID-19 epidemic has only aggravated conditions by threatening water quality [17]. The virus is capable of transmitting ribonucleic acid in wastewater, and excessive water consumption and increased detergent use have resulted in the introduction of organic and metallic compounds into home streams, degrading water quality. New modes of transportation and treatment are required to boost resource availability.

5. RECOMMENDATION

Government response strategies: The COVID-19 pandemic's preventative measures (lockdown, mobility restriction, social isolation, and interstate travel prohibition) had an impact on Nigeria's socioeconomic life because the country's economy is mostly driven by informal laborers. The government has responded to lessen its impact on people's ability to make a living. The government's palliative efforts, intended to lessen the impact of the COVID-19 epidemic, have not been very successful because of weak budgetary policies, human rights breaches, and poor coordination [18]. The study's recommendations center on the necessity for the government to diversify the economy by encouraging the informal and agricultural sectors, facilitating the development of infrastructure, and enhancing health facilities to prevent an economic recession in Nigeria following the COVID-19 outbreak.

Healthcare infrastructure preparedness: Both developed and developing countries' health systems are understaffed due to the COVID-19 epidemic. Africa has one of the worst health systems in the world, but little is known about how the continent is dealing with the pandemic—both in terms of preparation and response. The primary obstacles to the health system's readiness for the pandemic were the scarcity of services, equipment, and resources, as well as the COVID-19 testing and surge capacity limitations [19] A decrease in the number of patients and missed appointments were two of the COVID-19 pandemic's most prevalent effects. Africa's health systems suffered greatly as a result of the pandemic's poor preparation [20]. With a COVID-19 IPC checklist that we modified from the US Centers for Disease Control and Prevention; we conducted a cross-sectional assessment of health institutions throughout Nigeria. Personal protective equipment (PPE), IPC training, the presence of an IPC committee and teams with work plans and terms of reference, and the implementation of screening, isolating, and notifying COVID-19 patients were among the IPC factors evaluated. As long as the evaluated aspects were present, that aspect was considered prepared.

Social-economic interventions to COVID-19: The federal government quickly imposed strict rules to prevent the virus's spread, such as travel bans, state-to-state travel restrictions, homework bans, school closures, and limits on "non-essential" enterprises. These were some of the strictest regulations in the region On March 30, 2020, the President imposed a four-week nationwide overnight curfew and a complete lockdown in the most severely impacted states of Lagos, Ogun, and Abuja Federal Capital. In other states, lockdown measures were implemented to varied degrees [21]. The rapid health measures taken by the government prevented the outbreak of the first COVID-19 case in Nigeria. The National Emergency Operation Center, headed by the multi-sectoral NCDC, launched, and Rapid Response Teams (RRT) were then dispatched around the nation. On March 9, the Federal Government established a Presidential Task Force (PTF) on COVID-19, which worked with the NCDC to develop standardized protocols for handling the pandemic nationally. The PTF released policy directives for border closures, travel restrictions, lockdowns, and school closings [22]. The federal government's strict rules assisted in controlling the spread of the

virus and it should always be the way to control the spread of the virus in Nigeria.

International collaboration and support: In the fight against the COVID-19 epidemic, the federal government received a great deal of support. The only goal of the Private-Sector Task Force Coalition Against COVID-19 (CACOVID) is to combat the coronavirus (COVID-19) in Nigeria. It works in collaboration with the Federal Government, the Nigeria Centre for Disease Control (NCDC), and the World Health Organization (WHO). Over fifty partners in the private sector operate all over the nation. We have pooled our resources with the sole goal of eradicating the pandemic in Nigeria. Among these private sectors are Dangote, KPMG, Eco Bank, MTN, Access Bank, UBA, GTB, CBN, Promasidor, GLO, Deeper Life Campus Fellowship, etc [23]. A supportive role was also played by the UK government in ensuring an equitable and successful rollout of the COVID-19 vaccine. Other international organizations that have expressed support for Nigeria include the World Health Organization (WHO), which recently announced that 16 million doses of AstraZeneca/Oxford COVID-19 vaccines will be distributed to Nigerians out of the 88 million doses allocated to Africa by COVAX (COVID-19 Vaccines Global Access) [24]. All these partnerships assisted in mitigating COVID-19, and continuous partnerships will eradicate the virus in Nigeria.

Evaluation of key factors contributing to Low death rates: Nigeria's low death rate was caused by several variables, some of which are discussed here.

- ✓ **Home-based Care boosts Nigeria's COVID-19 fight:**

Through a Home-Based Care initiative run by the state government in association with the World Health Organization (WHO), some patients were able to get hospital-quality care in the comfort of their own homes. In six high-burden districts of Lagos state, 1060 persons were managed under the Home-Based Care program during the first surge implementation period, which ran from February to April 2021, without a single recorded death. 81.4% of the overall cases were accounted for by this. Subsequently, the Federal Capital Territory and all 37 states of Nigeria were included in the program [25]. In Nigeria, the Home-Based Care arrangement offers two advantages: firstly, it prioritizes the needs of the patient, and secondly, it frees up the treatment centers' scarce bed capacity for the more serious instances of COVID-19.

- ✓ **Self-isolation and quarantine measures**

One of the strategies used by the Nigerian National Commission on Disease Control (NCDC) to combat COVID-19 is 14 days of self-isolation. These cover returning tourists, those whose cases have been verified, and COVID-19 patients who have been released from hospitals. Before the travel ban, foreign visitors to Nigeria were permitted to self-quarantine for 14 days at airports without the need for testing or oversight from the country's public health agency. To battle the virus, self-isolation is crucial, according to the NCDC 2020e [11]. For 14 days, self-isolation entails remaining only at home or in designated lodging and avoiding social events with family members or the public [26]. This includes any circumstance in which you might come into proximity to people (face-to-face contact that is closer than two meters, or five feet).

- ✓ **Availability of ventilators, intensive care units (ICUs), and personal protection equipment**

Face mask use during the COVID-19 epidemic is becoming popular and ubiquitous among healthcare professionals and the general population. One non-pharmaceutical technique that requires little money and has a significant impact in preventing COVID-19 infection is wearing a face mask [27]. At the beginning of the pandemic, there were an estimated 450 ventilators, ICUs, and personal protective equipment (PPE) in Nigeria, with 350 ICU beds. In comparison to the estimated 8,000 ventilators used concurrently in the UK, this translates to around 2 ventilators per million people [28]. The low number of SARS-CoV-2-related deaths may have hidden the need for more intensive care unit beds in Nigeria's current medical facilities.

- ✓ **Social distancing**

A 1.5 m social distance gap can prevent the majority of respiratory infectious diseases from spreading between people. The virus spreads through air droplets, therefore one of the best ways to stop it is to socially distance yourself from people [29]. A specific transmission distance is associated with the droplets released during forced speech, sneezing, or coughing. We

can slow down the virus's transmission by maintaining this distance. Additional measures to stop the infection from spreading are wearing masks, constantly washing your hands, and using alcohol as a disinfectant.

- ✓ **COVID-19 Vaccination in Nigeria**

The greatest immunization campaign in Nigeria is against COVID-19. Through the COVID-19 Vaccine Global Access (COVAX) facility, a collaboration between the Coalition between Epidemic Preparedness Innovations (CEPI), Global Alliance for Vaccines and Immunizations (GAVI), United Nations Children's Fund (UNICEF), and WHO, the first COVID-19 vaccine, consisting of approximately 4 million doses of the AstraZeneca/Oxford vaccine, arrived in the nation on March 2, 2021. This is an effort to guarantee a fair distribution of COVID-19 vaccines throughout the world. Since frontline healthcare providers are among the groups most in need of the COVID-19 vaccine, immunization started as soon as the vaccine arrived [30]. As of November 19, 2021, over six million people living in Nigeria had received the first dose of the COVID-19 vaccine, while only 3,369,628 had received the second dosage. This means that over two hundred million people (97.6%) of Nigeria's population were not vaccinated [31]. The vaccination helped in the spreading of the COVID-19 virus in Nigeria

6. CONCLUSION

In conclusion, COVID-19 has become a major global concern to both the general people and medical professionals. On the other side, knowledge of the COVID-19 pandemic's prevalence, consequences for public health, and official reactions have been greatly aided by scientific research. The availability of PPE (personal protective equipment), home-based care boosting, vaccination campaigns, ongoing infrastructural improvements in the healthcare sector, and social distancing are the main elements that have contributed to Nigeria's low death rate.

Conclusively, these initiatives highlight how crucial it is to tackle public health catastrophes with all-encompassing and well-coordinated measures."

CONSENT AND ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

The authors have declared that no competing interests exist.

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