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RESEARCH ARTICLE

Global Impacts of the COVID-19 Pandemic on the Environment, Economy, Education, Climate Change, Policy and Vaccination Trends

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ABSTRACT

The effects of the coronavirus are obvious in every sectors of life. The COVID-19 pandemic has evidently disturbed global and local economies and the ecosystem. The COVID-19 pandemic has greatly interfered with the biotic and abiotic aspects of the environment. Hence the need for this review. This review article analyzed the effects of the COVID-19 on education, environmental ethics and policy, climate change, the physical environment, consumer behavior, the price and level of production of goods and services, disturbances in local and global economies, social gathering, the society, vaccination trends, and the impacts on man and his future generations. Articles search were conducted using, Web of Science, PubMed, Scopus index journals and Google Scholar databases for research articles, review related to COVID19, environment, national development and vaccine measures adopted globally. Vaccination is taking place all over the world, and this may help to curb the spread of the virus. The reduction in emissions have led to improvements in air quality which may be beneficial to the environment. Meanwhile, significant research is provided for the causes of pollution and the sudden stop in various form of economic activities, especially transportation. The implementation of environmental policy, development of research institute, employment opportunities, discovery of vaccine have improved national development.

Keywords: COVID-19, environment, national development, vaccine

Background

COVID-19 (Coronavirus Disease 2019) is caused by the severe acute respiratory syndrome coronavirus 2 (SARS-CoV2) ¹. About 15 years ago, two teams independently reported new coronaviruses that were related to the Human Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV). SARS-CoV2 is a 113 positive sense single-stranded ribonucleic acid (RNA) ² The RNA of SARS-CoV2 is identical to that of the infected host cell's mRNA, so the SARS-CoV2 RNA is directly translated by the host cell. COVID-19 belongs to the subfamily coronavirinae which belongs to the family of coronaviridae ³ alphacoronavirus, betacoronavirus, gammacoronavirus and deltacoronavirus are the genera in the subfamily coronavirinae and these viruses either infect only mammals (alphacoronavirus and betacoronavirus) or infect birds and/or mammals (gammacoronavirus and deltacoronavirus) (Pal *et al.*, 2020). Coronaviruses indicate a great burden of disease such as severe respiratory problems in humans, other upper respiratory difficulties, and intestinal infections which can also results to other pulmonary diseases such pulmonary and pleural fibrosis. Previous investigations unveiled that COVID-19 accounts for 3.25% of Disability-adjusted Life Years (DALYs) and it is 85th in rank in the cause of Years of Life Lost (YLLs) and 172nd of the cause of Years Lived with Disabilities (YLDs) ⁴

Current sequence database linked all the known coronaviruses that have infected man to animal origin ⁵. Bats are the number one animal reservoir of coronaviruses; MERS-CoV, HCoV-NL63, SARS-CoV, HCoV-229E are considered to have bat origins ⁶. Over the years, the number of coronaviruses phylogenetically related to SARS-CoV increased with the coronavirus originating from bats prominently residing in caves in Yunnan, China and parts of Europe, found to possess all the genetic combinations required to produce SARS-CoV ⁷. Due to the variant strains of SARS-CoV2 found in bats from Africa, Europe, South-East Asia and China, it is possible that bats had served as SARSr-CoV (coronavirus related) reservoirs for a very long time ⁸. Hence, the interaction of man with his environment has led to the pandemic.

The first case of COVID-19 disease was reported in the Wuhan City of China on 31st December, 2019 and by early April 2020, the death toll accounted for the infection by the virus had doubled, rising to such an extent that it became difficult to keep track of the number of deaths ⁹. As at December, 2020, the total number of

recorded death cases due to COVID-19 infection had risen beyond 1.5 million. The spread of the virus across the globe has led to the shutdown of human activities and the need for people to seek out refuge ¹⁰. The burden of the virus was disproportionately borne by poor people, refugees, displaced persons and homeless migrants. By mid-April 2020, almost every region of the globe had reported infectious cases except for few island countries like Palau, Tuvalu and Vanuatu. COVID-19 disease has greatly disturbed and interfered with normal human activities and a range of sectors. Thus, it becomes imperative for man to understand every aspect of his environment and the possible threats posed by further interactions with his environment.

Main Text

Impacts of the COVID-19 pandemic on Government and Institutions

The government of a nation is an important unit of the environment and it is worth noting that all aspects of the universe are interconnected. The government of a country is a system set aside to represent her people. The regulations and policies formulated by the government help in shaping the perceptions, interactions and values people place on the environment. Italy, for instance, experienced a remarkable increase in death toll from the coronavirus infection, because when the viral infection broke out in the country, it was undetected for about weeks ¹¹. By the time the government intervened to detect and curtail the spread of the virus, infections had already spread around Southern Lombardy and within a few weeks, patients who had tested positive were already hospitalized in intensive care ¹². People lost their lives while some lost their businesses due to negligence on the part of man to take full charge of his environment. When man avoids his responsibility towards his environment, the environment is also bound to fail him. This is typical of the government response towards forestalling the widespread of COVID-19 disease.

Although the first case of coronavirus infection was recorded in December 2019, it was not until 11th March, 2020 that the World Health Organization (WHO) announced the virus as a possible global threat ¹³. WHO had only forewarned on the 23rd and 30th January, 2020 about the possible outbreak of the coronavirus from China and labelled the virus as a public health emergency that required immediate attention ^{14, 15}. Governments of other countries did not also make things easy. The US government – a

prominent government in the world was not helpful at this point as they withdrew from funding the WHO despite being a major contributor to this organization over the years. Thus, with this withdrawal, the jumble grew worse¹⁵. One would have thought that WHO by January, 2020 should have immediately swung into action by organizing an international virtual summit across countries and would have advised that international borders across all countries be closed in order to control the spread of the virus. The few persons already infected as at January, 2020 would have also been quarantined. Governments across all countries should not lack proactive responses and a well-organized and cohesive health care system in such critical periods. Some countries lacking adequate healthcare systems suffered intensely while those countries which could afford good health facilities were too disorganized and disoriented that they failed to effectively use their resources. The pandemic revealed the disunity, lack of cooperation within governments and the presence of administrative barriers.

World governments were not quick to set stringent regulations, and as a consequence, by the first week of April, 2020, the virus had claimed about 50,000 lives around the world and spread to about 181 countries¹⁶. As at the second week of April, 2020, the United States had reported 600,000 deaths while Italy reported more than 20,000 deaths¹⁵. Despite the fact that the daily death toll massively increased, there were no established diagnostic test centers across the world. The United Kingdom was among the first to launch a test center in early April, 2020 as the government had to relinquish huge sums of money and made requisition of PCR machines from their universities¹⁷. The coronavirus had forced governments around the world to enforce policies that would ensure regulations of human behavior and their relationship to the non-human aspects of their environment. The government of Australia was the first to restrict flights coming into the country from China, as well as establish diagnostic test centers, introduce quarantine and isolation measures, restrict gatherings, and shut down businesses and institutions⁶. The country understood that her population was highly susceptible and put in place these regulations which were quite effective in controlling the rate of infections, such that by the first week of April, 2020, the country reported only 50 deaths unlike countries like the US, Italy and Spain whose death toll due to COVID-19 infection reached thousands

¹⁸. These regulations weren't relaxed but further enforced to ensure the safety of their citizens.

It is an inherent trait in man to be curious as he continually explores, discover and unveil secrets about his natural environment. However, man's inquisitive nature must be subjected to strict regulations by government policies in order to obviate the re-occurrence of cases like the COVID-19 disease. It has forced governments to critically reason and make right decisions. Governments had to use, manage and outsource available resources in order to maintain their economy and avoid over-exploitation in order to cater for future generations. Governments also had to regulate the number of international and local travelers using airplanes, buses, trains and other means of transportation. The incidence of coronavirus serves as a clarion call on governments to be the foremen of their countries. Governments had to source for sustainable solutions because of the huge sums of money they had to invest into establishment of test centers and conducting clinical trials. Moreover, schools, libraries, banking halls, worship centers, movie theatres, gyms and non-essential shops were shut down. Due to the COVID-19 lockdown, most institutions could not generate income, thus, governments were forced to think of novel ideas to sustain their economies and the welfare of their citizens¹⁹. For example, the governments of various countries had to organize evacuation flights for their citizens who had travelled to various countries prior to the incidence of the COVID-19 pandemic, to safely return them home. Some governments had to take responsibility for the welfare of their citizens through the payment of the wages and salaries of workers whose businesses were adversely affected by the outbreak. For instance, Nigeria offered some of her youths "Nigerian Youth Investment Fund (NYIF)" as an ameliorative measure against the devastating effects of the COVID-19 pandemic on livelihoods and small-scale businesses²⁰. The government and the people had a way of appreciating the fore-fighters of the COVID-19. This was seen in the residents of London, United Kingdom who applauded health-workers for taking the lead in the fight against the virus. Michel Foucault posited that power in itself is not good or bad but is dangerous when it is accepted without questioning or blindly as witnessed in the case of governments who waited until the escalation of infection rates before taking drastic measures to curtail the virus infection rate²¹.

The Economic impacts of the COVID-19 pandemic

Effects of COVID-19 on Consumer Behavior, Price and Level of production of Goods and Services

Economic activities were disrupted over several months due to the incidence of COVID-19 pandemic. Businesses were forced to shut down as lock-down measures were enforced. The production of most goods and services were suspended over the period of the pandemic, thus, the decrease in the supply of some goods and services led to increase in their prices²². The reduced supply of these goods and services is consequential to reduced supply of labour attributable to infected and laid off workers as well as the continual disruption of the value chain²³. Firms currently facing disruptions may lower their production. IBIS World records reports that the recurrent losses in countries like Germany, Canada, and the United States particularly in the food sector was as a result of the shut-down of restaurants, other catering services, corner shops and pubs during the lockdown²³.

Coronavirus influenced both markets and consumer behavior. While essential goods and services have maintained a high demand in developing countries, non-essential goods like luxury products have experienced a remarkable decreased demand in these countries²³. After the lockdown, consumers had formed the habit of buying only what is important, which include personal care products, while neglecting luxury and recreational goods²⁴. The lockdown period rendered leisure and recreational services, tourist centers, retail businesses, transportation services and other manufacturing and production company's income-less. For example, in the United Kingdom, all shops were locked and only certain supermarkets were allowed to function with a limited number of people allowed to shop at a time. Consumer behavior was by default regulated due to the regularly imposed lockdown restrictions. It became vivid to people that there are many goods and services that their survival does not depend on and this helped shaped their decisions on what services or items they purchase per time. Moreover, there were limited options for people during the months in lockdown since restaurants, corner shops and air travel were shut down, therefore, people were forced to spend money on purchasing only essential items. Additionally, a considerable number of people lost their jobs due to the virus, hence these people were forced to imbibe certain income-saving behaviors²⁵. Consumer behavior is one of the key drivers of economic growth. In

order to ensure sustainability, citizens should be concerned about ways to maximize their available resources while ensuring future generations' resources are not depleted, by maintaining the right consumer behaviors that foster sustainable development. Quarantine measures during the COVID-19 pandemic have also encouraged online shopping of most items while disfavoring in-store shopping.

The increase in the prices of goods and services propelled an increase in the standard of living²⁶. Majority of companies are reporting a negative impact on their businesses, hence, there is high probability that companies who reported a low demand for their goods and services before the pandemic might lower their prices whereas companies who reported a low supply and high demand for their goods and services before the pandemic might increase the prices of their goods and services²⁷. Increase in the demand for goods and services increases the likelihood of planned price increase, whereas decrease in demand decreases the likelihood of planned price decrease²⁸. Companies that have been greatly affected by the COVID-19 pandemic, with reported a decrease in sales of their goods and services are more likely to reduce their prices compared with companies that were not really affected or were affected but did not experience a decrease in the number of sales²⁹.

The Short and Long-Term Economic Impacts of COVID-19 on Local and Global Economies

In order to maintain a more sustainable lifestyle, it is imperative for people to integrate pandemic lifestyle into post-pandemic periods. Comparing the pre- and post- pandemic era, consumers and government agencies appear to spend more money in post-pandemic times than they did in pre-pandemic periods³⁰. In the short run, entertainment industries, household supplies and groceries, wellness products, gasoline and pet-care services might experience increased demand because with the advent of the lockdown, most people spent time purchasing one or more of these products and/or services. In the long run, if consumer behavior continues to lean towards these sectors, then there might be a global shift in consumer behavior. However, the question which remains to be addressed is, for how long would people continue to value these pandemic-dictated attitudes? Considering the ease of the lockdown globally, people are gradually returning to their normal lives and virtual meetings and all-day indoor life might cease to exist. Furthermore, a great number of people are craving the missed

restaurant experiences and their missed travel plans as they are willing to pay huge sums of money at the end of the lockdown to experience those moments again.

Supply and demand are two giant market forces which influence the price of goods and services as well as the level of production³¹. Following the COVID-19 pandemic, the World Bank in its June 2020 Global Economic Prospects predicted that global economy would decline by 5.2% in the year 2020³². This is a remarkable rate of recession since the second world war. Due to the COVID-19 pandemic, countries were forced to impose stringent restrictions on movements in and out of their borders, which indirectly translate to unprecedented detrimental effects on market exchange rates, local economies as well as the global economy at large. Global production within countries were threatened and under great pressure. Despite the alarms of recession by the world bank and nations such as Australia, Italy, Spain, and the United Kingdom, people in countries like Australia for example have not shown any remarkable change in economic attitudes, instead, it is twice as worse in 2020 than it was in 2008⁶. The government would have to decide to involve other factors that would shift demand curves and promote the economy by formulating and implementing policies that would reshape the taste and preferences of its citizens.

The Social Impacts of the COVID-19 pandemic

The Short- and Long-Term Impacts of COVID-19 on Human Relationships and Social Gatherings

The coronavirus pandemic has left an undeniable impact on human relationships. There is now a new normal compared to pre-coronavirus pandemic days. During pre-pandemic days, people hardly think of using other body parts like the elbow or leg to exchange greetings. However, nowadays that is the new normal. People also meet online via Zoom, Google Meet Skype and other online platforms for academic reasons, weddings, church meetings and romantic dates. The bond created by physical contact and togetherness is greatly missed, thus leading some to loneliness, depression and anxiety. Some had to be accustomed to habits of taking long walks and learning new habits e.g. eating new food recipes. The lockdown expanded great distances in some human relationships while mending and closing the gaps in families by fostering intensive family interaction and interdependence³³. The policy of keeping at least two meters apart has also served to distance man from his fellow man due to the fear of person-to-

person COVID-19 virus transmission. Proximity to fellow men is feared more than touching surfaces in public transport. Man is forced to live behind a masked face and is locked up on the inside. People stay meters away in person, and miles away virtually, but is it really possible for the virus to socially distance man for long? Man is involved with his fellow man as he need association in all aspects of life. No man is an island as he constantly seeks the presence, nurture, care and caressing of his fellow man.

The Impacts of COVID-19 on the interaction between Human and Non-Human Elements of the Environment

An unsustainable environment promotes the spread of COVID-19. Sustainable development cares about the environment and ponders on ways to protect it from harm; the ecosystem, economy, society, and human health need protection by a sustainable environment³⁴. The unsustainability of Wuhan, the capital of Hubei province, China had a part to play in the outbreak of the COVID-19 virus. Based on research, the Huanan Seafood Wholesale Wet Market in China is where the outbreak of COVID-19 virus first began in December 2019³⁵. Past cases of zoonotic diseases and SARS-CoV are related to animals and research has also shown that bats, civets and pangolins serve as reservoirs for coronaviruses³⁶. Despite this danger, the production of meat is growing fast daily. Human lives are at risk from zoonotic diseases that are often times very deadly. The virus must have been transmitted from human contact with an infected bat. The average amount of meat consumed per person has doubled in number over the past hundred years globally³⁷. This is not sustainable. The animals being killed and consumed are endangered and prone to extinction as the population of animals being killed is not commensurate with those being replaced.

The Impacts of COVID-19 on the Education of Future Generations

Genes are not the only elements transferrable from one generation to another, other environmental factors such as pollution, stress, malnutrition and infections, including COVID-19, can shape future generations. Recent evidence points to the role of epigenetic mechanisms, such as DNA methylation or histone modification in influencing how the hereditary material in genes is read and understood³⁸. COVID-19 disease caused by the SARS-CoV-2 virus can bind to sperm cells. The ACE2 receptors, used by SARS-CoV-2 to enter the cells can be found on almost all

testicular rat and human cells³⁹. Previously, SARS-CoV has been found to have a significant impact on testes, so it is likely that SARS-CoV-2 affects testicular tissue, semen parameters and male fertility³⁸. Future generations would need to rethink and innovate on how to get many things done due to the limitations imposed by the Covid-19 pandemic. Halting the education industry in a bid to limit social interactions to control the spread of infections would do more harm than good. The best panacea remains thinking of innovative ways to teach and prepare students who doubles as the future generation what to expect and the proactive remedies to forestall a repetition of the global pandemic experiences. In the pandemic area, various social media platforms such as Zoom, WhatsApp, Google Meet and many more were utilized by various educational outfits as avenues to foster continuous learning for students at all levels. These valuable resources can be tapped into and better improved on by future generation to facilitate undisrupted learning and technological development. The future generation commonly referred to as "generation Z" is a racially diverse generation, so adapting to the new norm may not be stressful⁴⁰.

Impacts of Environmental Policies and Laws on abating COVID-19 cases

The emergence of the COVID-19 pandemic has necessitated the formulation as well as promulgation of new environmental laws based on the pre-existing ones. The worldwide lockdown was part of the laws that were passed and implemented in each country for a period of time. This changed so many people's lives by confining them to their homes, and altering their transportation and consumption patterns. In Nigeria as a case study, many environmental policies and regulations have been relaxed or suspended, and new ones formulated since the emergence and spread of COVID-19 in the country. These regulations have a potential to last for a long term which can inadvertently create negative repercussions for the health of people and animals residing in the affected sites. The environmental regulations that were designed to serve the interests of the public in mitigating the transmission of COVID-19, such as wearing face masks in public, social distancing, and increased handwashing, is proving difficult to people as it disrupts their normal way of life. For example, since the COVID-19 pandemic, citizens visiting the banks or supermarket have to stand on long queues because of the limited number of people

allowed into the bank or supermarket at one time. It is necessary for the government to ensure that these rules are enforced in large gatherings, otherwise the objectives of enacting these regulations will be difficult to realize, and the COVID-19 infection rate will swell rapidly⁴¹.

Impacts of COVID-19 on Climate Change

As reported by NASA and the European space agency, the disappearance of clouds of nitrogen dioxide over China provides a ray of hope that the quarantine measures put in place by the government during the lockdown period due to COVID-19 pandemic, which eventually pave way for a suitable climate⁴². These efforts showed how much government's endorsement in science mattered, as state responses and scientific expertise were more coordinated on a global scale. It is worthy to mention that the impact of COVID-19 on climate change demands individual and collective behavioral adjustments. There is a need to fight for climate change which has been ongoing for years now, but the global pandemic made the governments to understand the importance to curb the pandemic⁴³.

Vaccination trends

The outbreak of the coronavirus has once again alarmed mankind of the indispensable value of his health of which vaccination has played a key role. In 2020, 58 vaccines were manufactured to combat the SARS-CoV-2. While some of these vaccines have shown 90% efficacy against the virus others are still under development and clinical trials⁴⁴. The Oxford AstraZeneca Chimpanzee adenovirus vectored vaccine ChAdOx1 nCoV-19 (AZD1222) has been remarkably safe and efficient against COVID-19 in adults aged 18 and older⁴⁴. The Oxford AstraZeneca vaccine is not only made available to high-income countries but also to low- and middle-income countries and has been adjudged as highly efficacious, even as the manufacturers of the vaccine seeks to maintain global supply, equity and commitment⁴⁴. Vaccines manufactured should foster equity which is one of the central goals of sustainable development. The COVID-19 vaccines are highly recommended by the WHO for patients with comorbidities such as cardiovascular diseases, respiratory diseases, and diabetes may increase the risk of severe COVID-19⁴⁴. The Oxford/AstraZeneca trial protocols supports its administration in two standard doses (SD/SD cohort) which are administered 28 days apart and 5×10^{10} viral particles per dose. According to the trials in the UK, a subset (LD/SD

cohort) first administered a low dose (LD) of the vaccine and then a booster after 28 days⁴⁴. The efficacy of the ChAdOx1 nCoV-19 vaccine was observed in an experiment involving 11,636 participants aged 18-55 years who were white and female, in which the vaccine was administered to some of the participants and the effect compared with that of administering a control (the control was either saline or meningococcal conjugate vaccine) to others. None of the recipients of the ChAdOx1 were admitted for COVID-19 related hospital admissions whereas 10 of the recipients of the control were admitted⁴⁴.

Prior exposure to a disease-causing organism (pathogen) as a means of protection against subsequent exposures, is the idea underlying vaccination⁴⁵. The works of Louis Pasteur in the 19th century also corroborates the fact that pathogens are reduced in their degree of virulence by exposure and interaction with environmental agents such as oxygen, chemicals, temperature and artificial media⁴⁶. Despite the vaccination that is ongoing, there are still some people who are not interested to be vaccinated⁴⁷. Notwithstanding, safety data for the use of the vaccine during pregnancy have been accumulated^{48, 49}. However due to the different strain of the virus that was discovered brought about unclear situation about the vaccine and pregnant women.^{49, 50}.

The number of people who have received at least one dose of the COVID-19 vaccine as of 22nd May, 2021 is indicated in Figure 1. 0-1% have received at least one dose of the vaccine in Mauritania, Niger, Nigeria, Sudan, Democratic Republic of Congo, South Sudan, Zambia, Central African Republic, Mauritania, Mali, Congo, Cameroon, Guinea-Bissau, Sierra-Leone, Somalia,

Yemen and Madagascar, Kyrgyzstan and Papua New Guinea. 1-5% have received at least one dose of the vaccine in Nicaragua, Honduras, Guatemala, Venezuela, Paraguay, Senegal, Guinea, Cote d'Ivoire, Ghana, Togo, Tunisia, Libya, Egypt, Ethiopia, Kenya, Uganda, Angola, Namibia, South Africa, Zimbabwe, Mozambique, Malawi, Iraq, Iran, Oman, Afghanistan, Pakistan, Uzbekistan, Ukraine and Belarus, Bosnia and Herzegovina, Bangladesh, Myanmar, Thailand, Malaysia, Philippines and Japan. 5-10% have received at least one dose of the vaccine in Bolivia, Peru, Ecuador, Colombia, Laos, Indonesia, Nepal, Sri Lanka, Cuba and South Korea. 10-20 % have received at least one dose of the vaccine in Argentina, Brazil, Mexico, Russia, Kazakhstan, India, Cambodia, Jordan and Turkey. 20-30% have received at least one dose of the vaccine in Morocco, Greenland, Romania, Norway, Latvia, Ireland and Slovakia. 30-40% have received at least one dose of the vaccine in Spain, France, Germany, Poland, Netherlands, Czechia, Italy, Serbia, Sweden and Denmark. 40-50% have received at least one dose of the vaccine in the United States, Finland, Uruguay and Iceland. 50-60% have received at least one dose of the vaccine in Mongolia, Hungary, United Kingdom, Chile and Canada. 60-70% have received at least one dose of the vaccine in Bhutan, Lebanon and Malta. No country is yet to have more than 70% of the population who had received one dose of any of the COVID-19 vaccines. However, there was no recorded data on the number of people who may have received at least one dose of the COVID-19 vaccine in French Guiana, Western Sahara, Algeria, Saudi-Arabia, Chad, Tanzania, Burkina Faso, China, Australia, Syria, Eritrea, Haiti, Puerto Rico and Turkmenistan.

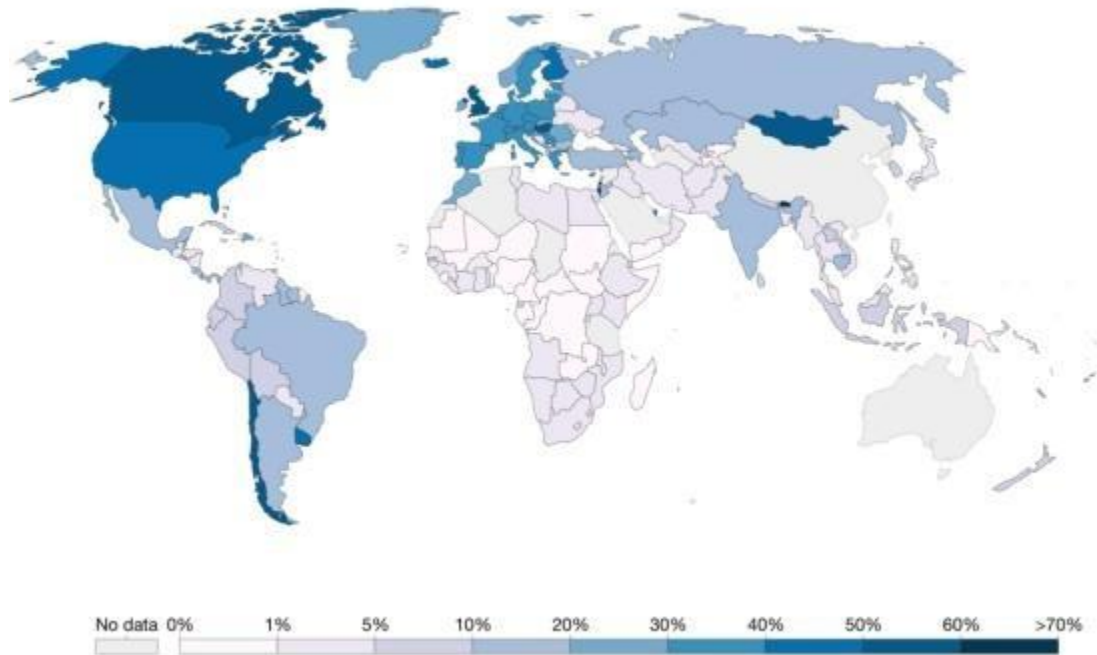


Figure 1. Share of people who received at least one dose of COVID-19 vaccine, May 22, 2021 (Adapted from Our world in data)

In the United States about 100 million – 1 billion people received all the doses of the vaccine. India, Brazil, Mexico, Germany, United Kingdom, Turkey and Russia have 10 – 100 million people who have received the full doses of the vaccine. Meanwhile, other countries have 10 million or less who have received the full doses of COVID-19

vaccine as at 22nd May, 2021 as indicated in Figure 2. The vaccination against COVID-19 as at 22nd May, 2021 has now started in 206 locations around the world with the Oxford/AstraZeneca being administered in most of these locations Figure 3.

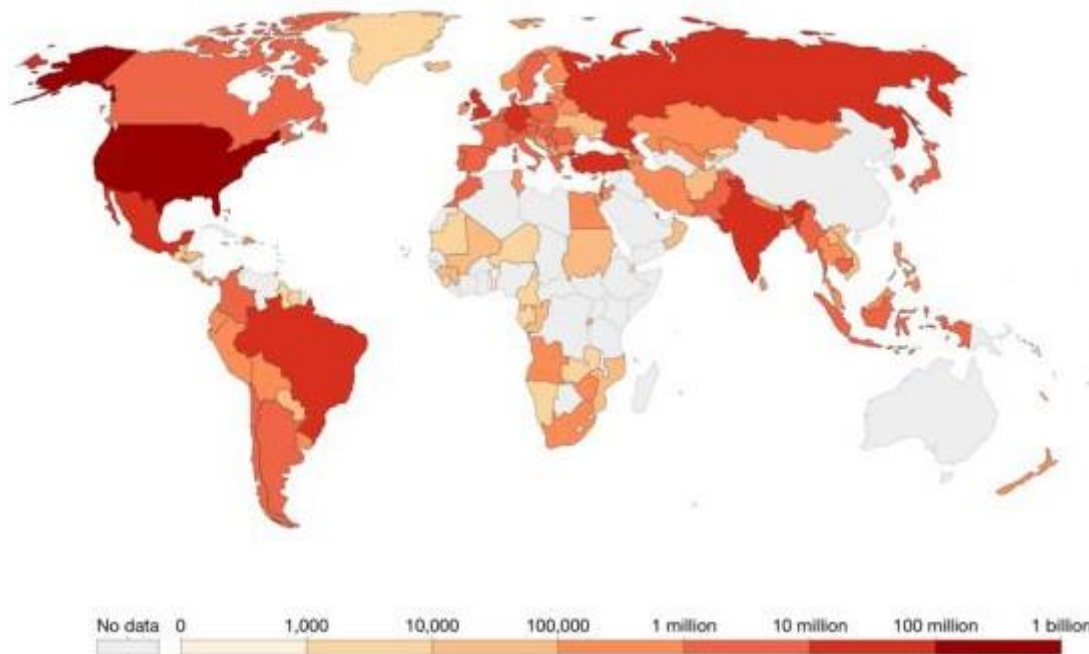
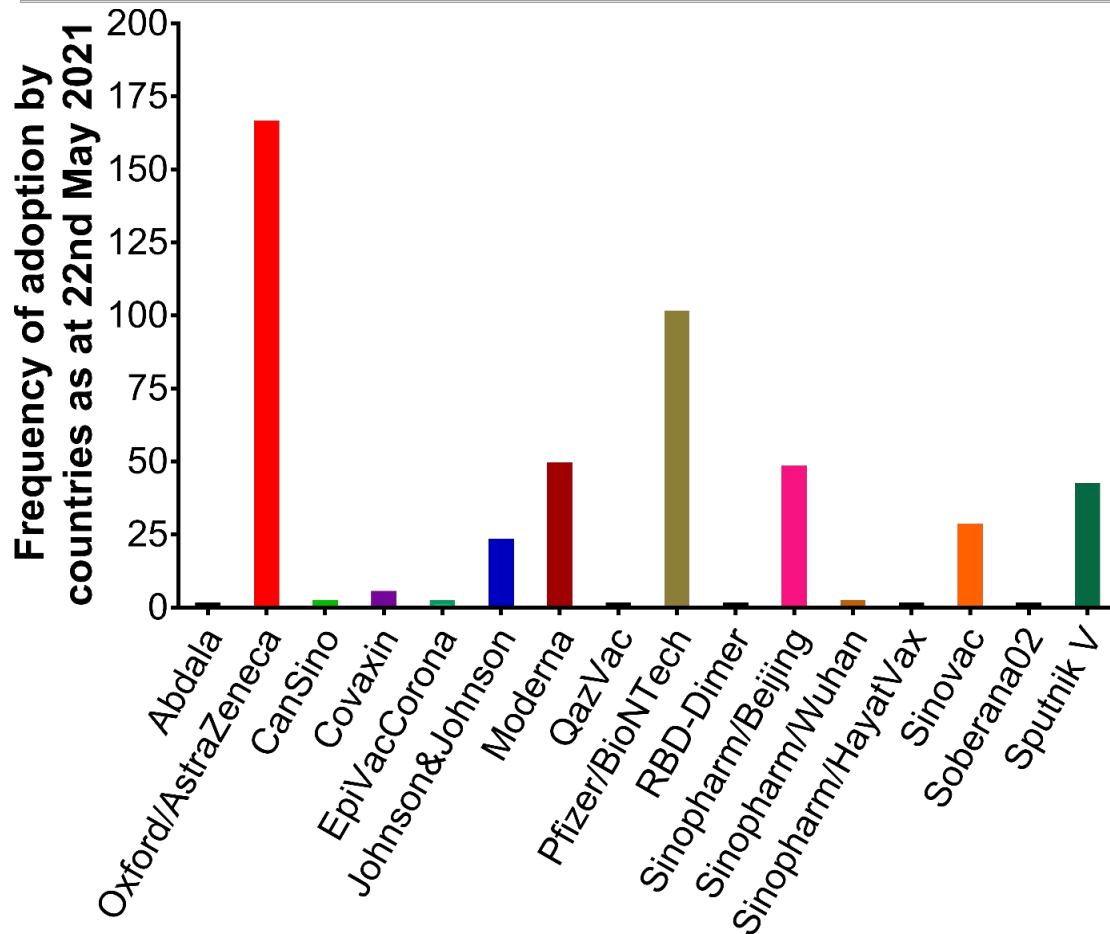


Figure 2. Number of people fully vaccinated against COVID-19; May 22, 2021 (Adapted from Our world in data) Total number of people who have received all doses prescribed by the vaccination protocol.



Covid-19 vaccines

Figure 3. Frequency of adoption of available Covid-19 vaccines for vaccination against SARS- CoV-2 viral infection across different countries as at 22nd May 2021.

Conclusions

Currently, vaccination is taking place in most countries of the world, and this may help to curb the spread of the virus. Hence, the need to know how to control and manage pandemic. Meanwhile, in the short term, the environment stands to accrue numerous gains from the impacts of COVID-19 pandemic due to the reduction in emissions and the resulting improvements in air quality. In the long term, valuable research evidence is provided for novel vaccine, various ways to prevent future outbreak of different diseases, the causes of pollution and of the rationale for a sudden stop in various form of economic activities. Some of the impacts of this virus includes improvement of air quality, governments awareness of the state of their countries and how to improve it drastically by implementing environmental policy, development of research institutes, employment opportunities, discovery of vaccine which brings about national development.

List of Abbreviation

COVID-19: Coronavirus Disease 2019
 SARS-CoV2: Severe Acute Respiratory Syndrome Coronavirus 2
 RNA: Ribonucleic Acid
 DALYs: Disability-adjusted Life Years
 YLLs: Years of Life Lost
 YLD: Years Lived with Disabilities
 WHO: World Health Organization
 NYIF: Nigerian Youth Investment Fund
 SD: Standard Doses
 LD: Low Doses

Ethics approval and consent to participate

Not applicable

Consent for publication

Not applicable

Availability of data and material

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Competing interests

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Authors' contributions

MHU, SND wrote the initial draft of the manuscript. AKO, RMH, AJ, TADO, collected and analyzed data. AMO conceived and designed the study

and revised the initial manuscript draft for improved intellectual content. All authors read and approved the final manuscript.

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