ISSN: 2350-2231(E) ISSN: 2346-7215 (P)

Amujiri, B. A., Onah, C. C. & Oloto, S. E., 2021, 6(1):50-59

DOI:10.36758/ijpamr/v6n1.2021/04

DOI: URL:https://doi.org/10.36758/ijpamr/v6n1.2021/04

Covid-19 Pandemic: Challenges and Opportunities

Dr. B.A. Amujiri

Department of Public Administration and Local Government, University of Nigeria, Nsukka, Nigeria

Mr. C.C. Onah

Social Sciences Unit, School of General Studies, UNEC

Mr. S.E. Oloto,

Department of Social Sciences Unit, School of General Studies, University of Nigeria, Nsukka, Nigeria

Abstract

It is no longer in doubt that Covid-19 pandemic caused by SARS-COV2 which was reported in Wuhan, China in December 2019, has caused a grave devastation and disrupted the way nations and their citizens conduct their affairs. It has witnessed upheaval in socio-economic norms, decimated jobs and placed millions of livelihood at risk globally. Consequently, many have resort to negative coping strategies such as distress sale of assets, predatory loans, child labour etc. The paper examines challenges and opportunities posed by Covid-19 pandemic. We employed secondary sources of data collection while we utilized content analysis in analyzing the data we collected. The study found out that despite the above challenges posed by Covid-19, a lot of advantages and opportunities are embedded in the pandemic which if well harnessed will lead to real human development. Based on the findings, the study argued that we should "never let a good crisis go to waste" for there are always opportunities in every crisis.

Keywords: Covid-19, Pandemic, Challenges, Opportunities, Human Development.

1.0 Introduction

This year 2020 begins a new decade that promises to be one of dreadful disruptions, with Africa holding the weakest end of the stick. In 2008/09, the global "great recession" was triggered by financial crisis in the US (world's largest economy). According to Soludo (2020) much of Africa was said to be decoupled from the crisis and muddled through without severe devastation of its economies. This year, a global health pandemic that has paused the global economy and certain to rail-road it into synchronized recession (if not depression) was triggered by the second largest economy, China. Unlike before, multilateralism and global coordination framework are at their weakest. National (local) self-defence is the rule. As before, the rich world with its generous welfare system and huge financial war chest, is taking care of itself (the US alone has US\$2.2 trillion stimulus package). Africa is left to its fate.

Covid-19 caught the world totally unprepared, and with no proven and available medical response. Ad-hoc cocktails and learning-by-doing constitute the strategic package. In most western countries, the cocktail of response has included a coterie of defensive measures including: border closure; prepare isolation centres and mobilize medical personnel/facilities; implement "stay at home" orders or lockdowns except for food, medicine and essential services; campaign for basic hygiene and social distancing; arrange welfare packages for the vulnerable; and also economic stimulus packages to mitigate the effects on the macro economy.

Many African countries have largely copied the above template, to varying degrees. Piece-meal extensions of "stay at home" or lockdown orders as in many western countries have

ISSN: 2350-2231(E) ISSN: 2346-7215 (P)

Amujiri, B. A., Onah, C. C. & Oloto, S. E., 2021, 6(1):50-59

also been copied in Africa. But the question is: can Nigeria really afford lockdowns, and can they be effective? Put differently, given the social and economic circumstances of Nigeria and the impending 'economic pandemic', can Nigeria successfully and sustainably defeat Covid-19 by copying the conventional trial-and-error template of the western nations? In confusion and desperation, the world seemed to be throwing any and everything at the pandemic. Recall President Trump's assertion that hydroxychloroquine "might help"? The evidence so far (from limited sample) is that it probably actually worsens the disease. The trial and error have left huge human toll and economic ruins, and there is still no solution. This tends to raise the following questions:

- i. What is the meaning, origin, and causes of coronavirus?
- ii. What are the challenges posed by the pandemic?
- iii. Are there any benefits associated with the pandemic or positive opportunities therein?
- iv. What should be done to contain the pandemic?

2.0 Meaning of Coronavirus

Coronaviruses are a group of enveloped viruses with nonsegmented, single-stranded, and positive-sense RNA genomes (Woo et al, 2010). Apart from infecting a variety of economically important vertebrates (such as pigs and chickens), six coronaviruses have been known to infect human hosts and cause respiratory diseases. Among them, severe acute respiratory syndrome coronavirus (SARS-CoV) and Middle East respiratory syndrome coronavirus (MERS-CoV) are zoonotic and highly pathogenic coronaviruses that have resulted in regional and global outbreaks Coronaviruses possess a distinctive morphology, the name being derived from the outer fringe, or coronal of embedded envelope protein. Members of the family *Coronaviridae* cause a broad spectrum of animal and human diseases. Uniquely, replication of the RNA genome proceeds through the generation of a nested set of viral mRNA molecules. Human coronavirus (HCoV) infection causes respiratory diseases with mild to severe outcomes. In the last 15 years, we have witnessed the emergence of two zoonotic, highly pathogenic HCoVs: severe acute respiratory syndrome coronavirus (SARS-CoV) and Middle East respiratory syndrome coronavirus (MERS-CoV). Replication of HCoV is regulated by a diversity of host

factors and induces drastic alterations in cellular structure and physiology (Drexter et al, 2010).

2.1 Origin

According to Zake et al, (2020), a novel coronavirus, designated as 2019-nCoV, emerged in Wuhan, China, at the end of 2019. As of January 24, 2020, at least 830 cases had been diagnosed in nine countries: China, Thailand, Japan, South Korea, Singapore, Vietnam, Taiwan, Nepal, and the United States. Twenty-six fatalities occurred, mainly in patients who had serious underlying illness. Although many details of the emergence of this virus — such as its origin and its ability to spread among humans — remain unknown, an increasing number of cases appear to have resulted from human-to-human transmission. Given the severe acute respiratory syndrome coronavirus (SARS-CoV) outbreak in 2002 and the Middle East respiratory syndrome coronavirus (MERS-CoV) outbreak in 2012, 2019-nCoV is the third coronavirus to emerge in the human population in the past two decades — an emergence that has put global public health institutions on high alert (Gralinski, 2020).

According to Barcenaim et al (2009), China responded quickly by informing the World Health Organization (WHO) of the outbreak and sharing sequence information with the international community after discovery of the causative agent. The WHO responded rapidly by coordinating diagnostics development; issuing guidance on patient monitoring, specimen collection, and treatment; and providing up-to-date information on the outbreak. Several countries in the region as well as the United States are screening travelers from Wuhan for fever, aiming to detect 2019-nCoV cases before the virus spreads further. Updates from China,

ISSN: 2350-2231(E) ISSN: 2346-7215 (P)

Amujiri, B. A., Onah, C. C. & Oloto, S. E., 2021, 6(1):50-59

Thailand, Korea, and Japan indicate that the disease associated with 2019-nCoV appears to be relatively mild as compared with SARS and MERS.

Coronaviruses make up a large family of viruses that can infect birds and mammals, including humans, according to world health organisation (WHO). These viruses have been responsible for several outbreaks around the world, including the severe acute respiratory syndrome (SARS) pandemic of 2002-2003 and the Middle East respiratory syndrome (MERS) outbreak in South Korea in 2015. Most recently, a novel coronavirus (SARS-CoV-2, also known as COVID-19) triggered an outbreak in China in December 2019, sparking international concern. While some coronaviruses have caused devastating epidemics, others cause mild to moderate respiratory infections, like the common cold.

2.2 Types

According to Luk, H. et al (2019)Coronaviruses belong to the subfamily Coronavirinae in the family Coronaviridae. Different types of human coronaviruses vary in how severe the resulting disease becomes, and how far they can spread. Doctors currently recognize seven types of coronavirus that can infect humans.

Common types

- 1. 229E (alpha coronavirus)
- 2. NL63 (alpha coronavirus)
- 3. OC43 (beta coronavirus)
- 4. HKU1 (beta coronavirus)

Rare strains that cause more severe complications include MERS-CoV, which causes Middle East respiratory syndrome (MERS), and SARS-CoV, the virus responsible for severe acute respiratory syndrome (SARS). In 2019, a dangerous new strain called SARS-CoV-2 started circulating, causing the disease COVID 19

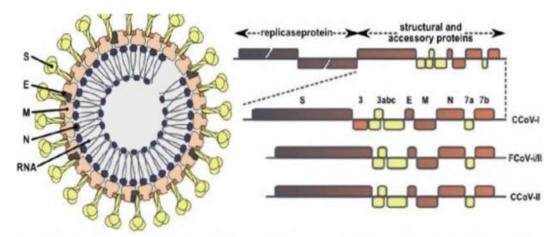


Fig. Coronavirus structure and comparison of CCoV and FCoV genome

Transmission

Limited research is available on how HCoV spreads from one person to the next. However, researchers believe that the viruses transmit via fluids in the respiratory system, such as mucus. See for instance: Drexler, J.F. et al (2010); Subissi, L. et al (2014) and Abrahams et al (1990) among others.

2.3 Causes/Spread

Coronaviruses can spread in the following ways:

Coughing and sneezing without covering the mouth can disperse droplets into the air. Touching or shaking hands with a person who has the virus can pass the virus between individuals. Making

ISSN: 2350-2231(E) ISSN: 2346-7215 (P)

Amujiri, B. A., Onah, C. C. & Oloto, S. E., 2021, 6(1):50-59

contact with a surface or object that has the virus and then touching the nose, eyes, or mouth. Some animal coronaviruses, such as feline coronavirus (FCoV), may spread through contact with feces. However, it is unclear whether this also applies to human coronaviruses. The National Institutes of Health (NIH) suggest that several groups of people have the highest risk of developing complications due to COVID-19. These groups include:

- 1. Young children
- 2. People aged 65 years or older
- 3. Women who are pregnant

3.0 Challenges posed by Covid-19 Pandemic

Ever since its identification as a cause of respiratory infection in Wuhan China in December 2019, Covid-19 has spread like a wildfire. With over 50 million confirmed cases and with about 1.2million death worldwide, every community are now faced with multiple challenges from the risk of contracting the virus itself and its impact to overstretched health services to knock-off repercussion from containment measures on health, education and livelihood system to the present most dangerous stage called community transmission.

The challenges Covid-19 pandemic pose in addition to the above can be summarized as follows:

- 1. Transportation: This section contributes greatly to Nigeria's GDP and is the lifeblood of all economic operations, its importance to the economy cannot be overemphasized. Moving passengers, goods and services with safety and security is a fundamental objective and top priority of every government. The pandemic has led to creating a wide gap in the transport sector that needs to be closed. This is compounded by bad road, high cost of spare parts, and associated security challenges.
- 2. Labour Force: Most small business in the country are ill equipped to handle a crisis of this sort especially as they were predominantly previously focused on survival. As Udemezue (2020) rightly noted, it is no longer in doubt that Covid-19 pandemic has decimated jobs and place millions of livelihood at risk. In fact, our investigations revealed that teeming job losses have been recorded and many earning significantly low incomes have been subjected to half salaries. This is a big challenge to our people's survival. In its latest report on the Covid-19 pandemic, ILO estimates that an equivalent of 195 million job will be wiped out globally before the end of 2020.
- 3. Security Challenge: The advent of the pandemic has in the words of caused a grave devastation on our security architecture. The increased rise and boldness of bandits and criminals has posed a serious security challenge in our country today. As Onoja (2020) asserted, without security, every economic aspiration and effort will be futile. The ill-trained and ill equipped nature of Nigeria Police Force has worsen the security challenge in our country today.
- **4. Tax Payment:** The Covid-19 pandemic has seen small business crushing and the unemployment rate increasing to meet those fundamental obligation when juxtaposed with personal survival. Business and individuals have been observing social distancing and self-isolation due to the pandemic, meeting obligations will be extremely hard.
- 5. Increased borrowing and foreign reserves: The harsh realities of the time mean that increased borrowing and reserve depletion is inevitable. This is a serious threat to our corporate existence. One of the serious challenges the Covid-19 pandemic posed to Nigeria is that it has reduced her to a beggar and debtor nation.
- 6. Infringement on our Fundamental Human Rights: As the spread of Covid-19 continue to increase, various measures were taken towards its containment. These includes closure of schools, closure of state boundaries, restriction of movement, banning congregational prayers in churches and mosques, social distancing etc. Activities like wedding, funerals, going to cinemas, clubs, beer palour were prohibited. A mandatory stay at home order was also declared in most states. Unfortunately, this has eroded as well as encroached on our Fundamental Human Rights.

ISSN: 2350-2231(E) ISSN: 2346-7215 (P)

Amujiri, B. A., Onah, C. C. & Oloto, S. E., 2021, 6(1):50-59

- 7. Lack of cash transfer policy: This lockdown as well as structure of movement had devastating effect on the livelihood of workers in the informal sector which the ILO estimates to be over 70% of the total workforce. Inspite of the above, the federal and state governments in Nigeria are yet to develop a sustainable cash transfer policy to support this vulnerable segments of the population to pull through the difficult period.
- **8. Mono-economy:** Nigeria is a mono-economy country. Lack of a well-diversified economy coupled with a weak healthcare system require urgent steps to be taken to avoid deeper crisis. Several sectors of the economy have also been greatly affected both in the formal and informal sector.
- 9. Healthcare Challenge: There is structural neglect of healthcare infrastructure across our spectrum throughout the federation as a result of decades of underfunding by all tiers of government. As a result of ill-equipped medical facilities and the resultant massive brain drain of Nigeria medical Doctors to Europe, America and the rest of the world, the pandemic is coming at a time that the country is ill-prepared to handle a major health crisis. This is a big challenge.
- 10. Borrowed Policy Factor: The borrowed policy that were horridly put in place by our various government caused more harm than good. As Director-General of ILO (2020) asserted, "if you require people to stop working, go home and stay at home but they have absolutely no other source of income, then the choice can become between that of protecting yourself against the virus and having no means of surviving, no means to feed yourself and these are impossible dilemma. This policy did not go down well with our people. This is even compounded by security agents who turn it into an "ATM machine" for swindling and extorting money from improvised masses. Infact, the Nigeria Strategy in Fighting the Covid-19 pandemic leaves a lot of holes. The so-called palliatives did not seriously impact on the lives of those whose economic activities have been seriously disrupted as a result of the enforcement stay at home and the hoarding of palliatives by our governors and all those connected with its distribution as exposed by ENDSARS protesters..
- 11. Corruption/Leadership Failure: There is a serious challenge that has affect our fight for the containment of Covid-19 pandemic. This was practically demonstrated by the way our leaders corruptly hoarded the palliatives meant to cushion the effects of the Covid-19 pandemic. If not because of END SARS Protest, the food items should have all expired in the warehouse and found their way to the market. As Achibe (1993) pointed out leadership issue is one of our greatest problem in Nigeria.
- 12. Inability to get a curing vaccine: The inability to get a vaccine that will cure the Covid-19 is one of the greatest challenge. Even the advanced countries are yet to find a drug that can cure the virus. This has made the Covid-19 to spread like waterhycienth. According to a publication by International Journal of Pharmaceutical and Life Sciences (2020), no know vaccine has been discovered to cure Covid-19 in any part of the world. To date, there are no anti-viral therapeutics that specifically target human coronavirus, so treatments are only supportive and of course speculative.

4.0 Are there any opportunities or benefits associated with Coronavirus pandemic?

There are two famous sayings that we need to invoke to appreciate the many right sides of coronavirus outbreak rather than the gloomy and fear-exciting pictures painted across the media. The first is that 'things are never as bad as they seem,' while the second is that 'sometimes you have to lose what you have to gain something new.' Even in the throes of enormous losses, scrap contemplative reflection may reveal a throne of benefits for which one needs to be grateful. The extent of acceptance or otherwise of this argument depends on where one is standing. It is also an axiomatic assertions that every undesirable situation presents apparent opportunities by itself. However, being responsible demands that we scavenge through the rubbles of damage for treasures possibly hidden therein. A fear and tear evoking circumstance will not immediately on

ISSN: 2350-2231(E) ISSN: 2346-7215 (P)

Amujiri, B. A., Onah, C. C. & Oloto, S. E., 2021, 6(1):50-59

the face of it throw up leverageable socio-economic opportunities. Opportunity discovery is, therefore, the work of the person who conscientiously looks for it. Accordingly, the rubbles of the coronavirus epidemic and the lockdown present definite opportunities/advantages for improving our country and businesses in the following ways:

- 1. Our state of affairs in the country: The first distinct advantage is another opportunity window open to us to experience the degree of our vulnerability in the face of an unexpected shock as well as another possible chance to put in place enduring remedies. Although the spill-over difficulties triggered by the epidemic cut across virtually every aspect of our economy, we focus on three areas in this our analysis here. These three concerns are (a) the risks of our old-age monolithic and factor-driven economy status, (b) disparaging neglect of our health sector, and (c) the questionable role of our research institutes in the country's production supply chain. We have had many oil price shock experiences, but we ignored the lessons that each of them taught. None, however, co-occurred with precipitous global supply, demand and price decline, severely threatened output and income prospects amidst substantial indebtedness at home and abroad. The current one, however, embodies the genuine reality of Fela's 'double wahala for dead bodi and the owner of dead bodi'. Overreliance and no utilization of this commodity to facilitate the private provision of public goods is the regrettable premise for today's undesirable and unwanted reality. It has helped to reduce the allowances of political appointees to 50%.
- 2. The attention given to our hospitals: The coronavirus invasion of Abba Kyari, the President's Chief of Staff, and many of the politically powerful persons in the country provided them with the opportunity to think again about the conditions of our domestic medical and diagnostics facilities. Many thanks to the spate of global country border closures successfully, which prevented many of them from jetting off to better medical facilities overseas. Meanwhile, the cost of this spiteful age-long culture of medical tourism is unofficially estimated to exceed \$1.3 billion annually. This anomaly is not surprising, though, since as of 2017, Nigeria was only better than three countries - Democratic Republic of the Congo, the Central African Republic and Myanmar – in the WHO global health index. At the last count, he - the president's Chief of Staff - ended up in a privately owned medical facility in Lagos state. Why is it so difficult for us to have global-level cutting-edge privately owned diagnostic facilities in at least each of the six geopolitical zones in the country? These diagnostic facilities can support proximate University teaching Hospitals with its management outsourced to seasoned private-sector health administrators for efficiency purposes and relative protection from public sector abuses. The role of government in all of these will be to provide the right set of incentives that would enable productive entrepreneurs to bring those dreams into existence.
- 3. The new role of our research institutes: The appreciation of our raw-material supply chain challenge vulnerability: China's early containment response crippled more than 50% of our manufacturing facilities far ahead of our response and lockdown. Unfortunately, and matter-of-factly, our manufacturing industries connect umbilically to production facilities in China. When these facilities are down, it means that ours will be down too. Even now that there are no encumbrances for pharmaceutical and allied products making factories to operate, they find it technically challenging to do so, because China's manufacturing industry is not fully functioning in some places yet. Regrettably, we have substantial endowments of many of the raw materials that the Chinese exploit and merely improve on and sell back to us as our intermediate manufacturing inputs. Sadly, too, we have the raw materials research Institute and many other similar institutions charged with the responsibility of looking inwards and developing valuable material inputs for our production plants. Perhaps, we may have to look seriously into the role of our supposedly research institutions in orchestrating the right kind

ISSN: 2350-2231(E) ISSN: 2346-7215 (P)

Amujiri, B. A., Onah, C. C. & Oloto, S. E., 2021, 6(1):50-59

of innovations and support for our development. Our manufacturing production needs to be free from Chinese exploitation. The Covid-19 has propelled our research institutes to look beyond China.

- 4. The unifying effect of the coronavirus: It is surprising how we no longer talk about or make allusions to religion, partisanship, and ethnic orientations in dealing with the challenges posed by the outbreak. The coronavirus outbreak automatically became a critical unifying factor. Practically all of us now seem to have recognized it as a common enemy and subconsciously assumed that we are all together in it. There no longer appears to be a distinction between Christians and Muslims, southerners and northerners, rich and poor, in the fight against the disease.
- 5. **Decline in Ethnicity/Tribalism:** Suddenly, altercations that always arose due to differences in belief systems and ethnic backgrounds all seemed to have vanished in this short period. It is typical of us to resist and effectively break down the walls of unproductive divisions when collectively confronted with conditions that evoke fear, uncertainty and urgency. Yet even though that the combination of these three elements fear, high level of uncertainty and economic urgency characterizes our macroeconomic environment in the ordinary course of our lives, we still fail to eliminate those sad divisions. This situation presents one more opportunity for us to discard those irrelevant differences that set us back as a nation and forge ahead as people from one nation.
- 6. The role that technology has been playing during the lockdown: Telecommunication companies and the banks facilitating digital transactions on data are reaping huge benefits on account of that. Companies have also elevated the levels of collaboration by leveraging several collaborative technologies to promote their meetings, as well as perform the function which they usually carry out on-site. The question, therefore, is why we cannot retain and mainstream this culture. The benefits are enormous and comprise the minimization of traffic congestions on our bad roads, the reduction of the negative impacts they have on our domestic logistics and supply chain as well as the reduction of the extremely high levels of stress that Nigerians go through in many cities. Lagos, for instance, is ranked as the third most stressful city in the world and only better than Baghdad in Iraq and Kabul in Afghanistan. Although traffic congestion is not the only considered factor, it is a significant consideration in the case of Lagos. Residents spend an average of six hours every day to and from work. Therefore, it will be heart-warming to see the emergence of a work-from-home culture in our corporate institutions. It will be a fair guess that about 50% of the tasks that people execute in their offices are easily executable from home if there is good internet infrastructure.
- 7. Unification of families: At home level, many families are for the first time in many years experiencing filial bonding. Macroeconomic challenges and the accompanying demands for more income have driven many of their members in different directions for many years. In many instances, virtually every member of the family has to make financial contributions for their common survival. Consequently, many children become partial breadwinners. However, this lockdown has provided many homes with the opportunity to spend time together in filial togetherness. As one of the WhatsApp comics put it, this period is the only time in the history of Lagos, Abuja and Ogun states of Nigeria that all the wives can afford to authoritatively account for the whereabouts of their husbands. Children are also thrilled because now they can have both parents together at home at the same time. These social benefits are, however enjoyed in families that hitherto lived in peace. At the other extreme where husbands and wives used to live like rats and cats, this may not be a good time for

Amujiri, B. A., Onah, C. C. & Oloto, S. E., 2021, 6(1):50-59

them at all. Either way, it seems that we may be welcoming more babies in the next coming months.

8. **Knowledge Increased Knowledge of ICT/Research:** It has increased our knowledge of ICT. Today we are doing meetings, conferences, seminars and workshop through Zoom. It has led to increase in research activities due to restrictions in travelling and unnecessary movements. We now produce quality research work.

Other Benefits/Opportunities includes:

It has brought back humanity; brought back people to their Creator and to their morals; it brought down interest rates; brought families together; it has stopped people eating dead and forbidden animals; so far it has moved one-third of military expenditure to health care; Coronavirus is pushing people to prayers; it undermines dictators and their powers; humans are now worshipping God rather than progress and technology; it is forcing authorities to look at its prisons and prisoners; it has taught humans how to sneeze, yawn and cough; Coronavirus us now making us stay at home, living simple lives. It equally ushered in era of reduction of 50% of allowances of our political appointees.

Conclusion

Winston Churchill once said, "Never let a good crisis go to waste." There are always opportunities in every crisis and it takes discernment and transformational leadership to explore and capture. As Soludo (2020) equally noted, every shock or pandemic represents opportunities. The lessons from Covid-19 pandemic has made us to act locally (depending on less on European materials and diets) and opportunistically to survive and prosper and exploit the global opportunities, offered by the crises. Nigeria needs a package for creating sustainable prosperity in a world of continuous techno-economic-health disruptions. The way we work, socialize, think, interact, meet etc. has drastically changed due to challenges posed by the Covid-19 and the opportunities it provided for us.

Amujiri, B. A., Onah, C. C. & Oloto, S. E., 2021, 6(1):50-59

References

- Abraham, S.; Kienzle, T.E.; Lapps, W.; Brian, D.A. (1990). Deduced sequence of the bovine coronavirus spike protein and identification of the internal proteolytic cleavage site. Virology, 176(1): 296 301.
- Armstrong, J.; Niemann, H.; Smeekens, S.; Rottler, P.; Warren, G. (1984). Sequence and topology of a model intreacellular membrane protein, E1 glycoprotein from a coronavirus. Nature, 308(5961): 751 752.
- Barcena, M.; Ooestergetel, G.T.; Bartelink, W.; Faas F.G. Verkleji, A.; Rottier, P.J.' Koster, A.J.; Bos, B.J. (2009). Cryo-electron tomography of moue hepatitis virus: Insight into the structure of the coronavirion. Proceedings of the National Academy of Sciences of the United States of America 105(2): 582 587.
- Beniac, D.R.; Andonoc, A.; Grudeski, E.; Booth, T.F. (2006). Architecture of the SARS coronavirus prefuse on spike. Nature structural & Molecular Biology, 13(8): 751 752.
- Bosch, B.J.; Van der Zee, R. fr Haan, C.A.; Rottier, P.J. (2003). The coronavirus spike protein is a class I virus fusion protein. Structural and functional characterization of the fusion core complex. J. Virol, 77(16): 8801 8811.
- Chen, Z.; Zhang, W.; Lu, Y. et al. (2020) From SARS-CoV to Wuhan 2019-nCoV Outbreak: Similarity of Early Epidemic and Prediction of Future Trends, Cell Press.
- Collins, A.R.; Knobler, R.L.; Powell, H.; Buchmeier, M.J. (1982). Monoclonal antibodies to murine hepatitis virus-4 (Strain JHM) define the viral glycoprotein responsible for attachment and cell-cell fusion. Virology, 119(2): 385 371.
- Coronavivrinae in Viral Zone, expasy.org/785 (accessed on 05 February, 2019).
- Covid 19 Pandemic & Eco crisis: The Nigeria Experience and Structural causes. April 2020 SSRN Electronic Journal University Essex.
- De Groot R.J.; Luytjes, W.; Lenstra, J.A. (1984). Evidence for a coiled-oil structure in the Spike proteins of coronavirus, J. Mol Biol. 196(4): 963 966.
- Deimas, B.;, Laude, H. (1990). Assembly of coronavirus spike protein into trimmers and its role in epitope expression. *Journal of Virology*, 64(11): 5367 5375.
- Drexler, J.F.; Gloza-Rausch, F.; Glende, J.; Corman, V.M.; Muth, D.; Goettsche, M.; Seebens, A.; Niedrig, M.; Pfefferle, S.; Yor-danov, S.; Zhelyazkov, L.; Hermanns, U.; Vallo, P.; Lukashev, A.; Muller, M.A.; Deng, H.; Herrler, G.; Drosten, C.; Gemo C.; Genomic characterization of severe acute respiratory syndrome-related coronavirus is European bats and classification of coronaviruses based on partial RNA-Independent RNA polymerase gene sequences. J. Virol, (2010); 84: 11336 11349.
- Etim, E. (2020). Covid-19 Nigeria's Response and the Big Challenges.
- European Centre for Disease Prevention and Control data (2019). Geographical distribution of 2019-nCov cases. https://www.ecdc.europa.eu/en/geographical-distribution-2019-ncov-cases). Accessed on 05 February 2020.
- Graqlinski, L.; Menachery, V.; Return of the Coronavirus: 2019-nCoV, Viruses (2020), 12(2): 135
- Imperial College of London (2020). Report 3: Estimating the potential total number of novel coronavirus cases in Wuhan City, China. Jan. disease-analysis /news-wuhan-coronavirus.
- Internet source; Challenges and responses in the workplace in relation to Covid-19 ILO. www.weforum.org (Accessed 11/11/20)
- Luk H.K.; Li, X.; Fung, J., Lau, S.K.; Wpp, P.C. (2019). Molecular epidemiology, evolution and phylogeny of SARS coronavirus. Infection, Genetics and Evolution 71:21-30.
- Luytjes, W.; Sturman, L.S.; Bredenbeck P.J.; Charite, J.; Van der Zeijst, B.A.; Horizinck, M.C.; Spaan, W.J. (. Primary structure of the glycoprotein E2 of coronavirus MHV-A59 and identification of the trypsin cleavage site. Virology; 161(2): 479 487.
- Nal, B.; Chan, C.; Kien, F.; Siu, L.; Tse, J.; Chu, K.; Kam, J.; Staropoli, I.; Crescenzo-Chaigne, B.; Escirou, N.; Van der Werf, S.; Yuen, K.Y.; Atmeyer, R. (2005). Differential

- maturation and subcellular localization of severe acute respiratory syndrome coronavirus surface protein S, M and E. *The Journal of general virology*, 86(pt 5): 1423 1434
- Neuman, B.W.; Adair, B.D.; Yashioka, C.; Quispe, J.D.; Orea, G.; Kuhn, P.; Yeager, M.; Bucheier, M.J.; (2006). Supramolecular architecture of severe acute respiratory syndrome coronavirus revealed by electron cryomicroscopy. *Journal of Virology*, 80(16)' 7918 7928.
- Newuaman, B.W.; Adair, B.D.; Yoshioka, C.; Aquispe, J.D.; Orea, G.; Kuhn, P.; Milligan, R.A.; Yeager, M.; Bucheier, M.J. (2006). Supramolecular architecture of severe acute respiratory syndrome coronavirus revealed by electron cryomicroscopy. *Journal of Virology*, 80(16): 7918-7928.
- Onoja, A, J,C, (2020). Post Covid-19: The Challenges Ahead. *A Publication by Nairametrics*, nairametric.com. (Accessed om 06/08/20).
- Peiris, J.S.M.; Lai;S.T.; Poon, L. et.al. (2003). Coronavirus as a possible cause of severe acute respiratory syndrome. The Lancet, 361(9366): 1319 1325.
- Seven days in medicine: 8 14 Jan 2020, BMJ, 2020; 368-132. 31948945.
- Soludo, C.C. (2020). Can African Survive: The Lockdown in the Covid-19. Being a lecture delivered by him
- Subsissi, L.; Posthuma, C.C; Collet, A.; Gobbalenya, A.E.; Docroly, E.; Snijder, E.J.; Camard, B.; Imbert, I. (2014). One severe acute respiratory syndrome coronavirus protein complex integrates progressive RNA polymerase and exonuclease activities. Proc. Natl, Acad. Sci. USA. 111, E3900 E3909.
- Thiami, A. (2020), Challenges of fighting Covid-19 Pandemic, the Nigeria case.
- Unicef (2020). Challenges posed by the Covid-19 pandemic in the health of women, Children and adolescents. Publications. www.latinamerica.undp.or (Accessed on 19/11/20)
- WHO (2020). Covid-19 in developing countries. Addressing the economic challenges of Covid in developing countries. Publication of international centre. www.theigc.org (Accessed on 19/19/20)
- WHO (2020). Impact of Covid on peoples levels of hands, the health and our food system. 13th Oct. 2020.
- WHO (2020). Ongoing Challenges faced in the global control of Covid-19 Pandemic. Publication of Archives of medical research.
- Woo, P.C., Hauang Y.; Lauk, S.K.; Yuen K.Y. (2010). Coronavirus genomics and bioinformatics analysis. Viruses, 2:1804 20.
- World Health Organization, nCoV Situation Report 22 on 12 February (2020). Coronavirus/situation-reports, 2019.
- Zaki, A.M. van Boheemen, S.; Bestebroer, T.M.; Osterhaus, A.D.; Founchier, R.A. (2012). Isolation of a novel coronavirus from a man with pneumonia in Saudi Arabia. N. Engel. J. Med, 367: 1814 20.
- Zhao. L.; Jha,B.K.; Eu, A.; Elliott, R. (Ziebuhr, J.; Gorbalenya, A.E.; Silverman, R.H.; Wiess, S.R. (2012). Antagonism of the Interferon-Induced OAS-RNase L. pathway by murine coronavirus ns2 protein is required for virus replication and liver pathology. Cell host & microbe 11(6): 607-616.