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COVID-19 IN NIGERIA BIBLIOGRAPHY 2020-2021

Compiled By:
Adewoyin O. O.

Edited By:
**Adewoyin, O. O.
Onuigbo, L. C.
Abulkareem, M. T.**

BIBLIOGRAPHY ON COVID-19

1. Abdullahi, I. N., Emeribe, A. U., Adekola, H. A., Abubakar, S. D., Dangana, A., Shuwa, H. A., Nwoba, S. T., Mustapha, J. O., Haruna, M. T., Olowookere, K. A., Animasaun, O. S., Ugwu, C. E., Onoja, S. O., Gadama, A. S., Mohammed, M., Daneji, I. M., Amadu, D. O., Ghamba, P. E., Onukegebe, N. B., Shehu, M. S., ... Ahmad, A. E. (2020). **Leveraging on the genomics and immunopathology of SARS-CoV-2 for vaccines development: prospects and challenges.** *Human vaccines & immunotherapeutics*, 1–18. Advance online publication. <https://doi.org/10.1080/21645515.2020.1812313>

ABSTRACT

The incidence and case-fatality rates (CFRs) of Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) infection, the etiological agent for Coronavirus Disease 2019 (COVID-19), have been rising unabated. Even though the entire world has been implementing infection prevention and control measures, the pandemic continues to spread. It has been widely accepted that preventive vaccination strategies are the public health measures for countering this pandemic. This study critically reviews the latest scientific advancement in genomics, replication pattern, pathogenesis, and immunopathology of SARS-CoV-2 infection and how these concepts could be used in the development of vaccines. We also offer a detailed discussion on the anticipated potency, efficacy, safety, and pharmaco-economic issues that are and will be associated with candidate COVID-19 vaccines.

KEYWORDS: COVID-19; Host-virus interaction; SARS-CoV-2; Vaccine discovery.

2. Abena, P. M., Decloedt, E. H., Bottieau, E., Suleman, F., Adejumo, P., Sam-Agudu, N. A., Muyembe TamFum, J. J., Seydi, M., Eholie, S. P., Mills, E. J., Kallay, O., Zumla, A., & Nachega, J. B. (2020). **Chloroquine and Hydroxychloroquine for the Prevention or Treatment of COVID-19 in Africa: Caution for Inappropriate Off-label Use in Healthcare Settings.** *The American journal of tropical medicine and hygiene*, 102(6), 1184–1188. <https://doi.org/10.4269/ajtmh.20-0290>

ABSTRACT

The novel severe acute respiratory syndrome-coronavirus-2 pandemic has spread to Africa, where nearly all countries have reported laboratory-confirmed cases of novel coronavirus disease (COVID-19). Although there are ongoing clinical trials of repurposed and investigational antiviral and immune-based therapies, there are as yet no scientifically proven, clinically effective pharmacological treatments for COVID-19. Among the repurposed drugs, the commonly used antimalarials chloroquine (CQ) and hydroxychloroquine (HCQ) have become the focus of global scientific, media, and political attention despite a lack of randomized clinical trials supporting their efficacy. Chloroquine has been used worldwide for about 75 years and is listed by the WHO as an essential medicine to treat malaria. Hydroxychloroquine is mainly used as a therapy for autoimmune diseases. However, the efficacy and safety of CQ/HCQ for the treatment of COVID-19 remains to be defined. Indiscriminate promotion and widespread use of CQ/HCQ have led to extensive shortages, self-treatment, and fatal overdoses. Shortages and increased market prices leave all countries vulnerable to substandard and falsified medical products, and safety issues are especially concerning

for Africa because of its healthcare system limitations. Much needed in Africa is a cross-continental collaborative network for coordinated production, distribution, and post-marketing surveillance aligned to low-cost distribution of any approved COVID-19 drug; this would ideally be piggybacked on existing global aid efforts. Meanwhile, African countries should strongly consider implementing prescription monitoring schemes to ensure that any off-label CQ/HCQ use is appropriate and beneficial during this pandemic.

3. Abah RC. **Achieving HIV targets by 2030: the possibility of using debt relief funds for sustainable HIV treatment in sub-Saharan Africa.** *J Public Health Policy*. 2020 Aug 3:1–15. doi: 10.1057/s41271-020-00238-x. Epub ahead of print. PMID: 32747703; PMCID: PMC7396728.

ABSTRACT

This paper assesses the possibility of using debt relief funds to sustain HIV treatment in sub-Saharan Africa, suppress transmission, and reach global goals to quell the epidemic by 2030. The cost of providing antiretroviral treatment is a huge burden on African countries. Concerns for Africa's capacity to keep pace with global advances are well founded. By analysing levels of 'debt distress', health expenditure per capita, and HIV antiretroviral therapy requirements in sub-Saharan African countries, the need for innovative finance with international cooperation emerges clearly. In addition to the HIV epidemic, African countries may become more vulnerable to disasters and other public health diseases such as malaria, tuberculosis, Ebola and COVID-19, especially without alternatives to current means of financing. Relief from debt service payments could release funds for sub-Saharan African countries to support universal HIV antiretroviral treatment with sustainable results.

KEYWORDS: Agenda 2030; Antiretroviral; COVID-19; Debt relief; HIV treatment; Sub-Saharan Africa.

4. Abdullahi, A., Candan, S. A., Soysal Tomruk, M., Elibol, N., Dada, O., Truijen, S., & Saeys, W. (2021). **Is Guillain-Barré Syndrome Associated With COVID-19 Infection? A Systemic Review of the Evidence.** *Frontiers in neurology*, 11, 566308. <https://doi.org/10.3389/fneur.2020.566308>

BACKGROUND: There is emerging evidence that Guillain-Barré syndrome (GBS) may be associated with coronavirus disease 2019 (COVID-19) infection. The aim of this review was to investigate the strength of the evidence. **METHOD:** The review was registered in PROSPERO (CDR42020184822). Three electronic databases, MEDLINE, PubMed, and Web of Science, and three preprint servers, MedRxiv, ChemRxiv, and BioRxiv, were searched from December 2019 to 24th September 2020. Studies were included if they were on COVID-19 and of any design. Articles that are reviews or opinion were excluded. The selection process was carried out using EndNote and Rayyan software. The main outcomes in the study were study design, sample size, sex, age, overall GBS symptoms, other COVID-19 symptoms, comorbidity, timing between infection and the onset of neurological symptoms, CT, MRI, and EMG results. Methodological quality of the studies was assessed using the McMaster Critical Review Form. The collected data was analyzed using qualitative synthesis. **FINDINGS:** Fifty-one high-quality studies (mostly) consisting of 83 patients were included in the study. All of the patients (except in a very few) in the included studies had confirmed diagnosis of COVID-19. Similarly, the diagnosis of GBS was based on standard clinical, electrophysiological, and cerebrospinal fluid (CSF) criteria. **CONCLUSION:** GBS may

be associated with COVID-19, and therefore, testing for COVID-19 is recommended in patients presenting with GBS during this pandemic.

KEYWORDS: COVID-19; Guillain Barre syndrome (GBS); cytokines storms; electromyography; intravenous immunoglobulin; olfactory bulb; physiotherapy; reactive protein.

5. Aborisade R. A. (2021). **Accounts of Unlawful Use of Force and Misconduct of the Nigerian Police in the Enforcement of COVID-19 Measures.** *Journal of police and criminal psychology*, 1–13. Advance online publication. <https://doi.org/10.1007/s11896-021-09431-4>

ABSTRACT

In response to the global COVID-19 pandemic, the Nigeria police was entrusted with the responsibility of coordinating local shutdowns, encouraging social distancing, enforcing stay-at-home mandates, and supervising compulsory wearing of face masks. Drawing from procedural justice theory, this study explored accounts of unlawful use of force, human rights violations, and other police misconducts that resulted from the enforcement of COVID-19 measures. Using a victim-centred approach involving qualitative, in-depth interviews with 71 people, who perceived their encounters with the police enforcing COVID-19 measures as bordering on their rights, were conducted, and a thematic analysis of the narratives carried out. Participants reported significant variety of police aggression directed towards them: including actual threats of physical violence, hostility, intimidation, extortion, and punishment. Female participants reported incidents of sexual harassment, unwanted sexual advances, and assault. The study concludes that the militarized option adopted by the police to enforce COVID-19 measures drew deeper divides between the police and communities than previously existed. This stresses the need for Nigeria police to train officers, reprimand erring officers, and deploy procedural justice principles in enforcing COVID-19 measures.

KEYWORDS: COVID-19; Misconduct; Nigeria police; Pandemic; Victims.

6. Aborode, A. T., David, K. B., Uwishema, O., Nathaniel, A. L., Imisioluwa, J. O., Onigbinde, S. B., & Farooq, F. (2021). **Fighting COVID-19 at the Expense of Malaria in Africa: The Consequences and Policy Options.** *The American journal of tropical medicine and hygiene*, 104(1), 26–29. <https://doi.org>

ABSTRACT

Malaria remains a major global health burden, killing hundreds of thousands annually, especially in sub-Saharan Africa. In December 2019, a novel illness termed COVID-19, caused by SARS-CoV-2, was reported in China. This disease soon spread around the world and was declared a pandemic by the WHO on March 11, 2020. Considering that the malaria burden is high in many low-income tropical countries with little capacity to fund malaria control and eradication programs, the fight against malaria in these regions is likely to be hindered by COVID-19. Indeed, access to health care has generally been limited during the pandemic, whereas malaria interventions, such as seasonal malaria chemoprevention, and distribution of long-lasting insecticide-treated bed nets, have been suspended because of lockdowns. Likewise, the repurposing of antimalarials for the treatment of COVID-19 and a shift in focus from the production of malaria rapid diagnostic tests to COVID-19 rapid diagnostic tests are causes for concern in malaria-endemic regions. COVID-19 has disproportionately affected

developed countries, threatening their capacity to aid in malaria control efforts. Here, we address impacts of the COVID-19 pandemic on the management and control of malaria in Africa.

7. Aborode, A. T., Ogunola, S. O., & Adeyemo, A. O. (2021). **A Crisis within a Crisis: COVID-19 and Hunger in African Children.** *The American journal of tropical medicine and hygiene*, 104(1), 30–31. <https://doi.org/10.4269/ajtmh.20-1213>

ABSTRACT

The WHO recently expressed concern at the potential impact of COVID-19 on hunger, which is likely to exacerbate the already considerable burden of malnutrition of Africa. The impact of the disease is expected to be greater among those grappling with malnutrition, whereas widespread hunger and malnutrition will likely increase because of movement restrictions. COVID-19 is unfolding in Africa against a backdrop of worrying levels of hunger and undernourishment which could worsen as the virus threatens livelihoods and household economies. The perspective piece addresses the crisis within crisis of COVID-19 and hunger on the well-being of children in Africa.

8. Al-Raei M. **The basic reproduction number of the new coronavirus pandemic with mortality for India, the Syrian Arab Republic, the United States, Yemen, China, France, Nigeria and Russia with different rate of cases.** *Clin Epidemiol Glob Health*. 2020 Aug 20. doi: 10.1016/j.cegh.2020.08.005. Epub

BACKGROUND: The basic reproduction number values give an initial prediction of the disease because the values predict of end of the disease if the values are less than one or the disease converts to epidemic if the values are more than one. We apply the SIRD epidemiology model for estimating the basic reproduction number of the new coronavirus disease for multiple different countries. **METHODS:** For estimating of the basic reproduction number values, we fit the SIRD model using the Runge-Kutta simulation method in addition to the analytical solution of parts of the model. We use the collected data of the new coronavirus pandemic reported up to date July 30, 2020 in India, the Syrian Arab Republic, the United States, France, Nigeria, Yemen, China and Russia. **RESULTS:** We find that the basic reproduction numbers of the new coronavirus disease are located in the range [1.0011-2.7936] for the different location countries and the values of the ratio between the rate of recovery and the rate of mortality are between 1.5905 for Yemen and 44.0805 for Russia. Also, we find the dates of the actual decreasing of Covid-19 cases in five countries. **CONCLUSIONS:** We find that the basic reproductive number is between 1.0011 for the smallest value and 2.7936 for the greatest value. The most important thing is that the values of the basic reproduction number of the new coronavirus disease in all considered countries are more than one which means that the new coronavirus disease is epidemic in all of considered countries.

KEYWORDS: COVID-19; New coronavirus disease; Runge-Kutta method; SIRD Epidemiology model; The basic reproduction number.

9. Abodunrin, S. & Abodunrin, O. **Covid-19 and social distancing: challenges faced by persons with visual impairment in south-west, Nigeria.** *Global Journal of Applied, Management and Social Sciences (GOJAMSS)*; Vol.19, March 2020; .107 –113

ABSTRACT

Persons with visual impairment are confronted with difficulties in maintaining and keeping social distancing guidelines in the fight against the spread of COVID-19 outbreak due to their peculiarities. This study examines COVID-19 and social distancing: the challenges of persons with visual impairment in the south-west, Nigeria. The objective of the study was to identify the contribution of Covid-19 pandemic to the challenges faced by persons with visual impairment in Nigeria and to examine how a social distancing measure has increased the challenges faced by persons with visual impairment in Nigeria. 150 respondents were purposively selected from 6 states of the south-west of Nigeria. The findings reveal that COVID-19 pandemic contribute more to the challenges faced by persons with visual impairment in Nigeria and Social distancing measure increases the challenges faced by persons with visual impairment in Nigeria. The study therefore recommends that, Persons with visual impairment should follow the Center for Disease Control guidelines in preventing COVID-19.

KEYWORDS: COVID-19, Social Distancing, Visual Impairment, South-West, Nigeria

10. Abdulmajeed, K., Adeleke, M., & Popoola, L. (2020). **Online forecasting of covid-19 cases in Nigeria using limited data.** *Data in brief*, 30, 105683. <https://doi.org/10.1016/j.dib.2020.105683>.

ABSTRACT

The novel Coronavirus disease (COVID-19) was first identified in Wuhan, China in December 2019 but later spread to other parts of the world. The disease as at the point of writing this paper has been declared a pandemic by the World Health Organization (WHO). The application of mathematical models, artificial intelligence, big data, and similar methodologies are potential tools to predict the extent of the spread and effectiveness of containment strategies to stem the transmission of this disease. In societies with constrained data infrastructures, modeling and forecasting COVID-19 becomes an extremely difficult endeavor. Nonetheless, we propose an online forecasting mechanism that streams data from the Nigeria Center for Disease Control to update the parameters of an ensemble model which in turn provides updated COVID-19 forecasts every 24 hours. The ensemble combines an Auto-Regressive Integrated Moving Average model (ARIMA), Prophet - an additive regression model developed by Facebook, and a Holt-Winters Exponential Smoothing model combined with Generalized Autoregressive Conditional Heteroscedasticity (GARCH). The outcomes of these efforts are expected to provide academic thrust in guiding the policymakers in the deployment of containment strategies and/or assessment of containment interventions in stemming the spread of the disease in Nigeria.

KEYWORDS: Analytic Modeling; Coronavirus COVID-19; Ensembles; Nigeria NCDC; Small Data; Timeseries forecasting.

11. Adebayo, P. B., Oluwole, O. J., & Taiwo, F. T. (2021). **COVID-19 and Teleneurology in Sub-Saharan Africa: Leveraging the Current Exigency.** *Frontiers in public health*, 8, 574505. <https://doi.org/10.3389/fpubh.2020.574505>

ABSTRACT

Africa has over 1.3 billion inhabitants, with over 60% of this population residing in rural areas that have poor access to medical experts. Despite having a ridiculously huge,

underserved population, very few African countries currently have any form of sustained and organized telemedicine practice, and even fewer have dedicated tele-neurology services. The ongoing COVID-19 pandemic has proved to be one of the most significant disruptors of vital sectors of human endeavor in modern times. In the healthcare sector, there is an increasing advocacy to deliver non-urgent care *via* telemedicine. This paper examined the current state of tele-neurology practice and infrastructural preparedness in sub-Saharan Africa. Currently, there is over 70% mobile phone penetration in most of the countries and virtually all of them have mobile internet services of different technologies and generations. Although the needed infrastructure is increasingly available, it should be improved upon. We have proposed the access, costs, ethics, and support (ACES) model as a bespoke, holistic strategy for the successful implementation and advancement of tele-neurology in sub-Saharan Africa.

KEYWORDS: Africa; COVID-19; coronavirus; telehealth; teleneurology.

12. Adegboye, O. A., Adekunle, A. I., & Gayawan, E. (2020). **Early Transmission Dynamics of Novel Coronavirus (COVID-19) in Nigeria.** *International journal of environmental research and public health*, 17(9), 3054. <https://doi.org/10.3390/ijerph17093054>

ABSTRACT

On 31 December 2019, the World Health Organization (WHO) was notified of a novel coronavirus disease in China that was later named COVID-19. On 11 March 2020, the outbreak of COVID-19 was declared a pandemic. The first instance of the virus in Nigeria was documented on 27 February 2020. This study provides a preliminary epidemiological analysis of the first 45 days of COVID-19 outbreak in Nigeria. We estimated the early transmissibility via time-varying reproduction number based on the Bayesian method that incorporates uncertainty in the distribution of serial interval (time interval between symptoms onset in an infected individual and the infector), and adjusted for disease importation. By 11 April 2020, 318 confirmed cases and 10 deaths from COVID-19 have occurred in Nigeria. At day 45, the exponential growth rate was 0.07 (95% confidence interval (CI): 0.05-0.10) with a doubling time of 9.84 days (95% CI: 7.28-15.18). Separately for imported cases (travel-related) and local cases, the doubling time was 12.88 days and 2.86 days, respectively. Furthermore, we estimated the reproduction number for each day of the outbreak using a three-weekly window while adjusting for imported cases. The estimated reproduction number was 4.98 (95% CrI: 2.65-8.41) at day 22 (19 March 2020), peaking at 5.61 (95% credible interval (CrI): 3.83-7.88) at day 25 (22 March 2020). The median reproduction number over the study period was 2.71 and the latest value on 11 April 2020, was 1.42 (95% CrI: 1.26-1.58). These 45-day estimates suggested that cases of COVID-19 in Nigeria have been remarkably lower than expected and the preparedness to detect needs to be shifted to stop local transmission.

KEYWORDS: Africa; COVID-19; Nigeria; coronavirus; importation; infectious diseases; reproduction number; travel.

13. Adegboye, O. A., Adekunle, A. I., Pak, A., Gayawan, E., Leung, D. H., Rojas, D. P., Elfaki, F., McBryde, E. S., & Eisen, D. P. (2021). **Change in outbreak epicentre and its impact on the importation risks of COVID-19 progression: A modelling study.**

ABSTRACT

BACKGROUND: The outbreak of Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2) that was first detected in the city of Wuhan, China has now spread to every inhabitable continent, but now the attention has shifted from China to other epicentres. This study explored early assessment of the influence of spatial proximities and travel patterns from Italy on the further spread of SARS-CoV-2 worldwide. **METHODS:** Using data on the number of confirmed cases of COVID-19 and air travel data between countries, we applied a stochastic meta-population model to estimate the global spread of COVID-19. Pearson's correlation, semi-variogram, and Moran's Index were used to examine the association and spatial autocorrelation between the number of COVID-19 cases and travel influx (and arrival time) from the source country. **RESULTS:** We found significant negative association between disease arrival time and number of cases imported from Italy ($r = -0.43$, $p = 0.004$) and significant positive association between the number of COVID-19 cases and daily travel influx from Italy ($r = 0.39$, $p = 0.011$). Using bivariate Moran's Index analysis, we found evidence of spatial interaction between COVID-19 cases and travel influx (Moran's $I = 0.340$). Asia-Pacific region is at higher/extreme risk of disease importation from the Chinese epicentre, whereas the rest of Europe, South-America and Africa are more at risk from the Italian epicentre. **CONCLUSION:** We showed that as the epicentre changes, the dynamics of SARS-CoV-2 spread change to reflect spatial proximities.

KEYWORDS: COVID-19; China; Coronavirus; Epicentre; Health security; Italy; One health; Spatial proximity; Travel.

14. Adamu, A. A., Jalo, R. I., Habonimana, D., & Wiysonge, C. S. (2020). **COVID-19 and routine childhood immunization in Africa: Leveraging systems thinking and implementation science to improve immunization system performance.** *International journal of infectious diseases: IJID: official publication*

ABSTRACT

One of the routine health services that is being disrupted by coronavirus disease 2019 (COVID-19) in Africa is childhood immunization. This is because the immunization system relies on functioning health facilities and stable communities to be effective. Its disruption increases the risk of epidemics of vaccine-preventable diseases, which could increase child mortality. Therefore, policymakers must quickly identify robust and context-specific strategies to rapidly scale-up routine immunization in order to mitigate the impact of COVID-19 on their national immunization performance. To achieve this, we propose a paradigm shift towards systems thinking and use of implementation science in immunization decision-making. Systems thinking can inform a more nuanced and holistic understanding of the interrelationship between COVID-19, its control strategies, and childhood immunization. Tools like causal loop diagrams can be used to explicitly illustrate the systems structure by identifying feedback loops. Once mapped and leverage points for interventions have been identified, implementation science can be used to guide the rapid uptake and utilization of multifaceted evidence-based innovations in complex practice settings. As Africa re-strategizes for the post-2020 era, these emerging fields could contribute significantly in accelerating progress towards universal access to vaccines for all children on the continent despite COVID-19.

KEYWORDS: Africa; COVID-19; Immunization; Implementation science; Systems thinking.

15. Adelodun, B., Ajibade, F. O., Ighalo, J. O., Odey, G., Ibrahim, R. G., Kareem, K. Y., Bakare, H. O., Tiamiyu, A. O., Ajibade, T. F., Abdulkadir, T. S., Adeniran, K. A., & Choi, K. S. (2021). **Assessment of socioeconomic inequality based on virus-contaminated water usage in developing countries: A review.** *Environmental research*, 192, 110309. <https://doi.org/10.1016/j.envres.2020.110309>

ABSTRACT

Water is an essential resource required for various human activities such as drinking, cooking, and other recreational activities. While developed nations have made significant improvement in providing adequate quality water and sanitation devoid of virus contaminations to a significant percentage of the residences, many of the developing countries are still lacking in these regards, leading to many death cases among the vulnerable due to ingestion of virus-contaminated water and other waterborne pathogens. However, the recent global pandemic of COVID-19 seems to have changed the paradigm by reawakening the importance of water quality and sanitation, and focusing more attention on the pervasive effect of the use of virus-contaminated water as it can be a potential driver for the spread of the virus and other waterborne diseases, especially in developing nations that are characterized by low socioeconomic development. Therefore, this review assessed the socioeconomic inequalities related to the usage of virus-contaminated water and other waterborne pathogens in developing countries. The socioeconomic factors attributed to the various waterborne diseases due to the use of virus-contaminated water in many developing countries are poverty, the standard of living, access to health care facilities, age, gender, and level of education. Some mitigation strategies to address the viral contamination of water sources are therefore proposed, while future scope and recommendations on tackling the essential issues related to socioeconomic inequality in developing nations are highlighted.

KEYWORDS: Developing countries; Drinking water; Inequality; Socioeconomic; Virus contamination.

16. Adeniran, J. A., Mohammed, I. A., Muniru, O. I., Oloyede, T., Sonibare, O. O., Yusuf, M. O., Abdulraheem, K. A., Odediran, E. T., Yusuf, R. O., & Sonibare, J. A. (2021). **Indoor transmission dynamics of expired SARS-CoV-2 virus in a model African hospital ward.** *Journal of environmental health science & engineering*, 1–11. Advance online publication. <https://doi.org/10.1007/s40201-020-00606-5>

ABSTRACT

Cough and sneeze droplets' interactions with indoor air of a typical hospital clinic that could be majorly found in developing African countries were studied to investigate the effectiveness of existing guidelines/protocols being adopted in the control of the widespread coronavirus disease (COVID-19) transmission. The influences of indoor air velocity, the type, size distribution, residence time in air, and trajectory of the droplets, were all considered while interrogating the effectiveness of physical distancing measures, the use of face covers, cautionary activities of the general public, and the plausibility of community spread of the SARS-CoV-2 virus through airborne

transmission. Series of 3-D, coupled, discrete phase models (DPM) were implemented in the numerical studies. Based on DPM concentration maps as function of particle positions and particle residence times that were observed under different droplets release conditions, the virus-laden droplets could travel several meters away from the source of release (index patient), with smaller-sized particles staying longer in the air. The behavior of indoor air was also found to indicate complex dynamics as particle transports showed no linear dependence on air velocity.

17. Adesunkanmi, A. O., Ubom, A. E., Olasehinde, O., Wuraola, F. O., Ijarotimi, O. A., Okon, N. E., Ikimalo, J. I., Fasubaa, O. B., & Adesunkanmi, A. (2021). **Impact of the COVID-19 Pandemic on Surgical Residency Training: Perspective from a Low-Middle Income Country.** *World journal of surgery*, 45(1), 10–17. <https://doi.org/10.1007/s00268-020-05826-2>

ABSTRACT

BACKGROUND: The COVID-19 pandemic has drastically impacted postgraduate training programmes worldwide. This study aims to evaluate the Nigerian situation with respect to surgical training, with a view to identifying gaps and proffering solutions. **METHODS:** A cross-sectional survey of surgical residents in Nigeria was conducted between 27 July 2020 and 14 August 2020. A structured questionnaire designed using the free software Google Forms® was utilised for the study. The questionnaire was electronically distributed randomly to 250 surgical residents via emails and social media platforms including WhatsApp and Telegram. The data obtained was analysed by Google Forms®. Ethical approval for the study was obtained from the ethics and research unit of the Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC), Ile-Ife, Osun State, Nigeria. **RESULTS:** At the end of the study period, 207 surgical residents completed and submitted the questionnaire, giving a response rate of 82.8%. The majority of respondents reported a reduction (164, 79.2%) or cancellation (11, 5.3%) of postgraduate programmes in their institutions. Of those who had academic programmes, meetings were done using virtual technology in all instances. The majority of respondents reported seeing fewer patients in the outpatient clinics (173, 83.6%), as well as a reduction in the number of emergency and elective operations (58.5% and 90.8%, respectively). About a third of the respondents (70, 33.8%) were contemplating emigrating from the country. **CONCLUSION:** The COVID-19 pandemic has significantly affected the clinical, research and teaching components of surgical training in Nigeria. It has, however, led to increased adoption of digital technology which should be further explored in the face of current realities.

20. Afolabi, A. A., & Ilesanmi, O. S. (2021). **Dealing with vaccine hesitancy in Africa: the prospective COVID-19 vaccine context.** *The Pan African medical journal*, 38, 3. <https://doi.org/10.11604/pamj.2021.38.3.27401>

ABSTRACT

The outbreak of the novel coronavirus disease (COVID-19) has resulted in many cases of morbidity and mortality across the globe, and the lack of the COVID-19 vaccine has contributed greatly to this experience. COVID-19 vaccines have currently been rolled out, and are available in some countries. However, strategies need to be put in place to prevent COVID-19 vaccine hesitancy (VH) especially in Africa; a continent where VH has been previously reported following the introduction of new vaccines. For this cause, we, therefore, recommend optimal community involvement in the structure and modalities for the delivery of the prospective COVID-19 vaccine. Also, feedback mechanisms for the acknowledgement of community efforts in previous health

interventions should be improved upon to encourage the acceptance of the prospective COVID-19 vaccine. In addition, improved multi-sectoral collaboration should be initiated and promoted to enhance the acceptance of COVID-19 vaccines through the provision of more resources required to address COVID-19 VH. Furthermore, integration of the COVID-19 vaccine into the routine immunization schedule would strengthen the health system, improve uptake of the COVID-19 vaccine, and improve the health of all persons living on the African continent.

KEYWORDS: Africa; COVID-19; vaccine hesitancy.

21. Ahmed, I., Modu, G. U., Yusuf, A., Kumam, P., & Yusuf, I. (2021). **A mathematical model of Coronavirus Disease (COVID-19) containing asymptomatic and symptomatic classes.** *Results in physics*, 21, 103776. <https://doi.org/10.1016/j.rinp.2020.103776>

ABSTRACT

The research work in this paper attempts to describe the outbreak of Coronavirus Disease 2019 (COVID-19) with the help of a mathematical model using both the Ordinary Differential Equation (ODE) and Fractional Differential Equation. The spread of the disease has been on the increase across the globe for some time with no end in sight. The research used the data of COVID-19 cases in Nigeria for the numerical simulation which has been fitted to the model. We brought in the consideration of both asymptomatic and symptomatic infected individuals with the fact that an exposed individual is either sent to quarantine first or move to one of the infected classes with the possibility that susceptible individual can also move to quarantined class directly. It was found that the proposed model has two equilibrium points; the disease-free equilibrium point (DFE) and the endemic equilibrium point (E1). Stability analysis of the equilibrium points shows (E0) is locally asymptotically stable whenever the basic reproduction number, $R_0 < 1$ and (E1) is globally asymptotically stable whenever $R_0 > 1$. Sensitivity analysis of the parameters in the R_0 was conducted and the profile of each state variable was also depicted using the fitted values of the parameters showing the spread of the disease. The most sensitive parameters in the R_0 are the contact rate between susceptible individuals and the rate of transfer of individuals from exposed class to symptomatically infected class. Moreover, the basic reproduction number for the data is calculated as $R_0 \approx 1.7031$. Existence and uniqueness of solution established via the technique of fixed-point theorem. Also, using the least square curve fitting method together with the *fminsearch* function in the MATLAB optimization toolbox, we obtain the best values for some of the unknown biological parameters involved in the proposed model. Furthermore, we solved the fractional model numerically using the Atangana-Toufik numerical scheme and presenting different forms of graphical results that can be useful in minimizing the infection.

KEYWORDS: 34A12; 39A30; 47H10; ABC-fractional operator; Basic reproductive number; Corona virus; Existence and uniqueness; Mathematical model; Nonlinear differential equations; Sensitivity analysis.

22. Akintayo, R. O., Akpabio, A. A., Kalla, A. A., Dey, D., Migowa, A. N., Olaosebikan, H., Bahiri, R., El Miedany, Y., Hadeif, D., Hamdi, W., Oyoo, O., Slimani, S., Yerima, A., Taha, Y., Adebajo, A. O., Adelowo, O. O., Tikly, M., Ghazlani, I., Ben Abdelghani, K., Fouad, N. A., ... Abdel-Magied, R. A. (2021). **The impact of COVID-19 on rheumatology practice across Africa.** *Rheumatology (Oxford, England)*, 60(1), 392–398. <https://doi.org/10.1093/rheumatology/keaa600>

ABSTRACT

OBJECTIVES: To identify the changes in rheumatology service delivery across the five regions of Africa from the impact of the COVID-19 pandemic. **METHODS:** The COVID-19 African Rheumatology Study Group created an online survey consisting of 40 questions relating to the current practices and experiences of rheumatologists across Africa. The CHERRIES checklist for reporting results of internet e-surveys was adhered to. **RESULTS:** A total of 554 completed responses were received from 20 countries, which include six in Northern Africa, six in West Africa, four in Southern Africa, three in East Africa and one in Central Africa. Consultant grade rheumatologists constituted 436 (78.7%) of respondents with a mean of 14.5 ± 10.3 years of experience. A total of 77 (13.9%) rheumatologists avoided starting a new biologic. Face-to-face clinics with the use of some personal protective equipment continued to be held in only 293 (52.9%) rheumatologists' practices. Teleconsultation modalities found usage as follows: telephone in 335 (60.5%), WhatsApp in 241 (43.5%), emails in 90 (16.3%) and video calls in 53 (9.6%). Physical examinations were mostly reduced in 295 (53.3%) or done with personal protective equipment in 128 (23.1%) practices. Only 316 (57.0%) reported that the national rheumatology society in their country had produced any recommendation around COVID-19 while only 73 (13.2%) confirmed the availability of a national rheumatology COVID-19 registry in their country. **CONCLUSION:** COVID-19 has shifted daily rheumatology practices across Africa to more virtual consultations and regional disparities are more apparent in the availability of local protocols and registries.

KEYWORDS: Africa; COVID-19; DMARD; rheumatic and musculoskeletal diseases; rheumatology; telemedicine.

23. Adesegun, O. A., Binuyo, T., Adeyemi, O., Ehioghae, O., Rabor, D. F., Amusan, O., Akinboboye, O., Duke, O. F., Olafimihan, A. G., Ajose, O., Idowu, A. O., & Abiodun, O. (2020). **The COVID-19 Crisis in Sub-Saharan Africa: Knowledge, Attitudes, and Practices of the Nigerian Public.** *The American journal of tropical medicine and hygiene*, 10.4269/ajtmh.20-0461. Advance online publication. <https://doi.org/10.4269/ajtmh.20-0461>

ABSTRACT

Within a short period of time, COVID-19 has spread globally, wreaking havoc in various facets of life. This study sought to measure the level of COVID-19 knowledge, attitudes, and practices of the Nigerian public. This was a cross-sectional online survey of the general population of educated Nigerians who had Internet access. Sociodemographic data and participants' knowledge, attitudes, and practices relating to COVID-19 were collected. Scores assessing knowledge, attitudes, and practices were allocated and graded based on specific stratified demarcations. Student's *t*-test, analysis of variance, and logistic regression analysis were used where appropriate. Of the total 1,015 respondents, most of them exhibited good knowledge of COVID-19, with a mean knowledge grade of 78%; this significantly affected their attitude and practice grades (66% and 60.4%, respectively). Most respondents expressed positive attitudes toward foreigners and other stigma-prone groups, while also practicing appropriate preventive measures. Those aged 21-30 years and those with medical-related occupations had significantly higher knowledge scores ($P < 0.001$); and having a medical-related occupation increased the likelihood of having good knowledge compared with being unemployed (odds ratio [95% CI]: 6.6 [2.5-17.3]). Male participants aged 21-30 years

and those with medical-related occupations had significantly higher attitude scores ($P < 0.05$). Engaging literate Nigerians on various media platforms, particularly social media, will result in wider reach for the purpose of COVID-19 education. Further studies on other sociodemographic groups within the country (e.g., the less educated) would give a clearer picture of the Nigerian situation as regards COVID-19 knowledge, attitudes, and practices (coronavirus, COVID-19, Public health, Nigeria, Africa).

24. Ammar, N., Aly, N. M., Folayan, M. O., Khader, Y., Mohebbi, S. Z., Attia, S., Howaldt, H. P., Boettger, S., Virtanen, J., Madi, M., Maharani, D. A., Rahardjo, A., Khan, I., Al-Batayneh, O. B., Rashwan, M., Pavlic, V., Cicmil, S., Noritake, K., Galluccio, G., Polimeni, A., ... El Tantawi, M. (2021). **Perceived Preparedness of Dental Academic Institutions to Cope with the COVID-19 Pandemic: A Multi-Country Survey.** *International journal of environmental research and public health*, 18(4), 1445. <https://doi.org/10.3390/ijerph18041445>

ABSTRACT

Dental academic institutions are affected by COVID-19. We assessed the perceived COVID-19 preparedness of these institutions and the characteristics of institutions with greater perceived preparedness. An international cross-sectional survey of dental academics was conducted from March to August 2020 to assess academics and institutional attributes, perceived preparedness, and availability of infection prevention and control (IPC) equipment. Principal component analysis (PCA) identified perceived preparedness components. Multilevel linear regression analysis assessed the association between perceived preparedness and fixed effect factors (academics' and institutions' attributes) with countries as random effect variable. Of the 1820 dental academics from 28 countries, 78.4% worked in public institutions and 75.2% reported temporary closure. PCA showed five components: clinic apparel, measures before and after patient care, institutional policies, and availability of IPC equipment. Significantly less perceived preparedness was reported in lower-middle income (LMICs) ($B = -1.31$, $p = 0.006$) and upper-middle income (UMICs) ($B = -0.98$, $p = 0.02$) countries than in high-income countries (HICs), in teaching only ($B = -0.55$, $p < 0.0001$) and in research only ($B = -1.22$, $p = 0.003$) than teaching and research institutions and in institutions receiving ≤ 100 patients daily than those receiving > 100 patients ($B = -0.38$, $p < 0.0001$). More perceived preparedness was reported by academics with administrative roles ($B = 0.59$, $p < 0.0001$). Academics from low-income countries (LICs) and LMICs reported less availability of clinic apparel, IPC equipment, measures before patient care, and institutional policies but more measures during patient care. There was greater perceived preparedness in HICs and institutions with greater involvement in teaching, research, and patient care.

KEYWORDS: COVID-19; academics; dental; institution; multilevel analysis; pandemic; preparedness; surveys and questionnaires.

25. Anjorin, A. A., Abioye, A. I., Asowata, O. E., Soipe, A., Kazeem, M. I., Adesanya, I. O., Raji, M. A., Adesanya, M., Oke, F. A., Lawal, F. J., Kasali, B. A., & Omotayo, M. O. (2020). **Comorbidities and the COVID-19 Pandemic Dynamics in Africa.** *Tropical medicine & international health: TM & IH*, 10.1111/tmi.13504. Advance online publication. <https://doi.org/10.1111/tmi.13504>

ABSTRACT

The debate around the COVID-19 response in Africa has mostly focused on effects and implications of public health measures, in light of the socio-economic peculiarities of the continent. However, there has been limited exploration of the impact of differences in epidemiology of key comorbidities, and related healthcare factors, on the course and parameters of the pandemic. We summarize what is known about (a) the pathophysiological processes underlying the interaction of co-infections and comorbidities in shaping prognosis of COVID-19 patients, (b) the epidemiology of key co-infections and comorbidities, and the state of related healthcare infrastructure that might shape the course of the pandemic, and (c) implications of (a) and (b) for pandemic management and post-pandemic priorities. There is a critical need to generate empirical data on clinical profiles and the predictors of morbidity and mortality from COVID-19. Improved protocols for acute febrile illness and access to diagnostic facilities, not just for SARS-CoV-2 but also other viral infections, is of urgent importance. The role of Malaria, HIV/TB and chronic malnutrition on pandemic dynamics should be further investigated. Although chronic non-communicable diseases account for a relatively lighter burden, they have a significant effect on COVID-19 prognosis, and the fragility of care-delivery systems implies that adjustments to clinical procedures and re-organization of care delivery that have been useful in other regions are unlikely to be feasible. Africa is a large region with local variations in factors that can shape pandemic dynamics. A one-size fits all response is not optimal, but there are broad lessons relating to differences in epidemiology and healthcare delivery factors, that should be considered as part of a regional COVID-19 response framework.

KEYWORDS: Africa; COVID-19; Co-infections; Co-morbidities; SARS-CoV-2; pandemic.

26. Aronu, A. E., Chinawa, A. T., Ossai, E. N., Onukwuli, V. O., & Chinawa, J. M. (2021). **COVID-19: Knowledge of Mode of Spread and Preventive Practices among College Adolescents in Nigeria.** *Journal of tropical pediatrics*, fmab002. Advance online publication. <https://doi.org/10.1093/tropej/fmab002>

ABSTRACT

BACKGROUND: Corona virus pandemic (COVID 19) has emerged as the single most important topical issue and poses a challenge to medicine. Adolescent school children are exposed to a varying degree. **OBJECTIVES:** The study is aimed to determine the knowledge of the mode of spread and preventive practices among college adolescents attending six secondary schools in Enugu metropolis. **METHODOLOGY:** This was a cross-sectional study carried out in 6 secondary schools among 500 college adolescents. A pretested, interviewer-administered questionnaire was used for data collection. **RESULTS:** Majority of the respondents, 98.4% were aware of COVID-19. Although, a higher proportion of the respondents, 52.0% were aware COVID-19 could be transmitted through contact with infected persons, only a minor proportion of them, 42.4% had a good knowledge of the mode of spread of COVID-19. However, a high proportion of the respondents, 69.2% practiced good preventive measures against COVID-19. Also, respondents whose parents were self-employed were 1.4 times more likely to have good knowledge of the mode of spread of COVID-19 when compared with those whose parents were on paid employment [adjusted odd ratio (AOR) = 1.4, 95% confidence interval (CI): 0.9-2.0]. The respondents whose fathers have attained tertiary education were 1.6 times more likely to have good preventive practices against COVID-19 when compared with those who had secondary school and below (AOR = 1.6, 95% CI: 1.04-2.5). **CONCLUSION:** Though college adolescents were aware of

COVID-19, not a significant proportion practiced good preventive measures against COVID-19. Knowledge of mode of spread and preventive practices were significantly enhanced by fathers' educational status and being a female adolescent child.

KEYWORDS: COVID 19; college adolescents; mode of spread; preventive practice.

27. Arawomo, A. O., Ajibade, A. I., Adeniyi, B., Aigbirior, J., & Erhabor, G. E. (2020). **Coronavirus Disease 2019 (COVID-19): Clinical Perspectives and Ongoing Challenges.** *West African journal of medicine*, 37(3), 295–316.

ABSTRACT

BACKGROUND: Emerging infectious diseases pose a great hazard to public health and the global economy. A novel coronavirus, SARS-CoV-2, causing coronavirus disease 2019 (COVID-19), emerged from Wuhan, China, in December 2019. Since then, it has spread globally causing a global health emergency of inconceivable magnitude, with significant morbidity and mortality. There is the need for clinicians and health care providers to understand and gain knowledge of the different aspects of the disease as it evolves. **OBJECTIVE:** We reviewed existing literature on COVID-19 in order to present a synopsis of current understanding of the disease. **METHODS:** Using PubMed, Embase and Medline, articles published between January and April 2020 on Coronavirus disease 2019 (COVID-19), and resources from World Health Organisation were analyzed in order to have an understanding of the clinical characteristics, transmission dynamics, virology, diagnostic possibilities, prevention, management approach, controversies and impact of COVID-19 on the healthcare workforce. **RESULTS:** Our review revealed that COVID-19 patients present with a myriad of symptoms, ranging from mild to severe respiratory disease, which can often be fatal. The mode of transmission via droplet infections makes it unduly contagious and difficult to control. Currently, antiviral drugs or vaccines are being developed to manage this condition. **CONCLUSION:** There is urgent need for potent antivirals and vaccine to manage those infected with COVID 19 and prevent infection. Global efforts need to be unified in combating this public health emergency and flattening the curve of spread.

28. Aluh, D. O., & Onu, J. U. (2020). **The need for psychosocial support amid COVID-19 crises in Nigeria. Psychological trauma : theory, research, practice and policy**, 12(5), 557–558. <https://doi.org/10.1037/tra0000704>.

ABSTRACT

With the closure of all public places, the stay-at-home order and the worsening economic indices occasioned by the fall in the price of crude oil with no foreseeable end, learned helplessness, negative emotions, and other psychosocial problems are bound to thrive. Interventions to improve social capital, coping resources, resilience, and good community and family cohesion are needed to promote psychosocial well-being during and after the COVID-19 pandemic in Nigeria.

29. Adekunle, A. I., Adegboye, O. A., Gayawan, E., & McBryde, E. S. (2020). **Is Nigeria really on top of COVID-19? Message from effective reproduction number.** *Epidemiology and infection*, 148, e166. <https://doi.org/10.1017/S0950268820001740>

ABSTRACT

Following the importation of coronavirus disease (COVID-19) into Nigeria on 27 February 2020 and then the outbreak, the question is: How do we anticipate the progression of the ongoing epidemic following all the intervention measures put in place? This kind of question is appropriate for public health responses and it will depend on the early estimates of the key epidemiological parameters of the virus in a defined population. In this study, we combined a likelihood-based method using a Bayesian framework and compartmental model of the epidemic of COVID-19 in Nigeria to estimate the effective reproduction number ($R(t)$) and basic reproduction number (R_0) - this also enables us to estimate the initial daily transmission rate (β_0). We further estimate the reported fraction of symptomatic cases. The models are applied to the NCDC data on COVID-19 symptomatic and death cases from 27 February 2020 and 7 May 2020. In this period, the effective reproduction number is estimated with a minimum value of 0.18 and a maximum value of 2.29. Most importantly, the $R(t)$ is strictly greater than one from 13 April till 7 May 2020. The R_0 is estimated to be 2.42 with credible interval: (2.37-2.47). Comparing this with the $R(t)$ shows that control measures are working but not effective enough to keep $R(t)$ below 1. Also, the estimated fraction of reported symptomatic cases is between 10 and 50%. Our analysis has shown evidence that the existing control measures are not enough to end the epidemic and more stringent measures are needed.

KEYWORDS: Basic reproduction number; COVID-19; Nigeria; effective reproductive number; imported cases.

30. Amoo, O. et al. **Implementation of a modified drive-through sampling strategy for SARS-CoV-2-the Nigerian experience. Pan African Medical Journal.** 2020;35(2):107. [doi: [10.11604/pamj.supp.2020.35.2.24319](https://doi.org/10.11604/pamj.supp.2020.35.2.24319)]

ABSTRACT

INTRODUCTION: effective and safe means of sample collection is a crucial component of testing for Covid-19. Uptake of testing is key to containing and controlling the spread of the virus. Scientists have been working on various strategies that will increase the uptake of testing for COVID-19. One such method involves the use of the drive-through sampling strategy. **METHODS:** data was collected by both qualitative and quantitative methods. An eligibility form was filled online. While in-depth interviews were conducted for the qualitative aspect of the study. **RESULTS:** 2,600 visits were recorded at the website, 2300 (88.46%) participants successfully registered for the test. 57.4% were found eligible of which 78.0% presented for the test. This Consisted of 78.0% drive-through and 22.0% walk-in. The average time for transiting through the drive-through site was 19.2 ± 4.6 minutes while that of the walk-in was 28 ± 9.2 min. This difference was statistically significant ($p < 0.001$). In the qualitative component, respondents opined that maximum safety measures were deployed to protect both participants and health workers. Most said that the turnaround time for the sampling process was short. **CONCLUSION:** the sampling strategy although largely successful, is largely dependent on Internet penetrability, thus this sampling modality will be best utilized as an adjunct to established models of sample collection.

31. Akande, O.N., Badmus, T.A., Akindele, A.T, Arulogun OT. **Dataset to support the adoption of social media and emerging technologies for students' continuous engagement. Data Brief.** 2020 Jun 25; 31:105926. doi: 10.1016/j.dib.2020.105926. PMID: 32665968; PMCID: PMC7316039.

ABSTRACT

The recent advancements in ICT have made it possible for teaching and learning to be conducted outside the four walls of a university. Furthermore, the recent COVID-19 pandemic that has crippled educational activities in all nations of the world has further revealed the urgent need for academic institutions to embrace and integrate alternative modes of teaching and learning via social media platforms and emerging technologies into existing teaching tools. This article contains data collected from 850 face to face University students during the COVID-19 pandemic lockdown. An online google form was used to elicit information from the students about their awareness and intention to use these alternative modes of teaching and learning. The questions were structured using the Unified Theory of Acceptance and Use of Technology (UTAUT) model. This data article includes the questionnaire used to retrieve the data, the responses obtained in spreadsheet format, the charts generated from the responses received, the Statistical Package of the Social Sciences (SPSS) file, the descriptive statistics, and reliability analysis computed for all the UTAUT variables. The dataset will enhance understanding of how face to face students use social media platforms and how these platforms could be used to engage the students outside their classroom activities. Also, the dataset exposes how familiar face to face University students are to these emerging teaching and learning technologies. The challenges that could inhibit the adoption of these technologies were also revealed.

KEYWORDS: Curriculum development; Education technology; Emerging technologies; Instructional Design; Online Learning; social media.

32. Amzat, J., Aminu, K., Kolo, V. I., Akinyele, A. A., Ogundairo, J. A., & Danjibo, M. C. (2020). **Coronavirus outbreak in Nigeria: Burden and socio-medical response during the first 100 days.** *International journal of infectious diseases : IJID : official publication of the International Society for Infectious Diseases*, 98, 218–224. <https://doi.org/10.1016/j.ijid.2020.06.067>

ABSTRACT

BACKGROUND: The coronavirus disease of 2019 (COVID-19) pandemic shocked the world, overwhelming the health systems of even high-income countries. Predictably, the situation has elicited social and medical responses from the public and governments, respectively. Nigeria recorded an imported case from Italy on February 27, 2020. Hence, this paper assesses the early socio-medical response to COVID-19 in Nigeria in the first 100 days after the index case. The paper employs analytical methods and collates data from various media reports and official sources. **FINDINGS:** The incidence of COVID-19 grew steadily in Nigeria, moving from an imported case and elitist pattern to community transmission. The case fatality stood at 2.8%. The country recorded an upsurge (52% of total cases) in the transmission of COVID-19 during the short period the lockdown was relaxed. This paper presents a concise response framework to highlight some specific multisectoral responses to the pandemic. A combination of social and medical responses to a large extent helped Nigeria curtail the spread of the virus. **CONCLUSION:** The potential of overwhelming COVID-19 is still imminent in Nigeria as the country is attempting to hurriedly open the economy, which could sacrifice public health gains for temporary economic gains.

KEYWORDS: COVID-19; Community transmission; Imported case; Multisectoral response; Nigeria.

33. Akande OW, Akande TM. **COVID-19 pandemic: A global health burden.** Niger Postgrad Med J. 2020 Jul-Sep;27(3):147-155. doi: 10.4103/npmj.npmj_157_20. PMID: 32687112.

ABSTRACT

Coronavirus disease 2019 (COVID-19) pandemic began in China with a group of severe pneumonia cases, later identified to be caused by the severe acute respiratory syndrome coronavirus 2 in December 2019. Thailand reported the first COVID-19 case outside of China on 13th January 2020, Africa reported its first case in Egypt on 14th February 2020 and Nigeria reported its index case of COVID-19 on 27th February 2020. Virtually, all countries in the world are affected, with over 5 million cases reported globally. A literature search was conducted using publications from academic databases and websites of relevant organisations. The disease is associated with typical and atypical signs and symptoms, mimicking other common illnesses. Nigeria is now in the phase of widespread community transmission as almost all the states have reported confirmed cases. The pandemic has shown a wide range of case-fatality rate (CFR) globally; this is postulated to be related to the demographics, existing health systems and probably other unidentified factors. There has been a steady increase in the burden caused by the disease in Nigeria with a relatively stable CFR, which is lower than the global CFR. Health systems have responded with the guidelines for prevention, management, and surveillance of the disease, while effort is being put in place to find a vaccine and a specific therapy for the cure of the disease. The pandemic has had a severe effect on health systems globally, including an unintended disruption in the service delivery of other diseases. It has the potential to disrupt the weak health system in Nigeria significantly. As such, a combination of non-pharmaceutical preventive measures that are cost-effective needs to be scaled up to prevent it from further weakening the existing health system.

KEYWORDS: Coronavirus disease 2019; Nigeria; health burden; pandemic.

34. Ahmed, S., Ajisola, M., Azeem, K., Bakibinga, P., Chen, Y. F., Choudhury, N. N., Fayehun, O., Griffiths, F., Harris, B., Kibe, P., Lilford, R. J., Omigbodun, A., Rizvi, N., Sartori, J., Smith, S., Watson, S. I., Wilson, R., Yeboah, G., Aujla, N., Azam, S. I., ... **Improving Health in Slums Collaborative (2020). Impact of the societal response to COVID-19 on access to healthcare for non-COVID-19 health issues in slum communities of Bangladesh, Kenya, Nigeria and Pakistan: results of pre-COVID and COVID-19 lockdown stakeholder engagements.** *BMJ global health*, 5(8), e003042. <https://doi.org/10.1136/bmjgh-2020-003042>

ABSTRACT

INTRODUCTION: With COVID-19, there is urgency for policymakers to understand and respond to the health needs of slum communities. Lockdowns for pandemic control have health, social and economic consequences. We consider access to healthcare before and during COVID-19 with those working and living in slum communities. **METHODS:** In seven slums in Bangladesh, Kenya, Nigeria and Pakistan, we explored stakeholder perspectives and experiences of healthcare access for non-COVID-19 conditions in two periods: pre-COVID-19 and during COVID-19 lockdowns. **RESULTS:** Between March 2018 and May 2020, we engaged with 860 community leaders, residents, health workers and local authority representatives. Perceived common illnesses in all sites included respiratory, gastric, waterborne and

mosquitoborne illnesses and hypertension. Pre-COVID, stakeholders described various preventive, diagnostic and treatment services, including well-used antenatal and immunisation programmes and some screening for hypertension, tuberculosis, HIV and vectorborne disease. In all sites, pharmacists and patent medicine vendors were key providers of treatment and advice for minor illnesses. Mental health services and those addressing gender-based violence were perceived to be limited or unavailable. With COVID-19, a reduction in access to healthcare services was reported in all sites, including preventive services. Cost of healthcare increased while household income reduced. Residents had difficulty reaching healthcare facilities. Fear of being diagnosed with COVID-19 discouraged healthcare seeking. Alleviators included provision of healthcare by phone, pharmacists/drug vendors extending credit and residents receiving philanthropic or government support; these were inconsistent and inadequate. CONCLUSION: Slum residents' ability to seek healthcare for non-COVID-19 conditions has been reduced during lockdowns. To encourage healthcare seeking, clear communication is needed about what is available and whether infection control is in place. Policymakers need to ensure that costs do not escalate and unfairly disadvantage slum communities. Remote consulting to reduce face-to-face contact and provision of mental health and gender-based violence services should be considered.

KEYWORDS: disease; disorder; health policy; health systems; or injury; other infection; public health; qualitative study.

35. Adebisi, Y. A., Alaran, A. J., Akinokun, R. T., Micheal, A. I., Ilesanmi, E. B., & Lucero-Prisno, D. E. (2020). **Sex Workers Should not be forgotten in Africa's COVID-19 Response.** *The American journal of tropical medicine and hygiene*, 10.4269/ajtmh.20-1045. Advance online publication. <https://doi.org/10.4269/ajtmh.20-1045>

ABSTRACT

COVID-19 is a global health emergency facing many countries around the world. Sex workers in Africa are among one of the vulnerable populations disproportionately affected by the COVID-19 pandemic on the continent. Sex workers are excluded from African government safety net, and this may force some sex workers back to sex work amid the COVID-19 pandemic. Because of the nature of sex work, physical distancing and other precautionary measures are impossible to observe, further compromising COVID-19 response. Sex workers in Africa have been known to face high levels of stigma and discrimination, including limited access to healthcare services. Disruption in HIV care and prevention services due to the pandemic among this key population may have negative impacts on the hard-won achievements in HIV response in Africa. In addition, stigma and discrimination toward sex workers could also make contact tracing challenging and limit access to COVID-19 testing among this vulnerable group. With the adoption of the 2030 Agenda for the UN Development Program, UN member states all pledged to ensure "no one will be left behind" and to "endeavor to reach the furthest behind first." This could not be more important than now as sex workers as a part of the population are left behind in COVID-19 response in Africa. It is important that the African government should ensure collective and inclusive response in the fight against COVID-19. Sex workers should not be forgotten in Africa's COVID-19 response because no one is safe, until all is safe.

36. Ayanlade, A., & Radeny, M. (2020). **COVID-19 and food security in Sub-Saharan Africa: implications of lockdown during agricultural planting seasons.** *NPJ science of food*, 4, 13. <https://doi.org/10.1038/s41538-020-00073-0>

ABSTRACT

COVID-19 pandemic movement restrictions as part of the control measures put in place by countries in Sub-Saharan Africa (SSA) has implications on food security, as movement restrictions coincided with planting periods for most of the staple crops. The measures are affecting important staple crops in SSA, and are likely to exacerbate food security challenges in many countries. Achieving adequate food supply in SSA requires developing better policies and packages to confronting the challenge of reducing hunger post COVID-19 pandemic. The lessons learned after COVID-19 crisis will be very important for African countries to rethink their strategies and policies for sustainable economic growth, as COVID-19 many have significant impacts on all sectors of their economies.

KEYWORDS: Agriculture; Environmental impact.

37. Ajibo H. (2020). **Effect of Covid-19 on Nigerian Socio-economic Well-being, Health Sector Pandemic Preparedness and the Role of Nigerian Social Workers in the War Against Covid-19.** *Social work in public health*, 35(7), 511–522. <https://doi.org/10.1080/19371918.2020.1806168>

ABSTRACT

Covid-19 is a virus that has created tension and devastation around the globe. This study is designed to specifically find out the effect of Covid-19 on the socioeconomic well-being of Nigerians, the health sector preparedness to handle the pandemic, and the role of Nigerian social workers in the fight against Covid-19 in Nigeria. The study employed a phenomenological and exploratory research design in its inquiry. Sixteen respondents made up the sample size for the study. A Focus Group Discussion Guide and an In-Depth Interview Guide were the instruments for data collection. The result of the study shows that the Covid-19 pandemic has had a devastating impact on the socioeconomic well-being of Nigerians. Second, the Nigerian health system is ill equipped and underprepared to handle the Covid-19 pandemic. Third, Nigerian social workers, most especially medical social workers, have played a significant role in passing out information on Covid-19 preventive measures to the general public. The study recommends that the Nigerian government should wake up and fix the health sector and make it proactive to handle epidemics/pandemics in the future. Social work practice in Nigeria should be promoted by the government through institutionalization of the profession.

KEYWORDS: Covid-19; effect; health sector; preparedness; social work; well-being.

38. Alhassan, G. N., Adedoyin, F. F., Bekun, F. V., & Agabo, T. J. (2020). **Does life expectancy, death rate and public health expenditure matter in sustaining economic growth under COVID-19: Empirical evidence from Nigeria?** *Journal of public affairs*, e2302. Advance online publication. <https://doi.org/10.1002/pa.2302>

ABSTRACT

The current health pandemic that has plagued the global of which the global south-Nigeria is not insulated from is the premise for this empirical investigation. The present

study relies on recent annual time-series data to conceptualize the hypothesized claim via Pesaran's Autoregressive distributed lag techniques. Empirical findings from the bounds test traces the long-run relationship between public health expenditure and economic growth over the study span. However, unlike previous studies, we introduce life expectancy and death rates in the model framework. Although health expenditure is not significant, empirical results show that a 1% increase in life expectancy and death rate increases and decreases economic growth by 3.85 and 1.84%, respectively. This suggests the need for Health Policymakers in Nigeria to implement active strategies that reduce the death rate, which is a blueprint for active engagement in the face of a global pandemic such as COVID-19.

39. Amoo, E. O., Adekeye, O., Olawole-Isaac, A., Fasina, F., Adekola, P. O., Samuel, G. W., Akanbi, M. A., Oladosun, M., & Azuh, D. E. (2020). **Nigeria and Italy Divergences in Coronavirus Experience: Impact of Population Density.** *The nScientificWorldJournal*, 2020, 8923036.

ABSTRACT

BACKGROUND: The reports and information on coronavirus are not conspicuously emphasising the possible impact of population density on the explanation of difference in rapid spread and fatality due to the disease and not much has been done on bicountry comparisons. **OBJECTIVE:** The study examined the impact of population density on the spread of COVID-19 pandemic in two sociodemographic divergent countries. *Methods.* The study conducted a scoping review of published and unpublished articles including blogs on incidences and fatalities of COVID-19. The analysis followed qualitative description and quantitative presentation of the findings using only frequency distribution, percentages, and graphs. **RESULTS:** The two countries shared similar experience of “importation” of COVID-19, but while different states ordered partial lockdown in Nigeria, it was an immediate total lockdown in Italy. The physician/patient ratio is high in Italy (1: 328) but low in Nigeria (1 : 2500), while population density is 221 in Nigeria and 206 in Italy. Daily change in incidence rate reduced to below 20% after 51 and 30 days of COVID-19 first incidence in Italy and Nigeria, respectively. Fatality rate has plummeted to below 10% after the 66th day in Italy but has not been stabilised in Nigeria. **CONCLUSION:** The authors upheld both governments’ recommending measures that tilted towards personal hand-hygienic practices and social distancing. Authors suggested that if Italy with its high physician/patient ratio and lower population density compared to Nigeria could suffer high fatality from COVID-19 pandemic under four weeks, then Nigeria with its low physician/patient ratio and higher population density should prepare to face harder time if the pandemic persists.

40. Baba, I. A., Yusuf, A., Nisar, K. S., Abdel-Aty, A. H., & Nofal, T. A. (2021). **Mathematical model to assess the imposition of lockdown during COVID-19 pandemic.** *Results in physics*, 20, 103716. <https://doi.org/10.1016/j.rinp.2020.103716>

ABSTRACT

Nigeria, like most other countries in the world, imposes lockdown as a measure to curtail the spread of COVID-19. But it is known fact that in some countries the lockdown strategy could bring the desired results while in some the situation could worsen the spread of the virus due to poor management and lack of facilities, palliatives and incentives. To this regard, we feel motivated to develop a new mathematical model that assesses the imposition of the lockdown in Nigeria. The model comprises of a

system of five ODE. Mathematical analysis of the model was carried out, where boundedness, computation of equilibria, calculation of the basic reproduction ratio and stability analysis of the equilibria were carried out. We finally study the numerical outcomes of the governing model in respect of the approximate solutions. To this aim, we employed the effective ODE45, Euler, RK-2 and RK-4 schemes and compare the results.

KEYWORDS: Covid-19; Lockdown; Runge-Kutta method; Stability analysis.

41. Babalola, O. E., Bode, C. O., Ajayi, A. A., Alakaloko, F. M., Akase, I. E., Otrofanowei, E., Salu, O. B., Adeyemo, W. L., Ademuyiwa, A. O., & Omilabu, S. (2021). **Ivermectin shows clinical benefits in mild to moderate COVID19: A randomised controlled double-blind, dose-response study in Lagos.** *QJM : monthly journal of the Association of Physicians*, hcab035. Advance online publication. <https://doi.org/10.1093/qjmed/hcab035>

ABSTRACT

INTRODUCTION: In vitro studies have shown the efficacy of Ivermectin (IV) to inhibit the SARS - CoV- 2 viral replication, but questions remained as to In-vivo applications. We set out to explore the efficacy and safety of Ivermectin in persons infected with COVID19. **METHODS:** We conducted a translational proof of concept (PoC) randomized, double blind placebo controlled, dose response, parallel group study of IV efficacy in RT - PCR proven COVID 19 positive patients. 62 patients were randomized to 3 treatment groups. (A) IV 6mg regime, (B)IV 12 mg regime (given Q84hrs for 2weeks) (C, control) Lopinavir/Ritonavir. All groups plus standard of Care. **RESULTS:** The Days to COVID negativity [DTN] was significantly and dose dependently reduced by IV ($p = 0.0066$). The DTN for Control were, $= 9.1 \pm 5.2$, for A 6.0 ± 2.9 , and for B 4.6 ± 3.2 . 2 Way repeated measures ANOVA of ranked COVID 19 +/- scores at 0, 84, 168, 232 hours showed a significant IV treatment effect ($p = 0.035$) and time effect ($p < 0.0001$). IV also tended to increase SPO2% compared to controls, $p = 0.073$, 95% CI - 0.39 to 2.59 and increased platelet count compared to C ($p = 0.037$) 95%CI 5.55 - 162.55 $\times 10^3$ /ml. The platelet count increase was inversely correlated to DTN ($r = -0.52$, $p = 0.005$). No SAE was reported. **CONCLUSIONS:** 12 mg IV regime may have superior efficacy. IV should be considered for use in clinical management of SARS-Cov-2, and may find applications in community prophylaxis in high-risk areas.

KEYWORDS: COVID-19; Days-to-Negative; Efficacy; Ivermectin; RCT; Safety.

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ABSTRACT

BACKGROUND: The Global Fund to Fight AIDS, Tuberculosis and Malaria is a robust vertical global health programme. The extent to which vertical programmes financially support health security has not been investigated. We, therefore, endeavoured to quantify the extent to which the budgets of this vertical programme support health security. We believe this is a crucial area of work as the global community works to combine resources for COVID-19 response and future pandemic

preparedness. **METHODS:** We examined budgets for work in Kenya, Uganda, Vietnam, Democratic Republic of the Congo, Guatemala, Guinea, India, Indonesia, Nigeria, and Sierra Leone from January, 2014 to December, 2020. These ten countries were selected because of the robustness of investments and the availability of data. Using the International Health Regulations Joint External Evaluation (JEE) tool as a framework, we mapped budget line items to health security capacities. Two researchers independently reviewed each budget and mapped item to the JEE. Budgets were then jointly reviewed until a consensus was reached regarding if an item supported health security directly, indirectly, or not at all. The budgets for the study countries were inputted into a single Microsoft Excel spreadsheet and line items that mapped to JEE indicators were scaled up to their respective JEE capacity. Descriptive analyses were then done to determine the total amount of money budgeted for activities that support health security, how much was budgeted for each JEE capacity, and how much of the support was direct or indirect. **FINDINGS:** The research team reviewed 37 budgets. Budgets totalled US\$6 927 284 966, and \$2 562 063 054 (37.0%) of this mapped to JEE capacities. \$1 330 942 712 (19.2%) mapped directly to JEE capacities and \$1 231 120 342 (17.8%) mapped indirectly to JEE capacities. Laboratory systems, antimicrobial resistance, and the deployment of medical countermeasures and personnel received the most overall budgetary support; laboratory systems, antimicrobial resistance, and workforce development received the greatest amount of direct budgetary support. **INTERPRETATION:** Over one-third of the Global Fund's work also supports health security and the organisation has budgeted more than \$2 500 000 000 for activities that support health security in ten countries since 2014. Although these funds were not budgeted specifically for health security purposes, recognising how vertical programmes can synergistically support other global health efforts has important implications for policy related to health systems strengthening. **FUNDING:** Resolve to Save Lives: An Initiative of Vital Strategies.

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ABSTRACT

In this paper, we sought and presented an 8-Dimensional deterministic mathematical COVID-19 dynamic model that accounted for the global stability analysis of the role of dual-bilinear treatment protocols of COVID-19 infection. The model, which is characterized by human-to-human transmission mode was investigated using dual non-pharmaceutical (face-masking and social distancing) and dual pharmaceutical (hydroxylchloroquine and azithromycin) as control functions following the interplay of susceptible population and varying infectious population. First, we investigated the model state-space and then established and computed the system reproduction number for both off-treatment $R_0(1) = 10.94$ and for onset-treatment $R_0(2) = 3.224$. We considered the model for off-treatment and thereafter by incorporating the theory of LaSalle's invariant principle into the classical method of Lyapunov functions, we presented an approach for global stability analysis of COVID-19 dynamics. Numerical verification of system theoretical predictions was computed using in-built Runge-Kutta of order of precision 4 in a Mathcad surface. The set approach produces highly significant results in the main text. For example, while rapid population extinction was observed by the susceptible under off-treatment scenario in the first $t_f \leq 18$ days, the application of non-pharmaceuticals at early stage of infection proved very effective strategy in curtailing the spread of the virus. Moreover, the implementation of dual

pharmacotherapies in conjunction with non-pharmaceuticals yields tremendous rejuvenation of susceptible population ($0.5 \leq Sp(t) \leq 3.143$ cells/ml³) with maximal reduction in the rates of isolation, super spreaders and hospitalization of the infectives. Thus, experimental results of investigation affirm the suitability of proposed model for the control and treatment of the deadly disease provided individuals adheres to treatment protocols.

KEYWORDS: 34H15; 65L20; 93A30; 93C15; Coronavirus; Dual-bilinear-control-functions; Global-stability-conditions; Lyapunov-stable; Measure-zero; Super-spreader.

44. Banke-Thomas A, Makwe CC, Balogun M, Afolabi BB, Alex-Nwangwu TA, Ameh CA. **Utilization cost of maternity services for childbirth among pregnant women with coronavirus disease 2019 in Nigeria's epicenter.** *Int J Gynaecol Obstet.* 2021 Feb;152(2):242-248. doi: 10.1002/ijgo.13436. Epub 2020 Nov 26. PMID: 33098673.

ABSTRACT

OBJECTIVE: To estimate utilization costs of spontaneous vaginal delivery (SVD) and cesarean delivery (CD) for pregnant women with coronavirus disease 2019 (COVID-19) at the largest teaching hospital in Lagos, the pandemic's epicenter in Nigeria. **METHODS:** We collected facility-based and household costs of all nine pregnant women with COVID-19 managed at the hospital. We compared their mean facility-based costs with those paid by pregnant women pre-COVID-19, identifying cost-drivers. We also estimated what would have been paid without subsidies, testing assumptions with a sensitivity analysis. **RESULTS:** Total utilization costs ranged from US \$494 for SVD with mild COVID-19 to US \$4553 for emergency CD with severe COVID-19. Though 32%-66% of facility-based cost were subsidized, costs of SVD and CD during the pandemic have doubled and tripled, respectively, compared with those paid pre-COVID-19. Of the facility-based costs, cost of personal protective equipment was the major cost-driver (50%). Oxygen was the major driver for women with severe COVID-19 (48%). Excluding treatment costs for COVID-19, mean facility-based costs were US \$228 (SVD) and US \$948 (CD). **CONCLUSION:** Despite cost exemptions and donations, utilization costs remain prohibitive. Regulation of personal protective equipment and medical oxygen supply chains and expansion of advocacy for health insurance enrollments are needed in order to minimize catastrophic health expenditure.

KEYWORDS: Coronavirus disease 2019; Nigeria; cost; economic evaluation; maternal health; out-of-pocket expenditure; skilled birth attendance.

45. Benson, N. U., Fred-Ahmadu, O. H., Bassey, D. E., & Atayero, A. A. (2021). **COVID-19 Pandemic and Emerging Plastic-based Personal Protective Equipment Waste Pollution and Management in Africa.** *Journal of environmental chemical engineering*, 9(3), 105222. Advance online publication. <https://doi.org/10.1016/j.jece.2021.105222>

ABSTRACT

The threat of plastic waste pollution in African countries is increasing exponentially since the World Health Organisation declared the coronavirus infection as a pandemic. Fundamental to this growing threat are multiple factors, including the increased public consumption for single-use plastics, limited or non-existence of adequate plastic waste management infrastructures, and urbanisation. Plastics-based personal protective equipment including millions of surgical masks, medical gowns, face shields, safety

glasses, protective aprons, sanitiser containers, plastics shoes, and gloves have been widely used for the reduction of exposure risk to severe acute respiratory syndrome (SARS) Coronavirus 2 (SARS-CoV-2). This paper estimates and elucidates the growing plethora of plastic wastes in African countries in the context of the current SARS-CoV-2 pandemic. A Fourier transform infrared (FTIR) spectral fingerprint indicates that face masks were characterised by natural and artificial fibres including polyester fibres, polypropylene, natural latex resin. Our estimate suggests that over 12 billion medical and fabric face masks are discarded monthly, giving the likelihood that an equivalent of about 105,000 tonnes of face masks per month could be disposed into the environment by Africans. In general, 15 out of 57 African countries are significant plastic waste contributors with Nigeria (15%), Ethiopia (8.6%), Egypt (7.6%), DR Congo (6.7%), Tanzania (4.5%), and South Africa (4.4%) topping the list. Therefore, this expert insight is an attempt to draw the attention of governments, healthcare agencies, and the public to the potential risks of SARS-CoV-2-generated plastics (COVID plastic wastes), and the environmental impacts that could exacerbate the existing plastic pollution epidemic after the COVID-19 pandemic.

KEYWORDS: COVID plastic wastes; SARS-CoV-2; SDG 11; SDG 14; SDG 3; plastic pollution; single-used plastics.

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ABSTRACT

Since 1999, the CORE Group Polio Project (CGPP) has developed, refined, and deployed effective strategies to mobilize communities to improve vaccine uptake for polio (and other vaccine-preventable diseases such as measles) and conduct surveillance for infectious disease threats in high-risk, border, and hard-to-reach locations. CORE Group Polio Project teams have been called upon to address the COVID-19 pandemic, and, like with polio, the pandemic response is impacted by stigma in all areas of response, from health education, testing, contact tracing, and even treatment for infected individuals. The CGPP has reached back into its polio experience and is redeploying successful community engagement activities to address stigma as part of the COVID-19 response. Across country programs, community health volunteers communicate risk and behavior change at the household level by integrating health education and promotion activities with a focus on practical measures of COVID-19 prevention. Moreover, leveraging established and trusted partnerships with community networks and community leaders are providing lessons that can be adopted by the global community. The CGPP offers three overarching recommendations to curb stigma: 1) facilitating inclusive community engagement, 2) leveraging existing community networks and 3) cocreating with community leaders.

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ABSTRACT

The novel coronavirus disease (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has previously never been identified with humans, thereby creating devastation in public health. The need for an effective vaccine to curb this pandemic cannot be overemphasized. In view of this, we designed a subcomponent antigenic peptide vaccine targeting the N-terminal (NT) and C-terminal (CT) RNA binding domains of the nucleocapsid protein that aid in viral replication. Promising antigenic B cell and T cell epitopes were predicted using computational pipelines. The peptides “RIRGGDGKMKDL” and “AFGRRGPEQTQGNFG” were the B cell linear epitopes with good antigenic index and nonallergenic property. Two CD8⁺ and Three CD4⁺ T cell epitopes were also selected considering their safe immunogenic profiling such as allergenicity, antigen level conservancy, antigenicity, peptide toxicity, and putative restrictions to a number of MHC-I and MHC-II alleles. With these selected epitopes, a nonallergenic chimeric peptide vaccine incapable of inducing a type II hypersensitivity reaction was constructed. The molecular interaction between the Toll-like receptor-5 (TLR5) which was triggered by the vaccine was analyzed by molecular docking and scrutinized using dynamics simulation. Finally, *in silico* cloning was performed to ensure the expression and translation efficiency of the vaccine, utilizing the pET-28a vector. This research, therefore, provides a guide for experimental investigation and validation.

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ABSTRACT

About a week after the confirmation of Nigeria's index case of COVID-19 on February 27, 2020, the Nigerian federal government set up a 12-member Presidential Task Force for the Control of the Coronavirus. The country's borders were closed on March 23, and the lockdown of cities was also implemented. The unanticipated disruption of scholarly or professional advancement for the 94% of university students who are not currently learning may increase the burden of mental illness among these students and predispose them to social vices. Two suicide deaths occurred during the lockdown. Poverty, lack of trust in the government, ignorance, denial and misplaced religious zealotry negatively impacts on the behavior of Nigerians. Fear-induced behavioral changes such as consuming lemon, ginger, garlic, local herbs, and other substances for protection have also become rampant. Loss of income due to the lockdown and the accompanying destitution can also be a pathfinder for numerous other sicknesses and deaths. For the benefit of enhanced prevention and control of infection, only government-funded hospitals and a few designated privately owned hospitals have been permitted to provide continued services at this time. The number of shifts in these hospitals were adjusted such that there are fewer health care professionals in the hospital at a given time. This strategy has inhibited treatment and care for certain groups of people who are not COVID-19 patients. Efforts are being made to develop telehealth services, but most rural residents may not benefit from them.

49. Debes, J. D., Quadri, N. S., Sultan, A., Yousif, M., Ali, S. I., Kayandabila, J., Ijeoma, I., Ssebambulidde, K., Ochola, L., & Moussa, A. (2021). **Risk of Healthcare Worker Burnout in Africa during the COVID-19 Pandemic**. *Annals of global health*, 87(1), 5. <https://doi.org/10.5334/aogh.3150>

ABSTRACT

COVID-19 is now impacting every country in Africa and healthcare workers (HCWs) across the continent remain susceptible to professional burnout. We designed a 43-question survey addressing multiple aspects of the COVID-19 pandemic. The survey was anonymous, distributed via email and phone messaging to 13 countries in Africa. We obtained 489 analyzable responses. 49% of HCWs reported a decrease in income, with the majority experiencing between 1-25% salary reduction. Sixty-six percent reported some access to personal protective equipment (PPE), 20% had no access to PPE and only 14% reported proper access. Strikingly, the percentage reporting never feeling depressed changed from 61% before the pandemic to 31% during the pandemic, with an increase in daily depression from 2% to 20%. We found no association between depression and change in income, household size, availability of PPE or lockdown. Safety concerns related to stigma from being HCWs affected 56% of respondents.

50. Doherty, F. V., Odeyemi, O. A., Adeola, A., Amolegbe, O., & Ajagbe, F. E. (2020). **Evaluation of knowledge, impacts and government intervention strategies during the COVID - 19 pandemic in Nigeria.** *Data in brief*, 32, 106177. <https://doi.org/10.1016/j.dib.2020.106177>

ABSTRACT

The SARS-CoV-2 is a novel strain of coronavirus which is ravaging many countries, and this has become a global public health concern. With the increasing number of COVID-19 confirmed cases and deaths in Nigeria, the pandemic has led to massive public reactions. This data attempted to evaluate the knowledge, impacts, and government intervention during the pandemic. An online survey was conducted using a questionnaire shared via social media using a Snowball sampling technique. The data were analyzed using descriptive statistics and analysis of variance (ANOVA). A total of 387 responses was received. Results show that a significant number of respondents had adequate knowledge about COVID-19 modes of transmission, symptoms, and preventive measures. Respondents maintain personal hygiene as 67% wash their hands with soap. The pandemic has caused worry (65%), anxiety (42%), panic (35%), and depression (16%) among respondents, even as government intervention is seen as inadequate by 70%. There is a need for mental health support and increased information campaigns about COVID-19.

KEYWORDS: COVID-19; Intervention strategies; Public health; SARS-CoV-2.

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ABSTRACT

The aim of this study was to explore knowledge, practice of risk and guidelines of the novel corona virus disease (COVID-19) infection among the eye care practitioners and the potential associated factors. A cross-sectional self-administered online survey was distributed via emails and social media networks between 2nd and 18th May 2020 corresponding to the week of the lockdown in Nigeria to eye care practitioners (ECPs). Data for 823 respondents were analyzed. Knowledge and risk practice were categorized as binary outcome and univariate and multivariate linear regression were used to

examine the associated factors. The mean score for COVID-19-related knowledge of public health guidelines was high and varied across the ECPs. Ophthalmic Nurses, Ophthalmologists and Optometrists showed higher COVID-19-related knowledge than other ECPs ($p < 0.001$), particularly those working in the private sector. More than 50% of ECPs stated they provided essential services during the COVID-19 lockdown via physical consultation, particularly the Ophthalmologists. Most respondents reported that the guidelines provided by their Association were useful but expressed their lack of confidence in attending to patients during and after the COVID-19 lockdown. Compared to other ECPs in Nigeria, more Ophthalmic Nurses received training in the use of Personal Protective Equipment (PPE). This survey is the first to assess knowledge, attitudes and practice in response to the COVID-19 pandemic in Nigeria. ECPs in Nigeria displayed good knowledge about COVID-19 and provided eye care services during the COVID-19 lockdown in Nigeria, despite the majority not receiving any training on the use of PPEs with concerns over attending to patients. There is need for the government to strengthen health systems by improving and extending training on standard infection prevention and control measures to ECPs for effective control of the pandemic and in the future as essential health workers.

KEYWORDS: coronavirus; essential service; eye care practitioners; pandemic; personal protective equipment.

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ABSTRACT

In this study, we analyse the role of forced lockdowns on electricity consumption behaviour and its effect on momentary transition in electricity use. Electricity consumption data for residential, commercial and industrial consumers within the Lagos metropolis representing 259 electrical feeder locations were collected and analysed under three scenarios: first, we analyse a business-as-usual scenario without a lockdown; secondly, we analyse the case of a partial lockdown; and finally, we analyse the case of a total lockdown. The study revealed that aside government announcement of the lockdown, certain social practices triggered changes in electricity consumption and use leading to momentary energy transition. Within the residential sector, increased cooking, home laundry, showering, and some professional practices that moved to the homes impacted on higher electricity consumption. Reduced manufacturing practices limited to those involved in food, personal care and pharmaceutical products led to a reduction in electricity use within the industrial sector, while reduced electricity use in the commercial sector was triggered mainly by a scaling down of trading services to essentials. The study concludes by highlighting the impact of changes in electricity demand and consumption under these scenarios and its implications for energy transition and electricity planning.

KEYWORDS: COVID-19; Commercial energy; Coronavirus; Energy consumption; Industrial energy; Residential energy.

53. Ezeibe, C. C., Ilo, C., Ezeibe, E. N., Oguonu, C. N., Nwankwo, N. A., Ajaero, C. K., & Osadebe, N. (2020). **Political distrust and the spread of COVID-19 in Nigeria.** *Global public health*, 1–14. Advance online publication. <https://doi.org/10.1080/17441692.2020.1828987> .

ABSTRACT

While studies have explored how health sector corruption, weak healthcare system, large-scale immune compromised population, misinformation and prevalence of highly congested slums contribute to the spread of COVID-19 in Nigeria, they have glossed over the impact of political distrust on the spread of the virus. This study explores the impact of political distrust on the spread of COVID-19 pandemic in Nigeria. The study utilised qualitative dominant mixed methods approach comprising telephone interviews and a survey of 120 educated Nigerians purposively selected from four COVID-19 most affected states including Lagos, Oyo, Kano and Rivers as well as the Federal Capital Territory, Abuja. The study also relied on secondary data on the spread of COVID-19 in Nigeria sourced from Nigeria Centre for Diseases Control from 27 February to 31st August 2020. The study found that political corruption motivates large-scale political distrust. This undermines public compliance to government protocols, limits the outcomes of government responses to COVID-19 and facilitates the spread of the virus in Nigeria. The paper concludes that improving government accountability in the public sector management is relevant for building public trust, promoting citizens' compliance to COVID-19 safety measure and mitigating the spread of the pandemic in Nigeria and beyond.

KEYWORDS: Political distrust; government response; health sector crisis; political corruption; spread of COVID-19.

54. Etteh, C. C., Adoga, M. P., & Ogbaga, C. C. (2020). **COVID-19 response in Nigeria: Health system preparedness and lessons for future epidemics in Africa.** *Ethics, medicine, and public health*, 15, 100580. <https://doi.org/10.1016/j.jemep.2020.100580>

ABSTRACT

The coronavirus disease 2019 (COVID-19) will continue to have a significant impact on the way we live for at least the next few years until the scale-up of production and administration of an effective vaccine. Unfortunately, this will not be the last pandemic of infectious diseases the world will experience, and the next one may have more devastating consequences in Africa than COVID-19, unless critical lessons for the future are learnt now for more rapid and robust containment measures. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the viral cause of COVID-19, is thought to have been introduced into the continent by returning travellers from hotspots in Asia, Europe and America. In a pandemic with Africa having relatively lower morbidity and mortality, it is alarming that in about five months since confirmation of the continent's first case of COVID-19 in Egypt on February 14th, 2020, the infection rate remains at an exponential phase with forty-seven African countries reporting a total of 766,803 cases, 13,191 deaths and 486,925 recoveries as at 31st July, 2020; out of which Nigeria reported 42,689 cases, 878 deaths and 19,290 recoveries, with Lagos State accounting for close to half of all cases in Nigeria. Importantly, lessons learnt during the Ebola epidemic have had a significant impact on Nigeria's COVID-19 response. In this article, we discuss Nigeria's response, health system preparedness and the lessons that are critical for containment of future outbreaks, epidemics or pandemics of any infectious disease in Africa.

KEYWORDS: Africa; Coronavirus disease 2019 (COVID-19); Health system preparedness; Nigeria; SARS-CoV-2.

55. Ekong, I., Chukwu, E., & Chukwu, M. (2020). **COVID-19 Mobile Positioning Data Contact Tracing and Patient Privacy Regulations: Exploratory Search of Global Response Strategies and the Use of Digital Tools in Nigeria.** *JMIR mHealth and uHealth*, 8(4), e19139. <https://doi.org/10.2196/19139>.

ABSTRACT

BACKGROUND: The coronavirus disease (COVID-19) pandemic is the biggest global economic and health challenge of the century. Its effect and impact are still evolving, with deaths estimated to reach 40 million if unchecked. One effective and complementary strategy to slow the spread and reduce the impact is to trace the primary and secondary contacts of confirmed COVID-19 cases using contact tracing technology. **OBJECTIVE:** The objective of this paper is to survey strategies for digital contact tracing for the COVID-19 pandemic and to present how using mobile positioning data conforms with Nigeria's data privacy regulations. **METHODS:** We conducted an exploratory review of current measures for COVID-19 contact tracing implemented around the world. We then analyzed how countries are using mobile positioning data technology to reduce the spread of COVID-19. We made recommendations on how Nigeria can adopt this approach while adhering to the guidelines provided by the National Data Protection Regulation (NDPR). **RESULTS:** Despite the potential of digital contact tracing, it always conflicts with patient data privacy regulations. We found that Nigeria's response complies with the NDPR, and that it is possible to leverage call detail records to complement current strategies within the NDPR. **CONCLUSIONS:** Our study shows that mobile position data contact tracing is important for epidemic control as long as it conforms to relevant data privacy regulations. Implementation guidelines will limit data misuse.

KEYWORDS: COVID-19; GDPR; General Data Protection Regulation; Nigeria's National Data Protection Regulation; contact tracing; coronavirus; digital health; eHealth; mHealth; surveillance.

56. Emmanuel Awucha, N., Chinelo JaneFrances, O., Chima Meshach, A., Chiamaka Henrietta, J., Ibilolia Daniel, A., & Esther Chidiebere, N. (2020). **Impact of the COVID-19 Pandemic on Consumers' Access to Essential Medicines in Nigeria.** *The American journal of tropical medicine and hygiene*, 103(4), 1630–1634.

ABSTRACT

COVID-19 is a global pandemic which has seriously impacted the economy of nations. Access to essential medicines is of utmost importance. This study examined the impacts of the COVID-19 pandemic on the ease of access to essential medicines by end users. A cross-sectional survey using electronic questionnaires was conducted on study participants across the 36 states of Nigeria. They were assessed on sociodemographics, health characteristics, and challenges in accessing essential medicines during the COVID-19 pandemic. Data obtained were analyzed using the Statistical Package for the Social Sciences (SPSS version 20, IBM, Armonk, NY) with overall impact of the pandemic operationalized as < 60.0% or ≥ 60.0% access to essential medicines by respondents as maximal and minimal impact, respectively. The results showed that 35.2% of the respondents managing chronic illnesses had difficulties accessing essential medicines during the COVID-19 lockdown, with 84.0% experiencing deteriorating chronic health conditions in the light of difficulty in accessing their

medicines. The proportion of respondents who sourced for orthodox medicines before COVID-19 lockdown (98.4%) was significantly ($P < 0.05$) higher than that of those who sourced for the same during the lockdown (89.0%). Increase in cost of medicines was observed by 77.7% of participants, with 73.9% of respondents living with chronic illness affirming that their income was negatively affected by the pandemic. The COVID-19 pandemic had minimal impact on consumers' ability to access essential medicines. However, important challenges identified were poor availability of means of transportation, reduced income, and high cost of medicines, as well as fear of contracting the virus.

57. Elekofehinti O.O, Iwaloye O, Famusiwa CD, Akinseye O, Rocha JBT. **Identification of Main Protease of Coronavirus SARS-CoV-2 (Mpro) Inhibitors from *Melissa officinalis*.** *Curr Drug Discov Technol.* 2020 Sep 17. doi: 10.2174/1570163817999200918103705. Epub ahead of print. PMID: 32957889.

ABSTRACT

The COVID-19 pandemic has disrupted traditional global point-of-care ultrasound (POCUS) education and training, as a result of travel restrictions. It has also provided an opportunity for innovation using a virtual platform. Tele-ultrasound and video-conferencing are alternative and supportive tools to augment global POCUS education and training. There is a need to support learners and experts to ensure that maximum benefit is gained from the use of these innovative modalities.

KEYWORDS: COVID-19; Education; Global point-of-care ultrasound; Training.

58. Eranga I. O. (2020). **COVID-19 Pandemic in Nigeria: Palliative Measures and the Politics of Vulnerability.***International journal of MCH and AIDS*, 9(2), 220–222. <https://doi.org/10.21106/ijma.394>

ABSTRACT

In a bid to slow the rate of spread of the virus, the Federal Government of Nigeria, on several occasions, imposed targeted lockdown measures in areas with rapid increase of Covid-19 cases. The states in which the federal government imposed the targeted lockdown included Lagos, Ogun, and the Federal Capital Territory in Abuja. Some States in the country imposed partial lockdown and closure of interstate borders. Curfews have also been introduced in all the states nationwide. To alleviate the effects of the lockdown, the Federal Government of Nigeria rolled out palliative measures for targeted groups. However, lamentations have trailed the distribution of government palliatives by the masses. Citizens allege that the process of distribution of palliatives had been politicized.

KEYWORDS: Corona virus; Covid-19; Nigeria; Palliatives.

59. Erim, D. O., Oke, G. A., Adisa, A. O., Odukoya, O., Ayo-Yusuf, O. A., Erim, T. N., Tsafa, T. N., Meremikwu, M. M., & Agaku, I. T. (2021). **Associations of Government-Mandated Closures and Restrictions with Aggregate Mobility Trends and SARS-CoV-2 Infections in Nigeria.** *JAMA network open*, 4(1), e2032101. <https://doi.org/10.1001/jamanetworkopen.2020.32101>

ABSTRACT

IMPORTANCE: To prepare for future coronavirus disease 2019 (COVID-19) waves, Nigerian policy makers need insights into community spread of COVID-19 and changes in rates of infection associated with government-mandated closures and restrictions. **OBJECTIVES:** To measure the association of closures and restrictions with aggregate mobility and the association of mobility with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) infections and to characterize community spread of COVID-19. **DESIGN, SETTING, AND PARTICIPANTS:** This cross-sectional study used aggregated anonymized mobility data from smartphone users in Nigeria who opted to provide location history (from a pool of up to 40 million individuals) collected between February 27 and July 21, 2020. The analyzed data included daily counts of confirmed SARS-CoV-2 infections and daily changes in aggregate mobility across 6 categories: retail and recreation, grocery and pharmacy, parks, transit stations, workplaces, and residential. Closures and restrictions were initiated on March 30, 2020, and partially eased on May 4, 2020. **MAIN OUTCOMES AND MEASURES:** Interrupted time series were used to measure associations of closures and restrictions with aggregate mobility. Negative binomial regression was used to evaluate associations between confirmed SARS-CoV-2 infections and mobility categories. Averted infections were estimated by subtracting cumulative confirmed infections from estimated infections assuming no closures and restrictions. **RESULTS:** Closures and restrictions had negative associations with mean change in daily aggregate mobility in retail and recreation (-46.87 [95% CI, -55.98 to -37.76] percentage points; $P < .001$), grocery and pharmacy (-28.95 [95% CI, -40.12 to -17.77] percentage points; $P < .001$), parks (-43.59 [95% CI, -49.89 to -37.30] percentage points; $P < .001$), transit stations (-47.44 [95% CI, -56.70 to -38.19] percentage points; $P < .001$), and workplaces (-53.07 [95% CI, -67.75 to -38.39] percentage points; $P < .001$) and a positive association with mobility in residential areas (24.10 [95% CI, 19.14 to 29.05] percentage points; $P < .001$). Most of these changes reversed after closures and restrictions were partially eased (retail and recreation: 14.63 [95% CI, 10.95 to 18.30] percentage points; $P < .001$; grocery and pharmacy: 15.29 [95% CI, 10.90 to 19.67] percentage points; $P < .001$; parks: 6.48 [95% CI, 3.98 to 8.99] percentage points; $P < .001$; transit stations: 17.93 [95% CI, 14.03 to 21.83] percentage points; $P < .001$; residential: -5.59 [95% CI, -9.08 to -2.09] percentage points; $P = .002$). Additionally, every percentage point increase in aggregate mobility was associated with higher incidences of SARS-CoV-2 infection in residential areas (incidence rate ratio [IRR], 1.03 [95% CI, 1.00 to 1.07]; $P = .04$), transit stations (IRR, 1.02 [95% CI, 1.00 to 1.03]; $P = .008$), and workplaces (IRR, 1.01 [95% CI, 1.00 to 1.02]; $P = .04$). Lastly, closures and restrictions may have been associated with averting up to 5.8 million SARS-CoV-2 infections over the study period. **CONCLUSIONS AND RELEVANCE:** In this cross-sectional study, closures and restrictions had significant associations with aggregate mobility and were associated with decreased SARS-CoV-2 infections. These findings suggest that future anticontagion measures need better infection control and contact tracing in residential areas, transit stations, and workplaces.

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ABSTRACT

The COVID-19 epidemic is the latest evidence of critical gaps in our collective ability to monitor country-level preparedness for health emergencies. The global frameworks that exist to strengthen core public health capacities lack coverage of several preparedness domains and do not provide mechanisms to interface with local intelligence. We designed and piloted a process, in collaboration with three National Public Health Institutes (NPHIs) in Ethiopia, Nigeria and Pakistan, to identify potential preparedness indicators that exist in a myriad of frameworks and tools in varying local institutions. Following a desk-based systematic search and expert consultations, indicators were extracted from existing national and subnational health security-relevant frameworks and prioritised in a multi-stakeholder two-round Delphi process. Eighty-six indicators in Ethiopia, 87 indicators in Nigeria and 51 indicators in Pakistan were assessed to be valid, relevant and feasible. From these, 14-16 indicators were prioritised in each of the three countries for consideration in monitoring and evaluation tools. Priority indicators consistently included private sector metrics, subnational capacities, availability and capacity for electronic surveillance, measures of timeliness for routine reporting, data quality scores and data related to internally displaced persons and returnees. NPHIs play an increasingly central role in health security and must have access to data needed to identify and respond rapidly to public health threats. Collecting and collating local sources of information may prove essential to addressing gaps; it is a necessary step towards improving preparedness and strengthening international health regulations compliance.

KEYWORDS: health policy; health systems; public health; review.

61. Eyawo, O., Viens, A. M., & Ugoji, U. C. (2021). **Lockdowns and low- and middle-income countries: building a feasible, effective, and ethical COVID-19 response strategy.** *Globalization and health*, 17(1), 13. <https://doi.org/10.1186/s12992-021-00662-y>

ABSTRACT

Lockdowns can be an effective pandemic response strategy that can buy much needed time to slow disease transmission and adequately scale up preventative, diagnostic, and treatment capacities. However, the broad restrictive measures typically associated with lockdowns, though effective, also comes at a cost - imposing significant social and economic burdens on individuals and societies, especially for those in low- and middle-income countries (LMICs). Like most high-income countries (HICs), many LMICs initially adopted broad lockdown strategies for COVID-19 in the first wave of the pandemic. While many HICs experiencing subsequent waves have returned to employing lockdown strategies until they can receive the first shipments of COVID-19 vaccine, many LMICs will likely have to wait much longer to get comparable access for their own citizens. In leaving LMICs vulnerable to subsequent waves for a longer period of time without vaccines, there is a risk LMICs will be tempted to re-impose lockdown measures in the meantime. In response to the urgent need for more policy development around the contextual challenges involved in employing such measures, we propose some strategies LMICs could adopt for safe and responsible lockdown entrance/exit or to avoid re-imposing coercive restrictive lockdown measures altogether.

KEYWORDS: COVID-19; Global health; Health equity; Health policy; Lockdown; Low- and middle-income countries.

62. Eze, P. U., Ezenkwu, C. P., & Etteh, C. C. (2021). **Community informatics for sustainable management of pandemics in developing countries: A case study of COVID-19 in Nigeria.** *Ethics, medicine, and public health*, 16, 100632. <https://doi.org/10.1016/j.jemep.2021.100632>

ABSTRACT

Although a significant number of the human population in developing countries live in urban communities, majority of the population lives in rural areas. Developing countries, especially in their rural areas, suffer from a lack of healthcare facilities, poverty and high rate of illiteracy. Motivated by the huge socio-economic gap between the developed and the developing worlds, there have been several studies into the COVID-19 pandemic management in developing countries. However, none of these research works emphasised the health cultural beliefs of any developing economy as a basis for their recommendations. Specifically, this paper discusses the pandemic situation in Nigeria with emphasis on the prevalent health cultural beliefs of the citizens of the country, especially those living in rural communities. This is important because each local community defines a socio-ecological cluster of people who are more tightly knitted together in terms of language, relationship, culture, religion, social amenities, business, leadership and so on. As such, there is a need to prepare the socio-ecological units to be more resistant to the spread of the virus; a weaker social-ecological unit will entail a higher risk of community transmissions. With respect to the peculiarity of each local community, this paper recommends strategies for controlling and managing the pandemic in Nigeria using community informatics or grass-root computing. We argue that community informatics can empower and support policy makers and governments of developing countries such as Nigeria in combating and effectively managing a pandemic.

KEYWORDS: COVID-19; Informatics; Nigeria; OGHCS; Public Health; Reproduction number.

63. Falade, V. A., Adelusi, T. I., Adedotun, I. O., Abdul-Hammed, M., Lawal, T. A., & Agboluaje, S. A. (2021). **In silico investigation of saponins and tannins as potential inhibitors of SARS-CoV-2 main protease (M^{pro}).** *In silico pharmacology*, 9(1), 9. <https://doi.org/10.1007/s40203-020-00071->

ABSTRACT

It is no longer news that a novel strain of coronavirus named SARS-CoV-2 is ravaging the health sector worldwide, several attempts have been made to curtail this pandemic via repurposing of old drugs but at the present, available drugs are not adequately effective. Over the years, plant phytochemicals are increasingly becoming alternative sources of antimicrobial agents with novel mechanisms of action and limited side effects compared to synthetic drugs. Isolated saponins and tannins were evaluated for antiviral activity against SARS-CoV-2 (M^{pro}) via Molecular Docking and it was observed that a handsome number of the phytochemicals had binding affinities much better than Remdesivir, Dexamethasone, and N3 inhibitor which were used as the standards in this study. Further investigation of drug-likeness, ADMET profile, PASS profile, oral bioavailability, bioactivity, binding mode, and molecular interactions of these phytochemicals revealed that binding affinity alone is not enough to justify the potency of a molecule in the drug discovery process, as only 4 among the screened

compounds passed all the analyses and are identified as potential inhibitors of SARS-CoV-2 (M^{pro}). This preliminary study thereby recommends Ellagic acid (- 8.4 kcal/mol), Arjunic Acid (- 8.1 kcal/mol), Theasapogenol B (- 8.1 kcal/mol), and Euscaphic Acid (- 8.0 kcal/mol) as potential inhibitors of SARS-CoV-2 (M^{pro}) with better pharmacokinetics and bioavailability compared to Remdesivir which is currently used compassionately.

KEYWORDS: Drug-likeness; Molecular docking; Pharmacokinetics; SARS-CoV-2 (M^{pro}); Saponins; Tannins.

64. Fatoba, A. J., Maharaj, L., Adeleke, V. T., Okpeku, M., Adeniyi, A. A., & Adeleke, M. A. (2021). **Immunoinformatics prediction of overlapping CD8⁺ T-cell, IFN- γ and IL-4 inducer CD4⁺ T-cell and linear B-cell epitopes-based vaccines against COVID-19 (SARS-CoV-2).** *Vaccine*, 39(7), 1111–1121. <https://doi.org/10.1016/j.vaccine.2021.01.003>

ABSTRACT

At the beginning of the year 2020, the world was struck with a global pandemic virus referred to as SARS-CoV-2 (COVID-19) which has left hundreds of thousands of people dead. To control this virus, vaccine design becomes imperative. In this study, potential epitopes-based vaccine candidates were explored. Six hundred (600) genomes of SARS-CoV-2 were retrieved from the viPR database to generate CD8⁺ T-cell, CD4⁺ T-cell and linear B-cell epitopes which were screened for antigenicity, immunogenicity and non-allergenicity. The results of this study provide 19 promising candidate CD8⁺ T-cell epitopes that strongly overlap with 8 promising B-cells epitopes. Another 19 CD4⁺ T-cell epitopes were also identified that can induce IFN- γ and IL-4 cytokines. The most conserved MHC-I and MHC-II for both CD8⁺ and CD4⁺ T-cell epitopes are HLA-A*02:06 and HLA-DRB1*01:01 respectively. These epitopes also bound to Toll-like receptor 3 (TLR3). The population coverage of the conserved Major Histocompatibility Complex Human Leukocyte Antigen (HLA) for both CD8⁺ T-cell and CD4⁺ T-cell ranged from 65.6% to 100%. The detailed analysis of the potential epitope-based vaccine and their mapping to the complete COVID-19 genome reveals that they are predominantly found in the location of the surface (S) and membrane (M) glycoproteins suggesting the potential involvement of these structural proteins in the immunogenic response and antigenicity of the virus. Since the majority of the potential epitopes are located on M protein, the design of multi-epitope vaccine with the structural protein is highly promising though the whole M protein could also serve as a viable epitope for the development of an attenuated vaccine. Our findings provide a baseline for the experimental design of a suitable vaccine against SARS-CoV-2.

KEYWORDS: Immune-response; Immunoinformatics; Multi-epitope; SARS-CoV-2; Vaccine.

65. Fatoki TH, Ibraheem O, Ogunyemi IO, Akinmoladun AC, Ugboko HU, Adeseko CJ, Awofisayo OA, Olusegun SJ, Enibukun JM. **Network analysis, sequence and structure dynamics of key proteins of coronavirus and human host, and molecular docking of selected phytochemicals of nine medicinal plants.** *J Biomol Struct Dyn*. 2020 Jul 20;1-23. doi: 10.1080/07391102.2020.1794971. Epub ahead of print. PMID: 32686993.

ABSTRACT

The novel coronavirus of 2019 (nCoV-19) has become a pandemic, affecting over 205 nations with over 7,410,000 confirmed cases which has resulted to over 418,000 deaths worldwide. This study aimed to identify potential therapeutic compounds and phytochemicals of medicinal plants that have potential to modulate the expression network of genes that are involve in SARS-CoV-2 pathology in human host and to understand the dynamics key proteins involved in the virus-host interactions. The method used include gene network analysis, molecular docking, and sequence and structure dynamics simulations. The results identified DNA-dependent protein kinase (DNA-PK) and Protein kinase CK2 as key players in SARS-CoV-2 lifecycle. Among the predicted drugs compounds, clemizole, monorden, spironolactone and tanespimycin showed high binding energies; among the studied repurposing compounds, remdesivir, simeprevir and valinomycin showed high binding energies; among the predicted acidic compounds, acetylursolic acid and hardwickiic acid gave high binding energies; while among the studied anthraquinones and glycosides compounds, ellagitannin and friedelanone showed high binding energies against 3-Chymotrypsin-like protease (3CL^{pro}), Papain-like protease (PL^{pro}), helicase (nsp13), RNA-dependent RNA polymerase (nsp12), 2'-O-ribose methyltransferase (nsp16) of SARS-CoV-2 and DNA-PK and CK2alpha in human. The order of affinity for CoV proteins is 5Y3E > 6NUS > 6JYT > 2XYR > 3VB6. Finally, medicinal plants with phytochemicals such as caffeine, ellagic acid, quercetin and their derivatives could possibly remediate COVID-19. Communicated by Ramaswamy H. Sarma.

KEYWORDS: COVID-19; SARS-CoV-2; drug discovery; gene expression network; molecular docking and dynamics simulation.

66. Fawole, O. I., Okedare, O. O., & Reed, E. (2021). **Home was not a safe haven: women's experiences of intimate partner violence during the COVID-19 lockdown in Nigeria.** *BMC women's health*, 21(1), 32. <https://doi.org/10.1186/s12905-021-01177-9>

ABSTRACT

BACKGROUND: Emergency situations, including epidemics, increase incidence of violence against women, especially intimate partner violence (IPV). This paper describes specific scenarios of IPV reported by women during the COVID-19 pandemic in Nigeria to provide insight for policy and programmatic efforts. **METHODS:** This paper draws on seven de-identified case reports from organisations serving women experiencing IPV as well as media coverage of IPV cases in Nigeria, between April and May, 2020. **RESULTS:** In most cases, reports identified IPV that was occurring prior to the lockdown, but increased in severity or involved new types of violence during the lockdown. The case scenarios included descriptions of many forms of IPV commonly reported, including physical, economic, psychological and sexual violence, often concurrently. Several women also reported threats of being thrown out of their homes by perpetrators, which threatens women's ability to protect themselves from exposure to COVID-19, but could also leave women stranded with no access to transportation, social services, or other resources during the lockdown. Several women also reported IPV that involved custody of children, as well as IPV that disrupted women's income generation. IPV was also reported in relation to economic stressors associated with the lockdown. Reports highlight how the lockdown disrupted women's social support, hindering accessibility of formal and informal sources of help. **CONCLUSION:** The lockdowns in Nigeria may have inadvertently placed women already experiencing

partner violence at risk for experiencing more severe violence, new challenges to cope with violent experiences, and other forms of violence, including violence that used the lockdown as a way to threaten women's security and ability to protect themselves from the virus. Hence, there is need for innovative approaches to support victims, with emphasis on ways in which perpetrators of IPV may be using the threat of COVID-19 to further gain power and control over partners.

KEYWORDS: COVID-19 lock down; COVID-19 pandemic; Gender based violence; Intimate partner violence

67. Goel, R., Bloch, E. M., Pirenne, F., Al-Riyami, A. Z., Crowe, E., Dau, L., Land, K., Townsend, M., Jecko, T., Rahimi-Levene, N., Patidar, G., Josephson, C. D., Arora, S., Vermeulen, M., Vrielink, H., Montemayor, C., Oreh, A., Hindawi, S., van den Berg, K., Serrano, K., ... **ISBT COVID-19 Working Group (2021). ABO blood group and COVID-19: a review on behalf of the ISBT COVID-19 working group.** *Vox sanguinis*, 10.1111/vox.13076. Advance online publication. <https://doi.org/10.1111/vox.13076>

ABSTRACT

Growing evidence suggests that ABO blood group may play a role in the immunopathogenesis of SARS-CoV-2 infection, with group O individuals less likely to test positive and group A conferring a higher susceptibility to infection and propensity to severe disease. The level of evidence supporting an association between ABO type and SARS-CoV-2/COVID-19 ranges from small observational studies, to genome-wide-association-analyses and country-level meta-regression analyses. ABO blood group antigens are oligosaccharides expressed on red cells and other tissues (notably endothelium). There are several hypotheses to explain the differences in SARS-CoV-2 infection by ABO type. For example, anti-A and/or anti-B antibodies (e.g. present in group O individuals) could bind to corresponding antigens on the viral envelope and contribute to viral neutralization, thereby preventing target cell infection. The SARS-CoV-2 virus and SARS-CoV spike (S) proteins may be bound by anti-A isoagglutinins (e.g. present in group O and group B individuals), which may block interactions between virus and angiotensin-converting-enzyme-2-receptor, thereby preventing entry into lung epithelial cells. ABO type-associated variations in angiotensin-converting enzyme-1 activity and levels of von Willebrand factor (VWF) and factor VIII could also influence adverse outcomes, notably in group A individuals who express high VWF levels. In conclusion, group O may be associated with a lower risk of SARS-CoV-2 infection and group A may be associated with a higher risk of SARS-CoV-2 infection along with severe disease. However, prospective and mechanistic studies are needed to verify several of the proposed associations. Based on the strength of available studies, there are insufficient data for guiding policy in this regard.

KEYWORDS: ABO blood groups; COVID-19; SARS-CoV-2; disease severity; disease susceptibility.

68. Gyebi, G. A., Ogunro, O. B., Adegunloye, A. P., Ogunyemi, O. M., & Afolabi, S. O. (2020). **Potential inhibitors of coronavirus 3-chymotrypsin-like protease (3CL^{pro}): an *in-silico* screening of alkaloids and terpenoids from African medicinal plants.**

ABSTRACT

The novel coronavirus disease 2019 (COVID-19) caused by SARS-CoV-2 has raised myriad of global concerns. There is currently no FDA approved antiviral strategy to alleviate the disease burden. The conserved 3-chymotrypsin-like protease (3CL^{pro}), which controls coronavirus replication is a promising drug target for combating the coronavirus infection. This study screens some African plants derived alkaloids and terpenoids as potential inhibitors of coronavirus 3CL^{pro} using *in silico* approach. Bioactive alkaloids (62) and terpenoids (100) of plants native to Africa were docked to the 3CL^{pro} of the novel SARS-CoV-2. The top twenty alkaloids and terpenoids with high binding affinities to the SARS-CoV-2 3CL^{pro} were further docked to the 3CL^{pro} of SARS-CoV and MERS-CoV. The docking scores were compared with 3CL^{pro}-referenced inhibitors (Lopinavir and Ritonavir). The top docked compounds were further subjected to ADEM/Tox and Lipinski filtering analyses for drug-likeness prediction analysis. This ligand-protein interaction study revealed that more than half of the top twenty alkaloids and terpenoids interacted favourably with the coronaviruses 3CL^{pro}, and had binding affinities that surpassed that of lopinavir and ritonavir. Also, a highly defined hit-list of seven compounds (10-Hydroxyusambarensine, Cryptoquindoline, 6-Oxoisoiguesterin, 22-Hydroxyhopan-3-one, Cryptospirolepine, Isoiguesterin and 20-*Epibryonolic* acid) were identified. Furthermore, four non-toxic, druggable plant derived alkaloids (10-Hydroxyusambarensine, and Cryptoquindoline) and terpenoids (6-Oxoisoiguesterin and 22-Hydroxyhopan-3-one), that bind to the receptor-binding site and catalytic dyad of SARS-CoV-2 3CL^{pro} were identified from the predictive ADME/tox and Lipinski filter analysis. However, further experimental analyses are required for developing these possible leads into natural anti-COVID-19 therapeutic agents for combating the pandemic. Communicated by Ramaswamy H. Sarma.

KEYWORDS: COVID-19; SARS-CoV-2; coronavirus 3CL^{pro}; molecular docking; natural product.

69. Habib, M. A., Dayyab, F. M., Iliyasu, G., & Habib, A. G. (2021). **Knowledge, attitude and practice survey of COVID-19 pandemic in Northern Nigeria.** *PloS one*, 16(1), e0245176. <https://doi.org/10.1371/journal.pone.0245176>

ABSTRACT

BACKGROUND: A pandemic of coronavirus disease 2019 (COVID-19) emerged and affected most of the world in early 2020. To inform effective public health measures we conducted a knowledge, attitude and practice (KAP) survey among a Hausa Muslim society in Nigeria in March 2020. **METHODS:** The study is an analytic cross-sectional survey with questionnaires administered to the general population including Health Care Workers (HCW) in Kano, Nigeria. Participants were recruited by convenience sampling following informed consent. The percentage of KAP scores were categorized as good and poor. Independent predictors of good knowledge of COVID 19 were ascertained using a binary logistic regression model. **RESULTS:** The questionnaire was administered among urban 32.8%, peri-urban dwellers 32.4%, and to online participants 34.8%. The peri-urban and urban participants were given paper questionnaires. There were 886 study participants with mean age 28.58yrs [SD:10.25] (Interquartile range [IQR]:22yrs-32yrs), males 55.4% with 57.3% having had or were in tertiary education. Most participants were students 40% and civil servants 20%. The

overall mean [standard deviation (SD)] for knowledge, attitude and practice scores expressed in percentage was 65.38%[SD15.90], 71.45% [SD14.10], and 65.04% [SD17.02] respectively. Out of the respondents, 270(30.47%) had good knowledge (GK), 158(17.8%) had good attitude (GA), and 230(25.96%) had good practice (GP) using cut-off scores of 75%, 86.5%, and 75% respectively. Over 48% did not agree COVID-19 originated from animals while 60% perceived the pandemic to be due to God's punishment. Also, 36% thought it was a man-made virus. When rating fear, most respondents [63.5%] had marked fear i.e. ≥ 7 out of 10 and 56% admitted to modifying their habits recently in fear of contracting the virus. As regards attitude to religious norms, 77.77% agreed on cancellation of the lesser pilgrimage as a measure to curb the spread of the disease while 23.64% admitted that greater pilgrimage (Hajj) should proceed despite the persistence of the ongoing pandemic. About 50% of the respondents insisted on attending Friday congregational prayers despite social distancing. One in four people still harbored stigma towards a person who has recovered from the virus. 28% felt some races are more at risk of the disease though 66% mentioned always practicing social distancing from persons coughing or sneezing. Almost 70% of respondents said they were willing to accept a vaccine with 39% saying they would be willing to pay for it if not publicly funded. In univariate analysis increasing age and having been ever married were associated with GK while tertiary education was associated with GA [Odds Ratio; 95% Confidence Interval] 2.66(1.79-3.95). Independent positive predictors of GK were those who were or had ever been married, those who had marked fear of COVID-19, and had modified their habits in the last three months. Those who had non-tertiary education and had the questionnaire administered as paper rather than online version had GK but age was not a predictor. **CONCLUSION:** Knowledge of transmission and preventive measures should be improved in the general population cognizant of cultural norms and Islamic practices. The study highlights the importance of considering belief systems and perception in developing control measures against COVID-19.

70. Hedima, E. W., Adeyemi, M. S., & Ikunaiye, N. Y. (2021). **Community Pharmacists: On the frontline of health service against COVID-19 in LMICs.** *Research in social & administrative pharmacy: RSAP*, 17(1), 1964–1966. <https://doi.org/10.1016/j.sapharm.2020.04.013>

ABSTRACT

The COVID-19 outbreak is a global public health crisis which has affected healthcare practice across professions. In the context of this pandemic, there is a need to highlight the roles and responsibilities of pharmacists. Community pharmacists are the most accessible healthcare professionals to the general public and have a lot to offer amid the COVID-19 response. This have led to significant changes in the health systems of many countries. This article seeks to highlight additional roles and activities relating to the public health response that can be undertaken by community pharmacists that could help to reduce pressure on general practice and other areas of the health service.

KEYWORDS: COVID-19; Community pharmacists; Health systems; Healthcare professionals; Public health.

71. Hager, E., Odetokun, I. A., Bolarinwa, O., Zainab, A., Okechukwu, O., & Al-Mustapha, A. I. (2020). **Knowledge, attitude, and perceptions towards the 2019 Coronavirus Pandemic: A bi-national survey in Africa.** *PloS one*, 15(7), e0236918. <https://doi.org/10.1371/journal.pone.0236918>

ABSTRACT

The current Coronavirus (COVID-19) pandemic has impacted and changed lives on a global scale since its emergence and spread from China in late 2019. It has caused millions of infections, and thousands of deaths worldwide. However, the control of this pandemic still remains unachievable in many African countries including Egypt and Nigeria, despite the application of some strict preventive and control measures. Therefore, this study assessed the knowledge, attitude, and perceptions of Egyptians and Nigerians towards the COVID-19 pandemic. This study was designed as a cross-sectional community-based questionnaire survey in both countries. Participants' demography, knowledge, attitude, and perceptions towards the COVID-19 outbreak were obtained using a convenience sampling technique. Data collected were subjected to descriptive statistics and logistic regression analysis. A total of 1437 respondents were included in this preliminary report. The mean knowledge score was 14.7 ± 2.3 . The majority of the respondents (61.6%) had a satisfactory knowledge of the disease. Age (18-39 years), education (College/bachelors), and background of respondents were factors influencing knowledge levels. The attitude of most respondents (68.9%) towards instituted preventive measures was satisfactory with an average attitude score of 6.9 ± 1.2 . The majority of the respondents (96%) practiced self-isolation and social-distancing but only 36% follow all health recommendations. The perception of most respondents (62.1%) on the global efforts at controlling the virus and preventing further spread was satisfactory with an average score of 10.9 ± 2.7 . Only 22% of the respondents were satisfied with their country's handling of the pandemic. An apprehensive understanding of the current status in Africa through studies like KAP is crucial to avoid Africa being the next epicenter of the pandemic. For the populace to follow standard infection prevention and control measures adequately, governments need to gain the trust of citizens by strengthening the health systems and improving surveillance activities in detecting cases, to offer the optimum health services to their communities.

72. Hamzat, Saheed Abiola and Otulugbu, Dumebi, **Social Media Use and the Challenges of Information Dissemination during Emergencies: Experience of Library and Information Scientists on Covid-19 in Nigeria (2020)**. *Library Philosophy and Practice (e-journal)*. 4267.

ABSTRACT

Corona virus is a form of respiratory ailment that ravaged human health and social interaction. Since its emergence and subsequent spread to various countries of the world, various governments, organisations, agencies and individuals have been making frantic efforts to curtail the disease using different media. Prominent among the media being used is social media. However, the preliminary investigation of the researchers indicated that the social media are being wrongly used to disseminate information on the emergence, causes, prevention and curtailment of the disease particularly in a developing country like Nigeria. The need to address these challenges and to drum home the contribution of Library and Information Scientists necessitated this study. Self-structured questionnaire administered at various online fora (NLA, NALISE and individuals) was the instrument used for the collection of data among the library and information scientists (librarians and library and information science educators). Total enumeration technique was employed to cover all the 201 respondents that participated in the survey monkey conducted. The study found that varying social media were being used to disseminate information about COVID-19. It was reported that library and

information scientists are playing active role in enlighten masses on the danger of COVID-19, and has established an enduring relationship with the National Centre for Disease Control (NCDC) on the importance of library use as change agents. The need for Library and Information Scientists to sustain the use of social media while rendering information services especially in the time of pandemic such as COVID-19 was recommended.

KEYWORDS: COVID-19 in Nigeria, Information dissemination, Library and Information Scientists, Social media use, NCDC

73. Hasford, F., Ige, T. A., & Trauernicht, C. (2020). **Safety measures in selected radiotherapy centres within Africa in the face of Covid-19.** *Health and technology*, 1–6. Advance online publication. <https://doi.org/10.1007/s12553-020-00472-z>

ABSTRACT

Radiotherapy is life-saving treatment which ought to be guaranteed for all cancer patients who are indicated. While this is so, it is incumbent on the management of radiotherapy centres to ensure that patients, patient care-givers and radiotherapy personnel are at all times safe within the radiotherapy facility. Cancer patients are known to have increased risk for respiratory viruses like Covid-19 due to the compromised immune state of such persons. It is thus important to institute adequate safety measures in radiotherapy centres to prevent infection of cancer patients during the global Covid-19 pandemic. A survey conducted in 12 radiotherapy centres in 8 African countries has highlighted key measures needing implementation to ensure safety against Covid-19 infections. The safety measures were indexed on a 16-point questionnaire covering 5 main areas of staffing, radiotherapy environment, equipment and treatment protocols, patient condition and scheduling, and education/sensitization. The study shows that use of personal protective equipment, provision of hand washing and sanitizing facilities, social distance observance, restrictions for patient care-givers, provision of isolation unit meant for holding suspected Covid-19 cases, existence of working protocols, and Covid-19 safety education for staff are fully complied with by the surveyed radiotherapy centres. A greater portion of the centres, are however, without radiotherapy facilities solely dedicated for suspicious and confirmed Covid-19 cases. Strict adherence of the safety measures is highly essential to contain the spread and prevent infection of the disease to patients, care-givers and staff of the radiotherapy departments.

74. Ibn-Mohammed, T., Mustapha, K. B., Godsell, J., Adamu, Z., Babatunde, K. A., Akintade, D. D., Acquaye, A., Fujii, H., Ndiaye, M. M., Yamoah, F. A., & Koh, S. (2021). **A critical analysis of the impacts of COVID-19 on the global economy and ecosystems and opportunities for circular economy strategies.** *Resources, conservation, and recycling*, 164, 105169. <https://doi.org/10.1016/j.resconrec.2020.105169>

ABSTRACT

The World Health Organization declared COVID-19 a global pandemic on the 11th of March 2020, but the world is still reeling from its aftermath. Originating from China, cases quickly spread across the globe, prompting the implementation of stringent measures by world governments in efforts to isolate cases and limit the transmission rate of the virus. These measures have however shattered the core sustaining pillars of the modern world economies as global trade and cooperation succumbed to nationalist focus and competition for scarce supplies. Against this backdrop, this paper presents a

critical review of the catalogue of negative and positive impacts of the pandemic and proffers perspectives on how it can be leveraged to steer towards a better, more resilient low-carbon economy. The paper diagnosed the danger of relying on pandemic-driven benefits to achieving sustainable development goals and emphasizes a need for a decisive, fundamental structural change to the dynamics of how we live. It argues for a rethink of the present global economic growth model, shaped by a linear economy system and sustained by profiteering and energy-gulping manufacturing processes, in favour of a more sustainable model recalibrated on circular economy (CE) framework. Building on evidence in support of CE as a vehicle for balancing the complex equation of accomplishing profit with minimal environmental harms, the paper outlines concrete sector-specific recommendations on CE-related solutions as a catalyst for the global economic growth and development in a resilient post-COVID-19 world.

KEYWORDS: COVID-19; Circular economy; Climate change; Supply chain resilience; Sustainability; Sustainable development.

75. Ishtiaq, Sadia Ms; Sehar, Naveed; and Shahid, Attia, **Information Dissemination during Covid-19 and Lockdown: The Role of University libraries of Sindh, Pakistan. (2020). *Library Philosophy and Practice (e-journal)*. 4280.**

ABSTRACT:

Universities librarians play vital and varied roles in the life of the university, guiding students and faculty at the reference desk, instructing library research sessions, and developing library collections. It is a truism to say that librarians in all sectors of an academic library wear many different hats and provide numerous services to patrons. This research paper seeks to investigate the role of university libraries in this outbreak situation. The novel virus COVID-19 discovered as a global pandemic. This contagious virus changed working Style tradition to online because of the shutdown of all activities of life. The main objective of this study to find out those services, skills, instructional, and training programs being carried out during this period of the pandemic. Secondly, another aim of this study is to highlight how university libraries are contributing to their members for disseminating and mobilizing information during this emergency. In this study online survey research design used and covers 29 libraries from private sector universities of Sindh Province, Pakistan. The collected data were analyzed by the Statistical Package for Social Sciences (SPSS) software version23.0. Findings also revealed that highest percentage (79.3%) of the university library providing the services during the lockdown in contrast to few libraries relying on traditional services not offered online services in this outbreak, lockdown period. The study concluded that in this new information era library staff, should always be ready to face a challenging situation. Mostly university libraries suggested in the future to adopt webinars services and focused on motivating, encouraging the librarians to enhance their digital skills to be in pace with the present digital age.

KEYWORDS: COVID -19, University Libraries, Outbreak, Digital Library, Lockdown, Online Services.

76. Idris MO, Yekeen AA, Alakanse OS, Durojaye OA. **Computer-aided screening for potential TMPRSS2 inhibitors: a combination of pharmacophore modeling, molecular docking and molecular dynamics simulation approaches. *J Biomol Struct Dyn*. 2020 Jul 16:1-19. doi:**

ABSTRACT

Transmembrane serine protease 2 (TMPRSS2) has been established as one of the host proteins that facilitate entry of coronaviruses into host cells. One of the approaches often employed towards preventing the entry and proliferation of viruses is computer-aided inhibition studies to identify potent compounds that can inhibit activity of viral targets in the host through binding at the active site. In this study, we developed a pharmacophore model of reportedly potent drugs against severe acute respiratory syndrome coronaviruses 1 and 2 (SARS-CoV-1 and -2). The model was used to screen the ZINC database for commercially available compounds having similar features with the experimentally tested drugs. The top 3000 compounds retrieved were docked into the active sites of a homology-modelled TMPRSS2. Docking scores of the top binders were validated and the top-ranked compounds were subjected to ADME, Lipinski's and medicinal Chemistry property predictions for druglikeness analyses. Two lead compounds, ZINC64606047 and ZINC05296775, were identified having binding affinities higher than those of the reference inhibitors, favorable interactions with TMPRSS2 active site residues and good ADME and medicinal chemistry properties. Molecular dynamics simulation was used to assess the stability and dynamics of the interactions of these compounds with TMPRSS2. Binding free energy and contribution energy evaluations were determined using MMPBSA method. Analyses of the trajectory dynamics collectively established further that the lead compounds bound and interacted stably with active site residues of TMPRSS2. Nonetheless, experimental studies are needed to further assess the potentials of these compounds as possible therapeutics against coronaviruses.

KEYWORDS: Pharmacophore modeling, homology modeling, COVID-19, serine protease

77. Iheagwam FN, Rotimi SO. **Computer-Aided Analysis of Multiple SARS-CoV-2 Therapeutic Targets: Identification of Potent Molecules from African Medicinal Plants.** Scientifica (Cairo). 2020 Sep 12;2020:1878410. doi: 10.1155/2020/1878410. PMID: 32963884; PMCID: PMC7492903.

ABSTRACT

The COVID-19 pandemic, which started in Wuhan, China, has spread rapidly over the world with no known antiviral therapy or vaccine. Interestingly, traditional Chinese medicine helped in flattening the pandemic curve in China. In this study, molecules from African medicinal plants were analysed as potential candidates against multiple SARS-CoV-2 therapeutic targets. Sixty-five molecules from the ZINC database subset (AfroDb Natural Products) were virtually screened with some reported repurposed therapeutics against six SARS-CoV-2 and two human targets. Molecular docking, druglikeness, absorption, distribution, metabolism, excretion, and toxicity (ADMET) of the best hits were further simulated. Of the 65 compounds, only three, namely, 3-galloylcatechin, proanthocyanidin B1, and luteolin 7-galactoside found in almond (*Terminalia catappa*), grape (*Vitis vinifera*), and common verbena (*Verbena officinalis*), were able to bind to all eight targets better than the reported repurposed drugs. The findings suggest these molecules may play a role as therapeutic leads in tackling this pandemic due to their multitarget activity.

78. Ilesanmi, F. F., Ilesanmi, O. S., & Afolabi, A. A. (2021). **The effects of the COVID-19 pandemic on food losses in the agricultural value chains in Africa: The Nigerian case study.** *Public health in practice (Oxford, England)*, 2, 100087. <https://doi.org/10.1016/j.puhip.2021.100087>

ABSTRACT

The Coronavirus disease (COVID-19) pandemic has wrecked great havoc in many spheres of life, including the educational, health, economic, and agricultural sectors. To break the transmission chain of SARS-CoV-2, public health safety measures such as social distancing, regular hand hygiene, border closure, restrictions on internal movement, and lockdown were implemented. Some of these measures have however contributed to reduced economic power, shortage of labor for agricultural production, and huge losses in the agricultural sector. To avert the effects of the COVID-19 pandemic on food losses in the agricultural value chain in Nigeria, much precedence should be placed on adequate stakeholder engagement. Amid the COVID-19 pandemic, logistics for unhindered agricultural trade should be put in place. In addition, policy makers should implement the institutionalization and implementation of social protection system in Nigeria. To address the financial difficulties during the COVID-19 pandemic, provision of loans and grants should be commenced in an organized fashion.

KEYWORDS: Africa; Agricultural value chain; COVID-19; Coronavirus disease; Food losses; Nigeria.

79. Ilesanmi, O., & Afolabi, A. (2020). **Perception and practices during the COVID-19 pandemic in an urban community in Nigeria: a cross-sectional study.** *PeerJ*, 8, e10038. <https://doi.org/10.7717/peerj.10038>

ABSTRACT

BACKGROUND: Various perceptions and practices have been associated with the COVID-19 pandemic. In this study, we assessed the perception and practices regarding COVID-19 among residents in selected urban communities of Ibadan, Oyo State, Nigeria. **METHODS:** A descriptive cross-sectional study design using a multi-stage sampling technique was used to recruit 360 respondents (Mean age: 33.2 ± 10.6 years; 62.5% females) from households in Ibadan. Data were collected using an interviewer-administered questionnaire from 3rd to 6th June 2020. Those who demonstrated washing of the palm, back of the hand, spaces between the fingers, fingernails, wrist, and thumbs had six points and were categorized to have had a good practice of handwashing. Descriptive statistics were conducted. Bivariate analyses of sociodemographic characteristics and good handwashing practices were conducted using Chi-square test. Logistic regression was conducted to identify the determinants of good handwashing practices. P -values < 0.05 were statistically significant. **RESULTS:** Going to the hospital (95%) and calling the COVID-19 help number (58.3%) were the frequently reported practices among respondents following the development of COVID-19 symptoms. Also, 89 (26%) knew they could contract COVID-19, while 41 (12%) perceived it as an exaggerated event. The effects most frequently reported by respondents were hunger/low income (48.8%) and academic delay (8.8%). Use of face masks by 64.5% and social distancing (48%) were the most frequently reported practices for prevention. Only 71 (20.8%) demonstrated good hand washing practices. The perception of the likelihood to contract COVID-19 and practices to prevent COVID-19 had a weak correlation of 0.239 ($p < 0.001$). **CONCLUSION:** Gaps exist in the practices that prevent COVID-19. There is a need to improve hand

washing, use of face masks and other practices that prevent COVID-19. Implications across public health communication and policies were stated.

KEYWORDS: COVID-19; COVID-19 risk perception; Coronavirus; Hand washing practices; Nigeria.

80. Ijarotimi, O. A., Ubom, A. E., Olofinbiyi, B. A., Kuye-Kuku, T., Orji, E. O., & Ikimalo, J. I. (2020). **COVID-19 and obstetric practice: A critical review of the Nigerian situation.** *International journal of gynaecology and obstetrics: the official organ of the International Federation of Gynaecology and Obstetrics*, 10.1002/ijgo.13325. Advance online publication. <https://doi.org/10.1002/ijgo.13325>

ABSTRACT

OBJECTIVE: To review what is known about COVID-19 and highlight gaps in the context of Nigerian obstetric practice. Research data on COVID-19 are understandably sparse in Africa. Nigeria, like most African countries, is battling a disease she is poorly equipped to fight. **METHODS:** The current available literature on COVID-19 was reviewed in relation to obstetric practice in the Nigerian context, gaps were identified, and recommendations were made to improve the handling of the COVID-19 pandemic in Nigerian obstetric practice. **RESULTS:** In and out of hospital, both the obstetrician and the obstetric patient are constantly being put at risk of exposure to the coronavirus because testing and preventive measures are either ineffective or non-existent. **CONCLUSION:** The pandemic has exposed the gross inadequacies in Nigeria's healthcare system and is therefore a wake-up call to the need for a complete overhaul of infrastructure and services. The government will do well to increase the budget allocation for health from the current paltry 4.14% to the recommended 15% of the total budget.

KEYWORDS: COVID-19; Health workers; Nigeria; Obstetric practice.

81. Ishtiaq, Sadia Ms; Sehar, Naveed; and Shahid, Attaya, **Information Dissemination during Covid-19 and Lockdown: The Role of University libraries of Sindh, Pakistan.** (2020). *Library Philosophy and Practice (e-journal)*. 4280.

ABSTRACT: Universities librarians play vital and varied roles in the life of the university, guiding students and faculty at the reference desk, instructing library research sessions, and developing library collections. It is a truism to say that librarians in all sectors of an academic library wear many different hats and provide numerous services to patrons.

This research paper seeks to investigate the role of university libraries in this outbreak situation. The novel virus COVID-19 discovered as a global pandemic. This contagious virus changed working Style tradition to online because of the shutdown of all activities of life. The main objective of this study to find out those services, skills, instructional, and training programs being carried out during this period of the pandemic. Secondly, another aim of this study is to highlight how university libraries are contributing to their members for disseminating and mobilizing information during this emergency. In this study online survey research design used and covers 29 libraries from private sector universities of Sindh Province, Pakistan. The collected data were analyzed by the Statistical Package for Social Sciences (SPSS) software version23.0. Findings also revealed that highest percentage (79.3%) of the university library providing the services during the lockdown in contrast to few libraries relying on traditional services not

offered online services in this outbreak, lockdown period. The study concluded that in this new information era library staff, should always be ready to face a challenging situation. Mostly university libraries suggested in the future to adopt webinars services and focused on motivating, encouraging the librarians to enhance their digital skills to be in pace with the present digital age.

KEYWORDS: COVID -19, University Libraries, Outbreak, Digital Library, Lockdown, Online Services,

82. Isiekwe, I. G., Adeyemi, T. E., Aikins, E. A., & Umeh, O. D. (2020). **Perceived impact of the COVID-19 pandemic on orthodontic practice by orthodontists and orthodontic residents in Nigeria.** *Journal of the World federation of orthodontists*, 9(3), 123–128. <https://doi.org/10.1016/j.ejwf.2020.07.001>.

ABSTRACT

BACKGROUND: The Coronavirus Disease 2019 (COVID-19) pandemic has had far-reaching effects on orthodontic care delivery worldwide. This study aimed to assess the impacts of the pandemic on orthodontists and orthodontic residents in Nigeria.

METHODS: This cross-sectional study was conducted among consenting orthodontists and orthodontic residents. The respondents were contacted through the WhatsApp group of the Nigerian Association of Orthodontists to fill the self-administered online questionnaires (Google forms). The questionnaire had two sections: A, Sociodemographics; B, Perceived impact of the COVID-19 pandemic. Data were analyzed using Statistical Package for Social Sciences (SPSS) version 20. Descriptive statistics were used to compute mean and standard deviation and chi-square for association. Level of significance was set at $P < 0.05$. **RESULTS:** This study population comprised 98 people; however, only 73 participants responded, which represented a response rate of 74.5%. Approximately 60% (44) of the respondents thought that the COVID-19 pandemic would lead to a reduction in the number of orthodontic patients in the future, whereas almost all the respondents reported that it would affect their future practice of orthodontics. Most of the respondents (63.0%) reported that the pandemic had recorded a moderate to severe negative economic impact on them. Significant gender differences were recorded, in the social life of respondents, in addition to economic and psychosocial effects. **CONCLUSIONS:** Almost all respondents reported that they would change their future practice of orthodontics, particularly with respect to placing a greater emphasis on infection control. Most of the respondents reported perceived economic, psychosocial, and social impacts due to the pandemic.

KEYWORDS: COVID-19; Nigeria; Orthodontic practice; Perceived impact.

83. Ishola, A. A., Joshi, T., Abdulai, S. I., Tijjani, H., Pundir, H., & Chandra, S. (2021). **Molecular basis for the repurposing of histamine H2-receptor antagonist to treat COVID-19.** *Journal of biomolecular structure & dynamics*, 1–18. Advance online publication. <https://doi.org/10.1080>

ABSTRACT

With the world threatened by a second surge in the number of Coronavirus cases, there is an urgent need for the development of effective treatment for the novel coronavirus (COVID-19). Recently, global attention has turned to preliminary reports on the

promising anti-COVID-19 effect of histamine H₂-receptor antagonists (H₂RAs), most especially Famotidine. Therefore, this study was designed to exploit a possible molecular basis for the efficacy of H₂RAs against coronavirus. Molecular docking was performed between four H₂RAs, Cimetidine, Famotidine, Nizatidine, Ranitidine, and three non-structural proteins viz. NSP3, NSP7/8 complex, and NSP9. Thereafter, a 100 ns molecular dynamics simulation was carried out with the most outstanding ligands to determine the stability. Thereafter, Famotidine and Cimetidine were subjected to gene target prediction analysis using HitPickV2 and eXpression2Kinases server to determine the possible network of genes associated with their anti-COVID activities. Results obtained from molecular docking showed the superiority of Famotidine and Cimetidine compared to other H₂RAs with a higher binding affinity to all selected targets. Molecular dynamic simulation and MMPBSA results revealed that Famotidine as well as Cimetidine bind to non-structural proteins more efficiently with high stability over 100 ns. Results obtained suggest that Famotidine and Cimetidine could be a viable option to treat COVID-19 with a mechanism of action that involves the inhibition of viral replication through the inhibition of non-structural proteins. Therefore, Famotidine and Cimetidine qualify for further study as a potential treatment for COVID-19.

KEYWORDS: COVID-19; Molecular dynamic simulation; Nsps; famotidine; molecular docking.

84. Jelilov, G., Iorember, P. T., Usman, O., & Yua, P. M. (2020). **Testing the nexus between stock market returns and inflation in Nigeria: Does the effect of COVID-19 pandemic matter?** *Journal of public affairs*, e2289. Advance online publication. <https://doi.org/10.1002/pa.2289>

ABSTRACT

Given the palpable fear generated by the threat of COVID-19 pandemic and the bearish sentiments of stock investors, this study represents one of the first efforts towards testing the effect of COVID-19 on the stock market returns-inflation relationship. Specifically, the study investigates the stock market returns-inflation nexus by controlling for the effect of COVID-19 pandemic in Nigeria from February 27, 2020 to April 30, 2020. Using the estimation procedures based on the generalized autoregressive conditional heteroskedasticity type models (GARCH (1,1), the GJR-GARCH), and the accounting innovation tests, our results show that COVID-19 increases volatility and distorts the positive relationship between inflation and stock market returns, which tends to negate the Fisher's hypothesis. In addition, the results reveal that the negative effects of COVID-19 on the market returns and its disruption to the stock market returns-inflation relationship may not die away rapidly considering that the duration of the pandemic is unknown. Further, these findings are validated by the innovation accounting tests. Therefore, the study presents to policymakers the consequences of COVID-19 and the urgent need to strengthen the market through collaborative efforts.

85. Kotila, T. R., Alonge, T. O., Fowotade, A., Famuyiwa, O. I., & Akinbile, A. S. (2021). **Association of the ABO blood group with SARS-CoV-2 infection in a community with low infection rate.** *Vox sanguinis*, 10.1111/vox.13077. Advance online publication. <https://doi.org/10.1111/vox.13077>

ABSTRACT

BACKGROUND AND OBJECTIVES: Reports on the association of the ABO phenotypes with infection by the SARS-CoV-2 virus have mostly come from countries with high infection rates. This study examined the possible association between SARS-CoV-2 infection and the ABO phenotype in Black Africa. **MATERIALS AND METHODS:** This report is from a single centre where both asymptomatic and symptomatic patients were quarantined. At the time of this report, Oyo State, Nigeria had carried out 15 733 tests of which 3119 were positive for the virus with 1952 recoveries and 37 deaths. The ABO distribution of patients was compared with that of a blood donor population. **RESULTS:** Of the 302 participants, 297 (98%) had their blood group determined, asymptomatic and symptomatic individuals were 123 (40.7%) and 179 (59.3%) respectively. Blood group O was significantly less represented among the patients ($P < 0.01$) while blood groups B and AB were significantly more represented ($P < 0.01$, $P = 0.03$ respectively). Patients with anti-B (groups A and O) were significantly less represented than those without anti-B (B and/or AB): B and AB ($P < 0.001$), B ($P = 0.002$), AB ($P = 0.01$). There was no difference in the blood group distribution of symptomatic and asymptomatic patients (χ^2 (3, $N = 302$) = 2.29; $P = 0.51$), but symptomatic patients with anti-A (groups B and O) were more represented than asymptomatic patients with anti-A (χ^2 4.89; $P = 0.03$). **CONCLUSION:** The higher prevalence of blood group O and more potent beta haemolysins (anti-B antibodies) are likely reasons for the lower infectivity by the SARS-CoV-2 virus and severity of COVID-19 disease in the community.

KEYWORDS: COVID-19; antibodies; blood group; haemolysin; isoagglutinins; serology.

86. Lawal Y. (2021). **Africa's low COVID-19 mortality rate: A paradox?** *International journal of infectious diseases: IJID: official publication of the International Society for Infectious Diseases*, 102, 118–122. <https://doi.org/10.1016/j.ijid.2020.10.038>.

ABSTRACT

BACKGROUND: COVID-19 continues to spread worldwide, with high numbers of fatalities reported first in China, followed by even higher numbers in Italy, Spain, the UK, the USA, and other advanced countries. Most African countries, even with their less advanced healthcare systems, continue to experience lower COVID-19 mortality rates. This was the case as the pandemic reached its first peak, plateaued, and declined. It is currently rising again in some countries, though not as rapidly as before. This study aimed to determine the predictors of COVID-19 mortality rate. This may help explain why Africa's COVID-19 mortality rate is, ironically, lower than that of more advanced countries with better health systems. This will also assist various governments in balancing their COVID-19 restrictive and socioeconomic measures. **METHODOLOGY:** This was an analytical review, which used pre-COVID-19 era population data and current COVID-19 mortality figures to determine predictors of COVID-19 mortality rates. Pearson's correlation was used to test the association between some population variables and COVID-19 mortality rates. Next, stepwise multiple regression analysis was used to determine significant predictors of COVID-19 mortality rates. **RESULTS:** Significant positive predictors of COVID-19 mortality rate included pre-COVID-19 era '65-yr+ mortality %' ($R^2 = 0.574$, $B = 2.86$, $p < 0.001$), population mean age ($R^2 = 0.570$, $B = 4.77$, $p = 0.001$), and life expectancy ($R^2 = 0.524$, $B = 1.67$, $p = 0.008$). Pre-COVID-19 era CVD death rate was a negative predictor of COVID-19 mortality rate ($R^2 = 0.524$, $B = -0.584$, $p = 0.012$). **CONCLUSION:** Africa's

lower COVID-19 mortality rate is due to the lower population mean age, lower life expectancy, lower pre-COVID-19 era '65yr+ mortality rate', and smaller pool of people surviving and living with cardiovascular diseases.

KEYWORDS: Africa; COVID-19; cardiovascular disease; Case fatality rate; Elderly; Mortality rate.

87. Lucero-Prisno DE, Ogunkola IO, Imo UF, Adebisi YA. **Who Will Pay for the COVID-19 Vaccines for Africa?** Am J Trop Med Hyg. 2021 Jan 7. doi: 10.4269/ajtmh.20-1506. Epub ahead of print. PMID: 33427194.

ABSTRACT

Africa's health systems are strained by the COVID-19 pandemic. There are global efforts toward the development and trial of COVID-19 vaccines. However, considering the challenges and economic conditions of African nations, there could be limited access and availability of the vaccines on the continent. This will be the result of high cost and technical requirements to acquire the vaccines. There are indications that possible donor funding for COVID-19 vaccines from rich countries maybe put off considering the various challenges they face currently and the moves they are making in response to the disease. The issue of justice in health for protecting the vulnerable populations and regions also supports the need for COVID-19 vaccine availability on the African continent. Means to achieve uniform control of the disease burden across the globe should be adopted. Governments of African nations should also scale up their efforts toward COVID-19 vaccine acquisition and utilization through viable efforts. It is therefore important to assist the African continent in acquiring the COVID-19 vaccines by leveling all power dynamics that will affect access and distribution.

88. Lucero-Prisno, D. E., 3rd, Adebisi, Y. A., & Lin, X. (2020). **Current efforts and challenges facing responses to 2019-nCoV in Africa.** *Global health research and policy*, 5, 21. <https://doi.org/10.1186/s41256-020-00148-1>.

ABSTRACT

The novel coronavirus is a pandemic that has started to creep into Africa thus making the virus a truly global, health security threat. The number of new 2019-nCoV cases has been rising in Africa, though currently lower than the cases reported outside the region. African countries have activated their Emergency Operations Centres to coordinate responses and preparedness activities to the pandemic. A series of measures such as restricting travel, case detection and contact tracing, mandatory quarantine, guidance and information to the public among other efforts are being implemented across Africa. However, the presence of porous borders, the double burden of communicable and noncommunicable diseases, poverty, poor health literacy, infodemic and family clustering, and most of all, weak health systems, may make containment challenging. It is important for African countries to continue to intensify efforts and address the challenges to effectively respond to the uncertainty the pandemic poses.

KEYWORDS: 2019-nCoV, SARS-CoV-2, COVID-19, Coronavirus, Africa, Outbreak, Global Health, Pandemic

89. Mbanuzuru, A. V., Okoro, C. C., Mbanuzuru, C. M., & Ibeh, C. C. (2021). **Call for proper documentation of COVID-19 deaths in poor resource setting: a necessity for management of future occurrences.** *Expert review of anti-infective therapy*, 19(1), 17–21. <https://doi.org/10.1080/14787210.2020.1801418>

ABSTRACT

INTRODUCTION: A Pandemic is an epidemic at a global scale. The word 'epidemic' has the potential to lead to chaotic, unreasoned responses to health problems, especially when used by journalists. Nigeria like other poor resource countries is equally affected by the current coronavirus disease 2019 (COVID-19) pandemic. Standardization and proper documentation of the mortality of the COVID-19 in the poor-resource countries will help in managing other disease outbreaks in future. This paper calls for improvement in capturing of these data for better planning in the future. **AREAS COVERED:** Quality data is very essential for policy makers to appreciate any disease condition. In order to present a comprehensive picture of COVID-19 mortality, the deaths were broadly grouped into two as follows: direct and indirect COVID-19 deaths. Most of the current reported deaths seem to be direct deaths. **EXPERT OPINION:** We propose that for better estimation and standardization, verbal autopsy could be used to differentiate direct/indirect COVID deaths. At full development, this model could be applied to other diseases, outbreaks, or pandemics. The disease surveillance officers, and other health workers can be trained in this regard as well as scaling up the e-surveillance of the DSNOs.

KEYWORDS: COVID-19; Nigeria; deaths; disease surveillance notification officers (DSNOs); poor-resource setting.

90. Moti UG, Goon DT. **Novel Coronavirus Disease: A delicate balancing act between health and the economy.** *Pak J Med Sci.* 2020May;36(COVID19-S4):S134-S137. doi: 10.12669/pjms.36. COVID19-S4.2751. PMID: 32582333; PMCID: PMC7306950.

ABSTRACT

The emergence of the deadly novel Coronavirus Disease (COVID-19) has resuscitated global attention on the state of health governance and well-being of citizens. Worldwide, countries are in dire dilemma of safeguarding the health of their citizens and equally salvaging economy, arising from the social distancing and lockdown strategies, which affects negatively the economic activities. This paper examines the intricate balance between health and the economy in the wake of the Covid-19 pandemic and the policy options needed to assist countries to implement strategies to protect the health of their citizens and promote economic recovery in this unprecedented global crisis situation. There is need for a coordinated public-private sector partnership in the recovery plan of each country, taking into account their contextual and country specific health system and economy, but not discarding the universal application thereof. Global, regional, national geo-political and public health collaboration is needed to save the world from COVID-19 catastrophic consequences.

KEYWORDS: Disruption; Economy; Health; Mitigation; Pandemic.

91. Mahmoud, D. B., Shitu, Z., & Mostafa, A. (2020). **Drug repurposing of nitazoxanide: can it be an effective therapy for COVID-19?** *Journal, genetic engineering & biotechnology*, 18(1), 35. <https://doi.org/10.1186/s43141-020-00055-5>

ABSTRACT

BACKGROUND: The current outbreak of pandemic coronavirus disease 2019 (COVID-19) aggravates serious need for effective therapeutics. Over recent years, drug repurposing has been accomplished as an important opportunity in drug development as it shortens the time consumed for development, besides sparing the cost and the efforts exerted in the research and development process. The FDA-approved antiparasitic drug, nitazoxanide (NTZ), has been found to have antiviral activity against different viral infections such as coronaviruses, influenza, hepatitis C virus (HCV), hepatitis B virus (HBV), and other viruses signifying its potential as a broad-spectrum antiviral drug. Moreover, it has been recently reported that NTZ exhibited in vitro inhibition of SARS-CoV-2 at a small micromolar concentration. Additionally, NTZ suppresses the production of cytokines emphasizing its potential to manage COVID-19-induced cytokine storm. Furthermore, the reported efficacy of NTZ to bronchodilate the extremely contracted airways can be beneficial in alleviating COVID-19-associated symptoms. **SHORT CONCLUSION:** All these findings, along with the high safety record of the drug, have gained our interest to urge conductance of clinical trials to assess the potential benefits of using it in COVID-19 patients. Thus, in this summarized article, we review the antiviral activities of NTZ and highlight its promising therapeutic actions that make the drug worth clinical trials.

KEYWORDS: Broad spectrum antiviral; Bronchodilation; COVID-19; Cytokines; Repurposed nitazoxanide.

92. Makwe, C. C., Okunade, K. S., Rotimi, M. K., Ekor, O. E., Oyeleke, O. G., Bello, Q. O., Oluwole, A. A., Akase, I. E., Ezenwa, B. N., Fajolu, I. B., Dada, R. W., Oshodi, Y., Olatosi, J. O., Opanuga, O. O., Omilabu, S., Ezeaka, V. C., & Afolabi, B. B. (2020). **Caesarean delivery of first prediagnosed COVID-19 pregnancy in Nigeria.** *The Pan African medical journal*, 36, 100.

ABSTRACT

The COVID-19 pandemic is currently causing widespread infection and deaths around the world. Since the identification of the first case in Nigeria in February 2020, the number of confirmed cases has risen to over 9,800. Although pregnant women are not necessarily more susceptible to infection by the virus, changes to their immune system in pregnancy may be associated with more severe symptoms. Adverse maternal and perinatal outcomes have been reported among pregnant women with COVID-19 infection. However, literature is scarce on the peripartum management and pregnancy outcome of a pregnant woman with COVID-19 in sub-Saharan Africa. We report the first successful and uncomplicated caesarean delivery of a pregnant woman with COVID-19 infection in Nigeria.

KEYWORDS: COVID-19; Nigeria; SARS-CoV-2; caesarean section; delivery; pregnancy.

93. Mohammed M, Sha'aban A, Jatau AI, Yunusa I, Isa AM, Wada AS, Obamiro K, Zainal H, Ibrahim B. **Assessment of COVID-19 Information Overload Among the General Public.** *J Racial Ethn Health Disparities*. 2021 Jan 19:1–9. doi: 10.1007/s40615-020-00942-0. Epub ahead of print. PMID: 33469869; PMCID: PMC7815186.

ABSTRACT

BACKGROUND: A relentless flood of information accompanied the novel coronavirus 2019 (COVID-19) pandemic. False news, conspiracy theories, and magical cures were shared with the general public at an alarming rate, which may lead to increased anxiety and stress levels and associated debilitating consequences. **OBJECTIVES:** To measure the level of COVID-19 information overload (COVIO) and assess the association between COVIO and sociodemographic characteristics among the general public. **METHODS:** A cross-sectional online survey was conducted between April and May 2020 using a modified Cancer Information Overload scale. The survey was developed and posted on four social media platforms. The data were only collected from those who consented to participate. COVIO score was classified into high vs. low using the asymmetrical distribution as a guide and conducted a binary logistic regression to examine the factors associated with COVIO. **RESULTS:** A total number of 584 respondents participated in this study. The mean COVIO score of the respondents was 19.4 (\pm 4.0). Sources and frequency of receiving COVID-19 information were found to be significant predictors of COVIO. Participants who received information via the broadcast media were more likely to have high COVIO than those who received information via the social media (adjusted odds ratio ([aOR], 14.599; 95% confidence interval [CI], 1.608-132.559; p = 0.017). Also, participants who received COVID-19 information every minute (aOR, 3.892; 95% CI, 1.124-13.480; p = 0.032) were more likely to have high COVIO than those who received information every week. **CONCLUSION:** The source of information and the frequency of receiving COVID-19 information were significantly associated with COVIO. The COVID-19 information is often conflicting, leading to confusion and overload of information in the general population. This can have unfavorable effects on the measures taken to control the transmission and management of COVID-19 infection.

KEYWORDS: COVID-19; General public; Information overload.

94. Muhammad, D. G., & Abubakar, I. A. (2021). **COVID-19 lockdown may increase cardiovascular disease risk factors.** *The Egyptian heart journal : (EHJ) : official bulletin of the Egyptian Society of Cardiology*, 73(1), 2. <https://doi.org/10.1186/s43044-020-00127-4>

ABSTRACT

BACKGROUND: Coronavirus disease 2019 (COVID-19) is a disease caused by severe acute respiratory syndrome coronavirus 2 (SARS CoV-2) and was declared a worldwide pandemic by the World Health Organization (WHO) on 11 March 2020 which is leading to significant morbidity and mortality. In compliance with WHO recommendation of movement restrictions, many countries have imposed compulsory self-quarantine and restricted movements of their citizenries (lockdown/sit at home) and closure of businesses and borders as preventive measures to the fast-spreading virus. Consequently, this decision has made the emergence of behaviors that are detrimental to cardiovascular diseases (CVDs) which are the leading cause of the global mortality rate. **MAIN BODY:** The increase in sedentary lifestyles, alcohol consumption, and substance abuse during COVID-19 pandemic lockdown as a result of personal restrictions in COVID-19 lockdown is linked with the risk of death from chronic diseases such as cardiovascular diseases (CVDs). **CONCLUSION:** The lockdown has increased risk factors of CVDs, and as such, there might be an increase

in the number of non-communicable disease (NCD)-related mortality rate. The effect does not end during the period of coronavirus pandemic but even after the pandemic.

KEYWORDS: Alcohol; COVID-19; CVDs; Physical activity; Tobacco.

95. Mustapha, J. O., Abdullahi, I. N., Ajagbe, O., Emeribe, A. U., Fasogbon, S. A., Onoja, S. O., Ugwu, C. E., Umeozuru, C. M., Ajayi, F. O., Tanko, W. N., Omosigho, P. O., Aliyu, A. S., Shuwa, H. A., Nwofe, J. O., Dangana, A., Alaba, O., Ghamba, P. E., Ibrahim, Y., Aliyu, D., Animasaun, O. S., ... Oyewusi, S. (2021). **Understanding the implications of SARS-CoV-2 re-infections on immune response milieu, laboratory tests and control measures against COVID-19.** *Heliyon*, 7(1), e05951. <https://doi.org/10.1016/j.heliyon.2021.e05951>

ABSTRACT

Several months after the emergence of severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), cases of re-infection after recovery were reported. The extent and duration of protective immunity after SARS-CoV-2 infection is not fully understood. As such, the possibility of re-infection with SARS-CoV-2. Furthermore, cases of re-infection were mainly due to different variants or mutant SARS-CoV-2. Following the fast and pandemic-scale spread of COVID-19, mutations in SARS-CoV-2 have raised new diagnostic challenges which include the redesign of the oligonucleotide sequences used in RT-PCR assays to avoid potential primer-sample mismatches, and decrease sensitivities. Since the initial wave of the pandemic, some regions had experienced fresh outbreaks, predisposing people to be susceptible to SARS-CoV-2 re-infection. Hence, this article sought to offer detailed biology of SARS-CoV-2 re-infections and their implications on immune response milieu, diagnostic laboratory tests and control measures against COVID-19.

KEYWORDS: COVID-19; Diagnostic challenges; Immune evasion; Infection control; SARS-CoV-2 re-infection.

96. Nwakpu ES, Ezema VO, Ogbodo JN. **Nigeria media framing of coronavirus pandemic and audience response.** *Health Promot Perspect.* 2020 Jul 12;10(3):192-199. doi: 10.34172/hpp.2020.32. PMID: 32802755; PMCID: PMC7420160.

ABSTRACT

BACKGROUND: Part of the role of the media is to report any issue affecting the society to the masses. Coronavirus has become an issue of transnational concern. The importance of the media in the coverage of coronavirus disease 2019 (COVID-19) in Nigeria and its implications among Nigerian populace cannot be overestimated. This study evaluates how Nigerian media depict the coronavirus pandemic and how the depictions shape people's perception and response to the pandemic. **METHODS:** The study employed a quantitative design (newspaper content analysis and questionnaire). The content analysis examines the nature of media coverage of coronavirus in Nigeria and China using four major national newspapers (The Sun, The Vanguard, The Guardian and The Punch). The period of study ranged from January 2020 to March 2020. A total of 1070 newspaper items on coronavirus outbreak were identified across the four newspapers and content-analysed. **RESULTS:** The finding shows that the coverage of the pandemic was dominated by straight news reports accounting for 763 or (71.3%) of all analysed items. This was followed by opinions 169(15.8%), features 120 (11.2%) and editorials 18 (1.7%) respectively. The Punch 309 (28.9%) reported the outbreak more frequently than The Sun 266 (24.9%), The Guardian 258 (24.1%), and

Vanguard 237 (22.1%). Finding further suggests that the framing pattern adopted by the newspapers helped Nigerians to take precautionary measures. **CONCLUSION:** Continuous reportage of COVID-19 has proved effective in creating awareness about safety and preventive measures thereby helping to 'flatten the curve' and contain the spread of the virus. However, the newspapers should avoid creating fear/panic in reporting the pandemic.

KEYWORDS: COVID-19; Coronavirus; Framing pandemic; Media and coronavirus; SARS-CoV-2.

97. Nwozor, A., Okolie, C., Okidu, O., & Oshewolo, S. (2020). **The Looming Dangers of Explosion in Community Transmissions of COVID-19 in Nigeria.** *Annals of global health*, 86(1), 95. <https://doi.org/10.5334/aogh.2990Aug> 6;86(1):95. doi: 10.5334/aogh.2990. PMID: 32832388; PMCID: PMC7413142.

ABSTRACT

Currently, Nigeria is still at the ascending phase of the COVID-19 curve with no sign of deceleration. Thus, the recent decision by governors of states in northern Nigeria to deport Almajirai (itinerant Islamic school pupils) from their states as part of efforts to contain COVID-19 transmission is likely to have a serious backlash. With hundreds of Almajirai testing positive to COVID-19, and millions of others untested, they constitute ubiquitous nodes of transmission. Their deportation has created multiple emigration channels that constitute prospective feeders to covert community transmission. This viewpoint examines this trend within the context of Nigeria's current [in]capacity to manage the spread of COVID-19 and concludes that greater risks seem to lie ahead unless the government takes stringent containment measures.

98. Mantena, S., Rogo, K., & Burke, T. F. (2020). **Re-Examining the Race to Send Ventilators to Low-Resource Settings.** *Respiratory care*, 65(9), 1378–1381. <https://doi.org/10.4187/respcare.08185>

ABSTRACT

COVID-19 is devastating health systems globally and causing severe ventilator shortages. Since the beginning of the outbreak, the provision and use of ventilators has been a key focus of public discourse. Scientists and engineers from leading universities and companies have rushed to develop low-cost ventilators in hopes of supporting critically ill patients in developing countries. Philanthropists have invested millions in shipping ventilators to low-resource settings, and agencies such as the World Health Organization and the World Bank are prioritizing the purchase of ventilators. While we recognize the humanitarian nature of these efforts, merely shipping ventilators to low-resource environments may not improve outcomes of patients and could potentially cause harm. An ecosystem of considerable technological and human resources is required to support the usage of ventilators within intensive care settings. Medical-grade oxygen supplies, reliable electricity, bioengineering support, and consumables are all needed for ventilators to save lives. However, most ICUs in resource-poor settings do not have access to these resources. Patients on ventilators require continuous monitoring from physicians, nurses, and respiratory therapists skilled in critical care. Health care workers in many low-resource settings are already exceedingly overburdened, and pulling these essential human resources away from other critical patient needs could reduce the overall quality of patient care. When deploying medical devices, it is vital to align the technological intervention with the clinical reality. Low-income settings often will not benefit from resource-intensive equipment, but rather

from contextually appropriate devices that meet the unique needs of their health systems.

KEYWORDS: COVID-19; cost effectiveness; global health; low-resource settings; mechanical ventilation; resource allocation.

99. Motayo, B. O., Oluwasemowo, O. O., Olusola, B. A., Akinduti, P. A., Arege, O. T., Obafemi, Y. D., Faneye, A. O., Isibor, P. O., Aworunse, O. S., & Oranusi, S. U. (2021). **Evolution and genetic diversity of SARS-CoV-2 in Africa using whole genome sequences.** *International journal of infectious diseases: IJID: official publication of the International Society for Infectious Diseases*, 103, 282–287. <https://doi.org/10.1016/j.ijid.2020.11.190>

ABSTRACT

BACKGROUND: The ongoing SARS-CoV-2 pandemic was introduced into Africa on 14th February 2020 and has rapidly spread across the continent causing a severe public health crisis and mortality. We investigated the genetic diversity and evolution of this virus during the early outbreak months, between 14th February to 24th April 2020, using whole genome sequences. **METHODS:** We performed recombination analysis against closely related CoV strains, Bayesian time scaled phylogeny, and investigation of spike protein amino acid mutations. **RESULTS:** Recombination signals were observed between the Afr-SARS-CoV-2 sequences and reference sequences within the RdRPs and S genes. The evolutionary rate of the Afr-SARS-CoV-2 was 4.133×10^{-4} Highest Posterior Density (HPD 4.132×10^{-4} to 4.134×10^{-4}) substitutions/site/year. The time to most recent common ancestor (TMRCA) of the African strains was December 7th 2019, (95% HPD November 12th 2019–December 29th 2019). The Afr-SARCoV-2 sequences diversified into two lineages A and B, with B being more diverse with multiple sub-lineages confirmed by both maximum clade credibility (MCC) tree and PANGOLIN software. There was a high prevalence of the D614G spike protein amino acid mutation 59/69 (82.61%) among the African strains. **CONCLUSION:** This study has revealed a rapidly diversifying viral population with the G614G spike protein variant dominating advocate for up scaling NGS sequencing platforms across Africa to enhance surveillance and aid control effort of SARS-CoV-2 in Africa.

KEYWORDS: Africa; Phylogeny; SARSCoV-2; Virus evolution.

100. Muhammad, L., Algehyne, E., Usman, S., Ahmad, A., Chakraborty, C., & Mohammed, I. (2021). **Supervised Machine Learning Models for Prediction of COVID-19 Infection using Epidemiology Dataset.** *SN computer science*, 2(1), 11. <https://doi.org/10.1007/s42979-020-00394-7>

ABSTRACT

COVID-19 or 2019-nCoV is no longer pandemic but rather endemic, with more than 651,247 people around world having lost their lives after contracting the disease. Currently, there is no specific treatment or cure for COVID-19, and thus living with the disease and its symptoms is inevitable. This reality has placed a massive burden on limited healthcare systems worldwide especially in the developing nations. Although neither an effective, clinically proven antiviral agents' strategy nor an approved vaccine exist to eradicate the COVID-19 pandemic, there are alternatives that may reduce the huge burden on not only limited healthcare systems but also the economic sector; the

most promising include harnessing non-clinical techniques such as machine learning, data mining, deep learning and other artificial intelligence. These alternatives would facilitate diagnosis and prognosis for 2019-nCoV pandemic patients. Supervised machine learning models for COVID-19 infection were developed in this work with learning algorithms which include logistic regression, decision tree, support vector machine, naïve Bayes, and artificial neural network using epidemiology labeled dataset for positive and negative COVID-19 cases of Mexico. The correlation coefficient analysis between various dependent and independent features was carried out to determine a strength relationship between each dependent feature and independent feature of the dataset prior to developing the models. The 80% of the training dataset were used for training the models while the remaining 20% were used for testing the models. The result of the performance evaluation of the models showed that decision tree model has the highest accuracy of 94.99% while the Support Vector Machine Model has the highest sensitivity of 93.34% and Naïve Bayes Model has the highest specificity of 94.30%.

KEYWORDS: COVID-19; Dataset; Decision tree; Machine learning; Pandemic.

101. Muhammad, D. G., & Abubakar, I. A. (2021). **COVID-19 lockdown may increase cardiovascular disease risk factors.** *The Egyptian heart journal : (EHJ) : official bulletin of the Egyptian Society of Cardiology*, 73(1), 2. <https://doi.org/10.1186/s43044-020-00127-4>

ABSTRACT

BACKGROUND: Coronavirus disease 2019 (COVID-19) is a disease caused by severe acute respiratory syndrome coronavirus 2 (SARS CoV-2) and was declared a worldwide pandemic by the World Health Organization (WHO) on 11 March 2020 which is leading to significant morbidity and mortality. In compliance with WHO recommendation of movement restrictions, many countries have imposed compulsory self-quarantine and restricted movements of their citizenries (lockdown/sit at home) and closure of businesses and borders as preventive measures to the fast-spreading virus. Consequently, this decision has made the emergence of behaviors that are detrimental to cardiovascular diseases (CVDs) which are the leading cause of the global mortality rate. **MAIN BODY:** The increase in sedentary lifestyles, alcohol consumption, and substance abuse during COVID-19 pandemic lockdown as a result of personal restrictions in COVID-19 lockdown is linked with the risk of death from chronic diseases such as cardiovascular diseases (CVDs). **CONCLUSION:** The lockdown has increased risk factors of CVDs, and as such, there might be an increase in the number of non-communicable disease (NCD)-related mortality rate. The effect does not end during the period of coronavirus pandemic but even after the pandemic.

KEYWORDS: Alcohol; COVID-19; CVDs; Physical activity; Tobacco.

102. Nachega, J. B., Atteh, R., Ihekweazu, C., Sam-Agudu, N. A., Adejumo, P., Nsanzimana, S., Rwagasore, E., Condo, J., Paleker, M., Mahomed, H., Suleman, F., Ario, A. R., Kiguli-Malwadde, E., Omaswa, F. G., Sewankambo, N. K., Viboud, C., Reid, M., Zumla, A., & Kilmarx, P. H. (2021). **Contact Tracing and the COVID-19 Response in Africa: Best Practices, Key Challenges, and Lessons Learned from Nigeria, Rwanda, South Africa, and Uganda.** *The American journal of tropical medicine and hygiene*, tpm210033. Advance online publication. <https://doi.org/10.4269/ajtmh.21-0033>

ABSTRACT

Most African countries have recorded relatively lower COVID-19 burdens than Western countries. This has been attributed to early and strong political commitment and robust implementation of public health measures, such as nationwide lockdowns, travel restrictions, face mask wearing, testing, contact tracing, and isolation, along with community education and engagement. Other factors include the younger population age strata and hypothesized but yet-to-be confirmed partially protective cross-immunity from parasitic diseases and/or other circulating coronaviruses. However, the true burden may also be underestimated due to operational and resource issues for COVID-19 case identification and reporting. In this perspective article, we discuss selected best practices and challenges with COVID-19 contact tracing in Nigeria, Rwanda, South Africa, and Uganda. Best practices from these country case studies include sustained, multi-platform public communications; leveraging of technology innovations; applied public health expertise; deployment of community health workers; and robust community engagement. Challenges include an overwhelming workload of contact tracing and case detection for healthcare workers, misinformation and stigma, and poorly sustained adherence to isolation and quarantine. Important lessons learned include the need for decentralization of contact tracing to the lowest geographic levels of surveillance, rigorous use of data and technology to improve decision-making, and sustainment of both community sensitization and political commitment. Further research is needed to understand the role and importance of contact tracing in controlling community transmission dynamics in African countries, including among children. Also, implementation science will be critically needed to evaluate innovative, accessible, and cost-effective digital solutions to accommodate the contact tracing workload.

103. Nwosu, U. I., & Obite, C. P. (2021). **Modeling Ivory Coast COVID-19 cases: Identification of a high-performance model for utilization.** *Results in physics*, 20, 103763. <https://doi.org/10.1016/j.rinp.2020.103763>

ABSTRACT

This study modelled the reported daily cumulative confirmed, discharged and death Coronavirus disease 2019 (COVID-19) cases using six econometric models in simple, quadratic, cubic and quartic forms and an autoregressive integrated moving average (ARIMA) model. The models were compared employing R-squared and Root Mean Square Error (RMSE). The best model was used to forecast confirmed, discharged and death COVID-19 cases for October 2020 to February 2021. The predicted number of confirmed and death COVID-19 cases are alarming. Good planning and innovative approaches are required to prevent the forecasted alarming infection and death in Ivory Coast. The applications of findings of this study will ensure that the COVID-19 does not crush the Ivory Coast's health, economic, social and political systems.

KEYWORDS: ARIMA; COVID-19 cases; Early warning; Econometric models; Pandemic disease.

104. Nnama-Okechukwu, C. U., Chukwu, N. E., & Nkechukwu, C. N. (2020). **COVID-19 in Nigeria: Knowledge and compliance with preventive measures.** *Social work in public health*, 35(7), 590–602. <https://doi.org/10.1080/19371918.2020.1806985>

ABSTRACT

The novel coronavirus pandemic has upended the world as we knew it and is a concern for governments globally. With cases still surging in different regions around the globe, the level of knowledge of COVID-19 and compliance with preventive measures still differ across cultural regions. Our study explored knowledge of COVID-19 and compliance with preventive measures among community members in Anambra State, Nigeria, using in-depth interviews (IDI). Data were sourced from 36 persons comprising 30 household heads age 48 years and above and six children age 13-17 years. Data were analyzed thematically. Findings revealed that a majority of the respondents believe that the COVID-19 pandemic is more of a hoax than reality. Other findings showed that this poor knowledge negatively affected their compliance with preventive measures to curb the spread of coronavirus. To improve knowledge on the coronavirus pandemic, we recommended dissemination of accurate information to ensure compliance with preventive measures.

KEYWORDS: COVID-19; Community transmission; coronavirus; physical/social distancing; social work.

105. Nweze, V. N., Anosike, U. G., Ogunwusi, J. F., Adebisi, Y. A., & Lucero-Prisno, D. E., 3rd (2021). **Prison health during the COVID-19 era in Africa.** *Public health in practice (Oxford, England)*, 2, 100083. <https://doi.org/10.1016/j.puhip.2021.100083>

ABSTRACT

The world is facing a dreadful outbreak of a novel disease, COVID-19, that has claimed the lives of thousands. African countries have recorded the least number of COVID-19 cases despite their weak healthcare systems. However, African prisons could be an hotspot for the spread of the virus. In this article, we focused on describing certain possibilities of an uncontrollable outbreak of this pandemic in African prisons considering the overcrowding, poor access to healthcare among inmates, and already existing abuse of human rights. We hypothesized that negligence to prison health in Africa during this pandemic could lead to devastating events. It is therefore important that inmates are not forgotten in COVID-19 responses.

KEYWORDS: African prisons; COVID-19; Infectious disease; Prison health.

106. Ogueji, I. A., Okoloba, M. M., & Demoko Ceccaldi, B. M. (2021). **Coping strategies of individuals in the United Kingdom during the COVID-19 pandemic.** *Current psychology (New Brunswick, N.J.)*, 1–7. Advance online publication. <https://doi.org/10.1007/s12144-020-01318-7>

ABSTRACT

The United Kingdom (UK) was among the hardest-hit by the COVID-19 pandemic. It is, therefore, imperative to understand the coping strategies of individuals in the UK during the pandemic to develop appropriate programs and policies for them. A heterogeneous sample of 50 UK residents (15 males & 35 females) with an age range of 18-55 years were recruited using a snowball technique from Facebook between April and May 2020. Participants responded to 4 open-ended questions (that were generated through consultation with literature and 2 health practitioners) that sought to explore their coping strategies during the COVID-19 pandemic. Thematic analysis was applied

to analyze data using a data-driven method. Eleven themes were found: "socializing with loved ones (e.g., through video calls)", "engaging in exercise", "being occupied with jobs", "being occupied with studies", "avoiding negative news on COVID-19", "consumption of alcohol", "healthy eating", "engaging in meditation activities", "gaming activities", "hope", and "self-care and self-appreciation", in that order. Positive and maladaptive coping strategies were employed by some individuals in the UK during the COVID-19 pandemic. This, therefore, echoes the need for appropriate psychosocial support programs that strengthen positive coping strategies and mitigate maladaptive coping strategies during the COVID-19 pandemic.

KEYWORDS: COVID-19 pandemic; Coping strategies; Qualitative research; U.K.

107. Ogboghodo, E. O., Osaigbovo, I. I., Obarisiagbon, O. O., Okwara, B. U., Obaseki, D. E., Omo-Ikirodah, O. T., Ehinze, E. S., Adio, F., Nwaogwugwu, J. C., & Esegbe, E. F. (2021). **Facility-Based Surveillance Activities for COVID-19 Infection and Outcomes among Healthcare Workers in a Nigerian Tertiary Hospital.** *The American journal of tropical medicine and hygiene*, tpm201402. Advance online publication. <https://doi.org/10.4269/ajtmh.20-1402>

ABSTRACT

COVID-19 in healthcare workers (HCWs) can result in nosocomial transmission, depletion in available workforce, and enhanced community transmission. This article describes surveillance for COVID-19 in HCWs at a tertiary healthcare facility and documents the outcomes. A descriptive cross-sectional study of all HCWs identified from surveillance for COVID-19 from March 31 to August 31, 2020 was conducted. Healthcare workers were categorized as high risk and low risk using an adapted the WHO Risk Assessment tool. Nasopharyngeal and oropharyngeal swab specimens obtained from high-risk subjects were tested by a reverse transcriptase PCR method. Data were analyzed with IBM SPSS version 25.0 software (IBM SPSS Statistics for Windows, Version 25.0, Armonk, NY), and results were presented as frequencies and percentages. The level of significance was set at $P < 0.05$. During 5 months of surveillance, 1,466 HCWs with a mean age of 38.1 ± 9.7 years were identified as contacts. On risk assessment, 328 (22.4%) were adjudged high risk. High risk was associated with increasing age ($P < 0.001$), male gender ($P = 0.001$), and nonclinical staff ($P = 0.002$). Following testing, 78 (5.3%) in the high-risk category were confirmed to have COVID-19. There was no record of COVID-19 in HCWs adjudged low risk. Forty-four (56.4%) cases were epidemiologically linked to the community, 20 (25.7%) to patients, and 14 (17.9%) to another HCW. Surveillance and risk assessment are crucial to COVID-19 response in healthcare facilities and revealed HCW infections with predominantly nonoccupational epidemiological links in this study.

108. Olagunju, A., Fowotade, A., Olagunoye, A., Ojo, T. O., Adefuye, B. O., Fagbamigbe, A. F., Adebisi, A. O., Olagunju, O. I., Ladipo, O. T., Akinloye, A., Adeagbo, B. A., Onayade, A., Bolaji, O. O., Happi, C., Rannard, S., & Owen, A. (2021). **Efficacy and safety of nitazoxanide plus atazanavir/ritonavir for the treatment of moderate to severe COVID-19 (NACOVID): A structured summary of a study protocol for a randomised controlled trial.** *Trials*, 22(1), 3. <https://doi.org/10.1186/s13063-020-04987-8>

ABSTRACT

OBJECTIVES: TO investigate the efficacy and safety of repurposed antiprotozoal and antiretroviral drugs, nitazoxanide and atazanavir/ritonavir, in shortening the time to clinical improvement and achievement of SARS-CoV-2 polymerase chain reaction (PCR) negativity in patients diagnosed with moderate to severe COVID-19. **TRIAL DESIGN:** This is a pilot phase 2, multicentre 2-arm (1:1 ratio) open-label randomised controlled trial. **PARTICIPANTS:** Patients with confirmed COVID-19 diagnosis (defined as SARS-CoV-2 PCR positive nasopharyngeal swab) will be recruited from four participating isolation and treatment centres in Nigeria: two secondary care facilities (Infectious Diseases Hospital, Olodo, Ibadan, Oyo State and Specialist State Hospital, Asubiaro, Osogbo, Osun State) and two tertiary care facilities (Obafemi Awolowo University Teaching Hospitals Complex, Ile-Ife, Osun State and Olabisi Onabanjo University Teaching Hospital, Sagamu, Ogun State). These facilities have a combined capacity of 146-bed COVID-19 isolation and treatment ward. **INCLUSION CRITERIA:** Confirmation of SARS-CoV-2 infection by PCR test within two days before randomisation and initiation of treatment, age bracket of 18 and 75 years, symptomatic, able to understand study information and willingness to participate. Exclusion criteria include the inability to take orally administered medication or food, known hypersensitivity to any of the study drugs, pregnant or lactating, current or recent (within 24 hours of enrolment) treatment with agents with actual or likely antiviral activity against SARS-CoV-2, concurrent use of agents with known or suspected interaction with study drugs, and requiring mechanical ventilation at screening. **INTERVENTION AND COMPARATOR:** Participants in the intervention group will receive 1000 mg of nitazoxanide twice daily orally and 300/100 mg of atazanavir/ritonavir once daily orally in addition to standard of care while participants in the control group will receive only standard of care. Standard of care will be determined by the physician at the treatment centre in line with the current guidelines for clinical management of COVID-19 in Nigeria. **MAIN OUTCOME MEASURES:** Main outcome measures are: (1) Time to clinical improvement (defined as time from randomisation to either an improvement of two points on a 10-category ordinal scale (developed by the WHO Working Group on the Clinical Characterisation and Management of COVID-19 infection) or discharge from the hospital, whichever came first); (2) Proportion of participants with SARS-CoV-2 polymerase chain reaction (PCR) negative result at days 2, 4, 6, 7, 14 and 28; (3) Temporal patterns of SARS-CoV-2 viral load on days 2, 4, 6, 7, 14 and 28 quantified by RT-PCR from saliva of patients receiving standard of care alone versus standard of care plus study drugs. **RANDOMISATION:** Allocation of participants to study arm is randomised within each site with a ratio 1:1 based on randomisation sequences generated centrally at Obafemi Awolowo University. The model was implemented in REDCap and includes stratification by age, gender, viral load at diagnosis and presence of relevant comorbidities. **BLINDING:** None, this is an open-label trial. **NUMBER TO BE RANDOMISED (SAMPLE SIZE):** 98 patients (49 per arm). **TRIAL STATUS:** Regulatory approval was issued by the National Agency for Food and Drug Administration and Control on 06 October 2020 (protocol version number is 2.1 dated 06 August 2020). Recruitment started on 9 October 2020 and is anticipated to end before April 2021. **TRIAL REGISTRATION:** The trial has been registered on ClinicalTrials.gov (July 7, 2020), with identifier number [NCT04459286](https://clinicaltrials.gov/ct2/show/study/NCT04459286) and on Pan African Clinical Trials Registry (August 13, 2020), with identifier number PACTR202008855701534 . **FULL PROTOCOL:** The full protocol is attached as an additional file which will be made available on the trial website. In the interest of expediting dissemination of this material, the traditional formatting has been eliminated, and this letter serves as a summary of the key elements in the full protocol. The study protocol has been reported in accordance with the Standard Protocol Items:

Recommendations for Clinical Interventional Trials (SPIRIT) guidelines (Additional file 2).

KEYWORDS: COVID-19; SARS-CoV-2; atazanavir/ritonavir; nitazoxanide; protocol; randomised controlled trial.

109. Olayanju, O., Bamidele, O., Edem, F., Eseile, B., Amoo, A., Nwaokenye, J., Udeh, C., Oluwole, G., Odok, G., & Awah, N. (2021). **SARS-CoV-2 Seropositivity in Asymptomatic Frontline Health Workers in Ibadan, Nigeria.** *The American journal of tropical medicine and hygiene*, 104(1), 91–94. <https://doi.org>

ABSTRACT

Global health has been thrown into turmoil by the COVID-19 pandemic, which has caused devastating morbidity and unprecedented loss of life in almost all continents of the world. It was predicted that the magnitude of the pandemic in Africa will be high because of poor health structure and intensely poor living condition, but that has not happened, surprisingly. It was hypothesized that the youthful population and a vastly primed immune system were protective, and many people may have been exposed without coming down with the severe disease. Most of them would have presented in hospitals with other medical conditions and possibly transmit COVID-19 to health workers inadvertently. This study is designed to measure serum SARS-CoV-2 IgG levels in health workers as a marker of latent exposure. Asymptomatic frontline health workers were randomly selected from the University College Hospital Ibadan, Nigeria; venous blood samples were obtained from them, and the serum SARS-CoV-2 IgG level was determined using ELISA techniques. A proportion of participants with seropositivity were obtained, and factors associated with seropositivity were determined. A total of 133 participants were recruited for this study, and 60 (45.1%) of them were seropositive for SARS-CoV-2. Among the seropositive participants were doctors, nurses, health assistants, laboratory scientists and technicians, and nonmedical staff. Obstetrics, gynecology, and emergency departments had higher odds of seropositivity. Seroprevalence of SARS-CoV-2 is very high among frontline health workers, though asymptomatic. This calls for a more stringent precaution against further spread within the hospital environment.

110. Okereke, M., Ukor, N. A., Adebisi, Y. A., Ogunkola, I. O., Favour Iyagbaye, E., Adiela Owor, G., & Lucero-Prisno, D. E., 3rd (2021). **Impact of COVID-19 on access to healthcare in low- and middle-income countries: Current evidence and future recommendations.** *The International journal of health planning and management*, 36(1), 13–17. <https://doi.org/10.1002/hpm.3067>

ABSTRACT

The COVID-19 pandemic continues to be a major public health threat globally and low- and middle-income countries (LMICs) are not an exception. The impact of the COVID-19 pandemic is far-reaching on many areas including but not limited to global health security, economic and healthcare delivery with a potential impact on access to healthcare in LMICs. We evaluate the impact of the COVID-19 pandemic on access to healthcare in LMICs, as well as plausible strategies that can be put in place to ensure that the delivery of healthcare is not halted. In order to mitigate the devastating effect of the COVID-19 pandemic on the already weak health systems in LMICs, it is much

necessary to reinforce and scale up interventions and proactive measures that will ensure that access to healthcare is not disrupted even in course of the pandemic.

KEYWORDS: COVID-19; LMICs; access; coronavirus; healthcare; pandemic.

- 112.Okoye O. G. (2021). **Implementing trauma resuscitation protocol in COVID 19 Era: Our modifications at the national trauma centre, Abuja, Nigeria.** *Nigerian journal of clinical practice*, 24(1), 138–141. https://doi.org/10.4103/njcp.njcp_352_20

ABSTRACT

Trauma remains the leading cause of death in individuals less than 45 years. Management of major trauma is protocol driven around the world. Most protocols are in line with the popular Advanced Trauma Life Support (ATLS) principles. These principles have been adjudged to be safe and consistent even in the presence of infectious diseases while employing standard precautions. In view of the current community spread, large cases of COVID 19 in the Federal Capital Territory (FCT) and the magnitude of the infectivity, it has become necessary to adjust our local trauma resuscitation protocols in order to ensure the safety of the trauma team and the trauma patients as well.

KEYWORDS: COVID 19; protocol; resuscitation; trauma.

- 113.Oladapo, B. I., Ismail, S. O., Afolalu, T. D., Olawade, D. B., & Zahedi, M. (2021). **Review on 3D printing: Fight against COVID-19.** *Materials chemistry and physics*, 258, 123943. <https://doi.org/10.1016/j.matchemphys.2020.123943>

ABSTRACT

The outbreak of coronavirus disease in 2019 (COVID-19) caused by the SARS-CoV-2 virus and its pandemic effects have created a demand for essential medical equipment. To date, there are no specific, clinically significant licensed drugs and vaccines available for COVID-19. Hence, mapping out COVID-19 problems and preventing the spread with relevant technology are very urgent. This study is a review of the work done till October, 2020 on solving COVID-19 with 3D printing. Many patients who need to be hospitalized because of COVID-19 can only survive on bio-macromolecules antiviral respiratory assistance and other medical devices. A bio-cellular face shield with relative comfortability made of bio-macromolecules polymerized polyvinyl chloride (BPVC) and other biomaterials are produced with 3D printers. Summarily, it was evident from this review study that additive manufacturing (AM) is a proffered technology for efficient production of an improved bio-macromolecules capable of significant COVID-19 test and personal protective equipment (PPE) to reduce the effect of COVID-19 on the world economy. Innovative AM applications can play an essential role to combat invisible killers (COVID-19) and its hydra-headed pandemic effects on humans, economics and society.

KEYWORDS: Additive manufacturing/3D printing; COVID-19 pandemic; Health; Medical devices; PPE.

- 114.Omotuyi, I. O., Nash, O., Ajiboye, O. B., Iwegbulam, C. G., Oyinloye, E. B., Oyedeji, O. A., Kashim, Z. A., & Okaiyeto, K. (2020). **Atomistic simulation reveals structural mechanisms underlying D614G spike glycoprotein-enhanced fitness in SARS-COV-2.** *Journal of computational chemistry*, 41(24),

ABSTRACT

D614G spike glycoprotein (sgp) mutation in rapidly spreading severe acute respiratory syndrome coronavirus-2 (SARS-COV-2) is associated with enhanced fitness and higher transmissibility in new cases of COVID-19 but the underlying mechanism is unknown. Here, using atomistic simulation, a plausible mechanism has been delineated. In G614 sgp but not wild type, increased D(G)614-T859 C α -distance within 65 ns is interpreted as S1/S2 protomer dissociation. Overall, ACE2-binding, post-fusion core, open-state and sub-optimal antibody-binding conformations were preferentially sampled by the G614 mutant, but not wild type. Furthermore, in the wild type, only one of the three sgp chains has optimal communication route between residue 614 and the receptor-binding domain (RBD); whereas, two of the three chains communicated directly in G614 mutant. These data provide evidence that D614G sgp mutant is more available for receptor binding, cellular invasion and reduced antibody interaction; thus, providing framework for enhanced fitness and higher transmissibility in D614G SARS-COV-2 mutant.

KEYWORDS: COVID-19; SARS-COV-2; molecular dynamics simulation; mutation; spike glycoprotein.

- 115.Ogoina D. (2020). **COVID-19: The Need for Rational Use of Face Masks in Nigeria.** *The American journal of tropical medicine and hygiene*, 103(1), 33–34. <https://doi.org/10.4269/ajtmh.20-0433>

ABSTRACT

Because of the pandemic of COVID-19, the federal government of Nigeria has instituted a mandatory policy requiring everyone going out in public to wear face masks. Unfortunately, the Nigeria media is awash with images of misuse and abuse of face masks by the public, government officials, and healthcare workers. Medical masks are used widely in community settings amid reported scarcity within healthcare facilities. It is observed that some people wear face masks on their chin and neck, and mask wearers give no attention to covering their mouth and nose, especially when talking. Used face masks are kept with personal belongings or disposed indiscriminately in public spaces, leading to self and environmental contamination. Inappropriate use and disposal of face masks in Nigeria could promote the spread of the novel coronavirus in the country and negate the country's efforts to contain the COVID-19 pandemic. In the implementation of the universal masking policy in Nigeria, federal and state governments ought to consider local applicability, feasibility, and sustainability, as well as identify and mitigate all potential risks and unintended consequences. Also critical is the need for intensive public sensitization and education on appropriate use and disposal of face masks in the country.

- 116.Onwuamah, C. K., Okwuraiwe, A. P., Salu, O. B., Shaibu, J. O., Ndodo, N., Amoo, S. O., Okoli, L. C., Ige, F. A., Ahmed, R. A., Bankole, M. A., Sokei, J. O., Mutiu, B. P., Ayorinde, J., Saka, B. A., Obiekea, C., Mba, N., Adegbola, R. A., Omilabu, S., Ihekweazu, C., Salako, B. L., ... Audu, R. (2021). **Comparative performance of SARS-CoV-2 real-time PCR diagnostic assays on samples from Lagos, Nigeria.** *PloS one*, 16(2), e0246637. <https://doi.org/10.1371/journal.pone.0246637>

ABSTRACT

A key element in containing the spread of the SARS-CoV-2 infection is quality diagnostics which is affected by several factors. We now report the comparative performance of five real-time diagnostic assays. Nasopharyngeal swab samples were obtained from persons seeking a diagnosis for SARS-CoV-2 infection in Lagos, Nigeria. The comparison was performed on the same negative, low, and high-positive sample set, with viral RNA extracted using the Qiagen Viral RNA Kit. All five assays are one-step reverse transcriptase real-time PCR assays. Testing was done according to each assay's manufacturer instructions for use using real-time PCR platforms. 63 samples were tested using the five qPCR assays, comprising of 15 negative samples, 15 positive samples (Ct = 16-30; one Ct = 35), and 33 samples with Tib MolBiol E-gene Ct value ranging from 36-41. All assays detected all high positive samples correctly. Three assays correctly identified all negative samples while two assays each failed to correctly identify one different negative sample. The consistent detection of positive samples at different Ct/Cq values gives an indication of when to repeat testing and/or establish more stringent in-house cut-off value. The varied performance of different diagnostic assays, mostly with emergency use approvals, for a novel virus is expected. Comparative assays' performance reported may guide laboratories to determine both their repeat testing Ct/Cq range and/or cut-off value.

- 117.Osseni I. A. (2020). COVID-19 pandemic in sub-Saharan Africa: preparedness, response, and hidden potentials. *Tropical medicine and health*, 48, 48. <https://doi.org/10.1186/s41182-020-00240-9>

ABSTRACT

After the detection of coronavirus disease 2019 (COVID-19) first reported case in Nigeria, the virus has spread to all sub-Saharan Africa (SSA). Through different initiatives, SSA countries came together to create goal-driven taskforces to improve their responses against the virus. As COVID-19 raises major concerns over the scarcity of medical supplies, numbers of SSA countries adopted innovative solutions to fill in their shortage. This health crisis may come as an opportunity for SSA to demonstrate its pandemic readiness, responses, and reveal unknown potential.

KEYWORDS: COVID-19; Pandemic; Potential; Preparedness; Response; Sub-Saharan Africa.

- 118.Oladipo, E. K., Ajayi, A. F., Odeyemi, A. N., Akindiya, O. E., Adebayo, E. T., Oguntomi, A. S., Oyewole, M. P., Jimah, E. M., Oladipo, A. A., Ariyo, O. E., Oladipo, B. B., & Oloke, J. K. (2020). **Laboratory diagnosis of COVID-19 in Africa: availability, challenges and implications.** *Drug discoveries & therapeutics*, 14(4), 153–160. <https://doi.org/10.5582/ddt.2020.03067>

ABSTRACT

The COVID-19 infection has been a matter of urgency to tackle around the world today, there exist 200 countries around the world and 54 countries in Africa that the COVID-19 infection cases have been confirmed. This situation prompted us to look into the challenges African laboratories are facing in the diagnosis of novel COVID-19 infection. A limited supply of essential laboratory equipment and test kits are some of the challenges faced in combatting the novel virus in Africa. Also, there is inadequate skilled personnel, which might pose a significant danger in case there is a surge in COVID-19 infection cases. The choice of diagnostic method in Africa is limited as there are only two available diagnostic methods being used out of the six methods used

globally, thereby reducing the opportunity of supplementary diagnosis, which will further lead to inappropriate diagnosis and affect the accuracy of diagnostic reports. Furthermore, challenges like inadequate power supply, the method used in sample collection, storage and transportation of specimens are also significant as they also pose their respective implication. From the observations, there is an urgent need for more investment into the laboratories for proper, timely, and accurate diagnosis of COVID-19.

KEYWORDS: Africa; COVID-19; challenges; implications; laboratory diagnosis.

119. Onawole, A. T., Sulaiman, K. O., Kolapo, T. U., Akinde, F. O., & Adegoke, R. O. (2020). **COVID-19: CADD to the rescue.** *Virus research*, 285, 198022. <https://doi.org/10.1016/j.virusres.2020.198022>

ABSTRACT

The recent outbreak of the deadly COVID-19 disease, being caused by the novel coronavirus (SARS-CoV-2), has put the world on red alert as it keeps spreading and recording more fatalities. Research efforts are being carried out to curtail the disease from spreading as it has been declared as of global health emergency. Hence, there is an exigent need to identify and design drugs that are capable of curing the infection and hinder its continual spread across the globe. Herein, a computer-aided drug design tool known as the virtual screening method was used to screen a database of 44 million compounds to find compounds that have the potential to inhibit the surface glycoprotein responsible for virus entry and binding. The consensus scoring approach selected three compounds with promising physicochemical properties and favorable molecular interactions with the target protein. These selected compounds can undergo lead optimization to be further developed as drugs that can be used in treating the COVID-19 disease.

KEYWORDS: CADD; COVID-19; Coronavirus; SARS-CoV-2; Virtual screening; Zoonotic diseases.

120. Omotuyi IO, Nash O, Ajiboye BO, Olumekun VO, Oyinloye BE, Osuntokun OT, Olonisakin A, Ajayi AO, Olusanya O, Akomolafe FS, Adelakun N. **Aframomum melegueta secondary metabolites exhibit polypharmacology against SARS-CoV-2 drug targets: in vitro validation of furin inhibition.**

ABSTRACT

COVID-19 pandemic is currently decimating the world's most advanced technologies and largest economies and making its way to the continent of Africa. Weak medical infrastructure and over-reliance on medical aids may eventually predict worse outcomes in Africa. To reverse this trend, Africa must re-evaluate the only area with strategic advantage; phytotherapy. One of the many plants with previous antiviral potency is against RNA viruses is *Aframomum melegueta*. In this study, one hundred (100) *A. melegueta* secondary metabolites have been mined and computational evaluated for inhibition of host furin, and SARS-COV-2 targets including 3C-like proteinase ($M^{pro}/3CL^{pro}$), 2'-O-ribose methyltransferase (nsp16) and surface glycoprotein/ACE2 receptor interface. Silica-gel column partitioning of *A. melegueta* fruit/seed resulted in 6 fractions tested against furin activity. Diarylheptanoid (Letestuienin A), phenylpropanoid (4-Cinnamoyl-3-hydroxy-spiro[furan-5,2'-(1'H)-indene]-1',2,3'(2'H,5H)-trione), flavonoids (Quercetin, Apigenin and Tectochrysin)

have been identified as high-binding compounds to SARS-COV-2 targets in a polypharmacology manner. Di-ethyl-ether ($IC_{50} = 0.03$ mg/L), acetone ($IC_{50} = 1.564$ mg/L), ethyl-acetate ($IC_{50} = 0.382$ mg/L) and methanol ($IC_{50} = 0.438$ mg/L) fractions demonstrated the best inhibition in kinetic assay while DEF, ASF and MEF completely inhibited furin-recognition sequence containing Ebola virus-pre-glycoprotein. In conclusion, *A. melegueta* and its secondary metabolites have potential for addressing the therapeutic needs of African population during the COVID-19 pandemic.

KEYWORDS: *Aframomum melegueta*; COVID-19; Diarylheptanoid; SARS-COV-2; flavonoids; phenylpropanoid.

121. Olapegba, P. O., Iorfa, S. K., Kolawole, S. O., Oguntayo, R., Gandi, J. C., Ottu, I., & Ayandele, O. (2020). **Survey data of COVID-19-related Knowledge, Risk Perceptions and Precautionary Behavior among Nigerians.** *Data in brief*, 30, 105685. <https://doi.org/10.1016/j.dib.2020.105685>.

ABSTRACT

In response to the global call for strategic information to understand the novel coronavirus, the dataset presented in this paper is an examination of COVID-19-related knowledge, risk perceptions and precautionary health behavior among Nigerians. The data were generated during the COVID-19 lockdown in the country through a survey distributed via an online questionnaire, assessing socio-demographic information (7 items), knowledge (5 items), information sources (1 item), risk perception (9 items), expected end of lockdown (1 item), and COVID-19 precautionary health behavior (10 items), from 28th March to 4th April, 2020, gathering a total of 1,357 responses. A combination of purposive and snowball techniques helped to select the respondents via Whatsapp and Facebook from 180 cities/towns in the 6 geopolitical zones of Nigeria. The survey data were analyzed using descriptive statistics. The entire dataset is stored in a Microsoft Excel Worksheet (xls) and the questionnaire is attached as a supplementary file. The data will assist in curbing the Coronavirus pandemic by offering evidence for strategic and targeted interventions as well as health policy formulations and implementation.

KEYWORDS: COVID-19; Knowledge; Nigeria; Precautionary Behavior; Risk Perceptions; Survey data.

122. Odukoya, O. O., Adeleke, I. A., Jim, C. S., Isikekpei, B. C., Obiodunukwe, C. M., Lesi, F. E., Osibogun, A. O., & Ogunsola, F. T. (2020). **Evolutionary trends of the COVID-19 epidemic and effectiveness of government interventions in Nigeria: A data-driven analysis.** *medRxiv: the preprint server for health sciences*, 2020.05.29.20110098. <https://doi.org/10.1101/2020.05.29.20110098>

ABSTRACT

BACKGROUND: Nigeria became the first sub-Saharan African country to record a case of COVID-19 after an imported case from Italy was confirmed on February 27, 2020. Moving averages and the Epidemic Evaluation Indices (EEI) are two important but complementary methods useful in monitoring epidemic trends, they can also serve as a useful guide for policy makers and inform the timing of decisions on preventive measures. The objectives of this paper are to graphically depict the trends of new COVID-19 cases nationally and in two key States (Lagos and Kano) and the Federal Capital Territory (FCT) using the moving averages and the EEI. In addition, we

examined the effects of government's public health interventions on the spread of COVID-19 and appraise the progress made so far in addressing the challenges of COVID-19 in Nigeria. **METHODS:** We used data on new cases of COVID-19 from public sources released by the Nigeria Center for Disease Control (NCDC) from the 27th February 2020, when the first case was recorded, to 11th May, 2020, one week after the lockdowns in Lagos and the FCT were lifted. We computed moving averages of various orders, the log transformations of the moving averages and then the EEIs of new COVID-19 cases for Nigeria as a whole, and then for two of the most affected states i.e., Lagos and Kano, as well as the Federal Capital Territory (FCT). Then, we plotted graphs to depict these indices and show the epidemic trends for COVID-19 in each scenario. **RESULTS:** Nationally, the number of new cases of COVID-19 showed an initial gradual rise from the first reported case on the 27th February 2020. However, by the second week in April, these numbers began to show a relatively sharper increase and this trend has continued till date. Similar trends were observed in Lagos state and the FCT. The rate of growth of the logarithm-transformed moving average in the period leading to, and including the lockdowns reduced by a factor of 0.65. This suggests that the policies put in place by the government including the lockdown measures in Lagos and the FCT may have had a positive effect on the development of new cases of COVID-19 in Nigeria. Nationally and in Lagos, the EEIs of the COVID-19 cases started off on very high notes, however, the effects of the lockdown gradually became evident by the end of April and early May 2020, as the EEIs headed closer to 1.0. In all case scenarios, the EEIs are still above 1.0. **CONCLUSIONS AND RECOMMENDATIONS:** The number of new cases of COVID-19 has been on a steady rise since the first reported case. In Nigeria especially across the two states and the FCT, public health interventions including the lockdown measures appear to have played a role in reducing the rate of increase of new infections. The EEIs are still above 1.0, suggesting that despite the progress that appears to have been made, the epidemic is still evolving and Nigeria has not yet reached her peak for COVID-19 cases. We recommend that aggressive public health interventions and restrictions against mass gatherings should be sustained.

- 123.Ogundele, I. O., Alakaloko, F. M., Nwokoro, C. C., & Ameh, E. A. (2020). **Early impact of COVID-19 pandemic on paediatric surgical practice in Nigeria: a national survey of paediatric surgeons.** *BMJ paediatrics open*, 4(1), e000732. <https://doi.org/10.1136/bmjpo-2020-000732>

ABSTRACT

Introduction: The novel coronavirus disease has had significant impact on healthcare globally. Knowledge of this virus is evolving; definitive care is not yet known and mortality is increasing. We assessed its initial impact on paediatric surgical practice in Nigeria, creating a benchmark for recommendations and future reference. **METHODS:** Survey of 120 paediatric surgeons from 50 centres to assess sociodemographics and specific domains of impact of COVID-19 on their services and training in Nigeria. Valid responses were represented as categorical data and presented in percentages. Duplicate submissions for centres were excluded by combining and taking the mean of responses from centres with multiple respondents. **RESULTS:** Response rate was 74 (61%). Forty-six (92%) centres had suspended elective surgeries. All centres continued emergency surgeries but volume reduced in March by 31%. Eleven (22%) centres reported 13 suspended elective cases presenting as emergencies in March, accounting for 3% of total emergency surgeries. Twelve (24%) centres adopted new modalities for managing selected surgical conditions: non-operative reduction of intussusception in 1

(2%), antibiotic management of uncomplicated acute appendicitis in 5 (10%) and more conservative management of trauma and replacement of laparoscopic appendectomy with open surgery in 3 (6%), respectively. Low perception of adequacy of personal protective equipment (PPE) was reported in 35 (70%) centres. Forty (80%) centres did not offer telemedicine for patients' follow-up. Twenty-nine (58%) centres had suspended academic training. Perception of safety to operate was low in 37 (50%) respondents, indifferent in 24% and high in 26%. **CONCLUSION:** Majority of paediatric surgical centres reported cessation of elective surgeries while continuing emergencies. There was, however, an acute decline in the volume of emergency surgeries. Adequate PPE needs to be provided and preparations towards handling backlog of elective surgeries once the pandemic recedes. Further study is planned to more conclusively understand the full impact of this pandemic on children's surgery.

KEYWORDS: health services research.

- 124.Ogundokun, R. O., Lukman, A. F., Kibria, G., Awotunde, J. B., & Aladeitan, B. B. (2020). **Predictive modelling of COVID-19 confirmed cases in Nigeria.** *Infectious Disease Modelling*, 5, 543–548. <https://doi.org/10.1016/j.idm.2020.08.003>

ABSTRACT

The coronavirus outbreak is the most notable world crisis since the Second World War. The pandemic that originated from Wuhan, China in late 2019 has affected all the nations of the world and triggered a global economic crisis whose impact will be felt for years to come. This necessitates the need to monitor and predict COVID-19 prevalence for adequate control. The linear regression models are prominent tools in predicting the impact of certain factors on COVID-19 outbreak and taking the necessary measures to respond to this crisis. The data was extracted from the NCDC website and spanned from March 31, 2020 to May 29, 2020. In this study, we adopted the ordinary least squares estimator to measure the impact of travelling history and contacts on the spread of COVID-19 in Nigeria and made a prediction. The model was conducted before and after travel restriction was enforced by the Federal government of Nigeria. The fitted model fitted well to the dataset and was free of any violation based on the diagnostic checks conducted. The results show that the government made a right decision in enforcing travelling restriction because we observed that travelling history and contacts made increases the chances of people being infected with COVID-19 by 85% and 88% respectively. This prediction of COVID-19 shows that the government should ensure that most travelling agency should have better precautions and preparations in place before re-opening.

KEYWORDS: COVID-19; Diagnostic checks; Linear regression model; Ordinary least squares estimator; Pandemic; Prediction.

- 125.Olusola, A., Olusola, B., Onafeso, O., Ajiola, F., & Adelabu, S. (2020). **Early geography of the coronavirus disease outbreak in Nigeria.** *GeoJournal*, 1–15. Advance online publication. <https://doi.org/10.1007/s10708-020-10278-10>

ABSTRACT

An understanding of the COVID-19 spread is growing around the world, yet little is known of Africa. This paper explores the time-space geographies of COVID-19

infection focusing on Africa and Nigeria especially. We appraise the global-to-local situation of confirmed cases, deaths and recoveries as well as measures engaged in response to the pandemic. Findings reveal that South Africa accounts for 40% of the total confirmed cases in Africa, followed by Egypt (18%), Nigeria (6.8%), Ghana (4.6%) and Algeria (3.6). Our study shows a significant relationship between population density and COVID-19 cases in Nigeria ($R^2 = 0.76$; $y = 2.43x - 268.7$). This expression suggests that high population densities catalyze the spread of COVID-19. While Nigeria has only recorded about 25,964 cases as at the time of writing, the country is struggling to match pressures from rising cases as a result of existing disparities in health care systems.

KEYWORDS: COVID-19; Health care; Nigeria; Population densities; Time–space geographies.

126. Olubiyi, O. O., Olagunju, M., Keutmann, M., Loschwitz, J., & Strodel, B. (2020). **High Throughput Virtual Screening to Discover Inhibitors of the Main Protease of the Coronavirus SARS-CoV-2.** *Molecules (Basel, Switzerland)*, 25(14), 3193. <https://doi.org/10.3390/molecules25143193>

ABSTRACT

We use state-of-the-art computer-aided drug design (CADD) techniques to identify prospective inhibitors of the main protease enzyme, 3CL^{pro} of the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) causing COVID-19. From our screening of over one million compounds including approved drugs, investigational drugs, natural products, and organic compounds, and a rescreening protocol incorporating enzyme dynamics via ensemble docking, we have been able to identify a range of prospective 3CL^{pro} inhibitors. Importantly, some of the identified compounds had previously been reported to exhibit inhibitory activities against the 3CL^{pro} enzyme of the closely related SARS-CoV virus. The top-ranking compounds are characterized by the presence of multiple bi- and monocyclic rings, many of them being heterocycles and aromatic, which are flexibly linked allowing the ligands to adapt to the geometry of the 3CL^{pro} substrate site and involve a high amount of functional groups enabling hydrogen bond formation with surrounding amino acid residues, including the catalytic dyad residues H41 and C145. Among the top binding compounds, we identified several tyrosine kinase inhibitors, which include a bioflavonoid, the group of natural products that binds best to 3CL^{pro}. Another class of compounds that decently binds to the SARS-CoV-2 main protease are steroid hormones, which thus may be endogenous inhibitors and might provide an explanation for the age-dependent severity of COVID-19. Many of the compounds identified by our work show a considerably stronger binding than found for reference compounds with in vitro demonstrated 3CL^{pro} inhibition and anticoronavirus activity. The compounds determined in this work thus represent a good starting point for the design of inhibitors of SARS-CoV-2 replication.

KEYWORDS: COVID-19; docking; drug repurposing; in silico drug design; natural products; viral replication inhibition.

127. Okunade, K. S., Okunowo, A. A., Ohazurike, E. O., & Anorlu, R. I. (2020). **Good clinical practice advice for the management of patients with gynaecological cancer during the COVID-19 pandemic in Nigeria and other resource-constrained countries.** *Ecancermedicalscience*, 14, 1075.

ABSTRACT

The impact of the COVID-19 pandemic on healthcare services in settings with under-resourced health systems such as that of Nigeria is likely to be substantial in the coming months. The gynecological oncology services still need to be prioritized as an essential core health service. There are increasing concerns from both physicians and patients regarding how to manage patients diagnosed with cancer during this pandemic as evidence suggests a substantial increase in the risk of COVID-19-related deaths amongst patients with cancer. However, we recognise that despite this great challenge, we must continue to provide the highest quality of care to the patients, whereas, at the same time, ensure adequate safety not only for the patients and their families but also for the entire oncology team. We advocate that due to the widespread travel restrictions and inability to refer patients for the highest level of care at this period, centres without radiotherapy facilities as seen in most resource-limited settings should always consider lower-level care options such as the use of chemotherapy pending when there is a better access to these facilities. We, therefore, developed this good clinical practice advice to staff of the gynaecological oncology unit in the centre and other resource-constrained settings for the management of patients with gynaecological cancer during the COVID-19 pandemic.

KEYWORDS: COVID-19; Nigeria; cancer treatment; coronavirus; gynaecological oncology.

128. Onyeaghala, A. A., & Olajide, I. (2020). **Managing COVID-19 outbreak in Nigeria: matters arising.** *Clinical chemistry and laboratory medicine*, 58(10), 1645–1650. <https://doi.org/10.1515/cclm-2020-0748>

ABSTRACT

Severe Acute Respiratory Syndrome - novel Coronavirus 2 (SARS-nCoV-2), was first reported in Wuhan, China, in December, 2019. Since the outbreak, the virus has infected more than 9,866,685 individuals, 4,983,029 treated and discharged and 495,692 deaths globally. The first Coronavirus Disease 2019 (COVID-19) in Nigeria was imported in February, 2020 and since then community transmission has been prevalent. As at the time of writing this report, Nigeria has reported about 23,298 cases of COVID-19, 8,253 treated and discharged and 554 deaths, giving a case mortality ratio of 2.4%. While responsible government agencies and international partners have been working hard to curtail the spread of the disease, we present in this report, some matters arising from managing COVID-19 pandemic in Nigeria; and proffered suggestions which could help not only in managing the current COVID-19 pandemic, but also for winning future outbreaks of public health significance with a view to curtailing global health security.

KEYWORDS: COVID-19; SARS-nCoV 2; coronavirus; laboratory network; outbreak.

129. Oyeyemi, A., Adesina, A., & Ogoina, D. (2020). **Fumigation of Schools for COVID-19 Prevention in Nigeria: The Need for a Rethink.** *The American journal of tropical medicine and hygiene*, 103(4), 1370–1371. Advance online publication. <https://doi.org/10.4269/ajtmh.20-1037>.

ABSTRACT

The government of Nigeria ordered closure of schools to slow the spread of COVID-19 when the pandemic hit the country. About 5 months into the outbreak, secondary schools have been reopened to allow students to write their terminal examinations. Many state governments and school owners are fumigating their schools as a way of disinfecting the school environment and ensuring safe resumption of academic activities. We discuss the undue attention given to fumigation in this instance and stress the importance of addressing more beneficial and sustainable strategies to prevent COVID-19 in Nigerian schools.

130. Olabumuyi, A. A., Ali-Gombe, M., Biyi-Olutunde, O. A., Gbolahan, O., Iwuji, C. O., Joseph, A. O., Lasebikan, N. N., Ogunnorin, B. O., Omikunle, A. E., Salako, O., & Salawu, A. (2020). **Oncology practice in the COVID-19 pandemic: a report of a Nigerian expert panel discussion (oncology care in Nigeria during the COVID-19 pandemic).** *The Pan African medical journal*, 36, 153. <https://doi.org/10.11604/pamj.2020.36.153.23662>

ABSTRACT

Since the first case of COVID-19 and its progression to a pandemic, healthcare systems the world over have experienced severe difficulties coping with patient care for both COVID-19 and other diseases most especially non communicable diseases like cancer. These difficulties in Low- and middle-income countries (LMICs), especially in Sub-Saharan Africa including Nigeria, are myriad. These LMICs are already bedeviled weak health systems, ill equipped cancer treatment centers, with outdated machines and grossly inadequate numbers of oncologists required to treat patients with cancer. As a result of these challenges coupled with unclear guidelines on how to manage cancer patients in the wake of the COVID-19 pandemic, 11 key Nigerian opinion leaders had a consensus meeting to identify challenges and possible workable solutions on continuing cancer care during the COVID-19 pandemic. The discussion highlighted ethical issues, barriers to continuing cancer care (such as lockdown, fear of contracting disease, downscaled health services) and resource constraints such as unavailable personal protective equipment. Yet, practical solutions were proffered such as necessary protective measures, case by case prioritization or de-prioritization, telemedicine and other achievable means in the Nigerian setting.

KEYWORDS: COVID-19; Low- and middle-income countries; Personal protective equipment; cancer; guidelines.

131. Oleribe, O. O., Osita-Oleribe, P., Salako, B. L., Ishola, T. A., Fertleman, M., & Taylor-Robinson, S. D. (2020). **COVID-19 Experience: Taking the Right Steps at the Right Time to Prevent Avoidable Morbidity and Mortality in Nigeria and Other Nations of the World.** *International journal of general medicine*, 13, 491–495. <https://doi.org/10.2147/IJGM.S261256>

ABSTRACT

The 2020 Coronavirus pandemic has caused countless governmental and societal challenges around the world. Nigeria, Africa's most populous nation, has been exposed in recent years to a series of epidemics including Ebola and Lassa fever. In this paper, we document our perception of the national response to COVID-19 in Nigeria. The response to the pandemic is with a healthcare system that has changed as a result of

previous infectious disease outbreaks but in the context of scarce resources typical of many low-middle income countries. We make recommendations regarding what measures should be in place for future epidemics.

KEYWORDS: COVID-19; Nigeria; pandemic; prevention.

- 132.Okoye J. O. (2020). **Attitudinal, regional and sex related vulnerabilities to COVID-19: Considerations for early flattening of curve in Nigeria.** *Medical journal of the Islamic Republic of Iran*, 34, 61. <https://doi.org/10.34171/mjiri.34.61>

ABSTRACT

Background: In Nigeria, the policies and interventions due to the COVID-19 pandemic are majorly directed at businesses and relief. There are no clear plans to identify individuals with comorbidities associated with high morbidity and fatality rates. This paper identifies comorbidities associated with high morbidity and fatalities of COVID-19 across countries and vulnerable groups in Nigeria. METHODS: Peer-reviewed articles published between 2010 and 2020 retrieved from Google scholar, African Journal Online, EMBASE, Scopus, and MEDLINE/PubMed (central) were systematically reviewed. RESULTS: The pooled prevalence of hypertension is the lowest in North Central Nigeria (22.0%) and the highest in South-Eastern Nigeria (33.6%) while the pooled prevalence of diabetes mellitus (DM) is lowest in North-Western Nigeria (3.0%) and highest in South-Southern Nigeria (9.8%). Significant differences in the frequency of comorbidities (hypertension, DM, cardiovascular disease, cancer, and chronic kidney disease; CKD) and complications (cardiac injury and acute respiratory disease syndrome; ARDS) were observed between fatal and non-fatal cases of COVID-19 ($p < 0.0001$). There were significant correlations between hypertension and ARDS ($p = 0.002$), DM and ARDS ($p = 0.010$), hypertension and CKD ($p < 0.0001$), DM and CKD ($p = 0.033$), and hypertension and DM ($p = 0.001$). CONCLUSION: High prevalence of comorbidity may be predictive of high COVID-19 morbidity and mortality. Thus, to flatten the curve early intervention funds should be appropriately allocated based on the prevalence of comorbidities in the geopolitical zones. Such high-risk groups should be identified, stratified and actively monitored during treatment to prevent the development or progression of complications such as cardiac injury and ARDS.

KEYWORDS: COVID-19; Cancer; Cardiac injury; Comorbidities; Fatality.

- 133.Oginni, O. A., Amiola, A., Adelola, A., & Uchendu, U. (2020). **A commentary on the Nigerian response to the COVID-19 pandemic.** *Psychological trauma : theory, research, practice and policy*, 10.1037/tra0000743. Advance online publication. <https://doi.org/10.1037/tra0000743>

ABSTRACT

In this commentary, we review the emergence of the COVID-19 pandemic in Nigeria and how aspects of the socioeconomic context and responses from the government and general public may contribute to its persistence. We also suggest mechanisms for the adverse mental health impacts of the pandemic and highlight the need for data and strengthening social infrastructure.

- 134.Ogaugwu, C., Mogaji, H., Ogaugwu, E., Nebo, U., Okoh, H., Agbo, S., & Agbon, A. (2020). **Effect of Weather on COVID-19 Transmission and Mortality in Lagos, Nigeria.** *Scientifica*, 2020, 2562641. <https://doi.org/10.1155/2020/2562641>

ABSTRACT

The novel coronavirus disease 2019 (COVID-19) has become a global pandemic with more than 4 million confirmed cases and over 280,000 confirmed deaths worldwide. Evidence exists on the influence of temperature and humidity on the transmission of related infectious respiratory diseases, such as influenza and severe acute respiratory syndrome (SARS). (This study therefore explored the effects of daily temperature and humidity on COVID-19 transmission and mortality in Lagos state, the epicenter of COVID-19 in Nigeria. Correlation analysis was performed using incidence data on COVID-19 and meteorological data for the corresponding periods from 9th March to 12th May, 2020. Our results showed that atmospheric temperature has a significant weak negative correlation with COVID-19 transmission in Lagos. Also, a significant weak negative correlation was found to exist between temperature and cumulative mortality. (e strength of the relationship between temperature and the disease incidence increased when 1 week and 2 weeks' predetection delays were put into consideration. However, no significant association was found between atmospheric humidity and COVID-19 transmission or mortality in Lagos. (is study contributes more knowledge on COVID-19 and will benefit efforts and decision-making geared towards its control.

- 135.Okuonghae, D., & Oname, A. (2020). Analysis of a mathematical model for COVID-19 population dynamics in Lagos, Nigeria. *Chaos, solitons, and fractals*, 139, 110032. <https://doi.org/10.1016/j.chaos.2020.110032>.

ABSTRACT

This work examines the impact of various non-pharmaceutical control measures (government and personal) on the population dynamics of the novel coronavirus disease 2019 (COVID-19) in Lagos, Nigeria, using an appropriately formulated mathematical model. Using the available data, since its first reported case on 16 March 2020, we seek to develop a predicative tool for the cumulative number of reported cases and the number of active cases in Lagos; we also estimate the basic reproduction number of the disease outbreak in the aforementioned State in Nigeria. Using numerical simulations, we show the effect of control measures, specifically the common social distancing, use of face mask and case detection (via contact tracing and subsequent testings) on the dynamics of COVID-19. We also provide forecasts for the cumulative number of reported cases and active cases for different levels of the control measures being implemented. Numerical simulations of the model show that if at least 55% of the population comply with the social distancing regulation with about 55% of the population effectively making use of face masks while in public, the disease will eventually die out in the population and that, if we can step up the case detection rate for symptomatic individuals to about 0.8 per day, with about 55% of the population complying with the social distancing regulations, it will lead to a great decrease in the incidence (and prevalence) of COVID-19.

KEYWORDS: COVID-19; Case-Detection; Face-Mask; Model-Fitting; Simulations; Social distancing.

- 136.Ogunkola, I. O., Adebisi, Y. A., Imo, U. F., Odey, G. O., Esu, E., & Lucero-Prisno, D. E., 3rd (2020). **Rural communities in Africa should not be forgotten in responses to COVID-19.** *The International journal of health planning and management*, 10.1002/hpm.3039. Advance online

ABSTRACT

Rural areas in Africa make up a large proportion of the continent. Since the emergence of COVID-19 on the continent, major attention and responses have been placed on urban areas. Rural areas are typified by certain challenges which may serve as limitations to the provision of resources and tools for COVID-19 responses in these areas. These major challenges include limited access to these areas due to poor road networks which may hamper the possibility of conveying resources and manpower. Shortage of healthcare workforce in these areas, poor health facilities/structures and limited access to COVID-19 diagnostics services may also make containment challenging. It is therefore important that investment should be made in these areas towards providing the necessary tools, resources, and manpower to ensure effective containment of COVID-19 and to alleviate the plight caused by the pandemic in rural Africa. Rural communities in Africa should not be left behind in COVID-19 responses.

KEYWORDS: Africa; COVID-19; challenges; responses; rural areas.

- 137.Ohia C, Bakarey AS, Ahmad T. **COVID-19 and Nigeria: putting the realities in context.** *Int J Infect Dis.* 2020 Jun;95:279-281. doi: 10.1016/j.ijid.2020.04.062. Epub 2020 Apr 27. PMID: 32353547; PMCID: PMC7184999.

ABSTRACT

BACKGROUND: Coronavirus disease 2019 (COVID-19), which was previously known as 2019-novel coronavirus (2019-nCoV), was first reported in Wuhan, China in December 2019. The disease evolved into a serious global emergency, leading to its declaration as a pandemic. **DISCUSSION:** On the African continent, Nigeria is just experiencing the direct effects of this pandemic, having recorded her index case in February 2020, with an increasing number of cases every day and a current case fatality ratio of 0.03 as at 13 April 2020. Although the recorded cases may seem low, it has been forecast that Africa will have some of the worst effects of this disease by the end of the pandemic. Generally, African countries have fragile health systems and this remains a source of concern, especially in the event of increased outbreaks. Nigeria's current national health systems cannot effectively respond to the growing needs of already infected patients requiring admission into intensive care units for acute respiratory diseases and severe acute respiratory syndrome (SARS COV-2) pneumonia. This has grim implications for Nigeria, especially as increased cases loom that may require critical care. Provision of quarantine or isolation facilities and availability of rapid diagnostic kits for fast and reliable testing and diagnosis of the disease can also be a challenge in Africa. **CONCLUSION:** There is an urgent need to put into perspective these realities peculiar to Africa including Nigeria and explore available collective measures and interventions to address the COVID-19 pandemic.

KEYWORDS: Africa; Collaborations; Coronavirus; Critical care; Health systems; Interventions; Nigeria.

- 138.Ojo, A. S., Balogun, S. A., Williams, O. T., & Ojo, O. S. (2020). **Pulmonary Fibrosis in COVID-19 Survivors: Predictive Factors and Risk Reduction Strategies.** *Pulmonary medicine*, 2020, 6175964. <https://doi.org/10.1155/2020/6175964>.

ABSTRACT

Although pulmonary fibrosis can occur in the absence of a clear-cut inciting agent, and without a clinically clear initial acute inflammatory phase, it is more commonly associated with severe lung injury. This may be due to respiratory infections, chronic granulomatous diseases, medications, and connective tissue disorders. Pulmonary fibrosis is associated with permanent pulmonary architectural distortion and irreversible lung dysfunction. Available clinical, radiographic, and autopsy data has indicated that pulmonary fibrosis is central to severe acute respiratory distress syndrome (SARS) and MERS pathology, and current evidence suggests that pulmonary fibrosis could also complicate infection by SARS-CoV-2. The aim of this review is to explore the current literature on the pathogenesis of lung injury in COVID-19 infection. We evaluate the evidence in support of the putative risk factors for the development of lung fibrosis in the disease and propose risk mitigation strategies. We conclude that, from the available literature, the predictors of pulmonary fibrosis in COVID-19 infection are advanced age, illness severity, length of ICU stay and mechanical ventilation, smoking and chronic alcoholism. With no proven effective targeted therapy against pulmonary fibrosis, risk reduction measures should be directed at limiting the severity of the disease and protecting the lungs from other incidental injuries.

- 139.Oladunni, F. S., Park, J. G., Chiem, K., Ye, C., Pipenbrink, M., Walter, M. R., Kobie, J., & Martinez-Sobrido, L. (2021). **Selection, identification, and characterization of SARS-CoV-2 monoclonal antibody resistant mutants.** *Journal of virological methods*, 290, 114084. Advance online publication. <https://doi.org/10.1016/j.jviromet.2021.114084>

ABSTRACT

The use of monoclonal neutralizing antibodies (mNAbs) is being actively pursued as a viable intervention for the treatment of Severe Acute Respiratory Syndrome CoV-2 (SARS-CoV-2) infection and associated coronavirus disease 2019 (COVID-19). While highly potent mNAbs have great therapeutic potential, the ability of the virus to mutate and escape recognition and neutralization of mNAbs represents a potential problem in their use for the therapeutic management of SARS-CoV-2. Studies investigating natural or mNAb-induced antigenic variability in the receptor binding domain (RBD) of SARS-CoV-2 Spike (S) glycoprotein, and their effects on viral fitness are still rudimentary. In this manuscript we described experimental approaches for the selection, identification, and characterization of SARS-CoV-2 monoclonal antibody resistant mutants (MARMs) in cultured cells. The ability to study SARS-CoV-2 antigenic drift under selective immune pressure by mNAbs is important for the optimal implementation of mNAbs for the therapeutic management of COVID-19. This will help to identify essential amino acid residues in the viral S glycoprotein required for mNAb-mediated inhibition of viral infection, to predict potential natural drift variants that could emerge upon implementation of therapeutic mNAbs, as well as vaccine prophylactic treatments for SARS-CoV-2 infection. Additionally, it will also enable the assessment of MARM viral fitness and its potential to induce severe infection and associated COVID-19 disease.

KEYWORDS: COVID-19; Monoclonal antibodies; Monoclonal antibody resistant mutant; Neutralizing antibodies; RBD; SARS-CoV-2; Spike glycoprotein; Viral drift.

140. Oyagbemi, A. A., Ajibade, T. O., Aboua, Y. G., Gbadamosi, I. T., Adedapo, A., Aro, A. O., Adejumobi, O. A., Thamahane-Katengua, E., Omobowale, T. O., Falayi, O. O., Oyagbemi, T. O., Ogunpolu, B. S., Hassan, F. O., Ogunmiluyi, I. O., Ola-Davies, O. E., Saba, A. B., Adedapo, A. A., Nkadimeng, S. M., McGaw, L. J., Kayoka-Kabongo, P. N., ... Yakubu, M. A. (2021). **Potential health benefits of zinc supplementation for the management of COVID-19 pandemic.** *Journal of food biochemistry*, e13604. Advance online publication. <https://doi.org/10.1111/jfbc.13604>

ABSTRACT

The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is the etiological agent for the Coronavirus Disease 2019 (COVID-19). The COVID-19 pandemic has created unimaginable and unprecedented global health crisis. Since the outbreak of COVID-19, millions of dollars have been spent, hospitalization overstretched with increasing morbidity and mortality. All these have resulted in unprecedented global economic catastrophe. Several drugs and vaccines are currently being evaluated, tested, and administered in the frantic efforts to stem the dire consequences of COVID-19 with varying degrees of successes. Zinc possesses potential health benefits against COVID-19 pandemic by improving immune response, minimizing infection and inflammation, preventing lung injury, inhibiting viral replication through the interference of the viral genome transcription, protein translation, attachment, and host infectivity. However, this review focuses on the various mechanisms of action of zinc and its supplementation as adjuvant for vaccines an effective therapeutic regimen in the management of the ravaging COVID-19 pandemic. **PRACTICAL APPLICATIONS:** The severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), the etiological agent for the Coronavirus Disease 2019 (COVID-19), has brought unprecedented untold hardship to both developing and developed countries. The global race for vaccine development against COVID-19 continues with success in sight with attendant increasing hospitalization, morbidity, and mortality. Available drugs with anti-inflammatory actions have become alternative to stem the tide of COVID-19 with attendant global financial crises. However, Zinc is known to modulate several physiological functions including intracellular signaling, enzyme function, gustation, and olfaction, as well as reproductive, skeletal, neuronal, and cardiovascular systems. Hence, achieving a significant therapeutic approach against COVID-19 could imply the use of zinc as a supplement together with available drugs and vaccines waiting for emergency authorization to win the battle of COVID-19. Together, it becomes innovative and creative to supplement zinc with currently available drugs and vaccines.

KEYWORDS: SARS-CoV-2; antioxidant; antiviral; immunomodulatory; zinc supplementation.

- 141 Oyeyemi, O. T., Oladoyin, V. O., Okunlola, O. A., Mosobalaje, A., Oyeyemi, I. T., Adebimpe, W. O., Nwuba, R. I., Anuoluwa, I. I., Tiamiyu, A. M., Ovuakporie-Uvo, O. O., Adesina, I. A., Olatunji, B. P., Kone, J. K., Oluwafemi, Y. D., Obajaja, C. O., & Ajiboye, A. A. (2021). **COVID-19 pandemic: an online-based survey of knowledge, perception, and adherence to preventive measures among educated Nigerian adults.** *Zeitschrift fur Gesundheitswissenschaften = Journal of public health*, 1–10. Advance online publication. <https://doi.org/10.1007/s10389-020-01455-0>

ABSTRACT

AIMS: One of the ways to manage the current coronavirus disease 2019 (COVID-19) pandemic is to monitor the public knowledge, risk perceptions, adherence to preventive measures, and level of preparedness behaviors. This is important in resource-limited countries. This study determined the knowledge and perception regarding COVID-19; adherence to COVID-19 preventive measures; as well as predictors of self-perceived risk of contracting COVID-19 among Nigerian adults. **METHODS:** A cross-sectional study was conducted among Nigerian adults ≥ 18 years using an online survey. A convenience sampling method was utilized to recruit a total of 1022 study participants. The participants were recruited using the authors' social media networks. Data were analyzed using descriptive and inferential statistics at a 5% level of statistical significance. Generally, a high proportion of respondents had correct knowledge about COVID-19. However, only approximately half (49.8% and 49.9%) had correct knowledge that obesity was a risk factor for COVID-19 and that antibiotics cannot be used to treat COVID-19. Most (84.1%) did not have a self-perceived risk of contracting COVID-19. Most (81.0%) have been avoiding crowded places and 61.3% washed their hands frequently. Predictors of self-perceived risk of COVID-19 were age 40-59 years (OR 2.05, CI 1.217-3.435), ≥ 60 years (OR 4.68, CI 1.888-11.583), and visiting crowded places (OR 2.27, CI 1.499-3.448). **CONCLUSION:** Our study recommends more rigorous public health education aimed at improving COVID-19 outbreak response in Nigeria. In addition, physical and social distancing should be emphasized across all age groups with additional focus on the older population.

KEYWORDS: Coronavirus disease 2019; Nigeria; Pandemic; Risk perception; Transmission control.

- 142 Osuagwu, U. L., Miner, C. A., Bhattarai, D., Mashige, K. P., Oloruntoba, R., Abu, E. K., Ekpenyong, B., Chikasirimobi, T. G., Goson, P. C., Ovenseri-Ogbomo, G. O., Langsi, R., Charwe, D. D., Ishaya, T., Nwaeze, O., & Agho, K. E. (2021). **Misinformation about COVID-19 in Sub-Saharan Africa: Evidence from a Cross-Sectional Survey.** *Health security*, 19(1), 44–56. <https://doi.org/10.1089/HS.2020.0202>

ABSTRACT

Misinformation about coronavirus disease 2019 (COVID-19) is a significant threat to global public health because it can inadvertently exacerbate public health challenges by promoting spread of the disease. This study used a convenience sampling technique to examine factors associated with misinformation about COVID-19 in sub-Saharan Africa using an online cross-sectional survey. A link to the online self-administered questionnaire was distributed to 1,969 participants through social media platforms and the authors' email networks. Four false statements-informed by results from a pilot study-were included in the survey. The participants' responses were classified as "Agree," "Neutral," and "Disagree." A multinomial logistic regression was used to examine associated factors. Among those who responded to the survey, 19.3% believed that COVID-19 was designed to reduce world population, 22.2% thought the ability to hold your breath for 10 seconds meant that you do not have COVID-19, 27.8% believed drinking hot water flushes down the virus, and 13.9% thought that COVID-19 had little effect on Blacks compared with Whites. An average of 33.7% were unsure whether the 4 false statements were true. Multivariate analysis revealed that those who thought COVID-19 was unlikely to continue in their countries reported higher odds of believing in these 4 false statements. Other significant factors associated with belief in

misinformation were age (older adults), employment status (unemployed), gender (female), education (bachelor's degree), and knowledge about the main clinical symptoms of COVID-19. Strategies to reduce the spread of false information about COVID-19 and other future pandemics should target these subpopulations, especially those with limited education. This will also enhance compliance with public health measures to reduce spread of further outbreaks.

COVID-19; Epidemic management/response; Infodemic; Misinformation; Public health preparedness/response.

- 143Owopetu, O., Fasehun, L. K., & Abakporo, U. (2021). **COVID-19: implications for NCDs and the continuity of care in Sub-Saharan Africa.** *Global health promotion*, 1757975921992693. Advance online publication. <https://doi.org/10.1177/1757975921992693>

ABSTRACT

There has been a rise in non-communicable diseases (NCD) in Sub-Saharan Africa (SSA), driven by westernization, urbanization and unhealthy lifestyles. The prevalence of NCDs and their risk factors vary considerably in SSA between countries and the various sub-populations. A study documented the prevalence of stroke ranging from 0.07 to 0.3%, diabetes mellitus from 0 to 16%, hypertension from 6 to 48%, obesity from 0.4 to 43%, and current smoking from 0.4 to 71%. The numbers of these NCD cases are predicted to rise over the next decade. However, in the context of a global pandemic such as COVID-19, with the rising cases, lockdowns and deaths recorded worldwide, many people living with NCDs may find accessing care more difficult. The majority of the available resources on the subcontinent have been diverted to focus on the ongoing pandemic. This has caused interruptions in care, complication management, drug pick-up alongside the almost neglected silent NCD epidemic, with major consequences for the health system post the COVID-19 era. We explore the issues surrounding the continuity of care and offer some solutions for Sub-Saharan Africa.

KEYWORDS: COVID-19; Sub-Saharan Africa; chronic disease/non-communicable disease.

- 144Onyeghala, C., Alasia, D., Eyar, O., Nsirim, P., Maduka, O., Osemwengie, N., Ugwueze, N., Ordu, C., Igbosi, E., Irabor, M., & Eyidia, E. (2021). **Multisystem Inflammatory Syndrome (MIS-C) in an Adolescent Nigerian Girl with COVID-19: A call for vigilance in Africa.** *International journal of infectious diseases : IJID : official publication of the International Society for Infectious Diseases*, S1201-9712(21)00103-X. Advance online publication. <https://doi.org/10.1016/j.ijid.2021.02.017>

ABSTRACT

Most reports of Multisystem Inflammatory Syndrome (MIS-C) have come from Europe and North America. The paucity of reports in Africa is in contrast with the demographics of the series in New York, Paris and UK with children of African ancestry accounting for over 40%, of all cases of MIS-C. With the global trend of higher prevalence of MIS-C in children of African ancestry, enhanced surveillance and awareness for this syndrome in children with COVID-19 in Africa are therefore important. A case report of a 12-year-old Nigerian girl with MIS-C is presented in line

with the WHO global surveillance especially in areas where MIS-C is considered a rarity. This case report stimulates a call for vigilance and expanded effort at surveillance to promote early recognition and diagnosis of MIS-C in Nigeria and Africa. The favourable outcome and experience from this case will create awareness, expand knowledge, and support clinicians in Nigeria and the African continent in their approach to other potential cases.

KEYWORDS: Africa; COVID-19; Kawasaki; MIS-C; SARS-COV2.

- 145 Olumade, T. J., & Uzairue, L. I. (2021). Clinical characteristics of 4499 COVID-19 patients in Africa: A meta-analysis. *Journal of medical virology*, 10.1002/jmv.26848. Advance online publication. <https://doi.org/10.1002/jmv.26848>

ABSTRACT

The novel coronavirus disease-2019 (COVID-19) pandemic that started in December 2019 has affected over 95 million people and killed over 2 million people as of January 19, 2021. While more studies are published to help us understand the virus, there is a dearth of studies on the clinical characteristics and associated outcomes of the severe acute respiratory syndrome coronavirus 2 on the African continent. We evaluated evidence from previous studies in Africa available in six databases between January 1 and October 6, 2020. Meta-analysis was then performed using Open-Meta Analyst and Jamovi software. A total of seven studies, including 4499 COVID-19 patients, were included. The result of the meta-analysis showed that 68.8% of infected patients were male. Common symptoms presented (with their incidences) were fever (42.8%), cough (33.3%), headache (11.3%), and breathing problems (16.8%). Other minor occurring symptoms included diarrhea (7.5%) and rhinorrhea (9.4%). Fatality rate was 5.6%. There was no publication bias in the study. This study presents the first description and analysis of the clinical characteristics of COVID-19 patients in Africa. The most common symptoms are fever, cough, and breathing problems.

KEYWORDS: coronavirus; pathogenesis; research and analysis methods; virus classification.

146. Olufadewa, I. I., Adesina, M. A., Ekpo, M. D., Akinloye, S. J., Iyanda, T. O., Nwachukwu, P., & Kodzo, L. D. (2021). **Lessons from the coronavirus disease 2019 (COVID-19) pandemic response in China, Italy, and the U.S.: a guide for Africa and low-and-middle-income countries.** *Global health journal (Amsterdam, Netherlands)*, 10.1016/j.glohj.2021.02.003. Advance online publication. <https://doi.org/10.1016/j.glohj.2021.02.003>

ABSTRACT

Africa can be "left behind" after other advanced continents recover from the coronavirus disease 2019 (COVID-19) pandemic as reflected by the global pandemic of HIV/AIDS. In this paper, we summarize potentially adaptable, effective and innovative strategies from China, Italy, and the U.S. The purpose is to help African countries with weaker healthcare systems better respond to the COVID-19 pandemic. China, being the first to detect COVID-19 infection swiftly swung into anti-epidemic actions by the use of innovative risk communication and epidemic containment strategies. Italy and U.S., the next rapidly hit countries after China, however, experienced sustained infections and deaths due to delayed and ineffective response.

Many African countries responded poorly to the COVID-19 pandemic as evidenced by the limited capacity for public health surveillance, poor leadership, low education and socioeconomic status, among others. Experience from China, Italy and U.S. suggests that a better response to the COVID-19 pandemic in Africa needs a strong public health leadership, proactive strategies, innovative risk communication about the pandemic, massive tests and isolation, and scaling-up community engagement. Lastly, African countries must collaborate with other countries to facilitate real-time information and experience exchange with other countries to avoid being left behind.

KEYWORDS: Africa; China; Coronavirus disease 2019 (COVID-19); Italy; Low-and-middle-income countries (LMICs); Pandemic response; U.S.

147. Salako, O., Okunade, K., Allsop, M., Habeebu, M., Toye, M., Oluyede, G., Fagbenro, G., & Salako, B. (2020). **Upheaval in cancer care during the COVID-19 outbreak.** *Ecancermedicalscience*, 14, ed97. <https://doi.org/10.3332/ecancer.2020.ed97>.

ABSTRACT

On Monday, 23 March 2020, Nigeria recorded its first mortality from the novel global COVID-19 outbreak. Before this, the country reported 36 confirmed cases (at the time of writing) and has discharged home two cases after weeks of care at a government-approved isolation centre in Lagos State. This first mortality was that of a 67-year-old man with a history of multiple myeloma, a type of blood cancer. He was undergoing chemotherapy and had just returned to Nigeria following medical treatment in the United Kingdom. The novel COVID-19 pandemic has grounded several global activities including the provision of health care services to people with chronic conditions such as cancer. Evidence from China suggests that cancer patients with COVID-19 infection are a vulnerable group, with a higher risk of severe illness resulting in intensive care unit admissions or death, particularly if they received chemotherapy or surgery. This letter is an attempt to suggest practicable interventions such as the use of existing digital health platforms to limit patients' and oncology professionals' physical interactions as a way of reducing the risk of COVID-19 infection transmission amongst cancer patients and oncologists, as well as outlining effective strategies to ensure that cancer care is not completely disrupted during the outbreak.

KEYWORDS: COVID-19; cancer; cancer treatment; coronavirus.

148. Park, J. G., Oladunni, F. S., Chiem, K., Ye, C., Pipenbrink, M., Moran, T., Walter, M. R., Kobie, J., & Martinez-Sobrido, L. (2021). **Rapid in vitro assays for screening neutralizing antibodies and antivirals against SARS-CoV-2.** *Journal of virological methods*, 287, 113995. <https://doi.org/10.1016/j.jviromet.2020.113995>

ABSTRACT

Towards the end of 2019, a novel coronavirus (CoV) named severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), genetically similar to severe acute respiratory syndrome coronavirus (SARS-CoV), emerged in Wuhan, Hubei province of China, and has been responsible for coronavirus disease 2019 (COVID-19) in humans. Since its first report, SARS-CoV-2 has resulted in a global pandemic, with over 10 million human infections and over 560,000 deaths reported worldwide at the end of June 2020. Currently, there are no United States (US) Food and Drug Administration (FDA)-approved vaccines and/or antivirals licensed against SARS-CoV-2. The high

economical and health impacts of SARS-CoV-2 has placed global pressure on the scientific community to identify effective prophylactic and therapeutic treatments for SARS-CoV-2 infection and associated COVID-19 disease. While some compounds have been already reported to reduce SARS-CoV-2 infection and a handful of monoclonal antibodies (mAbs) have been described that neutralize SARS-CoV-2, there is an urgent need for the development and standardization of assays which can be used in high through-put screening (HTS) settings to identify new antivirals and/or neutralizing mAbs against SARS-CoV-2. Here, we described a rapid, accurate, and highly reproducible plaque reduction microneutralization (PRMNT) assay that can be quickly adapted for the identification and characterization of both neutralizing mAbs and antivirals against SARS-CoV-2. Importantly, our MNA is compatible with HTS settings to interrogate large and/or complex libraries of mAbs and/or antivirals to identify those with neutralizing and/or antiviral activity, respectively, against SARS-CoV-2.

KEYWORDS: Antivirals; COVID-19; Monoclonal antibodies; Neutralization; Neutralizing antibodies; Plaque reduction microneutralization assay; Polyclonal antibodies; SARS-CoV-2.

149. Rutayisire, E., Nkundimana, G., Mitonga, H. K., Boye, A., & Nikwigize, S. (2020). **What works and what does not work in response to COVID-19 prevention and control in Africa.** *International journal of infectious diseases: IJID: official publication of the International Society for Infectious Diseases*, 97, 267–269. <https://doi.org/10.1016/j.ijid.2020.06>.

ABSTRACT

Since the emergence of the COVID-19 pandemic in December 2019 in Wuhan, China, there have been nearly 6,663,304 confirmed cases of COVID-19, including 392,802 deaths, worldwide as of 10:00 CEST 06 June 2020. In Africa, 152,442 COVID-19 cases and 4334 deaths have been reported as of 02 June 2020. The five countries with the highest commutative number of cases in Africa are South Africa, Egypt, Nigeria, Algeria, and Ghana. Africa, and the rest of world, has had to swiftly undertake the necessary measures to protect the continent from irreversible effects of the COVID-19 pandemic that is claiming lives and destroying livelihoods. The lower number of COVID-19 cases in most African countries is attributed to inadequate health systems, low-to-absent testing capacity, poor reporting systems, and insufficient numbers of medical staff. The COVID-19 pandemic poses a great threat to most African countries, from cities to rural areas, and has created a strong demand on already scarce resources. Intense mobilization of additional resources is required to implement established emergency contingency measures. Measures to prevent the spread of COVID-19 include closure of borders and restricting movement of people within a country; this has resulted in the tourism sector being adversely affected by the loss of income. Cooperative prevention and control measures are one of the promising solutions to deplete the spread of COVID-19 on the continent.

KEYWORDS: Africa; COVID-19; Control; Measures; Prevention; Response.

150. Rowaiye, A. B., Onuh, O. A., Oli, A. N., Okpalefe, O. A., Oni, S., & Nwankwo, E. J. (2020). **The pandemic COVID-19: a tale of viremia, cellular oxidation and immune**

dysfunction. *The Pan African medical journal*, 36, 188.
<https://doi.org/10.11604/pamj.2020.36.188.23476>.

ABSTRACT

COVID-19, caused by SARS-CoV-2 is a tester of the immune system. While it spares the healthy, it brings severe morbidity and, in a few cases, mortality to its victims. This article aims at critically reviewing the key virulence factors of COVID-19 which are the viremia, cellular oxidation and immune dysfunction. The adverse economic effect of certain disease control measures such as national lock-downs and social distancing, though beneficial, makes them unsustainable. Worse still is the fact that wild animals and domestic pets are carriers of SARS-CoV-2 suggesting that the disease would take longer than expected to be eradicated globally. A better understanding of the pathological dynamics of COVID-19 would help the general populace to prepare for possible infection by the invisible enemy. While the world prospects for vaccines and therapeutic agents against the SARS-CoV-2, clinicians should also seek to modulate the immune system for optimum performance. Immunoprophylactic and immunomodulatory strategies are recommended for the different strata of stakeholders combating the pandemic with the hope that morbidities and mortalities associated with COVID-19 would be drastically reduced.

KEYWORDS: COVID-19, SARS-CoV-2, immune, viremia, cellular oxidation, immunoprophylactic, immunomodulatory.

- 151 Reuben, R. C., Danladi, M., & Pennap, G. R. (2020). **Is the COVID-19 pandemic masking the deadlier Lassa fever epidemic in Nigeria?** *Journal of clinical virology: the official publication of the Pan American Society for Clinical Virology*, 128, 104434. <https://doi.org/10.1016/j.jcv.2020.104434> May 13.

ABSTRACT

With the COVID-19 officially declared a pandemic, Nigeria alongside other countries is directing all its resources and manpower to contain this pandemic. However, the existence of Lassa fever (LF), a more severe, zoonotic, endemic and viral haemorrhagic fever caused by Lassa virus with higher case fatality ratio (CFR) rages on across Nigeria while receiving little or no public health attention. The simultaneously increasing cases of COVID-19 and LF across Nigeria would be catastrophic unless infection prevention and control measures toward both LF and COVID-19 outbreaks are considered alongside.

KEYWORDS: COVID-19; Lassa fever; Outbreak; Public health.

- 152 Rutayisire, E., Nkundimana, G., Mitonga, H. K., Boye, A., & Nikwigize, S. (2020). **What works and what does not work in response to COVID-19 prevention and control in Africa.** *International journal of infectious diseases : IJID : official publication of the International Society for Infectious Diseases*, 97, 267–269. <https://doi.org/10.1016/j.ijid.2020.06>.

ABSTRACT

Since the emergence of the COVID-19 pandemic in December 2019 in Wuhan, China, there have been nearly 6,663,304 confirmed cases of COVID-19, including 392,802 deaths, worldwide as of 10:00 CEST 06 June 2020. In Africa, 152,442 COVID-19 cases

and 4334 deaths have been reported as of 02 June 2020. The five countries with the highest commutative number of cases in Africa are South Africa, Egypt, Nigeria, Algeria, and Ghana. Africa, and the rest of world, has had to swiftly undertake the necessary measures to protect the continent from irreversible effects of the COVID-19 pandemic that is claiming lives and destroying livelihoods. The lower number of COVID-19 cases in most African countries is attributed to inadequate health systems, low-to-absent testing capacity, poor reporting systems, and insufficient numbers of medical staff. The COVID-19 pandemic poses a great threat to most African countries, from cities to rural areas, and has created a strong demand on already scarce resources. Intense mobilization of additional resources is required to implement established emergency contingency measures. Measures to prevent the spread of COVID-19 include closure of borders and restricting movement of people within a country; this has resulted in the tourism sector being adversely affected by the loss of income. Cooperative prevention and control measures are one of the promising solutions to deplete the spread of COVID-19 on the continent.

KEYWORDS: Africa; COVID-19; Control; Measures; Prevention; Response.

153. Reuben, R. C., Danladi, M., Saleh, D. A., & Ejembi, P. E. (2020). **Knowledge, Attitudes and Practices towards COVID-19: An Epidemiological Survey in North-Central Nigeria.** *Journal of community health*, 1–14. Advance online publication. [HTTPS://DOI.ORG/10.1007/S10900-020-00881-1](https://doi.org/10.1007/s10900-020-00881-1)

ABSTRACT

The COVID-19 pandemic has become a major public health challenge globally with countries of the world adopting unprecedented infection prevention and control (IPC) measures to urgently curtail the spread of the COVID-19 virus. The knowledge, attitudes and practices (KAP) of the people toward COVID-19 is critical to understanding the epidemiological dynamics of the disease and the effectiveness, compliance and success of IPC measures adopted in a country. This study sought to determine the levels of KAP toward COVID-19 among residents of north-central Nigeria. A cross-sectional online survey with a semi-structured questionnaire using a Snowball sampling technique was conducted during the national lockdown. Data collected were analyzed using descriptive statistics, analysis of variance (ANOVA), Pearson's correlation and regression tests. From a total of 589 responses received, 80.6, 59.6, 90.4 and 56.2% were from respondents between ages 18-39 years, males, had a college (Bachelor) degree or above and reside in urban areas respectively. Respondents had good knowledge (99.5%) of COVID-19, gained mainly through the internet/social media (55.7%) and Television (27.5%). The majority of the respondents (79.5%) had positive attitudes toward the adherence of government IPC measures with 92.7, 96.4 and 82.3% practicing social distancing/self-isolation, improved personal hygiene and using face mask respectively. However, 52.1% of the respondents perceived that the government is not doing enough to curtail COVID-19 in Nigeria. Pearson's correlation showed significant relationship between knowledge of COVID-19 and attitude towards preventive measures ($r = 0.177$, $p = 0.004$, $r = 0.137$, $p = 0.001$). Although 61.8% of the respondents have no confidence in the present intervention by Chinese doctors, only 29.0% would accept COVID-19 vaccines when available. This study recorded good knowledge and attitudes among participants, however, community-based health campaigns are necessary to hold optimistic attitudes and practice appropriate intervention measures devoid of misconceptions.

KEYWORDS: Attitude; COVID-19; Knowledge; North-central Nigeria; Practice; Public health.

154. Rowaiye, A. B., Onuh, O. A., Oli, A. N., Okpalefe, O. A., Oni, S., & Nwankwo, E. J. (2020). **The pandemic COVID-19: a tale of viremia, cellular oxidation and immune dysfunction.** *The Pan African medical journal*, 36, 188. <https://doi.org/10.11604/pamj.2020.36.188.23476>.

ABSTRACT

COVID-19, caused by SARS-CoV-2 is a tester of the immune system. While it spares the healthy, it brings severe morbidity and in a few cases, mortality to its victims. This article aims at critically reviewing the key virulence factors of COVID-19 which are the viremia, cellular oxidation and immune dysfunction. The adverse economic effect of certain disease control measures such as national lock-downs and social distancing, though beneficial, makes them unsustainable. Worse still is the fact that wild animals and domestic pets are carriers of SARS-CoV-2 suggesting that the disease would take longer than expected to be eradicated globally. A better understanding of the pathological dynamics of COVID-19 would help the general populace to prepare for possible infection by the invisible enemy. While the world prospects for vaccines and therapeutic agents against the SARS-CoV-2, clinicians should also seek to modulate the immune system for optimum performance. Immunoprophylactic and immunomodulatory strategies are recommended for the different strata of stakeholders combating the pandemic with the hope that morbidities and mortalities associated with COVID-19 would be drastically reduced.

KEYWORDS: COVID-19, SARS-CoV-2, immune, viremia, cellular oxidation, immunoprophylactic, immunomodulatory

155. Sopeyin A, Hornsey E, Okwor T, Alimi Y, Raji T, Mohammed A, Moges H, Onwuekwe EVC, Minja FJ, Gon G, Ogbuagu O, Ogunsola F, Paintsil E. **Transmission risk of respiratory viruses in natural and mechanical ventilation environments: implications for SARS-CoV-2 transmission in Africa.** *BMJ Glob Health*. 2020

ABSTRACT

Respiratory viruses can be transmitted through contact, droplet and airborne routes. Viruses that are not naturally airborne may be aerosolised during medical procedures and transmitted to healthcare workers. Most resource-limited healthcare settings lack complex air handling systems to filter air and create pressure gradients that are necessary for minimising viral transmission. This review explores the association between ventilation and the transmission of respiratory viruses like SAR-CoV-2. When used appropriately, both natural and mechanical ventilation can decrease the concentration of viral aerosols, thereby reducing transmission. Although mechanical ventilation systems are more efficient, installation and maintenance costs limit their use in resource-limited settings, whereas the prevailing climate conditions make natural ventilation less desirable. Cost-effective hybrid systems of natural and mechanical ventilation may overcome these limitations.

KEYWORDS: prevention strategies; respiratory infections.

156. Sherrard-Smith, E., Hogan, A. B., Hamlet, A., Watson, O. J., Whittaker, C., Winskill, P., Ali, F., Mohammad, A. B., Uhomoibhi, P., Maikore, I., Ogbulafor, N., Nikau, J.,

Kont, M. D., Challenger, J. D., Verity, R., Lambert, B., Cairns, M., Rao, B., Baguelin, M., Whittles, L. K., ... Churcher, T. S. (2020). The potential public health consequences of COVID-19 on malaria in Africa. *Nature medicine*, 26(9), 1411–1416. <https://doi.org/10.1038/s41591-020-1025-y>

ABSTRACT

The burden of malaria is heavily concentrated in sub-Saharan Africa (SSA) where cases and deaths associated with COVID-19 are rising¹. In response, countries are implementing societal measures aimed at curtailing transmission of SARS-CoV-2^{2,3}. Despite these measures, the COVID-19 epidemic could still result in millions of deaths as local health facilities become overwhelmed⁴. Advances in malaria control this century have been largely due to distribution of long-lasting insecticidal nets (LLINs)⁵, with many SSA countries having planned campaigns for 2020. In the present study, we use COVID-19 and malaria transmission models to estimate the impact of disruption of malaria prevention activities and other core health services under four different COVID-19 epidemic scenarios. If activities are halted, the malaria burden in 2020 could be more than double that of 2019. In Nigeria alone, reducing case management for 6 months and delaying LLIN campaigns could result in 81,000 (44,000-119,000) additional deaths. Mitigating these negative impacts is achievable, and LLIN distributions in particular should be prioritized alongside access to antimalarial treatments to prevent substantial malaria epidemics.

157. Suleiman, A. A., Suleiman, A., Abdullahi, U. A., & Suleiman, S. A. (2020). **Estimation of the case fatality rate of COVID-19 epidemiological data in Nigeria using statistical regression analysis.** *Biosafety and health*, 10.1016/j.bsheal.2020.09.003. Advance online publication. <https://doi.org/10.1016/j.bsheal.2020.09.003>

ABSTRACT

Following the emergence of COVID-19 outbreak, number of studies have been conducted to curtail the global spread of the virus by identifying epidemiological changes of the disease through developing statistical models, estimation of the basic reproduction number, displaying the daily reports of confirmed and deaths cases, which are closely related to the present study. Reliable and comprehensive estimation method of the epidemiological data is required to understand the actual situation of fatalities caused by the epidemic. Case Fatality Rate (CFR) is one of the cardinal epidemiological parameters that adequately explains epidemiology of the outbreak of a disease. In the present study, we employed two statistical regression models such as the linear and polynomial models in order to estimate the CFR, based on the early phase of COVID-19 outbreak in Nigeria (44 days since first reported COVID-19 death). The estimate of the CFR was determined based on cumulative number of confirmed cases and deaths reported from 23 March to 30 April 2020. The results from the linear model estimated that the CFR was 3.11% (95% CI: 2.59-3.80%) with R^2 value of 90% and p -value of <0.0001. The findings from the polynomial model suggest that the CFR associated with the Nigerian outbreak is 3.0% and may range from 2.23 to 3.42% with R^2 value of 93% and p -value of <0.0001. Therefore, the polynomial regression model with the higher R^2 value fits the dataset well and provides better estimate of CFR for the reported COVID-19 cases in Nigeria.

KEYWORDS: COVID-19; Case fatality rate (CFR); Coronavirus; Epidemiology; Regression analysis; SARS-CoV-2.

- 158Tijjani, S. J., & Ma, L. (2020). Is Nigeria prepared and ready to respond to the COVID-19 pandemic in its conflict-affected northeastern states. *International journal for equity in health*, 19(1), 77. <https://doi.org/10.1186/s12939-020-01192-6>.

ABSTRACT

Northeastern Nigeria has over the decade suffered from the Boko Haram insurgency and is still in the process of recovery from the complex humanitarian crisis that has displaced and subjected millions of vulnerable children, women and elderly population to poverty, disease outbreaks, hunger and malnutrition. Yet, the conflict-affected states in Northeastern Nigeria are not far away from being the worse-hit by the COVID-19 pandemic if urgent public health preventive measures are not taken to contain the spread of the deadly and highly infectious virus. The question arises, "what is Nigeria doing to tackle the burden of a COVID-19 spread and an ongoing humanitarian crisis?"

- 159Umar, H. I., Siraj, B., Ajayi, A., Jimoh, T. O., & Chukwuemeka, P. O. (2021). **Molecular docking studies of some selected gallic acid derivatives against five non-structural proteins of novel coronavirus.** *Journal, genetic engineering & biotechnology*, 19(1), 16. <https://doi.org/10.1186/s43141-021-00120-7>

ABSTRACT

BACKGROUND: The World Health Organization has recently declared a new coronavirus disease (COVID-19) a pandemic and a global health emergency. The pressure to produce drugs and vaccines against the ongoing pandemic has resulted in the use of some drugs such as azithromycin, chloroquine (sulfate and phosphate), hydroxychloroquine, dexamethasone, favipiravir, remdesivir, ribavirin, ivermectin, and lopinavir/ritonavir. However, reports from some of the clinical trials with these drugs have proved detrimental on some COVID-19 infected patients with side effects more of which cardiomyopathy, cardiotoxicity, nephrotoxicity, macular retinopathy, and hepatotoxicity have been recently reported. Realizing the need for potent and harmless therapeutic compounds to combat COVID-19, we attempted in this study to find promising therapeutic compounds against the imminent threat of this virus. In this current study, 16 derivatives of gallic acid were docked against five selected non-structural proteins of SARS-COV-2 known to be a good target for finding small molecule inhibitors against the virus, namely, nsp3, nsp5, nsp12, nsp13, and nsp14. All the protein crystal structures and 3D structures of the small molecules (16 gallic acid derivatives and 3 control drugs) were retrieved from the Protein database (PDB) and PubChem server respectively. The compounds with lower binding energy than the control drugs were selected and subjected to pharmacokinetics screening using AdmetSAR server. **RESULTS:** 4-O-(6-galloylglucoside) gave binding energy values of - 8.4, - 6.8, - 8.9, - 9.1, and - 7.5 kcal/mol against Mpro, nsp3, nsp12, nsp13, and nsp15 respectively. Based on the ADMET profile, 4-O-(6-galloylglucoside) was found to be metabolized by the liver and has a very high plasma protein binding. **CONCLUSION:** The result of this study revealed that 4-O-(6-galloylglucoside) could be a promising inhibitor against these SAR-Cov-2 proteins. However, there is still a need for further molecular dynamic simulation, in vivo and in vitro studies to support these findings.

KEYWORDS: Binding energy; Druglikeness; Gallic acid derivatives; In silico; Molecular docking; Molecular interactions; Non-structural proteins; Novel coronavirus; SARS-COV-2.

160. Umeizudike, K. A., Isiekwe, I. G., Fadeju, A. D., Akinboboye, B. O., & Aladenika, E. T. (2020). **Nigerian undergraduate dental students' knowledge, perception, and attitude to COVID-19 and infection control practices.** *Journal of dental education*, 10.1002/jdd.12423. Advance online publication. <https://doi.org/10.1002/jdd.12423>

ABSTRACT

PURPOSE/OBJECTIVES: The current coronavirus disease 19 (COVID-19) pandemic has affected most countries. Infection, Prevention, and Control training is important in mitigating the spread of COVID-19. The closure of universities by the Nigerian government has hampered academic activities of dental students. Our objectives were to assess the knowledge, perception, and attitude of undergraduate dental students in Nigeria to the COVID-19 pandemic and infection control practices. **METHODS:** This was a cross-sectional study of undergraduate clinical dental students from the dental schools in Nigeria. Self-administered questionnaires were distributed to participants using an online data collection platform. Correct responses to the 45-item questionnaire on COVID-19 knowledge were scored to determine their knowledge level. A Likert scale of 1-5 was used to assess the 13-item perception and attitude questions. The level of significance was set at P values ≤ 0.05 . **RESULTS:** A total of 102 undergraduate clinical dental students participated in the study. Males represented 54.9%, and mean age was 25.3 ± 2.4 years. Fifty percent of the students had adequate knowledge of COVID-19. Final-year students (58.1%) demonstrated more adequate knowledge of COVID-19 than penultimate-year students (28.6%, $P = 0.008$). Most (95.1%) respondents had positive attitudes towards infection control practices against COVID-19. **CONCLUSION:** Although the clinical dental students had a positive attitude to infection control practices against COVID-19, the overall knowledge of COVID-19 was barely adequate. Guidelines on COVID-19 from reputable health authorities should be reviewed by dental school authorities and disseminated to the students to suit their clinical practice.

KEYWORDS: COVID-19; Nigeria; attitude; knowledge; undergraduate dental students.

161. Umar, S., Muhammad, B. Baband, Z. (2020). **Preparedness of Nigerian Health Institutions toward Managing Lassa Fever Epidemic and Covid19 Pandemic.** *Nigerian Journal of Medicine* 29(2).

ABSTRACT

OBJECTIVES: The objective is to assess standard practice of healthcare workers and preparedness of their healthcare institutions toward controlling spread of infectious diseases. **Background:** With the ongoing epidemic of Lassa fever and the rising incidence of Covid19 pandemic in Nigeria, there has been efforts from government and stakeholders in health towards controlling the surge of these diseases. This study is a multicenter survey involving frontline healthcare workers, from 102 health institutions. **METHODOLOGY:** Pretested self-administered questionnaires were sent through online Google form to healthcare workers across various health institutions through their respective social media platforms. Their consent was sought and the questionnaires were filled through registered emails. Multiple entry from same individual was prevented. The number of respondents was 451. The information gathered include bio data of healthcare workers, details of their cadre and years of practice, their level of standard precautions and preparedness of their health institutions.

Data gathered were collated, summarized, and analyzed using simple tables with proportions. **RESULTS:** The practice of standard precaution was inadequate with only 59.4% of respondents washing their hands regularly after touching patients or carrying out procedures, while only 34.4% of them used face masks while consulting patients with respiratory symptoms. As for preparedness of health institutions in control of Lassa fever and Covid19, 63.1% and 77.6% of respondents affirmed that their health institutions had written protocol of managing infectious diseases and had organized workshop on Lassa fever and/or Covid19, respectively, while only 45.5% and 20% of respondents had dedicated isolation wards and functional intensive care units in their health institutions. **CONCLUSION:** The standard safety precautions by healthcare workers were suboptimal and preparedness of their health institutions was generally inadequate for the management and control of infectious diseases.

KEYWORDS: Covid19, health institution, healthcare workers, Lassa fever, preparedness

- 162Eromon, P.E., Oseni, T.I.A., Fuh, N.F. Affusim, C.C., Adewuyi, B., &Imomoh, P.A. The family physicians in a tertiary setting in COVID-19 pandemic in Nigeria: The sixth experience. *Annals of Biomedical Sciences* 19 (2), 76-81PE. *Annals of Biomedical Sciences* 19 (2), 76-81.

AIM/BACKGROUND:

The Covid-19 pandemic continues to pose a major health challenge globally. Nigeria have been battling with the pandemic since recording its first case on 28th February, 2020. Irrua Specialist Teaching Hospital (ISTH) is one of the centres for the diagnosis and treatment of Covid-19 in Nigeria. **Materials and Methods:** To ensure safety of health care workers as well as non Covid-19 patients presenting to the hospital, measures were put in place by the hospital management and the department of family medicine. **RESULTS:** Patients were triaged prior to entering the hospital and the clinics such that patients with risk of Covid-19 were seen separately. Home visits,

- 163Victor Okhuese A. (2020). **Estimation of the Probability of Reinfection with COVID-19 by the Susceptible-Exposed-Infectious-Removed-Undetectable-Susceptible Model.** *JMIR public health and surveillance*, 6(2), e19097. <https://doi.org/10.2196/19097>

ABSTRACT

BACKGROUND: With the sensitivity of the polymerase chain reaction test used to detect the presence of the virus in the human host, the worldwide health community has been able to record a large number of the recovered population. **OBJECTIVE:** The aim of this study was to evaluate the probability of reinfection in the recovered class and the model equations, which exhibits the disease-free equilibrium state for the coronavirus disease. **METHODS:** The model differential equation was evaluated for the disease-free equilibrium for the case of reinfection as well as the existence and stability criteria for the disease, using the model proportions. This evaluation shows that the criteria for a local or worldwide asymptotic stability with a basic reproductive number ($R_0=0$) were satisfied. Hence, there is a chance of no secondary reinfections from the recovered population, as the rate of incidence of the recovered population vanishes (ie, $B=0$). **RESULTS:** With a total of about 900,000 infected cases worldwide,

numerical simulations for this study were carried out to complement the analytical results and investigate the effect that the implementation of quarantine and observation procedures has on the projection of further virus spread. **CONCLUSIONS:** As shown by the results, the proportion of the infected population, in the absence of a curative vaccination, will continue to grow worldwide; meanwhile, the recovery rate will continue slowly, which means that the ratio of infection rate to recovery rate will determine the death rate that is recorded. Most significant for this study is the rate of reinfection by the recovered population, which will decline to zero over time as the virus is cleared clinically from the system of the recovered class.

KEYWORDS: COVID-19; SEIRUS; coronavirus; disease; infectious; math; model; outbreak; pandemic; reinfection.

- 164Wallace, L. J., Nouvet, E., Bortolussi, R., Arthur, J. A., Amporfu, E., Arthur, E., Barimah, K. B., Bitouga, B. A., Chemusto, H., Ikechebelu, J., Joe-Ikechebelu, N., Kondé, M. K., Kabakambira, J. D., Kalombe, G. K., Karanja, D., Konje, E. T., Kouyate, S., Limeneh, G., Mulopo, F. M., Ndu, M., ... Singini, D. (2020). **COVID-19 in sub-Saharan Africa: impacts on vulnerable populations and sustaining home-grown solutions.** *Canadian journal of public health = Revue canadienne de sante publique*, 111(5), 649–653. <https://doi.org/10.17269/s41997-020-00399-y>

ABSTRACT

This commentary draws on sub-Saharan African health researchers' accounts of their countries' responses to control the spread of COVID-19, including social and health impacts, home-grown solutions, and gaps in knowledge. Limited human and material resources for infection control and lack of understanding or appreciation by the government of the realities of vulnerable populations have contributed to failed interventions to curb transmission, and further deepened inequalities. Some governments have adapted or limited lockdowns due to the negative impacts on livelihoods and taken specific measures to minimize the impact on the most vulnerable citizens. However, these measures may not reach the majority of the poor. Yet, African countries' responses to COVID-19 have also included a range of innovations, including diversification of local businesses to produce personal protective equipment, disinfectants, test kits, etc., which may expand domestic manufacturing capabilities and deepen self-reliance. African and high-income governments, donors, non-governmental organizations, and businesses should work to strengthen existing health system capacity and back African-led business. Social scientific understandings of public perceptions, their interactions with COVID-19 control measures, and studies on promising clinical interventions are needed. However, a decolonizing response to COVID-19 must include explicit and meaningful commitments to sharing the power-the authority and resources-to study and endorse solutions.

KEYWORDS: COVID-19; Decolonization; Equity; Global health; Infectious disease; Sub-Saharan Africa.

- 165Yusuf; H.A. Awere; O.Y. Ihekuna; O.A. Ayinde; E. Coker. O. O. 2 (2020). **Coronavirus Disease (COVID-19) Current Status in Ogun State, Nigeria.** *Nigerian Medical Practitioner*, 78, 1-2.

ABSTRACT

Coronavirus (COVID-19) is an illness caused by a virus that can be transmitted by human contact. After the first infections in China at the end of 2019, COVID-19 has continued to spread across the world. No continent has been able to escape this virus. In Nigeria, the first case of COVID-19 was detected on 27th February 2020 in Lagos State; an Italian visitor on a business trip to Ewekoro cement plant, Ogun State, this did not lead to an immediate outbreak in the state, however, series of immediate interventions were put in place by the government of Ogun state and the Federal Republic of Nigeria in response to COVID-19. At the time of preparing this manuscript the Nigeria Centre for Disease Control (NCDC) reported a total infected case of 25,133 people, with 9,402 recoveries and total death of 573 cases. In this article, the daily number of confirmed cases of COVID-19 were obtained from publicly available outbreak situation report of the Nigeria Centre for Disease Control (NCDC) and the Ogun State Ministry of Health a preliminary epidemiological analysis of COVID-19 outbreak in Ogun state between 27th February and 28th June, 2020 and a breakdown of the disease in the local governments of the state is provided. A total of 774 confirmed cases and 18 COVID-19 deaths were recorded in nineteen local government areas out of twenty local government areas in Ogun state, Nigeria. 342 (43.7%) of the infected cases seen were detected in the Ado Odo Ota local government area, and the Sagamu local government area with about 206 (26.3%) infected cases which are border towns to Lagos state the most infected state in Nigeria. 78.6% of the infected cases were in the middle age group, specifically the 25-34, 35-44 and 45-54 age categories. The number of men infected with COVID-19 in Ogun state is 3 times that of women infected implying that Men are more at risk for worse outcomes and death, irrespective of age, with COVID-19. This study thus provides an insight into the COVID-19 current situation in Ogun state and serve as a reminder to policymakers, health officers, disease control agencies and the general public, that although the number of confirmed cases may be relatively low in Ogun state, the risk is still very high and potentially, there could be many asymptomatic cases in the state, Ogun State

KEYWORDS: COVID-19, virus, cases.

- 166Zaman, R., van Vliet, O., & Posch, A. (2021). **Energy access and pandemic-resilient livelihoods: The role of solar energy safety nets.** *Energy research & social science*, 71, 101805. <https://doi.org/10.1016/j.erss.2020.101805>

ABSTRACT

Lack of energy access undermines the socio-economic conditions of households, reducing their resilience, particularly in the face of disruptive effects of the COVID-19 pandemic. Hundreds of millions of poor rural households, who live in remote and difficult-to-reach areas, are still without access to energy. Solar energy safety nets, in the form of targeted social assistance programs and off-grid technological solutions, do not only advance energy access but also develop capacities of households to prepare for, respond to, and recover from specific threats like pandemics. We discuss ongoing solar energy safety net programs in the largest off-grid solar markets of Bangladesh, India, Kenya, and Nigeria, and how such programs are affected by the COVID-19 pandemic. We find that solar energy safety net programs should be maintained and updated to emphasize their potential for building pandemic-resilient livelihoods. These programs can be supported with efforts to build local value chains and economies based on clean electricity. Well-designed solar energy safety net policies generate multiple co-benefits, including the resilience of households to pandemics.

KEYWORDS: COVID-19; Electrification; Energy access; Off-grid solar; Resilient livelihood; Rural poor.

167Zhao, Z., Li, X., Liu, F., Zhu, G., Ma, C., & Wang, L. (2020). **Prediction of the COVID-19 spread in African countries and implications for prevention and control: A case study in South Africa, Egypt, Algeria, Nigeria, Senegal and Kenya.** *The Science of the total environment*, 729, 138959. <https://doi.org/10.1016/j.scitotenv.2020.138959>

ABSTRACT

COVID-19 (Corona Virus Disease 2019) is globally spreading and the international cooperation is urgently required in joint prevention and control of the epidemic. Using the Maximum-Hasting (MH) parameter estimation method and the modified Susceptible Exposed Infectious Recovered (SEIR) model, the spread of the epidemic under three intervention scenarios (suppression, mitigation, mildness) is simulated and predicted in South Africa, Egypt, and Algeria, where the epidemic situations are severe. The studies are also conducted in Nigeria, Senegal and Kenya, where the epidemic situations are growing rapidly and the socio-economic are relatively under-developed, resulting in more difficulties in preventing the epidemic. Results indicated that the epidemic can be basically controlled in late April with strict control of scenario one, manifested by the circumstance in the South Africa and Senegal. Under moderate control of scenario two, the number of infected people will increase by 1.43-1.55 times of that in scenario one, the date of the epidemic being controlled will be delayed by about 10 days, and Algeria, Nigeria, and Kenya are in accordance with this situation. In the third scenario of weak control, the epidemic will be controlled by late May, the total number of infected cases will double that in scenario two, and Egypt is in line with this prediction. In the end, a series of epidemic controlling methods are proposed, including patient quarantine, close contact tracing, population movement control, government intervention, city and county epidemic risk level classification, and medical cooperation and the Chinese assistance.

KEYWORDS: Africa; COVID-19; Parameter estimation; Prediction; SEIR; Scenario analysis.

168Zhao, Z., Li, X., Liu, F., Zhu, G., Ma, C., & Wang, L. (2020). **Prediction of the COVID-19 spread in African countries and implications for prevention and control: A case study in South Africa, Egypt, Algeria, Nigeria, Senegal and Kenya.** *The Science of the total environment*, 729, 138959. <https://doi.org/10.1016/j.scitotenv.2020.138959>

ABSTRACT

COVID-19 (Corona Virus Disease 2019) is globally spreading and the international cooperation is urgently required in joint prevention and control of the epidemic. Using the Maximum-Hasting (MH) parameter estimation method and the modified Susceptible Exposed Infectious Recovered (SEIR) model, the spread of the epidemic under three intervention scenarios (suppression, mitigation, mildness) is simulated and predicted in South Africa, Egypt, and Algeria, where the epidemic situations are severe. The studies are also conducted in Nigeria, Senegal and Kenya, where the epidemic situations are growing rapidly and the socio-economic are relatively under-developed,

resulting in more difficulties in preventing the epidemic. Results indicated that the epidemic can be basically controlled in late April with strict control of scenario one, manifested by the circumstance in the South Africa and Senegal. Under moderate control of scenario two, the number of infected people will increase by 1.43-1.55 times of that in scenario one, the date of the epidemic being controlled will be delayed by about 10 days, and Algeria, Nigeria, and Kenya are in accordance with this situation. In the third scenario of weak control, the epidemic will be controlled by late May, the total number of infected cases will double that in scenario two, and Egypt is in line with this prediction. In the end, a series of epidemic controlling methods are proposed, including patient quarantine, close contact tracing, population movement control, government intervention, city and county epidemic risk level classification, and medical cooperation and the Chinese assistance.

KEYWORDS: Africa; COVID-19; Parameter estimation; Prediction; SEIR; Scenario analysis.