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The disproportionate burden of COVID-19 in Africa

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Introduction

The African continent is known to have a distinct epidemiological response to most of the epidemics occurring worldwide. However, it needs to be confirmed if this could be due to the tropical nature of the most African countries south of the Sahara. The burden of these various epidemics in Africa varies from that in other climates. For instance, prior to the widespread usage of vaccines against varicella in temperate, high-income countries, about 13–16 cases of varicella per 1000 population occurred annually, with children aged 1–9 years are mostly affected. In those countries, over 90% of the population become infected with varicella before adolescence. On the other hand, in tropical countries, including Africa, the primary infection of varicella tends to occur at a later stage in life, affecting a larger population of susceptible adults.

Coronavirus disease 2019 (COVID-19) is an emerging and rapidly evolving disease which presently has attained a pandemic status, according to the World Health Organization (WHO), and it has no cure. Following the above analogy, the burden of COVID-19, caused by the severe acute respiratory syndrome coronavirus 2 or novel coronavirus, in tropical Africa will be expectedly different compared to that in the Western world, made up of the “high-income countries”. Despite this assumption, however, the COVID-19 disease has challenged and placed some burden on the African people with scarce resources, poor infrastructure, and unstable governments among other factors. The burden of COVID-19 also differs among the different African countries depending on the speed with which they tried to contain it, availability of testing materials, population density, clusters of population at poverty level, and health infrastructure among others. The low level of testing in some countries has made it difficult to recognize the true impact of the disease in the continent. In addition, there are associated factors of uncertain significance as the causal relationship between administration of routine BCG vaccination, in countries that have such policy, and the relatively lower COVID-19 cases and deaths compared to countries not adhered to that practice, a relation that has been studied and found to be certain, according to a multicountry level study involving 178 countries.
COVID-19: Myths and fictions

It is interesting to note that in most parts of Africa, there are some people that believe that the COVID-19 is a “scam” from the Western world to ruin our economic base or to reduce the African population. In some instances, the outbreak was followed by rumors and misinformation about the virus. This is undoubtedly impacted the efforts of containment in some countries.

One of the myths that gained ground in tropical Africa, mostly at the beginning of the pandemic, was the idea that the coronavirus would not survive the tropical weather compared to the flu, also a viral infection which presents with similar respiratory symptoms and which thrives during the cold winter season in the Western world. It was thus hoped that warmer temperatures will help in curtailing the spread of the disease. However, this was not to be, as revealed by the progressive spread in cases in the most African countries.

Another myth was the fact that drinking plenty of water was a factor in the mitigation of the virus, as water was able to dilute the viremia and flush out the virus from the body. This is premised on the social media reports of those discharged from isolation centers that they were made to drink at least 1.5L of water daily while on admission. However, drinking water during infection with COVID-19 only helps with dehydration but does not dilute nor “flush” the virus from the body.

The art of washing hands regularly as a form of slowing down the spread of the COVID-19 is one of the recommended prophylactic measures by the WHO. However, some of the population in Nigeria, for instance, believe that using hot water to wash your hands will get germs off better than cold water. This myth, not supported by evidence, was an obstacle to implement the proven practice to simply wash hands with soap and running water for a long enough time (minimum of 20s) and to dry your hands afterward.

Evolution of COVID-19

The United Nations Economic Commission for Africa in April 2020 expressed the fear that even with social distancing, the continent of Africa could have nearly 123 million cases of COVID-19 in 2020 and that 300,000 people may die of the disease. They went further to state that many health systems in Africa are ill equipped. Challenges include inconsistent power supply with the dependency of some hospitals on generators, shortages of essential workers, such as anesthetists, intensivists, and critical care nurses much needed during the pandemic. Similarly, Reuters reported the scarcity of critical care beds and ventilators, counting with one or less for every 100,000 people. Some countries such as Guinea-Bissau were reputed to have no ventilators at all. In Uganda, there are only 55 functional intensive care unit (ICU) beds to serve the 40 million people (1.3 ICU beds per million population), 80% of which are located in the nation’s capital city with an estimated nurse to patient ratio of 1:8.
As of May 2020, there were more than 5 million confirmed cases of COVID-19 in the world surpassing 300,000 deaths. The United States of America, with a population of 330 million, contributed more than 30% of confirmed cases and deaths. All 54 African countries have had reported cases of COVID-19 disease and the African continent with over 100,000 confirmed cases, 20% of them reported in South Africa (Johns Hopkins University’s world map). The Johns Hopkins University further reported that other highly affected African countries were Egypt, Morocco, and Algeria.

The WHO African Regional Office, on May 19, 2020, reported on its official Twitter handle @WHOAFRO that South Africa, Algeria, and Nigeria were countries with the highest COVID-19 prevalence in Africa. However, Lesotho had only one confirmed case with no deaths. Nigeria, with a population of 200 million, on May 23, 2020, had 7520 confirmed cases with 221 fatalities. This was, however, increased to 27,564 confirmed cases with 616 deaths by July 4, 2020, while the global figure at the same time had risen to over 10 million and over half a million deceased. Meanwhile, the infection rate in the United States is even about 46 times greater than what is recorded so far in Africa. All these figures, could be deceivingly suggestive of Africa being “safer” than the rest of the world, something that requires deeper analysis.

There are also differences accounted among the different sub-Saharan countries. The index case of COVID-19 in Nigeria was reported on February 27, 2020 in Lagos, a 44-year-old traveler arrived at the Murtala Muhammed International Airport, at 10 P.M. Subsequently, several imported cases were detected at temperature screening points in International Airports and by cases of local population returning from trips who developed high-grade fever and sore throat. Surveillance was then heightened at the points of entry, and the list of high-risk countries was revised. Since March 17, 2020, the clusters of cases initially linked to travelers that had recently returned from the United Kingdom, the United States, France, and Spain evolved into community transmission of COVID-19.

In May 2020, Nigeria conducted about 38,000 tests, while Ghana conducted more than 184,000 tests. Both countries reported approximately 7000 positive results. Meanwhile, as Nigeria reported by that time 200 deaths, Ghana posted about 30 deceased.

In other parts of the continent, in countries like Kenya, as stated by the United Nations Development Program, COVID-19 represents more than a health crisis, as the pandemic impact in the economy, politics, and social life will leave behind deep scars. Kenya reported its first COVID-19 case on March 13, 2020, and by March 31, 2020, the number of confirmed cases has risen to 59, with over 70% of infections in Nairobi. As at April 22, 2020, the number of confirmed cases has increased to 303, nearly fivefold jump in the case count, i.e., the highest number of positive cases among the East African Community (EAC) member states. In the EAC countries, (Kenya, Uganda, Tanzania, Rwanda, and South Sudan) with a consistent and transparent reporting system, the numbers are only expected to rise as the governments roll out mass testing.
Epidemiology and surveillance

Since February 27, 2020, the outbreak of COVID-19 in Lagos State, Nigeria, has spread geographically as the numbers relentlessly increased. The evolution of the outbreak shows that the trend has not followed the projected paths of an outbreak with doubling time of seven days. However, the interventions implemented, including the “lockdown” has slowed the rise in the number of cases. However, the average reproductive number remains two (one confirmed case infects at least two other people).

In Nigeria, the majority of the infected people are males (60%). In both genders, the most of the infected cases are from the age group 31–40 years. The average age is 36 years old with the minimum age of 6 weeks and maximum age of 78 years old. In both genders, the most of the infected cases are from the age group 31–40 years. The average age is 36 years old with the minimum age of 6 weeks and maximum age of 78 years old. In both genders, the most of the infected cases are from the age group 31–40 years. The average age is 36 years old with the minimum age of 6 weeks and maximum age of 78 years old. In both genders, the most of the infected cases are from the age group 31–40 years. The average age is 36 years old with the minimum age of 6 weeks and maximum age of 78 years old. In both genders, the most of the infected cases are from the age group 31–40 years. The average age is 36 years old with the minimum age of 6 weeks and maximum age of 78 years old. In both genders, the most of the infected cases are from the age group 31–40 years. The average age is 36 years old with the minimum age of 6 weeks and maximum age of 78 years old. In both genders, the most of the infected cases are from the age group 31–40 years. The average age is 36 years old with the minimum age of 6 weeks and maximum age of 78 years old.

There is also a great variation in the number of fatalities but significantly lower reports compared to countries such as the United States, Italy, or Spain. As of May 23, 2020, the percentage of fatality in Nigeria was 0.0000012%, while the percentage of fatality in the United States was 0.00029%. A factor that could have contributed to these differences might be the average age of the infected population, younger in Nigeria compared to the United States and Western Europe. In addition to these, the presence of comorbidities in the latter countries compared to the predominant positive reports in Africa.

Political governance and COVID-19

Most African governments rose up to fight against the scourge of the COVID-19 infectivity as soon as it was declared a pandemic by the WHO, by restricting international travel even before a case was reported in their nations. Lagos State is the epicenter of the COVID-19 pandemic in Nigeria, where the Federal Government supported the efforts of the Lagos State authorities by giving them a financial aid of N10 Billion of Nigerian Dollars (equivalent to approximately 2.4 million US dollars) to help contain the COVID-19 pandemic.

One of the strategies employed by many African countries includes the construction of isolation centers in various capital cities and areas of high prevalence of the disease. The central governments, through the Presidential Task Force on COVID-19, in Nigeria or the Ghana’s Emergency Preparedness and Response Project, assist various committees in prevention, surveillance, and treatment protocols for the containment of the COVID-19 pandemic in the various African countries.

The United States and Western Europe introduced the policy of “lockdown” as a strategy to lower the incidence of fatalities and containment of the viral scourge. In a similar fashion, many African countries, including Nigeria, introduced the same policy of “lockdown” when it was evident that the number of infected cases was increasing.

Furthermore, as Africa faces the COVID-19 challenge, international agencies such as the African Development Bank, based in Côte d’Ivoire, have responded
proactively to support African countries by approving a $10 billion crisis response facility to support African countries. This is premised on the fact that many African countries, particularly those already dealing with high levels of debt, carry financial challenges, constraining their ability to respond to the COVID-19 crisis. In addition, this facility will assist in the provision of food relief and restoring the livelihoods of vulnerable populations severely affected by COVID-19. Also, this facility will complement ongoing activities of African governments to mitigate the effects of the virus pandemic on Africans.

The Joint United Nations Program on human immunodeficiency virus/acquired immunodeficiency syndrome was reported as saying that beating COVID-19 in Africa is the key to overcoming it globally. It went further to state that the greatest risk will be to poor people in resource-limited countries who are already battling other diseases such as human immunodeficiency virus/acquired immunodeficiency syndrome and tuberculosis.

**Advances in management of COVID-19**

The COVID-19 disease has no cure presently, but the advanced countries like United States and countries in Western Europe had been trying all kinds of drug combinations to supportively manage the disease. In the early days of the pandemic, some of these drugs include the use of antiretroviral drugs such as Kaletra (lopinavir/ritonavir), zinc, chloroquine, and hydroxychloroquine. Recently, the WHO warned against the use of chloroquine to treat the COVID-19 disease.

One of the tropical countries in Africa, Madagascar, has blazed the trail by launching the global “herbal medicine” business by manufacturing their Artemisia extract, called “COVID-Organics”, for the treatment of COVID-19 infection. They have exported this “wonder” herbal drug to various African and European countries, while the WHO itself has now shown interest in it.

Also, during the lockdown, the Rwandan government has introduced robots in the fight against COVID-19 at some of its treatment centers as a way of decreasing contact between medical personnel and patients as a barrier to the transmission of the infection. The robots are expected to be involved in testing for coronavirus and in the distribution of medicines. They are also involved in the administration of the isolation centers. On May 19, 2020, Rwanda has reported 11 confirmed cases and 6 recoveries. So far, the country has conducted 52,335 tests by that time.

According to the WHO, the lack of coronavirus tests is one of the biggest problems of the African continent. Senegal has developed a test kit with an estimated cost of less than USD10, and they are in the process of packaging it and distributing to African countries. Ghana has developed drones for the quick retrieval and delivery of swab samples from the various test centers around the country.
Research and treatment prospects

Remdesivir, an antiviral drug, has been recommended for use in the United States and Europe for the treatment of COVID-19, making it the first drug to be approved for treatment. It has been shown to reduce the time to discharge. It is recommended for its use in adults and adolescents from 12 years of age with pneumonia who require oxygen support. However, it may take significant time for this drug to be available in Africa because of its costs (over $5000 per course in the United States). It is available as an intravenous preparation, but there are plans of having the drug as an easier-to-use inhaled version.

Another drug that was recently introduced in the United Kingdom following a successful clinical trial by the “Oxford” Group, is the well-known steroid, dexamethasone, an antiinflammatory drug that acts as a modulator of inflammatory mediators. It is cheap and widely available making it attractive to most countries especially after it has shown benefits when used in patients with moderate-to-severe COVID-19 disease who are on the ventilator or receiving oxygen therapy. This drug regimen has been validated by several study groups through clinical trials in the COVID-19 ICUs in Nigeria.

Challenges

With the increasing number of COVID-19-positive patients in most African countries, the bed availability in isolation centers is becoming inadequate. In Nigeria, the construction of these isolation and treatment centers is very expensive. This led the Federal Government of Nigeria, through the Nigeria Centre for Disease Control (NCDC) to devise a new protocol of discharging home COVID-19-positive patients after testing negative once in the course of their treatment in the isolation center. Furthermore, the Lagos State Emergency Operations Center, following the increasing numbers of positive patients and still being the epicenter of the pandemic in Nigeria, has brought out their policy of “home-based” care. This new protocol rolled out in the last week of June 2020, based on the fact that many COVID-19 patients, especially the asymptomatic ones or those with mild disease, they typically refuse admission to these isolation centers for various reasons. The new protocol thus ensures admission to the isolation centers is limited to only those with moderate-to-severe COVID-19 disease.

Stigmatization is another big challenge in the management of COVID-19-positive patients in Africa. This accounts for many people refusing testing, especially during the phase of active case search in the community. This is a reason for refusal of evacuation of COVID-19-positive patients to the isolation centers, especially with the arrival of an ambulance at their residence with health workers fully dressed in the personal protective equipment outfit. In Africa, the challenge of testing the population is not a minor detail. In Nigeria, like in most African countries, only the molecular biology testing technique using the confirmatory polymerase chain reaction test...
is approved to use. However, there is a recurrent shortage and sometimes lack of availability of sampling and extraction kits, which are generally supplied by the WHO, through the NCDC in Nigeria.

Another important challenge is the access to oxygen and critical care beds. Most of the COVID-19-positive and symptomatic patients end up with respiratory hypoxemia and will require oxygen therapy, but this is not universally available outside state capitals or big cities. This is largely because of the nondevelopment of health infrastructure in most African countries. However, from anecdotal reports, the number of COVID-19-positive patients that required ICU admission is very low compared to the numbers reported by the United States and Western Europe. Presently, following more knowledge about the pathophysiology of the COVID-19 in the lungs, emphasis is now on noninvasive positive pressure ventilation, making use of the mechanical ventilator a last resource in the management of severe cases of COVID-19.

The burden of noncommunicable diseases such as diabetes, hypertension, and traffic crash injuries has been relatively high and worrisome in most African countries, especially south of the Sahara. However, the advent of the COVID-19 pandemic has shifted spending on these diseases and impacted on the successes being recorded in this health sector.

The travel restrictions resulting from the COVID-19 pandemic is already affecting Africa’s economy and developmental efforts. Most African countries depend on tourism to boost their revenue. Following this challenge, the economic growth in Africa has been predicted to decline by 2.1%–5.1% this year. Business travel is also constrained, and if the business sector is weak, it will affect the aviation industry. The airlines have been grounded as a result of the lockdown imposed in most countries, and this also affected the intercity vehicular transportation. It will be difficult for African airlines to get the proverbial “bailouts” from governments after the pandemic is contained and the lockdowns eased. However, it is a well-known fact that Africa remains a destination for a lot of people around the world. Hopefully, the aviation industry in Africa will be rejuvenated once the pandemic is over.

**Conclusions**

The COVID-19 pandemic, caused by the novel coronavirus disease, is a big challenge and posed a major burden on the African continent. The projection of the Western world that the upsurge in confirmed COVID-19 cases would weaken the health systems, and even the political stability of African nations has, however, not been the case, so far. Several theories for this have been propagated, but the BCG vaccination policy of countries with low case and fatality rates seems to be the most favored in this regard, as validated by a multicountry level study.

There are various implications and challenges in the COVID-19 pandemic and its impact on Africa as well as in its containment. These include chiefly economic challenges and those linked to sociopolitical matters such as stigmatization of patients
who tested positive to the virus and the state of the health infrastructure of the nations. Furthermore, COVID-19 has shifted focus from other noncommunicable killer diseases such as high blood pressure, diabetes, road traffic injuries that are the main killers in most African countries. It is hoped that health budgets of African countries may have to be reviewed in order to cater for the control of these noncommunicable diseases.

The pathophysiology and treatment options for the coronavirus disease are still evolving. With increased testing capacities, it remains to be seen whether the projected increase in number of COVID-19 patients will overtly overwhelm the health indices of African countries or not, in the face of global search for vaccines as well as the provision of support for the containment of the pandemic by international agencies like the African Development Bank.

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