

COVID-19 PANDEMIC-AN AFRICAN PERSPECTIVE

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ABSTRACT

Background: Corona virus is one of the most conservative agents that causes “severe acute respiratory syndrome mostly between the age of 50 years and above, in both male and female in Africa and Worldwide. Coronavirus-2 (SARS-CoV-2)”, caused a highly contagious disease called corona virus disease 2019 (COVID-19). This was first reported from Wuhan City in China, December, 2019.

Aim: This was aimed to determine the prevalence of COVID -19 pandemic and its effect in Africa.

Methodology: Information about COVID-19 were gathered and reviewed from different source, evaluating its effects in human respiratory system. Since the origin of COVID -19 in Wuhan City in China 2019 till date, It was believed that COVID-19 (corona virus) infection can cause acute respiratory distress in human mostly in old age in Africa, which can lead to death when there is no medical attention.

Results: Result shows that the rate of viral infection (COVID-19) which causes acute respiratory disease in human is higher within the age bracket of 50-90 in both male and female than the younger ages between 40-20 below respectively, in Africa. Corona virus is regarded as the most currently wild spread pandemic in Africa, causing morbidity and mortality rate among human population.

Conclusion: The high prevalence of the infection needs implementation of constant health education and sensitization such as hand washing, social distancing and others among all ages that are at the risk of contacting disease.

Keywords: SARS-CoV-2, COVID-19, Corona virus, Africa

INTRODUCTION

There are hundreds of viruses that belong to the corona virus family. However, only six (229E, NL63, OC43, HKU1, SARS-Cov and MERS-Cov) have been reported to cause mild to severe respiratory tract infections in humans. Among them are severe acute respiratory syndrome corona virus (SARS-CoV) reported in November 2002 and Middle East respiratory syndrome coronavirus (MERS-CoV) reported in September 2012, which emerged in human population from animal reservoirs and caused severe respiratory illness with high mortality rates. Once again, a novel severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2) has emerged, and caused an infectious disease called corona virus disease 2019 (COVID-19) (Paraskevis et al: 2020).The virus was first identified and

reported from Wuhan City of China in December, 2019. The SARS-CoV-2 is highly contagious, spread globally in a short period of time, and was declared a global pandemic by the World Health Organization on March 11, 2020. As of 18th April, 2020, 10:00am CEST; WHO reported more than 2.1 million confirmed cases of COVID-19, including 142,229 deaths in 213 countries, areas or territories. (Su et al ; 2016).The most-affected countries with more than 30,000 confirmed cases of SARS-CoV-2 are the United States of America, Spain, Italy, Germany, France, the United Kingdom, China, Iran, Turkey, Belgium, the Russian Federation, Canada and Brazil. However, the number of cases continues to rise throughout the globe and became a serious menace to public health.

COVID-19 is majorly affecting many countries all over the world, whereas Africa was the last continent to be hit by the pandemic and was expected to be the most vulnerable continent where COVID-19 spreading will have a major impact. The continent confirmed its first case of COVID-19 in Egypt on 14th of February, 2020, and from sub-Saharan Africa the first case was reported in Nigeria on 27th of February, in an Italian patient who flew to Nigeria from Italy on 25th of February, 2020 (NCDC, 2020).

As of 18th April 2020, 10:00 am CEST; Africa CDC reported, 19,895 confirmed cases, including 1,017 deaths and 4,642 recoveries, from 52 African countries, while two countries (Comoros and Lesotho) were still virus-free. Interestingly, most of the identified cases of COVID-19 in Africa have been imported from Europe and the United States, rather than from the original COVID-19 epicenter China (Du et al; 2020). The continent's weak health care system and a large immunocompromised population owing to high prevalence of malnutrition, anemia, malaria, HIV/AIDs, tuberculosis and poor economic discipline, make it distinct from the other continents that have experienced COVID-19 to date. Experts also anticipated that under these circumstances the pandemic in Africa could be challenging to control, and the consequences could be dismal. On the other hand, there is no drug/vaccine currently available to treat COVID-19; therefore, implementation of precautionary measures to contain the spread of this virus is being practiced throughout the globe; which includes social distancing, isolation and quarantine, community containment, national lockdowns, and travel restrictions (NCDC, 2020). So far, these measures are helping to control and reduced the spread of COVID-19; but subsequently hit the global economy and thereby pushing the nations towards recession. African economies were already struggling when COVID-19 hit the continent; which could further amplify the economic crisis (United Nations Human

Rights, 2020). A unique COVID-19 response needs to be developed for Africa, where all these issues which make the continent more vulnerable and different to the rest of the world, will be taken into consideration

Etiology of COVID-19

The uncertainty about the SARS-CoV-2 origin is still on .Initially there were reports that suggested the virus may have originated from bats, which are already known as a natural reservoir for various CoVs, including SARS-CoV-like and MERS-CoV-like viruses. Upon phylogenetic analysis it has now been shown that there is a 96.2% sequence identity of SARS-CoV-2 with a coronavirus isolated from a bat (BetaCoV/RaTG13/2013) (Wang et al; 2013). Furthermore, the genetic sequence of SARS-CoV-2 also shares >80% and 50% sequence identity to SARS-CoV and MERS-CoV respectively. Thus, these findings indicate that the COVID-19 belongs to genus β -CoVs that infects humans, bats and other wild animals. Other reports also suggested the possibility of virus transmission from bats to humans through unknown intermediate hosts (Li et al; 2005). Forster and colleagues analyzed 160 complete human SARS-Cov-2 genomes by using a phylogenetic network analysis, and came up with some interesting findings. The results revealed three distinct “variants” of COVID-19, consisting of clusters of closely related lineages, which they label “A”, “B” and “C”. They found that type “A” is closest to the one discovered in bats and is the ancestor to all other variants. Most cases of the COVID-19 in the United States and Australia were type “A”. Type “B”, only separated by two mutations from the ancestor “A”, was prevalent in China and other East Asian countries. (Forster et al with 2020). Type “C”, predominantly found in patients in European countries, showed very little linkage with Type “B”. So far, the genomic data is not sufficient and clear to prove the true origin and transmission source of SARS-CoV-2 (Lu et al with 2020).

Studies even seem to contradict previous hypotheses, which considered Wuhan, the City in China, as the origin of COVID-19. However, more sequencing is needed, using samples from other wild animals such as turtles, pangolins and snakes, which may play a possible role as intermediate hosts to solve this puzzle and confirm the origin of SARS-CoV-2. Compared to the global 7,700 genome sequences of SARS-CoV-2, the African continent has just pooled 90 genome sequences for this virus (Wu et al with 2020). Additionally these sequences are coming from only 5 out of 51 infected countries, leaving a data dark spot in the continent. Considering the mutations of the virus and the importance of this data for vaccine developments, African countries need to contribute more to the global genomic data pool; otherwise Africans will be facing the same problem as with the Rotavirus vaccine (NCDC, 2020). The vaccine was developed based on rotavirus strains predominantly found in Europe and North America for use against rotavirus infections. However, the vaccine exhibited efficacy variation, seems more effective in Europe and North America but less effective in Africa and is believed due to the circulation of different strain in the continent (WHO, 2020).

Mode of Transmission of the COVID-19 Virus

Respiratory infections can be transmitted through droplets of different sizes: when the droplet particles are $>5\text{-}10\ \mu\text{m}$ in diameter they are referred to as respiratory droplets, and when they are $<5\ \mu\text{m}$ in diameter, they are referred to as droplet nuclei. According to current evidence, COVID-19 virus is primarily transmitted between people through respiratory droplets and contact routes. In an analysis of 75,465 COVID-19 cases in China, airborne transmission was not reported (WHO, 2020). Droplet transmission occurs when a person is in close contact (within 1 m) with someone who has respiratory symptoms (e.g., coughing or sneezing) and is therefore at

risk of having his/her mucosa (mouth and nose) or conjunctiva (eyes) exposed to potentially infective respiratory droplets. Transmission may also occur through ruminant in the immediate environment around the infected person. Therefore, transmission of the COVID-19 virus can occur by direct contact with infected people and indirect contact with surfaces in the immediate environment or with objects used on the infected person (e.g., stethoscope or thermometer) (NCDC, 2020).

Airborne transmission is different from droplet transmission as it refers to the presence of microbes within droplet nuclei, which are generally considered to be particles $<5\ \mu\text{m}$ in diameter, can remain in the air for long periods of time and be transmitted to others over distances greater than 1 m (CDC, 2020).

In the context of COVID-19, airborne transmission may be possible in specific circumstances and settings in which procedures or support treatments that generate aerosols are performed; i.e., end tracheal intubation, bronchoscopy, open suctioning, administration of nebulizer treatment, manual ventilation before intubation, turning the patient to the prone position, disconnecting the patient from the ventilator, non-invasive positive-pressure ventilation, tracheotomy, and cardiopulmonary resuscitation (NCDC, 2020).

There is some evidence that COVID-19 infection may lead to intestinal infection and be present in faeces. However, to date only one study has cultured the COVID-19 virus from a single stool specimen. There have been no reports of faecal–oral transmission of the COVID-19 virus to date (Banerjee et al with 2019).

Epidemiology of COVID-19 in Africa

Starting from Wuhan City, Hubei Province of China (Original epicenter of COVID-19) and spreading around the globe in less than 3 months, the COVID-19 pandemic is considered the one among the biggest pandemics to humans.

As the pandemic is still ongoing, the number of countries involved confirmed cases and mortality rates are changing every day. As the virus enters different countries at different time points, these countries are at different stages of the outbreak (Zhong et al with 2013). With this complicity, true epidemiology is only possible at the end of this pandemic. As of 18th April, 2020, the novel SARS-CoV-2 has emerged in all seven continents and affects 213 countries and territories with 2,121,675 confirmed cases, and a mortality rate of 6.7% . To date, the top three most-affected countries with COVID-19 include the United States of America (confirmed cases at 665,330 and 4.6% mortality), Spain (confirmed cases 182,816 and 10.5% mortality), and Italy (confirmed cases 168,941 and 13.1% mortality) (WHO, 2020).

With the currently available data, we attempted to monitor and track the epidemics of SARS-CoV-2 in the African continent. The African continent is the last one and least to be affected by COVID-19 pandemic to date. As of 18th April, 2020, Africa reported 19,895 confirmed cases from 52 countries with a mortality rate of 5.1%. First seen in Egypt on 14th of February 2020, the virus has now been detected in almost all the countries of Africa except Lesotho and Comoros. Chronologically, Egypt was followed by Algeria, with its first case reported on 25th February, followed by Nigeria on 27th of February. Apart from these three countries, the first cases in other African countries were only detected in March. The most-affected countries so far are South Africa (confirmed cases = 2783, mortality = 1.8%), Egypt (confirmed cases=2844, mortality = 7.2%), Morocco (confirmed cases = 2564, mortality = 5.3%), Algeria (confirmed cases = 2418, mortality = 15.0%) and Cameroon (confirmed cases = 1016, mortality = 2.1%). However, due to inadequate testing capacity for COVID-19 the true number of cases may remain undetected, which makes it challenging to

predict or conclude the true epidemiology of COVID-19 in the continent (Giovantti et al:2020). Certainly, several major factors, such as late arrival of the pandemic, weak diagnostics including inadequate COVID-19 testing, lack of essential medical supplies and a large susceptible population will significantly affect and change the epidemiology of COVID-19 in the continent (NCDC, 2020).

COVID-19 Vulnerability and it's preparedness in Africa

The COVID-19 pandemic is a wake-up call for Africa: the high burden of infectious diseases, weak health systems, poverty and the arrival of the winter “flu” season in Southern Africa, are some major factors which particularly make the continent one of the most vulnerable to this current pandemic. According to the Infectious Disease Vulnerability Index (IDVI) 2016, out of 25 countries most vulnerable to infectious diseases, 22 are in the African region (WHO:2020). A country's healthcare capacity plays a vital role in COVID-19 management and control. In comparison to the developed nations such as USA, the UK and China, which have advanced health care systems but are still struggling to cope with the current pandemic, the majority of African countries have a weaker healthcare sector. The limited testing capacity, shortage of trained staff required for diagnostics and intensive care units (ICU), inadequate ventilators and ICU facilities (needed in severe cases of COVID-19), lack of personal protective equipment (PPE) for healthcare workers and scarcity of funds for the health sector, are some of the continent's core healthcare related issues, which make it more susceptible to the COVID-19 pandemic (NCDC: 2020). The other misfortune for Southern Africa is the arrival of winter, as all respiratory viruses spread more effectively in the winter; thus it is anticipated that the intensity of COVID-19 will increase in the coming winter months between May and September 2020.

On the other hand, this shift in the seasons may become fortunate for northern hemisphere countries, where summer is coming and will likely decrease the transmission of SARS-CoV-2 (Du et al with 2020).

As we are witnessing how the ongoing pandemic is hampering the world's most developed countries which have advanced healthcare, a low disease burden and established economies; it will be interesting to see the impact of COVID-19 on low- and middle-income countries. Unfortunately most of the African countries fall into this category, therefore it may be challenging for them to cope with the COVID-19 pandemic. However, the magnitude of the impact will depend on the management and control of COVID-19 within the respective countries. Recently, a modeling study based on the State Party Self-Assessment Annual Reporting (SPAR), Index and Infectious Disease Vulnerability Index (IDVI), measured the preparedness and vulnerability of African countries against COVID-19 importations from China. Both indicators (SPAR and IDVI) ranged from 0 to 100, measure increasing capacity and decreasing vulnerability (CDC: 2020). Egypt, Algeria and South Africa had the highest importation risk from China, with the SPAR scores of 87, 76, and 62 respectively, and have moderate to high capacity to respond to outbreaks, with IDVI scores of 53, 49, and 69 respectively. Countries such as Nigeria and Ethiopia have moderate importation risk, with SPAR scores of 51 and 67 respectively, but high vulnerability with IDVI scores of 27 and 38 respectively. Sudan, Angola, Tanzania, Ghana, and Kenya also have similar moderate importation risk with variable levels of capacity (ranging from 34 to 75), and an overall low IDVI (<46), reflecting high vulnerability (NCDC: 2020). On a positive note, the demography of the African continent seems to be an advantage when compared to other COVID-19 affected regions. The median age in Africa is less than 20 that makes the continent the

youngest in the world. Only 4% of Africa's population is older than 65, which are low as compared to 37% in Eastern and South-Eastern Asia and 29% in Europe and Northern America. Current data suggests that COVID-19 affects older people severely, with higher mortality than the younger population, which showed only milder symptoms. In addition, Africa is the last continent to be hit by COVID-19, and therefore gets some extra time with additional information for preparations to face the pandemic (NCDC:2020). Africa also had lessons to be learnt from other countries and from the previous outbreaks, to act urgently on specific weaknesses and implement strict measures of detection, prevention, and control to enhance preparedness for COVID-19 pandemic. Recently, several strategic measures, which include complete lockdowns, travel bans, closing of schools, companies, and offices, ban on large gatherings (including religious, sports, social and other events), systematic quarantines, increased testing capacity and strict infection control measures, are being implemented throughout the African continent to control the spread of COVID-19 (NCDC: 2020). Furthermore, on 5th February 2020, the African task force for corona virus (AFCOR) was established by Africa CDC in collaboration with the African Union Commission (AUC) and the WHO, to step up the preparedness measures for COVID-19 closure. The AFCOR aims to focus on six work streams: laboratory diagnosis and sub typing, surveillance including screening at points of entry and cross-border activities, infection prevention and control in healthcare facilities, clinical management of people with severe COVID-19, risk communication, supply-chain management and stockpiles. The measure breakthrough for preparedness is in terms of laboratories testing for SARS-CoV-2 in the African continent. On 6th of March 2020, Africa CDC reported that 43 African countries are now able to test for COVID-19, while as at February 2020.

only two countries (Senegal and South Africa) were capable of diagnosing the virus. (CDC: 2020). In Africa, immediate support of \$82 million for Ethiopia and \$47million for the Democratic Republic of Congo has been approved (NCDC: 2020). However, there are big supports from several agencies, Non-Governmental Organizations (NGOs), philanthropists, funding agencies and banks to all the African nations, in order to prepare for the ongoing COVID-19 pandemics. Nevertheless, it would not be ideal to suggest that this support will be enough to prepare these countries for this pandemic. Therefore, urgent attention, support and action are required to fight and control the further spread of the ongoing pandemic (CDC: 2020).

Economic impact of COVID-19 in Africa

The initial phase of the COVID-19 pandemic was all about clinical and epidemiological aspects however, the shift is now changing towards the global economy (United Nations Human Rights with 2020). The focus of effect of COVID-19 pandemics needs to shift to the developing nations, and particularly to African countries which rely mostly on developed countries. Economists had estimated Africa's growth in 2020 at 3.9%, which can now drop to 0.4% (in the best case) to -3.9% (in the severely hit case) (WHO: 2020). Experts also believe that growth in Sub-Saharan Africa may fall to between -2 and -5% in comparison to 2.4% in 2019, with a risk of the first recession in the last 25 years. The major factors which may affect the African economy related to COVID-19 are:

Reduction of importation of Chinese goods to the level that it inflates the African markets. This will have a further impact on the small scale traders of developing markets, and will increase the prices of local commodities (CDC: 2020).

Decreasing oil consumption due to travel bans, border closures, social distancing and lock downs lowering down the demand for

oil. The budget of some of the African oil-producing countries such as Nigeria, Angola, Algeria, Ghana and others, is dependent upon crude oil pricing, which has been badly hit by this pandemic, thereby impacting the GDP of these countries. This could however have a positive impact on oil-importing countries (United Nations Human Rights: 2020).

African mining industry: The mining sector is China's top most interest for investing in Africa than any other big economy. Travel restrictions, shutdowns and port closures have resulted in decreasing demand for steel, iron ore, lithium, and cobalt. Alone in South Africa, the mining industry employs around 420,000 people and thousands of them are working underground which suggests that the mining work environment is more exposed to pandemic and can become a catalyst for spreading the COVID-19. As such, the African mining sector faces an unavoidable hit from the ongoing COVID-19 pandemic, even though there is still much uncertainty as to how much and for how long the sector will be impacted (CDC: 2020)

Reduction of tourism: The major economic sector of many African countries such as South Africa, Ethiopia, Kenya and Tanzania is tourism, which is negatively affected due to COVID-19, thereby affecting the economies of these countries.

Withdrawal of investors: Developing markets already taste the bitterness where investors have already fled, with the largest capital flow ever recorded. Foreign direct investments have already been declined due to delays or cancellation of several revenue boosting projects. Also, the flow of aid and other assistance projects have been stopped, as the donor countries are themselves struggling with the same pandemic situation.

The shift of budgets from other sectors to the health sector is a timely need, and this will cause a further decline in the economic growth of these countries (NCDC: 2020).

The lower revenue will in turn reduce the tax rates; which will badly impact on the fiscal revenues of poor countries in Africa (The World Economic Forum on: COVID-19, 2020).

All these factors will put governments under extreme pressure in preparing for the post-crisis of the COVID-19 pandemic. Experts are calculating around 20 million job losses, which will further increase the unemployment rates of African countries. Increase in unemployment could possibly lead to social unrest and increasing crime rates in the countries with a history of sectarian violence (World Economic on: COVID-19, 2020).

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CONCLUSION

As COVID-19 continues to spread globally, with increasing morbidity and mortality, with some control in the African continent compared to the other parts of the world. The swift actions against this pandemics imposed by the governments have been effective so far. However, as the majority of African population is living from hand to mouth, these measures cannot sustain for long. Despite the stupendous efforts towards the eradication of the menace, COVID-19 still remain a huge threat to human population in African Continent and even at large.

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