The Late Arrival of COVID-19 in Africa - Mitigating Pan-Continental Spread

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word summary

The novel Coronavirus disease-19 (COVID-19) has rapidly spread to all seven continents. Due to yet unknown reasons, the African continent has remained relatively unaffected. We discuss the importance of mitigating pan-continental spread in light of the fragile healthcare systems.

Viewpoint editorial

On 30 January 2020, the World Health Organization (WHO) Director-General declared Coronavirus Disease 2019 (COVID-19), caused by SARS-CoV-2, a Global Public Health Emergency of International Concern [1]. Since then COVID-19 has spread to all continents. As of 22 March 2020, there have been 283,100 laboratory confirmed cases of COVID-19 with 12,400 deaths (4.3% case fatality ratio). The African continent has remained relatively unaffected, but African countries with unstable health systems and travel links between China, Italy, and other high COVID-19 endemic countries are most vulnerable. In anticipation of importation of cases to Africa, WHO, Africa CDC, national governments, and public health organizations have spent two months scaling up preparedness efforts to control the spread of the COVID-19 pandemic throughout Africa [2-4]. This support is critical to allow African governments to implement the International Health Regulations Emergency Committee recommendations.

The WHO African Region recently saw an upsurge in cases. As of 24 March 2020, 1305 confirmed COVID-19 cases with 26 deaths (0.2% case fatality) have been reported from across 33 countries [4]. The male to female ratio among the confirmed cases is 1.4, and the median age is 41.5 years old (IQR 31 – 54), which might explain the low number of deaths compared to the global average. The highest number of confirmed cases have been reported from South Africa (709 cases), Algeria (230 cases), Burkina Faso (114 cases), and Senegal (86 cases) [4]. Most of the cases in the African region are sporadic importations from European Union or United States, and, surprisingly, none are from China as anticipated [5]. All index cases reported in the WHO African Region had a history of travel to France, United Kingdom, Italy, Switzerland, Spain, Germany, USA, United Arab Emirates, India, Iran, Japan, or New Zealand (**Figure 1**) [6].

Without adequate capacity for Polymerase Chain Reaction (PCR) testing to confirm the causative virus (SARS-CoV-2) for suspected cases of COVID-19, community transmission may remain undetected for prolonged periods and lead to local outbreaks, as seen in and around Seattle, United States. WHO has rapidly built capacity for COVID-19 testing in 37 African countries, and as the number of cases rises, COVID-19 will have a major impact on already severely constrained/vulnerable health care systems [3]. To prevent excessive morbidity and mortality in the event of uncontrolled COVID-19, greater resources and novel approaches to strengthen the weak healthcare systems will be needed.

Also, the spread of COVID-19 in sub-Saharan Africa is an additional concern because the continent already bears approximately 70% of the global Human Immunodeficiency Virus (HIV) burden. The countries that have experienced the highest COVID-19 burden so far, including China, South Korea, Japan, Italy, and Iran, are very different from sub-Saharan Africa and thus there is limited information on how co-infection with HIV will affect COVID-19 patients. Of note, risk factors for more serious illness and fatal outcomes include older age (over 60 years old) and co-morbidities such as cardiovascular disease, chronic lung disease, diabetes, or cancer, which are also prevalent in ageing HIV-infected patients. Therefore, it can be reasonably hypothesized that many people in Africa will be at high risk for COVID-19. As the pandemic expands in sub-Saharan Africa, it will be critical to determine whether COVID-19-associated disease severity and mortality will be increased in immunocompromised patients, especially those with uncontrolled HIV (high viral load or low CD4+ T-cell count). Furthermore, there is concern that population confinements, due to necessary lockdowns implemented in several African countries, will interrupt the supply/refill of critical medications such as antiretroviral therapy (ART). Creative strategies learned from the HIV epidemic include differentiated service delivery models (e.g., community-based ART services such as home delivery of ART) [7] and the use of cellphone text messages to reinforce norms related to hygiene and health-seeking behavior [8].

To date, there are no proven effective treatments for COVID-19 disease. Numerous trials are currently evaluating therapeutic interventions targeting the SARS-CoV-2 virus and its damaging immune response in the lungs, which causes Acute Respiratory Distress Syndrome (ARDS) and is a major cause of death [9]. Among them, two Phase III trials involving remdesivir (GS-5734), a nucleoside analogue inhibitor originally under development for Ebola that has shown efficacy against SARS-CoV-2 in vitro and prevents serious pulmonary complications in vivo, began in March and are scheduled to conclude in May 2020 [10]. A randomized clinical trial of lopinavir/ritonavir, an HIV drug used extensively throughout Africa, conducted in China found no improvements in disease length, viral shedding, or 28-day mortality [9]. A small (n=36), non-randomized clinical trial that investigated the use of chloroquine/azithromycin reported that hydroxychloroquine was efficient in clearing viral nasopharyngeal carriages of SARS-CoV-2 in French patients with COVID-19 in only three to six days. However, the quality of evidence was low due to the small sample size, lack of clinical outcomes, and lack of randomization, and therefore the results of the study are not conclusive [11]. There remains an urgent need to conduct adequately-powered, randomized clinical trials to confirm chloroquine/azithromycin effectiveness for treatment of COVID-19.

In the absence of an effective treatment or vaccine, traditional measures for epidemic control of respiratory illness need to be reinforced in Africa, including social distancing, frequent hand washing, coughing and sneezing etiquette, and avoidance of touching one's eyes, nose, and mouth. Africa is known for its well-earned reputation of community, and many daily activities revolve around social interactions including church or market shopping. Social distancing will be particularly challenging, especially for individuals who are food-seeking or require daily pay. With an average incubation period of 5 – 7 days (and possibly as long as 12 – 14 days), it critical that those who have COVID-19 or have had close contact with a person with confirmed COVID-19 self-quarantine for 14 days. Innovative strategies to reduce social interactions must

begin immediately and utilize television (TV), church services (through radio, TV, socio-media), radio adverts, toll-free COVID-19 hotlines, and local leaders to inform the public.

Several countries in Africa have implemented travel bans on nationals from high COVID-19 endemic countries or complete lockdowns. Further, the Africa CDC established the Africa Task Force for Novel Coronavirus on 3 February 2020 and is working with WHO on surveillance, including screening at points of entry across the continent, infection prevention and control in health-care facilities, clinical management of people with severe COVID-19 infection, laboratory diagnosis, and risk communication and community engagement. The Africa Union has solicited the Infection Control Africa Network to provide training in COVID-19 containment; fourteen countries have participated in two courses with additional instruction scheduled [12].

African governments must continue to provide and leverage additional funding for essential health services during the COVID-19 pandemic, particularly TB, malaria, HIV, and maternal child health. People-centered delivery of prevention, diagnosis, treatment, and care services should be ensured in tandem with the COVID-19 response. As the modes of transmission of TB, COVID-19, and other respiratory tract infections (RTIs) are similar, measures must be put in place to limit transmission of TB and COVID-19 in congregate settings and health care facilities. Provision of personal protective equipment to healthcare workers who are putting their lives at risk must be prioritized and scale-up. Accurate diagnostic tests are essential for all RTIs (including COVID-19) and require a sustained supply of diagnostic tests. Existing pan-African networks for Emerging and Re-Emerging diseases that work in close liaison with the Africa CDC, WAHO, and WHO regional office will play a crucial role in buffering the impact of COVID-19. Existing tuberculosis laboratory networks and mechanisms for specimen transport and processing should be used for COVID-19 diagnosis and surveillance.

In conclusion, the global burden of COVID-19 will increase over the next few weeks, but as more people recover, the transmission will decrease. Effects of temperature and humidity play

a significant role in the spread of respiratory virus infections during what is commonly known as the “flu” season caused by Influenza virus. It remains unclear whether this will hold true for SARS-CoV-2 or how much the seasons contribute to the shift from an epidemic to a pandemic. However, if COVID-19 is not contained, it is possible that countries in the southern hemisphere like South Africa, Brazil, and Australia might see increased infection intensities during their winter months between May and September 2020 [13, 14]. Data from China showed that more than 99.0% of people between 1 and 70 years old who contract COVID-19 will recover without any specific treatment and generate herd immunity. Most will have a cold/flu symptom and will not even know they are infected. Effective public health messaging on COVID-19 should align with political and scientific briefings by African governments, and this should be focused on educating as well as reassuring the public. Elderly patients with co-morbidities or those with immunosuppression are at highest risk, and we must work to prevent infection in these populations. Relatively low longevity rates and most of the population under 70 years of age may ironically be advantages for Africa.

Potential Conflicts of Interest

All authors have a specialist interest in emerging and re-emerging pathogens and declare no conflicts of interest. Professor Nachega is an Infectious diseases internist and epidemiologist supported by United States National Institutes of Health (NIH)/National Institutes of Allergy and Infectious Diseases (NIAID) grant No. 5U01AI069521 (Stellenbosch University Clinical Trial Unit-CTU- of AIDS Clinical Trial Group-ACTG) as well as NIH/Fogarty International Center (FIC) grants Nos. 1R25TW011217-01 (African Association for Health Professions Education and Research) and 1D43TW010937-01A1 (University of Pittsburgh HIV-Comorbidities Research Training Program in South Africa). Sir Zumla is a co-PI of the Pan-African Network on Emerging and Re-Emerging Infections (PANDORA-ID-NET – https://www.pandora-id.net/) funded by the European and Developing Countries Clinical Trials Partnership the EU Horizon 2020 Framework Program for Research and Innovation. Sir Zumla is in receipt of a National Institutes of Health Research senior investigator award. Professor Seydi is an infectious

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References:

1) World Health Organization. Statement on the second meeting of the International Health Regulations (2005) Emergency Committee regarding the outbreak of novel coronavirus(2019-nCoV). Geneva, Switzerland: WHO. https://www.who.int/news-room/detail/30-01-2020-statement-on-the-second-meeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-outbreak-of-novel-coronavirus-(2019-ncov) [Accessed 21 March 2020]

2) Kapata N, Ihekweazu C, Ntoumi F, et al. Is Africa prepared for tackling the COVID-19 (SARS-CoV-2) epidemic. Lessons from past outbreaks, ongoing pan-African public health efforts, and implications for the future [published online ahead of print, 2020 Feb 28]. Int J Infect Dis. 2020;93:233–236. doi:10.1016/j.ijid.2020.02.049

3) Largent E.A. EBOLA and FDA: reviewing the response to the 2014 outbreak, to find lessons for the future.J Law Biosci. 2016; 3 ([published 2016 September 16]): 489-537https://doi.org/10.1093/jlb/lsw046

4) World Health Organization. Importation pattern of COVID-19 cases int he WHO African Region, 25 February –18 March 2020. Available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports. Accessed 21 March 2020.

5) Haider N, Yavlinsky A, Simons D, et al. Passengers' destinations from China: low risk of Novel Coronavirus (2019-nCoV) transmission into Africa and South America. Epidemiol Infect. 2020;148:e41. Published 2020 Feb 26. doi:10.1017/S0950268820000424

6) World Health Organization. Importation pattern of COVID-19 cases int he WHO African Region, 25 February –18 March 2020. Accessed on March 22 at. https://www.who.int/emergencies/diseases/novel-coronavirus-2019/situation-reports

7) Rory Leisegang R, Calkins K, Cotton M, et al. HIV-Positive Patients Receiving Antiretrovirals Through Home Delivery: Does it Matter? A Causal Analysis. Poster 5543. Conference on Retroviruses and Opportunistic Infection. March 6-11, 2020, Boston, MA, USA.

8) Nachega JB, Forrest JI, Wiens M, et al. Mobile health applications for HIV prevention and care in Africa. Curr Opin HIV AIDS. 2015 Nov;10(6):464-71.

9) Clinical Trial Gov Registry. Accessed on March 21th, 2020 at: https://clinicaltrials.gov/ct2/results?cond=covid19&term=&cntry=&state=&city=&dist= . Accessed on March 22, 2020.

10) Dong L, Hu S, Gao J. Discovering drugs to treat coronavirus disease 2019 (COVID-19). Drug Discov Ther.2020;14:58-60

11) Cao B, Wang, Y., Wen D. A Trial of Lopinavir–Ritonavir in Adults Hospitalized with Severe Covid-19. N Engl J Med. 2020 Mar 17. DOI: 10.1056/NEJMoa2001282. Accessed 21 March 2020.

12) Gautreta P., Lagiera J-C, Parolaa P.et al. Hydroxychloroquine and azithromycin as a treatment of COVID-19: results of an open-label non-randomized clinical trial. Intern Journal of Antimicrobiol Agent 2020 (In Press).

13) Infection Control Africa Network (ICAN). Online Training ECHO Programme. Available at: https://www.youtube.com/watch?v=OWDmx2XIOKk&feature=youtu.be Accessed 21 March 2020.

14) . Seasonality of SARS-CoV-2: Will COVID-19 go away on its own in warmer weather? Available at: https://ccdd.hsph.harvard.edu/will-covid-19-go-away-on-its-own-in-warmer-weather/; Accessed on March 24, 2020.

15) The role of absolute humidity on transmission rates of the COVID-19 outbreak. Available at: https://www.medrxiv.org/content/10.1101/2020.02.12.20022467v1; Accessed on March 24, 2020

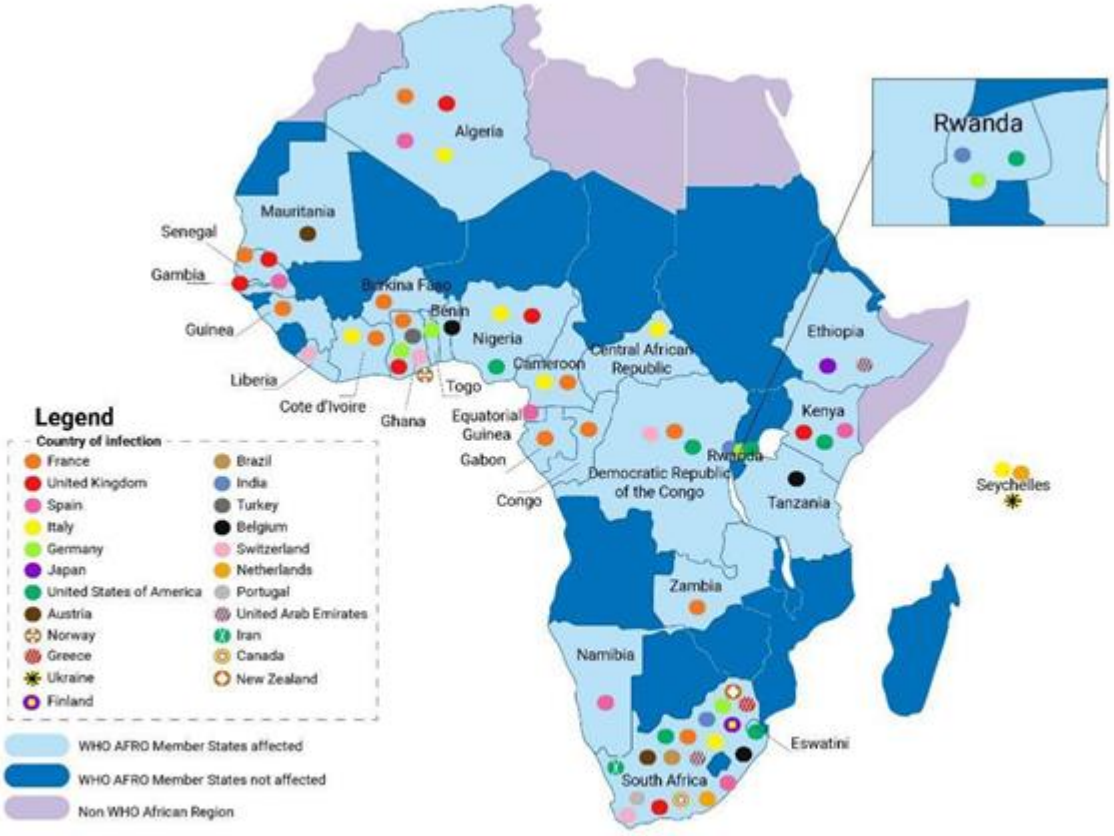

Figure 1. Importation pattern of COVID-19 cases in the WHO African Region, 25 February to 18 March 2020 [6].