The SARS-CoV-2 epidemic in Zimbabwe: Quo vadis?

Leolin Katsidzira: Department of Medicine, University of Zimbabwe College of Health Sciences, Harare, Zimbabwe

Lenon Gwaunza: Department of Physiology, University of Zimbabwe College of Health Sciences, Harare, Zimbabwe

James G Hakim: Department of Medicine, University of Zimbabwe College of Health Sciences, Harare, Zimbabwe

Correspondence: Leolin Katsidzira, Department of Medicine, College of Health Sciences, University of Zimbabwe, Mazowe Street, Harare, Zimbabwe email: katsidzira.leo@gitclinic.co.zw

Summary

The SARS-CoV-2 epidemic is likely to be attenuated in Zimbabwe, possibly with a reduced mortality, but this may still overwhelm the health system. Prevention interventions should be tailored to the unique social and cultural networks that may sustain the epidemic.

Abstract

The trajectory, and impact of the SARS-CoV-2 pandemic in sub-Saharan Africa is unclear, but it is seemingly varied between different countries, with most reporting low numbers. We use the situation in Zimbabwe to build an argument that the epidemic is likely to be attenuated in some countries with similar socio-economic and cultural structures. However, even an attenuated epidemic may overwhelm weak health systems, emphasising the importance of prevention. These prevention strategies should be tailored to the unique social and cultural networks of individual countries which may facilitate the spread of SARS-CoV 2. It is also equally important to maintain services for the major infectious diseases in the region such as tuberculosis and malaria. A breakdown of treatment and prevention services for these conditions may even overshadow the projected morbidity and mortality from COVID-19.

Keywords: COVID-19; SARS-CoV-2; Africa, south of Sahara; Zimbabwe,

The emergence of SARS-CoV-2 has shaken the globe in fundamental ways, and sub-Saharan Africa has been no exception. However, the magnitude and trajectory of the epidemic in the region is unclear, and the reflex response has ranged from nonchalant to assuming the worst-case scenario. The region was spared from the first two coronavirus epidemics of the 21st century, SARS and MERS, initially raising expectations of a similar scenario unfolding with SARS-CoV-2[1]. However, emerging information about the increased vulnerability of underprivileged groups to COVID-19 disease in the United States has heightened fears that Africa will be disproportionately affected by this pandemic[2]. Using Zimbabwe as an example, we argue that the magnitude, and impact of the epidemic in most of sub-Saharan Africa is likely to be smaller than anticipated, with a reduced morbidity and mortality. However, the nature, and impact of such an attenuated epidemic remains unclear, and may still overwhelm weak health systems.

In Zimbabwe, the threat of COVID-19 burst into national consciousness after the death of the second case to be diagnosed in the country. He was a young prominent media personality, and the son of a well-known politician and businessman, and had recently returned from New York. His demise gained intense media coverage, and highlighted the structural deficiencies in the Zimbabwean health system in dealing with a highly contagious disease, particularly one which may require critical care [3, 4]. This case strongly influenced the subsequent response to COVID-19 by both the government, and the private healthcare industry in Zimbabwe, and played a pivotal role in raising public awareness.

Subsequently, government reserved 425 hospital beds and 5 ventilators for COVID-19 at one of the tertiary care hospitals in the capital, Harare, and is upgrading and refurbishing infectious diseases hospitals around the country. Another set of, five

ventilators have been installed at one of the infectious diseases' hospitals in Harare. Historically, contagious diseases in Zimbabwe have been managed at infectious diseases hospitals under the control of local government authorities. These units functioned as isolation facilities, but with no capacity to handle cases requiring critical care. Alongside government initiatives, five private hospitals are being repurposed wholly, or partially as COVID-19 centres. Four of these are in Harare, with a fifth in the second largest city, Bulawayo, and they have capacity for approximately 650 beds and 20 ventilators.

The unintended consequence of these efforts has been a reduction in the already constrained capacity to provide routine emergency medical care for non-COVID-19 cases in the country. At government tertiary care hospitals, routine outpatient consultations and elective surgical procedures have been stopped, while the number of emergencies has dropped. The beds, and ventilators earmarked for COVID-19 have resulted in a reduced capacity for non-COVID-19 patients. Similarly, the change in focus of the infectious diseases' hospitals to COVID-19 may have an adverse effect on the tuberculosis programs in particular. Already, the two infectious diseases hospitals in Harare have stopped admitting non-COVID-19 patients, in a country with a high prevalence of tuberculosis and recurrent outbreaks of typhoid. This highlights the need to balance the response to COVID-19 with on-going public health needs[5]. It is not inconceivable that we may see an increase in mortality from non-COVID-19 related conditions, and this increase may even dwarf COVID-19 related deaths, as was previously observed after the Ebola outbreak in West Africa[6]. Thus, it is essential to maintain a sense of proportion, particularly in sub-Saharan Africa, where access to healthcare is a challenge even during normal times.

As of 1 May, 2020, there were 34 confirmed cases of SARS – CoV-2 infection in Zimbabwe mostly asymptomatic cases or with mild disease, with 4 fatalities. These cases of SARS-CoV-2 have all been diagnosed in Zimbabweans who visited the United Kingdom, the USA, and Dubai and their contacts. Surprisingly, there have been no reported cases of COVID-19 originating from the original epicentre, China, despite the increasing traffic between the two countries. This is consistent with a modelling study, which suggested a low risk of transmission of SARS-CoV-2 from China into Africa, despite an increase in the volume of traffic between the two since 2002[7]. Apart from increasing hospital capacity for COVID-19 cases, the response in Zimbabwe has included public awareness campaigns, promotion of social distancing including banning public gatherings, closing schools and colleges, and culminated in a 21-day general lockdown, which was later extended by 14 days. This response was probably influenced by unfolding events in Europe, the USA and South Africa, and gained impetus from the much-publicised unfavourable outcome of the second case of COVID-19. What has been understated though, is the lack of credible estimates on the expected trajectory of the SARS-CoV-2 epidemic in sub-Saharan Africa, and the need to have interventions tailored to the social, demographic and economic conditions.

A number of unique factors may affect such epidemiological estimates in sub-Saharan Africa. First, there is gross inequality, and this is particularly marked in southern Africa[8]. One of the legacies of colonialism in Zimbabwe and South Africa in particular, has been a stark segregation of where people live and socialise, though this is now nominally based on income. Those who live in the wealthier suburbs rarely mingle with the majority in the townships. Some interaction does occur during work-related activities, and between relatives and this is a potential bridge of the

infection. The nascent SARS-CoV-2 epidemic in sub-Saharan Africa has not followed the usual script of infectious diseases, of being predominantly found in impoverished areas. Rather, cases of SARS-CoV-2 first emerged in wealthier communities, mainly from travellers to Europe and North America, who are often relatively well-to-do. Recognising this fact highlights the potential benefits in restricting movements between different communities in the urban areas. Second, the majority of Zimbabweans (63%) live in the rural areas, where there is often inherent social distancing and minimal regular use of public transport[9]. This population, can be shielded by discouraging people in the urban areas from visiting their rural relatives until there is solid evidence that community transmission is not occurring at scale, or has been eliminated.

Third, Zimbabwe has been relatively isolated from global air travel. In 2018, only 8 foreign airlines were flying into the country, mostly from regional destinations[10]. There is a link between the volume of international flights, and the magnitude of the SARS-CoV-2 epidemic in sub-Saharan Africa[7, 11]. It is no coincidence that South Africa, with the most advanced economy in the region, and multiple international flights daily, has the highest number of SARS-CoV-2 cases in the region[7, 12]. Countries such as Zimbabwe, which are less integrated with the global economy, may have been inadvertently less exposed to the SARS-CoV-2 pandemic. Even after arrival in Zimbabwe, travellers are often ferried to their homes or hotels in private vehicles, limiting exposure to the public that may occur with efficient mass transport systems. This situation has an inherent social distancing, and may simplify contact tracing.

Finally, Zimbabwe and most of sub-Saharan Africa have a predominantly young population. According to the 2012 census, 89% of the Zimbabwean population was

younger than 50 years and only 2.8% were older than 75 years[13]. Older age has been consistently associated with heightened mortality from COVID-19[14-17]. Consequently, differences in the population age structure can lead to dramatic differences in mortality for COVID-19 disease[18] Thus, it is reasonable to anticipate a much lower mortality from COVID-19 in sub-Saharan Africa, compared to Europe and North America, where there is a much larger proportion of older people. Nonetheless, it is important to protect the small, elderly population in sub-Saharan Africa, and this may be easier to implement. There is limited use of institutional care for the elderly such as nursing homes, or retirement villages [19]. This may reduce the risk of nosocomial SARS-CoV-2 outbreaks in a vulnerable, captive population Since the majority of elderly people live in the rural areas, their risk of infection can be reduced by restricting movement between urban and rural areas.

A potential source of higher than anticipated mortality from COVID-19 disease in sub-Saharan Africa is the high burden of HIV infection [5]. It is also possible that individuals with HIV infection may have increased susceptibility to SARS-CoV-2 infection. However, there is no robust data on the interaction between HIV and COVID-19, although initial evidence from a small case series suggests that the impact could be less than initially feared [20]. Moreover, considerable progress has been made in the fight against HIV in Zimbabwe, where 90% of people with HIV know their status, 88% are on treatment and 73% are virally suppressed [21]. These achievements have reduced the pool of those HIV infected people who may be more susceptible to SARS-CoV-2 and its complications i.e. those with undiagnosed HIV infection or are not on treatment or have sub-optimal control.

It remains unclear whether complete lockdowns are the most ideal method to limit the spread of SARS-CoV-2 in sub-Saharan Africa [22]. A complete lockdown has its

own economic ramifications, and the SARS-CoV-2 pandemic in itself has led to the first recession in a quarter of a century in the region [23]. However, the degree of the adverse impact of lockdowns on the economy will differ between different countries. In Zimbabwe, there is likely to be disproportionate effect at household level, as most people now depend on the informal sector, in a country with limited formal social safety nets [24]. Moreover, enforcement of lockdowns is potentially unequal, and may take a punitive form in the poor neighbourhoods, that paradoxically, are less likely to have the initial imported, and imported-associated SARS-CoV-2 infections. Flattening the curve may not have a significant impact if the epidemic is small, and the existing healthcare infrastructure is already overwhelmed by the large burden of communicable and non-communicable diseases. However, the net effect of lockdowns will only become clearer retrospectively, and data from countries such South Africa becomes available. South Africa has the largest epidemic in the region, and has implemented a strict lockdown, and is generating high quality epidemiological data. For now, policymakers have to make decisions based on imperfect information, which is continuously changing as our understanding of the virus incrementally increases.

In the meantime, incorporating other approaches into the on-going measures may also help in limiting the spread on SARS-CoV-2. One such approach that can be undertaken in sub-Saharan Africa is to restrict the movement of people between different suburbs, and between urban and rural areas, while allowing some level of economic activity. Active surveillance, and testing for both imported and community cases with stringent contact tracing and isolation should continue. It is instructive that this approach has identified most of the reported cases in Zimbabwe. Localised lockdowns may also be considered for specific foci of infections. International travel

should continue to be curtailed, and more effective screening strategies at the ports of entry must be developed and implemented when it resumes. In Zimbabwe there is a dichotomous health system, one public, catering for the majority, and the other private sector, catering for the minority who are on medical insurance or can afford to pay. Given the aforementioned profile of the typical case in the country, it is important to ensure that prevention strategies are also implemented stringently at the private health facilities, which should be capacitated where necessary. The protection of healthcare workers should be a key priority, and some of them serve both the public and private sectors, and are a potential bridge of infection. All the cases seen in Zimbabwe so far have either been identified at private hospitals, or from screening returning travellers, or from contact tracing. As of 2 May 2020, there has not been a case, presenting initially to a public healthcare facility.

In conclusion, it is conceivable that the impact of COVID-19 in Zimbabwe could be attenuated in comparison to what has happened in economies with mass transport systems, high volume air travel and over-crowded social gatherings. This however, is on the proviso that there is adequate insulation of the community from returning travellers and a robust implementation of hygienic practices and social distancing. Finally, the COVID-19 epidemic is an opportunity for countries in sub-Saharan Africa to invest and innovate in the delivery of better health care including critical care infrastructure and to redirect dollars being lost in medical tourism inwardly [25].

Funding: No funding was required for this work.

Potential Conflicts of Interest: The authors declare no competing interests.

References

1. Rajakaruna SJ, Liu WB, Ding YB, Cao GW. Strategy and technology to prevent hospital-acquired infections: Lessons from SARS, Ebola, and MERS in Asia and West Africa. Mil Med Res **2017**; 4(1): 32.
2. Yancy CW. COVID-19 and African Americans. JAMA **2020**.
3. Nyoka S. Coronavirus: Zimbabwean broadcaster Zororo Makamba died 'alone and scared'. BBC News **2020**; https://www.bbc.com/news/world-africa-52061697 (Accessed 19 April 2020).
4. The Daily News Zimbabwe. Makamba family fumes over Zororo's death, 24 March 2020. The Daily News **2020**; https://dailynews.co.zw/makamba-family-fumes-over-zororos-death/ (Accessed 19 April 2020).
5. Nachega JB, Seydi M, Zumla A. The Late Arrival of COVID-19 in Africa - Mitigating Pan-Continental Spread. Clin Infect Dis **2020**.
6. Alyssa SP, Martial LN-M, Natasha SW, Alison PG. Effects of Response to 2014–2015 Ebola Outbreak on Deaths from Malaria, HIV/AIDS, and Tuberculosis, West Africa. Emerging Infectious Disease journal **2016**; 22(3): 433.
7. 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.
8. Odusola A, Cornia G, Bhorat H, Conceicao P. Income Inequality Trends in sub-Saharan Africa: Divergence, Determinants and Consequences. United Nations Development Programme **2017**; https://www.undp.org/content/dam/rba/docs/Reports/Overview-Income%20inequality%20Trends%20SSA-EN-web.pdf.
9. Zimbabwe National Statistical Agency and ICF International. Zimbabwe Demographic and Health Survey 2015: Final Report. Rockville, Maryland, USA: Zimbabwe National Statistical Agency (ZIMSTAT) and ICF International. **2016**.
10. Peters D. Zim's airline industry needs serious attention. The Zimbabwe Independent **2018**; June 13, 2018 https://www.theindependent.co.zw/2018/07/13/zims-airline-industry-needs-serious-attention/.
11. Martinez-Alvarez M, Jarde A, Usuf E, et al. COVID-19 pandemic in west Africa. Lancet Glob Health **2020**.
12. Gilbert M, Pullano G, Pinotti F, et al. Preparedness and vulnerability of African countries against importations of COVID-19: a modelling study. The Lancet **2020**; 395(10227): 871-7.
13. Zimbabwe National Statistical Agency. Census 2012 National Report. Zimstats **2013**; http://www.zimstat.co.zw/sites/default/files/img/publications/Population/National_Report.pdf (Accessed 18 April 2020).
14. Zhou F, Yu T, Du R, et al. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. The Lancet **2020**; 395(10229): 1054-62.
15. Yang J, Zheng Y, Gou X, et al. Prevalence of comorbidities in the novel Wuhan coronavirus (COVID-19) infection: a systematic review and meta-analysis. International Journal of Infectious Diseases.
16. Li X, Xu S, Yu M, et al. Risk factors for severity and mortality in adult COVID-19 inpatients in Wuhan. J Allergy Clin Immunol **2020**.
17. Chen T, Dai Z, Mo P, et al. Clinical characteristics and outcomes of older patients with coronavirus disease 2019 (COVID-19) in Wuhan, China (2019): a single-centered, retrospective study. J Gerontol A Biol Sci Med Sci **2020**.
18. Dowd JB, Andriano L, Brazel DM, et al. Demographic science aids in understanding the spread and fatality rates of COVID-19. Proceedings of the National Academy of Sciences **2020**: 202004911.

19. Berthé A, Berthé-Sanou L, Somda S, et al. The key actors maintaining elders in functional autonomy in Bobo-Dioulasso (Burkina Faso). BMC Public Health **2014**; 14(1): 689.
20. Blanco JL, Ambrosioni J, Garcia F, et al. COVID-19 in patients with HIV: clinical case series. The Lancet HIV.
21. UNAIDS. Country Factsheet: Zimbabwe. **2018**; https://www.unaids.org/en/regionscountries/countries/zimbabwe (Accessed 27 April 2020).
22. Dyer O. Covid-19: Africa records over 10 000 cases as lockdowns take hold. BMJ **2020**; 369: m1439.
23. The World Bank. COVID-19 (Coronavirus) Drives Sub-Saharan Africa Toward First Recession in 25 Years. **2020**; https://www.worldbank.org/en/news/press-release/2020/04/09/covid-19-coronavirus-drives-sub-saharan-africa-toward-first-recession-in-25-years (Accessed 18 April 2020).
24. Medina L, Schneider F. Shadow Economies Around the World: What did we learn over the last 20 years? IMF Working paper **2018**; https://www.imf.org/en/Publications/WP/Issues/2018/01/25/Shadow-Economies-Around-the-World-What-Did-We-Learn-Over-the-Last-20-Years-45583 (Accessed 27 April 2020).
25. Baker T, Schell CO, Petersen DB, et al. Essential care of critical illness must not be forgotten in the COVID-19 pandemic. The Lancet **2020**; 395(10232): 1253-4.