



SPANISH ASSOCIATION OF PAEDIATRICS

COVID-19 and Africa: Surviving between a rock and a hard place[☆]



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Abstract With over 575,000 deaths and about 13.3 million cases globally, the COVID-19 pandemic has had a terrible impact globally during the 6 months since cases were first detected in China. Conscious of the many challenges presented in settings with abundance of resources

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and with robust health systems, where mortality has been significant and transmission difficult to control, there was a logical concern to see how the virus could impact African countries, and their fragile and weak health systems. Such an anticipated “tsunami”, with potentially devastating consequences, seems however to not have yet arrived, and African countries, albeit witnessing an increasing degree of autochthonous transmission, seem to this day relatively unaffected by the pandemic. In this article we review the current situation of the pandemic in the African continent, trying to understand the determinants of its slow progress.

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COVID-19 y África: Sobreviviendo entre la espada y la pared

Resumen Con más de 575.000 muertes y cerca de 13.3 millones de casos a nivel global, la pandemia por COVID-19 ha causado un terrible impacto en apenas medio año de evolución desde que por primera vez fuesen detectados casos en China. Conscientes de las dificultades planteadas en entornos con sistemas de salud robustos, donde la mortalidad ha sido significativa, y la transmisión difícilmente controlable, había una lógica preocupación por ver cómo el virus podría afectar a los países africanos, donde sus frágiles sistemas de salud auguraban un impacto aún mayor. Este “tsunami” anunciado, de potenciales consecuencias devastadoras, parece sin embargo no haber llegado todavía, y los países africanos, donde ya se ha evidenciado una creciente transmisión, no están viendo el impacto en la salud de sus habitantes que muchos habían predicho. En este artículo repasamos la situación actual de la pandemia en el continente Africano, intentando entender los determinantes de su lenta progresión.

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Introduction

With more than 575 000 fatalities and nearly 13.3 million cases worldwide,¹ the global pandemic of coronavirus disease 2019 (COVID-19) has had a devastating impact in merely a half year since the first cases were detected in China. In light of the challenges experienced in regions with robust health care systems, where mortality has been substantial and spread difficult to control, there was a more than reasonable concern about the potential impact of the virus in African countries, which has been expected to be greater given the precarious state of their health care systems. This prophesied tsunami, with potentially devastating repercussions, has yet to come, and African countries where there has been evidence of some degree of spread are not experiencing the impact on public health that has been expected.

Needless to say, no country in the continent was prepared to face the coronavirus pandemic threatening the entire world. At present, South Africa, Egypt and to a lower extent some countries in the Sahel are the countries most affected in Africa. However, even the hardest-hit areas have had fewer cases and a lower associated mortality compared to Europe or America.

Obviously, we cannot paint the entire continent with the same brush, as the pandemic has yet to acquire a massive scope and is not having the same impact in South Africa compared to Malawi or Gambia. The responses of individual countries also differ.

While aware that we cannot discuss each of the 54 countries in Africa, we are writing this document to broaden our perspectives beyond our borders and challenge this pandemic that is making us even more self-centred than before.

Africa has recently reached the 600 000-case mark, and the deaths attributed to COVID-19 now exceed 13 500.¹ However, this only amounts to 4.6% of global cases and 2.3% of global deaths in a continent housing 17% of the global population. These figures, in a continent with more than 1300 million inhabitants, have yet to overwhelm health care systems, which seem to continue to function normally, albeit with their usual weaknesses. However, it is only reasonable to assume that this is just the beginning, as there is considerable community spread, especially in Western Africa.^{2,3} The worst-case scenario forecasts anticipate that there could be up to 220 million infections in the first year, including 37 symptomatic cases and more than 150 000 deaths.⁴ But only the future can tell.

Weak health care systems

Should these predictions come true, it is important to be aware that “the best defence against any outbreak is a strong health system,” as Tedros Adhanom Ghebreyesus, Director-General of the World Health Organization (WHO) and a native of Ethiopia, has stressed, adding that “COVID-19 is revealing how fragile many of the world’s health systems and services are.”

The pandemic poses a threat to health care systems everywhere in the world. The rapid increase in the occupancy of emergency departments, intensive care units and inpatient wards, overburdens and in some instances overwhelms health care systems and exhausts health care workers.

African countries are aware of the fragility of their health care systems, with approximately 5 hospital beds available per million inhabitants compared to 4000 in Europe (based on data published by the WHO)⁵ and only 2000 working ventilators in the public health systems of the entire continent.⁶ Many African countries have only about a dozen ventilators to cover populations of millions of people, and these devices are also concentrated in one or a few hospitals.

There is a similar pattern in the number of health care workers⁷: Only 5 of the 49 countries categorized as low-income economies by the World Bank meet the minimum threshold of 23 doctors, nurses and midwives per 10 000 population that was established by WHO as necessary to deliver essential health services. The issue is not only the number, but also the lack of a homogeneous distribution of professionals, as rural and remote areas continue to have considerably lower coverage compared to large cities. In addition to serious limitations in health care resources, there are also significant deficiencies in the access to first-line prevention measures due to the chronic lack of protective equipment for health care workers and the enormous difficulty involved in guaranteeing adherence to hygiene measures in areas without access to running water.

What seems to be clear is that if this pandemic ‘explodes’ in African countries, the consequences may be even more terrible than those experienced in high-income countries. The direct and indirect repercussions in a much more fragile and deficient health care system compared to those of high-income countries would be even more devastating, and the potential economic impact is unimaginable.

The coronavirus-19 pandemic in the African continent

Why is the transmission rate in Africa considerably lower compared to Western countries?

Several factors could hypothetically contribute to explain this phenomenon:

- 1 The pandemic arrived later, there was more time to prepare and above all for governments to respond quickly and appropriately with imposition of curfews, awareness campaigns and travel and movement restrictions. However, measures have not gone as far as imposing a total lockdown in countries where the population gets by on a day-by-day basis in a subsistence economy, where confinement measures could lead to social tension and generalized hunger. Aware of this and of the limited capacity for a rapid response in case of an exponential spike in cases, most countries quickly imposed early restrictive measures with the aim of containing the virus and preventing the collapse of the health care system. It is still early to assess the success and draw lessons from these early measures, but it is clear that African countries
- 2 are much more used to public health emergencies and epidemics compared to the rest of the world, and perhaps in this case their early measures provide a good example of what should be done early on, even in the absence of evidence of autochthonous transmission.
- 3 Less contact with other countries and early closure of borders and restrictions in air and land travel. The early stop to imported cases bought African countries precious time that was invested in creating emergency response teams, training, skill building and allocation of resources to confront the virus. Still, there have been cases of community spread in absence of contact with imported cases, which suggests that the spread of the virus was not fully contained.
- 4 The African continent has ample experience accumulated through the years in the management of epidemics (Ebola, measles, cholera, HIV, etc.), especially in prevention and community-based interventions, and in organizing interventions with limited human and material resources.⁸ Governments have experience establishing surveillance mechanisms, restructuring health care facilities and setting field hospitals. The customary protocols are simple and above all very pragmatic. It is also likely that the population is more open to messages about measures to control infection and to adhere to them, such as hand-washing or social distancing, which have been applied in the past in the context of previous epidemics, such as Ebola outbreaks.⁹
- 5 The broad-based population pyramid in most African countries reflects a much younger median age compared to other continents, which is a protective factor in a disease that predominantly affects the elderly.¹⁰ Barely 4% of the population of Africa is aged more than 60 years, compared to 29% in Europa and América,¹¹ and more than half the population is under 20 years of age. Another favourable characteristic of the African population is the lower prevalence of predictors of poor outcome such as diabetes or high blood pressure in African youth.
- 6 We currently do not know the effect of factors such as weather,¹² temperature¹³ or direct exposure to infrared radiation on the novel coronavirus (SARS-CoV-2), but there has been considerable speculation on the potential protective effect of warm temperatures that has been observed in other respiratory viruses.
- 7 Other causes that are merely methodological, such as incorrect calculations, underdiagnosis of COVID-19 due to lack of resources for screening or confirmatory diagnosis, or incorrect death reports (deaths not attributed to COVID-19) could explain the low number of detected cases. Underreporting of cases of any disease, including COVID-19, is a chronic problem in regions where there is limited access to diagnostic techniques. In wealthier countries, it is known that COVID-19 has been and continues to be underdiagnosed, so it is very likely that the magnitude of this problem is even greater in areas with fewer resources. Access to polymerase chain reaction (PCR) tests is extremely limited and clinical diagnosis is very complicated because the symptoms are nonspecific and overlap those of other infections (malaria, pneumonia, etc.) that are endemic in the continent. For example, the number of tests performed per million inhabitants at a given time point was 27 485 in South Africa and 1319 in

Egypt compared to 116 544 in Spain.¹⁴ These limitations notwithstanding, the number of cases in African countries where the most tests have been performed, such as Senegal, is still lower compared to other continents.

7 We cannot rule out the existence of idiosyncratic or genetic factors that could partly explain the lesser spread of the virus in Africa. It is known that genetic factors can be determinants of incidence in other infections (for instance, the absence of Duffy antigen receptors for chemokine in reticulocytes in a majority of African populations drastically limits the risk of malaria caused by *Plasmodium vivax* in most of the continent). However, we are far from having the necessary data to assess whether such factors are at play in COVID-19.

Also, we do not know whether the very high incidence of other infectious diseases (along the lines of hypotheses on the potential cross-protective immunity conferred by other coronaviruses causing the common cold in children) could somehow shape the immune system in a way that would minimise the risk of severe disease due to SARS-CoV-2 infection.

Impact of the pandemic in public health and the economy in Africa

Even if the pandemic does not go rampant, disruptions in health care systems caused by the drastic measures implemented and the decrease in foreign aid are already having significant repercussions on health and the economy in these countries of a much greater magnitude than those experienced in Spain.

When it comes to health, in addition of the direct effects of infection by SARS-CoV-2, we must consider the enormity of the indirect effects that the pandemic may have on endemic diseases already associated with a high morbidity and mortality before the pandemic. To put an example, the WHO Regional Office for Africa estimated that in 2019 there were 26 million people with HIV infection,¹⁵ 2.5 million with tuberculosis,¹⁶ 71 million with hepatitis B or C¹⁷ and 213 million with malaria¹⁸ in Africa. It is still early to estimate the potential synergistic or amplifying effect of infection by SARS-CoV-2 on other highly prevalent diseases such as AIDS, tuberculosis, malaria, bacterial pneumonia or malnutrition.

What is very clear is that the disruption caused by containment measures will have a very serious impact on well-established community-based interventions, such as childhood vaccination, prenatal care or the distribution of medications used in chronic diseases (with antiretroviral drugs for management of HIV being a prime example) and mosquito nets used to prevent malaria.

Predictive models in the field of malaria¹⁹ forecast increases in the incidence and mortality of malaria up to the levels observed 20 years ago, wrecking all that was accomplished in the last two decades in a single swoop. Furthermore, the indirect impact of COVID-19 on infant and maternal mortality could be dire, with a worst-case-scenario increase—in barely 6 months—by nearly 1 157 000 infant deaths and up to 56 700 maternal deaths.²⁰ Truly dismal figures. It is also well known that in crisis situations derived

from pandemics like the one we are currently experiencing, people are generally wary of visiting health care facilities, as they become an important source of transmission. This is another reason for concern.

From an economic perspective, the world is experiencing an unprecedented crisis the consequences of which are difficult to predict. The SARS-CoV-2 has caused a situation in which 90% of the world economies have entered a recession, 2 billion people have been forced into confinement and hundreds of thousands have lost their jobs. It is estimated that at least 8 billion dollars in aid will be needed to overcome this. The economic repercussions will be even grimmer in Africa, where most individuals live in extreme poverty in subsistence economies, without savings and eking out a living day to day. The African Development Bank (ADB) predicts a significant recession in the continent, with a decrease in the gross domestic product of 1.7% to 3.4% this year alone. This would correspond to losses of 5.6% to 7.3% compared to the projected growth before the pandemic, which was positive. According to the ADB, between 24.6 and 30 million jobs will be lost this year.^{21–23}

Another economic consequence of the coronavirus pandemic is the cuts made in foreign aid spending that many African health care systems depend on for funding. There is even a risk that funding usually allocated to research on neglected diseases (malaria, tuberculosis, dengue or Chagas disease), which was clearly insufficient before the start of the pandemic, will end up being diverted into research on the novel coronavirus. Nobody questions the need to prevent and treat the current pandemic, but this cannot be done at the expense of abandoning other diseases that are still associated with a significant mortality.

Future challenges

The pandemic has disrupted health care systems in Western countries that are currently unable to respond to the immediate needs of the population. Concepts that had long been forgotten in the West, such as insecurity, epidemic or limited resources that sadly have always remained present in Africa, are currently in the agendas of every country and are a priority in policy making. The government, health care workers and the general population of developed countries are now experiencing what is the norm in low-income countries, and it is the latter that now offer an example to the world on how to manage and organize resources in an emergency.

The following strategies should be implemented to minimise the impact of the pandemic in Africa:

- It is essential at a time like this that we mount a global response to a truly global disease. Government spending should be increased to revitalize the economy without forgetting investment in scientific research.
- The goal of providing adequate coverage should continue to be emphasised^{24,25} to ensure universal access to health care, especially in the most disadvantaged regions in the African continent, as this is the cornerstone on which all other interventions rest.
- All governments are now aware that epidemic preparedness plans must be prioritised, as COVID-19 has evinced the enormous disruptive potential of infections that can

- even ravage wealthy countries. Current and aspiring leaders have come to understand the importance of investing more and better in a domestic stock of essential supplies (plants for the manufacture of oxygen, protective equipment, masks, diagnostic tests and even drugs) and preparing better for future pandemics.
- The crisis has highlighted the importance of investing in the public sector and in the health education of the population, for instance, on handwashing, social distancing or adherence to protocols.
 - The challenge that we currently face is not growing complacent. Adherence to social distance measures is starting to become lax in many countries, yet it should continue to be rigorous, as second waves could be more lethal than the first if discipline is not maintained.
 - Lacking a vaccine, it is important that we continue to collect data and report outcomes of individual medical advances in real time for the benefit of the global community.
 - This virus has made it clear that we are interconnected and that diseases know no boundaries, so that if everyone to create a better world, we will all benefit.

Note

This document presents the opinions and concerns of the International Cooperation Group of the AEP in relation to the likely spread of the COVID-19 pandemic in Africa and its potential direct and indirect repercussions in child health, so we consider this a background paper of the AEP on the impact of the pandemic in children in low-resource regions.

Conflicts of interest

The authors have no conflicts of interest to declare.

References

1. Worldometer. COVID-19 Coronavirus Pandemic update. Available at: <https://www.worldometers.info/coronavirus/>. (Accessed 14 July 2020).
2. Erhabor O, Erhabor T, Adias TC, Okara GC, Retsky M. Zero tolerance for complacency by government of West African countries in the face of the COVID-19 pandemic. *Hum Antibodies*. 2020; <http://dx.doi.org/10.3233/HAB-200413>. Online ahead of print.
3. Martinez-Alvarez M, Jarde A, Usuf E, Brotherton H, Bittaye M, Samateh AL, et al. COVID-19 pandemic in west Africa. *Lancet Global Health*. 2020;8:e631–2.
4. Cabore JW, Karamagi HC, Kipruto H, Asamani JA, Droti B, Seydi ABW, et al. The potential effects of widespread community transmission of SARS-CoV-2 infection in the World Health Organization African Region: A predictive model. *BMJ Global Health*. 2020;5:e002647.
5. World Health Organization. Hospital bed density databy country. Global Health Observatory Data Repository (African Region) [Accessed 1 Jun 2020]. Available from: <https://apps.who.int/gho/data/node.main-afro.HS07?lang=en>.
6. Maclean R, Marks S. 10 African countries have no ventilators. That's only part of the problema. *New York Times*. 2020 [updated 17 May 2020] [Accessed 1 June 2020]. Available from: <https://www.nytimes.com/2020/04/18/world/africa/africa-coronavirus-ventilators.html>.
7. World Health Organization. Density of physicians (total number per 1000 population, latest available year). Global Health Observatory (GHO) data [Accessed 1 June 2020]. Available from: <https://www.who.int/gho/healthworkforce/physiciansdensity/en/>.
8. Lone SA, Ahmad A. COVID-19 pandemic - An African perspective. *Emerg Microbes & Infect*. 2020;9:133–8.
9. Chersich MF, Gray G, Fairlie L, Eichbaum Q, Mayhew S, Allwood B, et al. COVID-19 in Africa: care and protection for frontline healthcare workers. *Global Health*. 2020;16:46.
10. Diop BZ, Ngom M, Poug e Biyong C, Poug e Biyong JN. The relatively young and rural population may limit the spread and severity of COVID-19 in Africa: a modelling study. *BMJ Global Health*. 2020;5:e002699.
11. World Population Ageing. United Nations, Department of Economic and Social Affairs, Population Division. New York. 2019 [Accessed 14 July 2020]. Available from: <https://www.un.org/en/development/desa/population/publications7pdf/ageing/WorldPopulationAgeing2019-Highlights.pdf>
12. O'Reilly KM, Auzenbergs M, Jafari Y, Liu Y, Flasche S, Lowe R. Effective transmission across the globe: The role of climate in COVID-19 mitigation strategies. *Lancet Planetary Health*. 2020;4(5):e172.
13. Al-Rousan N, Al-Najjar H. The correlation between the spread of COVID-19 infections and weather variables in 30 Chinese provinces and the impact of Chinese government mitigation plans. *Eur Rev Med Pharmacol Sci*. 2020;24:4565–71.
14. Covid-19: Tasa de pruebas realizadas en pa ses seleccionados del mundo. [Accessed 1 June 2020]. Available from: <https://es.statista.com/estadisticas/1107740/covid-19-tasa-de-pruebas-realizadas-en-paises-seleccionados-del-mundo/>.
15. World Health Organization. World AIDS Day. Africa; 2019 [Accessed 1 June 2020]. Available from: <https://www.afro.who.int/regional-director/speeches-messages/world-aids-day-2019-message-who-regional-director-africa-dr>.
16. World Health Organization. World Tuberculosis Day. Africa; 2019 [Accessed 1 Jun 2020]. Available from: <https://www.afro.who.int/media-centre/events/world-tuberculosis-day-2019>.
17. World Health Organization [Accessed 1 June 2020]. Available from: <https://www.afro.who.int/regional-director/speeches-messages/world-hepatitis-day-2019-message-who-regional-director-africa>, 2019.
18. World Health Organization [Accessed 1 June 2020]. Available from: <https://www.who.int/news-room/feature-stories/detail/world-malaria-report-2019>, 2019.
19. World Health Organization. The potential impact of health service disruptions on the burden of malaria. A modelling analysis for countries in sub-Saharan Africa [Accessed 1 June 2020]. Available from: <https://www.who.int/publications-detail/the-potential-impact-of-health-service-disruptions-on-the-burden-of-malaria>.
20. Robertson T, Carter ED, Chou VB, Stegmuller AR, Jackson BD, Tam Y, et al. Early estimates of the indirect effects of the COVID-19 pandemic on maternal and child mortality in low-income and middle-income countries: A modelling study. *Lancet Global Health*. 2020;8:e901–908.
21. African Development Bank Group. African Economic Outlook 2020: Africa's economy forecast to grow despite external shocks. [Accessed 1 June 2020]. Available from: <https://www.afdb.org/en/news-and-events/press-releases/african-economic-outlook-2020-africas-economy-forecast-grow-despite-external-shocks-33839>.
22. Center for Global Development. The economic impact of COVID-19 in Africa: A round-up of this week's analysis. [Accessed 1 June 2020]. Available from: <https://www.cgdev.org/blog/economic-impact-covid-19-africa-weeks-latest-analysis>.

23. Deutsche Welle (DW). World Bank: No African country can face this crisis alone. [Accessed 1 June 2020]. Available from: <https://www.dw.com/en/world-bank-no-african-country-can-face-this-crisis-alone/a-53142901>.
24. Armocida B, Formenti B, Palestra F, Ussai S, Missoni E. COVID-19: Universal health coverage now more than ever. *J Global Health*. 2020;10:010350.
25. Dongarwar D, Salihu HM. COVID-19 Pandemic: Marked Global Disparities in Fatalities According to Geographic Location and Universal Health Care. *Int J MCH AIDS*. 2020; 9:213–6.