



ELSEVIER

Contents lists available at ScienceDirect

International Journal of Infectious Diseases

journal homepage: www.elsevier.com/locate/ijidINTERNATIONAL
SOCIETY
FOR INFECTIOUS
DISEASES

Editorial

Mitigating lockdown challenges in response to COVID-19 in Sub-Saharan Africa



The coronavirus disease 2019 (COVID-19) which was first reported in Wuhan, China at the end of 2019 (Luo et al., 2020) has spread across the world with remarkable speed, with the World Health Organization (WHO) officially declaring a pandemic in March, 2020. Most countries in sub-Saharan Africa (SSA) are now reporting an increasing number of cases, both imported and acquired locally. As of April 14th, 2020, a cumulative total of approximately, 10,757 confirmed COVID-19 cases with 520 deaths have been reported within the WHO African Region, with South Africa, Algeria and Cameroon recording the highest number of cases (WHO, 2020a). A recent analysis has indicated that the risk of transmission of COVID-19 in Africa to be relatively lower than in other continents (Haider et al., 2020). However, the scale of COVID-19 infection in the continent and its impact on population health is still unclear. Routine information systems in many parts of the region are inadequate, and the current data are likely to underestimate the true extent of the epidemic. Furthermore, because it is unclear as to how COVID-19 will interact with conditions such as malnutrition, HIV/AIDS, tuberculosis, and malaria, one cannot be certain that infection fatality rates in Africa will be similar to those that have been estimated elsewhere.

Africa will have to contend with the same features of COVID-19 that have made this an extremely difficult pandemic to deal with elsewhere. This includes the high degree of transmissibility of COVID-19 and the fact that the virus can be transmitted by individuals who are asymptomatic or pre-symptomatic (Luo et al., 2020). These features of COVID-19 mean that standard communicable disease (CD) control measures may often be insufficient to bring a COVID-19 outbreak under control. While case detection, contact tracing, physical distancing, hand hygiene, masks, and selective isolation and quarantine may reduce transmission, many countries have resorted to so-called 'lockdown' measures. This amounts to varying degrees of restriction on movement and gatherings of citizens to reduce transmission risks and to reduce the reproductive rate of an epidemic below 1.

Lockdown in the context of COVID-19 was first implemented in Wuhan on January 23rd, 2020, and then extended to the whole of Hubei province, helping to bring the epidemic in China under control quite rapidly (WHO, 2020b). Since then, a lockdown has been deemed necessary to prevent health systems in many high-income countries from being overwhelmed by COVID-19. Where this lockdown was early in the importation cycle through the

closure of air travel, the disease was also quickly brought under control, with very few deaths recorded, an example being New Zealand. However, many questions remain about the extent to which 'lockdown' is feasible, sustainable, and tolerable in the long term, and whether its disruption of normal social and economic life may produce more harm than the virus itself. The high pre-existing burden of disease and poverty in SSA, coupled with its under-resourced and fragmented health systems, also mean that African countries face additional challenges in controlling COVID-19 and implementing lockdown measures.

This paper examines and discusses the feasibility, effectiveness, and appropriateness of implementing lockdown in SSA. To begin with, it defines and describes what is meant by 'lockdown' and how it relates to other CD control measures. It then discusses how lockdown might work to either mitigate or suppress COVID-19 transmission, and the opportunities and challenges entailed in doing so. Lastly, the paper discusses some tentative conclusions and recommendations.

Over the past three months, the term 'lockdown' has become common parlance across the world and has been assimilated into multiple languages. However, it is not precisely defined. In fact, as recently as March 25th, 2020, the WHO was using the phrase 'so-called lockdown measures' (WHO, 2020c). A cursory examination of the academic literature also indicates no clear or universally-accepted definition of the term. We can also observe that neither WHO's 2018 guidelines for a national pandemic influenza preparedness (WHO, 2018), nor its 2017 Guidelines for Pandemic Influenza Risk Management (WHO, 2017) includes any mention of lockdown at all. This lack of definition and clarity is surprising, especially given the widespread reference to varying degrees of lockdown, such as 'total lockdown' and 'partial lockdown,' or 'tight lockdown' and 'loose lockdown.' It is also notable that the relationship between lockdown and other CD control measures is unclear.

We have therefore constructed a definition of lockdown, and related this to other CD control measures. We define it as a set of measures to reduce community transmission of COVID-19 that are compulsory *and* which are applied indiscriminately to the general population. This definition excludes measures that are compulsory but which are targeted at individuals or segments of the population that are deemed at high risk. By this definition, one can isolate three lockdown measures that are relevant to

COVID-19: (i) geographical containment; (ii) home confinement; and (iii) the closure of social, educational and economic activities, and prohibition of mass gatherings. Although separate, there is a degree to which these measures overlap and operate in synergy with each other. However, each of these measures exists across a spectrum ranging from being draconian at one end, to being lenient at the other.

The term lockdown is perhaps most associated with the decision of the Chinese authorities to stop the movement of people in and out of Wuhan City. This geographical containment (cordon sanitaire) of a city from the rest of the country was later extended to the entire province of Hubei (WHO, 2020c). The aim of such containment is to prevent epidemic hotspots from spreading the virus to other parts of a country or region. The degree of enforcement and use of sanctions to deter or punish transgressors are important details of the policy and may depend on the extent to which the policy is socially acceptable as well as on the government's capacity to monitor and police compliance. There may be less or no restriction for people traveling into an area that has been put on lockdown, and exemptions made for workers providing critical services such as maintaining the flow of food and other essential commodities into the lockdown area.

The containment of a defined geographical area is often accompanied by a requirement for home confinement. This policy may also span across the draconian-lenient spectrum, with exemptions allowed for key workers and their children, and allowances for people to leave their homes for certain prescribed activities. The term 'curfew' has sometimes been used to describe measures aimed at confining people to their homes or other indoor facilities. The third measure is the closure of schools, universities, sporting events, shops, restaurants, cinemas and theatres, and the prohibition of mass gatherings. The extent to which these measures are enforced, as well as the degree to which exemptions from these measures are permitted, can vary. In some countries, only mass gatherings above a specific size are prohibited; and certain types of businesses are allowed to continue opening.

There is a lot of variation in how lockdown is implemented. In addition to where they are positioned on the draconian-lenient spectrum for each measure, countries may vary in how they choose to combine the three measures as a single integrated lockdown strategy. Also, lockdown will vary according to what measures are put in place to mitigate the harms of lockdown. These include direct psychosocial and physical injuries associated with containment, confinement, loss of important socio-cultural activities, and economic hardship (Brooks et al., 2020). These direct injuries are aggravated by indirect ones associated with the impacts of lockdown on society, which include economic recession, reduced access to food and other basic needs, the aggravation of social tensions, disruption to education, and the erosion of civil liberties. Measures to mitigate these unwanted effects of lockdown may include enabling children to continue their schooling online, providing welfare support to poorer households that have lost income, and introducing fiscal measures to keep the economy going and ensure essential healthcare. Such measures are a critically important aspect of lockdown, although they tend to be neglected.

Total lockdown is unlikely to be accepted voluntarily by a majority of the population in SSA, owing to its highly disruptive nature. This is made worse by the fact that some of the countries which have implemented lockdown, have not put forward any clear strategy to support their populations, particularly the (most) vulnerable segments. As the epidemic progresses and many unknowns around its potential impact are resolved, context-specific measures should assume a more influential role in mitigation to avoid the unintended consequences of lockdown and other externalities. With this scenario in mind, it is essential

that national governments in SSA carefully evaluate the costs and benefits of stringent measures, with constant monitoring of the situation.

As an increasing number of SSA countries contemplate stricter containment strategies, it is critical to reflect on some salient features of the COVID-19 pandemic in the light of the experiences and circumstances in these countries. There are a few critical facts that decision-makers in SSA must take into consideration as the options are weighed. Country-specific risk assessments need to be undertaken to provide evidence for decision-making. This is an important take away from the different trajectories of the outbreak in several European and other countries, which evolved in response to country-specific measures. In this regard, a vital issue for public health experts is helping policymakers decide on the main objectives of mitigation, for instance minimizing morbidity and associated mortality, or avoiding an epidemic peak that overwhelms healthcare services, or keeping the effects on the economy within manageable levels, or flattening the epidemic curve (Anderson et al., 2020). So, the choice is between accepting spread and allowing herd immunity to develop and accepting a certain loss or attempting suppression.

In any case, setting the priorities should drive the choices of mitigation strategies (Hollingsworth et al., 2011). Thus, it is a matter of SSA countries predicting whether the relatively youthful population is resilient enough to withstand the disease and perhaps instituting protective measures only for the more vulnerable cohort of aged people. The latter could be appealing in many low-and-middle-income countries, but it is difficult to justify without knowing its potential impact on the outcomes. Drastic measures could benefit from an informed risk assessment that identifies and isolate the most vulnerable population segments. In the SSA context, whenever the scale of the COVID-19 crisis becomes apparent and reaches the stage when a countrywide lockdown might be inevitable, the adoption of a risk-based strategy could favor partial lockdown by identifying 'zones,' while keeping up economic activities in other areas or sectors of the country.

To control the spread of COVID-19 in the long run, continued compliance with physical distancing coupled with other personal behavioral measures will be essential. Moreover, for communities to comply with directives for self-quarantine, self-isolation, physical distancing, and limited travel over a possibly indefinite future, SSA governments must fulfill their reciprocal duties to make compliance safe and feasible. Effective surveillance countrywide and a trusted and transparent source of information is critical to regularly convey accurate information on the country's pandemic situation, the known and unknown risks as well as what is being done to learn more and what are the measures in place to control the spread of COVID-19.

Authors' contributions

Leonard Mboera, David McCoy, and George Akipepe conceptualized the editorial and developed the first draft. All authors contributed to writing and finalizing the manuscript.

Conflicts of interest

All authors declare no other conflicts of interest.

References

- Anderson RM, Heesterbeek H, Klinkenberg D, et al. How will country-based mitigation measures influence the course of the COVID-19 epidemic?. *Lancet* 2020;395:931–4.
- Brooks SK, Webster RK, Smith LE, et al. The psychological impact of quarantine and how to reduce it: rapid review of the evidence. *Lancet* 2020;395:912–20, doi: [http://dx.doi.org/10.1016/S0140-6736\(20\)30460-8](http://dx.doi.org/10.1016/S0140-6736(20)30460-8).

- 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. doi: <http://dx.doi.org/10.1017/S0950268820000424> e41, 1–7.
- Hollingsworth TD, Klinkenberg D, Heesterbeek H, Anderson RM. Mitigation strategies for pandemic influenza A: balancing conflicting policy objectives. *PLoS Comput Biol* 2011;7:e1001076.
- Luo Y, Trevathan E, Qian Z, et al. Asymptomatic SARS-CoV-2 infection in household contacts of a healthcare provider, Wuhan, China. *Emerg Infect Dis* 2020;26(8), doi: <http://dx.doi.org/10.3201/eid2608.200282>.
- WHO. World Health Organization Essential steps for developing or updating a national pandemic influenza preparedness plan. Geneva: World Health Organization; 2018 License: CC BY-NC-SA 3.0 IGO.
- WHO. World Health Organization Pandemic Influenza Risk Management: a WHO guide to inform and harmonize national and international pandemic preparedness and response. Geneva: World Health Organization; 2017 License: CC BY-NC-SA 3.0 IGO.
- WHO. World Health Organization. COVID-19 Situation update for the WHO African Region. External situation report 7. 2020. https://apps.who.int/iris/bitstream/handle/10665/331763/SITREP_COVID-19_WHOAFRO_20200415-eng.pdf.
- WHO. World Health Organization Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19). 2020. [16–24 February 2020] <https://www.who.int/docs/default-source/coronavirus/who-china-joint-mission-on-covid-19-final-report.pdf>.
- WHO. World Health Organization. WHO Director General's Opening Remarks at the media briefing on COVID-19. 2020. [25 March 2020] <https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19>.

Leonard E.G. Mboera*

SACIDS Foundation for One Health, Sokoine University of Agriculture, Morogoro, Tanzania

George O. Akipede^{a,b}

^aCollege of Medicine, Ambrose Alli University, Ekpoma, Nigeria

^bInstitute of Lassa Fever Research and Control, Irrua Specialist Teaching Hospital, Irrua, Nigeria

Amitava Banerjee

Institute of Health Informatics, University College London, London, United Kingdom

Luis E. Cuevas

Liverpool School of Tropical Medicine, Liverpool, United Kingdom

Thomas Cypionka^{a,b}

^aInstitute for Advanced Studies, Vienna, Austria

^bLondon School of Economics and Political Science, London, United Kingdom

Mishal Khan

London School of Hygiene & Tropical Medicine, London, United Kingdom

Richard Kock

Royal Veterinary College, London, United Kingdom

David McCoy

Institute of Population Health Sciences, Barts and London Medical and Dental School, Queen Mary University London, United Kingdom

Blandina T. Mmbaga

Kilimanjaro Christian Medical University College and Kilimanjaro Clinical Research Institute, Moshi, Tanzania

Gerald Misinzo^{a,b}

^aSACIDS Foundation for One Health, Sokoine University of Agriculture, Morogoro, Tanzania

^bSokoine University of Agriculture, Morogoro, Tanzania

Elizabeth H. Shayo

National Institute for Medical Research, Dar es Salaam, Tanzania

Meru Sheel

National Centre for Epidemiology and Population, ANU College of Health and Medicine, Australia National University, Canberra, Australia

Calvin Sindato^{a,b}

^aSACIDS Foundation for One Health, Sokoine University of Agriculture, Morogoro, Tanzania

^bNational Institute for Medical Research, Tabora, Tanzania

Mark Urassa

National Institute for Medical Research, Mwanza, Tanzania

* Corresponding author at: SACIDS Foundation for One Health, Sokoine University of Agriculture, P.O. Box 3297, Chuo Kikuu, Morogoro, Tanzania.

E-mail addresses: lmboera@gmail.com (L. Mboera), georgeakpede@yahoo.co.uk (G. Akipede), ami.banerjee@ucl.ac.uk (A. Banerjee), Luis.Cuevas@lstmed.ac.uk (L. Cuevas), cypionk@ihs.ac.at (T. Cypionka), Mishal.Khan@lshtm.ac.uk (M. Khan), rkock@rvc.ac.uk (R. Kock), d.mccoy@qmul.ac.uk (D. McCoy), blaymt@yahoo.com (B. Mmbaga), gmsinzo@gmail.com (G. Misinzo), bshayo@yahoo.com (E. Shayo), meru.sheel@anu.edu.au (M. Sheel), csindato@gmail.com (C. Sindato), urassamark@yahoo.co.uk (M. Urassa).

Received 2 May 2020