

London School of Hygiene and Tropical Medicine – Written evidence (ZAF0054)

Executive summary:

1. The following submission draws on cross-disciplinary expertise from the London School of Hygiene & Tropical Medicine (LSHTM) to offer comment on sub-Saharan Africa's capacity to address emerging outbreaks and infectious diseases, including progress made and remaining challenges, in the context of the current COVID-19 pandemic. Learning from key lessons from previous epidemics such as Ebola and HIV/ AIDS, such as community engagement, and transparent, coordinated responses tailored for specific settings, can strengthen approaches to current and future health threats. Sub-Saharan Africa is likely to face particular contextual challenges in tackling COVID-19, such as economic, social and cultural inequalities, lack of personal protective equipment (PPE), human resources and equipment, and the additional health burden of communicable and non-communicable diseases, including mental health. This current pandemic will further demonstrate the global need to invest heavily in strengthening public health systems, building surveillance and response capacity, strict infection control to prevent transmission in health care settings, and boosting research and development, particularly on vaccines, therapeutics, and diagnostics.

Institutional context:

2. This is an institutional submission from LSHTM, an institution renowned for its research and education in public and global health. The School has an international and collaborative ethos, and is uniquely placed to help shape health policy and translate research findings into tangible impact, and address major health inequalities and challenges. LSHTM deploys research in real time in response to crises, developing innovative programmes for major health threats. In addition, the UK Public Health Rapid Support Team (UK-PHRST), which is jointly run by LSHTM and Public Health England, rapidly deploys public health experts at 48 hours' notice to strengthen a country's response to outbreaks. These specialists in epidemiology, infection control, laboratory diagnostics, social science, and clinical care work with public health specialists and scientists already on the ground.
3. Our staff work and collaborate extensively in sub-Saharan Africa across a range of disciplines, themes and countries, with independent research institutions, local and UK government agencies, and large research-intensive universities. Many of these partnerships are founded on a long history of collaborative research and training, with significant impact on the development of African leadership and capacity in both research and public health. The breadth and depth of research and relationships

across Africa provides world-leading research output, and mutually beneficial skills and experience to our staff, students and African partners.

4. In February 2018 the [MRC Unit The Gambia](#) and the [MRC/UVRI Uganda Research Unit](#) formally joined LSHTM, building on a history of long-standing and successful collaborations with the School. The Units comprise more than half our staff and provide an important focus for the School's work in Africa, with the potential to serve as hubs for regional linkages. The Units are currently heavily involved in COVID-19 preparedness and response in their respective countries: in The Gambia, the Unit provides and supports the only laboratory testing centre for COVID-19 and is setting up national testing and treatment centres across the country, as well as training clinical staff for dealing with COVID-19, and the Uganda Unit is providing diagnostic support for testing and sequencing of samples.

What are the main challenges to sub-Saharan African health systems in combatting infectious diseases?

Impact of climate and environmental change on emerging zoonotic infectious diseases:

5. Science has recognised for a long time that we are in an era of anthropogenic environmental change. One tangible consequence of the impact of humans on their environment is the emergence of greater numbers of zoonotic infections, like SARS, H1N1 and Ebola. Human proximity to wildlife, and their pathogen pools, is increasing. For example, degradation of fertile land around the globe means farming communities, and their livestock, must push further into wildlife-rich areas. Additionally, we face unparalleled levels of global travel and interconnectedness. A growth in both legal and illegal wildlife trade fuels global movements of potentially infected wildlife and wildlife products, while international travel for business and leisure further exacerbates the spread of human-to-human infection. We need international, cross-sector and interdisciplinary collaboration to tackle these challenges for a sustainable future.
6. In this context, the recently defined field of "planetary health" (the health of human civilisation and the state of the natural systems on which it depends) takes on a new significance in the face of COVID-19 which underscores the interconnections between human actions and natural environmental systems. Recent outbreaks have exposed major gaps in countries' capacities to prevent, detect and respond to epidemics. For sub-Saharan Africa, the threat of the latest zoonotic infection – COVID-19 – overwhelming rich nations, raises the spectre of necessary support for its own response being severely curtailed. The West African Ebola outbreak saw a large influx of funding and resources from rich nations to bolster national responses. This is unlikely to be the

case for COVID-19 when the UK and other donor governments are struggling to properly equip and resource their own response.

Epidemic preparedness and response capacities:

7. Many African countries have made great strides in the last few decades in developing international and national public health institutions (e.g. Africa CDC, Nigeria CDC), with the potential for effective partnerships for transformative change in health. However, the current COVID-19 epidemic is, like previous outbreaks, exposing on the global stage major gaps in countries' preparedness for epidemics (and respiratory infections in particular). It has also laid bare the vulnerabilities of LMICs and inefficiencies of an international response and supply architecture that is still overly dependent on research-rich high income countries.
8. There is growing evidence that the African continent will soon be experiencing full pandemic expansion of COVID-19, and that the epidemic started later in sub-Saharan Africa than for other regions globally because of limited international air traffic, rather than warmer climate conditions. Now that community transmission is ongoing in some African countries, the time to prepare an epidemic response is limited. Early identification of confirmed cases, swift contact tracing with physical isolation, community engagement, and health systems measures are all necessary to avert the potentially harmful consequences of an epidemic in the region.
9. Three key factors have been identified that may exacerbate morbidity and mortality rates due to COVID-19 and other infectious diseases in sub-Saharan Africa and other low income settings.
 - i) Overcrowding and large household sizes increasing transmissibility
 - ii) High baseline prevalence of co-morbidities will facilitate progression to severe disease
 - iii) Lack of intensive care capacity may increase case fatality rates

Understanding the risk of co-morbidities will be critical to estimating the real COVID-19 future burden. Similarly, the trends in hospital-settings, e.g., typical treatment times, mortality rates, are not yet known. If the epidemic proceeds in Africa with severity rates seen elsewhere in the world, the demand for critical health care services will rapidly overwhelm local capacity. If the current intervention policies fail, health systems in LMICs will quickly devolve to triaging care and extreme levels of excess mortality.

10. The experience of countries in Asia and Europe highlights the importance of testing for the virus as an indispensable component of the required response to the pandemic. It will be critical that African countries establish and sustain effective diagnostic testing efforts, for COVID-19 and future outbreaks. The COVID-19 diagnostics workshops held earlier this year in Dakar by the Africa CDC massively assisted scale-up of

diagnostic capacity in the region. A similar set of supportive measures could be provided for establishment of serological testing for anti-COVID antibodies in African populations. Issues with procurement and delivery of essential reagents need to be addressed.

Health systems:

11. The disruption in health systems caused by outbreaks, the influx of funds for specific purposes, and uncertainty can lead to unintended consequences. Demand for routine services in many African countries is already constrained by shortages and health worker absenteeism driven by institutional and political factors, and the situation is likely to worsen with the COVID-19 epidemic, the depletion of the health workforce and fracturing of the global supply chain. The inflow of resources combined with poor regulatory capacity, awarding difficult-to-enforce contracts to private companies, may undermine key functions of public health systems. Given these concerns and the uncertainty related to the consequences of the response to COVID-19 in Africa, strengthening health systems, particularly their governance, should be a critical part of any emergency interventions. This includes ensuring that accountability, ability to raise, allocate and safeguard scarce resources, and deliver adaptable and patient-centred services are upheld as key principles within health systems.
12. WHO emphasises that actions and partnerships will be needed at all levels to respond to COVID-19 as well as to maintain functional health systems. This follows evidence that success requires 'joined-up' approaches involving national planners who can design and coordinate efforts, working alongside district authorities with capacity to implement, and local actors who can reach communities and convey their concerns. Even where these approaches exist, during outbreaks governments often to revert to nationally-led ('command and control') approaches, often aligned with internationally recommended practices. However, the involvement of the district and local level planners and influential individuals and organizations is critical to rapidly adapt and adjust services as the epidemic develops, using local and institutional knowledge about what has worked historically and what is likely to be accepted by the population, particularly vulnerable groups. All levels of a health system - national, district and local - need to shape key decisions and adopt roles according to their strengths and resources, while ensuring that their actions are coordinated.

1. Are there lessons from previous crises, such as Ebola, that can inform how sub-Saharan African countries respond to the outbreak of COVID-19?

13. Lessons from previous epidemics have shown that the indirect mortality effects of a crisis in the context of a health system lacking resilience (i.e. diverting resources and attention away from pre-existing disease burdens) may be as important as the direct mortality effects of the crisis itself. This underscores the importance of prioritising continuity of essential health services such as immunisation services, maternal and child care, and care for non-communicable diseases (diabetes, hypertension) and key communicable diseases (TB, HIV/AIDS, malaria) which can be delivered, if necessary, via alternative service delivery modalities. Neglecting other health conditions poses a danger of a system collapse and deterioration of population health, especially among the poor and vulnerable populations.

Ebola:

14. The West African Ebola epidemic highlighted importance of health systems strengthening, equitable economic growth for long-term resilience and the importance of working with communities. The World Health Organisation received around US\$460 million between March 2014 and April 2016 for the West African Ebola response and millions more went directly to Sierra Leone, Liberia and Guinea through bi-lateral donors and non-government agencies. The epidemic and its response highlighted a number of critical weaknesses. First, that weak health systems cannot cope with epidemic response and that serious efforts must be made for long-term strengthening of basic infrastructure and personnel. This is challenged by serious lack of funding and requires long-term investment by donor-governments as well as national governments. It also requires attention to the global economic order; in West Africa it was the combination of weak health systems, poverty, and political and economic fragilities that created a “perfect storm” that fuelled the epidemic spread.
15. Second, global, cross-sector coordination and solidarity is needed for outbreak response, that strengthens – not weakens – existing health systems. Serious criticisms of the international response in West Africa were its slow initial response, then its failure to bolster existing health systems infrastructures and instead spend large amounts on stand-alone, parallel facilities and supply chains that were removed, or unsupported, after the epidemic was over.
16. Third, critical lessons were highlighted from the 2013-16 West Africa Ebola outbreak about the importance of listening to, engaging and working with communities and front-line responders. This resulted, among other things, in the development of procedures for safe and dignified burials and building trust by bringing treatment centres closer to people’s communities which reduced fear and encouraged families and local leaders to report and contact trace suspected cases. The influence of community engagement in decision-making, design and

implementation of locally affordable and effective responses to epidemics is pivotal, however is often only taken seriously after other epidemiological efforts have been ineffective in stemming infection rates. Efforts to address COVID-19 in sub-Saharan Africa must adopt community engagement as an integral pillar within their response from the start.

17. The establishment of the [Ebola Response Anthropology Platform](#) to inform the West Africa Ebola outbreak response was a ground-breaking step. It recognised the value – and necessity – of understanding and harnessing local community perspectives and actions in order to roll-out epidemic response “on the ground”. Nevertheless, there remains questionable commitment to adopting a ground-up locally-owned response in outbreak-response measures which continue to rely primarily on top-down clinical control measures – this is exemplified in the UK’s own COVID-19 response. Building strong *public* health systems is still not seen as a priority. Yet, tackling future outbreaks in sub-Saharan Africa will fail without the establishment of structures and mechanisms to rapidly mobilise communities to take control of their own health decision making and behaviour (e.g. on complying with quarantine or lockdowns), particularly in times when central capacities are in short supply. In the face of decreased global funding at times of pandemic crises, this becomes imperative.

HIV/ AIDS:

18. The HIV pandemic also provides lessons for the response to the COVID-19 pandemic given their similarities in that no vaccine is available for either, and there are no licensed pharmaceuticals for COVID-19, just as there were none for HIV infection in the early years. Additionally, population behaviour will determine the pandemic trajectory of COVID-19, just as it did for HIV (sexual behaviour and needle sharing for HIV, physical proximity and hand washing for COVID-19).
19. First, there is a need to anticipate health inequalities. Pandemic HIV transmission accelerated among mobile, well-connected networks, but the burden shifted to poorer people and countries, young women, and marginalised groups. The global burden of COVID-19 will likely fall hardest among older people and vulnerable groups in LMICs; it will be critical to track socioeconomic status and gender of those affected and extend this effort to track the economic impacts. Social conditions make it difficult for the vulnerable to change behaviours; for example encouragement for abstinence and condom use could not prevent HIV where gender inequalities and stigma were the norm. Similarly, following handwashing and physical distancing instructions will be hardest for those in poverty.

20. New advances often most rapidly benefit high income countries, increasing inequalities. Rich countries might seek to prioritise vaccine doses for their own people. With HIV, millions died because of inequitable access to life-saving antiretrovirals, and the same trend could occur with COVID-19. Global policy must prioritise access to innovations for those individuals in greatest need.
21. Second, creating an enabling environment to support behaviour change through fast, decisive political leadership is crucial. School closures and quarantine measures are powerful tools but the lesson of HIV is that supporting safer behaviours means addressing structures that constrain or enable people's choices. In the short term, pragmatic responses such as rapid mass distribution of soap, sanitiser, and personal protective equipment for COVID-19 will be needed (just as female condom distribution was for HIV control).
22. Unintended social consequences must be avoided; laws that contribute to blaming in society lead to prejudice, which hampered efforts to control HIV. If people infected with SARS-CoV-2 become stigmatised, others could be less likely to self-quarantine. Similarly, the unfolding global economic upheaval will have resounding impacts on LMICs that might exacerbate the conditions that spread SARS-CoV-2, for example leading to social upheaval.
23. Third, a multidisciplinary effort is essential. Whilst epidemiological models can predict the dynamics of the COVID-19 epidemic, a multidisciplinary effort is essential to design, characterise, and evaluate interventions that can shape behaviour. Innovative elements of the HIV response included structured community mobilisation, targeted social protection, and differentiated health-care delivery. Implementation science approaches have allowed timely study of novel health care and social delivery models. As countries take different approaches to control the pandemic, we must characterise what measures are working in practice, evaluate how people respond, and be alert to unintended effects. Transparency facilitates evaluation and encourages scrutiny of assumptions, leads to better practice, and harnesses ideas from a range of scientific disciplines.

Are there any particular local conditions and cultural norms in sub-Saharan Africa which could increase the challenge of tackling the spread of COVID-19?

24. The health impact of COVID-19 is likely to differ in African settings compared to European or Asian countries, due to a range of demographic, epidemiological, environmental and socio-economic factors. Learning from the pandemic as it affects predominantly high-

and middle-income countries has shown the value of social distancing measures and healthcare system preparedness. However, there is doubt as to whether responding by implementation of Europe-style lockdowns are sustainable or effective in African settings given their fragile economic context and reduced means to suppress transmission and manage cases.

25. In African countries, recent evidence suggests that public health strategies combining self-isolation of cases and suspects, moderate 'social' or physical distancing by the general population and shielding of individuals at high-risk from complications of COVID-19 could achieve substantial reductions in mortality due to COVID-19. However, in many settings these measures are unlikely to be feasible and may not reach high levels of adherence to reduce community transmission. It will require close collaboration with communities to select, adapt, implement and monitor a range of preventive approaches, e.g. adapting essential services to meet physical distancing requirements, creating 'shielding green zones' for vulnerable populations in urban settings, and evacuating crowded facilities. However, the implementation of these approaches must consider economic inequities and vulnerabilities and how the most harmful effects of public health approaches can be mitigated. Community engagement processes which are inclusive and work with legitimate and trusted leaders will be instrumental in ensuring that interventions are contextually appropriate and effective.
26. Findings from rapid qualitative research investigating community and healthcare worker perspectives on COVID-19 in Zimbabwe demonstrated contextual social, financial and resource-related obstacles to COVID-19 prevention measures. This supports commentary questioning the reality of practising social distancing and hand hygiene measures in sub-Saharan African countries, particularly in lower income communities where water is often available only at public boreholes and income is informally made on a day-to-day basis. Within communities, there is limited ability to comply with prevention interventions; lockdowns implemented in Zimbabwe saw little change in the volume of people moving in the community. Social distancing needs to be implemented alongside a package to support families and communities enabling families to stay at home, such as review of water supply to home, food package distribution, and cash transfers to offset the economic damage of COVID-19. This could be facilitated by government partnerships with international organisations, such as the Global Fund.
27. Countries in sub-Saharan Africa are trying to increase hospital capacity, but available data suggest serious shortfalls in critical care beds, PPE, and ventilators. Due to demographic differences, the profile of hospitalisations will be different in Africa than in other regions of the

world, with a higher proportion of children and adults and a lower proportion of the elderly. This will have implications for the care provided and resource allocation. Adequate PPE is critical (gloves, facemasks, gowns/ aprons, and eye protection), and there is an urgent need to supply PPE for local healthcare workers, alongside hand hygiene facilities. The capacity of health systems in these countries to screen, let alone treat, COVID-19, will be limited. In South Africa, each test costs around \$75 (£60) – this exceeds total government per head health spending in many African countries. Additional research and development of preventive measures that are effective and acceptable to local communities is critically important. WHO has provided guidance on home-based care of patients presenting mild symptoms, for use especially when health systems are over-burdened and hospital based isolation is infeasible.

28. The anxiety and distress associated with fear of infection, loss of loved ones, and concern over access to basic needs and emotional support during isolation, is well recognised. A substantial rise in mental health conditions has been measured not only in surveys but in increased demand for helplines and other support mechanisms. In many sub-Saharan African countries, several of these concerns are accentuated. People living on subsistence incomes have few reserves to cope with an economic downturn, or movement restrictions. Isolation and physical distancing is impossible to achieve in crowded informal settlements, also increasing anxiety which in some cases fuels protest and behaviour that may increase transmission. Maintaining social relationships is the single most important promoter of wellbeing during challenging times, but online communication cannot be relied upon to replace social or work-related contact in many countries. Health systems are poorly equipped to provide an adequate response to mental health needs that arise, and experience of other outbreaks is that people with severe mental conditions are at great risk of neglect.

29. In the current national and international response, appropriate measures to promote wellbeing and support mental health must be put in place, as well attention paid to mental health impacts of response measures. Such considerations not only have inherent value, but are essential to achieving optimal results, for example in compliance to behavioural recommendations, including eventual uptake of vaccines.

How would you assess the current status of the HIV epidemic in sub-Saharan Africa, and is sufficient international attention paid to this crisis?

30. There has been significant progress against HIV/AIDS in many countries, including sub-Saharan Africa, however the end of the HIV

pandemic is not yet in sight. This rhetoric of HIV/ AIDS being a 'manageable' pandemic threatens to undermine the global effort against HIV/ AIDS by causing unintended complacency. Despite availability of antiretroviral therapy (ART), many countries still report increasing deaths from HIV/ AIDS. Rates of global prevalence and incidence of HIV are highest in sub-Saharan Africa. Of the 37.9 million people living with HIV in 2018, 25.6 million of them were in Africa, 68% of the global total. It is however important not to generalise when making reference to the highly heterogeneous African continent. The aforementioned numbers are concentrated within certain countries in Africa, particularly Southern Africa - such as South Africa, Zimbabwe, Lesotho, Swaziland and Mozambique - that continue to have exceptionally high rates of HIV. Although lower, rates are also high in East Africa. The reasons for this are manifold, including regional historical colonialism and apartheid, and recent cultural factors such as circumcision trends, conflict, and humanitarian crises. Many regions of Southern Africa present the opportunity for the manifestation of all risk factors for HIV transmission.

31. Previous efforts to mitigate HIV have focused on a single solution approach, however the growing consensus is that success against the virus will be as a result of a combination of approaches, with a greater focus on prevention to bring about a pivotal turning point in sub-Saharan Africa, especially within high-risk groups such as women and the large adolescent population. International investment in prevention after years of focus on treatment will consolidate the last two decades worth of progress, and a re-energisation of the field is what is required to bring about the end of the virus and deaths from AIDS.

How closely do UK research institutions and the UK government co-operate with their counterparts in sub-Saharan Africa on tackling infectious diseases?

32. The UK has been extensively involved in tackling infectious disease in sub-Saharan Africa, and the response to COVID-19 reflects this. The [UK Public Health Rapid Support Team \(UK-PHRST\)](#), co-led by Public Health England and LSHTM, initially deployed personnel to a number of LMICs at the request of WHO, Africa CDC, and national governments to provide support in epidemiology, data analysis, infection prevention and control, clinical care, laboratory diagnostics, social science, logistics, and strategic guidance. These included deployments to Ethiopia and Nigeria, with others planned until travel and flight restrictions forced recalling of all personnel back to the UK. The team continues to provide remote support to the aforementioned international stakeholders as well as remote engagement with the WHO African Regional Office in the Republic of the Congo. LSHTM and the UK-PHRST have also developed a [COVID-19 Massive Open Online Course](#) oriented toward LMICs, with over 200,000 registrants from over 184 countries. The course is now included

in the training for Africa CDC's African Volunteer Health Corps. The MRC Unit The Gambia at LSHTM and MRC/UVRI & LSHTM Uganda Research Unit are playing key roles to support the response to COVID-19, including supporting surveillance and testing.

33. The [DFID UK Emergency Medical Team](#) and [UK-Med](#) are similarly engaged in providing clinical support to a number of sub-Saharan African countries, including Burkina Faso, Zambia, and Ghana. Many UK NGOs are also engaged in the COVID-19 response, although often hampered by the global travel restrictions and severely fractured global supply chain.
34. The UK also provides significant indirect support for infectious diseases in sub-Saharan Africa in general, and to the COVID-19 response in particular, through its financial support to WHO (as the organisation's second largest donor) and upcoming support for Africa CDC, as well as through participation on the WHO Global Outbreak Alert and Response Network (GOARN) Steering Committee and GOARN Research Working Group.

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