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## Access to lifesaving medical resources for African countries: COVID-19 testing and response, ethics, and politics

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## Introduction

Coronavirus disease 2019 (COVID-19) has revealed how strikingly unprepared the world is for a pandemic and how easily viruses spread in our interconnected world. A governance crisis is unfolding alongside the pandemic as health officials around the world compete for access to scarce medical supplies. As governments of African countries, and those in low-income and middle-income countries around the world, seek to avoid potentially catastrophic epidemics and learn from what has worked in other countries, testing and other medical resources are of concern. With accelerating spread, funding is urgently needed. Yet even where there is enough money, many African health authorities are unable to obtain the supplies needed as geopolitically powerful countries mobilise economic, political, and strategic power to procure stocks for their populations.<sup>1,2</sup>

We have seen this before. In the AIDS pandemic lifesaving diagnostics and drugs came to many African countries long after they were available in Europe and North America. In 2020, this situation can be avoided. Although health system weakness remain acute in many places, investments by national governments, the African Union, and international initiatives to tackle AIDS, tuberculosis, malaria, polio, and post-Ebola global health security have built important public health capacities. Global leaders have an ethical obligation to avoid needless loss of life due to the foreseeable prospect of slow and inadequate access to supplies in Africa.

## COVID-19 testing and response strategies

Having navigated Ebola, HIV, and tuberculosis epidemics, and a range of annual, sporadic, and concurrent outbreaks, several African countries have unparalleled disease response capacity. African governments are offering rare examples of effective international cooperation on COVID-19. The African Union started early to strengthen response with readiness assessments, an emergency ministerial meeting, and a continental strategy. However, with a highly transmissible and fast spreading virus these strengths can quickly be overwhelmed.

In the absence of a vaccine or highly-effective treatment, widespread testing is crucial to halting transmission and death, especially with presymptomatic transmission responsible for up to 44% of secondary infections.<sup>3</sup> For example, South Africa, South Korea, and Germany are reporting tentative signs of success through mass testing, isolation, contact tracing, and physical distancing. Extensive testing efforts have been key to some of the lowest fatality rates in the world.<sup>4</sup> South

Africa, which has the second largest economy in Africa, put community testing at the core of its multifaceted response. Although testing 2.7 per thousand members of the population is lower than Germany and South Korea, the strategy in South Africa—with over 4000 reported cases and 79 deaths as of April 25, 2020—is yielding similar fatality rates.<sup>5</sup> With only 2.8% of those tested being positive for COVID-19, there is hope for rapidly scaling testing to detect and halt community spread.<sup>5</sup>

COVID-19 cases have been reported across the African continent—with the number of confirmed cases passing 30 000 on April 25, 2020.<sup>5</sup> These numbers reflect restricted testing as higher capacity countries, such as South Africa, Morocco, and Algeria, report many times more cases than countries with lower testing capacity (eg, Nigeria). The African CDC has announced a plan for 1 million tests and a promising partnership aiming to produce 10 million tests, but this will not solve the immediate need.<sup>6</sup>

National contexts and responses are diverse—which will continue in the short-term and longer-term. African governments are applying an assortment of non-pharmaceutical interventions including quarantines, curfews, closures of markets and schools, and restrictions on the types and number of attendees at social gatherings, with successes and challenges. Rwanda, a country of 12 million people with a universal health care structure, implemented a lockdown shortly after the first detected case of COVID-19 (reported on March 8, 2020) and the government is supplying 20 000 households with free food through a social protection scheme. Ethiopia, one of Africa's largest countries of over 100 million people, declared a state of emergency, postponed highly anticipated elections, and closed borders, but has not implemented a lockdown movement in the country.

In many high population density, unplanned areas of Africa's megacities, distancing is not feasible. Where informal employment is common, the social and economic consequences of shutdowns will be severe. Many people face food insecurity and economic crises amidst lockdowns. Targeted interventions, informed by testing, are needed to allow day-wage workers to work and children who are at a higher-risk of the disease to return to school.

Testing strategies are key to ameliorating economic and social hardship, concentrating resources, and allowing more targeted interventions. For example, South Korea has been able to avoid the kind of full-scale lockdowns required elsewhere. In South Africa, testing data has informed a five-tier risk adjusted strategy to

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ease lockdown measures based on incidence and readiness.

Meanwhile, China's 3·6 critical care beds per 100 000 population was insufficient during the COVID-19 epidemic.<sup>7</sup> Malawi has as few as 25 critical care beds for 19 million people—or 0·1 beds per 100 000 people,<sup>8</sup> and most counties in Kenya reportedly have no functioning ventilators.<sup>9</sup> Although a lower median age might help, the number of people with malnutrition, HIV, and tuberculosis in the region could increase the need for critical care. In Veneto, Italy home-based care was combined with widespread testing and early diagnosis, resulting in a mortality rate four-times lower than that reported in Lombardy.<sup>10</sup> Such home-based care could be a model for African contexts, building on community-level response experiences from the West African Ebola outbreak.<sup>11</sup>

### Africa competes for testing kits and a future vaccine

Rolling out testing, tracing, and care across Africa will not be easy. Increased funding from national governments and donors is urgently needed. But recent investments have created important capacities. Africa CDC is providing strong coordination and COVID-19 guidance; additionally, strengthened national public health institutes, referral laboratories, laboratory and epidemiology workforce,

infection control, and community networks are ready to be harnessed. By March 7, 2020, laboratories in 43 African countries could already do COVID-19 testing.<sup>12</sup> Africa leads much of the world in community health-care networks that could be mobilised for the hard work of communication, testing, and contact tracing.<sup>13</sup>

However, restricted supplies of test reagents and consumables is making it difficult to mobilise capacity. The manufacturers of PCR platforms, such as Roche, Abbott, Hologic, Thermo Fisher, and Cepheid) cannot scale up production quickly enough. A WHO-validated rapid diagnostic test could provide a faster and cheaper alternative to PCR.<sup>14</sup> Currently, only a few rapid immunodiagnostic tests with high specificity and sensitivity are available and only in higher-income settings.

Countries in Africa have worked to procure swabs, reagents, test cartridges, and other commodities using national and donor funds. This is a complex endeavor with bottlenecks in procuring multiple laboratory consumables, specific to the platforms in a given geography. Despite best efforts, procurement remains a problem. One of the biggest deliveries has been tens of thousands of tests to each African Union member state from the Jack Ma Foundation, but additional components need to be procured.<sup>15</sup> Africa CDC has a plan to distribute 1 million tests,<sup>6</sup> but even with a newly established pooled purchasing platform that secured 100 000 tests from Germany, in April, 2020, the continent falls very short from the tens of millions tests the UN estimates will be required.<sup>16</sup> Health officials report procurements have been unsuccessful because supplies have already been purchased for use in North America and Europe.<sup>17,18</sup> There are several factors slowing testing—from demand to insufficient staff and specimen referral systems. However, the need for diagnostics has never been higher.

Many countries with successful testing strategies have rapidly reached at least 1% of their population. By early April, South Korea had tested 1% of its entire population while Germany surpassed 1·5%, now testing over 500 000 people each week.<sup>19</sup> The table shows the numbers of tests needed to reach this level in African countries for which data is complete, compared with the low reported numbers of COVID tests done. Yet, with the expansion of funding and supplies, widespread testing is possible (eg, using trained staff and platforms from the AIDS and tuberculosis response). The table also shows over half of countries did more HIV tests between Oct 1, 2019 and Dec 31, 2019 than the 1% target for COVID-19 testing; capacity for more complex HIV viral load testing last year approached this level.

On vaccines and therapies, the current situation of inequitable access will repeat without action, as leaders highlighted at the launch of a new international effort to accelerate COVID-19 tools.<sup>20</sup> Rich countries monopolising vaccine markets would mirror past actions.<sup>21</sup> Meanwhile, demand for masks, gloves, and other personal protective equipment face similar dynamics.

	Tests to reach 1% of the population	Reported COVID-19 tests done*	HIV tests done (Oct 1–Dec 31, 2019)	HIV viral load tests done (Oct 1, 2018–Sept 30, 2019)
South Africa	593 087	161 004	7 287 515	2 730 530
Kenya	537 713	16 738	2 177 170	1 046 910
Uganda	457 410	20 329	2 098 734	1 012 685
Mozambique	312 554	1 644	1 814 959	583 689
Tanzania	597 342	652	1 462 879	913 255
Nigeria	2 061 396	10 061	1 160 920	576 469
Malawi	191 300	617	1 060 031	539 532
Zambia	183 840	5 341	948 247	643 163
Zimbabwe	148 629	6 067	645 402	487 182
Côte d'Ivoire	263 783	1 545	495 543	200 337
DR Congo	895 614	1 425	203 859	72 549
Cameroon	265 459	6 352	197 965	89 113
Rwanda	129 522	18 556	187 915	85 657
Ethiopia	1 149 636	13 645	136 307	332 528
South Sudan	111 937	91	79 992	13 284
Burundi	118 908	204	61 074	33 772
Botswana	23 516	4 432	36 219	145 776
Ghana	310 729	68 591	25 426	13 733
Overall	8 352 375	337 294	20 080 157	9 520 164

Only countries for which there is full data available are included. Data obtained from Africa CDC and PEPFAR Panorama. COVID-19=coronavirus disease 2019. \*Test done up until April 26, 2020.

**Table: COVID-19 testing needs and HIV testing in selected countries in sub-Saharan Africa**

For more on Africa CDC see <https://africacdc.org/covid-19/>

For more on PEPFAR Panorama see <https://data.pepfar.gov/dashboards>

## Ethics and human rights in pandemics

The ethical frameworks for allocating scarce resources largely apply within, not between, countries.<sup>22</sup> WHO instruments like the International Health Regulations and Pandemic Influenza Framework are inapplicable. Binding human rights treaties are not specific on distributing scarce goods in health emergencies.<sup>23</sup> World Trade Organization rules require free flow of medical goods in the market, with little provision for crises when markets inequitably distribute goods in ways that

undermine public health. The AIDS pandemic should have taught us this lesson. Scale up of HIV diagnosis and treatment in African public health systems arrived years after North America and Europe, long after the pandemic had taken hold.<sup>24</sup> In HIV, market forces impeded access through insufficient financing, high prices, and intellectual property barriers. In COVID-19, market forces are different—adding unequal procurement power. Yet the results will be the same without action.

**Governments** have an obligation to protect their own citizens. However, principles of fairness must be applied. No single community, country, or continent should bear the full brunt of global shortages. Although difficult decisions in resource allocation are inevitable, it is unethical for African countries to have considerably less access and harder choices than others.

## Toward coordinated effort for ethical access

Political leadership is urgently required to secure ethical global allocation of scarce resources. It is entirely foreseeable that many countries will be locked out of the market. Governments have structured the global trading system and they have the power now to ameliorate its ill effects during a crisis. This is an ethical imperative but also a shared interest; the COVID-19 pandemic has taught us that unaddressed outbreaks in one part of the world put people throughout the world at risk.

Political convening is urgent, yet many international forums are struggling without consensus from powerful states. It will be hard to convince some governments to do anything besides maximising access for their own citizens. A new COVID-19 accelerator on vaccines, diagnostics, and treatments could offer a promising venue in a moment where international cooperation is at a low point. With leadership from the extended G20 and EU, coordinated by WHO, it engages a range of financing agencies including the Gates Foundation, World Bank, Global Fund, Global Alliance for Vaccines and Immunization, and Wellcome Trust. To be effective, the effort must be transparent, bold, collaborative, and explicitly address thorny ethical issues in affordability, access, and distribution for the global public good. It needs to include strong African leadership and must be conscious of the “asymmetrical power structures that still dominate the largely high-income-country concept of global health.”<sup>25</sup> Governments in advanced economies

1 must not ignore the effects of market forces and their procurements on other countries.

Short-term and medium-term actions are needed. The African Union’s Partnership to Accelerate COVID-19 Testing (PACT) is an important step. WHO has been providing critical support through guidelines, convening, and coordinated programmes. Pooling regional procurement is needed, which can be improved through cooperation between Africa CDC and the WHO-led UN Supply Chain Taskforce, the Global Fund to Fight AIDS, Tuberculosis, and Malaria, and other organisations. Mechanisms for equitable distribution might require decisions based on population size and risk, prioritising health workers, and allowing countries to draw down allocations of supplies as needed without fear of losing access. African governments must mobilize domestic funds, while bilateral and multilateral aid must be increased—with resources flowing in weeks, not months. External funding streams could be channeled through existing mechanisms like the Global Fund, which opened a new mechanism to receive and distribute funds for COVID-19 in April 9, 2020. Securing open access to newly developed products and fair pricing will require coordinated action by WHO and national governments.

Serious efforts to overcome barriers to regional production and reduce reliance on foreign equipment are overdue—for diagnostics, personal protective equipment, and with sufficient investment for both vaccines and therapies. South Africa, Kenya, Zimbabwe, and Morocco have begun either scaling up existing production or converting universities and non-health industries to improve access to personal protective equipment. A partnership, led by Institut Pasteur, Dakar, Senegal, is advancing a prototype affordable, rapid test that could be produced in the millions.<sup>26</sup> Past lessons show that national governments can incentivise production, but international cooperation has been shown to be crucial for ensuring financing and technology transfer—with collaboration between governments and manufacturers in low-income and middle-income countries particularly powerful.<sup>27</sup>

## Conclusion

Every life has equal worth. Yet global allocation of testing and other goods currently means that some are forced to wait, while those ahead in the global procurement line take precedence. In 2020, we have the opportunity to learn from past mistakes by countering market forces, thus ensuring that lives on the African continent count equally. Doing so will take both moral clarity and political courage.

### Contributors

All authors conceived of the Viewpoint together. MMK, NAE, and ICA drafted initial text, EAO searched media reports, and OT and MMK compiled the table. The text was revised and edited significantly by all authors.

### Declaration of interests

VJD reports deferred compensation from Medtronic Inc until 2018 for services on the Board of Directors which ended in 2014. All other authors report no competing interests.

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