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Commentary

SARS-CoV-2 pandemic expanding in sub-Saharan Africa: Considerations for COVID-19 in people living with HIV

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In December 2019, a novel coronavirus, SARS-CoV-2, started a global pandemic of respiratory illness, termed COVID-19 [1]. The spectrum of COVID-19 has ranged from a mild, self-limiting respiratory tract illness to severe progressive pneumonia, multi-organ failure, and death [2]. Older patients and those with a weaker immune system appear to have a greater risk of death [3]. Thus far, the vast majority of deaths from COVID-19 have occurred in Italy, China, Iran, and Spain—all Northern hemisphere countries with good health care resources and a low HIV prevalence. After the SARS-CoV-2 pandemic reached sub-Saharan Africa, COVID-19 cases may expand more quickly in high HIV prevalence communities with poor health resources.

The first reported cases of COVID-19 in South Africa occurred in early March from travelers who returned from Italy. South Africa has since reported over 400 cases (as of this writing), and the number continues to grow each day. Given the rapid spread of SARS-CoV-2 in South Africa, it now seems likely that COVID-19 cases will occur in all sub-Saharan African countries (Fig. 1). Perhaps what may be less certain is how SARS-CoV-2 will spread in HIV-endemic settings, and whether COVID-19 will have a higher morbidity and mortality rate among people living with HIV (PLHIV). In South Africa, where only 54% of the estimated 7.7 million PLHIV are virally suppressed and tuberculosis remains the leading cause of HIV-related mortality, these questions will need to be addressed.

So far, little is known about the pathogenesis and clinical outcomes of COVID-19 in PLHIV. In this EClinicalMedicine issue, Dr. Zhao and colleagues describe a 50-year-old Chinese male living with HIV who had evidence of viral shedding for 39 days after symptom onset, but recovered after receiving human immunoglobulin, methylprednisolone, and inhaled interferon alpha-2b [4]. Another case report described a 61–year–old Chinese male with a history of diabetes, who presented with acute respiratory symptoms, and was newly diagnosed with both HIV and COVID-19 pneumonia [5]. The patient recovered after receiving steroid therapy, respiratory support, and starting antiretroviral therapy (ART). This author (PKD), however, had a 66-year-old American male with suppressed HIV recently succumb to COVID-19 pneumonia, despite ventilatory support and hydroxychloroquine.

Currently, the US Centers for Disease Control and Prevention and the International AIDS Society consider PLHIV with low CD4+ T-cell count or not on ART as potentially vulnerable to more severe COVID-19 disease [6]. This concern is based on data from other respiratory diseases, including pneumococcal pneumonia and pulmonary tuberculosis, where PLHIV with compromised immunity have significantly worse health outcomes [7,8]. However, the experience from prior coronavirus outbreaks, including SARS CoV-1 and MERS, were limited among PLHIV, suggesting that PLHIV may not have a significantly higher risk of infection or mortality from SARS-CoV-2.

For several years, the World Health Organization (WHO) has recommended a "Test and Treat" strategy to identify all PLHIV and initiate ART. The current treatment options for COVID-19 are limited and may not be effective—a randomized trial of lopinavir/ritonavir, a common HIV medication, had no clinical benefit, while clinical trials of hydroxychloroquine, Remdesivir, and Tocilizumab are ongoing [9]. With no proven therapeutic options for COVID-19, the WHO recommends a "Test, Test, Test" strategy in response to the SARS CoV-2 pandemic. Since the response to the HIV/AIDS epidemic was developed and refined over decades, some lessons may be applicable for the response to SARS CoV-2.

First, establishing access to rapid, point-of-care COVID-19 testing in both community-based and clinical settings will be essential. The WHO has identified the development and evaluation of "rapid point-of-care diagnostics for use at the community level" as a top research priority [10]. Second, the mortality rate of HIV-associated TB has declined in part by initiating more PLHIV on ART. Starting ART may improve the immune response to COVID-19 for PLHIV, and may help prevent onset of Cytokine Release Syndrome or progression to severe respiratory failure. Third, the HIV epidemic led to crowded and overburdened health care facilities

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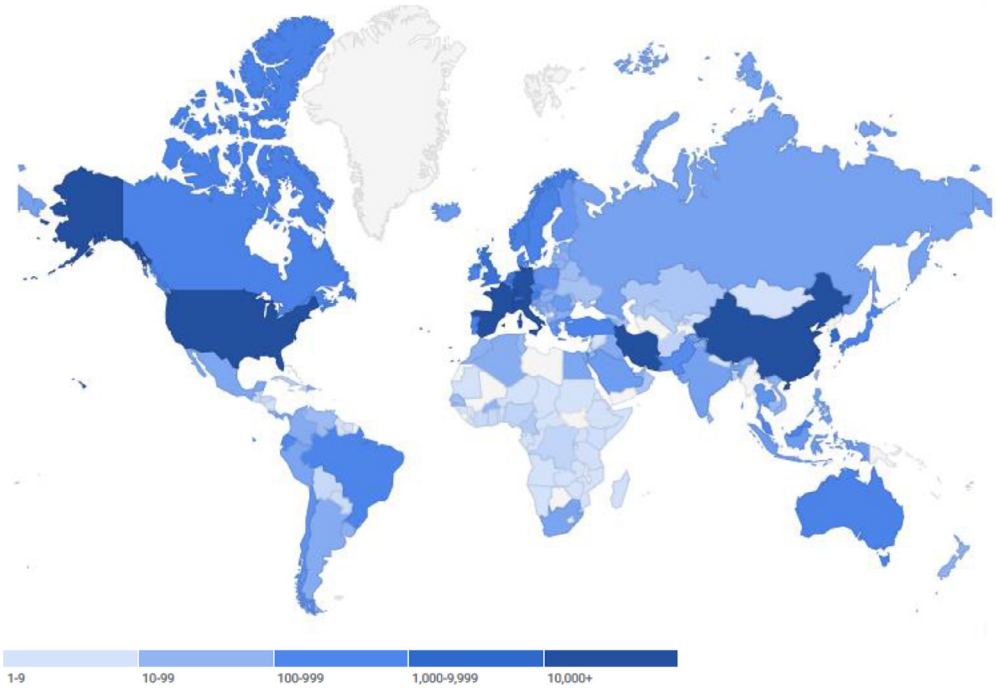

Fig. 1. Reported cases of COVID-19, as of March 24, 2020. (Source: World Health Organization [10]).

and hospitals. There is now a similar concern that COVID-19 will severely divert limited health care resources, which could reverse observed reductions in HIV and TB mortality in recent years. The public health response may need to incorporate additional COVID-specific resources, while still maintaining the supply chain of care and ART for PLHIV. With millions of PLHIV receiving ART throughout sub-Saharan Africa, perhaps the best way to protect this population from COVID-19 may be to ensure an uninterrupted supply of ART.

As the COVID-19 response gathers momentum across sub-Saharan Africa, additional research will be needed to fully understand the susceptibility, transmission dynamics, pathogenesis and clinical outcomes of COVID-19 among PLHIV compared to the general population. Those most vulnerable to COVID-19 may be PLHIV who are either unaware of their diagnosis or not yet receiving ART. An important part of the response therefore will be not suspending the HIV 90-90-90 efforts during the SARS CoV-2 pandemic, but to expand ART in order to protect PLHIV from severe COVID-19 disease. Since the response will require adequate health care infrastructure, integrating COVID-19 testing services within the HIV treatment infrastructure may be essential for controlling the spread of SARS-CoV-2 in sub-Saharan Africa.

Declaration of Competing Interest

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Supplementary materials

Supplementary material associated with this article can be found, in the online version, at doi:10.1016/j.eclinm.2020.100342.

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