



COVID-19 Lockdowns: Impact on Facility-Based HIV Testing and the Case for the Scaling Up of Home-Based Testing Services in Sub-Saharan Africa

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The Covid-19 Pandemic and Lockdowns

In December 2019, China reported the emergence of a pneumonia of unknown cause in Wuhan [1]. By 7 January 2020, the etiology of the pneumonia was attributed to a virus of the coronavirus family, and later on the disease was named coronavirus disease (COVID-19) on 11 February 2020 by the WHO [2, 3]. The symptoms of COVID-19 appear after an average incubation period of 5.2 days [1]. The median period from the onset of the disease to death is 14 days (range 6 to 41) [3]. Transmission of the virus is human to human through direct contact, or air droplets from infected persons spread by coughing or sneezing. The infection droplets can also contaminate surfaces, and the virus can remain infectious for several days in the environment, providing a reservoir for the infection [4]. The majority of infections go into remission without intervention, while approximately 15% will require hospitalization, with approximately 5% of these requiring intensive care [3, 4]. Unmitigated spread of COVID-19 creates pressure on health systems, and diverts resources that could have otherwise been better utilized for other health conditions. Sub-Saharan Africa health systems

are already strained and are characterized by poor health outcomes with high mortality rates linked to the triple burden of disease (HIV, tuberculosis, and non-communicable diseases) and out of pocket healthcare.

In response to the epidemic China imposed restriction such as quarantine (lockdown) of the whole city of Wuhan. This model proved efficacious, resulting in some Sub-Saharan Africa countries implementing the same. The lockdown measures are in no way aimed at ending the pandemic but seek to protect the health systems of countries from being overwhelmed by flood of infected and sick patients needing medical care. However, the restrictions come with unintended consequences, such as widening inequalities, mental health problems, and exacerbating poor medical outcomes that are not COVID-19-related. Of particular interest to this paper, The Joint United Nations Programme on HIV and AIDS (UNAIDS) and the World Health Organization (WHO) have announced that the number of AIDS-related deaths in Sub-Saharan Africa could double if access to healthcare for people living with HIV (PLWH) is interrupted during the COVID-19 pandemic. While interruption to the supply of ARV drugs would have by far the largest impact of any potential disruptions [5], suspension of HIV testing would also have significant population impact.

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Current State of the HIV Epidemic in Sub-Saharan Africa

Sub-Saharan Africa (SSA) is home to over one billion people, with a current growth rate of 2.3% [6]. By the end of 2020, it is estimated that the SSA region will have an approximate population of 1.1 billion and it will account for most of the world's population growth in the coming decades, whilst other regions' populations will be declining [6]. However, with this growing population, the region has persisted as the epicenter of the HIV epidemic [7]. There

are over 26 million PLWH in Sub-Saharan Africa [7, 8]. It was estimated that 1.7 million new HIV infections occurred globally during the year 2018, which translates to 5000 new infections per day. Overall, 61% of these new infections occurred in SSA [7]. Key populations and their sexual partners contributed approximately 25% of the new infections in the Eastern and Southern regions of Africa, whilst contributing 64% of the new infections in the Western and Central African regions [8]. In the Eastern and Southern region of Africa, 85% of PLWH knew their status, whilst 67% of those were on treatment and 58% of those on treatment had viral suppression [8]. In the Western and Central African region, 64% of PLWH knew their status, 79% were accessing treatment, and 76% had viral suppression [8]. Approximately 310,000 people died due to HIV/AIDS in 2018 in East and Southern Africa, whilst 280,000 died in West and Central Africa [8]. Given the HIV disease burden in SSA, it is critical that the region continues to implement control efforts, even in the context of the COVID-19 pandemic [9]. Interventions that reach and test people earlier and retest persons with ongoing HIV risk have benefits not only for reducing HIV morbidity and mortality, but in interrupting and preventing HIV transmission [10–12].

The Case for Scaling Up Home-Based HIV Testing Interventions

HIV testing remains the primary entry point to care and treatment services. UNAIDS is targeting viral suppression in at least 73% of PLWH by the end of 2020 in an effort to end AIDS by 2030 [13]. This goal can only be achieved if at least 90% of the HIV infected population is diagnosed and linked to care. Historically, community-based testing has targeted volunteers, who were mostly women, to get tested. Men and youth are not as forthcoming with regards to testing, and are disproportionately contributing to testing gaps [14–16]. While interventions have been in place to improve testing rates among these priority populations, confinement due to natural disasters in the United States [17] and violence in Kenya [18, 19] have been shown to hinder uptake of HIV testing services. The current COVID-19 crisis is even more complicated, as there are multifaceted barriers to facility-based HIV testing, including but not limited to a lack of access due to the closure of facilities, shortage of staff due to illness, and reluctance by individuals to attend clinics due to fear of being exposed to SARS-COV 2 at health facilities [20].

The lockdown measures are in no way a panacea to the pandemic [9], but are aimed at ameliorating shocks to the health systems of countries due to flood of infected and sick patients needing medical care. The restrictive measures are, therefore, intended to manage COVID 19 spread and the number of cases

requiring treatment at any given time—referred to as flattening the curve—so as to not overstretch health systems. However, the restrictions come with unintended consequences in terms of HIV testing and care [21]. Healthcare workers are focused on COVID 19 treatment and care, while the general public are quarantined or scared to seek medical attention for other illnesses due to the threat of acquiring the virus. The restrictive measures and threat of disease have curtailed access to provider-initiated and community testing. SSA has to consider the scaling up of home based HIV testing [22].

The WHO has recommended HIV self-testing (HIVST) as an additional method to increase HIV testing rates. HIVST affords individuals privacy, convenience, and empowering options for care [14, 15]. HIVST offers a means to fast track pre-screening and triaging out of those who self-test negative. HIVST can close the testing gap, as it can increase testing coverage and frequency. This allows the health system to focus only on those who require further assistance with respect to counselling, confirmation testing, and ART initiation. HIVST has the added benefit of reducing the number of health center visits during the period of quarantine and social distancing, in order to curb viral transmission. The COVID-19 pandemic has already placed a strain on the health system, and expansion of the HIVST approach will ease the strain and help to prevent overwhelming of facilities with HIV testing. Multiple studies conducted in the Sub-Saharan Africa region have already revealed high acceptance across individuals of various demographics [14, 23]. HIVST can be made available on online drug stores, so that those requiring these services can order and have them delivered and use them in the comfort of their homes. Population Services International has already reported success with HIVST in Kenya [22]. In Eswatini, there has been a growing demand for HIV testing services during the COVID-19 pandemic, as people are interested in knowing their underlying conditions [24]. Scaling up of a home-based option to HIV testing such as HIVST could prove beneficial and improve health outcomes with little strain to the health system.

The COVID-19 pandemic and associated restrictive measures to curb its spread have stifled HIV testing. This not only threatens attainment of the UNAIDS goal to end AIDS by 2030, but may result in increased AIDS-related mortality. Scaling up of HIVST has the potential to improve awareness of HIV status and increase Sub-Saharan Africa population's ability to address and control the HIV epidemic, and save lives.

References

1. WHO. Novel coronavirus (COVID-19). *World Health Organization website*. <https://www.who.int/emergencies/diseases/novel-coronavirus-2019>. Published 2020.
2. Zhou, F.; Yu, T.; Du, R.; Fan, G.; Liu, Y.; Liu, Z.; Xiang, J.; Wang, Y.; Song, B.; Gu, X. Clinical course and risk factors for mortality

- of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. *The Lancet* 2020
3. Rothan, H.A.; Byrareddy, S.N. The epidemiology and pathogenesis of coronavirus disease (COVID-19) outbreak. *Journal of autoimmunity* 2020, 102433.
 4. Lai, C.-C.; Shih, T.-P.; Ko, W.-C.; Tang, H.-J.; Hsueh, P.-R. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and corona virus disease-2019 (COVID-19): the epidemic and the challenges. *International journal of antimicrobial agents* 2020, 105924.
 5. Britta, L.J.; Edinah, M.; John, S.; Sherrie L., K.; Andrew, P. Potential effects of disruption to HIV programmes in sub-Saharan Africa caused by COVID-19: results from multiple mathematical models. Available online: https://figshare.com/articles/Potential_effects_of_disruption_to_HIV_programmes_in_sub-Saharan_Africa_caused_by_COVID-19_results_from_multiple_mathematical_models/12279914 (accessed on 13 May 2020).
 6. United Nations, Department of Economic and Social Affairs, Population Division (2019). World Population Prospects, Volume I: Comprehensive Tables. Available online: https://population.un.org/wpp/Publications/Files/WPP2019_Volume-I_Comprehensive-Tables.pdf (accessed on 12 May 2020).
 7. de Mendoza C. UNAIDS Update Global HIV Numbers. *AIDS Rev.* 2019;21:170–1.
 8. UNAIDS. Factsheet: global AIDS update. 2019. UNAIDS Geneva: 2019.
 9. Dzobo M, Chitungo I, Dzinamarira T. COVID-19: a perspective for lifting lockdown in Zimbabwe. *Pan African Medical Journal.* 2020;35:13. <https://doi.org/10.11604/pamj.supp.2020.35.2.23059>.
 10. De Cock KM, Barker JL, Baggaley R, El Sadr WM. Where are the positives? HIV testing in sub-Saharan Africa in the era of test and treat. *Aids.* 2019;33:349–52. <https://doi.org/10.1097/qad.0000000000002096>.
 11. Kim AA, Behel S, Northbrook S, Parekh BS. Tracking with recency assays to control the epidemic: real-time HIV surveillance and public health response. *AIDS (London, England).* 2019;33:1527–9. <https://doi.org/10.1097/QAD.0000000000002239>.
 12. Jones J, Sullivan PS, Curran JW. Progress in the HIV epidemic: Identifying goals and measuring success. *PLoS medicine.* 2019;16:e1002729–e10027291002729. <https://doi.org/10.1371/journal.pmed.1002729>.
 13. Celum C, Barnabas R. Reaching the 90–90–90 target: lessons from HIV self-testing. *The Lancet HIV.* 2019;6:e68–e6969.
 14. Dzinamarira T, Muvunyi CM, Kamanzi C, Mashamba-Thompson TP. HIV self-testing in Rwanda: awareness and acceptability among male clinic attendees in Kigali, Rwanda: A cross-sectional survey. *Heliyon.* 2020;6:e03515–e0351503515. <https://doi.org/10.1016/j.heliyon.2020.e03515>.
 15. Dzinamarira, T. The Call to Get More Men Tested for HIV: A Perspective on What Policy Makers Need to Know for Implementing and Scaling up HIV Self-Testing in Rwanda. *Global Journal of Health Science* 2019, 11.
 16. Kumwenda MK, Johnson CC, Choko AT, Lora W, Sibande W, Sakala D, Indravudh P, Chilongosi R, Baggaley RC, Nyirenda R, et al. Exploring social harms during distribution of HIV self-testing kits using mixed-methods approaches in Malawi. *Journal of the International AIDS Society.* 2019;22(Suppl 1):e25251–e2525125251. <https://doi.org/10.1002/jia2.25251>.
 17. Ekperi LI, Thomas E, LeBlanc TT, Adams EE, Wilt GE, Molinari NA, Carbone EG. The Impact of Hurricane Sandy on HIV Testing Rates: An Interrupted Time Series Analysis, January 1, 2011–December 31, 2013. *PLoS Curr.* 2011December. <https://doi.org/10.1371/currents.dis.ea09f9573dc292951b7eb0cf9f395003>.
 18. Vreeman RC, Nyandiko WM, Sang E, Musick BS, Braitstein P, Wiehe SE. Impact of the Kenya post-election crisis on clinic attendance and medication adherence for HIV-infected children in western Kenya. *Confl Health.* 2009;3:5. <https://doi.org/10.1186/1752-1505-3-5>.
 19. Goodrich S, Ndege S, Kimaiyo S, Some H, Wachira J, Braitstein P, Sidle JE, Sitienei J, Owino R, Chesoli C, et al. Delivery of HIV care during the 2007 post-election crisis in Kenya: a case study analyzing the response of the Academic Model Providing Access to Healthcare (AMPATH) program. *Confl Health.* 2013;7:25–25. <https://doi.org/10.1186/1752-1505-7-25>.
 20. The Lancet H. When pandemics collide. *Lancet HIV.* 2020;7:e301. [https://doi.org/10.1016/s2352-3018\(20\)30113-2](https://doi.org/10.1016/s2352-3018(20)30113-2).
 21. MacIntyre, C.R.; Heslop, D.J. Public health, health systems and palliation planning for COVID-19 on an exponential timeline. *The Medical Journal of Australia* 2020, 1.
 22. Hatzold, K. RAMPING UP HIV TESTING IN THE ERA OF COVID-19. Available online: <https://www.psi.org/project/self-care/ramping-up-hiv-testing-in-the-era-of-covid-19/> (accessed on 19 May 2020)
 23. Harichund C, Moshabela M. Acceptability of HIV self-testing in sub-Saharan Africa: scoping study. *AIDS Behav.* 2018;22:560–8.
 24. PSI. In Eswatini, HIV Testing Increases during the COVID-19 Pandemic. Available online: <https://www.psi.org/2020/04/hiv-testing-covid19-eswatini/> (accessed on 19 May 2020).

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