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emphasised that people living with HIV should maintain at least a 30-day supply and ideally a 90-day supply of ART and all other drugs, by mail-order delivery if possible.

Community-based organisations have also played an important part in maintaining HIV services. UNAIDS is working with the BaiHuaLin alliance of people living with HIV and other community partners to reach and help those who will run out of antiviral drugs in the near future.⁶ Since the lock down of Wuhan on Jan 23, 2020, a community-based organisation (Wuhan TongZhi Center) has dedicated resources to ensure the supply of antiviral drugs and opened a hotline to provide consultations. As of March 31, 2020, this organisation has had more than 5500 consultations with people living with HIV and has helped more than 2664 individuals obtain antiviral drugs. The Thai Red Cross AIDS Research Centre set up a visible platform outside their anonymous clinic with a screening system for every client, providing HIV testing and prevention supplies (eg, condoms, postexposure prophylaxis, and pre-exposure prophylaxis).⁹

As COVID-19 continues to spread around the world, many locations are facing the risk of SARS-CoV-2 infection and barriers and challenges for maintaining the HIV care continuum. The situation could be worse in places with weak health-care systems. We recommend that governments, community-based organisations, and international partners should work together to maintain the HIV care continuum during the COVID-19 pandemic, with particular efforts made to ensure timely access to, and to avoid disruption of, routine HIV services.

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- 1 Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. *Lancet* 2020; **395**: 497–506.
- 2 Joint United Nations Programme on HIV/AIDS (UNAIDS). Fact sheet: World AIDS Day 2019—global HIV statistics. Dec 1, 2019. https://www.unaids.org/sites/default/files/media_asset/UNAIDS_FactSheet_en.pdf (accessed April 1, 2020).
- 3 Hogg RS. Understanding the HIV care continuum. *Lancet HIV* 2018; **5**: e269–70.
- 4 Tang W, Wu D. Opportunities and challenges for HIV self-testing in China. *Lancet HIV* 2018; **5**: e611–12.
- 5 Guo W, Weng H, Bai H, et al. Quick community survey on the impact of COVID-19 outbreak for the healthcare of people living with HIV. *Chin J Epidemiol* 2020; **41**: 663–67.
- 6 UNAIDS. UNAIDS and China working together during the COVID-19 outbreak to ensure that people living with HIV continue to get treatment. Feb 19, 2020. https://www.unaids.org/en/resources/presscentre/pressreleaseandstatementarchive/2020/february/20200218_china_covid19 (accessed April 1, 2020).
- 7 WHO. Q&A on COVID-19, HIV and antiretrovirals. March 24, 2020. <https://www.who.int/news-room/q-a-detail/q-a-on-covid-19-hiv-and-antiretrovirals> (accessed April 1, 2020).
- 8 UNAIDS. What people living with HIV need to know about HIV and COVID-19. April, 2020. <https://www.unaids.org/en/covid19> (accessed April 1, 2020).
- 9 UNAIDS. Feature story: Thai hospitals to provide three- to six-month supplies of antiretroviral therapy. March 25, 2020. https://www.unaids.org/en/resources/presscentre/featurestories/2020/march/20200325_thailand (accessed April 1, 2020).
- 10 US Department of Health and Human Services. Interim guidance for COVID-19 and persons with HIV. March 20, 2020. <https://aidsinfo.nih.gov/guidelines/html/8/covid-19-and-persons-with-hiv--interim-guidance-/554/interim-guidance-for-covid-19-and-persons-with-hiv> (accessed April 1, 2020).

Three lessons for the COVID-19 response from pandemic HIV



The HIV pandemic provides lessons for the response to the novel coronavirus disease 2019 (COVID-19) pandemic: no vaccine is available for either and there are no licensed pharmaceuticals for COVID-19, just as there was not for HIV infection in the early years. Population behaviour will determine the pandemic trajectory of COVID-19,¹ just as it did for HIV.

Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and HIV are, of course, different. Untreated HIV infection usually causes death; SARS-CoV-2 kills a

minority. Behaviour changes that will slow transmission are different: sexual behaviour and needle sharing for HIV, physical proximity and hand washing for SARS-CoV-2. Early HIV cases doubled over 6–12 months,² for SARS-CoV-2 the serial interval is a matter of days.¹

A severe COVID-19 epidemic in low-income and middle-income countries (LMICs) with weak health systems is a sobering prospect. In many ways, the history of HIV prevention is of a failure of global health. Some 32 million have died with sub-Saharan Africa worst

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affected.³ But critical lessons have been learnt: three stand out.

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.⁴ The global burden of COVID-19 will likely fall hardest among older people and vulnerable groups in LMICs.⁵ We must track the socioeconomic status and gender of those affected and extend this effort to track the economic impacts. UN member states have pledged that “no one will be left behind”. The global response to COVID-19 must honour this pledge. Social conditions make it difficult for the vulnerable to change behaviours. Encouragement to “Abstain, Be Faithful and Use Condoms” could not prevent HIV where gender inequalities and stigma were the norm. Similarly, following instructions to wash hands and ensure physical distancing will be hardest for those living in poverty. Public-health initiatives must overcome barriers to reach poor people, even if they seem to be less affected by the virus now.

New advances often most rapidly benefit the better off, increasing inequalities.⁶ Rich countries might seek to prioritise vaccine doses for their own people. Millions of less well-off people died because of inequitable access to life-saving antiretrovirals, and the same trend might occur with COVID-19.⁷ Global policy must prioritise access to innovations for those individuals in greatest need. COVID-19 will not affect everyone equally. Our efforts should acknowledge this inequality, not increase it.

Second, create an enabling environment to support behaviour change. 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. Just as gender-based violence hindered safer sexual behaviour choices for women, the scarcity of clean water will limit handwashing. In the short term, pragmatic responses such as rapid mass distribution of soap, sanitiser, and personal protective equipment for SARS-CoV-2 will be needed (just as female condom distribution was for HIV control).

Modern approaches to HIV prevention are driven by a social-ecological framework.⁸ Meaningful involvement of communities can shape social norms. Building social capital, trust, and community cohesion catalyses the

impact of health messages, and can be fostered by supporting local leadership.⁹ These dynamics accelerated control of HIV among gay men in the USA, sex workers in India and Thailand, and other communities. The design of the COVID-19 response will need to include older people, those with comorbidities, and those already living at the margin.

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. We must be attentive to these dynamics from the start.

Third, a multidisciplinary effort is essential. Epidemiological models can predict the dynamics of the SARS-CoV-2 epidemic. But a multidisciplinary effort is essential to design, characterise, and evaluate interventions that can shape behaviour. Innovative elements of the HIV response include structured community mobilisation, targeted social protection, and differentiated health-care delivery.¹⁰ Implementation science approaches have allowed timely study of novel health care and social delivery models.

LMICs must gain access to protective and sanitation equipment before their epidemics grow. Testing programmes must start urgently, and contact tracing will be essential. But, innovation and adaptation will be needed to make these efforts effective in new settings. A theory of change is necessary to describe how inputs (eg, government messaging) should lead to activities (eg, people adjusting to working alone) that will lead to outcomes (eg, fewer physical contacts) to reduce the spread of the virus. Social and behavioural theory is relevant here, to complement the epidemiological theory in the 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. Just as modellers must defend their predictions, so policy makers should clarify the evidence and theory underlying their behavioural interventions. Transparency facilitates evaluation and encourages scrutiny of assumptions, leads to better

practice, and harnesses ideas from a range of scientific disciplines.

Three lessons from the HIV response can help stop exponential transmission of SARS-CoV-2, reduce deaths, prevent future outbreaks, and support affected communities in LMICs. Policies must create enabling environments for physical distancing and health promotion interventions to work. These policies must have a theory of change and address inequalities. Decision makers from all sectors, at all levels, should be supported to design, implement, and evaluate combination prevention approaches to reducing SARS-CoV-2 transmission. Finally, LMICs will need to be supported to strengthen the entire health system as reflected in the Sustainable Development Goal Agenda. A wave of public health action and evaluation built on these principles should be launched immediately.

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- 1 Anderson RM, Heesterbeek H, Klinkenberg D, Hollingsworth TD. How will country-based mitigation measures influence the course of the COVID-19 epidemic? *Lancet* 2020; **395**: 931–34.
- 2 May RM, Anderson RM. The transmission dynamics of human immunodeficiency virus (HIV). *Philos Trans R Soc Lond B Biol Sci* 1988; **321**: 565–607.
- 3 UNAIDS. Miles to go: closing gaps breaking barriers righting injustices. Aug 13, 2018. <https://www.unaids.org/en/resources/documents/2018/global-aids-update> (accessed April 7, 2020).
- 4 Hargreaves JR, Delany-Moretlwe S, Hallett TB, et al. The HIV prevention cascade: integrating theories of epidemiological, behavioural, and social science into programme design and monitoring. *Lancet HIV* 2016; **3**: 318–22.
- 5 Gilbert M, Pullano G, Pinotti F, et al. Preparedness and vulnerability of African countries against importations of COVID-19: a modelling study. *Lancet* 2020; **395**: 871–77.
- 6 Victora CG, Joseph G, Silva ICM, et al. The inverse equity hypothesis: analyses of institutional deliveries in 286 national surveys. *Am J Public Health* 2018; **108**: 464–71.
- 7 Goe M. Will vaccines reach low-income countries during a global pandemic? Feb 26, 2020. <https://www.devex.com/news/will-vaccines-reach-low-income-countries-during-a-global-pandemic-96635> (accessed April 1, 2020).
- 8 DiClemente RJ, Salazar LF, Crosby RA. A review of STD/HIV preventive interventions for adolescents: sustaining effects using an ecological approach. *J Pediatr Psychol* 2007; **32**: 888–906.
- 9 Parker RG, Perez-Brumer A, Garcia J, et al. Prevention literacy: community-based advocacy for access and ownership of the HIV prevention toolkit. *J Int AIDS Soc* 2016; **19**: 21092.
- 10 Krishnaratne S, Hensen B, Cordes J, Enstone J, Hargreaves JR. Interventions to strengthen the HIV prevention cascade: a systematic review of reviews. *Lancet HIV* 2016; **3**: 307–17.

See Online for appendix

HIV-related stigma among health-care workers in the MENA region



In its commitment to end the HIV epidemic by 2030, UNAIDS set the 90-90-90 targets for testing, retention, and viral suppression. In 2016, a new and fourth 90 target—namely, that 90% of people living with HIV should have a good health-related quality of life—was advocated to be equally important.¹ Although health-related quality of life is influenced by various factors, one highly important determinant is exposure to stigma and discrimination.¹

Stigma has accompanied the HIV epidemic since the beginning and remains prevalent worldwide. Yet, in some settings, such as the Middle East and North Africa (MENA) region, stigma is more pronounced because of the interplay between religion, culture, and geopolitics. The MENA region is one of two WHO regions (the other being Eastern Europe and Central Asia) that has an increasing HIV incidence: estimates reveal that the number of new infections increased by

10%, and the number of AIDS-related deaths by 9%, since 2010.²

Key populations account for the majority of people living with HIV in the MENA region and together with populations at higher risk face high levels of stigma because of their gender identity, sexual orientation, sex work, or drug use. The stigmatising and discriminatory attitudes that exist not only among the general population, but also in specific care-giving populations such as health-care workers, might result in a biased provision of care.³ This stigma can affect access to care for people living with HIV, and creates a gap in the HIV care continuum, thus hindering efforts to reach the 90-90-90 targets.²

At the beginning of the HIV epidemic, several MENA governments portrayed HIV as a problem predominantly affecting North American and European countries, concealing or denying the existence of HIV within their

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