



Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.

A collision of pandemics: HIV and COVID-19



Published Online
May 10, 2022
[https://doi.org/10.1016/S2352-3018\(22\)00132-1](https://doi.org/10.1016/S2352-3018(22)00132-1)
See [Articles](#) page e486

From the beginning of the pandemic, serious concerns were raised that COVID-19 might be associated with more severe disease and worse outcomes in people living with HIV. These concerns were not unfounded, given that respiratory viral infections are common, and might be more severe, in people living with HIV. Influenza, for example, leads to mortality rates up to 20-times greater in people with HIV, compared with those without HIV.¹ Data regarding the outcomes of COVID-19 in people living with HIV have been conflicting. Initial matched case-control studies from the UK,² USA,³ and South Africa⁴ showed no difference in disease severity and outcomes, including need for intensive care unit admission and death, compared with people who were HIV-negative, especially when adjusting for potential confounding demographic, clinical, and laboratory parameters.^{3,4} In contrast, large-scale population-based data from South Africa have shown an association between COVID-19 mortality and HIV status.^{5,6}

Subsequent systematic and scoping reviews have also yielded conflicting data. An early review of 36 studies, including more than 89 000 patients, concluded that people living with HIV have a lower risk for severe COVID-19, especially in the setting of advanced HIV disease with low CD4 cell counts, although the authors acknowledged that there were contradictory findings in the different studies included in the review.⁷ A more recent scoping review of 20 studies noted an increased risk of COVID-19 mortality in people living with HIV.⁸ While yet another meta-analysis, including 44 studies reporting on more than 38 million patients with COVID-19, found that people living with HIV are at increased risk of COVID-19-related hospitalisation, but not death.⁹

In *The Lancet HIV*, Sylvia Bertagnolio and colleagues¹⁰ report the findings of a study undertaken to assess whether people living with HIV were at greater risk of more severe or critical disease on hospital admission for COVID-19 infection, and whether they had a higher inpatient mortality (primary outcomes) when compared with people who were HIV-negative. They used data from the WHO Global Clinical Platform on COVID-19—a secure, web-based database of anonymised individual-level, clinical data of hospitalised patients with suspected or confirmed

COVID-19 infection in different health-care facilities across the world, established in April, 2020, to which data have, and are, being submitted using a standardised case report form and dictionary. In their study, descriptive and regression analyses were used to summarise demographic and clinical characteristics of the patients by HIV status to evaluate the association of HIV with the primary outcome.

The analysis included 197 479 patients (of these, 16 955 [8.6%] were people living with HIV and 180 524 were HIV-negative) submitted to the platform between Jan 1, 2020, and July 1, 2021, from 38 countries. Overall, 94.6% of the people living with HIV were from Africa, mostly from South Africa (16 008/16 955). 38.4% were admitted with severe illness and 24.3% died in hospital. Of the people for whom information was available, 91.5% were receiving antiretroviral therapy (ART). The main outcome findings were that people living with HIV had a 15% greater odds of a severe or critical COVID-19 presentation (aOR 1.15, 95% CI 1.10–1.20) and a 38% greater chance of dying in hospital (aHR 1.38, 1.34–1.41) compared with people who were HIV-negative. Although additional subgroup analyses showed an association between individuals using ART or viral load suppression with a reduced risk of poor outcomes, HIV infection itself still remained a risk factor for severity of illness and mortality. As has been noted previously, the presence of at least one additional underlying comorbidity was more frequent among people living with HIV compared with people who were HIV negative,^{3,5} which indicates that not only does HIV need to be comprehensively managed with ART to achieve viral suppression, but also prevention and good management of associated comorbid conditions are essential for better COVID-19 outcomes.

The authors recognise the potential limitations of their study, largely related to missing data—specifically CD4 cell counts, use of ART, viral loads, and vaccination coverage, as well as there being sparse data available on COVID-19 therapeutics, precluding an analysis of their potential impact on outcomes. Fortunately, as the authors indicate, they are intending to analyse data on an ongoing basis as datasets are received from other countries, and are expanding their collection of variables, to include other parameters of interest.

This study adds to the growing body of literature on the potential negative impact of HIV infection on COVID-19 infection. However, given the continued discordance in findings, prospective studies with long-term follow-up are also warranted to assess the true impact of HIV on COVID-19 severity and outcome.

We declare no competing interests.

*Charles Feldman, Jarrod Zamparini
charles.feldman@wits.ac.za

Department of Internal Medicine, Charlotte Maxeke Johannesburg Academic Hospital and Faculty of Health Sciences, University of the Witwatersrand, Johannesburg 2192, South Africa (CF, JZ)

- 1 Cainelli F, Dzudzor B, Lanzafame M, Goushchi A, Chhem S, Vento S. HIV and SARS-coronavirus-2 epidemics: possible interactions and need for studies, especially in Africa. *Front Med* 2020; <https://www.frontiersin.org/article/10.3389/fmed.2020.00216> (accessed April 4, 2022).
- 2 Lee MJ, Smith C, Fidler S, et al. HIV and COVID-19 inpatient outcomes: a matched retrospective multicentre analysis. In: COVID epidemiology and its impact on HIV care and prevention. <https://www.croiconference.org/abstract/hiv-and-covid-19-inpatient-outcomes-a-matched-retrospective-multicentre-analysis/> (accessed May 14, 2021).
- 3 Sigel K, Swartz T, Golden E, et al. Coronavirus 2019 and people living with Human Immunodeficiency Virus: outcomes for hospitalized patients in New York City. *Clin Infect Dis* 2020; **71**: 2933–38.
- 4 Venturas J, Zamparini J, Shaddock E, et al. Comparison of outcomes in HIV-positive and HIV-negative patients with COVID-19. *J Infect* 2021; **83**: 217–27.
- 5 Boulle A, Davies M-A, Hussey H, et al. Risk factors for coronavirus disease 2019 (COVID-19) death in a population cohort study from the Western Cape province, South Africa. *Clin Infect Dis* 2021; **73**: e2005–15.
- 6 Jassat W, Cohen C, Tempia S, et al. Risk factors for COVID-19-related in-hospital mortality in a high HIV and tuberculosis prevalence setting in South Africa: a cohort study. *Lancet HIV* 2021; **8**: e554–67.
- 7 SeyedAlinaghi S, Karimi A, MohsseniPour M, et al. The clinical outcomes of COVID-19 in HIV-positive patients: a systematic review of current evidence. *Immun Inflamm Dis* 2021; **9**: 1160–85.
- 8 Varshney K, Ghosh P, Stiles H, Iriowen R. Risk factors for COVID-19 mortality among people living with HIV: a scoping review. *AIDS Behav* 2022; published online Jan 13. <https://doi.org/10.1007/s10461-022-03578-9>.
- 9 Danwang C, Noubiap JJ, Robert A, Yombi JC. Outcomes of patients with HIV and COVID-19 co-infection: a systematic review and meta-analysis. *AIDS Res Ther* 2022; **19**: 3.
- 10 Bertagnolio S, Thwin SS, Silva R, et al. Clinical features of, and risk factors for, severe or fatal COVID-19 among people living with HIV admitted to hospital: analysis of data from the WHO Global Clinical Platform of COVID-19. *Lancet HIV*; published online May 10. [https://doi.org/10.1016/S2352-3018\(22\)00097-2](https://doi.org/10.1016/S2352-3018(22)00097-2).

Simulating HIV dynamics in the Middle East and north Africa

See [Articles](#) page e496

Although the number of identified people who live with HIV in the Middle East and north Africa is relatively small in comparison with the rest of the world, the region is one of the only world regions with a rapidly growing HIV epidemic and ranks the lowest in antiretroviral therapy (ART) coverage. The HIV epidemic in the Middle East and north Africa is concentrated among key populations, such as people who inject drugs, female sex workers, and men who have sex with men.^{1,2} Most of the existing evidence on HIV among female sex workers is derived from integrated bio-behavioural surveillance surveys. A few countries (eg, Djibouti, Iran, and Morocco) have a stable and functioning HIV surveillance system, however, none has been able to have consistent integrated bio-behavioural surveillance surveys among key populations.^{3,4}

In *The Lancet HIV*, Hiam Chemaitelly and colleagues⁵ used a complex, well described mathematical model to estimate HIV incidence among female sex workers and simulate HIV transmission dynamics among their heterosexual sex work networks. Simulations were also used to quantify the impact of specific HIV prevention interventions (ie, ART among female sex workers and their injecting partners, condom use, voluntary medical male circumcision among clients, and pre-exposure prophylaxis among female sex workers) on

reducing HIV incidence among these key populations by 2030. The proposed model based on combined data from 12 of the 23 countries in the Middle East and north Africa estimates the incident HIV cases in 2020 to account for about a quarter of incident cases in the region, and range widely across these 12 countries (3471, 95% UI 1295–10 308 among female sex workers; 6416, 3144–14 223 among their clients; and 4717, 3490–7288 among their clients' spouses). Model estimates highlighted the high burden of HIV incidence among female sex workers' heterosexual sex work networks, even in settings where HIV prevalence is low. The simulations also suggested that all examined interventions, individual or in combination, would be beneficial in reducing the burden of HIV in the studied population. Although the estimates and recommendations are an essential and timely contribution to understanding HIV dynamics in the Middle East and north Africa, they need to be interpreted with caution for a few reasons.

First, mathematical HIV models are not empirical, provide an approximation of the reality, and cannot adjust for several unmeasured sources of uncertainty in real-world settings. These limitations are particularly pronounced when the quality of input data is low—as is the case for the Middle East and north Africa—and