

## REVIEW ARTICLE

# Intersecting Epidemics of Many Unknowns: Human Immunodeficiency Virus and Covid-19

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## Abstract

Since July 2020, or around six months after the outbreak of the new corona virus infection in 2019, no one has been able to explain why people with HIV (PLWH) are negatively affected (COVID-19). COVID-19 vulnerability appears to be the same in HIV-positive and HIV-negative individuals, however results may be inconsistent. Some of the misunderstandings are due to the lack of data and the novelty of COVID-19, while others are due to the ambiguity of the question "when?" It has the means to make HIV a "risk factor" for the development of COVID-19.

## KEY WORDS

HIV, COVID-19, Epidemics.



**INTRODUCTION**

Covid-19 has a nucleus made of single-stranded RNA and has a diameter of 65 nm to 125 nm. The global spread of Covid-19, its recurrence, and the massive number of deaths the most prevalent manner for the virus to spread from person to person was through physical contact. Coughing, sneezing, and laughing produce droplets. Fever, chills, cough, sore throat, difficulty breathing, myalgia or fatigue, nausea, vomiting, and diarrhea are all symptoms of COVID-19 infection. Wuhan, the capital of Hubei province and home to 11 million people, was the site of the first discovery of the new coronavirus. Thailand, Japan, Korea, the United States, and Iran were among the first countries to contract the COVID-19 virus in January 2020. On January 7, 2020, Chinese scientists identified 2019-nCoV, a previously unknown coronavirus, as the etiological cause of the outbreak (for 2019 novel corona virus). On February 11, 2020, the World Health Organization (WHO) designated the novel coronavirus sickness as corona virus infection 19 (COVID-19). COVID-19 symptoms include fever, cough, and weariness, as well as myalgia, sputum production, and headache. Since December 2019, an unique pneumonia (corona virus sickness 2019 (COVID-19) has been spreading across China, originating in Wuhan, the country's beauty capital. It's unknown if PLWH are more susceptible to SARS-CoV-2 infection or have worse health consequences. There are a number of reasons to believe PLWH are in great danger: PLWH have reduced immune responses to immune system challenges, as well as a high rate of risk factors for severe covid-19 illness, such as high blood pressure, diabetes, cardiovascular disease, obesity, lung disease, smoking, male sex, and old age (1,2). Poorer COVID-19 result, on the other hand, may be linked to untouchable (over) creation, and so PLWH may have a lower chance of worsening SARS-CoV-2 illness outcomes due to their weakened immune systems. However, there are currently insufficient numbers to support or refute any of these hypotheses. Early in the course of a new disease outbreak, data is poor, and the case report or case series (4–8) technique of epidemiologic investigation is the most feasible, if not the only, option. Attempts to estimate the prevalence of past SARS-CoV-2 virus in PLWH, like attempts to estimate incidence, must take into account who is and is not included in multiple sero examinations. Residents in a few states are being randomly sampled for seroinspection (19); these serosurveys might provide estimates of prior SARS-CoV-2 contamination in PLWH if sampling processes include special interest groups like PLWH. FOR HEPATITIS C, A "RISK FACTOR" (3,4). To conduct efficient epidemiologic research on the property of COVID-19 on PLWH, researchers must carefully analyze the study topic at hand as well as how the data will be used. It's reasonable to be cautious about HIV being labeled as a "independent risk factor" for deficient COVID-19 findings based on a contrived multivariable model, because this might lead to improper care rationing or treatment decisions. Demographic and scientific distinctiveness of in Wuhan's Wuchang and Qinshan districts had COVID-19 (0.7 percent as of the end of

February or beginning of March 2020), which was comparable to the common residents' threat (0.5 percent) (14). As of April 30, 2020, COVID-19 had been detected in 51 (3.8 percent) of 1,339 PLWH undergoing daily treatment in Madrid, Spain. For the same time period, the COVID-19 risk in Madrid (4.0 percent) was comparable. Finally, the SARS-CoV-2 positivity rate among PLWH tested in a Chicago, Illinois medical center (15%) was comparable to that of HIV-negative persons (19 percent) (16) (5,6). Despite both cohorts indicate equal illness obligation in people via an exclusive of HIV, unpublished observation records from South Africa's Western Cape area suggest that PLWH are 2.3 times more likely to die from COVID-19 than those without HIV (7). The present study on the relationship between HIV and COVID-19 results hasn't always been consistent in terms of what they're searching for. In a retrospective matched cohort of PLWH and HIV-negative persons hospitalized in New York for COVID-19, the findings were consistent. HIV illness indicators such as HIV viral load and CD4 cell count, which would be expected to be the most powerful peacekeepers of a direct effect of HIV infectivity on COVID-19 outcome, were not observed to be closely related with COVID-19 morbidity among PLWH. Because only SARS-CoV-2 infections that resulted in indicative disease have been studied thus far, these findings should be interpreted with caution. HIV may influence whether SARS-CoV-2 infections are observed, either because PLWH have more or less contact with transmission, or because HIV may raise the fraction of infections that are indicative. The considerable prevalence of HIV viral suppression in COVID-19 cases suggests that PLWH without access to HIV medication are less likely to be identified with COVID-19 or documented as HIV-infected in the results (8). the epidemics of many unknown diseases: Human Immunodeficiency Virus and COVID-19.

**EFFECT OF anti-viral drugs on the progression of the COVID-19 virulent strain:**

Treatment for additional coronaviruses with comparable symptoms has been recommended and tested using ant retro viral medicines like lopinavir-ritonavir (a protease inhibitor). The time it takes to reach scientific development (hazard ratio = 1.24, 95% confidence interval: 0.90, 1.72) and 28-day death (risk difference = 5.8%, 95% confidence interval: 17.3%, 5.7%) were only slightly different in a study of 199 patients randomly assigned to lopinavir ritonavir vs. ordinary of mind. Some research suggested that lopinavir-impact ritonavir's on transience was greater if treatment began sooner after the onset of symptoms, but the results were unclear. Lopinavir-ritonavir was found to have "no benefit," but some correlations indicated that it may have some protective impact. The results of this study do not suggest that patients with SARS-CoV-2 should begin treatment with lopinavir-ritonavir. Furthermore, there isn't enough information on the link between ART regimen and COVID-19 result to recommend or rule out any particular regimen (9,10).

**MODERNIZING, MEASURING, AND SUPERVISING CARE ENGAGEMENT:**

The well-being of PLWH is dependent on their willingness to continue therapy. HIV viral load and CD4 cell count must be examined every three to six months. The risk of SARS-CoV-2 transmission from face-to-face interaction, especially in a health check environment, led to the conversion of numerous trial contacts (for all people, including those with PLWH).

Short- and long-term impacts on patient interest and adherence to antiretroviral therapy (ART) have not yet been studied. More than 90 percent of patients in a Missouri HIV center who had completed a telehealth appointment during COVID-19 stated that their telehealth visit was just as good as or better than an usual in-clinic visit (12,13). Incomplete telehealth appointments were not included in the data. Only 21% of scheduled appointments at a Chicago clinic were actually performed between late March and mid-April. Thirty-one percent of activities were rescheduled, two percent took place in person, and forty-six percent were skipped (14). It might be difficult for patients to fully participate in therapy due to a lack of proper technology and resources as well as an absence of technological awareness and an environment that is safe and private. Smartphone ownership and internet use among people with disabilities (PLWD) is not well documented (15). HIV-infected women in the Bronx, New York, in 2014, had 87 percent smartphones, compared to 90 percent to 92 percent of the overall population at that time. A mere 60 percent of the PLWH who were enrolled in British Columbia, Canada, in 2012 possessed a cell phone. Descriptive data on US population demographic tendencies can be found here. The demographics of those who have a high incidence of HIV infection include those who lack access to smartphones and home internet networks: non-Whites, older adults, and those with less education or income. Telehealth isn't only about having a mobile phone; it's about having a solid connection. The cost of telehealth visits may be higher for patients who do not have unlimited phone or internet access. There may also be safety concerns when seeking medical attention outside of the facility, because PLWH may not be in control of their environment. One-quarter of people with limited English proficiency (PLWH) who participated in a survey regarding their attitudes toward telehealth had doubts about their ability to communicate effectively without a face-to-face encounter. This variety will need to be taken into consideration when deciding how to implement telemedicine in clinical practice (e.g., prioritizing patients for in-clinic visits versus continued telehealth visits when clinics reopen). but with a limited number of patients in the clinic to provide physical isolation). Patients' access to the internet and a safe, protected location from which to dial in, as well as their distance from and means of transportation to the clinic, are all factors that should be evaluated on a regular basis. As a result of the pandemic, millions of individuals lost their jobs and employer-sponsored benefits, causing a worldwide economic crisis. In the event that PLWH who previously had private insurance abruptly lose their capacity to pay for treatment, they may encounter delays in care. Clinical cohorts provide a unique tool to track how changes in insurance status effect patient participation, ART accessibility, and viral suppression. Therefore, it will be necessary to conduct additional checks on patients who were supposed to return to the clinic but did not (16,17).

## **THE RELATIONSHIP BETWEEN SUBSTANCE USE AND MENTAL HEALTH:**

In PLWH, alcoholism, other substance misuse, and mental health difficulties are all common, and they may pose special risks and obstacles during the SARS-CoV-2 pandemic. Physical separation prohibitions, as well as the sorrow and worry that comes with them, can lead to an increase in the use of alcohol and other drugs. To map any of these instances, epidemiologists should look for new data sources. For example, Nielsen Retail Measurement Services shows a significant growth (+234%) in online wine purchases and sales of bigger amounts of alcohol (40). To get beyond ecological inference, more traditional polls of alcohol and other drug use will be required to determine whether individual PLWH are increasing their use and changing when and how they use alcohol and other drugs (18,19). Pre-existing mental health concerns are likely to be exacerbated by physical distance constraints. Individuals have relied on artistic outlets to help them cope in the past. Physical distance can obliterate social structures and artistic outlets that previously assisted people in coping. Senior PLWH, in particular, are already at a significant risk of social isolation. As a result of SARS-CoV-2 exposure or stigma, breaking the physical separation principle in order to locate these coping techniques may result in heightened stress. Accurate PLWH risk evaluations are needed to help participants consider the risks and benefits of participating in such activities, but they are currently unavailable. People who can protect themselves in their homes may experience more stress if they are alone in their homes, if being at home entails additional caregiving responsibilities, or if they live with a significant other who constitutes a physical or emotional threat (20,21). While mental health treatment may be one of the care settings best suited to cassette conferencing, it may also serve as a "canary in the coal mine" for growing inequality in access to technology and personal, secure therapy locations. For instance, one HIV clinic in Chicago, Illinois, discovered that several patients who were receiving rational strength therapy prior to the implementation of bodily hostility interventions temporarily stopped receiving it when it was delivered via telehealth, while others started receiving it for the first time. People with strict rational health symptoms may be more vulnerable to SARS-CoV-2 infection if their understanding of public health messaging is impaired or if they do not recognize their opportunity and how to manage it, in addition to having their psychological potency symptoms exacerbate as a result of significant separation (22,23).

## **CONCLUSION**

Everyone's health and well-being would be affected if there was a COVID-19 pandemic. People living with HIV/AIDS have an increased risk of being harmed, both directly and indirectly, by the outbreak. For COVID-19, should we pay more attention to PLWH? In the United States, are there any unanswered questions about PLWH testing procedures? People infected with SARS-CoV-2 may be at greater risk of developing SARS-CoV-2 sickness or having worse COVID-19 outcomes if they have HIV. There are various ways to overcome some of these difficulties with a comprehensive HIV testing infrastructure. Do physical separation therapies have any influence, systemically speaking, on HIV treatment, drug use and mental health outcomes for those living with HIV? A strong HIV testing infrastructure provides a number of avenues for addressing some of these persisting concerns, given that we adhere to rigorous epidemiological criteria. In order to take advantage of these potential to influence public health practice, the

focus of the study must be clearly defined and suitable analysis applied.

**Conflict of Interest:** None

## REFERENCES

- Bhadarge G, Bankar N, Hadke S. Study of liver function test, haematological parameters and Crp derangements in covid-19 patients. *Biosc. Biotech. Res. Comm.* 2021;36-40. <http://dx.doi.org/10.21786/bbrc/14.6.8>
- Mascolo S, Romanelli A, Carleo MA, Esposito V. Could HIV infection alter the clinical course of SARS-CoV-2 infection? When less is better. *Journal of Medical Virology.* 2020 Jul 11;92(10):1777-8. <https://doi.org/10.1002/jmv.25881>
- Zhu F, Cao Y, Xu S, Zhou M. Co-infection of SARS-CoV-2 and HIV in a patient in Wuhan city, China. *Journal of Medical Virology.* 2020 Jun;92(6):529-30. <https://doi.org/10.1002/jmv.25732>
- Blanco JL, Ambrosioni J, Garcia F, Martínez E, Soriano A, Mallolas J, Miro JM. COVID-19 in patients with HIV: clinical case series. *The lancet HIV.* 2020 Apr 15;7(5):e314-6. [https://doi.org/10.1016/s2352-3018\(20\)30111-9](https://doi.org/10.1016/s2352-3018(20)30111-9)
- Ambrosioni J, Blanco JL, Reyes-Urueña JM, Davies MA, Sued O, Marcos MA, Martínez E, Bertagnolio S, Alcamí J, Miro JM, Blanco JL. Overview of SARS-CoV-2 infection in adults living with HIV. *The lancet HIV.* 2021 May 1;8(5):e294-305. [https://doi.org/10.1016/S2352-3018\(21\)00070-9](https://doi.org/10.1016/S2352-3018(21)00070-9)
- Patel RH, Pella PM. COVID-19 in a patient with HIV infection. *Journal of Medical Virology.* 2020 Jun 3;92(11):2356-7. <https://doi.org/10.1002/jmv.26049>
- Sun LJ, Wong SX, Gollamudi S. A case of HIV and SARS-CoV-2 co-infection in Singapore. *Journal of Acquired Immune Deficiency Syndromes (1999).* 2020 Aug 1. <https://dx.doi.org/10.1097%2FQAI.00000000000002401>
- Baluku JB, Mwebaza S, Ingabire G, Nsereko C, Muwanga M. HIV and SARS-CoV-2 coinfection: A case report from Uganda. *Journal of medical virology.* 2020 Nov;92(11):2351-3. <https://doi.org/10.1002/jmv.26044>
- Zhao J, Liao X, Wang H, Wei L, Xing M, Liu L, Zhang Z. Early virus clearance and delayed antibody response in a case of coronavirus disease 2019 (COVID-19) with a history of coinfection with human immunodeficiency virus type 1 and hepatitis C virus. *Clinical Infectious Diseases.* 2020 Oct 15;71(16):2233-5. <https://doi.org/10.1093/cid/ciaa408>
- Gervasoni C, Meraviglia P, Riva A, Giacomelli A, Oreni L, Minisci D, Atzori C, Ridolfo A, Cattaneo D. Clinical features and outcomes of HIV patients with coronavirus disease 2019. *Clinical Infectious Diseases.* 2020 May 14. <https://academic.oup.com/cid/article/71/16/2276/5837155>
- Härter G, Spinner CD, Roeder J, Bickel M, Krznanic I, Grunwald S, Schabaz F, Gillor D, Postel N, Mueller MC, Müller M. COVID-19 in people living with human immunodeficiency virus: a case series of 33 patients. *Infection.* 2020 Oct;48(5):681-6. <https://doi.org/10.1007/s15010-020-01438-z>
- Baluku JB, Olum R, Agolor C, Nakakande J, Russell L, Bongomin F, Nakawesi J. Prevalence, clinical characteristics and treatment outcomes of HIV and SARS-CoV-2 co-infection: a systematic review and meta-analysis. *medRxiv.* 2020 Jan 1. <https://doi.org/10.1101/2020.05.31.20118497>
- Guo W, Ming F, Dong Y, Zhang Q, Zhang X, Mo P, Feng Y, Liang K. A survey for COVID-19 among HIV/AIDS patients in two districts of Wuhan, China. *AIDS Patients in Two Districts of Wuhan, China (3/4/2020).* 2020 Mar 4. [https://doi.org/10.1016/S2352-3018\(20\)30164-8](https://doi.org/10.1016/S2352-3018(20)30164-8)
- Vizcarra P, Pérez-Elías MJ, Quereda C, Moreno A, Vivancos MJ, Drona F, Casado JL, Moreno S, Pérez-Elías MJ, Fortún J, Navas E. Description of COVID-19 in HIV-infected individuals: a single-centre, prospective cohort. *The lancet HIV.* 2020 Aug 1;7(8):e554-64. [https://doi.org/10.1016/S2352-3018\(20\)30164-8](https://doi.org/10.1016/S2352-3018(20)30164-8)
- Ridgway JP, Schmitt J, Friedman E, Taylor M, Devlin S, McNulty M, Pitrak D. HIV care continuum and COVID-19 outcomes among people living with HIV during the COVID-19 pandemic, Chicago, IL. *AIDS and Behavior.* 2020 Oct;24(10):2770-2. <https://doi.org/10.1007/s10461-020-02905-2>
- Pillay-van Wyk V, Bradshaw D, Groenewald P, Seocharan I, Manda S, Roomaney RA, Awotiwo O, Nkwenika T, Gray G, Buthelezi SS, Mkhize ZL. COVID-19 deaths in South Africa: 99 days since South Africa's first death. *SAMJ: South African Medical Journal.* 2020 Nov;110(11):1093-9. <http://dx.doi.org/10.7196/samj.2020.v110i11.15249>
- Kolhe S, Dambhare M, Dhankasar P, Dhole P, Nair A, Rewatkar P. Home Remedies During Covid Pandemic Lockdown. *Journal of Research in Medical and Dental Science.* 2020:103-7. <https://pesquisa.bvsalud.org/global-literature-on-novel-coronavirus-2019-ncov/resource/pt/covidwho-921431>
- Ridgway JP, Schmitt J, Friedman E, Taylor M, Devlin S, McNulty M, Pitrak D. HIV care continuum and COVID-19 outcomes among people living with HIV during the COVID-19 pandemic, Chicago, IL. *AIDS and Behavior.* 2020 Oct;24(10):2770-2. <https://doi.org/10.1007/s10461-020-02905-2>
- Williamson E, Walker AJ, Bhaskaran K, Bacon S, Bates C, Morton CE, Curtis HJ, Mehrkar A, Evans D, Inglesby P, Cockburn J. OpenSAFELY: factors associated with COVID-19-related hospital death in the linked electronic health records of 17 million adult NHS patients. *MedRxiv.* 2020 Jan 1. <https://doi.org/10.1101/2020.05.06.20092999>
- Westreich D, Greenland S. The table 2 fallacy: presenting and interpreting confounder and modifier coefficients.

- American journal of epidemiology. 2013 Feb 15;177(4):292-8. <https://doi.org/10.1093/aje/kws412>
21. Karmen-Tuohy S, Carlucci PM, Zervou FN, Zacharioudakis IM, Rebick G, Klein E, Reich J, Jones S, Rahimian J. Outcomes among HIV-positive patients hospitalized with COVID-19. Journal of acquired immune deficiency syndromes (1999). 2020 Sep 1. <https://dx.doi.org/10.1097%2FQAI.0000000000002423>
  22. Sigel K, Swartz T, Golden E, Paranjpe I, Somani S, Richter F, De Freitas JK, Miotto R, Zhao S, Polak P, Mutetwa T. Coronavirus 2019 and people living with human immunodeficiency virus: outcomes for hospitalized patients in New York City. Clinical infectious diseases. 2020 Dec 1;71(11):2933-8. <https://doi.org/10.1093/cid/ciaa880>
  23. Zumla A, Chan JF, Azhar EI, Hui DS, Yuen KY. Coronaviruses—drug discovery and therapeutic options. Nature reviews Drug discovery. 2016 May;15(5):327-47 <https://doi.org/10.1038/nrd.2015.37>