

People on ART with low levels of HIV viral load found to have almost zero risk of sexually transmitting the virus

July 29 2023



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People living with HIV who maintain low—but still detectable—levels of the virus and adhere to their antiretroviral regimen have almost zero risk

of transmitting it to their sexual partners, according to an analysis published in *The Lancet*. The study's findings will be presented at an official satellite session ahead of the 12th International AIDS Society Conference on HIV Science (IAS 2023).

Findings from the [systematic review](#) indicate the risk of sexual transmission of HIV is almost zero at viral loads of less than 1,000 copies of the virus per milliliter of blood—also commonly referred to as having a suppressed viral load. The systematic review also confirms that people living with HIV who have an undetectable viral load (not detected by the test used) have zero risk of transmitting HIV to their sexual partners.

A new policy brief from the World Health Organization (WHO), published alongside the research paper, provides updated sexual transmission prevention and viral load testing guidance to policymakers, public health professionals, and people living with HIV based on this analysis.

This guidance aims to further prevent the transmission of HIV and ultimately support global efforts to achieve undetectable viral loads through [antiretroviral therapy](#) for all people living with HIV and to prevent onward transmission to their sexual partner(s) and children.

Previous research has shown people living with HIV with viral loads below 200 copies/mL have zero risk of sexually transmitting the virus. However, until now, the risk of transmission at viral loads between 200 and 1,000 copies/mL was less well defined.

The authors filled this knowledge gap by searching databases for all research studies published between January 2000 and November 2022 on sexual transmission of HIV at varying viral loads. In total, eight studies were included in the systematic review, providing data on 7,762

serodiscordant couples—in which one partner was living with HIV—across 25 countries.

Lead author Laura Broyles, MD, of the Global Health Impact Group (Atlanta, U.S.), said, "These findings are important as they indicate that it is extremely rare for people who maintain low levels of HIV to transmit it to their sexual partners. Crucially, this conclusion can promote the expansion of alternative viral load testing modalities that are more feasible in resource-limited settings. Improving access to routine viral load testing could ultimately help people with HIV live healthier lives and reduce transmission of the virus."

Taking daily medicine to treat HIV—antiretroviral therapy, or ART—lowers the amount of the virus in the body which preserves immune function and reduces morbidity and mortality associated with the virus and helps reduce HIV progression. Without ART, people living with HIV can have a viral load of 30,000 to more than 500,000 copies/mL, depending on the stage of infection.

While using lab-based plasma sample methods provides the most sensitive viral load test results, such tests are not feasible in many parts of the world. However, the new findings support the greater use of simpler testing approaches, such as using dried blood spot samples, as they are effective at categorizing viral loads for necessary clinical decision-making.

Of the 323 sexual transmissions of HIV detected across all eight studies, only two involved a partner with a viral load of less than 1,000 copies/mL. In both cases, the viral load test was performed at least 50 days before transmission, suggesting individuals' viral load may have risen in the period following the test. In studies that provided the full range of viral loads in partners with HIV, at least 80% of transmissions involved viral loads greater than 10,000 copies/mL.

Co-author Dr. Lara Vojnov, of WHO, said, "The ultimate goal of antiretroviral therapy for people living with HIV is to maintain undetectable viral loads, which will improve their own health and prevent transmission to their sexual partners and children. But these new findings are also significant as they indicate that the risk of sexual transmission of HIV at low viral loads is almost zero. This provides a powerful opportunity to help destigmatize HIV, promote the benefits of adhering to antiretroviral therapy, and support people living with HIV."

The authors acknowledge some limitations to their study. Some of the data analyzed were imprecise due to variations across the studies in the definitions of "low viral load," and in the timing and frequency of viral load testing and patient follow-up. Today, HIV treatment is recommended for everyone living with HIV and very large sample sizes would be needed to develop more precise estimates given the extremely low number of transmissions.

Further, the findings do not apply to HIV transmission from mother to child, as the duration and intensity of exposure—during pregnancy, childbirth, and breastfeeding—is much higher. Differences also exist in the way the virus is passed from mother to child as compared with sexual transmission. Ensuring pregnant and breastfeeding women have undetectable viral loads throughout the entire exposure period is key to preventing new childhood HIV infections.

Writing in a linked Comment, co-authors Linda-Gail Bekker, Philip Smith, and Ntobeko A B Ntusi (who were not involved in the study) said, "Laura N Broyles and colleagues' systematic review in *The Lancet* further supports the almost zero risk for sexual [transmission](#) of HIV at levels less than 1,000 copies per mL...This evidence is relevant for at least three important reasons."

"First, it highlights the need for viral load testing scale-up in all settings

where people are living with HIV and taking ART...Second, as pointed out by Broyles and colleagues, these data are probably the best that we will ever have. Standard of care now requires that individuals are offered life-saving ART regardless of viral load...Third, and most importantly, this study provides strong support for the global undetectable equals untransmittable (U=U) campaign."

"This campaign seeks to popularize the concept that individuals with undetectable [viral loads](#) are not infectious to [sexual partners](#), thereby reducing stigma and improving quality of life."

More information: Laura N Broyles et al, The risk of sexual transmission of HIV in individuals with low-level HIV viraemia: a systematic review, *The Lancet* (2023). [DOI: 10.1016/S0140-6736\(23\)00877-2](#)

Linda-Gail Bekker et al, HIV is sexually untransmittable when viral load is undetectable, *The Lancet* (2023). [DOI: 10.1016/S0140-6736\(23\)01519-2](#)

Provided by Lancet

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