

HIV treatment as prevention

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For transmission of HIV to occur, four conditions are needed:

- Virus must be present in a person's body fluid
- It must be present in sufficient quantity to cause infection
- There must be an effective route of transmission into the body of another person, and
- It must reach cells that HIV can infect in that person's body.

(You can find out more about the factors that enable HIV to be passed on in our resource, *HIV transmission and testing*, which is available on aidsmap.com.)

When someone has HIV, it can be present in potentially infectious quantities in blood, semen, vaginal fluids, rectal secretions and breast milk. Transmission of HIV can happen if one of these fluids gets into somebody else's body, either directly into the bloodstream (such as in injecting drug use, or from an HIV-positive woman to her baby), or through unprotected anal, or vaginal sex, and much less often, unprotected oral sex.

Various factors affect the risk of HIV transmission. How likely it is that transmission will occur is directly linked to the viral load of the HIV-positive person. The more virus that is present, the more likely it is to be passed on. In this context we sometimes talk about 'infectiousness'.

The effect of HIV treatment

Effective HIV treatment reduces the amount of HIV in the body. The goal of HIV treatment is to reduce the amount of virus in the blood to a level so low that it cannot be measured using standard tests (this is called an undetectable viral load), but HIV treatment also reduces the amount of HIV in sexual fluids.

There has been a lot of debate about whether having an undetectable viral load means someone is uninfected, and therefore whether being on successful HIV treatment is an effective form of preventing HIV transmission. The debate was intensified in 2008, with the so-called 'Swiss statement', in which HIV doctors in Switzerland said that a person taking HIV treatment with an undetectable viral load in their blood should not be considered sexually infectious provided:

- Their viral load had been undetectable for at least six months.
- They did not have a sexually transmitted infection (STI).
- They took their HIV treatment properly (often called adherence).

However, some researchers believe that there can still be a risk of transmission even if a person is taking treatment and has a low viral load. It was pointed out that the research supporting the statement was conducted in heterosexual couples, looking at vaginal sex, and that there isn't much evidence about viral load, HIV transmission and anal sex.

Evidence for 'treatment as prevention'

There is now considerable evidence that people with suppressed or undetectable HIV viral loads, especially those on HIV treatment, are much less likely to pass on HIV than people not on treatment.

A large randomised controlled trial called HPTN 052 has found that antiretroviral treatment reduced the risk of passing on HIV to a regular partner by 96%, and several other studies have shown a similar reduction in the risk of passing on HIV to a sexual partner.

This result proved definitively that being on effective treatment reduces the risk of someone with HIV passing it on to their sexual partner. However, the risk of transmission cannot be ruled out altogether.

There are at least two aspects to the implications of these important findings.

Implications of the research findings for individuals

The recognition of the preventive effect of HIV treatment has potentially significant and far-reaching implications for people living with HIV, in at least three areas:

- The possibility that, alongside condom use and other safer sex practices, in certain situations people with an undetectable viral load could consider adherence to HIV treatment to be a method of preventing onward transmission of HIV.
- For serodiscordant couples thinking about pregnancy. The reduced risk of transmission may mean couples feel able to have unprotected sex in order to conceive.
- Where someone is at risk of criminal prosecution for 'HIV exposure' but is on HIV treatment and has an undetectable viral load. In this situation, they may be considered uninfected and therefore not to have met the criteria for 'reckless' or deliberate transmission of HIV.

Following the Swiss statement, the British HIV Association (BHIVA) and other UK organisations concerned with the health of people living with HIV and with sexual and reproductive health produced [guidelines](#) acknowledging the effect treatment has on reducing the risk of transmission, but not endorsing the Swiss statement.

If you are in a relationship with someone who is HIV-negative and are thinking about having unprotected sex, it's important to discuss this carefully, both together and with your HIV doctor or someone else in your healthcare team.

Implications of the research findings for communities

The findings of HPTN 052 suggest that, if a sufficiently large proportion of the HIV-positive population was taking effective HIV treatment and their viral loads were brought down to an undetectable level, transmission might become rare enough for the epidemic to be ended.

On a population level this can be expressed as a reduction in the 'community viral load', the viral load averaged over the whole population. This suggests a new approach to HIV prevention: mass treatment of people with HIV. There are some programmes already underway taking this approach to HIV prevention (in San Francisco and British Columbia, for example, where people are encouraged to start HIV treatment at the time they are diagnosed, regardless of their CD4 cell count).

However, there are concerns about the introduction of mass programmes based on treatment as prevention, including:

- the cost and practical implications of treating a much larger number of people;
- fears that people may be coerced into treatment;
- the lack of absolute certainty that undetectable means completely uninfected;
- together with the concern that reliance on the effect of treatment will result in an increase in risky sexual behaviour, for example.

One challenge to the success of a programme like this is the fact that a significant proportion of people with HIV are as yet undiagnosed.