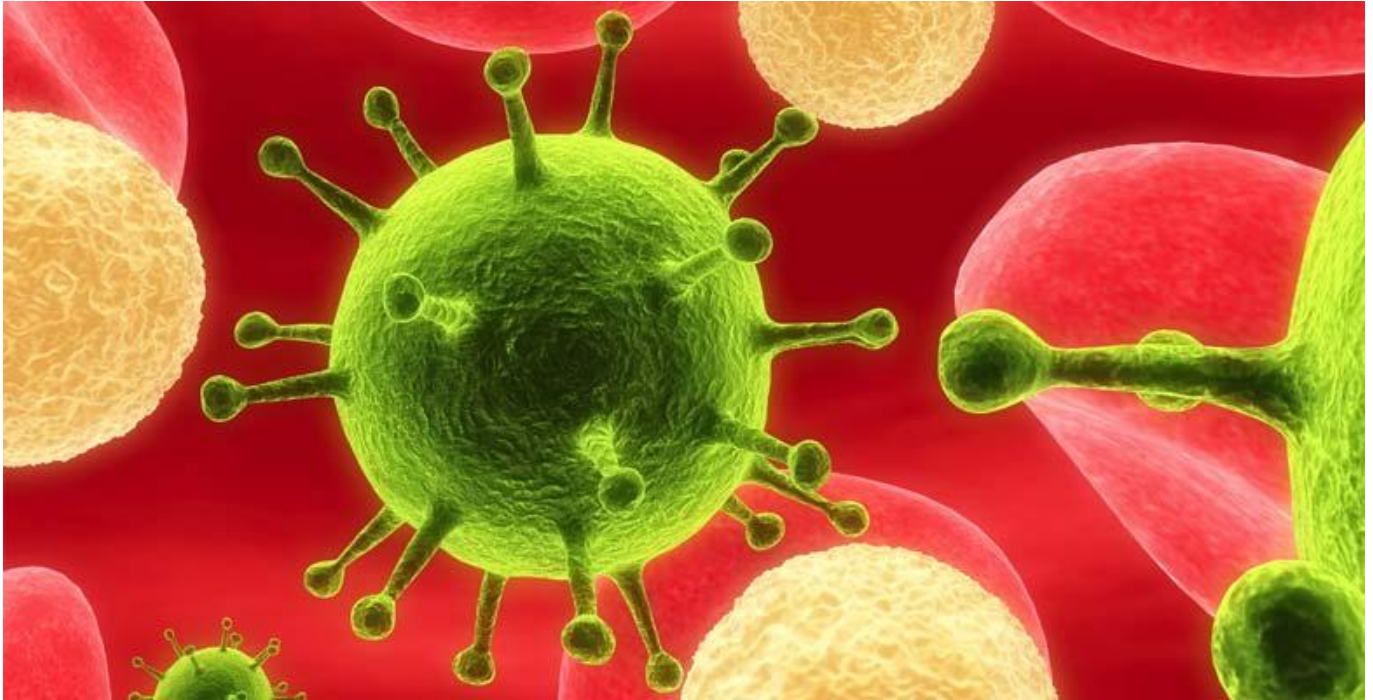


HIV strains and types



KEY POINTS

- There are two main types of HIV - HIV-1 (the most common) and HIV-2 (relatively uncommon and less infectious).
- Like many viruses, HIV has the ability to mutate and change over time - within the main types of HIV there are many genetically distinct subgroups.
- Tests to diagnose HIV and monitor the level of virus in the body that are sensitive to the full range of subtypes (and to group O and HIV-2) do exist, but may not be readily available in all settings.

Explore this page to find out more about [HIV-1 and HIV-2](#), [groups within HIV-1](#), [subtypes within HIV-1](#), and [why differences in subtypes matter](#).

HIV-1 and HIV-2

HIV-1 and HIV-2 are two distinct viruses. Although tests which are sensitive to both types of viruses are widely available, the significant genetic differences between the two types mean that a test specifically designed to detect one type will not reliably identify the other.

Worldwide, the predominant, earliest and most commonly referred to virus is HIV-1. HIV-1 accounts for around 95% of all infections worldwide.

The relatively uncommon HIV-2 virus is concentrated in West Africa, but has been seen in other countries. It is less infectious and progresses more slowly than HIV-1, resulting in fewer deaths. It is estimated to be more than 55% genetically distinct from HIV-1.¹

While many commonly used antiretroviral drugs are active against HIV-2, non-nucleoside reverse

transcriptase inhibitors (NNRTIs) like nevirapine and efavirenz do not work against it. The best strategy with which to treat HIV-2 has been less clearly defined than HIV-1.^{2 3}

Groups within HIV-1

HIV Types and Strains



The strains of HIV-1 can be classified into four groups.⁴ Of these, M is the ‘major’ group and is responsible for the majority of the global HIV epidemic.

The other three groups - N, O and P - are quite uncommon. Group O represents up to 5% of infections in several west and central African countries, and Group N and P have been rarely identified in Cameroon.

Subtypes within HIV-1 group M

Within group M there are known to be at least nine genetically distinct subtypes of HIV-1. These are subtypes A, B, C, D, F, G, H, J and K.

Additionally, different subtypes can combine genetic material to form a hybrid virus, known as a ‘circulating recombinant form’ (CRFs). Around 89 of these are known to exist.^{5 6}

The dominant HIV subtype in the [Americas](#), [Western Europe](#) and Australasia is subtype B. As a result, the great majority of HIV clinical research has been conducted in populations where subtype B predominates, despite this subtype representing only 12% of global HIV infections.

In contrast, less research is available for subtype C, although nearly 50% of all people living with HIV have subtype C. It is very common in the high prevalence countries of Southern Africa, as well as in the horn of Africa and [India](#).

The greatest diversity of subtypes is found in Cameroon and the Democratic Republic of Congo - the region [where the HIV-1 epidemic originated](#). But migration and population mixing means geographical patterns in the distribution of subtypes are changing over time, and predicting transmission patterns in particular areas has also become more difficult.⁷

Do differences in subtypes matter?

Some studies suggest that certain subtypes have a greater risk of transmission or faster disease progression than others.⁸ On the other hand, antiretroviral drugs (ARVs), although largely developed in relation to subtype B, have generally proven to be effective against a wide range of

subtypes.^{9 10} However, infection with subtype C virus has been associated with poorer ART treatment outcomes in Sweden.^{11 12 13}

Nonetheless, comparative research on these important issues is relatively limited, partly because individuals with different subtypes are found in distinct geographical locations.

A more practical concern are the tests used to diagnose HIV and monitor the level of virus in the body (viral load). Tests that are sensitive to the full range of subtypes (and to group O and HIV-2) do exist but may not be readily available in all settings. This is a concern in places where diverse subtypes are prevalent.

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Last full review: 19 July 2017

Last updated: 23 January 2018

Next full review: 18 July 2020