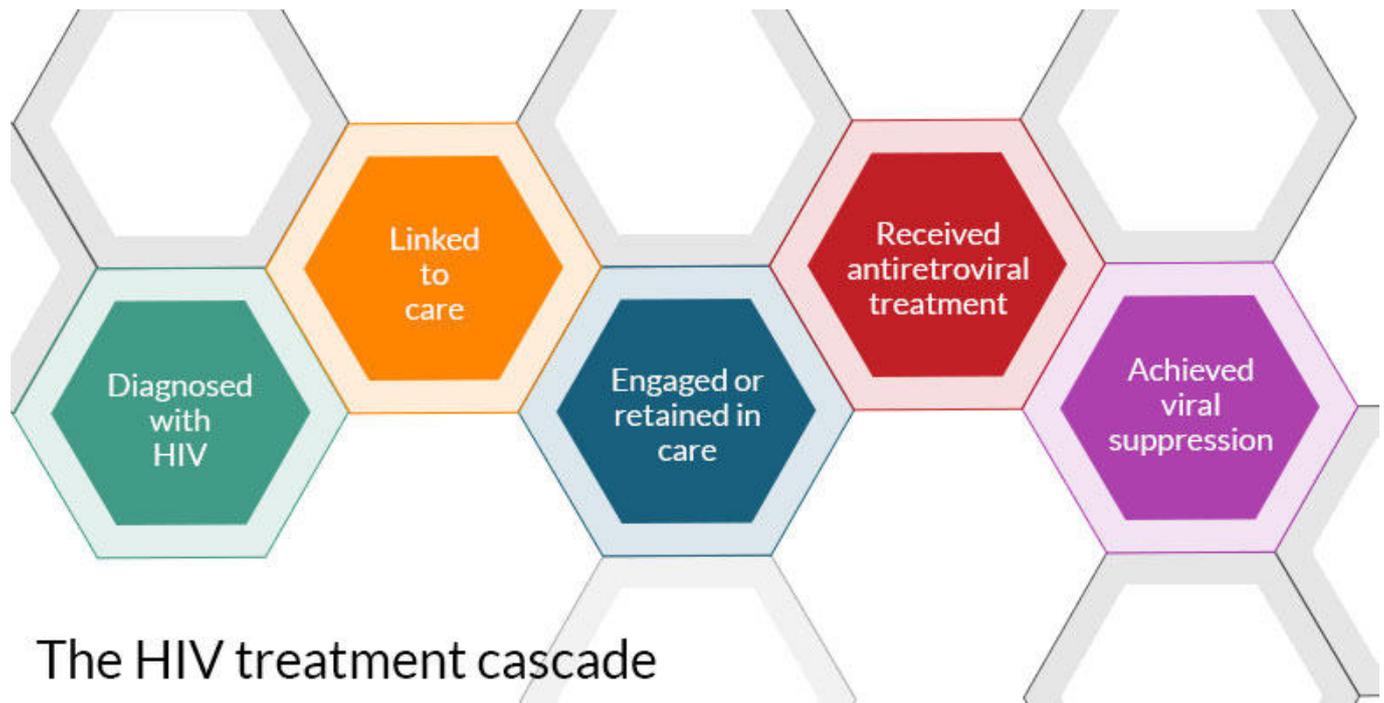


The HIV treatment cascade



The HIV treatment cascade

The HIV treatment cascade is a model that outlines the steps of care that people living with HIV go through from initial diagnosis to achieving viral suppression (a very low level of HIV in the body), and shows the proportion of individuals living with HIV who are engaged at each stage.

In most parts of the world, large gaps exist between the number of people who have HIV, those who are aware of their infection, those attending medical services, and those receiving effective treatment.

The treatment cascade can identify weaknesses at different stages or unacceptable variations between different groups or countries. They can focus the attention of policy makers or help persuade political leaders that more needs to be done.

The ultimate aim for an HIV treatment programme is for people living with HIV to be virally suppressed. For this to happen, people living with HIV need to be diagnosed promptly, quickly receive antiretroviral treatment (ART), continuously engage with medical services, adhere to medication, and have any difficulties with treatment appropriately managed. If any of these steps are missed, the benefits of treatment for the individual, and the [prevention benefits](#) for their sexual partners and for the wider population can be lost.

For weak health systems, maintaining a strong treatment cascade is challenging. Notably, it is poor in the [United States of America \(USA\)](#), a very rich country with a health system that is not accessible to all (only 30% of Americans living with HIV achieve viral suppression).¹ In fact, a number of programmes in much lower-income countries have had significantly better results.

The link between testing and treatment

Testing and diagnosis

The first step in the treatment cascade is for individuals who are living with HIV to be diagnosed and be made aware of their infection. However, only 53% of people with HIV are thought to be diagnosed, with wide variations between countries - 86% in Australia, 71% in Canada, 51% in [sub-Saharan Africa](#) and 44% in Ukraine.²

Services that test and diagnose people need to be more accessible. However, testing programmes often rely on individuals being aware of the need to test for HIV and to seek out testing themselves.

One study discovered a big difference in the number of people agreeing to an HIV test depending on the wording of offers of testing. 38% of patients offered opt-in testing agreed to a test, compared to 51% of people actively given the choice whether to test or not and 66% of people given an opt-out offer. This strongly highlights the need for the way in which tests are offered to be reconsidered in favour of more opt-out approaches.³

Experience also shows that when individuals are attending a health facility for another purpose and are advised that HIV testing is routine there, most people are happy to be tested.⁴ This is the approach frequently taken in antenatal services, tuberculosis clinics and sexual health clinics and could be extended to other health services.

Community-based testing

Several approaches that can boost the proportion of people diagnosed with HIV aim to take HIV testing services out of health facilities and into communities. These approaches include:

- self-testing (tests completed by the person rather than a health worker)⁵
- outreach testing in diverse settings including villages, workplaces and venues used by [key affected populations](#) (often delivered by peers of those being tested)
- multi-disease campaigns (offering tests for less stigmatised conditions such as diabetes or high blood pressure alongside HIV)
- home-based testing (health workers going door to door).⁶

Services may also propose HIV testing to both members of a couple, or seek out sexual partners of individuals who have themselves been recently diagnosed. Similarly, it is important to provide testing for the infants and [children](#) of people living with HIV.

Linking testing and treatment services

In order to strengthen the treatment cascade, services offering HIV testing and treatment need to be closely linked. An increasing number of these testing facilities are offering immediate ART to those individuals they diagnose, in line with the most recent World Health Organisation (WHO) treatment guidelines.

In contrast, in situations where testing and treatment services are provided at separate locations and without effective communication channels, individuals newly diagnosed with HIV may not engage with treatment services or delay doing so.

When people are not given support to adjust to an HIV-positive diagnosis or there are practical

barriers to accessing health services, people may not get prompt access to treatment.⁷ Even when initial contact with a service providing HIV treatment is made, if a person is told that they do not need medication yet they may disengage with care. The risk is that by the time they do make contact again, their health has considerably deteriorated. Delayed treatment is something the most recent WHO guidelines aims to prevent.

Offering immediate treatment

Immediately offering treatment to newly diagnosed individuals can plug a gap in the HIV treatment cascade, reducing the number of people lost between diagnosis and treatment initiation. Past experience with [programmes to prevent the mother to child transmission of HIV](#) has shown that the immediate offer of HIV treatment can lead to high levels of uptake and prevent dangerous delays. If only an HIV diagnosis is required to start ART, it is possible to provide treatment at the smallest and most remote health centres.⁸

Maintaining a continuum of care at sites where [women](#) are diagnosed – rather than referring them to specialised ART facilities elsewhere – has improved uptake.⁹

Engagement and retention in care

Many of the same barriers that may discourage an individual from engaging with healthcare in the first place can also make on-going retention in care challenging, including [HIV stigma](#), distrust of health services, concerns about confidentiality, the time and cost of transport to a clinic, loss of income due to attending healthcare, waiting times in clinics, lack of support from partners and family – as well as other personal priorities.^{10 11}

As a result, many people receiving HIV treatment drop out of care – the World Health Organisation estimates that the average retention rate was 81% 12 months after initiating ART, 75% at 24 months, and 67% at 60 months.¹²

Retention of children and [adolescents](#) is often poor and heavily influenced by the attitudes of families, caregivers and the wider community.¹³ Gaps between child and adult services, and inadequate support for young people moving from one to the other, can result in loss to follow up.

The World Health Organisation's guidelines include recommendations on how to organise services in order to promote engagement and retention in care.

They state that HIV programmes should provide people-centred services that are organised around the health needs and preferences of people living with HIV. Some examples of this include decentralisation, reduction in clinic visits and clinic waiting times, and “upholding individual dignity and respect, especially for vulnerable populations.”¹⁴

Adherence

The WHO also make recommendations on how to support adherence to medication. Antiretroviral treatment requires tablets to be taken at the same time once or twice daily, but if doses are missed or taken late it can become ineffective. Adherence may be affected by individual factors (such as changes in daily routines, depression), medication-related factors (like side-effects, complex dosing regimens) and health system factors (including requiring the patient to visit facilities frequently to

receive medication, asking the patient for out-of-pocket payments).

The WHO recommends interventions such as support on adherence from peer counsellors, support using mobile phone text messages, reminder devices such as alarms, cognitive behavioural therapy, behavioural skills training, and medication adherence training. Moreover, they recommend simpler once-a-day regimens which combine several drugs in one pill.¹⁵

Innovative programmes in specific settings may also bolster adherence. Community and peer groups can support people to adhere to their medications. Food and nutrition support, including cash transfers, may help individuals on low incomes.¹⁶

Adherence interventions can also tackle health system factors. To ensure a continued supply of medication and prevent stock-outs, the WHO recommends that pharmaceutical supply management systems used to forecast, procure and deliver ARV drugs are optimised.¹⁷

Achieving viral suppression

The aim of HIV treatment and the final step on the treatment cascade is viral suppression.

Individuals who are virally suppressed are responding well to HIV treatment and are highly **unlikely to pass HIV on to others**. This underscores the need to ensure that every person living with HIV has access to viral load monitoring – the test that provides information on viral suppression.

The WHO recommends that viral load testing should be carried out six and 12 months after starting antiretroviral treatment, and for patients stable on ART, every twelve months after that.¹⁸ However, while point-of-care and dried blood spot versions of these tests are now available and their price is falling, they remain inaccessible for many health services and clinics.

Viral load tests are important because they give an early indication of difficulties with adherence and/or treatment failure, allowing patients to be switched promptly to an alternative treatment – so long as effective second-line treatments or third-line treatments are available. Delays in switching treatment risks allowing drug resistance to develop. While the WHO treatment guidelines recommend HIV drug resistance testing when assessing first-line ARV failures, laboratory facilities for these complex tests are even less readily available than viral load tests in low- and middle- income countries.

Viral suppression around the world

When provided appropriately, modern HIV treatment is highly effective – as shown by the treatment cascades in several high-income countries in which over 90% of those receiving treatment are virally suppressed. For example, Switzerland has one of the strongest treatment cascades in the world, with a suppressed viral load achieved in 95% of people taking treatment.¹⁹ However, around the world the percentage of all people living with HIV with a suppressed viral load is lower (68%) due to people remaining undiagnosed or not receiving treatment.²⁰

Moreover, a number of low- and middle-income countries have been able to achieve good rates of viral suppression in those who receive treatment. This is the case for 72% in **Brazil**, 77% in Georgia and 82% in Rwanda.²¹

Nonetheless it is important to look at the overall treatment cascades in these countries to get a fuller

picture. For example, in Brazil only 80% of people living with HIV have been diagnosed and only 60% of those diagnosed receive treatment. This means just 40% of HIV-positive Brazilians are actually virally suppressed. The picture in Georgia is comparable.

Attention to each step in the treatment cascade and high-quality health services throughout are needed for HIV treatment programmes to be successful. In the face of extremely challenging circumstances, the results achieved in Rwanda are inspiring – around 90% of those living with HIV are diagnosed and linked with care, 70% of this group receive antiretroviral treatment and 82% of those on treatment are virally suppressed. Overall, 52% of HIV-positive Rwandans are virally suppressed – a figure comparable to that in many much higher-income countries.²²

Photo credit: Copyright AVERT

HELP US HELP OTHERS

Avert.org is helping to prevent the spread of HIV and improve sexual health by giving people trusted, up-to date information.

We provide all this for FREE, but it takes time and money to keep Avert.org going.

[Can you support us and protect our future?](#)

Every contribution helps, no matter how small.

[PLEASE DONATE NOW](#)

Photo credit: Copyright AVERT



Tools and resources:

World Health Organization (2016) ['What's new in monitoring fact sheet: HIV treatment and care'](#)

-
1. Levi, J. et al (2015) 'Can the UNAIDS 90-90-90 target be achieved? Analysis of 12 national level HIV treatment cascades' Eighth International AIDS Society Conference on HIV Pathogenesis, Treatment and Prevention, Vancouver, Abstract MOAD0102
 2. Levi, J. et al (2015) 'Can the UNAIDS 90-90-90 target be achieved? Analysis of 12 national level HIV treatment cascades' Eighth International AIDS Society Conference on HIV Pathogenesis, Treatment and Prevention, Vancouver, Abstract MOAD0102

3. Montoy, J.C.C. et al (2015) 'Patient choice in opt-in, active choice, and opt-out HIV screening: randomized clinical trial', *BMJ* 2016, 352:h6895
4. World Health Organisation (WHO) (2015) 'Consolidated guidelines on HIV testing services'
5. World Health Organisation (2016) 'Guidelines on HIV self-testing and partner notification'
6. World Health Organisation (WHO) (2015) 'Consolidated guidelines on HIV testing services'
7. Musheke, M. et al (2013) 'A systematic review of qualitative findings on factors enabling and deterring uptake of HIV testing in sub-Saharan Africa' *BMC Public Health* 13:220
8. Schouten, E.J. et al (2011) 'Prevention of mother-to-child transmission of HIV and the health-related Millennium Development Goals: time for a public health approach' *The Lancet* 378(9787):282-284
9. Suthar, A.B. et al (2013) 'Integrating antiretroviral therapy into antenatal care and maternal and child health settings: a systematic review and meta-analysis' *Bulletin of the World Health Organization* 91:46-56
10. Suthar, A.B. et al (2013) 'Integrating antiretroviral therapy into antenatal care and maternal and child health settings: a systematic review and meta-analysis' *Bulletin of the World Health Organization* 91:46-56
11. Musheke, M. et al (2013) 'A systematic review of qualitative findings on factors enabling and deterring uptake of HIV testing in sub-Saharan Africa' *BMC Public Health* 13:220
12. World Health Organisation (WHO) (2013) 'Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection'
13. World Health Organisation (2011) 'Retention in HIV programmes: Defining the challenges and identifying solutions'
14. World Health Organisation (2015) 'Policy brief: Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection: What's new'
15. World Health Organisation (2015) 'Policy brief: Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection: What's new'
16. UNAIDS (2015) 'On the Fast-Track to end AIDS by 2030: Focus on location and population'
17. World Health Organisation (WHO) (2013) 'Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection'
18. World Health Organisation (2015) 'Policy brief: Consolidated guidelines on the use of antiretroviral drugs for treating and preventing HIV infection: What's new'
19. Levi, J. et al (2015) 'Can the UNAIDS 90-90-90 target be achieved? Analysis of 12 national level HIV treatment cascades' Eighth International AIDS Society Conference on HIV Pathogenesis, Treatment and Prevention, Vancouver, Abstract MOAD0102
20. UNAIDS (2014) '90-90-90 - An ambitious treatment target to help end the AIDS epidemic'
21. Levi, J. et al (2015) 'Can the UNAIDS 90-90-90 target be achieved? Analysis of 12 national level HIV treatment cascades' Eighth International AIDS Society Conference on HIV Pathogenesis, Treatment and Prevention, Vancouver, Abstract MOAD0102
22. Farmer, P.E. et al (2013) 'Reduced premature mortality in Rwanda: lessons from success' *British Medical Journal* 346:f65

Last full review:
08 March 2016

Next full review:
02 August 2019