

HIV



Human Immunodeficiency Virus (HIV) is a major global health issue, infecting millions of people worldwide, the highest burden of which is in Sub Saharan Africa.

There is no vaccine or cure for the virus. Without antiviral treatment, HIV causes Acquired Immunodeficiency Syndrome (AIDS) and death. While there have been transformative advances in the treatment of HIV with antiretroviral therapy (ART) and uptake of ART in over 18 million people in low and middle income countries, multiple challenges remain in testing, implementation and the costs of lifelong treatment. For people living with HIV the effects of the virus are not just physical; a significant level of stigma remains, and those with the virus often face discrimination.

HIV prevention, treatment and cure

Prevention

- Condom use
- Access to clean injecting equipment for people who use drugs
- Testing of blood bank supplies
- Pre-exposure prophylaxis (PrEP) – an antiviral tablet taken by someone at risk of HIV infection that works like taking the contraceptive pill and can reduce the risk of acquiring HIV by 90%
- Treatment as prevention (TasP) – people who are able to maintain an undetectable viral load on ART cannot transmit HIV
- Circumcision reduces the risk of a man acquiring HIV by 70%
- There is no effective vaccine for HIV

Treatment and cure

- ART rapidly controls the virus, and allows the immune system to rebuild
- People living with HIV who receive ART at the right time have a normal life expectancy
- Treatment is lifelong and cannot eliminate the virus
- There is no cure for HIV

The Doherty Institute's expertise

HIV is a major focus for the Peter Doherty Institute for Infection and Immunity (Doherty Institute), with a broad spectrum of activities spanning discovery research, public health, and clinical care.

Research

The biggest hurdle to curing HIV infection is the persistence of HIV in a silent form, meaning it is able to hide from the individual's immune system and ART. This is called HIV latency. Director of the Doherty Institute, University of Melbourne Professor Sharon Lewin's and Associate Professor Paul Cameron's laboratory focuses on understanding where and why HIV remains in the body, even after years of treatment, and developing clinical trials aimed at ultimately finding a cure. Key components of their research include looking at the different cells where HIV hides and how to harness the immune system to eliminate HIV latency. The laboratory also focuses on the effects of antiviral therapy on the immune system and other common co-infections such as hepatitis B virus and unusual fungal and virus infections. This work is done in collaboration with groups in the United States, Denmark, Thailand, Malaysia and South Africa.

University of Melbourne Professor Damian Purcell's laboratory is developing new drugs to eliminate latency and better ways to understand the detail of how HIV replicates, while University of Melbourne Professor Stephen Kent's laboratory is working on boosting different parts of the immune system to also eliminate latent infection.

36.7
million

Approximately 36.7 million people are living with HIV globally and 26,400 in Australia

HIV



Professor Sharon Lewin's laboratory focuses on understanding where and why HIV remains in the body, even after years of treatment.

35 million

Approximately 35 million people have died globally due to AIDS-related causes

Professor Kent's and Professor Purcell's laboratories are also developing new strategies to create an effective HIV vaccine. One approach developed by Professor Kent uses microscopic particles (nanoparticles) that are loaded with genes and proteins of the virus to induce a powerful immune response. Professor Purcell is developing potent antibodies to HIV through immunising cows. Their work on HIV vaccines is done in collaboration with investigators in Sydney and a large European network, the European AIDS Vaccine Initiative (EAVI2020).

Public health and policy

The Royal Melbourne Hospital's Victorian Infectious Diseases Reference Laboratory (VIDRL) at the Doherty Institute provides the state's HIV diagnostic and clinical testing services and consists of the HIV Serology Laboratory, HIV Characterisation Laboratory and HIV State Reference Laboratory. These laboratories confirm all diagnoses of HIV across Victoria and provide specialised tests used to ensure that treatment is effective.



The Doherty Institute is home to the secretariat of the Fast-Track Cities initiative for Victoria. Fast-Track Cities is a global partnership between municipalities and four core partners – International Association of Providers of AIDS Care (IAPAC), UNAIDS, the United Nations Human Settlements Programme (UN-Habitat), and the City of Paris. Victoria's Fast-Track City initiative is a collaboration between the Victorian Department of Health and Human Services and the City of Melbourne, and aims to see enhanced uptake of ART, elimination of new HIV infections and elimination of HIV-related stigma and discrimination in Victoria by 2020.

Clinical care

The Victorian Infectious Diseases Service (VIDS) provides inpatient and outpatient services for the clinical management of HIV at The Royal Melbourne Hospital.

Statistics sources: UNAIDS AIDS Info 2017, The Kirby Annual Surveillance Report 2016, World Health Organization

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