

The CIHR Institute

The CIHR Institute of Infection and Immunity takes the lead for CIHR in the fight against HIV/AIDS. CIHR administers the research arm of the Federal Initiative to Address HIV/AIDS in Canada. The Institute, under the leadership of Scientific Director Dr. Bhagirath Singh, is identifying research priorities and undertaking collaborative research initiatives to reduce the burden of HIV/AIDS domestically and internationally. The Institute has created the CIHR HIV/AIDS Research Advisory Committee to assist CIHR in determining research priorities and ensuring that research is relevant and meets identified needs. The committee members represent five CIHR Institutes, the Public Health Agency of Canada, the Ministerial Council on HIV/AIDS, and the HIV/AIDS research and volunteer communities.

Much of CIHR's support for HIV/AIDS research is funneled through the Canadian HIV Trials Network (CTN), a partnership of researchers, practitioners, the private sector and people living with HIV/AIDS, that facilitates clinical trials of the highest scientific and ethical standards. As of April 2005, the CTN had reviewed 208 trial protocols, implemented 89 clinical trials involving 8,448 volunteers at sites across Canada and enrolled another 11,000 Canadians in expanded (compassionate) access trials.

About the Canadian Institutes of Health Research

The Canadian Institutes of Health Research is the Government of Canada's agency for health research. Its objective is to excel, according to internationally accepted standards of scientific excellence, in the creation of new knowledge and its translation into improved health for Canadians, more effective health services and products and a strengthened Canadian health care system. Composed of 13 Institutes, CIHR provides leadership and support to close to 10,000 researchers and trainees in every province of Canada. For more information visit www.cihr-irsc.gc.ca

The Canadian Institutes of Health Research (CIHR) is the Government of Canada's agency for health research. Through CIHR, the Government of Canada has invested approximately \$28.2 million in 2004-05 in research on HIV/AIDS across Canada.

The facts

- Human Immunodeficiency Virus (HIV) is the virus that causes Acquired Immunodeficiency Syndrome (AIDS). The virus mutates rapidly, creating new strains that make it hard to detect, prevent and treat. While treatments exist, they are costly and not readily available in developing countries. There is no cure for AIDS.
- The HIV virus is transmitted by the transfer of blood and semen through such activities as sexual intercourse and the sharing of needles. It can also be transmitted by infected mothers who breastfeed their infants.
- The first case of AIDS in Canada was reported in 1982. By June 2004 there were more than 56,000 positive HIV test reports in Canada.
- During 2004 around five million adults and children became infected with HIV worldwide. By the end of the year, an estimated 39.4 million people were living with HIV/AIDS. The year also saw more than three million deaths from AIDS. More than 95% of new HIV infections were in developing countries and more than half of the newly infected were children.
- In the early years of the epidemic in North America, AIDS predominantly affected men who have sex with men (MSM) and those who received blood and blood products. The MSM category still accounts for the largest number of HIV and AIDS case reports. Increasingly, however, injection drugs users, women, youth and Aboriginal people are being affected by HIV/AIDS.
- Women have accounted for about one-quarter of adult HIV diagnoses in each year since 2000. This proportion has more than doubled from 12% in the period 1985-87.
- In 2003, 14.4% of Canadian AIDS cases with known ethnicity were Aboriginal people. Compared to the general population, Aboriginal people who test positive for HIV are more likely to be female, under 30 and have been infected through injection drug use. A high proportion of HIV-infected pregnant women are Aboriginal.

Research finding solutions to HIV/AIDS

- Vaccine development is the ultimate and challenging goal of much HIV/AIDS research. Dr. Francis Plummer and his team at the National Microbiology Laboratory are helping to move a step closer to achieving the goal with their work on people who are resistant to HIV infection. They have discovered that cytotoxic T cells (CTL) that are reactive to HIV are present in both the blood and genital mucosa of resistant women, supporting the belief that a mucosal-based vaccine is the best hope. They have also discovered that CTL can be elicited by single or infrequent exposures to HIV, suggesting that a single- or low-dose vaccine that elicits CTL responses may be possible.
- Resistance to antiretroviral drugs among people with HIV continues to be a problem. Dr. Michel Tremblay of Laval University is focusing on new ways to circumvent this resistance. He has found evidence that treatment with statins, drugs currently used to lower cholesterol, can decrease HIV replication and attachment to target cells. The ability of statins to limit the initial steps in virus replication provides a new approach for treating HIV-1 infection.

- Treatment for HIV infection can start later than originally believed – when CD4 count is as low as 200, instead of 500, as has been the recommended guideline to this point – according to CIHR-supported researcher Dr. Julio Montaner. This finding means relief from the significant side-effects of HIV therapy for some patients, and cost savings for the health care system.
- Nearly half of the 40 million people in the world infected with HIV/AIDS are women. They, in turn, spread the disease to their children through childbirth and breastfeeding. CIHR-supported researcher Dr. Michel G. Bergeron of Université Laval is testing a vaginal gel containing the microbicide sodium lauryl sulfate, and is focusing on both its safety and acceptability in healthy young African women in Cameroon. If the gel proves effective, a new method of HIV/AIDS prevention may provide women with a means of controlling their exposure to the HIV virus.
- Aboriginal injection drug users in Vancouver are becoming infected with HIV at twice the rate of non-Aboriginal injection drug users, according to research by CIHR-supported Dr. Patricia Spittal of the B.C. Centre for Excellence in HIV/AIDS. Her team's finding emphasizes the need for a public health strategy planned and implemented with the Aboriginal community to reduce the harms of injection drug use in the Aboriginal population.
- A drug being tested for use in cancer is showing promise for halting AIDS-related dementia, according to a study by CIHR-funded Dr. Chris Power of the University of Calgary. AIDS-related dementia affects 20% of people with AIDS and usually begins seven-to-ten years into the disease – meaning that as survival rates increase, more and more patients will experience the dementia.

In the pipeline ... Involving communities in research

Community involvement has been a hallmark of health research and action on HIV/AIDS from the beginning, creating a model for communities taking action on other diseases and conditions. Through the Community-Based Research (CBR) Program, CIHR is supporting research that engages communities in taking control of health promotion and practices to reduce the risk of HIV/AIDS infection in all settings. The program, which was initially administered by Health Canada but moved to CIHR in April 2004, provides funding for projects in Aboriginal and non-Aboriginal communities that promote greater involvement of communities in all aspects of research – from determining the research question to conducting the research and disseminating the results.

The CBR Program's first Request for Applications (RFA), issued in November 2000, resulted in 21 projects receiving funding, including: a study of the impact of housing support and homelessness on the health outcomes of people with HIV/AIDS in Ontario; cultural competence for health care providers providing care to Aboriginal people with HIV/AIDS; and HIV prevention and care among women sex workers in Vancouver. The results of these projects will improve communities' abilities to prevent and treat HIV/AIDS among their populations.

The researchers ... Dr. Liviana Calzavara: Changing behaviours regarding HIV

Dr. Liviana Calzavara's experiences in Canada as a child immigrant from Italy gave her a lifelong interest in peoples' experiences of stigma.

Today, as a highly respected sociologist and Associate Professor at the University of Toronto, Dr. Calzavara has concentrated her research on the social determinants of HIV among vulnerable populations, including homosexuals, injection drug users, prisoners and immigrants.

She has found that the negative beliefs people have about HIV mean that these groups suffer from stigma.

"People look at those who suffer from HIV as being immoral," she says, "because they're perceived as engaging in immoral behaviours."

From 2001 to 2005, Dr. Calzavara was the lead investigator of the groundbreaking, CIHR-funded Polaris HIV Seroconversion study, which supplied a wealth of information to help target HIV prevention efforts. Dr. Calzavara discovered that delaying the application of condoms for anal sex made gay and bisexual men six times more likely to contract HIV. The study also found that people at risk of contracting HIV who repeatedly tested negative developed a misperception that their current high-risk behaviour was safe.

The Polaris study built on her earlier work, carried out throughout the 1990s, which helped to measure the incidence of HIV among people who underwent repeat testing in Ontario. Her finding of increased HIV infection rates among men having sex with men received significant media coverage and generated community-based prevention efforts, including an information campaign called 'Welcome to Condom Country'. As a result, infection rates stabilized in 2000.

Now Dr. Calzavara is extending her research internationally to help transitioning countries that don't have the research capacity in place to deal with HIV. As a member of the Canada AIDS Russia Project (CARP), developed in conjunction with the Canadian International Development Agency (CIDA), she is adapting the Polaris study to a Russian context in order to trace the growth of HIV in that country. Applying the Polaris model revealed 30,124 new infections in Russia in 2003 – information that is a vital prerequisite for effective prevention and treatment.