

HIV RESEARCH FUNDED BY NIH CRITICAL TO ENDING THE HIV EPIDEMIC

HIV Research: Saving Money, Saving Lives

NIH-supported research has been critical in the discovery of interventions that have been translated into significant progress in preventing and treating HIV infection. And while much progress has been made, a sustained commitment is needed to achieve breakthroughs to end the HIV epidemic – including a vaccine and a cure. The investment will pay dividends. In the U.S. alone, the savings in medical costs that could be realized from preventing 37,600 new infections per year would be nearly \$13.8 billion.ⁱ

NIH funding supported remarkable advances that have revolutionized our ability to prevent and treat HIV infection. One study (called HPTN-052) confirmed that treating individuals with HIV not only saves their lives but reduces their risk of transmitting the virus to others to near zero. The significance of the HPTN-052 findings were recognized by *Science* as the “Scientific Breakthrough of the Year in 2011.”ⁱⁱ Other key studies (SMART and START) have evaluated the risks and benefits of the timing when individuals with HIV start taking antiretroviral therapy, and demonstrated that initiating treatment early keeps them healthier, significantly reducing their risk of death.^{iii iv} On the prevention front, an NIH-supported trial discovered that taking an antiretroviral tablet daily was highly effective in preventing HIV acquisition by individuals at high risk (iPREX study).^v

Snapshot of the U.S. Epidemic

New HIV Diagnoses in 2014:
37,600

Number of people living with HIV:
1.1 million

Percent of people infected with HIV who don't know it:
15%

Percent of people diagnosed with HIV who are virally suppressed:
55%

The Global HIV Epidemic at a Glance

Number of new HIV infections in 2014:
1.9 million

Number of people living with HIV:
36.7 million

Percent of people infected with HIV who don't know it:
45%

Number of people on antiretroviral therapy:
18.2 million

A decade of flat funding imperils discovery of the next game-changer in HIV research. Key priorities and opportunities include:

- **Developing a Cure:** In July 2016, NIH awarded \$30 million over five years to six research collaborations working to advance [basic medical science toward an HIV cure that would permanently suppress the virus without the need for ongoing lifelong treatment.](#)
- **Improving Implementation on the Ground:** Understanding how to effectively deploy biomedical prevention interventions, such as [Pre-Exposure Prophylaxis \(PrEP\)](#)
- **Developing a Vaccine:** The discovery of an antibody that can neutralize many variants of the most common strain of HIV holds [promise for a vaccine](#) that could protect against HIV infection
- **Addressing Health Disparities:** Reducing the [higher HIV infection rates](#) and [poorer health outcomes](#) occurring among adolescents and young black men in particular
- **Improving Prevention Options for Women:** Improving prevention interventions for [women](#) who represent [51% of people living with HIV](#) worldwide.
- **Responding to HIV & Aging:** Learning more about the impact of HIV infection on the aging process.

The Far-Reaching Benefits of HIV Research

Investments in HIV research have fueled biomedical advances that have medical and financial benefits beyond the HIV pandemic. Researchers have applied HIV research methods and findings to other serious conditions, including cancer, Alzheimer's, and hepatitis B and C. AIDS research also has deepened our understanding of immunology, virology, microbiology, molecular biology, and genetics. Drugs developed to prevent and treat AIDS-associated opportunistic infections benefit patients undergoing cancer chemotherapy and patients receiving anti-transplant rejection therapy. Potentially revolutionary new avenues of research hold the promise not only for more effective prevention and treatment of HIV infection but also new approaches for responding to other diseases and conditions.

Research Investments Spur Economic Growth and Create Jobs

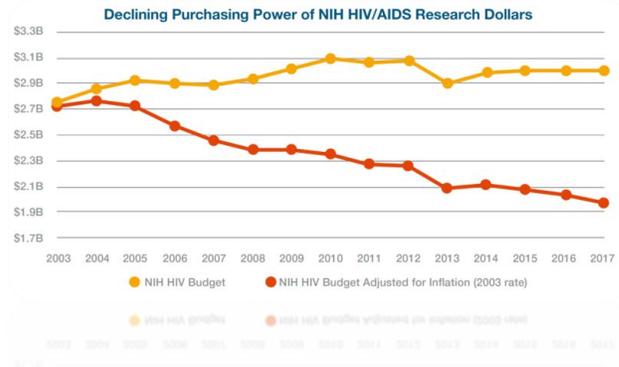
The life sciences field is responsible for more than seven million jobs in the U.S. and adds \$69 billion annually to the gross domestic product.^{vi} Every dollar invested in the NIH results in \$2.21 in local economic growth.^{vii} With a \$3.8 billion investment, the Human Genome Project alone generated an estimated \$796 billion in economic growth between 2000 and 2010—a 141-fold return on investment.^{viii}

Supporting the Next Generation of Infectious Diseases Physicians

The infectious diseases workforce is central to our ability to effectively respond to the HIV epidemic as well as to emerging infections, from Ebola to Zika, and difficult to treat infections such as sepsis (bloodstream infection and shock) caused by antibiotic resistant bacteria. NIH-supported research funding opportunities play a critical role in attracting and retaining physicians in infectious diseases and without this funding it is difficult for physicians to stay in the field.

Restricting research opportunities now will have a long-term impact on our country's ability to prevent and treat deadly infections by limiting research discoveries and eroding infectious diseases workforce capacity.

HIV & New Approaches to Beating Cancer: An innovative immunotherapy treatment for an acute form of leukemia uses the HIV virus to reprogram a patient's immune system to effectively fight off cancer cells. The exciting new treatment has helped patients with few treatment options achieve remission. Learn more by listening to this [presentation by Dr. Carl June at CROI 2017](#).



Declining ID Workforce Capacity: Fewer physicians are entering the ID specialty due to lower compensation relative to other specialties coupled with high medical school debt. In 2016, **fewer than half of ID programs filled their fellowships resulting in approximately more than one-third of fellowship positions across the country going without fellows.** In 2017, 80% of ID training fellowships filled which is an improvement but below the nearly 100% rate of most other specialties that fully fill their fellowship slots. Learn more in [Charting the Future of Infectious Disease: Anticipating and Addressing the Supply and Demand Mismatch](#).

Chart source: NIH. *Research Project Success Rates*. https://report.nih.gov/success_rates/Success_ByIC_Details.cfm (2016)

ⁱ The [CDC estimates](#) the lifetime cost of HIV care and treatment per individual at \$367,134.

ⁱⁱ Cohen, Jon. HIV Treatment As Prevention. *Science*. 334:6063. Online at: <http://science.sciencemag.org/content/334/6063/1628>.

ⁱⁱⁱ The Strategies for Management of Antiretroviral Therapy (SMART) Study Group. CD4+ Count-Guided Interruption of Antiretroviral Treatment. *N Engl J Med*. 355:2283-2296. Online at <http://www.nejm.org/doi/full/10.1056/NEJMoa062360>.

^{iv} The INSIGHT START Study Group. Initiation of Antiretroviral Therapy in Early Asymptomatic HIV Infection. *N Engl J Med* 2015; 373:795-807. Online at: <http://www.nejm.org/doi/full/10.1056/NEJMoa1506816>.

^v Grant, RM et al. Preexposure Chemoprophylaxis for HIV Prevention in Men Who Have Sex with Men. *N Engl J Med* 2010; 363:2587-2599. Online at: <http://www.nejm.org/doi/full/10.1056/NEJMoa1011205>.

^{vi} NIH (2013). *Global Competitiveness: The Importance of U.S. Leadership in Science and Innovation for the Future of Our Economy and Our Health*

^{vii} NIH (2012). *Our Economy*

^{viii} Tripp S, Greuber M (2011). *Economic Impact of the Human Genome Project*. Battelle Memorial Institute.