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AIDS Drugs Have Saved 3 Million Years of Life in the U States

HIV disease model details survival benefits of HIV therapies

from [National Institute of Allergy and Infectious Diseases](#)

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Increasingly effective HIV therapy -- including a decade of highly active antiretroviral therapy (HAART) -- has provided 3 million years of extended life to Americans with AIDS since 1981, report researchers funded by the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health (NIH).

Rochelle Walensky, M.D., M.P.H., Kenneth Freedberg, M.D., M.Sc., and their colleagues report that advances in HIV care have yielded a total survival benefit of 2.8 million years in the United States. The researchers also estimate that drugs to prevent mother-to-child transmission have averted 2,900 infant infections, saving an additional 137,000 years of life. The model also projected that a person initiating HIV therapy in 2003 could expect to live more than 13 years longer than if he or she had been diagnosed in 1988.

The paper by Drs. Walensky and Freedberg, of Massachusetts General Hospital and the Harvard Medical School Center for AIDS Research, and their coauthors has been posted online in the *Journal of Infectious Diseases*.

"Since the early 1980s, soon after the first reports of what we now know as AIDS, NIH has devoted \$30 billion to HIV/AIDS research," says NIH Director Elias A. Zerhouni, M.D. "This study clearly shows the dramatic impact that sustained investment in biomedical research can have in improving the lives of Americans."

"As new HIV therapies have come into the clinic, we have witnessed the transformation of HIV/AIDS from a rapidly fatal disease into a controllable condition," notes NIAID Director Anthony S. Fauci, M.D. "Although the rate of new infections in this country remains unacceptably high for many people, HIV infection is no longer the death sentence it once was."

"Advances in HIV/AIDS treatments have been striking, particularly over the past decade. This study was the first to quantify the clinical progress in AIDS care in terms of years of life saved," says Dr. Walensky. The researchers used a computer model, developed by Dr. Freedberg and his colleagues, that incorporates literature-based data of clinical measures including HIV viral load, CD4+ T-cell counts (a measure of immune system health), efficacy of HAART, and incidence of opportunistic infections, to simulate HIV disease progression both with and without treatment. Information about the number of people diagnosed with AIDS and accessing health care each year between 1989 and 2003 came from U.S. Centers for Disease Control and Preventive surveillance and other published data.

The investigators defined six eras of AIDS treatment between 1989 and 2003. In the first two periods, 1989 to 1992 and 1993 to 1995, drugs became available to prevent two common opportunistic infections -- *Pneumocystis jirovecii* pneumonia and *Mycobacterium avium* complex. Although these drugs provided an average per-person survival benefit during that time of only 2.6 months, the early eras helped to shape the perception that AIDS was a treatable condition, notes Dr. Freedberg. Drs. Walensky and Freedberg subdivided the HAART era, which began in 1996, into four periods corresponding to increasingly effective HAART and other advances in HIV care.

For each year of the six eras, the investigators ran simulations of HIV disease progression in equal-sized groups of hypothetical people with AIDS. One group received no therapy, while the other group received all available therapies of that era. The model calculated a per-person survival benefit and a total survival benefit in each era. By 2003, the model projected that an individual beginning treatment that year could expect to live more than 13 years longer than if she had been diagnosed in 1988. The total survival benefit for the 24,780 people diagnosed with AIDS and entering care in 2003 was 330,189 years. The total cumulative survival benefit across all eras from all forms of HIV therapy was 2.8 million years.

Dr. Walensky emphatically notes, however, that survival benefits related to therapy are only to those with known HIV infection. But about one-fourth of people in the United States infected with HIV are unaware of their infection, she adds. "We calculated that a cohort of patients presenting with AIDS at higher CD4 cell counts -- simulating slightly earlier entry into care -- had an additional gain of 740,000 years of survival," says Dr. Walensky. "These findings underscore the importance of expanded HIV testing and better linkage to care for people living with HIV-infection, so that more of them can realize the life-extending benefits of HIV therapy."

"This type of research can also be used to understand the tremendous survival benefits that can be gained globally by continued rapid expansion of access to these very effective HIV/AIDS treatments in resource-limited settings," adds Dr. Freedberg. "This expansion is of critical importance."

The National Institute on Drug Abuse and the National Institute of Mental Health, parts of the NIH, also provided support for this research.

Reference

1. RP Walensky et al. [The survival benefits of AIDS treatment in the United States](#). *Journal of Infectious Diseases*. Published online June 1, 2006.

Additional Information

1. [NIAID Exploring: Treatment of HIV Infection](#)