Working toward an AIDS-free generation

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Ending the global HIV/AIDS pandemic may be possible by implementing a multifaceted global effort that expands testing, treatment, and prevention programs, as well as meets the scientific challenges of developing an HIV vaccine and possibly a cure, according to a Viewpoint in the July 25 issue of *JAMA*, a theme issue on HIV/AIDS.

Anthony S. Fauci, M.D., Director, National Institute of Allergy and Infectious Diseases (NIAID), Bethesda, Md., presented the article at a *JAMA* media briefing at the International AIDS Conference.

Dr. Fauci and co-author Gregory K. Folkers, M.S., M.P.H., also of the NIAID, write that "since the first cases of what is now known as AIDS were reported in 1981, an entire generation has grown up under the constant cloud of this modern-day plague. Across the globe, more than 34 million people are living with the human immunodeficiency virus (HIV), the virus that causes AIDS, including approximately 1.2 million individuals in the United States. HIV/AIDS has been responsible for the deaths of an estimated 30 million individuals." They add that although the rate of new HIV infections has declined or stabilized in many countries, the disease continues to exact an enormous toll: 1.8 million deaths in 2010 alone, and grief and hardship for countless families and communities.

Because powerful interventions have been developed and scientifically proven effective, the fight against HIV/AIDS is currently viewed with considerably more optimism than in past years, the authors write. "If

these tools are made widely available to those who need them, an AIDS-free generation may be possible—that is, today's children could one day live in a world in which HIV infections and deaths from AIDS are rare."

Among the most important interventions is combination antiretroviral therapy, which significantly improves the health and longevity of individuals infected with HIV. "Since the advent of antiretroviral therapy, the annual number of deaths due to AIDS has decreased by two-thirds in the United States. Globally, an estimated 700,000 lives were saved in 2010 alone due to the increased availability of antiretroviral therapy in low- and middle-income countries," the authors write. "Important challenges remain—notably finding the resources and developing the infrastructure to provide antiretroviral therapy to the estimated 8 million individuals with HIV infection who need these drugs but are not receiving them."

The authors add that antiretroviral therapy can also prevent HIV infection by reducing the amount of virus in an infected person's blood and other body fluids, making it less likely that the virus will be transmitted to others. Also, antiretroviral therapy is highly effective in blocking mother-to-child HIV transmission.

Other important interventions include medical male circumcision, which offers a highly effective and durable way to protect heterosexual men from HIV infection; and potentially, pre-exposure prophylaxis with antiretroviral medications, which have shown promise in reducing an individual's risk of acquiring HIV infection.

"Each of these treatment and prevention strategies has a strong evidence base; with further refinement and scale-up and also when used in combination, they could have an extraordinary effect on decreasing the trajectory of the HIV pandemic."

According to the authors, researchers are maintaining focus on 2 key scientific challenges that remain: the development of a vaccine and a cure. They write that modest success in a large-scale clinical trial of an HIV vaccine, promising results in animal models, and advances in structure-based vaccine design suggest that an HIV vaccine is feasible. The prospect of an HIV cure remains challenging.

The authors conclude that ending the global HIV/AIDS pandemic "will require a global commitment of resources involving additional donor countries, strengthening health care systems overall, and fostering greater ownership by host countries of HIV/AIDS effort, including investing more in the health of their people. With collective and resolute action now and a steadfast commitment for years to come, an AIDS-free generation is indeed within reach."

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