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# Early HIV antiviral treatment found to be cost-effective in South Africa, India

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early initiation of antiretroviral therapy (ART) for HIV-infected individuals with uninfected sexual partners to prevent viral transmission – appears to make economic sense, along with meeting its clinical goals of helping infected patients stay healthy and reducing transmission. A model-based analysis of data from an important clinical trial projected that early ART for such patients in both South Africa and India would be very cost-effective over the lifetime of patients. In fact, early ART in South Africa would actually save money during the first five years. The report appears in the October 31 *New England Journal of Medicine*.

"By demonstrating that early HIV therapy not only has long-term clinical benefits to individuals but also provides excellent economic value in both low- and middle-income countries, this study provides a critical answer to an urgent policy question," says Rochelle Walensky, MD, MPH, of the Massachusetts General Hospital (MGH) Division of Infectious Disease, corresponding author of the *NEJM* report. "In short, early ART is a 'triple winner': HIV-infected patients live healthier lives, their partners are protected from HIV, and the investment is superb."

In 2011 the HIV Prevention Trials Network – an international research collaborative – published results of a trial showing that treatment as prevention dramatically reduced the risks of viral transmission and also substantially cut the time to AIDS-related events and infections like tuberculosis in the HIV-infected patients. Called HPTN 052 and conducted at sites in nine countries, that trial was led by Myron Cohen, MD, of the University of North Carolina at Chapel Hill, and

subsequently was named the 2011 Breakthrough of the Year by the journal Science. In the current National Institute of Allergy and Infectious Disease (NIAID)-supported study, the researchers worked in collaboration with the HPTN 052 trial team to analyze the trial data – focusing on sites in India and South Africa, countries with the world's highest rates of HIV infection – to determine whether those clinical benefits were worth the costs of ART on both short- and long-term bases.

HPTN 052 participants in the early-ART group started treatment at CD4 T cells – a measure of immune system function – between 350 and 550, while the control group did not start therapy until their CD4 cells dropped below 250, which was in line with World Health Organization treatment guidelines at the time. In their current analysis, the researchers used a mathematical model simulating HIV treatment and transmission and its associated health and economic outcomes to make projections for two years (the time period covered by HPTN 052), five years, and the expected lifetime of the infected participants.

The results indicated that, during the first five years, 93 percent of patients receiving early ART would survive, compared with 83 percent of those whose treatment was delayed. Life expectancy for the early-treatment group was almost 16 years, compared with nearly 14 years for the delayed treatment group. During the first five years, the potential costs of infections that were prevented by early treatment in South Africa – particularly tuberculosis – would outweigh the costs of ART medications, indicating that the strategy actually would save overall costs. While this was not the case for India, where costs of care for opportunistic infections are less, early ART in that country was projected to be cost-effective, according to established standards. Across patient lifetimes, early ART was determined to be very cost effective in both countries. Most of the clinical benefits were seen in the infected patients – fewer illnesses and deaths – and there were also added clinical

and economic benefits from reducing HIV transmission.

"The reason early ART doesn't save money in the long term is actually due to its success," explains Walensky, who is a professor of Medicine at Harvard Medical School. "Patients will live much longer and take these effective medications for many years. Now that we know that early ART not only improves clinical and prevention outcomes but also is a great investment, we need to redouble international efforts to provide ART to any HIV-infected person who can benefit from it."

"Some people have questioned whether providing early ART to all who need it would be feasible in resource-limited countries," adds Kenneth Freedberg, MD, MSc, director of the MGH Medical Practice Evaluation Center and professor of Medicine at Harvard Medical School. "We've shown that in countries like South Africa, where it actually saves money in the short-term, the answer is 'yes.' We believe that continued international public and private partnerships can make this true in other countries as well. With this kind of investment, we foresee dramatic decreases in infections and illness that could save millions of lives over the next decade."

Provided by Massachusetts General Hospital