

Combination approach reduces spread of drug-related HIV

4 March 2014

A computer model has created the most effective formula for reducing the spread of HIV among drug users in New York City over the next 25 years. Developed by scientists at Columbia University's Mailman School of Public Health and Brown University, the model recommends a combination of interventions, including increased HIV testing, improved access to substance abuse treatment, increased use of needle and syringe exchange programs, and broad implementation of antiretroviral treatment as prevention. The result would lower new infections by more than 60% by 2040.

Results are published online in the March issue of the journal *Health Affairs*, which includes a cluster of articles on HIV/AIDS in America.

To estimate the effectiveness of various prevention settings, the researchers modeled HIV transmission in a group of sexually active adults age 15 to 64 in the New York metropolitan area, including those who inject drugs, who are non-injection [drug users](#), and people who do not use drugs. They compared the projected HIV incidence in 2020 and 2040 using current approaches to the incidence if one or more of the four interventions were applied.

The combination of all four approaches led to the largest proportion of new cases averted. Scaling-up all four interventions simultaneously resulted in a 62.4% decrease in new infections by 2040.

"A combination intervention of scaling up [treatment](#) - as-prevention strategies by increasing access to HIV treatment for people who inject drugs, improving their adherence to therapy, and ensuring that they remained in care was the most effective approach that we analyzed," said Sandro Galea, MD, DrPH, Gelman Professor and chair of the Department of Epidemiology at the Mailman School of Public Health.

Every hypothetical strategy on its own resulted in a greater reduction in HIV compared to the strategies that are in place now. Increased HIV testing resulted in a 12% percent reduction; with expanded access to [substance abuse treatment](#) there was a 26% reduction. The other reductions were 34% for increased [needle](#) and syringe program usage, and 45% percent for scaling up treatment as prevention.

When two of the four interventions were combined—improving needle exchange programs and scaling up HIV treatment and care—the gains produced almost as much reduction in new HIV cases as all four interventions together. No strategy completely eliminated HIV transmission.

"This modeling demonstrates that there is an important role to play for the whole spectrum of prevention efforts we have at our disposal," said Brandon Marshall, PhD, assistant professor of [public health](#) at Brown and a former postdoctoral scholar at the Mailman School. "Importantly, this research supports the goals of New York's Enhanced Comprehensive Prevention Plan that calls for increased HIV testing, programs to improve retention in HIV care, syringe exchange funding, and better linkage to substance [abuse treatment](#) for people who use drugs. We really have to redouble our efforts scaling up these programs if we are to achieve the objectives of this ambitious plan, and ultimately, get incidence down to zero."

Recent surveillance data from the Centers for Disease Control and Prevention indicate that approximately one in ten new HIV infections annually—or 4,000 cases—are attributable to the injection of drugs. Drs. Galea and Marshall suggest that their latest results might also have important implications for international settings especially those that restrict or prohibit access to harm reduction programs.

Also of note, according to Dr. Marshall: "While this particular study did not focus on the cost

effectiveness aspect, other research has showed that the interventions we modeled turn out to be cost-saving—on an average of \$350,000 in lifetime treatment costs—because they prevent new infections."

Provided by Columbia University's Mailman
School of Public Health

APA citation: Combination approach reduces spread of drug-related HIV (2014, March 4) retrieved 4 November 2022 from <https://medicalxpress.com/news/2014-03-combination-approach-drug-related-hiv.html>

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