CDUHR FACT SHEET

Using computer simulation modeling to assess the impact of HIV prevention programs in NYC: costs and effects

Purpose of this study

With limited budgets for prevention programs, along with new evidence-based interventions, computer-based mathematical modeling can provide a clearer picture to policy makers and funders of how to select strategies to prevent the greatest number of cases the most economically.

How was the study conducted and who was involved?

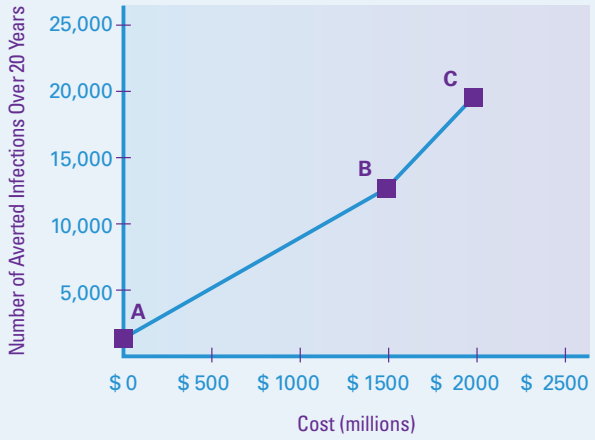
Information from a computer simulation of HIV progression was incorporated into a model used to estimate the HIV epidemic over the next 20 years. To construct the model, researchers entered data on effect sizes, levels of evidence for the individual interventions, and costs of the interventions. A computer simulation then generated all possible outcomes.

What were some of the findings of the study?

- Continuing current prevention efforts would result in 58,632 new cases of HIV in New York City over the next 20 years
- Different interventions, targeting particular groups, produce widely varying numbers of new infections averted in New York City over the next 20 years, for example:
  - —Condom programs targeting only HIV-infected and groups designated as high risk (HR) have a cost of $4.5 million, but reduce the number of new infections by only 4%, or 1,514 infections averted
  - —Linkage to support programs targeting all HIV-infected (HIV+) persons would cost approximately $1.6 billion, and would reduce the number of new infections by 23%, or 13,532 infections averted
  - —A combination of the 4 most cost-effective interventions examined in the model (linkage to support for HIV+, community level intervention, STD screening for HR, and HIV+ partner services) would cost $2.15 billion, and reduce the number of new infections by 34%, or 20,211 infections averted

What might this mean for policy makers and funders who plan HIV prevention efforts?

- When deciding on which prevention programs to implement, consideration of the populations to be targeted is highly important, as the impact and cost can be dramatically different between interventions
- Targeting the greatest number of people may not be advantageous, as interventions focused on smaller populations may avert more infections at a lower cost
- Computer simulations can be used to identify the optimal implementation of evidence-based interventions to reduce infections. As new interventions are found to be effective, new simulations can be prepared



A. Condom programs targeting HIV+ and high-risk groups
B. Linkage to support programs targeting HIV+
C. Combination intervention (linkage to support for HIV+, community level, STD screening for HR, and HIV+ partner services)

Where can you find more information about these findings?

Kessler J, Myers JE, Nucifora KA, Mensah N, Kowalski A, Sweeney M, Toohey C, Khademi A, Shepard C, Cutler B, & Braithwaite RS (2013) Averting HIV infections in New York City: A modeling approach estimating the future impact of additional behavioral and biomedical HIV prevention strategies. PLOS ONE, 8, e73269.

Or contact Jason Kessler, MD, MPH at jason.kessler@nyumc.org

Supported by a subcontract by the NYC Department of Health and Mental Hygiene, Bureau of HIV/AIDS Prevention and Control