

Estimating Averted HIV-related Medical Costs on the Path to Eliminating Mother-to-child Transmission Among HIV-infected Pregnant Women in New York State: 1998-2010

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Introduction

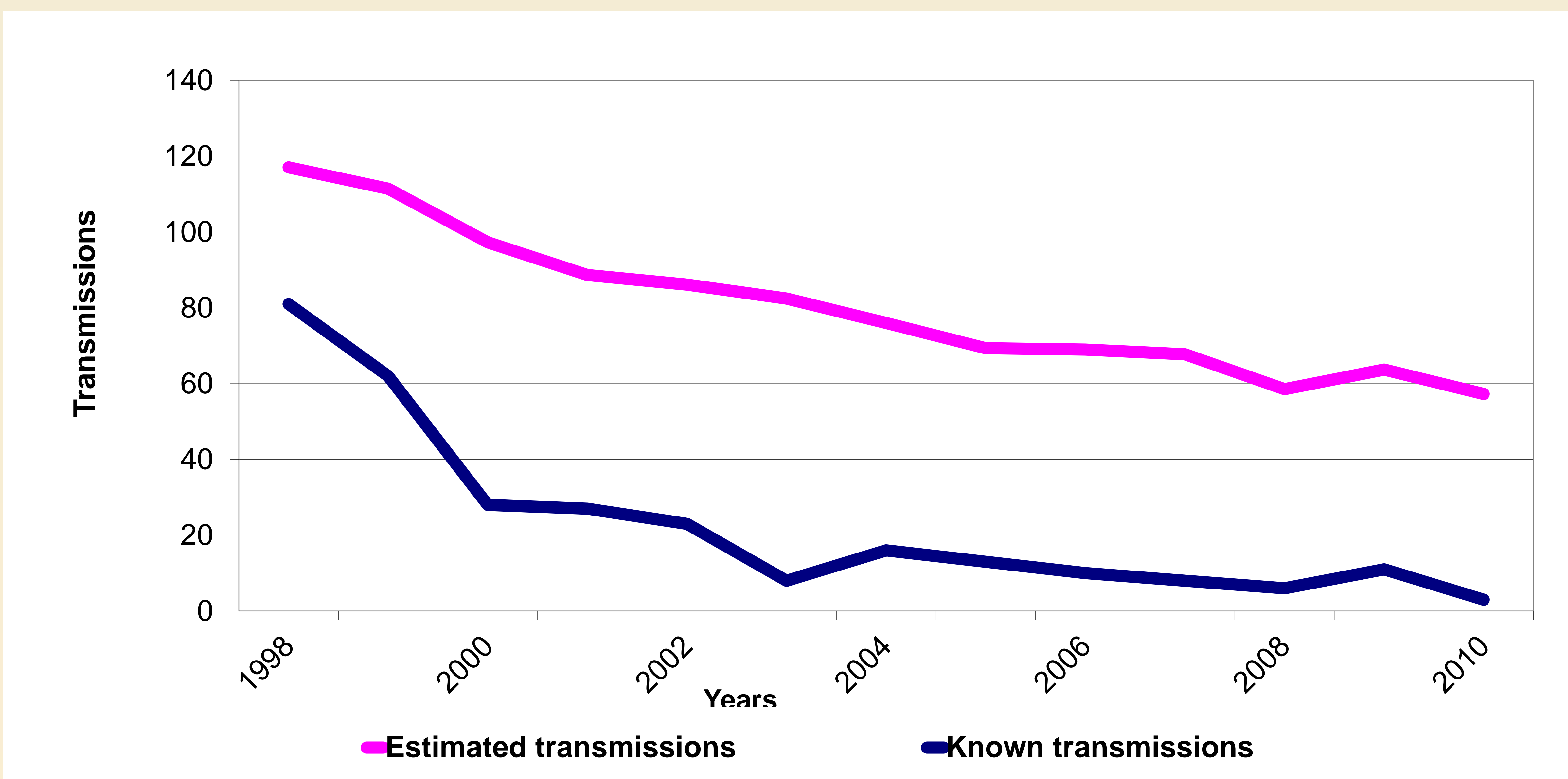
Eliminating mother-to-child transmission (MTCT) of HIV has been one of New York State's public health priorities, and that goal has been virtually accomplished. The Centers for Disease Control and Prevention (CDC) has adopted the goal of eliminating MTCT, which it defines as a transmission rate of less than 1% of exposed infants and less than one case of MTCT per 100,000 live births. With a transmission rate of 0.7%,¹ New York State (NYS) has met at least one aspect of the CDC's goal. This reduction in MTCT in NYS was accomplished through a multifaceted public health program comprised of interventions intended to maximize the benefits of advances in both the diagnosis and treatment of HIV infection. We use a return on investment (ROI) approach to compare the expenditures incurred to prevent MTCT in NYS during the 13-year period of 1998 through 2010 to the benefits realized from these efforts, as expressed in terms of the estimated number of HIV infections among newborns averted and HIV-related medical costs saved.

Methodology and Results

We calculated a return on investment (ROI) for the 13-year period 1998 through 2010 for the expenditures on HIV counseling and testing, antiretroviral therapy medications for mothers and their newborns, and a portion of the State's Newborn Screening Program attributable to HIV screening of newborns. ROI was calculated as program benefits (the averted HIV-related medical costs associated with MTCTs prevented) divided by the expenditures. An ROI > \$1 would indicate that benefits (savings in terms of treatment costs averted) exceeded the investment made to achieve those benefits.

HIV Infections Averted Among Newborns

In 1997, the prevalence rate of HIV-infected newborns in NYS was 11.5%, and we extrapolated the number of HIV-infected newborns had this prevalence been experienced in each of the following years. The figure below presents the difference between the projected and actual numbers of perinatally HIV-infected children between 1998 and 2010. Aggregating the differences between these estimated and actual numbers of transmissions results in a projected 749 cases of averted HIV infections due to MTCT during the 13-year period.



HIV Medical Care Costs Averted

We used a published estimate of lifetime HIV-related medical care costs for a perinatally HIV-infected child. This value, given as \$251,243 (2001 US\$), includes HIV-related prescription drugs, hospitalization, laboratory testing, and pediatric outpatient care over a median survival time of 25 years.² (Costs unrelated to HIV medical care, such as those incurred for social, cognitive, or developmental conditions or caregiver expenses were not considered.) Adjusting this value by the Consumer Price Index for medical care³ results in \$357,741 for lifetime HIV-related medical costs in 2010 US dollars. The aggregated savings in lifetime HIV-related medical care costs for the projected 749 averted perinatal HIV infections yields a savings of \$267.95 million when expressed in 2010 US dollars.

Expenditures for Services Directly Associated with Preventing MTCT

As shown in the table below, expenditures for services directly associated with preventing MTCT, including an allocation of costs for the state's Newborn Screening Program, expressed in 2010 dollars, totals \$70.59 million.

Eliminating Mother-to-Child Transmission of HIV Cost Calculation for 1998 through 2010 *	
Cost Category	Cost (000s) 2010 (US\$)
Women testing for HIV during pregnancy ⁽¹⁾	\$44,513
Confirmatory testing for women with positive results	\$86
Enhanced Medicaid payments for counseling during expedited testing in labor and delivery ⁽²⁾	\$168
Increased frequency of CD4 and viral load testing during final 20 weeks of pregnancy	\$6,632
Initiating antiretroviral therapy at 12 - 14 weeks and continuing through 40 weeks	\$12,558
Antiretroviral therapy for HIV-exposed newborns	\$553
New York State's Newborn HIV Screening Program	\$6,083
Total Costs	\$70,593

* All activities occurred between 1998 through 2010 unless otherwise noted
 (1) Prenatal testing in women not known to be HIV-infected. Includes repeat testing of HIV-negative women in 3rd trimester, which began in 2007.
 (2) Policy effective beginning 1999

Calculating Financial Return on Investment

To calculate the financial return on investment (ROI), we divide the estimated amount of HIV medical care costs averted by the expenditures for services directly associated with preventing MTCT. This calculation - dividing \$267.95 million in HIV medical care costs averted by \$70.59 million in expenditures - yields an ROI value of \$3.80. Net savings - the difference between \$267.95 million in estimated costs averted and the \$70.59 million in expenditures incurred to achieve these averted costs - is \$197.36 million.

Conclusion

Aside from the human suffering from MTCT of HIV that is averted, expenditures for treatment protocols and interventions to prevent MTCT are relatively inexpensive and can result in almost four times their value in HIV treatment cost savings realized.

References

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2. Sansom SL et al. Updated estimates of healthcare utilization and costs among perinatally HIV-infected children. *JAIDS* 2006;41(4):521-526.
3. US Bureau of Labor Statistics. Consumer Price Index - All Urban Consumers.