Introduction

Current strategies for the elimination of perinatal HIV infections (>1% transmission rate) call for targeting areas of missed opportunities for HIV prevention among HIV+ women of childbearing age.

Yet enumeration of HIV+ women of childbearing age for the U.S. is lacking due to incomplete reporting of perinatally HIV-exposed cases from the 50 states and the District of Columbia. Currently, 34 jurisdictions collect data on perinatal HIV exposure, which include reporting of HIV+ infants and infants that seroconvert after birth.

The total number of infants perinatally exposed to HIV is needed to determine overall transmission rates for perinatal infection in the U.S. Without a denominator for determining the number of women of childbearing age and information on demographic, clinical, and behavioral characteristics of HIV-exposed infants, it is difficult to systematically eliminate the strategies to enumerate the total number of infants to HIV+ women at risk would be problematic.

This study applies a variety of methods to determine the number of HIV+ infants of childbearing age in the U.S. The number of HIV-exposed infants is approximately the number of HIV+ women of childbearing age giving birth.

Methods

The model used in the current study was based on the abstract from Fleming et al. in 2002 [1] using a Poisson model to estimate the total number of HIV+ women of childbearing age and HIV prevalence estimates for 2006 [2, 3].

The model of births to HIV+ women in 2006 was estimated as the product of two parameters: the total number of HIV+ women of childbearing age, and the pregnancy rate for HIV+ women.

The model of the total number of women of childbearing age, living with AIDS, (immunologic AIDS, and clinical AIDS) was computed directly from the reported data of AIDS diagnosis from 50 states and the District of Columbia, adjusting for reporting delay.

The pregnancy rate of HIV+ women was estimated from the Adult/Adolescent Spectrum of Disease (AIDS) project conducted in over 100 clinics in 11 U.S. cities.

Finally, by using the observed pregnancy rates from AIDS, births were estimated for the total number of living with HIV diagnosis (not AIDS), immunologic AIDS, and clinical AIDS. All analyses were conducted using SAS Version 9.1.

Results

As of 2006, 111,332 women aged 13-44 years were diagnosed and living with HIV (not AIDS) in the United States.

By using back-calculation, we obtained the undiagnosed (not AIDS) and undiagnosed (not AIDS and AIDS) living with HIV prevalence estimates for 2006 [2, 3].

The estimated number of births to HIV+ women of childbearing age giving birth in the United States in 2006 was estimated from 80,293 to 86,080 (not AIDS), 8,650-8,900 (not AIDS and AIDS). There were an estimated 7,021-7,272 pregnancies for women living with HIV in 2006.

Table 1: Total number of women of childbearing age giving birth in 2000 and 2006, U.S.

<table>
<thead>
<tr>
<th>Year</th>
<th>Total number of women giving birth</th>
<th>Total number of women living with HIV (not AIDS)</th>
<th>Total number of women living with AIDS</th>
<th>Total number of women living with HIV (not AIDS and AIDS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>N=8,650-8,900</td>
<td>N=8,650</td>
<td>N=9,574</td>
<td>N=111,332</td>
</tr>
<tr>
<td>2006</td>
<td>N=111,332</td>
<td>N=80,293</td>
<td>N=125,050-128,653</td>
<td>N=8,650-8,900</td>
</tr>
</tbody>
</table>

Although the incidence of HIV infection through perinatal transmission has declined over 95% in the past decade with adherence to USPHS recommendations, the estimated numbers of HIV+ women of childbearing age giving birth in the United States increased from 2000 to 2006.

HIV infected women of childbearing age are living longer, have a wider range of reproductive choices (including assisted reproductive technologies for HIV discordant couples), and leading healthier lives.

A number of assumptions were made in this study:

1. The prevalent number of HIV-positive women aged 13-44 follows a Poisson distribution, and the number of HIV infections in the 33 states with HIV data is a proportion of the HIV infection in the United States (51 areas with AIDS data) and may not accurately represent the entire nation.

2. The Adult Spectrum of Disease study does not systematically record pregnancy outcome, so we assumed that all pregnancies resulted in single live births, which may overestimate the number of live births to women with AIDS.

3. In addition, there are a number of assumptions made in using back-calculation to estimate the number of women diagnosed with HIV infection in the United States of women of childbearing age.

Comment / Discussion

The total number of HIV+ women of childbearing age in 2006 was estimated from 125,050-128,653 women living with HIV (not AIDS) in 2006. Fleming et al. reported that 80,263-80,869 women were living with HIV (not AIDS) in 2006 [2], which represents an increase of approximately 33.6% of women of childbearing age living with HIV (not AIDS) from 2000 to 2006.

We calculated the pregnancy rate for women aged 14-44 per 100 person years of observation during 1998-2001, stratified by race, ethnicity, age group, risk category, and clinical status for HIV (not AIDS) and AIDS. There was an estimated 2.021-2.727 pregnancies for women of childbearing age, living with HIV in 2006.

The estimated number of births to HIV-positive women of childbearing age giving birth in the United States in 2006 was estimated from 80,293 to 86,080 (not AIDS), 8,650-8,900 (not AIDS and AIDS). There were an estimated 7,021-7,272 pregnancies for women living with HIV in 2006.

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The estimated number of births to women aged 13-44 living with HIV (not AIDS) in 2000 and 2006, U.S.

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</tbody>
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Table 2: Estimated number of births to women aged 13-44 living with HIV in 2000 and 2006, U.S.

<table>
<thead>
<tr>
<th>Year</th>
<th>Estimated number of births</th>
<th>Low Estimate</th>
<th>High Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>8,076</td>
<td>6,422</td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td>8,650</td>
<td>8,800</td>
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</tr>
</tbody>
</table>

References


Acknowledgements

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