Eliminating Perinatal HIV Transmission in the United States

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Estimated Number of Perinatally Acquired AIDS Cases by Year of Diagnosis, 1985–2006—United States and Dependent Areas

Note. Data have been adjusted for reporting delays and cases without risk factor information were proportionally redistributed.
Number of perinatally infected infants by year of birth & year reported, in 33 states with HIV infection reporting since 2001—United States.

<table>
<thead>
<tr>
<th>Year of Report</th>
<th>Total Reported</th>
<th>Number infected infants in birth cohort (95% CI)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth Year</td>
<td>2001</td>
<td>2002</td>
</tr>
<tr>
<td>2001</td>
<td>39</td>
<td>74</td>
</tr>
<tr>
<td>2002</td>
<td>29</td>
<td>50</td>
</tr>
<tr>
<td>2003</td>
<td>25</td>
<td>34</td>
</tr>
<tr>
<td>2004</td>
<td>25</td>
<td>33</td>
</tr>
</tbody>
</table>

*Data from 33 states with HIV infection reporting were extrapolated to the entire United States. Estimates include adjustments for delays in reporting, and underreporting of cases.

McKenna, Hu. AJOG 2007, Sept. 197: S10-16
Estimated number of births to women living with HIV infection, 2000-2006, United States

2006 estimate (8,650 – 8,900) is ~30% > 2000 estimate (6,075 – 6,422)

Office of Inspector General (Fleming), 2002
Whitmore, et al. CROI, 2009
Figure 1. Estimation of the number of HIV-infected infants, United States, 2005

Modeled estimate of HIV+ women aged 13-44 diagnosed and living with HIV without AIDS (using Poisson Regression) N=78,365

Modeled estimate of HIV+ women aged 13-44 undiagnosed and living with HIV without AIDS (using back-calculation) N=38,312

Estimated number of women aged 13-44 living with AIDS N=55,702

Estimated births to women living with immunologic AIDS N=881

Estimated births to women living with clinical AIDS N=715

Estimated births to women living with HIV without AIDS N=7,017-7,089

Estimated total births N=8,613-8,685

Est. 30% (2584-2605) receive < 3 arms of ARV. 6.3% infected

Est. 69% (5909-6078) receive all 3 arms of ARV. 1.3% infected

Estimated total infections N=215-370
Annual rate of diagnoses of perinatal HIV infection per 100,000 infants aged ≤1 year, by race/ethnicity — 34 states, 2004-2007

CDC. MMWR, Feb 5, 2010, Vol. 59 No. 4
HIV infected infants in the United States: model estimates from 1978-2005

Davis et al., *JAMA* 1995;274:952-5.

Taylor et al., unpublished, 2008.
# MCT Rates in Industrialized Countries in the HAART Era

<table>
<thead>
<tr>
<th>Country</th>
<th>Author</th>
<th>Years</th>
<th>Women</th>
<th>Overall</th>
<th>VL&lt;50</th>
<th>with NVP</th>
<th>w/o NVP</th>
<th>w/mat. ARVs</th>
<th>% C/S</th>
</tr>
</thead>
<tbody>
<tr>
<td>USA-WITS</td>
<td>Cooper</td>
<td>1996-2000</td>
<td>1542</td>
<td>3.5%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.1% (HAART)</td>
</tr>
<tr>
<td>USA, Europe, Brazil, Bahamas</td>
<td>Dorenbaum</td>
<td>1997-2000</td>
<td>1270</td>
<td></td>
<td></td>
<td>1.4%</td>
<td>1.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>France</td>
<td>Warszawski</td>
<td>1997-2004</td>
<td>5721</td>
<td>1.3%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.4%</td>
</tr>
<tr>
<td>European Collab. Study</td>
<td>ECS</td>
<td>1997-2004</td>
<td>1983</td>
<td>2.87%</td>
<td>0.99%</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>2001-2003</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Sweden</td>
<td>Navér</td>
<td>1999-2003</td>
<td>184</td>
<td>0.6%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>80.3%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2000-2003</td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Spain</td>
<td>Fernández-Ibieta</td>
<td>2000-2005</td>
<td>632</td>
<td>1.4%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>United Kingdom</td>
<td>Townsend</td>
<td>2000-2006</td>
<td>2100</td>
<td>1.2%</td>
<td></td>
<td>0.1%</td>
<td></td>
<td></td>
<td>0.8% (&gt;2wks ARV)</td>
</tr>
</tbody>
</table>

Perinatal Prevention Cascade

**Missed Opportunities**

- HIV-infected woman
- Become Pregnant
- Inadequate Prenatal Care
- No (or late) HIV Test
- No ARV Prophylaxis
- Child Infected

**Data Needs**

- Number of HIV-infected women of childbearing age by state, race/ethnicity
- Number of HIV-infected women giving birth (or exposed infants)
- % of all women (and HIV+) with adequate prenatal care
- % of all women (and HIV+) tested in pregnancy
- % of HIV+ women with ARV prophylaxis in pregnancy
- HIV transmission rate and number of infected infants
Missed Opportunities—Enhanced Perinatal Surveillance (EPS), 1999-2003, 24 sites, United States

8596 HIV-exposed singleton births with known HIV infection status

– 7605 (88%) had prenatal care
  • 7151 (94%) had HIV testing
  – 6553 (92%) had ARV during pregnancy
    » 4636 (70%) had ARV during Labor/Delivery

Prenatal HIV testing rates—national data, United States

- 69% 2002 National Survey of Family Growth¹
- 50-96% 2003 DHAP/RTI chart review²
- 45-96% 2004-6 Pregnancy Risk Assessment and Monitoring System (PRAMS)³
- 74% 2006 National Hepatitis B Hospital Survey⁴

Elimination of Perinatal HIV in the United States—Why?

- It is feasible
  - We know how
  - We have the tools
- Missed opportunities account for most remaining transmissions
- Cost-savings potentially $25,000,000/yr
  - Discounted lifetime medical care cost for an HIV-infected child= $250,000
  - > 100 perinatal infections per year remaining
- It’s the right thing to do.
Racial/ethnic distribution in total population, infants aged ≤ 1 year, persons aged ≥13 years with diagnoses of HIV infection & children with diagnoses of perinatal HIV infection, 34 states, 2004-2007

CDC. MMWR, Feb 5, 2010, Vol. 59 No. 4 (slide updated after publication)
Elimination of Perinatal HIV Transmission in the United States—Goal

- Incidence < 1/100,000 live births
  - < 40 cases annually among a 4 million birth cohort
- Transmission Rate < 1%
  - e.g., < 87 cases in 2006 (8700 HIV-exposed births)

_Both goals represent a reduction of >100 cases per year._
Reproductive health and family planning services, preconception care, and universal HIV testing are essential components of EMCT and facilitate comprehensive real-time case finding of all HIV-infected pregnant women. Real-time case finding enables: comprehensive clinical care and social services for women and infants; detailed review of select cases to identify and address missed prevention opportunities and local systems issues through continuous quality improvement; research and long-term follow-up to develop and ensure safe, efficacious interventions for EMCT; thorough data reporting for HIV surveillance and EMCT evaluation.
Will the annual number of perinatal HIV infections in the United States continue to decline without additional effort?

- Annual number of HIV-exposed births is increasing (30% increase from 2000 to 2006)
- Hardest-to-reach HIV-infected women & their infants pose an ongoing, significant challenge
- Evidence suggests that the annual number of HIV-infected infants is stable or increasing
Brown’s Law

"...as a disease control program approaches the end point of eradication, it is the program, not the disease, which is more likely to be eradicated... due to the increase of the cost in skill, effort, and resources to trace the last remaining cases and treat them; and to the increase in the disinterest of society in bearing that cost."

Elimination of perinatal HIV in the United States—key points

The target population, i.e., HIV-infected (pregnant) women is increasing:

- 30% increase HIV-exposed births/year between 2000-2006
- Further increase may occur due to effects of:
  - Increasing number of HIV-infected women of childbearing age
  - Longer survival and increased well-being of HIV-infected women
  - Safer conception methods (PrEP, assisted reproductive technologies, etc.)
Elimination of perinatal HIV in the United States—key points

- The stark racial/ethnic disparity in HIV MCT deserves further attention & action.
- Not a one-time accomplishment, i.e., an ongoing, annual effort