HIV Epidemiology among Special Populations

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The findings and conclusions in this presentation are those of the author and do not necessarily represent the official position of the Centers for Disease Control and Prevention.
Objectives and Disclosure

At the conclusion of this presentation, you will be able to:

• Use the epidemiology of HIV in special populations to contextualize their disproportionate burden of HIV compared to the general population and in your practice
• Characterize the HIV epidemic in special populations—injection drug users, incarcerated populations, transgender persons, foreign-born populations, and older populations

I do not intend to discuss any non-FDA-approved or investigational uses of any products/devices in this presentation
Overview

- General HIV estimates in U.S.
- Characteristics of special populations
  - Injection drug users
  - Incarcerated populations
  - Transgender persons
  - Foreign-born populations
  - Older populations
- Data sources, limitations, challenges
HIV Prevalence - 2006

- New estimate released October 2008
- 1.1 million adults and adolescents (age≥13y) with HIV (diagnosed and undiagnosed) in U.S.
- 11.3% increase from 2003
- Overall 0.45% (65.4% non-white, 48.1% MSM)
- Whites 0.22%
- Blacks 1.71%, 7.6x whites
- Hispanics 0.59%, 2.6x whites

MMWR 2008
Estimated Number of AIDS Cases, Deaths, and Persons Living with AIDS, 1985–2006—United States and Dependent Areas

- No. of cases and deaths (in thousands)
- Prevalence (in thousands)

Year of diagnosis or death

CDC 2008
Estimated Number of Persons Living with AIDS
By Region – United States

Number living with AIDS

South
Northeast
West
Midwest

↑ 25.9%
↑ 17.9%
↑ 19.5%
↑ 28.1%

CDC 2008
33 U.S. States with Confidential Name-based HIV reporting, 2001-05
Estimated Numbers of Adults and Adolescents Living with HIV, by Sex, 2004–2007—34 States
Estimated Numbers of Persons Living with HIV/AIDS, by Race/Ethnicity, 2004–2007—34 States

Note. Data include persons with a diagnosis of HIV infection regardless of their AIDS status at diagnosis.
Data from 34 states with confidential name-based HIV infection reporting since at least 2003.
Data have been adjusted for reporting delays.
*Hispanics/Latinos can be of any race.
†Includes Asian and Pacific Islander legacy cases.
Percentages of HIV Cases among Adults and Adolescents, by Sex and Transmission Category, 2007—34 States

- **Males**
  - Male-to-male sexual contact: 71%
  - Injection drug use (IDU): 10%
  - Male-to-male sexual contact and IDU: 4%
  - Other/not identified: 16%

- **Females**
  - High-risk heterosexual contact*: 83%
  - Other/not identified†: 1%

*CDC 2008*
Injection Drug Users
Injection Drug Users (IDUs)

- Estimated 1.5 million IDUs in U.S. in 2002 (Brady et al 2008)
- Difficult group to reach, limited access to care
- Injection of HIV, risk for unsafe behavior while intoxicated

Survival analysis of IDUs
  - National HIV/AIDS Surveillance System
  - Newly diagnosed cases 1996-2004
  - 33 states with confidential name-based HIV reporting
  - Adult and adolescent IDUs aged ≥13 years
### Percentages of Late HIV Diagnoses by Transmission Category — 33 States, 1996-2004

<table>
<thead>
<tr>
<th>Category</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSM</td>
<td>39.8*</td>
</tr>
<tr>
<td>IDU</td>
<td>42.2</td>
</tr>
<tr>
<td>MSM &amp; IDU</td>
<td>38.6*</td>
</tr>
<tr>
<td>HRH</td>
<td>36.6*</td>
</tr>
</tbody>
</table>

*p < .0001

Grigoryan, APHA 2008
Survival after HIV Diagnosis by Transmission Category, 33 U.S. States, 1996-2004

<table>
<thead>
<tr>
<th>Tx Category</th>
<th>No</th>
<th>Probability of surviving 1 year after HIV Dx</th>
<th>Probability of surviving 3 year after HIV Dx</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>95% CI</td>
<td>95% CI</td>
</tr>
<tr>
<td>MSM</td>
<td>82,673</td>
<td>95.2 , 95.3</td>
<td>91.6 , 91.7</td>
</tr>
<tr>
<td>IDU Male</td>
<td>17,528</td>
<td>93.1 , 93.4</td>
<td>87.1 , 87.4</td>
</tr>
<tr>
<td>Female</td>
<td>9,498</td>
<td>95.0 , 95.3</td>
<td>89.4 , 89.6</td>
</tr>
<tr>
<td>MSM &amp; IDU</td>
<td>7,616</td>
<td>95.5 , 95.6</td>
<td>90.6 , 90.8</td>
</tr>
<tr>
<td>HRH Male</td>
<td>18,670</td>
<td>95.6 , 95.8</td>
<td>91.8 , 91.9</td>
</tr>
<tr>
<td>Female</td>
<td>33,708</td>
<td>96.7 , 96.9</td>
<td>93.3 , 93.4</td>
</tr>
</tbody>
</table>

Grigoryan, APHA 2008
Incarcerated Populations
HIV among Incarcerated Population

- Prevalence for incarcerated population 5x general population (2.0% vs. 0.43%) in U.S.
- Sex among inmates does occur, laws and policies difficult to implement or enforce
- HIV screening at entry, before release, voluntary periodic testing
- Important settings for prevention efforts
  - High prevalence, high risk
  - Demonstrated HIV transmission
  - Eventual release to community
  - High rates of re-incarceration
HIV Infection in Prison Inmates, 1995-2001

Source: Bureau of Justice Statistics
HIV Diagnosis among Incarcerated Persons in 33 U.S. States, 2001-05
Hernandez et al, 2007 HIV Prevention Conference

• Estimated HIV diagnosis while incarcerated
  10,023 (5.4%) of 184,170
• 8285 (83%) men, 1739 (17%) women
• 3977 (44%) aged 35-44, 3054 (30%) aged 25-34,
  1555 (16%) aged 45-54, 1161 (12%) aged 15-24
• 6434 (64%) Black, 2014 (20%) White, 1453 (15%) Hispanic
Estimated Numbers of HIV/AIDS Diagnoses among Incarcerated Adults and Adolescents by Sex and Transmission Category - 33 U.S. States, 2001–2005

<table>
<thead>
<tr>
<th>Transmission Category</th>
<th>Male</th>
<th></th>
<th>Female</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>%</td>
<td>N</td>
<td>%</td>
</tr>
<tr>
<td>MSM</td>
<td>2,984</td>
<td>36</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>IDU</td>
<td>2,680</td>
<td>32</td>
<td>787</td>
<td>45</td>
</tr>
<tr>
<td>MSM &amp; IDU</td>
<td>903</td>
<td>11</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>HC</td>
<td>1,677</td>
<td>20</td>
<td>935</td>
<td>54</td>
</tr>
<tr>
<td>Other</td>
<td>41</td>
<td>&lt;1</td>
<td>16</td>
<td>&lt;1</td>
</tr>
<tr>
<td>Total</td>
<td>8,285</td>
<td>100</td>
<td>1,738</td>
<td>100</td>
</tr>
</tbody>
</table>

Hernandez et al
Proportion of HIV/AIDS Diagnoses among Adults and Adolescents Incarcerated and Non-Incarcerated by Race/Ethnicity, 2001-05 – 33 U.S. States

Hernandez et al
Proportion of HIV/AIDS Diagnoses among Male Adults and Adolescents Incarcerated and Non-Incarcerated Population by Transmission Category, 2005 - 33 U.S. States

**Non-Incarcerated**
- Male-to-male sexual contact: 64%
- Injection drug use (IDU): 17%
- Male-to-male sexual contact and IDU: 14%
- Other/not identified: 5%

**Incarcerated**
- Male-to-male sexual contact: 38%
- High-risk heterosexual contact: 19%
- Injection drug use (IDU): 30%
- Male-to-male sexual contact and IDU: 12%

Hernandez et al
TABLE 2. Exact multivariate conditional logistic regression analysis of characteristics and risk behaviors among prison inmates* who became HIV† positive during incarceration, compared with matched controls* — Georgia state prison system, 2005

<table>
<thead>
<tr>
<th>Characteristic/Behavior</th>
<th>Case inmates*</th>
<th>Controls*</th>
<th>AOR $^$</th>
<th>(95% CI $^{11}$)</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any male-male sex in prison</td>
<td>45 (66)</td>
<td>9 (13)</td>
<td>10.1</td>
<td>(3.0–54.9)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Received tattoo in prison</td>
<td>40 (59)</td>
<td>28 (41)</td>
<td>13.7</td>
<td>(1.5–390.6)</td>
<td>0.01</td>
</tr>
<tr>
<td>Body mass index</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;25.4 kg/m² at entry</td>
<td>51 (75)</td>
<td>23 (34)</td>
<td>3.8</td>
<td>(1.2–15.2)</td>
<td>0.02</td>
</tr>
<tr>
<td>Black race</td>
<td>45 (66)</td>
<td>40 (59)</td>
<td>3.7</td>
<td>(1.1–16.7)</td>
<td>0.03</td>
</tr>
</tbody>
</table>

NOTE: All values are statistically significant.

* Case inmates (n = 68) were male prison inmates who seroconverted to HIV in prison; controls (n = 68) were HIV-uninfected male prison inmates with comparable sentence lengths and time served.

† Human immunodeficiency virus.

§ Adjusted odds ratio.

$^{11}$ Confidence interval.
Transgender Persons
Transgender (TG)

• Describes persons whose sex assigned at birth does not match current gender identity or expression
• Male-to-female, female-to-male, male, female
• Frequently subject to stigmatization, discrimination, and violence
• Lack of access to stable employment, education, and/or health care
HIV Risk Behaviors
Male-to-female (MTF) TG persons

• Sexual risk behaviors
  – Commercial sex work: 41.5% (39.5–43.6)
  – Unprotected anal intercourse: 44.1% (42.0–46.2)
  – HIV positive sex partner: 8.5% (6.8–10.2)
  – IDU sex partner: 24.3% (19.5–29.1)

• Injecting and drug using behaviors
  – Injecting hormones: 27.0% (25.0–29.0)
  – Injecting silicone: 24.7% (22.6–26.8)
  – Injecting illicit drugs: 12.0% (10.4–13.5)
  – Needle-sharing: 6.0% (5.1–6.8)
  Crack/other illicit drugs: 26.7% (24.5–29.0)

HIV Infection among TG Persons

• High rates of HIV infection, especially among African-American MTFs

• 2008 meta-analysis (Herbst et al, 2008)
  – All MTFs: 28% tested HIV(+), 12% self-reported HIV(+)
  – African American MTFs: 56% tested HIV(+), 31% self-reported HIV(+)

• 2009 literature review (DeSantis, 2009)
  – HIV(+) ranged 12%-52%
Challenges for HIV Surveillance for TG

• Limitations in current measures, definitions
  – TG terminology not standardized

• Medical record documentation
  – Gender identity vs. expression
  – Not routine or standardized

• Lack of denominators
  – No reliable estimate in U.S.

• Reporting TG surveillance data
  – HIV risk factor and transmission categories not designed to capture those for TG HIV cases
  – Current reporting: MTF classified as MSM
Foreign-born Persons
Estimated Number of HIV/AIDS Diagnoses among Black Adults and Adolescents, by Nativity
33 States, 2001–2005

<table>
<thead>
<tr>
<th>Nativity</th>
<th>HIV/AIDS diagnoses</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>U.S.-born</td>
<td>65,095</td>
</tr>
<tr>
<td>Foreign-born</td>
<td>8,665</td>
</tr>
<tr>
<td>Total</td>
<td>73,760</td>
</tr>
</tbody>
</table>

Satcher-Johnson, 2007 National HIV Surveillance Conference
Foreign-born Persons (FBP) and HIV

- FBP ~13% U.S. Population
- Surveillance in 31 states: 24,913 (15.1%) FBP among 165,007 persons diagnosed with HIV
- Geographic areas of origin
  - 4138 (17%) Africa
  - 7481 (30%) Central America
  - 7737 (31%) Caribbean

Prosser et al, Abstract 990, CROI 2010
Foreign-Born Persons Diagnosed with HIV Disease in the U.S. by Gender and World Region of Birth, 31 States, 2002-2007

**Foreign-Born Men**

- Africa: 35%
- Asia: 14%
- Europe: 29%
- Middle East: 11%
- North America: 5%
- Central America: 4%
- South America: 0%
- Caribbean: 0%
- Oceania: 0%

n=16,612

**Foreign-Born Women**

- Africa: 31%
- Asia: 0%
- Europe: 7%
- Middle East: 37%
- North America: 0%
- Central America: 20%
- South America: 3%
- Caribbean: 0%
- Oceania: 0%

n=7,662

Prosser et al, CDC

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>U.S.-born (%)</th>
<th>Foreign-born (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age at Diagnosis (yr)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;13</td>
<td>785 (0.6)</td>
<td>176 (0.7)</td>
</tr>
<tr>
<td>13-19</td>
<td>5,123 (3.7)</td>
<td>475 (1.9)</td>
</tr>
<tr>
<td>20-29</td>
<td>30,430 (22.1)</td>
<td>5,885 (23.6)</td>
</tr>
<tr>
<td>30-39</td>
<td>41,097 (29.9)</td>
<td>8,862 (35.6)</td>
</tr>
<tr>
<td>40-49</td>
<td>39,175 (28.5)</td>
<td>5,906 (23.7)</td>
</tr>
<tr>
<td>50-59</td>
<td>15,807 (11.5)</td>
<td>2,552 (10.2)</td>
</tr>
<tr>
<td>60+</td>
<td>5,037 (3.7)</td>
<td>1,056 (4.2)</td>
</tr>
<tr>
<td><strong>Race/Ethnicity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American Indian/Alaskan Native</td>
<td>904 (0.7)</td>
<td>23 (0.1)</td>
</tr>
<tr>
<td>Asian</td>
<td>403 (0.3)</td>
<td>983 (4.0)</td>
</tr>
<tr>
<td>Black/African American</td>
<td>72,035 (52.4)</td>
<td>10,162 (40.8)</td>
</tr>
<tr>
<td>Hispanic/Latino</td>
<td>14,747 (10.7)</td>
<td>12,216 (49.0)</td>
</tr>
<tr>
<td>Native Hawaiian/Pacific Islander</td>
<td>131 (0.1)</td>
<td>46 (0.2)</td>
</tr>
<tr>
<td>White</td>
<td>48,076 (35.0)</td>
<td>1,303 (5.2)</td>
</tr>
<tr>
<td>Multiple or Unknown</td>
<td>1,157 (0.8)</td>
<td>178 (0.7)</td>
</tr>
<tr>
<td><strong>Transmission Category</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MSM</td>
<td>67,507 (67.3)</td>
<td>9,996 (58.9)</td>
</tr>
<tr>
<td>IDU</td>
<td>12,658 (12.6)</td>
<td>1,236 (7.3)</td>
</tr>
<tr>
<td>MSM+IDU</td>
<td>5,732 (5.7)</td>
<td>508 (3.0)</td>
</tr>
<tr>
<td>Hetero</td>
<td>13,550 (13.5)</td>
<td>5,066 (29.8)</td>
</tr>
<tr>
<td>Female</td>
<td></td>
<td></td>
</tr>
<tr>
<td>IDU</td>
<td>8,117 (21.8)</td>
<td>520 (6.6)</td>
</tr>
<tr>
<td>Hetero</td>
<td>28,401 (76.3)</td>
<td>7,197 (90.7)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>AIDS diagnosis after HIV diagnosis</th>
<th>U.S.-born</th>
<th>Foreign-born</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥12 months</td>
<td>71381</td>
<td>11215</td>
</tr>
<tr>
<td>&lt;12 months</td>
<td>41073</td>
<td>9151</td>
</tr>
</tbody>
</table>

Prosser et al, CROI 2010
Older Populations

Age won’t protect you from AIDS

More than 8,000 New Yorkers over 50 years old have been diagnosed with AIDS.

To prevent HIV infection:
- Use a condom every time you have sex.
- Don’t shoot drugs. Sharing works can spread AIDS.

It’s not how old you are... it’s what you do that matters.

HIV prevention is a lifelong job.

To learn more, call 1-800-541-AIDS

New York State Health Department
### Estimated Number and Percent of HIV/AIDS Diagnoses, by Age at Diagnosis, 33 States, 2005

<table>
<thead>
<tr>
<th>Age at dx (yrs)</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;13</td>
<td>168</td>
<td>0.5</td>
</tr>
<tr>
<td>13-49</td>
<td>31,409</td>
<td>84.1</td>
</tr>
<tr>
<td>50-64</td>
<td>5,094</td>
<td>13.6</td>
</tr>
<tr>
<td>65+</td>
<td>660</td>
<td>1.8</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>37,331</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
HIV Diagnosis at Age ≥50 Years at Diagnosis, 33 States, 2005

- 51% Black, 32% white, 15% Hispanic
  - More Blacks and whites
  - Fewer Hispanics and Asian/Pacific Islanders
- Rates per 100,000 compared to whites
  - Ages ≥50: Blacks 12x, Hispanics 5x
  - Disparity compared to ages 13-49: Blacks 7x, Hispanics 3x
- Transmission risks compared to aged 13-49
  - Males: Fewer MSM, more IDU and high risk hetero
  - Females: Similar

Linley, 2007
### Time to an AIDS Diagnosis after a Diagnosis of HIV Infection, by Age at Diagnosis, 33 U.S. States, 2005

<table>
<thead>
<tr>
<th>&lt;12 mos after HIV dx</th>
<th>13-49 Years</th>
<th>50+ Years</th>
<th>OR</th>
<th>95%CI</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No.</td>
<td>%</td>
<td>No.</td>
<td>%</td>
</tr>
<tr>
<td>Yes</td>
<td>10,973</td>
<td>37.2</td>
<td>2,792</td>
<td>52.6</td>
</tr>
<tr>
<td>No</td>
<td>18,515</td>
<td>62.8</td>
<td>2,515</td>
<td>47.4</td>
</tr>
</tbody>
</table>
Populations Covered

- General HIV estimates in U.S.
- Characteristics of special populations
  - Injection drug users
  - Incarcerated populations
  - Transgender persons
  - Foreign-born populations
  - Older populations
- Data sources, limitations, challenges
Thank You