Epidemiology of HIV Infection
United States – 2013

John T. Brooks, M.D.
Epidemiology Branch
Division of HIV/AIDS Prevention, CDC

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 or the National Institutes of Health.
How many new HIV infections were diagnosed in the United States in 2010?

1. ~10,000
2. ~50,000
3. ~100,000
4. ~1,000,000
Is the number of new HIV infections in the United States …..?

1. Increasing
2. Decreasing
3. Stable
Estimated number of AIDS diagnoses and deaths and estimated number of persons living with AIDS diagnosis* and living with diagnosed or undiagnosed HIV infection† among persons aged ≥13 years

Stable incidence
~ 50,000/year
Geography

- Numbers and rates highest in urban areas

<table>
<thead>
<tr>
<th>MSA*</th>
<th>Living with HIV, year end of 2010**</th>
<th>Number new diagnoses, 2011</th>
<th>Rate of new diagnoses per 10,000 persons, 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>≥ 500,000</td>
<td>82.6%</td>
<td>81.2%</td>
<td>19.6</td>
</tr>
<tr>
<td>50,000 – 499,999</td>
<td>10.2%</td>
<td>11.4%</td>
<td>10.1</td>
</tr>
<tr>
<td>&lt; 50,000</td>
<td>6.2%</td>
<td>6.4%</td>
<td>6.5</td>
</tr>
</tbody>
</table>

* Metropolitan statistical area

** Jurisdictions with stable confidential name-based reporting

50% of Persons Living with HIV Infection Located in 12 Cities

- New York
- Philadelphia
- Baltimore
- Washington, DC
- Tampa
- Miami
- Houston
- Dallas
- Chicago
- Atlanta
- Los Angeles
- San Francisco

www.cdc.gov/hiv/topics/surveillance/resources/slides/index.htm
15 Cities with Highest Rates of New HIV Diagnoses - 2011

<table>
<thead>
<tr>
<th>City</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Miami</td>
<td>46.0</td>
</tr>
<tr>
<td>2. New Orleans</td>
<td>43.0</td>
</tr>
<tr>
<td>3. Baton Rouge</td>
<td>41.6</td>
</tr>
<tr>
<td>4. Jackson</td>
<td>36.7</td>
</tr>
<tr>
<td>5. Washington DC</td>
<td>34.5</td>
</tr>
<tr>
<td>6. Baltimore</td>
<td>33.8</td>
</tr>
<tr>
<td>7. Memphis</td>
<td>32.6</td>
</tr>
<tr>
<td>8. Atlanta</td>
<td>30.3</td>
</tr>
<tr>
<td>9. New York</td>
<td>28.1</td>
</tr>
<tr>
<td>10. Jacksonville</td>
<td>28.1</td>
</tr>
<tr>
<td>11. Orlando</td>
<td>28.1</td>
</tr>
<tr>
<td>12. Houston</td>
<td>26.8</td>
</tr>
<tr>
<td>13. San Juan</td>
<td>26.6</td>
</tr>
<tr>
<td>14. Charlotte</td>
<td>25.7</td>
</tr>
<tr>
<td>15. Columbia</td>
<td>24.7</td>
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</table>

U.S. total: 19.6

## 15 Cities with Highest Rates of New HIV Diagnoses - 2011

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<tr>
<td>15. Columbia</td>
<td>24.7</td>
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</table>

**U.S. total**: 19.6

11 in the southeast

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Estimated HIV Incidence Rates, by Race/Ethnicity United States, 2009

Annual U.S. incidence: ~ 50,000 cases
2009 U.S. incidence rate: 19/100,000

- Asian: 8
- White: 9
- American Indian/Alaska Native: 14
- Multiple races: 18
- Hispanic/Latino: 26
- Native Hawaiian/Other Pacific Islander: 44
- Black/African American: 70

Rate per 100,000

2.9x greater
7.8x greater

Prejean, Jet al. PLoS ONE 6(8): e17502
Adults and Adolescents Living with Diagnosed HIV Infection, by Sex and Race/Ethnicity, Year-end 2010—United States and 6 Dependent Areas

- **Males**
  - 74.9% White
  - 21% Black/African-American
  - 37% Hispanic/Latino
  - 2% Asian
  - 1% Multiple races

- **Females**
  - 60% White
  - 19% Hispanic/Latino
  - 1% Native Hawaiian/Other Pacific Islander
  - <1% American Indian/Alaska Native
  - <1% Multiple races

**U.S. Census 2011 estimates:**
- 13% Black/African-American
- 17% Hispanic/Latino
- 78% White

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Note: Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. All displayed data have been statistically adjusted to account for reporting delays, but not for incomplete reporting.

a Includes Asian/Pacific Islander legacy cases.
b Hispanics/Latinos can be of any race.
* Total males include 562 persons and total females include 180 persons with unknown race/ethnicity.
Rates of HIV of Diagnosis by Race/Ethnicity
United States, 2005-2008

Adults and Adolescents Living with Diagnosed HIV Infection, by Sex and Transmission Category, Year-end 2010—United States and 6 Dependent Areas

Overall:
- 50% MSM
- 18% heterosexual women

Note. Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. All displayed data have been statistically adjusted to account for reporting delays and missing transmission category, but not for incomplete reporting.

a Heterosexual contact with a person known to have, or to be at high risk for, HIV infection.
b Includes hemophilia, blood transfusion, and risk factor not reported or not identified.
Estimated Number of Incident HIV Infections Among MSM by Race/Ethnicity and Age
United States, 2009

Millet G et al. Lancet 2012
What percentage of new (i.e., incident) HIV infections are among U.S. persons age 50 years or greater?

A. 1%
B. 5%
C. 10%
D. 15%
E. 20%
HIV Incidence by Age, 2006

Estimated New HIV Infections, 2006, by Age

- 31% under age 30 years
- 34% under age 40 years
- 25% under age 40–49 years
- 10% under age 50+

Source: Centers for Disease Control and Prevention

Rates of HIV of Diagnosis by Race/Ethnicity
United States, 2005-2008

How Many Women Age 65-74 Years Report Having Sexual Intercourse in Prior Year?

A. 10%
B. 25%
C. 40%
D. 70%
E. My grandmother has sex?
Sex is Not Only for the Young

Percentage reporting sex in last 12 months

- 57-64: 61.6%
- 65-74: 39.5%
- 75-85: 16.7%

Lindau *NEJM* 2007 357(8):762, 2004
Sex is Not Only for the Young

Percentage reporting sex in last 12 months

<table>
<thead>
<tr>
<th>Age</th>
<th>Men</th>
<th>Women</th>
</tr>
</thead>
<tbody>
<tr>
<td>57-64</td>
<td>83.7</td>
<td>61.6</td>
</tr>
<tr>
<td>65-74</td>
<td>67.0</td>
<td>39.5</td>
</tr>
<tr>
<td>75-85</td>
<td>38.5</td>
<td>16.7</td>
</tr>
</tbody>
</table>

Lindau *NEJM* 2007 357(8):762, 2004
Social Determinants of Health: Poverty and HIV Prevalence

CDC, MMWR 60(31): 1045-1049, 2011
CDC. HIV prevalence estimates—United States, 2006. MMWR2008;57:1073-76

* census tract where ≥20% of residents had household incomes below the U.S. poverty level in 24 cities (N = 14,837 interviewees tested for HIV infection)
Epidemiology of HIV Infection as a Chronic Disease

HAART Use Over Time, HOPS, 1994-2006

% Patients on HAART

Deaths per 100 Person-years

Palella et al., NEJM 1998, 338: 853-860 and CDC unpublished data
Incidence of high frequency AIDS-defining opportunistic infections, the HIV Outpatient Study, 1994-2007

Buchacz et al., AIDS 2010, 24(10): 1549-1559
CD4 Cell Count at Death Among Patients in Care by Year NA-ACCORD 2000-2008

Median CD4 T-lymphocyte count (cells/L) at or within 18 months prior to death

- All: N=320, 60; N=241, 66; N=446, 72; N=486, 124; N=577, 125; N=622, 136; N=632, 152; N=577, 209
- <50 y.o.: N=241, 60; N=336, 66; N=372, 72; N=377, 124; N=399, 125; N=305, 136; N=376, 152; N=372, 209

p-value for trend <0.001

Life Expectancy Substantially Improved

Among newly diagnosed patients started on effective therapy:

• “life expectancy …approaches that of non-infected individuals” ¹

• “life expectancy only slightly lower than that of a person in the general US population” ²

• Effect of HIV on life expectancy equated to lifetime of smoking ³,⁴

1. van Sighem et al., AIDS 2010, 24(10): 1527-2535
2. Hogg et al., abstract #137, 19th CROI, Seattle WA, 2012
3. Nakagawa et al., AIDS 2012, 26(3): 335-343
4. Helleberg et al., 2012, Clinical Infectious Diseases, published ahead of print
Estimated numbers of persons living with HIV infection, by age
Centers for Disease Control and Prevention, 2010

Median age: 45-49 years
35.2% aged ≥ 50 years
~ 2% increase per year

Changing Epidemiology of Chronic HIV Infection in the HAART Era

*from infectious disease back to internal medicine*

- Increasing burden of non-AIDS-defining illness
  - Malignancy (Hodgkins lymphoma, anal)
  - End-organ disease (CVD, hepatic, renal, CNS)
  - Metabolic disease (bone density, metabolic syndrome)

- Need to address prevention and treatable co-morbidities
  - Tobacco use, diet, exercise
  - HTN, dyslipidemia, glucose intolerance, HCV coinfection
  - STDs and risk of onward HIV transmission
All-Cause Mortality Among Persons with HIV Infection and Smokers, Denmark 1995-2010

Table 3. Number of Life-Years Lost and Population-Attributable Risk of Death Associated With Smoking and With HIV Among Individuals in the Danish HIV Cohort and the Copenhagen General Population Study (Controls)

<table>
<thead>
<tr>
<th>Factor</th>
<th>Lost Life-Years (Age 35–80 y) Years (95% CI)</th>
<th>PAR, %</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV among never smokers</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(never smoking HIV patients vs never smoking controls)</td>
<td>5.1 (4.4–5.8)</td>
<td>0.3</td>
</tr>
<tr>
<td>Smoking among controls</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(smoking controls vs never smoking controls)</td>
<td>3.6 (3.1–4.0)</td>
<td>34.4</td>
</tr>
<tr>
<td>Smoking among HIV patients</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(smoking HIV patients vs never smoking HIV patients)</td>
<td>12.3 (11.5–13.0)</td>
<td>61.5</td>
</tr>
</tbody>
</table>

Abbreviations: CI, confidence interval; HIV, human immunodeficiency virus; PAR, population-attributable risk.

Helleberg, 2012, Clinical Infectious Diseases, published ahead of print DOI: 10.1093/cid/cis933
Proportion of MSM* Attending STD Clinics with Primary and Secondary Syphilis, Gonorrhea or Chlamydia by HIV Status†, STD Surveillance Network (SSuN), 2011

Percentage

<table>
<thead>
<tr>
<th></th>
<th>HIV-</th>
<th>HIV+</th>
</tr>
</thead>
<tbody>
<tr>
<td>P&amp;S syphilis</td>
<td>3%</td>
<td>6%</td>
</tr>
<tr>
<td>GC urethral</td>
<td>8%</td>
<td>12%</td>
</tr>
<tr>
<td>GC pharyngeal</td>
<td>6%</td>
<td>10%</td>
</tr>
<tr>
<td>GC rectal</td>
<td>8%</td>
<td>15%</td>
</tr>
<tr>
<td>CT urethral</td>
<td>7%</td>
<td>13%</td>
</tr>
<tr>
<td>CT rectal</td>
<td>14%</td>
<td>18%</td>
</tr>
</tbody>
</table>

*MSM = men who have sex with men.
†Excludes all persons for whom there was no laboratory documentation or self-report of HIV status.
‡GC urethral and CT urethral include results from both urethral and urine specimens.

http://www.cdc.gov/std/stats11/
Proportion of MSM* Attending STD Clinics with Primary and Secondary Syphilis, Gonorrhea or Chlamydia by HIV Status†, STD Surveillance Network (SSuN), 2011

<table>
<thead>
<tr>
<th>Percentage</th>
<th>P&amp;S syphilis</th>
<th>GC urethral</th>
<th>GC pharyngeal</th>
<th>GC rectal</th>
<th>CT urethral</th>
<th>CT rectal</th>
</tr>
</thead>
<tbody>
<tr>
<td>HIV-</td>
<td>1.0%</td>
<td>8.0%</td>
<td>5.0%</td>
<td>7.0%</td>
<td>7.0%</td>
<td>13.0%</td>
</tr>
<tr>
<td>HIV+</td>
<td>20.0%</td>
<td>16.0%</td>
<td>15.0%</td>
<td>17.0%</td>
<td>17.0%</td>
<td>18.0%</td>
</tr>
</tbody>
</table>

STDs can increase HIV shedding
STDs can increase susceptibility to HIV
STDs are preventable and treatable

*MSM = men who have sex with men.
†Excludes all persons for whom there was no laboratory documentation or self-report of HIV status.
‡GC urethral and CT urethral include results from both urethral and urine specimens.

http://www.cdc.gov/std/stats11/
Proportion of MSM* Attending STD Clinics with Primary and Secondary Syphilis, Gonorrhea or Chlamydia by HIV Status†, STD Surveillance Network (SSuN), 2011

Screening urine only (urethra) can miss up to 85% of STDs in rectum and oropharynx

*MSM = men who have sex with men.
†Excludes all persons for whom there was no laboratory documentation or self-report of HIV status.
‡GC urethral and CT urethral include results from both urethral and urine specimens.

http://www.cdc.gov/std/stats11/
Among MSM in care for HIV infection, what percentage reported engaging in unprotected anal or vaginal intercourse at least once in the prior 12 months?

1. About 5%
2. About 25%
3. About 50%
4. About 75%
Unprotected Intercourse Among HIV-infected Persons In Care

Number and percentage of persons who had unprotected anal or vaginal intercourse with at least one partner during the past 12 months, by sex of participant and sex partner

Medical Monitoring Project*, United States, 2007

<table>
<thead>
<tr>
<th>Sex of participant and sex partner</th>
<th>Number</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male with male sex partner (N = 970)</td>
<td>527</td>
<td>54%</td>
</tr>
<tr>
<td>Male with female sex partner (N = 553)</td>
<td>176</td>
<td>32%</td>
</tr>
<tr>
<td>Female with male sex partner (N = 516)</td>
<td>216</td>
<td>42%</td>
</tr>
</tbody>
</table>
In a study of 8 clinics caring for HIV-infected MSM, what percentage of men were tested at least once for rectal gonorrhea or chlamydia during any one-year period 2004-2006?

1. About 5%
2. About 25%
3. About 50%
4. About 75%
STD Testing Among HIV-infected Persons In Care

Percentage of MSM tested at least once per year for STDs at 8 U.S. HIV Clinics, 2004-2006 (N = 1,113), limited to asymptomatic men

<table>
<thead>
<tr>
<th>Tested for:</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
</tr>
</thead>
<tbody>
<tr>
<td>Syphilis</td>
<td>72.8%</td>
<td>76.8%</td>
<td>66.0%</td>
</tr>
<tr>
<td>Gonorrhea:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Urethra</td>
<td>14.0%</td>
<td>17.8%</td>
<td>18.3%</td>
</tr>
<tr>
<td>- Rectum</td>
<td>6.4%</td>
<td>3.6%</td>
<td>3.6%</td>
</tr>
<tr>
<td>- Pharynx</td>
<td>4.9%</td>
<td>7.7%</td>
<td>3.0%</td>
</tr>
<tr>
<td>Chlamydia:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Urethra</td>
<td>13.8%</td>
<td>17.1%</td>
<td>18.3%</td>
</tr>
<tr>
<td>- Rectum</td>
<td>4.3%</td>
<td>4.3%</td>
<td>3.6%</td>
</tr>
</tbody>
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Routine screening coupled with risk reduction counseling reduces STD incidence.

Patel et al. *Sex Transm Dis* 2012
Summary: HIV in the United States, 2013

• Incidence stable → prevalence steadily climbing

• HIV prevalence greatest in urban areas

• Expanding in southeast United States

• 3 of every 4 infections among men
  – MSM comprise most prevalent and new diagnoses

• Disproportionate risk for infection among:
  • Young MSM of color
  • Women of color
  • Older persons
  • Impoverished
Summary: HIV in the United States, 2013

• Longer survival leading to greater contribution of non-AIDS-defining illness to morbidity/mortality

• Increasing focus on:
  – Prevention/treatment co-morbidities (e.g., smoking)
  – Reducing risk of onward HIV transmission (e.g., STDs)
Thank you.
Questions?

http://www.cdc.gov/hiv