Epidemiology of HIV in the United States, 2019

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HIV Diagnostics Conference
Atlanta, GA – March 25, 2019
Dr. Brooks has no relevant financial affiliations to disclose
Progress Controlling HIV in the United States

Number of New Infections

Source: Hall et al., JAMA, 2008, 300(5):520-529 and CDC surveillance data
### Death Rate Among Persons with AIDS Declining and Median Age at Death due to HIV Infection Increasing

#### Death Rate, Ever AIDS (1987-2016)
- **Deaths per 1,000 persons living with AIDS**
  - **Year of death**
  - **Rate > 20 times**
  - **375 per 1,000 in 1987**
  - **17 per 1,000 in 2016**

#### Age at Death, HIV Infected (1987-2016)
- **Median age at death**
  - **Year of death**
  - **In 1987**: 36 years
  - **In 2016**: 53 years
  - **17 years**
Death due to HIV Declining Among Persons 25-44 Years Old


Note: For comparison with data for 1999 and later years, data for 1987–1998 were modified to account for ICD-10 rules instead of ICD-9 rules. The data for this slide come from death certificate data compiled by the National Center for Health Statistics.
Progress Controlling HIV in the United States

- First HIV test approved, 1985
- First drug (AZT) approved, 1987
- Effective combination therapy introduced, 1996
- First single tablet regimen (STR) approved, 2006
- PrEP approved, 2012

Source: Hall et al., JAMA, 2008, 300(5):520-529 and CDC surveillance data
HIV Overall Status – United States, 2016

**HIV Incidence**
- 38,700
- The estimated number of new HIV infections in a year

**HIV Prevalence**
- 1.1 M
- The estimated number of all people with diagnosed or undiagnosed HIV infections at a point in time

**HIV Diagnoses**
- 38,739
- The actual number of reported HIV diagnoses in a year

Median time to diagnosis 3 years

Annual Number of New Infections Has Stabilized
Progress Appears to Be Stalling

Lifetime Risk of HIV Diagnosis by Sex

Estimated HIV Incidence among Persons Aged ≥ 13 Years, by Transmission Category 2016—United States

- **Heterosexual**: 9,100 (24%)
- **Injection Drug Use (IDU)**: 1,900 (5%)
- **MSM & IDU**: 1,200 (3%)
- **Men Who Have Sex with Men (MSM)**: 26,400 (68%)

Note. Estimates were derived from a CD4 depletion model using HIV surveillance data. Data have been statistically adjusted to account for missing transmission category. Heterosexual contact is with a person known to have, or to be at high risk for, HIV infection.

* Difference from the 2010 estimate was deemed statistically significant (P < .05). Values adjusted for missing risk-factor data; sum <38,7000 for 2016.
Estimated HIV Incidence among Persons Aged \( \geq 13 \) Years, by Transmission Category 2010–2016—United States

- Male-to-male sexual contact: No change
- Heterosexual contact: 17% decrease
- Injection drug use (IDU): 30% decrease

Note. Estimates were derived from a CD4 depletion model using HIV surveillance data. Data have been statistically adjusted to account for missing transmission category. Heterosexual contact is with a person known to have, or to be at high risk for, HIV infection.

* Difference from the 2010 estimate was deemed statistically significant (\( P < .05 \)). Values adjusted for missing risk-factor data; sum <38,700 for 2016.
Estimated HIV Incidence Among Men Who Have Sex with Men Aged ≥ 13 Years by Race/Ethnicity, 2010–2016—United States

Note. Estimates were derived from a CD4 depletion model using HIV surveillance data. Data have been statistically adjusted to account for missing transmission category. Data on men who have sex with men do not include men with HIV infection attributed to male-to-male sexual contact and injection drug use. Hispanics/Latinos can be of any race.

*Difference from the 2010 estimate was deemed statistically significant (P < .05).
Estimated HIV Incidence Among Men Who Have Sex with Men Aged ≥ 13 Years by Age, 2010–2016—United States

Note. Estimates were derived from a CD4 depletion model using HIV surveillance data. Data have been statistically adjusted to account for missing transmission category. Data on men who have sex with men do not include men with HIV infection attributed to male-to-male sexual contact and injection drug use.

*Difference from the 2010 estimate was deemed statistically significant (P < .05).
New Infections Rising Fastest Among Young Black and Latino MSM

- Black gay and bisexual men ages 25–34
- Latino gay and bisexual men ages 25–34

Increased **65%** overall

Increased **68%** overall
Lifetime Risk of HIV Diagnosis by Transmission Category

- **MSM**: 1 in 6
- **Women Who Inject Drugs**: 1 in 23
- **Men WhoInject Drugs**: 1 in 36
- **Heterosexual Women**: 1 in 241
- **Heterosexual Men**: 1 in 473

Lifetime Risk of HIV Diagnosis by Transmission Category

1 in 6

1 in 23

1 in 36

1 in 241

1 in 473

1 in 2

1 in 4

1 in 11

Southern U.S. Disproportionately Affected By HIV

Southern states account for 38% of the US population but bear the highest burden of HIV infection.

- 51% of annual HIV infections
- 45% of persons living with HIV infections
- 50% of undiagnosed HIV infections
Trends in the Percentage Distribution of Deaths due to HIV Infection by Geographic Region, United States, 1987-2014

- Midwest: 28% of nation’s population
- Northeast: 38% of nation’s population
- West: 53% of nation’s population
- South: 53% of nation’s population

Note. For comparison with data for 1999 and later years, data for 1987–1998 were modified to account for ICD-10 rules instead of ICD-9 rules.
Effective Treatment Extends Lifespan

End of mono/dual era | Highly effective combination therapy era

<table>
<thead>
<tr>
<th>Period</th>
<th>Potential survival gains (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1995-1996</td>
<td>+8 years</td>
</tr>
<tr>
<td>2000-2002</td>
<td>+36 years</td>
</tr>
<tr>
<td>2003-2006</td>
<td>+45 years</td>
</tr>
<tr>
<td>2006-2007</td>
<td>+51 years</td>
</tr>
<tr>
<td>2010</td>
<td>+55 years</td>
</tr>
<tr>
<td>2010</td>
<td>+60 years</td>
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Living with HIV Diagnoses by Age, Year-End 2016
U.S. and Dependent Areas

48% aged > 50 years

New HIV Diagnoses by Age, 2017, U.S. and Dependent Area

Estimated Diagnoses of HIV Infection

New HIV Diagnoses by Age, 2017, U.S. and Dependent Area


17% aged ≥ 50 years
Many People at Risk for HIV Not Tested Annually

7 in 10 people at high risk who weren’t tested for HIV in the past year saw a healthcare provider during that time. More than 75% of them weren’t offered a test.

In 2015, nearly 40,000 people in the US received an HIV diagnosis:

1 in 2 had been living with HIV 3 years or more
1 in 4 had been living with HIV 7 years or more
1 in 5 already had the most advanced stage of HIV (AIDS)

Dailey et al., MMWR Morb Mortal Weekly Rep, 2017; 66(47): 1300-1306
Test-and-Treat Strategy Suppresses Viral Load Quickly and is Highly Acceptable

Same-day treatment suppressed almost two and half times as fast as conventional...

RAPID pilot (2013-5)
56 days to Undetectable Viral Load (UVL)
suppressed

Universal Era (2010-3)
132 days to UVL
suppressed

...and was highly acceptable to patients measured by number on ART since diagnosis

Pilcher et al., J Acquir Immune Defic Syndr, 2017; data from San Francisco General Hospital
HIV Medical Therapy is Now Simple and Effective

1990s

- Complex
- Limited potency
- High toxicity

TODAY

<table>
<thead>
<tr>
<th>Atripla®</th>
<th>Complera®</th>
<th>Stribli®</th>
<th>Odefsey®</th>
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<tbody>
<tr>
<td>123</td>
<td>GSI</td>
<td>1</td>
<td>255</td>
</tr>
<tr>
<td>Genvoya®</td>
<td>Biktarvy®</td>
<td>Triumeq®</td>
<td></td>
</tr>
<tr>
<td>510</td>
<td>9883</td>
<td>572 Tri</td>
<td></td>
</tr>
</tbody>
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- Simplified (one pill per day)
- Very potent
- Few side effects
Effective Treatment Prevents Sexual HIV Transmission

THREE LARGE SCALE CLINICAL TRIALS

- HPTN 052
- PARTNER 1 & 2
- OPPOSITES ATTRACT

3,777 mixed HIV-status couples
- 2,311 heterosexual
- 1,466 MSM

Approximately 125,000 condomless episodes vaginal/anal sex with
NO TRANSMISSION of HIV

Persons who achieve and maintain a suppressed viral load
have effectively no risk of transmitting HIV infection

Persons Living with Diagnosed or Undiagnosed HIV Infection
HIV Care Continuum Outcomes, 2015—United States

Note. Receipt of medical care was defined as ≥1 test (CD4 or VL) in 2015. Retained in continuous medical care was defined as ≥2 tests (CD4 or VL) ≥3 months apart in 2015. Viral suppression was defined as <200 copies/mL on the most recent VL test in 2015.
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Most Infections from Persons Undiagnosed or Not in Care

### HIV TRANSMISSIONS IN 2016

<table>
<thead>
<tr>
<th>% OF PEOPLE WITH HIV</th>
<th>STATUS OF CARE</th>
<th>ACCOUNTED FOR X% OF NEW TRANSMISSIONS*</th>
</tr>
</thead>
<tbody>
<tr>
<td>15%</td>
<td>didn’t know they had HIV</td>
<td>38%</td>
</tr>
<tr>
<td>23%</td>
<td>knew they had HIV but weren’t in care</td>
<td>43%</td>
</tr>
<tr>
<td>11%</td>
<td>in care but not virally suppressed</td>
<td>20%</td>
</tr>
<tr>
<td>51%</td>
<td>taking HIV medicine and virally suppressed</td>
<td>0%</td>
</tr>
</tbody>
</table>

*8 in 10 NEW INFECTIONS COME FROM PEOPLE WHO ARE NOT IN HIV CARE.*

38% of infected persons account for 81% of new infections

Pre-Exposure Prophylaxis (PrEP)

• Single tablet combination of tenofovir/emtricitabine
• Currently the only FDA-approved drug for PrEP in the U.S.
• > 90% effective for preventing sexual transmission
• Estimated 1.1 million Americans eligible
PrEP Awareness and Use Growing Among MSM

CDC National HIV Behavioral Surveillance

2017 overall: 90%

2017 overall: 35%
only 1 in 3 had used

Finlayson et al., abstract #972, CROI 2019, Seattle WA
With ART HIV Infection in 2019 is a Highly Preventable and Manageable Chronic Disease

- ART requires life-long care to suppress viral replication
  - Facilitated by multiple single-tablet once-daily regimens
- “Near normal” life expectancy if effectively treated
- Getting suppressed requires **getting diagnosed** and into ongoing care
  - HIV care continuum is key focus
- PrEP is a potent and highly efficacious prevention tool
  - Underutilized among MSM
Coinfections HIV and HCV/HBV: General Population

252 million adults age > 18 years

- HCV: 2.4 million
- HIV: 1.1 million
- HBV: 850,000

<5% ~5% 20% 8%

Moorman AC et al., Clin Infect Dis, 2018; 56a(1):40-50.
BoshKA et al., Epidemiol Infect, 2018; 87(11):2415-2422.
Combined diagnoses of chlamydia, gonorrhea, and syphilis increased sharply over the past five years.

**Total Cases**
- 2013: 1.8 Million
- 2017*: 2.3 Million
- 31% Increase

**Gonorrhea**
- 2013: 333,004
- 2017*: 555,608
- 67% Increase

**Syphilis**
- 2013: 17,375
- 2017*: 30,644
- 76% Increase

**Chlamydia**
- 1.7 MILLION

In 2017* chlamydia was the most common condition reported to CDC.

*Preliminary data
Condomless Sex and STI Testing Among MSM by PrEP Use in Past 12 Months

CDC National HIV Behavioral Surveillance

Among PrEP users in 2017:
- More condomless sex
- More STI testing
Summary

- New HIV diagnoses continue to decline but disproportionately and increasingly affect certain populations MSM, especially young Latino/Hispanic and Black African-American
  - The southern United States region

- With antiretrovirals, there is the possibility of true HIV control
  - *No new infections* is within our grasp
  - Requires that all infected persons must know their status and at-risk persons be provided effective options to protect themselves

- Without HIV diagnosis, access to life-saving care is denied and risk of on-going transmission persists.

- Persons at risk for and with HIV will require testing for comorbid infections
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For more information, contact CDC
1-800-CDC-INFO (232-4636)

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.
Extent of Comorbid Conditions: PWID
6.6 million ever used, 775,000 used in past year

- **HCV**: 960,000 (~40% PWID)
- **HIV**: 126,700 (13% PWID)
- **HBV**: ~50-80%

New HCV, 2016: 28,430 (69% PWID)
New HIV, 2016: 2,224 (6% PWID)
New HBV, 2016: 7,190 (34% PWID)

* PWID – persons who inject drugs