



# An Update on the US HIV Epidemic and Recent Strides in HIV Care

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Grand Rounds – 05/24/2016

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## Overview of Presentation

- Update on the epidemiology of HIV/AIDS in the US.
- Racial/Ethnic health disparities in HIV/AIDS epidemic.
- Update on the epidemiology of HIV/AIDS in Florida.
- Barriers to poor linkage/entry, engagement, and retention in care.
- Effect of poor linkage/entry, engagement, and retention in care.
- Update on trends in mortality in people living with HIV/AIDS.
- Update on prevention and treatment of HIV/AIDS.

## Common abbreviations used in this talk

- HIV – Human Immunodeficiency Virus
- AIDS – Acquired Immunodeficiency Syndrome
- PLWHIV – People Living With HIV
- ART – Anti-Retroviral Treatment
- ARV – Anti-Retroviral Medications

# Epidemiology

- What is the current status of the HIV/AIDS epidemic in the US?
- How has it changed over time?

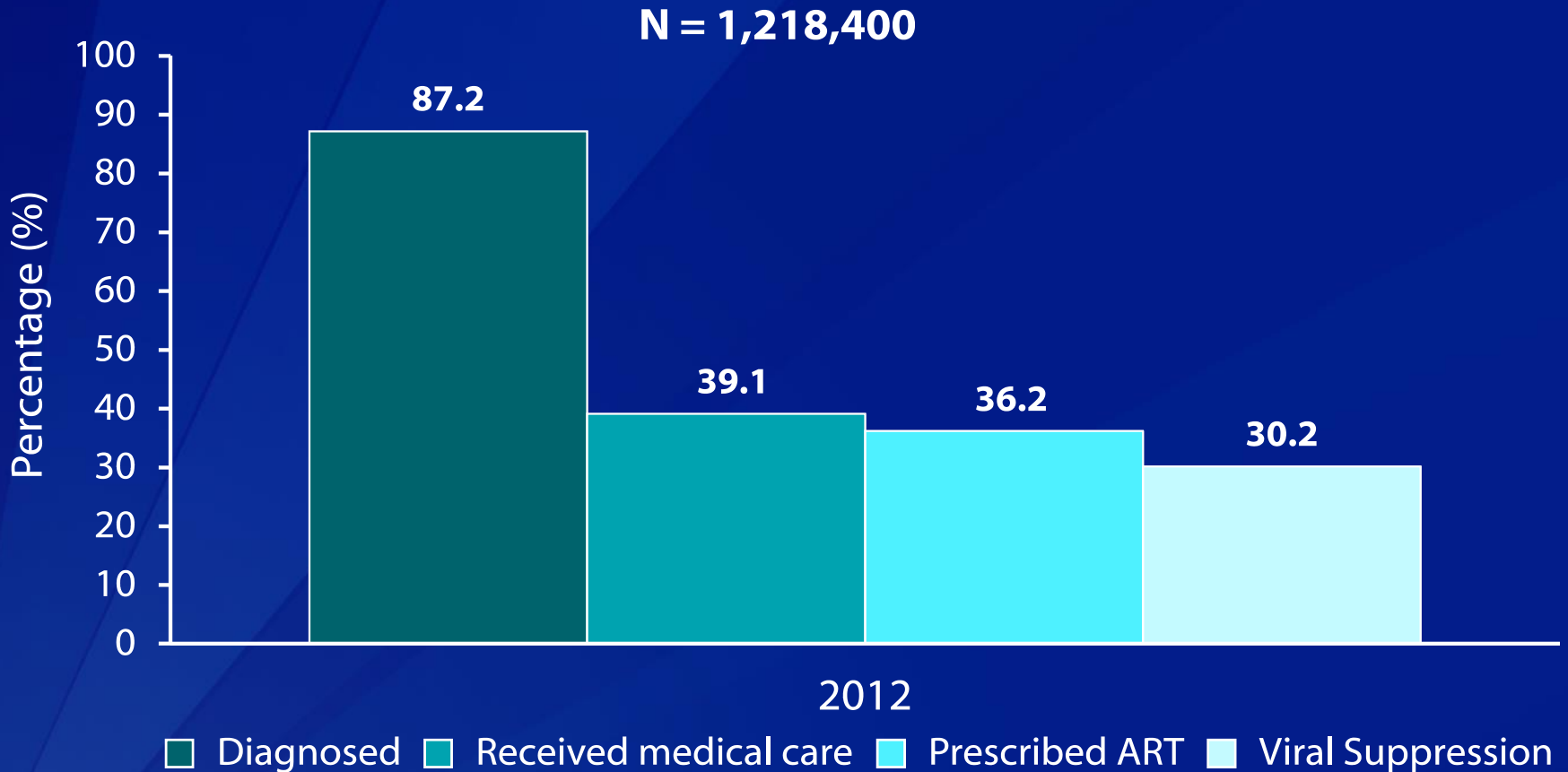
# HIV Care Continuum for the United States and Puerto Rico

National Center for HIV/AIDS, Viral Hepatitis, STD & TB Prevention

Division of HIV/AIDS Prevention



# Persons Living with Diagnosed or Undiagnosed HIV Infection HIV Care Continuum Outcomes, 2012 — US and Puerto Rico



**National HIV Surveillance System:** Estimated number of persons aged  $\geq 13$  years living with diagnosed or undiagnosed HIV infection (prevalence) in the United States at the end of 2012. The estimated number of persons with diagnosed HIV infection was calculated as part of the overall prevalence estimate.

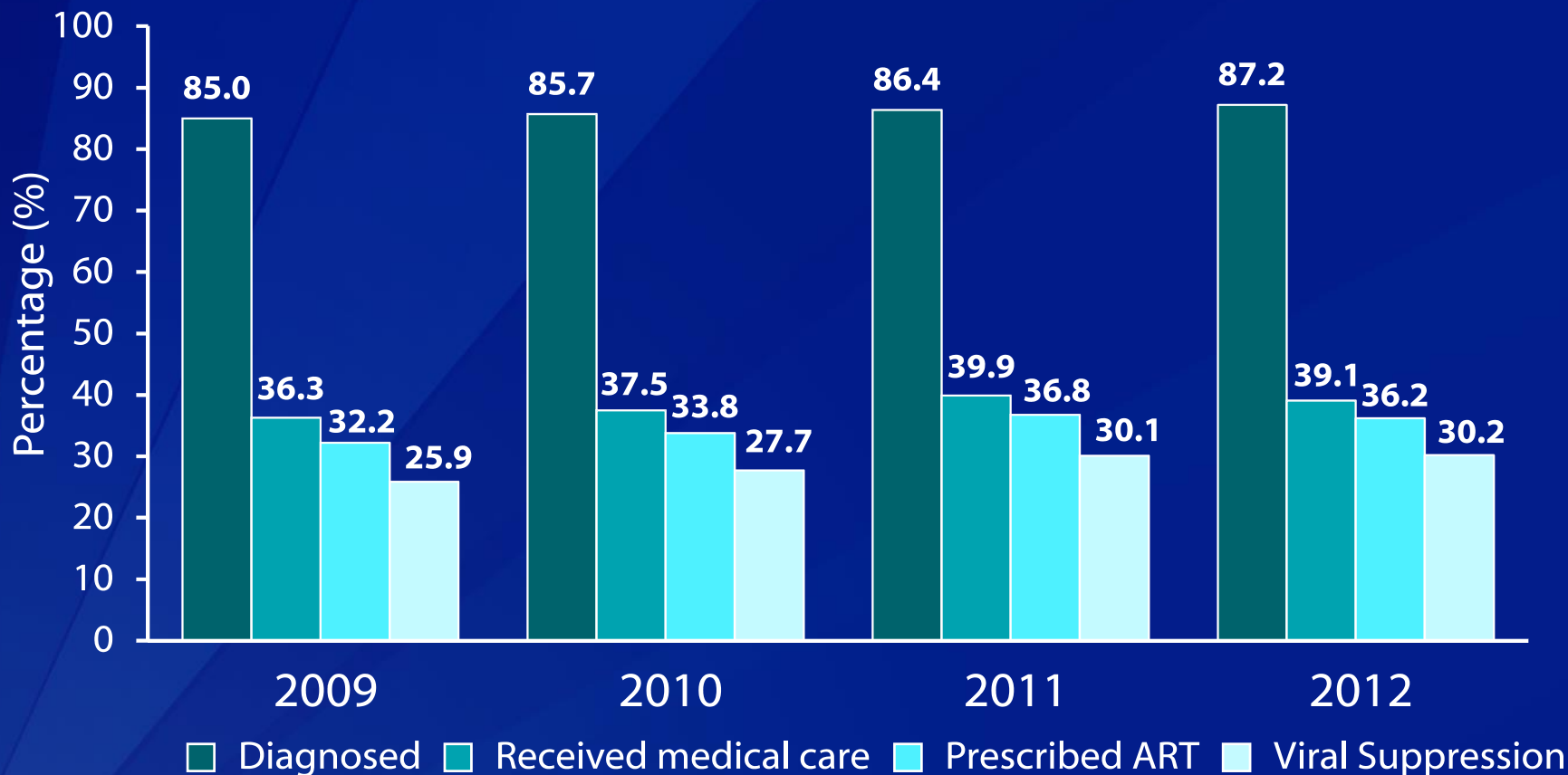
**Medical Monitoring Project:** Estimated number of persons aged  $\geq 18$  years who received HIV medical care during January to April of 2012, were prescribed ART, or whose most recent VL in the previous year was undetectable or  $< 200$  copies/mL—United States and Puerto Rico.



# Persons Living with Diagnosed or Undiagnosed HIV Infection

## HIV Care Continuum Outcomes, 2009, 2010, 2011 and 2012

### US and Puerto Rico

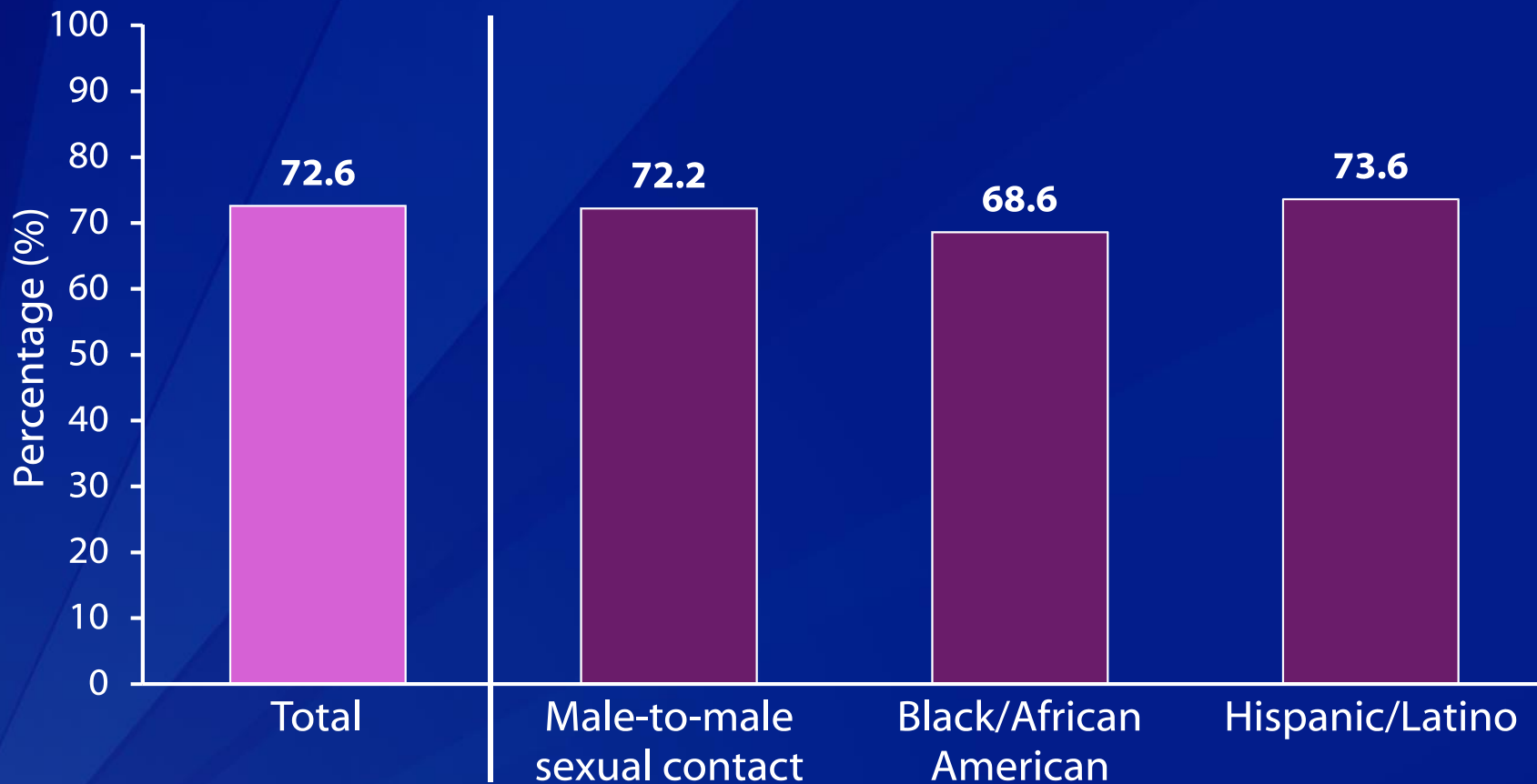


**National HIV Surveillance System:** Estimated number of persons aged  $\geq 13$  years living with diagnosed or undiagnosed HIV infection (prevalence) in the United States at the end of the specified year. The estimated number of persons with diagnosed HIV infection was calculated as part of the overall prevalence estimate.

**Medical Monitoring Project:** Estimated number of persons aged  $\geq 18$  years who received HIV medical care during January to April of the specified year, were prescribed ART, or whose most recent VL in the previous year was undetectable or  $< 200$  copies/mL—United States and Puerto Rico.



# Linkage to HIV Medical Care within 1 Month after HIV diagnosis during 2013, among persons aged $\geq 13$ years 27 States and the District of Columbia

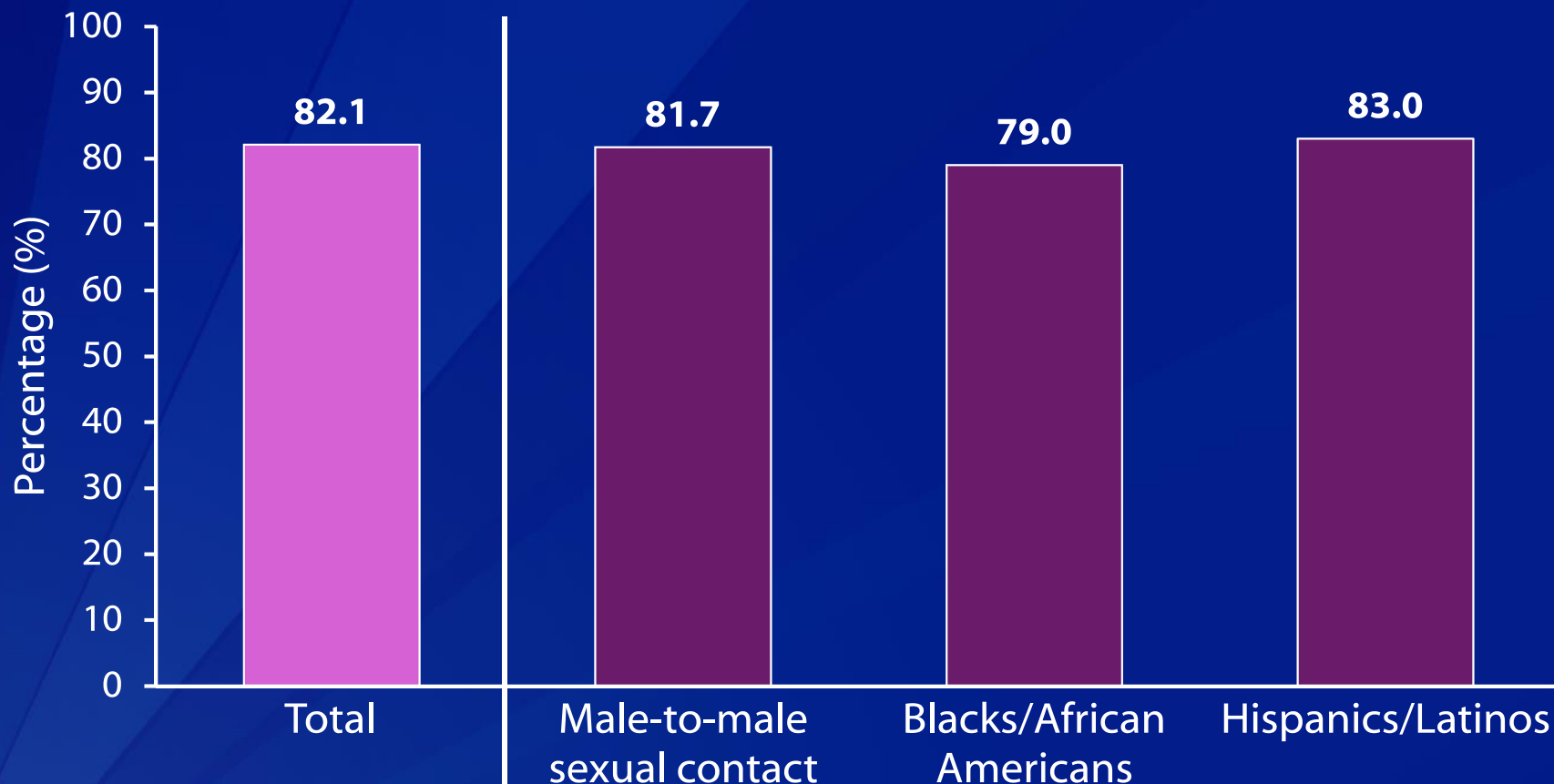


Note. Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. Linkage to HIV medical care was defined as having CD4 or VL test  $\leq 1$  month after HIV diagnosis. Hispanics/Latinos can be of any race.





# Linkage to HIV Medical Care within 3 Months after HIV diagnosis during 2013, among persons aged $\geq 13$ years 27 States and the District of Columbia



Note. Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. Linkage to HIV medical care was defined as having CD4 or VL test  $\leq 3$  months after HIV diagnosis. Hispanics/Latinos can be of any race.

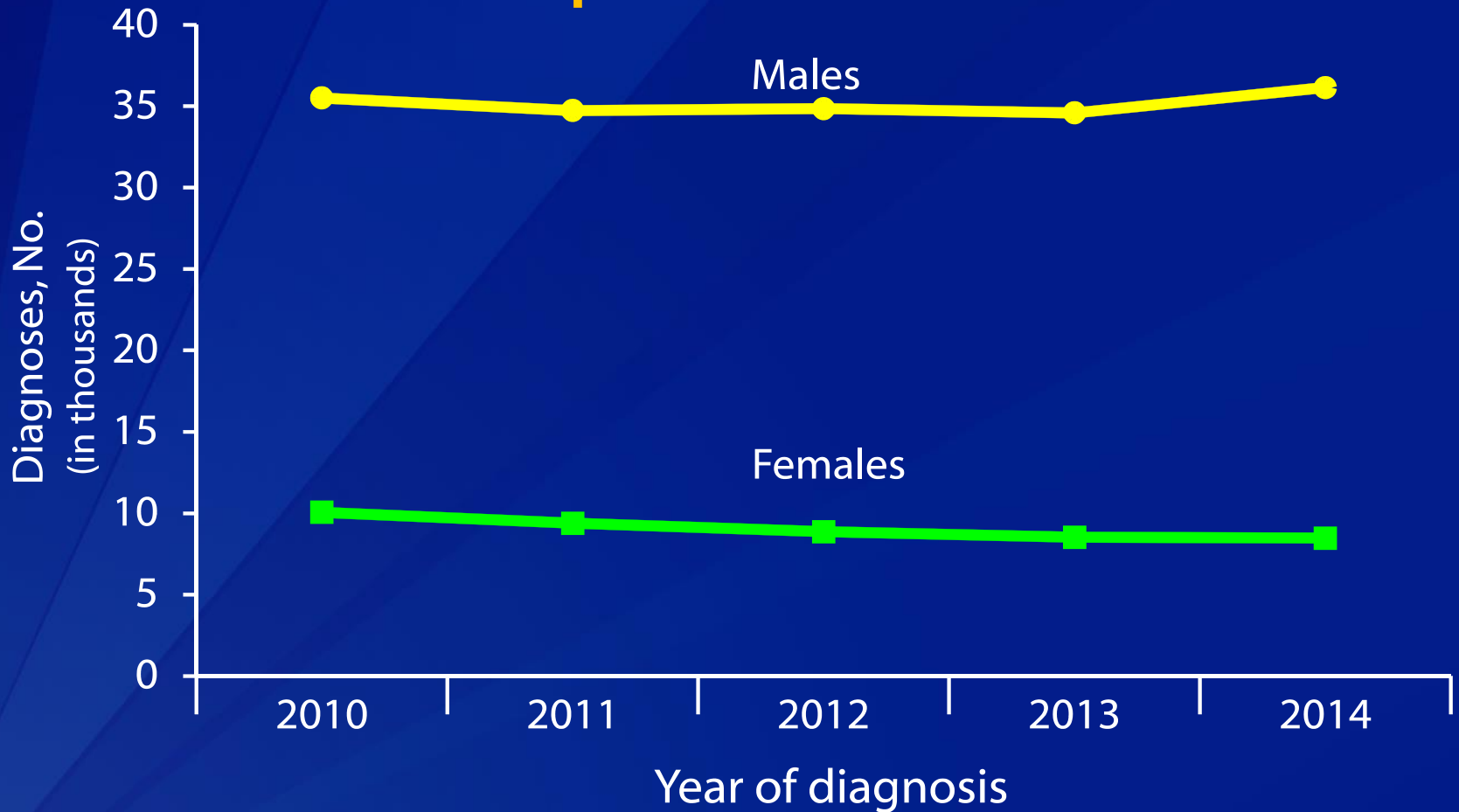


# Epidemiology of HIV Infection through 2014

National Center for HIV/AIDS, Viral Hepatitis, STD & TB Prevention  
Division of HIV/AIDS Prevention



# Diagnoses of HIV Infection among Adults and Adolescents, by Sex, 2010-2014: US and 6 Dependent Areas

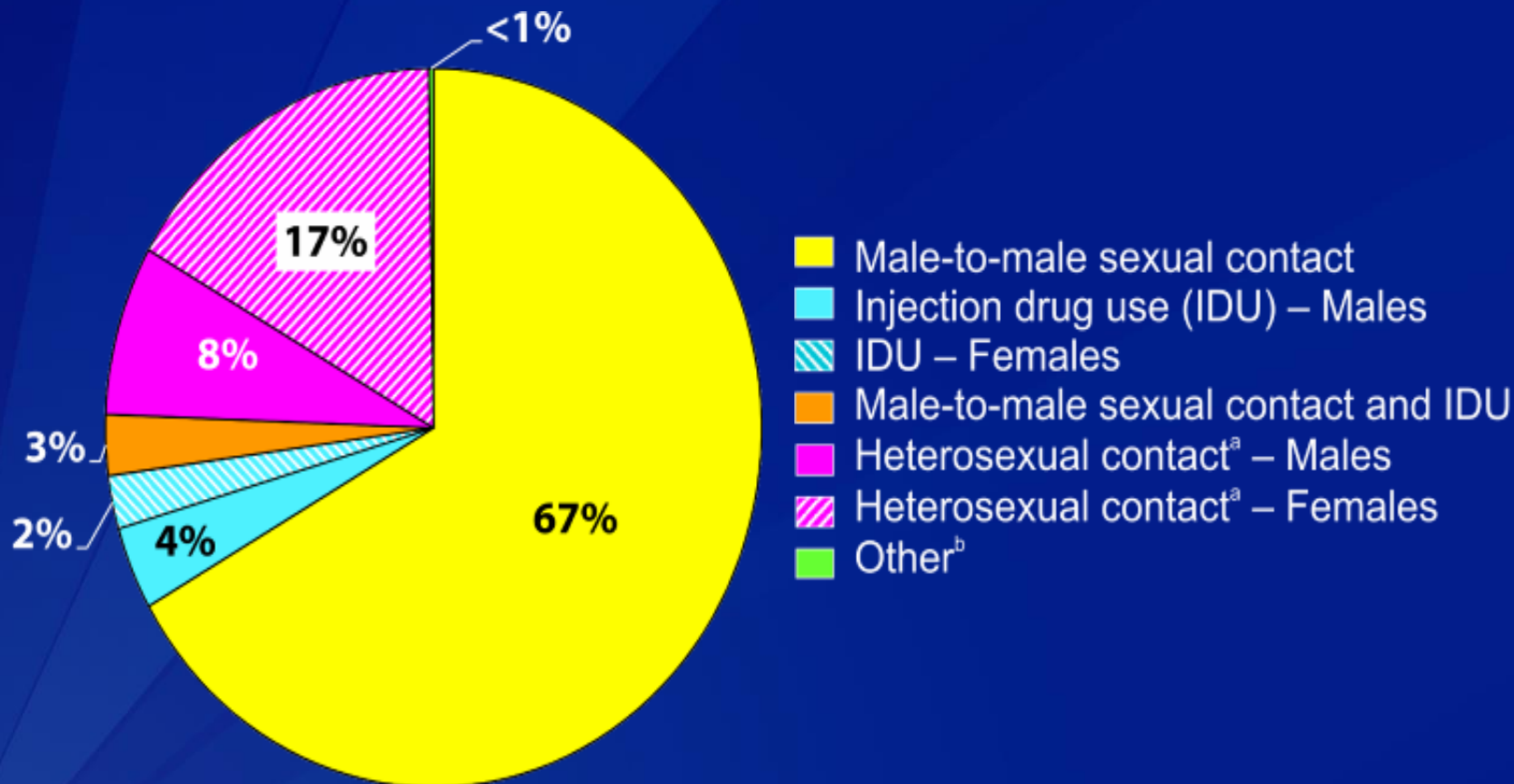


Note. Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. All displayed data have been statistically adjusted to account for reporting delays, but not for incomplete reporting.



# Diagnoses of HIV Infection among Adults and Adolescents, by Transmission Category, 2014: US and 6 Dependent Areas

N = 44,609



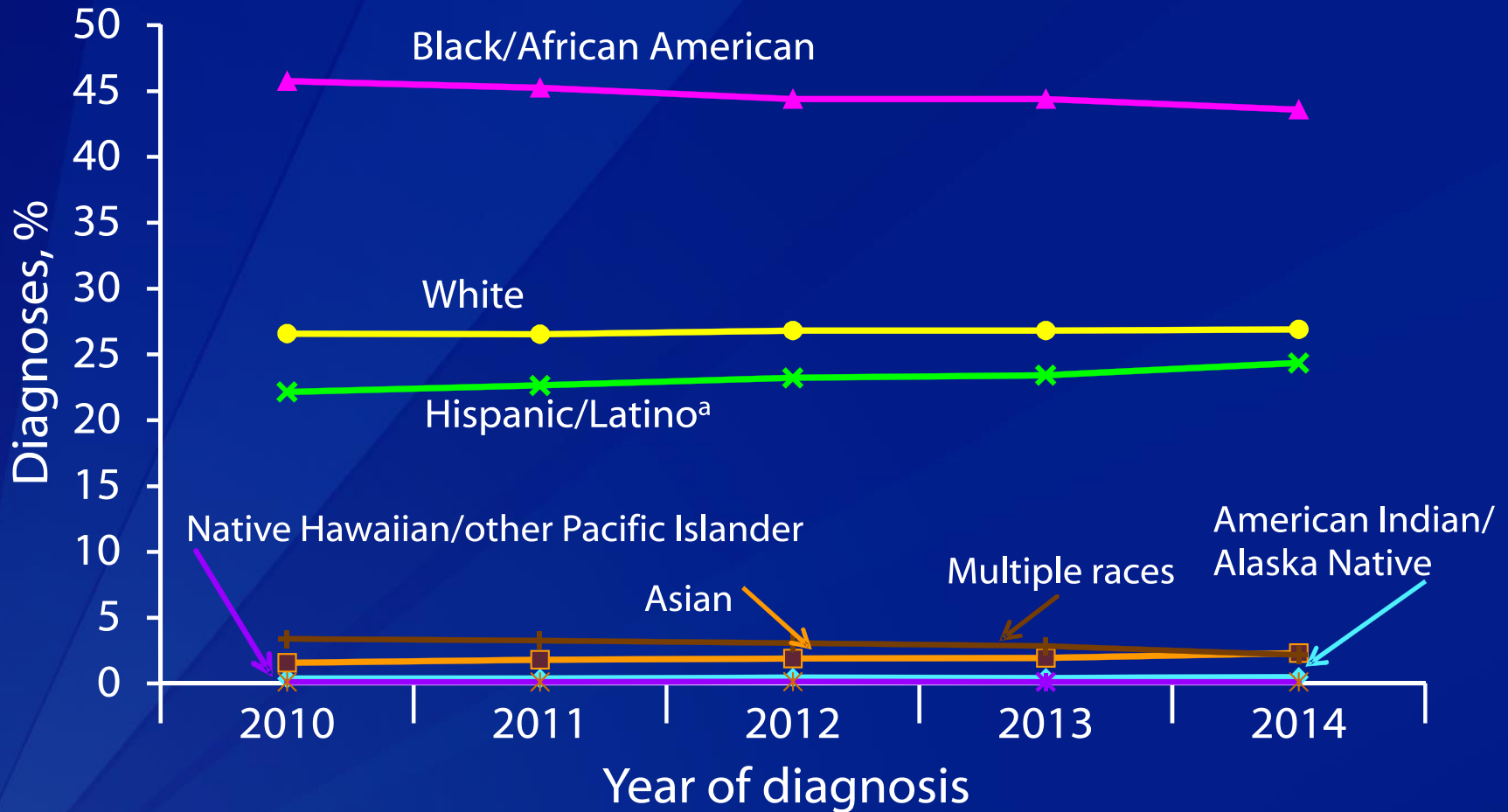
Note. Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. All displayed data have been statistically adjusted to account for reporting delays and missing transmission category, but not for incomplete reporting.

<sup>a</sup> Heterosexual contact with a person known to have, or to be at high risk for, HIV infection.

<sup>b</sup> Includes hemophilia, blood transfusion, perinatal exposure, and risk factor not reported or not identified.



# Diagnoses of HIV Infection among Adults and Adolescents, by Race/Ethnicity, 2010–2014: US and 6 Dependent Areas



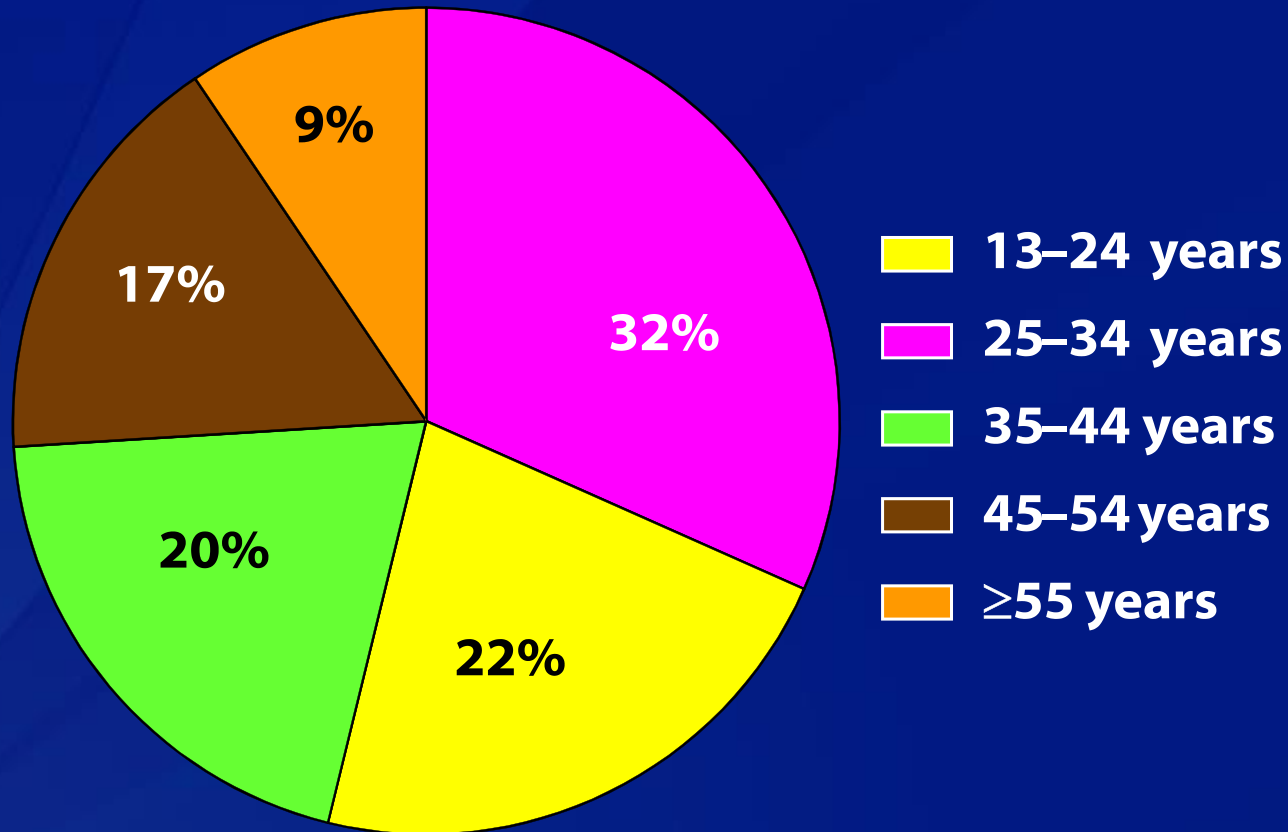
Note. Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. All displayed data have been statistically adjusted to account for reporting delays, but not for incomplete reporting.

<sup>a</sup> Hispanics/Latinos can be of any race.



# Diagnoses of HIV Infection among Adults and Adolescents, by Age at Diagnosis, 2014: US

N = 43,899



*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.

# Deaths of Persons with Diagnosed HIV Infection, by Race/Ethnicity, 2013: US

| Race/ethnicity                         | No.           | Rate       |
|--|---------------|------------|
| American Indian/Alaska Native          | 66            | 2.8        |
| Asian <sup>a</sup>                     | 64            | 0.4        |
| Black/African American                 | 7,581         | 19.4       |
| Hispanic/Latino <sup>b</sup>           | 2,664         | 4.9        |
| Native Hawaiian/other Pacific Islander | 5             | 0.9        |
| White                                  | 5,028         | 2.5        |
| Multiple races                         | 874           | 14.1       |
| <b>Total<sup>c</sup></b>               | <b>16,281</b> | <b>5.1</b> |

*Note.* Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. Deaths of persons with a diagnosed HIV infection may be due to any cause. All displayed data have been statistically adjusted to account for reporting delays, but not for incomplete reporting. Rates are per 100,000 population.

<sup>a</sup> Includes Asian/Pacific Islander legacy cases.

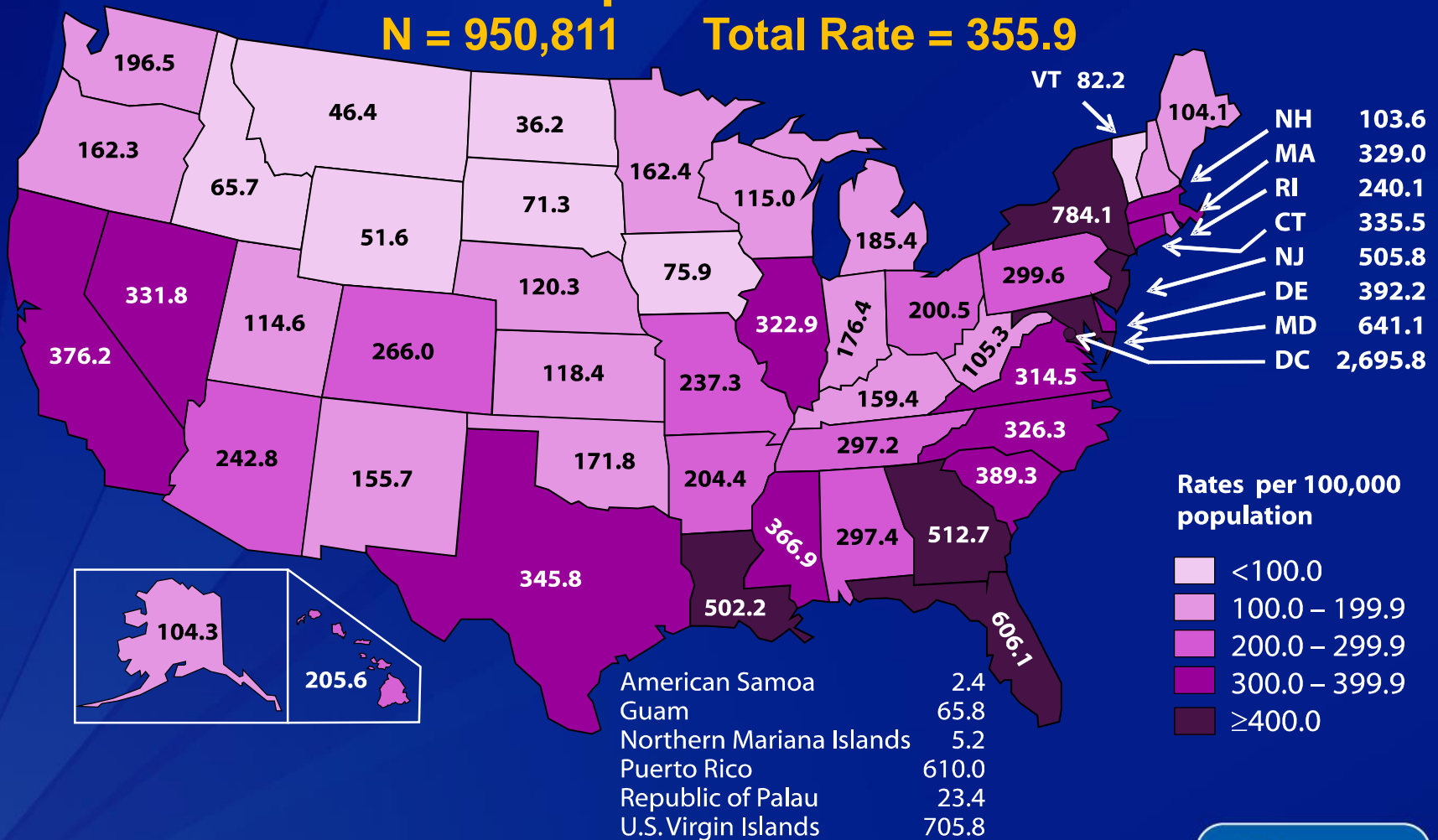
<sup>b</sup> Hispanics/Latinos can be of any race.

<sup>c</sup> Because column totals for estimated numbers were calculated independently of the values for the subpopulations, the values in each column may not sum to the column total.



# Rates of Adults and Adolescents Living with Diagnosed HIV Infection, Year-end 2013—United States and 6 Dependent Areas

**N = 950,811      Total Rate = 355.9**



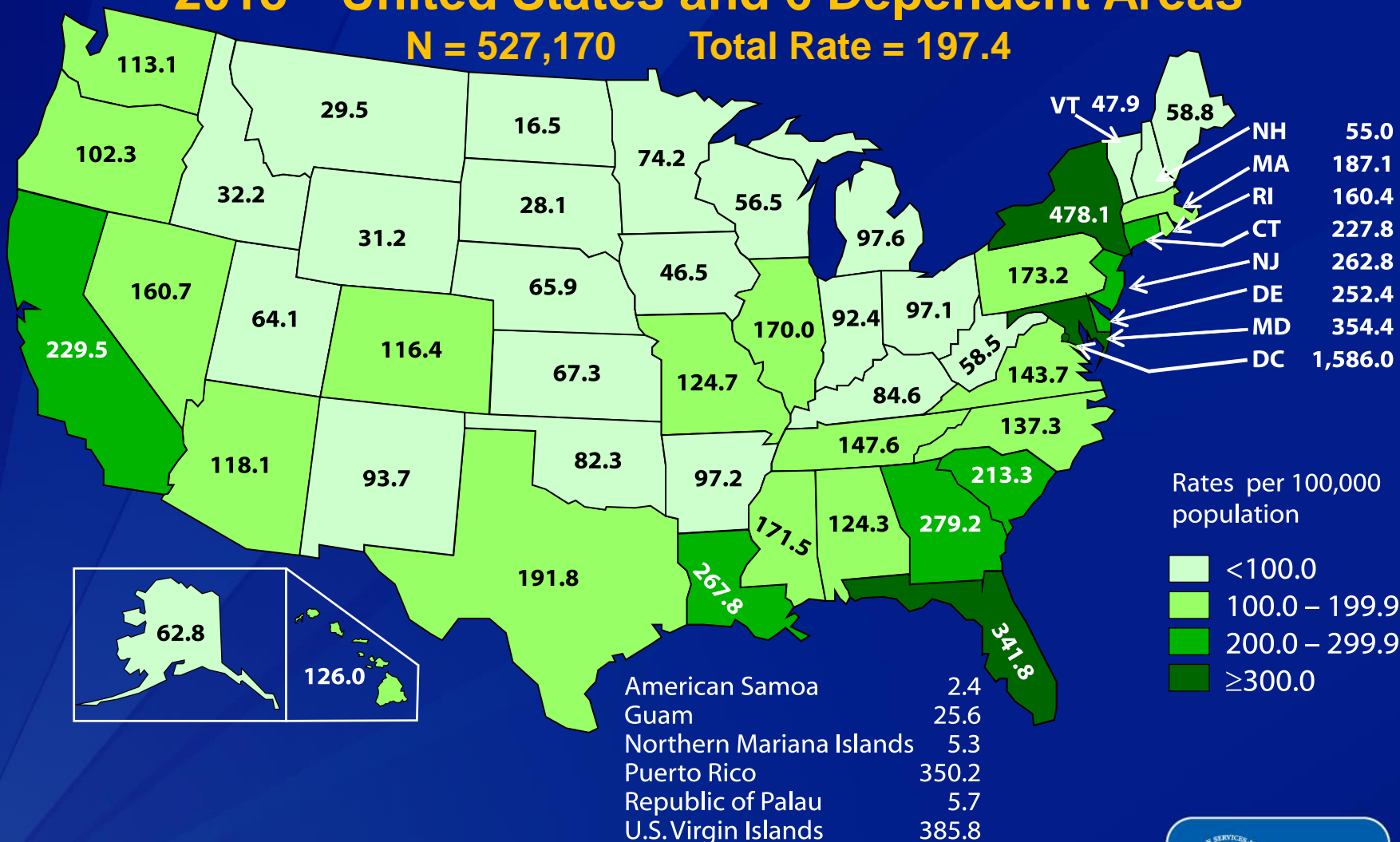
Note. Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. All displayed data have been statistically adjusted to account for reporting delays, but not for incomplete reporting.





# Rates of Adults and Adolescents Living with Diagnosed HIV Infection Ever Classified as Stage 3 (AIDS), Year-end 2013—United States and 6 Dependent Areas

N = 527,170 Total Rate = 197.4



Note. All displayed data have been statistically adjusted to account for reporting delays, but not for incomplete reporting.



# Epidemiology

- What is the current status of the HIV/AIDS epidemic in the state of Florida?
- How has it changed over time?

# The Epidemic in Florida

**Newly *diagnosed*\*\* HIV infections in 2014: 5,897**  
*(1<sup>st</sup> in the nation in 2013, up 17% from 2013 in FL)*

**Newly *diagnosed*\*\* AIDS cases in 2014: 2,349**  
*(1<sup>st</sup> in the nation in 2013, down 21% from 2013 in FL)*

**Cumulative pediatric AIDS cases *diagnosed*\*\* through 2014:**  
**1,548**  
*(2<sup>nd</sup> in the nation in 2013)*

**Persons *diagnosed* and living\*\*\***  
**with HIV disease through 2014: 110,000→**  
*(3<sup>rd</sup> in the nation in 2013)*

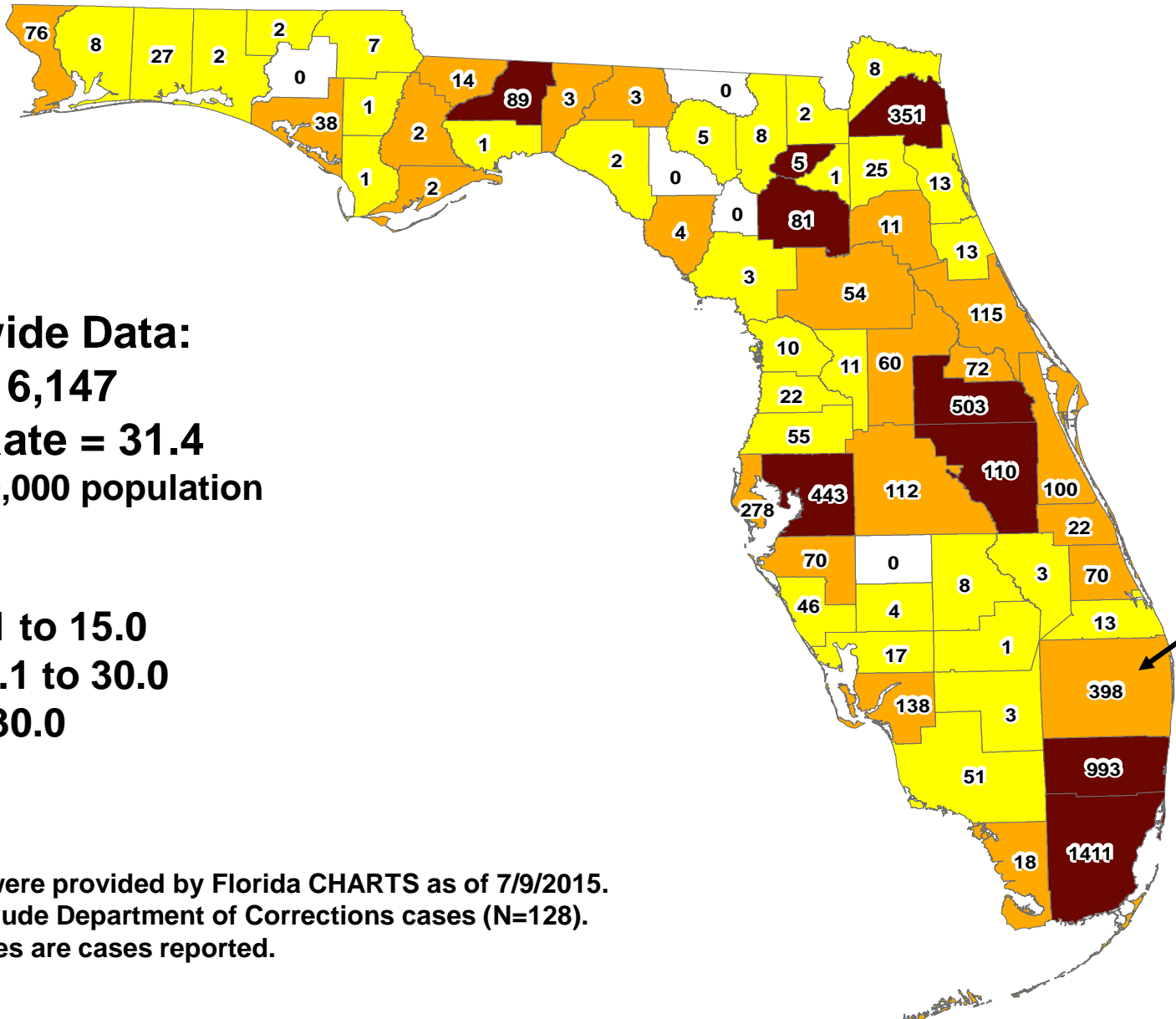
**HIV prevalence estimate through 2014: 126,100**  
*(accounts for 12.8% national estimated unaware of their status)*

\* Other = Asian/Pacific Islanders; American Indians/Alaskan Natives; multi-racial.

\*\* Data by year of diagnosis for 2014, data as of 06/30/2015

\*\*\* Living (prevalence) data as of 06/30/2015

# HIV Infection Case Rates\* by County of Residence,\*\* Reported in 2014, Florida



**Statewide Data:**

**N= 6,147**

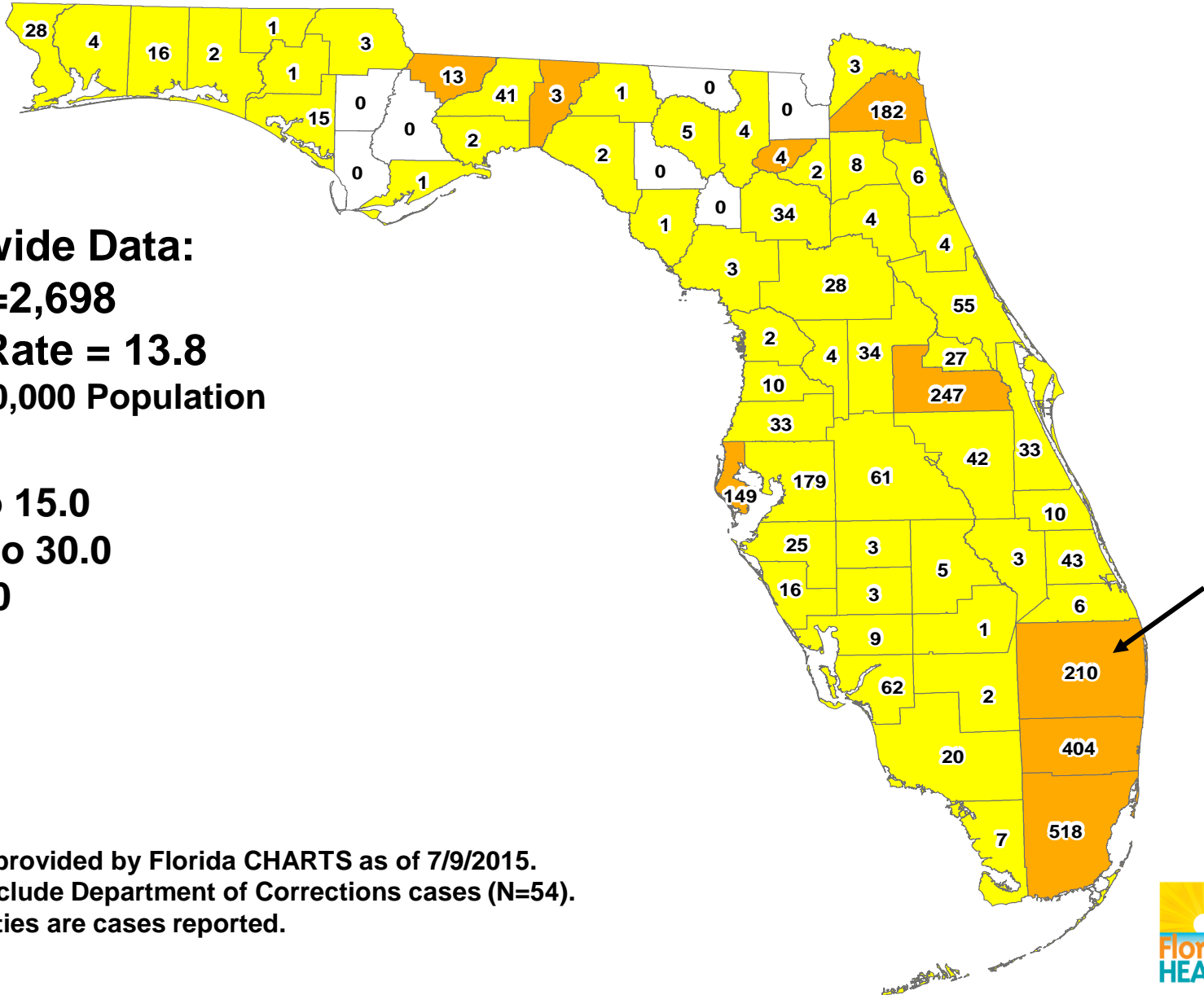
**State Rate = 31.4**

**Rate per 100,000 population**



\*Population data were provided by Florida CHARTS as of 7/9/2015.  
 \*\*County totals exclude Department of Corrections cases (N=128).  
 Numbers on counties are cases reported.

# AIDS Case Rates\* by County of Residence,\*\* Reported in 2014, Florida



**Statewide Data:**

**N=2,698**

**State Rate = 13.8**

**Rate per 100,000 Population**

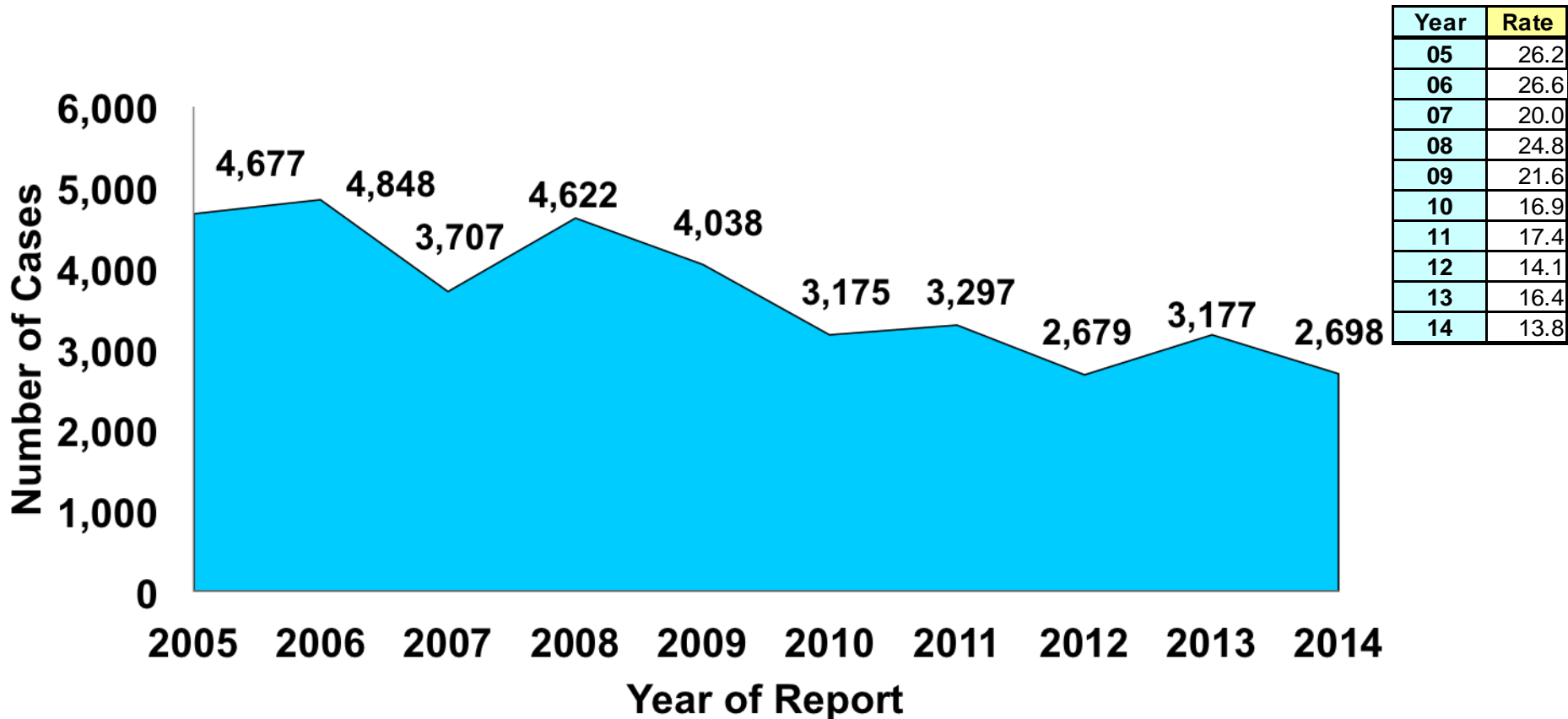


\*Population data provided by Florida CHARTS as of 7/9/2015.

\*\*County totals exclude Department of Corrections cases (N=54).

Numbers on counties are cases reported.

# AIDS Cases and Rates\*, by Year of Report, 2005-2014, Florida



**Note:**

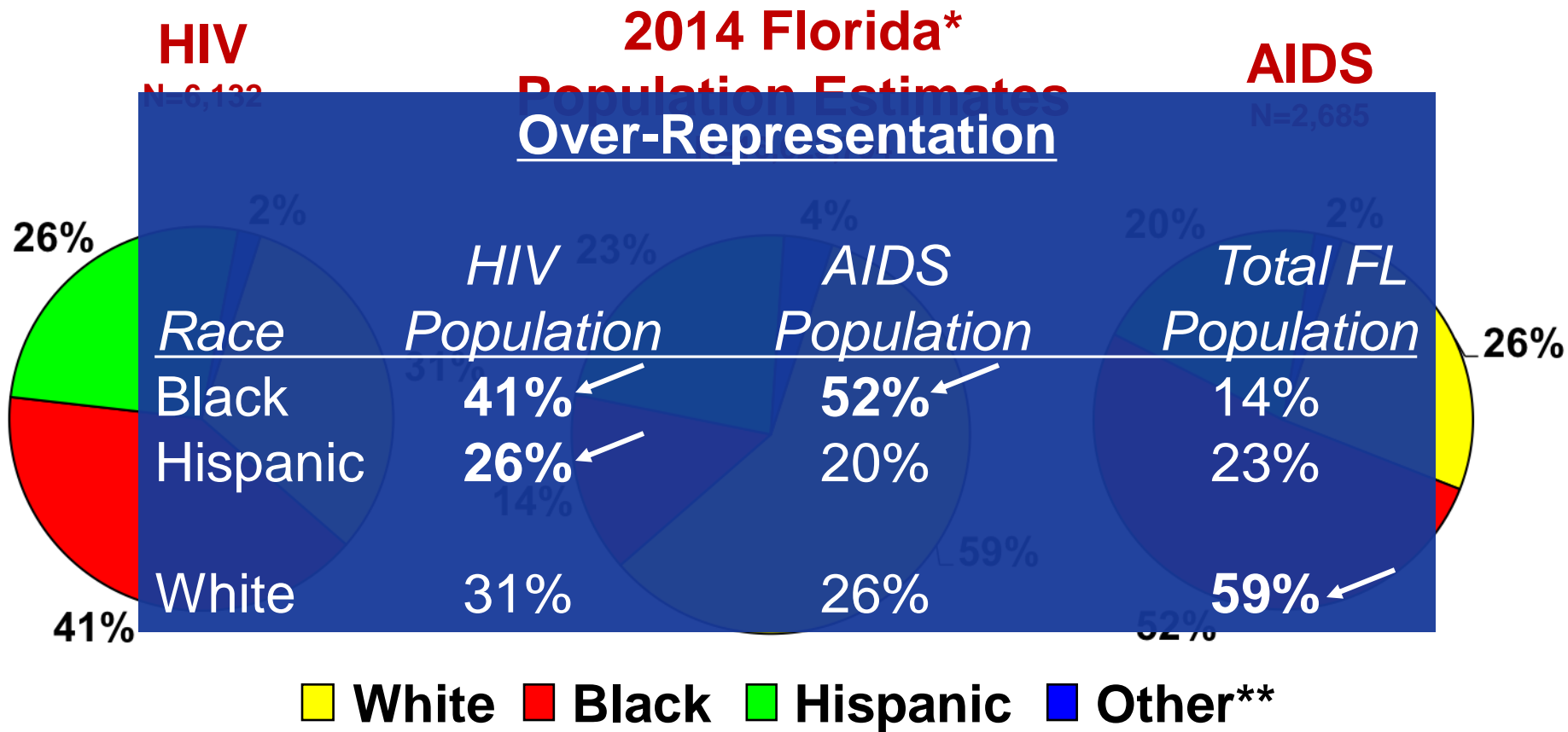
Enhanced laboratory reporting (ELR) laws in 2006 and the expansion of ELR in 2007 led to an artificial peak in newly reported cases of AIDS in 2008.

Another surge in the expansion of ELR in 2012 was followed by another increase in newly reported cases of AIDS in 2013.

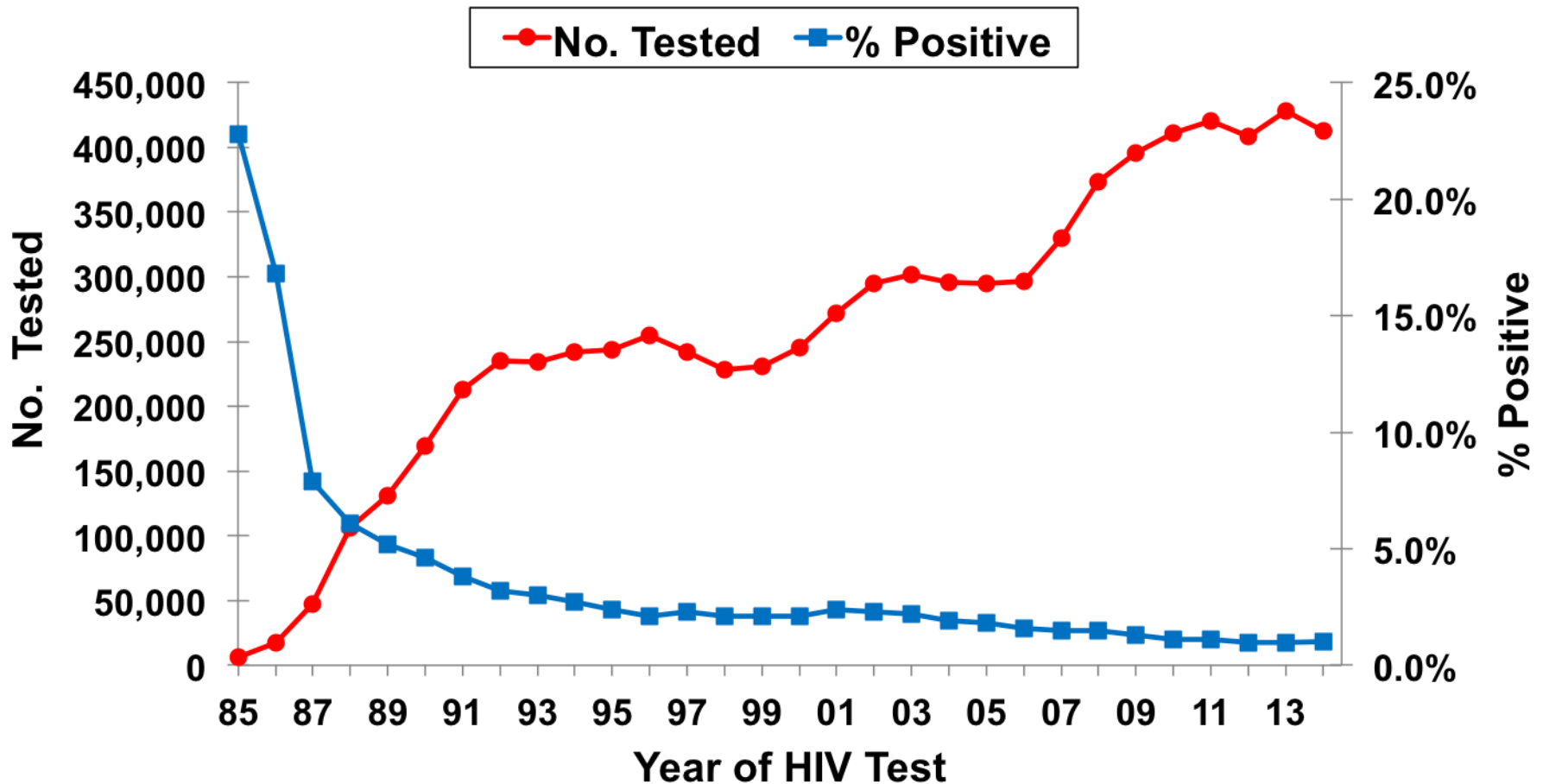
\*Source: Population estimates are provided by Florida CHARTS as of 7/9/2015.



# Adult HIV Infection and AIDS Cases Reported in 2014 and Population, by Race/Ethnicity, Florida



# HIV Tests Conducted in Florida and Seropositivity Rates\*, 1985-2014



\*Seropositivity rates are defined as the percent of positive over the number of tests conducted each year. Data validated from HIV CT as of 3/9/2015.





# Underlying Factors Affecting HIV/AIDS Disparities

- Amount of HIV already in the community
- Late diagnosis of HIV or AIDS\*
- Access to/acceptance of care\*
- Stigma, denial\*
- Discrimination, homophobia\*
- HIV/AIDS complacency\*
- Poverty and unemployment

**\*Factors that HIV/AIDS initiatives can impact.**

# Conference on Retroviruses and Opportunistic Infections (CROI). Boston, 2016.

- Hess K, et al. *Estimating the lifetime risk of a diagnosis of HIV infection in the United States. Abstract 52.*
- CDC calculated lifetime risk of HIV infection
  - General US population 1 in 64 people
  - Black 1 in 20
  - Hispanic 1 in 48
  - Hawaiian/Pacific Island 1 in 82
  - American Indian/Alaskan Native 1 in 129
  - White 1 in 132
  - Asians 1 in 174

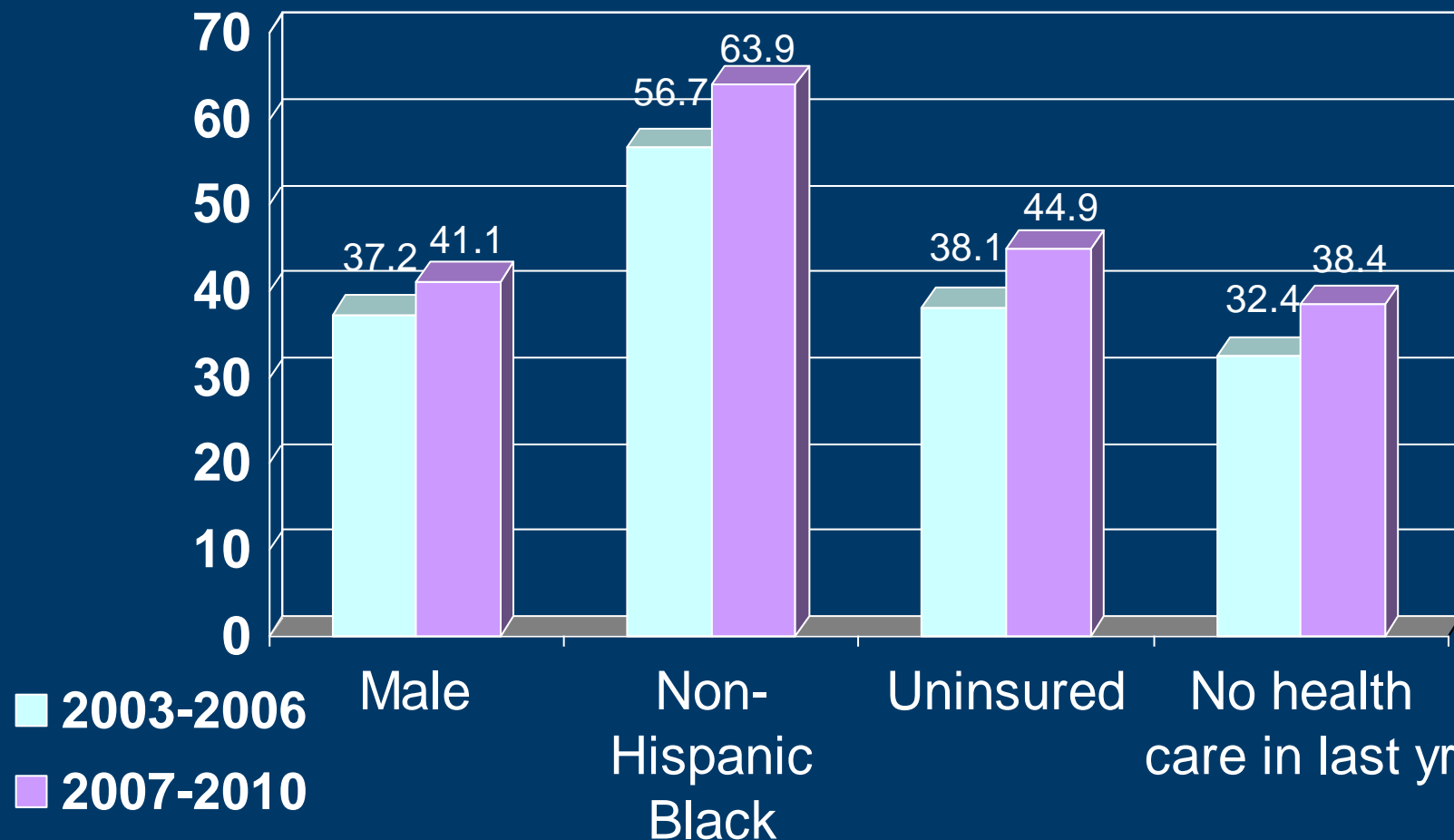
# Conference on Retroviruses and Opportunistic Infections (CROI). Boston, 2016.

- Hess K, et al. *Estimating the lifetime risk of a diagnosis of HIV infection in the United States*. Abstract 52.
- CDC calculated lifetime risk of HIV infection
  - MSM General 1 in 6 people
    - Black 1 in 2
    - Hispanic 1 in 4
    - White 1 in 11
  - IVDU
    - Women 1 in 23
    - Men 1 in 36
    - Black Women 1 in 6
    - Black Men 1 in 9

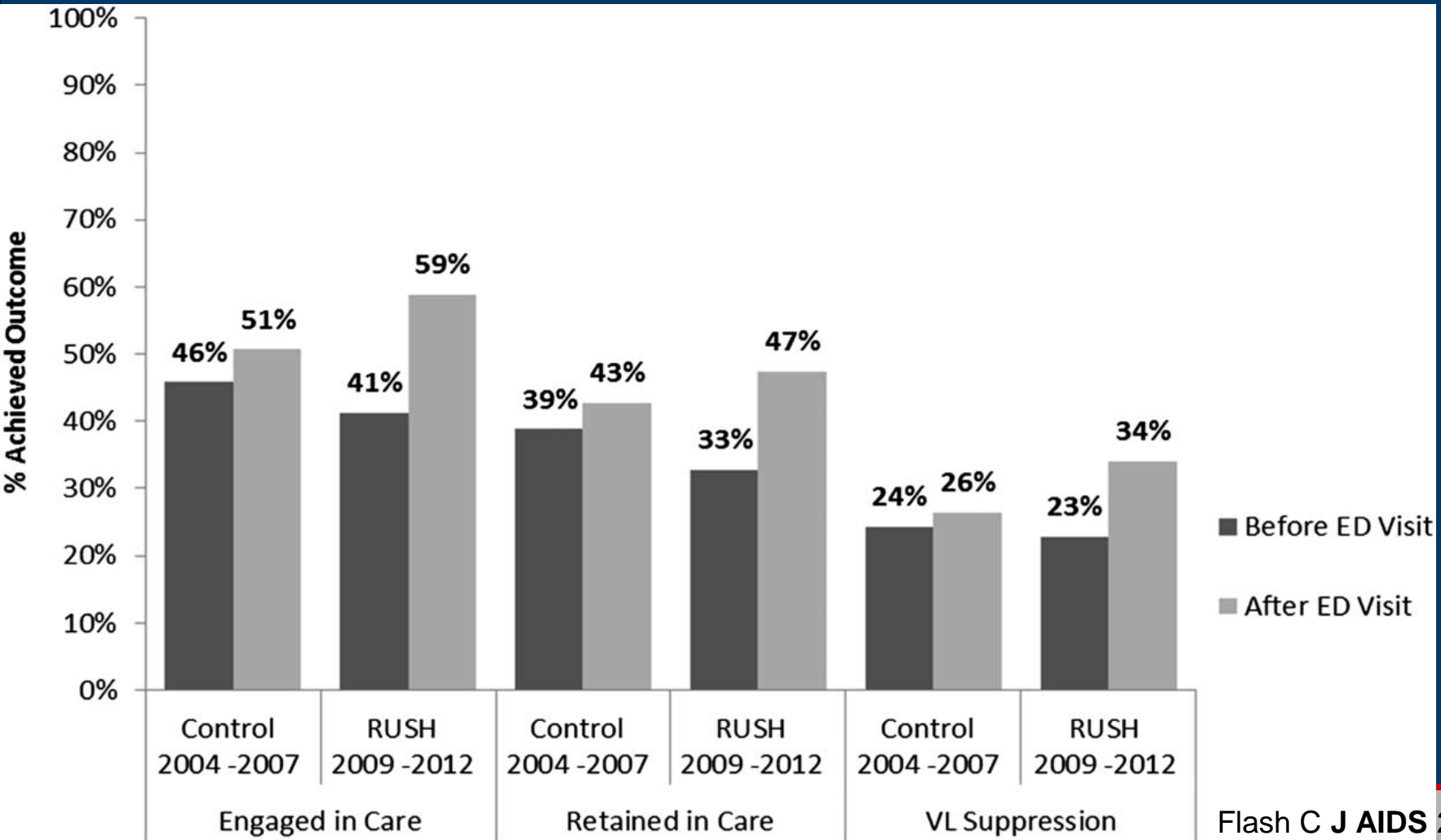
## CDC. Revised Recommendations for HIV Testing . . . MMWR. 2006;55(No.RR-14):1-24.

- HIV screening is recommended for patients in all health-care settings . . . unless the patient declines (opt-out screening).
- Separate written consent for HIV testing should not be required; general consent for medical care should be considered sufficient to encompass consent for HIV testing.
- Prevention counseling should not be required with HIV diagnostic testing or as part of HIV screening programs in health-care settings.

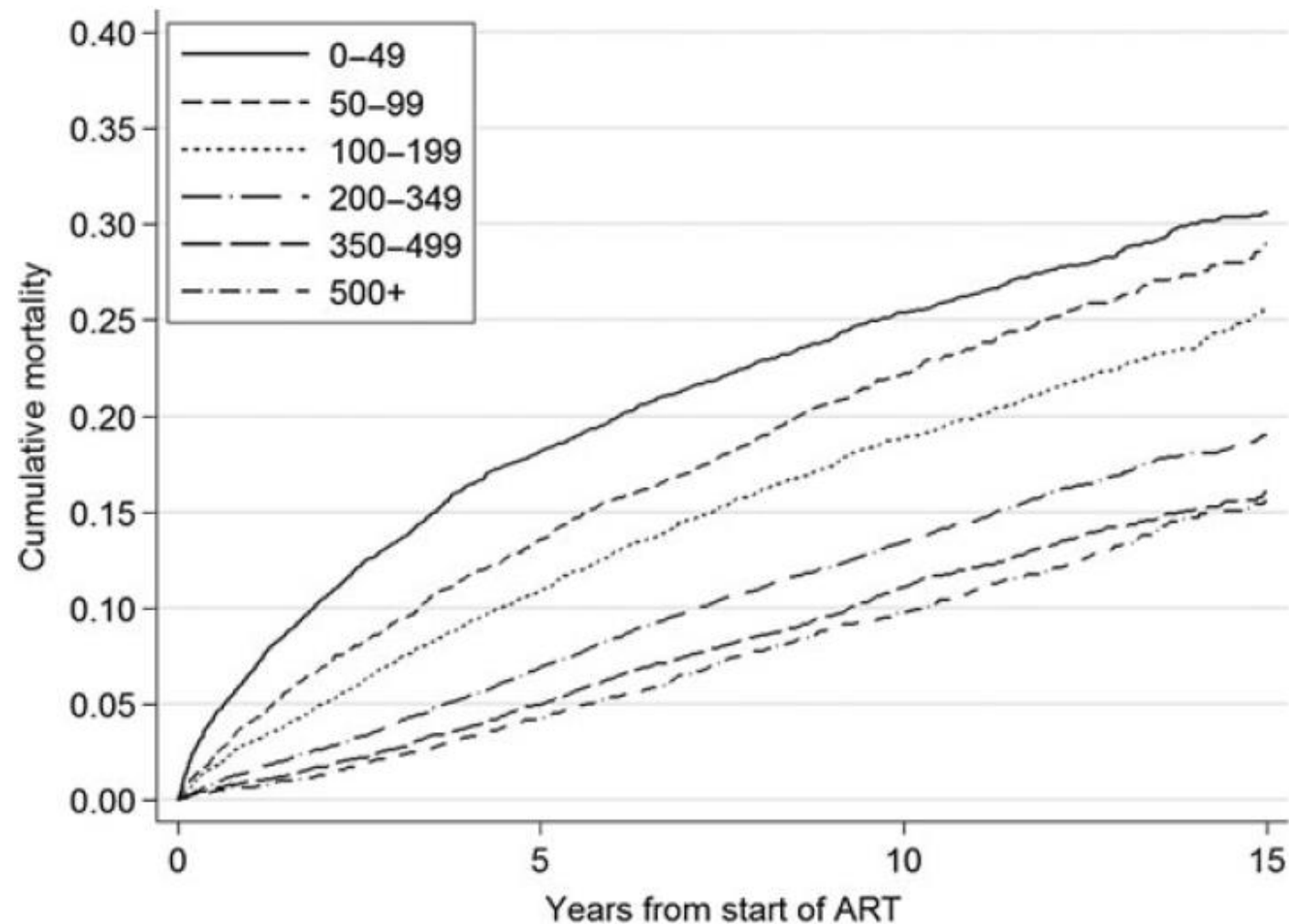
# Did CDC's 2006 revised HIV testing recommendations make a difference?



# Opt-Out HIV testing helps engagement and retention in care and VL suppression



# How does late entry into care affect outcomes?



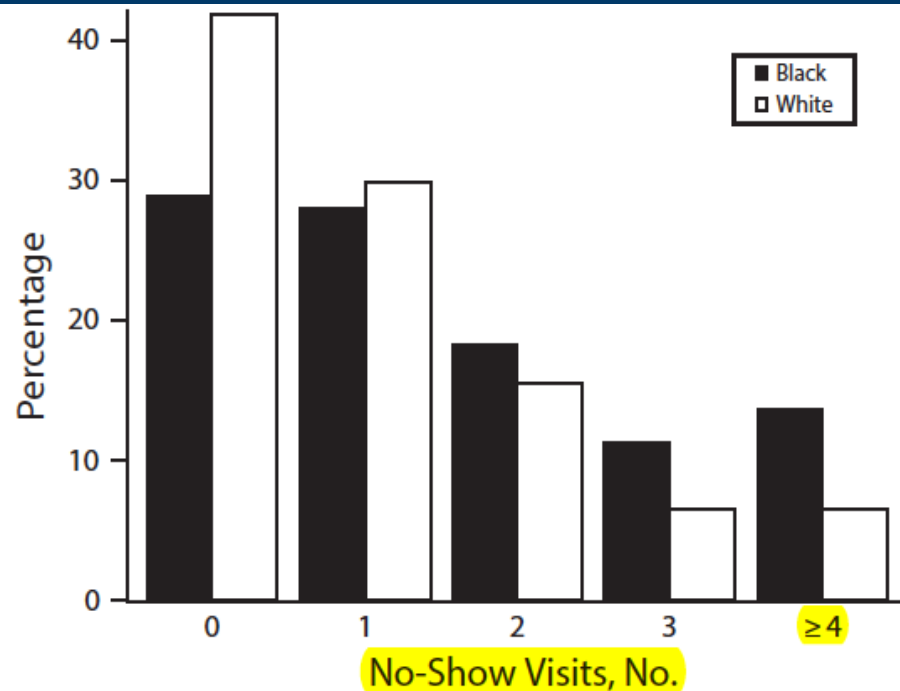
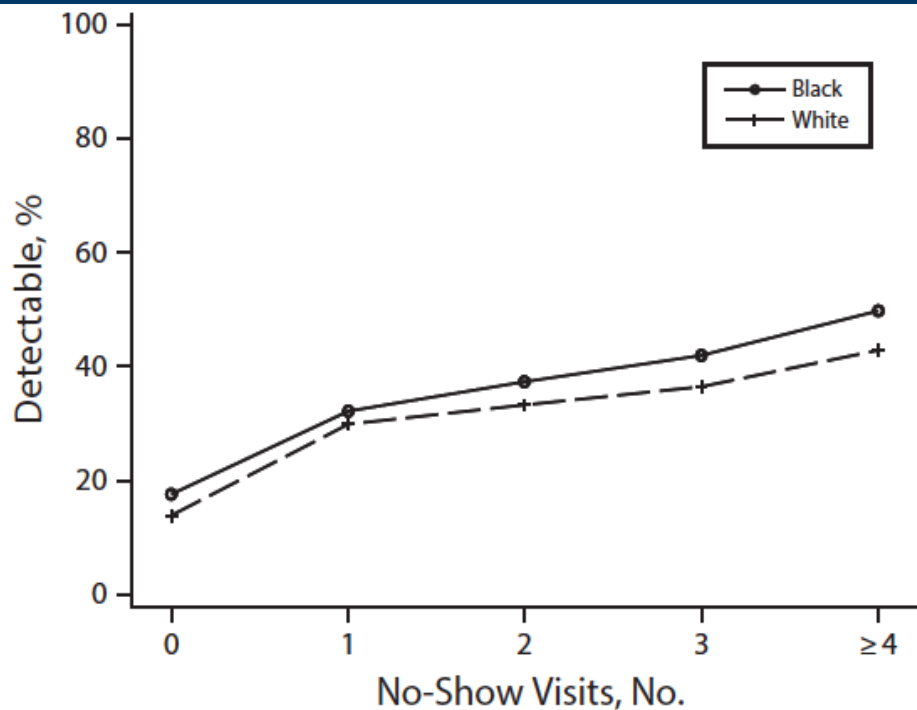
# Racial/ethnic disparities drive missed clinic visits and HIV viral load

**TABLE 2—Odds of Virological Failure in Multivariable Analyses for Characteristics With Patient Variables and No-Show Visit Count: Centers for Disease Control and Prevention and Health Resources and Services Administration Retention in Care Preintervention, 6 US Metropolitan Areas, May 2008–April 2009**

| Characteristic                      | Odds of VF, Patient Variables Only |             | Odds of VF, With No-Show Count |             |
|-------------------------------------|------------------------------------|-------------|--------------------------------|-------------|
|                                     | OR (95% CI)                        | <i>P</i>    | OR (95% CI)                    | <i>P</i>    |
| Gender: male vs female              | 1.05 (0.91, 1.21)                  | .526        | 1.07 (0.92, 1.23)              | .371        |
| Ethnicity: Hispanic vs non-Hispanic | <b>0.81</b> (0.67, 0.98)           | .03         | <b>0.79</b> (0.65, 0.96)       | <b>.015</b> |
| Race                                |                                    |             |                                |             |
| Black vs White                      | <b>1.19</b> (1.01, 1.40)           | <b>.039</b> | 1.11 (0.94, 1.32)              | .202        |
| Other vs White                      | 1.24 (0.89, 1.73)                  | .198        | 1.20 (0.85, 1.68)              | .283        |



# Racial/ethnic disparities drive missed clinic visits and HIV viral load



Note. The metropolitan areas surveyed were in Baltimore, MD; Birmingham, AL; Boston, MA; Brooklyn, NY; Houston, TX; and Miami, FL.

**FIGURE 1—Percentage of (a) virological failure by race stratified by frequency of no-show visits and (b) no-show visits by race: Centers for Disease Control and Prevention and Health Resources and Services Administration Retention in Care preintervention, 6 US metropolitan areas, May 2008 to April 2009.**

## Racial/ethnic disparities drive missed clinic visits and HIV viral load

All patients in the following settings (in areas of high undiagnosed HIV prevalence) should be routinely tested<sup>c</sup>

|   |                   |
|---|-------------------|
| <b>Prenatal care settings</b>   | <b>126 (92.6)</b> |
| <b>Primary care practices caring for adolescents (aged 13-17 years)</b>   | <b>74 (54.4)</b>  |
| <b>Primary care practices caring for adults (aged 18 years and older)</b> | <b>103 (75.7)</b> |
| <b>Emergency departments</b>  | <b>109 (80.1)</b> |
| <b>Hospital inpatient wards</b>   | <b>90 (66.2)</b>  |
| <b>Sexually transmitted infection clinics</b>                             | <b>132 (97.1)</b> |

# Care engagement: Do missed visits matter?

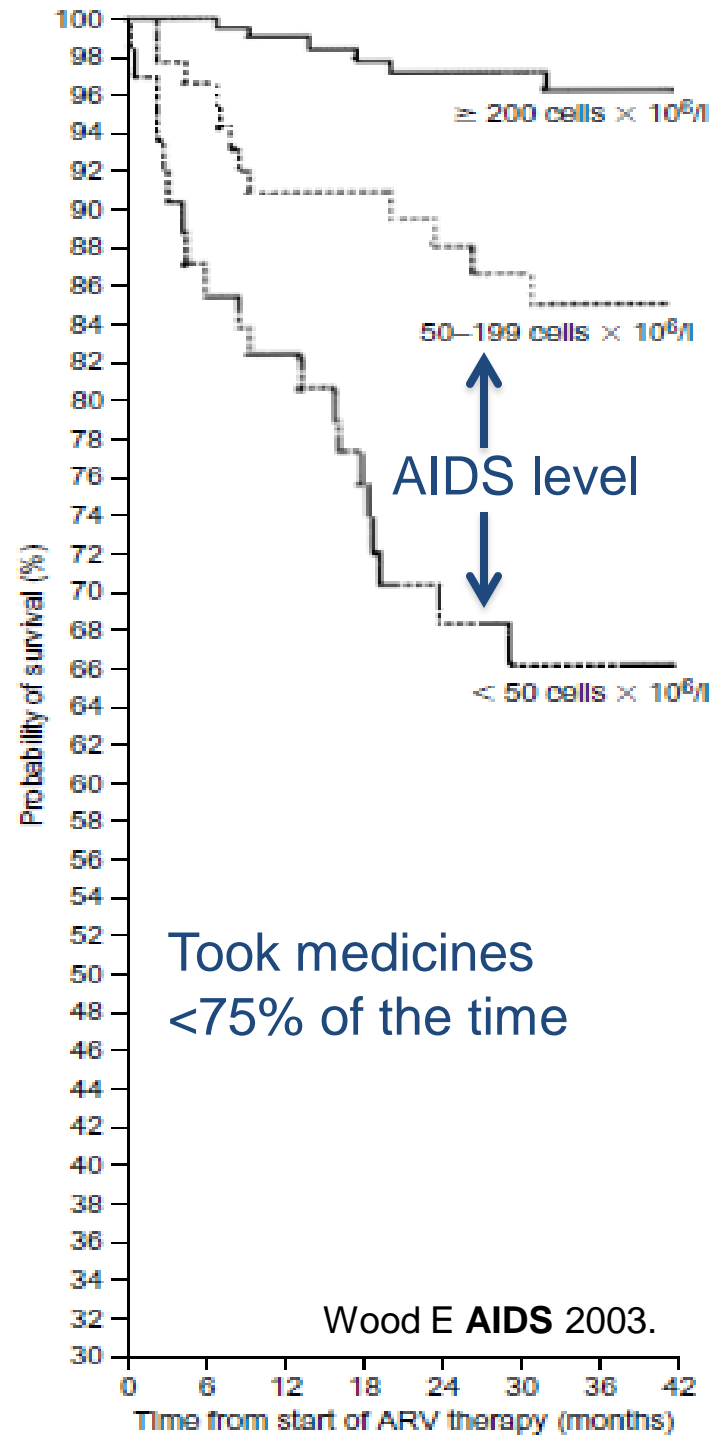
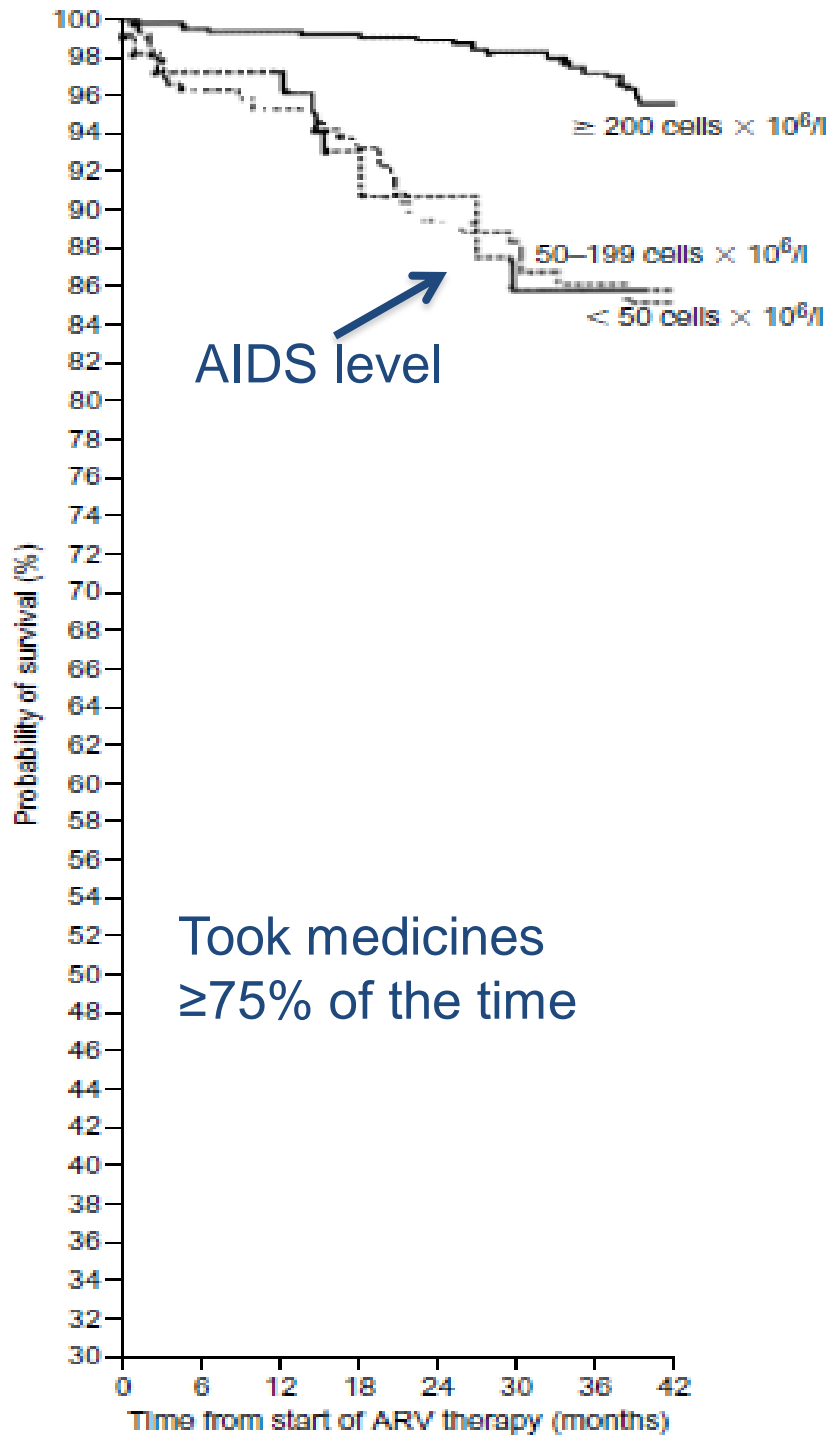
| Variable                                | Adjusted hazard ratio (95% CI) | <i>P</i> |
|---|--------------------------------|----------|
| No. of quarters with visit <sup>a</sup> |                                |          |
| 1                                       | 1.94 (1.36–2.76)               | <.001    |
| 2                                       | 1.68 (1.24–2.26)               | <.001    |
| 3                                       | 1.41 (1.10–1.82)               | <.01     |
| 4                                       | 1.00                           |          |
| Baseline CD4 <sup>+</sup> cell count    |                                |          |
| ≤200 × 10 <sup>6</sup> cells/L          | 2.35 (1.82–3.05)               | <.001    |
| 201–350 × 10 <sup>6</sup> cells/L       | 1.36 (0.99–1.87)               | .06      |
| >350 × 10 <sup>6</sup> cells/L          | 1.00                           |          |



# Care engagement: Do missed visits matter?



| Variable                                      | Adjusted hazard ratio (95% CI) | P     |
|---|--------------------------------|-------|
| <b>No. of quarters with visit<sup>a</sup></b> |                                |       |
| 1   | 1.94 (1.36–2.76)               | <.001 |
| 2   | 1.68 (1.24–2.26)               | <.001 |
| 3   | 1.41 (1.10–1.82)               | <.01  |
| 4   | 1.00                           |       |
| <b>Baseline CD4<sup>+</sup> cell count</b>    |                                |       |
| ≤200 × 10 <sup>6</sup> cells/L                | 2.35 (1.82–3.05)               | <.001 |
| 201–350 × 10 <sup>6</sup> cells/L             | 1.36 (0.99–1.87)               | .06   |
| >350 × 10 <sup>6</sup> cells/L                | 1.00                           |       |



## Financial Barriers of Care: Competing Subsistence Needs

- Competing Subsistence Needs
  - Routine basic necessities (food, shelter, clothing, child care, etc) that compete for resources otherwise used on health care.
- Cunningham W, et al. 1999.
  - HCSUS Cohort 1996-1997.
  - Prospective interview on social determinants.
  - 2,864 individuals living with HIV interviewed

## Financial Barriers of Care: Competing Subsistence Needs

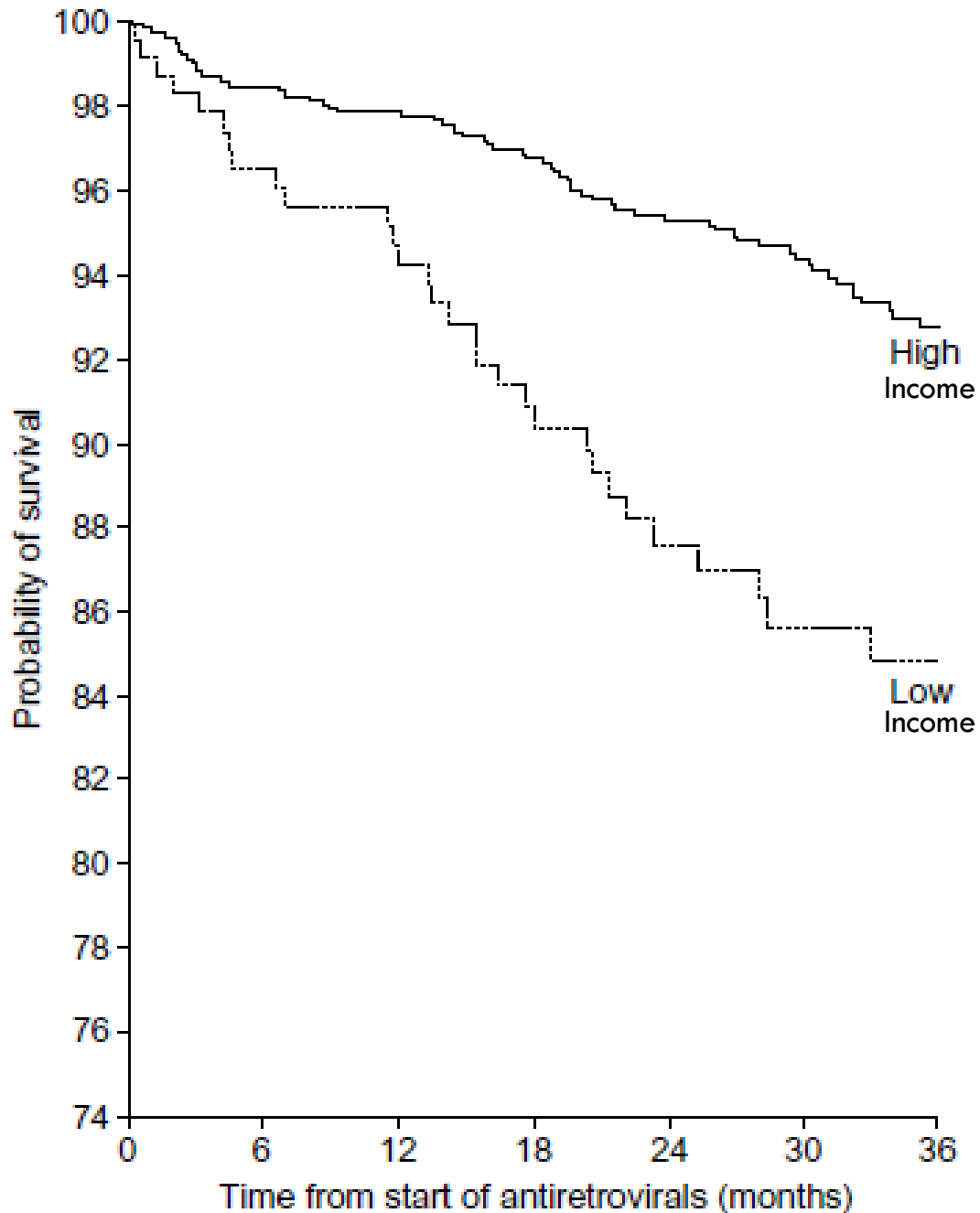
- >33% of the 2,864 sampled patients in care missed or postponed care because of  $\geq 1$  of the 4 reasons.
  - Needed money for food, clothing, housing
  - Lacked transportation
  - Felt too sick
  - Couldn't get off work
- Some reported foregoing food, clothing, and/or housing because needed money for medical care.

## Financial Barriers of Care: Competing Subsistence Needs

- Approximately 1/3 of people with each barrier go to the ED for access to care.

| Barrier to Care   | ED Visit in Past 6 Months |
|---|---------------------------|
| Needed money for food, clothing, housing                          | 32.9%                     |
| Lacked Transportation   | 35.4%                     |
| Felt too sick   | 39.7%                     |
| Foregoing food, clothing, and/or housing because for medical care | 37.5%                     |





## Financial Barriers: Survival Impact

## HIV/AIDS Mortality

- How has the lifespan changed since pre-HAART (pre-1996) era?
- What are the common causes of mortality nowadays?

## Conference on Retroviruses and Opportunistic Infections (CROI). Boston, 2016.

- Marcus JL, et al. *Narrowing the gap in life expectancy for HIV+ compared with HIV- individuals*. Abstract 54.
  - Question: What is the life-expectancy gap between PLWHIV and HIV uninfected patients?
  - Cohort comparison between 25,768 PLWHIV and 257,600 HIV uninfected patients.
    - Cohort match: age, gender, med center, and year.
    - Retrospective analysis of Kaiser Permanente EMR, CA state death certificate registry, and Social Security Admin databases.
    - Patient data 1996 – 2011.

# Conference on Retroviruses and Opportunistic Infections (CROI). Boston, 2016.

- Marcus JL, et al. *Narrowing the gap in life expectancy for HIV+ compared with HIV- individuals. Abstract 54.*

## Additional Yrs of Life at Age 20yrs

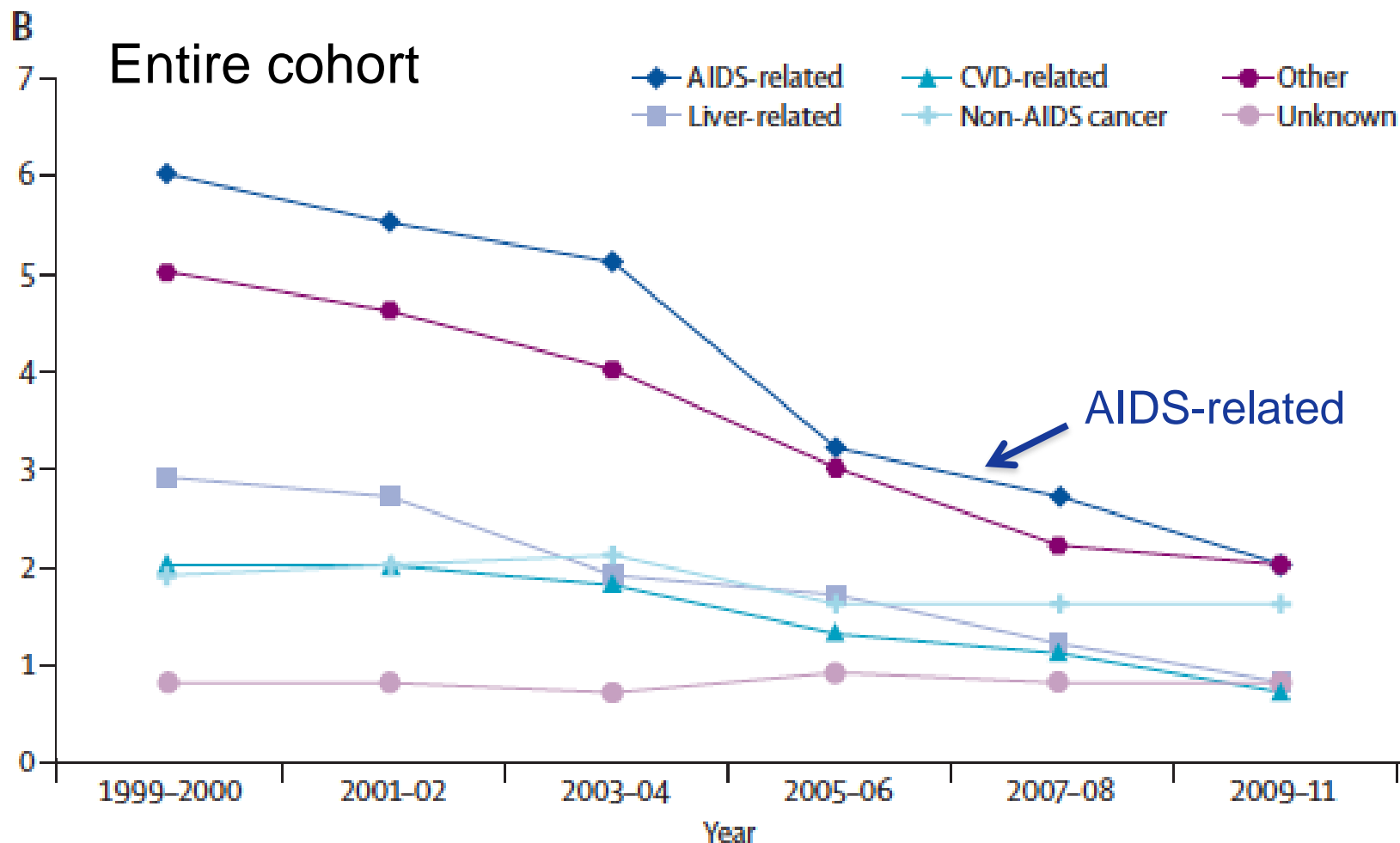
| Era       | HIV +    | HIV -    | Gap     |
|-----------|----------|----------|---------|
| 1996-2006 | +36yrs   | +62.3yrs | 26.3yrs |
| 2007-2011 | +48.5yrs | +62.3yrs | 13.8yrs |

# Causes of Mortality in People Living with HIV

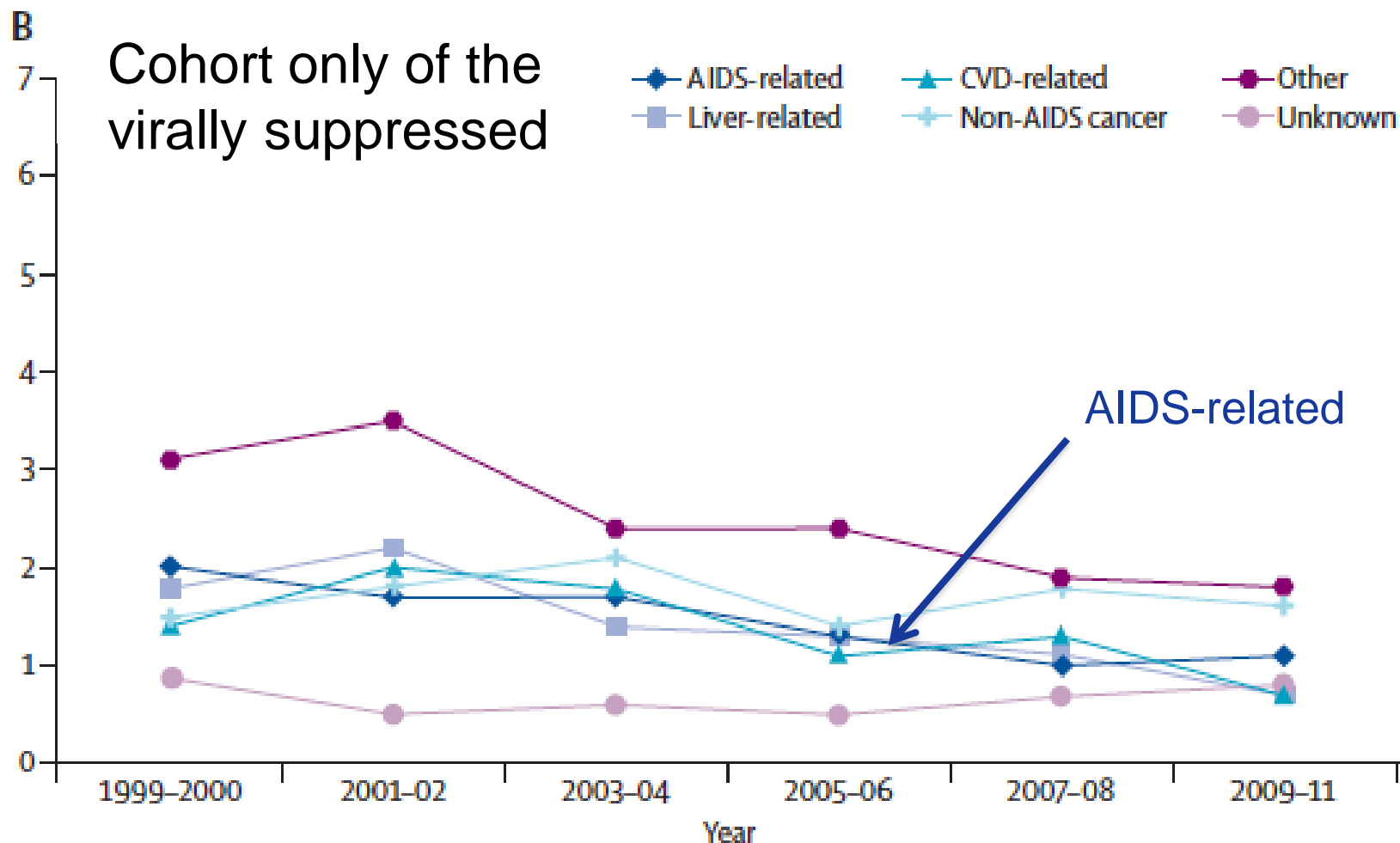
- Analysis of D:A:D collaborative cohort database.
  - 1999 - 2011
  - n=3,909

|                               |       |
|-------------------------------|-------|
| AIDS-relate                   | 29%   |
| Liver-related                 | 13%   |
| -Chronic viral hepatitis      | 11%   |
| -Liver failure                | 2%    |
| CVD-related                   | 11%   |
| -MI or other heart disease    | 8%    |
| -Stroke or other CVD          | 3%    |
| -DM related complications     | <0.5% |
| Non-AIDS cancers              | 15%   |
| Other or unknown              | 32%   |
| -Suicide                      | 4%    |
| -Invasive bacterial infection | 7%    |

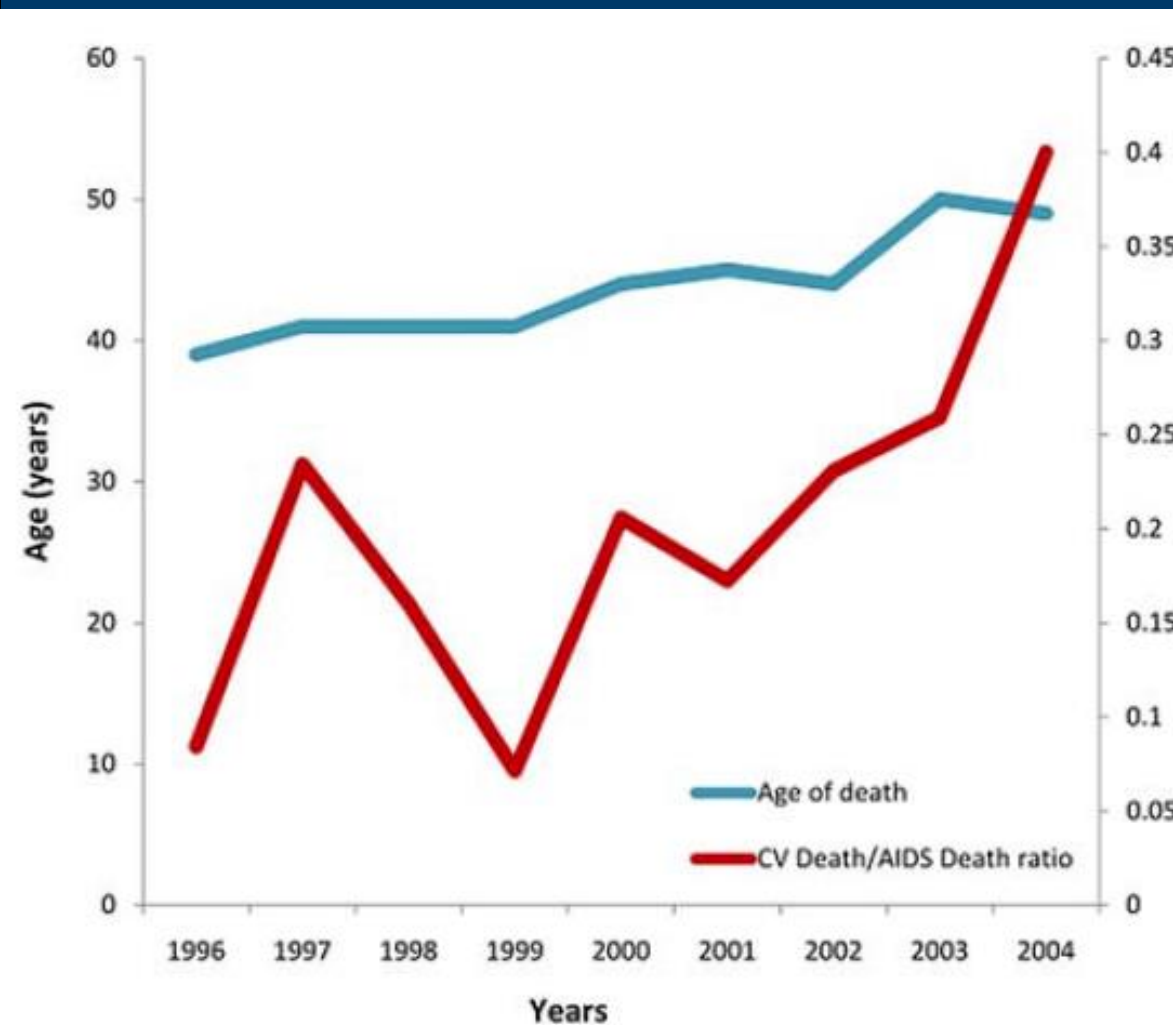
# Causes of Mortality in People Living with HIV: Trend in Changes



# Causes of Mortality in People Living with HIV: Trend in Changes



# Causes of Mortality in People Living with HIV: Trend in Changes



- Data from the HOPS trial  
n=6945
- Red line is ratio of CV Death to AIDS



# Pre-Exposure Prophylaxis (PrEP)

- What is recommended?
- Is it effective?

## Pre-Exposure Prophylaxis (PrEP)

- Daily oral PrEP (combination tenofovir disoproxil fumarate (TDF) 300 mg + emtricitabine (FTC) 200 mg) is recommended as one prevention option:
  - Adult MSM (men who have sex with men) at substantial risk of HIV acquisition (IA)
  - Adult heterosexually active men and women who are at substantial risk of HIV acquisition. (IA)
  - Injection drug users (IDU) at substantial risk of HIV acquisition. (IA)

## Pre-Exposure Prophylaxis (PrEP)

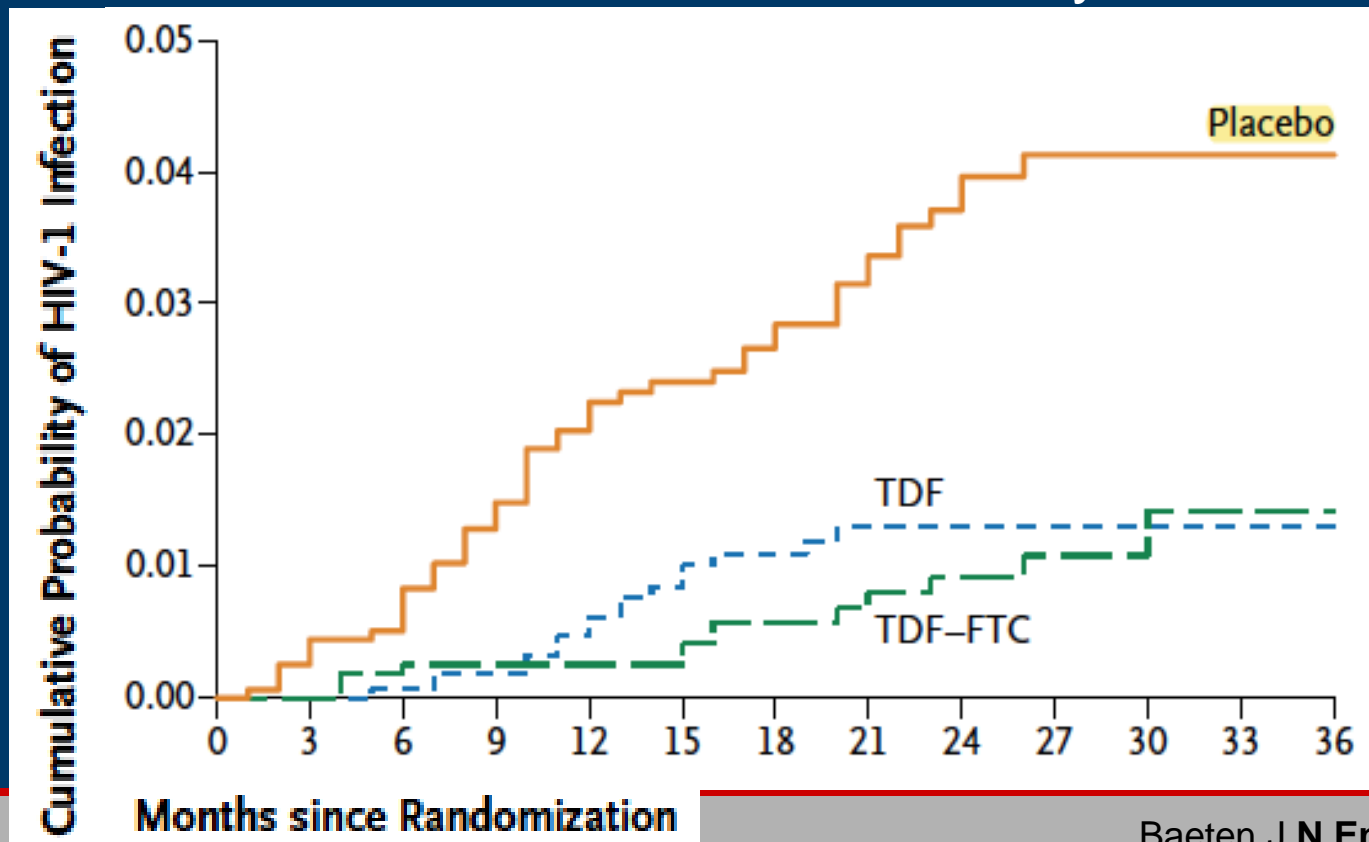
- Daily oral PrEP (combination tenofovir disoproxil fumarate (TDF) 300 mg + emtricitabine (FTC) 200 mg) should be discussed:
  - Uninfected heterosexually-active individuals whose partners are HIV infected (HIV-discordant couples) as one option to protect the uninfected partner during conception and pregnancy. (IIB)
- Data is insufficient for the efficacy and safety of PrEP for adolescents. The risks and benefits of PrEP should be weighed carefully in the context of local laws and regulations about autonomy in health care decision-making by minors. (IIB)

## Pre-Exposure Prophylaxis (PrEP)

- Baeten J, et al. *Antiretroviral Prophylaxis for HIV Prevention in Heterosexual Men and Women*. **N Engl J Med**. 2012.
  - Oral NRTI medication given to HIV-1 negative partners of heterosexual serodiscordant couples (one partner + and other partner neg for HIV)
  - Once daily medication – 3 arms (n=4747)
    - Tenofovir (TDF) n=1584
    - Tenofovir-Emtracitabine (TDF/FTC) n=1579
    - Placebo n=1584

# Pre-Exposure Prophylaxis (PrEP): TDF-FTC (Truvada)

- TDF alone reduced HIV-1 transmission by 67%.
- TDF/FTC reduced HIV-1 transmission by 75%.

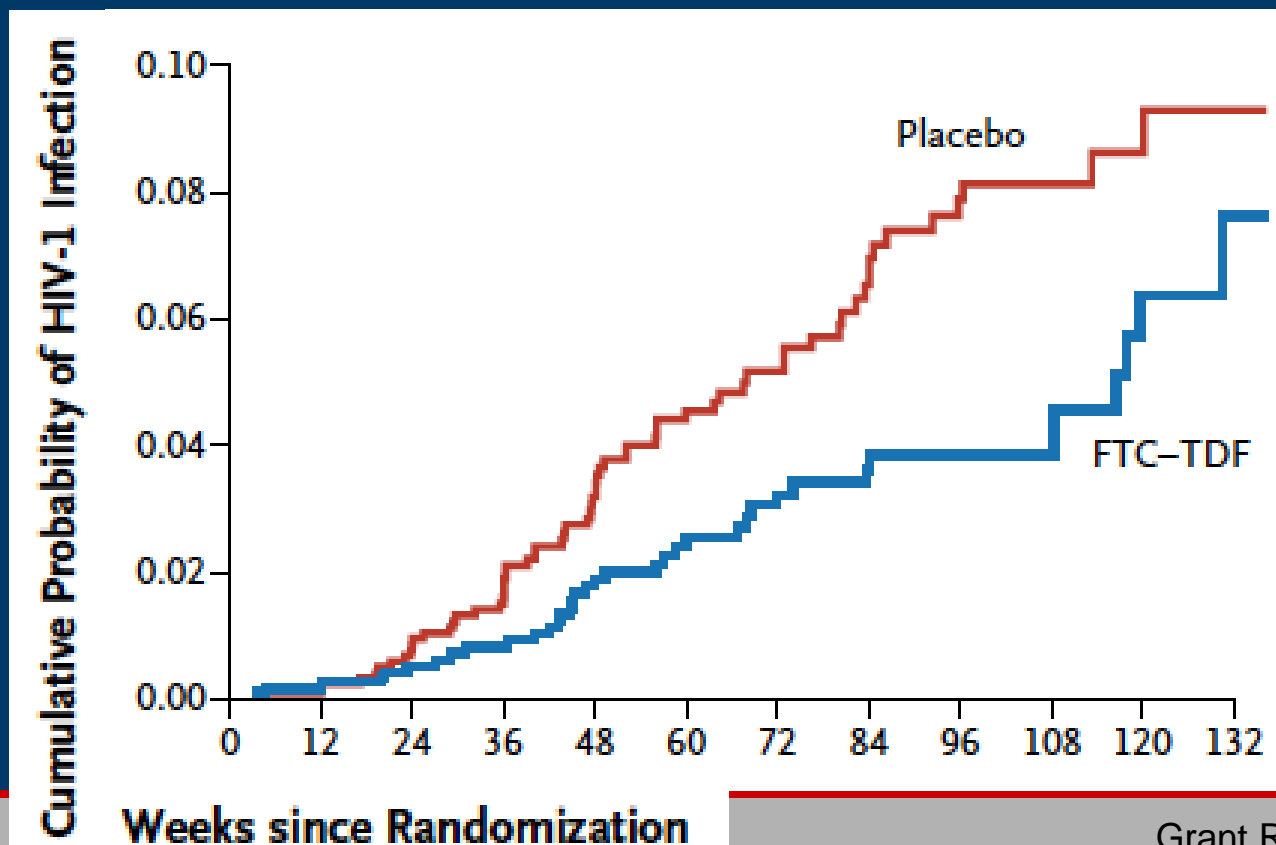


## Pre-Exposure Prophylaxis (PrEP)

- Grant R, et al. *Preexposure Chemoprophylaxis for HIV Prevention in Men Who Have Sex with Men*. **N Engl J Med**. 2010.
  - Oral NRTI medication given to HIV-1 negative men or transgender women who have sex with men
  - Once daily NRTI – 2 arms (n=2499)
    - Tenofovir-Emtracitabine (TDF/FTC) n=1579
    - Placebo n=1584

# Pre-Exposure Prophylaxis (PrEP)

- TDF/FTC reduced HIV-1 transmission by 44%.



# Pre-Exposure Prophylaxis (PrEP): Dapivirine Vaginal Ring in Women

- Silicone elastomer vaginal matrix ring containing NNRTI dapivirine 25 mg; ring replaced every 4 wks
  - Randomized, double-blind phase III trials
  - Sexually active HIV uninfected women
  - Primary endpoints: efficacy and safety

Dapivirine 25 mg Vaginal Ring Q4W +  
HIV Prevention Service Package  
(ASPIRE<sup>1,2</sup>: n = 1313; IPM-027<sup>3</sup>: n = 1300)

Versus

Placebo Vaginal Ring Q4W +  
HIV Prevention Service Package  
(ASPIRE<sup>1,2</sup>: n = 1316; IPM-027<sup>3</sup>: n = 650)

1. Baeten JM, et al. CROI 2016. Abstract 109LB.

2. Baeten JM, et al. N Engl J Med. 2016;[Epub ahead of print].

3. Nel A, et al. CROI 2016. Abstract 110LB.





# Pre-Exposure Prophylaxis (PrEP): Dapivirine Vaginal Ring in Women

| Outcome  | ASPIRE <sup>[1,2]</sup> : 15 Sites |                       | ASPIRE <sup>[1,2]</sup> : 13 Sites* |                       | IPM-027/Ring Study <sup>[3]</sup> |                      |
|--|------------------------------------|-----------------------|-------------------------------------|-----------------------|-----------------------------------|----------------------|
|  | Dapivirine<br>(n = 1308)           | Placebo<br>(n = 1306) | Dapivirine<br>(n = 1198)            | Placebo<br>(n = 1197) | Dapivirine<br>(n = 1300)          | Placebo<br>(n = 650) |
| HIV infections, n                              | 71                                 | 97                    | 54                                  | 85                    | 77                                | 56                   |
| HIV incidence<br>(per 100 PYs)                 | 3.3                                | 4.5                   | 2.8                                 | 4.4                   | 4.1                               | 6.1                  |
| <b>HIV protection<br/>efficacy, %</b>          | <b>27 (P = .046)</b>               |                       | <b>37 (P = .007)</b>                |                       | <b>31 (P = .040)</b>              |                      |
| ▪ <b>Among<br/>women older<br/>than 21 yrs</b> | -                                  |                       | <b>56 (P &lt; .001)</b>             |                       | <b>37 (P = .10)</b>               |                      |

1. Baeten JM, et al. CROI 2016. Abstract 109LB.
2. Baeten JM, et al. N Engl J Med. 2016;[Epub ahead of print].
3. Nel A, et al. CROI 2016. Abstract 110LB.

## Summary

- The incidence of HIV/AIDS is decreasing, but the population of HIV-1 infected people continues to grow.
- Racial/ethnic minorities over-represent the HIV infected population and remain at risk for health care disparities.
- Late entry into care and poor adherence to care is strongly associated with increased mortality.
- Non-AIDS related causes of mortality, particularly CVD and hepatic disease, are increasing in relationship to AIDS related causes.
- Certain medications have been approved for PreP.

## Summary

- There is a broad armamentum of effective antiviral medications for successful HIV suppression.
- Genetic sequence manipulation (such as CRISPR) may be the future of curing HIV.

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