




# Update on HIV in the United States



Kevin Fenton, MD, PhD, FFPH  
National Center for HIV/AIDS,  
Viral Hepatitis, STD, and TB Prevention  
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**2008 National Summit on HIV Diagnosis**



# Overview

- ① HIV Prevalence
- ② HIV Incidence
- ③ HIV in Special Populations
- ④ Implications of HIV Prevention

# HIV Prevalence



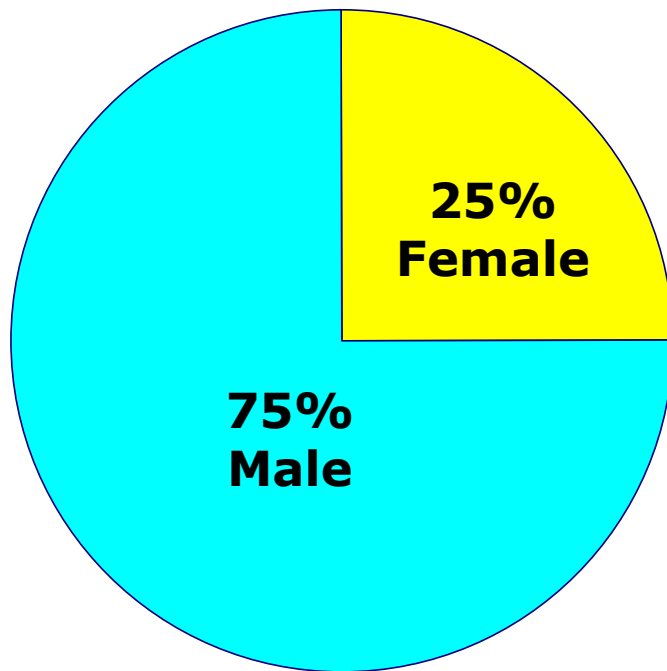
# Methods

- ➔ Prevalence was calculated by an **extended back-calculation** methodology
  - Incorporates AIDS, HIV and HIV testing data from routine surveillance
- ➔ Undiagnosed infections calculated by **subtracting** diagnosed AIDS prevalence and diagnosed HIV prevalence from estimated overall prevalence

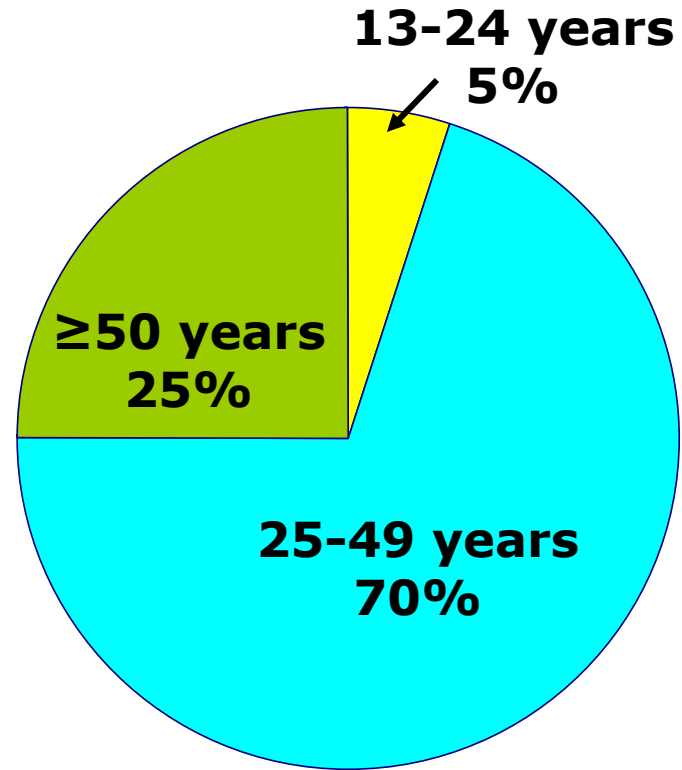
In 2006, there were an estimated\* **1,106,400** (95%CI 1,056,400-1,156,400) prevalent HIV infected individuals in the United States of which **232,700 (21%)** were undiagnosed

\* Data from Extended Back Calculation Approach

# Estimated HIV Prevalence, by Sex and Age, United States, 2006

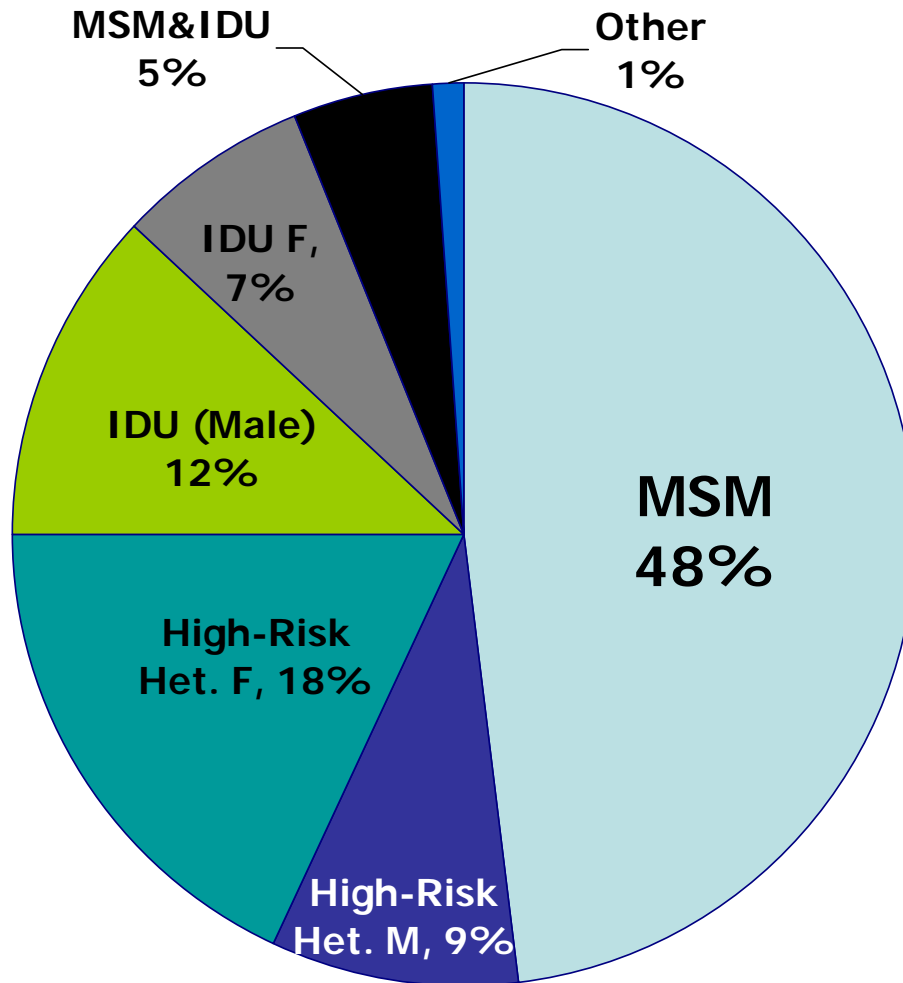


HIV Prevalence, by Gender



HIV Prevalence, by Age

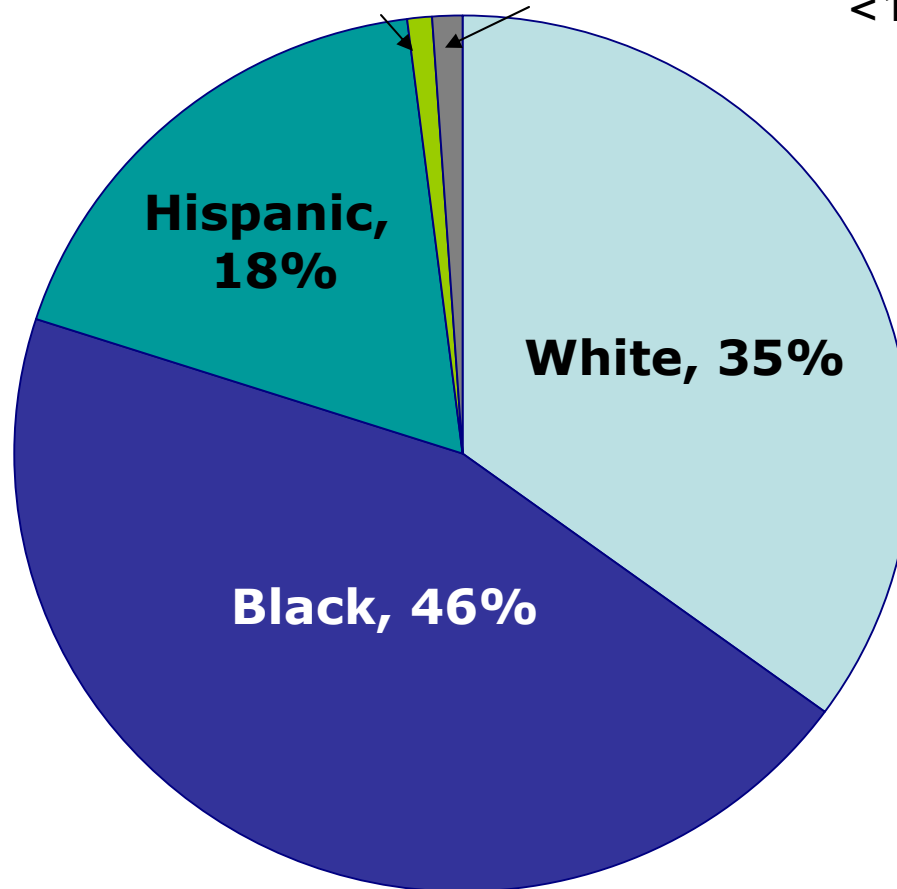
# Estimated HIV Prevalence, by Transmission Category, 2006



# Estimated HIV Prevalence, by Race/Ethnicity, United States, 2006

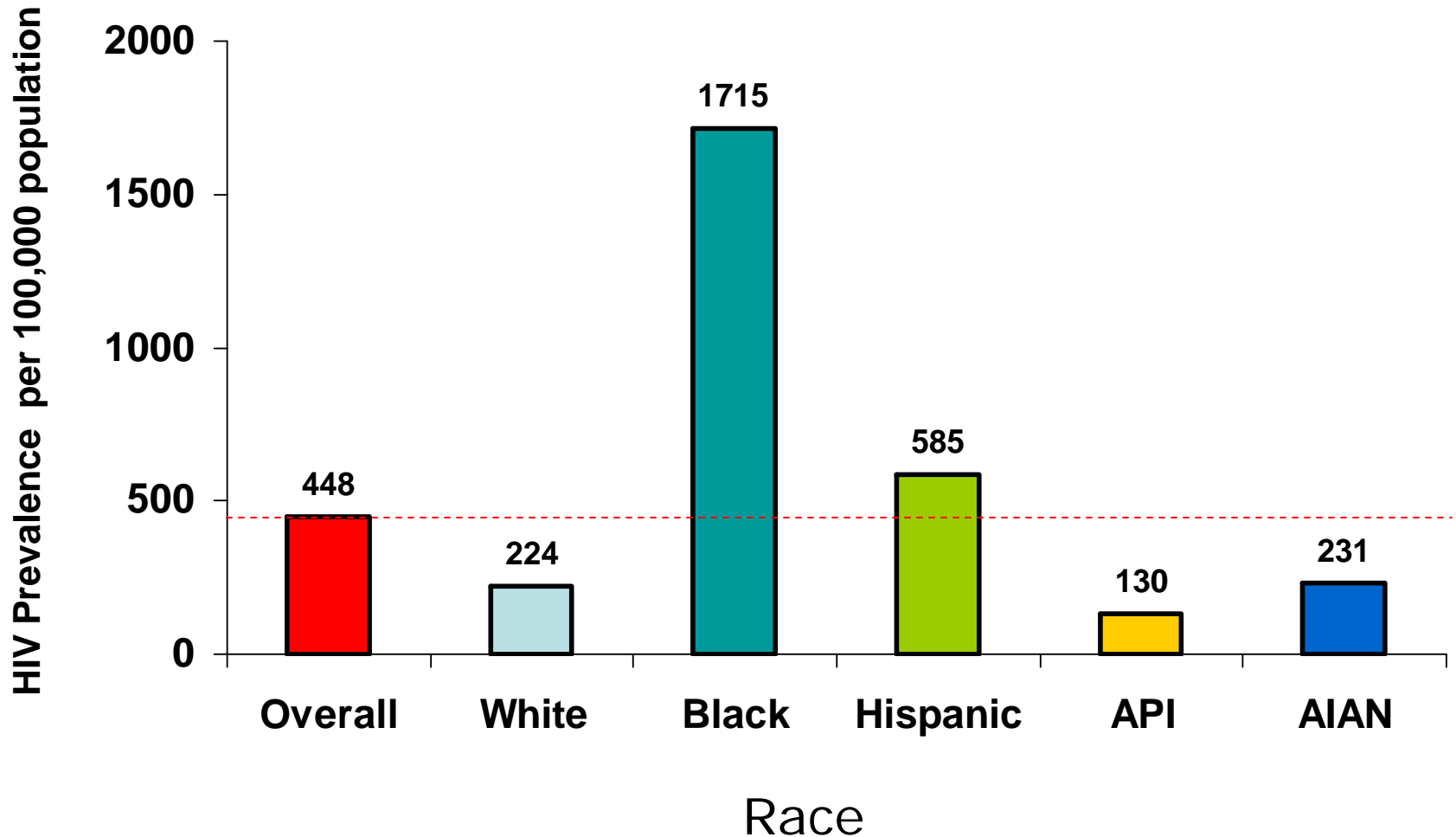
Asian/Pacific Islander, 1%

American Indian/Alaska Native, <1%

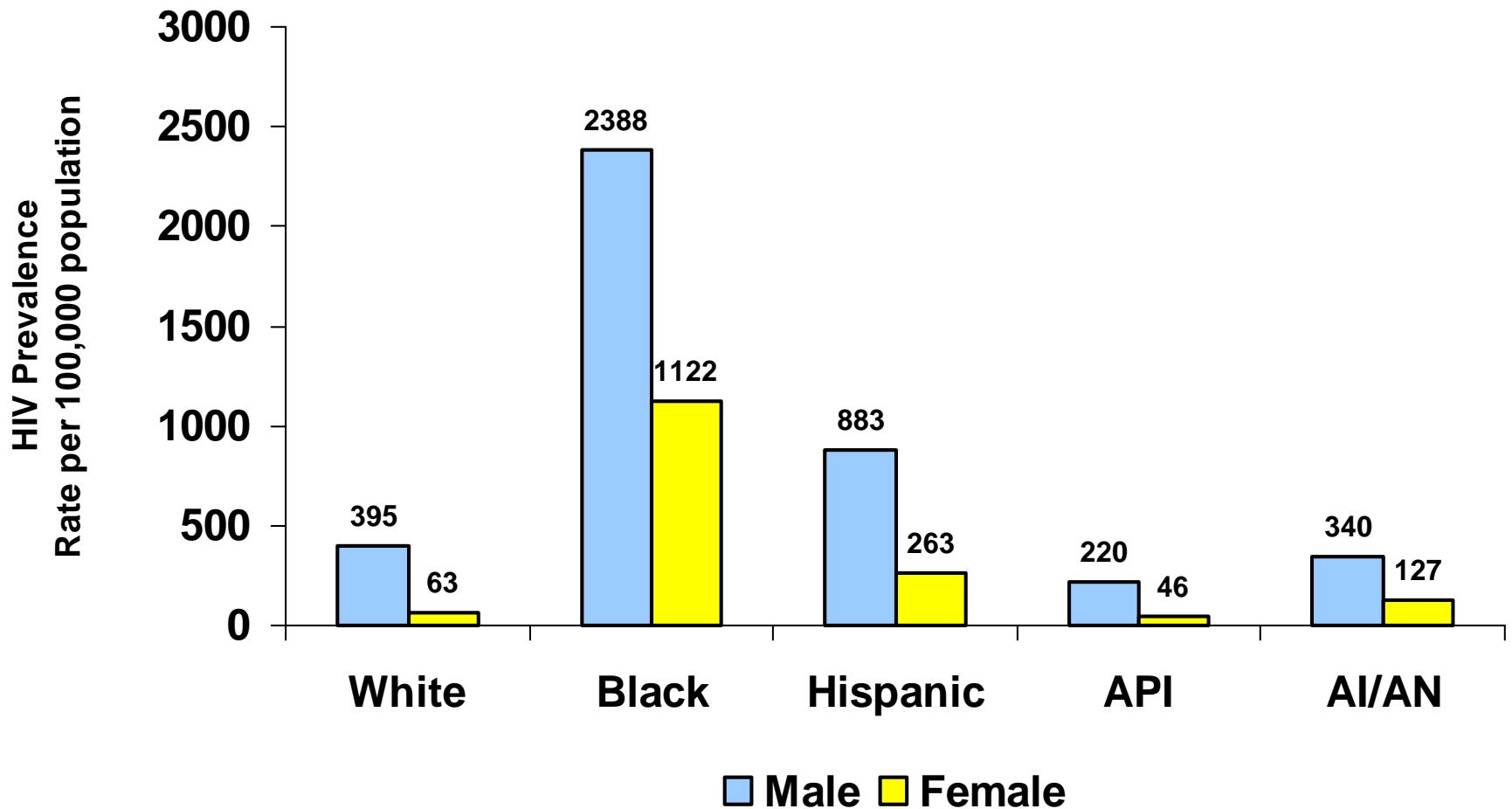




# Estimated HIV prevalence rate (per 100,000 population), by race — United States, 2006



# Est. HIV prevalence: Rate per 100,000 population, by sex and race — United States, 2006



# HIV Incidence



# New HIV Incidence Estimates

ORIGINAL CONTRIBUTION

# JAMA<sup>®</sup>

The Journal of the American Medical Association

## Estimation of HIV Incidence in the United States

H. Irene Hall, PhD  
Ruiguang Song, PhD  
Philip Rhodes, PhD  
Joseph Prejean, PhD  
Qian An, MS  
Lisa M. Lee, PhD  
John Karon, PhD  
Ron Brookmeyer, PhD  
Edward H. Kaplan, PhD  
Matthew T. McKenna, MD  
Robert S. Janssen, MD  
for the HIV Incidence  
Surveillance Group

**Context** Incidence of human immunodeficiency virus (HIV) in the United States has not been directly measured. New assays that differentiate recent vs long-standing HIV infections allow improved estimation of HIV incidence.

**Objective** To estimate HIV incidence in the United States.

**Design, Setting, and Patients** Remnant diagnostic serum specimens from patients 13 years or older and newly diagnosed with HIV during 2006 in 23 states were tested with the BED HIV-1 capture enzyme immunoassay to classify infections as recent or long-standing. Information on HIV cases was reported to the Centers for Disease Control and Prevention through June 2007. Incidence of HIV in the 22 states during 2006 was estimated using a statistical approach with adjustment for testing frequency and extrapolated to the United States. Results were corroborated with back-calculation of HIV incidence for 1977-2006 based on HIV diagnoses from 40 states and AIDS incidence from 50 states and the District of Columbia.

**Main Outcome Measure** Estimated HIV incidence.

**Results** An estimated 39 400 persons were diagnosed with HIV in 2006 in the 22 states. Of 6864 diagnostic specimens tested using the BED assay, 2133 (31%) were classified as recent infections. Based on extrapolations from these data, the estimated number of new infections for the United States in 2006 was 56 300 (95% confidence interval [CI], 48 200-64 500); the estimated incidence rate was 22.8 per 100 000 population (95% CI, 19.5-26.1). Forty-five percent of infections were among black individuals and 53% among men who have sex with men. The back-calculation (n=1 230 million HIV/AIDS cases reported by the end of 2006) yielded an estimate of 55 400 (95% CI, 50 000-60 800) new infections per year for 2003-2006 and indicated that HIV incidence increased in the mid-1990s, then slightly declined after 1999 and has been stable thereafter.

**Conclusions** This study provides the first direct estimates of HIV incidence in the United States using laboratory technologies previously implemented only in clinic-based settings. New HIV infections in the United States remain concentrated among men who have sex with men and among black individuals.

JAMA. 2008;300(5):520-529.

www.jama.com

**K**NOWLEDGE ABOUT TRENDS AND current patterns of human immunodeficiency virus (HIV) infections is essential for planning and evaluating prevention efforts and for resource allocation. In the past, data on AIDS incidence and, more recently, data on HIV diagnoses and prevalence have been used for planning and targeting HIV prevention programs. Timely information on national HIV incidence among key US populations can provide a more accurate picture of the HIV epidemic and likely lead to improved reach and impact of domestic programs. However, the incidence of HIV infection in the United States has never been directly measured.<sup>1</sup>

In the early 1990s, back-calculation models using AIDS incidence data and the probability distribution of the incubation period from HIV infection to AIDS diagnosis<sup>2,3</sup> provided historical trends of HIV incidence, but these models could not provide timely data on

current transmission patterns. In addition, with the change in the AIDS case definition in 1993 and the advent of effective treatments that slow disease progression to AIDS, back-calculation models based exclusively on incident AIDS cases are no longer valid because the incubation period from HIV infection to AIDS diagnosis is difficult to estimate and inconsistently ascertained on a population level. Estimates of the annual number of new in-

**Author Affiliations:** Division of HIV/AIDS Prevention, Centers for Disease Control and Prevention, Atlanta, Georgia (Dr Hall, Song, Rhodes, Prejean, Lee, McKenna, and Janssen); The Green Cross Inc, Richardson, Texas (Dr An); Emergent Corporation, Louisville, Kentucky (Dr Janssen); Johns Hopkins Bloomberg School of Public Health, Baltimore, Maryland (Dr Brookmeyer); and Yale School of Management, Department of Epidemiology and Public Health, Yale School of Medicine, and Yale School of Engineering and Applied Science, New Haven, Connecticut (Dr Kaplan); Dr Janssen's now with Glaxo Sciences Inc, Foster City, California.

**Members of the HIV Incidence Surveillance Group** are listed at the end of this article.

**Corresponding Author:** H. Irene Hall, PhD, MS E-47, Centers for Disease Control and Prevention, 1600 Clifton Rd NE, Atlanta, GA 30333 (ihh1@cdc.gov).

CDC's new HIV incidence estimates published in JAMA on August 6, 2008.

Hall et al. *JAMA*. 2008; 300: 520-529.

# New methods for HIV incidence

## ⇒ Stratified Extrapolation Approach

- Based on surveillance information, standard HIV testing, and new HIV testing technology
- Used STARHS approach to distinguish recent from long-standing infections
- Applied to a sample of newly HIV diagnosed individuals from 22 states in 2006

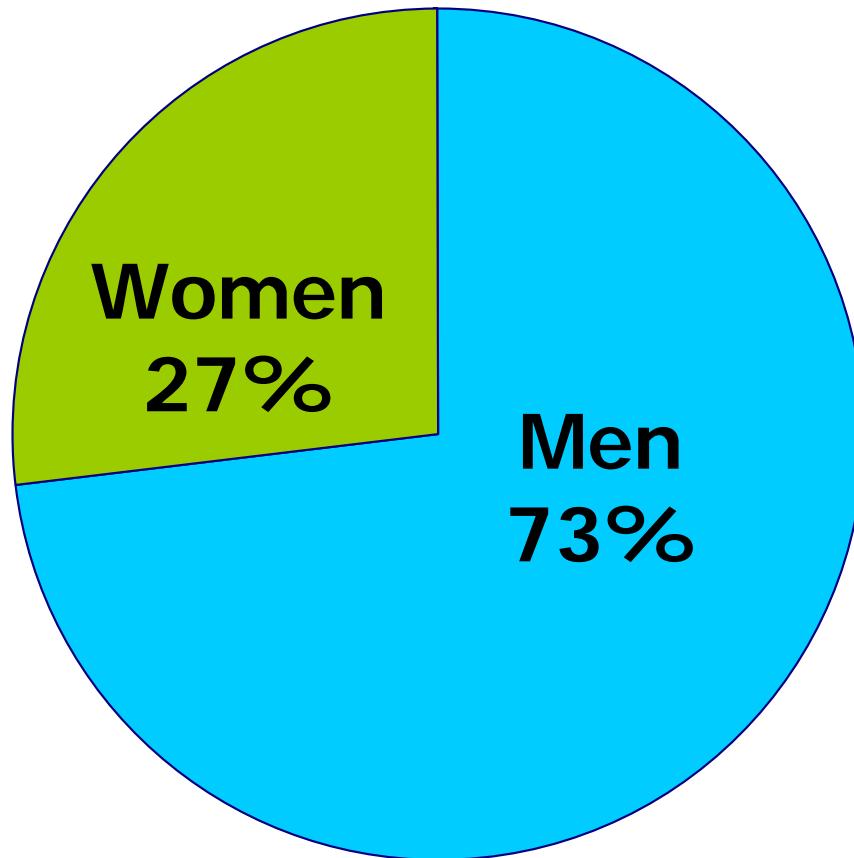
## ⇒ Extended back calculation approach

- Enabled a retrospective view of the evolution of HIV incidence since 1977
- Incorporates AIDS, HIV and HIV testing data from routine surveillance

In 2006, an estimated **56,300** (95%CI 48,200-64,500) new HIV infections occurred in the United States.\*

\* Data from the Stratified Extrapolation Approach

# Estimated percentage of new HIV Infections, by Sex, 2006

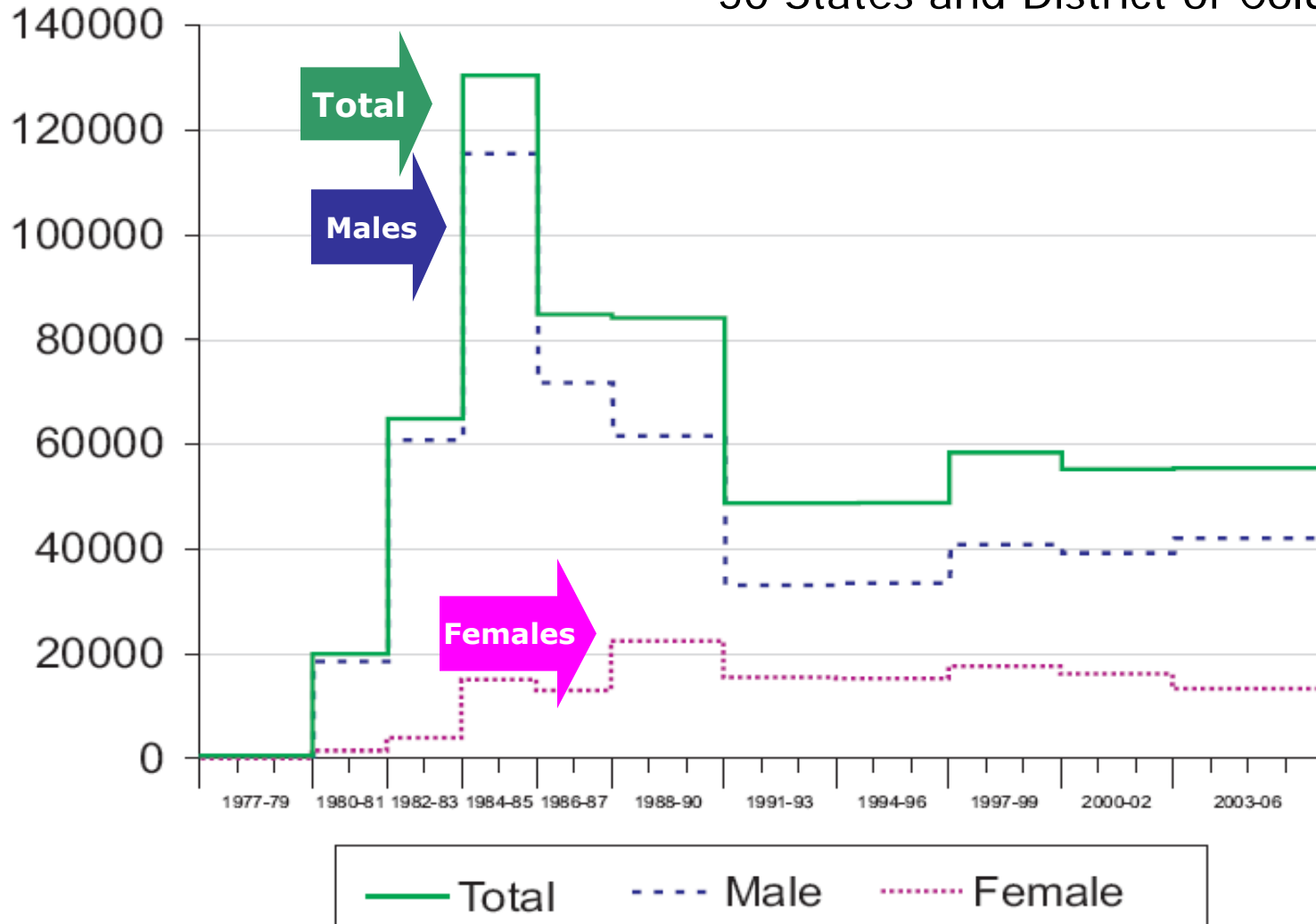


N=56,300

\*50 States and District of Columbia

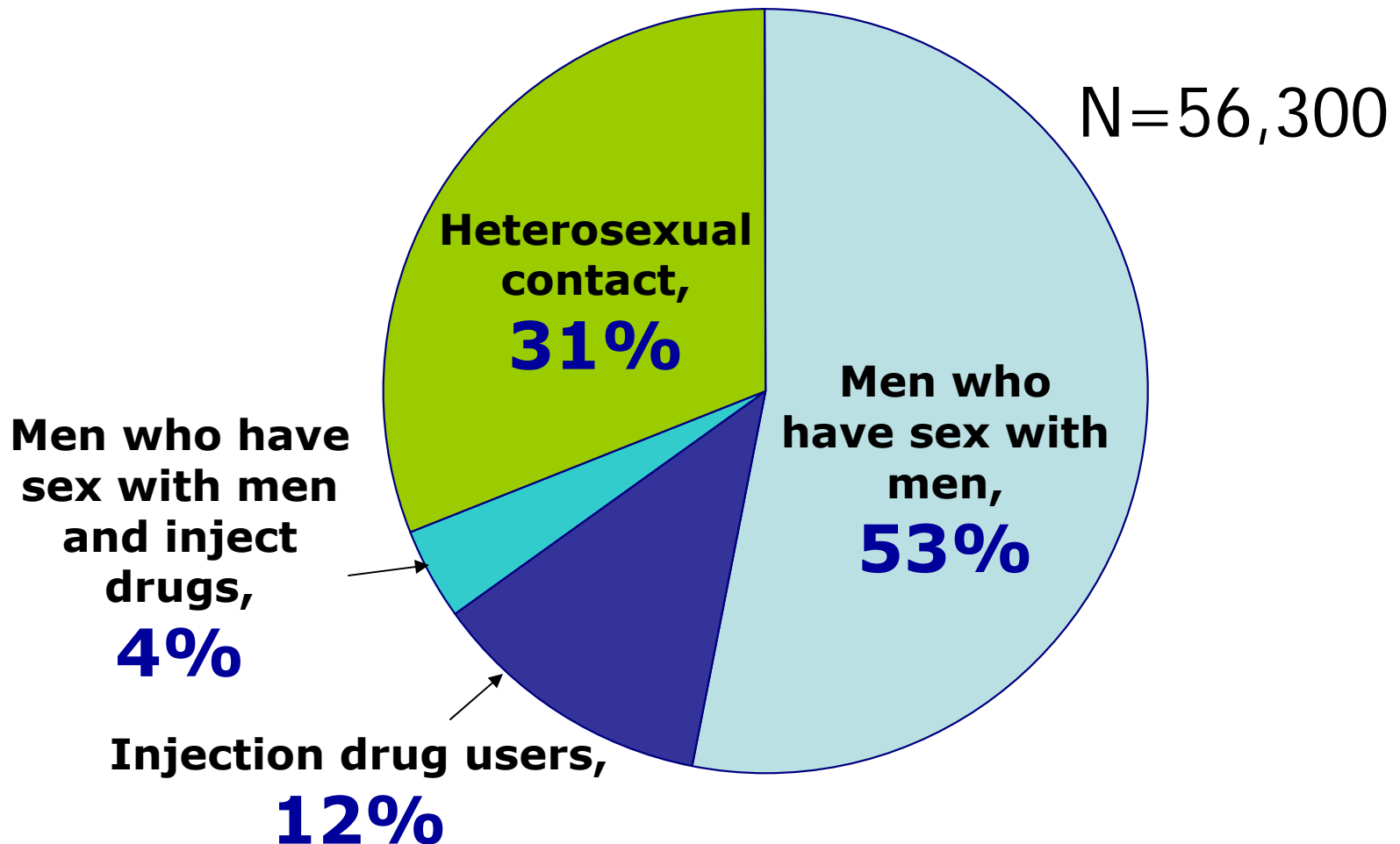
# Estimated number of new HIV infections, by sex, 1977-2006\*

\*50 States and District of Columbia





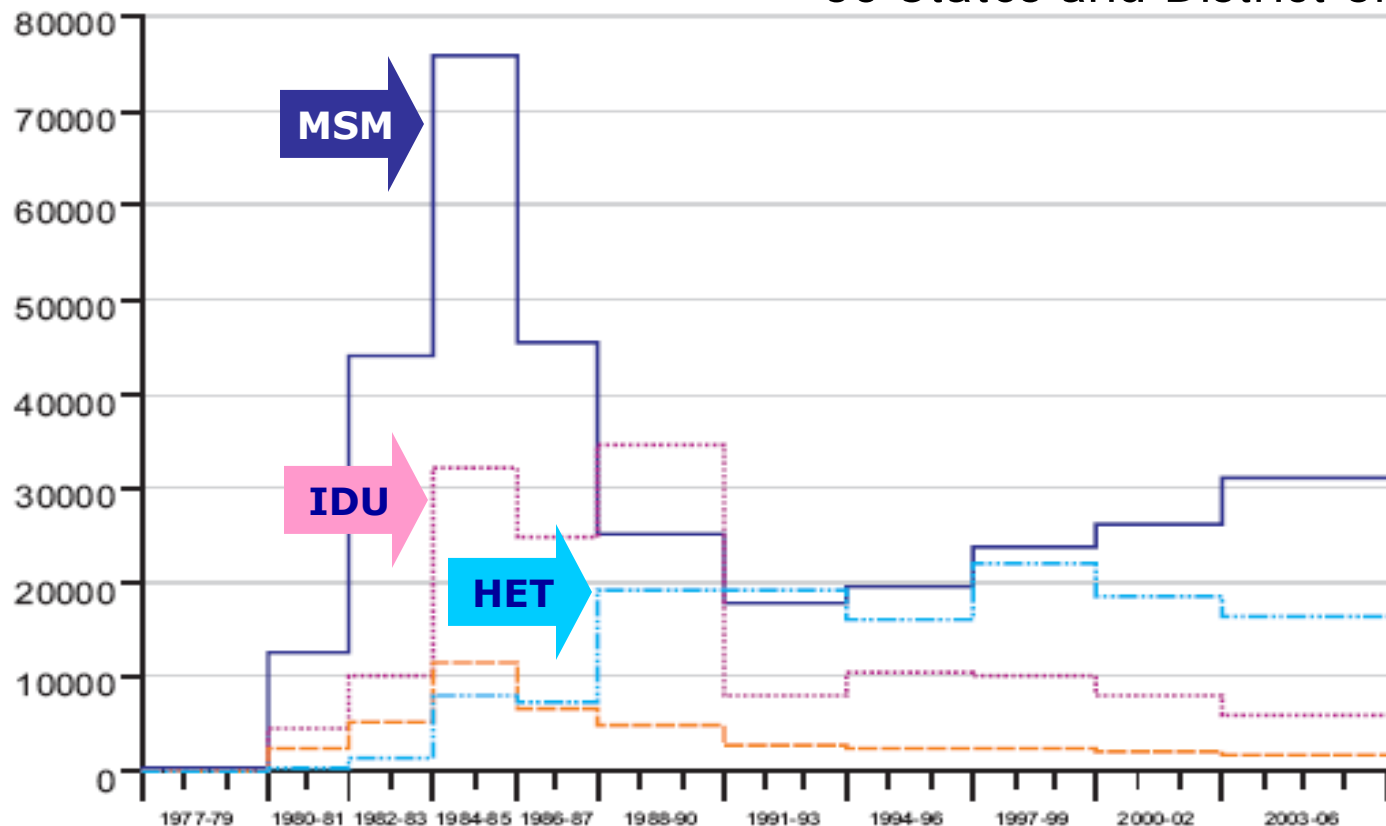
# Estimated percentage of new HIV Infections, by Transmission Category, 2006\*



\*50 States and District of Columbia

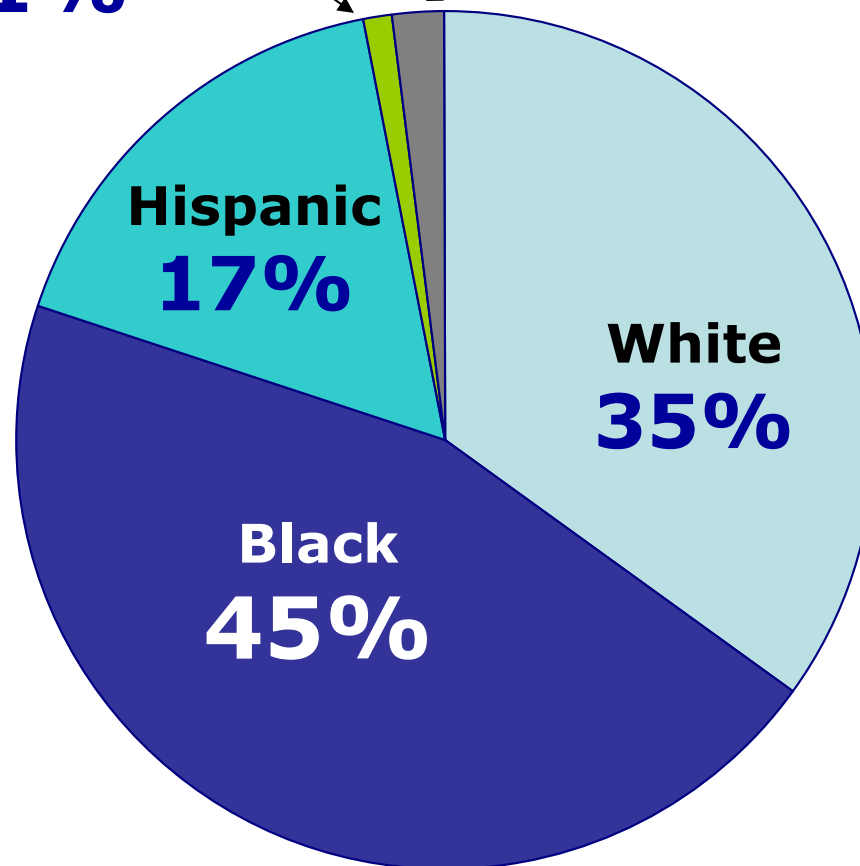
# Estimated number of new HIV infections by transmission category, 1977-2006

\*50 States and District of Columbia



# Estimated percentage of new HIV Infections, by Race/Ethnicity, 2006\*

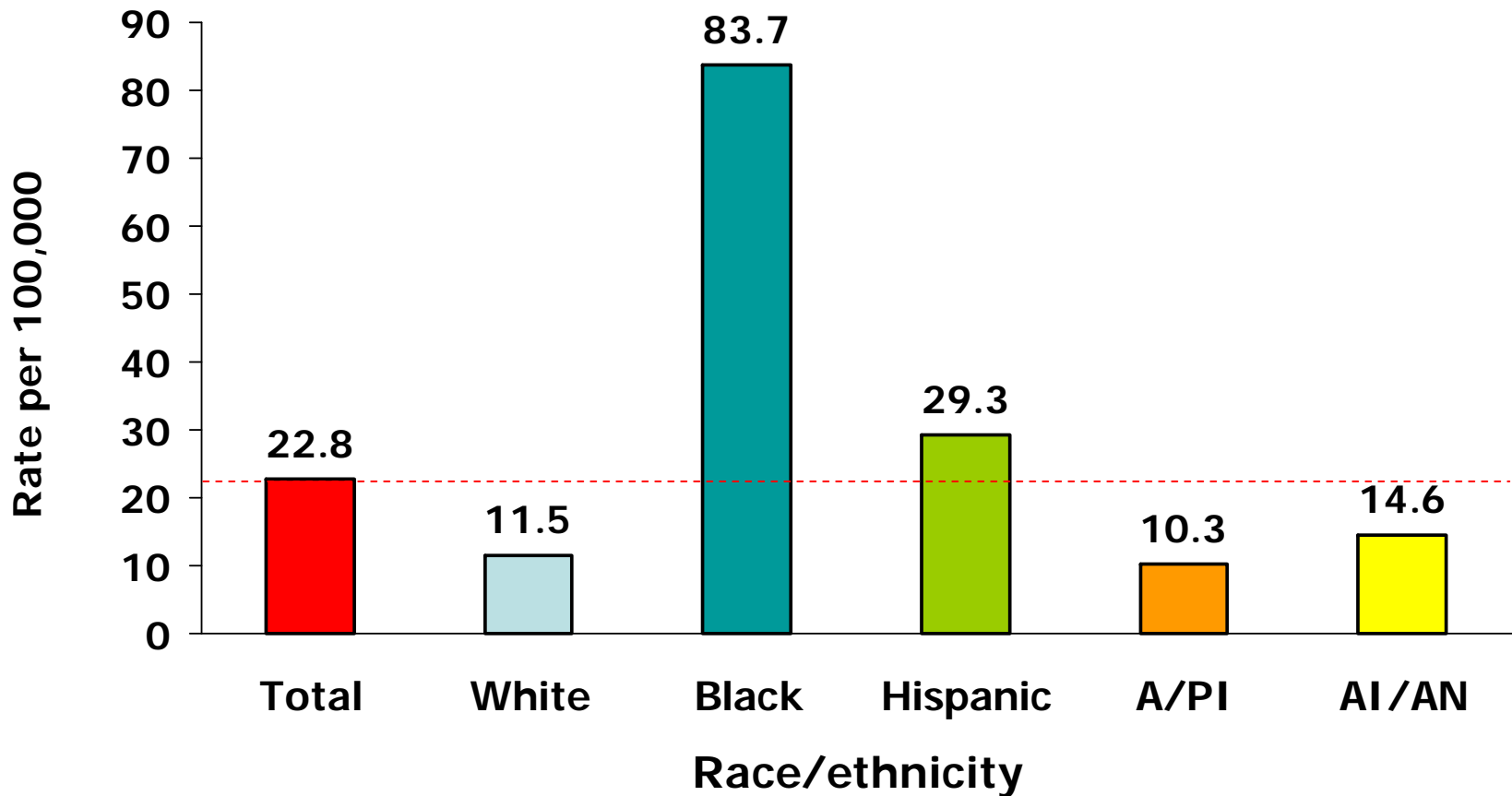
American Indian/Alaska Native, **1%**      Asian/Pacific Islander, **2%**



N=56,300

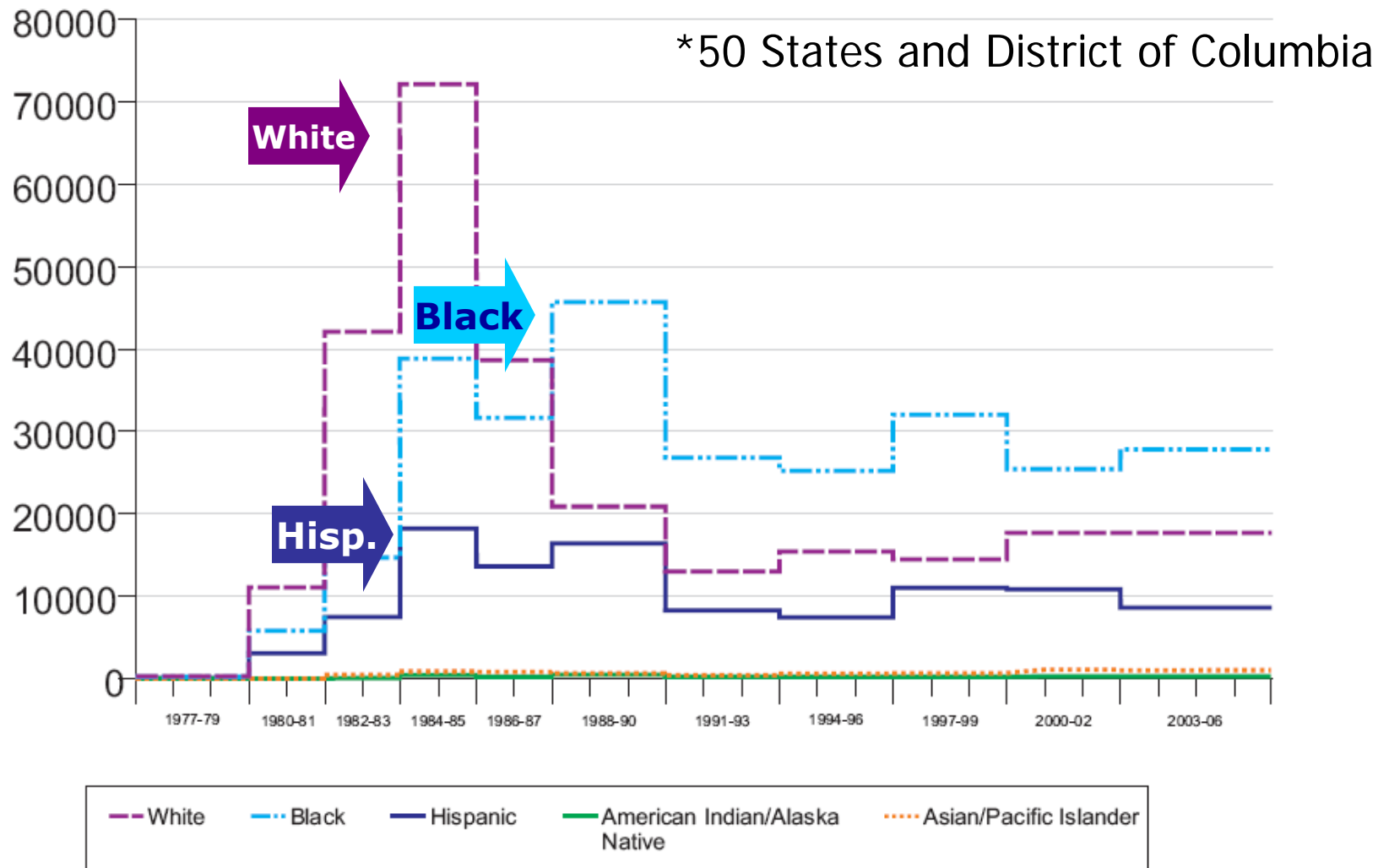
\*50 States and District of Columbia

# Estimated rates of new HIV Infections, by race/ethnicity, 2006\*

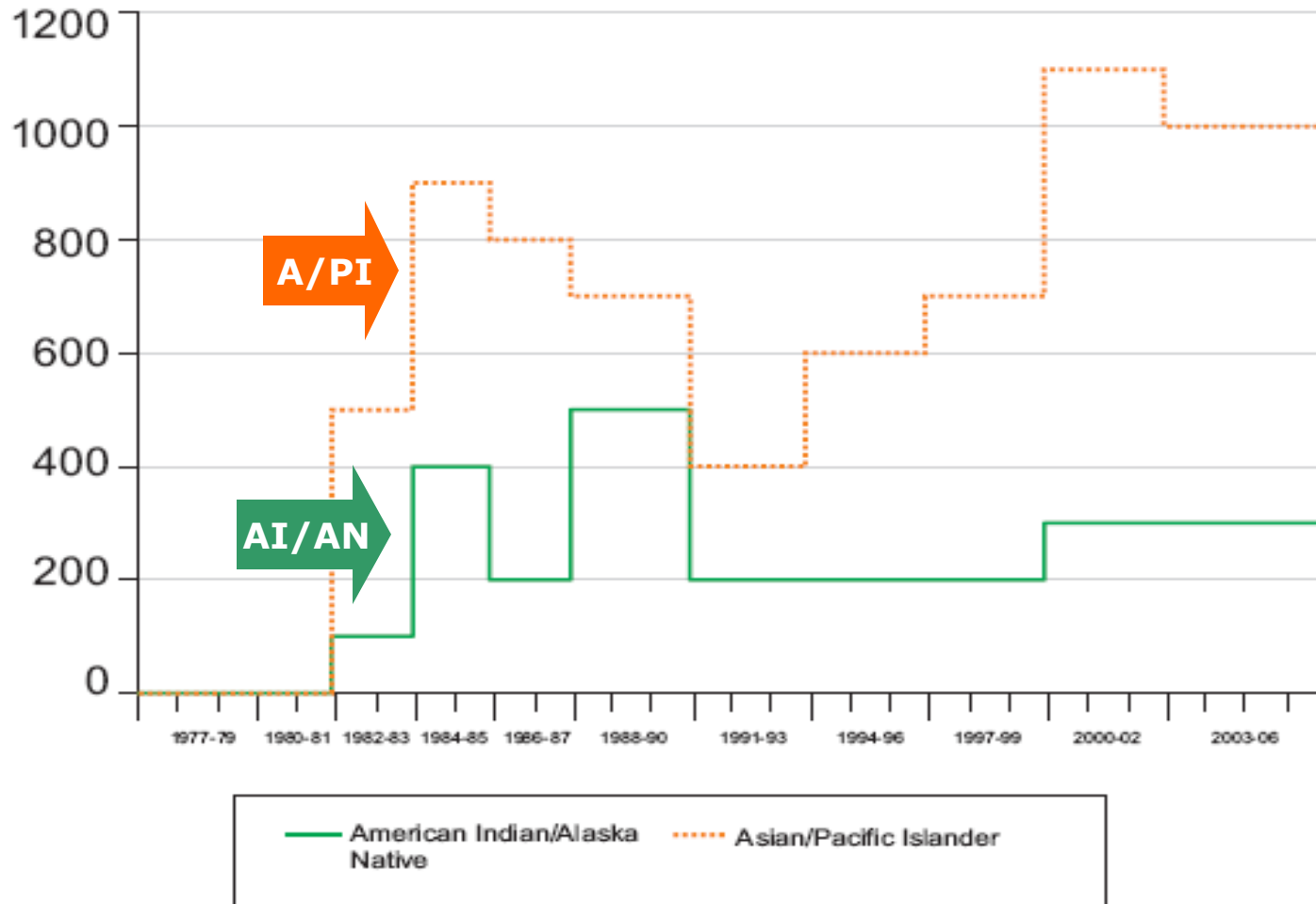


\*50 States and District of Columbia

# Estimated number of new HIV infections, by race/ethnicity, 1977-2006\*



# Estimated number of new HIV infections, by race/ethnicity, 1977-2006\*

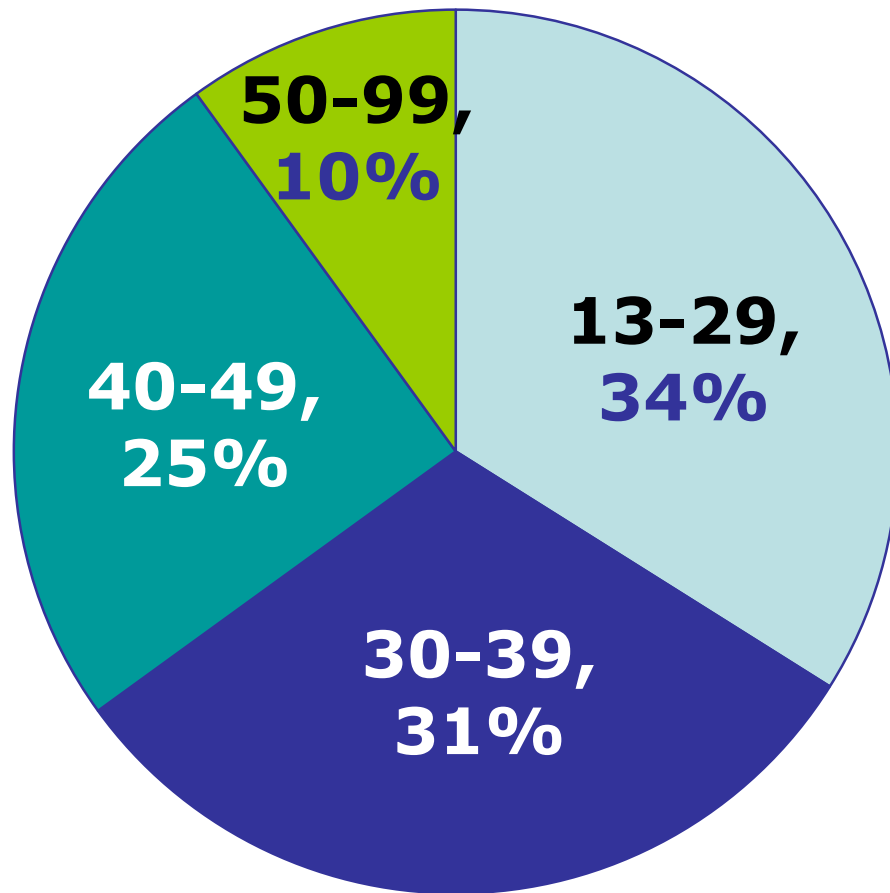


\*50 States and District of Columbia

# HIV in key sub-populations



# Estimated percentage of new HIV Infections, by Age, 2006\*

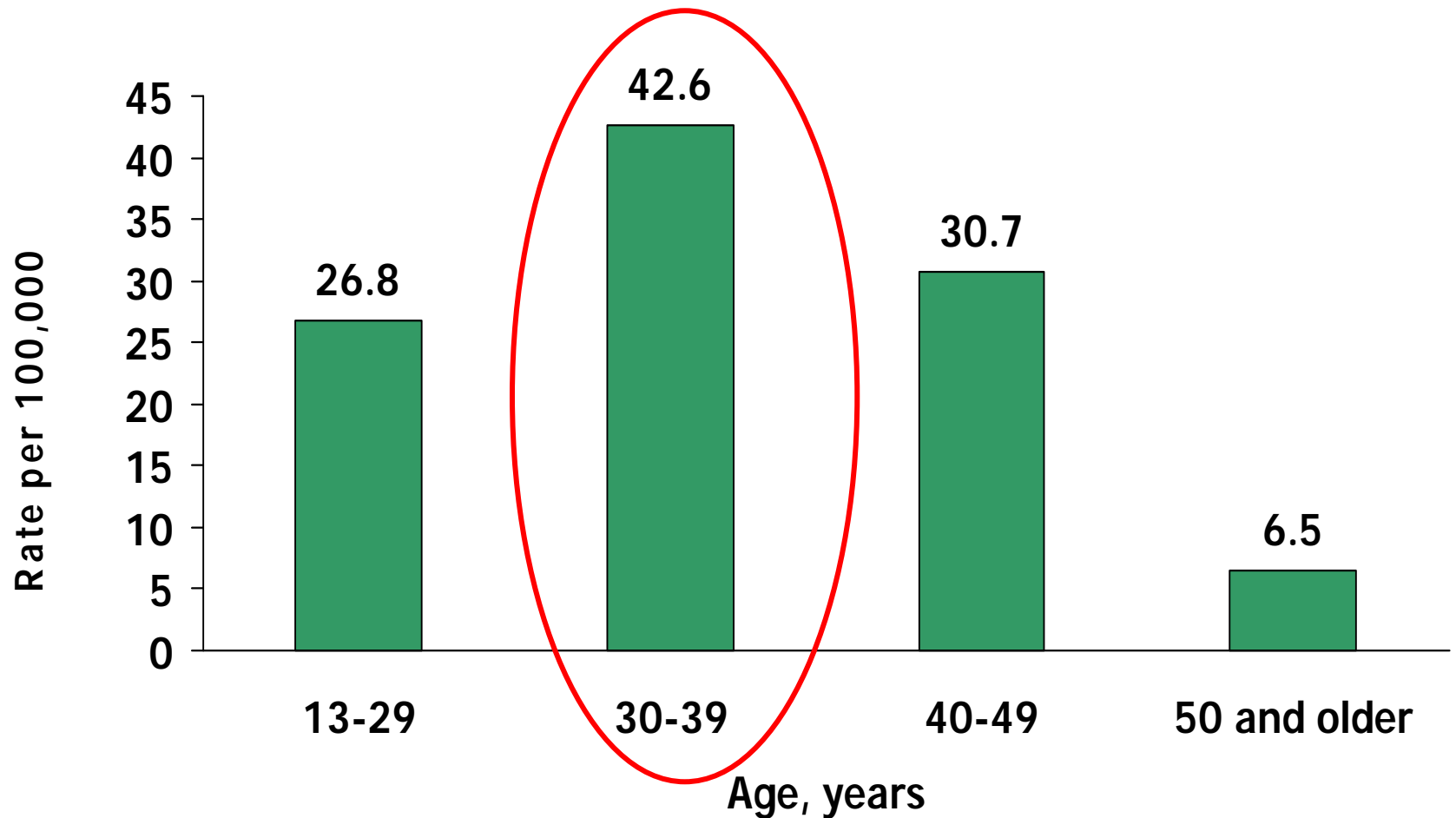


N=56,300

\*50 States and District of Columbia

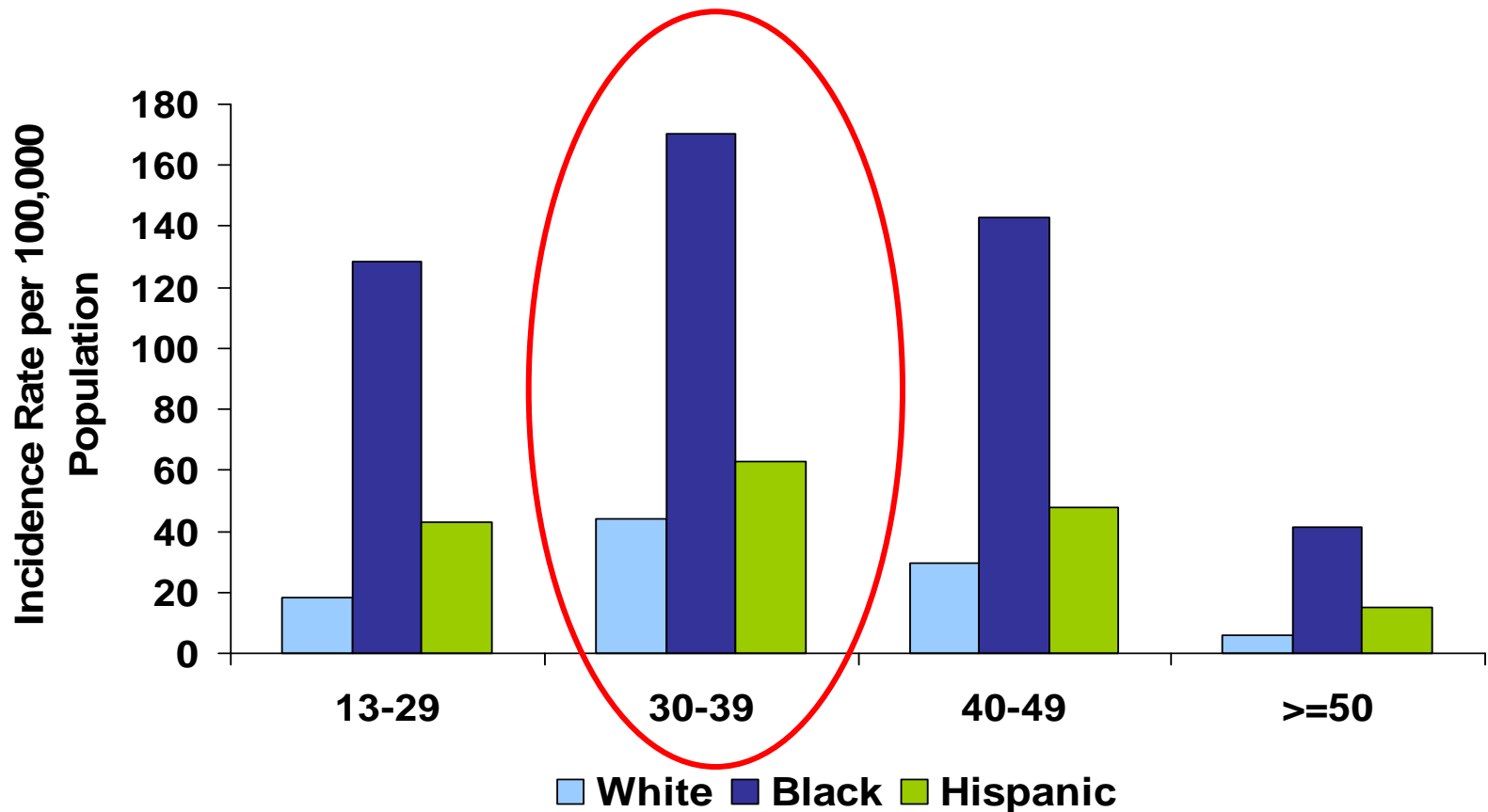


# Estimated rates of new HIV Infections, by age, 2006\*



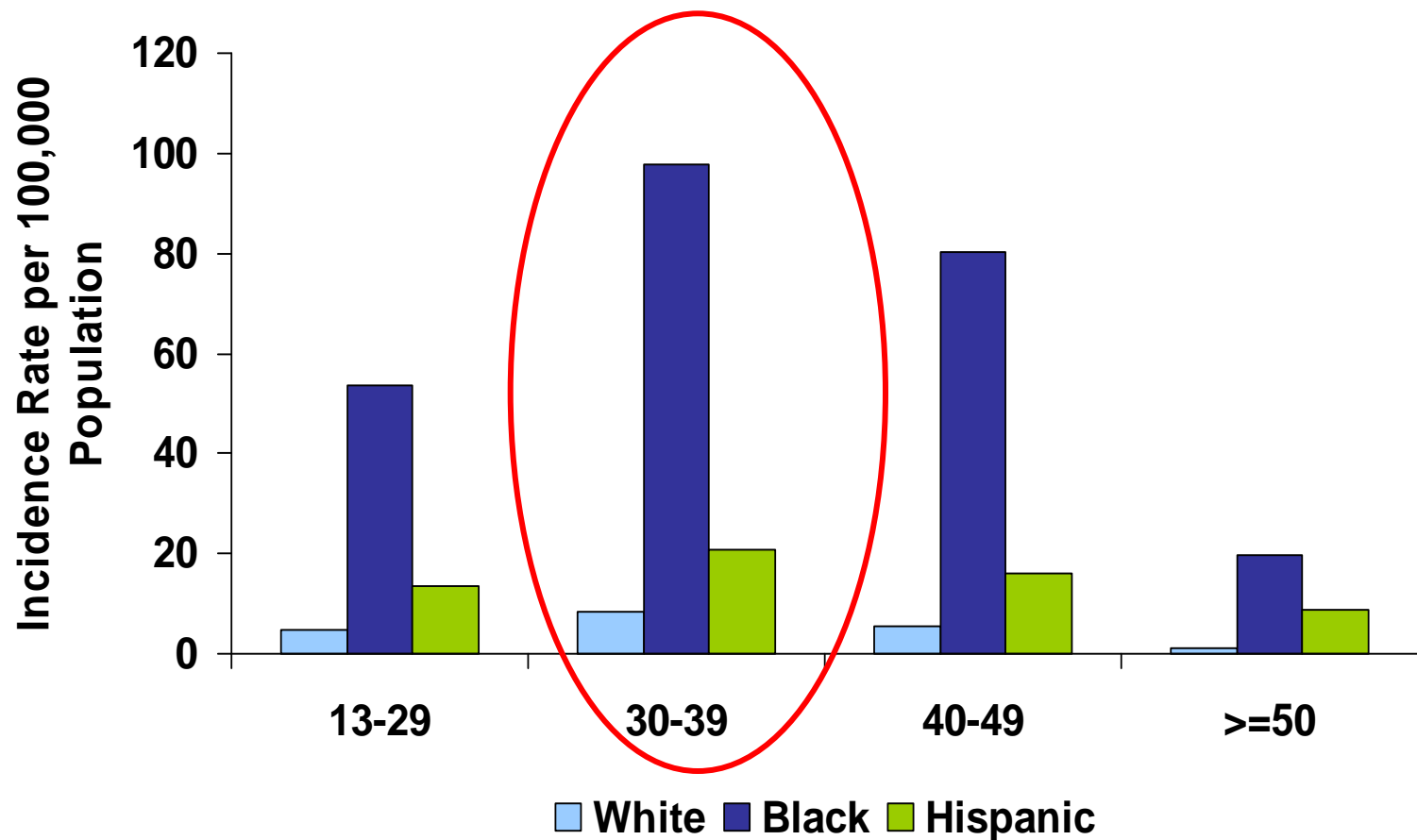
\*50 States and District of Columbia

# Estimated HIV incidence rate among **Males** by Age and Race/Ethnicity, 2006\*



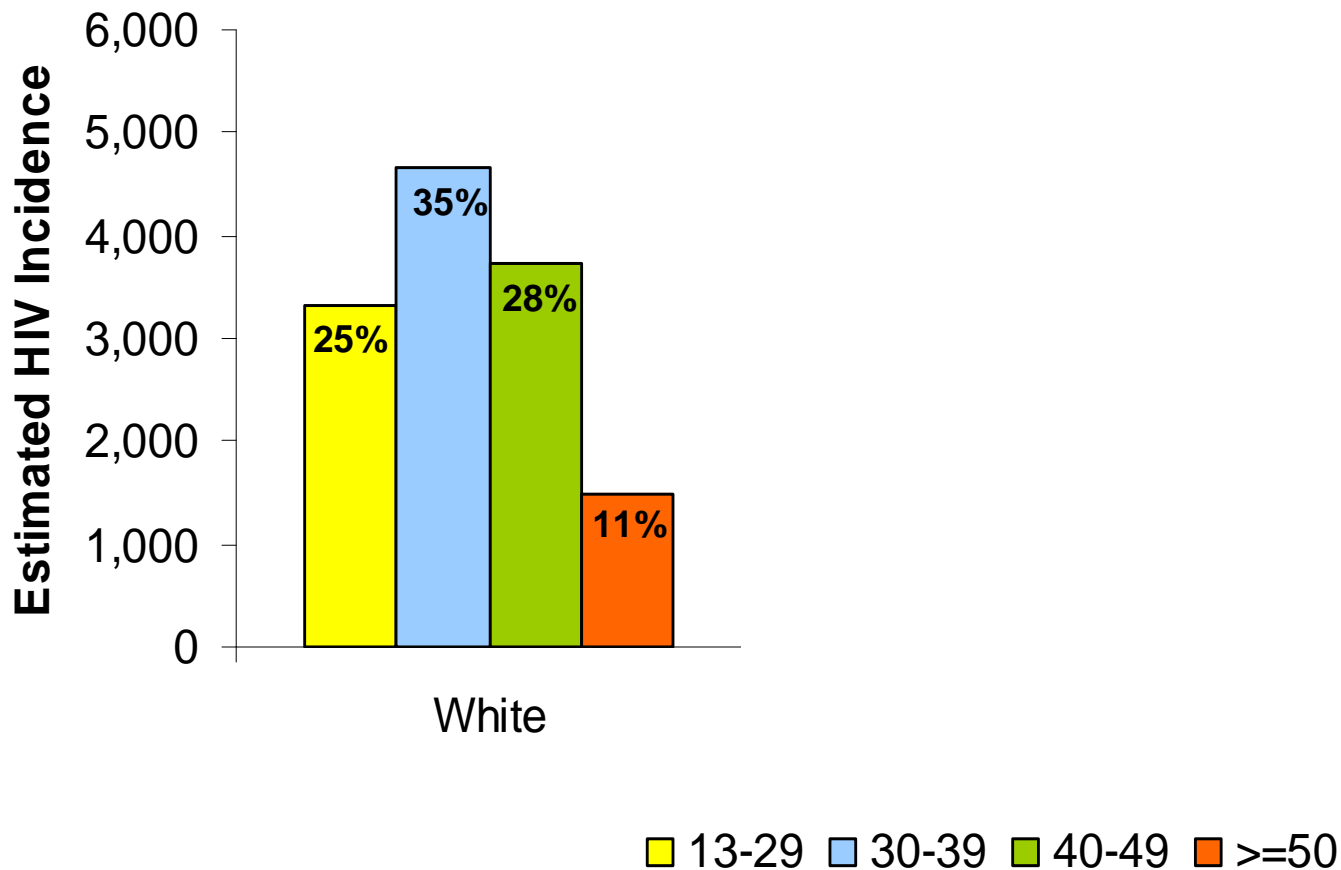
\*50 States and District of Columbia

# Estimated HIV incidence rate among **Females** by Age and Race/Ethnicity, 2006\*



\*50 States and District of Columbia

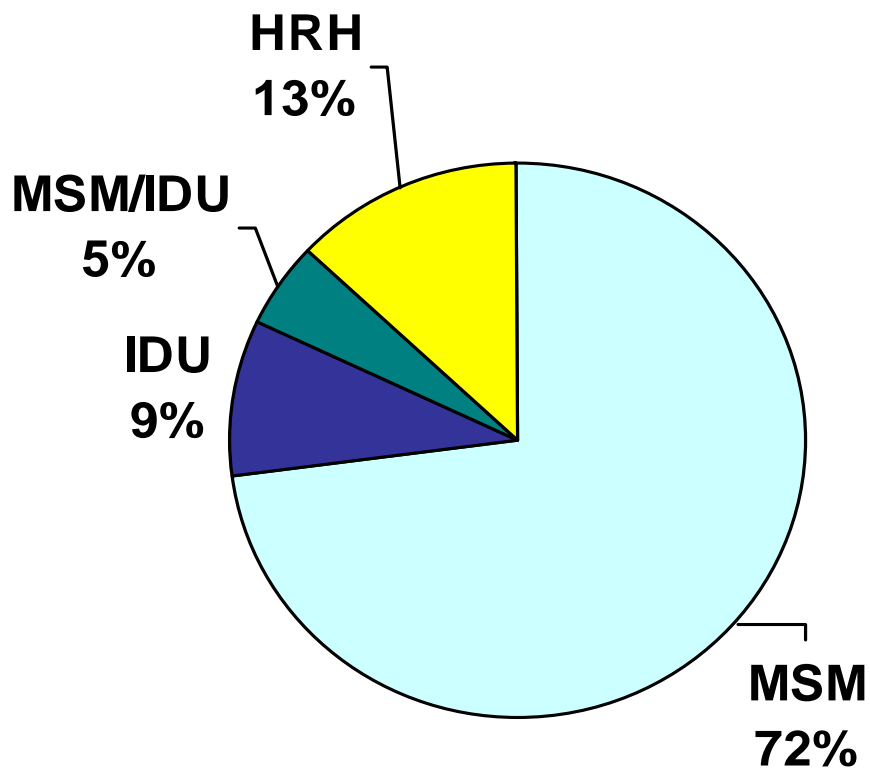
# Estimated Number of New HIV Infections in MSM, by Race/Ethnicity and Age Group, 2006 \*



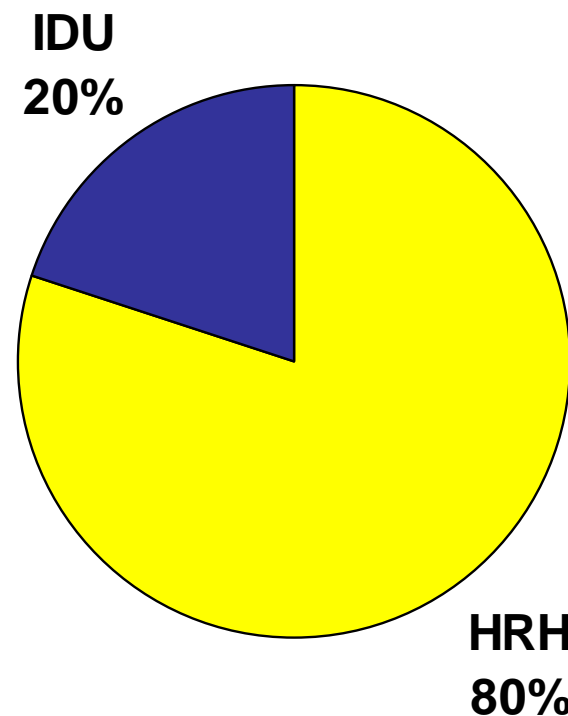
\*50 States and District of Columbia

# Estimated Percentage of New Infections by Sex and Transmission Category, 2006\*

## Male

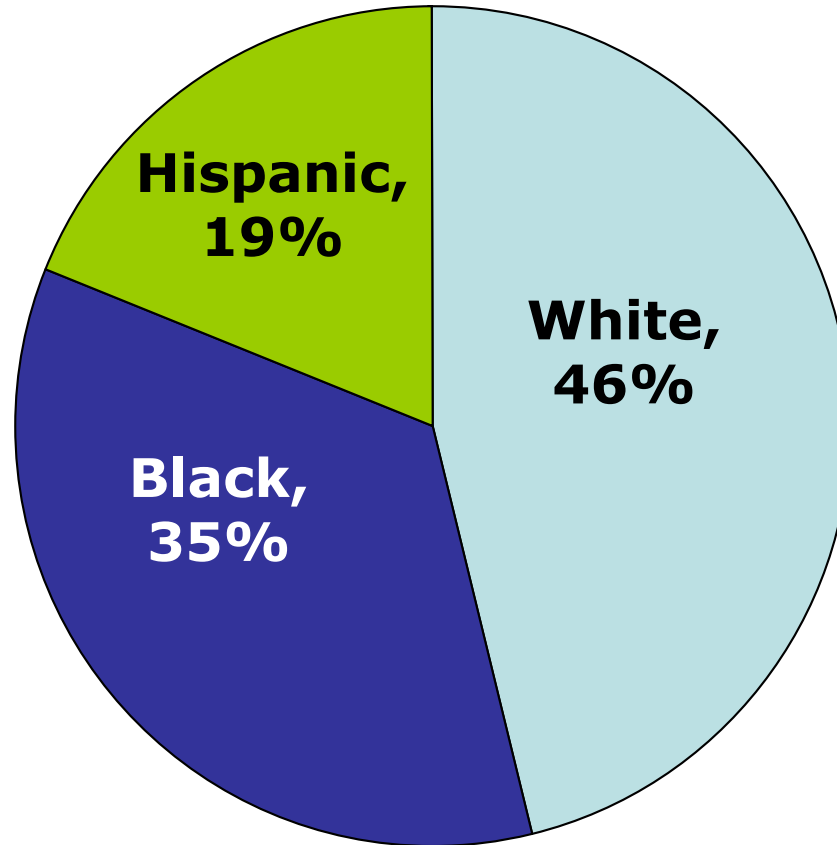


## Female



\*50 States and District of Columbia

# Estimated Percentage of New HIV Infections among **MSM** by Race/Ethnicity, US, 2006\*



\*50 States and District of Columbia

# Summary



# HIV/AIDS epidemic in the United States: Urgent threats and realities

- ⇒ One fifth of those with HIV infection **undiagnosed**
- ⇒ **MSM of all races** remain at increased HIV risk; only group where incidence is increasing
- ⇒ **HIV incidence in young MSM** is of particular concern among Black and Hispanics
- ⇒ **African Americans** and **Hispanics** bear heaviest burden
- ⇒ **Incidence highest in 30-39 year** age-group for men and women



# Implications for prevention: CDC Response

- ➔ Expanding **HIV testing**
- ➔ Expanding **access** to effective programs
- ➔ **Mobilizing** at risk communities
- ➔ **Reassessing efforts** for MSM, and other hardest hit communities
- ➔ Conducting **research** on new prevention interventions
- ➔ Promoting **integration and collaboration** between programs and sectors

# Summary

- ➔ HIV/AIDS continues to evolve in the US with a high burden among **MSM** of all races and **African Americans, Hispanics**.
- ➔ Among black and Hispanic MSM the highest number of new infections was in the youngest age group
- ➔ **Renewed commitment** to mobilizing communities, HIV testing, intensifying and targeting prevention efforts needed.



# Thank You

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

[www.cdc.gov/nchstp](http://www.cdc.gov/nchstp)

