

*Update on Emerging and Re-emerging  
Infectious Diseases:*

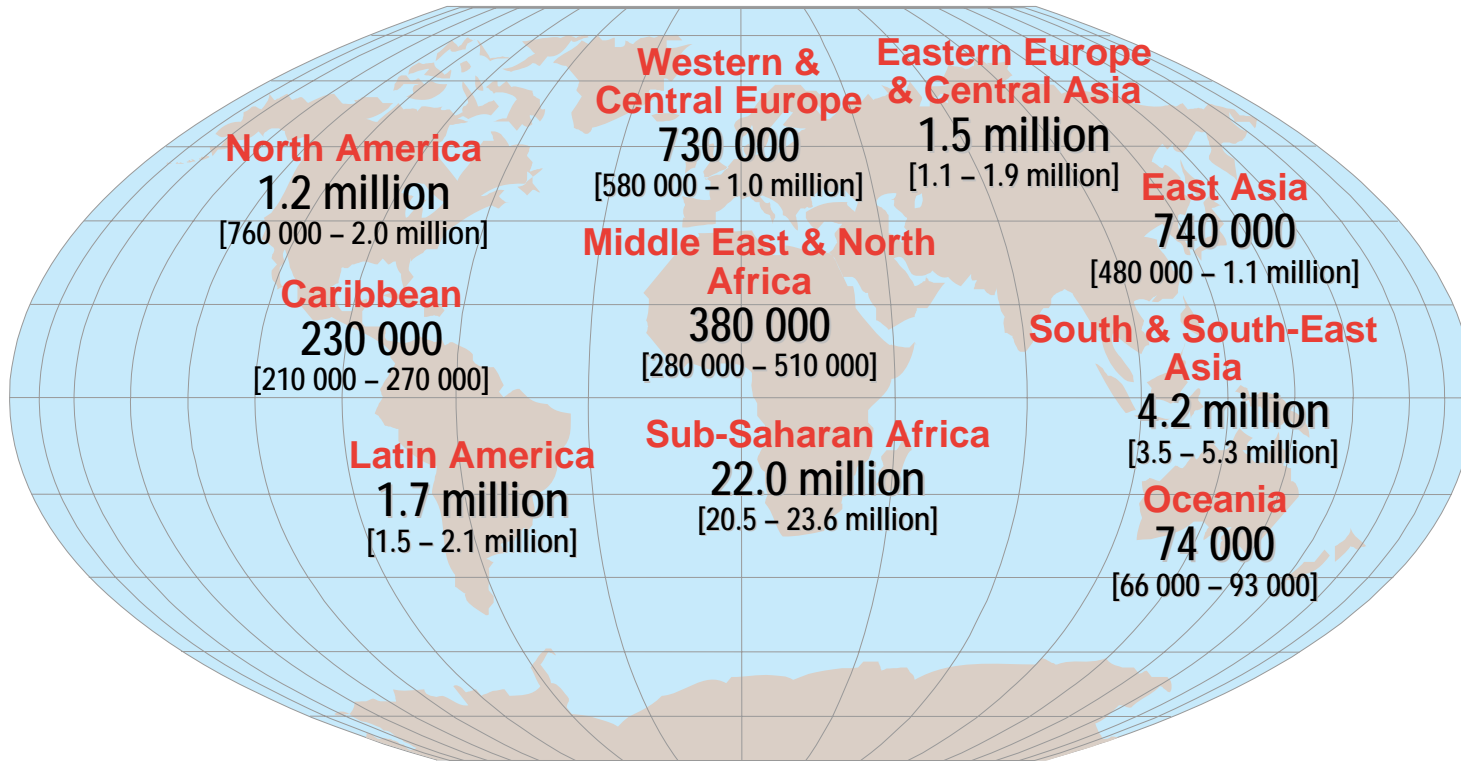
**Update on HIV  
in Los Angeles County**

*~ Presentation at CIDER Summit on June 25, 2010 ~*

**Douglas M. Frye, MD, MPH  
Director, HIV Epidemiology Program**



# Adults and children estimated to be living with HIV, Total as of December 2008, Map from 2007



**Total: 33.4 million (31 – 36 million)**

# Persons Living with HIV (and AIDS) in L.A. County

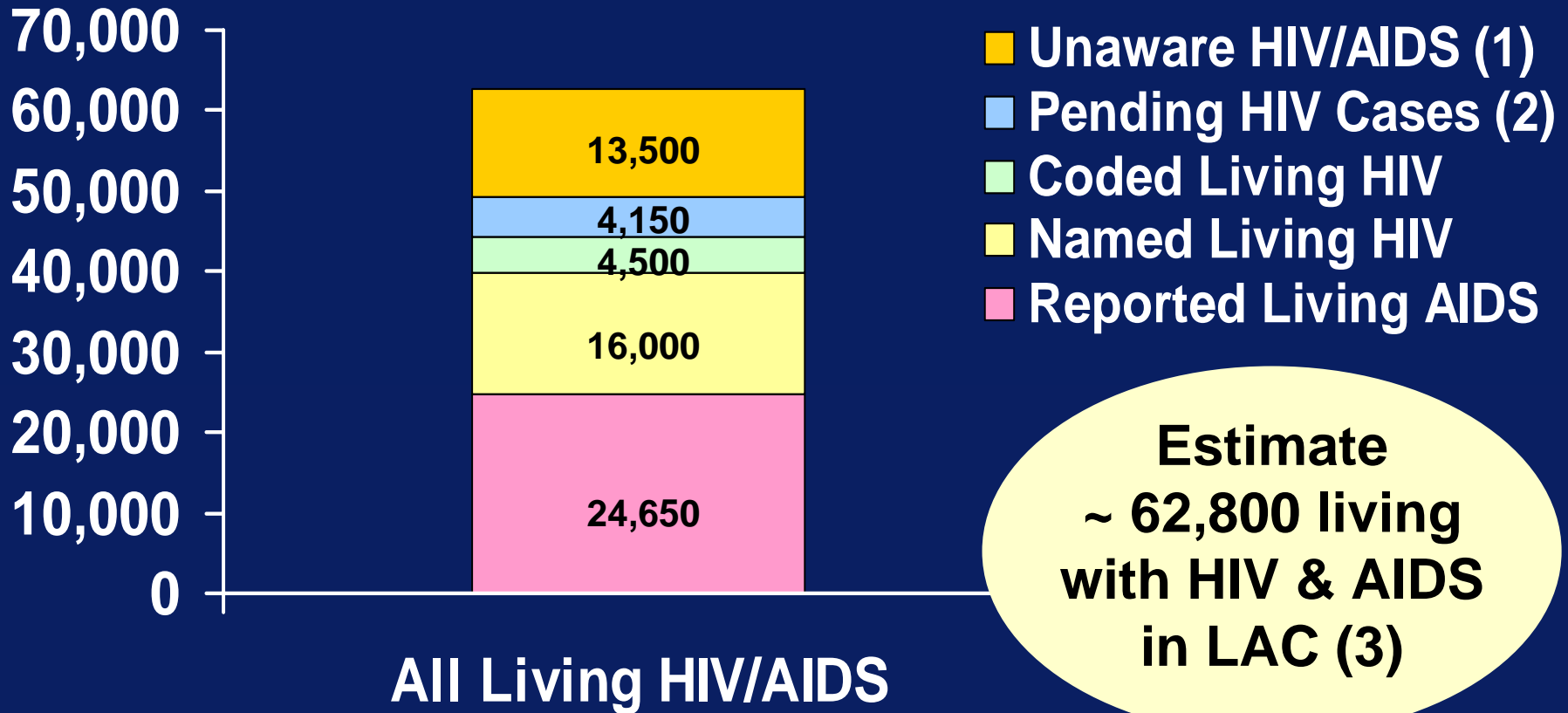


# **HIV / AIDS Surveillance in California**

- **1981: First cases of PCP reported in LA County**
- **1982: AIDS Surveillance put into state law**
- **2002: Coded HIV Cases and Laboratory reporting in California Code of Regulations**
- **2006: Named HIV Surveillance mandated**
- **2008: CD4 Lab Reporting mandated**
- **2009: HIV/AIDS Reporting System (HARS) replaced by Evaluation HARS (eHARS)**



# Estimated Number of Persons Living with HIV and AIDS in LAC



Source: LAC HIV Epidemiology Program, reported as of 12/31/2009.

(1) Estimate that 21.5% of HIV+ in LA County are unaware of their infection; modified from CDC estimate.

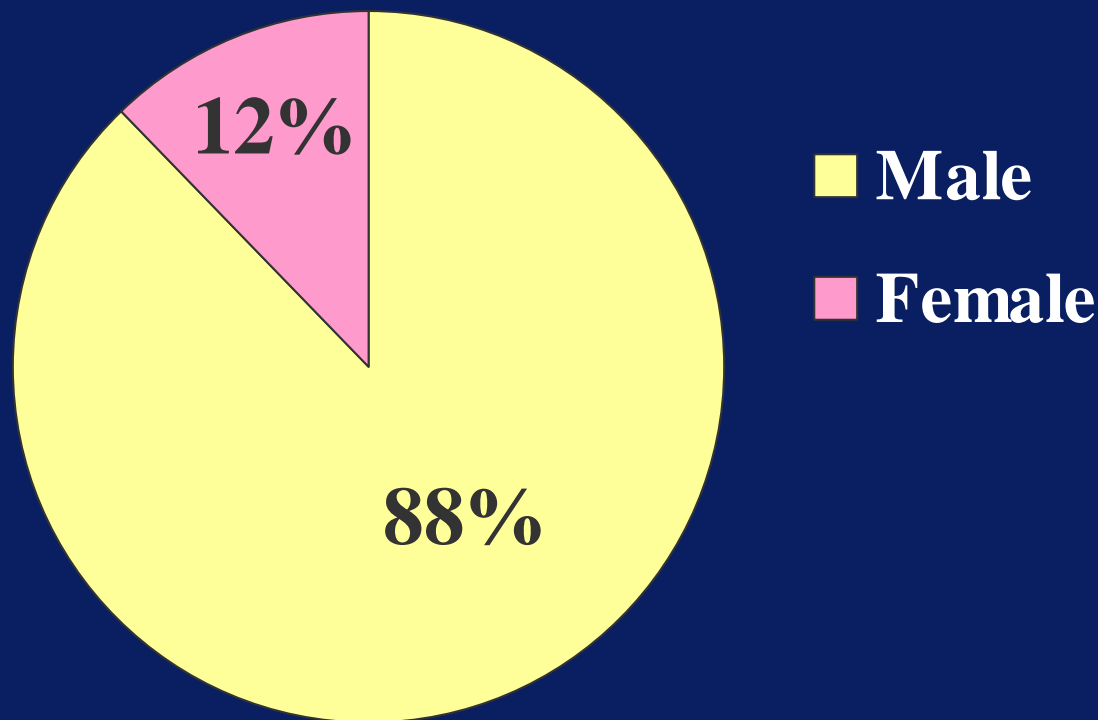
(2) Of 6,700 notifications pending investigation, estimate >4,000 to be cases.

(3) Estimate based on a 1:1 ratio of HIV (non-AIDS) to living AIDS cases and includes reported, named, coded, pending and unaware HIV and AIDS cases.



# Persons living with HIV and AIDS in LAC, by Gender (N=44,450)

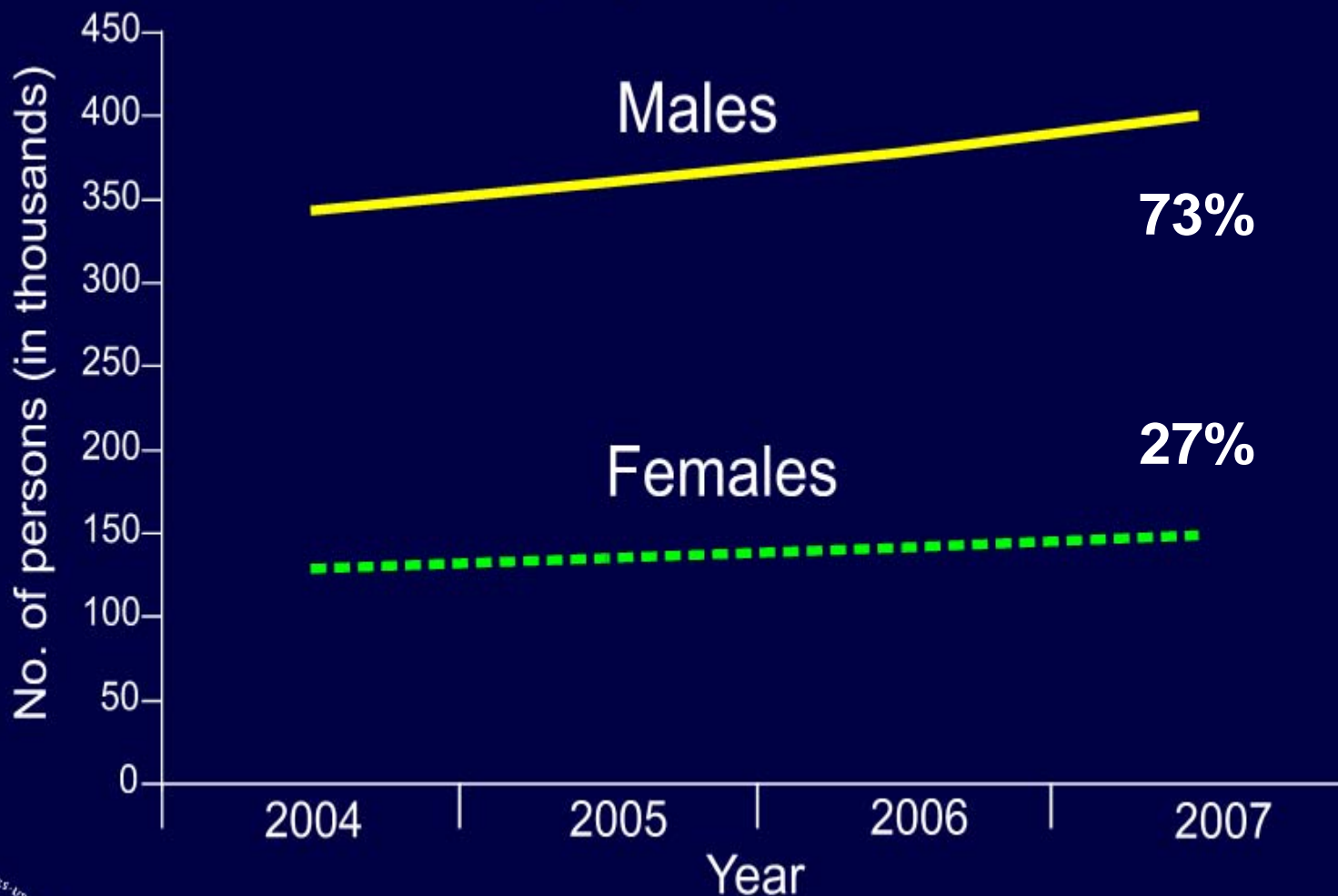
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Source: *HIV/AIDS Surveillance Summary*, data as of Dec. 2008.



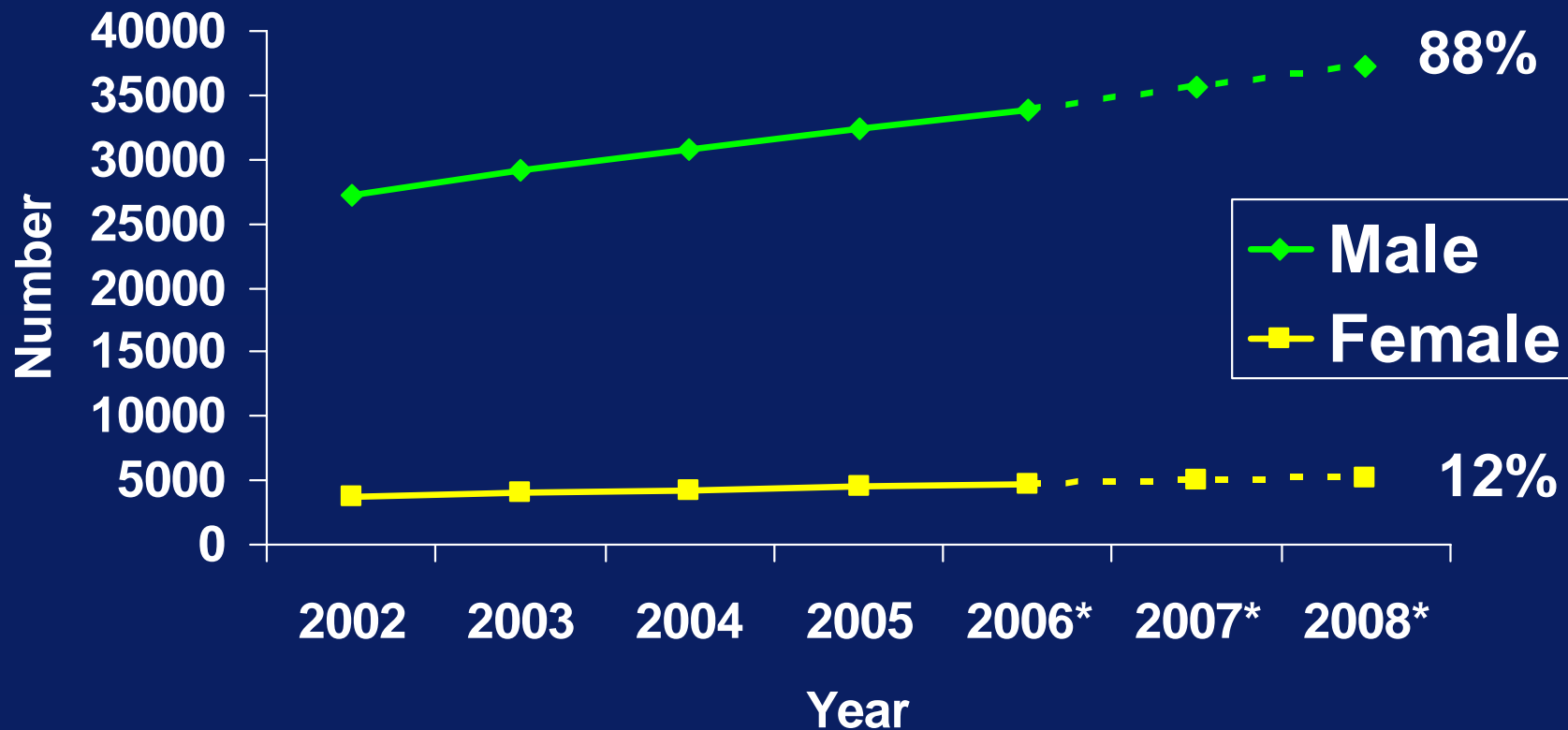
# Estimated Numbers of Adults and Adolescents Living with HIV/AIDS, by Sex, 2004–2007—34 States



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. Age as of end of year.



# Number of Persons Living with HIV/AIDS, by Gender and Year, LAC, 2002-08

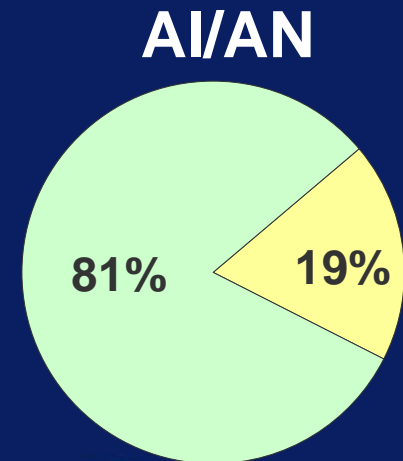
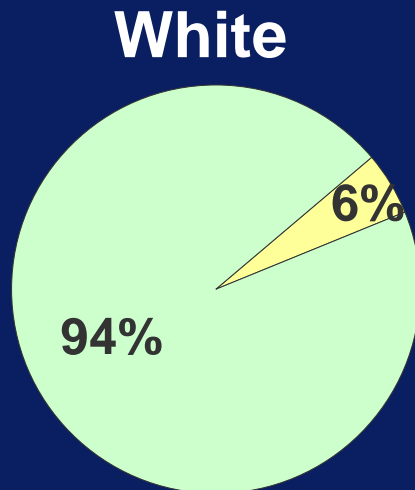
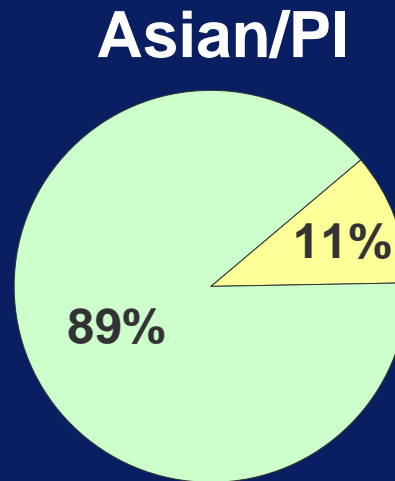
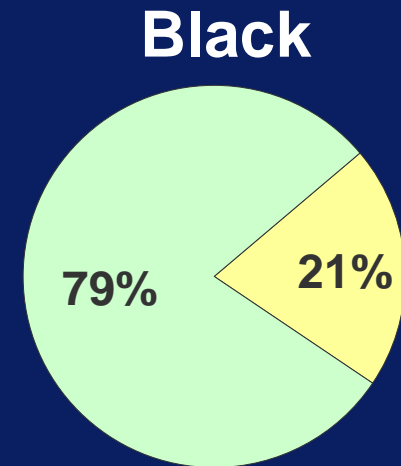
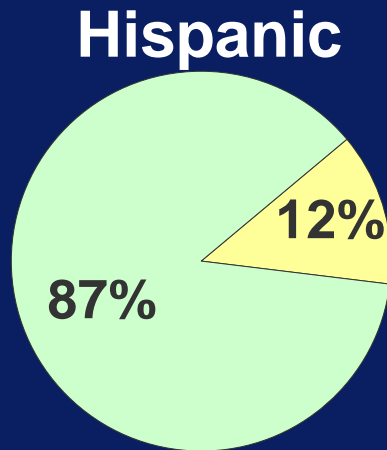


\*Data is provisional due to reporting delay (2006-2008)



Source: HIV Epidemiology Program, LAC-DPH; data as of May 31, 2009

# Proportion of Persons Living with HIV/AIDS, by Race/Ethnicity and Sex, 2009 in LA County

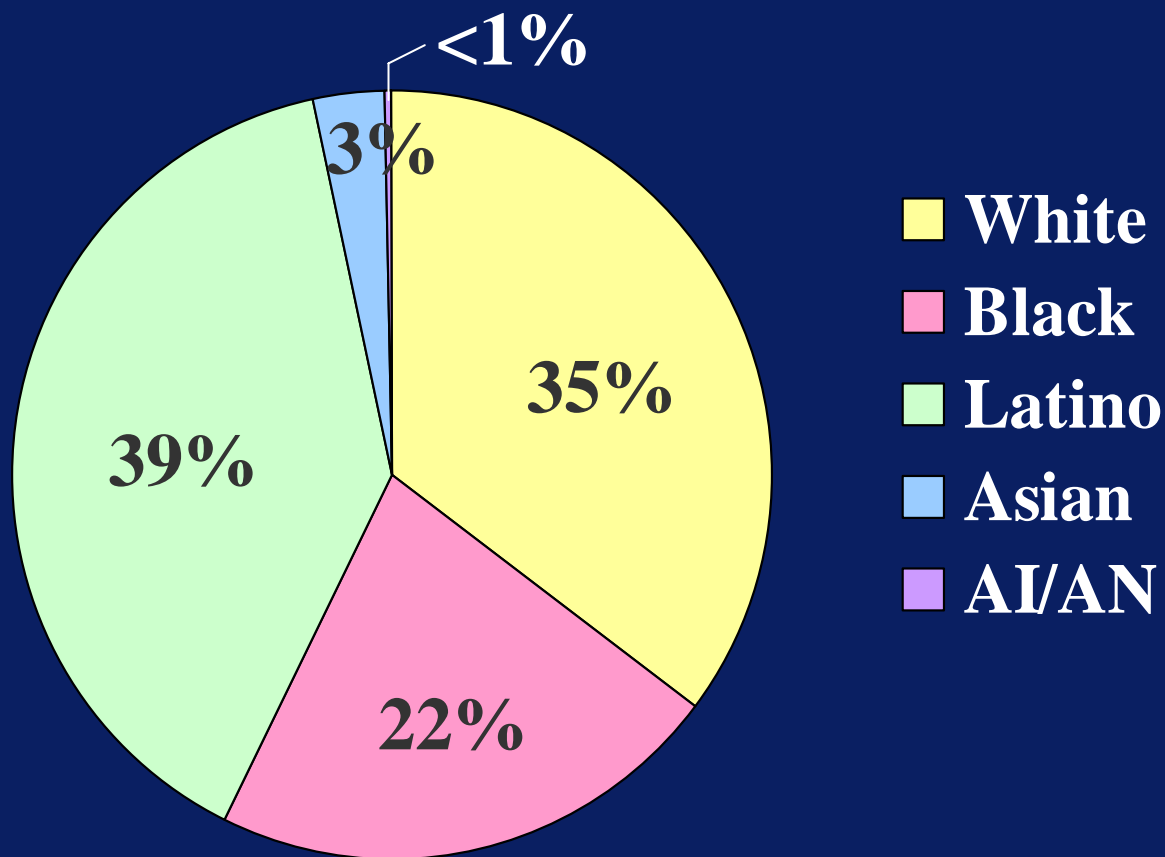


\* Data are provisional due to reporting delay.

Source: HIV Epidemiology Program; data as of December 31, 2009



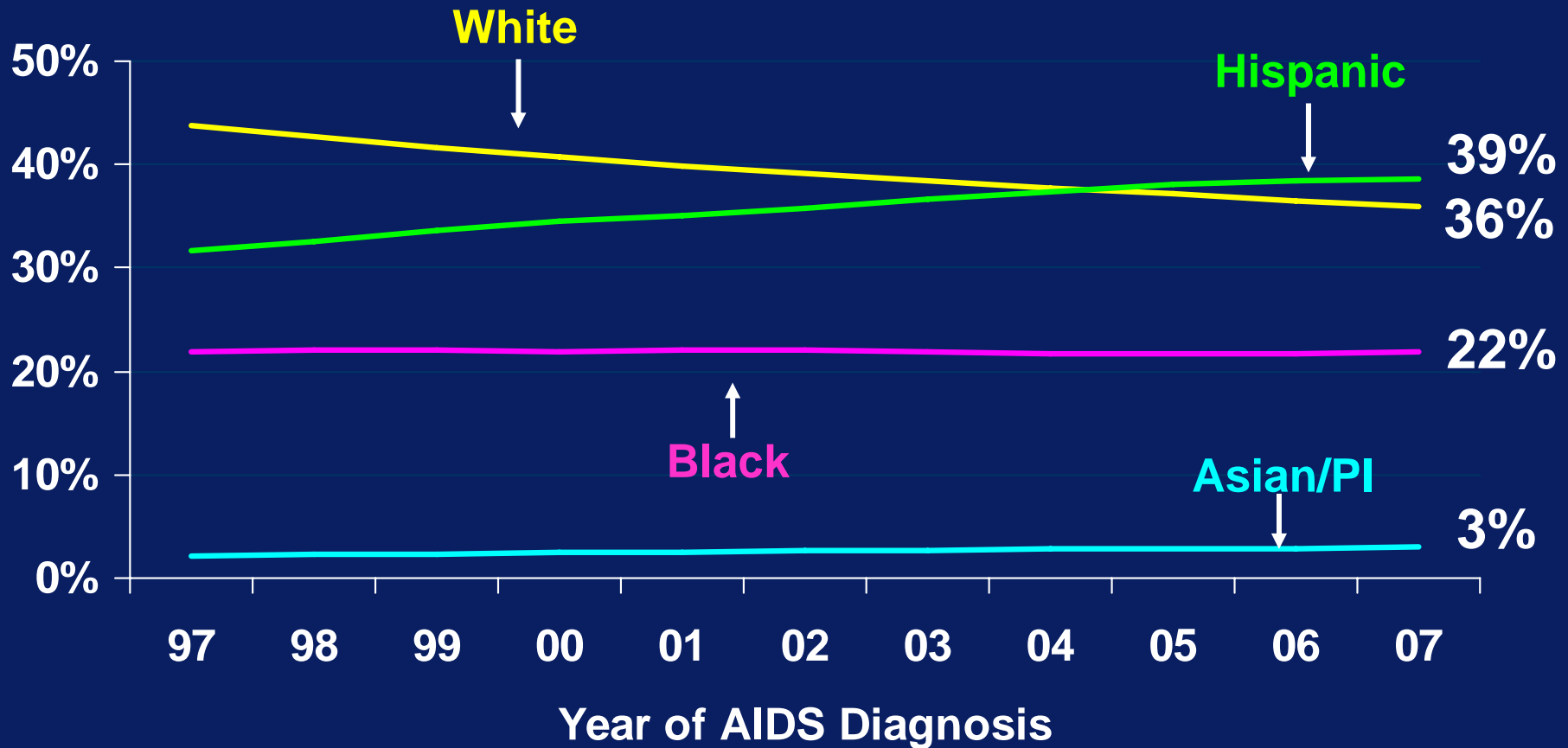
# Persons living with HIV and AIDS in LAC, by Race/Ethnicity (N=44,450)



Source: *HIV/AIDS Surveillance Summary*, data as of Dec. 2008.



# Proportion of LAC PLWHA Cases by Race/Ethnicity\* & Diagnosis Year, 1997-07



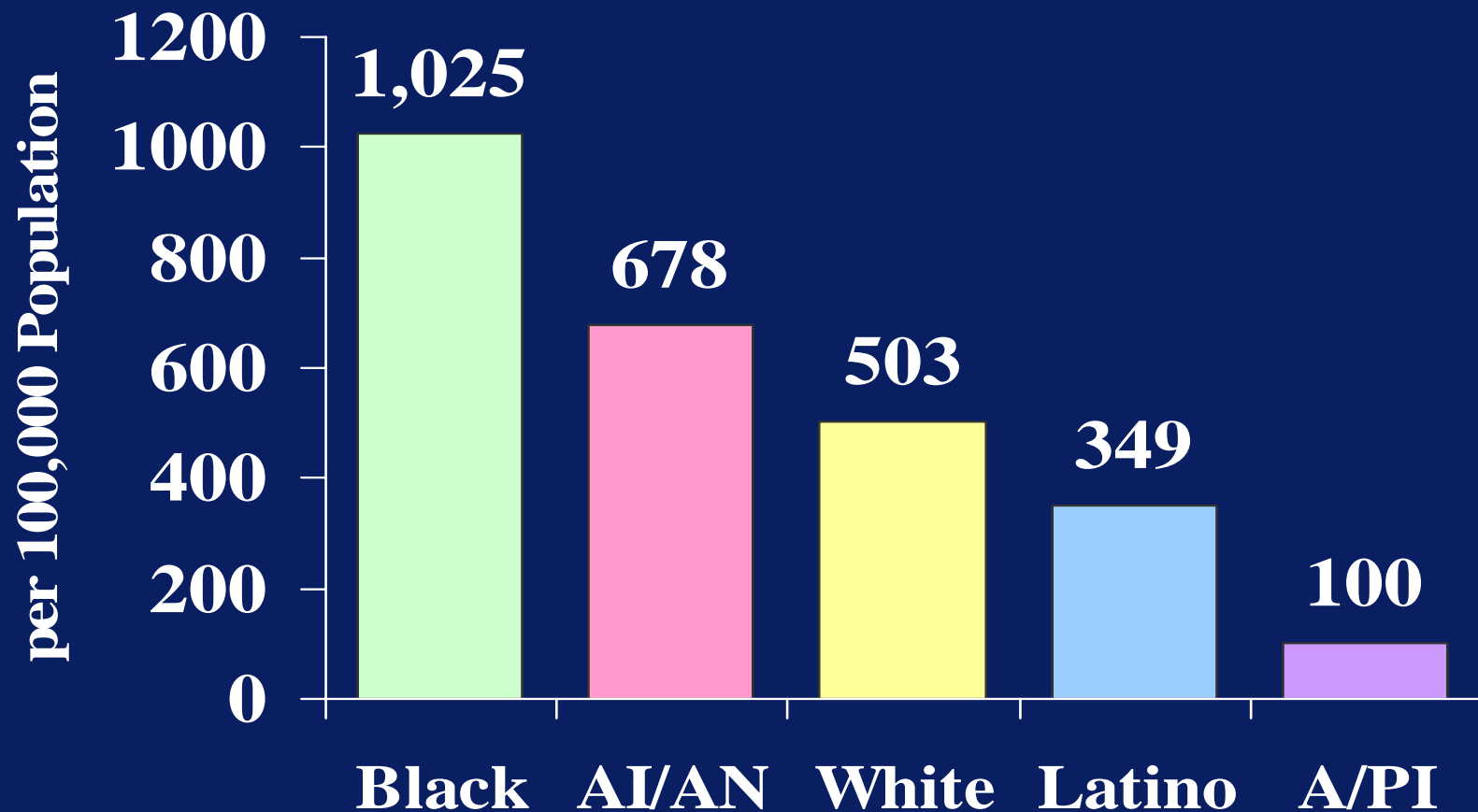
\*American Indian and Alaska Native are not presented here but consistently comprise <1% of cases.

\*Data are provisional due to reporting delay.

Source: HIV Epidemiology Program, LAC-DPH; data as of December 31, 2009



# Persons Living with HIV and AIDS in LAC per 100,000 population by Race/Ethnicity\*

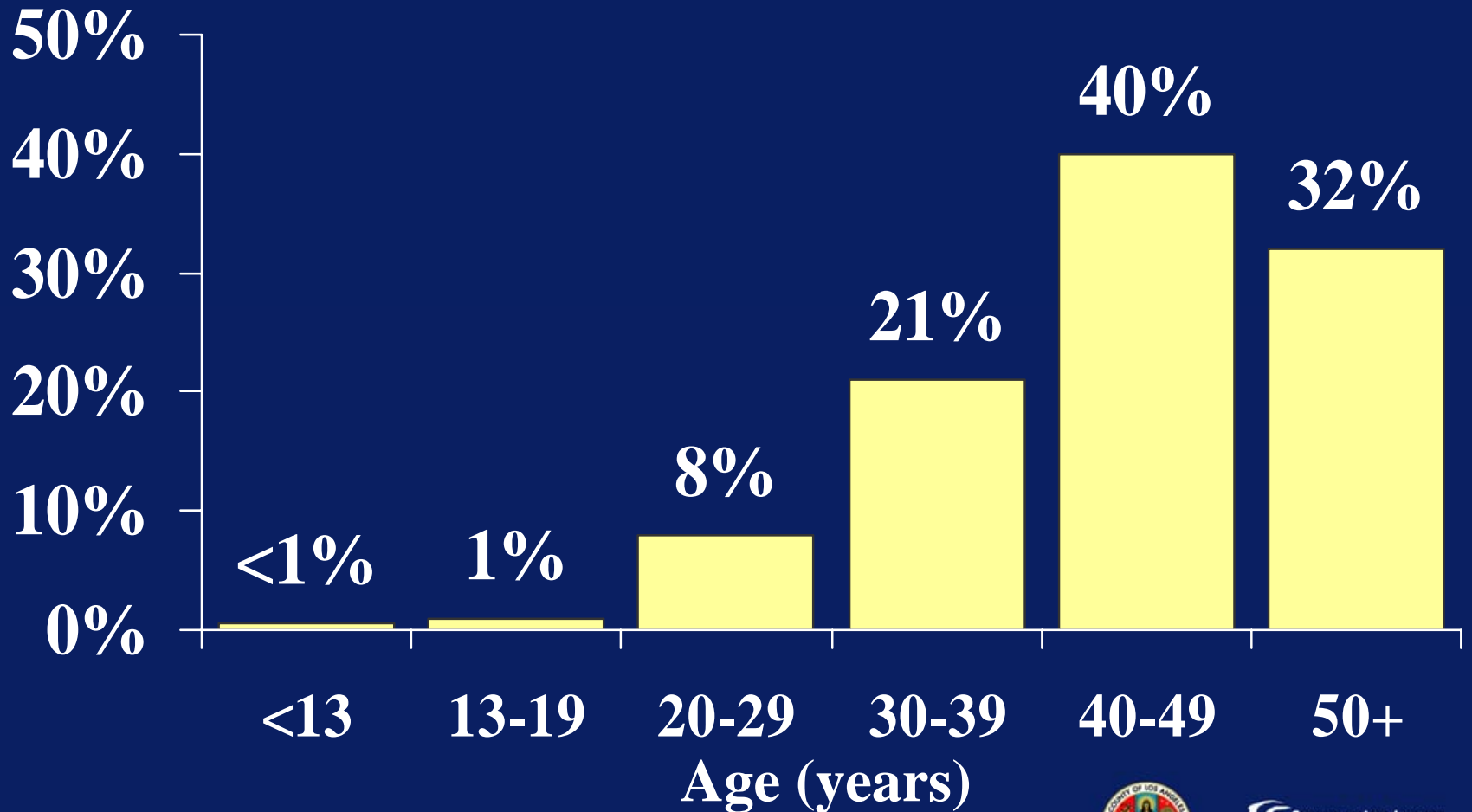


\*Sometimes called “Prevalence Rate”; it is really a proportion.

Source: *HIV/AIDS Surveillance Summary*, data as of Dec. 2009.



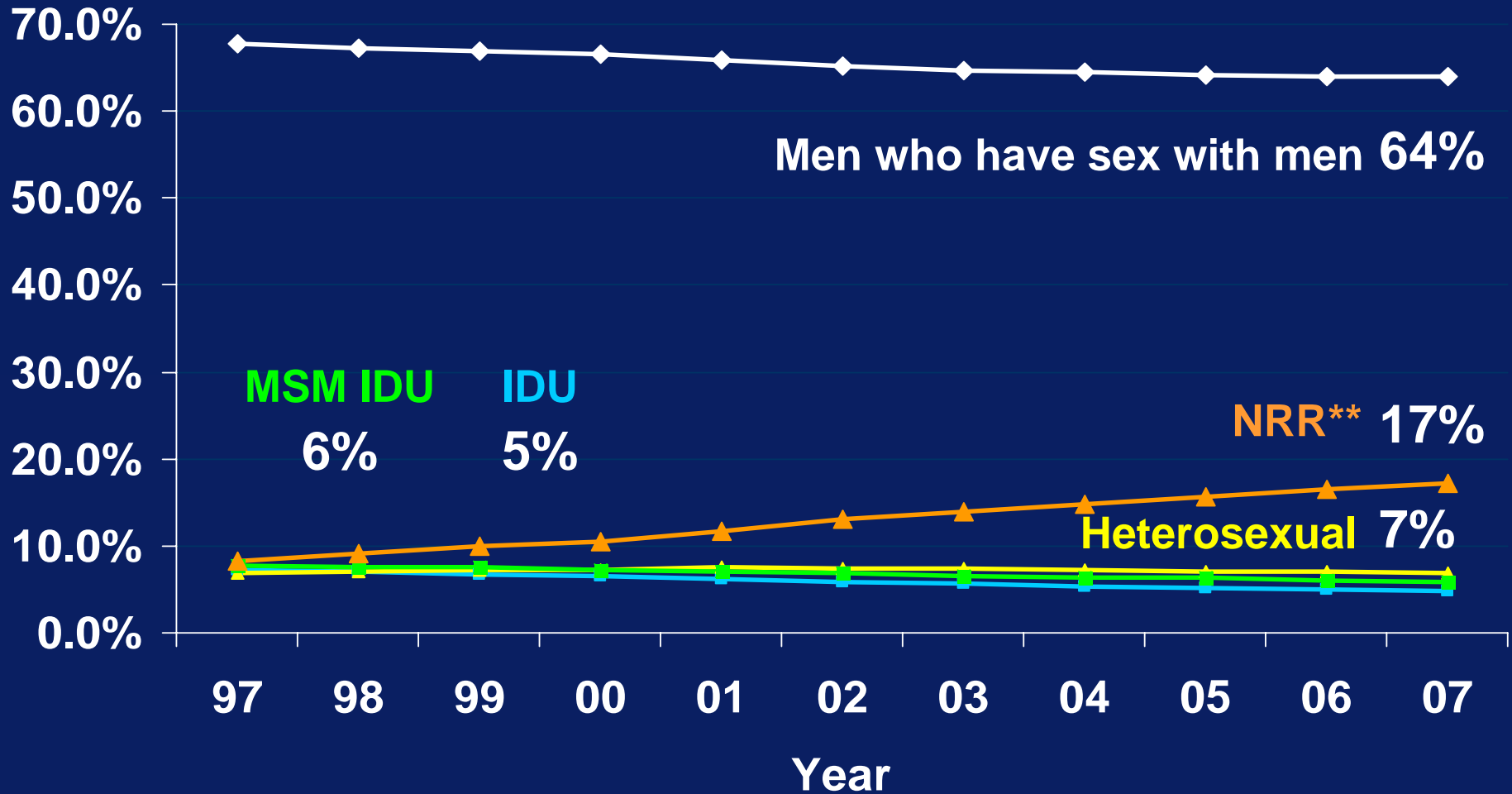
# Current Age of Reported Persons Living with HIV and AIDS (PLWHA) in LAC (N=44,450)



Source: *HIV/AIDS Surveillance Summary*, data as of Dec. 2009.



# Proportion of LAC PLWHA by Mode of Exposure and Calendar Year, 1997-2007\*



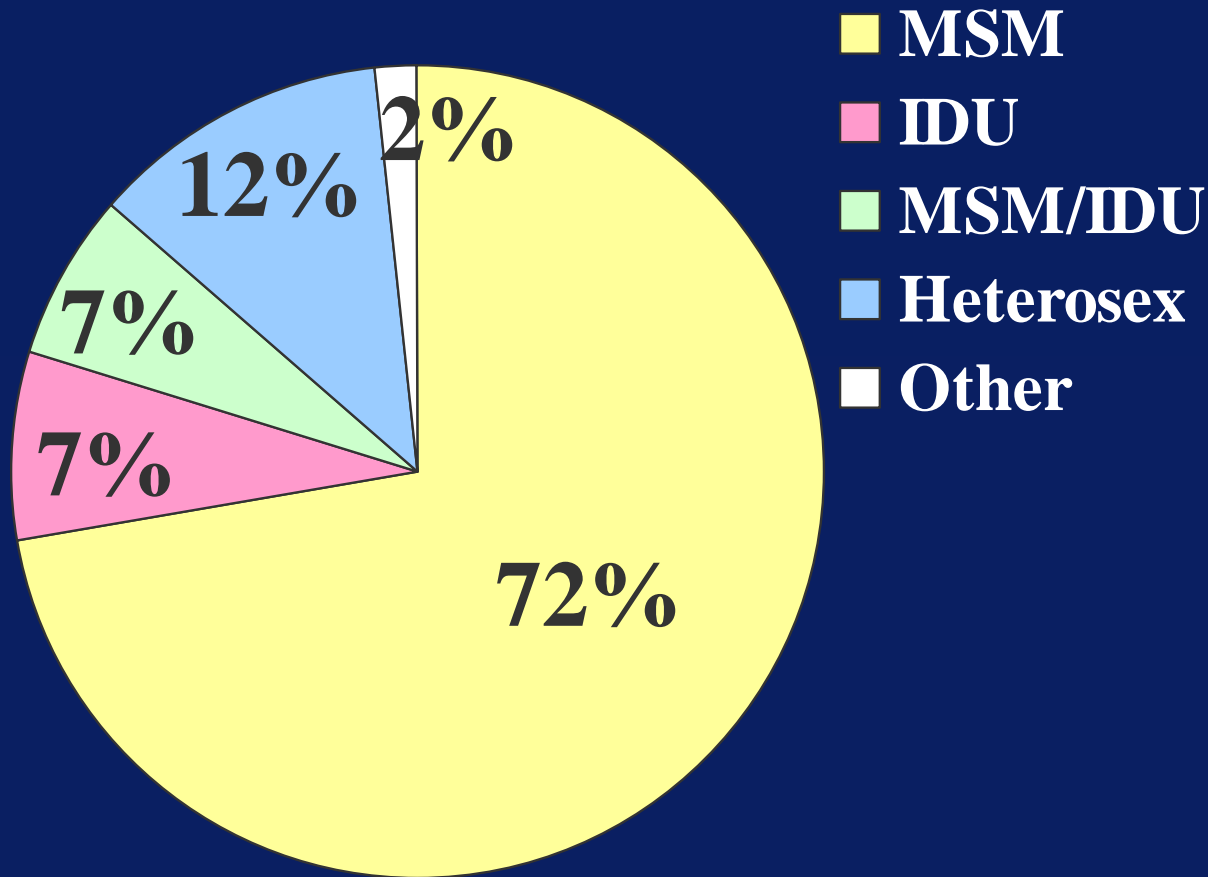
\*\*NRR = no reported risk.

\*Data are provisional due to reporting delay.

Source: HIV Epidemiology Program, LAC-DPH; data as of December 31, 2009



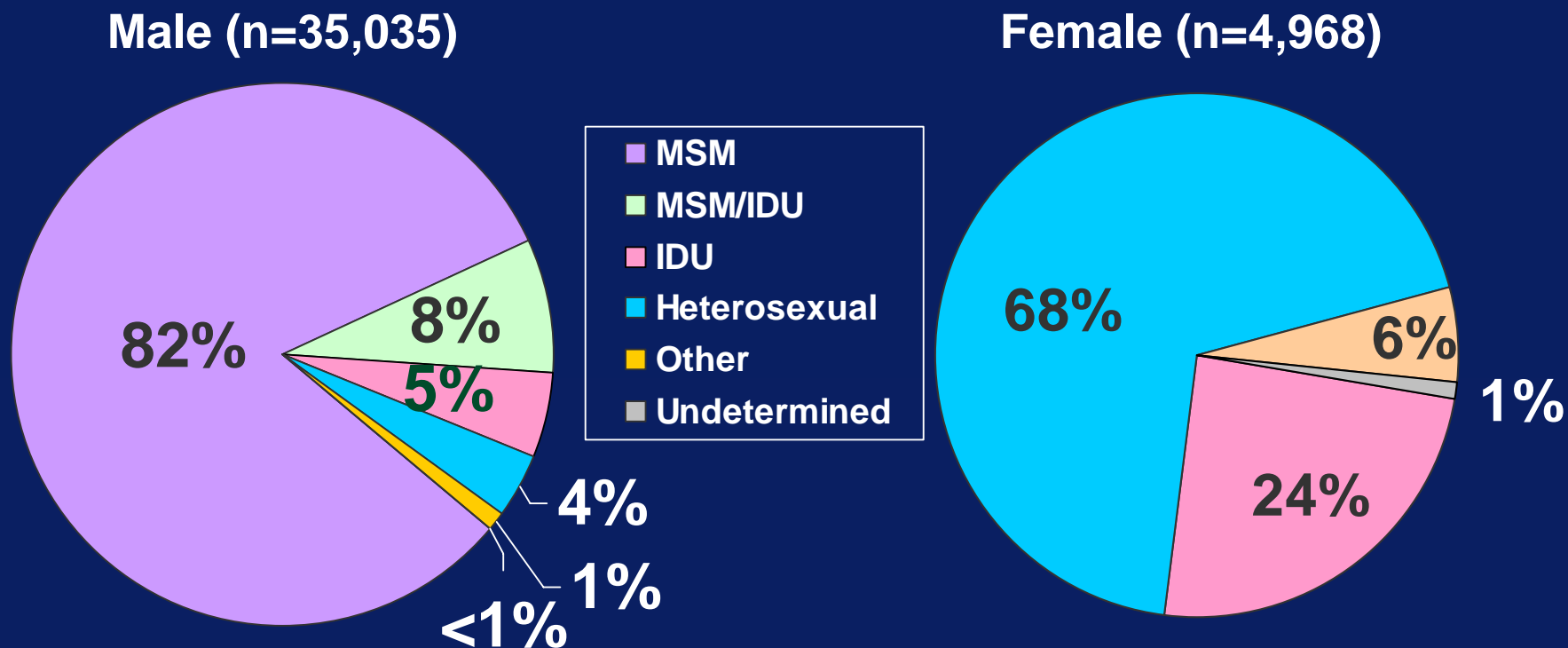
# Persons living with HIV and AIDS in LAC, 2007, by Mode of Exposure, Adjusted (N=40,000)



Source: *HIV/AIDS Surveillance Summary*, data as of Sept. 2008.



# Adjusted Mode of Exposure for Persons Living with HIV/AIDS by Gender in LAC, as of December 31, 2007



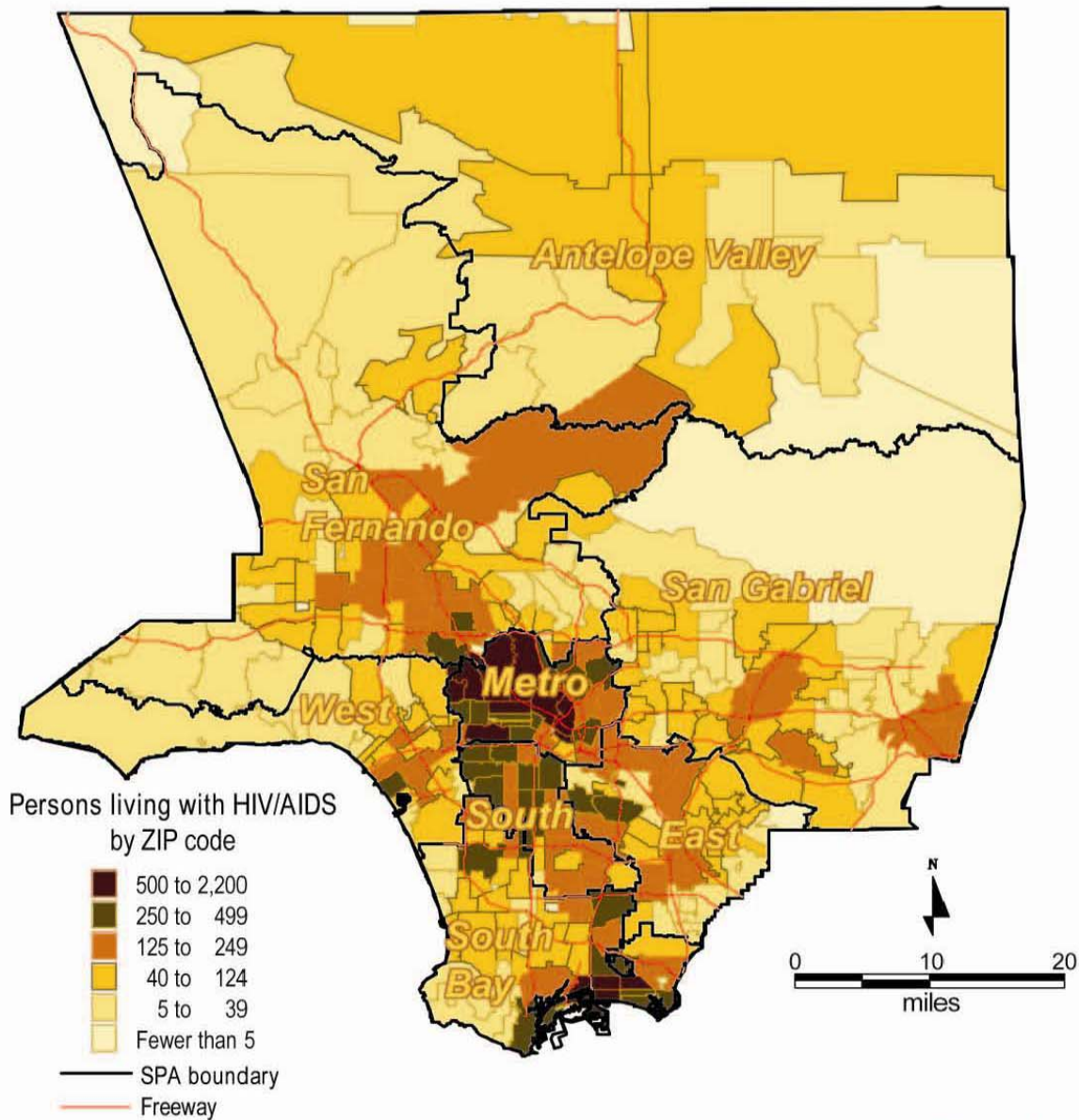
\*Persons who had no reported risk for HIV infection had been redistributed to a valid mode of exposure category based on the CDC method for distribution of reclassified cases.

Source: *HIV/AIDS Surveillance Summary*, data as of September 2008.



# Persons Living with HIV and AIDS by Zip Code and Service Planning Area (SPA) in Los Angeles County, as of December 31, 2009 (N=44,450)

Source: *HIV/AIDS Surveillance Summary.*



1. Persons with HIV are based on the preliminary data collected from July 2002 to December 2009.
2. ZIP code information is based on the residence at time of diagnosis or the care facility location when the residential information is unknown.

# Severe HIV Disease (AIDS) in L.A. County



# AIDS cases from *HIV/AIDS Semiannual Surveillance Summary*

	<u>No. cases</u>	<u>No. deaths</u>	<u>No. Living</u>
US*	1,06,391	597,499	440,902
CA**	156,066	87,022	69,044
LAC***	56,091	31,448	24,643

\*From CDC HIV Surveillance Report, 2008, Vol 20.

\*\*Reported as of 12/31/2009 (preliminary)

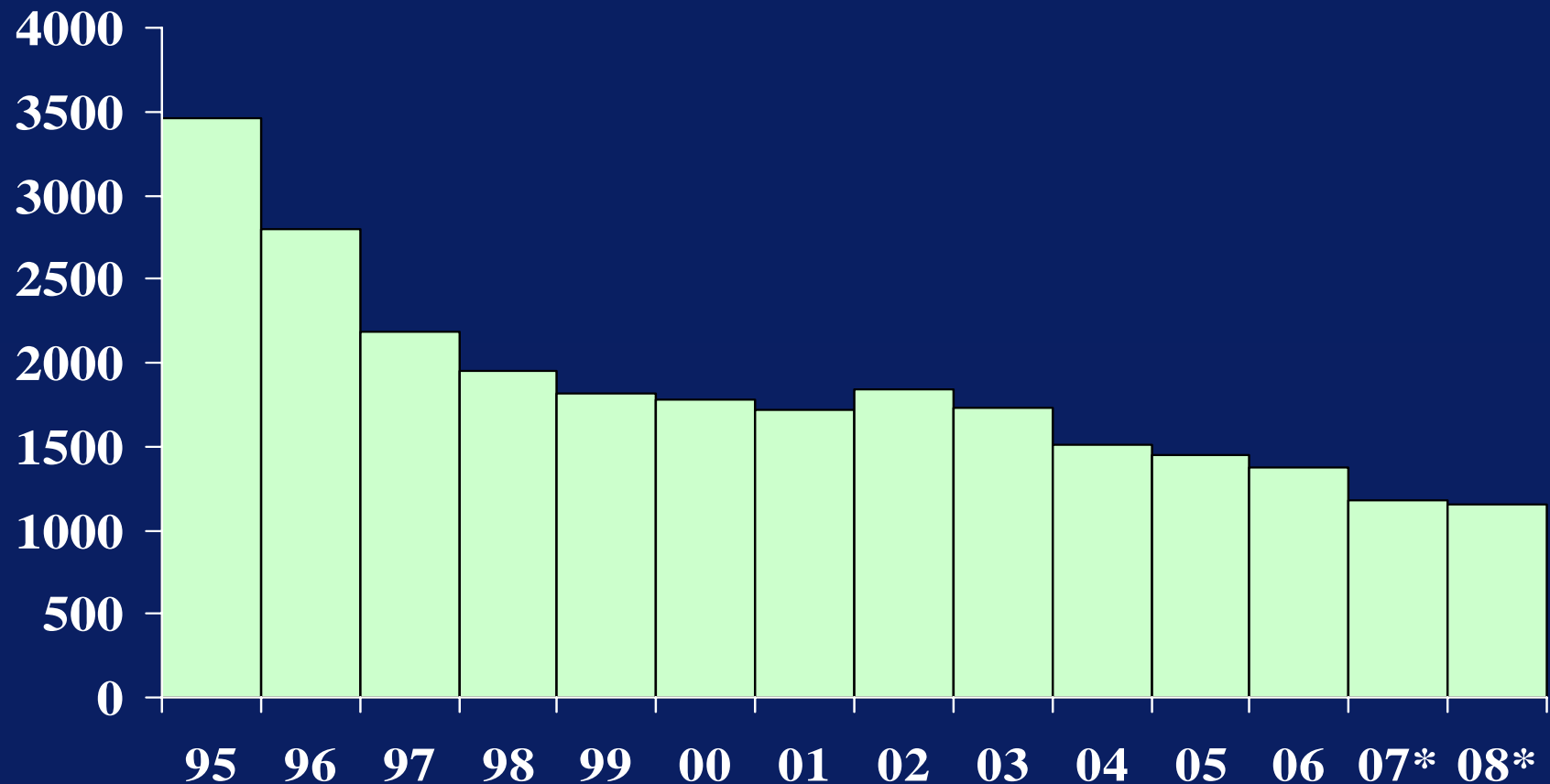
\*\*\*Reported as of 12/31/2009



# Number of reported AIDS Cases by Year of Report and Year of Diagnosis



# Number of AIDS Cases by Year of Diagnosis - LAC, 1995 - 2008

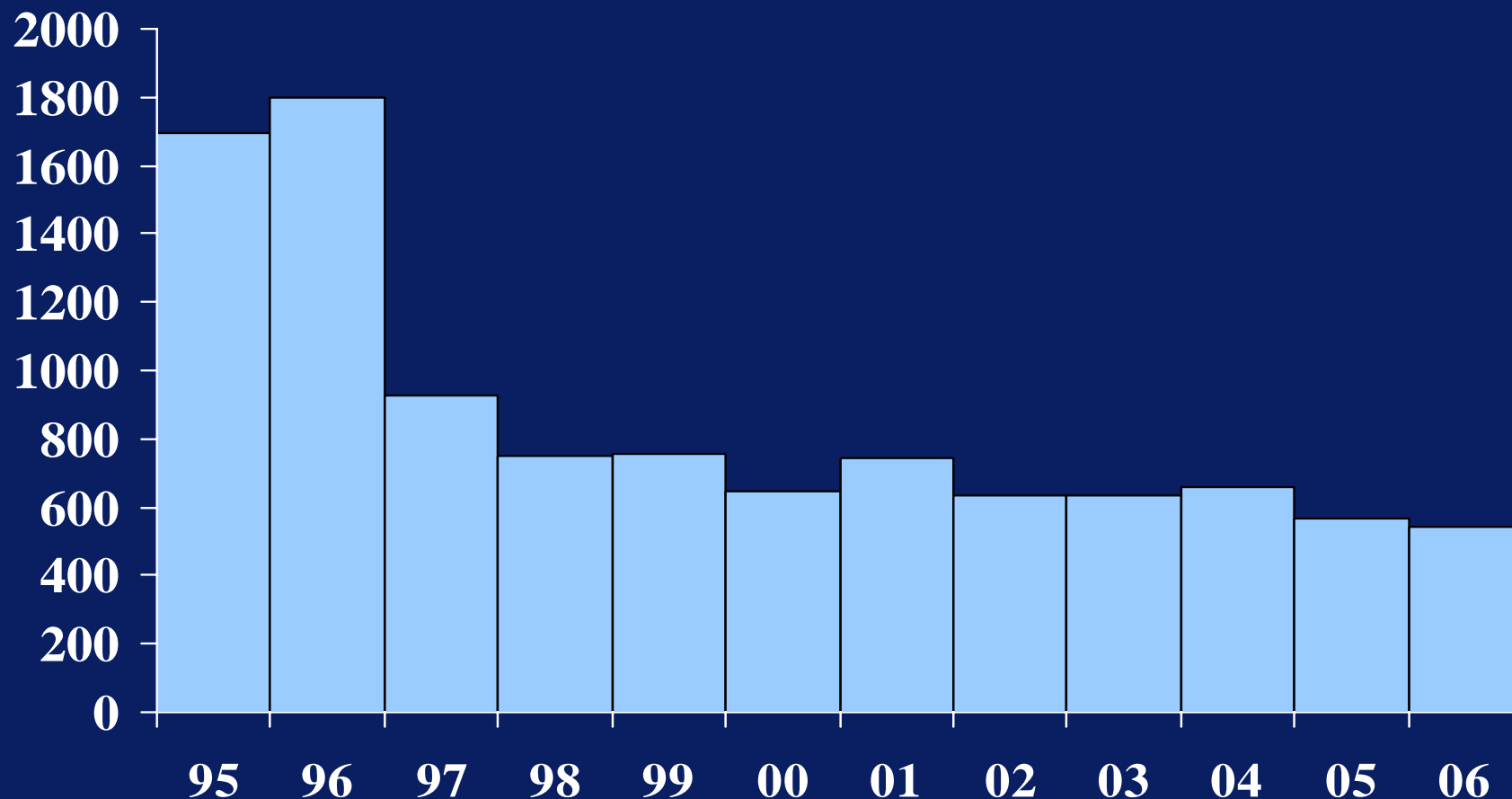


\* Data are provisional due to reporting delay.

Source: *HIV/AIDS Surveillance Summary*, data as of Dec. 2009.



# Number of AIDS Deaths by Year of Death - LAC, 1995 - 2006

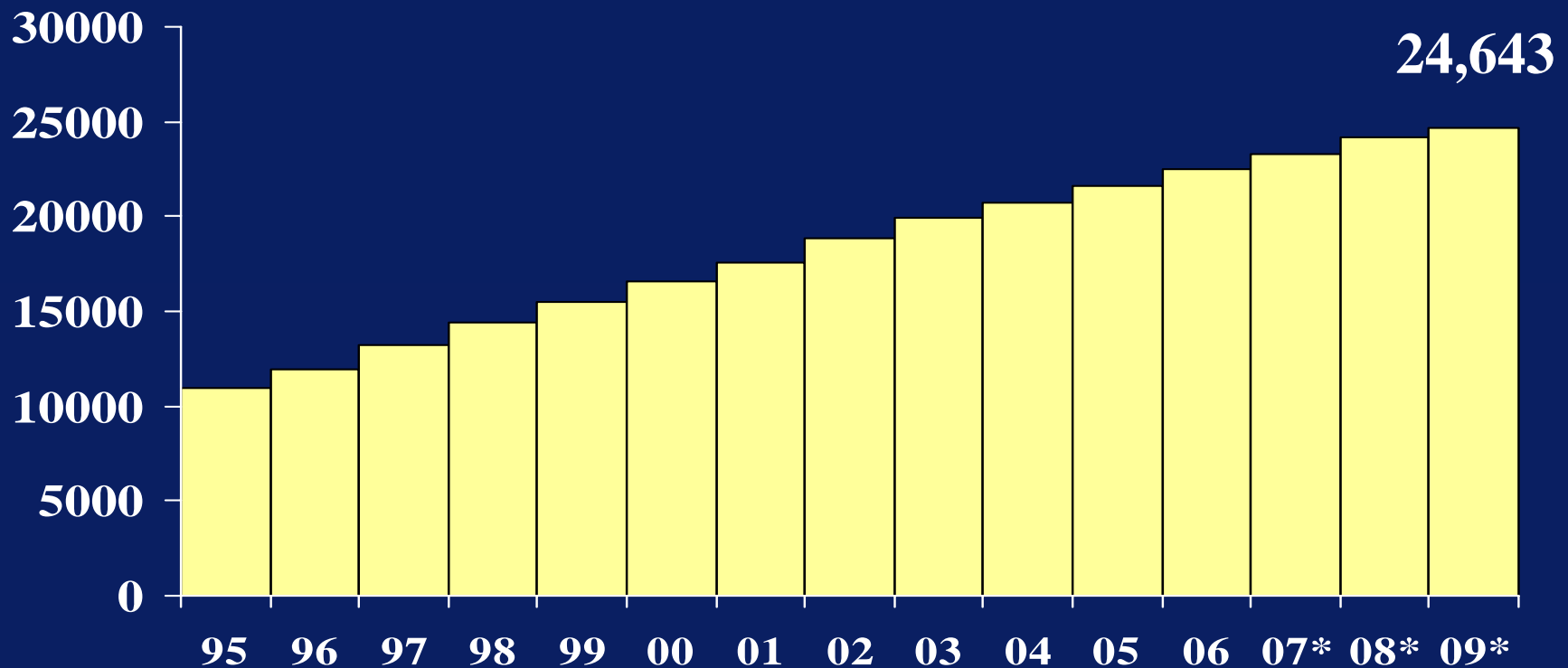


**Note: Data for 2007-09 are provisional due to reporting delay and that data are not shown.**

**Source: HIV/AIDS Surveillance Summary, data as of Dec. 2009.**



# Number of Persons Living with AIDS (PLWA) by Calendar Year - LAC, 1995 - 2009

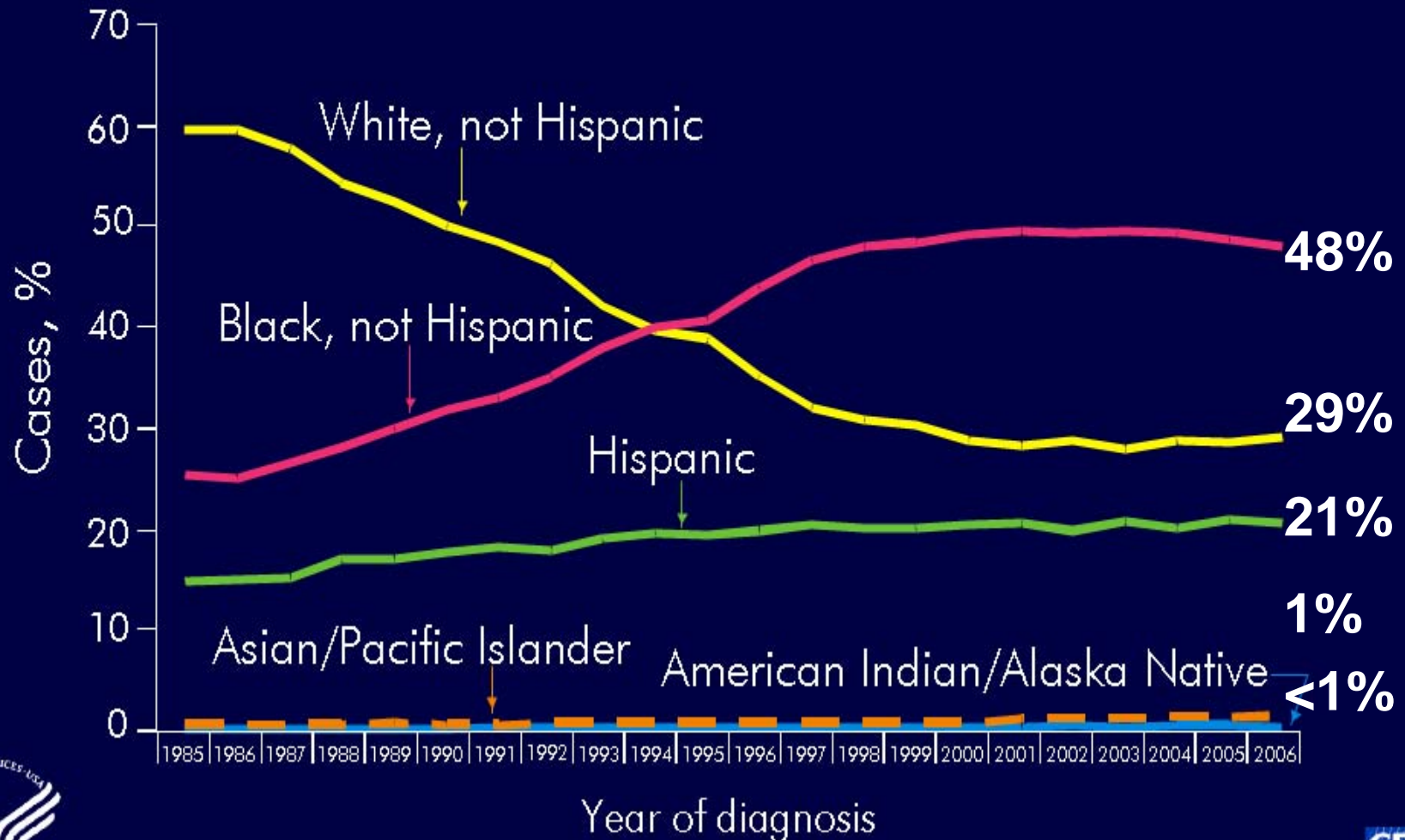


\* Data are provisional due to reporting delay.

Source: HIV/AIDS Surveillance Summary, data as of Dec. 2009.



# Proportion of AIDS Cases among Adults and Adolescents by Race/Ethnicity and Year of Diagnosis 1985–2006—United States and Dependent Areas

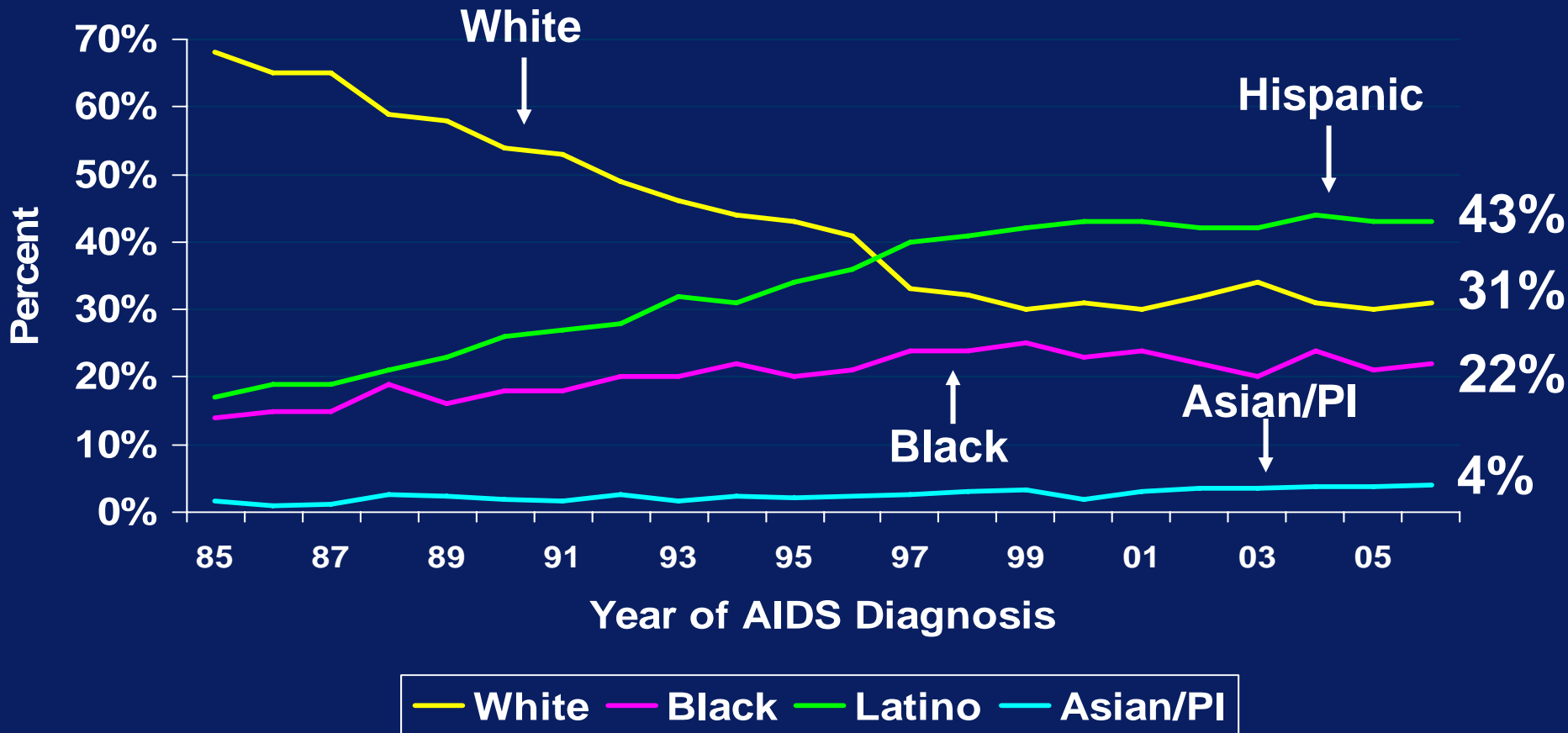


Note. Data have been adjusted for reporting delays.



Source: Centers for Disease Control and Prevention.

# Proportion of AIDS Cases by Race/Ethnicity\* & Diagnosis Year, 1985-06, LAC



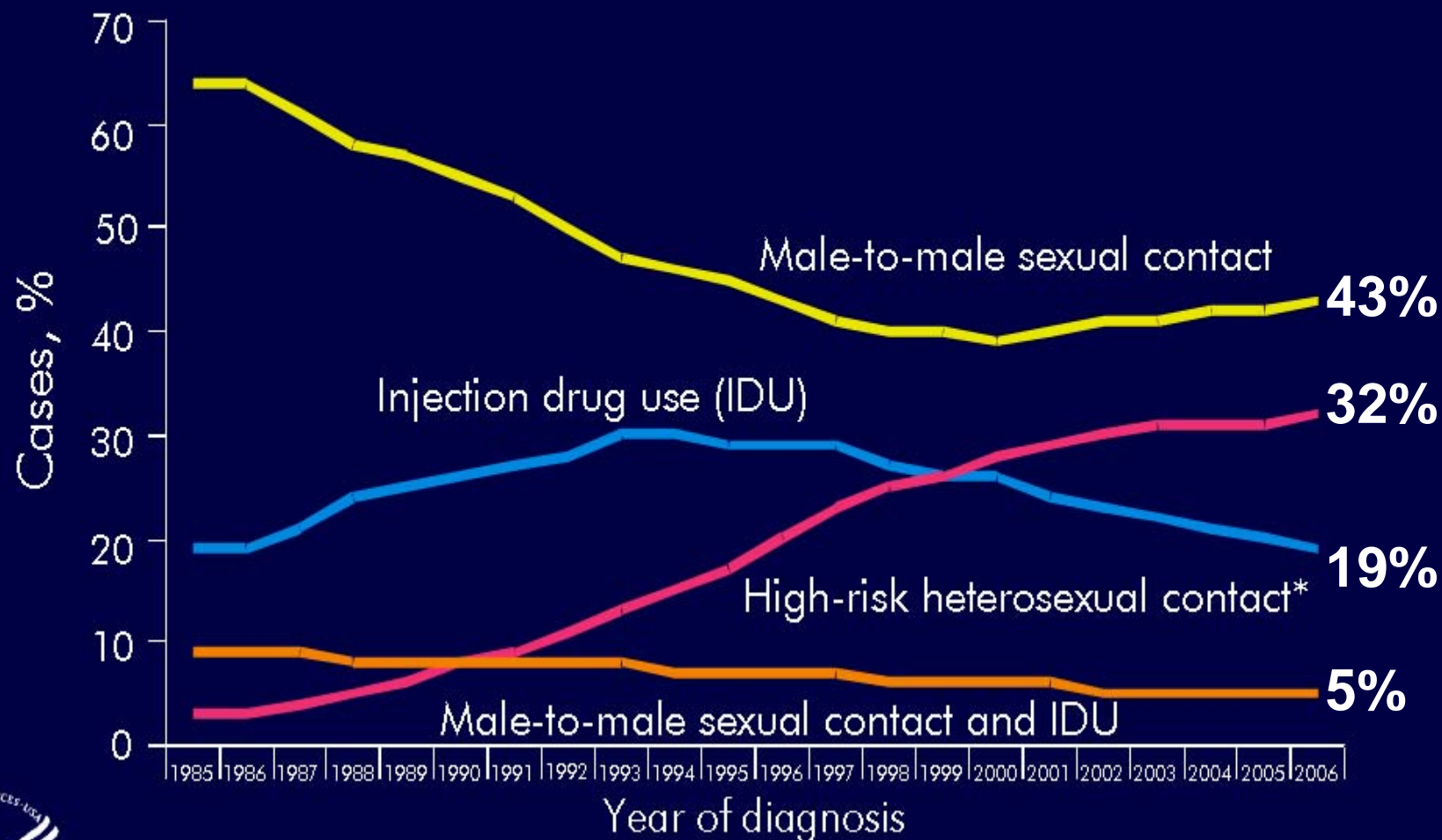
\*American Indian and Alaska Native are not presented here but consistently comprise <1% of cases.

\*\*Data are provisional due to reporting delay (2006).

Source: HIV Epidemiology Program, LAC-DPH; data as of December 31, 2009



# Proportion of AIDS Cases among Adults and Adolescents by Transmission Category and Year of Diagnosis 1985–2006—United States and Dependent Areas



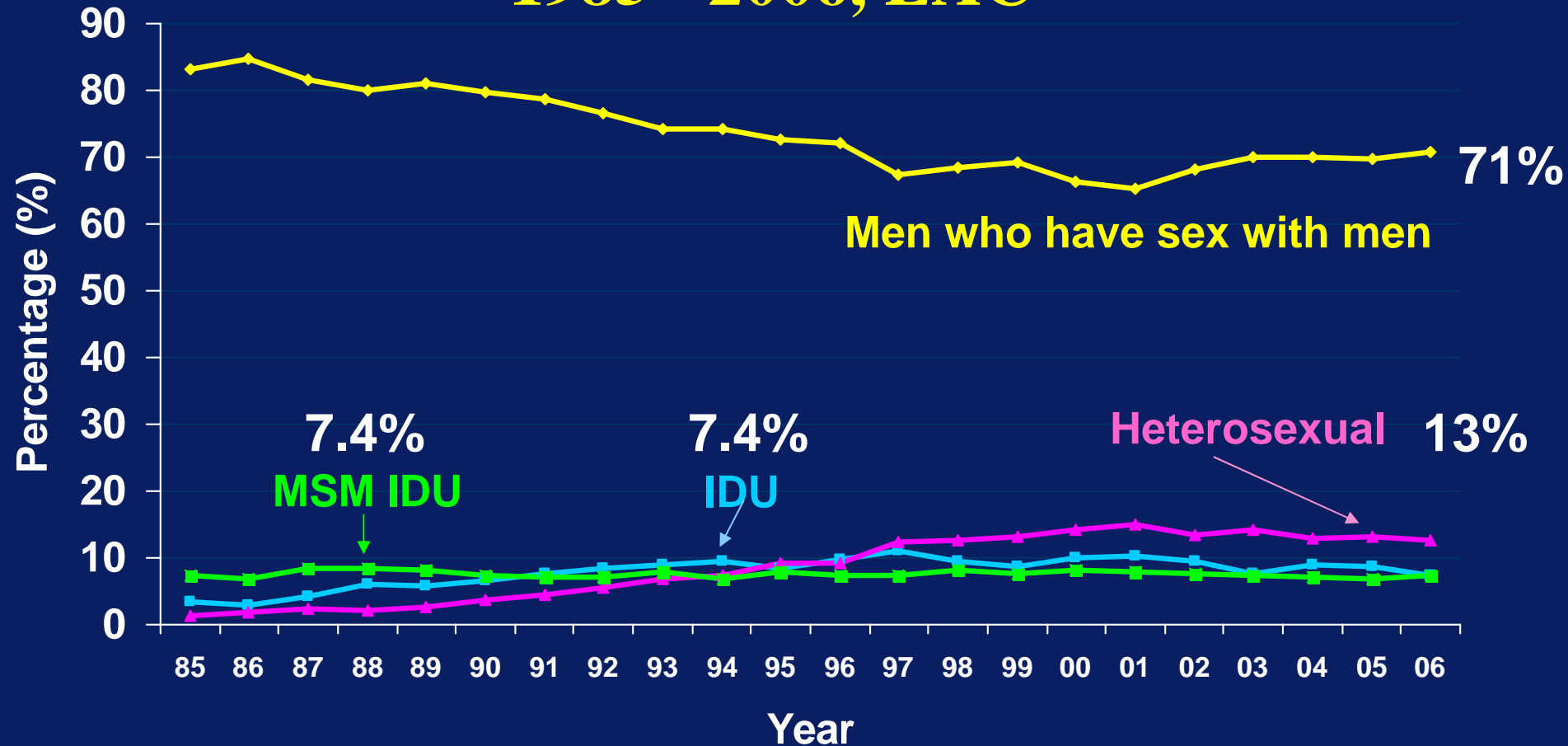
Note. Data have been adjusted for reporting delays and cases without risk factor information were proportionally redistributed.

\* Heterosexual contact with a person known to have, or to be at high risk for, HIV infection.



**Source: Center for Disease Control and Prevention.**

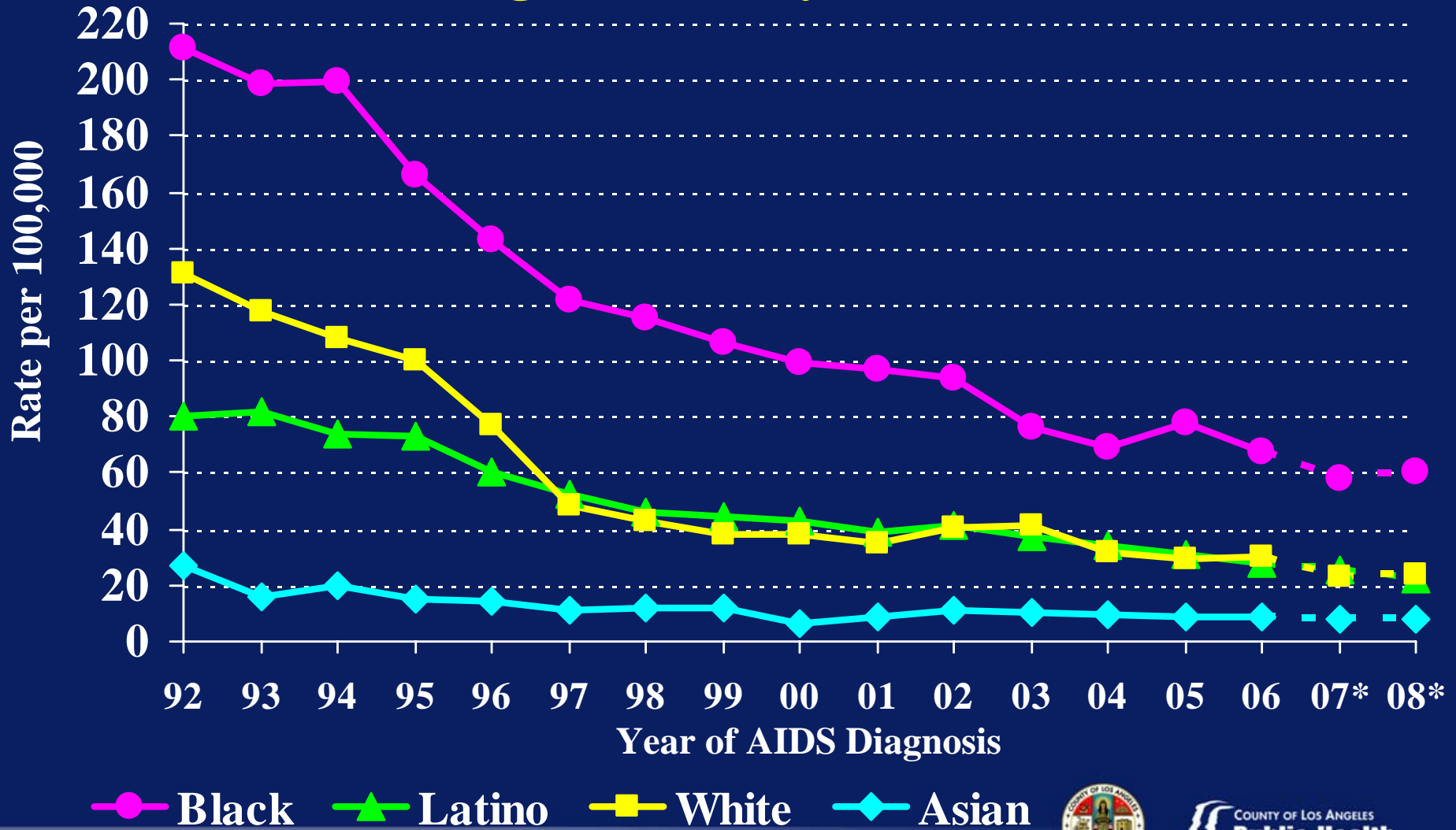
# Proportion of AIDS Cases by Adjusted Mode of Exposure and Year of Diagnosis 1985 - 2006, LAC\*



\*Cases without reported risk redistributed using CDC protocol.

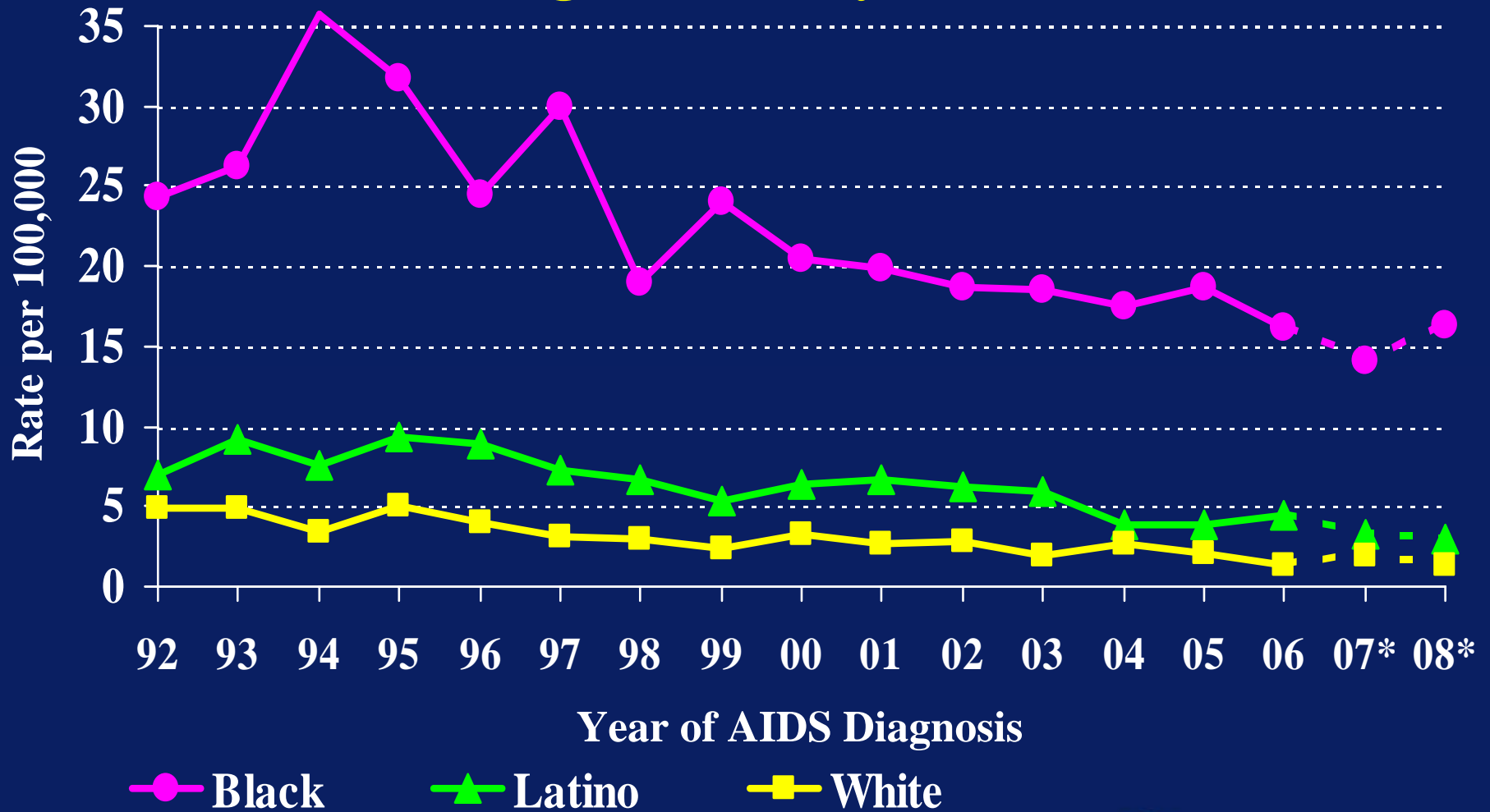


# Male Adult/Adolescent Annual AIDS Rates by Race/Ethnicity and Year of Diagnosis Los Angeles County, 1992 - 2008



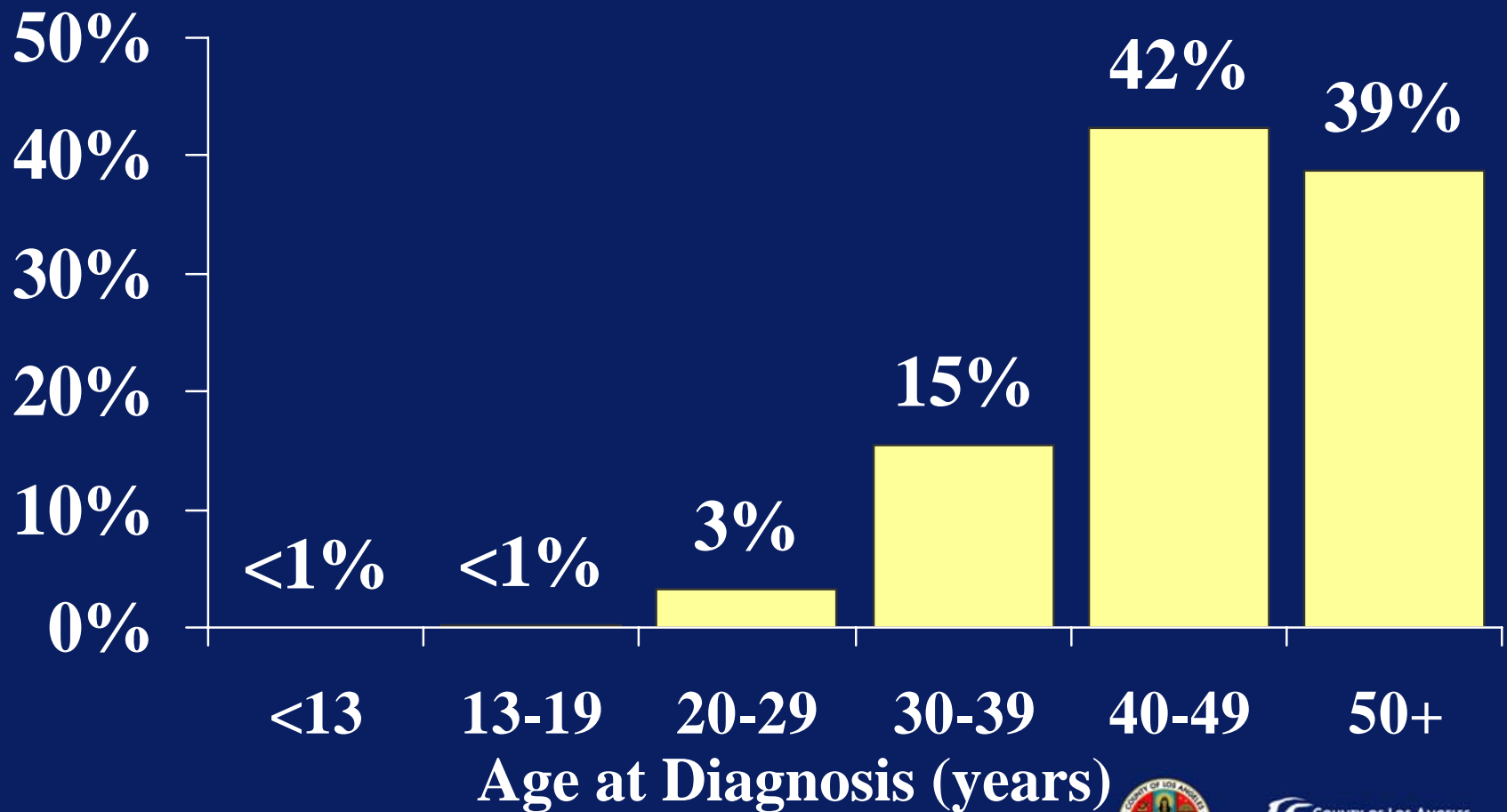
Source: HIV/AIDS Surveillance Summary, data as of December 2009.

# Female Adult/Adolescent AIDS Rates by Race/Ethnicity and Year of Diagnosis, Los Angeles County, 1992-2008



Source: HIV/AIDS Surveillance Summary, data as of December 2009.

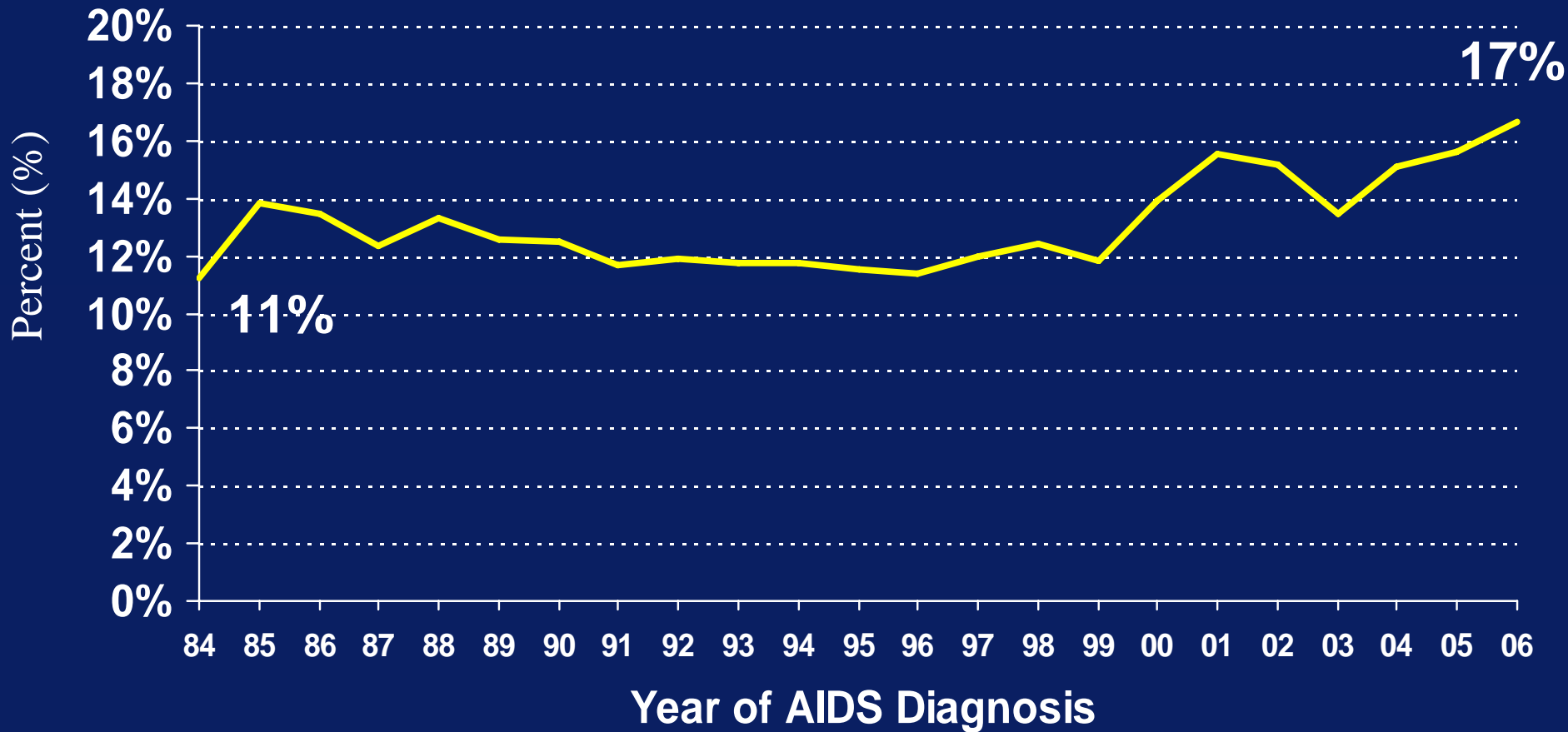
# Current Age for Persons Living with Severe HIV Disease (AIDS) in LAC (N = 24,643)



Source: *HIV/AIDS Surveillance Summary*, data as of Dec. 2008.



# Percent of Newly Diagnosed Severe HIV Disease (AIDS) Cases Among Persons 50 Years and Older, by Year of Diagnosis 1984-2006



Source: HIV Epidemiology Program, LAC-DPH; data as of December 31, 2009

# HIV Incidence Surveillance

- Provide reliable, scientifically valid estimates of newly acquired infections at local, state and national level
- Window into HIV epidemic at earlier disease stage
- Guide allocation of resources to plan, implement and evaluate prevention programs and services
- CDC released HIS estimate in August 2008
  - 56,300 new HIV infections in U.S. in 2006
  - Used HIS data from 22 states to impute for entire nation
  - “Increase” from previous estimate of 40,000
- LAC estimate for 2007: range 2,000-3,000
  - Awaiting revised CDC methodology



# 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

**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

**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 22 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.

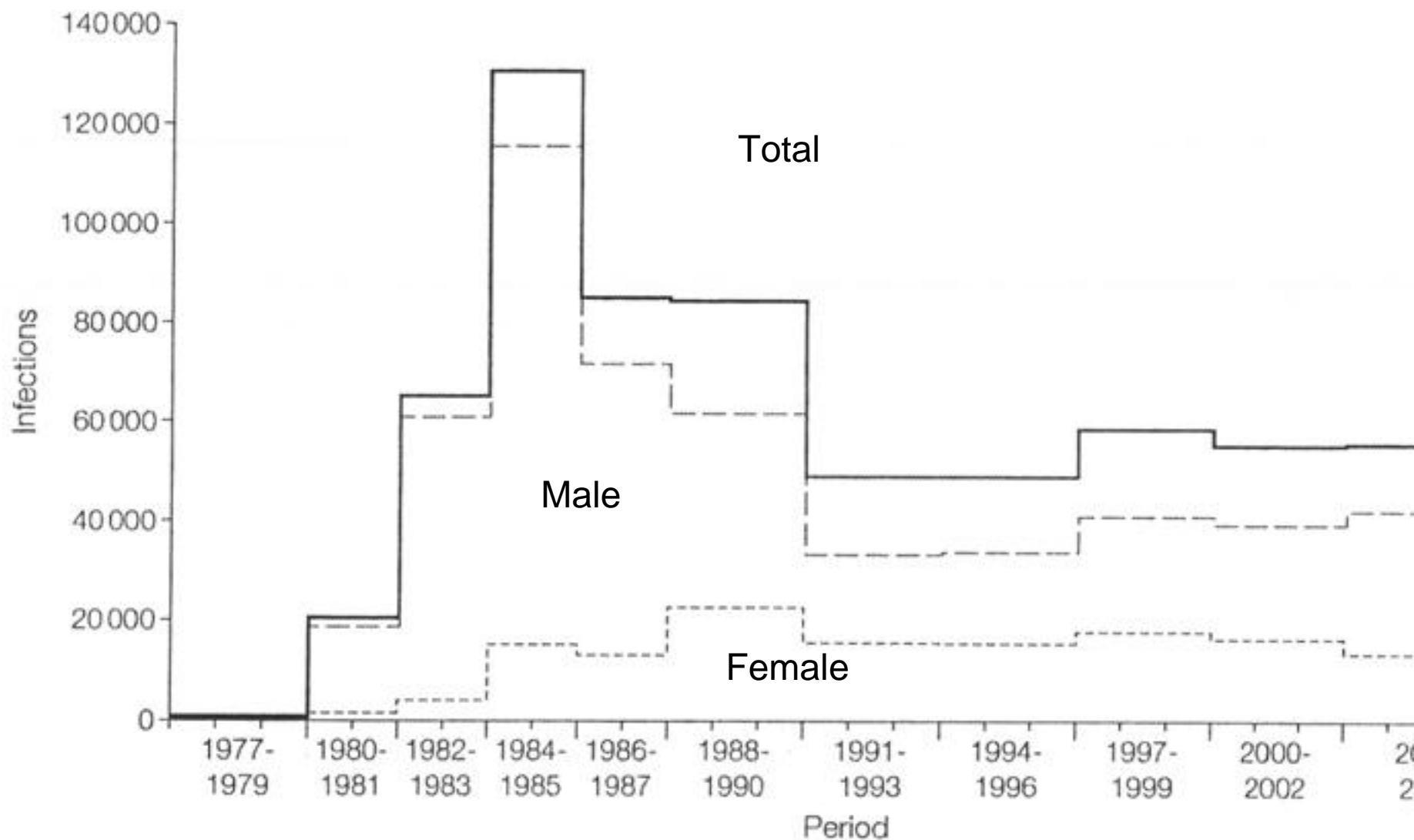
JAMA. 2008;300(5):520-529

[www.jama.com](http://www.jama.com)

current transmission patterns. In addition, with the change in the AIDS case definition in 1993 and the advent of effective treatments that slow disease pro-

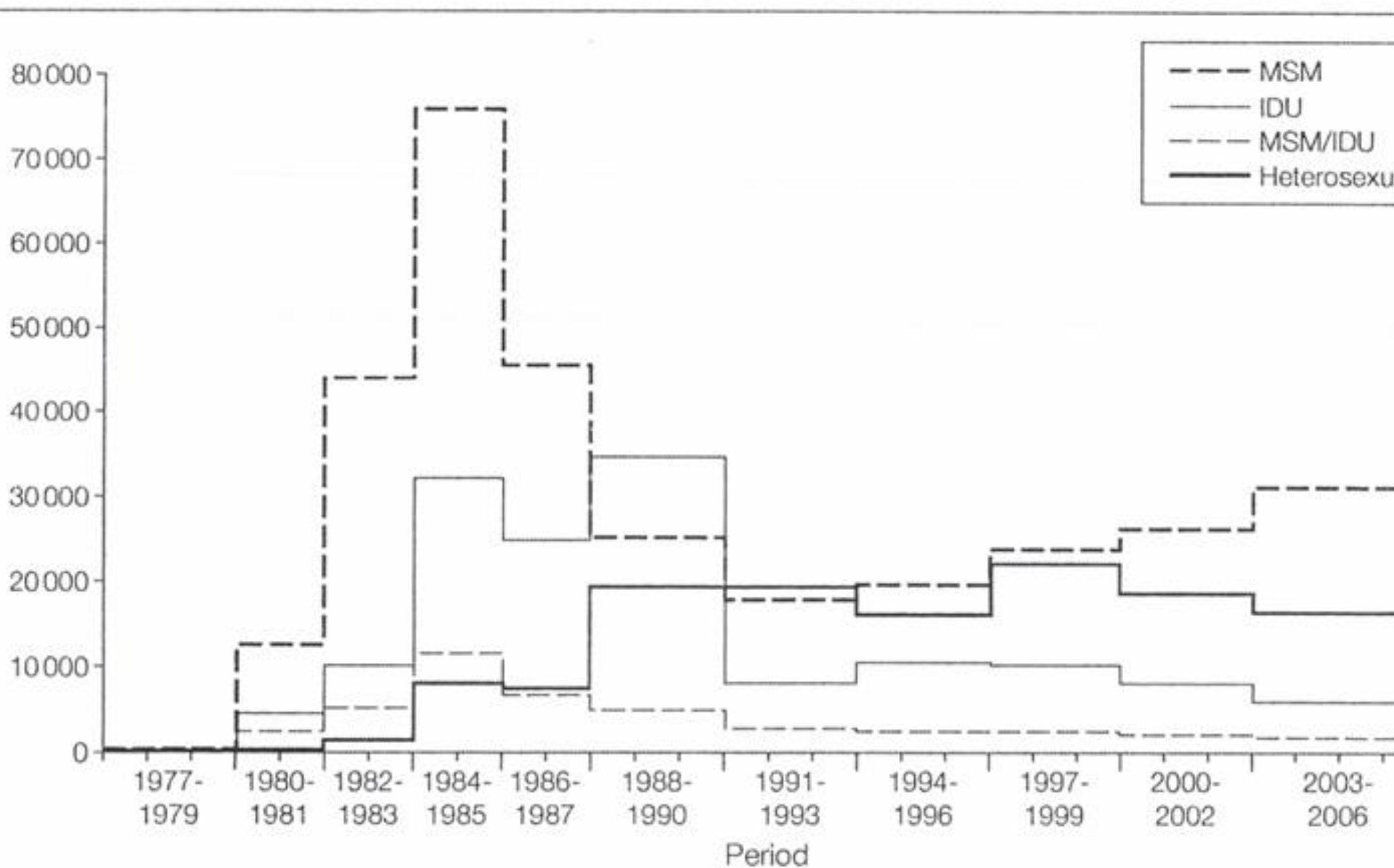
**Author Affiliations:** Division of HIV/AIDS Prevention, Centers for Disease Control and Prevention, Atlanta, Georgia (Drs Hall, Song, Rhodes, Prejean, Lee, McKenna, and Janssen); The Ginn Group Inc, Peachtree City, Georgia (Ms An); Emergent Corporation, Louisville, Kentucky (Dr Karon); Johns Hopkins Bloomberg School of

**Figure 1.** Estimated New Human Immunodeficiency Virus (HIV) Infections, Extended Back-Calculation Model, 50 US States and the District of Columbia, 1977-2006



Tick marks denote beginning and ending of a year. The model specified periods within which the number of infections was constant.

**Figure 2.** Estimated New Human Immunodeficiency Virus (HIV) Infections by Transmission Category, Extended Back-Calculation Model, 50 US States and the District of Columbia, 1977-2006



# Topics in HIV Surveillance

- | **Aging of persons living with HIV and AIDS**
- | **Success of reducing perinatal transmission**
- | **Health Disparities in HIV testing and care**
- | **Late entry into care: early treatment translates to decreased transmission – “Test and Treat”**
- | **Routine testing guidelines from CDC**
- | **Persons unaware of their infection responsible for majority of HIV transmission**

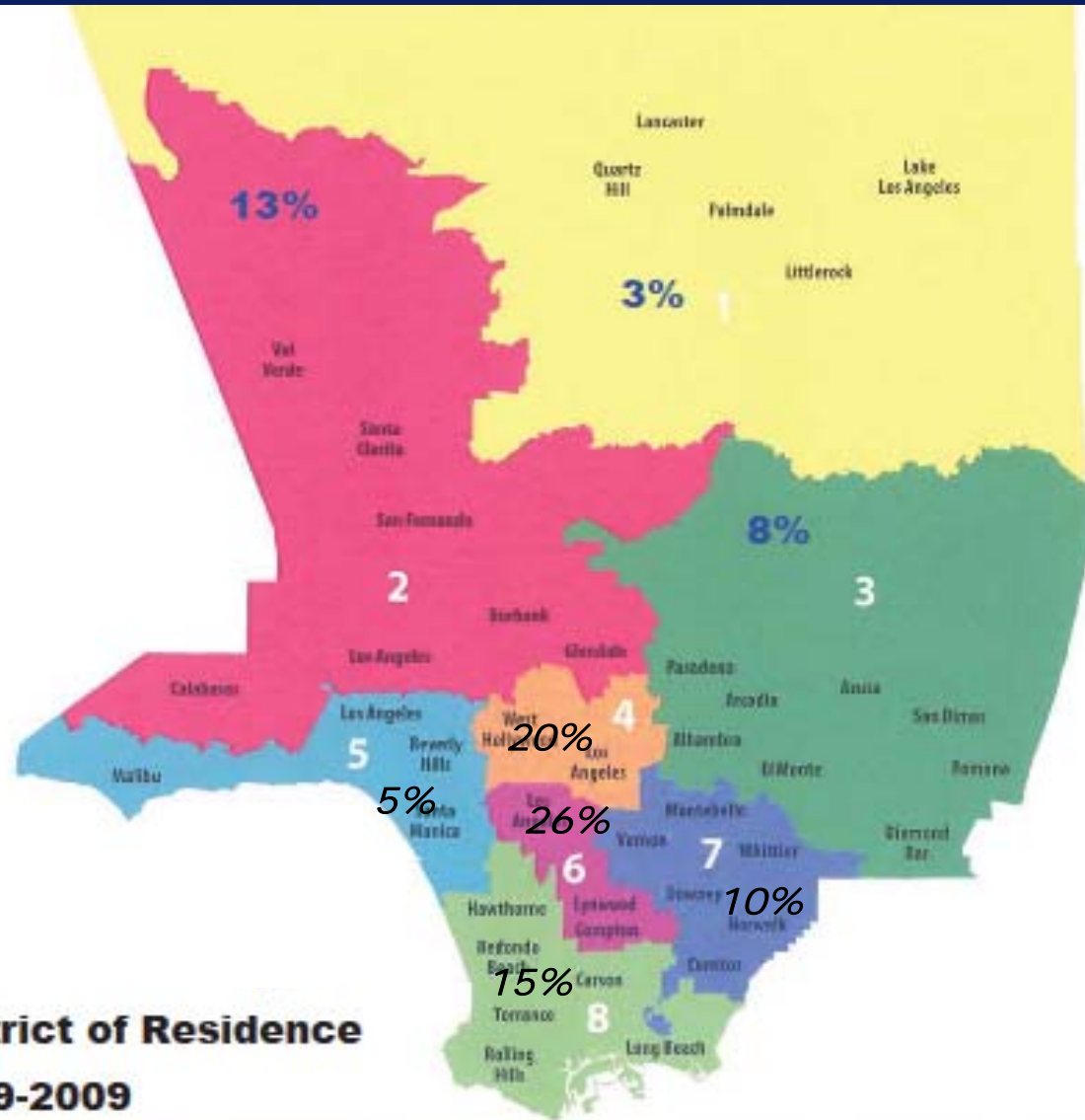


# Perinatally Exposed Infants in LA County by Service Planning Area, 1999-2009 (N=993)



## SERVICE PLANNING AREAS

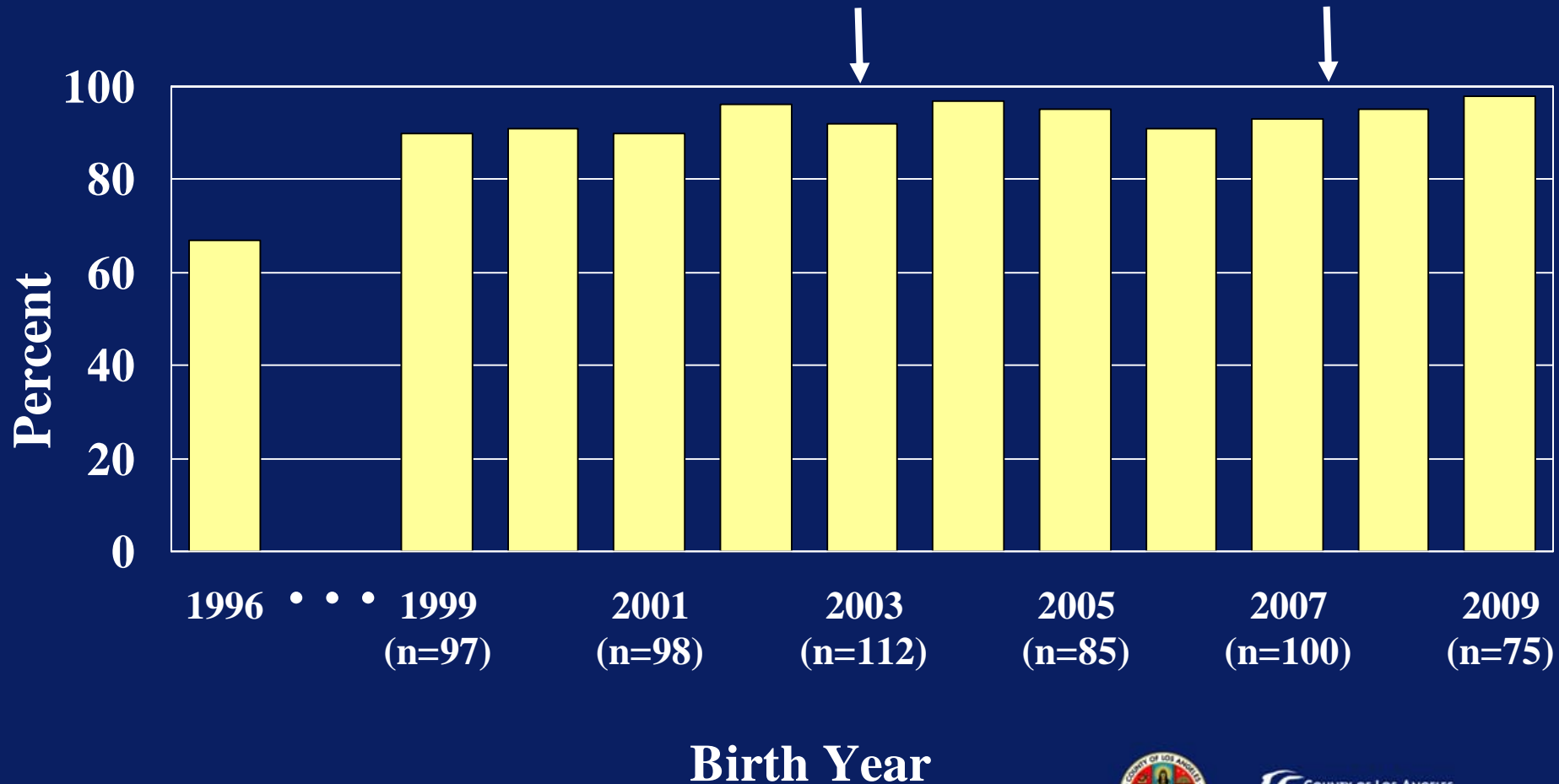
SPA 1 Antelope Valley	n=32
SPA 2 San Fernando	n=131
SPA 3 San Gabriel	n=81
SPA 4 Metro	n=197
SPA 5 West	n=50
SPA 6 South	n=250
SPA 7 East	n=100
SPA 8 South Bay <small>includes Catalina Island</small>	n=152



**Service Planning Area/Health District of Residence  
Los Angeles County, 1999-2009**

# Maternal Antiretroviral Use by HIV-infected Women Giving Birth in LAC, 1999 – 2009

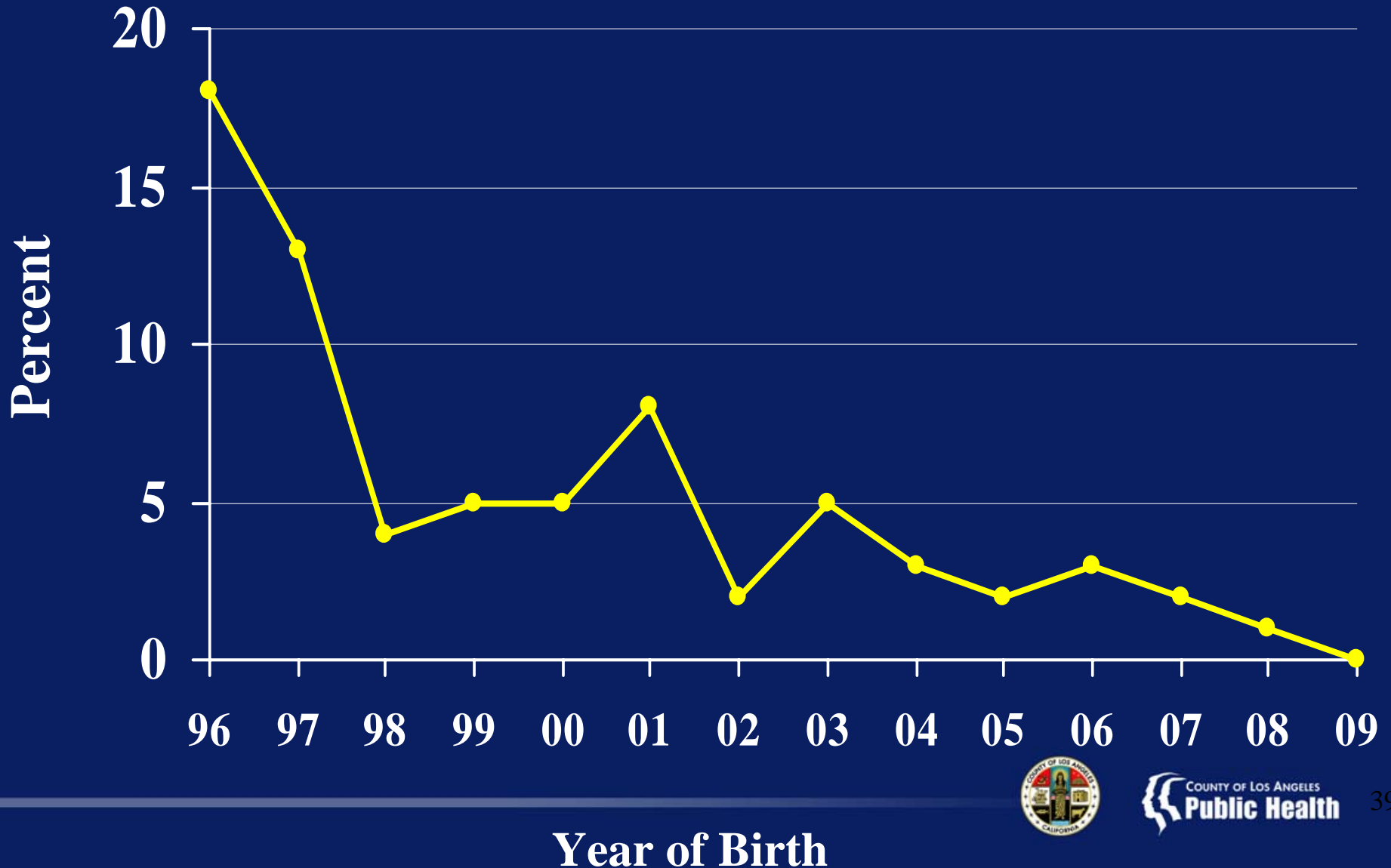
## Enhanced Perinatal Surveillance Project



\*Defined as AZT or other antiretrovirals received Prenatal or during labor/delivery



# Percent Perinatal HIV Transmission by Birth Year, Los Angeles County, 1996 – 2009



# Cumulative AIDS Rates (per 100,000) by Race/Ethnicity and Median Household Income\* Los Angeles County, 2004-2006

Race/Ethnicity	Income	Overall Rate	Rate
<b>White</b>		<b>11</b>	
	<b>Low</b>		<b>33</b>
	<b>Middle</b>		<b>14</b>
	<b>High</b>		<b>5</b>
<b>African-American</b>		<b>30</b>	
	<b>Low</b>		<b>35</b>
	<b>Middle</b>		<b>26</b>
	<b>High</b>		<b>20</b>
<b>Latino</b>		<b>11</b>	
	<b>Low</b>		<b>14</b>
	<b>Middle</b>		<b>9</b>
	<b>High</b>		<b>7</b>
<b>Asian/Native American</b>		<b>4</b>	
	<b>Low</b>		<b>6</b>
	<b>Middle</b>		<b>5</b>
	<b>High</b>		<b>2</b>



# Undiagnosed HIV Prevalence Among Adults and Adolescents in the United States at the End of 2006

*Michael L. Campsmith, DDS, MPH, Philip H. Rhodes, PhD, H. Irene Hall, PhD,  
and Timothy A. Green, PhD*

**Objectives:** To describe adults/adolescents (age 13 years and older) living with undiagnosed HIV infection in the United States at the end of 2006.

**Methods:** HIV prevalence and percentage undiagnosed were estimated from cumulative HIV incidence using an extended back-calculation model (using both HIV and AIDS data, the time of first diagnosis with HIV, and disease severity at diagnosis) and estimated cumulative deaths.

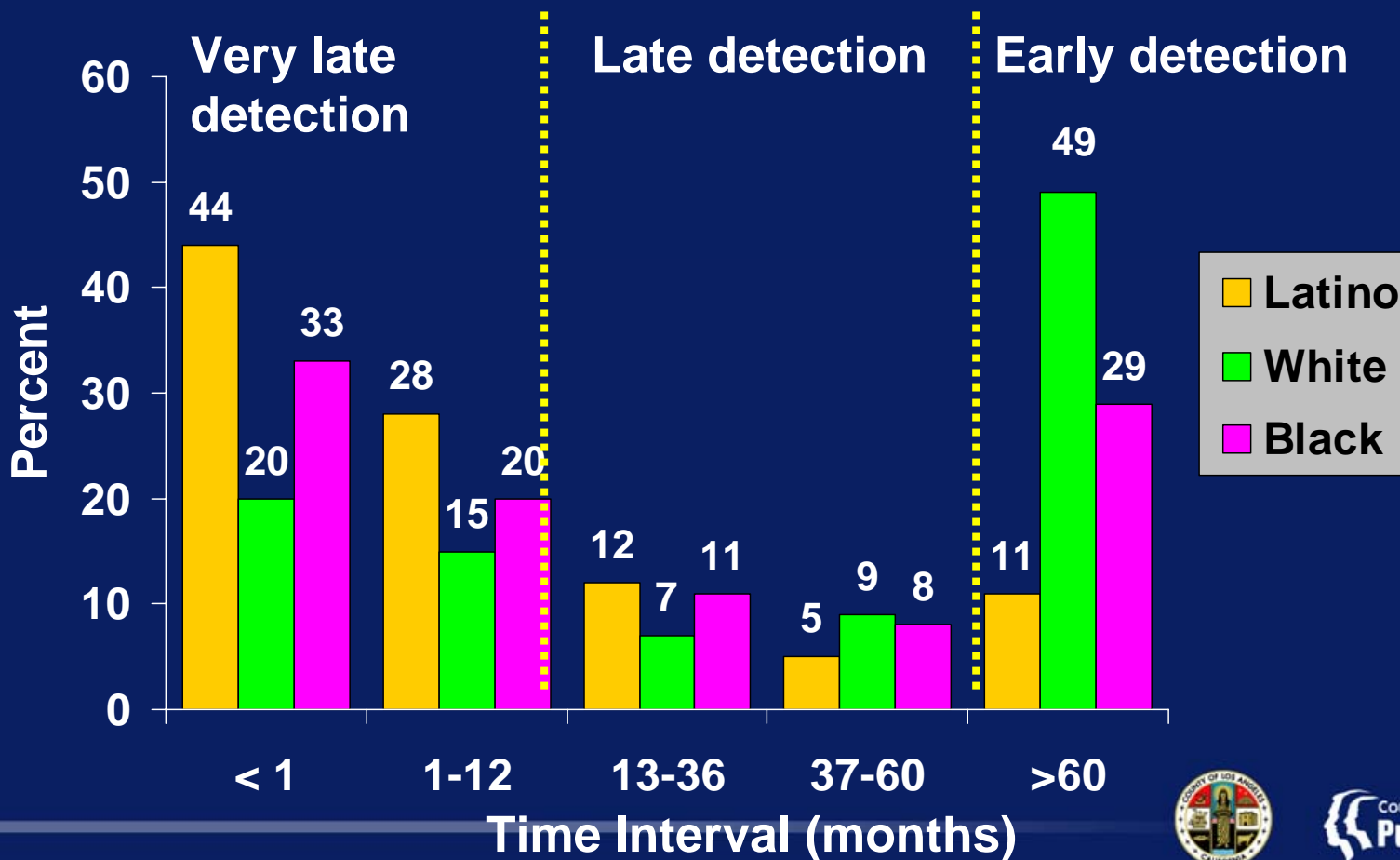
**Results:** An estimated 1,106,400 adults/adolescents (95% confidence interval = 1,056,400–1,156,400) were living with HIV in the United States at the end of 2006; overall, 21.0% (232,700; 95% confidence interval = 221,200–244,200) were undiagnosed. Whites had the lowest percentage undiagnosed (18.8%) compared with Hispanics/Latinos (21.6%), blacks/African Americans (22.2%), American Indians/Alaska Natives (25.8%), and Asians/Pacific Islanders (29.5%; all  $P < 0.001$ ). Persons with a behavioral risk of injection drug use (IDU) had the lowest percentage undiagnosed (female IDU: 13.7% and male IDU: 14.5%); men exposed through heterosexual contact had the highest (26.7%) followed by men who have sex with men (23.5%).

## INTRODUCTION

Current, accurate, and timely public health surveillance data on HIV prevalence are needed to guide decisions on planning for disease prevention activities, program evaluation, and resource allocation at the local, state, and national levels.<sup>1–3</sup> However, the overall prevalence of persons living with HIV cannot be directly observed, as a percentage of persons infected with HIV has not yet been tested, diagnosed, and reported to local disease surveillance programs. Having a better understanding of the characteristics of the undiagnosed population (eg, by race/ethnicity, sex, age, and risk) is important for focusing HIV testing and prevention initiatives and to measure progress in decreasing the size of the undiagnosed population.

Research has indicated that persons who are infected but not diagnosed disproportionately contribute to the annual number of new HIV infections.<sup>4</sup> This may be due to (1) increased infectivity due to greater levels of circulating HIV early after infection<sup>5,6</sup> and/or (2) higher level of behavioral risks that lead to HIV transmission (unprotected sex, concurrent sex partners, and sharing of injection equipment).<sup>7,8</sup> Thus, increasing the number of HIV-infected persons

# Time between first learned of HIV+ status and AIDS Diagnosis, by Race/Ethnicity SHAS, LAC, 2000 - 2004 (N = 819)





## **Effect of Antiretroviral Therapy on Risk of Sexual Transmission of HIV Infection and Superinfection**

### **Background**

The past decade has seen substantial advances in the development of antiretroviral therapy (ART)—medications used in combination to reduce the replication of HIV virus and treat HIV-infected persons. Because of these medications, many HIV-infected persons are able to reduce levels of virus in the bloodstream (plasma viral load) to undetectable levels. Data suggest that HIV-infected persons with undetectable viral load are less infectious, and may be less likely to transmit HIV via sexual contact. This fact sheet summarizes the implications of these data to individual couples and to the potential impact of ART in the prevention of HIV transmission within populations.

### **Prevention of Sexual Transmission of HIV: Individual Couples vs. Populations**

Evidence from observational studies among heterosexual populations [1–4] and men who have sex with men (MSM) [5] suggests that effective ART may greatly reduce the likelihood of sexual transmission from infected individuals to their sexual partners. A study of heterosexual couples in Uganda in which one partner was infected revealed that infected persons who did transmit virus to their partners had significantly higher mean viral load than those who did not transmit (90,254 copies/mL vs. 38,029 copies/mL); no transmissions occurred among couples in which the infected partners viral load was under 1,500 copies/mL [1]. Among infected persons at a clinic in Spain, under availability of

# Contact Information

**Douglas M. Frye**  
**(213) 351-8190**

**HIV Epidemiology Program**  
**Phone: (213) 351 – 8196**

**[www.publichealth.lacounty.gov/hiv](http://www.publichealth.lacounty.gov/hiv)**

