

Current Epidemiology of Selected STDs

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for STD 101

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What we'll cover today

□ Diseases

- Chlamydia
- Gonorrhea
- Syphilis
- Viral STDs
 - HSV-2, HPV
- Other STDs
 - Chancroid, trich

□ Special Populations

- Adolescents
- MSM

What is epidemiology?

- ❑ **Distribution and determinants of disease within a population**
 - Who, what, and where
- ❑ **Part of the core function of public health**
 - Assessment
 - Assurance
 - Policy development
- ❑ **Why is this important?**
 - Lets us know where disease is occurring, and who is getting it
 - Lets us plan for control and prevention activities

CHLAMYDIA

Sexually Transmitted Disease Surveillance 2010
Division of STD Prevention

Epidemiology of Chlamydia

□ Incidence

- 1,307,893 cases reported in 2010
 - Largest no. of cases ever reported to CDC for any condition
 - Most frequently reported STD in US
- Case rate = 426.0 per 100,000 population
 - 5.1% increase over the previous year

□ Rates 2.5x higher in females

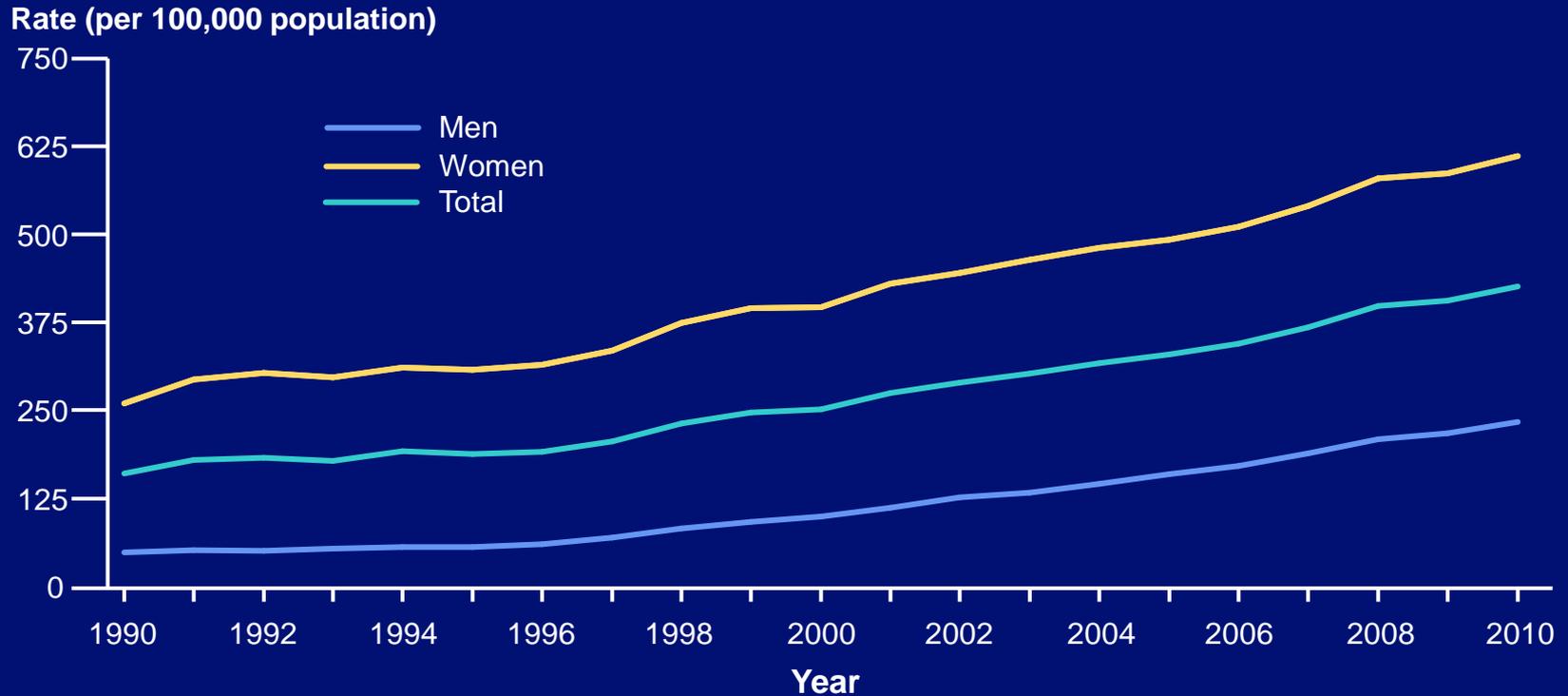
- Higher screening rates in women
- But male screening is increasing due to urine-based testing

Epidemiology of Chlamydia

□ High prevalence among

- Family planning clinics (8.0%)
- Prenatal clinics (7.2%)
- National job training program (11.4% women, 7.2% men)
- Adolescent corrections (14.5% women, 6.5% men)

Chlamydia—Rates by Sex, United States, 1990–2010

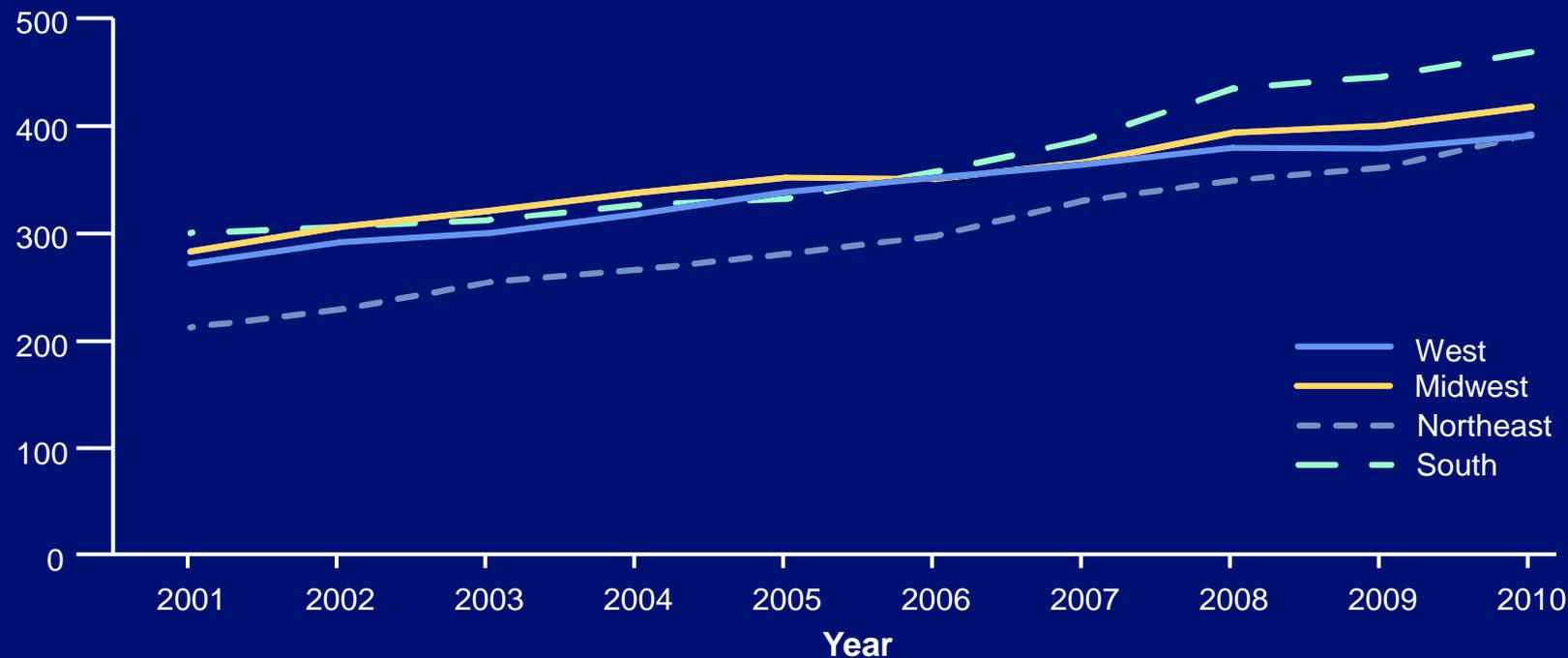


NOTE: As of January 2000, all 50 states and the District of Columbia have regulations that require the reporting of chlamydia cases.

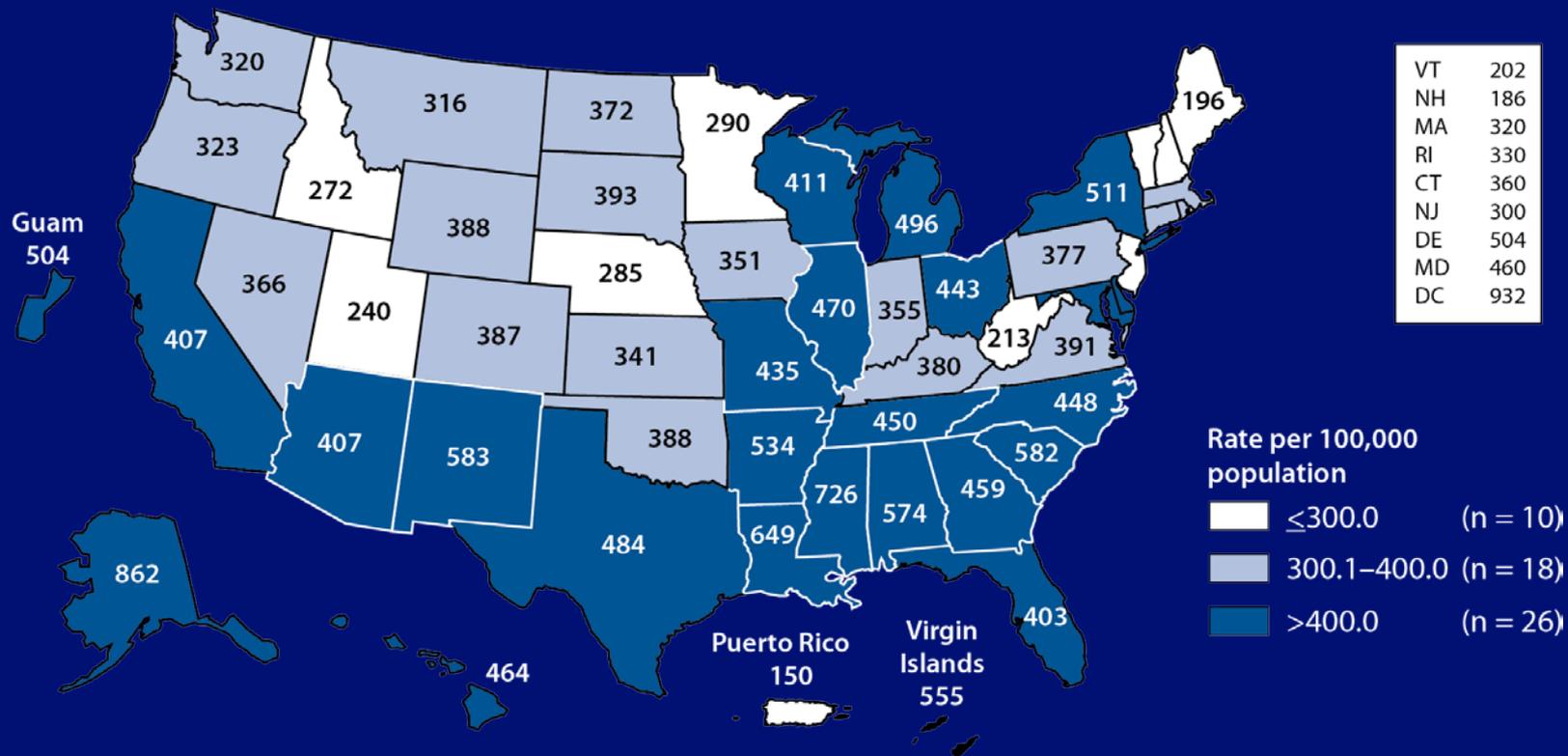


Chlamydia—Rates by Region, United States, 2001–2010

Rate (per 100,000 population)



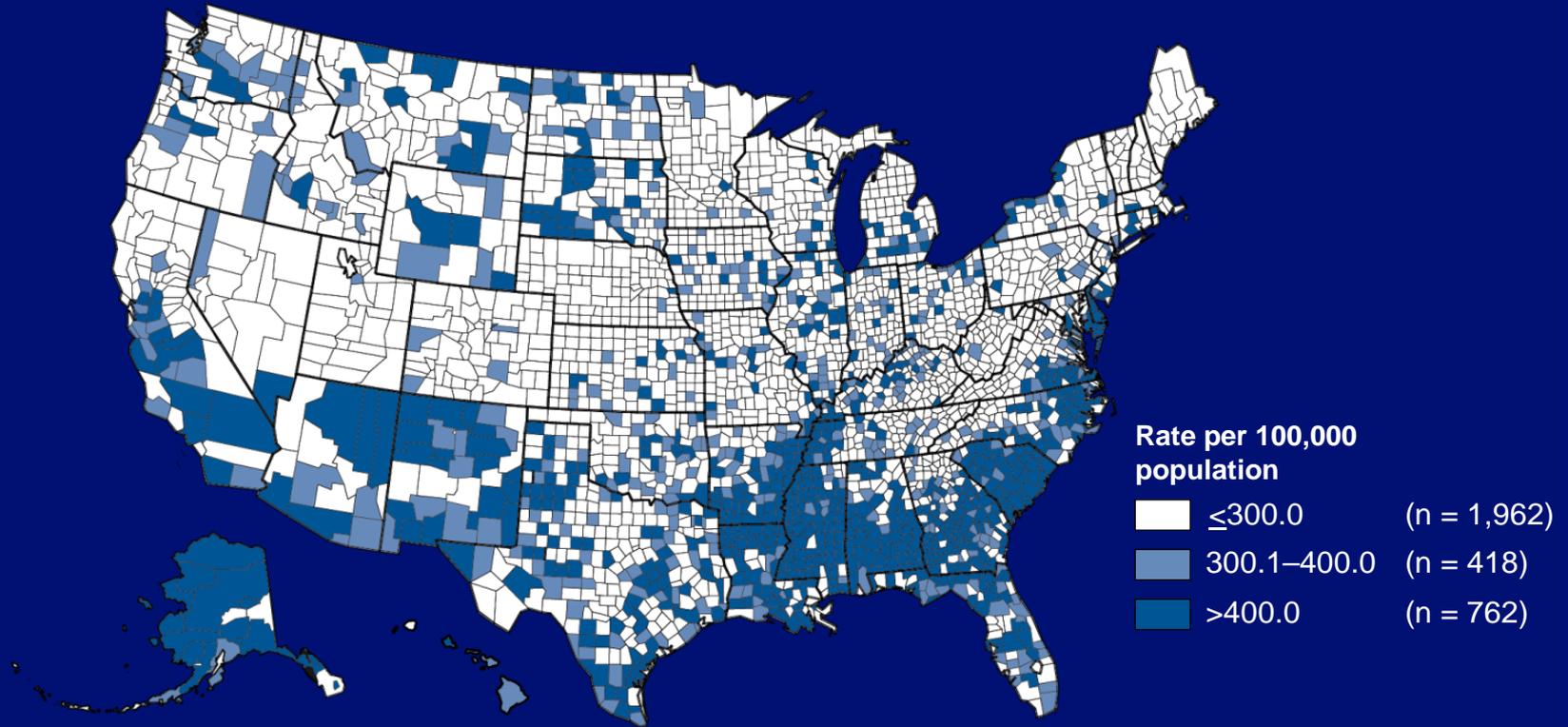
Chlamydia—Rates by State, United States and Outlying Areas, 2010



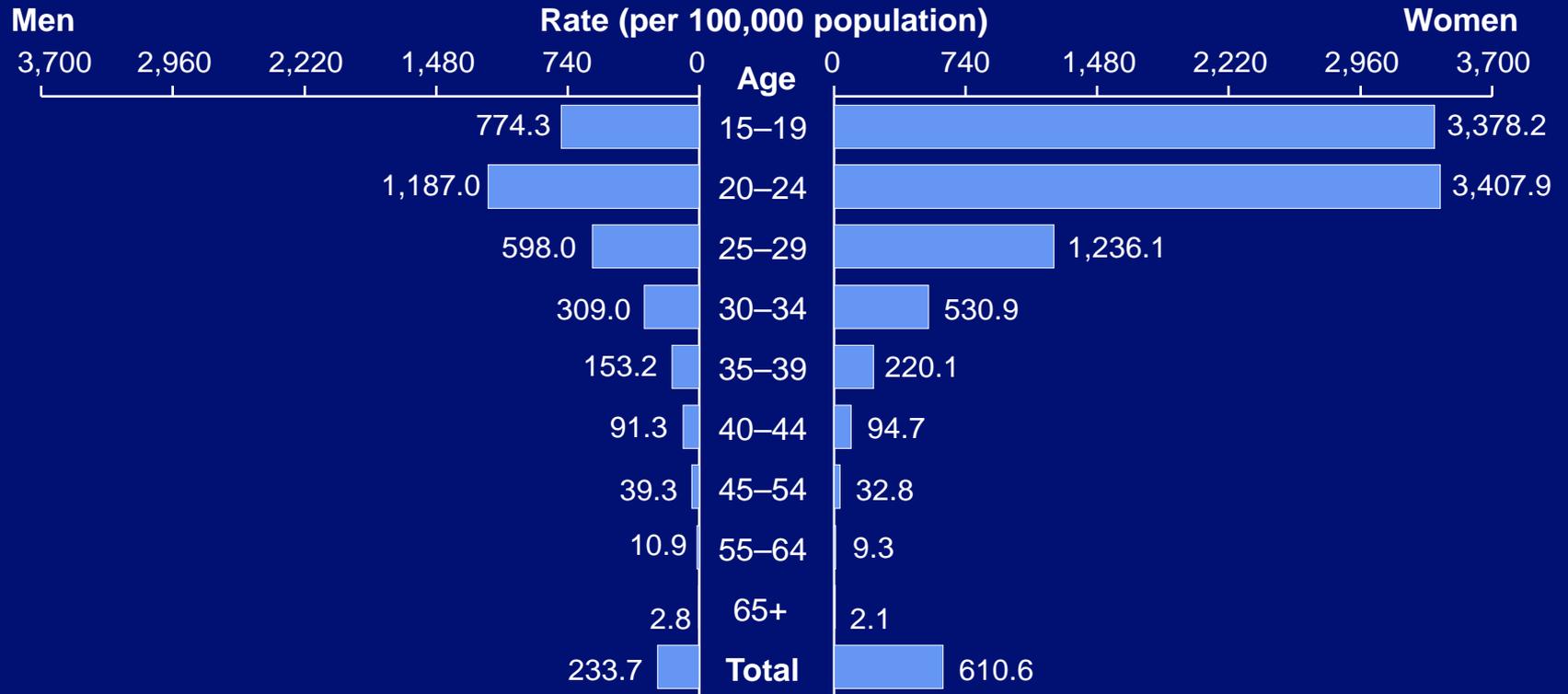
NOTE: The total rate of chlamydia for the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 422.6 per 100,000 population.



Chlamydia—Rates by County, United States, 2010

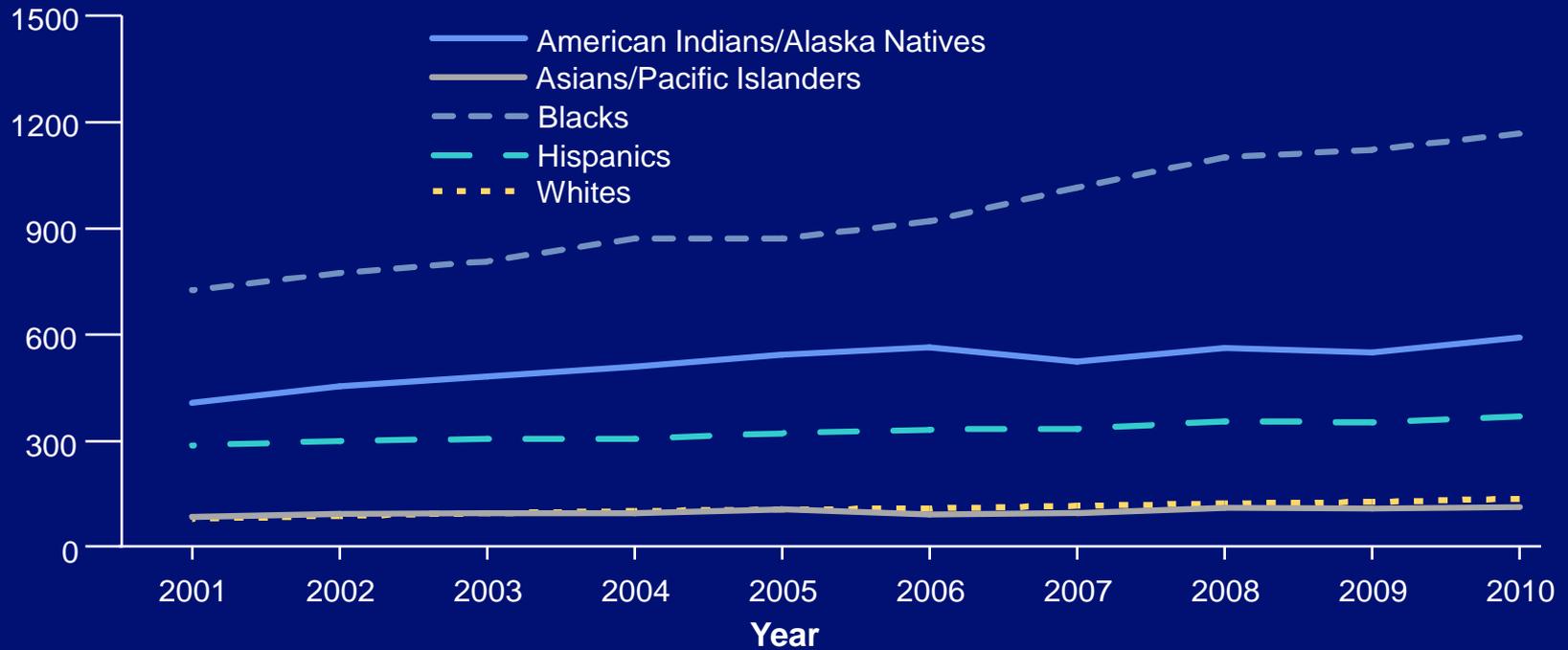


Chlamydia—Rates by Age and Sex, United States, 2010

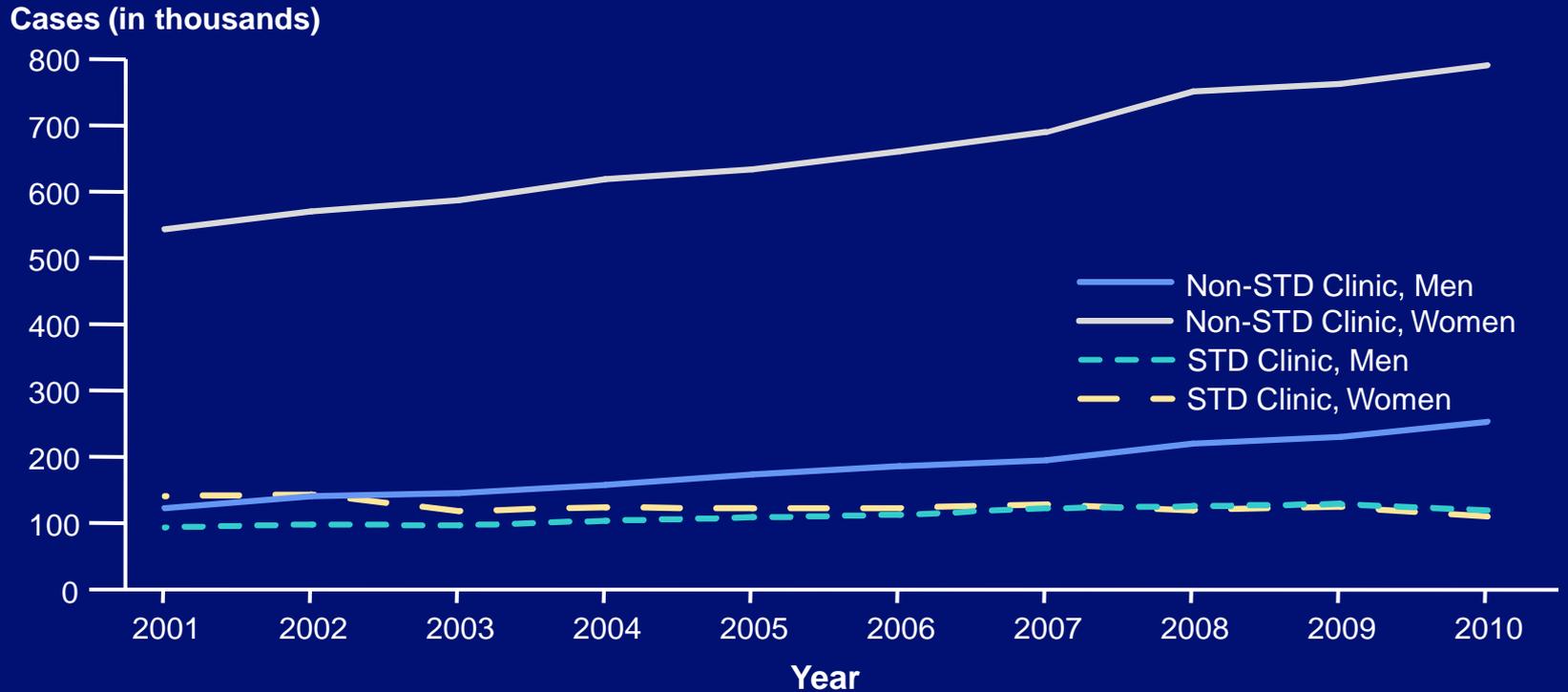


Chlamydia—Rates by Race/Ethnicity, United States, 2001–2010

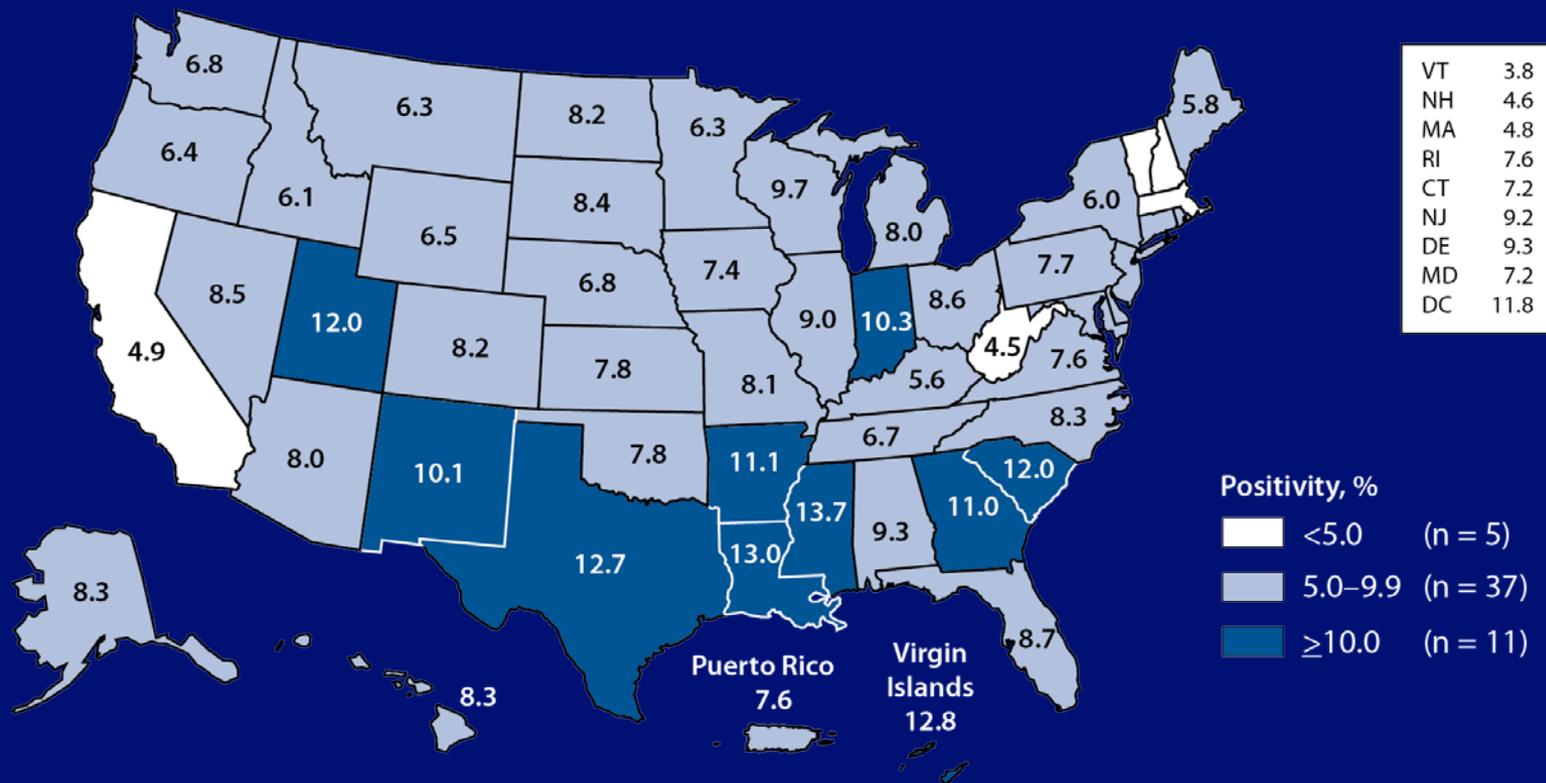
Rate (per 100,000 population)



Chlamydia—Cases by Reporting Source and Sex, United States, 2001–2010



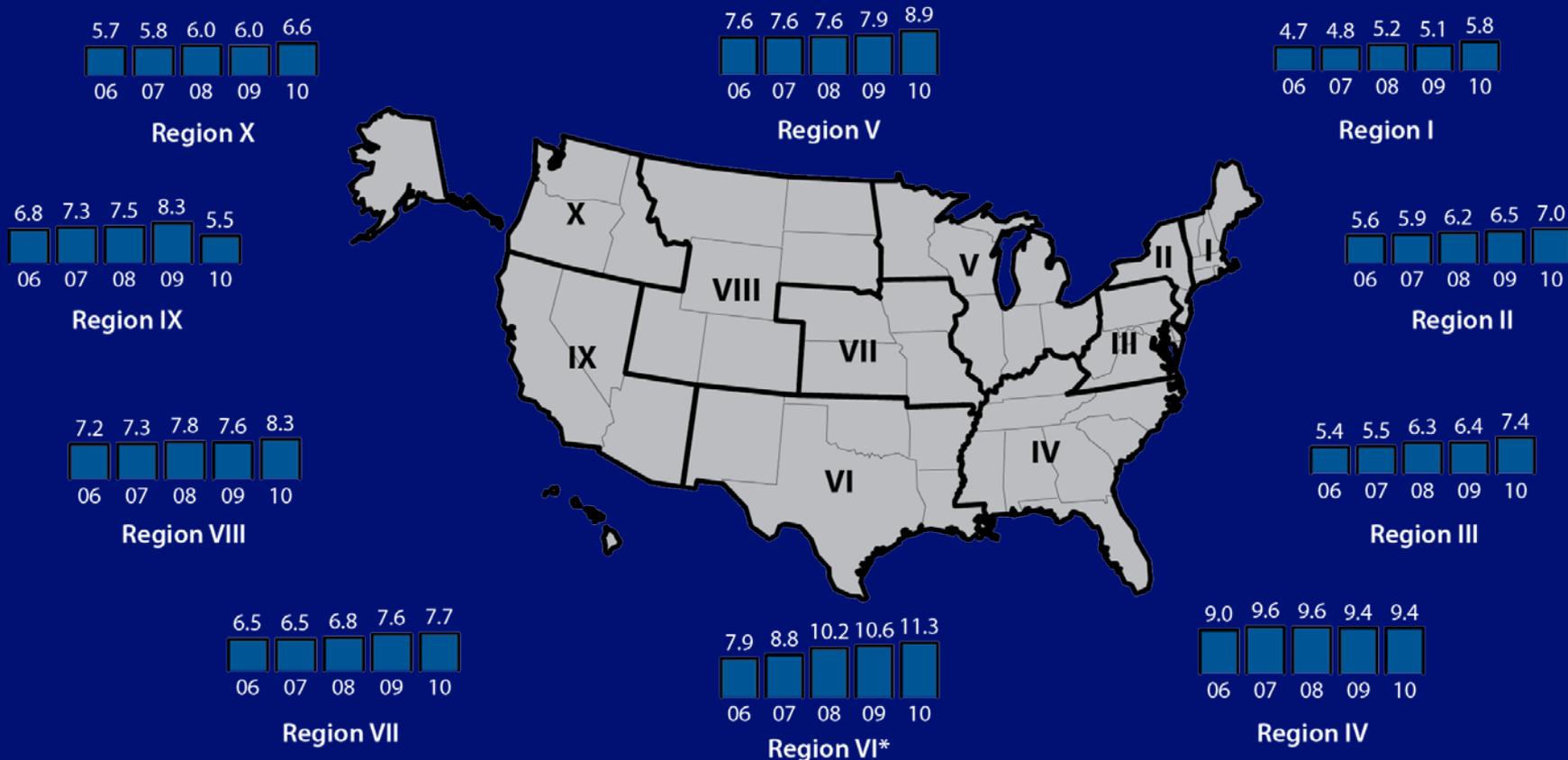
Chlamydia—Positivity Among Women Aged 15–24 Years Tested in Family Planning Clinics, by State, Infertility Prevention Project, United States and Outlying Areas, 2010



NOTE: Includes states and outlying areas that reported chlamydia positivity data on at least 500 women aged 15–24 years screened during 2010.



Chlamydia—Trends in Positivity Rates Among Women Aged 15–24 Years Tested in Family Planning Clinics, by U.S. Department of Health and Human Services (HHS) Region, Infertility Prevention Project, 2006–2010



* 2009 percent positivity for Region VI previously published in the 2009 Surveillance report has been corrected.



GONORRHEA

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Epidemiology of Gonorrhea

□ Incidence

- 309,341 cases reported in 2010
 - Downward trend between 1975-1996, then plateau until 2006
 - 2009 rate was lowest since national reporting began
- Case rate = 100.8 per 100,000 population
 - 2.8% increase over the previous year

□ Slightly higher rates in females

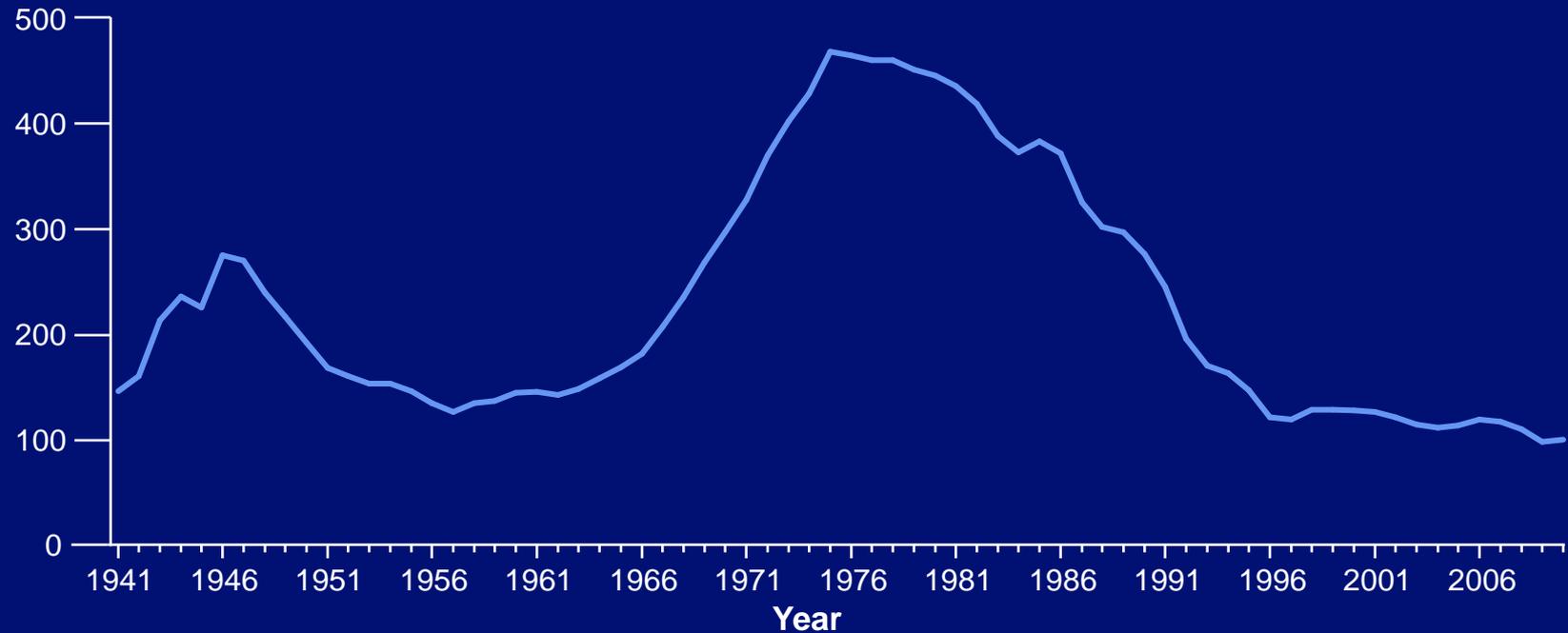
- Women highest rates age 15-24 year olds
- Men highest rates 20-24

Epidemiology of Gonorrhea

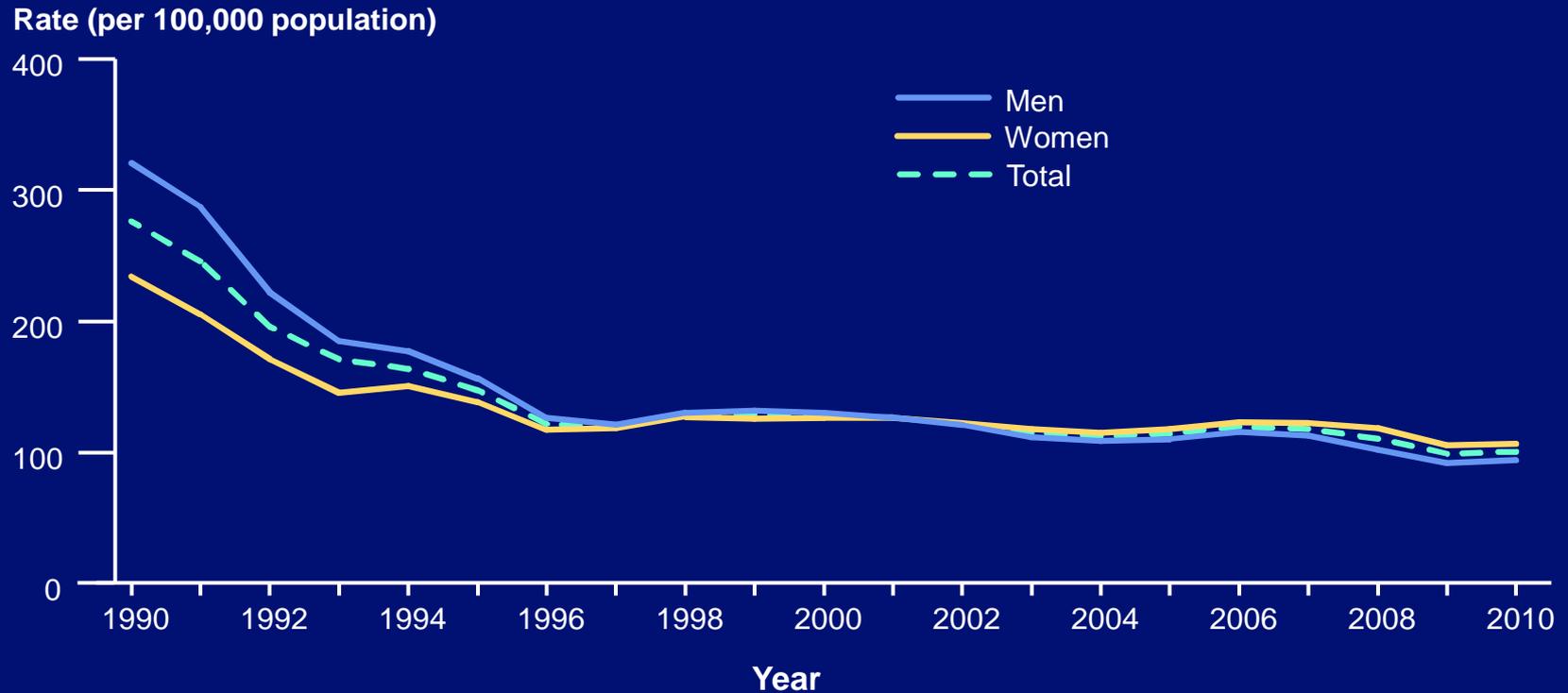
- ❑ Proportion of gonococcal infections caused by resistant organisms is increasing**
- ❑ Incidence remains high in some groups defined by geography, age and race/ethnicity, or sexual orientation**

Gonorrhea—Rates, United States, 1941–2010

Rate (per 100,000 population)

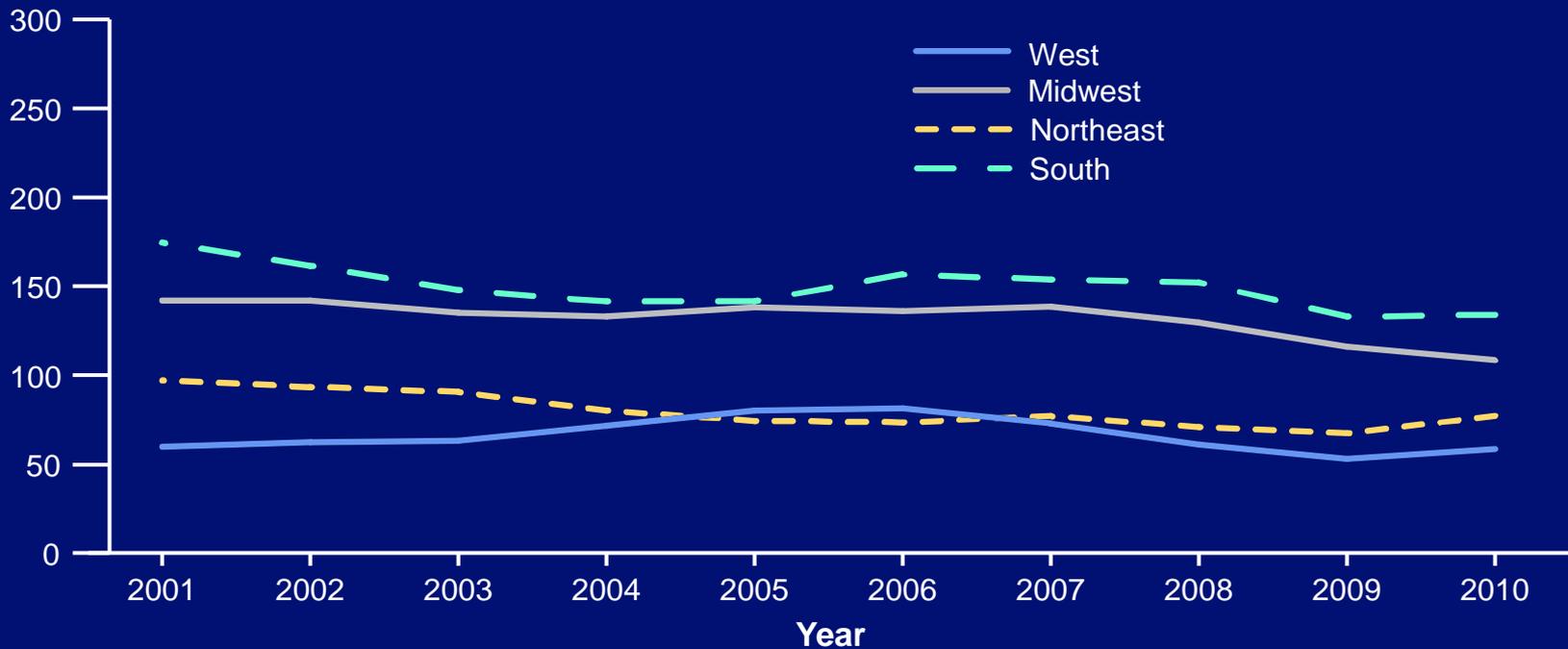


Gonorrhea—Rates by Sex, United States, 1990–2010

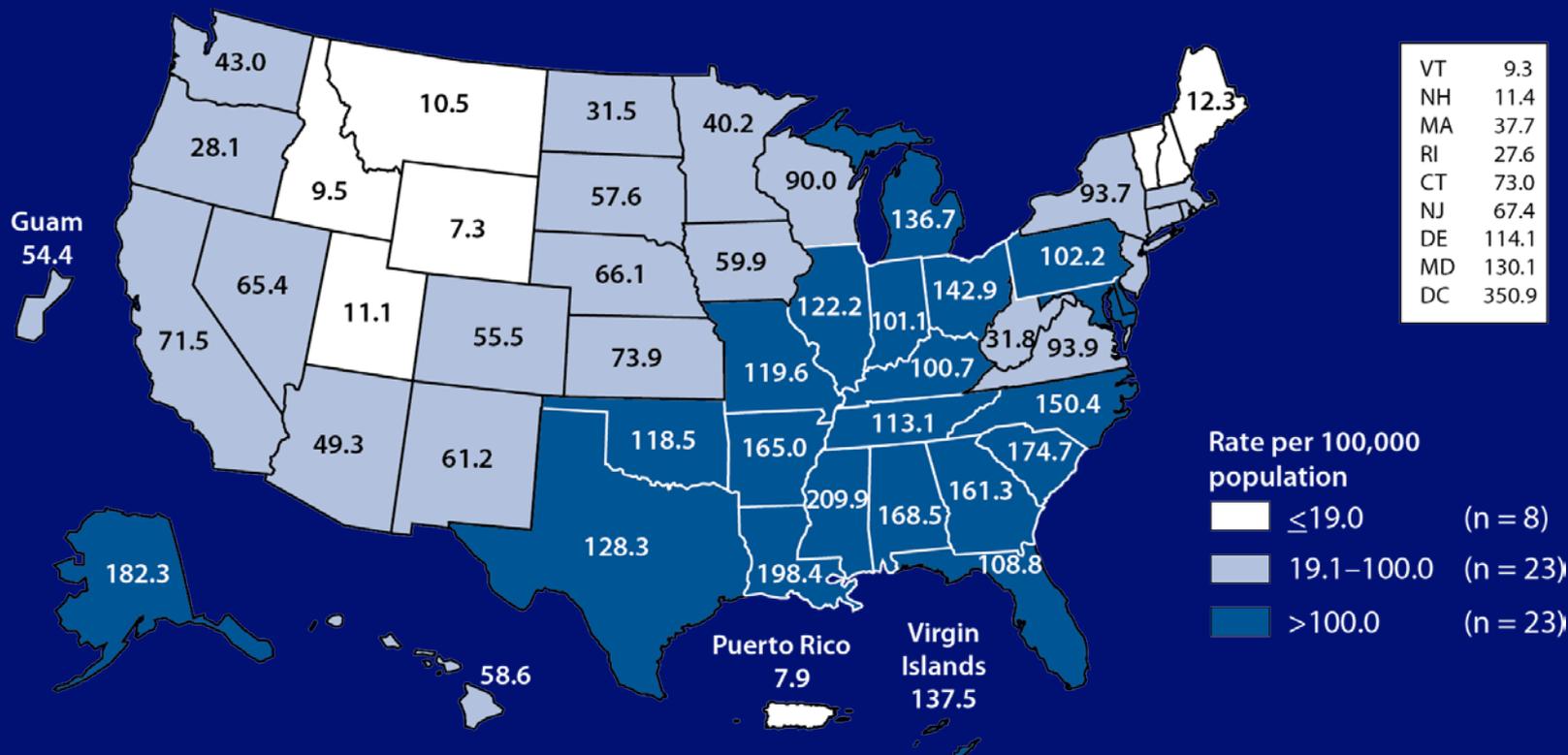


Gonorrhea—Rates by Region, United States, 2001–2010

Rate (per 100,000 population)



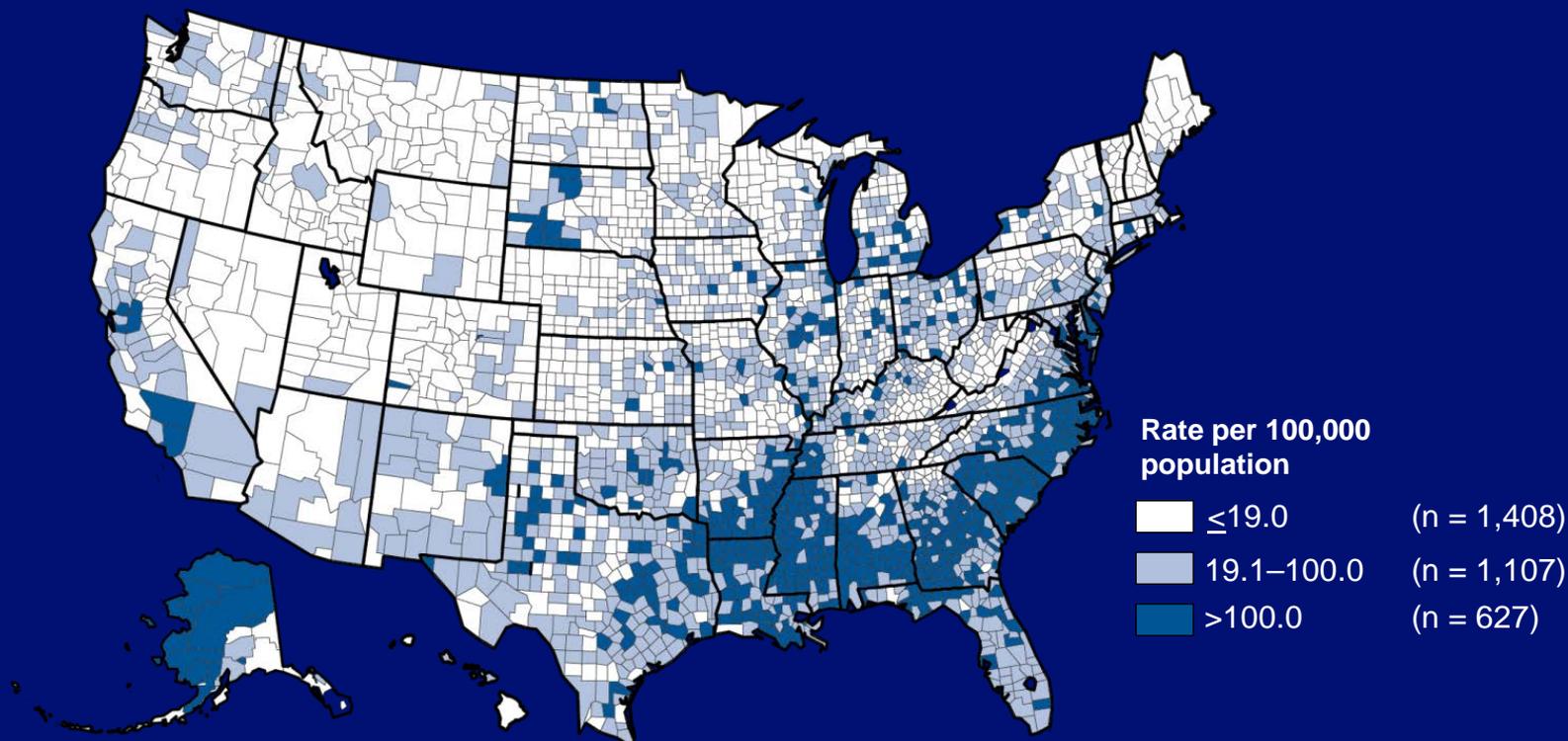
Gonorrhea—Rates by State, United States and Outlying Areas, 2010



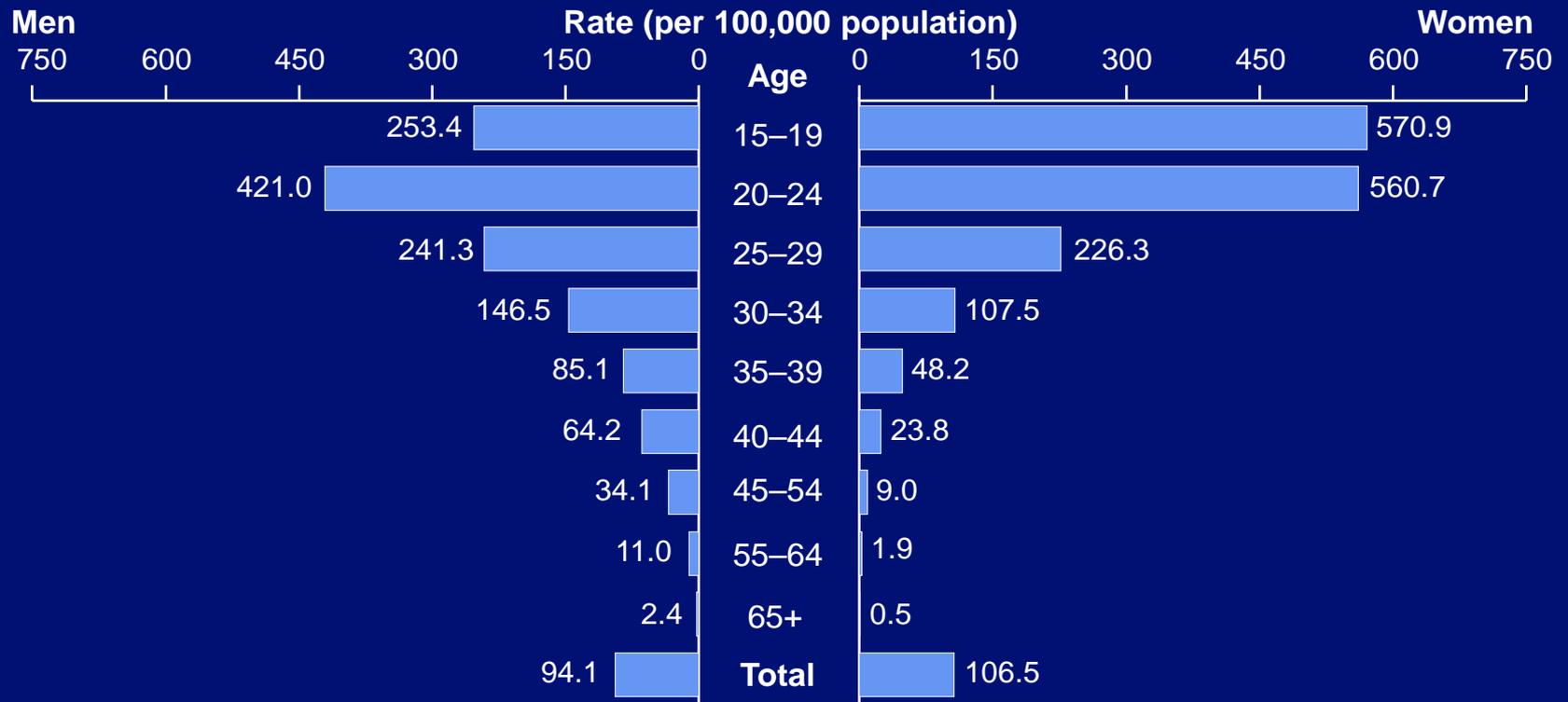
NOTE: The total rate of gonorrhea for the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 99.6 per 100,000 population.



Gonorrhea—Rates by County, United States, 2010

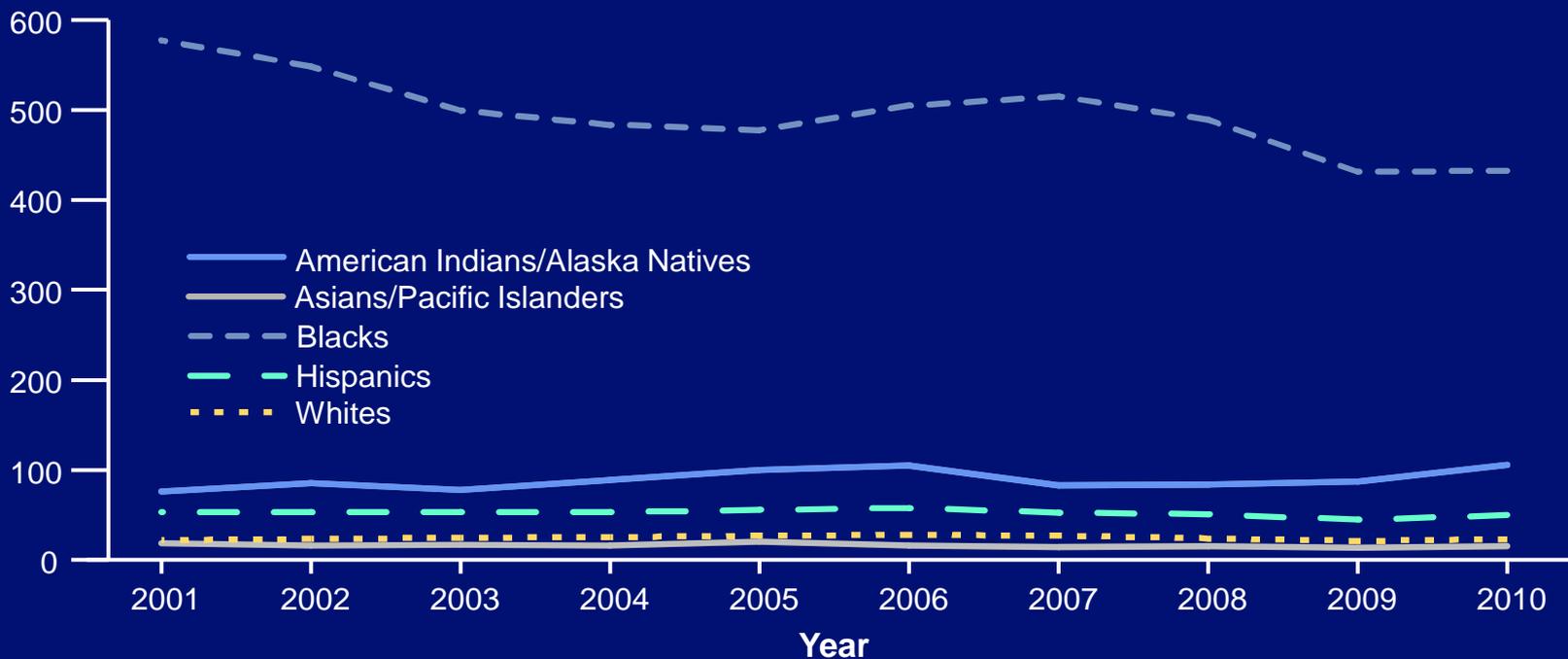


Gonorrhea—Rates by Age and Sex, United States, 2010



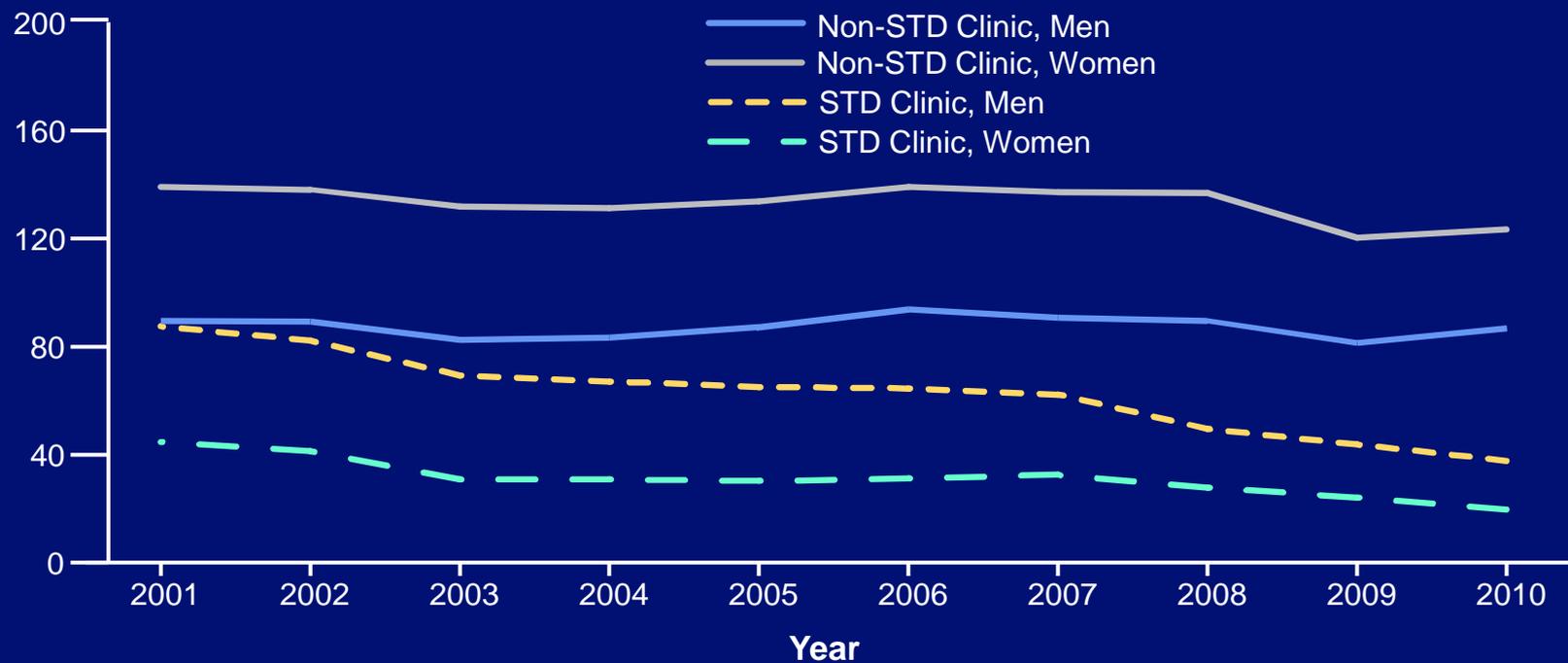
Gonorrhea—Rates by Race/Ethnicity, United States, 2001–2010

Rate (per 100,000 population)

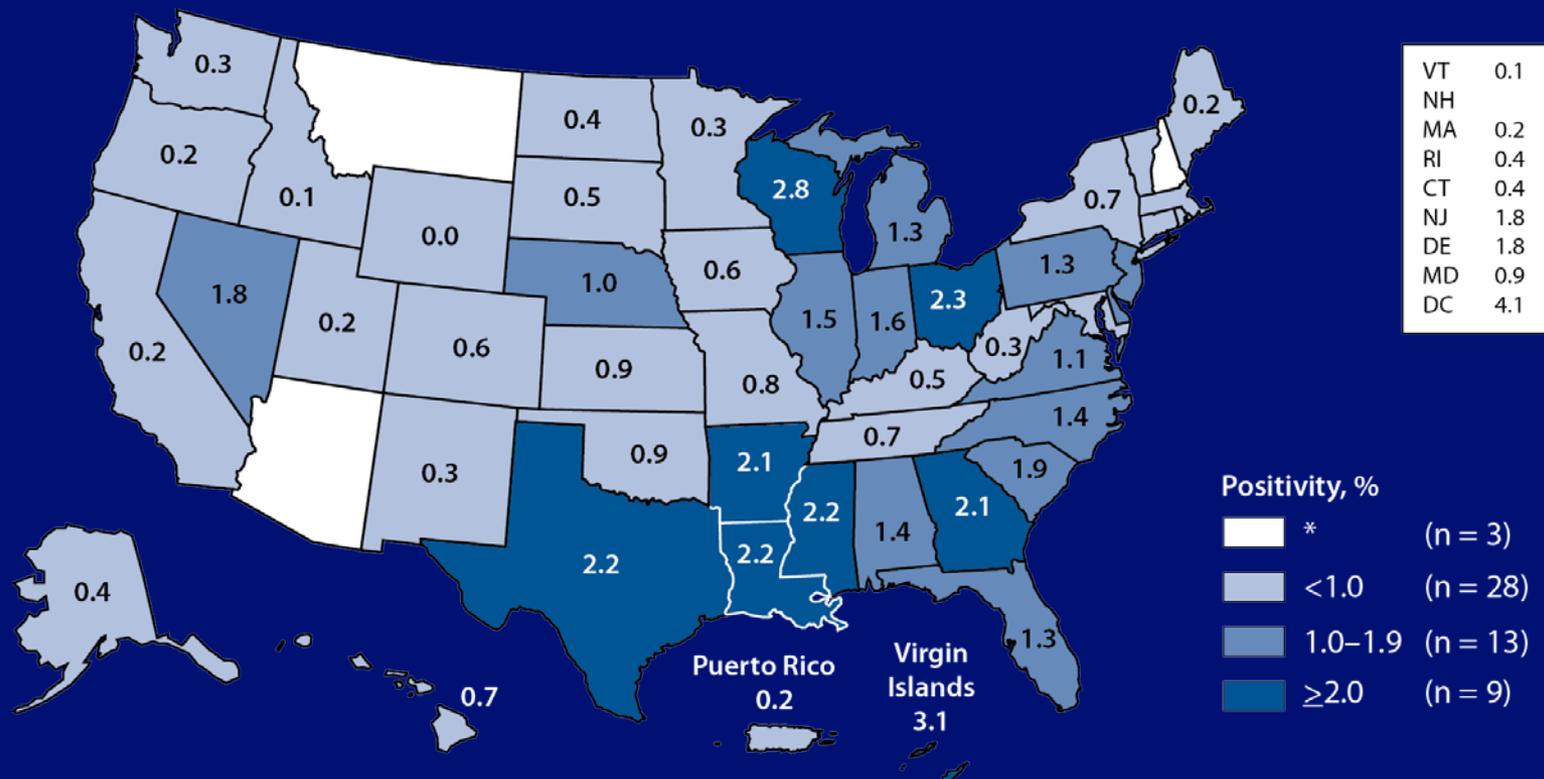


Gonorrhea—Cases by Reporting Source and Sex, United States, 2001–2010

Cases (in thousands)



Gonorrhea—Positivity Among Women Aged 15–24 Years Tested in Family Planning Clinics, by State, Infertility Prevention Project, United States and Outlying Areas, 2010



* States/areas not meeting minimum inclusion criteria.

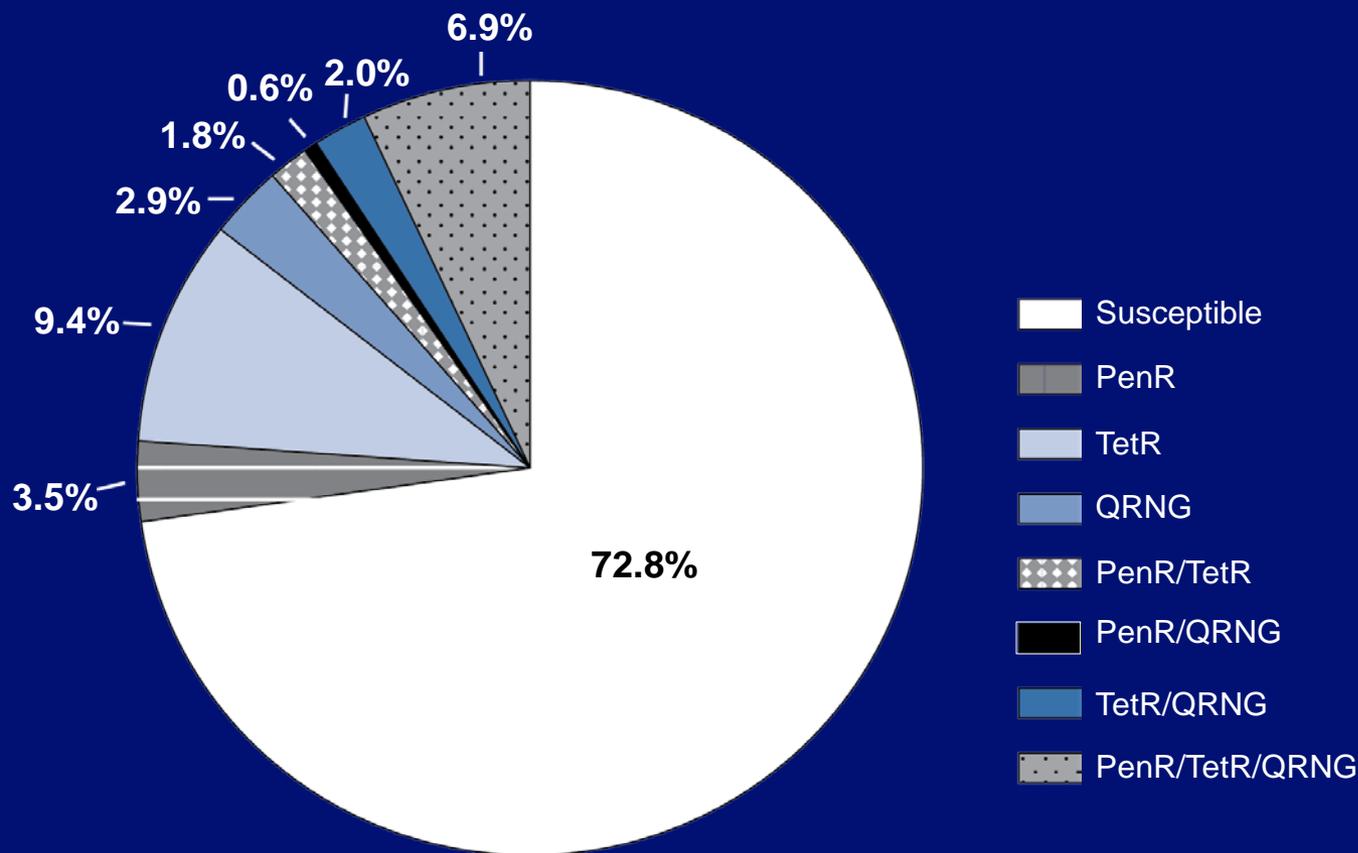
NOTE: Includes states and outlying areas that reported positivity data on at least 500 women aged 15–24 years who were screened during 2010.



Gonococcal Isolate Surveillance Project (GISP)—Location of Participating Sentinel Sites and Regional Laboratories, United States, 2010



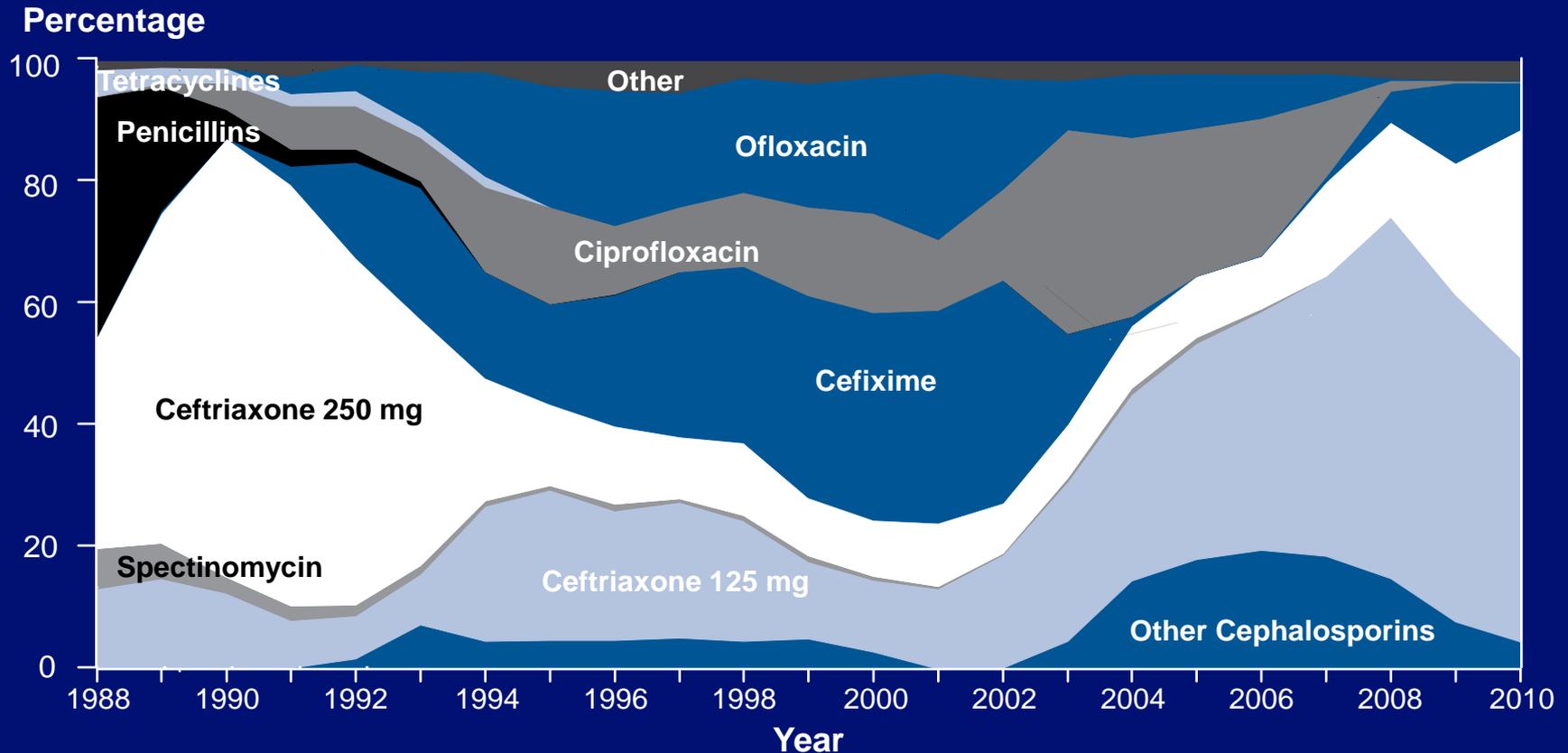
Gonococcal Isolate Surveillance Project (GISP)— Penicillin, Tetracycline, and Ciprofloxacin Resistance Among GISP Isolates, 2010



NOTE: PenR = penicillinase producing *Neisseria gonorrhoeae* and chromosomally mediated penicillin-resistant *N. gonorrhoeae*; TetR = chromosomally and plasmid mediated tetracycline-resistant *N. gonorrhoeae*; and QRNG = quinolone-resistant *N. gonorrhoeae*.



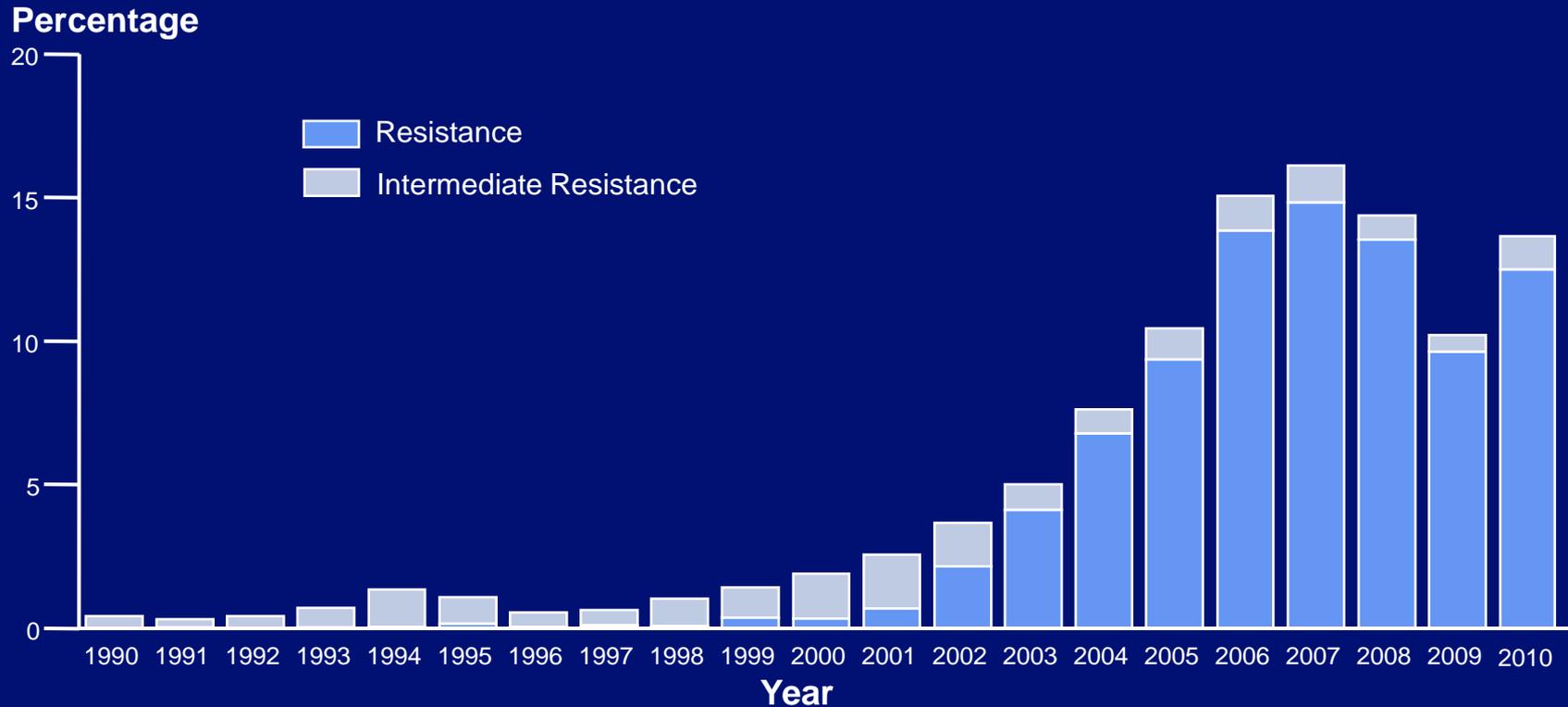
Gonococcal Isolate Surveillance Project (GISP)—Drugs Used to Treat Gonorrhea Among GISP Participants, 1988–2010



NOTE: For 2010, "Other" includes no therapy (1.2%), azithromycin 2 g (1.7%), and other less frequently used drugs.



Gonococcal Isolate Surveillance Project (GISP)—Percentage of *Neisseria gonorrhoeae* Isolates with Resistance or Intermediate Resistance to Ciprofloxacin, 1990–2010



NOTE: Resistant isolates have ciprofloxacin minimum inhibitory concentrations (MICs) ≥ 1 $\mu\text{g/ml}$. Isolates with intermediate resistance have ciprofloxacin MICs of 0.125–0.5 $\mu\text{g/ml}$. Susceptibility to ciprofloxacin was first measured in GISP in 1990.



SYPHILIS

Sexually Transmitted Disease Surveillance 2010
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Epidemiology of Syphilis

□ Incidence

- 13,774 cases (primary and secondary) reported in 2010
 - Annual increase from 2001-2009
 - 2010 represents first decrease in 10 years (1.6%)
- Case rate = 4.5 per 100,000 population
 - 2.2% lower than 2009 rate
 - 21% decrease in women
 - 1.3% increase in men

□ Congenital syphilis rates decreased 15% since 2008

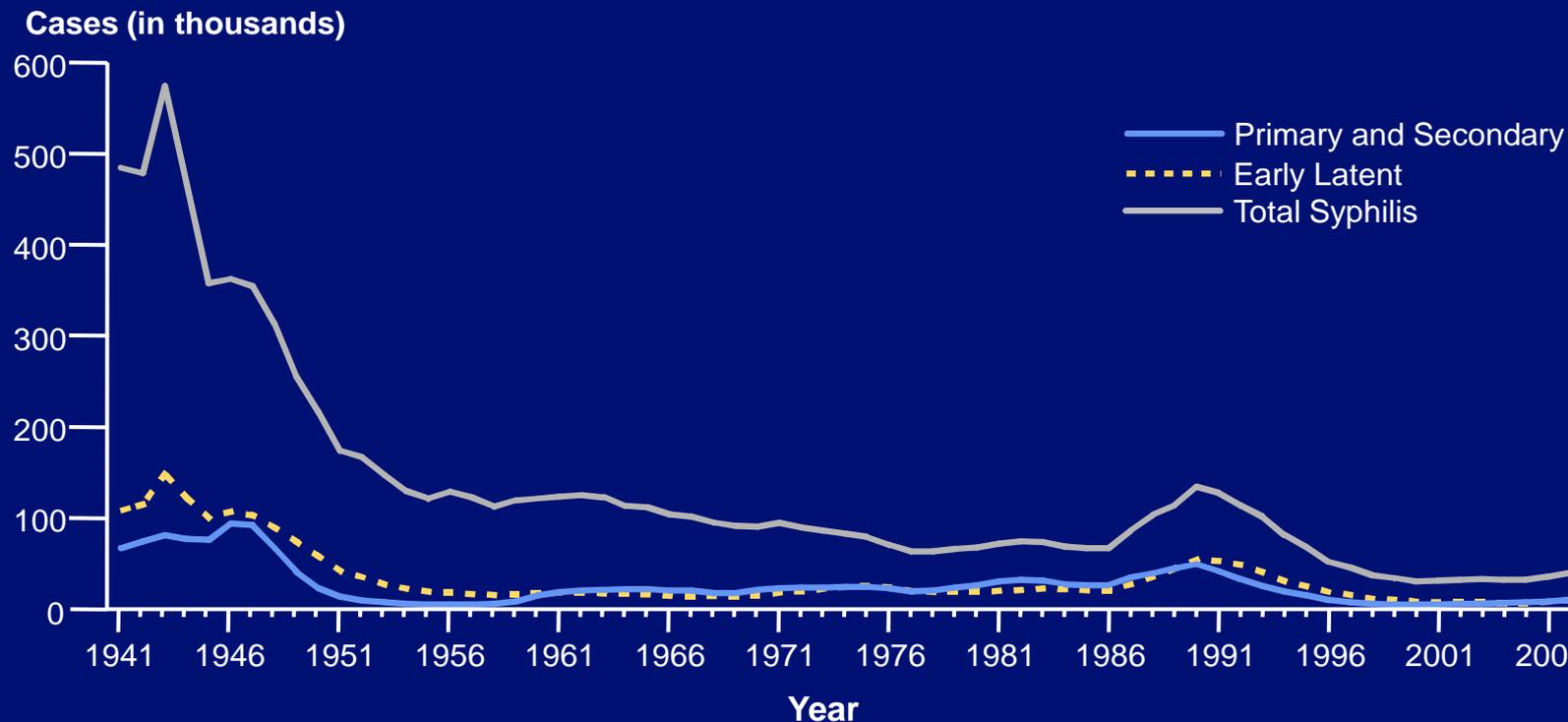


Epidemiology of Syphilis (cont'd)

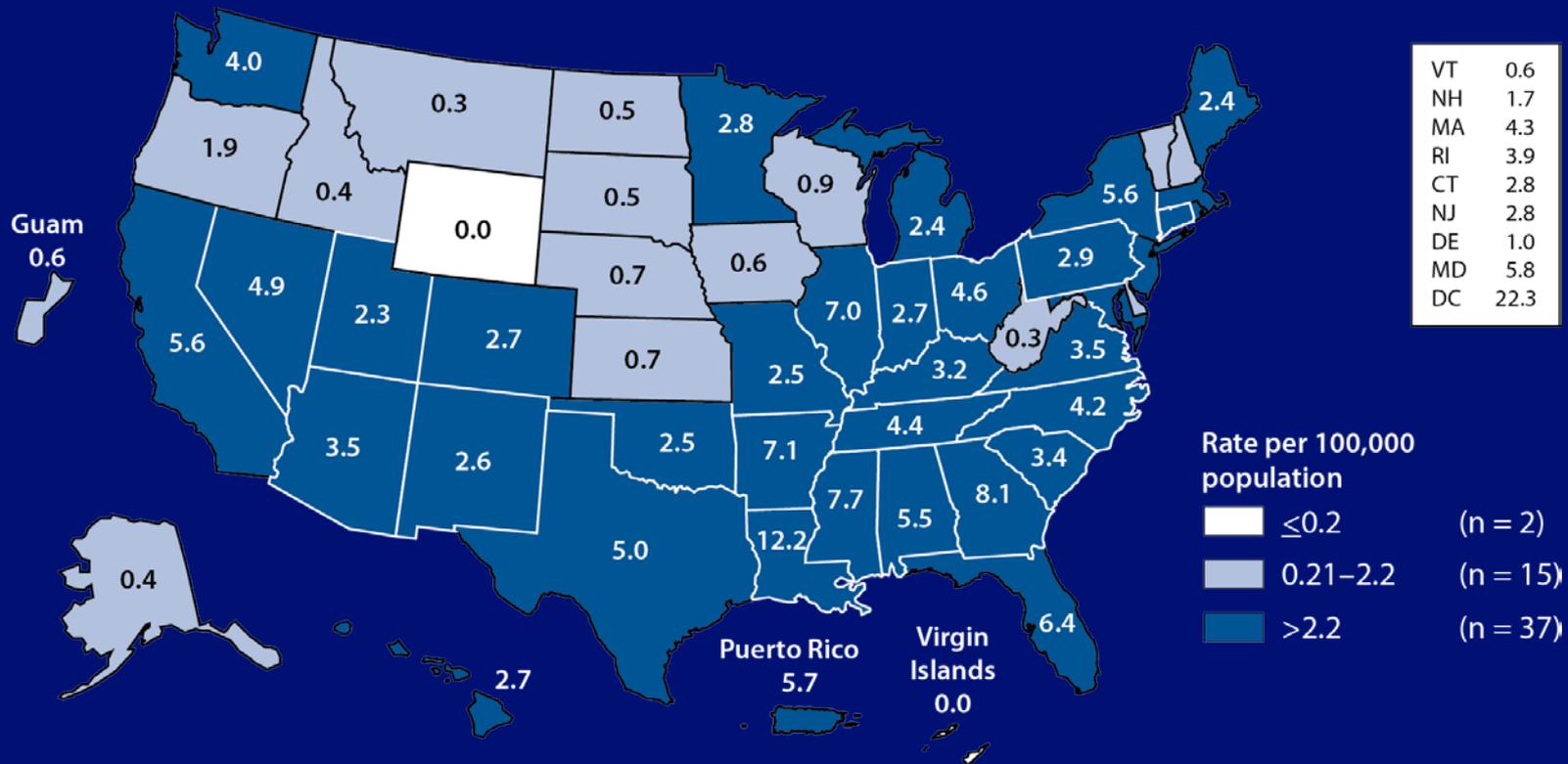
- ❑ **Rates remain high in:**
 - Some urban areas throughout the U.S.
 - Rural areas in the South

- ❑ **Common co-occurrence of syphilis and HIV in men who have sex with men (MSM)**

Syphilis—Reported Cases by Stage of Infection, United States, 1941–2010



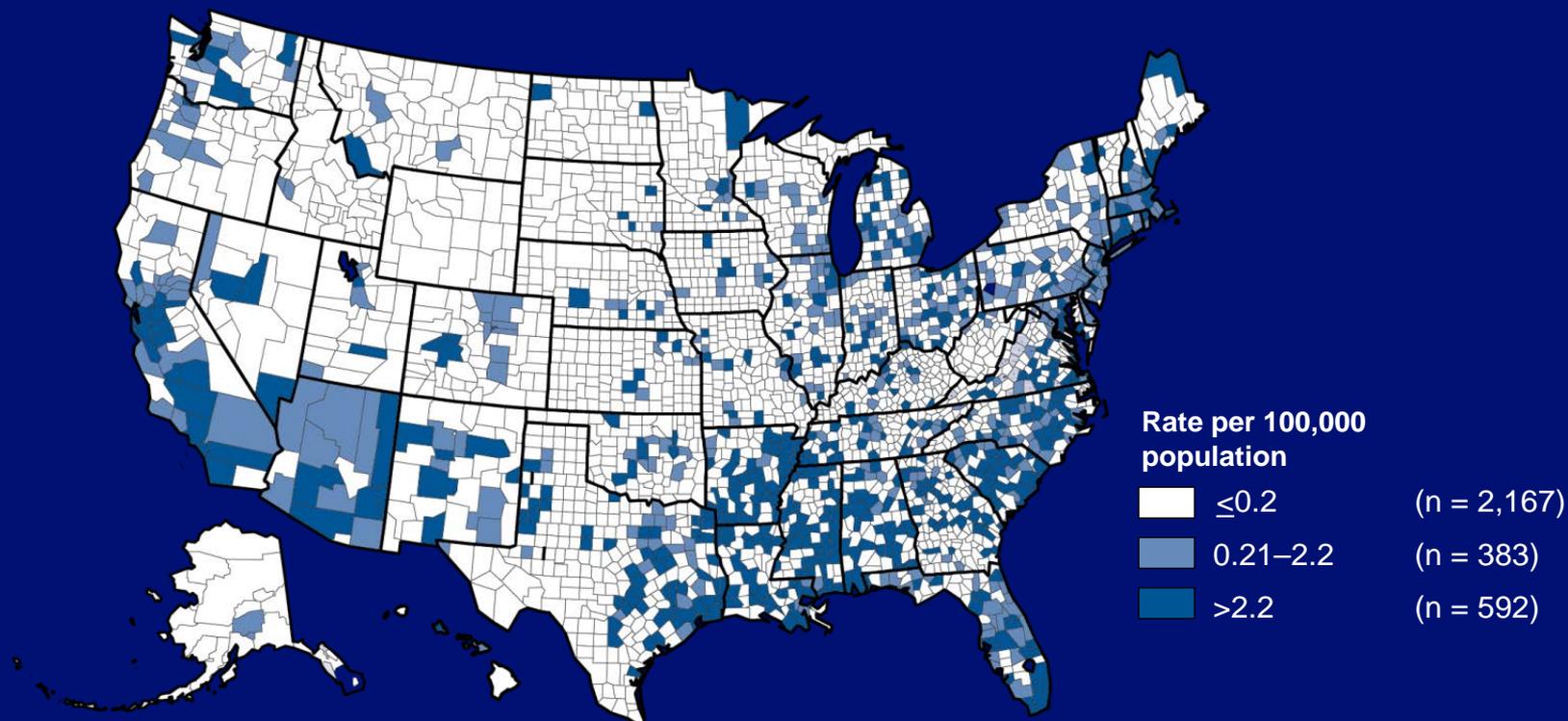
Primary and Secondary Syphilis—Rates by State, United States and Outlying Areas, 2010



NOTE: The total rate of primary and secondary syphilis for the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 4.5 per 100,000 population.



Primary and Secondary Syphilis—Rates by County, United States, 2010

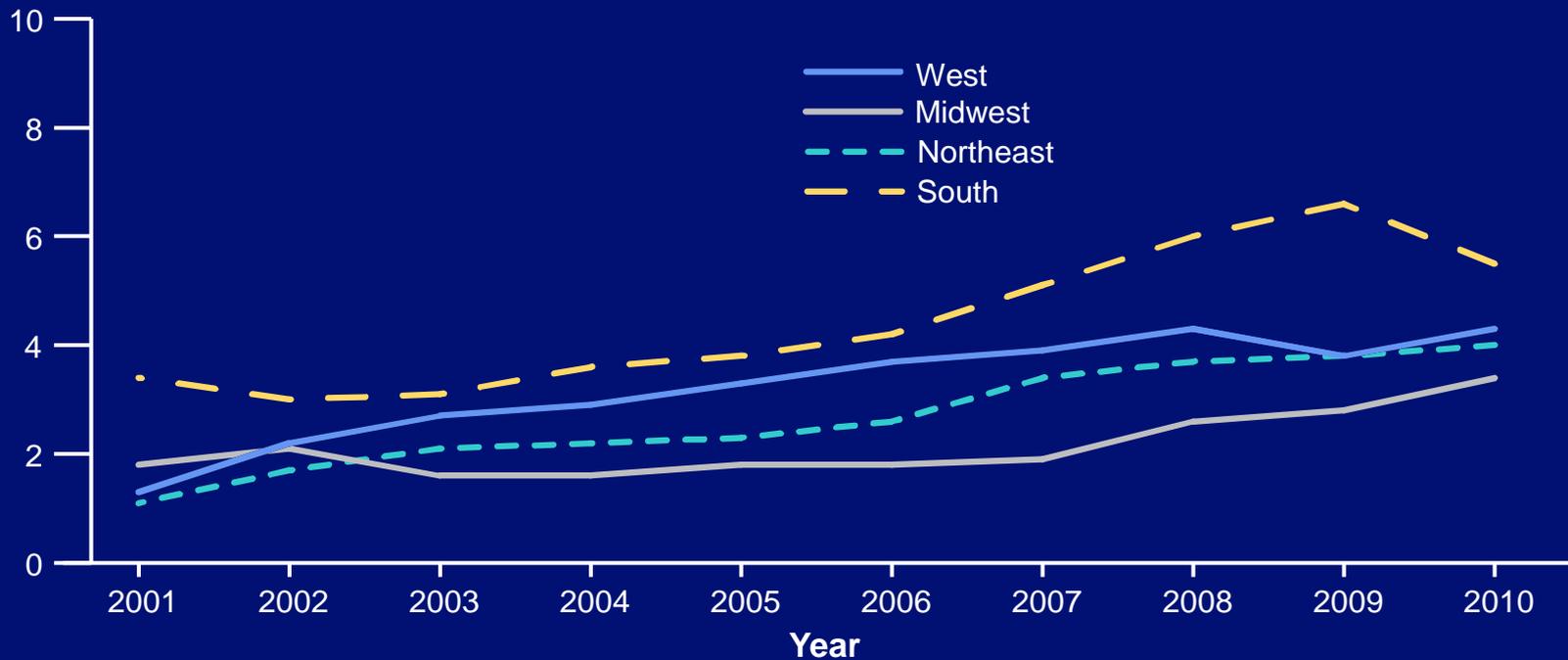


NOTE: In 2010, 2,167 (69.0%) of 3,141 counties in the United States reported no cases of primary and secondary syphilis.

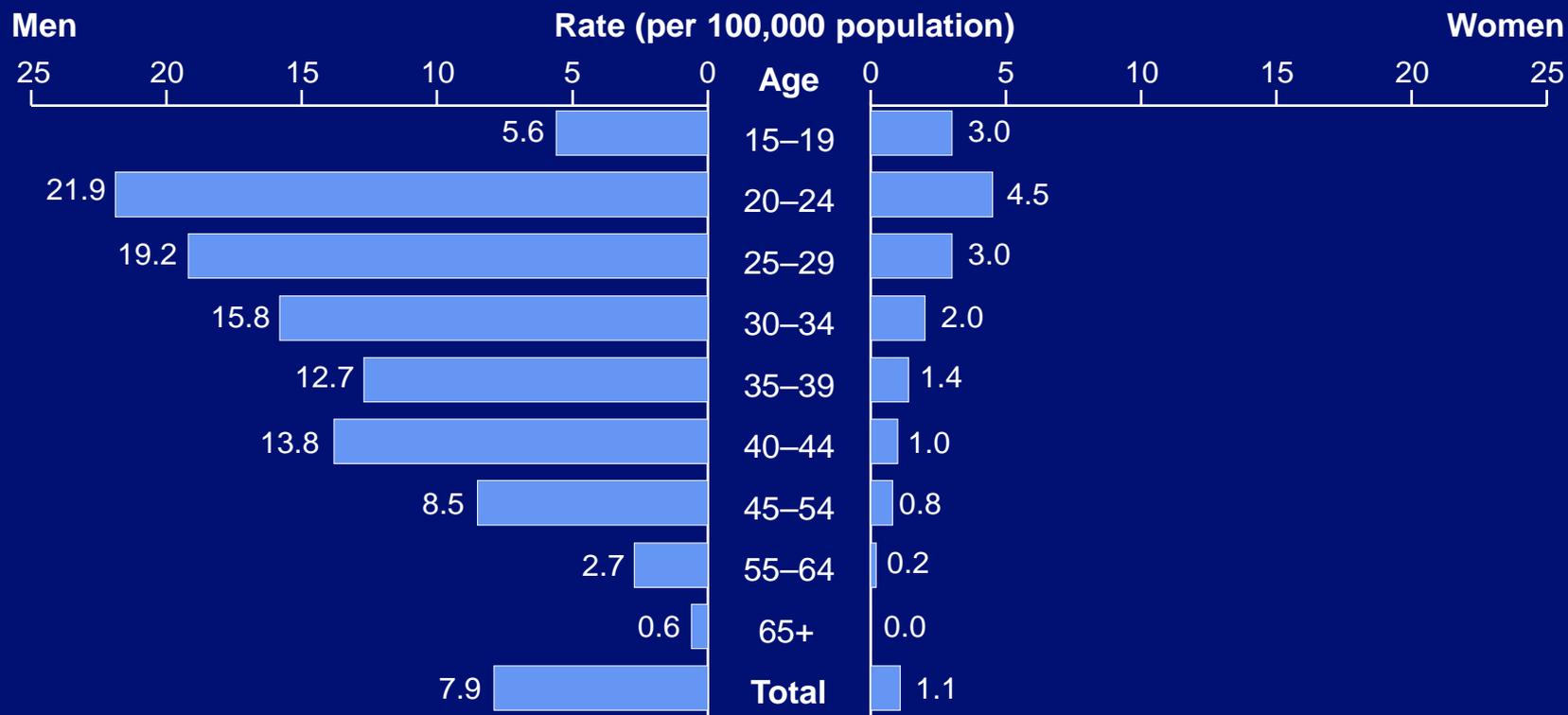


Primary and Secondary Syphilis—Rates by Region, United States, 2001–2010

Rate (per 100,000 population)

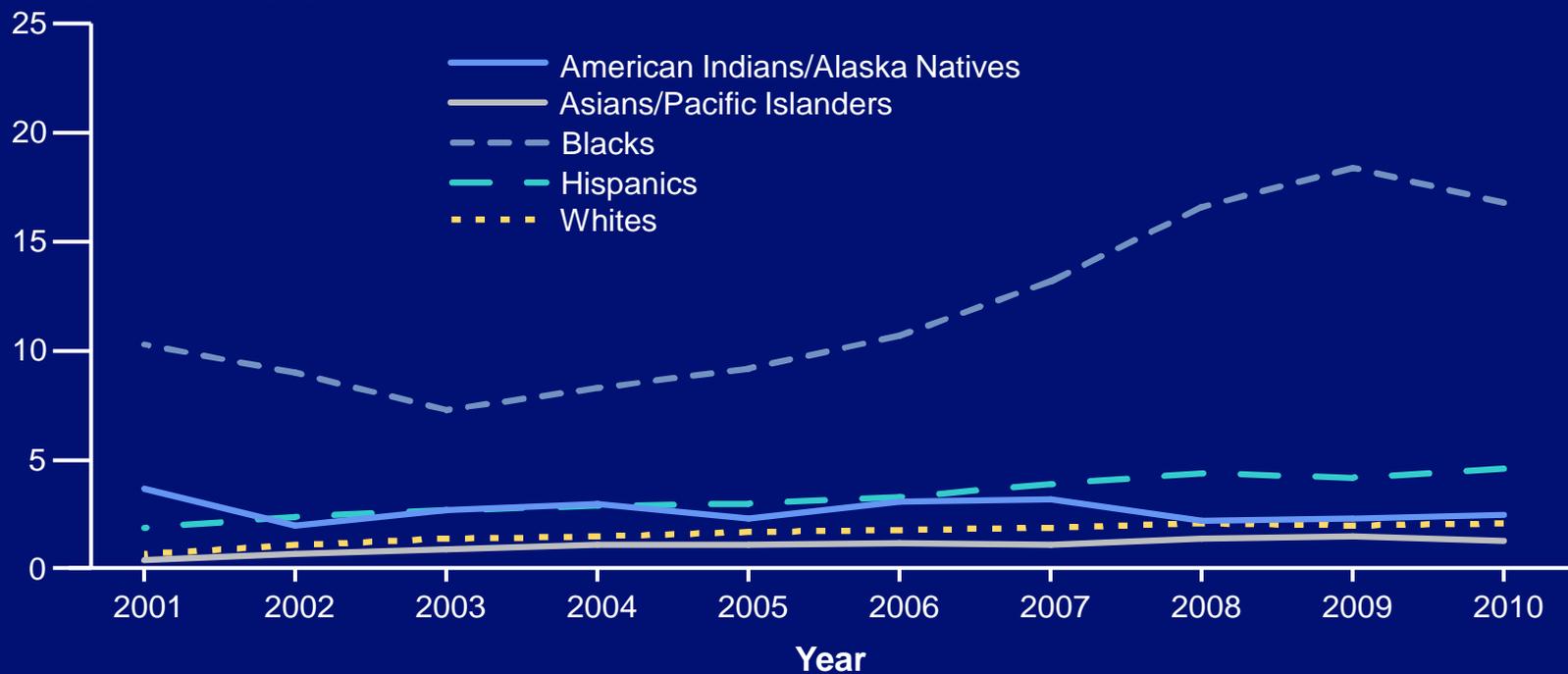


Primary and Secondary Syphilis—Rates by Age and Sex, United States, 2010



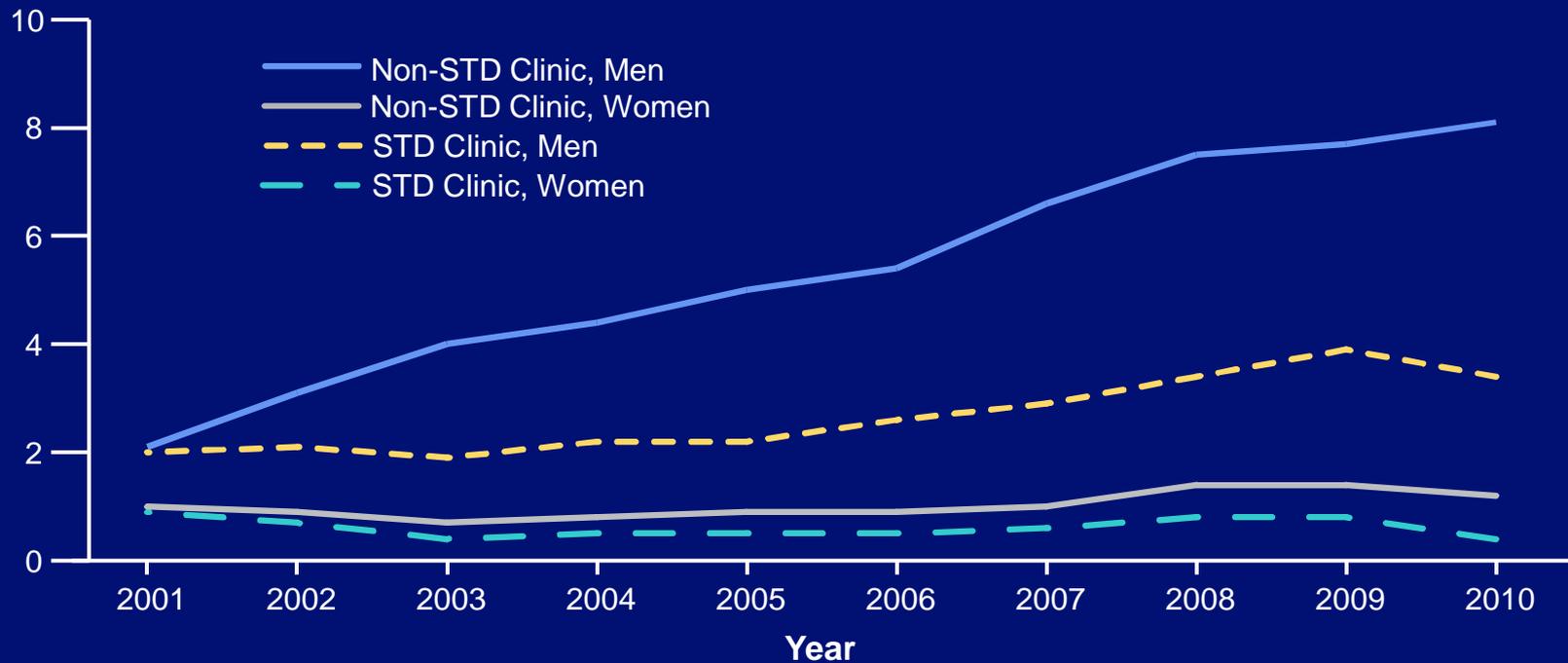
Primary and Secondary Syphilis—Rates by Race/Ethnicity, United States, 2001–2010

Rate (per 100,000 population)

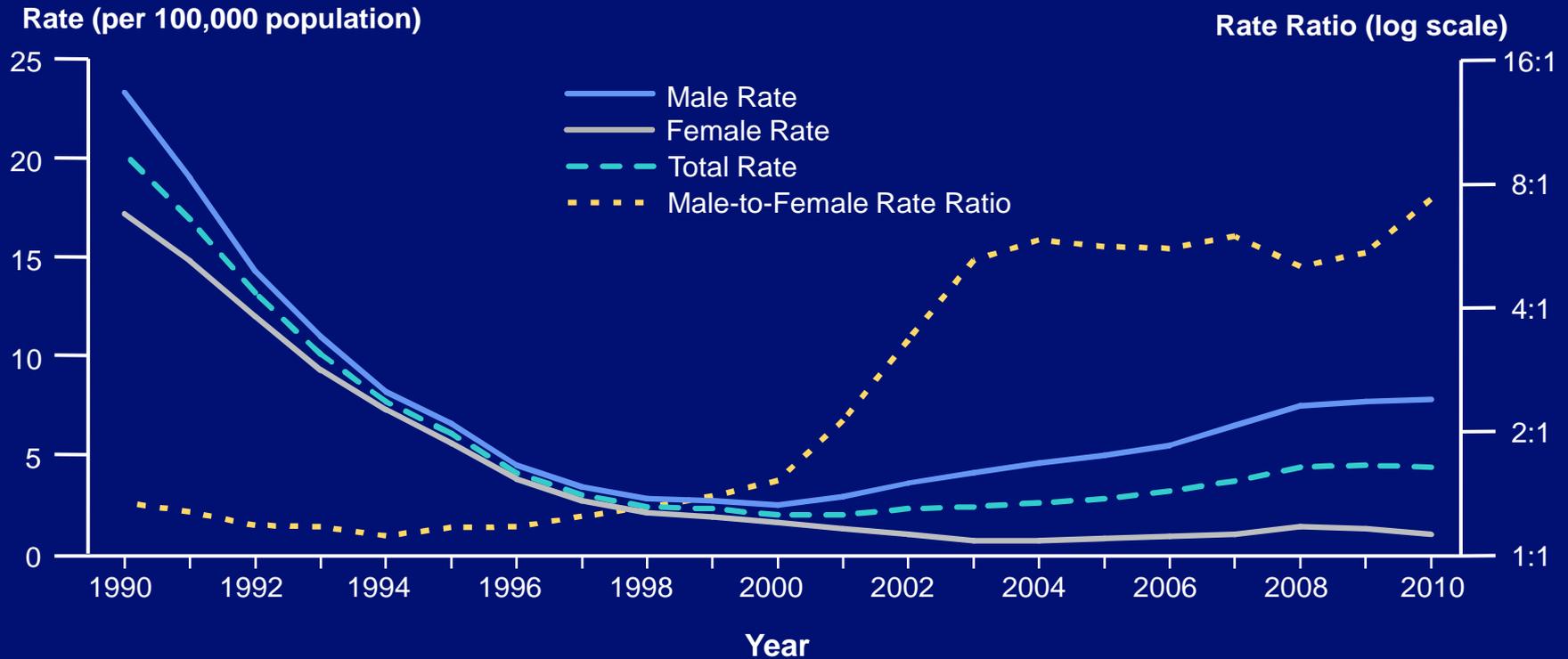


Primary and Secondary Syphilis—Reported Cases by Reporting Source and Sex, United States, 2001–2010

Cases (in thousands)

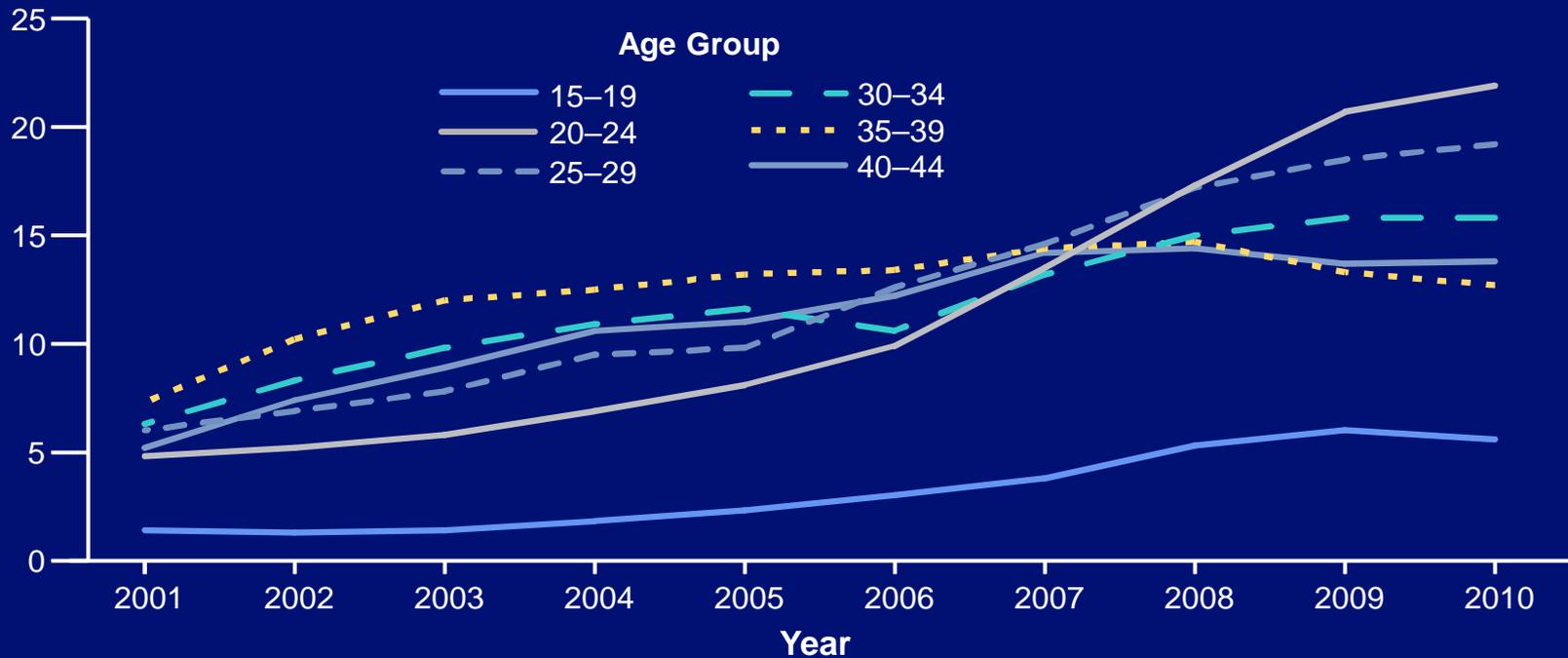


Primary and Secondary Syphilis—Rates by Sex and Male-to-Female Rate Ratios, United States, 1990–2010



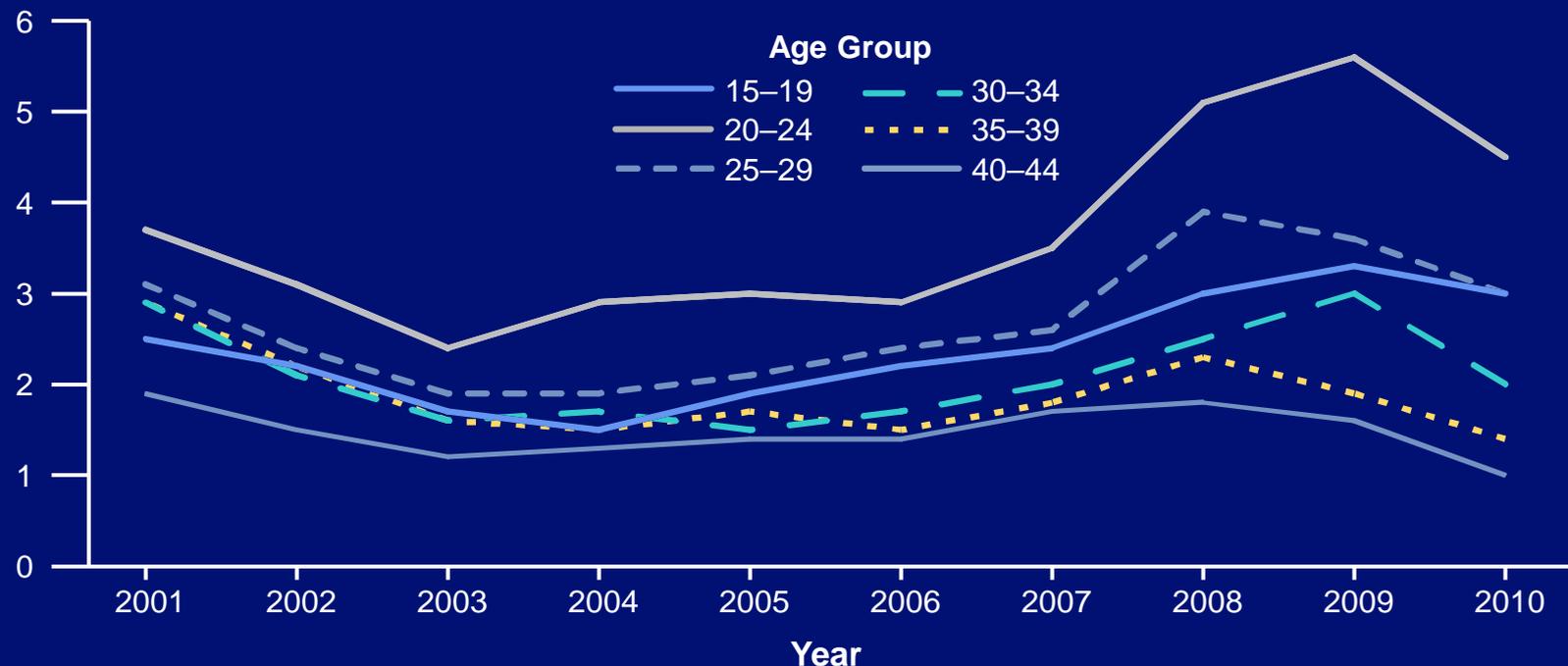
Primary and Secondary Syphilis—Rates by Age Among Men Aged 15–44 Years, United States, 2001–2010

Rate (per 100,000 population)

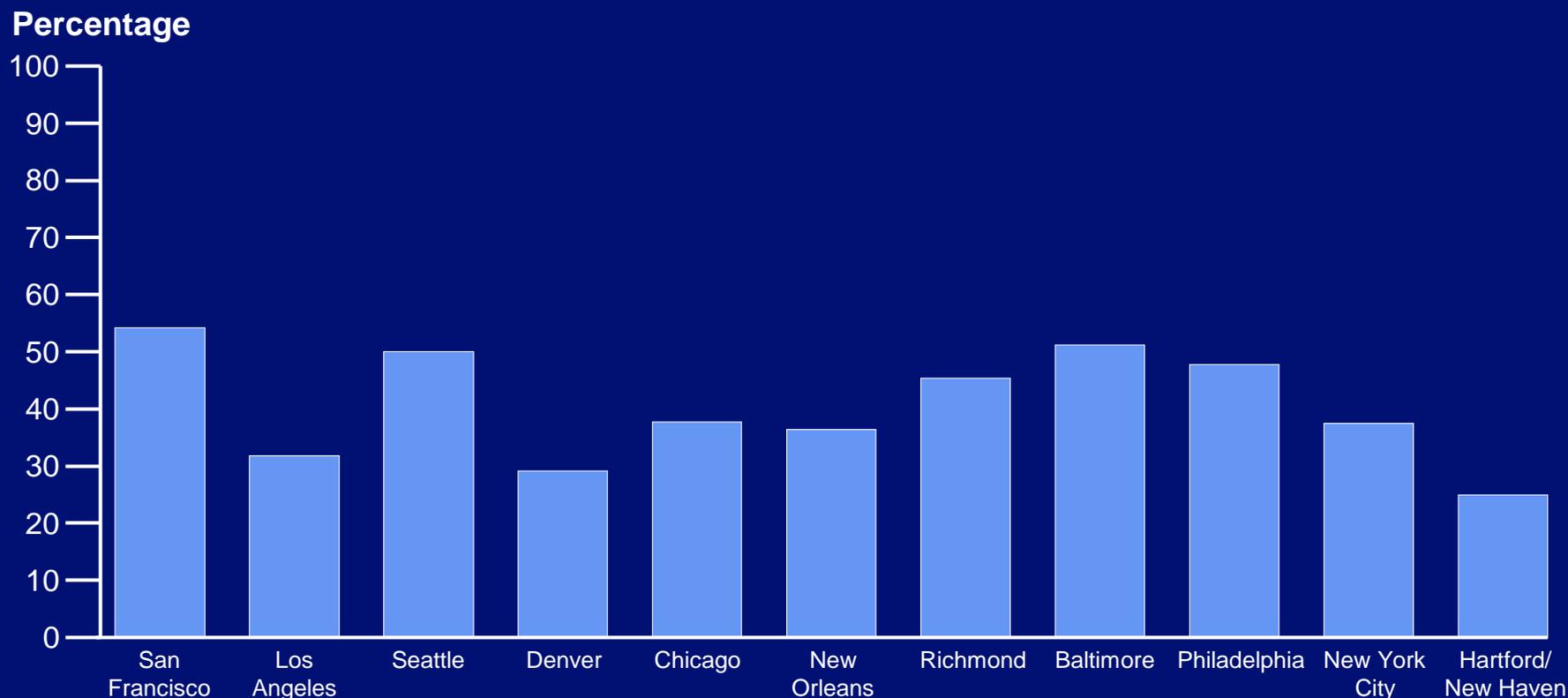


Primary and Secondary Syphilis—Rates by Age Among Women Aged 15–44 Years, United States, 2001–2010

Rate (per 100,000 population)



STD Surveillance Network (SSuN)—Primary and Secondary Syphilis and HIV—Proportion of MSM* with Primary and Secondary Syphilis Who Are Co-infected with HIV, 2010

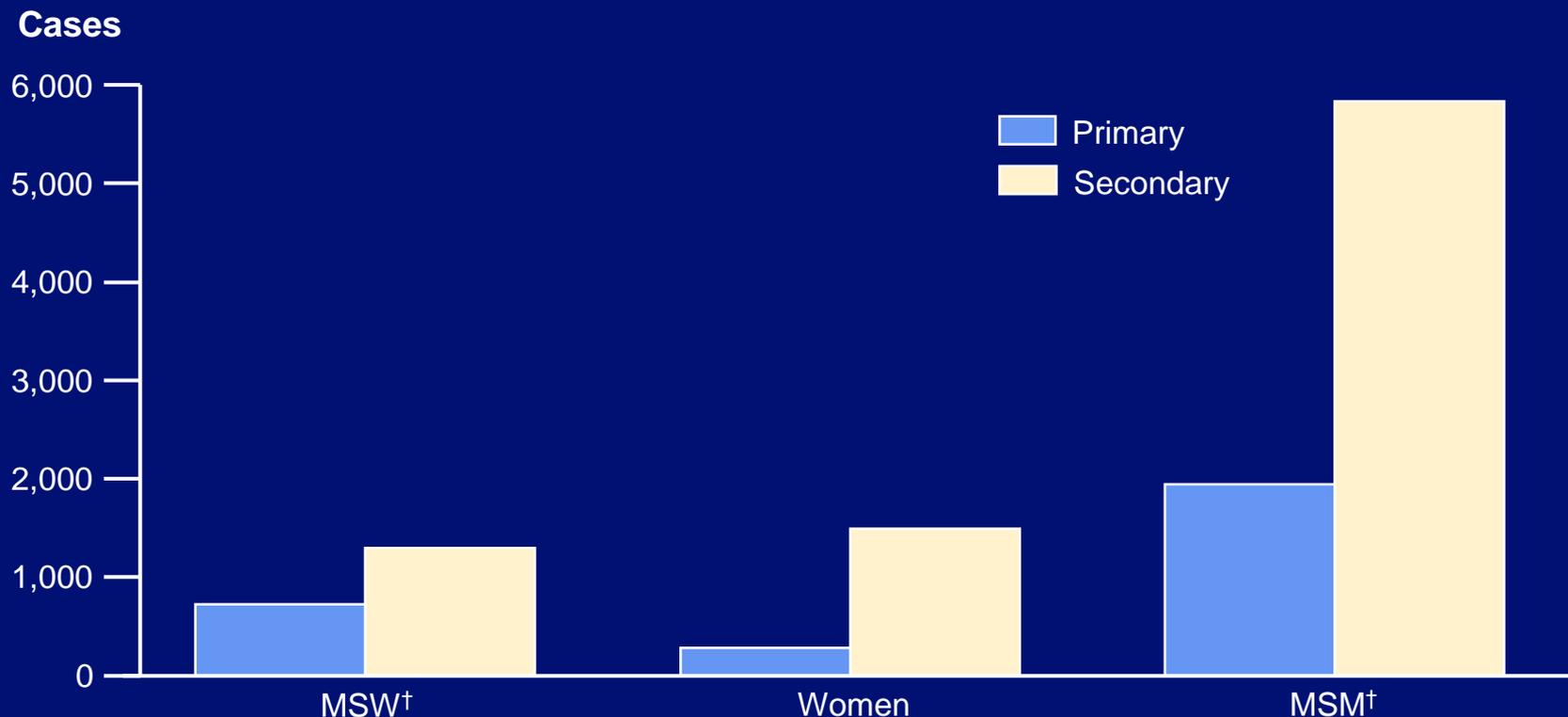


* MSM = men who have sex with men.

NOTE: Includes sites that reported data on at least 5 MSM with P&S syphilis in 2010.



Primary and Secondary Syphilis—Reported Cases* by Stage, Sex, and Sexual Behavior, United States, 2010

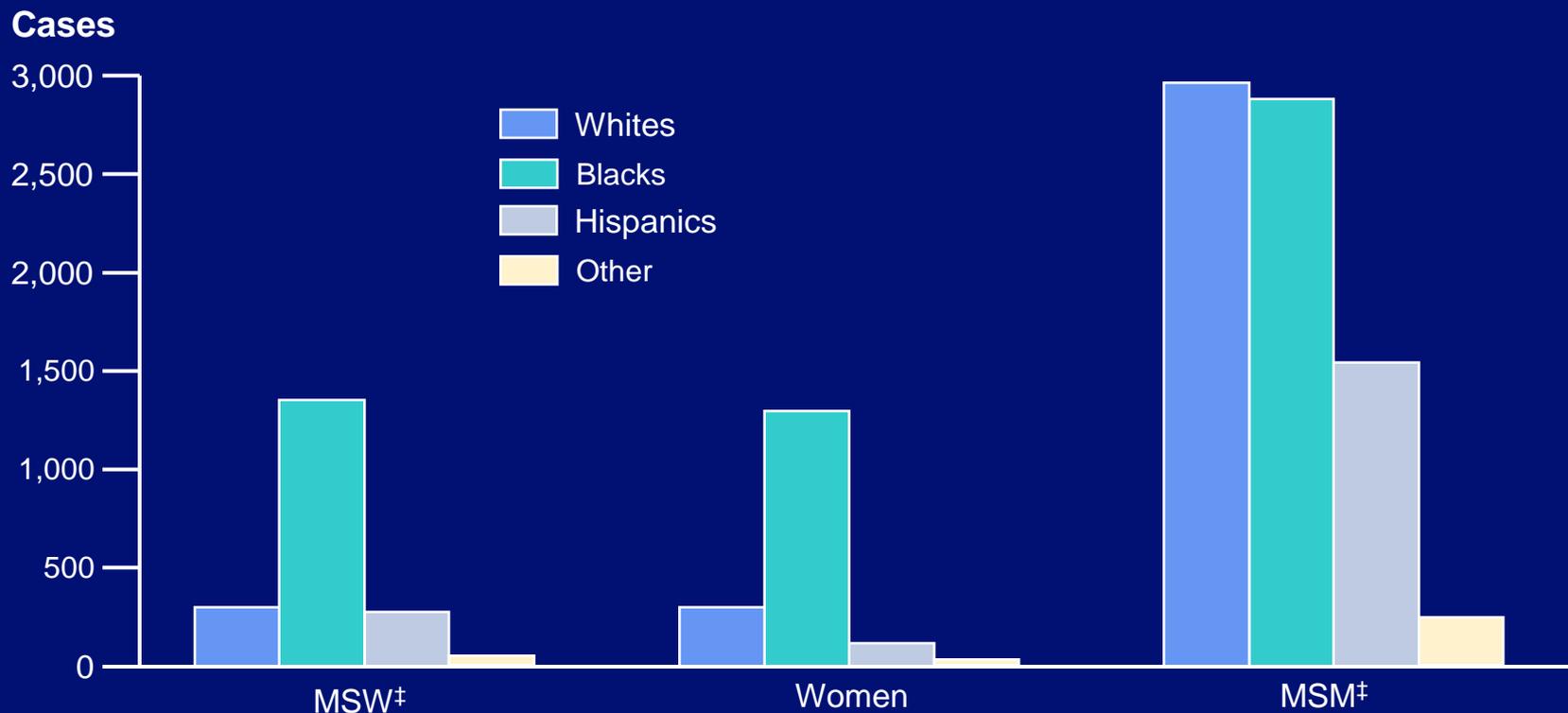


* Of the reported male cases of primary and secondary syphilis, 18.3% were missing sex of sex partner information.

† MSW = men who have sex with women only; MSM = men who have sex with men.



Primary and Secondary Syphilis—Reported Cases* by Sex, Sexual Behavior, and Race/Ethnicity,[†] United States, 2010



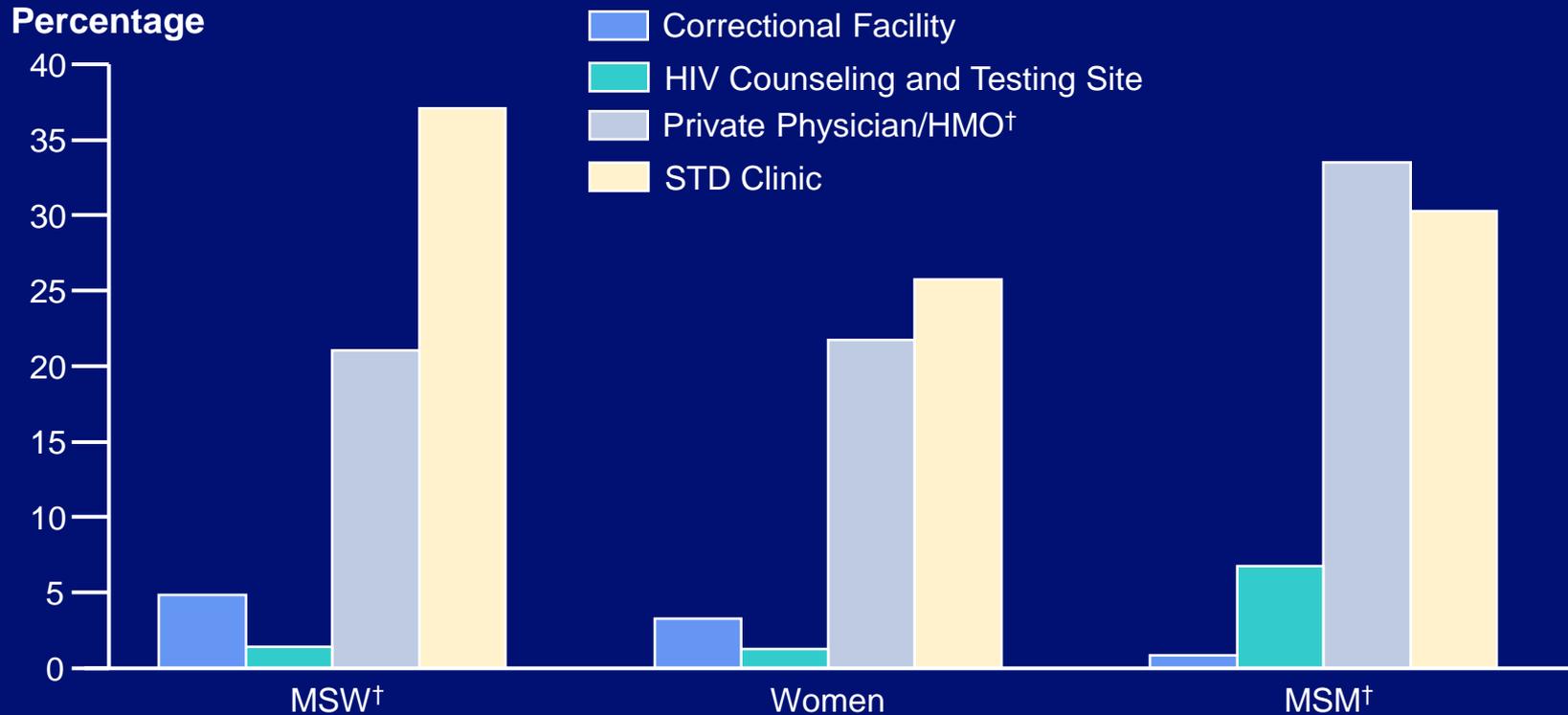
* Of the reported male cases of primary and secondary syphilis, 18.3% were missing sex of sex partner information; 2.0% of reported male cases with sex of sex partner data were missing race/ethnicity data.

[†] No imputation was done for race/ethnicity.

[‡] MSW = men who have sex with women only; MSM = men who have sex with men.



Primary and Secondary Syphilis—Percentage of Reported Cases* by Sex, Sexual Behavior, and Selected Reporting Sources, 2010

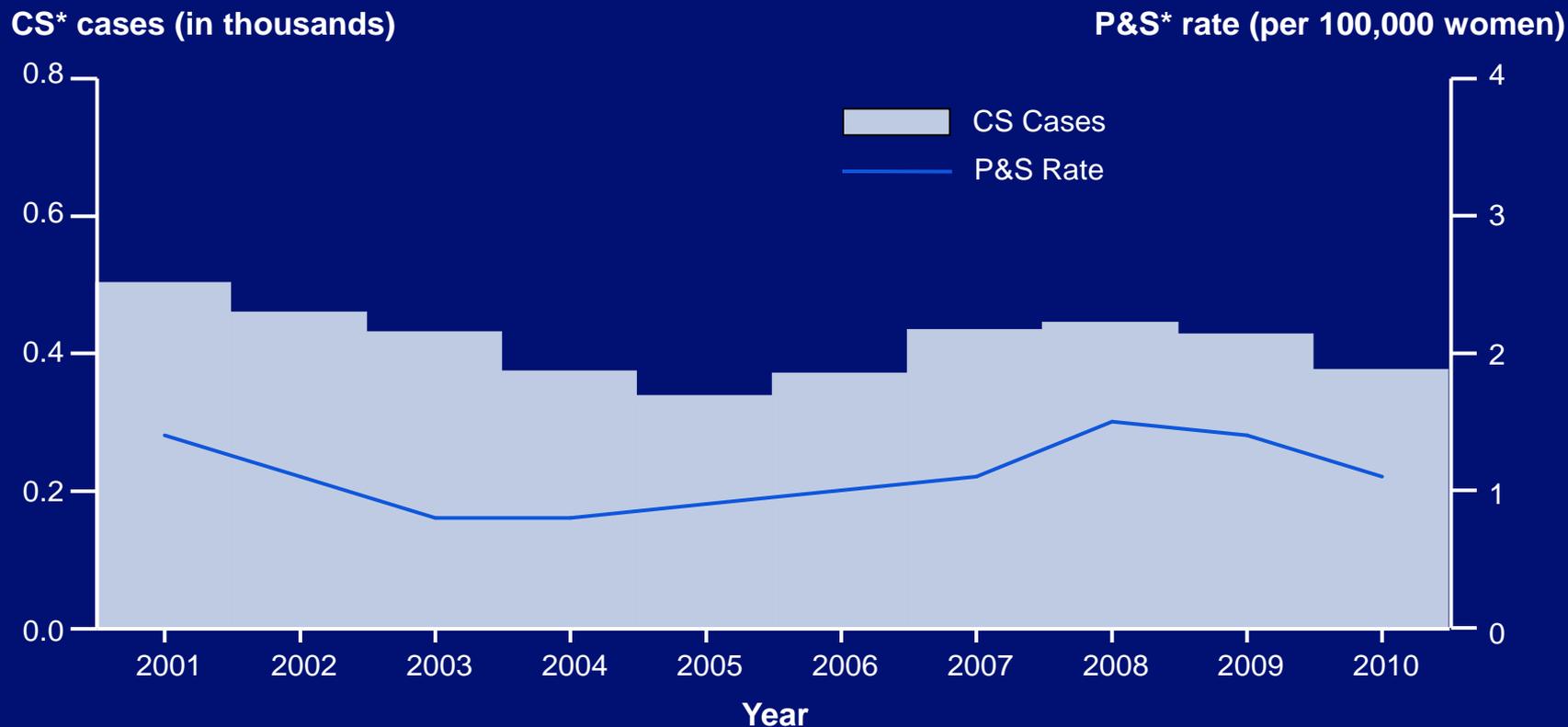


* Of the reported male cases of primary and secondary syphilis, 18.3% were missing sex of sex partner information, and 2.7% of reported male cases with sex of sex partner data were missing source of information data.

† HMO = health maintenance organization; MSW = men who have sex with women only; MSM = men who have sex with men.



Congenital Syphilis—Reported Cases Among Infants by Year of Birth and Rates of Primary and Secondary Syphilis Among Women, United States, 2001–2010



* CS = congenital syphilis; P&S = primary and secondary syphilis.



GENITAL HERPES

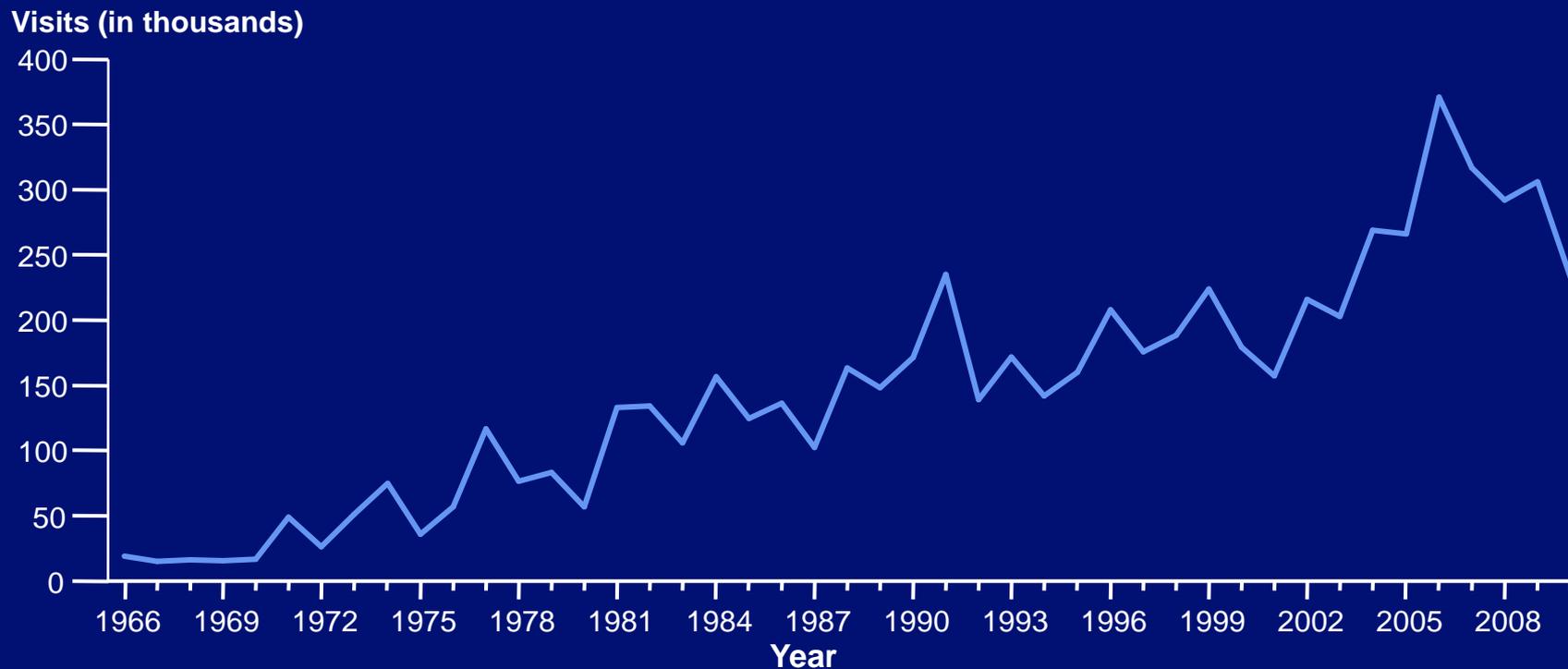
Sexually Transmitted Disease Surveillance 2010
Division of STD Prevention

Epidemiology of Genital Herpes

- ❑ **The majority of genital and perirectal herpetic outbreaks in the U.S. are caused by HSV-2**
- ❑ **Case reporting data are not available**
 - Trend data based on estimates of initial visits to physicians' offices
- ❑ **Seroprevalence of HSV-2 (NHANES data – 14-49 yr. olds)**
 - 1988-1994: 21.0%
 - 1999-2004: 17.0%
 - 2005-2008 16.2%
- ❑ **Most persons with HSV-2 have not received a diagnosis of genital herpes**



Genital Herpes—Initial Visits to Physicians' Offices, United States, 1966–2010

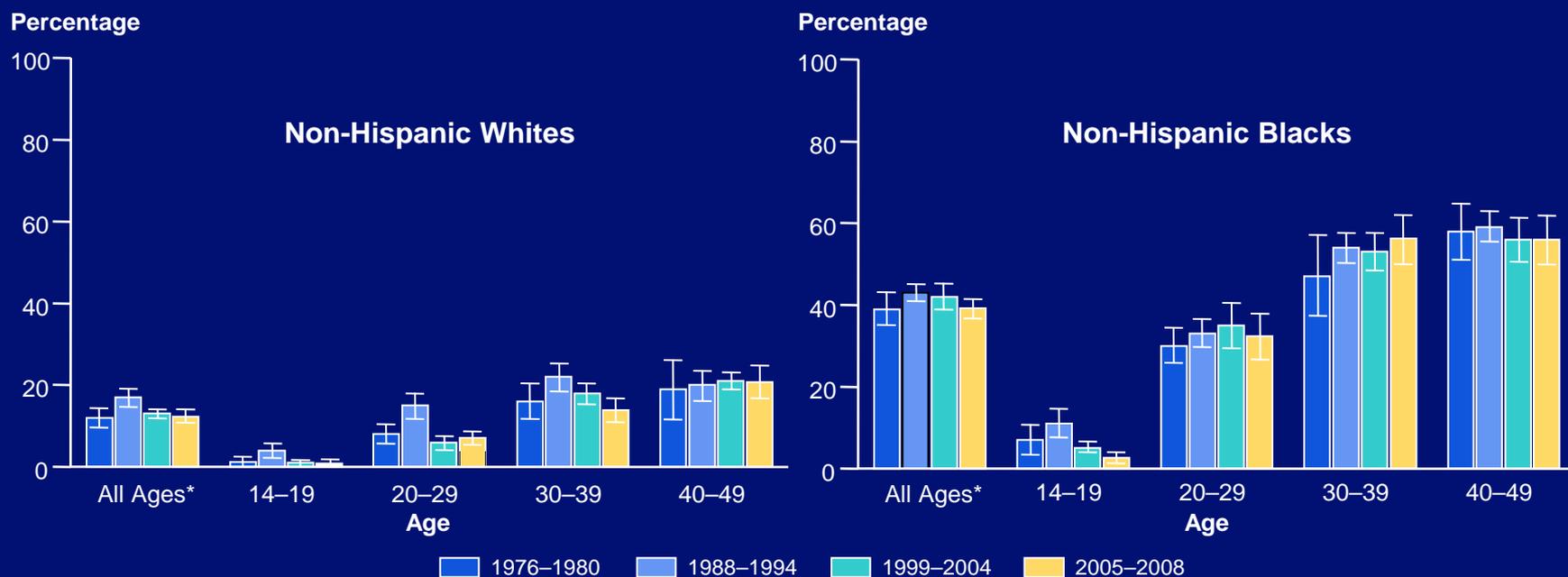


NOTE: The relative standard errors for genital herpes estimates of more than 100,000 range from 18% to 30%.

SOURCE: IMS Health, Integrated Promotional Services™. IMS Health Report, 1966–2010.



Herpes Simplex Virus Type 2—Seroprevalence in Non-Hispanic Whites and Non-Hispanic Blacks by Age Group, National Health and Nutrition Examination Survey, 1976–1980, 1988–1994, 1999–2004, 2005–2008



* Age-adjusted by using the 2000 U.S. Census civilian, non-institutionalized population aged 14–49 years as the standard.

NOTE: Error bars indicate 95% confidence intervals.



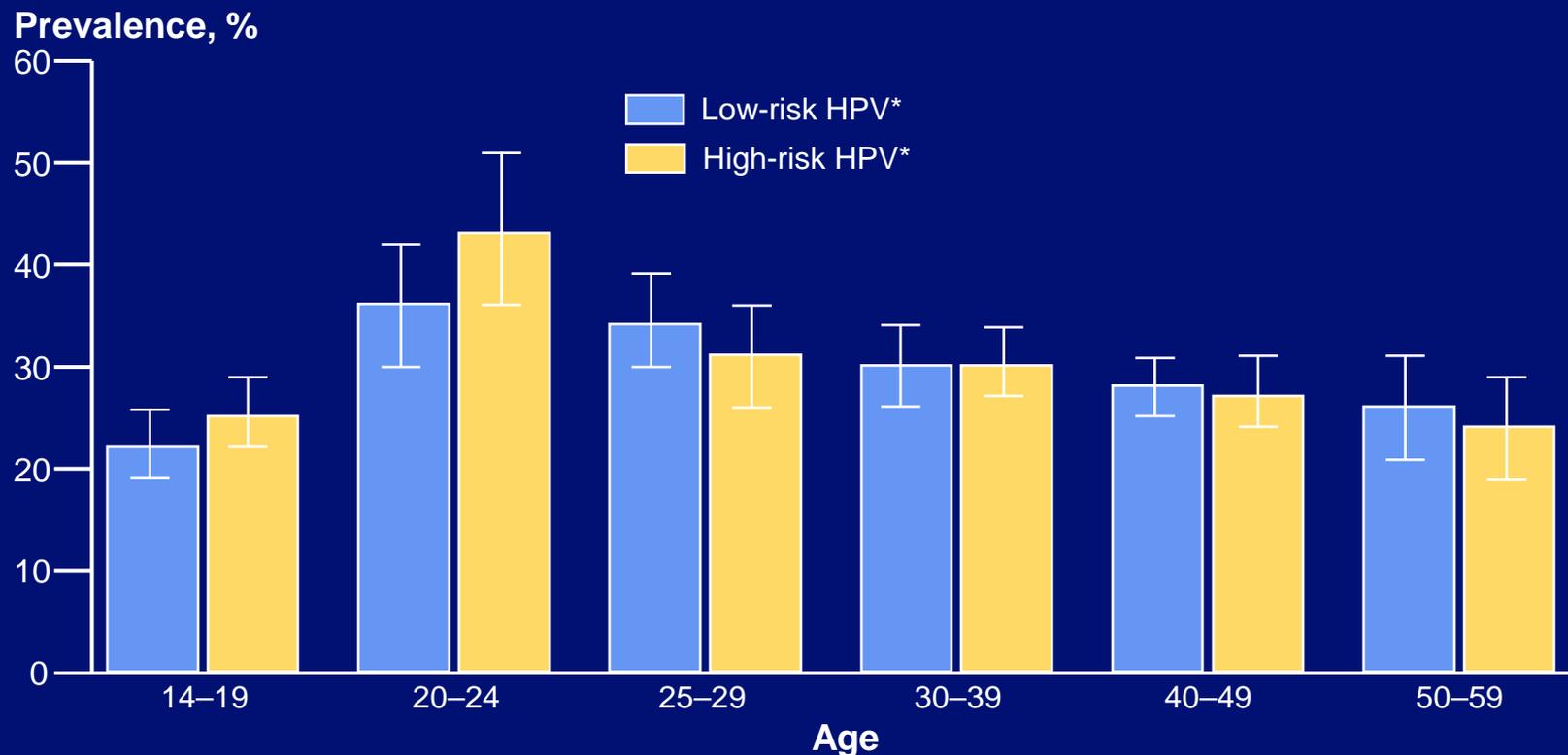
HUMAN PAPILOMAVIRUS

Sexually Transmitted Disease Surveillance 2010
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Epidemiology of HPV

- ❑ **Low-risk types (6 and 11) are responsible for about 90% of anogenital warts**
- ❑ **High-risk oncogenic types (16, 18, and others) are associated with anogenital cancers**
- ❑ **Overall HPV prevalence among women 42.5%**
 - NHANES 2003-2006
- ❑ **5.6% of sexually active adults 18-59 years have self-reported history of genital warts**

Human Papillomavirus—Prevalence of High-risk and Low-risk Types Among Females Aged 14–59 Years, National Health and Nutrition Examination Survey, 2003–2006



* HPV = human papillomavirus.

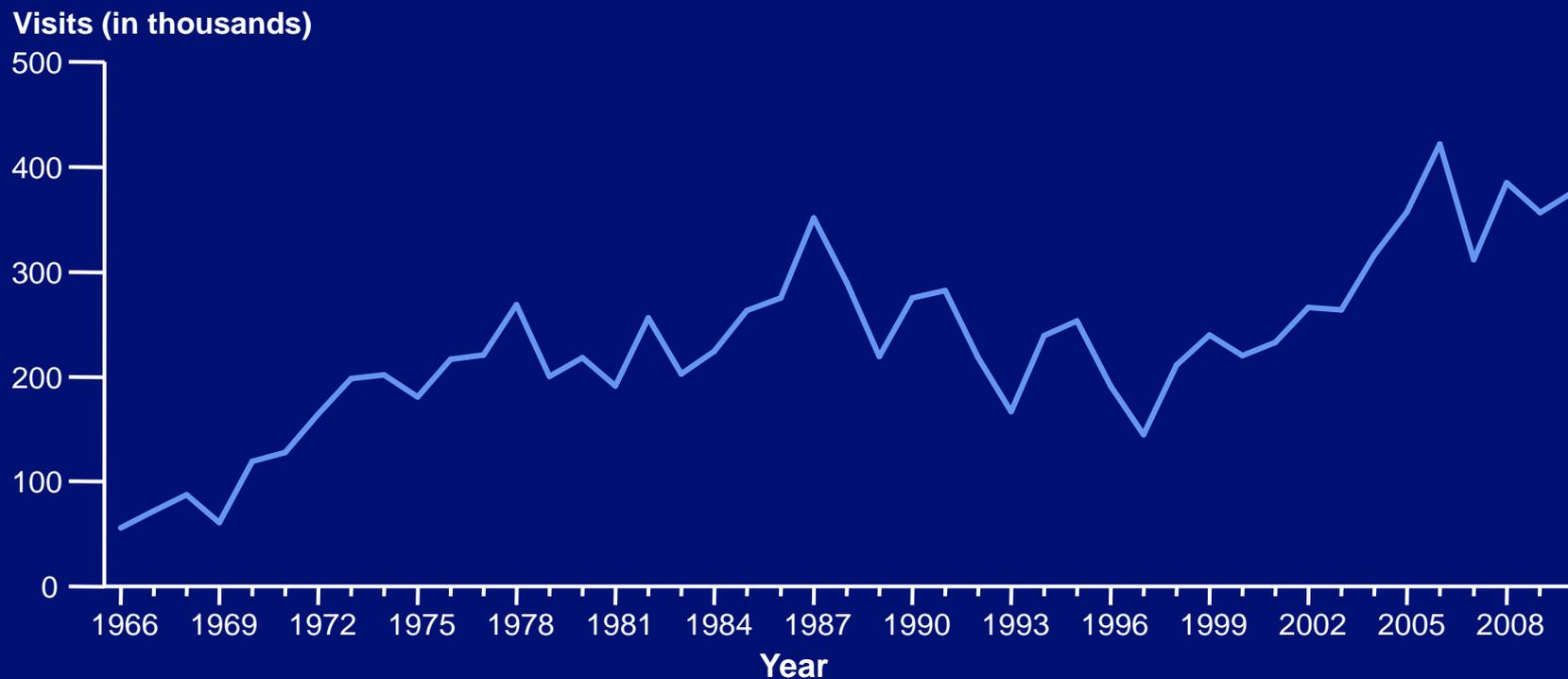
NOTE: Error bars indicate 95% confidence intervals. Both high-risk and low-risk HPV types were detected in some females.

SOURCE: Hariri S, Unger ER, Sternberg M, Dunne EF, Swan D, Patel S, et al. Prevalence of genital HPV among females in the United States, the National Health and Nutrition Examination Survey, 2003–2006.

J Infect Dis. 2011;204(4):566-73



Genital Warts—Initial Visits to Physicians' Offices, United States, 1966–2010



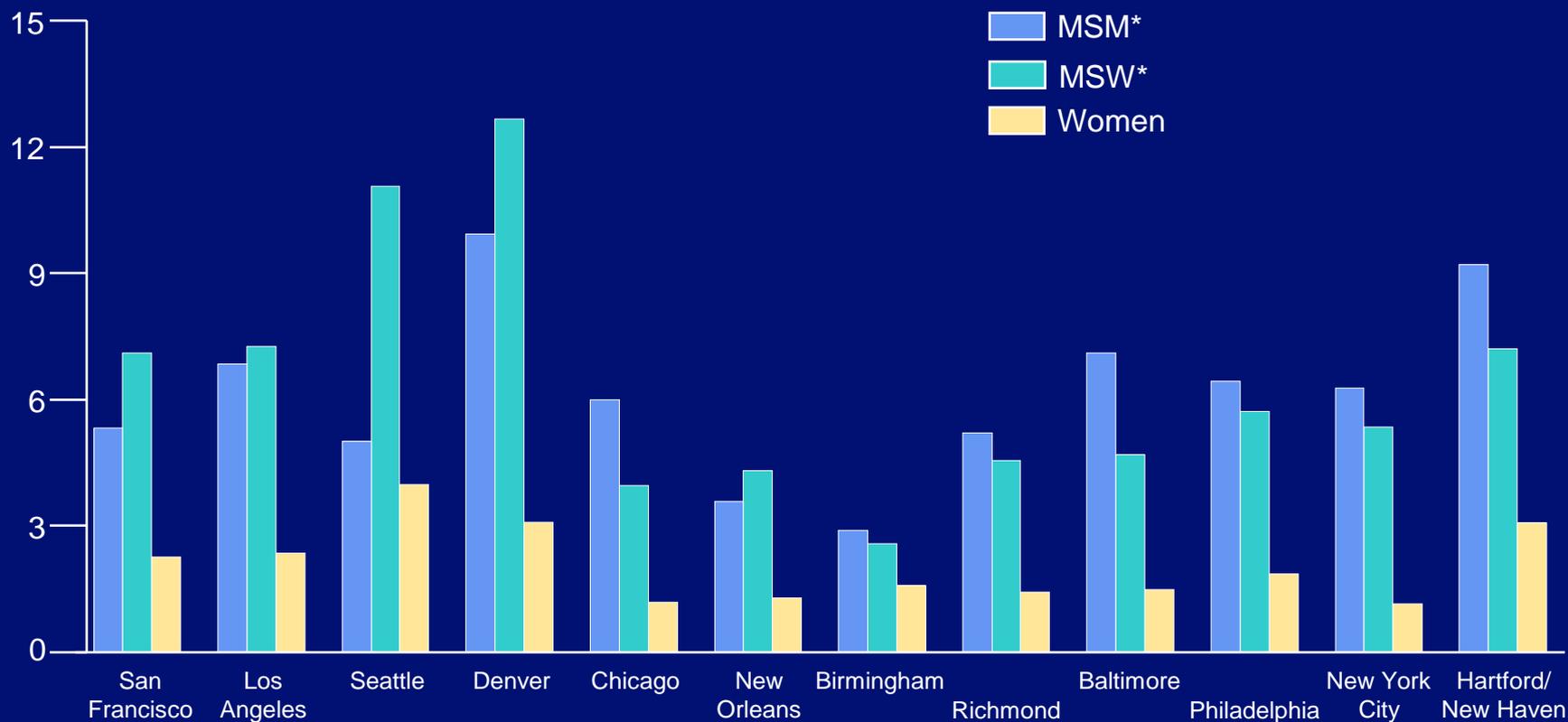
NOTE: The relative standard errors for genital warts estimates of more than 100,000 range from 18% to 30%.

SOURCE: IMS Health, Integrated Promotional Services™. IMS Health Report, 1966–2010.



STD Surveillance Network (SSuN)—Genital Warts— Prevalence Among Sexually Transmitted Disease (STD) Clinic Patients by Sex, Sex of Partners, and Site, 2010

Percentage



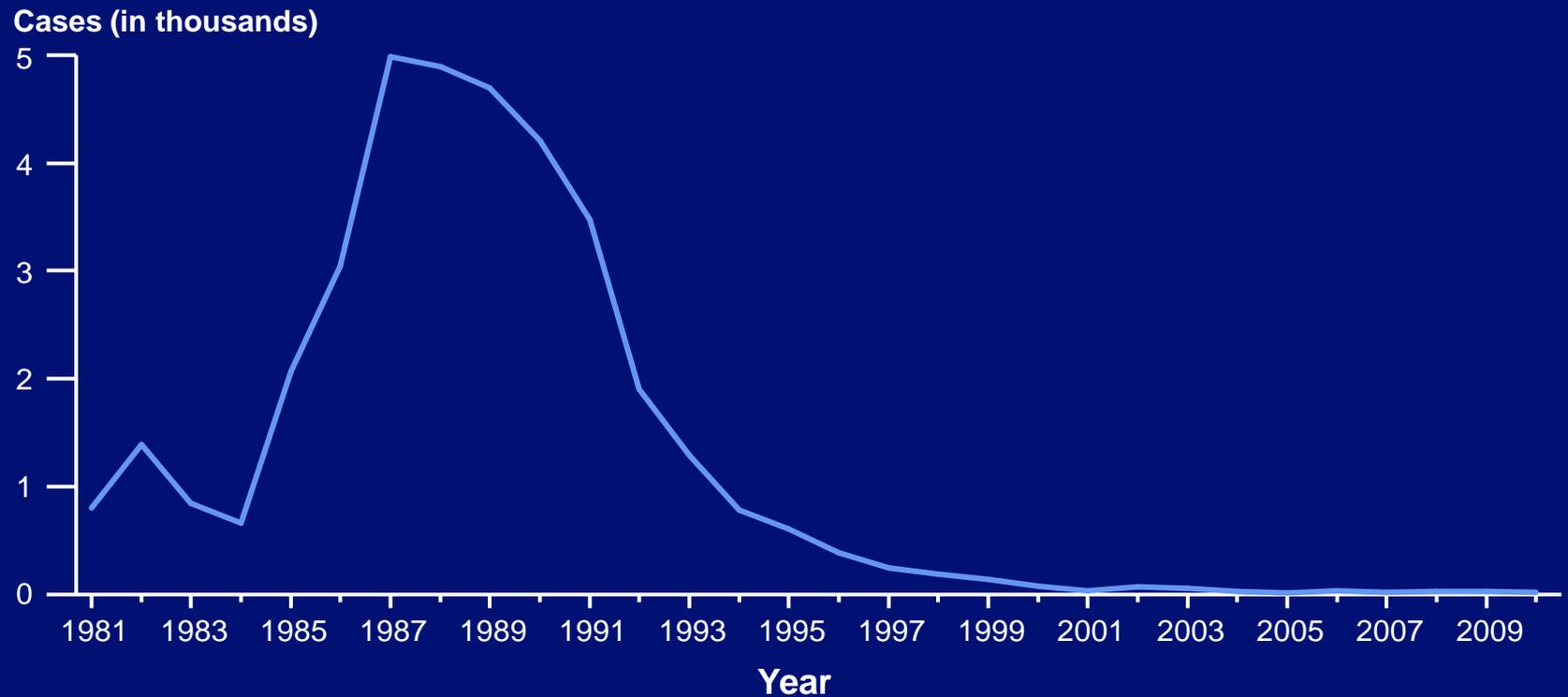
* MSM = men who have sex with men; MSW = men who have sex with women only.



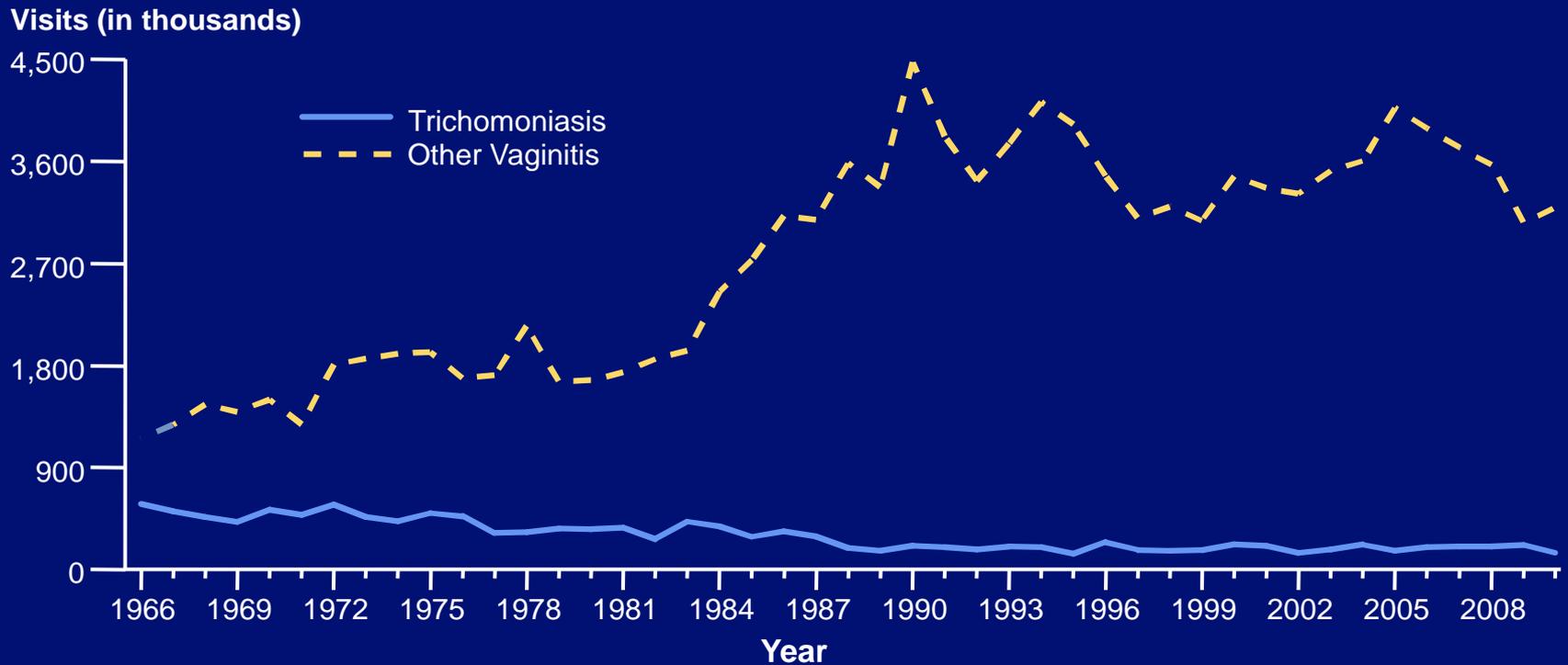
OTHER STDs

Sexually Transmitted Disease Surveillance 2010
Division of STD Prevention

Chancroid—Reported Cases, United States, 1981–2010



Trichomoniasis and Other Vaginal Infections—Women— Initial Visits to Physicians' Offices, United States, 1966–2010

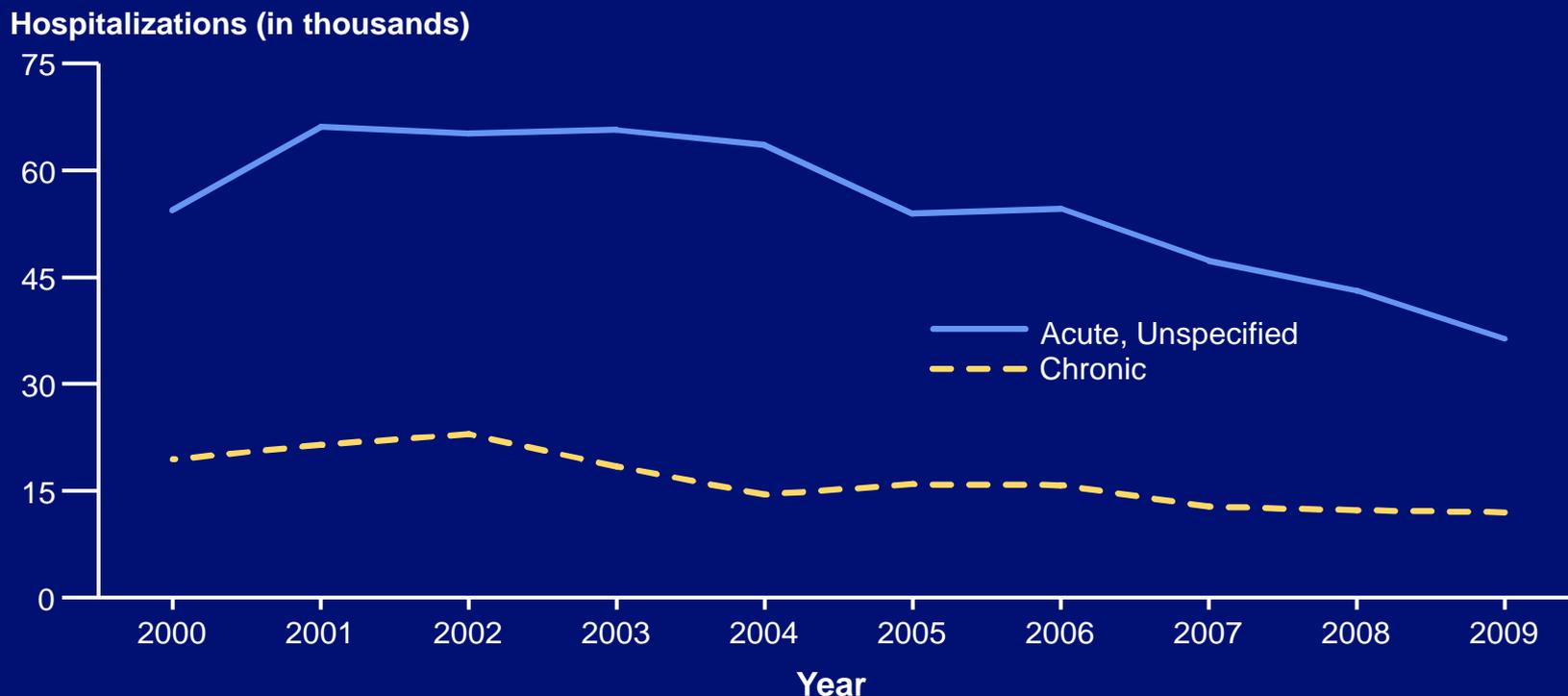


NOTE: The relative standard errors for trichomoniasis estimates range from 16% to 27% and for other vaginitis estimates range from 8% to 13%.

SOURCE: IMS Health, Integrated Promotional Services™, IMS Health Report, 1966–2010.



Pelvic Inflammatory Disease—Hospitalizations of Women Aged 15–44 Years, United States, 2000–2009

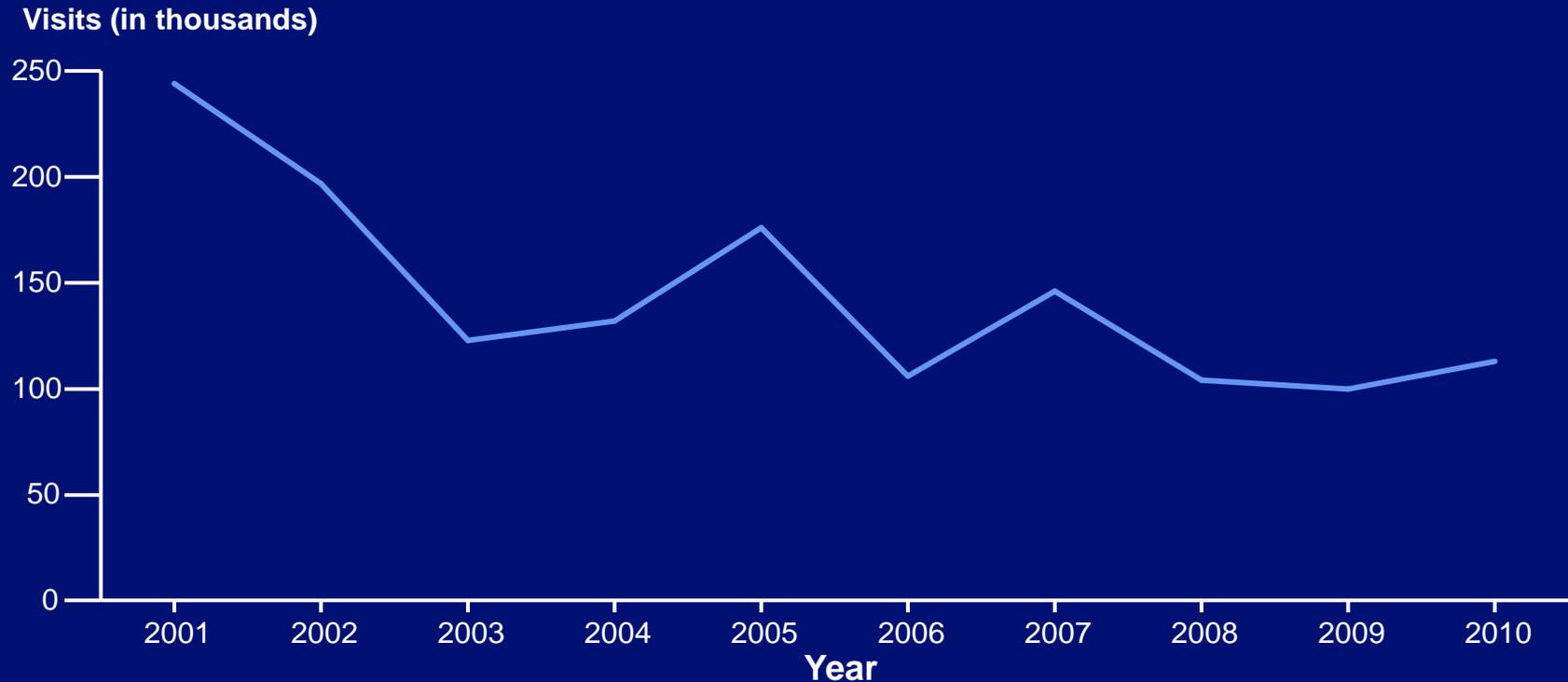


NOTE: The relative standard errors for acute and unspecified pelvic inflammatory disease (PID) cases ranges from 8%–18%. The relative standard error for chronic PID cases ranges from 12%–28%. Data only available through 2009.

SOURCE: 2009 National Hospital Discharge Survey [Internet]. Atlanta: Centers for Disease Control and Prevention. Available from: <http://www.cdc.gov/nchs/nhds/about/nhds.htm>.



Pelvic Inflammatory Disease—Initial Visits to Physicians' Offices by Women Aged 15–44 Years, United States, 2001–2010

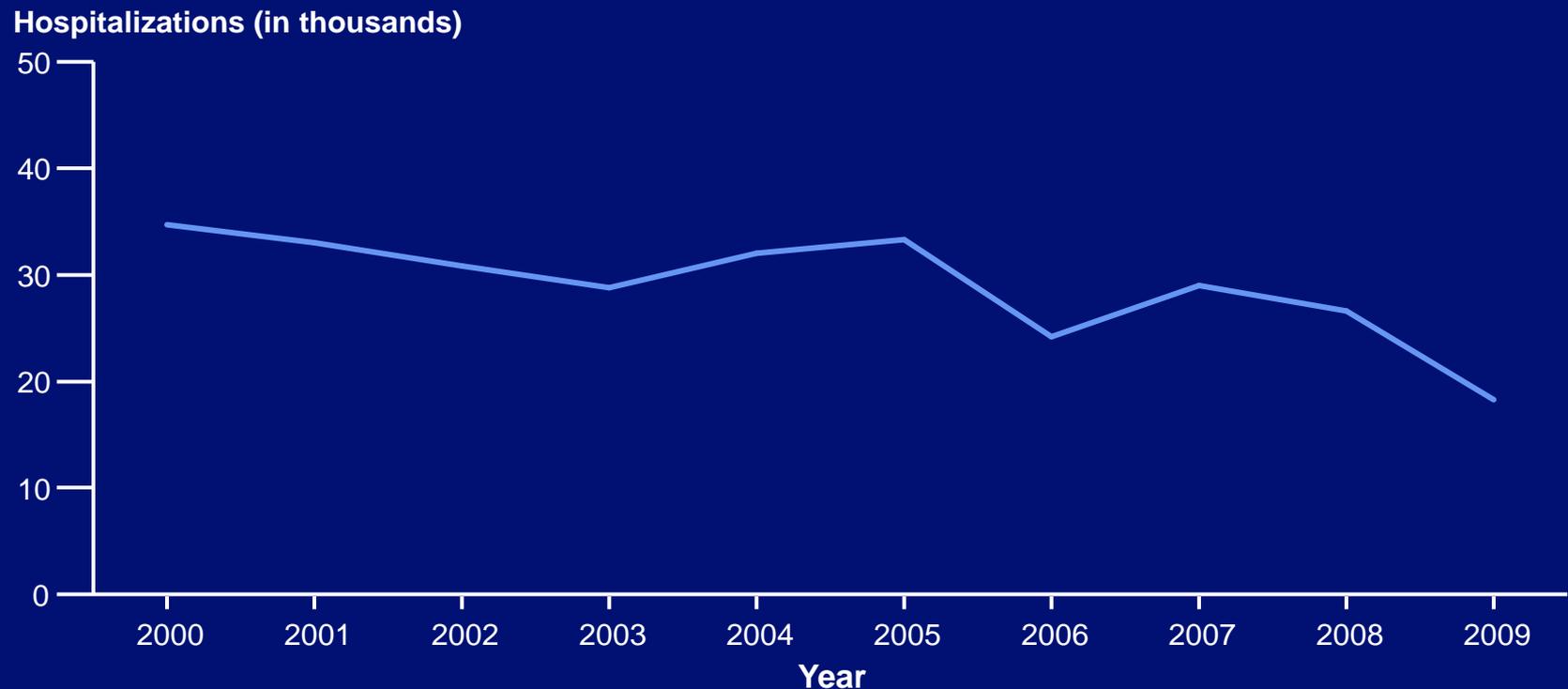


NOTE: The relative standard errors for these estimates are 21.6%–30%.

SOURCE: IMS Health, Integrated Promotional Services™. IMS Health Report, 1966–2010.



Ectopic Pregnancy—Hospitalizations of Women Aged 15–44 Years, United States, 2000–2009



NOTE: The relative standard errors for these estimates are 10%–23%. Data only available through 2009.

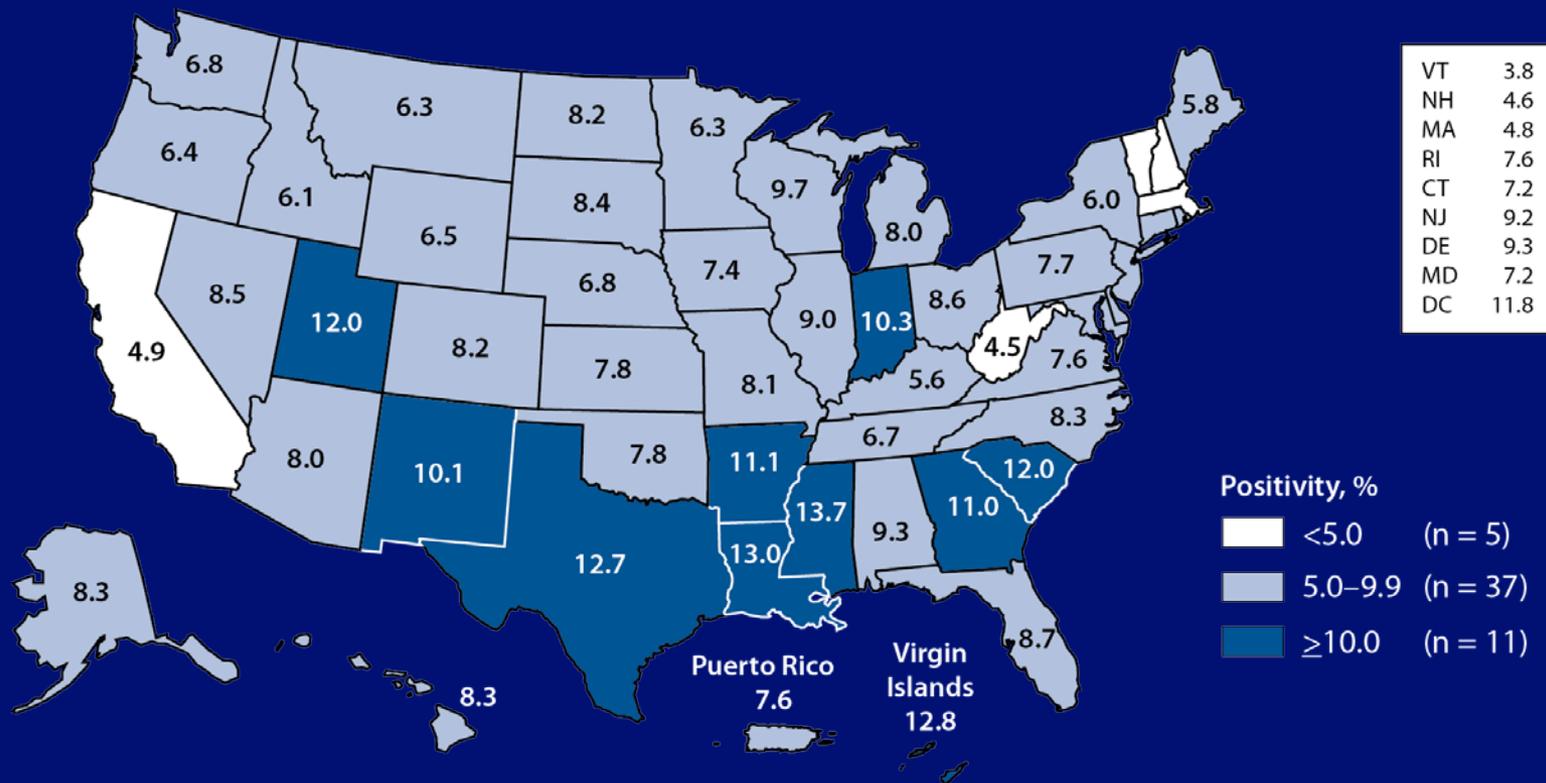
SOURCE: 2009 National Hospital Discharge Survey [Internet]. Atlanta: Centers for Disease Control and Prevention. Available from: <http://www.cdc.gov/nchs/nhds/about/nhds.htm>.



STDs IN ADOLESCENTS AND YOUNG ADULTS

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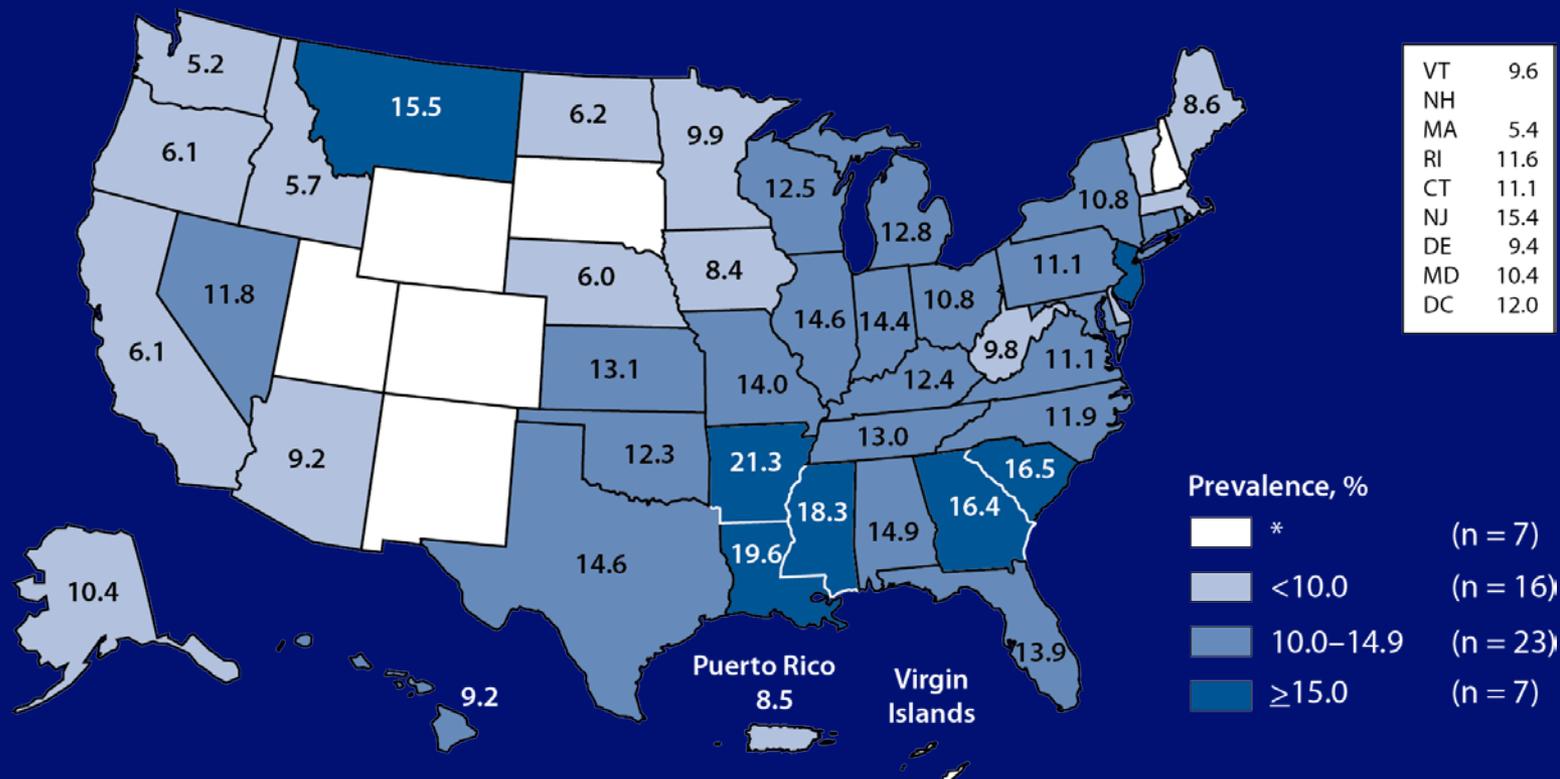
Chlamydia—Positivity Among Women Aged 15–24 Years Tested in Family Planning Clinics, by State, Infertility Prevention Project, United States and Outlying Areas, 2010



NOTE: Includes states and outlying areas that reported chlamydia positivity data on at least 500 women aged 15–24 years screened during 2010.



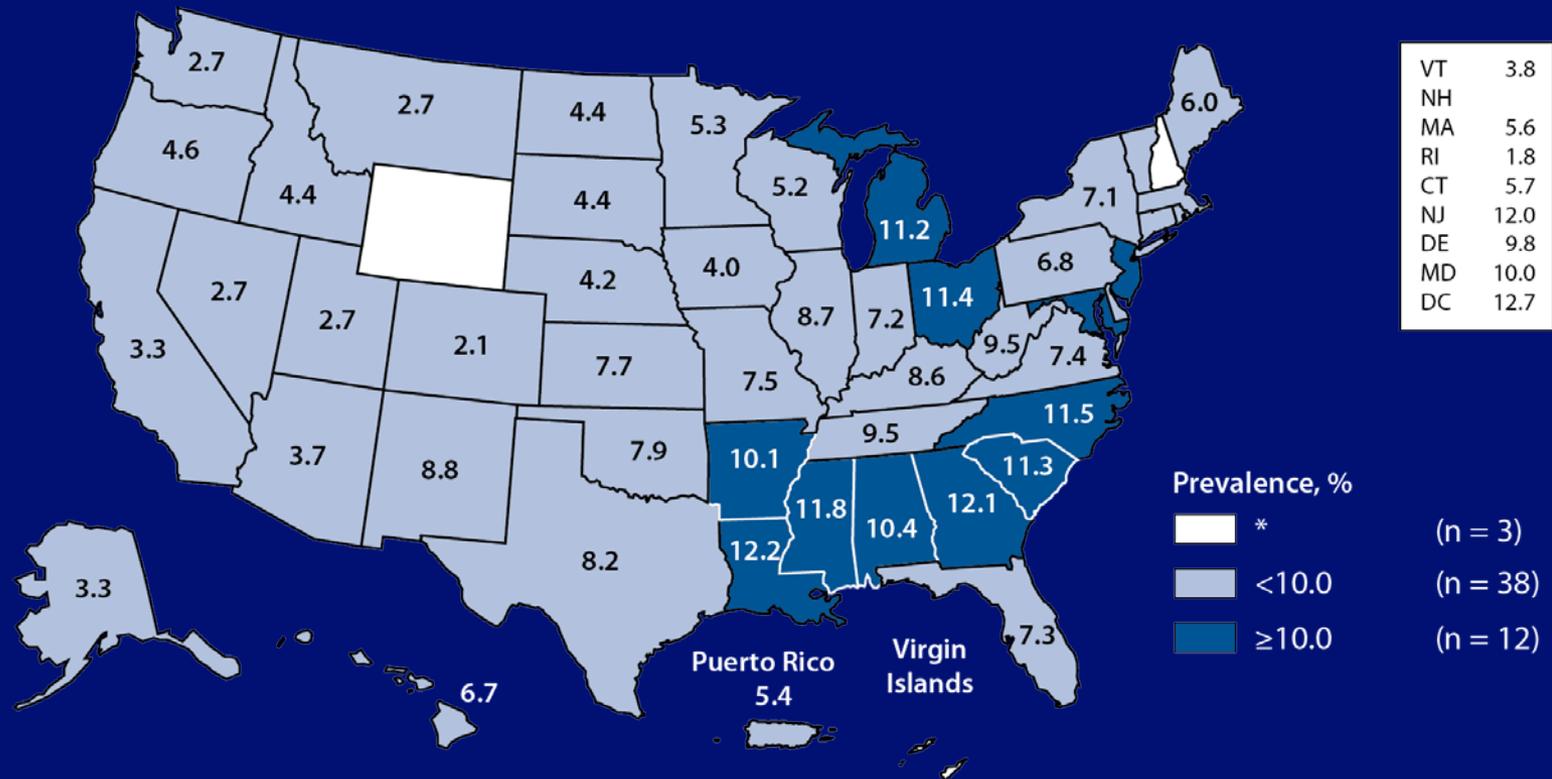
Chlamydia—Prevalence Among Women Aged 16–24 Years Entering the National Job Training Program, by State of Residence, United States and Outlying Areas, 2010



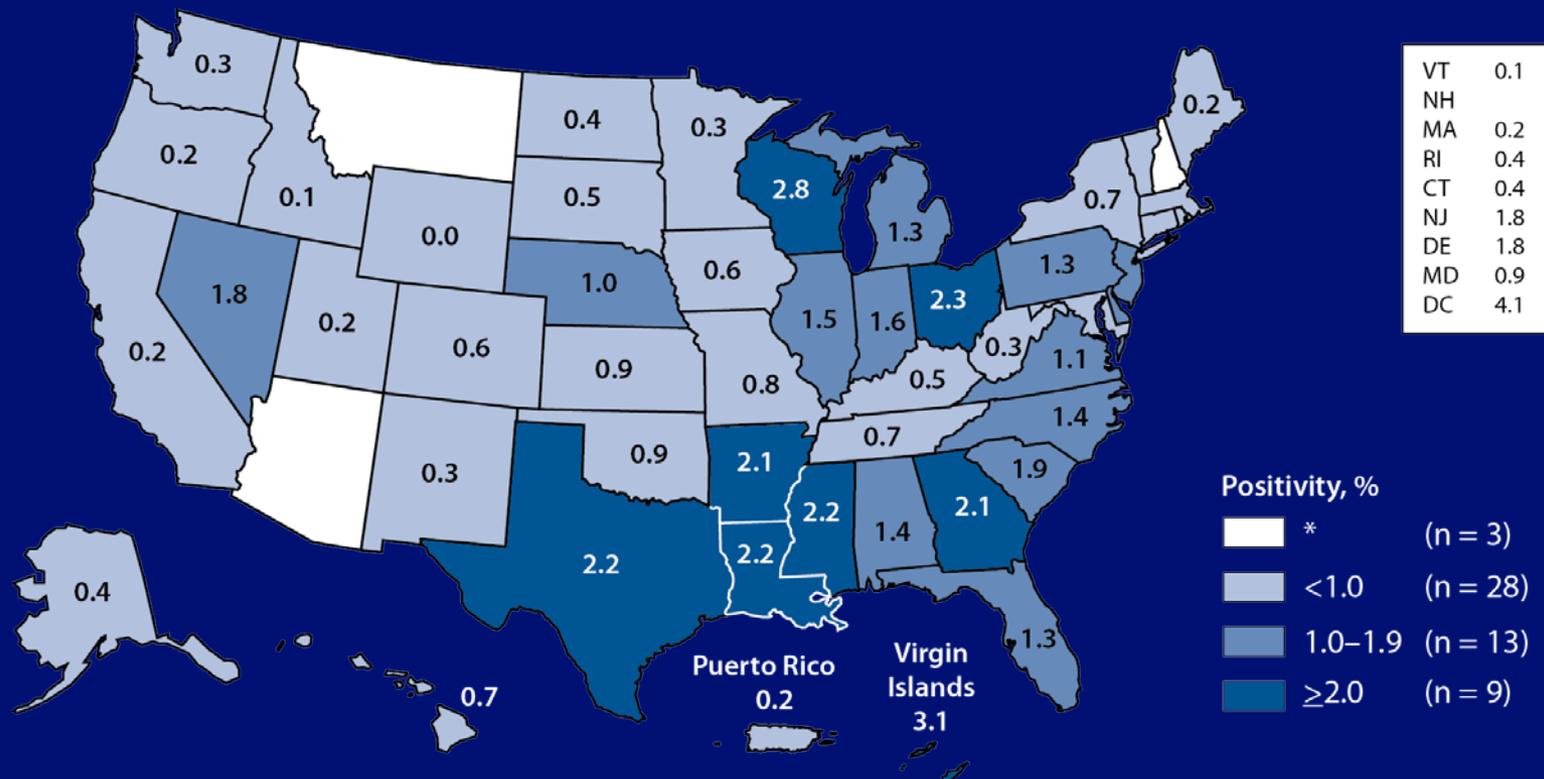
* Fewer than 100 women who resided in these states/areas and entered the National Job Training Program were screened for chlamydia in 2010.



Chlamydia—Prevalence Among Men Aged 16–24 Years Entering the National Job Training Program, by State of Residence, United States and Outlying Areas, 2010



Gonorrhea—Positivity Among Women Aged 15–24 Years Tested in Family Planning Clinics, by State, Infertility Prevention Project, United States and Outlying Areas, 2010

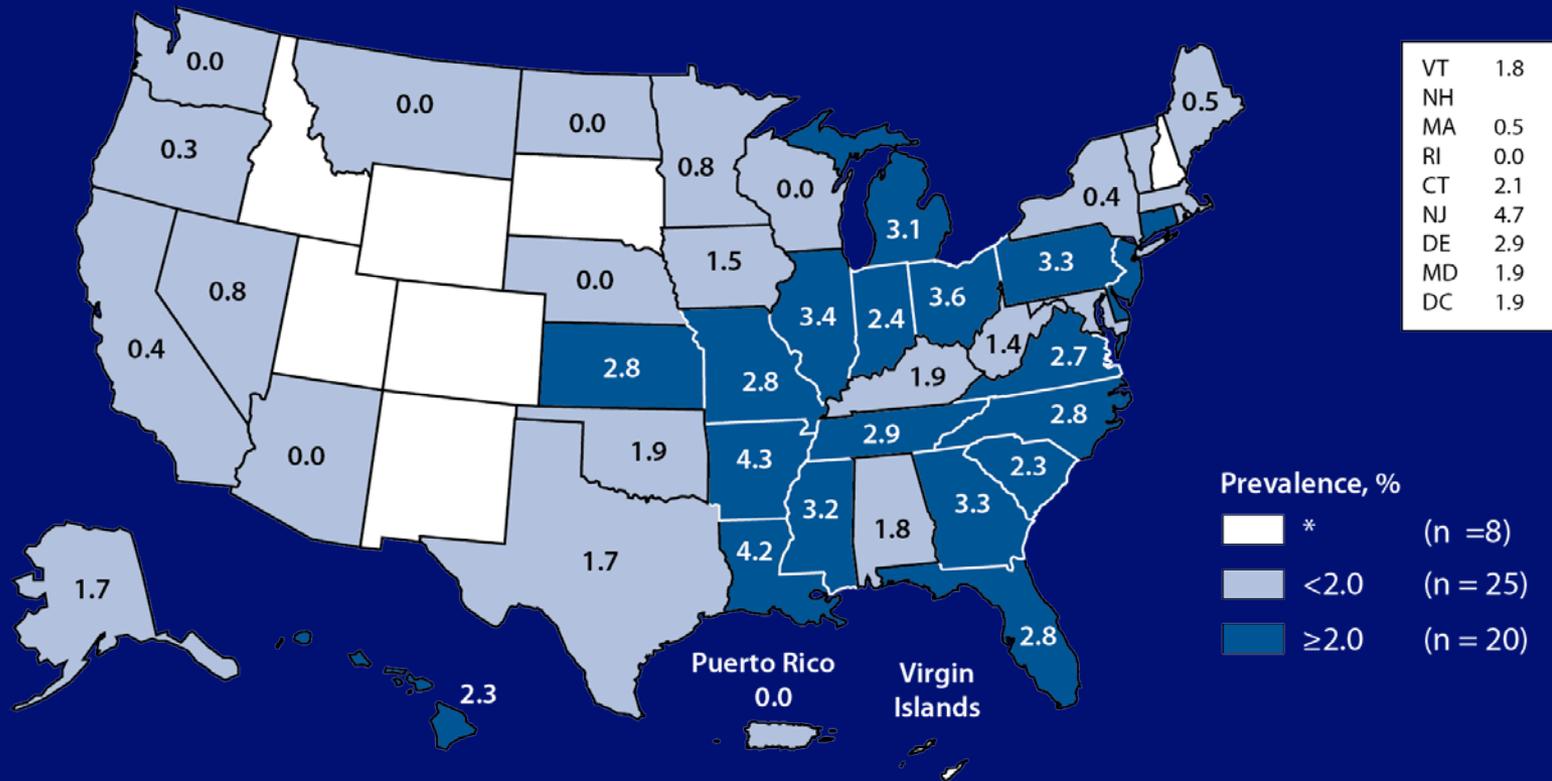


* States/areas not meeting minimum inclusion criteria.

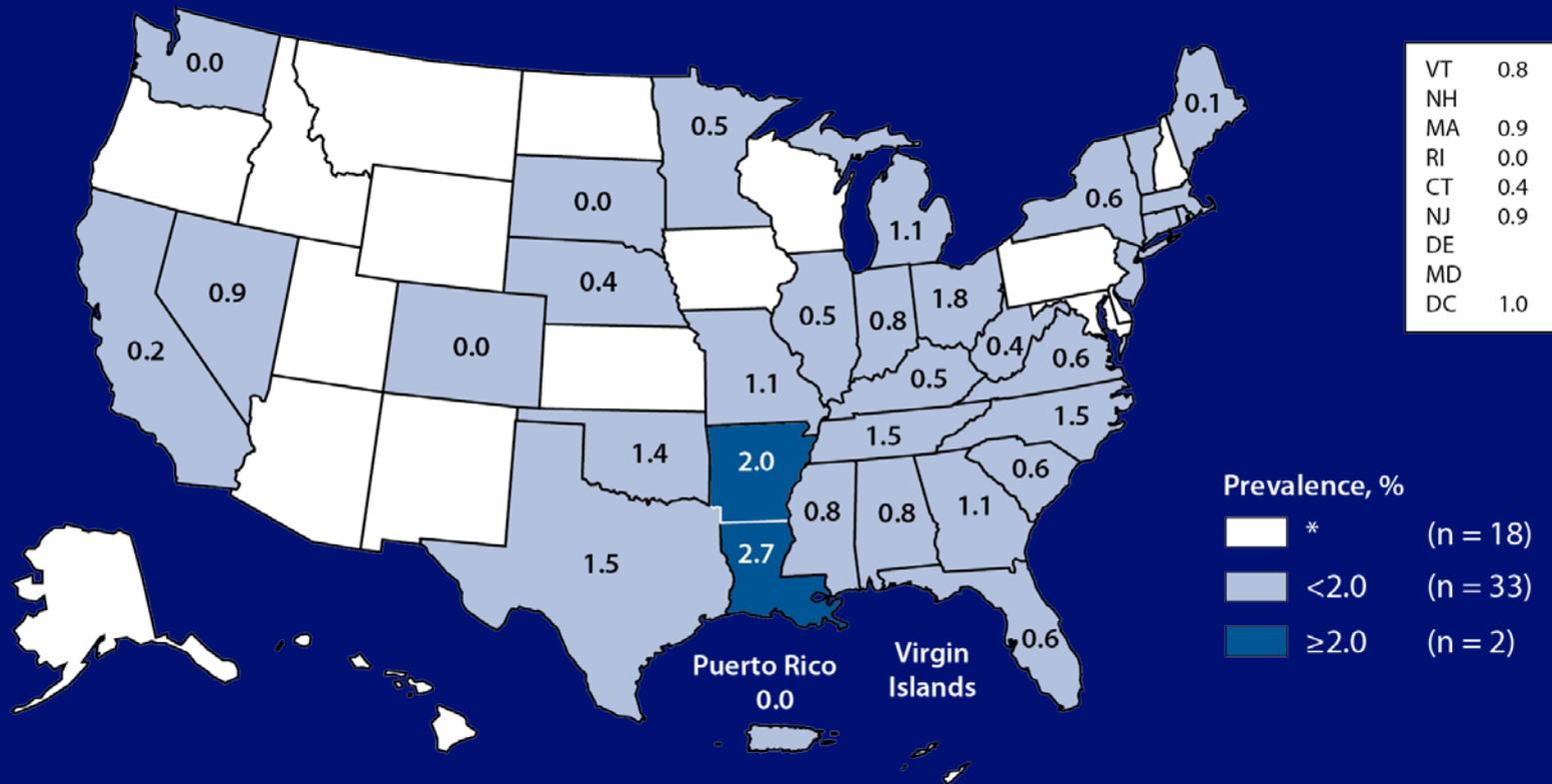
NOTE: Includes states and outlying areas that reported positivity data on at least 500 women aged 15–24 years who were screened during 2010.



Gonorrhea—Prevalence Among Women Aged 16–24 Years Entering the National Job Training Program, by State of Residence, United States and Outlying Areas, 2010



Gonorrhea—Prevalence Among Men Aged 16–24 Years Entering the National Job Training Program, by State of Residence, United States and Outlying Areas, 2010

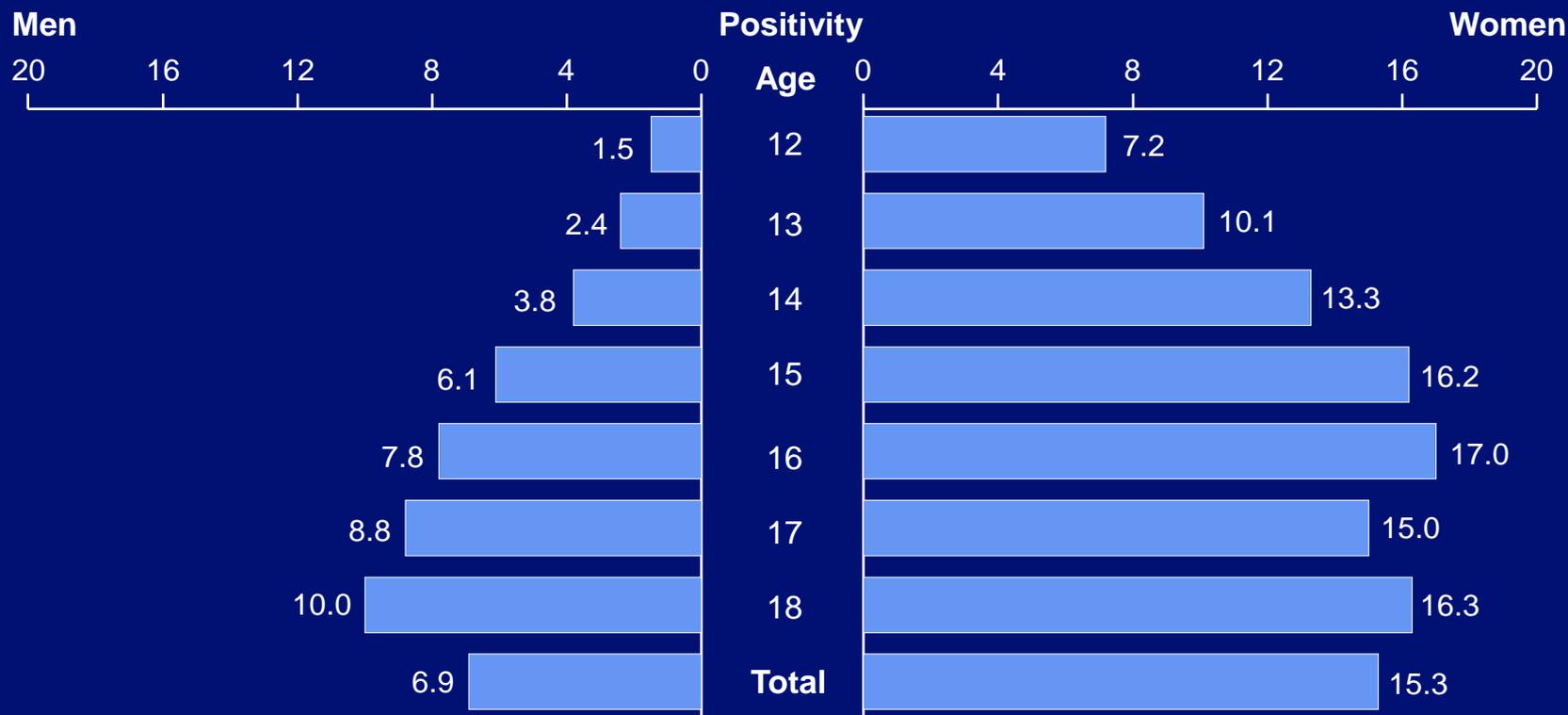


* Fewer than 100 men who resided in these states/areas and entered the National Job Training Program were screened for gonorrhea in 2010.

NOTE: Many training centers use local laboratories to test male students for gonorrhea; these results are not available to CDC. For this map, gonorrhea test results for students at centers that submitted specimens to the national contract laboratory were included if the number of gonorrhea tests submitted was greater than 90% of the number of chlamydia tests submitted.



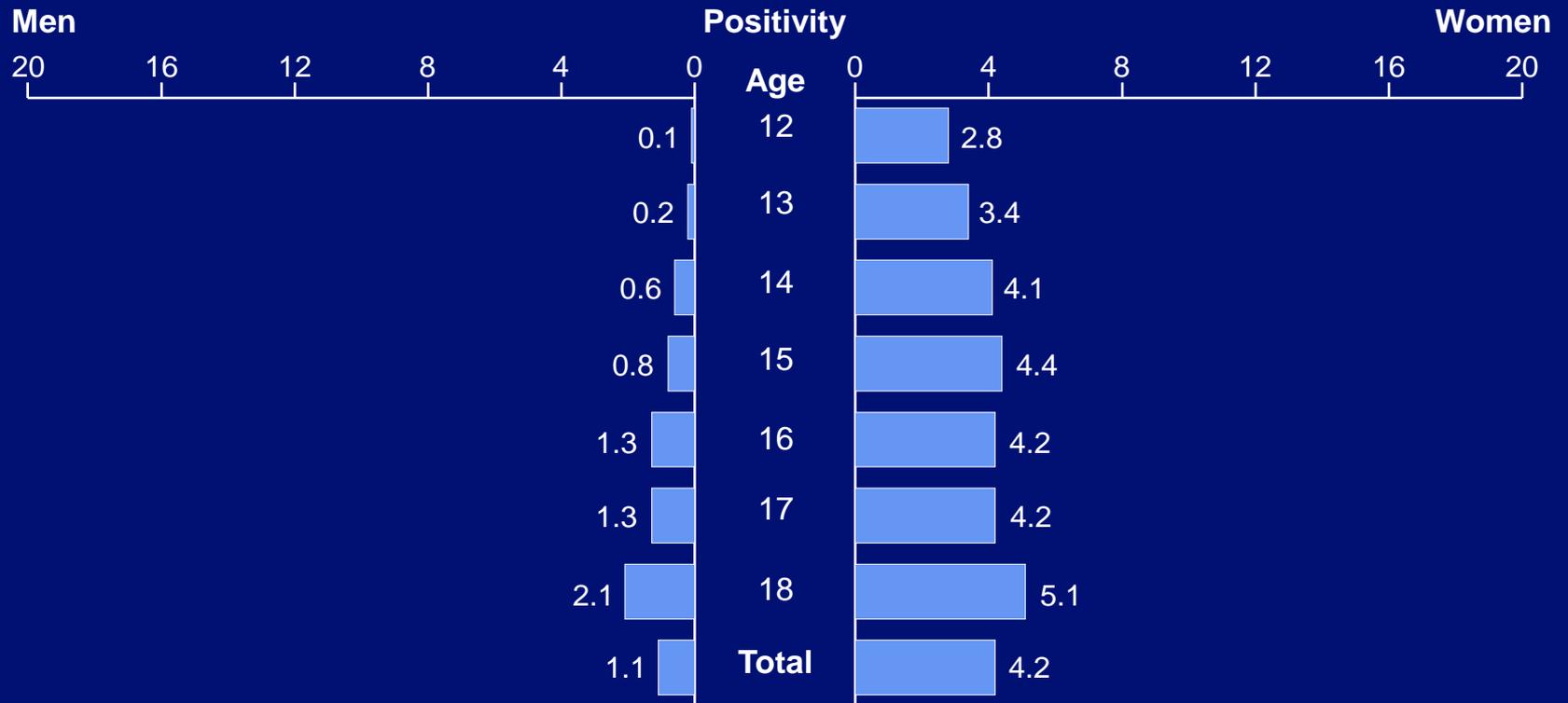
Chlamydia—Positivity by Age and Sex, Juvenile Corrections Facilities, 2010



NOTE: Positivity percentage is presented from facilities reporting more than 100 test results.



Gonorrhea—Positivity by Age and Sex, Juvenile Corrections Facilities, 2010



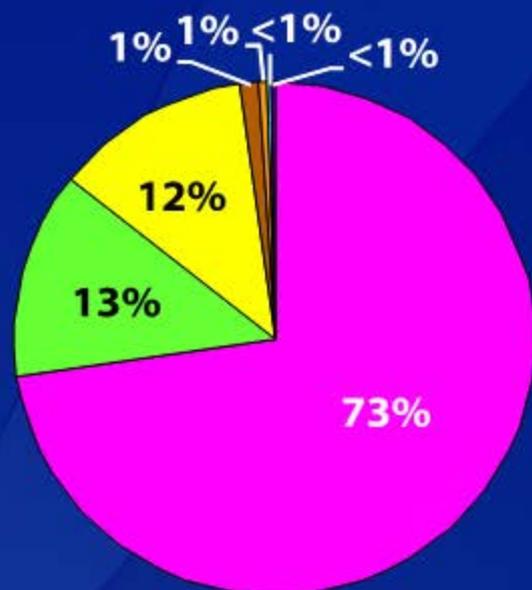
NOTE: Positivity percentage is presented from facilities reporting more than 100 test results.



Diagnoses of HIV Infection and Population among Adolescents Aged 13–19 Years, by Race/Ethnicity, 2009—40 States

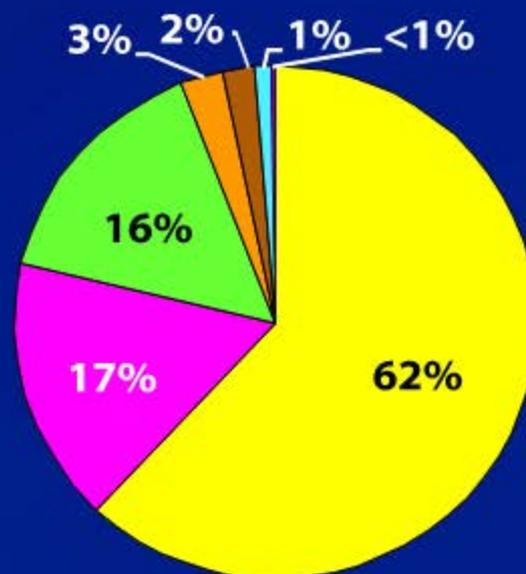
Diagnoses of HIV Infection

N=2,056



U.S. Population aged 13–19 years

N=23,287,078



American Indian/Alaska Native

Asian

Black/African American

Multiple races

Hispanic/Latino^a

Native Hawaiian/Other Pacific Islander

White

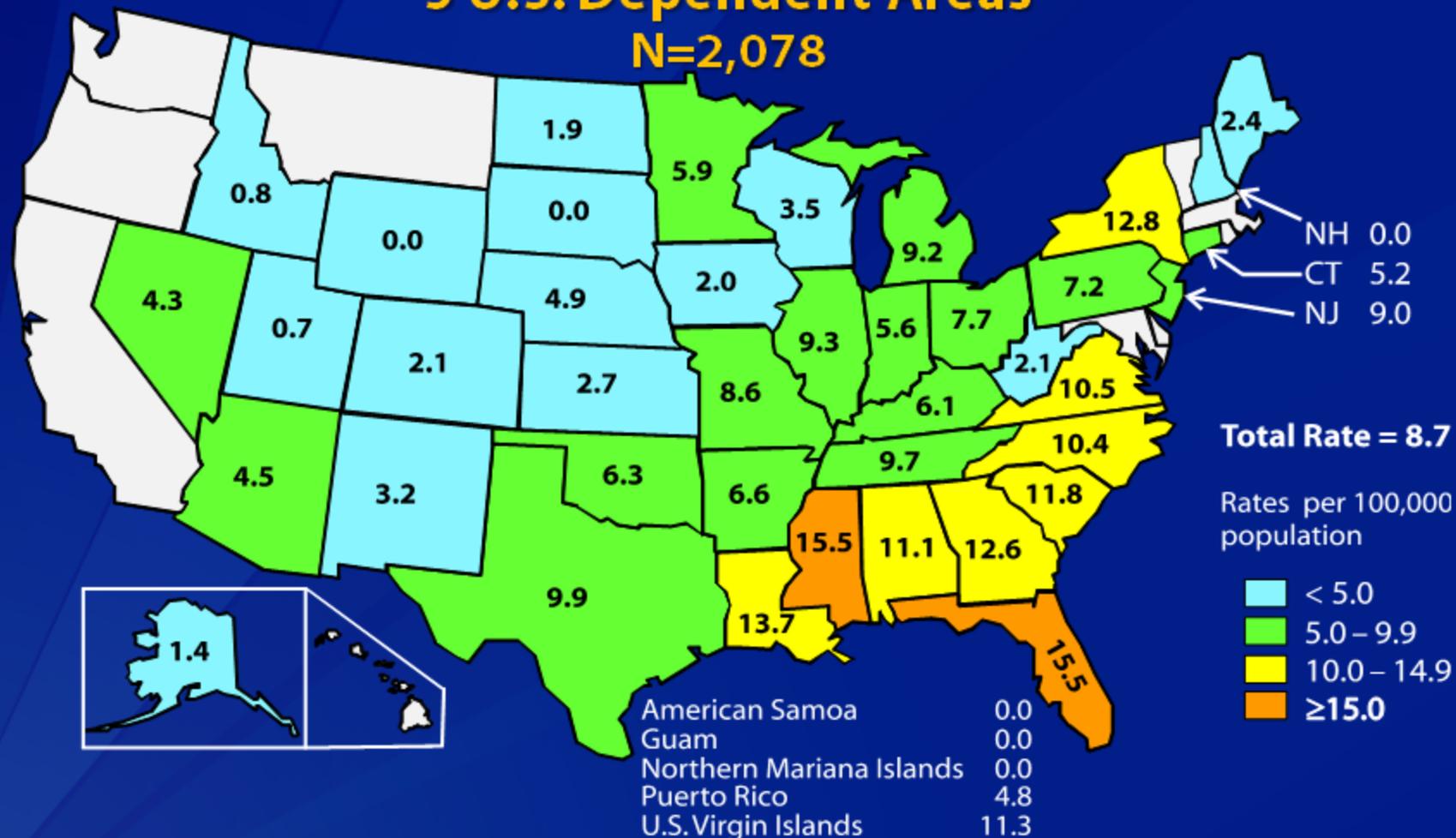
Note. Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. All displayed data have been statistically adjusted to account for reporting delays, but not for incomplete reporting.

^a Hispanics/Latinos can be of any race.



Rates of Diagnoses of HIV Infection among Adolescents Aged 13–19 Years, 2009—40 States and 5 U.S. Dependent Areas

N=2,078

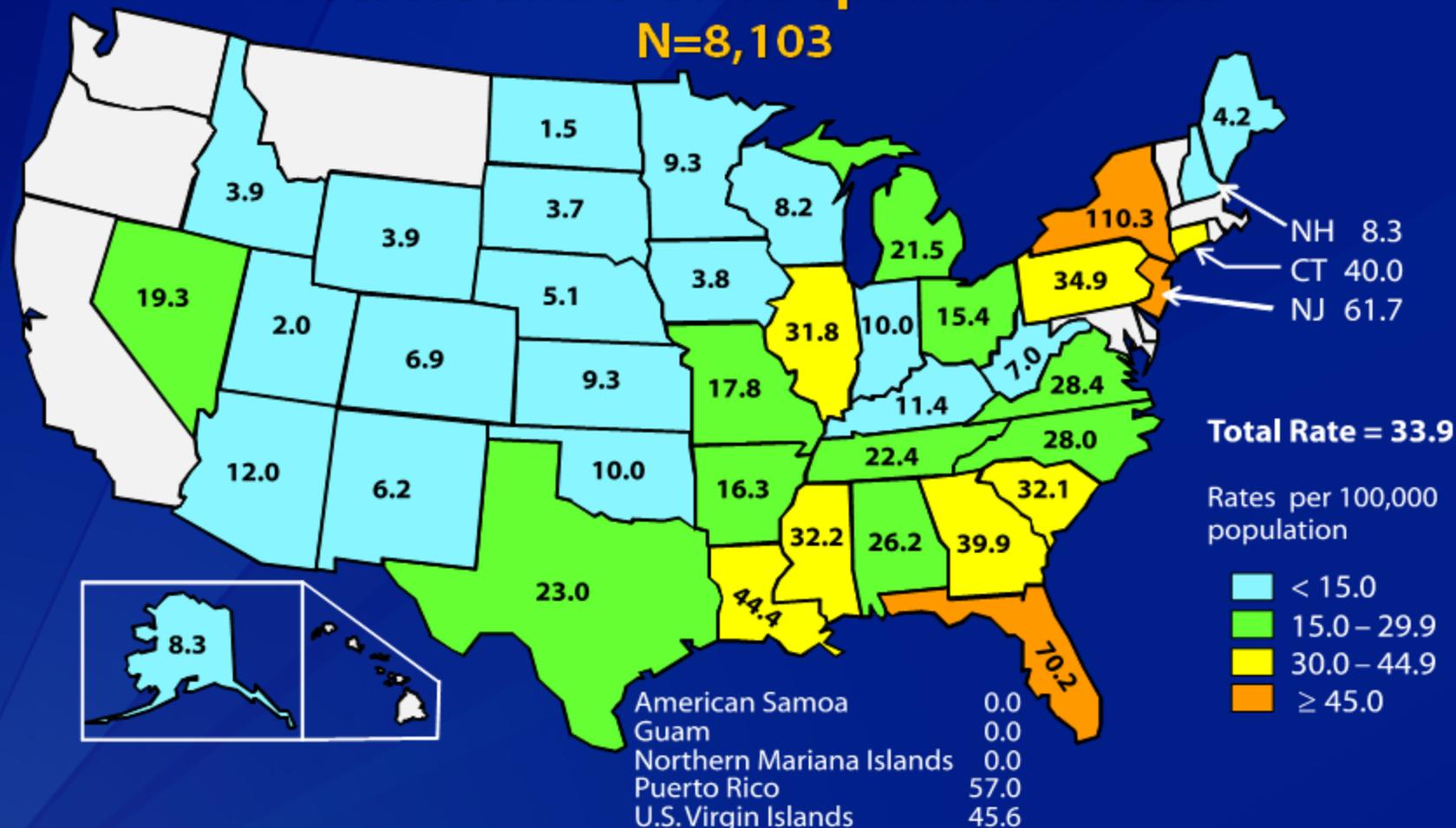


Note. Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. All displayed data have been statistically adjusted to account for reporting delays, but not for incomplete reporting. Rates are per 100,000 population.



Rates of Adolescents Aged 13–19 Years Living with a Diagnosis of HIV Infection, Year-end 2008— 40 States and 5 U.S. Dependent Areas

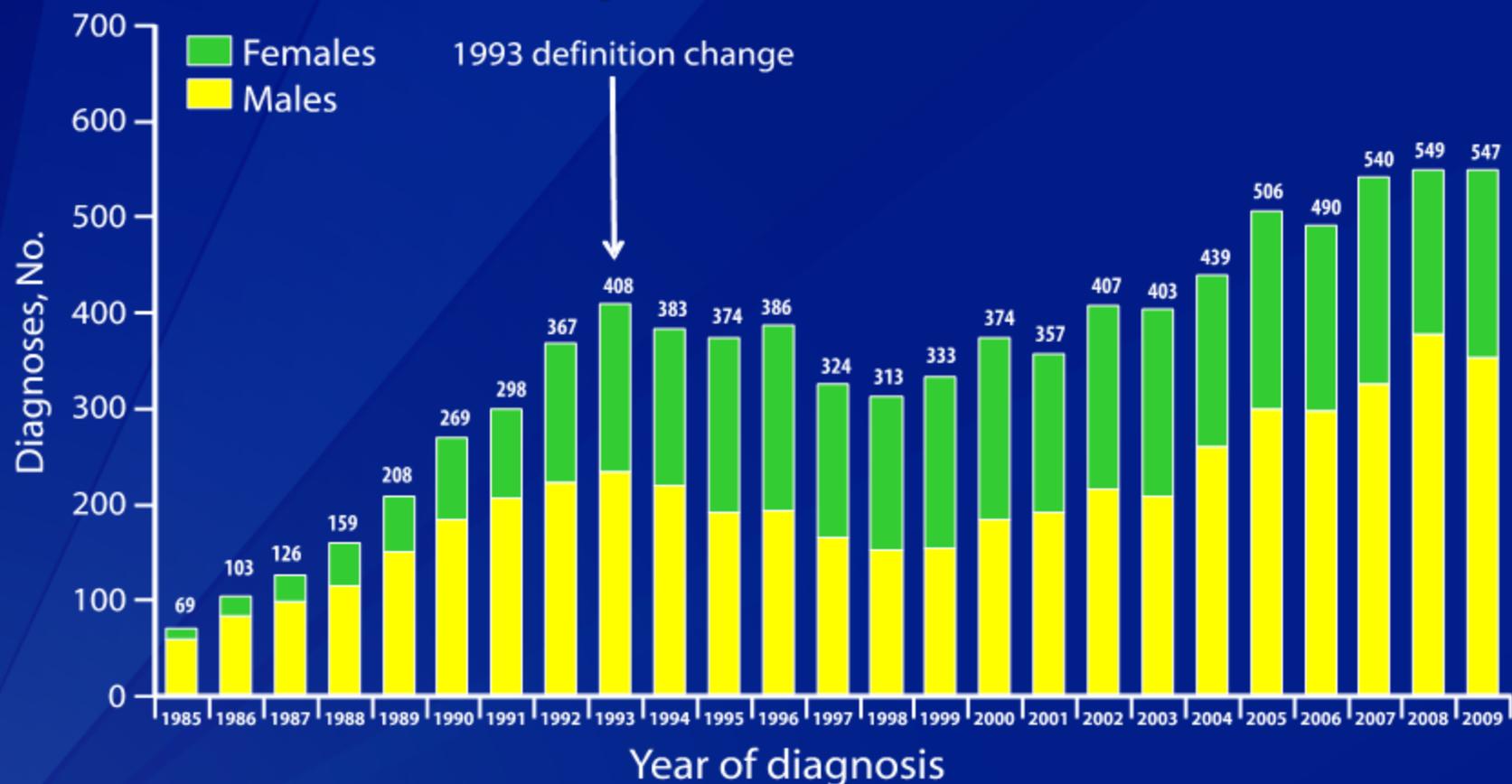
N=8,103



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 are per 100,000 population.



AIDS Diagnoses among Adolescents Aged 13–19 Years, by Sex, 1985–2009—United States and Dependent Areas

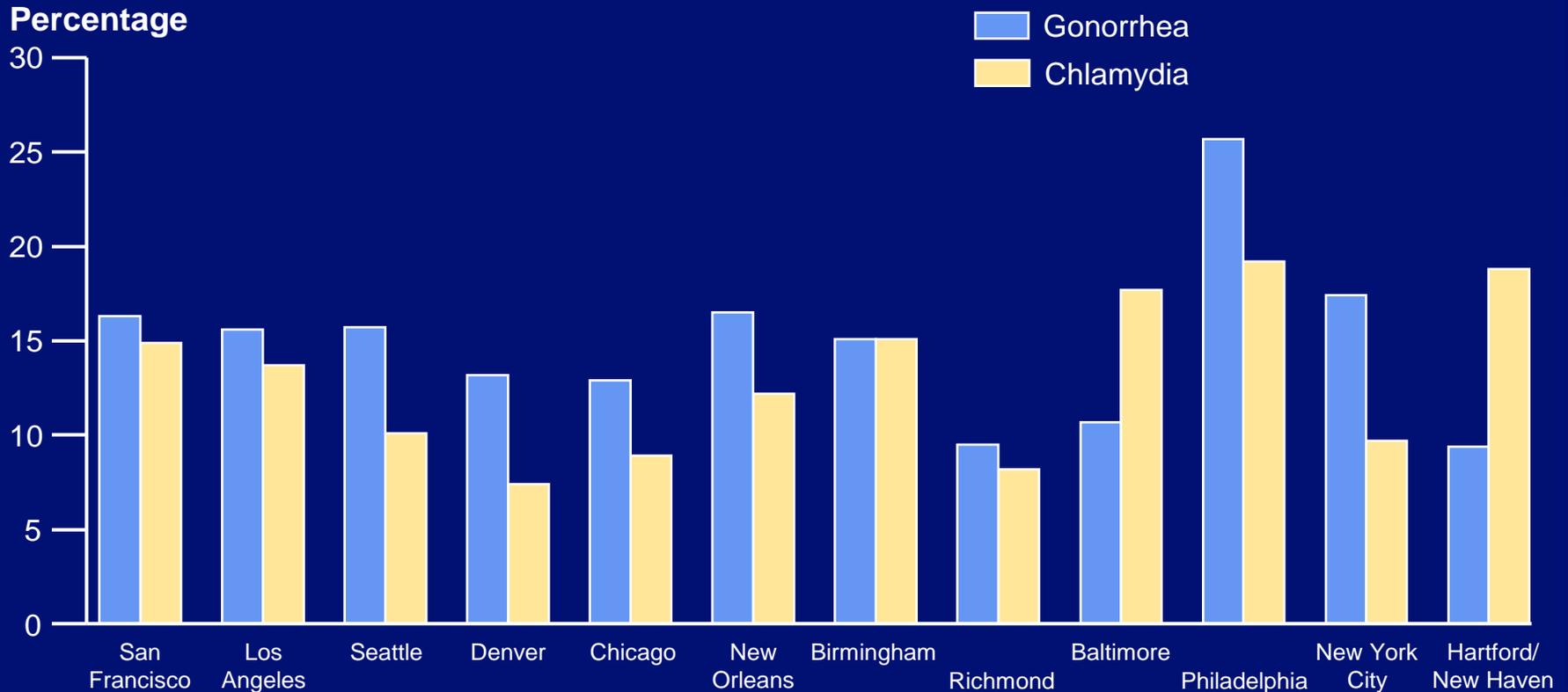


Note. All displayed data have been statistically adjusted to account for reporting delays, but not for incomplete reporting.

STDs IN MEN WHO HAVE SEX WITH MEN (MSM)

Sexually Transmitted Disease Surveillance 2010
Division of STD Prevention

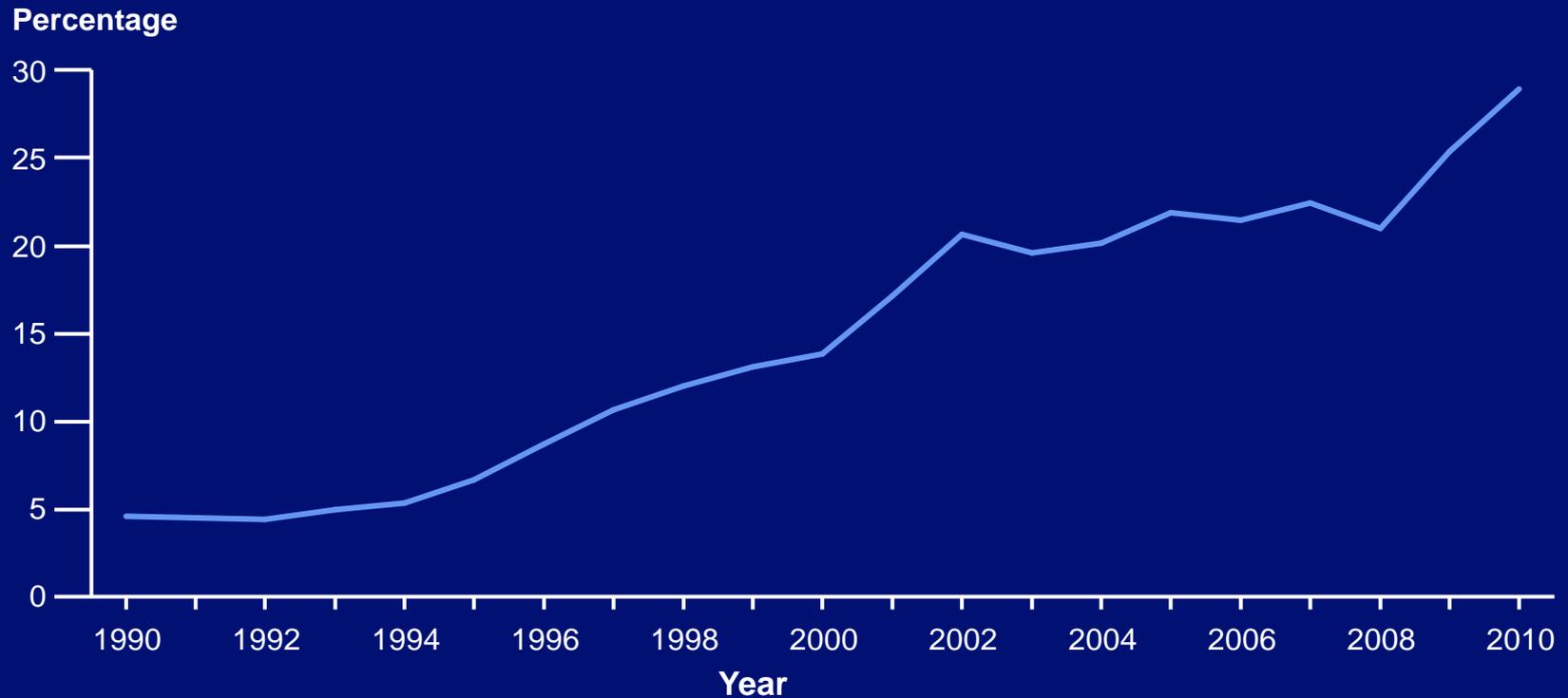
STD Surveillance Network (SSuN)—Gonorrhea and Chlamydia— Proportion of MSM* Testing Positive for Gonorrhea and Chlamydia, by Site, 2010



* MSM = men who have sex with men.



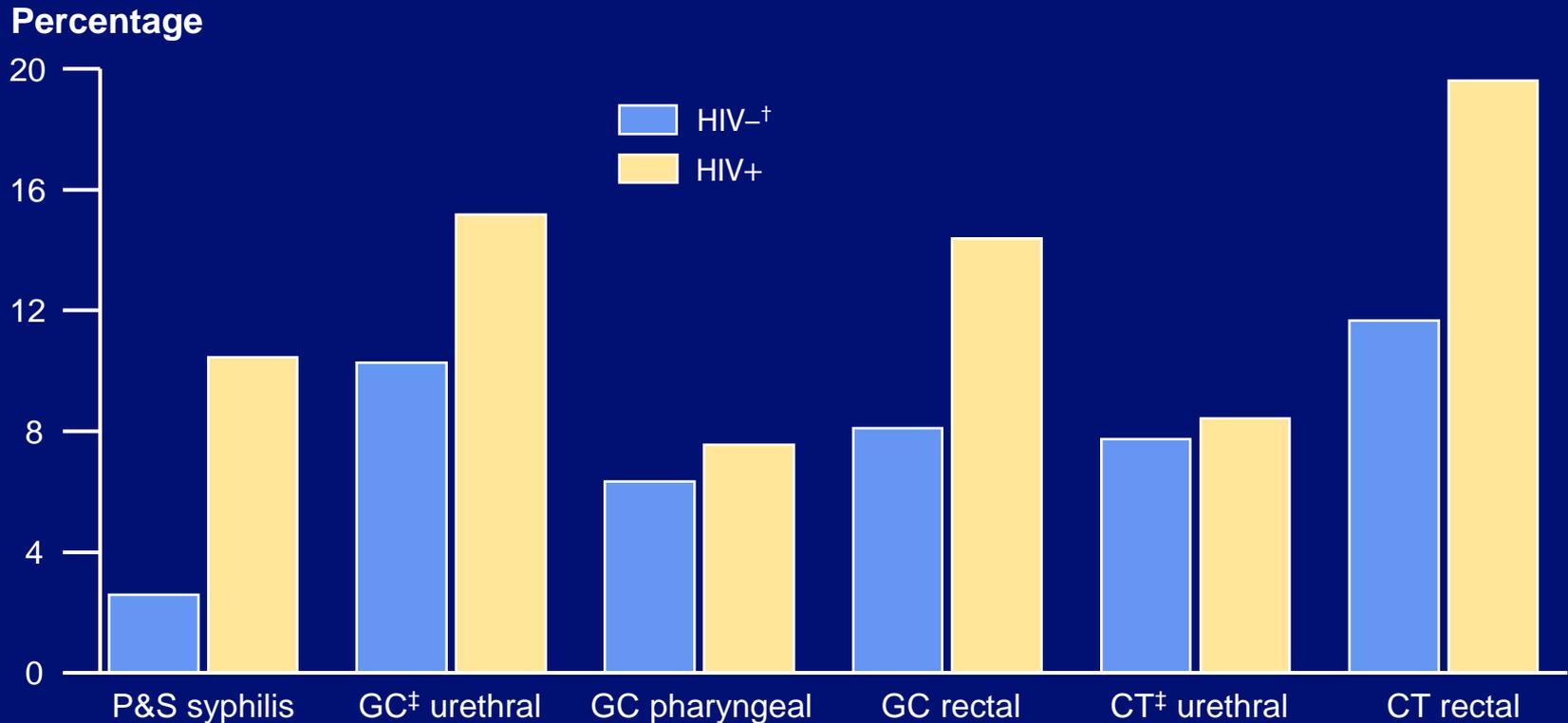
Gonococcal Isolate Surveillance Project (GISP)—Percentage of Urethral *Neisseria gonorrhoeae* Isolates Obtained from MSM* Attending STD Clinics, 1990–2010



* MSM = men who have sex with men.



STD Surveillance Network (SSuN)—Proportion of MSM* Attending STD Clinics with Primary and Secondary Syphilis, Gonorrhea or Chlamydia by HIV Status, 2010



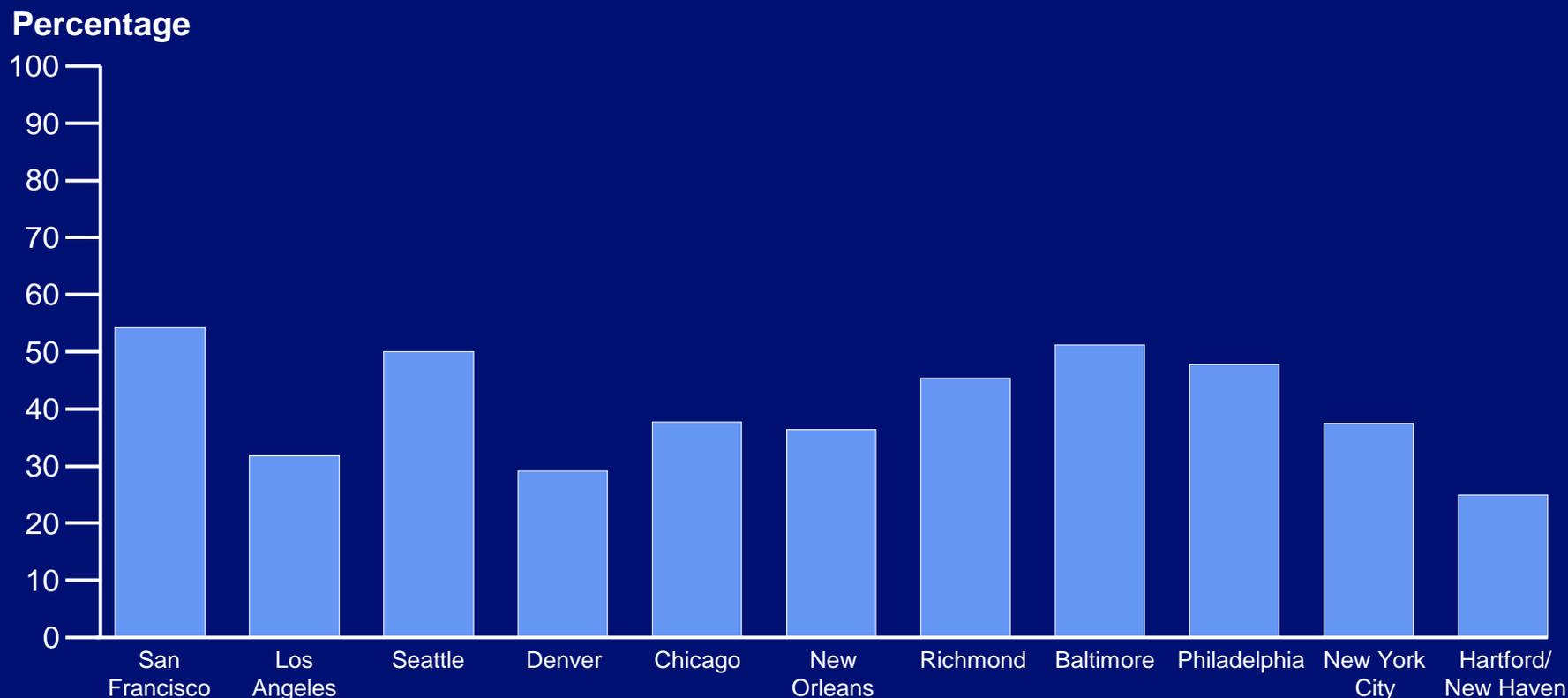
* MSM = men who have sex with men.

† HIV negative status includes persons of unknown status for this analysis.

‡ GC urethral and CT urethral include results from both urethral and urine specimens.



STD Surveillance Network (SSuN)—Primary and Secondary Syphilis and HIV—Proportion of MSM* with Primary and Secondary Syphilis Who Are Co-infected with HIV, 2010



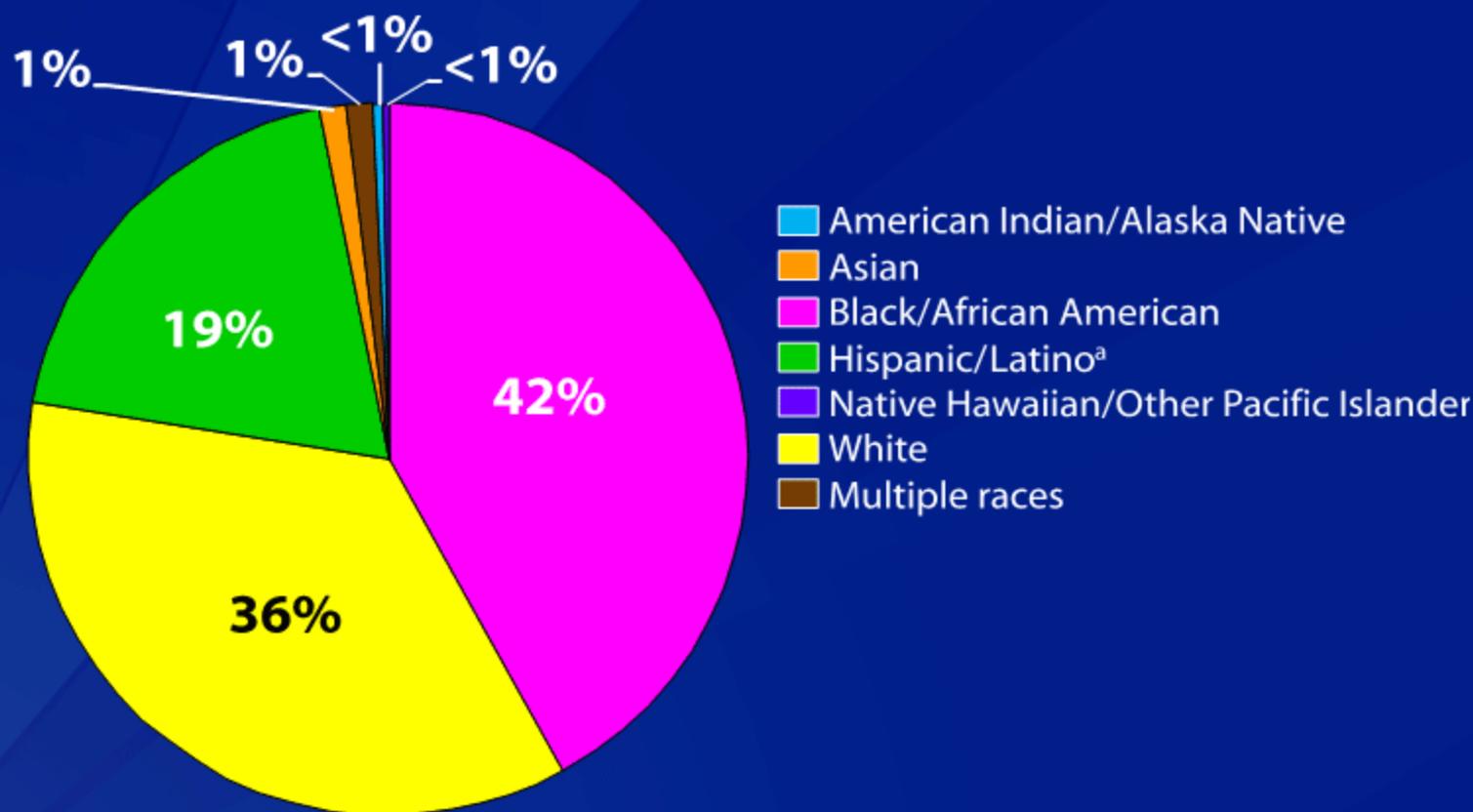
* MSM = men who have sex with men.

NOTE: Includes sites that reported data on at least 5 MSM with P&S syphilis in 2010.



Diagnoses of HIV Infection among Men Who Have Sex with Men, by Race/Ethnicity, 2009—40 States and 5 U.S. Dependent Areas

N=24,132

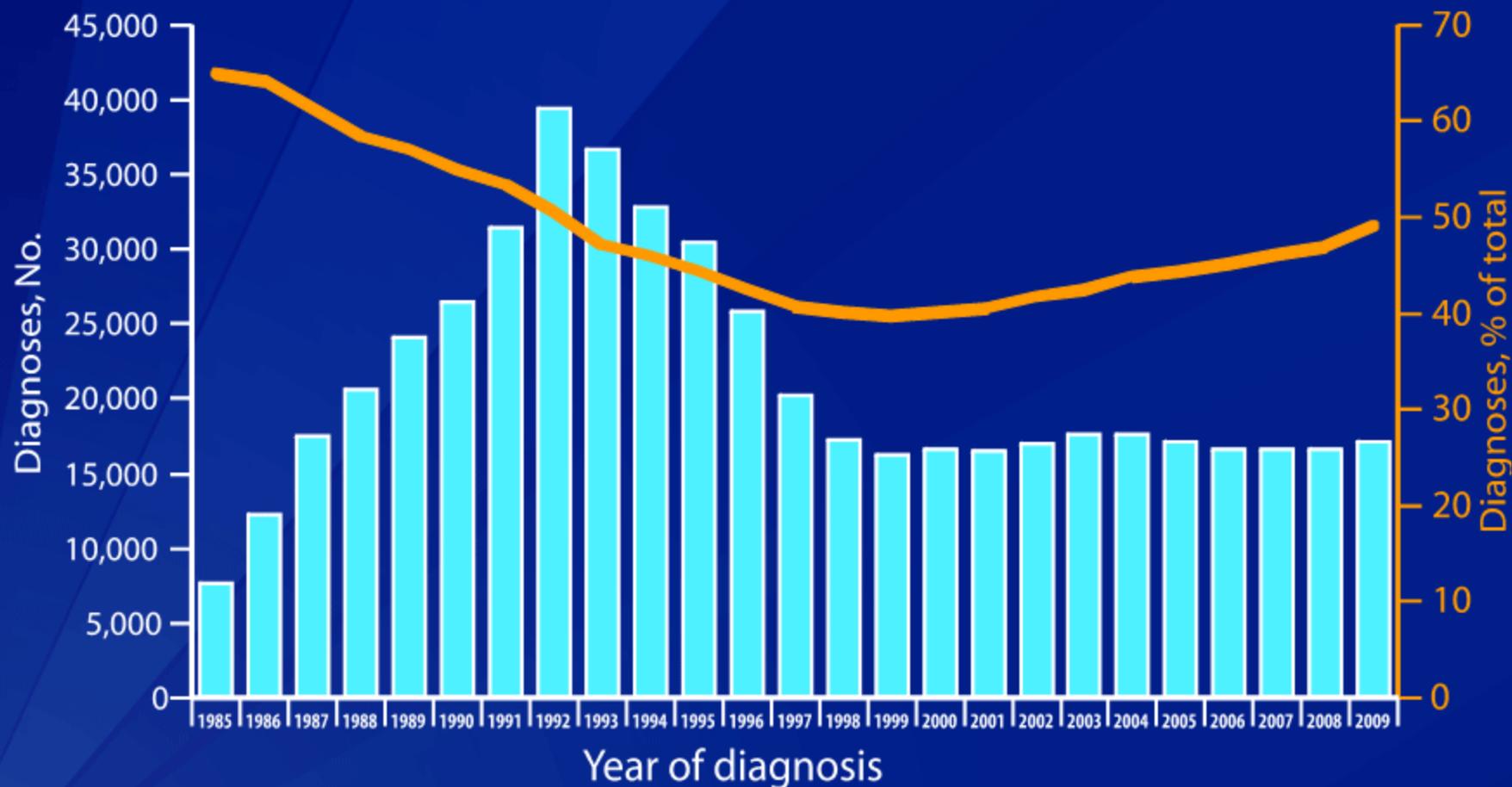


Note. Data include persons with a diagnosis of HIV infection regardless of stage of disease at diagnosis. All displayed data have been statistically adjusted to account for reporting delays and missing risk-factor information, but not for incomplete reporting. Data exclude men who reported sexual contact with other men *and* injection drug use.

^a Hispanics/Latinos can be of any race.



AIDS Diagnoses among Men Who Have Sex with Men, 1985–2009—United States and Dependent Areas



Note. All displayed data have been statistically adjusted to account for reporting delays and missing risk-factor information, but not for incomplete reporting. Data exclude men who reported sexual contact with other men and injection drug use.

