Foreword

"STDs are hidden epidemics of enormous health and economic consequence in the United States. They are hidden because many Americans are reluctant to address sexual health issues in an open way and because of the biologic and social characteristics of these diseases. All Americans have an interest in STD prevention because all communities are impacted by STDs and all individuals directly or indirectly pay for the costs of these diseases. STDs are public health problems that lack easy solutions because they are rooted in human behavior and fundamental societal problems. Many of the strongest predictors of health, including sexual health, are social, economic, and environmental. Providing information about personal health and health services can empower people to make healthier choices to protect their health. Indeed, there are many obstacles to effective prevention efforts. The first hurdle will be to confront the reluctance of American society to openly confront issues surrounding sexuality and STDs. Despite the barriers, there are existing individual- and community-based interventions that are effective and can be implemented immediately. That is why a multifaceted approach is necessary at both the individual and community levels.

To successfully prevent STDs, many stakeholders need to redefine their mission, refocus their efforts, modify how they deliver services, and accept new responsibilities. In this process, strong leadership, innovative thinking, partnerships, and adequate resources will be required. The additional investment required to effectively prevent STDs may be considerable, but it is negligible when compared with the likely return on the investment. The process of preventing STDs must be a collaborative one. No one agency, organization, or sector can effectively do it alone; all members of the community must do their part. A successful national initiative to confront and prevent STDs requires widespread public awareness and participation and bold national leadership from the highest levels."[1]

[1] Eng TR, Butler WT, editors; Institute of Medicine (US). Summary: The hidden epidemic: confronting sexually transmitted diseases. Washington (DC): National Academy Press; 1997. p. 43.

Preface

Sexually Transmitted Disease Surveillance 2012 presents statistics and trends for sexually transmitted diseases (STDs) in the United States through 2012. This annual publication is intended as a reference document for policy makers, program managers, health planners, researchers, and others who are concerned with the public health implications of these diseases. The figures and tables in this edition supersede those in earlier publications of these data.

The surveillance information in this report is based on the following sources of data: (1) notifiable disease reporting from state and local STD programs; (2) projects that monitor STD positivity and prevalence in various settings, including the National Job Training Program, the STD Surveillance Network, and the Gonococcal Isolate Surveillance Project; and (3) other national surveys implemented by federal and private organizations.

The STD surveillance systems operated by state and local STD control programs, which provide the case report data for chlamydia, gonorrhea, syphilis, and chancroid, are the data sources of many of the figures and most of the statistical tables in this publication. These systems are an integral part of program management at all levels of STD prevention and control in the United States. Because of incomplete diagnosis and reporting, the number of STD cases reported to the Centers for Disease Control and Prevention is less than the actual number of cases occurring in the U.S. population. National summary data of case reports for other STDs are not available because they are not nationally notifiable diseases.

Prior to the publication of *Sexually Transmitted Disease Surveillance 2010*, when the percentage of unknown, missing, or invalid values for age group, race/ethnicity, and sex exceeded 50% for any state, the state's incidence and population data were excluded from the tables that presented data stratified by one or more of these variables. For the states for which 50% or more of their data were valid for age group, race/ethnicity, and sex, the values for unknown, missing, or invalid data were redistributed on the basis of the state's distribution of known age group, race/ethnicity, and sex data. Beginning with the publication of *Sexually Transmitted Disease Surveillance 2010,* redistribution methodology is not applied to any of the data. The counts presented in this report are summations of all valid data reported in reporting year 2012. Because missing data are excluded from calculations of rates by age group, race/ethnicity, and sex, incidence rates by these characteristics, particularly by race/ethnicity for chlamydia and gonorrhea, appear somewhat lower than in reports before 2010.

The collection of information on race/ethnicity has been standardized since 1997 in the United States from the Office of Management and Budget (OMB). Following a revision in the National Electronic Telecommunication System for Surveillance (NETSS) implementation guide in April 2008, jurisdictions reporting STD data were to collect race according to the current standard categories: American Indian or Alaska Native, Asian, Black or African American, Hispanic or Latino, Native Hawaiian or Other Pacific Islander, White and multirace. Beginning with this publication, *Sexually Transmitted Disease Surveillance 2012*, data on race/ ethnicity are displayed in compliance with the OMB standards.While 48 jurisdictions (47 states and the District of Columbia) collect and report data in formats compliant with these standards as of 2012, some jurisdictions only recently adopted this standard and used previous standards to report their case data to CDC in past years. Subsequently, historical trend and rate data by race/ethnicity displayed in figures and interpreted in this report for 2008–2012 include only those jurisdictions (38 states plus the District of Columbia) reporting in the current standard consistently for 2008 through 2012.

Sexually Transmitted Disease Surveillance 2012 consists of four sections: the National Profile, the Special Focus Profiles, the Tables, and the Appendix. The National Profile section contains figures that provide an overview of STD morbidity in the United States. The accompanying text identifies major findings and trends for selected STDs. The Special Focus Profiles section contains figures and text that describe STDs in selected populations that are a focus of national and state prevention efforts. The Tables section provides statistical information about STDs at county, metropolitan statistical area, regional, state, and national levels. The Appendix includes information on how to interpret the STD surveillance data used to produce this report, as well as information about *Healthy People 2020* STD objectives and progress toward meeting these objectives, Government Performance and Results Act goals and progress toward meeting these goals, and STD surveillance case definitions.

Any comments and suggestions that would improve future publications are appreciated and should be sent to

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National Overview of Sexually Transmitted Diseases (STDs), 2012

All Americans should have the opportunity to make choices that lead to health and wellness. Working together, interested, committed public and private organizations, communities, and individuals can take action to prevent sexually transmitted diseases (STDs) and their related health burdens. In addition to federal, state, and local public support for STD prevention, local community leaders can promote STD prevention education. Health providers can assess their patients' risks and talk to them about testing. Parents can better educate their children about STDs and sexual health. Individuals can use condoms consistently and correctly, and openly discuss ways to protect their health with partners and providers. As noted in the Institute of Medicine report, *The Hidden Epidemic: Confronting Sexually Transmitted Diseases,* surveillance is a key component of all our efforts to prevent and control these diseases.[1]

This overview summarizes national surveillance data for 2012 on the three notifiable diseases for which there are federally funded control programs: chlamydia, gonorrhea, and syphilis. Several observations for 2012 are worthy of note. During the mid-1990s to 2011, chlamydia and gonorrhea positivity among women screened in correctional facilities and in family planning and prenatal care clinics participating in infertility prevention activities were sent to Centers for Disease Control and Prevention (CDC) to monitor prevalence for those conditions. As the infertility prevention program expanded, trends in prevalence have become increasingly difficult to interpret[2] and are no longer included in this report. For the first time, the data presented here by race and ethnicity are categorized according to the revised Office of Management and Budget standards. However, data for all jurisdictions by race/ethnicity using these categories are not available; consequently, absolute rates by race/ethnicity and comparisons between racial/ethnic groups may not match those provided in previous reports.

Chlamydia

In 2012, a total of 1,422,976 cases of *Chlamydia trachomatis* infection were reported to the CDC (Table 1). This is the largest number of cases ever reported to CDC for any condition. This case count corresponds to a rate of 456.7 cases per 100,000 population, an increase of only 0.7% compared with the rate in 2011, the smallest annual increase since nationwide reporting for chlamydia began. For the first time since nationwide reporting of chlamydia began, the rate in women did not increase. The rate in men increased 3.2%.

In 2012, the overall rate of chlamydial infection in the United States among women (643.3 cases per 100,000 females) was over two times the rate among men (262.6 cases per 100,000 males), reflecting the larger number of women screened for this infection (Tables 4 and 5). However, with the increased availability of urine testing, men are increasingly being tested for chlamydial infection. During 2008–2012, the chlamydia rate in men increased 25%, compared with an 11% increase in women during this period. Rates also varied among different racial and ethnic minority populations. For example, in 2012, the chlamydia rate in blacks was 6.8 times the rate in whites.

Gonorrhea

Following a 74% decline in the rate of reported gonorrhea during 1975–1997, overall gonorrhea rates plateaued for 10 years. After the decline halted for several years, gonorrhea rates decreased further to 98.1 cases per 100,000 population in 2009, the lowest rate since recording of gonorrhea rates began. Since 2009, the gonorrhea rate has increased slightly each year to 107.5 cases per 100,000 population in 2012, a 9.6% increase overall. In 2012, there were 334,826 cases of gonorrhea reported in the United States. The 4% increase between 2011 and 2012 was observed in all regions except for the South where rates are still the highest of any region in the country. In 2012, rates increased in all age groups except those aged 15–19.

Since 2001, the rates in women have been somewhat higher than rates in men (Figure 12). In 2012, the gonorrhea rate in women was 108.7 cases per 100,000 population compared with a rate of 105.8 in men. During 2011–2012 the gonorrhea rate among women increased only 0.6% (4% since 2009) while it increased 8.3% among men (17.7% since 2009). As with

chlamydia, gonorrhea rates in women were highest among those aged 15–24 years with the highest rate being in women 19 years of age (761 cases per 100,000 population, Table 23). In men, they were highest among those aged 20–24 years (Figure 16). However, the largest observed increases in 2012 were in women aged 40–44 years old and in men aged 30–34. In 2012, the gonorrhea rate in blacks was 15 times the rate in whites (Table 22B). As with chlamydia, data on gonorrhea prevalence in defined populations were available from several sources in 2012. These data showed a continuing high burden of disease in some adolescents and young adults in parts of the United States.

Antimicrobial resistance remains an important consideration in the treatment of gonorrhea. With increased resistance to the fluoroquinolones and the declining susceptibility to cefixime, dual therapy with ceftriaxone and either azithromycin or doxycycline is now the only CDC recommended treatment for gonorrhea.[3] Continued monitoring of susceptibility patterns to these antibiotics is critical. One isolate with decreased susceptibility to ceftriaxone was seen in 2012 in CDC's sentinel surveillance system, the Gonococcal Isolate Surveillance Project (GISP). No increases in Minimum Inhibitory Concentration (MIC) trends for cephalosporins were observed in 2012 (Figures 24 and 25).

Syphilis

The rate of primary and secondary (P&S) syphilis reported in the United States decreased during the 1990s, and in 2000, it was the lowest since reporting began in 1941. The low rate of syphilis and the concentration of most syphilis cases in a small number of geographic areas led to the development of the *National Plan to Eliminate Syphilis from the United States*, which was announced by the Surgeon General in 1999 and updated in 2006.[4] The overall rate of P&S syphilis in the United States declined 89.7% during 1990–2000, then increased each year from 2001 through 2009. In 2010, the overall rate decreased for the first time in 10 years. But, in 2011 this rate remained unchanged, and in 2012, the rate increased 11.1% from that in 2011. This increase was solely among men in whom rates increased 14.8% overall. (Figure 31). In 33 areas where sex of partner data were available for at least 70% of cases each year during 2007-2012, cases among men who have sex with men (MSM) increased 15% between 2011 and 2012; in men who have sex with women only, cases increased 4% (Figure 30). In the US as a whole, rates in women remained unchanged between 2011 and 2012. In 2012, a total of 15,667 cases of P&S syphilis were reported to CDC, 1,697 more cases than were reported in 2011. Approximately 75% of cases were in MSM.

The 2012 rate of congenital syphilis (7.8 cases per 100,000 live births) marks the lowest rate of congenital syphilis recorded since 1988, when the case definition was changed. The rate of congenital syphilis decreased 10% between 2011 and 2012 and 26% since 2008. There were 322 cases of congenital syphilis reported in 2012.

Significant race and ethnic disparities in STD rates persist. In 2012, the P&S syphilis rate among blacks was six times the rate among whites. (Figure 38) In some subgroups, however, these disparities are much higher. The 2012 rate among blacks aged 15–19 years was 16 times the rate for whites of that age. While rates in congenital syphilis have decreased in recent years, the rates are still 14 times higher in blacks than whites and almost 4 times higher in Hispanics than whites (Table 43).

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1 Eng TR, Butler WT, editors; Institute of Medicine (US). The hidden epidemic: confronting sexually transmitted diseases. Washington (DC): National Academy Press; 1997. p 43.

2 Satterwhite CL, Grier L, Patzer R, Weinstock H, Howards P, Kleinbaum D. Chlamydia positivity trends among women attending family planning clinics: United States, 2004-2008. Sex Transm Dis 2011;38 (11): 989-994.

3 Centers for Disease Control and Prevention. Update to CDC's sexually transmitted diseases treatment guidelines, 2010. Oral cephalosporins no longer a recommended treatment for gonococcal infection. MMWR Morb Mortal Wkly Rep. 2012;61(31):590-594.

4 Centers for Disease Control and Prevention. The national plan to eliminate syphilis from the United States. Atlanta: U.S. Department of Health and Human Services; 2006.

Chlamydia

Background

C. trachomatis infection is the most commonly reported notifiable disease in the United States. It is among the most prevalent of all STDs, and since 1994, has comprised the largest proportion of all STDs reported to CDC (Table 1). Studies also demonstrate the high prevalence of chlamydial infections in the general U.S. population. Based on estimates from national surveys conducted from 1999–2008, chlamydia prevalence is 6.8% among sexually active females aged 14–19 years.[1]

Chlamydial infections in women are usually asymptomatic. However, these can result in pelvic inflammatory disease (PID), which is a major cause of infertility, ectopic pregnancy, and chronic pelvic pain. Data from a randomized controlled trial of chlamydia screening in a managed care setting suggested that screening programs can lead to as much as a 60% reduction in the incidence of PID.[2] As with other inflammatory STDs, chlamydial infection might facilitate the transmission of human immunodeficiency virus (HIV) infection.[3] In addition, pregnant women infected with chlamydia can pass the infection to their infants during delivery, potentially resulting in neonatal ophthalmia and pneumonia. Because of the large burden of disease and risks associated with infection, CDC recommends that all sexually active women younger than age 26 years receive annual chlamydia screening.[4]

The Healthcare Effectiveness Data and Information Set (HEDIS) contains a measure which assesses chlamydia screening coverage of sexually active young women who receive medical care through commercial or Medicaid managed care organizations.[5] Among sexually-active women aged 16–24 years in commercial plans, chlamydia screening increased from 23.1% in 2001 to 45.0% in 2011. During the same time period, the screening rate among sexually-active women aged 16–24 years covered by Medicaid increased from 40.4% to 58.0%.[6] Although chlamydia screening is expanding, many women who are at risk are still not being tested—reflecting, in part, the lack of awareness among some health care providers and the limited resources available to support these screenings.

The increase in reported chlamydial infections during the last 20 years reflects the expansion of chlamydia screening activities, the use of increasingly sensitive diagnostic tests, an increased emphasis on case reporting from providers and laboratories, and improvements in the information systems used for reporting. To supplement case report data, chlamydia positivity and prevalence among people screened in a variety of settings are monitored.

Chlamydia—United States

In 2012, a total of 1,422,976 chlamydial infections were reported to CDC in 50 states and the District of Columbia (Table 1). This case count corresponds to a rate of 456.7 cases per 100,000 population, only a 0.7% increase compared with the rate of 453.4 in 2011. During 1992–2012, the rate of reported chlamydial infection increased from 182.3 to 456.7 cases per 100,000 population (Figure 1, Table 1).

Chlamydia by Region

During 2003–2012, chlamydia rates increased in all regions (Figure 2). In 2012, rates were highest in the South (496.9 per 100,000 population), followed by the Midwest (452.1), the West (426.5), and the Northeast (417.8) (Table 3).

Chlamydia by State

In 2012, chlamydia rates by state ranged from 233.0 cases per 100,000 population in New Hampshire to 774.0 cases in Mississippi (Figure 3, Table 2); the rate in the District of Columbia was 1,101.6 cases per 100,000 (Table 3).

Chlamydia by Metropolitan Statistical Area

In 2012, the chlamydia rate per 100,000 population in the 50 most populous metropolitan statistical areas (MSAs) was similar to the rate in 2011 (481.1 and 480.9 cases, respectively) (Table 6). In 2012, 56.8% of chlamydia cases were reported by these MSAs. Among women in these MSAs, the 2012 rate of 661.8 cases per 100,000 females was similar to the 2011 rate of 667.6 cases per 100,000 females (Table 7). Among men, the 2012 rate (291.3 per 100,000 males) increased 2.6% from the 2011 rate (284.0 cases per 100,000 males) (Table 8).

Chlamydia by County

Counties in the United States with the highest chlamydia case rates per 100,000 population were located primarily in the Southeast and West, including Alaska (Figure 4). In 2012, 927 (29.5%) of 3,142 counties had rates higher than 400.0 cases per 100,000 population. Seventy counties and independent cities reported 44% of all chlamydia cases in 2012 (Table 9).

Chlamydia by Sex

During 1995–2011, chlamydia rates among females increased each year (Figure 1). In 2012, the overall rate of reported chlamydial infection among women in all 50 states and the District of Columbia (643.3 cases per 100,000 females) was similiar to the reported case rate in 2011 (643.4 cases per 100,000 females). This is the first time since nationwide reporting began in 1995 that chlamydia case rates among females did not increase.

The overall case rate among males increased 3.2% during 2011–2012 (254.4 to 262.6 cases per 100,000 males). As in previous years, the reported case rate among females was about two times the case rate among men in 2012, likely reflecting a larger number of women screened for this infection (Figure 1, Tables 4 and 5). The lower rates among men also suggest that many of the sex partners of women with chlamydia are not receiving a diagnosis of chlamydia or being reported as having chlamydia.

However, with the advent of highly sensitive nucleic acid amplification tests (NAATs) that can be performed on urine, chlamydial infection is increasingly being diagnosed in symptomatic and asymptomatic men. During 2008–2012, the reported chlamydial infection rate among men increased 25.5% (from 209.3 to 262.6 cases per 100,000 males) compared with a 11.0% increase among women during the same period (from 579.4 to 643.3 cases per 100,000 females).

Chlamydia by Age

Chlamydia rates are highest among adolescents and young adults aged 15–24 years (Table 10). Among those aged 15–19 years, rates increased 8.9% during 2008–2011 (1,947.7 to 2,120.8 cases per 100,000 population) and then decreased 5.6% during 2011–2012 (2,120.8 to 2,001.7 cases per 100,000 population). Among those aged 20–24 years, rates increased 18.1% during 2008–2011 (2,075.9 to 2,450.8 cases per 100,000) and then increased slightly (2.1%) during 2011–2012 (2,450.8 to 2,501.5 cases per 100,000).

Among women, the highest age-specific rates of reported chlamydia in 2012 were among those aged 15–19 years (3,291.5 cases per 100,000 females) and 20–24 years (3,695.5 cases per 100,000 females) (Figure 5, Table 10). Within these age ranges, reported rates were highest among women aged 18 years (4,666.3 cases per 100,000 females), aged 19 years (4,921.1 cases per 100,000 females), and aged 20 years (4,647.5 cases per 100,000 females) (Table 12). After increasing steadily from 2000 to 2011, during 2011–2012, rates among women aged 15–19 years decreased 5.6% (3,485.2 to 3,291.5 cases per 100,000 females). Rates increased slightly (1.8%) among women aged 20–24 years (3,630.0 to 3,695.5 cases per 100,000 females) during 2011–2012.

Age-specific rates among men, although substantially lower than the rates among women, were highest in those aged 20–24 years (1,350.4 cases per 100,000 males) (Figure 5, Table 10). Similar to trends in women, after increasing for the last decade, during 2011–2012 reported case rates among men aged 15–19 years decreased 5.1% (816.3 to 774.8 cases per 100,000 males). During 2011–2012, reported cases among men aged 20–24 years increased slightly (1,307.8 to 1350.4 cases per 100,000 males).

Chlamydia by Race/Ethnicity

Among the 48 jurisdictions (47 states and the District of Columbia) that submitted data in the new race and ethnicity categories in 2012 according to the revised OMB standards, chlamydia rates were highest among black men and women (Figure L, Table 11B). The rate of chlamydia among blacks was almost seven times the rate among whites (1,229.4 and 179.6 cases per 100,000 population, respectively). The rate among American Indians/Alaska Natives (728.2 cases per 100,000) was 4.1 times the rate among whites. The rate among Hispanics (380.3 cases per 100,000) was 2.1 times the rate among whites. The rate among Native Hawaiians/Other Pacific Islanders (590.4 cases per 100,000) was 3.3 times the rate among whites. The rate among Asians was lower than the rate among whites (112.9 cases and 179.6 cases per 100,000, respectively).

Among the 39 jurisdictions (38 states and the District of Columbia) that submitted data in the new race and ethnicity categories from 2008–2012 according to the OMB standards, rates among blacks increased 3.7% (from 1,186.5 to 1,230.6 cases per 100,000). Among whites, rates increased 38.5% (from 134.4 to 186.2 cases per 100,000) (Figure 6).

Chlamydia by Reporting Source

Most chlamydia cases reported in 2012 were from venues outside of STD clinics (Figure 8 and Table A2). Over time, the proportion of cases reported from non-STD clinic sites has continued to increase (Figure 7). In 2012, among women, only 6.9% of chlamydia cases were reported through an STD clinic (Figure 8). Most cases among women were reported from private physicians/health maintenance organizations (HMOs) (38.5%). Among men, 21.4% of chlamydia cases were reported from an STD clinic in 2012 and 27.7% were reported from private physicians/HMOs.

Chlamydia Prevalence in the Population

The National Health and Nutrition Examination Survey (NHANES) is a nationally representative survey of the U.S. civilian, non-institutionalized population aged 14–39 years that provides an important measure of chlamydia disease burden. From 1999–2000 to 2007–08, there was an estimated 40% reduction (95% Confidence Interval [CI]: 8%, 61%) in prevalence among persons aged 14–39 years.[7] During 2005–2008, the overall prevalence of chlamydia among persons aged 14–39 years was 1.5% (95% CI: 1.2%, 1.9%). Prevalence was highest among non-Hispanic blacks (5.9%, 95% CI: 4.5%, 7.7%) (Figure 10).

Chlamydia Positivity in Selected Populations

In 2005, the STD Surveillance Network (SSuN) was established to improve the capacity of national, state, and local STD programs to detect, monitor, and respond to trends in STDs. In 2012, a total of 42 STD clinics at 12 sites collected enhanced behavioral information on patients who presented for care to these clinics. More detailed information about SSuN methodology can be found in the STD Surveillance Network section of the Appendix, Interpreting STD Surveillance Data.

In 2012, the proportion of STD clinic patients testing positive for chlamydia varied by age, sex, and sexual behavior. Adolescent men who have sex with women (MSW) had the highest prevalence (26.4%). Among MSW and women, prevalence among those tested decreased with age. The variation in prevalence by age was not as pronounced for men who have sex with men (MSM) (Figure 9).

During the mid-1990s to 2011, chlamydia positivity among women screened in family planning and prenatal care clinics participating in infertility prevention activities were sent to CDC to monitor chlamydia prevalence. As the national infertility prevention program expanded, these data became difficult to interpret as trends were influenced by changes in screening coverage, screening criteria, and test technologies, as well as demographic changes in patients attending clinics reporting data to CDC. These issues could not be addressed with the limited variables that were collected at the national level. Chlamydia positivity data continue to be useful locally to inform clinic-based screening recommendations and to identify at-risk populations in need of prevention interventions, but are no longer collected to monitor national trends in chlamydia.

Chlamydia Among Special Populations

More information on chlamydia among women of reproductive age, adolescents and young adults, men who have sex with men, and minority populations is presented in the Special Focus Profiles.

Chlamydia Summary

Chlamydia continues to be the most commonly reported nationally notifiable disease with 1,422,976 cases reported in 2012. For the first time since 1995, chlamydia case rates among females did not increase. For the first time since 2000, chlamydia case rates decreased among both males and females aged 15–19 years. However, both test positivity and the number of reported cases of *C. trachomatis* infections remain high among most age groups, racial/ethnic groups, geographic areas, and both sexes. Racial differences also persist; reported case rates and prevalence estimates among blacks continue to be substantially higher than among other racial/ethnic groups.

[1] Centers for Disease Control and Prevention. CDC Grand Rounds: Chlamydia prevention: challenges and strategies for reducing disease burden and sequelae. MMWR Morb Mortal Wkly Rep. 2011;60(12):370-3.

[2] Scholes D, Stergachis A, Heidrich FE, Andrilla H, Holmes KK, Stamm WE. Prevention of pelvic inflammatory disease by screening for cervical chlamydial infection. N Engl J Med. 1996;34(21):1362-6.

[3] Fleming DT, Wasserheit JN. From epidemiological synergy to public health policy and practice: the contribution of other sexually transmitted diseases to sexual transmission of HIV infection. Sex Transm Infect. 1999;75:3-17.

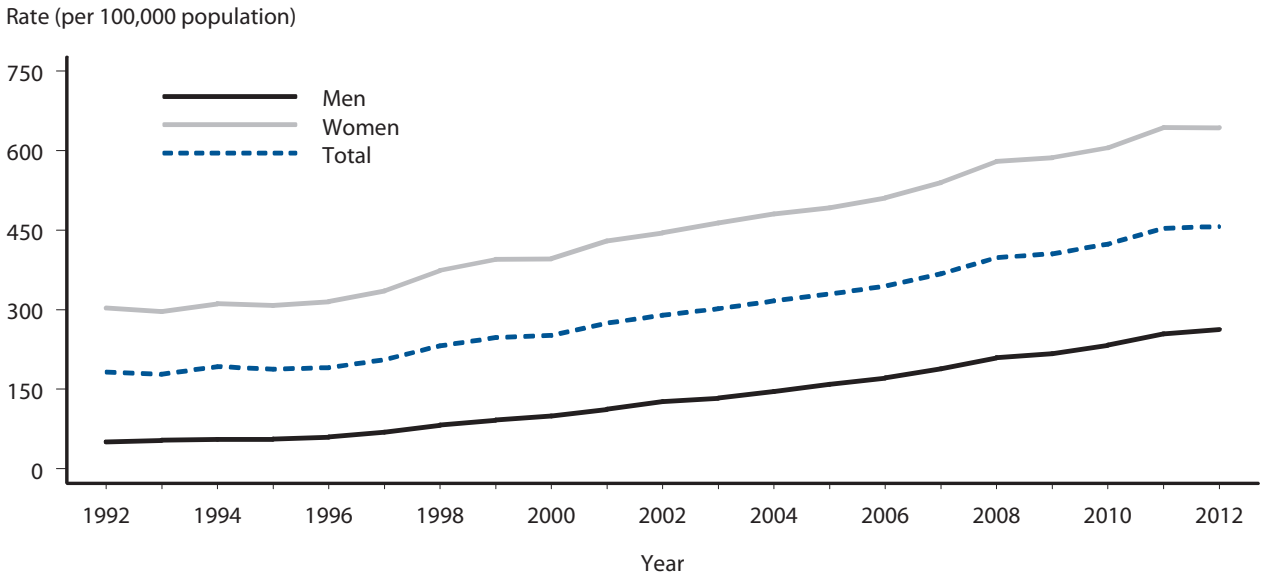
[4] Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2010; No.59(RR-12):1-110. Erratum in: MMWR Recomm Rep. 2011;60(1):18.

[5] National Committee for Quality Assurance. HEDIS 2013: technical specifications. Washington (DC): National Committee for Quality Assurance; 2012. p. 90-93.

[6] National Committee for Quality Assurance. The state of healthcare quality 2012. Washington (DC): National Committee for Quality Assurance; 2011. p. 84-86.

[7] Datta SD, Torrone E, Kruszon-Moran D, Berman S, Johnson R, Satterwhite CL, Papp J, Weinstock H. *Chlamydia trachomatis* trends in the United States among persons 14 to 39 years of age, 1999-2008. Sex Transm Dis. 2012 Feb;39(2):92-6.

Figure 1. Chlamydia — Rates by Sex, United States, 1992 – 2012



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

Figure 2. Chlamydia — Rates by Region, United States, 2003 – 2012

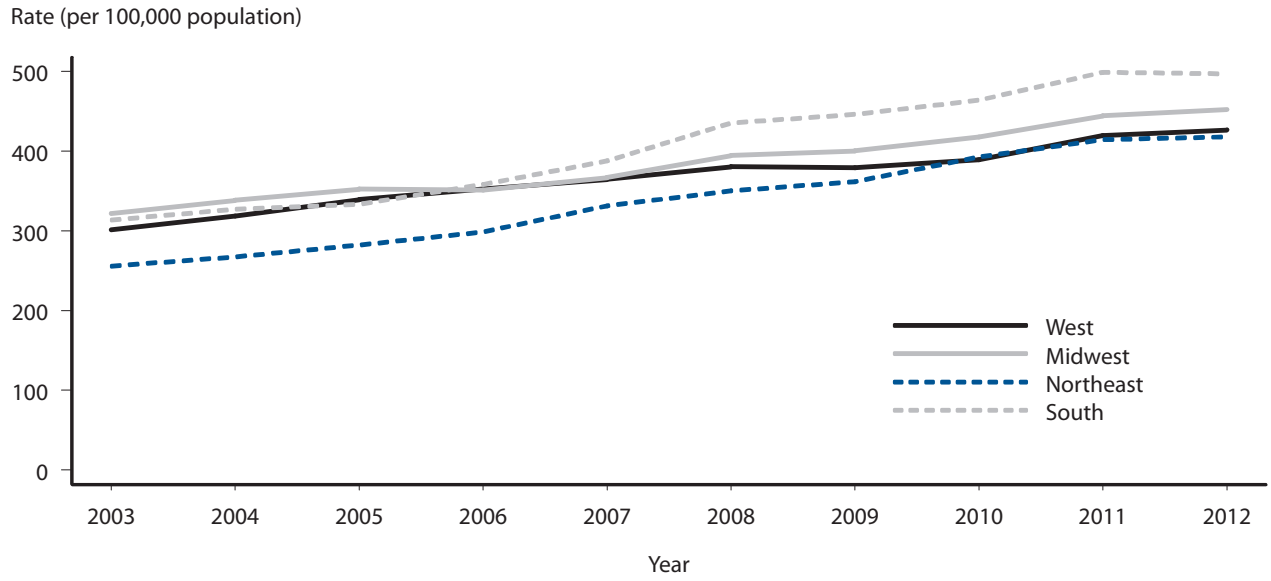
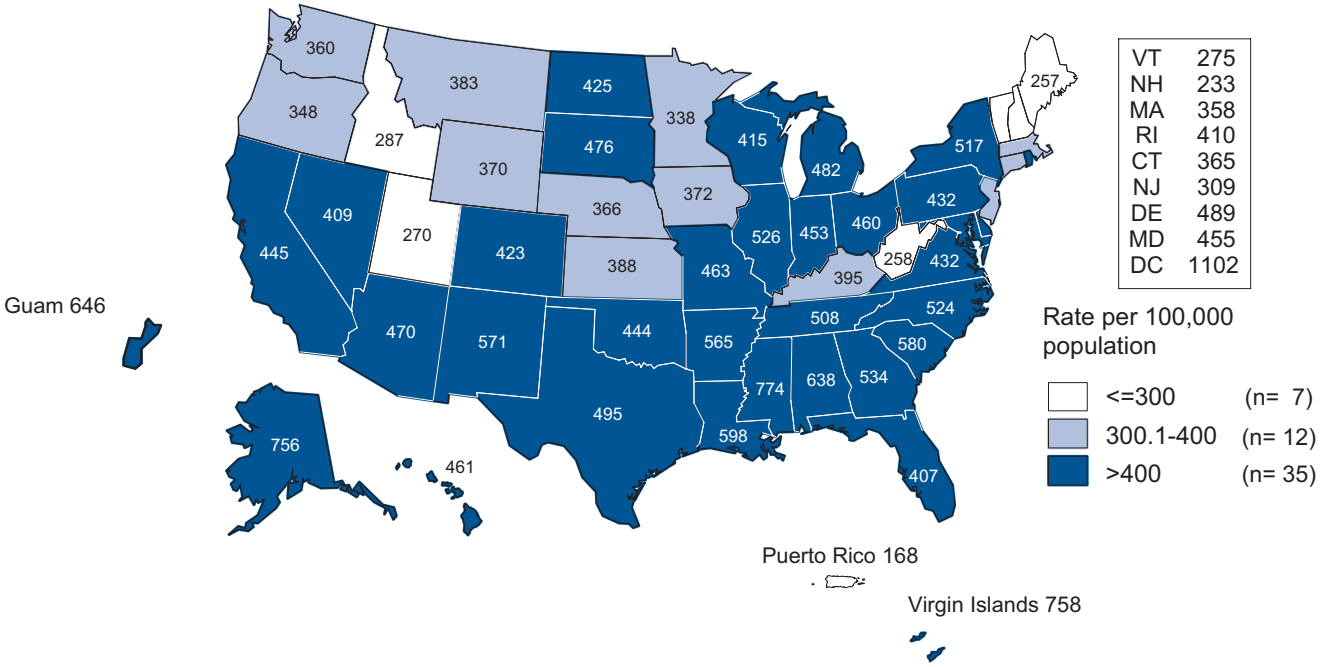


Figure 3. Chlamydia — Rates by State, United States and Outlying Areas, 2012



NOTE: The total rate of chlamydia for the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 453.5 per 100,000 population.

Figure 4. Chlamydia — Rates by County, United States, 2012

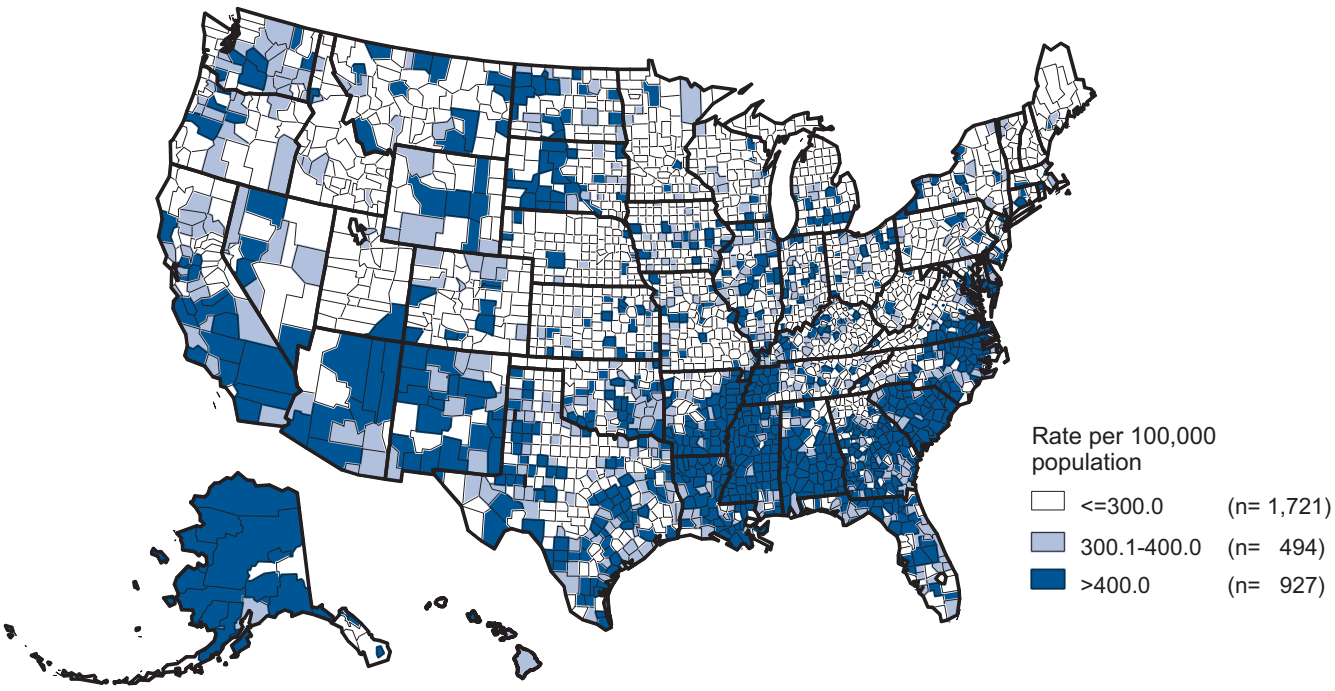


Figure 5. Chlamydia — Rates by Age and Sex, United States, 2012

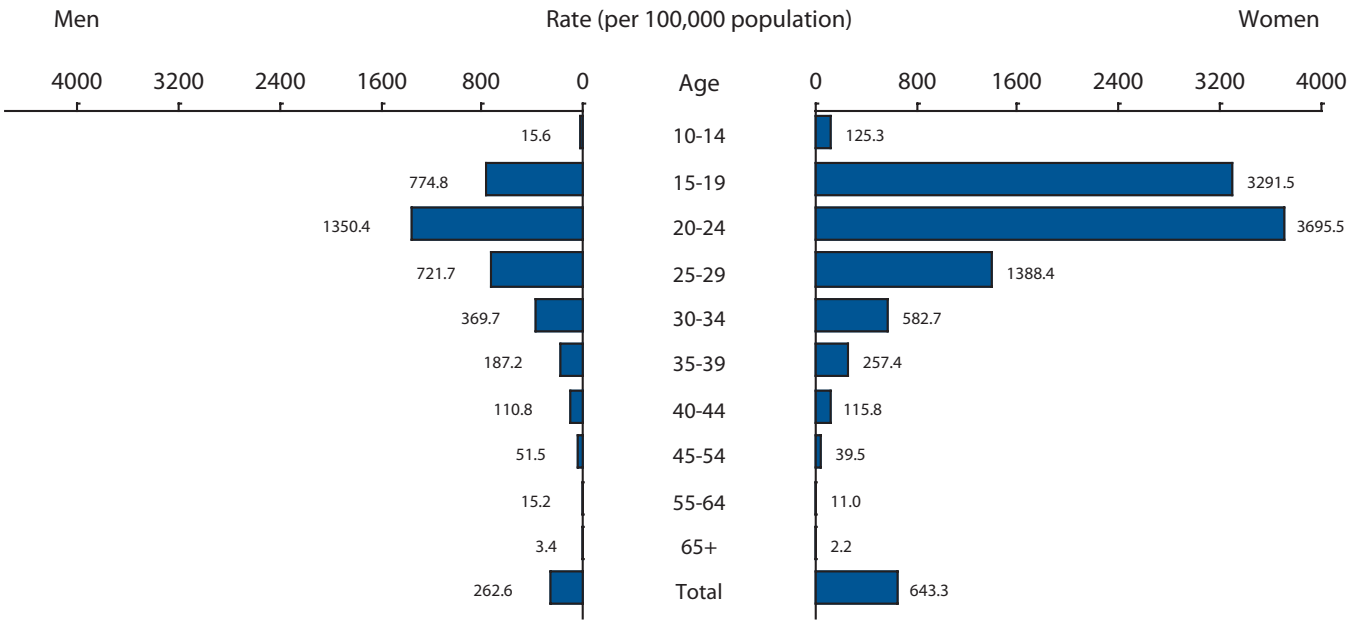
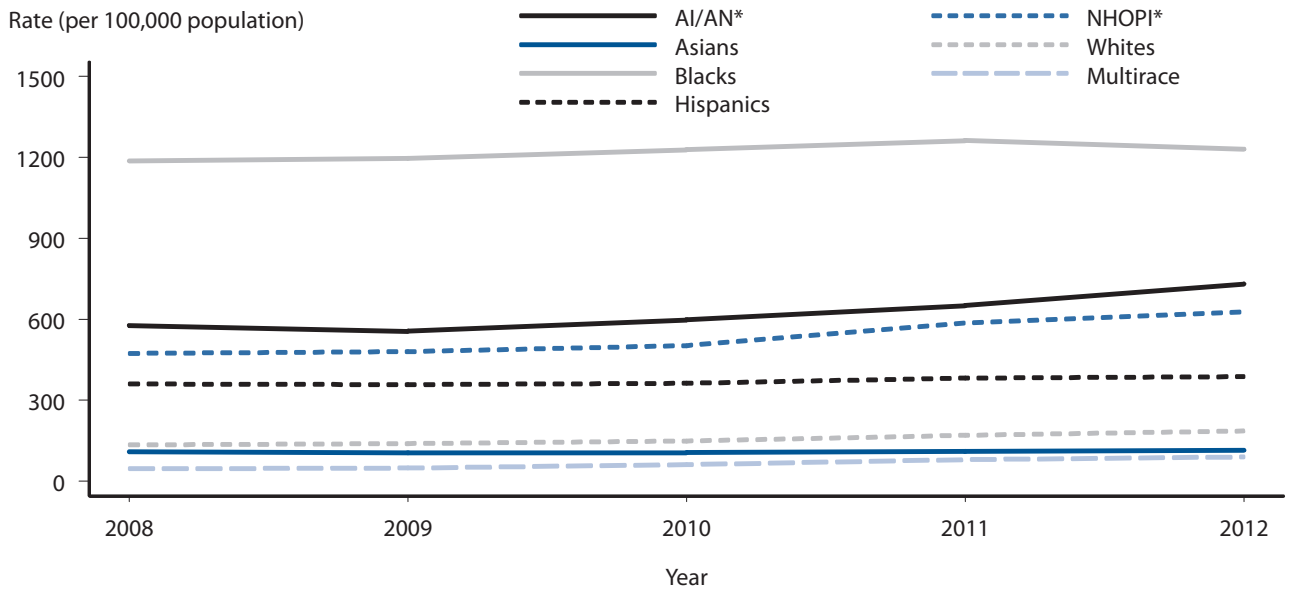


Figure 6. Chlamydia — Rates by Race/Ethnicity, United States 2008 – 2012



* AI/AN= American Indians/Alaska Natives; NHOPI= Native Hawaiian and Other Pacific Islanders.
NOTE: Includes 38 states and the District of Columbia reporting race/ethnicity data in Office of Management and Budget compliant formats during 2008–2012 (see Appendix "Interpreting STD Surveillance Data").

Figure 7. Chlamydia — Cases by Reporting Source and Sex, United States, 2003 – 2012

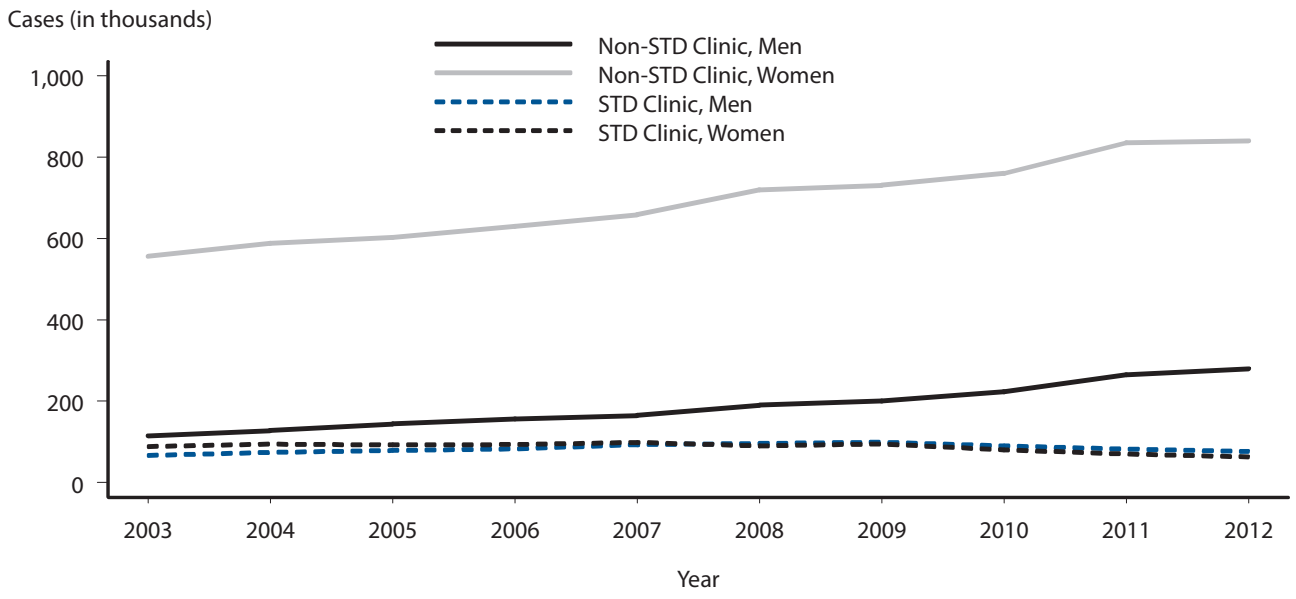
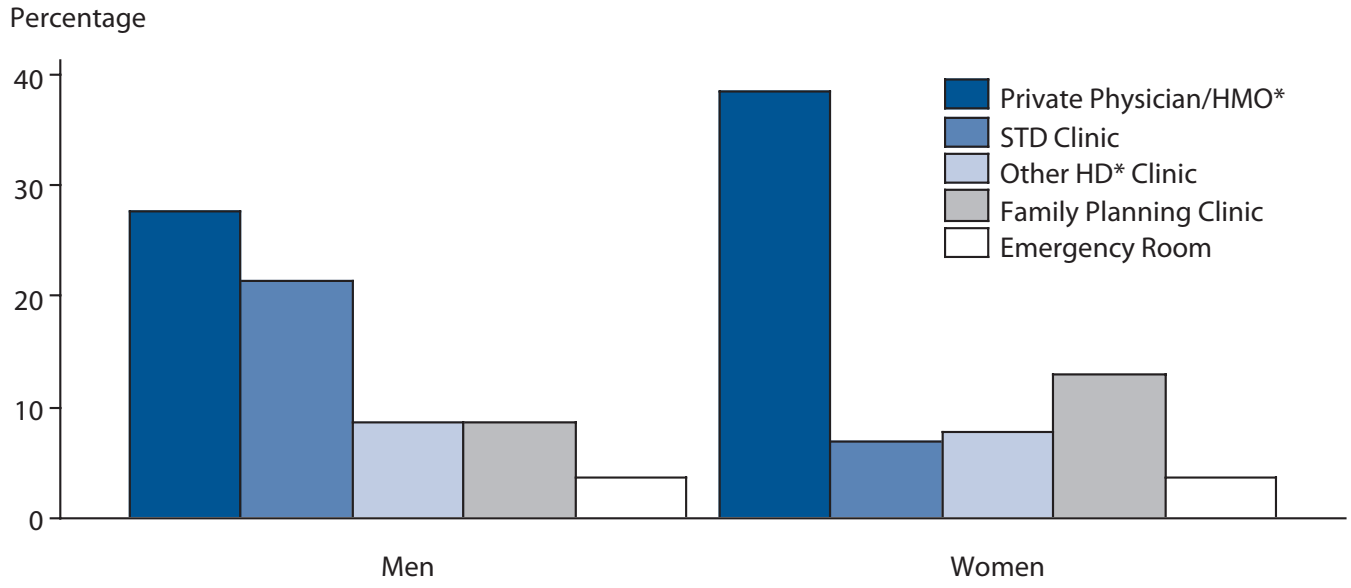
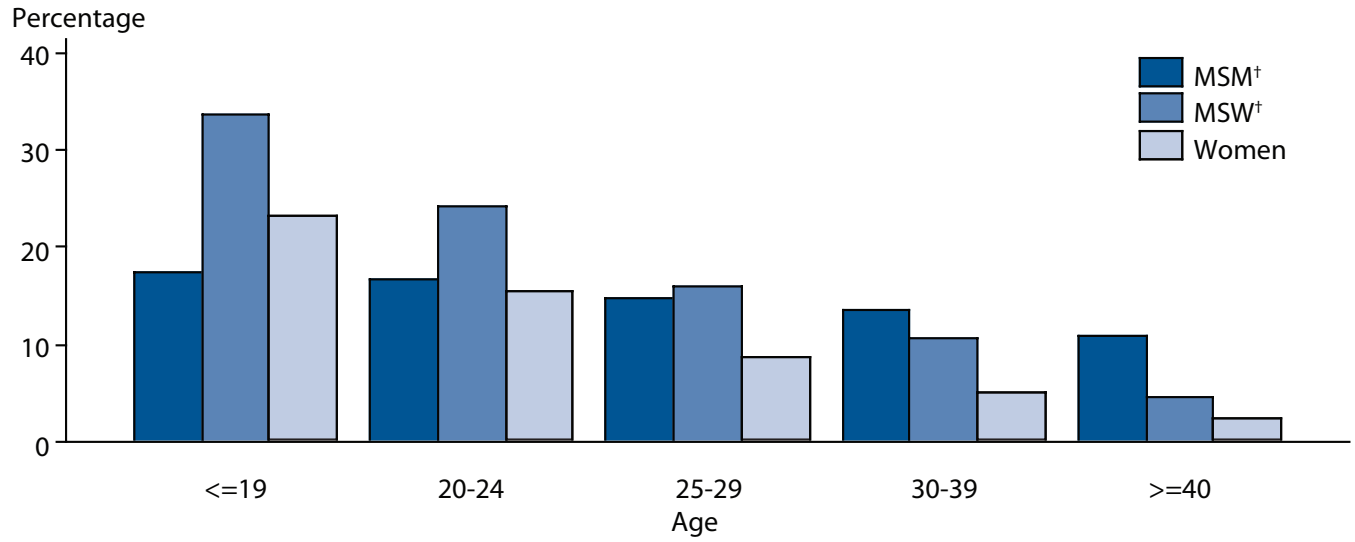


Figure 8. Chlamydia — Percentage of Reported Cases by Sex and Selected Reporting Sources, United States, 2012



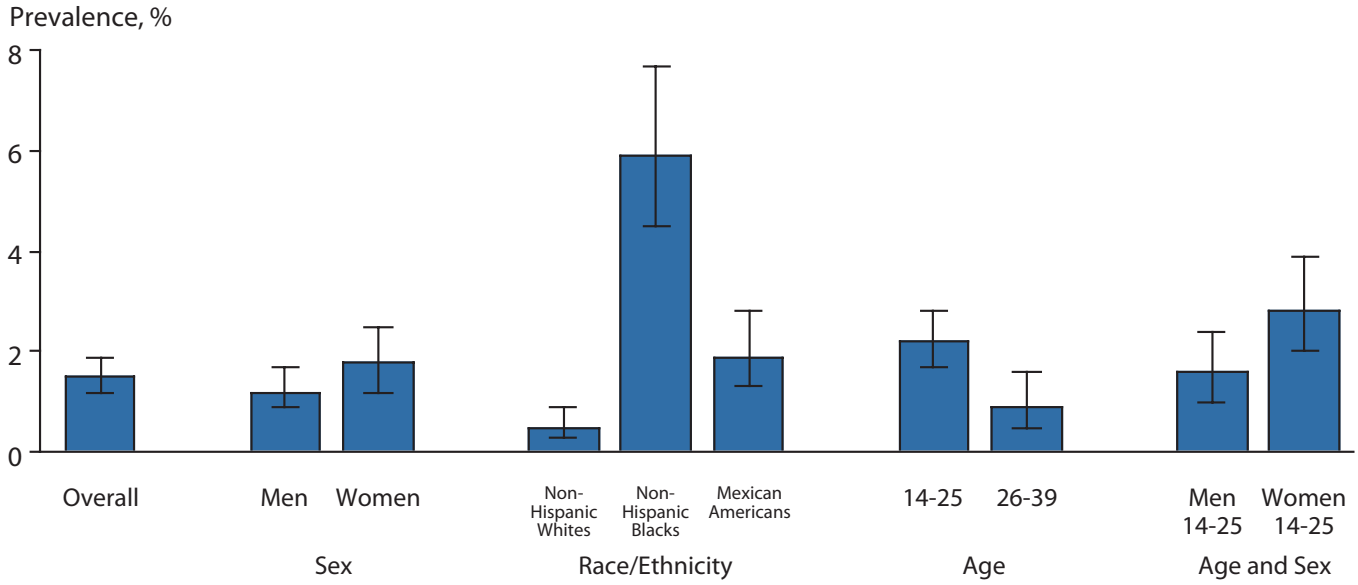
* HMO = health maintenance organization; HD = health department.
NOTE: Of all cases, 11.4% had a missing or unknown reporting source. Among cases with a known reporting source, the categories presented represent 69.8% of cases; 30.2% were reported from sources other than those shown.

Figure 9. Chlamydia — Proportion of STD Clinic Patients* Testing Positive by Age, Sex, and Sexual Behavior, STD Surveillance Network (SSuN), 2012



* Only includes patients tested for chlamydia
† MSM = men who have sex with men; MSW = men who have sex with women only.

Figure 10. Chlamydia — Prevalence Among Persons Aged 14 – 39 Years by Sex, Race/Ethnicity, or Age Group, National Health and Nutrition Examination Survey, 2005 – 2008



NOTE: Error bars indicate 95% confidence intervals.

Gonorrhea

Background

Gonorrhea is the second most commonly reported notifiable disease in the United States. Infections due to *Neisseria gonorrhoeae*, like those resulting from *C. trachomatis*, are a major cause of pelvic inflammatory disease (PID) in the United States. PID can lead to serious outcomes in women, such as tubal infertility, ectopic pregnancy, and chronic pelvic pain. In addition, epidemiologic and biologic studies provide evidence that gonococcal infections facilitate the transmission of HIV infection.[1] Although an individual's sexual behavior can increase the risk of acquiring gonorrhea, social determinants of health, such as socioeconomic status, may contribute to the burden of gonorrhea in a community.[2]

During 1975–1997, the national gonorrhea rate declined 74% after implementation of the national gonorrhea control program in the mid-1970s (Figure 11). After the decline halted for several years, gonorrhea rates decreased further to 98.1 cases per 100,000 population in 2009. This was the lowest rate since recording of gonorrhea rates began. Since 2009, the rate has increased slightly each year, to 100.2 in 2010, 103.3 in 2011, and to 107.5 cases per 100,000 population in 2012, with a total of 334,826 cases reported in the United States in 2012 (Figure 11 and Table 1).

The increase in gonorrhea rates during 2011–2012 was observed among both men and women (Figure 12). Gonorrhea rates increased in the Northeast, Midwest, and West, but decreased in the South (Figure 13). Rates increased among persons aged 20 years or older, but decreased among those aged 15–19 years (Figures 17 and 18).

Although gonorrhea case reporting is useful for monitoring disease trends, the number of gonorrhea cases reported to CDC is affected by many factors in addition to the actual occurrence of the infection within the population. Changes in the burden of gonorrhea may be masked by changes in screening practices (e.g., screening for chlamydia with tests that also detect *N. gonorrhoeae* infections and broader use of nucleic acid amplification tests [NAATs] at non-genital anatomic sites), the use of diagnostic tests with different test performance, and changes in reporting practices. As with other STDs, the reporting of gonorrhea cases to CDC is incomplete.[3] For these reasons, supplemental data on gonorrhea prevalence in persons screened in a variety of settings are useful in assessing the burden of disease in selected populations.

Neisseria gonorrhoeae has progressively developed resistance to each of the antibiotics used for treatment of gonorrhea. In the last decade, the development of fluoroquinolone resistance has resulted in the availability of only a single class of antibiotics that meet CDC's efficacy standards—the cephalosporins.[4,5] Most recently, declining susceptibility to cefixime resulted in a change in the CDC treatment guidelines, so that dual therapy with ceftriaxone and either azithromycin or doxycycline is now the only CDC-recommended treatment regimen for gonorrhea.[6] The emerging threat of cephalosporin resistance highlights the need for continued surveillance of *N. gonorrhoeae* antibiotic susceptibility.

The combination of persistently high gonorrhea morbidity in some populations and threat of cephalosporin-resistant gonorrhea reinforces the need to better understand the epidemiology of gonorrhea.

Gonorrhea—United States

In 2012, a total of 334,826 cases of gonorrhea were reported in the United States, yielding a rate of 107.5 cases per 100,000 population (Table 1). The rate increased 4.1% since 2011; however, the rate decreased 2.9% overall during 2008–2012.

Gonorrhea by Region

In 2012, as in previous years, the South had the highest gonorrhea rate (131.9 cases per 100,000 population) among the four regions of the United States, followed by the Midwest (114.6), Northeast (92.6), and West (73.3) (Table 14). During 2011–2012, rates increased 19.4% in the West, 8.4% in the Northeast, and 3.4% in the Midwest; rates decreased 1.4% in the South (Figure 13, Table 14).

Gonorrhea by State

In 2012, gonorrhea rates per 100,000 population ranged by state from 7.7 in Wyoming to 230.8 in Mississippi; the gonorrhea rate in the District of

Columbia was 388.7 (Figure 14, Tables 13 and 14). During 2011–2012, gonorrhea rates increased in 70% (35/50) of states and decreased in 30% (15/50) of states and in the District of Columbia (Table 14).

Gonorrhea by Metropolitan Statistical Area (MSA)

The overall gonorrhea rate in the 50 most populous MSAs was 121.5 cases per 100,000 population in 2012 (Table 17), representing a 4.2% rate increase from 2011 (116.6). In 2012, 60.9% of gonorrhea cases were reported by these MSAs. The total gonorrhea rate among women in these MSAs in 2012 (114.3) was lower than rates among men (128.7) (Tables 18 and 19).

Gonorrhea by County

In 2012, 52% of reported gonorrhea cases occurred in just 70 counties or independent cities (Table 20). In 2012, 1,192 counties (37.9%) in the United States had a rate less than or equal to 19 cases per 100,000 population (Figure 15). Rates ranged from 19.1 to 100 per 100,000 population in 1,300 counties (41.4%) and more than 100 cases per 100,000 population in 650 counties (20.7%). Most counties with more than 100 cases per 100,000 population were located in the South.

Gonorrhea by Sex

Gonorrhea rates among women have been slightly higher than those among men since 2001 (Figure 12). During 2011–2012, the gonorrhea rate among women increased 0.6%, to 108.7 cases per 100,000 population, and the rate among men increased 8.3%, to 105.8 per 100,000 population (Tables 15 and 16). The magnitude of the increase among men compared to women is suggestive of either increased transmission or increased case ascertainment (e.g., through increased extra-genital screening) among men who have sex with men (MSM). However, most jurisdictions do not routinely report sex of sex partners or site of infection for gonorrhea cases, so trends in gonorrhea rates among MSM cannot be assessed.

Gonorrhea by Age

In 2012, gonorrhea rates were highest among adolescents and young adults. In 2012, the highest rates were observed among women aged 20–24 years (578.5) and 15–19 years (521.2). Among men, the rate was highest among those aged 20–24 years (462.8) (Figure 16, Table 21).

In 2012, persons aged 15–44 years accounted for 95.0% of reported gonorrhea cases with known age. During 2011–2012, gonorrhea rates increased among most age groups within this age range: the gonorrhea rate increased 3.1% among those aged 20–24 years, 9.8% among those aged 25–29 years, 15.7% among those aged 30–34 years, 14.7% among those aged 35–39 years, and 13.0% among those aged 40–44 years (Table 21). The gonorrhea rate decreased 7.5% among those aged 15–19 years.

Among women aged 15–44, the largest increase was among those aged 40–44 years (14.1%) (Figure 17). Among men aged 15–44, the largest increase was among those aged 30–34 years (18.1%) (Figure 18).

Gonorrhea by Race/Ethnicity

In 2012, among the 48 jurisdictions (47 states and the District of Columbia) that submitted data in the new race and ethnic categories according to the revised Office of Management and Budget (OMB) standards, gonorrhea rates remained highest among blacks (462.0 cases per 100,000 population) (Table 22B). The rate among blacks was 14.9 times the rate among whites (31.0 per 100,000 population). The gonorrhea rate among American Indians/Alaska Natives (124.9) was 4.0 times that of whites, the rate among Native Hawaiians/Other Pacific Islanders (87.8) was 2.8 times that of whites, the rate among Hispanics (60.4) was 1.9 times that of whites, and the rate among Asians (16.9) was 0.5 times that of whites (Table 22B).

During 2008–2012, among the 39 jurisdictions (38 states and the District of Columbia) that submitted data in the new race and ethnic categories for all five years during that period, gonorrhea rates increased among American Indians/Alaska Natives (61.8%), Native Hawaiians/Pacific Islanders (33.5%), whites (22.9%), and Asians (14.5%). During this same time period, the gonorrhea rate decreased among blacks (15.5%) (Figure 19).

More information on gonorrhea rates among racial/ethnicity groups can be found in the Special Focus Profiles.

Gonorrhea by Region and Sex

During 2011–2012, gonorrhea rates among women and among men increased in the Northeast, Midwest, and West (Tables 15 and 16). In the South, the gonorrhea rate among men increased, but the gonorrhea

rate among women decreased. In 2012, women in the South (138.5), women in the Midwest (127.1) and men in the South (124.5) had the highest gonorrhea rates.

Gonorrhea by Race/Ethnicity and Sex

Among the 48 jurisdictions (47 states and the District of Columbia) that submitted data in the new race and ethnic categories according to the revised OMB standards, gonorrhea rates were higher in women than men among American Indians/Alaska Natives, Native Hawaiians/Other Pacific Islanders, and whites in 2012 (Figure N, Table 22B). Gonorrhea rates were higher in men than women among Asians, blacks, and Hispanics. Overall, gonorrhea rates were highest among black men (467.7) and black women (456.3).

Gonorrhea by Reporting Source

The number of gonorrhea cases reported by STD clinics declined during 2003–2012 (Figure 20). In 2012, 17.3% of gonorrhea cases with known reporting source were reported by STD clinics (Table A2). This is a decrease from 2011, when 18.6% of gonorrhea cases were reported by STD clinics. In 2012, among women, private physicians or health maintenance organizations (HMOs) (30.2%) were the most common reporting source, followed by family planning clinics (11.3%), STD clinics (10.6%), other health department clinics (6.8%), and emergency rooms (5.7%) (Figure 21). Among men, STD clinics were the most common reporting source (24.5%) (Figure 21). Other common reporting sources for males were private physicians/HMOs (22.9%), other health department clinics (8.8%), emergency rooms (5.8%), and family planning clinics (5.8%).

STD Surveillance Network

The STD Surveillance Network (SSuN) is a network of 12 states and independently funded cities collecting enhanced information on a representative sample of gonorrhea cases reported to the state or city health department from all reporting sources. This project provides more complete estimates of case characteristics often missing on routine case reports—such as gender of sex partners—which is essential for better targeting of gonorrhea control efforts. In 2012, SSuN collaborators interviewed 6,228 gonorrhea cases representing 8.2% of total morbidity across participating jurisdictions. Additional information about SSuN methodology can be found in the STD Surveillance Network section of the Appendix, Interpreting STD Surveillance Data.

Based on these enhanced interviews, the burden of disease represented by MSM, men who have sex with women only (MSW), and women varied substantially across collaborating sites (Figure 22). San Francisco County had the highest proportion of estimated MSM cases (87.8%), while the lowest proportion of morbidity estimated to be attributed to MSM was found in Jefferson County (Birmingham), Alabama at 10.9%. Across all SSuN jurisdictions in 2012, 26.6% of gonorrhea cases were estimated to be among MSM, 29.4% among MSW, and 44.1% among women.

Gonococcal Isolate Surveillance Project

Antimicrobial resistance remains an important consideration in the treatment of gonorrhea.[4–9] In 1986, the Gonococcal Isolate Surveillance Project (GISP), a national sentinel surveillance system, was established to monitor trends in antimicrobial susceptibilities of urethral *N. gonorrhoeae* strains in the United States.[10] Data are collected from selected STD clinic sentinel sites and from regional laboratories (Figure 23).

Information on the antimicrobial susceptibility criteria used in GISP can be found in the Gonococcal Isolate Surveillance Project section of the Appendix, Interpreting STD Surveillance Data. More information about GISP and additional data can be found at http://www.cdc.gov/std/GISP.

Susceptibility to Ceftriaxone

Susceptibility testing for ceftriaxone began in 1987. The percentage of GISP isolates that exhibited elevated ceftriaxone minimum inhibitory concentrations (MICs), defined as ≥0.125 µg/ml, increased from 0.1% in 2008 to 0.4% in 2011, and decreased slightly to 0.3% in 2012 (Figure 24).

One isolate with decreased susceptibility to ceftriaxone (MIC = 0.5 µg/ml) was identified in 2012. The isolate was collected in Oklahoma City, Oklahoma from a heterosexual man; the isolate exhibited penicillin resistance (MIC = 2.0 µg/ml), intermediate susceptibility to tetracycline (MIC = 1.0 µg/ml), and decreased susceptibility to cefixime (MIC = 1.0 µg/ml). Four isolates with decreased susceptibility to

ceftriaxone (MIC = 0.5 µg/ml) have been previously identified in GISP: one from San Diego, California (1987), two from Cincinnati, Ohio (1992 and 1993), and one from Philadelphia, Pennsylvania (1997).

Susceptibility to Cefixime

Susceptibility testing for cefixime began in 1992, was discontinued in 2007, and was restarted in 2009. The percentage of isolates with elevated cefixime MICs (≥0.25 µg/ml) increased from 0.1% in 2006 to 1.4% in 2010 and 2011, and declined to 1.0% in 2012 (Figure 25).

In 2012, two isolates had cefixime MICs of 0.5 µg/ml (from Chicago, Illinois and Orange County, California), and one had an MIC of 1.0 µg/ml (from Oklahoma City, Oklahoma).

Susceptibility to Cefpodoxime

Monitoring of cefpodoxime susceptibility in GISP began in 2009. Of 5,495 GISP isolates tested for cefpodoxime susceptibility in 2012, 0.8% had MICs of 0.5 µg/ml, 1.3% had MICs of 1.0 µg/ml, and 0.4% had MICs of 2.0 µg/ml.

Susceptibility to Azithromycin

Susceptibility testing for azithromycin began in 1992. The proportion of GISP isolates with azithromycin MICs of ≥2.0 µg/ml decreased from 0.5% in 2010 to 0.3% in 2012 (Figure 26). In 2012, two (0.04%) isolates had azithromycin MICs of 8.0 µg/ml, four (0.1%) isolates had MICs of 16.0 µg/ml, and one isolate, collected from a heterosexual man in Honolulu, Hawaii had an MIC ≥256 µg/ml.

Susceptibility to Spectinomycin

All isolates were susceptible to spectinomycin in 2012. A spectinomycin-resistant isolate was last identified in GISP in 1994 (West Palm Beach, Florida).

Susceptibility to Ciprofloxacin

The proportion of GISP isolates with ciprofloxacin resistance (MIC ≥1 µg/ml) peaked in 2007 at 14.8%. Following a decline in 2008 and 2009, the proportion increased from 9.6% in 2009 to 14.7% in 2012. In 2012, 27.1% of isolates from MSM and 8.7% of isolates from MSW exhibited ciprofloxacin resistance.

Other Antimicrobial Susceptibility Testing

In 2012, 33.4% of isolates collected from GISP sites were resistant to penicillin, tetracycline, ciprofloxacin, or some combination of those antimicrobials (Figure 27). Although these antimicrobials are no longer recommended for treatment of gonorrhea, the resistance phenotypes remain common. Conversely, 66.6% of isolates were susceptible to all three of these antimicrobials.

Antimicrobial Treatments Given for Gonorrhea

The antimicrobial agents given to GISP patients for gonorrhea therapy are shown in Figure 28. The proportion of patients treated with ceftriaxone 250 mg increased from 84.0% in 2011 to 93.9% in 2012. The proportion treated with cefixime decreased from 5.3% in 2011 to 1.6% in 2012.

In 2012, 3.2% of patients were treated with azithromycin 2 grams as monotherapy, and 0.1% of patients were treated with a fluoroquinolone (ciprofloxacin or ofloxacin).

Among patients treated with ceftriaxone 250 mg or cefixime 400 mg, 83.1% were also treated with azithromycin one gram, 16.7% were also treated with doxycycline, and 0.2% did not receive a second antimicrobial.

Gonorrhea Among Special Populations

More information about gonorrhea in racial/ethnic groups, women of reproductive age, adolescents, MSM, and other populations at higher risk can be found in the Special Focus Profiles.

Gonorrhea Summary

The national gonorrhea rate declined dramatically during 1975–1997. After 1997, the gonorrhea rate fluctuated but generally trended downwards until it reached an all-time low in 2009. However, during 2009–2012 the gonorrhea rate has increased each year. High rates persist in some geographic areas, among adolescents and young adults, and in some racial/ethnic groups.

The GISP continues to monitor for the emergence of decreased susceptibility and resistance to cephalosporins and azithromycin.

[1] Fleming DT, Wasserheit JN. From epidemiological synergy to public health policy and practice: the contribution of other sexually transmitted diseases to sexual transmission of HIV infection. Sex Transm Infect. 1999;75(1):3-17.

[2] Sullivan AB, Gesink DC, Brown P, Zhou L, Kaufman JS, Fitch M, et al. Are neighborhood sociocultural factors influencing the spatial pattern of gonorrhea in North Carolina? Ann Epidemiol 2011; 21:245-252.

[3] American Social Health Association. Sexually transmitted diseases in America: how many cases and at what cost? Menlo Park (CA): Kaiser Family Foundation; 1998.

[4] Centers for Disease Control and Prevention. Update to CDC's sexually transmitted diseases treatment guidelines, 2006: fluoroquinolones no longer recommended for treatment of gonococcal infections. MMWR Morb Mortal Wkly Rep. 2007;56:332-6.

[5] Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2010. MMWR Recomm Rep. 2010;59(No.RR-12).

[6] Centers for Disease Control and Prevention. Update to CDC's sexually transmitted diseases treatment guidelines, 2010: Oral cephalosporins no longer a recommended treatment for gonococcal infections. MMWR Morb Mortal Wkly Rep. 2012;61(31):590-594.

[7] Centers for Disease Control and Prevention. *Neisseria gonorrhoeae* with reduced susceptibility to azithromycin — San Diego County, California, 2009. MMWR Morb Mortal Wkly Rep. 2011;60:579-81.

[8] Centers for Disease Control and Prevention. Cephalosporin susceptibility among *Neisseria gonorrhoeae* isolates—United States, 2000–2010. MMWR Morb Mortal Wkly Rep. 2011;60:873-7.

[9] Kirkcaldy RD, Ballard RC, Dowell D. Gonococcal Resistance: Are Cephalosporins Next? Curr Infect Dis Rep. 2011;13: 196-204.

[10] Schwarcz S, Zenilman J, Schnell D, Knapp JS, Hook EW 3rd, Thompson S, et al. National surveillance of antimicrobial resistance in *Neisseria gonorrhoeae.* JAMA. 1990;264:1413-7.

Figure 11. Gonorrhea — Rates by Year, United States, 1941 – 2012

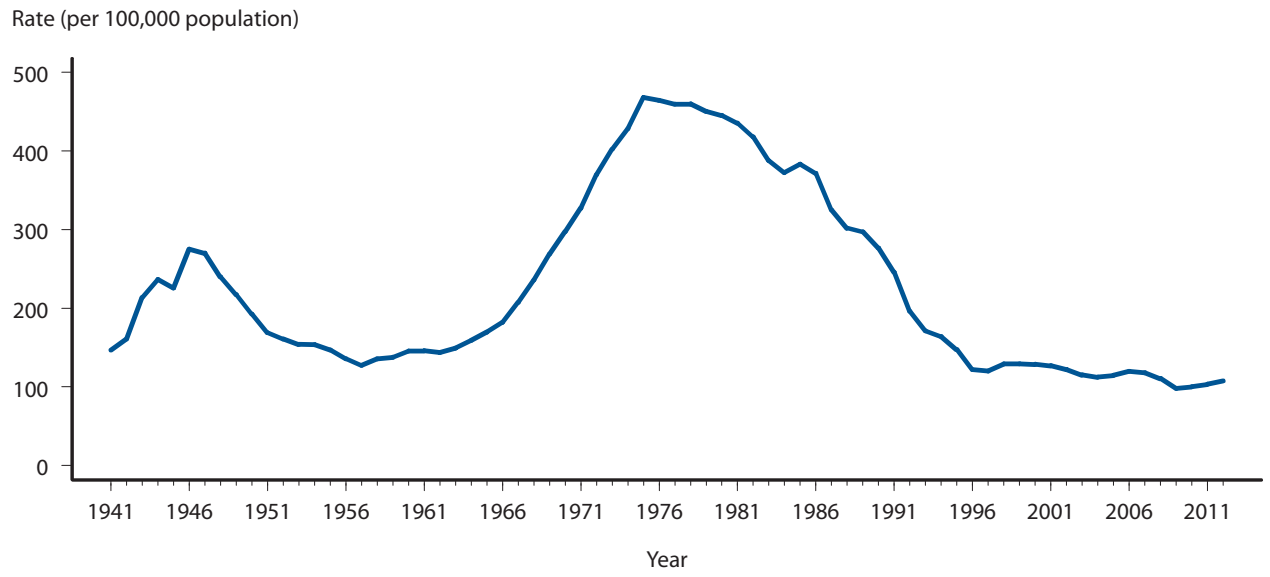


Figure 12. Gonorrhea — Rates by Sex, United States, 1992 – 2012

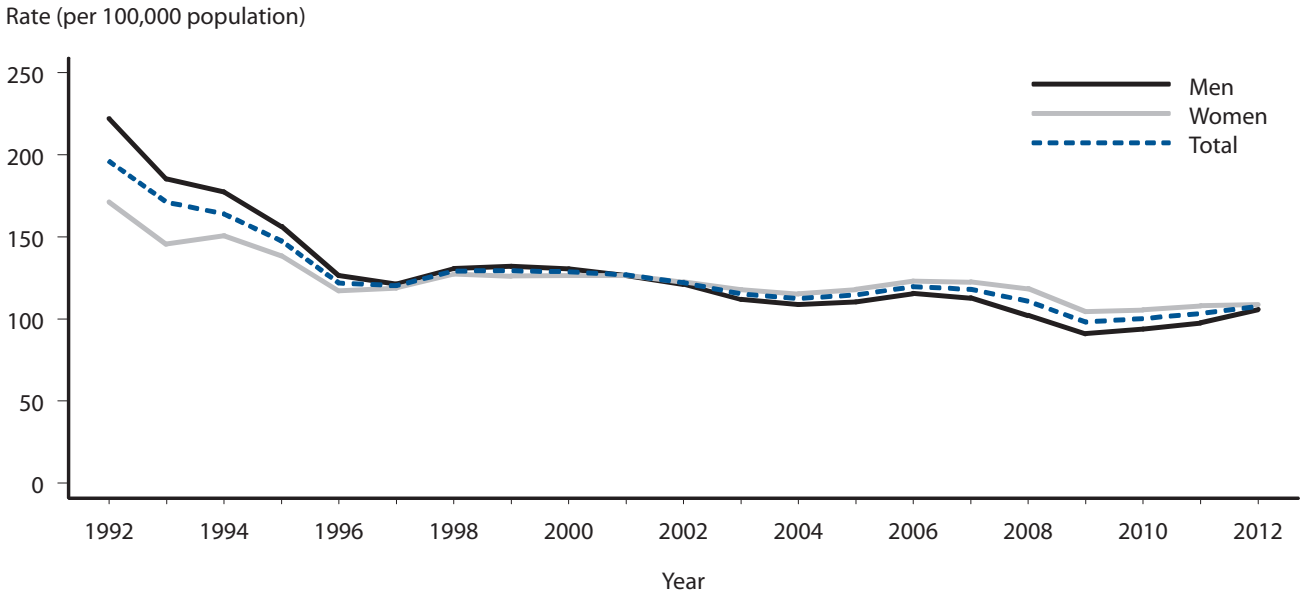


Figure 13. Gonorrhea — Rates by Region, United States, 2003 – 2012

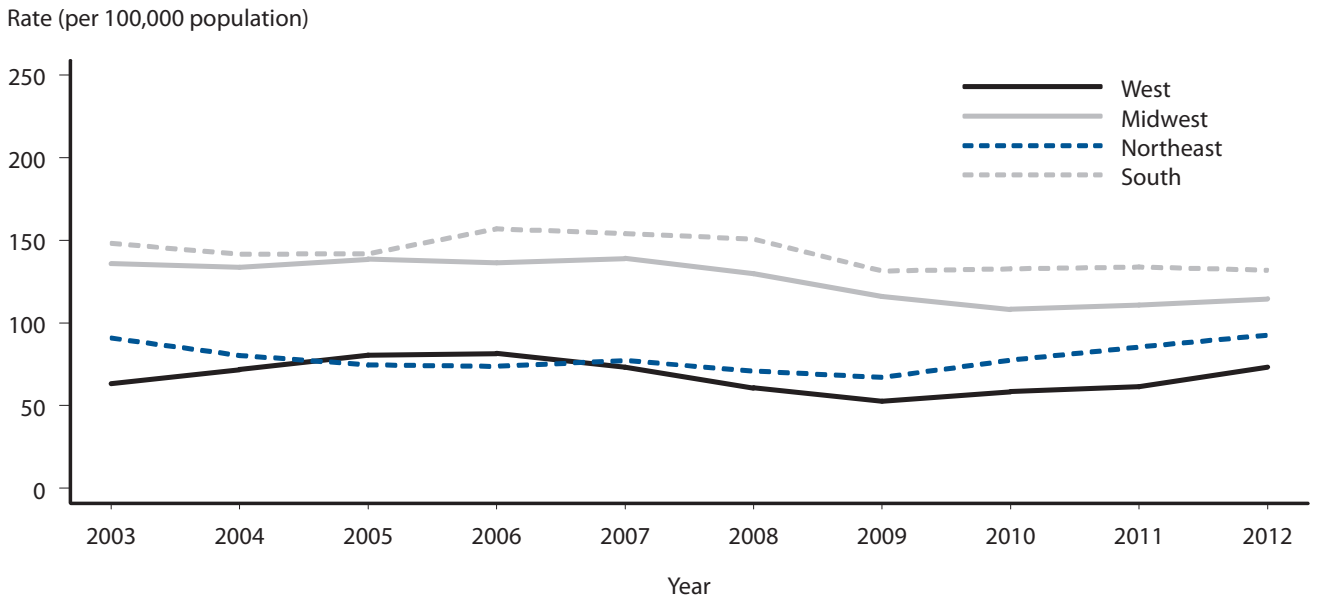
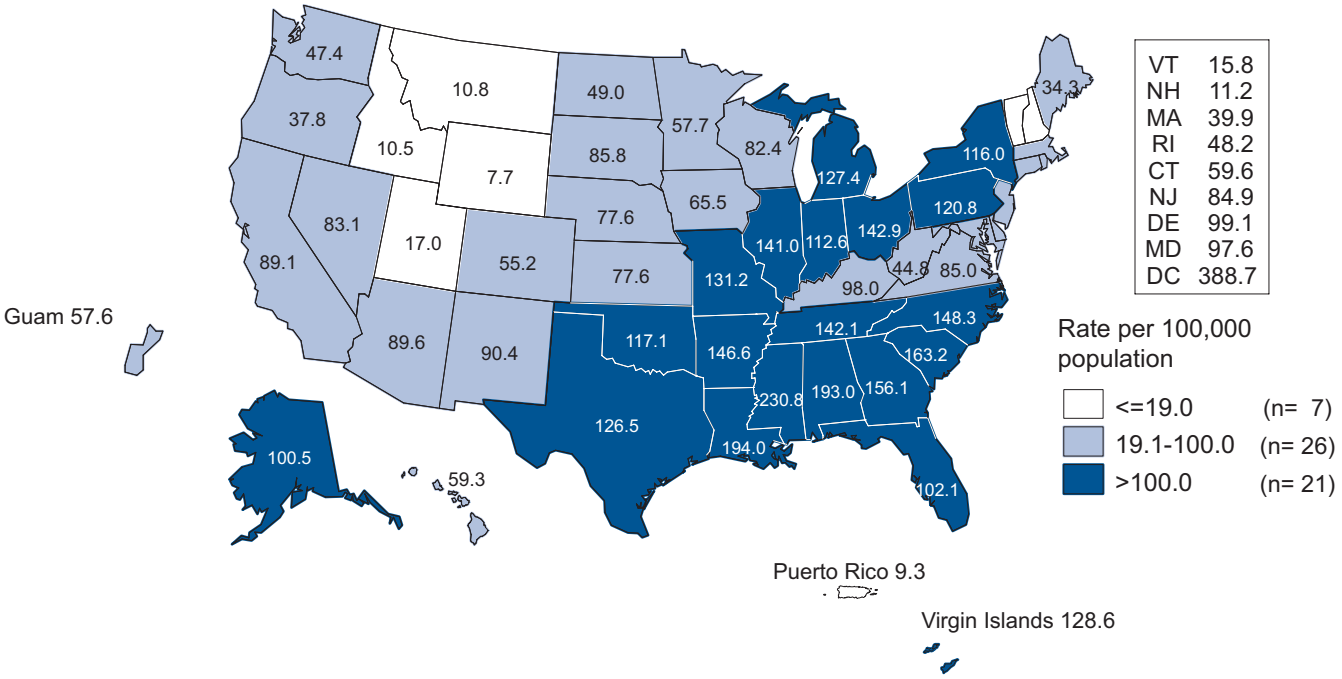


Figure 14. Gonorrhea — Rates by State, United States and Outlying Areas, 2012



NOTE: The total rate of gonorrhea for the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 106.3 per 100,000 population.

Figure 15. Gonorrhea — Rates by County, United States, 2012

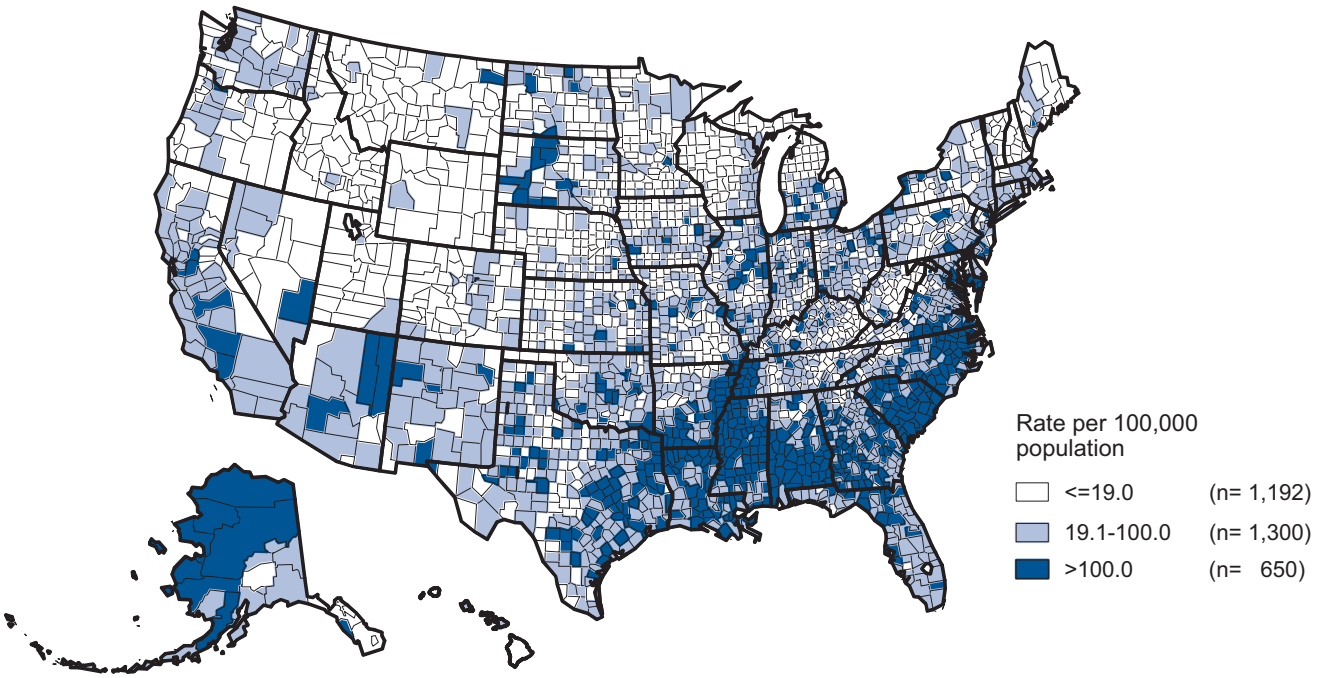


Figure 16. Gonorrhea — Rates by Age and Sex, United States, 2012

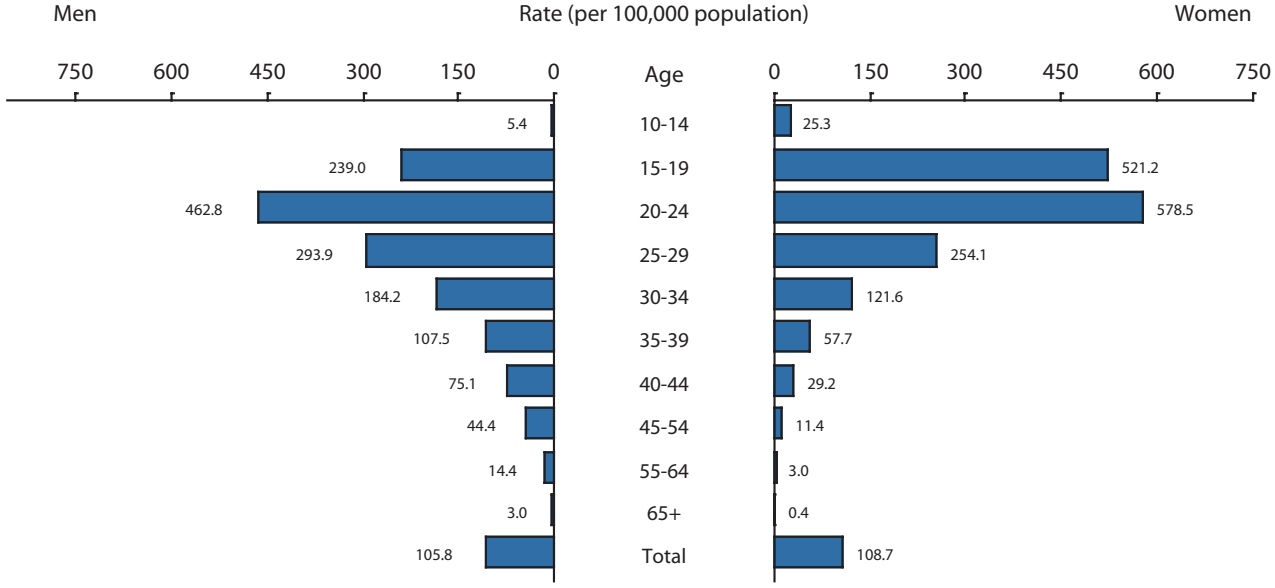


Figure 17. Gonorrhea — Rates by Age Among Women Aged 15 – 44 Years, United States, 2003 – 2012

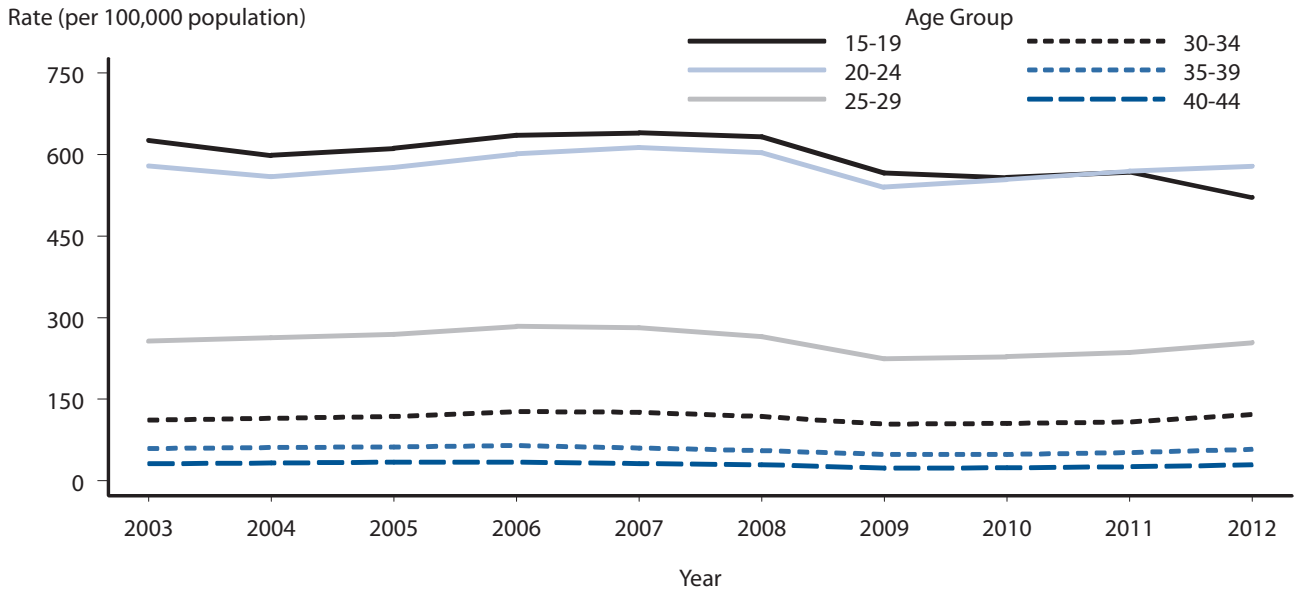


Figure 18. Gonorrhea — Rates by Age Among Men Aged 15 – 44 Years, United States, 2003 – 2012

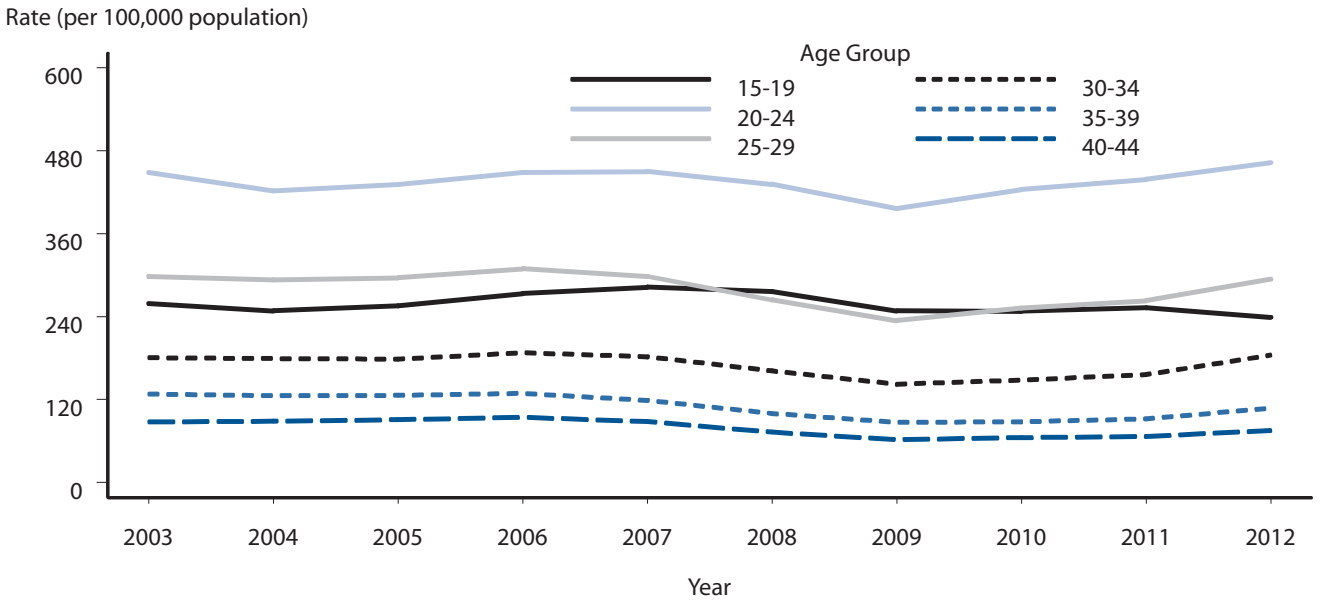
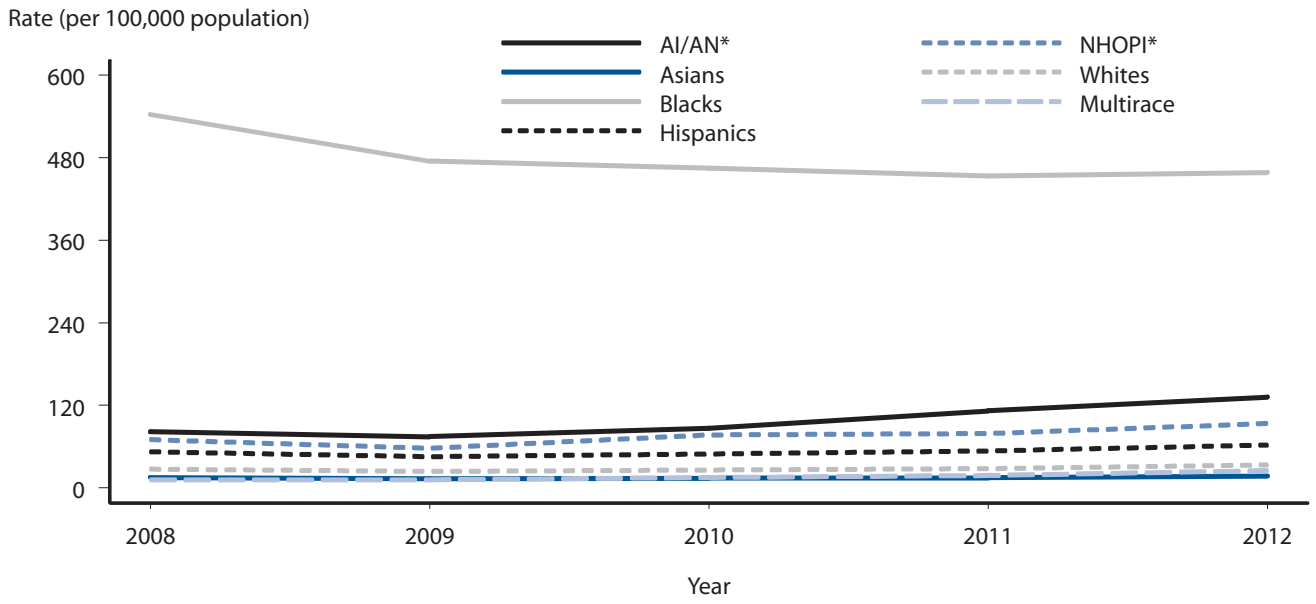


Figure 19. Gonorrhea — Rates by Race/Ethnicity, United States, 2008 – 2012



* AI/AN= American Indians/Alaska Natives; NHOPI= Native Hawaiian and Other Pacific Islanders.
NOTE: Includes 38 states and the District of Columbia reporting race/ethnicity data in Office of Management and Budget compliant formats during 2008–2012 (see Appendix "Interpreting STD Surveillance Data").

Figure 20. Gonorrhea — Cases by Reporting Source and Sex, United States, 2003 – 2012

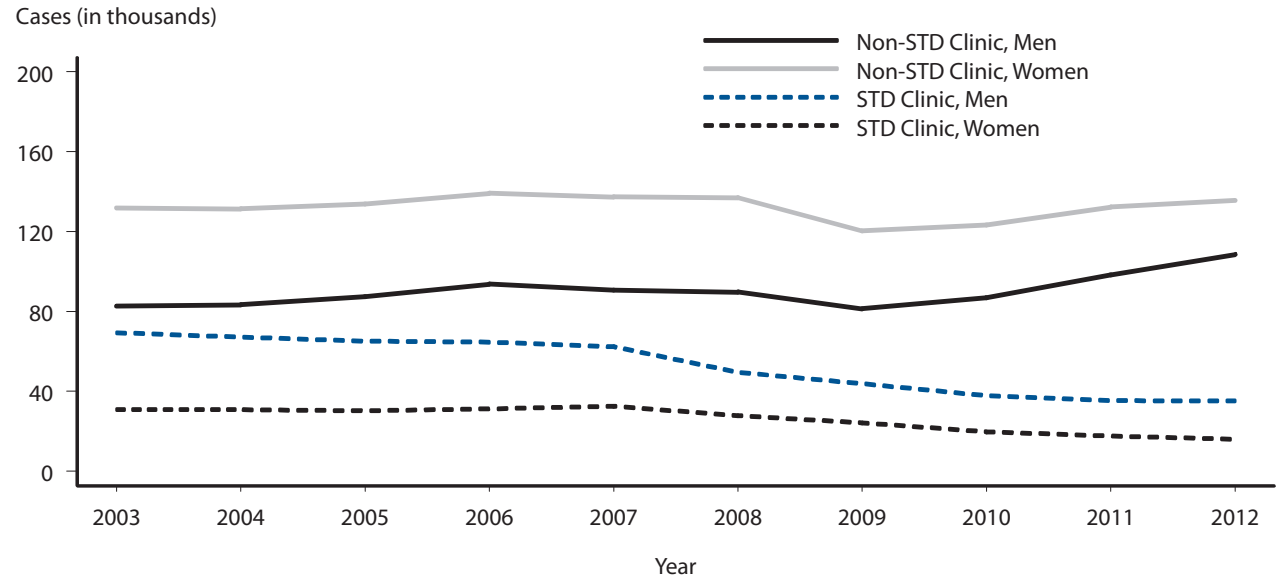
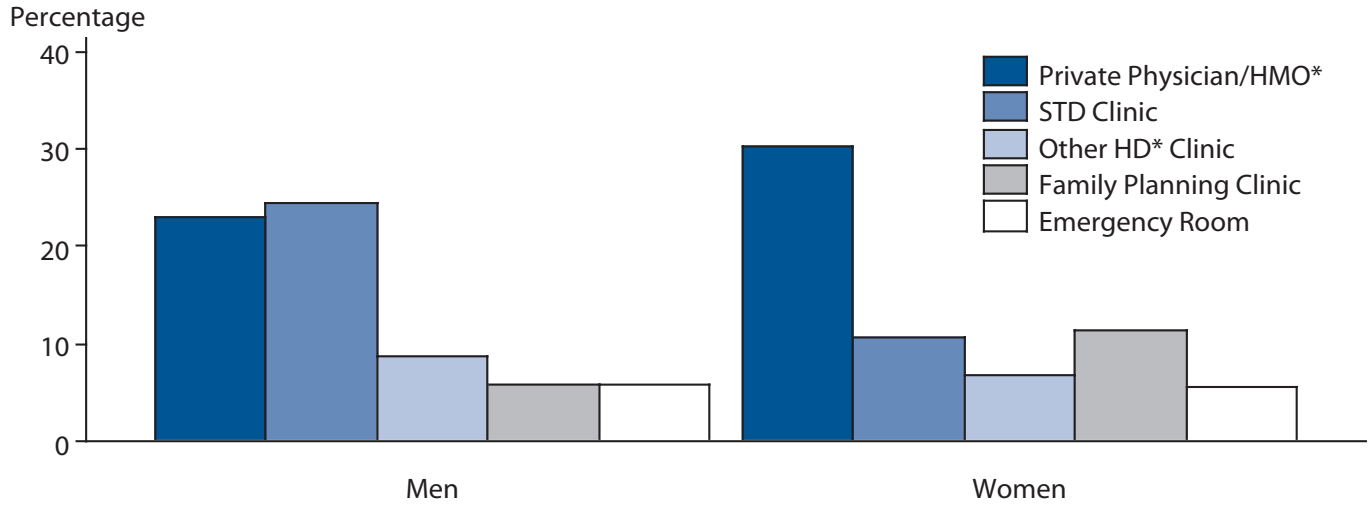
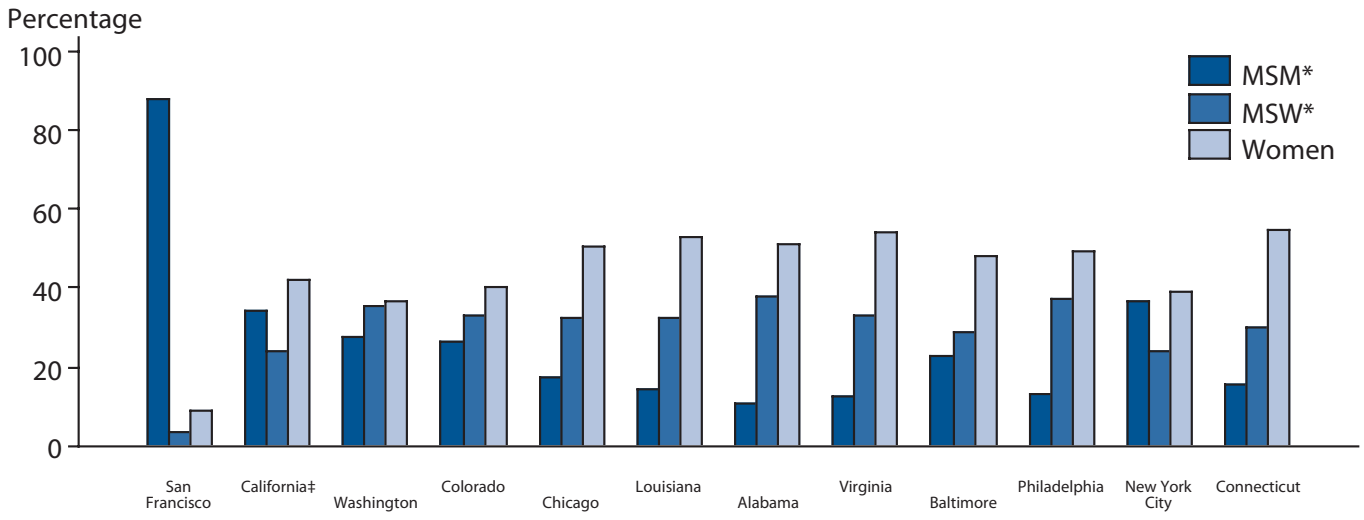


Figure 21. Gonorrhea—Percentage of Reported Cases by Sex and Selected Reporting Sources, United States, 2012



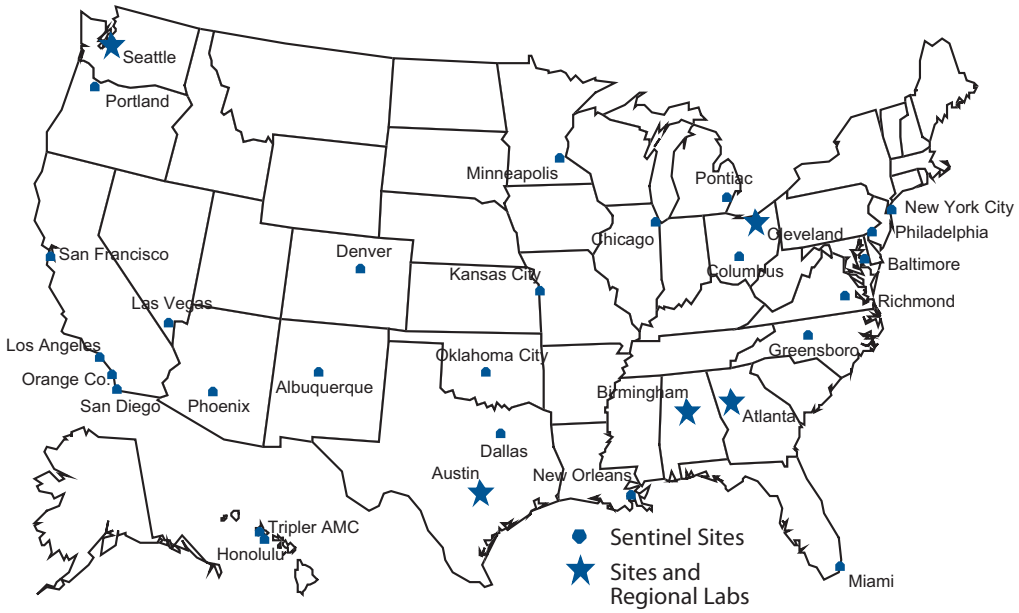
* HMO = health maintenance organization; HD = health department.
NOTE: Of all cases, 11.7% had a missing or unknown reporting source. Among cases with a known reporting source, the categories presented represent 66.2% of cases; 33.8% were reported from sources other than those shown.

Figure 22. Estimated Proportion of MSM*, MSW*, and Women Among Gonorrhea Cases† by Site, STD Surveillance Network (SSuN), 2012



* MSM = men who have sex with men; MSW = men who have sex with women only.
† Estimate based on interviews (n=6,228) conducted from a random sample of reported cases of gonorrhea in 2012; cases weighted for analysis by county and to adjust for non-response.
‡ California data excludes San Francisco County (shown separately).
NOTE: See Appendix for jurisdictions included in each project area.

Figure 23. Location of Participating Sentinel Sites and Regional Laboratories, Gonococcal Isolate Surveillance Project (GISP), United States, 2012



NOTE: Austin is a regional laboratory only.

Figure 24. Percentage of *Neisseria gonorrhoeae* Isolates with Elevated Ceftriaxone Minimum Inhibitory Concentrations (MICs) (≥0.125 µg/ml), Gonococcal Isolate Surveillance Project (GISP), 2005 – 2012

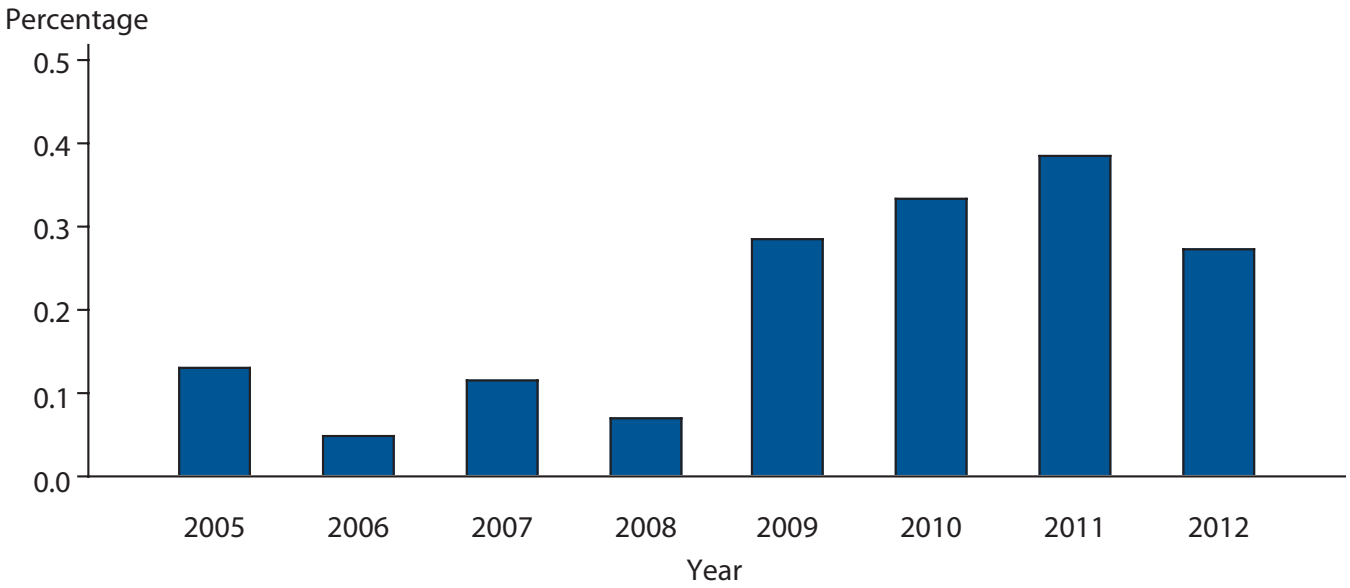
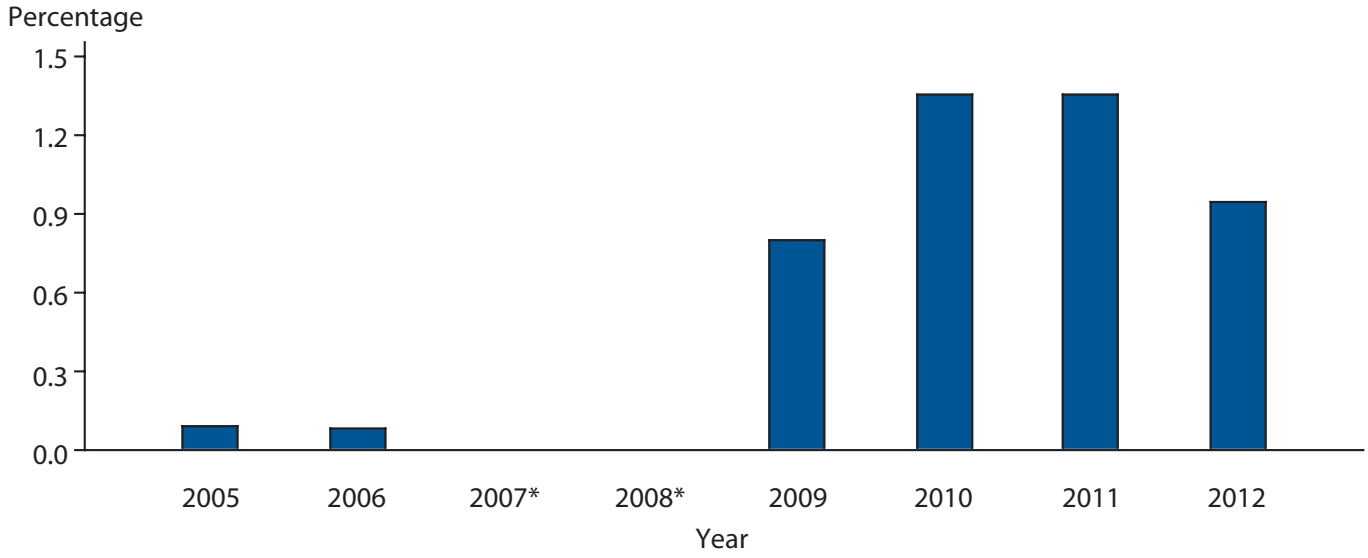


Figure 25. Percentage of *Neisseria gonorrhoeae* Isolates with Elevated Cefixime Minimum Inhibitory Concentrations (MICs) (≥0.25 µg/ml), Gonococcal Isolate Surveillance Project (GISP), 2005 – 2012



* Isolates not tested for cefixime susceptibility in 2007 and 2008.

Figure 26. Percentage of *Neisseria gonorrhoeae* Isolates with Elevated Azithromycin Minimum Inhibitory Concentrations (MICs) (≥2.0 µg/ml), Gonococcal Isolate Surveillance Project (GISP), 2005 – 2012

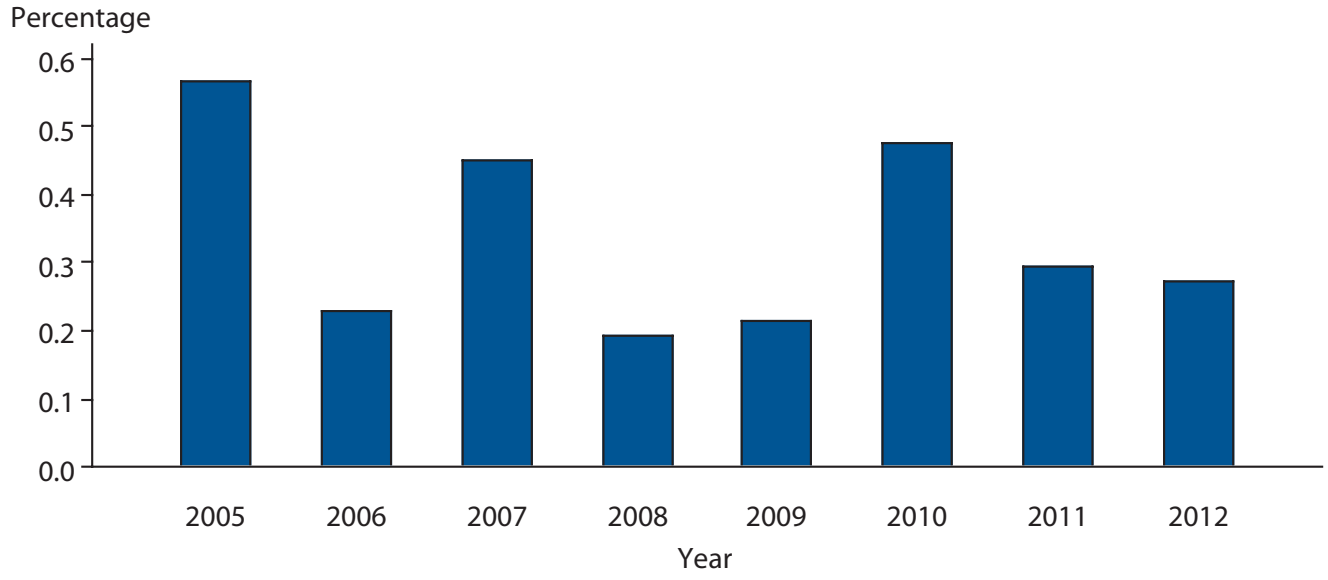
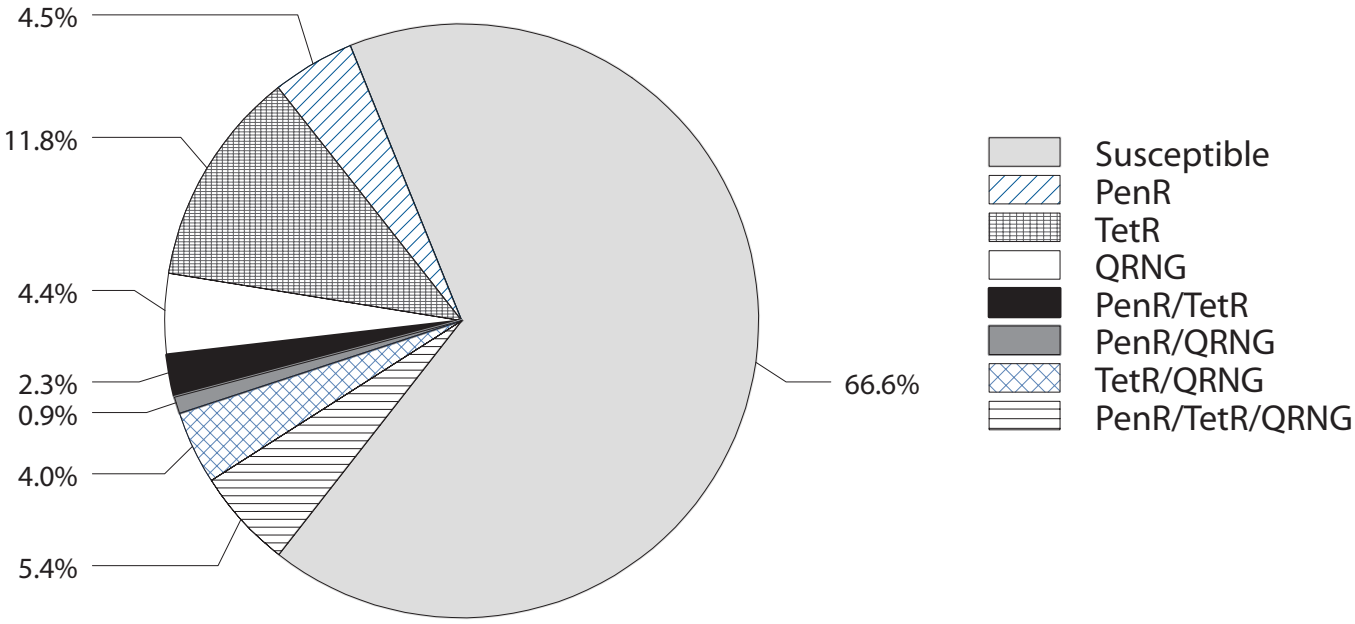
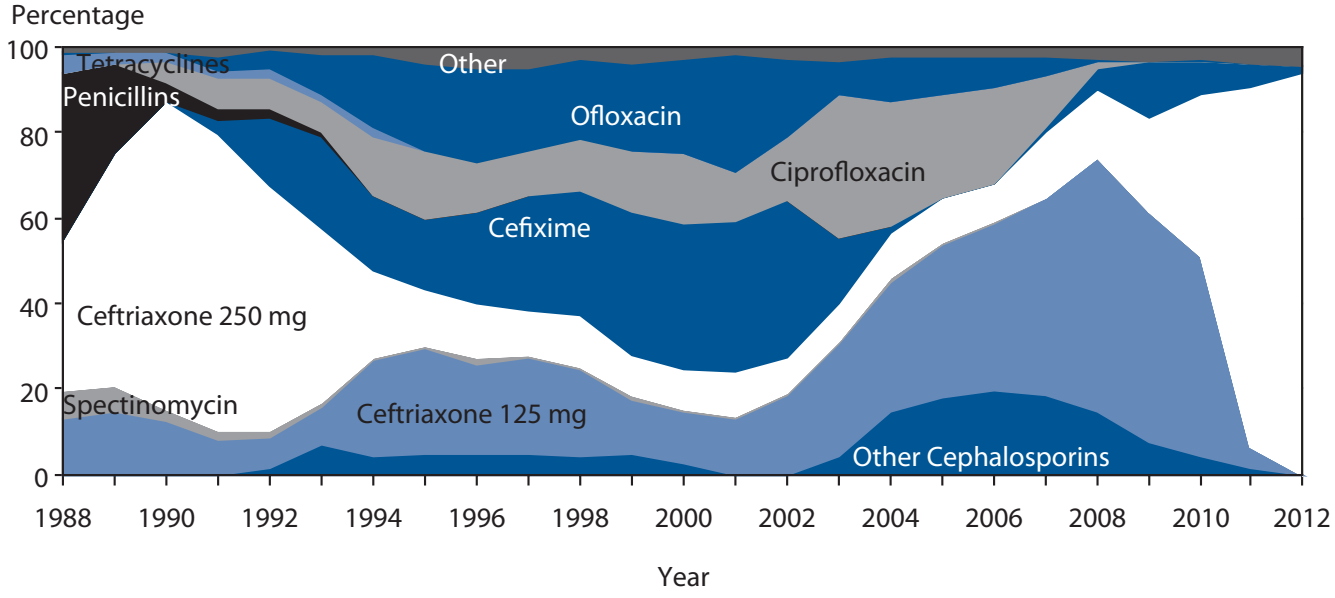


Figure 27. Penicillin, Tetracycline, and Ciprofloxacin Resistance Among *Neisseria gonorrhoeae* Isolates, Gonococcal Isolate Surveillance Project (GISP), 2012



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*.

Figure 28. Antimicrobial Drugs Used to Treat Gonorrhea Among Participants, Gonococcal Isolate Surveillance Project (GISP), 1988 – 2012



NOTE: For 2012, "Other" includes no therapy (1.1%), azithromycin 2g (3.2%), and other less frequently used drugs (0.1%).

Syphilis

Background

Syphilis, a genital ulcerative disease, causes significant complications if untreated and facilitates the transmission of HIV infection. Untreated early syphilis in pregnant women results in perinatal death in up to 40% of cases and, if acquired during the 4 years before pregnancy, can lead to infection of the fetus in 80% of cases.[1]

The rate of P&S syphilis reported in the United States decreased during the 1990s; in 2000, the rate was the lowest since reporting began in 1941 (Figure 29). The low rate of P&S syphilis and the concentration of the majority of syphilis cases in a small number of geographic areas in the United States led to the development of CDC's *National Plan to Eliminate Syphilis*, which was announced by the Surgeon General in October 1999 and revised in May 2006.[2]

Although the rate of P&S syphilis in the United States declined 89.7% during 1990–2000, the rate increased annually during 2001–2009 before decreasing in 2010 and remaining unchanged during 2011. During 2012, rates again increased (to 5.0 cases per 100,000 population). Overall increases in rates were observed primarily among men (increasing from 8.1 cases (in 2011) to 9.3 cases (in 2012) per 100,000 population). After persistent declines during 1992–2003, the rate among women increased from 0.8 cases (in 2004) to 1.5 cases (in 2008) per 100,000 population, declining to 0.9 cases per 100,000 population in 2011 and 2012.

Syphilis remains a major health problem with increases persisting among men who have sex with men (MSM). Cases among MSM have been characterized by high rates of HIV co-infection and high-risk sexual behaviors.[3–7] The estimated proportion of P&S syphilis cases attributable to MSM increased from 7% in 2000 to 64% in 2004.[8,9] In 2005, CDC requested that all state health departments report the sex of sex partners for persons with syphilis. Of reported male cases with P&S syphilis, sex of sex partner information in 2012 was available for 82%. In 2012, 49 states and the District of Columbia provided information about sex of sex partners. Among cases of P&S syphilis for whom sex of partner was known, MSM accounted for 75% of P&S syphilis cases.

Syphilis—All Stages (P&S, Early Latent, Late, Late Latent, and Congenital)

During 2011–2012, the number of cases of early latent syphilis reported to CDC increased 10.4% (from 13,136 cases to 14,503 cases), and the number of cases of late and late latent syphilis increased 4.5% (from 18,576 cases to 19,411 cases) (Tables 1, 37, and 39). The total number of cases of syphilis (P&S, early latent, late, late latent, and congenital) reported to CDC increased 8.4% (from 46,040 cases to 49,903 cases) during 2011–2012 (Table 1).

P&S Syphilis—United States

P&S syphilis cases reported to CDC increased from 13,970 in 2011 to 15,667 in 2012, an increase of 12.1%. The rate of P&S syphilis in the United States increased from 4.5 to 5.0 (an 11.1% increase) during 2011– 2012 (Table 1).

P&S Syphilis by Region

The South accounted for 43.5% of P&S syphilis cases in 2012 and 44.1% in 2011. During 2011–2012, rates increased 11.3% in the South (from 5.3 to 5.9 cases per 100,000 population), 15.8% in the Northeast (from 3.8 to 4.4 cases), 3.1% in the Midwest (from 3.2 to 3.3 cases), and 18.4% in the West (from 4.9 to 5.8 cases) (Figure 33, Table 27).

P&S Syphilis by State

In 2012, the 15 states and areas (including the District of Columbia) with the highest rates of P&S syphilis accounted for 70% of all U.S. cases of P&S syphilis. The rate of P&S syphilis in 11 of these 15 states and areas (including the District of Columbia) exceeded the national rate of 5.0 cases per 100,000 population; 9 of these 15 states and areas (including the District of Columbia) were in the South (Figure 33, Table 26).

P&S Syphilis by Metropolitan Statistical Area

The rate of P&S syphilis in 2012 for the 50 most populous MSAs (7.2 cases per 100,000 population) (Table 30) exceeded the overall rate for the United States (5.0 cases) (Table 27). The rate increased in 31 of these 50 MSAs (62%) during 2011–2012.

P&S Syphilis by County

In 2012, 2,123 of 3,142 counties (67.6%) in the United States reported no cases of P&S syphilis, compared with 2,154 counties (68.5%) in 2011 (Figure 34). In 2012, half of the total number of P&S syphilis cases was reported from 26 counties and two cities (Table 33).

P&S Syphilis by Sex

The rate of P&S syphilis increased 14.8% among men (from 8.1 to 9.3 cases per 100,000 men) during 2011–2012 (Figure 31, Table 29). During this same period, the rate among women remained unchanged (0.9 cases per 100,000 women) (Figure 31, Table 28).

P&S Syphilis by Age Group

In 2012, the rate of P&S syphilis was highest among persons aged 20–24 years and 25–29 years (14.8 and 13.7 cases per 100,000 population, respectively) (Table 35).

Rates were highest among men 20–29 years, increasing 11.0% (from 22.8 to 25.3 cases) among men 20–24 years and 15.6% (from 21.2 to 24.5 cases) among men 25–29 years during 2012 (Figures 35 and 37, Table 35). This marks the fifth consecutive year that rates of P&S syphilis among men have been highest among men aged 20–29 years (Table 35). During this time period (2008–2012), rates have increased among men aged 20–24 years by 46.2% (from 17.3 to 25.3 cases) and among men aged 25–29 years by 45.0% (from 16.9 to 24.5 cases). These data indicate a shift since 2006, when the highest rates were in men aged 35–39 years.

Rates increased among women aged 20–24 years and 45–54 years (from 3.7 to 3.9 and from 0.5 to 0.6 cases per 100,000 population, respectively). Rates remained the same or decreased for women of all other age groups. Rates remained highest among women aged 20–24 years (Figures 35 and 36, Table 35).

P&S Syphilis by Race/Ethnicity

In 2012, among the 48 jurisdictions (47 states and the District of Columbia) that submitted data in the new race and ethnic categories according to the revised Office of Management and Budget (OMB) standards, rates of P&S syphilis remained highest among blacks (16.4 cases per 100,000 population) (Table 36B). The rate among blacks was 6.1 times the rate among whites (2.7 cases per 100,000 population). The rate among American Indians/Alaska Natives (2.9) was 1.1 times that of whites, the rate among Native Hawaiians/Other Pacific Islanders (8.4) was 3.1 times that of whites, the rate among Hispanics (5.7) was 2.1 times that of whites, and the rate among Asians (2.0) was 0.7 times that of whites (Table 36B).

During 2008–2012, among the 39 jurisdictions (38 states and the District of Columbia) that submitted data in the new race and ethnic categories for all five years during that period, the rate of P&S syphilis increased 40.9% among Hispanics (from 4.2 to 5.9 cases per 100,000 population), 21.4% among non-Hispanic whites (from 2.4 to 2.9 cases per 100,000 population), 17.8% among American Indians/Alaska Natives (from 2.9 to 3.4 cases per 100,000 population), 55.6% among Asians (from 1.4 to 2.1 cases per 100,000 population), 57.6% among Native Hawaiian or Other Pacific Islanders (from 5.4 to 8.5 cases per 100,000 population), and 188.9% among Multirace individuals (from 0.7 to 1.9 cases per 100,000 population) (Figure 38). The rate decreased 0.7% among non-Hispanic blacks (from 17.1 to 16.9 cases per 100,000 population). Non-Hispanic blacks, non-Hispanic whites, and Hispanics comprised 94.5% of reported cases in 2008 and 93.8% of reported cases in 2012.

P&S Syphilis by Sex and Sex Behavior

The male-to-female rate ratio for P&S syphilis rates rose steeply during 2000–2003 (from 1.5 to 5.3), and again during 2008–2012 (from 5.0 to 10.3), reflecting higher rates in men than women (Figure 31). In 2012, this ratio was almost double the ratio of 2003, and almost seven times the ratio of 2000.

In 2005, CDC began collecting information on the sex partners of patients with P&S syphilis. In 2012, this information was available for 82% of male cases. During 2007–2012, 33 areas reported sex of partner data for at least 70% of cases each year during this time period (Figure 30). During 2007–2008 in these areas, increases in cases occurred among women, men having sex with women only (MSW), and MSM. During 2008–2012 in these areas, cases among women and MSW declined 24% (from 1,364 to 1,034 cases) and 15% (from 1,884 to 1,600 cases), respectively, while cases among MSM increased 46% (from 5,872 to 8,553 cases). During 2011–2012 in these areas, cases increased very slightly among MSW (4%) and women (1%), while cases among MSM increased 15% (from 7,422 cases in 2011 to 8,553 cases in 2012)—a larger increase than in previous years. (In these areas, cases among MSM increased 6% during 2008–2009 (from 5,872 to 6,243), 10% during 2009–2010 (from 6,243 to 6,870 cases), and 8% during 2010–2011 (from 6,870 to 7,422 cases).) In 2012, among MSW with

P&S syphilis, 39.2% had primary syphilis, and 60.8% had secondary syphilis. Among women with P&S syphilis, 18.6% had primary syphilis, and 81.4% had secondary syphilis. Among MSM, 27.2% had primary syphilis, and 72.8% had secondary syphilis (Figure 39).Among women with P&S syphilis, 18.1% were white, 65.2% were black, 13.2% were Hispanic, and 2.5% were of other races/ethnicities. Among MSW, 20.4% were white, 55.9% were black, 19.2% were Hispanic, and 2.8% were of other races/ethnicities. Among MSM, 37.9% were white, 34.4% were black, 21.1% were Hispanic, and 4.5% were of other races/ethnicities (Figure 40).

P&S Syphilis by Race/Ethnicity and Sex

In 2012, among the 48 jurisdictions (47 states and the District of Columbia) that submitted data in the new race and ethnic categories according to OMB standards, rates of P&S syphilis among men were highest among non-Hispanic black men (28.9 cases per 100,000 population), followed by Native Hawaiian or Other Pacific Islander (14.9 cases per 100,000 population), Hispanic (10.4 cases per 100,000 population), American Indians/Alaska Natives (5.3 cases per 100,000 population), non-Hispanic white (5.1 cases per 100,000 population), Asian (4.0 cases per 100,000 population) and Multirace (3.8 cases per 100,000 population) men (Figure P, Table 36B).

In 2012, among the 48 jurisdictions (47 states and the District of Columbia) that submitted data in the new race and ethnic categories according to OMB standards, rates of P&S syphilis among women were highest among non-Hispanic black women (4.9 cases per 100,000 population), followed by Native Hawaiian or Other Pacific Islander (1.6 cases per 100,000 population), Hispanic (0.8 cases per 100,000 population), American Indian/Alaska Native (0.7 cases per 100,000 population), non-Hispanic white (0.3 cases per 100,000 population), Multirace (0.2 cases per 100,000 population) and Asian (0.1 cases per 100,000 population) women (Figure P, Table 36B).

P&S Syphilis by Race/Ethnicity, Age, and Sex

In 2012, among the 48 jurisdictions (47 states and the District of Columbia) that submitted data in the new race and ethnic categories according to OMB standards, the rate of P&S syphilis among non-Hispanic blacks remained highest among women aged 20–24 years (19.1 cases per 100,000 women) and among men aged 20–24 years and 25–29 years (96.7 and 89.2 cases per 100,000 men, respectively). For Hispanics, the rate was highest among women aged 20–24 years and 25–29 years (2.1 and 2.0 cases per 100,000 women, respectively), and among men aged 20–24 years and 25–29 years (24.3 and 23.2 cases per 100,000 men, respectively). For non-Hispanic whites, the rate was highest among women aged 20–24 years (1.1 cases per 100,000 women) and among men aged 25–29 years and 30–34 years (10.8 cases per 100,000 men for both groups) (Table 36B).

For Asians, the rate was highest among women aged 15–19 years and 20–24 years (0.8 cases per 100,000 women for both groups) and among men aged 25–29 years (10.3 cases per 100,000 men). For American Indians/Alaska Natives, the rate was highest among women aged 20–24 years (3.5 cases per 100,000 women) and among men aged 20–24 years (17.9 cases per 100,000 men). For Native Hawaiian or Other Pacific Islanders, the rate was highest among women aged 20–24 years (9.0 cases per 100,000 women) and among men aged 25–29 years (34.8 cases per 100,000 men). For Multirace individuals, rates were highest among women aged 35–39 years (1.5 cases per 100,000 women) and among men aged 30–34 years (11.7 cases per 100,000 men) (Table 36B).

In some age groups, particularly young men aged 20–24 years and 25–29 years, wide disparities in rates of P&S syphilis have occurred in recent years.[9,10] During 2007–2011, rates among black men aged 20–24 years increased from 54.9 to 96.2 cases per 100,000 population (75%). In 2012, rates among men aged 20–24 years and 25–29 years remained highest among blacks (96.7 cases and 89.2 cases per 100,000 population, respectively). These rates were 10.6 and 8.3 times (respectively) the rate of white men of the same age groups. The 2012 rate among Hispanic men aged 20–24 years is almost double the 2007 rate (24.3 versus 14.4 cases per 100,000 population, respectively), and is 2.7 times the rate of white men aged 20–24 years (9.1 cases per 100,000 population).

These disparities in syphilis rates among young men are of particular concern given data indicating increasing HIV incidence among young men.[11, 12]

P&S Syphilis by Reporting Source

In 1990, 25.6% of P&S syphilis cases were reported from sources other than STD clinics; this figure increased to 39.2% in 1998. During 1998–2012, the proportion of cases reported from sources other than STD clinics increased from 39.2% to 68.1% (Figure 41, Table A2). During 2003–2012, the number of

cases among males reported from non-STD clinic sources increased steadily, while the number reported from STD clinics increased slightly by comparison (Figure 41).

In 2012, patients with P&S syphilis usually sought care from private physicians or STD clinics. Similar proportions of cases among women and MSM were reported from private physicians and STD clinics, while substantially more cases among MSW were reported from STD clinics than from private physicians (Figure 42).

Congenital Syphilis—United States

After an 18% increase in the rate of congenital syphilis during 2006–2008, the rate of congenital syphilis decreased 25% during 2008–2012 (from 10.4 to 7.8 cases per 100,000 live births) (Table 42). In 2012, a total of 322 cases were reported, a decrease from 358 cases in 2011, 387 cases in 2010, and 431 cases in 2009. This recent decrease in the rate of congenital syphilis is associated with the decrease in the rate of P&S syphilis among women that has occurred since 2008 (Figure 43). The 2012 rate of congenital syphilis (7.8 cases per 100,000 live births) marks the lowest rate of congenital syphilis recorded since 1988, when the case definition was changed.

Syphilis among Special Populations

More information about syphilis and congenital syphilis in racial and ethnic minority populations, adolescents, MSM, and other populations at higher risk can be found in the Special Focus Profiles.

Syphilis Summary

In recent years, young MSM have accounted for an increasing proportion of syphilis cases in the United States.[9, 10] According to information reported from 49 states and the District of Columbia, 75% of P&S syphilis cases are among MSM. Although the majority of U.S. syphilis cases have occurred among MSM, transmission among MSW and women continues to occur in certain jurisdictions.

1 Ingraham NR. The value of penicillin alone in the prevention and treatment of congenital syphilis. Acta Derm Venereol. 1951:31(Suppl 24):60-88.

2 Centers for Disease Control and Prevention. The national plan to eliminate syphilis from the United States. Atlanta: U.S. Department of Health and Human Services; 2006.

3 Centers for Disease Control and Prevention. Resurgent bacterial sexually transmitted disease among men who have sex with men — King County, Washington, 1997–1999. MMWR Morb Mortal Wkly Rep. 1999;48:773-7.

4 Centers for Disease Control and Prevention. Outbreak of syphilis among men who have sex with men — Southern California, 2000. MMWR Morb Mortal Wkly Rep. 2001;50(7):117-20.

5 Centers for Disease Control and Prevention. Primary and secondary syphilis among men who have sex with men — New York City, 2001. MMWR Morb Mortal Wkly Rep. 2002;51:853-6.

6 Chen SY, Gibson S, Katz MH, Klausner JD, Dilley JW, Schwarcz SK, et al. Continuing increases in sexual risk behavior and sexually transmitted diseases among men who have sex with men: San Francisco, California, 1999–2001 [Letter] Am J Public Health. 2002;92:1387-8.

7 D'Souza G, Lee JH, Paffel JM. Outbreak of syphilis among men who have sex with men in Houston, Texas. Sex Transm Dis. 2003;30:872-3.

8 Centers for Disease Control and Prevention. Primary and secondary syphilis — United States, 2003–2004. MMWR Morb Mortal Wkly Rep. 2006;55:269-73.

9 Heffelfinger JD, Swint EB, Berman SM, Weinstock HS. Trends in primary and secondary syphilis among men who have sex with men in the United States. Am J Public Health. 2007;97:1076-83.

10 Su JR, Beltrami JF, Zaidi AA, Weinstock HS. Primary and secondary syphilis among black and Hispanic men who have sex with men: case report data from 27 States. Ann Intern Med. 2011;155(3):145-51.

11 Centers for Disease Control and Prevention. Trends in HIV/AIDS diagnoses among men who have sex with men — 33 States, 2000–2006. MMWR Morb Mortal Wkly Rep. 2008; 57:681–686.

12 Brewer TH, Schillinger J, Lewis FM, Blank S, Pathela P, Jordahl L, et al. Infectious syphilis among adolescent and young adult men: implications for human immunodeficiency virus transmission and public health interventions. Sex Transm Dis. 2011 May;38(5):367-71.

Figure 29. Syphilis—Reported Cases by Stage of Infection, United States, 1941 – 2012

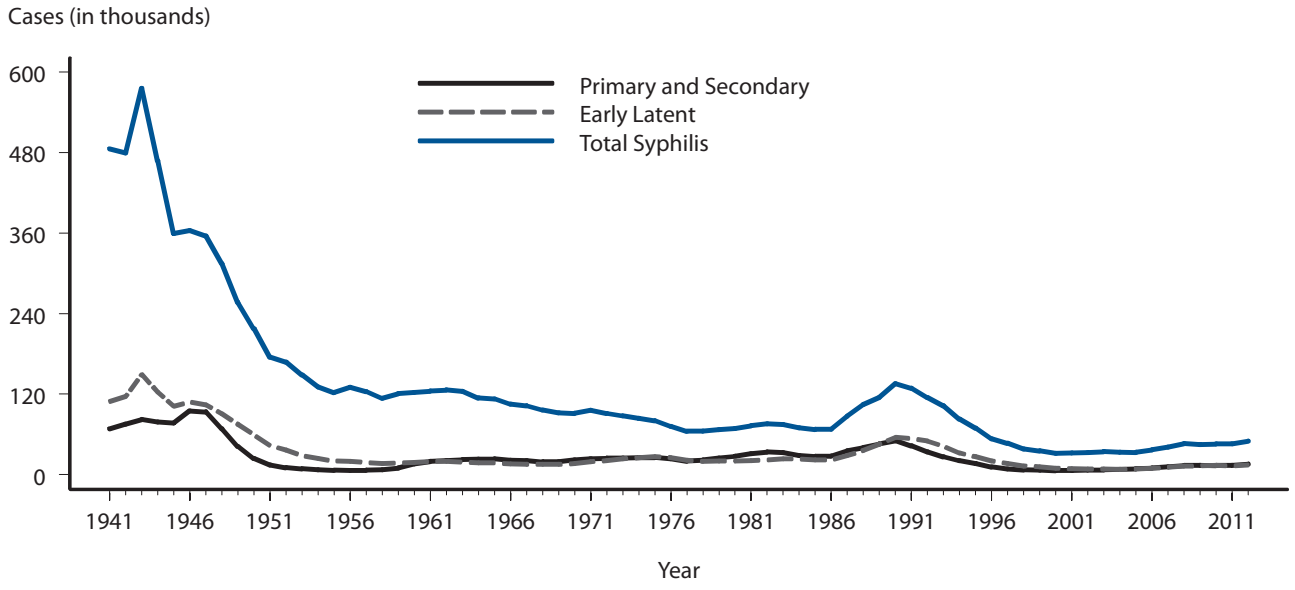
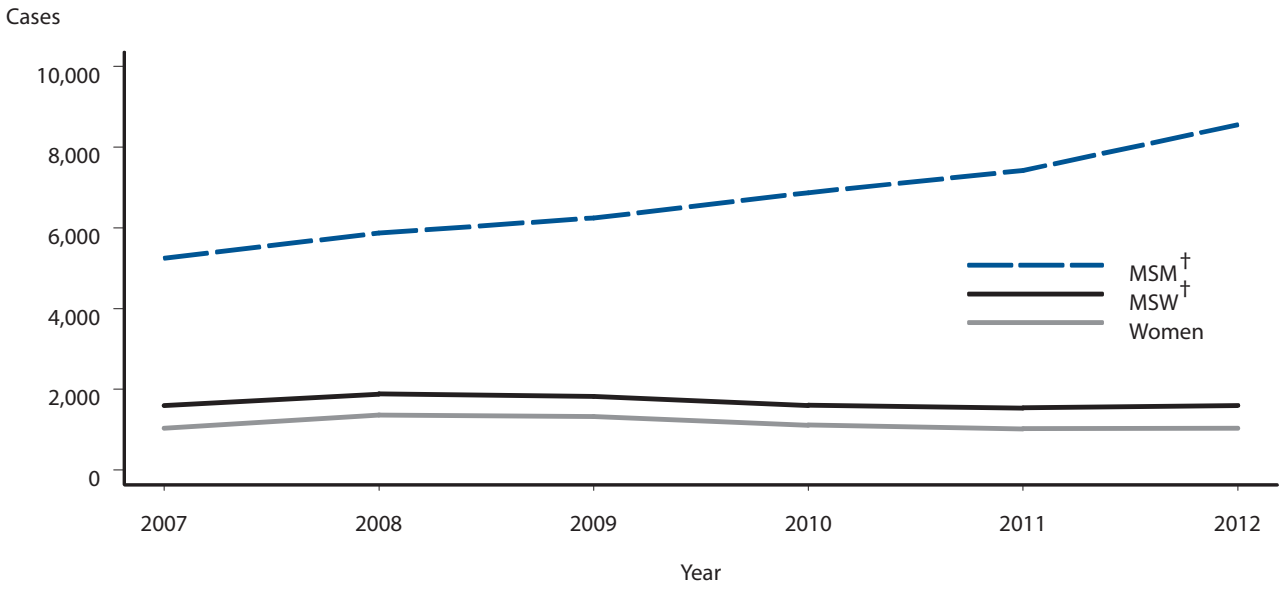


Figure 30. Primary and Secondary Syphilis — by Sex and Sexual Behavior, 33 areas*, 2007 – 2012



* 32 states and Washington, DC reported sex of partner data for ≥70% of reported cases of P&S syphilis for each year during 2007–2012.
† MSM = men who have sex with men; MSW = men who have sex with women only.

Figure 31. Primary and Secondary Syphilis — Rates by Sex and Male-to-Female Rate Ratios, United States, 1990 – 2012

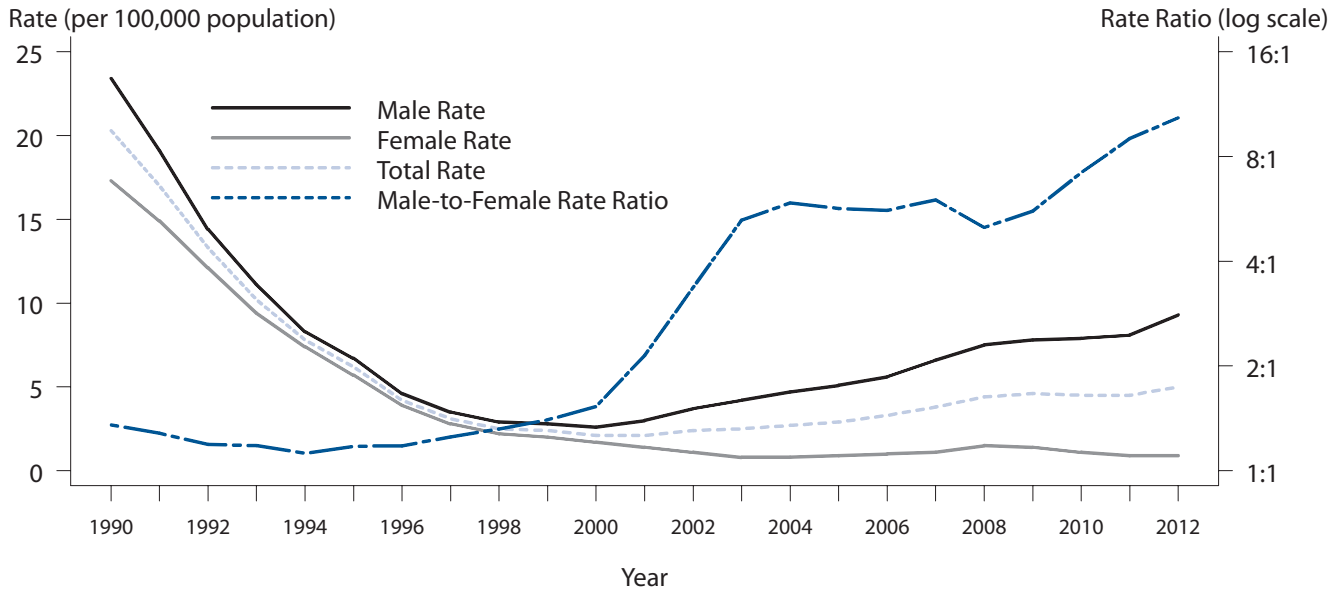


Figure 32. Primary and Secondary Syphilis—Rates by Region, United States, 2003 – 2012

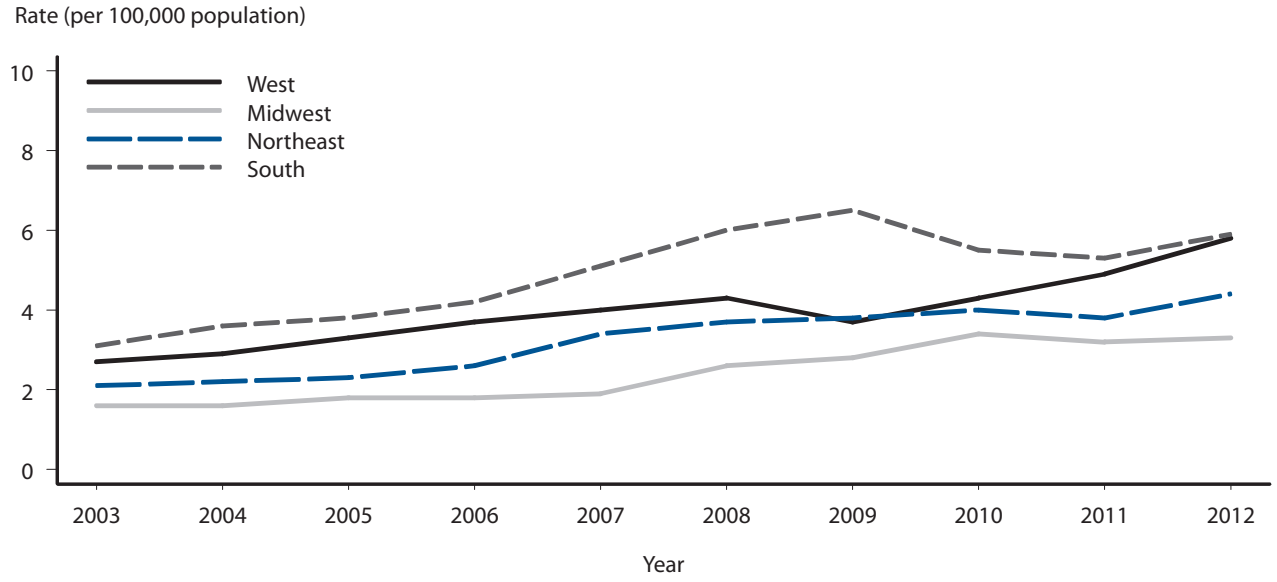
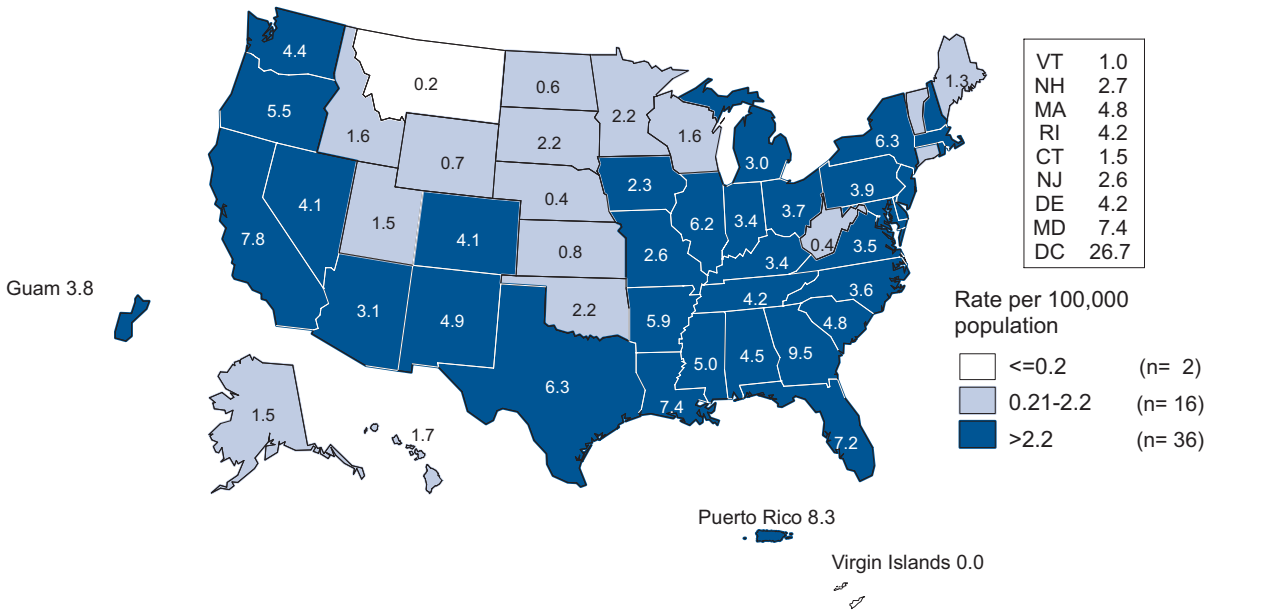
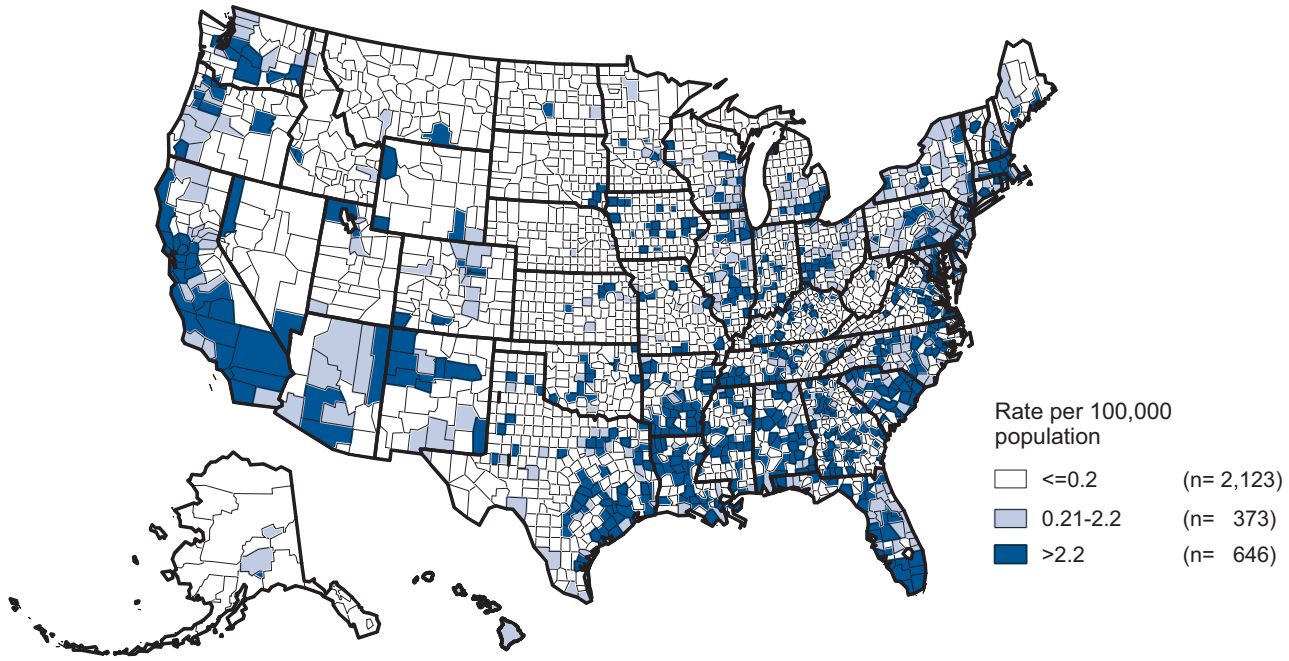


Figure 33. Primary and Secondary Syphilis—Rates by State, United States and Outlying Areas, 2012



NOTE: The total rate of primary and secondary syphilis for the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 5.1 per 100,000 population.

Figure 34. Primary and Secondary Syphilis—Rates by County, United States, 2012



NOTE: In 2012, 2,123 (67.6%) of 3,142 counties in the United States reported no cases of primary and secondary syphilis.

Figure 35. Primary and Secondary Syphilis—Rates by Age and Sex, United States, 2012

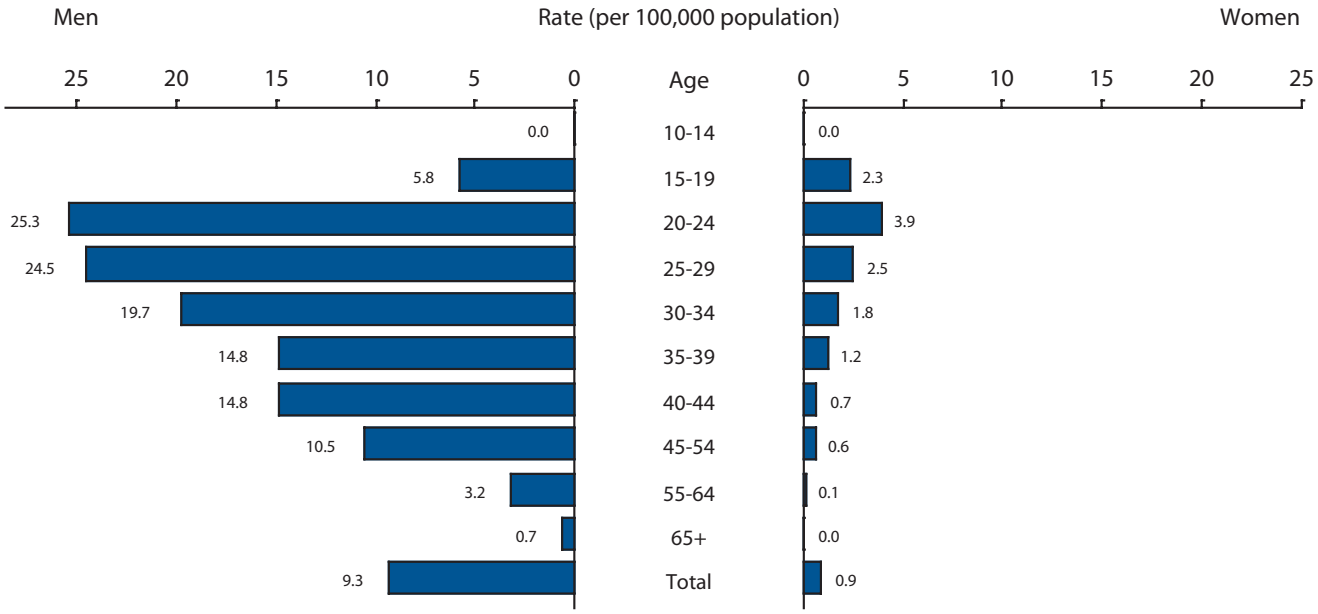


Figure 36. Primary and Secondary Syphilis — Rates by Age Among Women Aged 15 – 44 Years, United States, 2003 – 2012

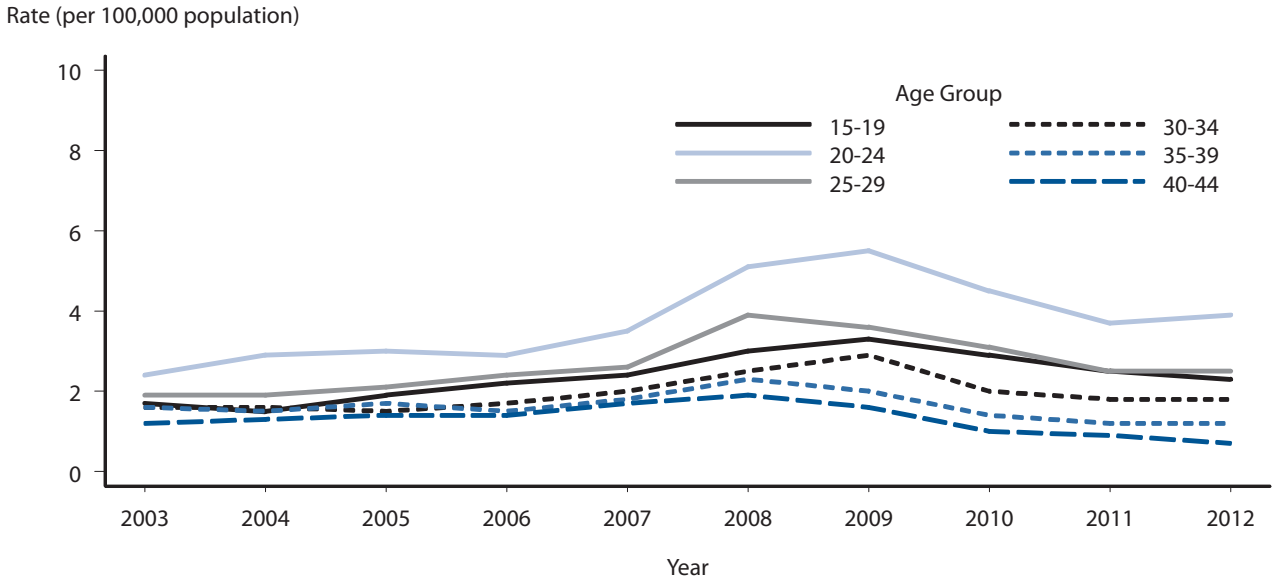


Figure 37. Primary and Secondary Syphilis — Rates by Age Among Men Aged 15 – 44 Years, United States, 2003 – 2012

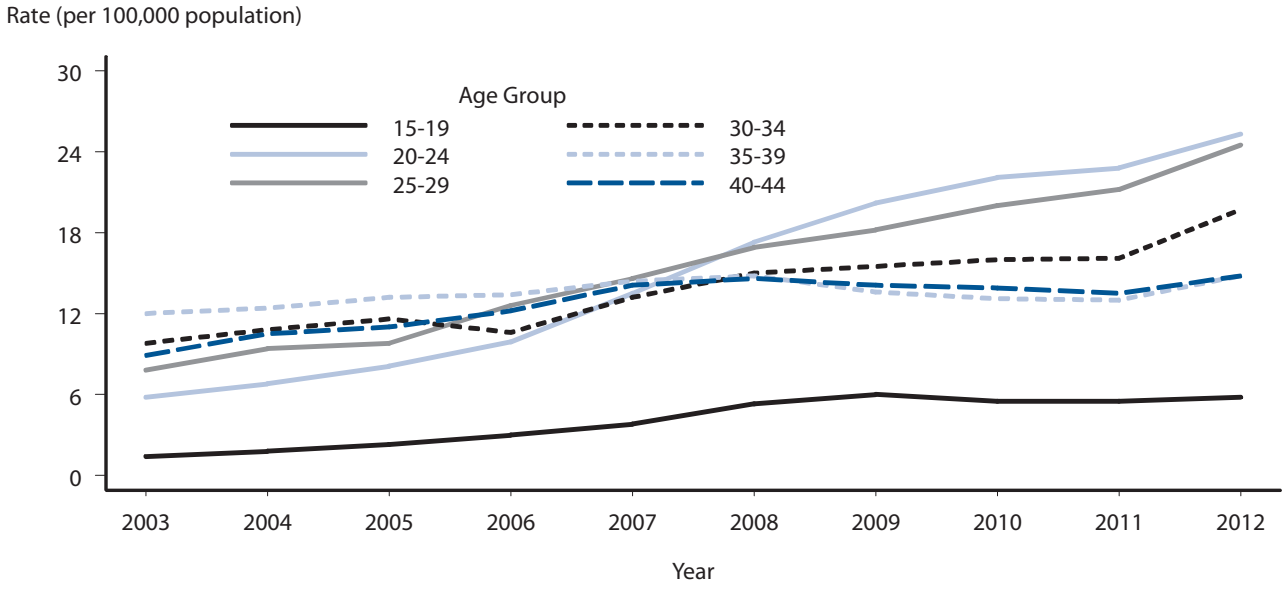
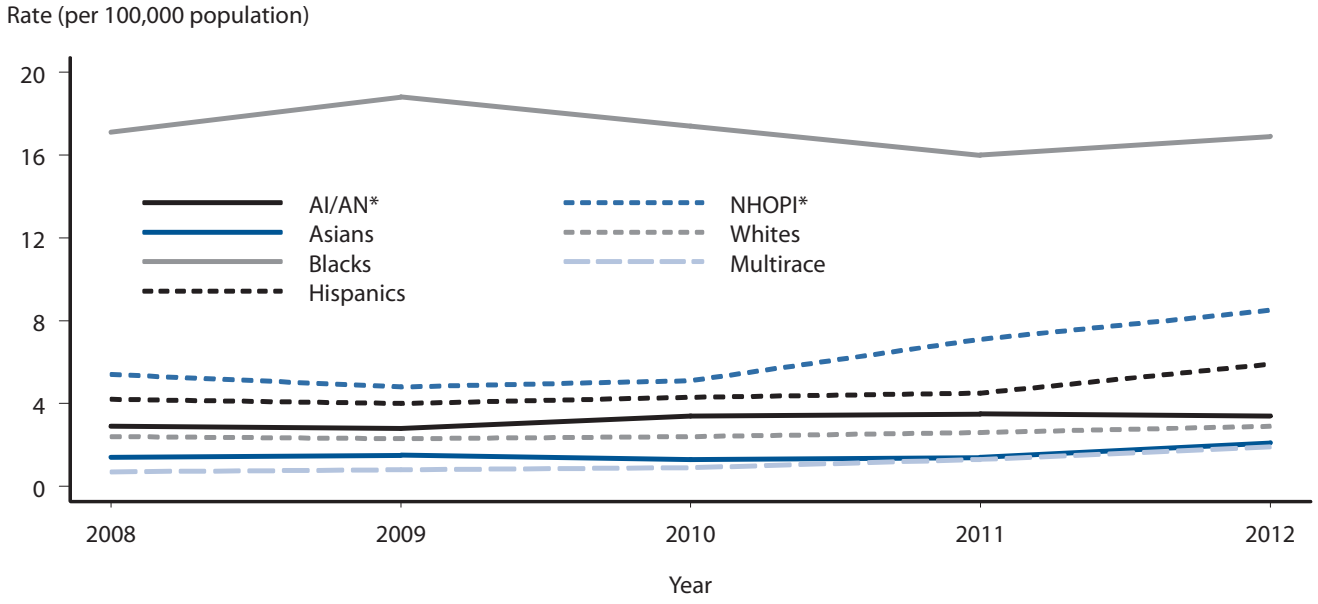
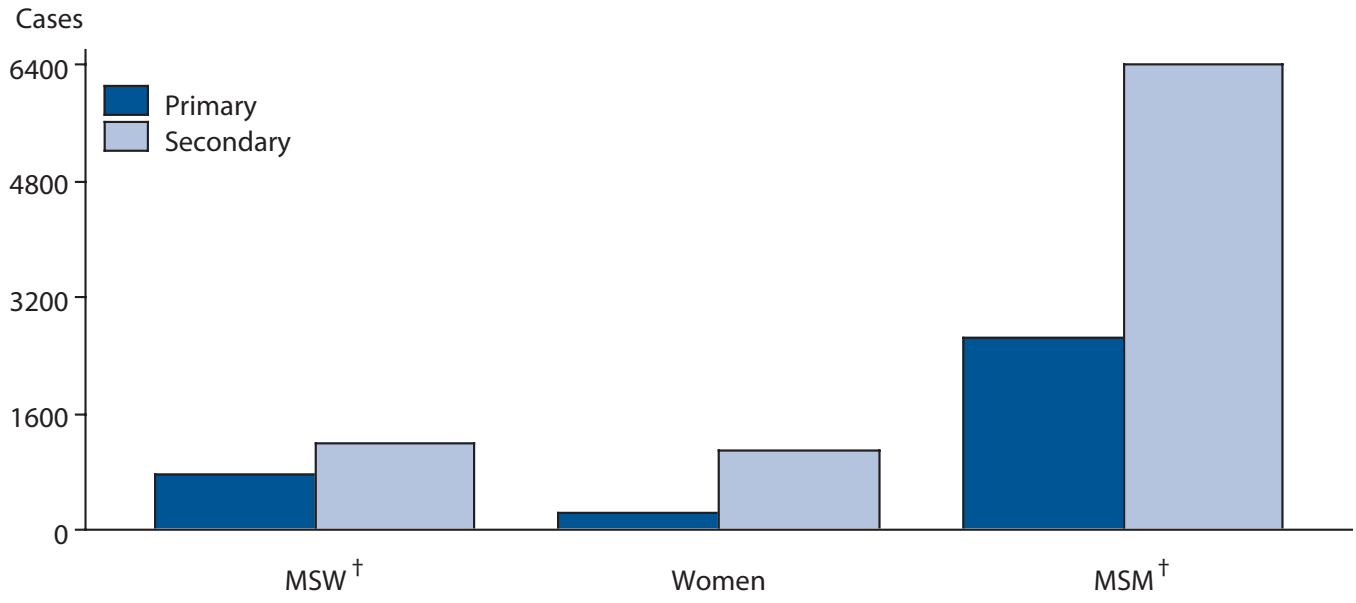


Figure 38. Primary and Secondary Syphilis — Rates by Race/Ethnicity, United States, 2008 – 2012



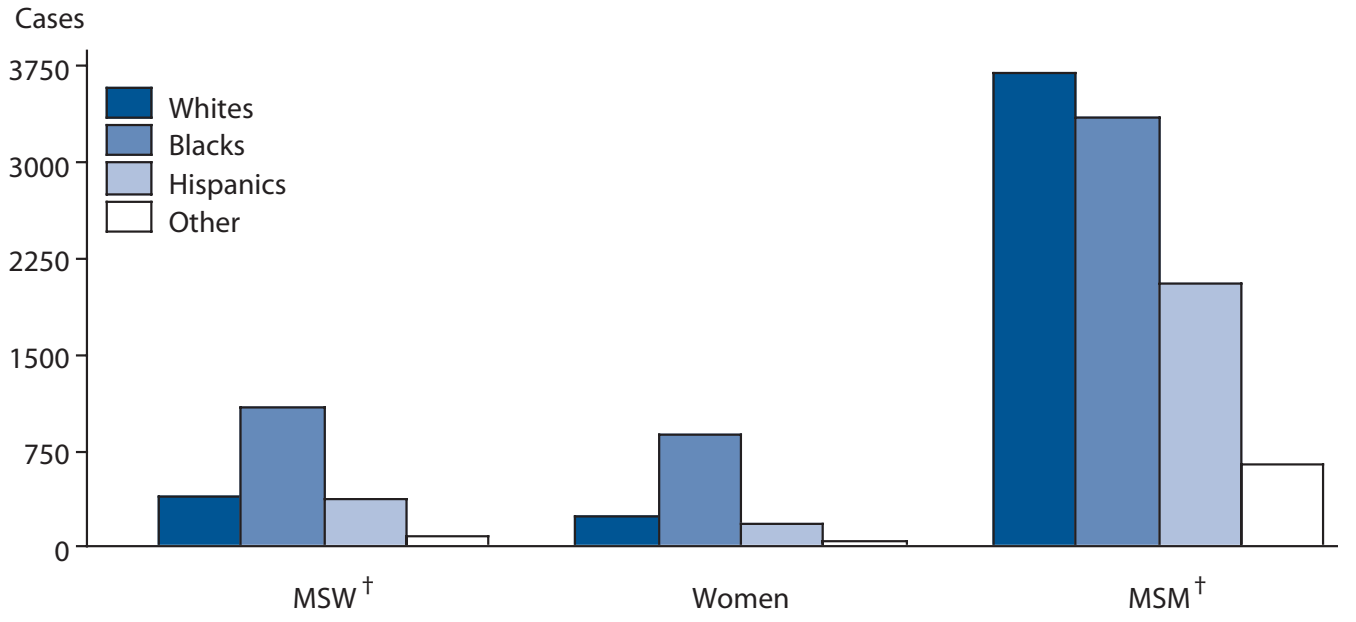
* AI/AN = American Indians/Alaska Natives; NHOPI = Native Hawaiian and Other Pacific Islanders.
NOTE: Includes 38 states and the District of Columbia reporting race/ethnicity data in Office of Management and Budget compliant formats during 2008–2012 (see Appendix "Interpreting STD Surveillance Data").

Figure 39. Primary and Secondary Syphilis — Reported Cases* by Stage, Sex, and Sexual Behavior, 2012



* Of the reported male cases of primary and secondary syphilis, 17.4% were missing sex of sex partner information.
† MSW = men who have sex with women only; MSM = men who have sex with men.

Figure 40. Primary and Secondary Syphilis—Reported Cases* by Sex, Sexual Behavior, and Race/Ethnicity, United States, 2012



* Of the reported male cases of primary and secondary syphilis, 17.4% were missing sex of sex partner information; 2.0% of reported male cases with sex of sex partner data were missing race/ethnicity data.
† MSW = men who have sex with women only; MSM = men who have sex with men.

Figure 41. Primary and Secondary Syphilis — Reported Cases by Reporting Source and Sex, United States, 2003 – 2012

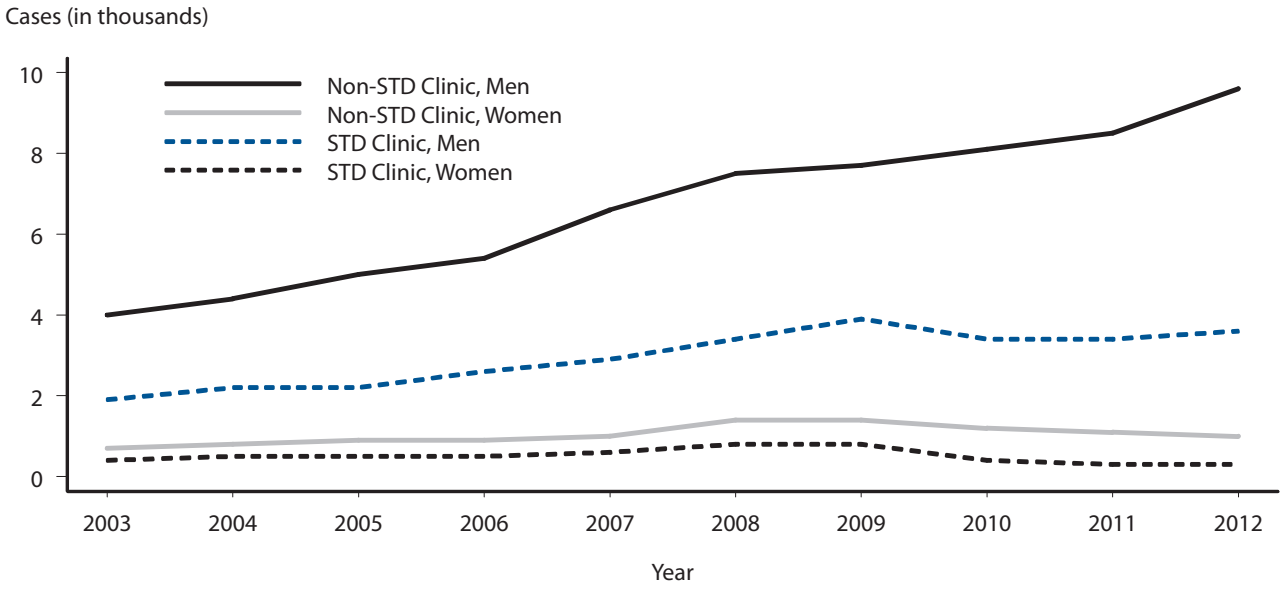
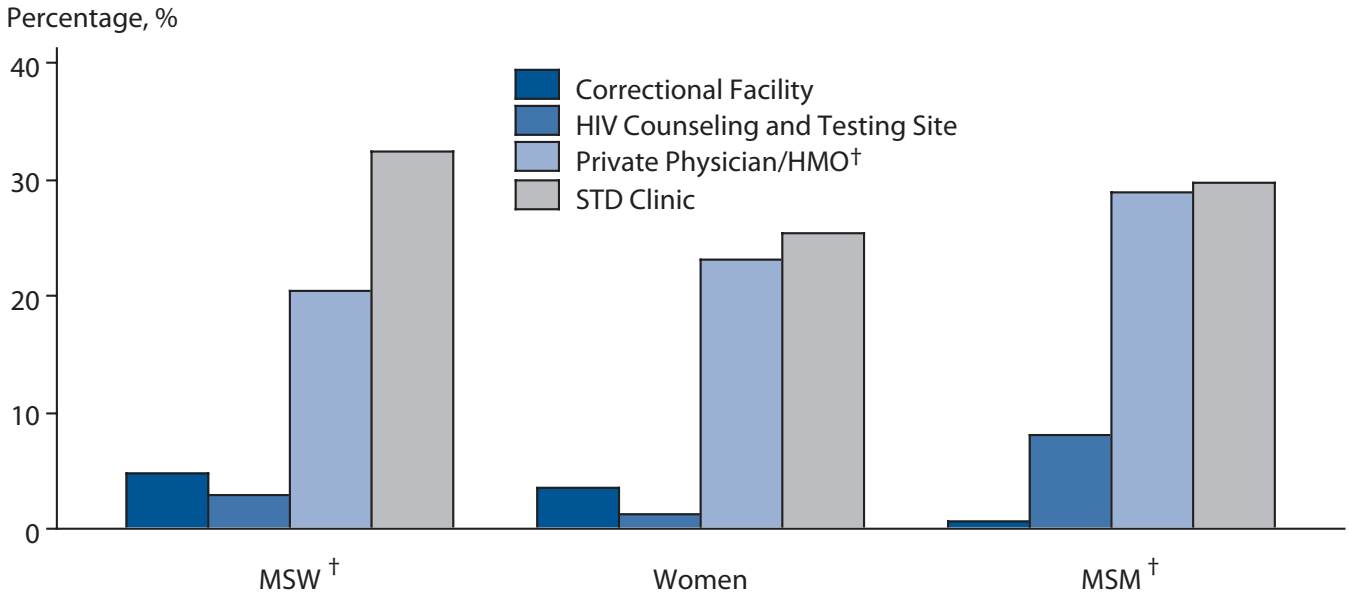


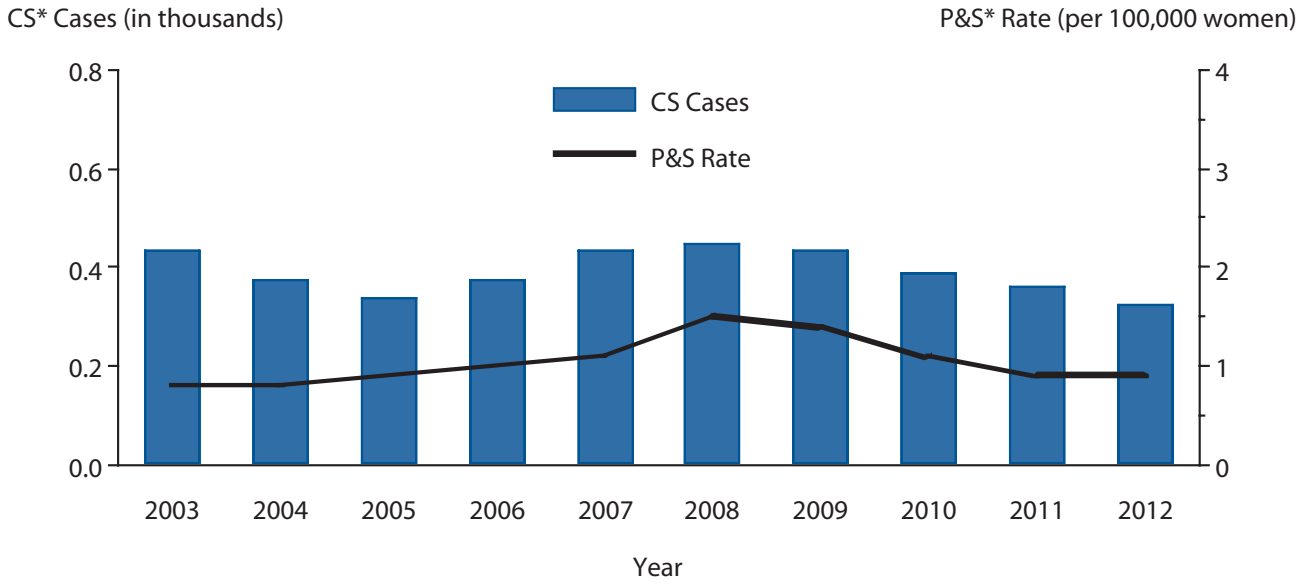
Figure 42. Primary and Secondary Syphilis — Percentage of Reported Cases* by Sex, Sexual Behavior, and Selected Reporting Sources, 2012



* Of the reported male cases of primary and secondary syphilis, 17.4% were missing sex of sex partner information, and 6.2% of reported male cases with sex of sex partner data were missing source of information data.

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

Figure 43. Congenital Syphilis — Reported Cases Among Infants by Year of Birth and Rates of Primary and Secondary Syphilis Among Women, United States, 2003 – 2012



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

Other Sexually Transmitted Diseases

Chancroid

Reported cases of chancroid declined steadily between 1987 and 2001. Since then, the number of reported cases has fluctuated (Figure 44, Table 1). In 2012, a total of 15 cases of chancroid were reported in the United States. Only eight states reported one or more cases of chancroid in 2012 (Table 44).

Although the overall decline in reported chancroid cases most likely reflects a decline in the incidence of this disease, these data should be interpreted with caution because *Haemophilus ducreyi*, the causative organism of chancroid, is difficult to culture; as a result, this condition may be substantially underdiagnosed.[1,2]

Human Papillomavirus

In June 2006, a quadrivalent HPV vaccine was licensed for use in the United States in females aged 9–26 years;[3] in October 2009, this vaccine also was licensed for use in males aged 9–26 years.[4] This vaccine provides protection against HPV types 6, 11, 16, and 18. HPV 6 and 11 are responsible for about 90% of anogenital warts,[5,6] while HPV 16 and 18 are high-risk oncogenic types that cause approximately 70% of cervical cancers worldwide.[7,8] In October 2009, a bivalent HPV vaccine that provides protection against types 16 and 18 was licensed for use in females aged 10–25 years.[9]

HPV vaccine uptake in the US is relatively low. In 2012, a national survey found that 54% of girls aged 13-17 years had received at least 1 dose of the HPV vaccine series, but only 33% had received all 3 doses in the series.[10] Vaccine uptake is very low among boys.[11]

Sentinel surveillance for cervical infection with high-risk HPV types 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, or 68 was conducted from 2003 through 2005 in 26 STD, family planning, and primary care clinics in 6 locations (Boston, Baltimore, New Orleans, Denver, Seattle, and Los Angeles). Testing was performed using a commercially available test for high-risk HPV DNA (Hybrid Capture 2, Qiagen). Overall prevalence of high-risk HPV was 23% (95% confidence interval [CI]: 22-24). Age- and city-adjusted prevalence was 26% (95% CI: 24-29) in STD clinics, 24% (95% CI: 22-26) in family planning clinics, and 17% (95% CI: 16-20) in primary care clinics. Prevalence by age group was 35% (95% CI: 32-38) in women aged 14–19 years, 29% (95% CI: 28-30) in those aged 20–29, 13% (95% CI: 12-15) in those aged 30–39, 11% (95% CI: 9-13) in those aged 40–49, and 6% (95% CI: 4-8) in those aged 50–65.[12]

National population-based data were obtained from NHANES to examine the prevalence of both high-risk HPV and low-risk HPV in the civilian, non-institutionalized female population during 2003–2006 (Figure 45). HPV detection and typing were performed using the Research Use Only Linear Array genotyping assay (Roche Diagnostics), resulting in higher HPV prevalence than previously reported for NHANES 2003–2004 data. The overall prevalence of high- and low-risk HPV was 42.5% (95% CI: 40.3–44.7) among females aged 14–59 years.[13] HPV vaccine-preventable low-risk types 6 or 11 or high-risk types 16 or 18 were detected in 8.8% of female participants: HPV 6 in 2.8% (95% CI: 2.2–3.6), HPV 11 in 0.3% (95% CI: 0.2–0.7), HPV 16 in 4.7% (95% CI: 4.0–5.5), and HPV 18 in 1.9% (95% CI: 1.4–2.5).[14] Prevalence of quadrivalent vaccine-type HPV decreased from 11.5% (95% CI: 9.2-14.4) in 2003-2006 to 5.1% (95% CI: 3.8-6.6) in 2007-2010 among females aged 14-19 years, the age group most likely to be affected by introduction of the HPV vaccine, despite low vaccine uptake.[15]

Data from the National Disease and Therapeutic Index (NDTI) suggest that cases of genital warts (Figure 46, Table 45), as measured by initial visits to physicians' offices, may have increased during the late 1990s through 2011; although cases appear to have decreased in 2012, more years of data are needed to discern whether genital warts are declining. Prevalence of genital warts in a large US cohort of individuals with private health insurance significantly declined in 2007 to 2010 among girls aged 15-19.[16] NHANES data for 1999–2004 indicated that 5.6% (95% CI: 4.9–6.4) of sexually active adults aged 18–59 years self-reported a history of a genital wart diagnosis.[17]

For data reported in Figure 47, enhanced behavioral and demographic information on patients who presented for care in 2012 at the 42 clinics participating in the STD Surveillance Network (SSuN) was used. Genital warts were identified by provider

diagnosis or by documentation from the physical examination. Men who have sex with men (MSM) and men who have sex with women only (MSW) were defined by self-report or by sex of reported sex partners. More detailed information about SSuN methodology can be found in the STD Surveillance Network section of the Appendix, Interpreting STD Surveillance Data. The prevalence of genital warts in 2012 is presented separately for MSM, MSW, and women by SSuN site. Prevalence was lowest in women for all sites. Among women the median prevalence of genital warts was 1.6% (range 0.5 to 2.3) across all sites compared to 4.8% (range 2.5 to 7.4) for MSM and 6.0% (range 1.9 to 9.5) for MSW.

Pelvic Inflammatory Disease

For data on pelvic inflammatory disease, see Special Focus Profiles, STDs in Women and Infants.

Herpes Simplex Virus

Case reporting data for genital herpes simplex virus (HSV) are not available. Trend data are based on estimates of initial visits to physicians' offices for this condition from the NDTI (Figure 48, Table 45).

National trend data on the seroprevalence of HSV-2 among those aged 14–49 years from NHANES 2005–2008 were compared with NHANES survey years 1988–1994 and 1999–2004. Seroprevalence decreased from 21.0% (95% CI: 19.1–23.1) in 1988–1994[18] to 17.0% (95% CI: 15.8–18.3) in 1999–2004[18] and 16.2% (95% CI: 14.6–17.9) in 2005–2008.[19] These data, along with data from NHANES survey years 1976–1980,[18] indicate that blacks had higher seroprevalence than whites for each survey period and age group (Figure 49).

Although HSV-2 seroprevalence is decreasing, most persons with HSV-2 have not received a diagnosis. During 2005–2008, the percentage of NHANES survey participants aged 20–49 years infected with HSV-2 who reported a diagnosis of genital herpes was 18.9%.[19] An overall increase in the number of visits for genital herpes over time, as suggested by NDTI data, may indicate increased recognition of infection.

Trichomoniasis

Trend data for this infection are limited to estimates of initial physician office visits from the NDTI (Figure 50, Table 45). NHANES data from 2001–2004 indicated an overall prevalence of 3.1% (95% CI: 2.3–4.3), with the highest prevalence observed among blacks (13.3%) (95% CI: 10.0–17.7).[20]

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Figure 44. Chancroid — Reported Cases by Year, United States, 1981 – 2012

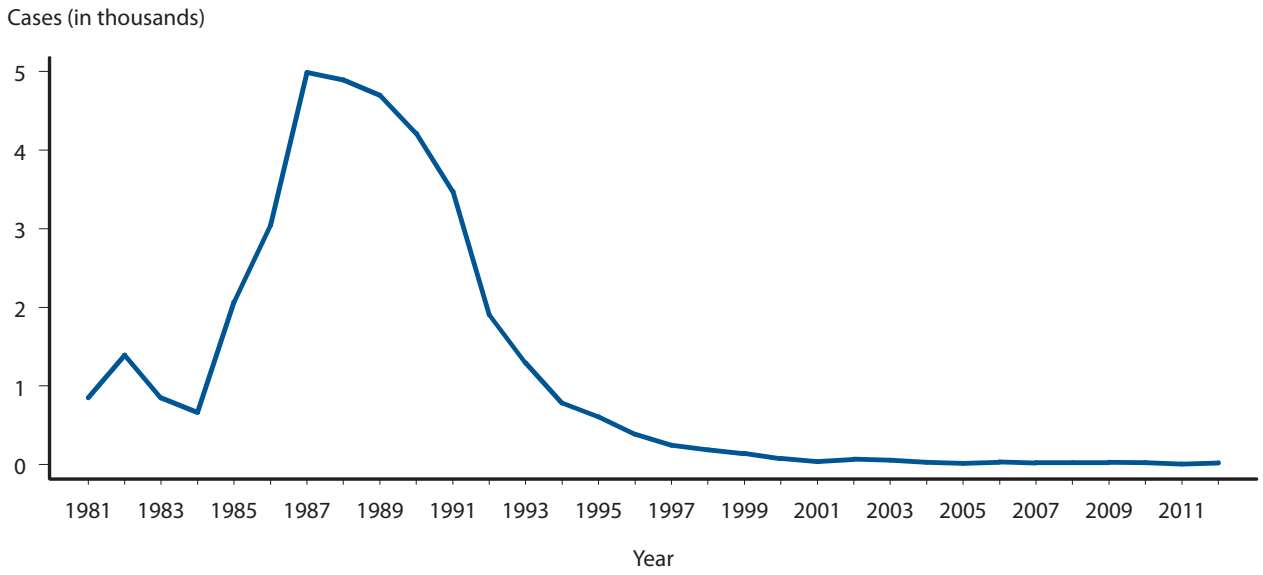
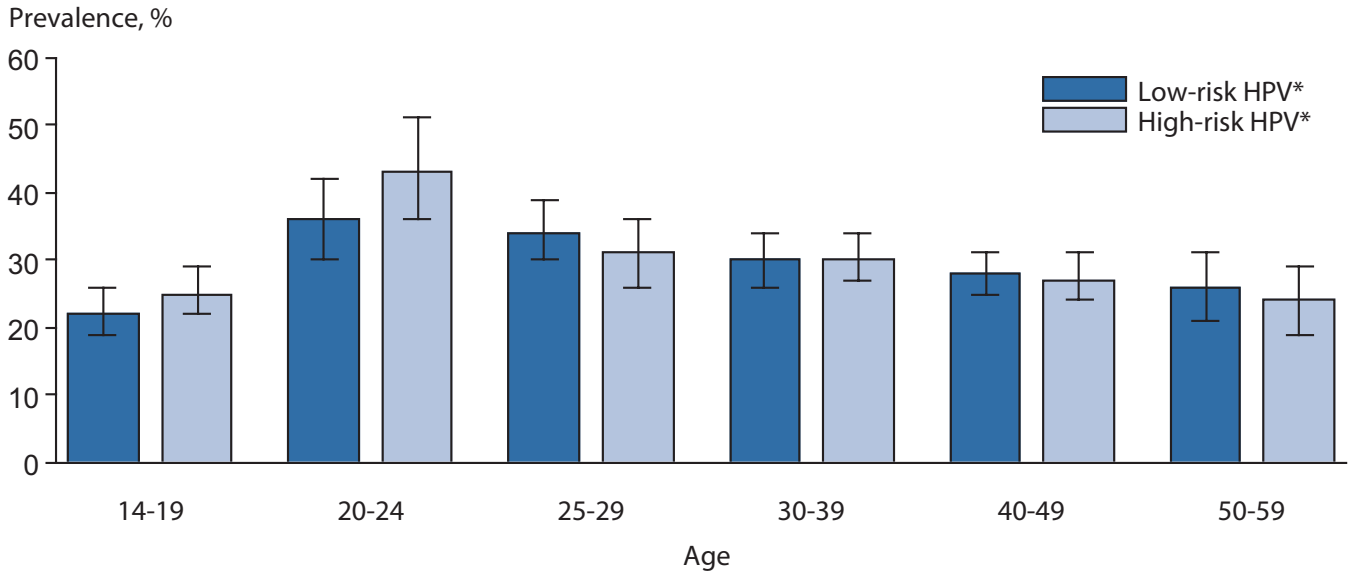
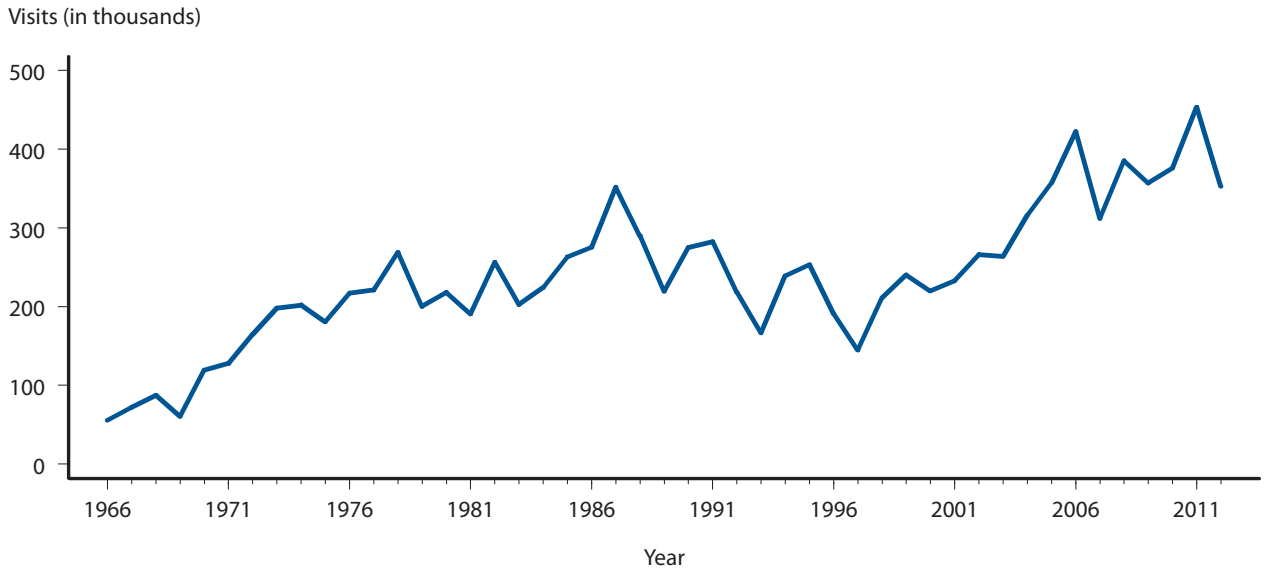


Figure 45. Human Papillomavirus — Prevalence of High-risk and Low-risk Types Among Females Aged 14 – 59 Years, National Health and Nutrition Examination Survey, 2003 – 2006



* HPV = human papillomavirus.
NOTE: Error bars indicate 95% confidence interval. 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 human papillomavirus among females in the United States, the National Health and Nutrition Examination Survey, 2003–2006. J Infect Dis. 2011;204(4):566-73.

Figure 46. Genital Warts — Initial Visits to Physicians' Offices, United States, 1966 – 2012

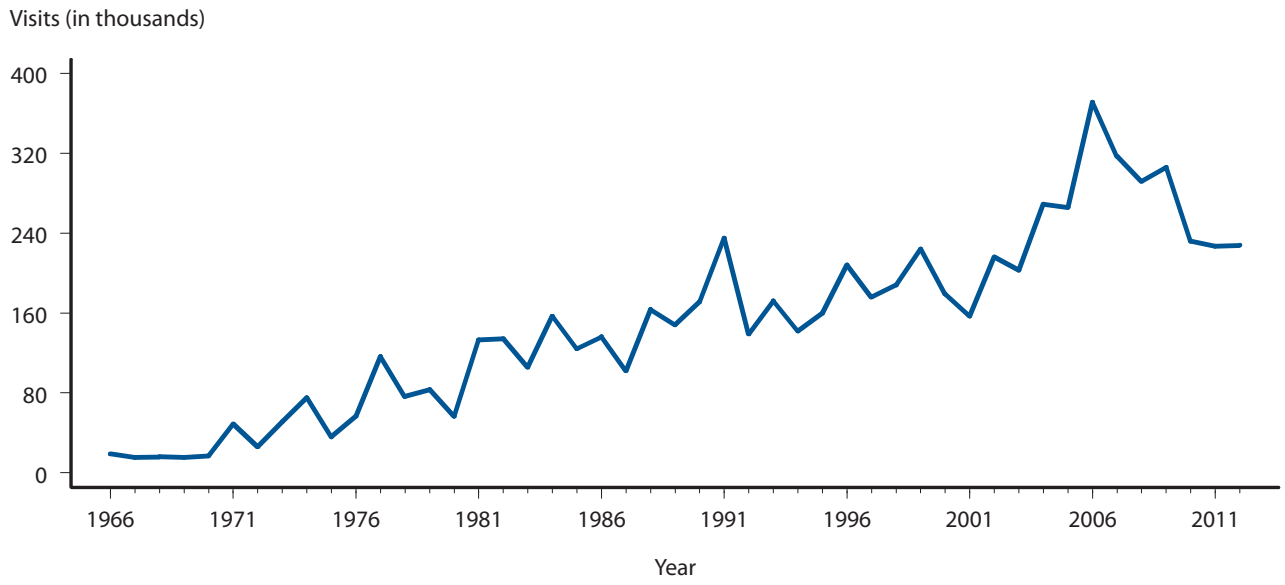


NOTE: The relative standard errors for genital warts estimates of more than 100,000 range from 18% to 30%. See Other Surveillance Data Sources in the Appendix and Table 45.
SOURCE: IMS Health, Integrated Promotional Services™. IMS Health Report, 1966 – 2012.

Figure 47. Genital Warts — Prevalence Among STD Clinic Patients by Sex, Sex of Partners, and Site, STD Surveillance Network (SSuN), 2012

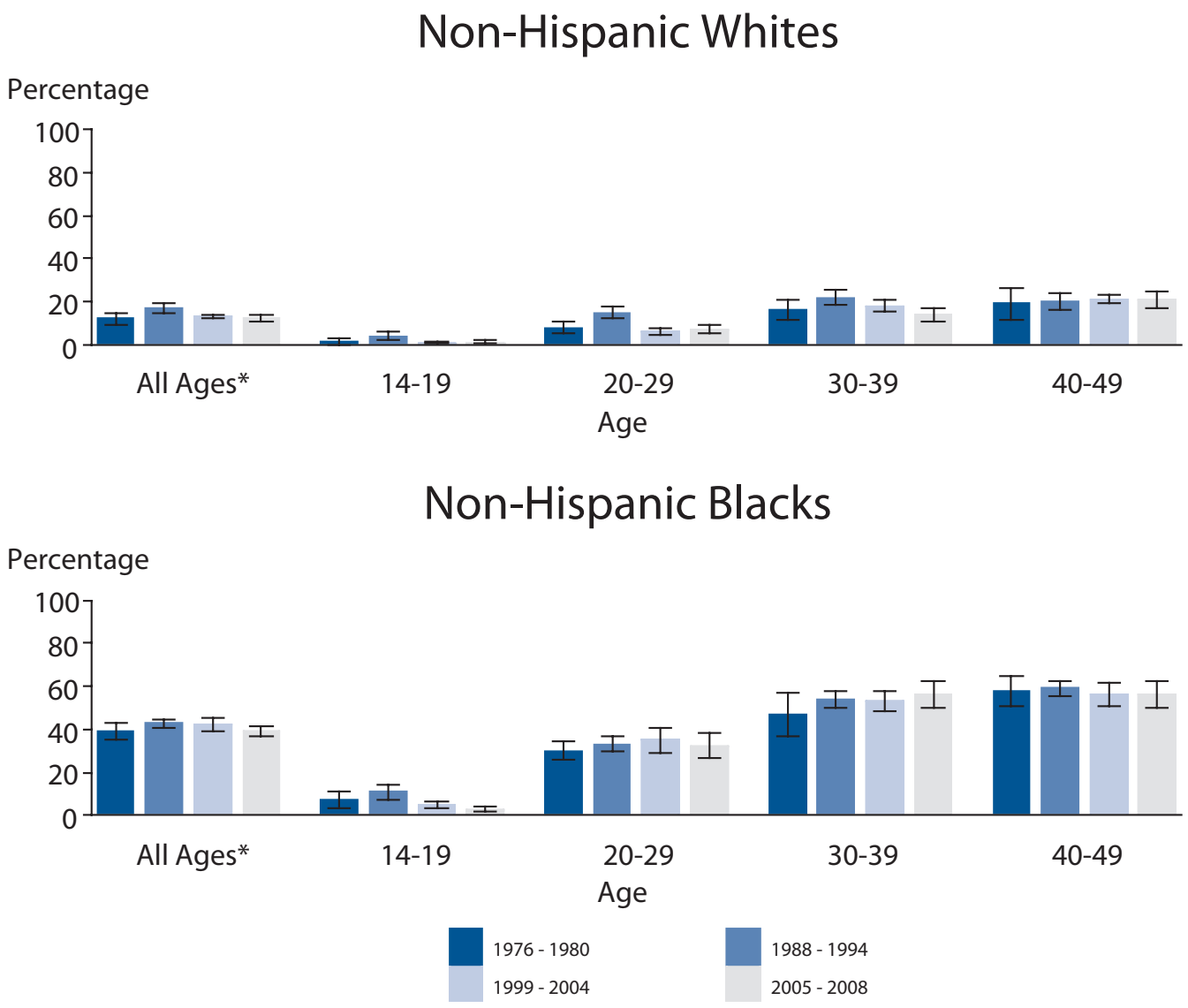
* MSM = men who have sex with men; MSW = men who have sex with women only.

Figure 48. Genital Herpes — Initial Visits to Physicians' Offices, United States, 1966 – 2012



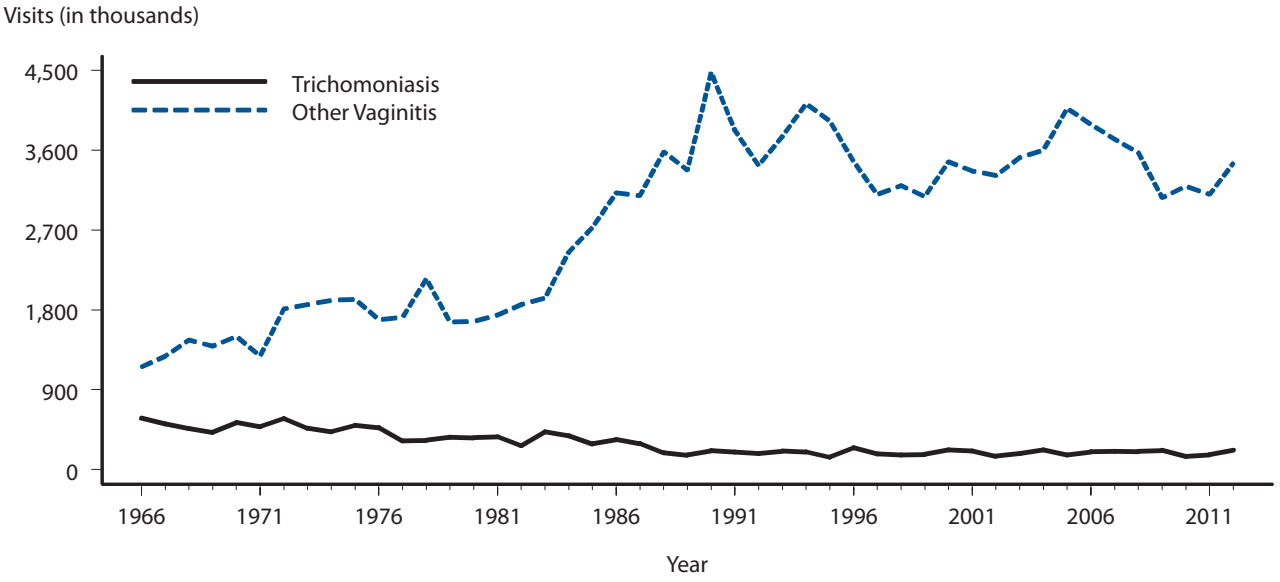
NOTE: The relative standard errors for genital herpes estimates of more than 100,000 range from 18% to 30%. See Other Surveillance Data Sources in the Appendix and Table 45.
SOURCE: IMS Health, Integrated Promotional Services™. IMS Health Report, 1966 – 2012.

Figure 49. Herpes Simplex Virus Type 2 — Seroprevalence Among 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 interval.

Figure 50. Trichomoniasis and Other Vaginal Infections—Women—Initial Visits to Physicians' Offices, United States, 1966 – 2012



NOTE: The relative standard errors for trichomoniasis estimates range from 16% to 27% and for other vaginitis estimates range from 8% to 13%. See Other Surveillance Data Sources in the Appendix and Table 45.
SOURCE: IMS Health, Integrated Promotional Services™, IMS Health Report, 1966–2012.