NATIONAL PROFILE

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National Profile

The **National Profile** section contains figures showing trends and the distribution of nationally reportable sexually transmitted diseases (chlamydia, gonorrhea, syphilis and chancroid) by age, sex, race/ethnicity, and location for the United States. Where relevant, the figures illustrate progress towards specific Healthy People 2010 targets* for the nation.[1]

* See the **Appendix** for a listing of the Healthy People 2010 objectives for the diseases addressed in this report.

[1] U.S. Department of Health and Human Services. *Healthy People 2010*. 2nd ed. With Understanding and Improving Health and Objectives for Improving Health. 2 vols. Washington, DC: U.S. Government Printing Office, November 2000.

Chlamydia

Background

Chlamydia trachomatis infections are the most commonly reported notifiable disease in the United States. They are among the most prevalent of all STDs and, since 1994, have comprised the largest proportion of all STDs reported to CDC (Table 1). In women, chlamydia infections, which are usually asymptomatic, may 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 a reduction in the incidence of PID by as much as 60%.[1] As with other inflammatory STDs, chlamydia infection can facilitate the transmission of HIV infection. In addition, pregnant women infected with chlamydia can pass the infection to their infants during delivery, potentially resulting in neonatal ophthalmia and pneumonia. Due to the large burden of disease and risks associated with infection, CDC recommends screening all sexually active women aged less than 26 years for chlamydia.[2]

The increase in reported chlamydia infections during the last 10 years reflects the expansion of chlamydia screening activities, use of increasingly sensitive diagnostic tests, an increased emphasis on case reporting from providers and laboratories, and improvements in the information systems for reporting. However, many women who are at risk are still not being tested, reflecting, in part, lack of awareness among some health care providers and limited resources available to support screening. Chlamydia screening and reporting are likely to continue to expand further in response to the Health Plan Employer Data and Information Set (HEDIS) measure for chlamydia screening of sexually active women 15 through 25 years of age who receive medical care through managed care organizations or Medicaid.[3] To better monitor trends in disease burden in defined populations during the expansion of chlamydia screening activities, data on chlamydia positivity among persons screened in a variety of settings are used; in most instances, test positivity serves as a reasonable approximation of prevalence.[4]

Chlamydia – United States

In 2000, for the first time, all 50 states and the District of Columbia had regulations requiring the reporting of chlamydia cases.

In 2005, 976,445 chlamydia infections were reported to CDC from 50 states and the District of Columbia (Table 1). This case count corresponds to a rate of 332.5 cases per 100,000 population, an increase of 5.1% compared with the rate of 316.5 in 2004. The reported number of chlamydia infections was almost three times the number of reported cases of gonorrhea (339,593 gonorrhea cases were reported in 2005) (Table 1).

From 1986 through 2005, the rates of reported chlamydia infection increased from 35.2 to 332.5 cases per 100,000 population (Figure 1, Table 1). The continuing increase in reported cases likely represents the further expansion of screening for this infection, the development and use of more sensitive

screening tests, and more complete national reporting.

Chlamydia by Sex

In 2005, the overall rate of reported chlamydia infection among women in the United States (496.5 cases per 100,000 females) was over three times higher than the rate among men (161.1 cases per 100,000 males), likely reflecting a greater 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 diagnosed or reported. However, with the advent of highly sensitive nucleic acid amplification tests that can be performed on urine, symptomatic and asymptomatic men are increasingly being diagnosed with chlamydia infection. From 2001 through 2005, the chlamydia infection rate in men increased by 43.5% (from 112.3 to 161.1 cases per 100,000 males) compared with a 15.6% increase in women over the same period (from 429.6 to 496.5 cases per 100,000 females).

Chlamydia by Region

For the years 1996–2001, the chlamydia rates in the Southern region of the United States were slightly higher than the rates in any other region of the country (Figure 2, Table 3). For the years 2002–2005, overall rates were comparable in the Midwest, West, and South (353.7, 343.6, 338.1 cases per 100,000 population, respectively). Although slight increases occurred in all regions, rates have remained lowest in the Northeast since 1996. In 2005, the case rate per 100,000 population in the Northeast was 282.5.

Chlamydia by State

In 2005, chlamydia rates per 100,000 population by state ranged from 141.7 cases in New Hampshire to 732.6 cases in Mississippi (Figure 3, Table 2). Thirty-two states and one outlying area had chlamydia case rates higher than 300.0 cases per 100,000 population.

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 2005, 799 (25.4%) of 3,140 counties had rates greater than 300.0 cases per 100,000 population. Rates per 100,000 population were 150.0 or less in 1,391 counties (44.3%) and between 150.1 and 300.0 in 950 counties (30.3%).

Chlamydia by Reporting Source

The majority of chlamydia cases reported in 2005 were reported through non-STD clinics (Figure 5, Table A2). Among women, only 12.5% of chlamydia cases were reported through an STD clinic (92,229 of 740,371 total cases). Women are more frequently asymptomatic and less likely than men to seek care at an STD clinic. In contrast, among men, 33.8% of chlamydia cases were reported through an STD clinic (78,677 of 232,781 total cases).

Chlamydia by Race

In 2005, chlamydia rates increased for all race/ethnic groups (Figure 6, Table 10B). The rate of chlamydia among blacks was over eight times higher than that of whites (1,247.0 and 152.1 cases per 100,000, respectively). The rates among American Indian/Alaska Natives (748.7) and Hispanics (459.0) were also higher than that of whites (4.9 and 3.0 times higher, respectively).

Chlamydia by Age and Sex

Among women, the highest age-specific rates of reported chlamydia in 2005 were among 15- to 19-year-olds (2,796.6 cases per 100,000 females) and 20- to 24-year-

olds (2,691.1 cases per 100,000 females). These increased rates in women may be, in part, due to increased screening in this group. Age-specific rates among men, while substantially lower than the rates in women, were highest in the 20- to 24-year-olds (804.7 cases per 100,000 males) (Figure 7, Table 9).

Chlamydia Screening and Prevalence Monitoring Project

Chlamydia screening and prevalence monitoring activities were initiated in Health and Human Services (HHS) Region X (Alaska, Idaho, Oregon, Washington) in 1988 as a CDC-supported demonstration project. In 1993, chlamydia screening services for women were expanded to three additional HHS regions (III, VII, and VIII) and, in 1995, to the remaining HHS regions (I, II, IV, V, VI, and IX). In some regions, federally-funded chlamydia screening supplements local- and state-funded screening programs. Screening criteria and practices vary by region and state.

In 2005, the median state-specific chlamydia test positivity among 15- to 24-year-old women who were tested during visits to selected family planning clinics in all states and outlying areas was 6.3% (range 3.0% to 20.3%) (Figures 8 and 9). See **Appendix** (Chlamydia, Gonorrhea, and Syphilis Prevalence Monitoring) for details.

To examine trends in regional chlamdyia positivity, rates were adjusted to account for changes in laboratory test methods and associated increases in test sensitivity (Figure 10, see **Appendix**).[5] Even after adjustment, chlamydia test positivity has remained fairly stable within regions from 2001–2005. Positivity slightly decreased in six of ten HHS regions from 2004 through 2005, increased in three regions, and remained the same in one region.

Chlamydia Among Special Populations

Additional information on chlamydia screening programs for women of reproductive age and chlamydia among adolescents and minority populations can be found in the **Special Focus Profiles**.

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[1] 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): 1362-66.

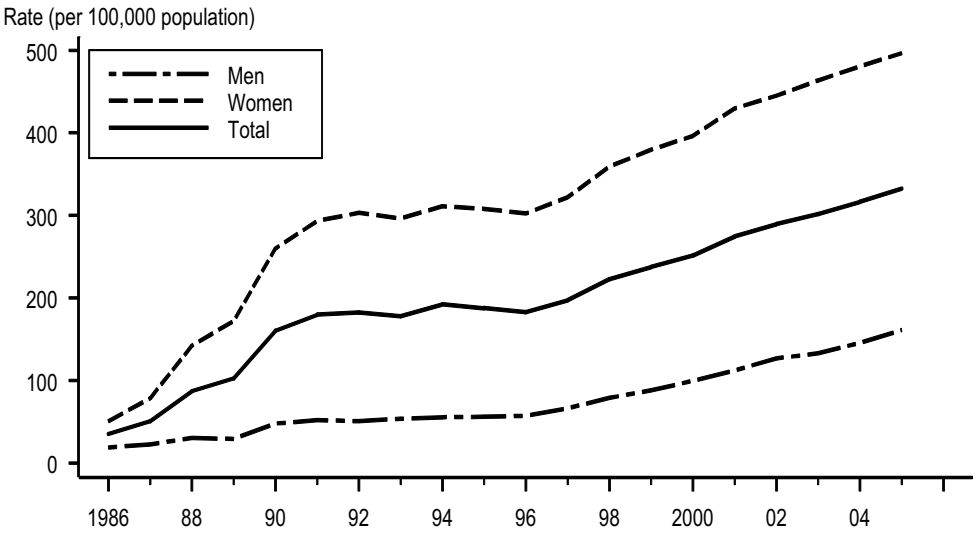
[2] Centers for Disease Control and Prevention. *Sexually Transmitted Diseases Treatment Guidelines, 2006*. *MMWR*, 2006;55(No. RR-11):38.

[3] National Committee for Quality Assurance (NCQA). *HEDIS 2000: Technical Specifications*, Washington, DC, 1999, pp. 68-70, 285-286.

[4] Dicker LW, Mosure DJ, Levine WC. Chlamydia positivity versus prevalence: what's the difference? *Sexually Transmitted Diseases* 1998;25:251-3.

[5] Dicker LW, Mosure DJ, Levine WC, et al. Impact of switching laboratory tests on reported trends in *Chlamydia trachomatis* infections. *Am J Epidemiol* 2000;51:430-5.

Figure 1. Chlamydia — Rates: Total and by sex: United States, 1986–2005



Note: As of January 2000, all 50 states and the District of Columbia had regulations requiring the reporting of chlamydia cases.

Figure 2. Chlamydia — Rates by region: United States, 1996–2005

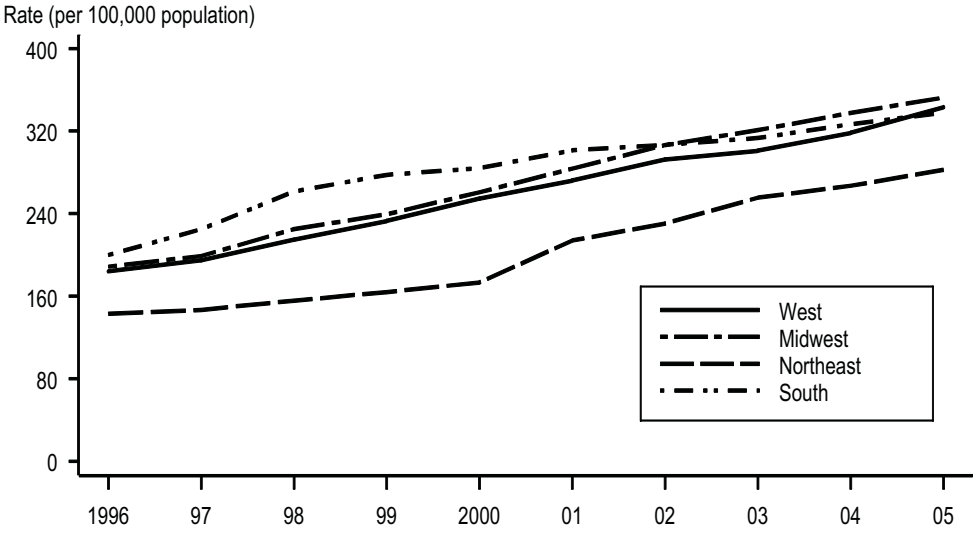
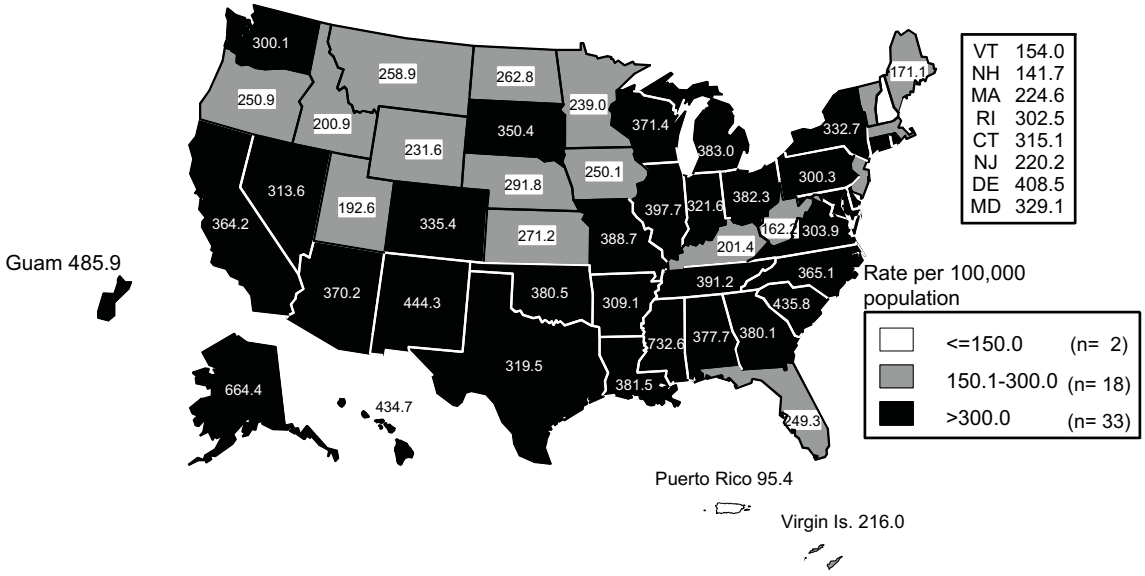


Figure 3. Chlamydia — Rates by state: United States and outlying areas, 2005



Note: The total rate of chlamydia for the United States and outlying areas (Guam, Puerto Rico and Virgin Islands) was 329.5 per 100,000 population. For further information on chlamydia reporting, see Appendix (Chlamydia Morbidity Reporting).

Figure 4. Chlamydia — Rates by county: United States, 2005

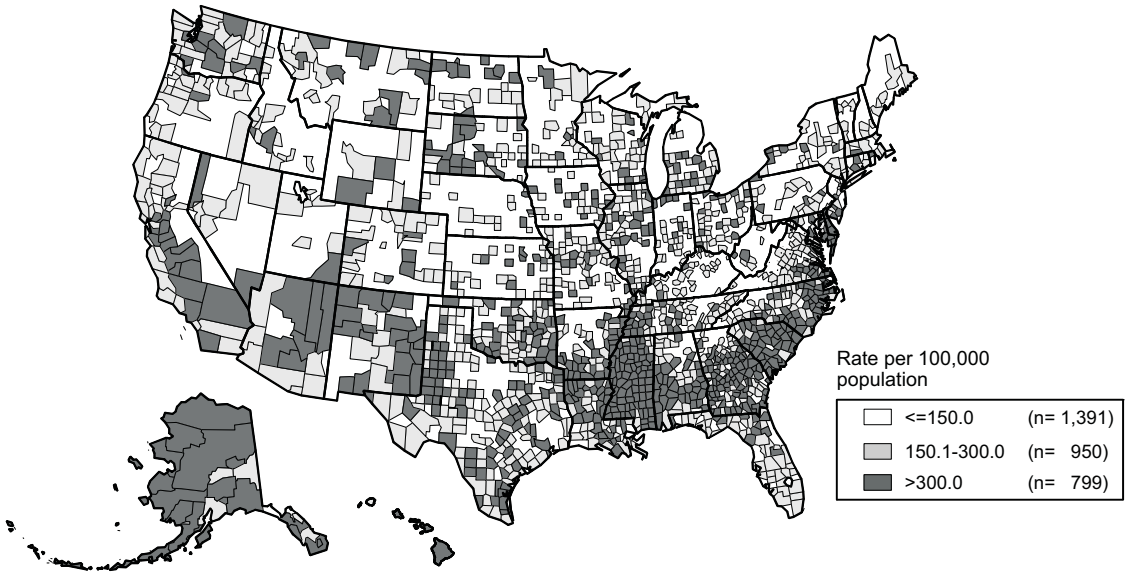


Figure 5. Chlamydia — Cases by reporting source and sex: United States, 1996–2005

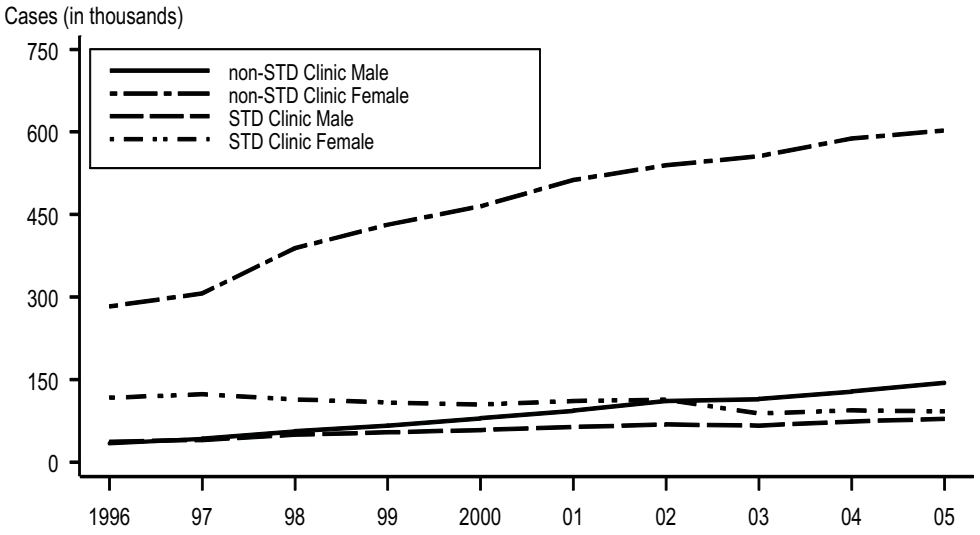


Figure 6. Chlamydia — Rates by race/ethnicity: United States, 1996–2005

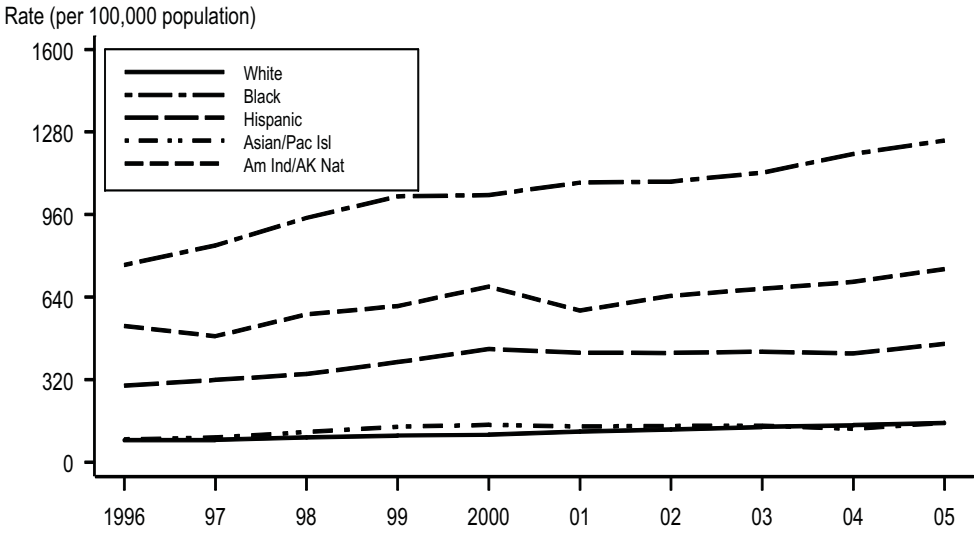


Figure 7. Chlamydia — Age- and sex-specific rates: United States, 2005

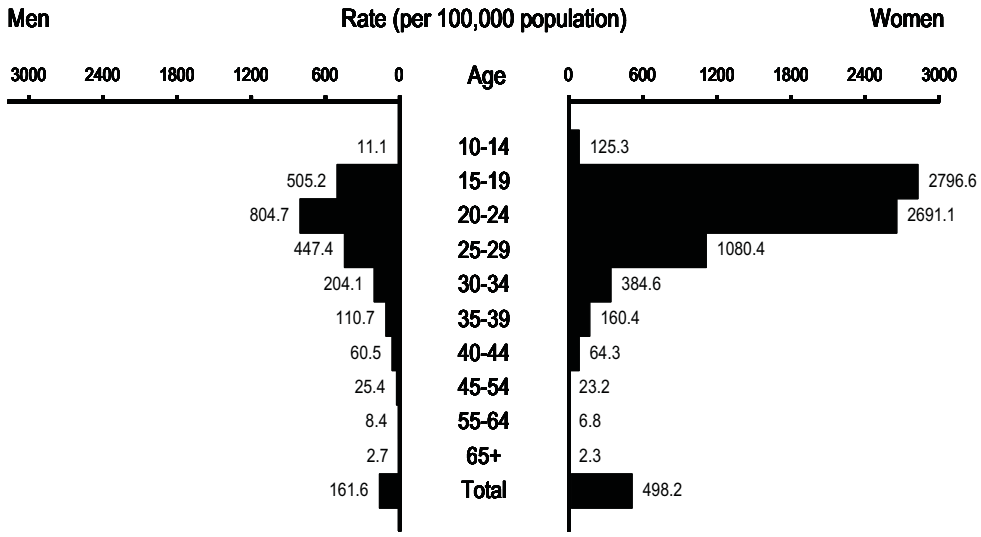
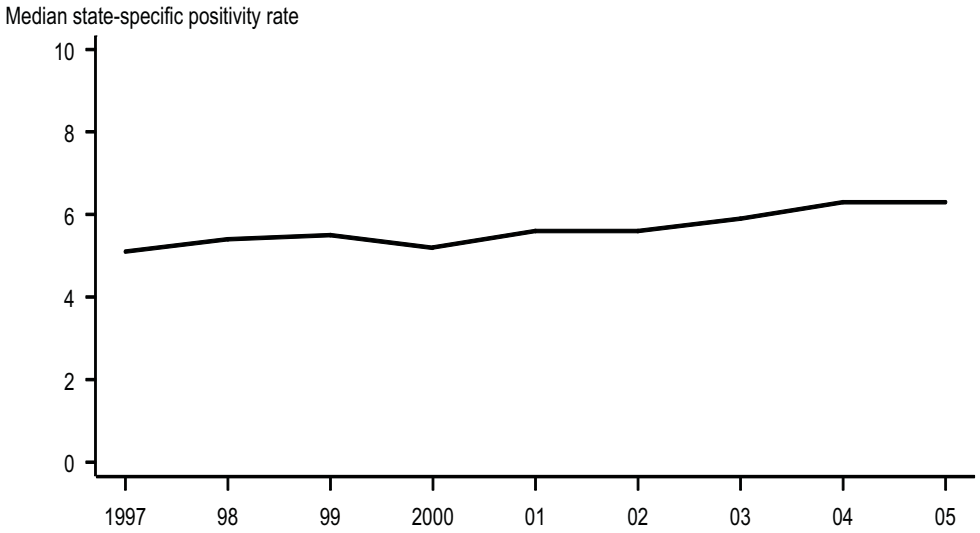
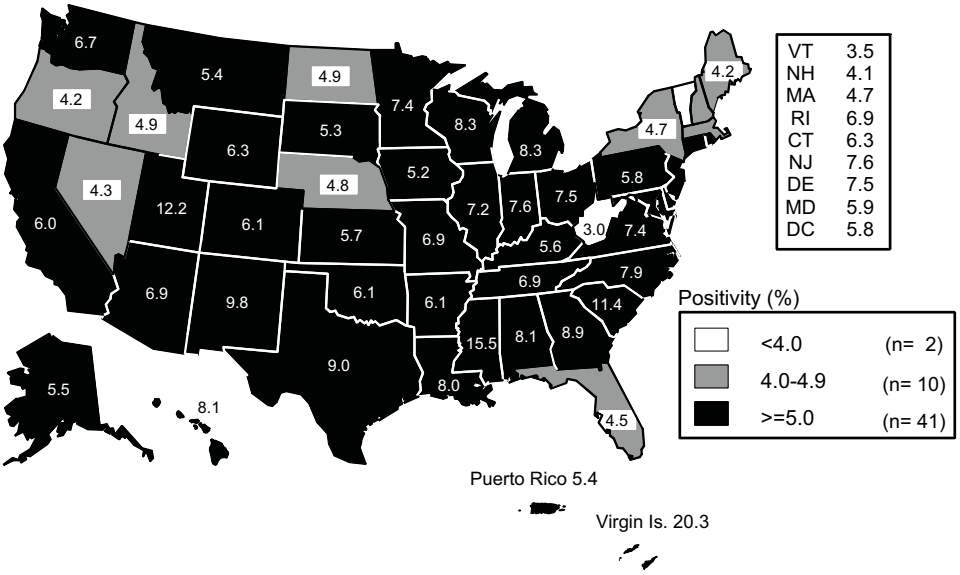


Figure 8. Chlamydia — Median state-specific positivity among 15- to 24-year-old women tested in family planning clinics: United States, 1997–2005



Note: As of 1997, all 10 Health and Human Services (HHS) regions, representing all 50 states, the District of Columbia, and outlying areas, reported chlamydia positivity data. See Appendix for definitions of HHS regions.

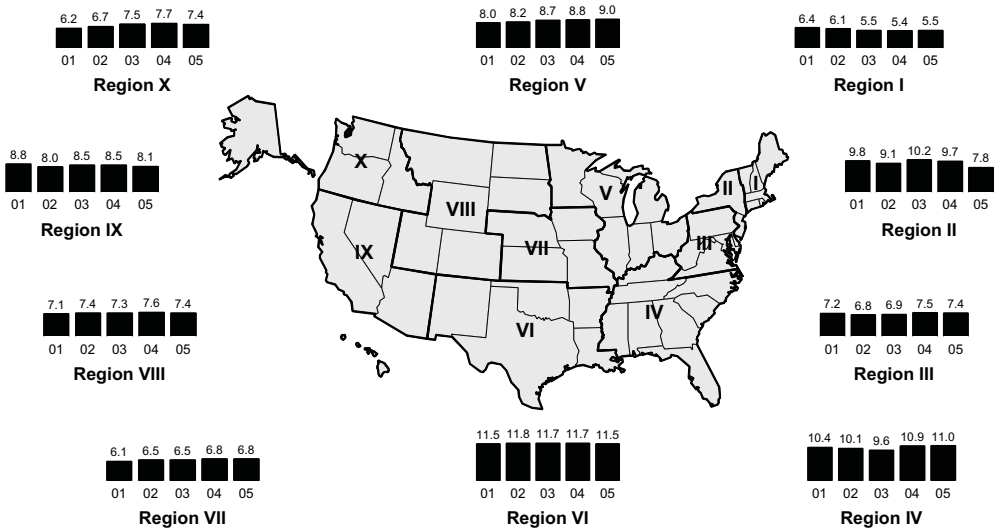
Figure 9. Chlamydia — Positivity among 15- to 24-year-old women tested in family planning clinics by state: United States and outlying areas, 2005



Note: Includes states and outlying areas that reported chlamydia positivity data on at least 500 women aged 15-24 years screened during 2005.

SOURCE: Regional Infertility Prevention Projects; Office of Population Affairs; Local and State STD Control Programs; Centers for Disease Control and Prevention

Figure 10. Chlamydia — Trends in positivity among 15- to 24-year-old women tested in family planning clinics by HHS region, 2001–2005



Note: Trends adjusted for changes in laboratory test method and associated increases in test sensitivity. See Appendix (Chlamydia, Gonorrhea, and Syphilis Prevalence Monitoring) for more information. See Appendix for definitions of Health and Human Services (HHS) regions.

SOURCE: Regional Infertility Prevention Projects; Office of Population Affairs; Local and State STD Control Programs; Centers for Disease Control and Prevention

Gonorrhea

Background

Gonorrhea is the second most commonly-reported notifiable disease in the United States. Infections due to *Neisseria gonorrhoeae*, like those resulting from *Chlamydia 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 strong evidence that gonococcal infections facilitate the transmission of HIV infection.[1]

From 1975 through 1997, the national gonorrhea rate declined 74% following implementation of the national gonorrhea control program in the mid-1970s (Table 1). Gonorrhea rates subsequently appeared to plateau for several years. However, in 2005, rates increased slightly from 2004 with 339,593 cases of gonorrhea reported in the United States (Figure 11 and Table 1). True increases or decreases may be masked by changes in screening practices (affected by concomitant testing for chlamydia and broader use of urine-based testing), use of diagnostic tests with differing test performance, and changes in reporting practices.[2]

For most areas, the number of gonorrhea cases reported to CDC is affected by many factors, in addition to the occurrence of the infection within the population. As with reporting of other STDs, reporting of gonorrhea cases to CDC is incomplete.[3] In addition, reporting practices for gonococcal infections may have been biased towards reporting of infections in persons of minority race or ethnicity, who are more likely to attend public STD clinics.[4] For such reasons, supplemental data on gonorrhea prevalence in persons screened in a variety of different settings are useful in assessing disease burden in selected populations.

Gonorrhea – United States

In 2005, 339,593 cases of gonorrhea were reported in the United States. The rate of reported gonorrhea in the United States was 115.6 cases per 100,000 population in 2005 (Figure 11 and Table 1), the first increase in gonorrhea since 1999.

Gonorrhea by Region

As in previous years, in 2005 the South had the highest gonorrhea rate among the four regions of the country. However, the gonorrhea rate in the South has declined by 17.6% from a rate of 174.6 per 100,000 population in 2001 to 143.9 in 2005. Rates in the Northeast have also declined 23.1% from 2001 to 2005 (from 97.2 to 74.7). In contrast, the gonorrhea rate in the West has increased by 35.4% from 60.2 cases per 100,000 population in 2001 to 81.5 in 2005. The rate in the Midwest (142.5 in 2001 and 139.1 in 2005) has shown minimal change since 2001. Of note, however, is that gonorrhea rates in both the Midwest and the South increased slightly (4.0% and 1.6% respectively) from 2004 to 2005 (Figure 13 and Table 12).

Gonorrhea by State

In 2005, only states and Puerto Rico had gonorrhea rates below the Healthy People

2010 (HP2010) national target of 19 cases per 100,000 population (Figure 14 and Table 11).[5]

Gonorrhea by Metropolitan Statistical Area (MSA)

The overall gonorrhea rate in the 50 most populous MSAs was 128.2 cases per 100,000 population in 2005. This is a 3.9% increase from the prior year. All of these MSAs had rates higher than the HP2010 target of 19 cases per 100,000 population (Table 16). In 2005, 59.6% of gonorrhea cases were reported by these MSAs. Similar to previous years, in 2005 the total gonorrhea rate among females in these MSAs (127.4) remained similar to that among males (128.4) (Tables 17 and 18).

Gonorrhea by County

In 2005, 1,303 (41.5%) of 3,140 counties in the United States had gonorrhea rates at or below the HP2010 national target of 19 cases per 100,000 population. Rates per 100,000 population were between 19 and 100 in 1,118 counties (35.6%), and greater than 100 in 719 counties (22.9%). The majority of counties with greater than 100 cases per 100,000 population were located in the South (Figure 15).

In 2005, 50% of reported gonorrhea cases occurred in just 66 counties or independent cities (Table 15).

Gonorrhea by Reporting Source

In 2005, 28.1% of gonorrhea cases were reported by STD clinics. This is a change from 2001, when 36.6% of gonorrhea cases were reported by STD clinics (Table A2). In 2005, similar to previous years, a higher proportion of male gonorrhea cases were reported from STD clinics than female cases (40.4% and 17.0% respectively) (Figure 16).

Gonorrhea by Region and Sex

From 2001 to 2005, gonorrhea rates among women increased 41.4% in the West, and decreased 23.0% in the Northeast and 15.0% in the South. Over the same time period, gonorrhea rates among men increased 30.7% in the West, and decreased 23.2% in the Northeast and 20.4% in the South (Tables 13 and 14). Rates among both women and men in the Midwest remained relatively unchanged over this time period.

Gonorrhea by Sex

Prior to 1996, rates of gonorrhea among men were higher than rates among women. For the fifth straight year, however, gonorrhea rates in women are slightly higher than in men (Figure 12). In 2005 the gonorrhea rate among women was 119.1 and the rate among men was 111.5 cases per 100,000 population (Tables 13 and 14).

Gonorrhea by Race/Ethnicity

Changes in gonorrhea rates from 2001 through 2005 differed by racial/ethnic group. Gonorrhea rates decreased by 17.8% during this time period for African Americans from 762.0 to 626.4 cases per 100,000 population. In contrast, rates in other racial/ethnic groups have increased. Since 2001, the gonorrhea rate among American Indian/Alaska Natives increased 28.4% (131.7 per 100,000 in 2005), whites increased 19.7% (35.2 per 100,000 in 2005), Hispanics increased 6.4% (74.8 per 100,000 in 2005), and Asian/Pacific Islanders increased 5.3% (25.9 per 100,000 in 2005) (Figure 17 and Table 20B).

In 2005, the gonorrhea rate among African Americans was 18 times greater than the rate for whites. This is a decrease from 2001 when there was a 26-fold difference in rates. Gonorrhea rates were 3.7 times greater among American Indian/Alaska Natives, and 2.1 times greater among Hispanics than among whites in 2005.

Gonorrhea by Age and Sex

In 2005, gonorrhea rates continued to be highest among adolescents and young adults. The overall gonorrhea rate was highest for 20- to 24-year-olds (506.8), which is over 4 times higher than the national gonorrhea rate. Among females in 2005, 15- to 19- and 20- to 24-year-olds had the highest rates of gonorrhea (624.7 and 581.2, respectively); among males, 20- to 24-year-olds had the highest rate (436.8) (Figure 18 and Table 19).

Although the gonorrhea rate among 15- to 19-year-olds decreased in recent years, in 2005 this rate increased 3.9%. Similar slight increases were seen among 20- to 24-year-olds and 25- to 29-year-olds (3.0% and 4.3%) (Table 19). Increases over this time period were similar among males 15- to 19-years, 20- to 24-years, and 25- to 29-years (4.4%, 2.8%, and 3.8% respectively) and among females 15- to 19-years, 20- to 24-years, and 25- to 29-years (3.6%, 3.2%, and 4.8%, respectively) (Figures 19 and 20, and Table 19).

Gonorrhea by Race/Ethnicity and Sex

From 2001 to 2005 the overall rate in African-American men decreased 19.4% from 826.8 per 100,000 population to 666.0. Decreases were seen in all age groups of African-American men over this time period. However, the overall rate in white males increased 18.9% from 23.3 per 100,000 population in 2001 to 27.7 in 2005. Rates among American Indian/Alaska Native men increased 44.1%, Asian/Pacific Islander men increased 13.7%, and Hispanic men increased 2.6% (Table 20B).

From 2001 to 2005 the overall rate among African-American women decreased 16.1% from 703.3 per 100,000 population to 590.4. Decreases were noted in 15- to 19-year-old African-American women (18.3% from 2001 through 2005).

However, 15- to 19-year-old African-American women still have the highest gonorrhea rate of any group (2,814.0 per 100,000 population). Rates among white women increased 20.4% from 35.3 per 100,000 population in 2001 to 42.5 in 2005. Increases were also seen among American Indian/Alaska Native women (21.4%) and Hispanic women (10.0%) over this time period (Table 20B). The rate among Asian/Pacific Islander women remained essentially unchanged (1.9% decrease).

Gonorrhea Prevalence Monitoring Projects

Gonorrhea test positivity data are available from a variety of settings. Screening criteria and practices may vary by state.

Family Planning Clinics

In 2005, the median state-specific gonorrhea test positivity among 15- to 24-year-old women screened in selected family planning clinics in 41 states, Puerto Rico, the District of Columbia, and the Virgin Islands was 1.0% (range 0.0% to 3.8%) (Figure 21). Median gonorrhea positivity in family planning clinics has shown minimal change in recent years (1.0% in 2001).

Prenatal Clinics

For women attending selected prenatal clinics in 20 states, Puerto Rico, and the Virgin Islands, the median positivity was 0.9% (range 0.0% to 3.2%) (Figure F). Median gonorrhea positivity in prenatal clinics has shown minimal change in recent years (0.9% in 2001).

National Job Training Program

For 16- to 24-year-old women entering the National Job Training Program in 32 states and the District of Columbia in 2005, the median state-specific gonorrhea prevalence

was 2.4% (range 0.0% to 6.6%) in 2005 (Figure M). Among men entering the program from 14 states in 2005, the median state-specific gonorrhea positivity was 2.2% (range 0.0% to 6.1%) (Figure N).

Juvenile Corrections

In 2005, the median positivity for gonorrhea in women entering 38 juvenile corrections facilities was 4.7% (range 0.9% to 14.2%), and in men entering 65 juvenile corrections facilities was 1.0% (range 0.0% to 19.0%) (Table CC).

Gonococcal Isolate Surveillance Project (GISP)

Antimicrobial resistance remains an important consideration in the treatment of gonorrhea.[6-10] Overall, 19.6 % of isolates collected in 2005 in 27 STD clinics by the Gonococcal Isolate Surveillance Project (GISP) were resistant to penicillin, tetracycline, or both, up from 15.9% in 2004 (Figure 23).

Quinolone-resistant N. Gonorrhoeae (QRNG)

Resistance to ciprofloxacin (a fluoroquinolone in the quinolone family of antimicrobials) was first identified in GISP sites in 1991. From 1991 through 1998, fewer than nine quinolone-resistant *N. gonorrhoeae* (QRNG) isolates were identified each year, and such isolates were identified in only a few GISP clinics. In 2000, similar to 1999, 19 (0.4%) quinolone-resistant GISP isolates were identified in seven GISP clinics. In 2001, 38 (0.7%) QRNG isolates were identified in six clinics; in 2002, 116 (2.2%) such isolates were identified in 13 clinics; in 2003, 270 (4.1%) were identified in 21 clinics; in 2004, 429 (6.8%) were identified in 24 clinics; and in 2005, 581 (9.4%) isolates were submitted and identified in 25 of the 27 clinics in GISP demonstrating resistance to ciprofloxacin (Figure 24).

QRNG by Region

In Honolulu, the prevalence of QRNG identified remains high but has slightly decreased from 2004. In 2005, 17 (19.3%) of 88 isolates submitted from Honolulu demonstrated ciprofloxacin-resistance, down from 21 (22.8%) of 92 isolates in 2004.

In California, increases in the number of isolates resistant to ciprofloxacin were identified in four of five GISP sites, while one site, Long Beach, experienced a slight decrease from 25% in 2004 to 23.5% in 2005. Whereas, in Los Angeles, 14.5% of isolates in 2005 were ciprofloxacin-resistant compared with 13.8% in 2004; in Orange County, 27.5% were resistant in 2005 compared to 20.5% in 2004; in San Diego, 26.2% were resistant in 2005 compared to 20.6% in 2004; and in San Francisco, 31.3% were resistant in 2005 compared to 24.3% in 2004.

Similarly in other West Coast sites, Portland, Denver, and Las Vegas experienced a substantial increase in prevalence of QRNG, whereas Seattle experienced a slight decrease. In Portland, the prevalence of QRNG doubled to 23.1% in 2005 from 11.5% in 2004; in Denver, to 10.9% in 2005 from 8.3% in 2004; and in Las Vegas, to 5.4% in 2005 from 2.4% in 2004. In Seattle the prevalence dropped to 11.6% in 2005 from 16.2% in 2004. The QRNG prevalence in Phoenix remained relatively stable.

In the South, increases in prevalence of QRNG occurred in Atlanta, Miami, Oklahoma City, and New Orleans. In Atlanta, QRNG resistance increased to 3.8% in 2005 from 0.9% in 2004; in Miami, to 9.1% in 2005 from 6.8% in 2004; in Oklahoma City, to 2.3% in 2005 from 1.3% in 2004; and in New Orleans, to 6.3% in 2005 from 1.6% in 2004. (Note: As a result of Hurricane Katrina, the 2005 prevalence for QRNG in New Orleans contains isolates only from January–May

2005.) In Greensboro, the prevalence was slightly down to 0.6% in 2005 from 0.8% in 2004; the prevalence in Dallas remained the same.

In the Midwest and Northeast, there were large increases in prevalence of QRNG seen in Baltimore, Chicago, Cincinnati, Cleveland, and Philadelphia. In Baltimore, prevalence increased to 3% in 2005 from 1% in 2004; in Chicago to 4.7% in 2005 from 2.3% in 2004; in Cincinnati to 1% in 2005 from 0.3% in 2004; in Cleveland to 2.8% in 2005 from 0.4% in 2004; and in Philadelphia, the prevalence quadrupled to 14.3% in 2005 from 3.3% in 2004. There was a slight decrease in QRNG prevalence in Minneapolis for 2005.

Sites that identified ciprofloxacin-resistant isolates for the first time in 2005 include Birmingham and Detroit. Only Albuquerque and Tripler did not identify QRNG isolates during 2005.

Overall, outside of Hawaii and California, 6.1% of isolates were ciprofloxacin-resistant in 2005, an increase from 3.6% in 2004.

Additional information on antimicrobial susceptibility data and treatment recommendations from state and local health departments may be found in the 2005 GISP report[7] or the GISP website (**http://www.cdc.gov/std/GISP**).

QRNG by Sexual Behavior

The number of QRNG isolates from men who have sex with men (MSM) continued to increase in 2005 to 387 (29% of all specimens from MSM). During the same time period, the number of these isolates from heterosexuals increased from 136 (2.9%) in 2004 to 183 (3.8%) in 2005 (Figure 25).

As a result of this continued high prevalence of quinolone-resistant *N. gonorrhoeae* in California, Hawaii, among MSM, and the increasing prevalence of QRNG in areas other than the West Coast, in 2006 CDC recommended that quinolones should not be used for infections in MSM or in those with a history of recent foreign travel or partners' travel, infections acquired in California or Hawaii, or infections acquired in other areas with increased QRNG prevalence.[10]

Other Antimicrobial Susceptibility Testing

To date, cephalosporin resistance has not been identified in GISP, and the proportion of GISP isolates demonstrating decreased susceptibility to ceftriaxone or cefixime has remained very low over time. In 2001, three GISP isolates with decreased susceptibility to cefixime were also found to be resistant to penicillin, tetracycline, and ciprofloxacin; such multi-drug resistance in combination with decreased susceptibility to cefixime had not previously been identified in the United States.[11] In 2004, two GISP isolates had decreased susceptibility to cefixime; one of those isolates demonstrated the same resistance pattern as the 2001 isolates described above. In 2005, no GISP isolates had decreased susceptibility to ceftriaxone or cefixime.

The proportion of GISP isolates demonstrating elevated minimum inhibitory concentrations (MICs) to azithromycin has been increasing since GISP began monitoring azithromycin susceptibility in 1992. In 1992, there were no isolates with azithromycin MIC $\geq$ 1.0 mg/ml but in 2004 there were 57 (0.9%) such isolates, and this has now tripled to 181 (2.9%) in 2005. However, caution is needed when interpreting this increase, as a change in the media used for antimicrobial susceptibility testing in 2005 may have contributed to the increase.

Gonorrhea Among Special Populations

Additional information about gonorrhea in racial and ethnic minority populations, adolescents, men who have sex with men, and other at risk populations can be found in the **Special Focus Profiles**.

Gonorrhea Summary

In summary, the national gonorrhea rate increased in 2005 for the first time since 1999. Gonorrhea rates have declined among African Americans, but increased in all other racial and ethnic groups since 2001. However, rates among African Americans remain markedly higher than among other racial and ethnic groups.

Gonorrhea has increased in the West for several years, and 2005 data now suggest that these increases may be appearing in the South and the Midwest as well. Rates among adolescent and young adults had been decreasing in recent years, but 2005 data now suggest possible increases in these populations.

In addition, 2005 GISP data has shown notable increases in QRNG prevalence, especially in the Midwest and Northeast regions where previously it had been lower. As a response to these observations, modifications were made in the 2006 CDC STD Treatment Guidelines.[10] Also, elevated MICs for azithromycin have been observed but the significance of this is yet to be determined.

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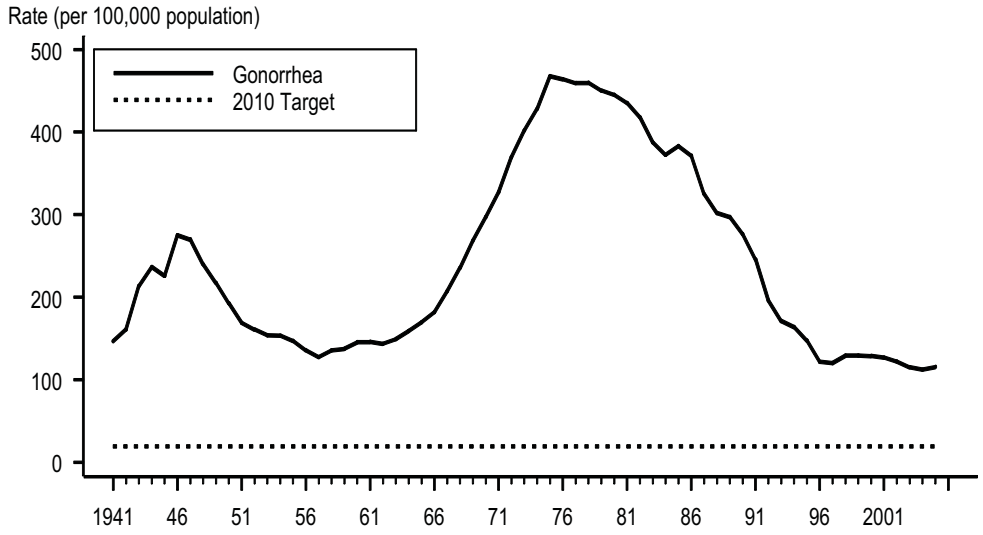
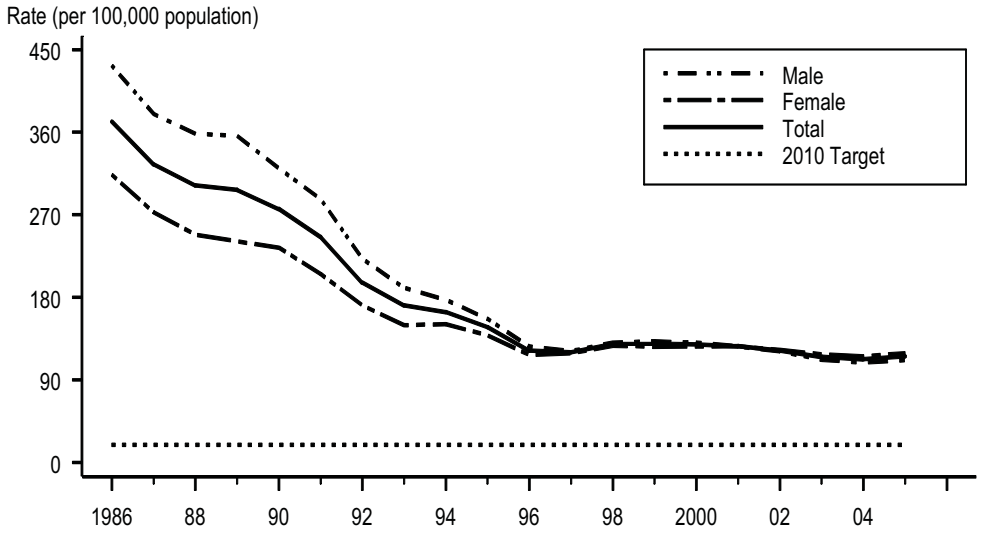
Figure 11. Gonorrhea — Rates: United States, 1941–2005 and the Healthy People 2010 target



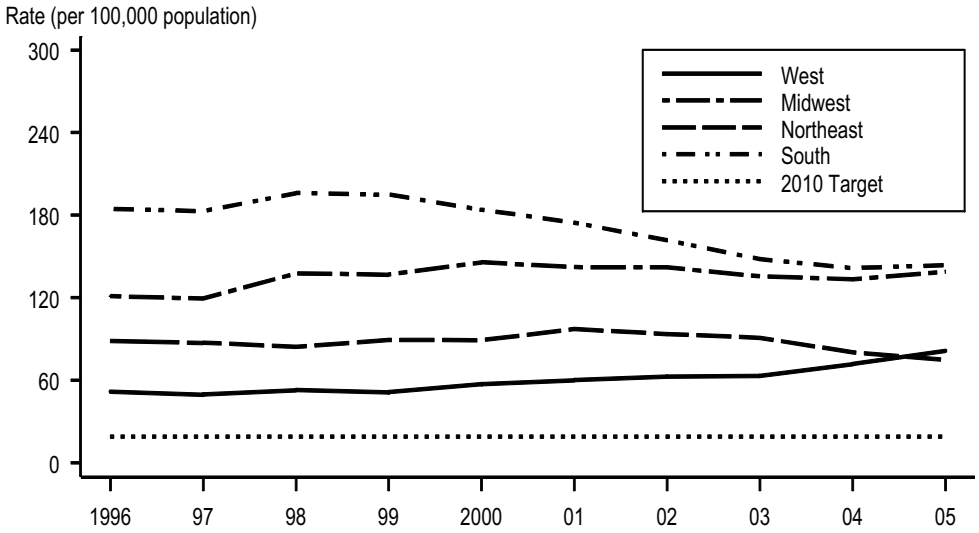
Note: The Healthy People 2010 target for gonorrhea is 19.0 cases per 100,000 population.

Figure 12. Gonorrhea — Rates: Total and by sex: United States, 1986–2005 and the Healthy People 2010 target



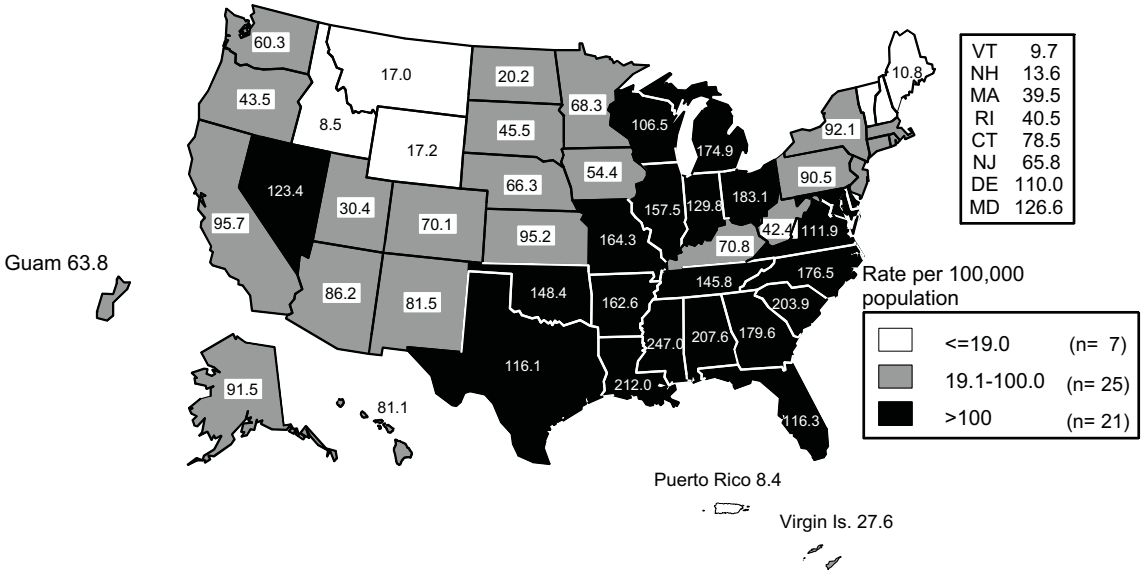
Note: The Healthy People 2010 target for gonorrhea is 19.0 cases per 100,000 population.

Figure 13. Gonorrhea — Rates by region: United States 1996–2005 and the Healthy People 2010 target



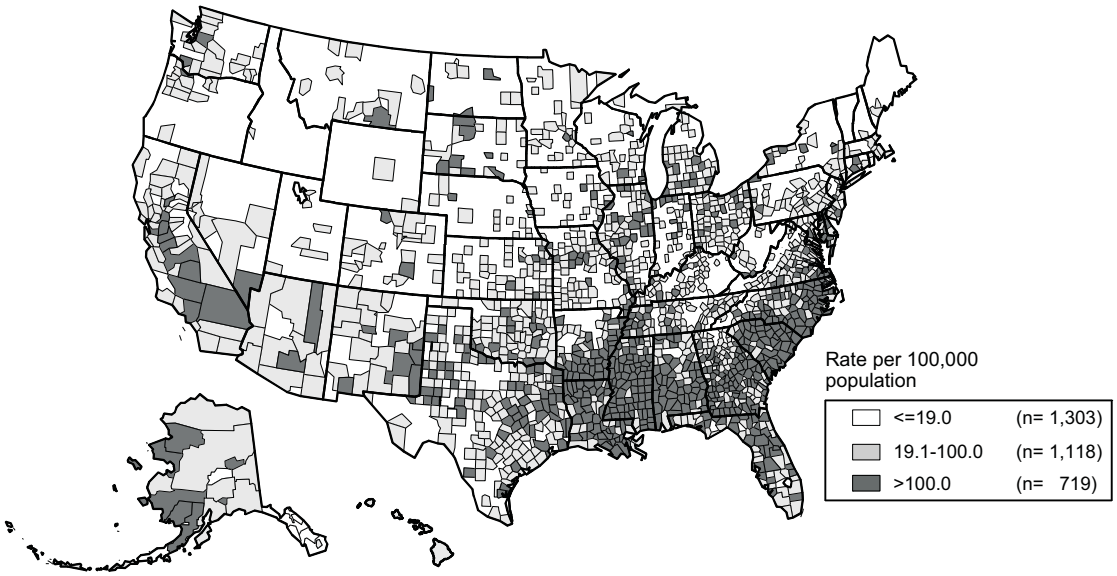
Note: The Healthy People 2010 target for gonorrhea is 19.0 cases per 100,000 population.

Figure 14. Gonorrhea — Rates by state: United States and outlying areas, 2005



Note: The total rate of gonorrhea for the United States and outlying areas (Guam, Puerto Rico and Virgin Islands) was 114.2 per 100,000 population. The Healthy People 2010 target is 19.0 cases per 100,000 population.

Figure 15. Gonorrhea — Rates by county: United States, 2005



Note: The Healthy People 2010 target for gonorrhea is 19.0 cases per 100,000 population.

Figure 16. Gonorrhea — Cases by reporting source and sex: United States, 1996–2005

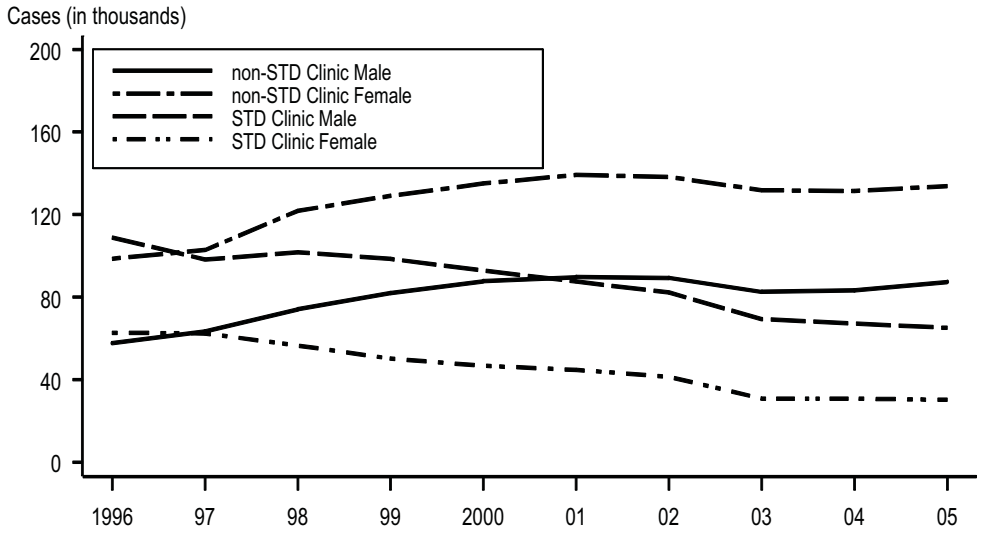


Figure 17. Gonorrhea — Rates by race/ethnicity: United States, 1996–2005

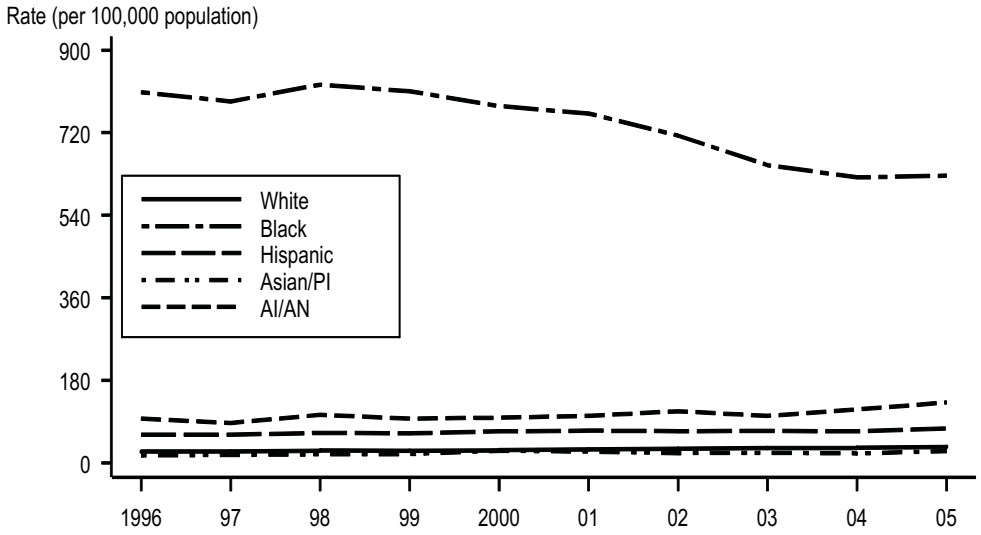


Figure 18. Gonorrhea — Age- and sex-specific rates: United States, 2005

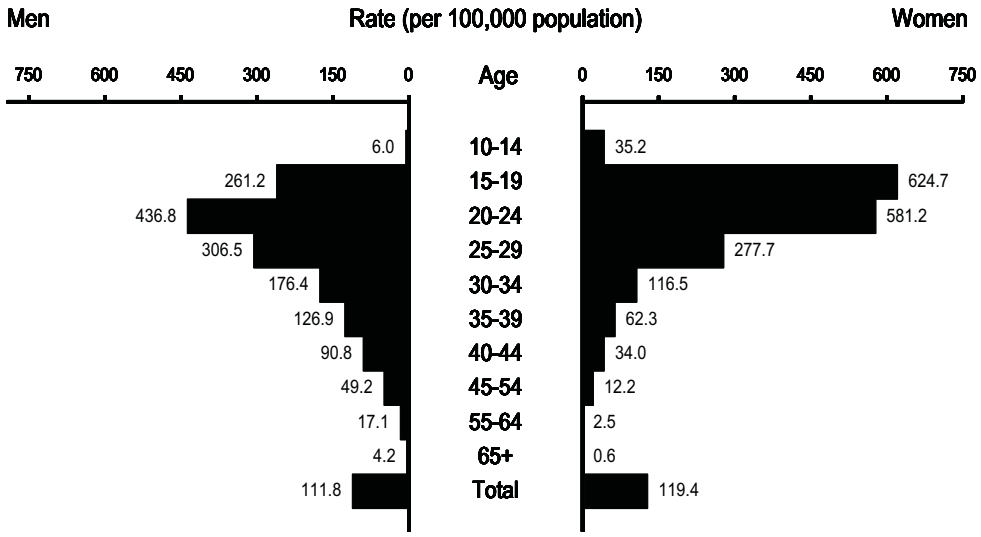


Figure 19. Gonorrhea — Age-specific rates among women 15 to 44 years of age: United States, 1996–2005

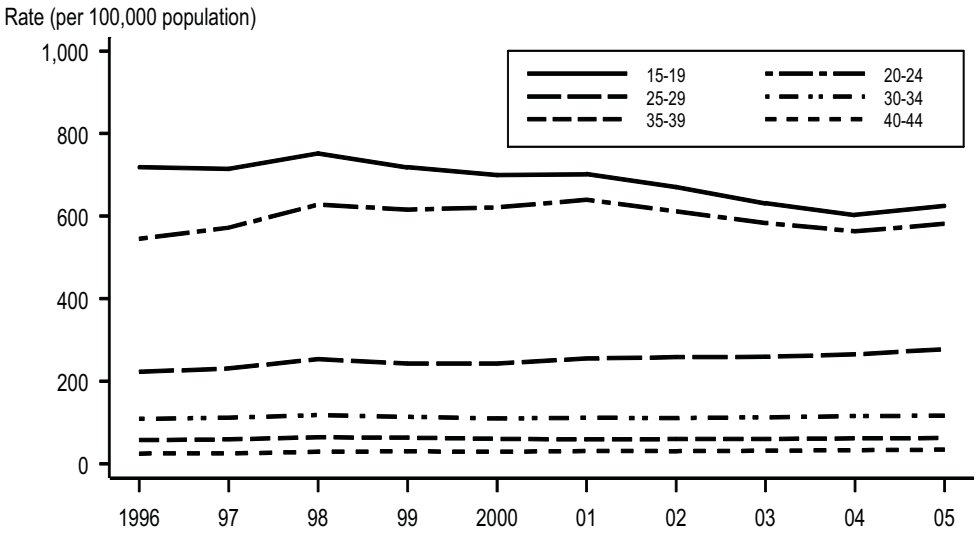


Figure 20. Gonorrhea — Age-specific rates among men 15 to 44 years of age: United States, 1996–2005

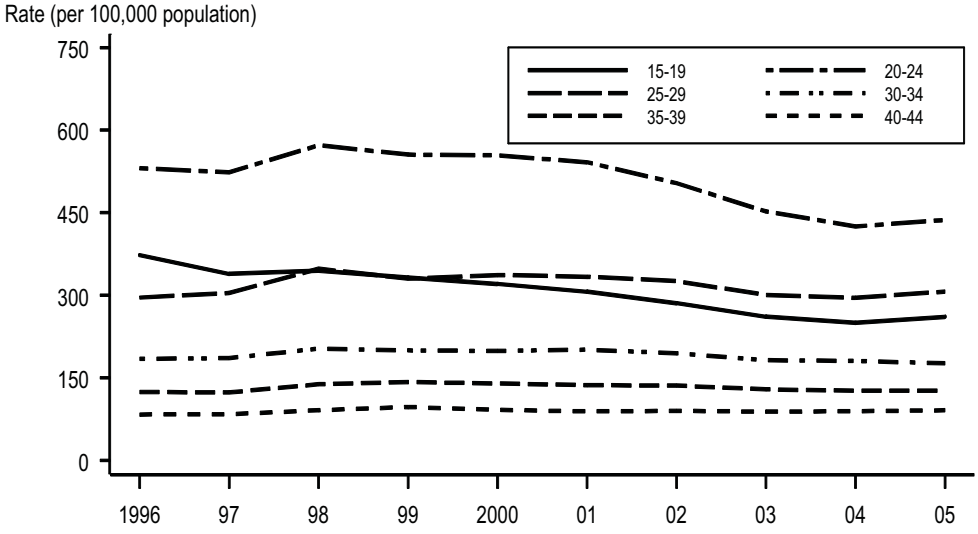
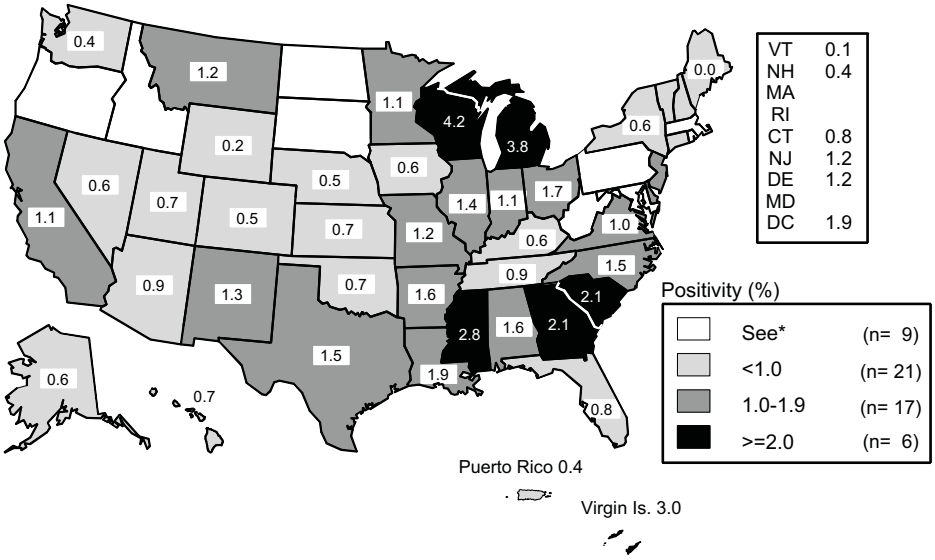


Figure 21. Gonorrhea — Positivity among 15- to 24-year-old women tested in family planning clinics by state: United States and outlying areas, 2005



*States/areas not meeting minimum inclusion criteria.

Note: Includes states and outlying areas that reported positivity data on at least 500 women aged 15-24 years screened during 2006.

SOURCE: Regional Infertility Prevention Projects; Office of Population Affairs; Local and State STD Control Programs; Centers for Disease Control and Prevention

Figure 22. Gonococcal Isolate Surveillance Project (GISP) — Location of participating clinics and regional laboratories: United States, 2005

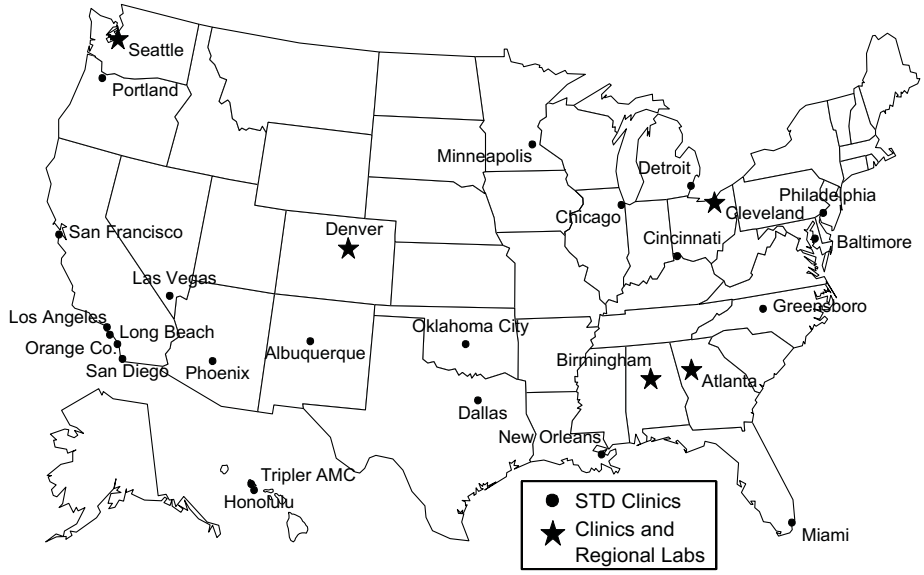


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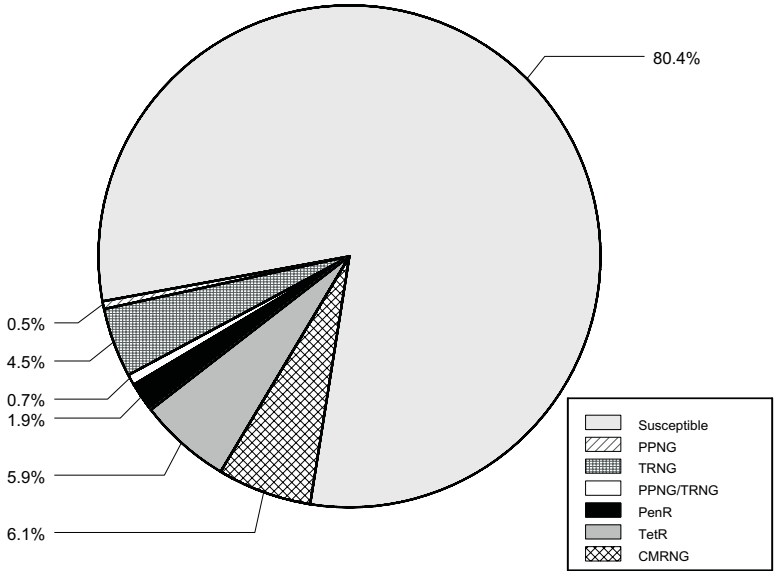
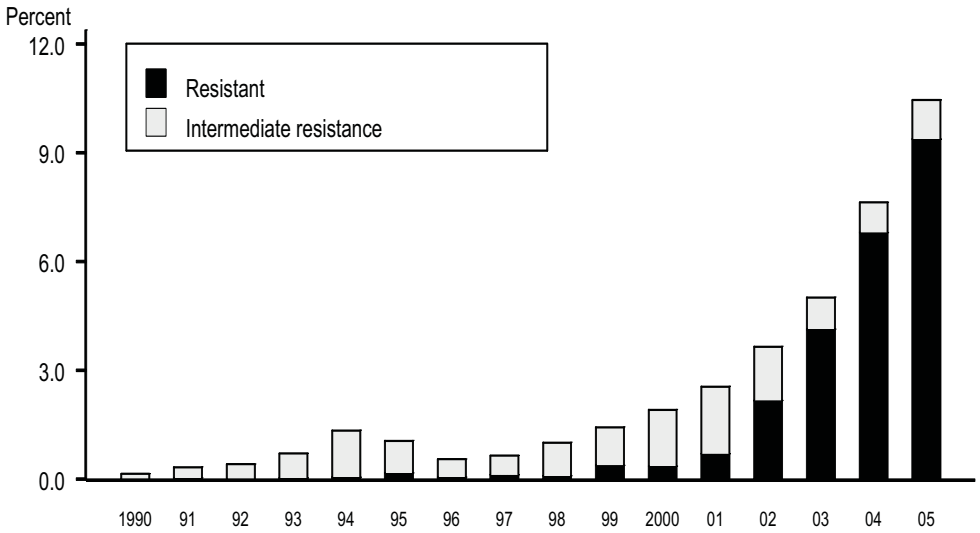
Figure 23. Gonococcal Isolate Surveillance Project (GISP) — Penicillin and tetracycline resistance among GISP isolates, 2005



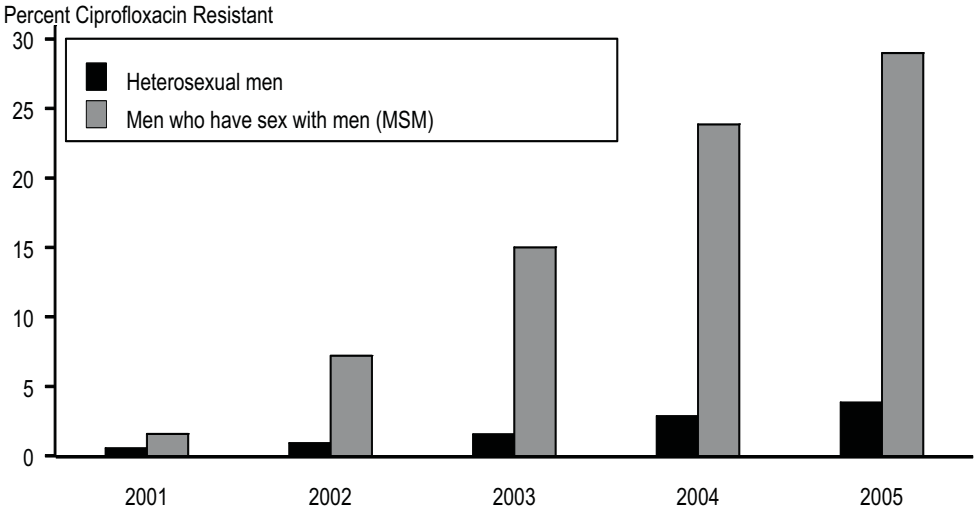
Note: PPNG=penicillinase-producing *N. gonorrhoeae;* TRNG=plasmid-mediated tetracycline-resistant *N. gonorrhoeae;* PPNG-TRNG=plasmid-mediated penicillin and tetracycline-resistant *N. gonorrhoeae;* PenR=chromosomally mediated penicillin-resistant *N. gonorrhoeae;* TetR= chromosomally mediated tetracycline-resistant *N. gonorrhoeae;* CMRNG=chromosomally mediated penicillin- and tetracycline-resistant *N. gonorrhoeae.*

Figure 24. Gonococcal Isolate Surveillance Project (GISP) — Percent of *Neisseria gonorrhoeae* isolates with resistance or intermediate resistance to ciprofloxacin, 1990–2005



Note: Resistant isolates have ciprofloxacin MICs $\geq$ 1 μg/ml. Isolates with intermediate resistance have ciprofloxacin MICs of 0.125 - 0.5 μg/ml. Susceptibility to ciprofloxacin was first measured in GISP in 1990.

Figure 25. Gonococcal Isolate Surveillance Project (GISP) — Percent of *Neisseria gonorrhoeae* isolates with resistance to ciprofloxacin by sexual behavior, 2001–2005



Syphilis

Background

Syphilis, a genital ulcerative disease, causes significant complications if untreated and facilitates the transmission of HIV. Untreated early syphilis in pregnant women results in perinatal death in up to 40% of cases and, if acquired during the four years preceding pregnancy, may lead to infection of the fetus in over 70% of cases.[1]

The rate of primary and secondary (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 26). The low rate of infectious 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 the *CDC's National Plan to Eliminate Syphilis*, which was announced by Surgeon General David Satcher in October 1999 and revised in May 2006.[2] Collaboration with diverse organizations, public health professionals, the private medical community, and other partners working in the fields of STD and HIV is essential for the successful elimination of syphilis in the United States.[3]

Although the rate of P&S syphilis in the United States declined 89.7% between 1990 and 2000, the rate of P&S syphilis increased from 2001 to 2005. Overall increases in rates between 2001 and 2005 were observed primarily among men. In 2005, for the first time in over 10 years, the rate of primary and secondary syphilis among women increased from 0.8 cases per 100,000 population in 2003 and 2004 to 0.9 cases per 100,000 population.

Despite national progress toward syphilis elimination, syphilis remains an important problem in the South and in urban areas in other regions of the country. Increases among men who have sex with men have occurred at least since 2000 and continue through 2005. These men have been characterized by high rates of HIV co-infection and high-risk sexual behavior.[4-11]

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

Between 2004 and 2005, the number of cases of early latent syphilis reported to CDC increased 5.3% (from 7,768 to 8,176), while the number of cases of late and late latent syphilis decreased 7.2% (from 17,300 to 16,049) (Table 1). The total number of cases of syphilis (all stages: P&S, early latent, late, late latent, and congenital syphilis) reported to CDC decreased 0.4% (from 33,419 to 33,278) between 2004 and 2005 (Table 1).

P&S Syphilis – United States

In 2005, P&S syphilis cases reported to CDC increased to 8,724 from 7,980 in 2004, an increase of 9.3%. The rate of P&S syphilis in the United States in 2005 (3.0 cases per 100,000 population) was 11.1% higher than the rate in 2004 (2.7 cases per 100,000 population), and it is greater than the HP 2010 target of 0.2 case per 100,000 population (Figure 26, Table 1).[12] Between 2004 and 2005, P&S syphilis rates in most age groups increased. (Table 31).

P&S Syphilis by Region

The South accounted for 46.4% of P&S syphilis in 2005 and 47.5% in 2004. Between 2004 and 2005, rates increased in all U.S. regions; rates increased 5.6% in the South (from 3.6 to 3.8 cases per 100,000 population), 4.5% in the Northeast (from 2.2 to 2.3), 14% in the West (from 2.9 to 3.3); and 13% in the Midwest (from 1.6 to 1.8). The 2005 rates in all regions were greater than the HP 2010 target of 0.2 case per 100,000 population (Figure 28, Table 24).

P&S Syphilis by State

In 2005, P&S syphilis rates in six states and no outlying areas were less than or equal to the HP 2010 target of 0.2 case per 100,000 population (Figure 29, Table 23). Seven states and two outlying areas reported five or fewer cases of P&S syphilis in 2005 (Table 23).

P&S Syphilis by County

In 2005, 2,434 of 3,140 counties (77.5%) in the United States reported no cases of P&S syphilis compared with 2,488 (79.3%) counties reporting no cases in 2004. Of 706 counties reporting at least one case of P&S syphilis in 2005, 5 (0.7%) had rates at or below the HP2010 target of 0.2 case per 100,000 population. Rates of P&S syphilis were above the HP2010 target for 701 counties in 2005 (Figure 30). These 701 counties (22.3% of the total number of counties in the United States) accounted for 99.9% of the total P&S syphilis cases reported in 2005.

In 2005, half of the total number of P&S syphilis cases were reported from 19 counties and two cities (Table 27).

P&S Syphilis by MSA

The rate of P&S syphilis in 2005 for the 50 most populous MSAs (4.5) exceeded the HP 2010 target of 0.2 case per 100,000 population (Table 28).

P&S Syphilis by Reporting Source

Between 1990 and 2005, the proportion of P&S syphilis cases reported from sources other than STD clinics increased from 25.6% to 68.7% (Figure 31, Table A2). Between 2001 and 2005, the number of cases among males reported from non-STD clinic sources increased sharply while the number from STD clinics remained stable (Figure 31).

P&S Syphilis by Sex

The rate of P&S syphilis increased 8.5% among men (from 4.7 cases to 5.1 cases per 100,000 men) between 2004 and 2005 (Figure 27, Table 26). During this time, the rate increased among women from 0.8 to 0.9 cases per 100,000 women (Figure 27, Table 25).

P&S Syphilis by Male to Female Rate Ratio

The male-to-female rate ratio for P&S syphilis has risen steadily since 1996 when it was 1.2 (Figure 33), suggesting an increase in syphilis among MSM during this time. The male-to-female rate ratio in 2005 was 5.7.

Between 2004 and 2005, the male-to-female rate ratio for P&S syphilis increased among whites (from 10 to 11), African Americans (from 3.3 to 3.6) Asian/Pacific Islanders (from 11 to 12), and American Indians/Alaska Natives (from 1.3 to 2.1). The male-to-female rate ratio decreased among Hispanics (from 7.7 to 6.1) (Table 32B).

An increase in the male-to-female rate ratio for P&S syphilis occurred in the District of Columbia, Puerto Rico and in 18 of 33 states (55%) that reported at least 25 cases in 2005.

P&S Syphilis by Race/Ethnicity and Sex

From 2004 to 2005, the rate among non-Hispanic whites increased 12.5% (from 1.6 to 1.8); rates among men increased 10% (from 3.0 to 3.3) and stayed the same among women (0.3). The rate among African Americans increased 11.4% (from 8.8 to 9.8); rates among men increased 12.9% (from 13.9 to 15.7), and rates among women increased 4.8% (from 4.2 to 4.4). The rate among Hispanics increased 6.5% (from 3.1 to 3.3); rates among men increased 1.9% (from 5.4 to 5.5), and rates among women increased 28.6% (from 0.7 to 0.9). The rate among Asian/Pacific Islanders stayed the same (1.2); rates among men increased 4.5% (from 2.2 to 2.3) and stayed the same among women (0.2). The rate among American Indian/Alaska Natives decreased 22.6% (from 3.1 to 2.4); rates among men decreased 5.7% (from 3.5 to 3.3), and rates among women decreased 42.9% (from 2.8 to 1.6) (Figure 32, Table 32B).

In 2005, the rate of P&S syphilis reported among African Americans (9.8 cases per 100,000 population) was 5.4 times higher than the rate among non-Hispanic whites (1.8 cases per 100,000 population), reflecting an overall decrease in disparity during the last several years (Table 32B).

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

In 2005, the rate of P&S syphilis among African Americans was highest among women aged 20-24 years (13.5) and among men aged 25-29 years (38.2). For non-Hispanic whites, the rate was highest among women aged 20-24 years (0.8) and among men aged 35-39 years (10.3). For Hispanics, the rate was highest among women aged 20-24 years (2.9) and among men aged 35-39 years (14.0). For Asian/Pacific Islanders, the rate was highest among women aged 20-24 years (0.8) and among men aged 30-34 years (6.6). For American Indian/Alaska Natives, the rate was highest among women aged 35-39 years (4.7) and among men aged 30-34 years (11.4) (Table 32B).

Congenital Syphilis – United States

Between 2004 and 2005, the overall rate of congenital syphilis decreased 12.1% in the United States, from 9.1 to 8.0 cases per 100,000 live births (Figure 37, Table 37). The continuing decline in the rate of congenital syphilis (Figure 38) likely reflects the substantial reduction in the rate of P&S syphilis among women that has occurred during the last decade (Figure 37).[13,14]

Between 1996 and 2005, the average yearly percentage decrease in the congenital syphilis rate was 14.1% (Table 37). The average yearly percentage decrease in the rate of P&S syphilis among women between 1996 and 2005 was 14.1%. Overall, there has been a 74% decrease in cases of congenital syphilis since 1996.

Congenital Syphilis by State

In 2005, 26 states and two outlying areas had rates of congenital syphilis that exceeded the HP 2010 target of one case per 100,000 live births (Tables 38-39).

Syphilis Among Special Populations

Additional information about syphilis and congenital syphilis in racial and ethnic minority populations, adolescents, men who have sex with men, and other at risk populations can be found in the **Special Focus Profiles**.

[1] Ingraham NR. The value of penicillin alone in the prevention and treatment of congenital syphilis. *Acta Derm Venereol* 31 (suppl 24):60,1951.

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[12] U.S. Department of Health and Human Services. *Healthy People 2010*. 2nd ed. With Understanding and Improving Health and Objectives for Improving Health. 2 vols. Washington, DC: U.S. Government Printing Office, November 2000.

[13] Centers for Disease Control and Prevention. Congenital syphilis – United States, 2002. *MMWR* 2004;53:716-9.

[14] Centers for Disease Control and Prevention. Primary and secondary syphilis – United States, 2002. *MMWR* 2003;52(46):1117-20.

Figure 26. Syphilis — Reported cases by stage of infection: United States, 1941–2005

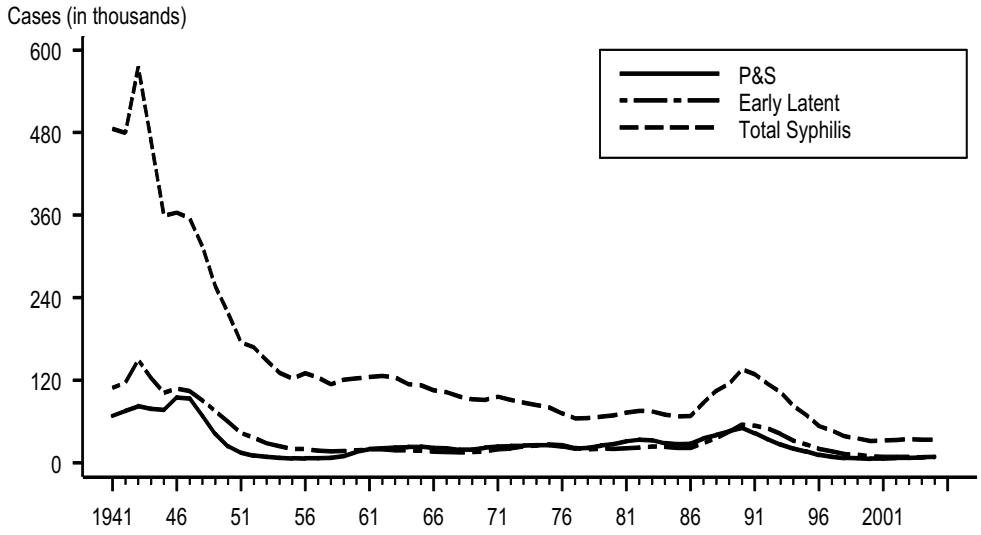
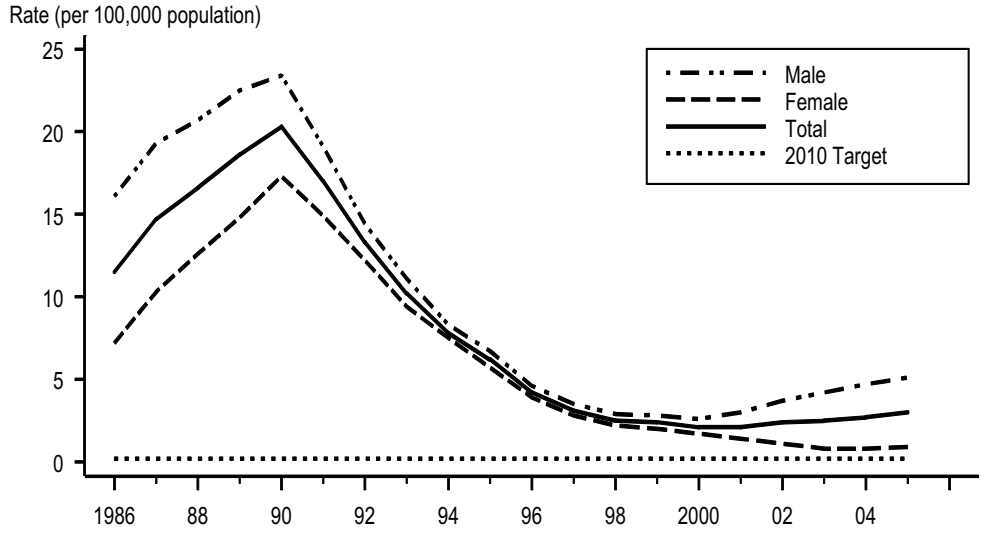
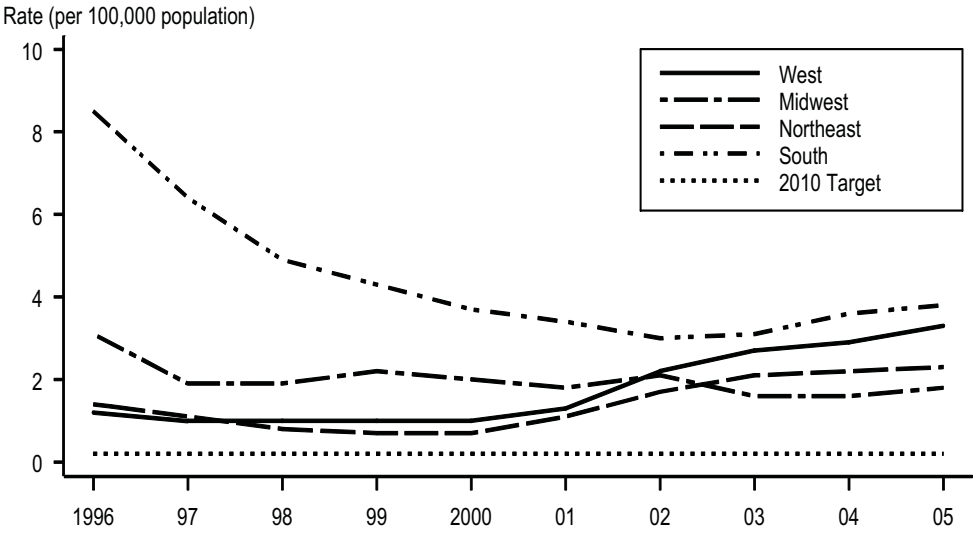


Figure 27. Primary and secondary syphilis — Rates: Total and by sex: United States, 1986–2005 and the Healthy People 2010 target



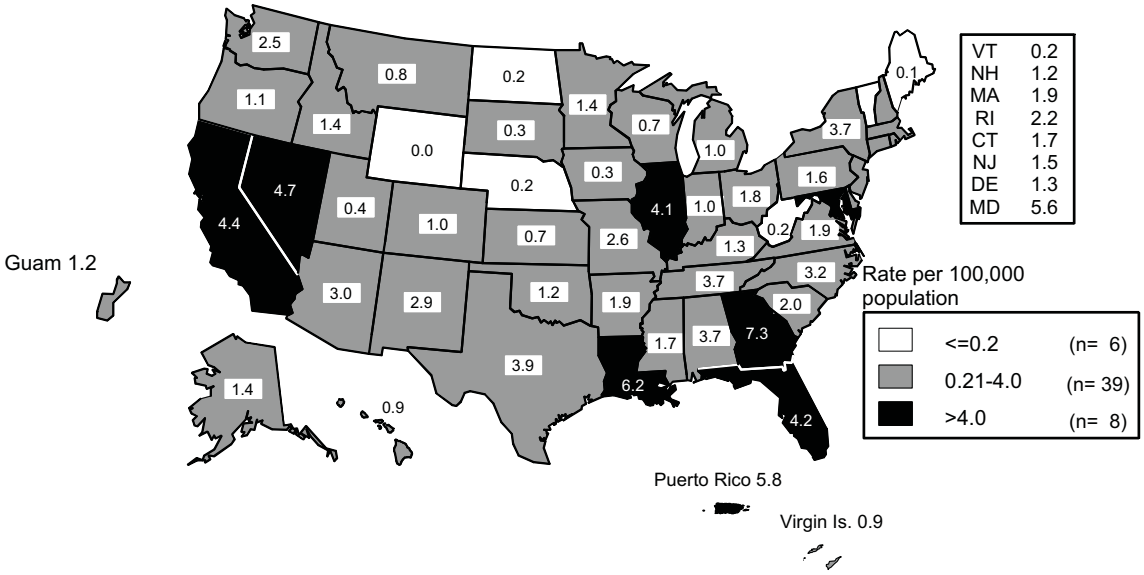
Note: The Healthy People 2010 target for P&S syphilis is 0.2 case per 100,000 population.

Figure 28. Primary and secondary syphilis — Rates by region: United States, 1996–2005 and the Healthy People 2010 target



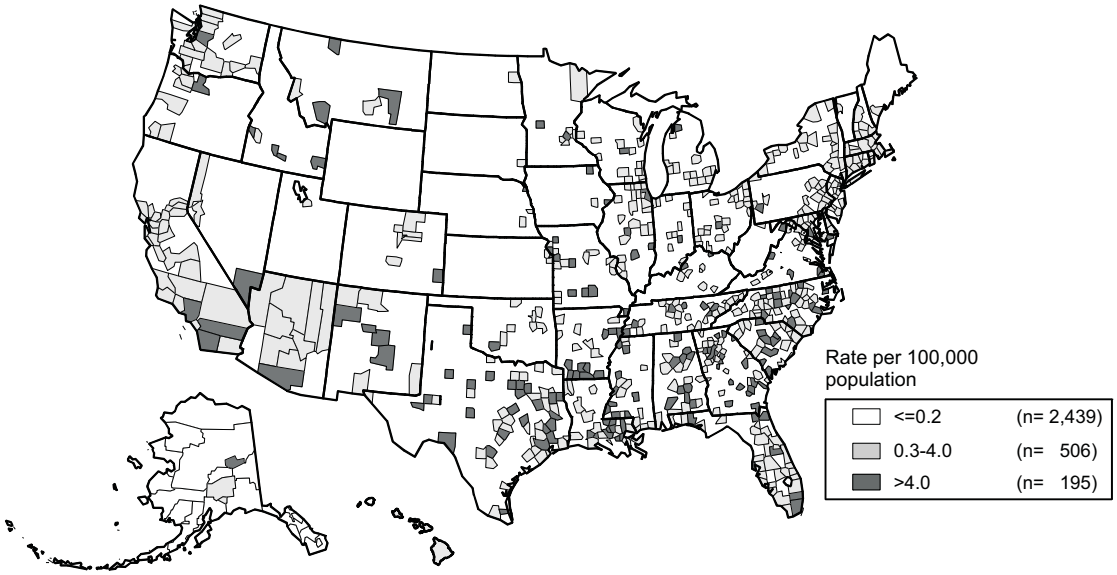
Note: The Healthy People 2010 target for P&S syphilis is 0.2 case per 100,000 population.

Figure 29. Primary and secondary syphilis — Rates by state: United States and outlying areas, 2005



Note: The total rate of P&S syphilis for the United States and outlying areas (Guam, Puerto Rico and Virgin Islands) was 3.0 per 100,000 population. The Healthy People 2010 target is 0.2 case per 100,000 population.

Figure 30. Primary and secondary syphilis — Rates by county: United States, 2005



Note: The Healthy People 2010 target for P&S syphilis is 0.2 case per 100,000 population. In 2005, 2,434 (77.5%) of 3,140 counties in the U.S. reported no cases of P&S syphilis.

Figure 31. Primary and secondary syphilis — Cases by reporting source and sex: United States, 1996–2005

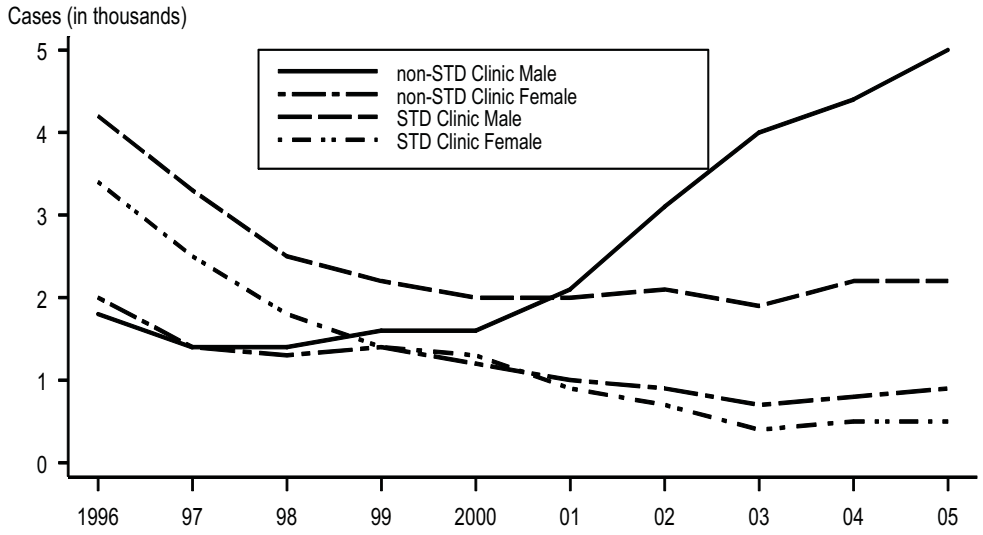


Figure 32. Primary and secondary syphilis — Rates by race/ethnicity: United States, 1996–2005

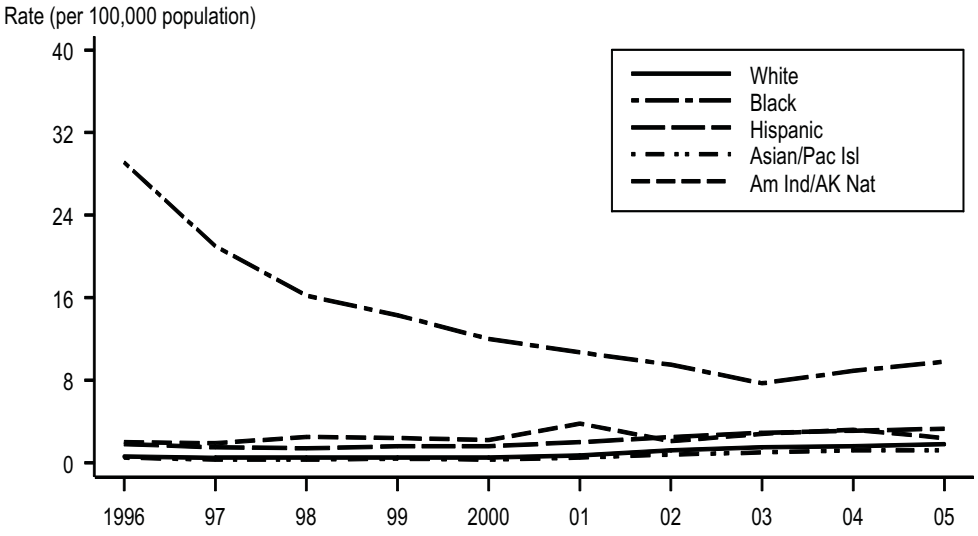


Figure 33. Primary and secondary syphilis — Male-to-female rate ratios: United States, 1996–2005

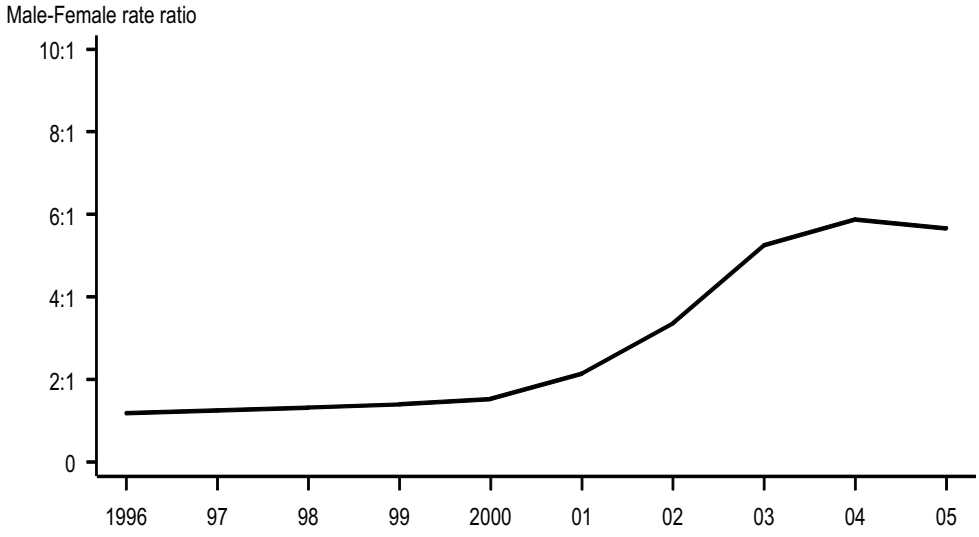


Figure 34. Primary and secondary syphilis — Age- and sex-specific rates: United States, 2005

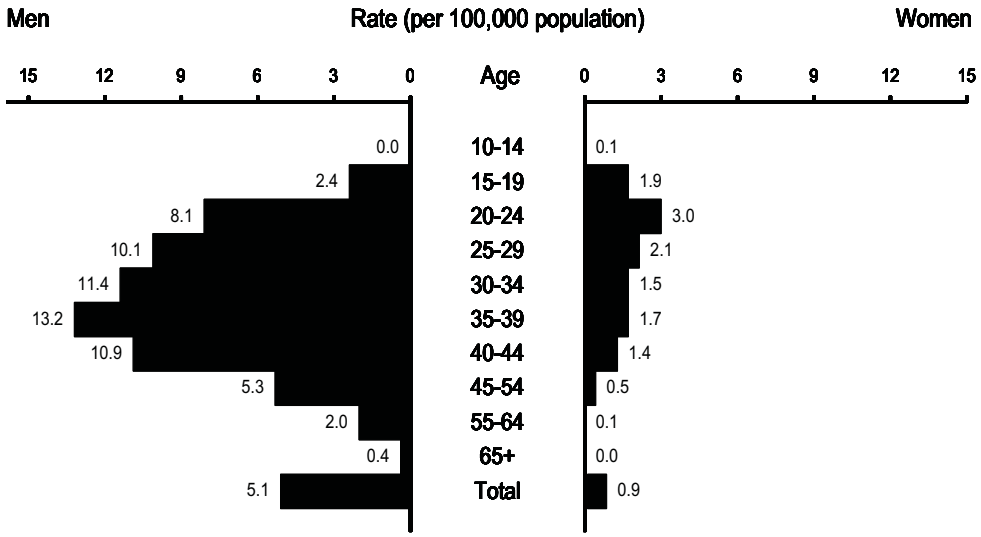


Figure 35. Primary and secondary syphilis — Age-specific rates among women 15 to 44 years of age: United States, 1996–2005

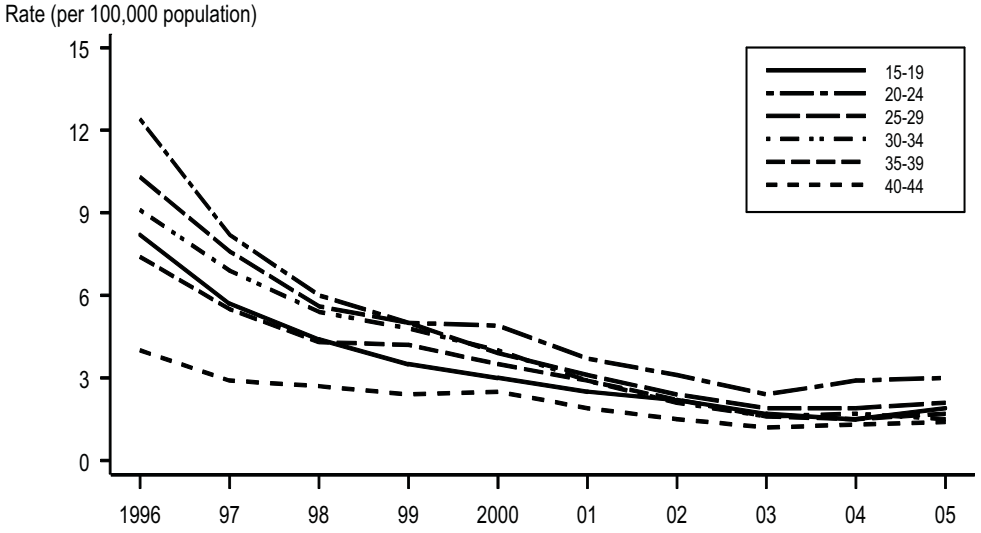


Figure 36. Primary and secondary syphilis — Age-specific rates among men 15 to 44 years of age: United States, 1996–2005

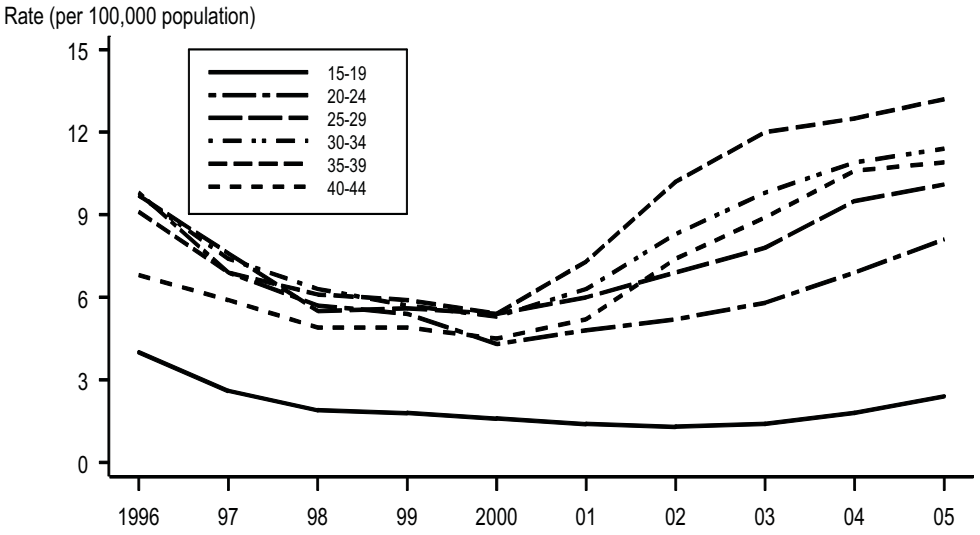


Figure 37. Congenital syphilis (CS) — Reported cases for infants < 1 year of age and rates of primary and secondary syphilis among women: United States, 1996–2005

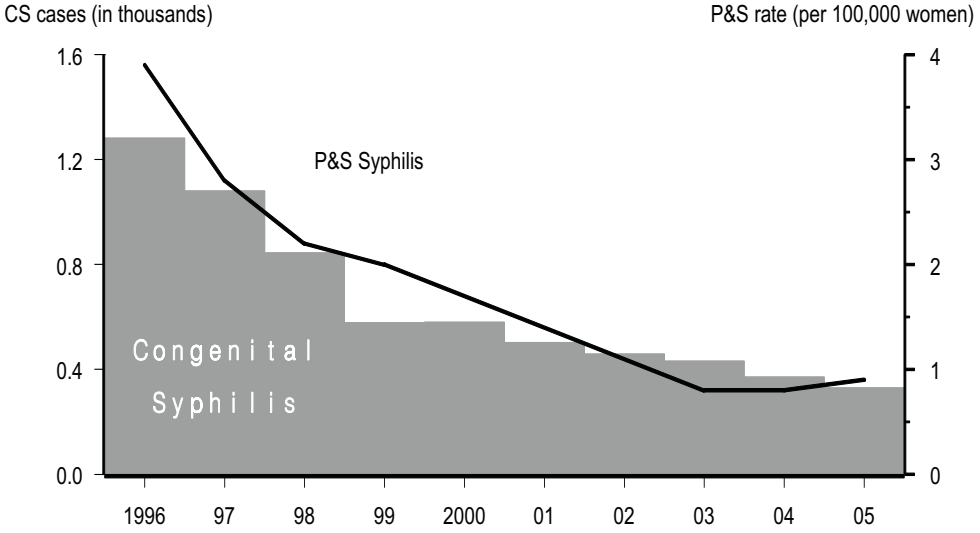
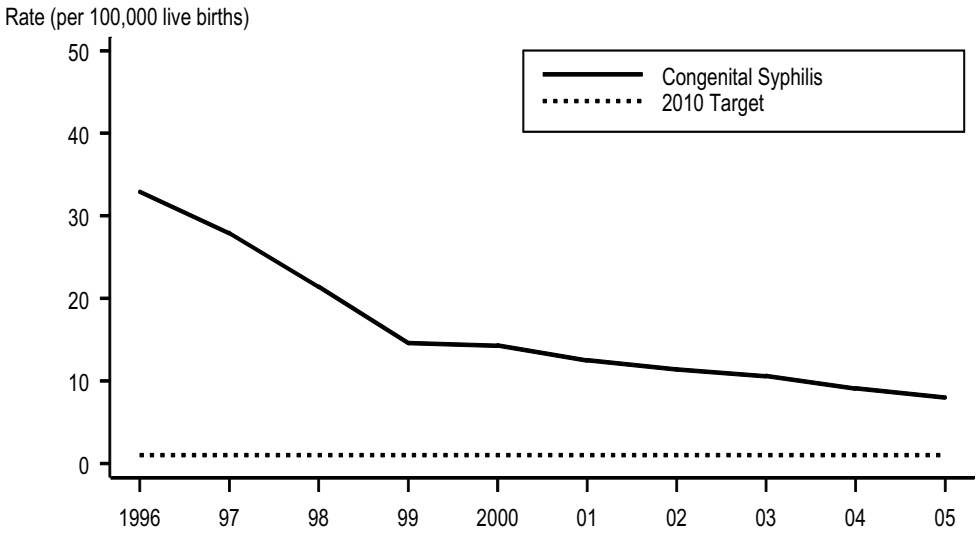


Figure 38. Congenital syphilis — Rates for infants < 1 year of age: United States, 1996–2005 and the Healthy People 2010 target



Note: The Healthy People 2010 target for congenital syphilis is 1.0 case per 100,000 live births.

Other Sexually Transmitted Diseases

Chancroid

Since 1987, reported cases of chancroid declined steadily until 2001 when 38 cases were reported (Figure 39, Table 1). In 2005, 17 cases of chancroid were reported in the United States, the lowest number of cases ever reported. Only 10 states and one outlying area reported one or more cases of chancroid in 2005 (Table 41). 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 since *Haemophilus ducreyi*, the causative organism of chancroid, is difficult to culture and, as a result, this condition may be substantially under diagnosed.[1,2]

Human Papillomavirus

Persistent infection with high risk human papillomavirus (HR-HPV) can lead to development of anogenital cancers (i.e. cervical cancer). Sentinel surveillance for cervical infection with high-risk human papillomavirus types 16, 18, 31, 33, 35, 39, 45, 51, 52, 56, 58, 59, 68 was conducted in 29 STD, family planning and primary care clinics in six locations (Boston, Baltimore, New Orleans, Denver, Seattle and Los Angeles) as part of an effort to estimate national burden of disease and inform prevention programs such as vaccine programs in the U.S. Testing was performed using a commercially available test for HR-HPV testing (Digene Hybrid Capture 2, Gaithersburg). Interim results from 2003–2004 document an overall HR-HPV prevalence of 22.5%. Prevalence in STD clinics was 28%, 24% in family planning clinics, and 16% in primary care clinics. Prevalence by age group was: 14-19 years 35%; 20-29 years 29%; 30-39 years 14%; 40-49 years 12%; and 50-65 years 6%.

In June 2006, a quadrivalent HPV vaccine was licensed for use in the United States. The vaccine provides protection against types 6, 11, 16, and 18. PCR based HR-HPV testing and typing using the Roche line blot assay provided type-specific estimates of prevalence for types 16 and 18, two types contained in the HPV vaccine. Overall prevalence of HPV 16/18 was 8%. Prevalence of HPV 16/18 by age group was: 14-19 years 16%; 20-29 years 10%; 30-39 years 3%; 40-49 years 2%; 50-65 years 1%.[3,4]

Pelvic Inflammatory Disease

For data on Pelvic Inflammatory Disease (PID), see the **Special Focus Profile** on Women and Infants.

Other Sexually Transmitted Diseases

Case reporting data for genital herpes simplex virus (HSV), genital warts or other human papillomavirus infections, and trichomoniasis are not available. Trend data are limited to estimates of the initial office visits in physicians' office practices for these conditions from the National Disease and Therapeutic Index (NDTI) (Figures 40-42 and Table 42).

[1] Schulte JM, Martich FA, Schmid GP. Chancroid in the United States, 1981–1990: Evidence for underreporting of cases. *MMWR* 1992;41(no. SS-3):57-61.

[2] Mertz KJ, Trees D, Levine WC, *et* al. Etiology of genital ulcers and prevalence of human immunodeficiency virus coinfection in 10 US cities. *J Infect Dis* 1998;178:1795-8.

[3] Datta SD, Koutsky L, Douglas J, *et* al. Sentinel surveillance for human papillomavirus among women in the United States, 2003–2004 [Abstract no. MO-306]. In: Program and abstracts of the 16th Biennial Meeting of the International Society for Sexually Transmitted Diseases Research, Amsterdam, The Netherlands, July 10-13, 2005

[4] Datta SD, Koutsky L, Ratelle S, *et* al. Type-Specific High-Risk HPV Prevalence from the HPV Sentinel Surveillance Project, US, 2003–2005 [Abstract no. P-099]. In Program and abstracts of the International Human Papillomavirus Meeting, Prague, Czech Republic, September 2006.

Figure 39. Chancroid — Reported cases: United States, 1981–2005

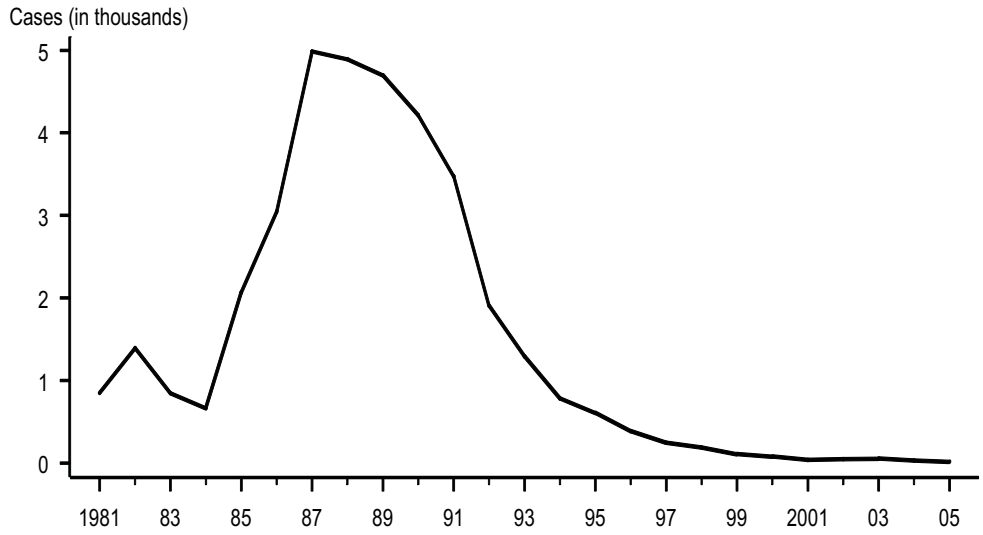
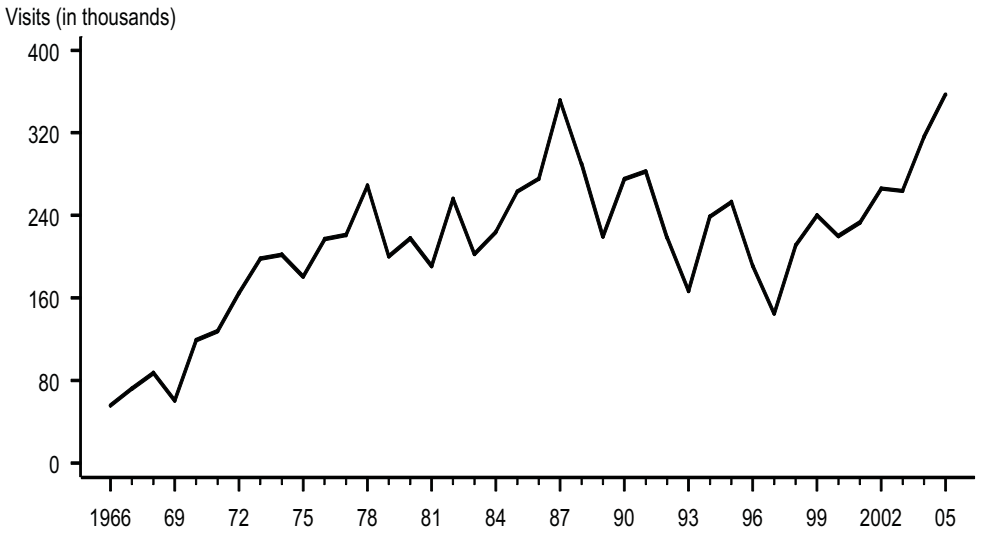


Figure 40. Genital herpes — Initial visits to physicians' offices: United States, 1966–2005

Note: See Appendix (Other Data Sources) and Table 42. The relative standard error for genital herpes estimates range from 20% to 30%.

SOURCE: National Disease and Therapeutic Index (IMS Health)

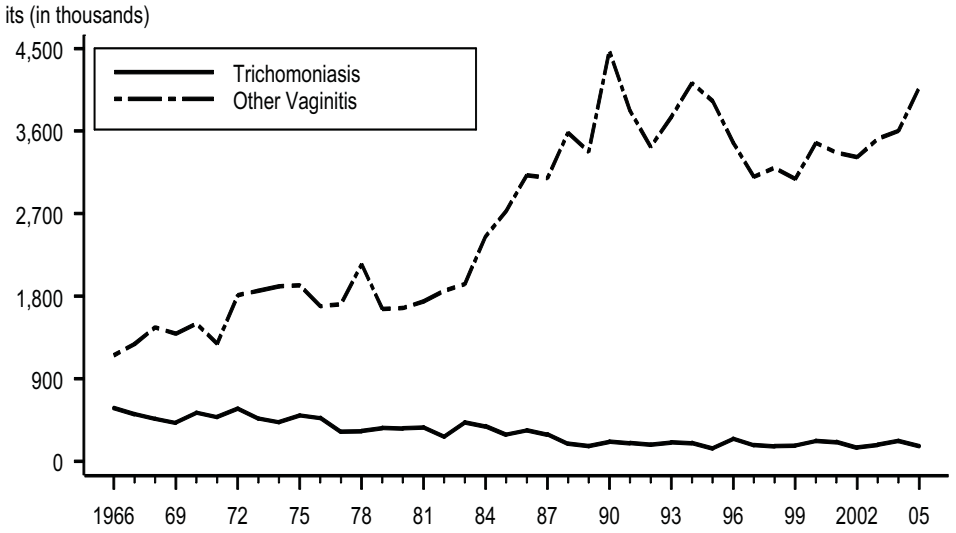
Figure 41. Genital warts — Initial visits to physicians' offices: United States, 1966–2005



Note: See Appendix (Other Data Sources) and Table 42. The relative standard error for genital warts estimates range from 20% to 40%.

SOURCE: National Disease and Therapeutic Index (IMS Health)

Figure 42. Trichomoniasis and other vaginal infections in women — Initial visits to physicians' offices: United States, 1966–2005



Note: See Appendix (Other Data Sources) and Table 42. The relative standard error for trichomoniasis estimates range from 7.5% to 13% and for other vaginitis estimates range from 16% to 30%.

SOURCE: National Disease and Therapeutic Index (IMS Health)