STDs in Women and Infants

Public Health Impact

Women and infants bear significant long-term consequences of STDs. In addition to biological and social factors such as poverty and access to quality STD services, a woman's inability to negotiate safer sexual practices, such as condom use, can significantly affect her sexual health and subsequently the health of her unborn baby.[1,2] A woman's relationship status with her male partner, in particular, has been identified as an important predictor of her sexual health.[3] For example, a perceived shortage of available men in a community, can cause women to be more accepting of their partners' concurrent sexual relationships, and partner concurrency is a factor associated with increased risk for STDs.[4] A number of studies have found significant associations between condom use and socio-demographic characteristics, including age, income, education, and acculturation.[5] Because it may be the behavior of her male partner, rather than the woman's own behavior, that increases a woman's risk for STDs, even a woman who has only one partner may be obliged to practice safer sex such as using condoms.[6]

Women infected with *C. trachomatis* or *N. gonorrhoeae* can develop PID, which, in turn, can lead to reproductive system morbidity such as ectopic pregnancy and tubal factor infertility. An estimated 10%–20% of women with chlamydia or gonorrhea may develop PID if they do not receive adequate treatment.[7,8] Among women with PID, tubal scarring can cause infertility in 8% of women, ectopic pregnancy in 9%, and chronic pelvic pain in 18%.[9]

About 80%–90% of chlamydial infections[10] and up to 80% of gonococcal infections[11] in women are asymptomatic. These infections are detected primarily through screening. The symptoms associated with PID are vague so 85% of women with PID delay seeking medical care, thereby increasing the risk for infertility and ectopic pregnancy.[12] Data from two randomized controlled trials of chlamydia screening suggest that such screening programs reduce PID incidence. [13,14]

HPV infections are highly prevalent in the United States, especially among young sexually active women. Although most HPV infections in women resolve within 1 year, they are a major concern because persistent infection with specific types of the virus are causally related to cervical cancer; these types also cause Papanicolaou (Pap) smear abnormalities. Other types cause genital warts, low-grade Pap smear abnormalities, and, rarely, recurrent respiratory papillomatosis in infants born to infected mothers.[15]

Direct Impact on Pregnancy

Chlamydia and gonorrhea can result in adverse outcomes of pregnancy, including neonatal ophthalmia and, in the case of chlamydia, neonatal pneumonia. Although topical prophylaxis of infants at delivery is effective for prevention of gonococcal ophthalmia neonatorum, prevention of neonatal pneumonia requires prenatal detection and treatment.

Genital infections with HSV are extremely common, can cause painful outbreaks, and can have serious consequences for pregnant women and their infants.[16]

When a woman has a syphilis infection during pregnancy, she can transmit the infection to the fetus in utero. Transmission can result in fetal death or an infant born with physical and mental developmental disabilities. Most cases of congenital syphilis are easily preventable if women are screened for syphilis and treated early during prenatal care.[17]

Observations

Chlamydia—United States

Chlamydial infections in women are usually asymptomatic and screening is necessary to identify most infections.[18] Routine chlamydia screening of sexually-active young women has been recommended by CDC since 1993.[19] Increases in reported cases among women since the early 1990s likely reflect expanded screening coverage (Figure 1). In 2012, there were 1,018,272 cases reported among women for a rate of 643.3 per 100,000 females. This rate is similar to the rate of 643.4 per 100,000 females in 2011.

Chlamydia rates are highest among young women, the population targeted for screening (Figure 5, Table 10). Within the young age group, rates were highest in 2012 among 19 year old females (4,921.1 per 100,000 females) although this was a slight decrease from the 2011 rate of 5,122.1 per 100,000 females (Table 12). Regionally, chlamydia case rates are highest among women in the South, with a rate of 715.4 per 100,000 females in 2012 (Table 4). Chlamydia rates exceeded gonorrhea rates among women in all states (Figures A and B, Tables 4 and 15).

Gonorrhea—United States

Like chlamydia, gonorrhea is often asymptomatic in women. Thus, gonorrhea screening is an important strategy for the identification of gonorrhea among women. Large-scale screening programs for gonorrhea in women began in the 1970s. After an initial increase in cases detected through screening, gonorrhea rates for both women and men declined steadily throughout the 1980s and early 1990s and then declined more gradually in the late 1990s and the 2000s (Figure 11). After reaching an all-time low in 2009 (104.5 cases per 100,000 females), the gonorrhea rate for women has increased slightly each year, and was 108.7 cases per 100,000 females in 2012 (Figure 12, Table 15).

The gonorrhea rate among women has been slightly higher than the rate among men since 2001 (Figure 12, Tables 15 and 16).Gonorrhea rates are highest among young women (Figure 16, Table 21). Within the young age group, rates were highest in 2012 among 19 year old females (761.3 per 100,000 females) (Table 23).

Positivity in Selected Populations

During the mid-1990s to 2011, chlamydia and gonorrhea positivity among young women screened in prenatal care clinics participating in infertility prevention activities were reported to CDC to monitor chlamydia and gonorrhea prevalence in women. 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. 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 and gonorrhea.

Congenital Syphilis

Trends in congenital syphilis usually follow trends in P&S syphilis among women, with a lag of 1–2 years (Figure 43). The rate of P&S syphilis among women declined 95.4% (from 17.3 to 0.8 cases per 100,000 females) during 1990–2004 (Figure 31). The rate of congenital syphilis declined by 92.4% (from a peak of 107.6 cases to 8.2 cases per 100,000 live births) during 1991–2005 (Table 1). Rates of both female P&S and congenital syphilis increased during 2005–2008. During 2009-2012, rates of both female P&S and congenital syphilis declined (from 1.4 to 1.1 cases per 100,000 population and from 10.4 to 7.8 cases per 100,000 live births, respectively) (Tables 28 and 42). The rate of congenital syphilis was 7.8 cases per 100,000 live births in 2012, the lowest rate since 1988, when the case definition was changed (Table 42).

The highest rates of P&S syphilis among women and congenital syphilis were observed in the South (Figures C and D, Table 42).

Although most cases of congenital syphilis occur among infants whose mothers have had some prenatal care, late or limited prenatal care has been associated with congenital syphilis. Failure of health care providers to adhere to maternal syphilis screening recommendations also contributes to the occurrence of congenital syphilis.[20]

Pelvic Inflammatory Disease

Accurate estimates of PID and tubal factor infertility resulting from chlamydial and gonococcal infections are difficult to obtain, in part because definitive diagnoses of these conditions can be complex. Published data suggest overall declining rates of women diagnosed with PID in the United States in both hospital and ambulatory settings.[21-23]

During 2001-2010, hospitalizations for acute PID overall have shown modest declines, although hospitalizations for acute PID increased by 44.3% (from 36.3 to 52.4 per 100,000) between 2009 and 2010 (Figure G). Hospitalizations for chronic PID have also shown modest declines, remaining relatively stable between 2007 and 2010 (Figure G). The National

Hospital Discharge Survey (NHDS) was discontinued in 2010. In 2011, a new survey, the National Hospital Care Survey (NHCS), was launched that integrates inpatient data formerly collected by the NHDS with emergency department, outpatient department, and ambulatory surgery center data previously collected by the National Hospital Ambulatory Medical Care Survey.

The estimated number of initial visits to physicians' offices for PID from NDTI declined during 2003–2012 (Figure F, Table 45).

Racial disparities in diagnosed PID have been observed in both ambulatory and hospitalized settings. [21] Using data from three nationally representative surveys conducted by the National Center for Health Statistics (NCHS), disease rates were two to three times higher among black women than among white women. These disparities are consistent with the marked racial disparities observed for chlamydia and gonorrhea. However, because of the subjective methods by which PID is diagnosed, racial disparity data should be interpreted with caution.

Ectopic Pregnancy

The incidence of ectopic pregnancy in the United States during the 1970's and 1980's was marked by significant increases. This surveillance who also relied on the NHDS, which collected information on discharged hospital inpatients in the United States. Since the late 1980s, the ability to ascertain the number of ectopic pregnancies occurring in the United States has been affected by changing health care practices, including technological advances that permit early, accurate diagnosis of pregnancy and ectopic pregnancy, and pharmacological and technical advances in treatment of ectopic pregnancy. Data from the NHDS suggest that hospitalizations for ectopic pregnancy have decreased from 33.0 per 100,000 in 2001 to 21.6 per 100,000 in 2010 (Figure I). However, this likely does not reflect a decrease in the actual public health burden of ectopic pregnancy given that administrative data from the middle of the decade show that the proportion of cases being treated with nonsurgical intervention is increasing.[24] In the future years, data on ectopic pregnancy will be available from NHCS.

[1] Pulerwitz J, Amaro H, De Jong W, Gortmaker SL, Rudd R. Relationship power, condom use and HIV risk among women in the USA. AIDS Care. 2002;14(6):789-800.

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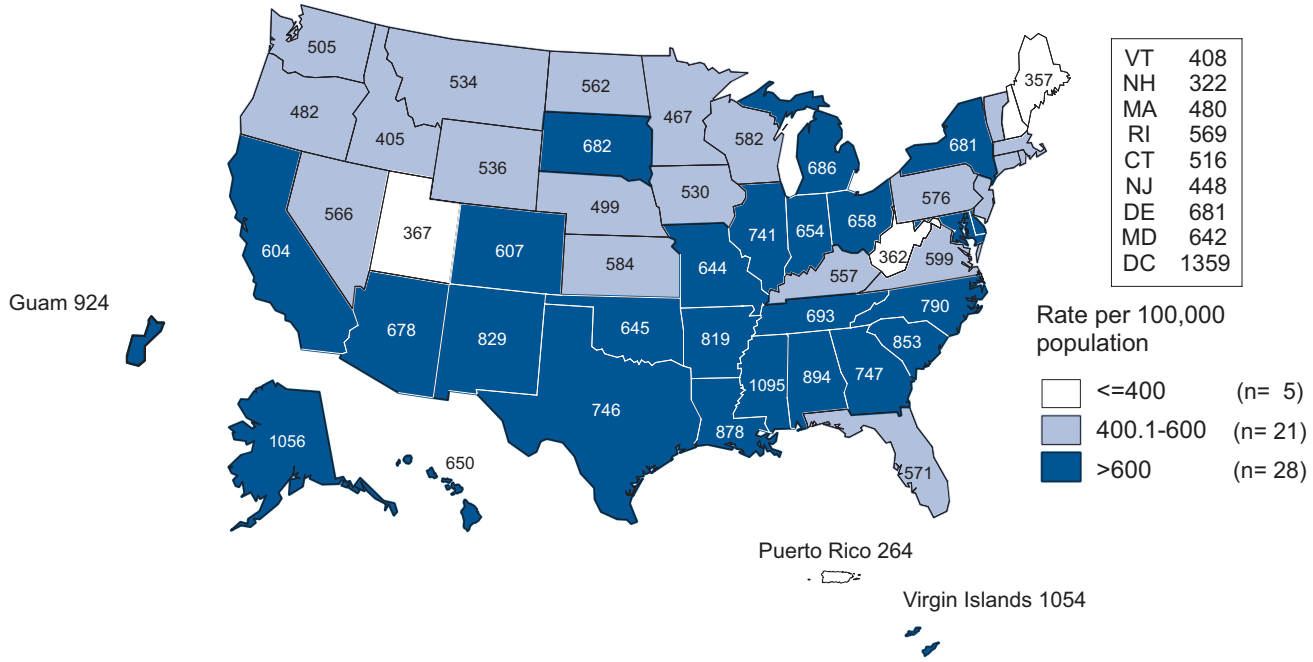
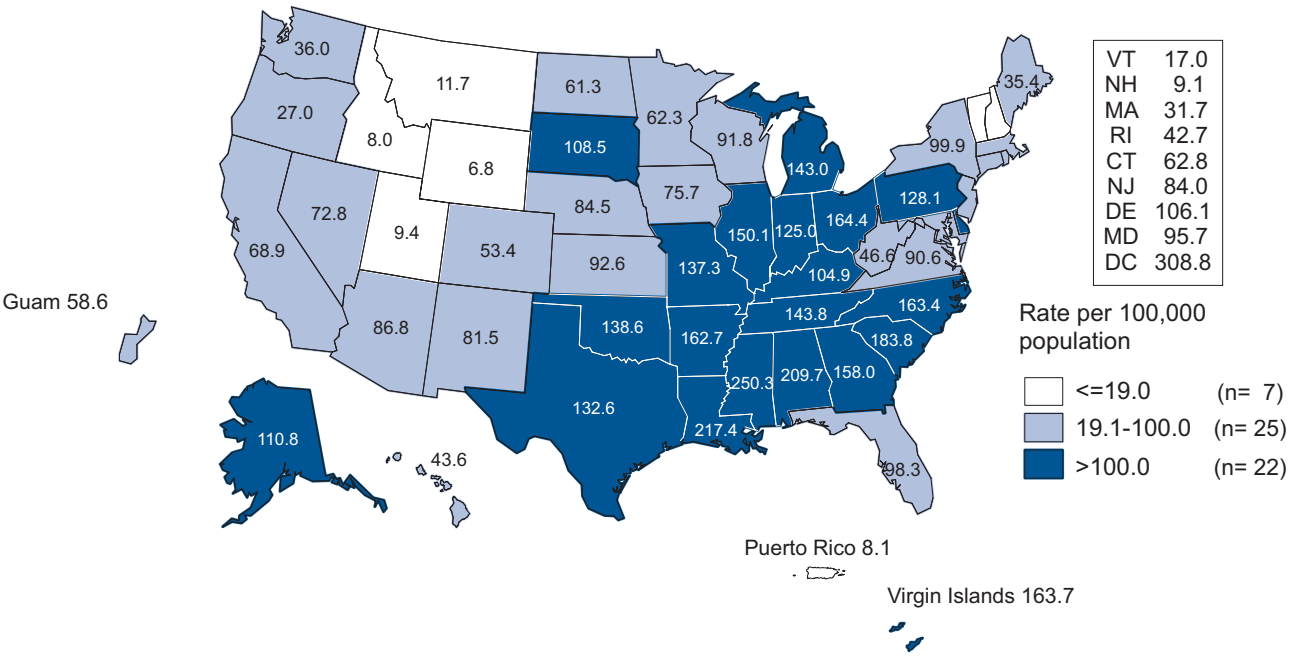
Figure A. Chlamydia — Women — Rates by State, United States and Outlying Areas, 2012



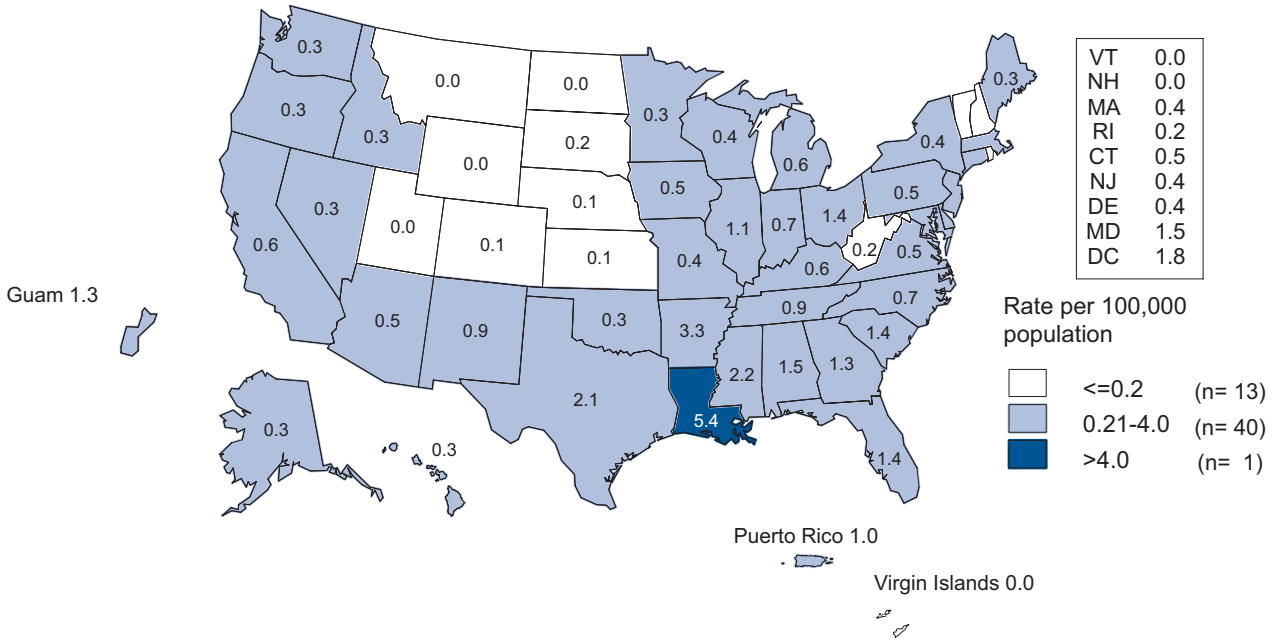
NOTE: The total chlamydial infection rate among women in the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 639.0 per 100,000 female population.

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



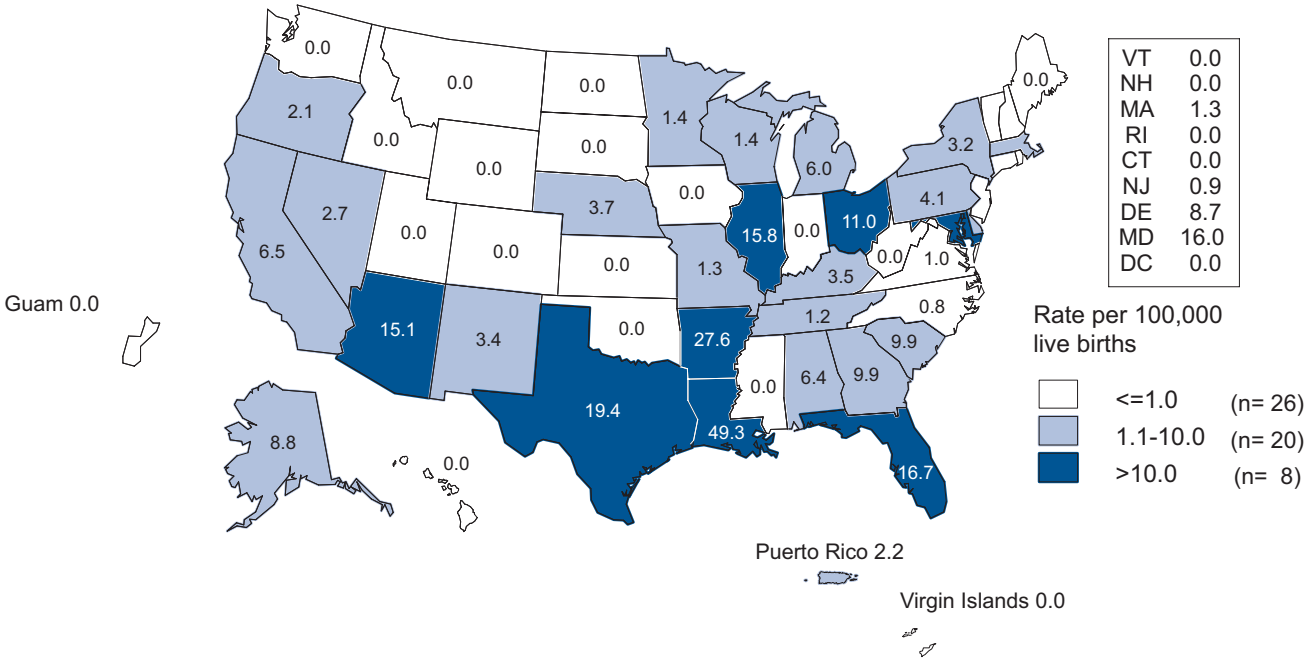
NOTE: The total gonorrhea infection rate among women in the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 107.5 per 100,000 female population.

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



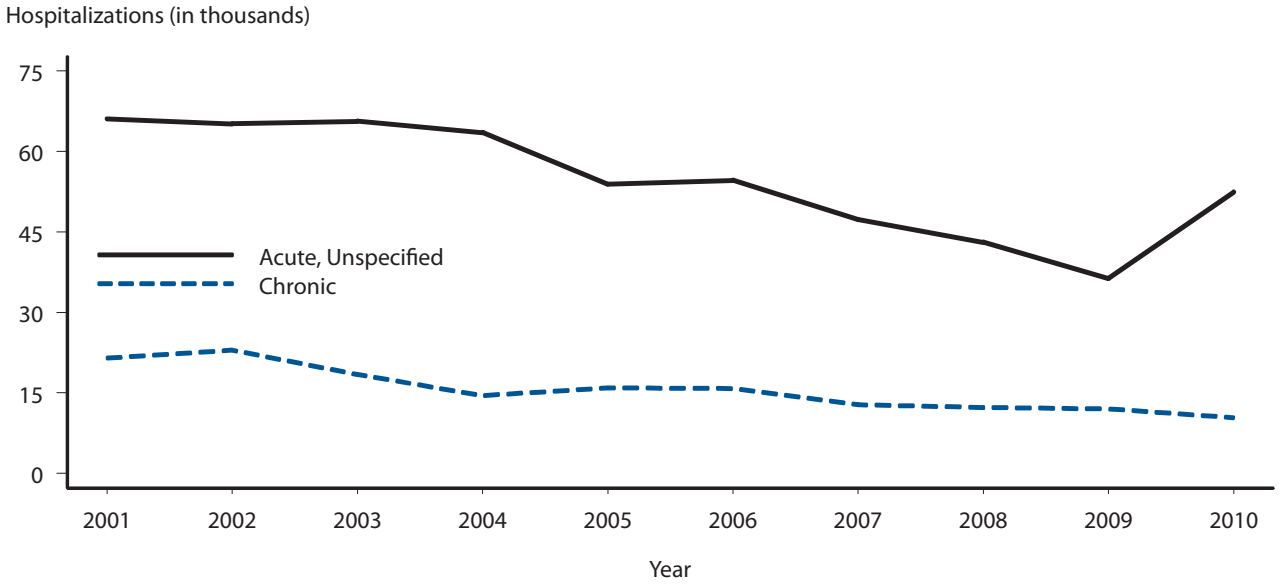
NOTE: The total rate of primary and secondary syphilis among women in the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 0.9 per 100,000 females.

Figure D. Congenital Syphilis — Infants — Rates by Year of Birth and State, United States and Outlying Areas, 2012



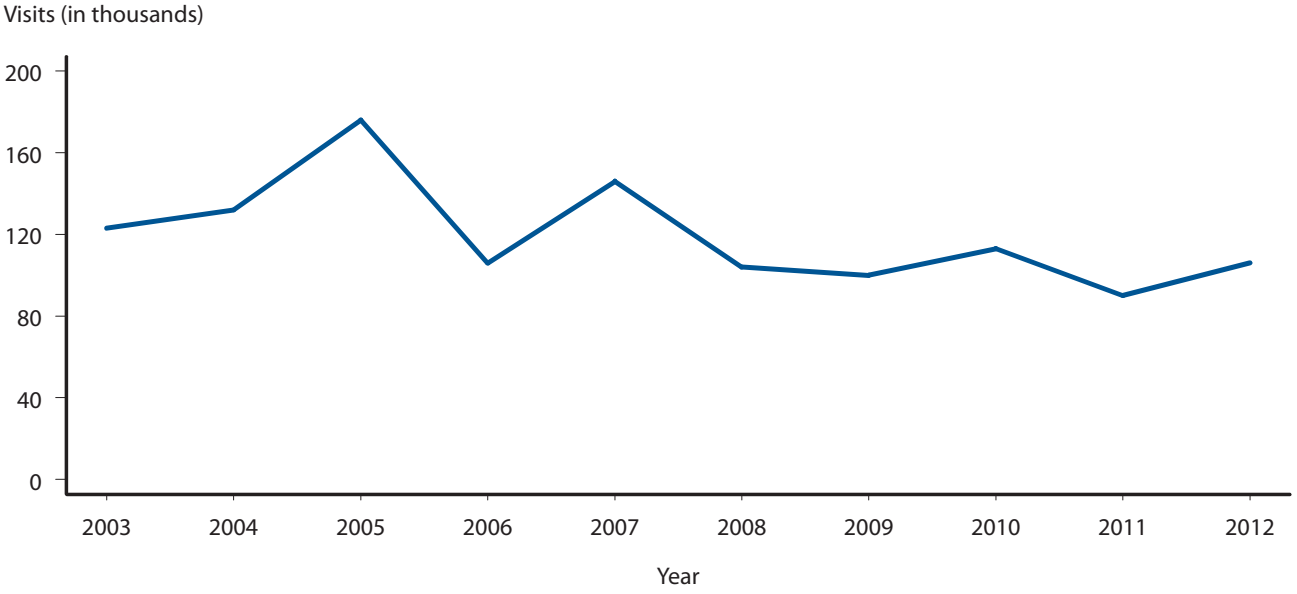
NOTE: The total rate of congenital syphilis for infants by year of birth for the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 7.7 per 100,000 live births.

Figure E. Pelvic Inflammatory Disease — Hospitalizations of Women Aged 15 – 44 Years, United States, 2001 – 2010



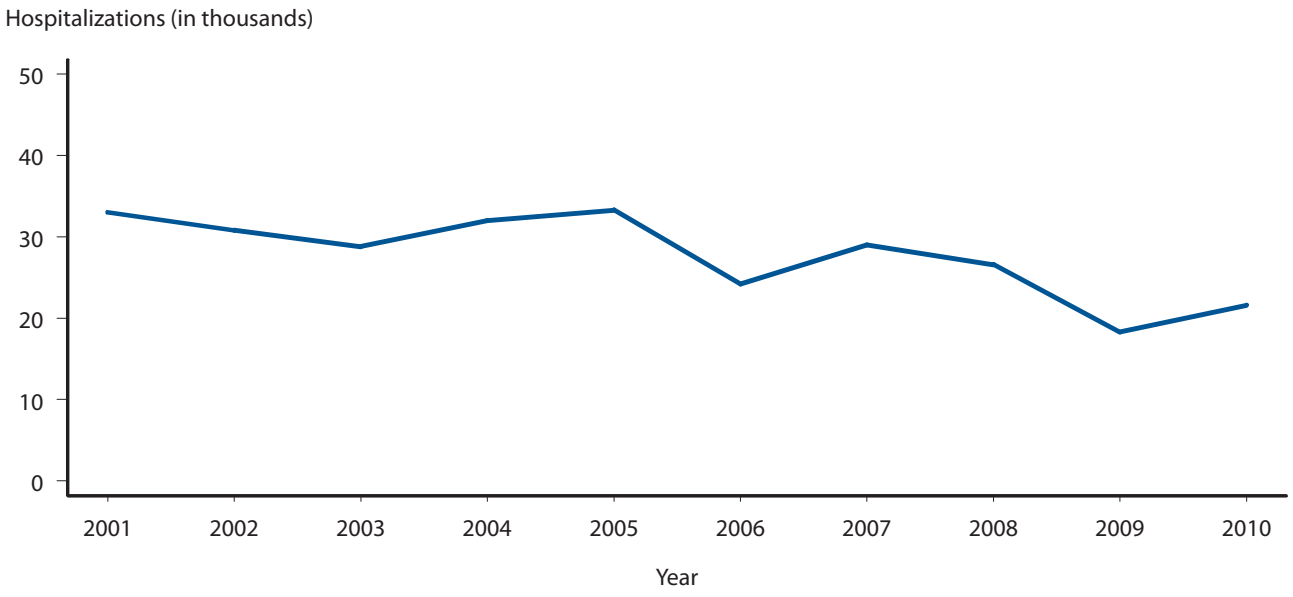
NOTE: The relative standard errors for acute and unspecified pelvic inflammatory disease (PID) cases ranges from 8%–18%. The relative standard error for chronic PID cases ranges from 12%–28%. Data only available through 2010.
SOURCE: 2010 National Hospital Discharge Survey. Atlanta: Centers for Disease Control and Prevention. Available from: http://www.cdc.gov/nchs/nhds.htm.

Figure F. Pelvic Inflammatory Disease — Initial Visits to Physicians' Offices by Women Aged 15 – 44 Years, United States, 2003 – 2012



NOTE: The relative standard errors for these estimates are 21.6%–30%. See Other Data Sources in the Appendix and Table 45.
SOURCE: IMS Health, Integrated Promotional Services™. IMS Health Report, 1966 – 2012.

Figure G. Ectopic Pregnancy—Hospitalizations of Women Aged 15 – 44 Years, United States, 2001 – 2010



NOTE: The relative standard errors for these estimates are 10% – 23%. Data only available through 2010.
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STDs in Women and Infants

Public Health Impact

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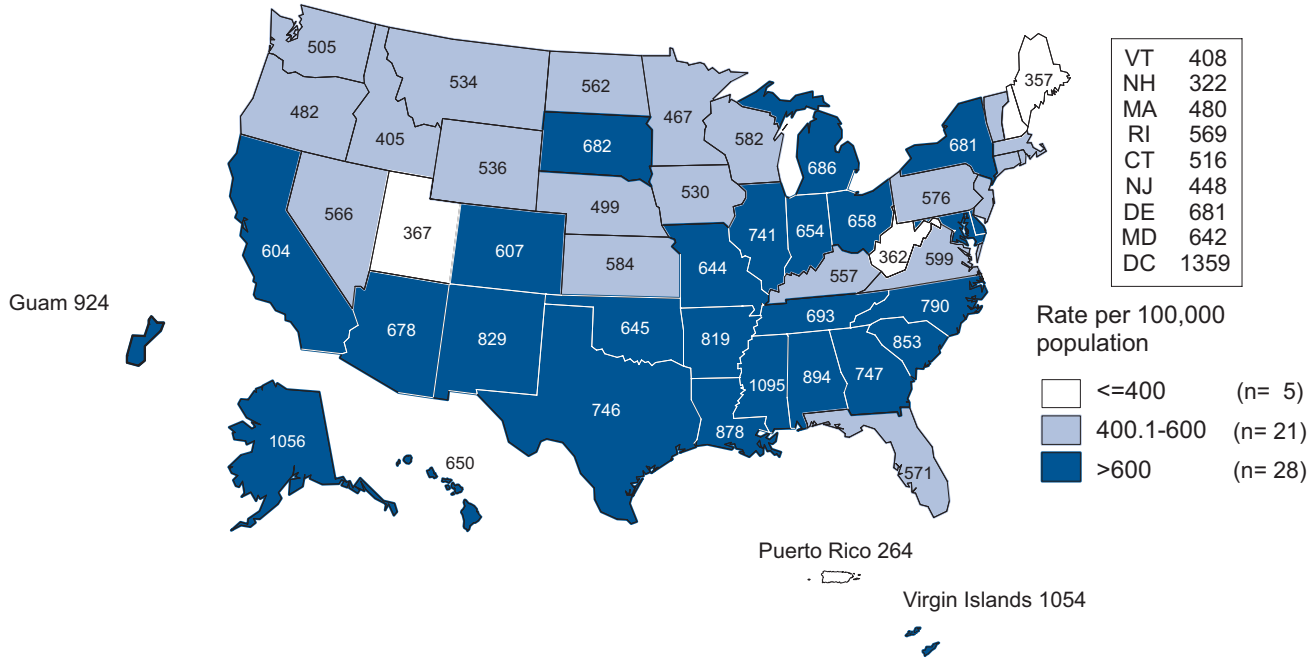
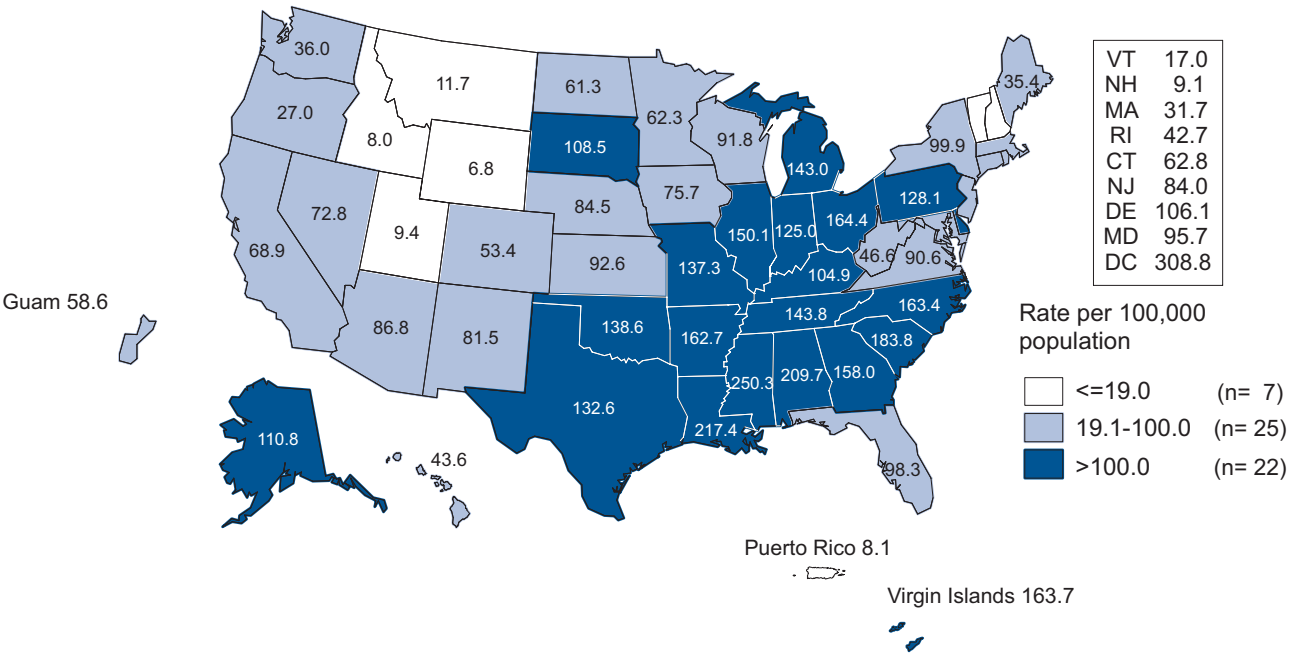
Figure A. Chlamydia — Women — Rates by State, United States and Outlying Areas, 2012



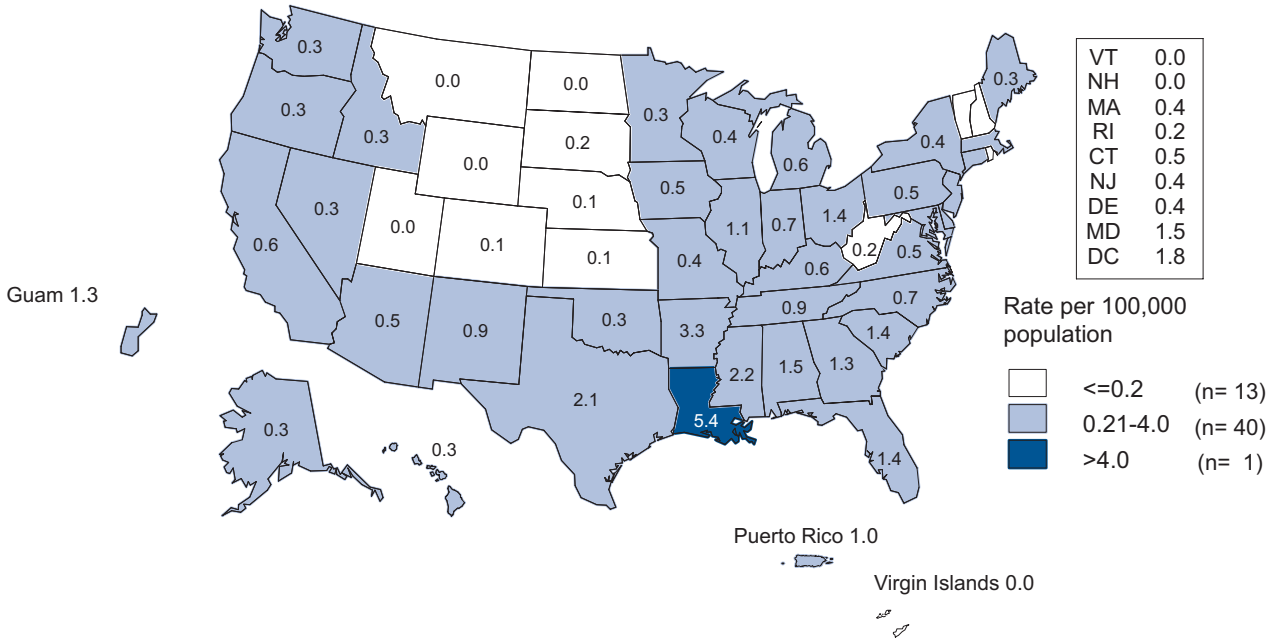
NOTE: The total chlamydial infection rate among women in the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 639.0 per 100,000 female population.

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



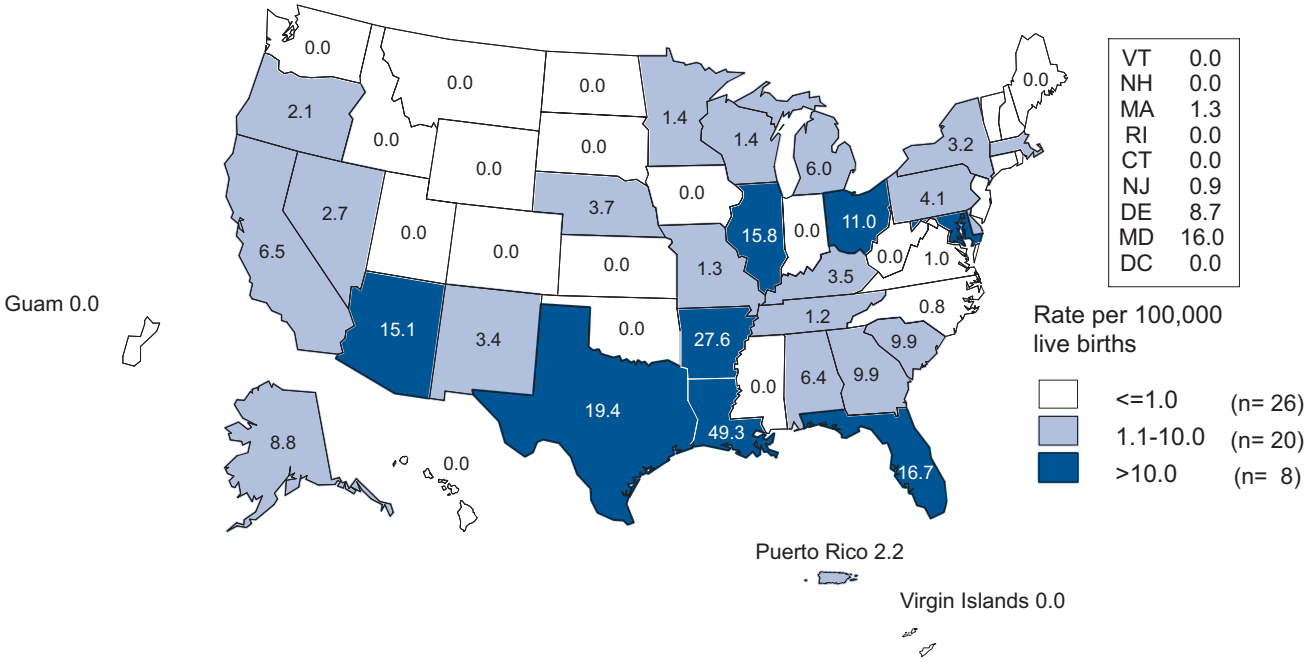
NOTE: The total gonorrhea infection rate among women in the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 107.5 per 100,000 female population.

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



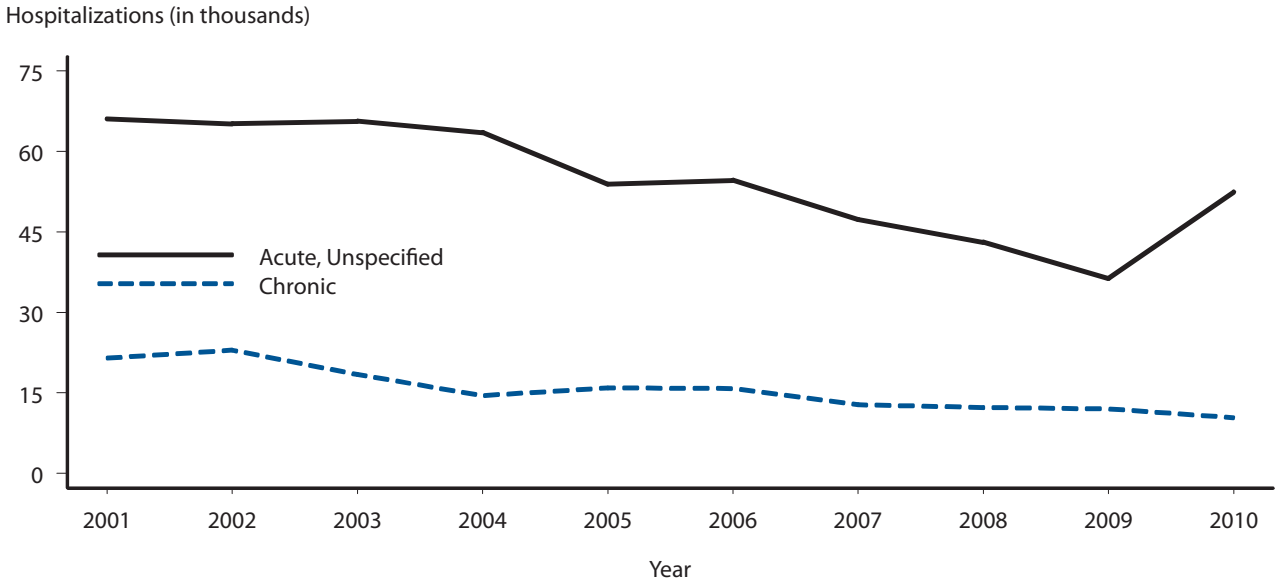
NOTE: The total rate of primary and secondary syphilis among women in the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 0.9 per 100,000 females.

Figure D. Congenital Syphilis — Infants — Rates by Year of Birth and State, United States and Outlying Areas, 2012



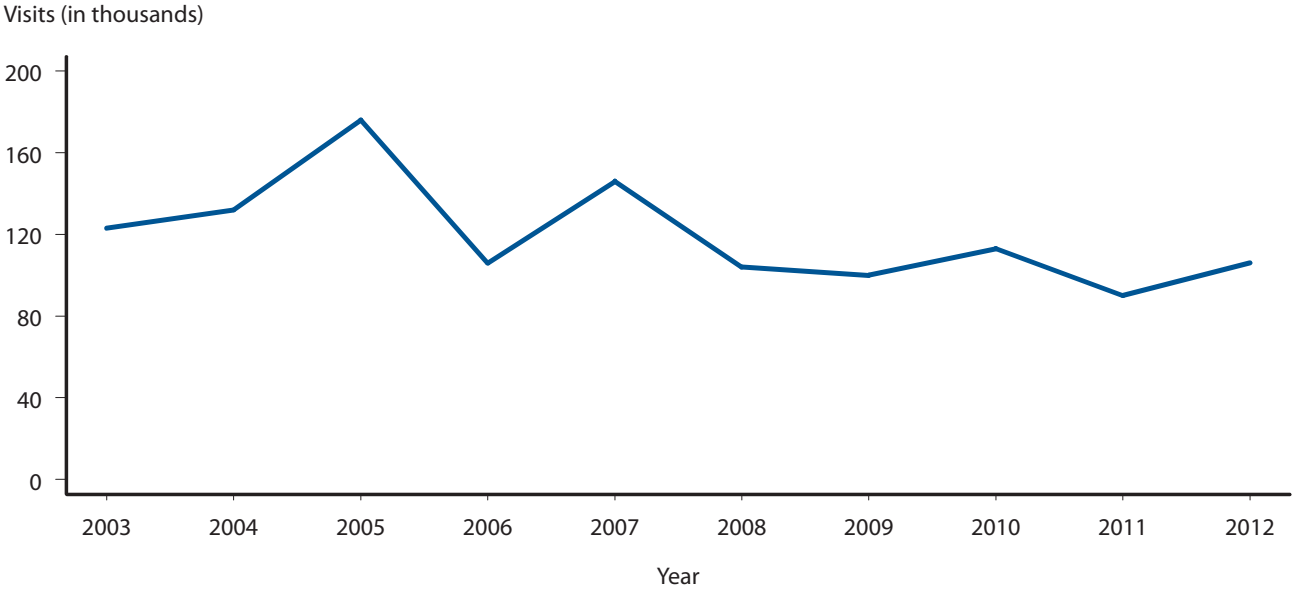
NOTE: The total rate of congenital syphilis for infants by year of birth for the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 7.7 per 100,000 live births.

Figure E. Pelvic Inflammatory Disease — Hospitalizations of Women Aged 15 – 44 Years, United States, 2001 – 2010



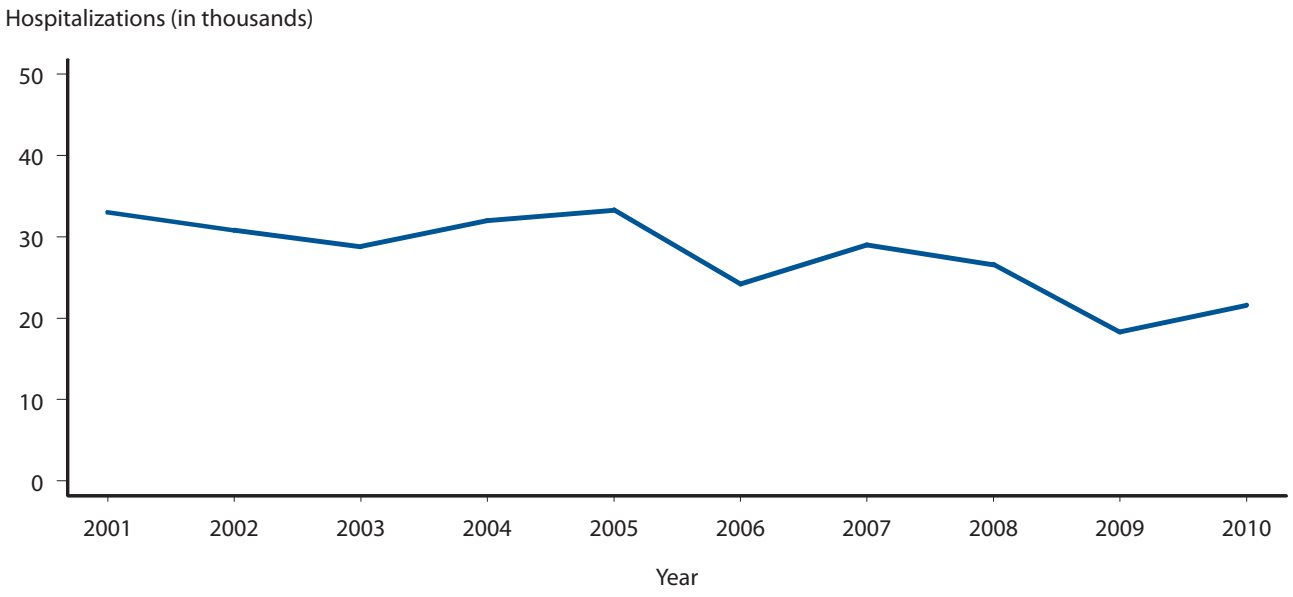
NOTE: The relative standard errors for acute and unspecified pelvic inflammatory disease (PID) cases ranges from 8%–18%. The relative standard error for chronic PID cases ranges from 12%–28%. Data only available through 2010.
SOURCE: 2010 National Hospital Discharge Survey. Atlanta: Centers for Disease Control and Prevention. Available from: http://www.cdc.gov/nchs/nhds.htm.

Figure F. Pelvic Inflammatory Disease — Initial Visits to Physicians' Offices by Women Aged 15 – 44 Years, United States, 2003 – 2012



NOTE: The relative standard errors for these estimates are 21.6%–30%. See Other Data Sources in the Appendix and Table 45.
SOURCE: IMS Health, Integrated Promotional Services™. IMS Health Report, 1966 – 2012.

Figure G. Ectopic Pregnancy—Hospitalizations of Women Aged 15 – 44 Years, United States, 2001 – 2010



NOTE: The relative standard errors for these estimates are 10% – 23%. Data only available through 2010.
SOURCE: 2010 National Hospital Discharge Survey. Atlanta: Centers for Disease Control and Prevention. Available from http://www.cdc.gov/nchs/nhds.htm.

STDs in Adolescents and Young Adults

Public Health Impact

Prevalence estimates suggest that young people aged 15–24 years acquire half of all new STDs[1] and that 1 in 4 sexually active adolescent females have an STD, such as chlamydia or human papillomavirus (HPV).[2] Compared with older adults, sexually active adolescents aged 15–19 years and young adults aged 20–24 years are at higher risk of acquiring STDs for a combination of behavioral, biological, and cultural reasons. For some STDs, such as chlamydia, adolescent females may have increased susceptibility to infection because of increased cervical ectopy. The higher prevalence of STDs among adolescents also may reflect multiple barriers to accessing quality STD prevention services, including lack of health insurance or ability to pay, lack of transportation, discomfort with facilities and services designed for adults, and concerns about confidentiality. Traditionally, intervention efforts have targeted individual-level factors associated with STD risk which do not address higher-level factors (e.g., peer norms and media influences) that may also influence behaviors.[3] Interventions for at-risk adolescents and young adults that address underlying aspects of the social and cultural conditions that affect sexual risk-taking behaviors are needed, as are strategies designed to improve the underlying social conditions themselves.[4,5]

Observations

Chlamydia

In 2012, 1,002,692 cases of chlamydial infection were reported among persons under 25 years of age, representing 70% of all reported chlamydia cases. Rates of reported chlamydial infection are highest among persons aged 15–19 years and 20–24 years (Figure 5). From 2008–2011, rates increased steadily among those aged 15–19 years (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) (Table 10). 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 increased slightly (2.1%) during 2011–2012 (2,450.8 to 2,501.5 cases per 100,000) (Table 10).

15- to 19-Year-Old Women—In 2012, the rate among women aged 15–19 years was 3,291.5 cases per 100,000 females, a 5.6% decrease from the 2011 rate of 3,485.2 cases per 100,000 females (Figure 5, Table 10). This is the first time that chlamydia rates among 15–19 year old females have decreased since 2000.

20- to 24-Year-Old Women—In 2012, women aged 20–24 years had the highest rate of chlamydia (3,695.5 cases per 100,000 females) compared with any other age and sex group (Figure 5). Chlamydia rates for women in this age group increased slightly (1.8%) during 2011–2012 (Figure 5, Table 10).

15- to 19-Year-Old Men—Chlamydia rates for men aged 15–19 years decreased 5.1% from 816.3 cases per 100,000 males in 2011 to 774.8 cases per 100,000 males in 2012 (Figure 5, Table 10). This is the first time that chlamydia rates among 15–19 year old males have decreased.

20- to 24-Year-Old Men—In 2012, as in previous years, men aged 20–24 years had the highest rate of chlamydia among men (1,350.4 cases per 100,000 males). Chlamydia rates for men in this age group increased 3.3% during 2011–2012 (Figure 5, Table 10).

Gonorrhea

During 2011–2012, gonorrhea rates decreased 7.5% for persons aged 15–19 years and increased 3.1% for persons aged 20–24 years.

15- to 19-Year-Old Women—In 2012, women aged 15–19 years had the second highest rate of gonorrhea (521.2 cases per 100,000 females) compared with any other age or sex group (Figure 16, Table 21). During 2011–2012, the gonorrhea rate for women in this age group decreased 8.2%.

20- to 24-Year-Old Women—In 2012, women aged 20–24 years had the highest rate of gonorrhea (578.5 cases per 100,000 females) compared with any other age or sex group (Figure 16, Table 21). During 2011–2012, the gonorrhea rate for women in this age group increased 1.6%.

15- to 19-Year-Old Men—In 2012, the gonorrhea rate among men aged 15–19 years was 239.0 cases per 100,000 males (Figure 16, Table 21). During 2011–2012, the gonorrhea rate for men in this age group decreased 5.4%.

20- to 24-Year-Old Men—In 2012, as in previous years, men aged 20–24 years had the highest rate of gonorrhea (462.8 cases per 100,000 males) compared with other males (Figure 16, Table 21). During 2011–2012, the gonorrhea rate for men in this age group increased 5.5%.

Primary and Secondary Syphilis

Syphilis rates among women aged 15–19 years increased annually during 2004–2009, from 1.5 cases per 100,000 females to 3.3 cases in 2009, but decreased from 2.9 cases in 2010 to 2.3 cases in 2012. Rates among women aged 20–24 years remained stable during 2004–2006 (2.9–3.0 cases per 100,000 population), then increased during 2007–2009 (from 3.5 to 5.5 cases), before declining during 2010 and 2011 (to 4.5 and 3.7 cases, respectively); rates rose during 2012 (to 3.9 cases). Rates in women have been highest each year among those aged 20–24 years with 3.9 cases per 100,000 females in 2012 (Figures 35 and 36, Table 35).

Rates among men aged 15–19 years are much lower than the rates among men in older age groups (Figures 35 and 37, Table 35). Rates in this group increased during 2002–2009 (from 1.3 cases per 100,000 males to 6.0 cases in 2009), decreased to 5.5 cases in 2010 and 2011, and increased to 5.8 cases in 2012. However, rates among men aged 20–24 years have increased each consecutive year since 2002, from 5.2 cases per 100,000 males to 25.3 cases in 2012. Not only have men aged 20–24 years seen large increases in rates, they also have had the highest rate of P&S syphilis among men of any age group since 2008 (Table 35). These changes reflect a shift in the age distribution of P&S syphilis; rates were highest among men aged 35–39 years during 2002–2006.

Positivity in Selected Populations

During the mid-1990s to 2011, chlamydia and gonorrhea positivity among young women screened in clinics and juvenile correctional facilities participating in infertility prevention activities were reported 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. Variables available at the national level limited the ability to address these issues. 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 and gonorrhea.

National Job Training Program

The NJTP is an educational program for socioeconomically disadvantaged youth aged 16–24 years and is administered at more than 100 sites throughout the country. The NJTP screens participants for chlamydia and gonorrhea within two days of entry to the program. All of NJTP's chlamydia screening tests and the majority of gonorrhea screening tests are conducted by a single national contract laboratory*, which provides these data to CDC. To increase the stability of the estimates, chlamydia or gonorrhea prevalence data are presented when valid test results for 100 or more students per year are available for the population subgroup and state.

Among women entering the program in 47 states, the District of Columbia, and Puerto Rico, the median state-specific chlamydia prevalence in 2012 was 11.0% (range: 5.5% to 19.4%) (Figure H). Among men entering the program in 47 states, the District of Columbia, and Puerto Rico, the median state-specific chlamydia prevalence was 7.0% (range: 0.6% to 13.5%) (Figure I).

Among women entering the program in 45 states, the District of Columbia, and Puerto Rico, the median state-specific gonorrhea prevalence in 2012 was 1.3% (range: 0.0% to 4.8%) (Figure J). Among men entering the program in 41 states, the District of Columbia, and Puerto Rico, the median state-specific gonorrhea prevalence was 0.7% (range: 0.0% to 2.8%) (Figure K).

* Laboratory data are provided by the Center for Disease Detection, LLC San Antonio, Texas.

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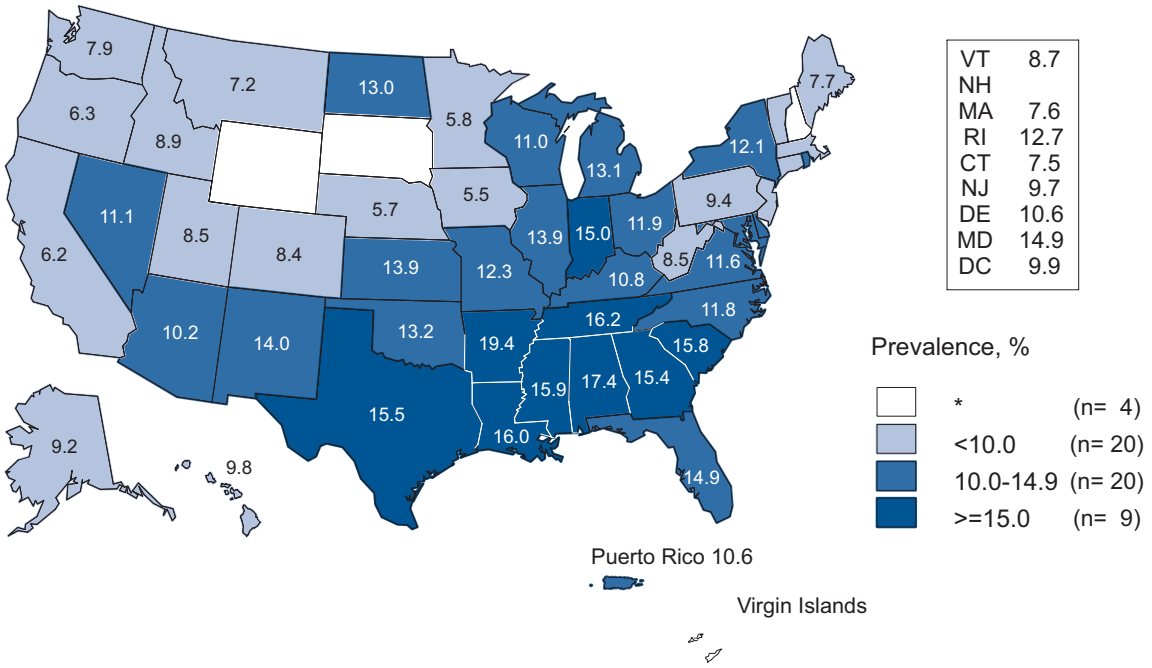
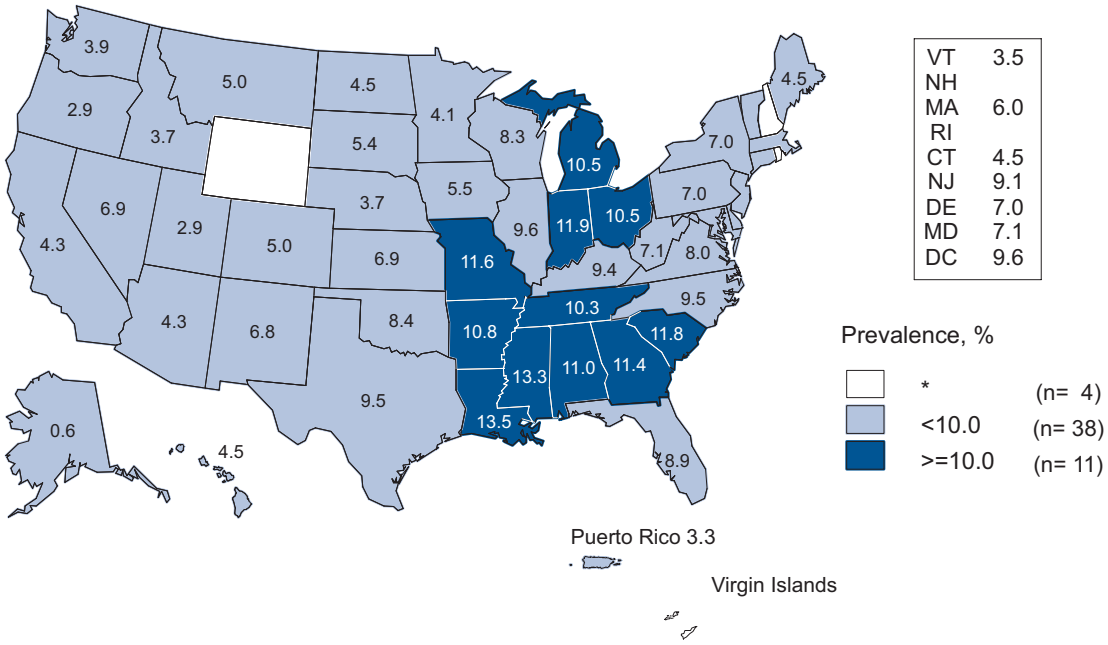
Figure H. Chlamydia—Prevalence Among Women Aged 16 – 24 Years Entering the National Job Training Program, by State of Residence, United States and Outlying Areas, 2012



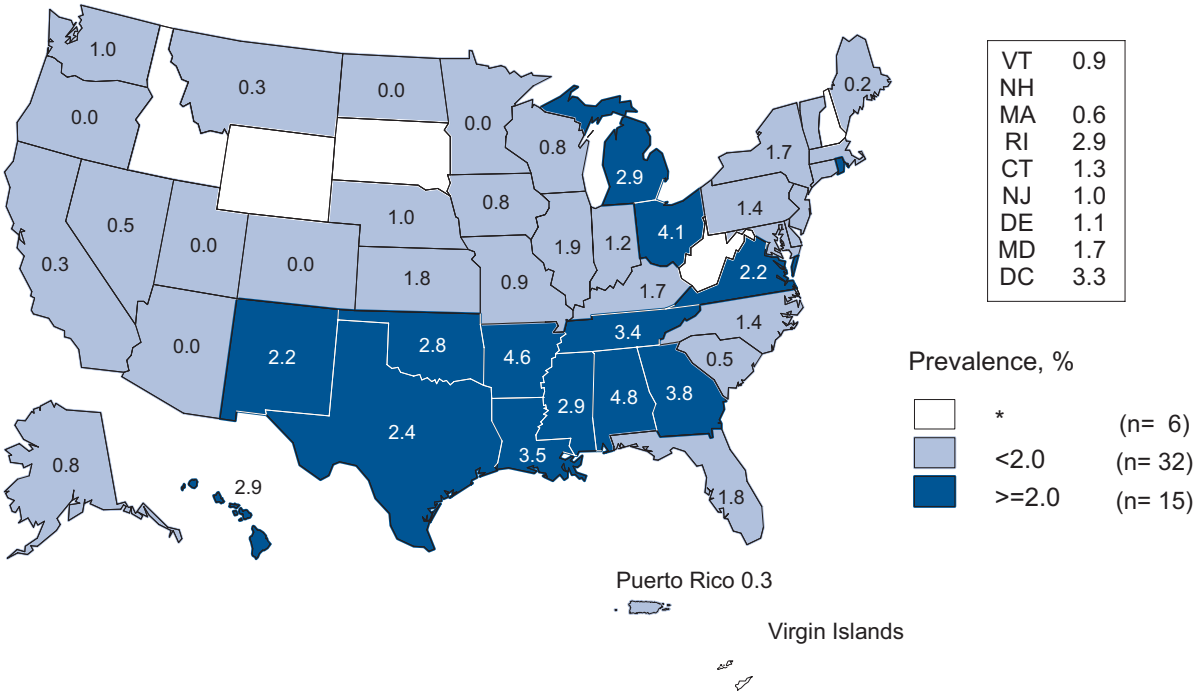
* Fewer than 100 women who resided in these states/areas and entered the National Job Training Program were screened for chlamydia in 2012.

Figure I. Chlamydia — Prevalence Among Men Aged 16 – 24 Years Entering the National Job Training Program, by State of Residence, United States and Outlying Areas, 2012



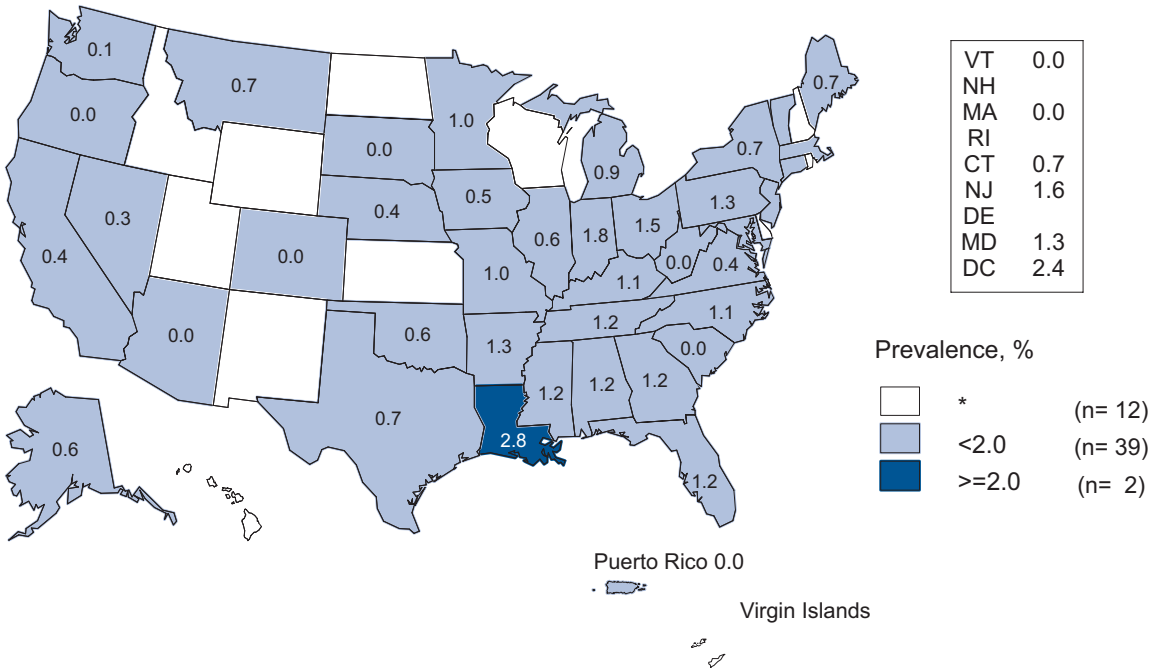
* Fewer than 100 men who resided in these states/areas and entered the National Job Training Program were screened for chlamydia in 2012.

Figure J. Gonorrhea — Prevalence Among Women Aged 16 – 24 Years Entering the National Job Training Program, by State of Residence, United States and Outlying Areas, 2012



* Fewer than 100 women who resided in these states/areas and entered the National Job Training Program were screened for gonorrhea in 2012.
NOTE: Many training centers use local laboratories to test female students for gonorrhea; these results are not available to CDC. For this map, gonorrhea test results for students at centers that submitted specimens to the national contract laboratory were included if the numbers of gonorrhea tests submitted was greater than the 90% of the number of chlamydia tests submitted.

Figure K. Gonorrhea — Prevalence Among Men Aged 16 – 24 Years Entering the National Job Training Program, by State of Residence, United States and Outlying Areas, 2012



* Fewer than 100 men who resided in these states/areas and entered the National Job Training Program were screened for gonorrhea in 2012.
NOTE: Many training centers use local laboratories to test male students for gonorrhea; these results are not available to CDC. For this map, gonorrhea test results for students at centers that submitted specimens to the national contract laboratory were included if the number of gonorrhea tests submitted was greater than 90% of the number of chlamydia tests submitted.

STDs in Racial and Ethnic Minorities

Public Health Impact

Surveillance data show higher rates of reported STDs among some racial or ethnic minority groups when compared with rates among whites. Race and ethnicity in the United States are population characteristics that also correlate with other fundamental determinants of health status.[1,2]

Social and economic conditions, such as high rates of poverty, income inequality, unemployment, low educational attainment and geographic isolation can make it more difficult for individuals to protect their sexual health.[3] People who struggle financially are often experiencing life circumstances that increase their risk for STDs.[4] Those who cannot afford basic necessities may have trouble accessing and affording quality sexual health services.[5] As an example, in 2010, the poverty rates, unemployment rates, and high school drop-out rates for blacks, American Indians/Alaska Natives, and Hispanics were considerably higher than for whites, differences commensurate with observed disparities in STD burden.[6–9] Many people of Hispanic ethnicity face additional barriers arising from immigration or undocumented citizenship status.[10] Even when health care is available, fear and distrust of health care institutions can negatively affect the health care-seeking experience for many racial/ethnic minorities when there is social discrimination, provider bias, or the perception that these may exist.[11,12]

In communities where STD prevalence is higher, individuals may have a more difficult time reducing their risk for infection. With each sexual encounter, they face a greater chance of encountering an infected partner than those in lower prevalence settings.[13] Acknowledging the inequity in STD rates by race or ethnicity is one of the first steps in empowering affected communities to organize and focus on this problem.

STD Reporting Practices

Surveillance data are based on cases of STDs reported to state and local health departments (see Interpreting STD Surveillance Data in the Appendix). In many state and local health jurisdictions, reporting from public sources (e.g., STD clinics) is thought to be more complete than reporting from private sources. Because minority populations may use public clinics more than whites, differences in rates between minorities and whites may be increased by this reporting bias.[14] However, prevalence data from population-based surveys, such as NHANES and the National Longitudinal Study of Adolescent Health, confirm the existence of marked STD disparities in some minority populations.[15,16]

Method of Classifying Race & Hispanic Ethnicity

Interpretation of racial and ethnic disparities among persons with STDs is influenced by data collection methods, and by the categories by which these data are displayed. For the first time, data on race and Hispanic ethnicity are displayed in this report in compliance with the 1997 Office of Management and Budget (OMB) standards.[17] 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. The completeness of data available in current OMB standards continues to improve. However, historical trend and rate data by race and Hispanic 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. Please refer to Interpreting STD Surveillance Data in the Appendix for a complete listing of these jurisdictions.

Completeness of Race/Ethnicity Data

Many cases are reported with race and/or ethnicity missing. Rate data presented in this report are not adjusted for missing race or ethnicity.

Chlamydia—In 2012, 25.8% of chlamydia case reports were missing race or ethnicity data, ranging by state from 0.0% to 57.0% (Table A1).

Gonorrhea—In 2012, 19.2% of gonorrhea case reports were missing information on race or ethnicity, ranging by state from 0.0% to 43.3% (Table A1).

Syphilis—In 2012, 2.6% of P&S syphilis case reports were missing information on race or ethnicity, ranging from 0.0% to 21.9% among states with 10 or more cases of P&S syphilis (Table A1).

Observations

Chlamydia

Among the 39 jurisdictions (38 states and the District of Columbia) that submitted data on race and Hispanic ethnicity from 2008–2012 according to the revised OMB standards, chlamydia case rates increased during 2008–2012 among all racial and ethnic groups (Figure 6). During 2008–2012, chlamydia rates increased by 3.7% among blacks, 26.7% among American Indians/Alaska Natives, 7.6% among Hispanics, 5.1% among Asians, 32.4% among Native Hawaiians/Other Pacific Islanders, and 38.5% among whites.

In 2012, 48 jurisdictions (47 states and the District of Columbia) submitted data on race and Hispanic ethnicity in 2012 according to the revised OMB standards. The following data pertain to those jurisdictions:

Blacks—In 2012, the overall rate among blacks in the United States was 1,229.4 cases per 100,000 population (Table 11B). The rate of chlamydia among black women was over six times the rate among white women (1,613.6 and 260.5 per 100,000 females, respectively) (Table 11B and Figure L). The chlamydia rate among black men was over eight times the rate among white men (809.2 and 95.9 cases per 100,000 males, respectively).

Chlamydia rates were highest for blacks aged 15–19 and 20–24 years in 2012 (Table 11B). The chlamydia rate among black females aged 15–19 years was 7,719.1 cases per 100,000 females, which was over five times the rate among white females in the same age group (1,458.3 per 100,000 females). The rate among black women aged 20–24 years was 4.4 times the rate among white women in the same age group (Table 11B).

Similar racial disparities in reported chlamydia rates exist among men. Among males aged 15–19 years, the rate among blacks was 9.9 times the rate among whites (Table 11B). The chlamydia rate among black men aged 20–24 years was six times the rate among white men of the same age group (3,556.0 and 590.6 cases per 100,000 males, respectively).

American Indians/Alaska Natives— In 2012, the chlamydia rate among American Indians/Alaska Natives was 728.2 cases per 100,000 population (Table 11B). Overall, the rate of chlamydia among American Indians/Alaska Natives in the United States was 4.1 times the rate among whites.

Native Hawaiians/Other Pacific Islanders— In 2012, the chlamydia rate among Native Hawaiians/Other Pacific Islanders was 590.4 cases per 100,000 population (Table 11B). The overall rate among Native Hawaiians/Other Pacific Islanders was 3.3 times the rate among whites and 5.2 times the rate among Asians.

Asians— In 2012, the chlamydia rate among Asians was 112.9 cases per 100,000 population (Table 11B). The overall rate among whites is 1.6 times the rate among Asians.

Hispanics— In 2012, the chlamydia rate among Hispanics was 380.3 cases per 100,000 population (Table 11B) which is over two times the rate among whites.

Gonorrhea

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 61.8% among American Indians/Alaska Natives (81.6 to 132.0), 33.5% among Native Hawaiians/Other Pacific Islanders (70.0 to 93.4), 22.9% among whites (27.1 to 33.3), 18.9% among Hispanics (52.3 to 62.2), and 14.5% among Asians (15.0 to 17.2) (Figure 19). The gonorrhea rate decreased 15.5% among blacks (542.7 to 458.7)

In 2012, 48 jurisdictions (47 states and the District of Columbia) submitted data in the new race and ethnic categories according to the revised OMB standards. The following data pertain to those jurisdictions:

Blacks—In 2012, 63% of reported gonorrhea cases with known race/ethnicity occurred among blacks (excluding cases with missing information on race or ethnicity, and cases whose reported race or ethnicity was other) (Table 22A). The rate of gonorrhea among blacks in 2012 was 462.0 cases per 100,000 population, which was 14.9 times the rate among whites (31.0 per 100,000) (Table 22B). This disparity has decreased slightly in recent years (Figure M). This disparity was larger for black men (16.2 times) than for black women (13.8 times) (Figure N, Table 22B).

As in previous years, the disparity in gonorrhea rates for blacks in 2012 was larger in the Midwest and Northeast than in the West or the South (Figure O).

Considering all racial/ethnic and age categories, gonorrhea rates were highest for blacks aged 20–24 and 15–19 years in 2012 (Table 22B). Black women aged 20–24 had a gonorrhea rate of 2,172.6 cases per 100,000 women. This rate was was 11.1 times the rate among white women in the same age group (194.9 per 100,000). Black women aged 15–19 years had a gonorrhea rate of 2,032.2 cases per 100,000 women, which was 15.1 times the rate among white women in the same age group (134.5).

Black men aged 20–24 years had a gonorrhea rate of 1,903.7 cases per 100,000 men, which was 16.4 times the rate among white men in the same age group (115.9 per 100,000). Black men aged 15–19 years had a gonorrhea rate of 1,012.3 cases per 100,000 men, which was 26.2 times the rate among white men in the same age group (38.7 per 100,000).

American Indians/Alaska Natives—In 2012, the gonorrhea rate among American Indians/Alaska Natives was 124.9 cases per 100,000 population, which was 4.0 times the rate among whites (Table 22B). The disparity between gonorrhea rates for American Indians/Alaska Natives and whites was larger for American Indian/Alaska Native women (4.8 times) than for American Indian/Alaska Native men (3.1 times) (Figure N, Table 22 B). The disparity in gonorrhea rates for American Indians/Alaska Natives in 2012 was larger in the Midwest than in the West, Northeast, and South (Figure O).

Native Hawaiians/Other Pacific Islanders—In 2012, the gonorrhea rate among Native Hawaiians/Other Pacific Islanders was 87.8 cases per 100,00 population, which was 2.8 times the rate among whites (Table 22B). The disparity between gonorrhea rates for Native Hawaiians/Other Pacific Islanders and whites was the same for Native Hawaiian/Other Pacific Islander women and Native Hawaiian/Other Pacific Islander men (2.8 times) (Figure N, Table 22B). The disparity in gonorrhea rates for Native Hawaiian/Other Pacific Islanders in 2012 was lower in the West than in the Midwest, Northeast, and South (Figure O).

Asians—In 2012, the gonorrhea rate among Asians was 16.9 cases per 100,000 population, which was lower than (0.5 times) the rate among whites (Table 22B). This difference is larger for Asian women than for Asian men (Figure N, Table 22B). In 2012, rates among Asians were lower than rates among whites in all four regions of the United States (Figure O).

Hispanics—In 2012, the gonorrhea rate among Hispanics was 60.4 cases per 100,000 population, which was 1.9 times the rate among whites (Table 22B). This disparity was larger for Hispanic men (2.2 times) than for Hispanic women (1.8 times) (Figure N, Table 22B). The disparity in gonorrhea rates for Hispanics was highest in the Northeast and lowest in the West and Midwest (Figure O).

Primary and Secondary Syphilis

The syphilis epidemic in the late 1980s occurred primarily among men who have sex with women only (MSW), women, and minority populations.[18,19] While the rate of P&S syphilis declined among all racial and ethnic groups during the 1990s, rates again began increasing in the early 2000s among men who have sex with men (MSM) in their 30s and 40s of varied racial and ethnic groups.[19] Among the 39 jurisdictions (38 states and the District of Columbia) that submitted data on race and Hispanic ethnicity from 2008–2012 according to the revised OMB standards, rates increased among non-Hispanic whites, Hispanics, Asians, American Indians/Alaska Natives, Native Hawaiian or Other Pacific Islanders, and Multirace individuals, and decreased slightly among non-Hispanic blacks (Figure 38).

In 2012, 48 jurisdictions (47 states and the District of Columbia) submitted data on race and Hispanic ethnicity in 2012 according to the revised OMB standards. The following data pertain to those jurisdictions:

Blacks — In 2012, 39.7% of all cases reported to CDC were among blacks. The overall 2012 rate for blacks was 6.1 times the rate for whites. In 2012, the rate of P&S syphilis among black men was 5.7 times the rate among white men; the rate among black women was 16 times the rate among white women (Table 36B).

In 2012, rates among both men and women aged 20–24 years remained highest among blacks (96.7 cases and 19.1 cases per 100,000 population, respectively). The 2012 rate among black men aged 15–19 years was 14 times the rate for white men and 4 times the rate for Hispanic men of the same age, and 2012 rates for black women aged 15–19 years were 23 times and 8 times the rate for white and Hispanic women of the same ages, respectively (Table 36B).

American Indians/Alaska Natives — In 2012, 0.4% of all cases reported to CDC were among American Indians/Alaska Natives. The 2012 rate of P&S syphilis for American Indians/Alaska Natives was 2.9 cases per 100,000 population, slightly higher than the rate for whites (Table 36B).

Native Hawaiians or Other Pacific Islanders — In 2012, 0.3% of all cases reported to CDC were among Native Hawaiians or Other Pacific Islanders. The 2012 rate of P&S syphilis for Native Hawaiians or Other Pacific Islanders was 8.4 cases per 100,000 population, which is 3.1 times the rate for whites (Table 36B).

Asians — In 2012, 1.9% of all cases reported to CDC were among Asians. The 2012 rate of P&S syphilis for Asians was 2.0 cases per 100,000 population, which was 0.7 times the rate for whites (Table 36B).

Hispanics— In 2012, 19.5% of all cases reported to CDC were among Hispanics (an increase from 16.7% of all cases in 2011). The 2012 rate of P&S syphilis for Hispanics was 5.7 cases per 100,000 population, which was 2.3 times the rate for whites (Table 36B).

Congenital Syphilis

Race/ethnicity for cases of congenital syphilis is based on the mother's race/ethnicity. In 2012, the rate of congenital syphilis was 29.6 cases per 100,000 live births among blacks and 7.9 cases per 100,000 live births among Hispanics. These rates were 14.1 and 3.8 times, respectively, the rate among whites (2.1 cases per 100,000 live births) (Table 43, Figure S).

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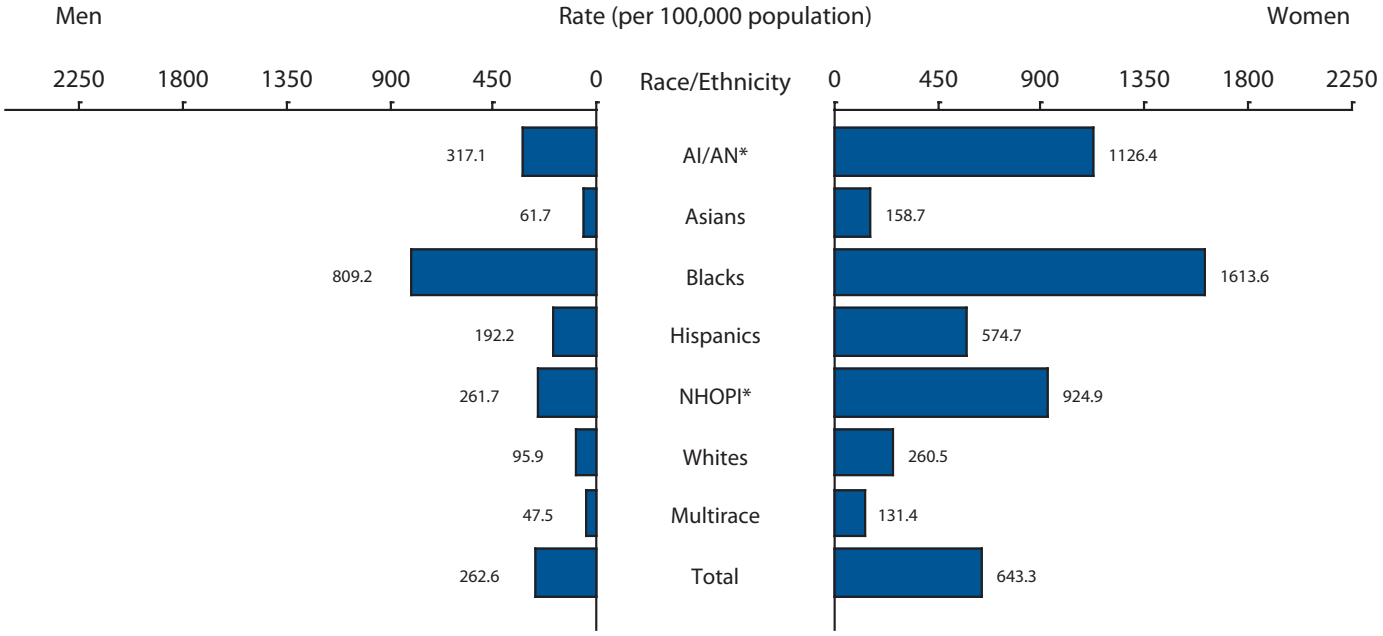
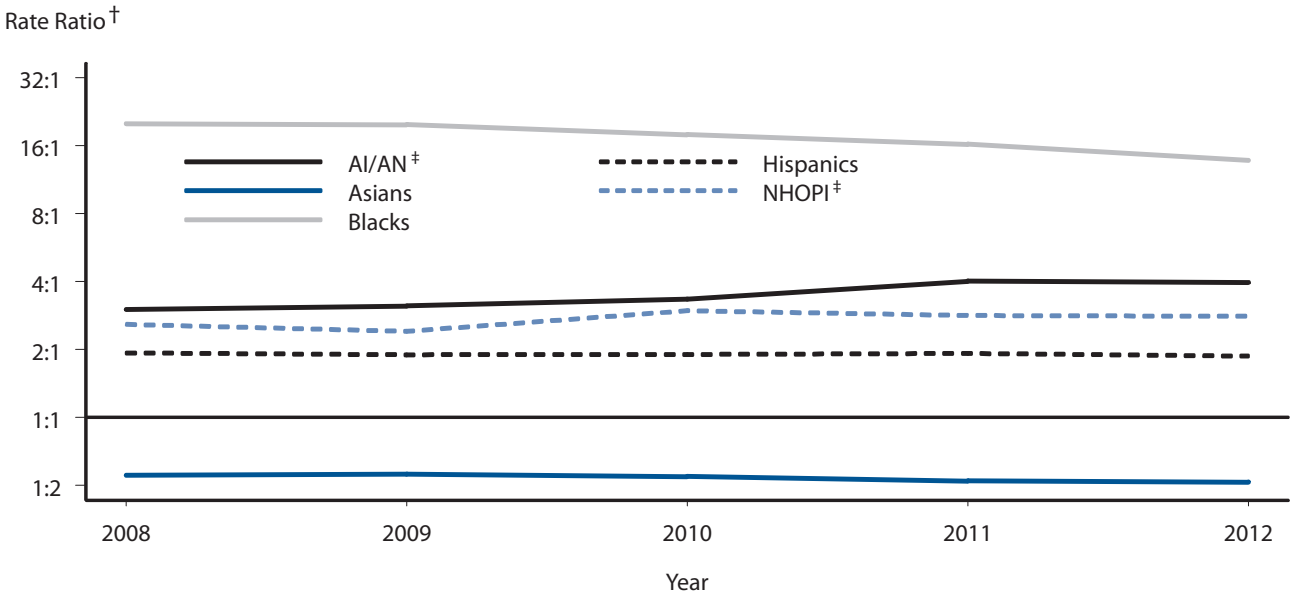
Figure L. Chlamydia — Rates by Race/Ethnicity and Sex, 2012



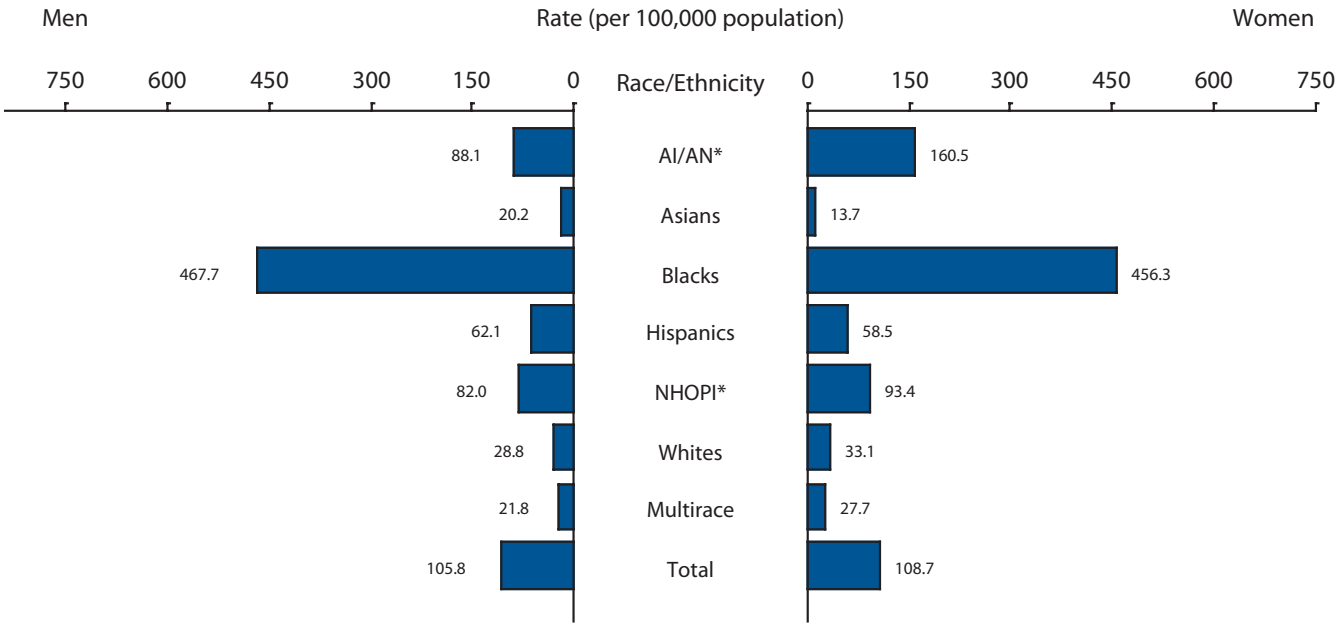
* AI/AN = American Indians/Alaska Natives; NHOPI = Native Hawaiian and Other Pacific Islanders.
NOTE: Includes 47 states and the District of Columbia reporting race/ethnicity data in Office of Management and Budget compliant formats in 2012 (see Appendix "Interpreting STD Surveillance Data").

Figure M. Gonorrhea — Rate Ratios* by Race/Ethnicity, United States, 2008 – 2012



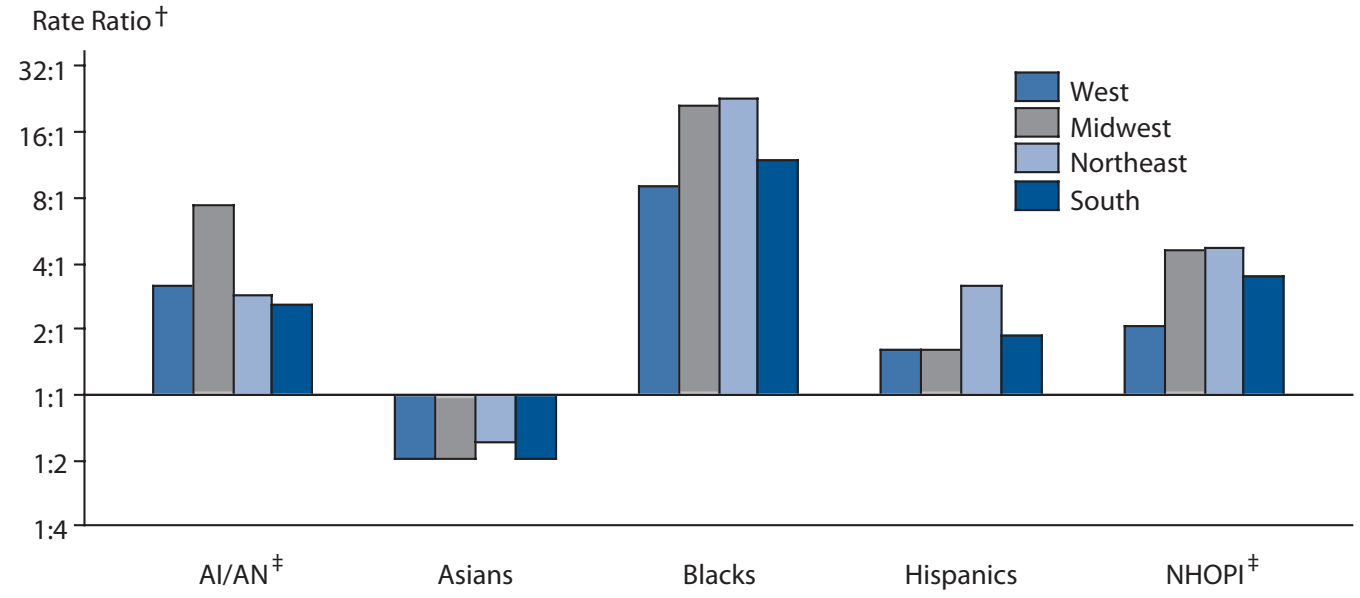
* Rate ratios are calculated as the gonorrhea rate per 100,000 population for a given racial or ethnic minority population divided by the gonorrhea rate per 100,000 population for non-Hispanic whites. Any population with a lower rate of gonorrhea than the non-Hispanic white population will have a rate ratio of less than 1:1.
† Y-axis is log scale.
‡ 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 N. Gonorrhea — Rates by Race/Ethnicity and Sex, United States, 2012



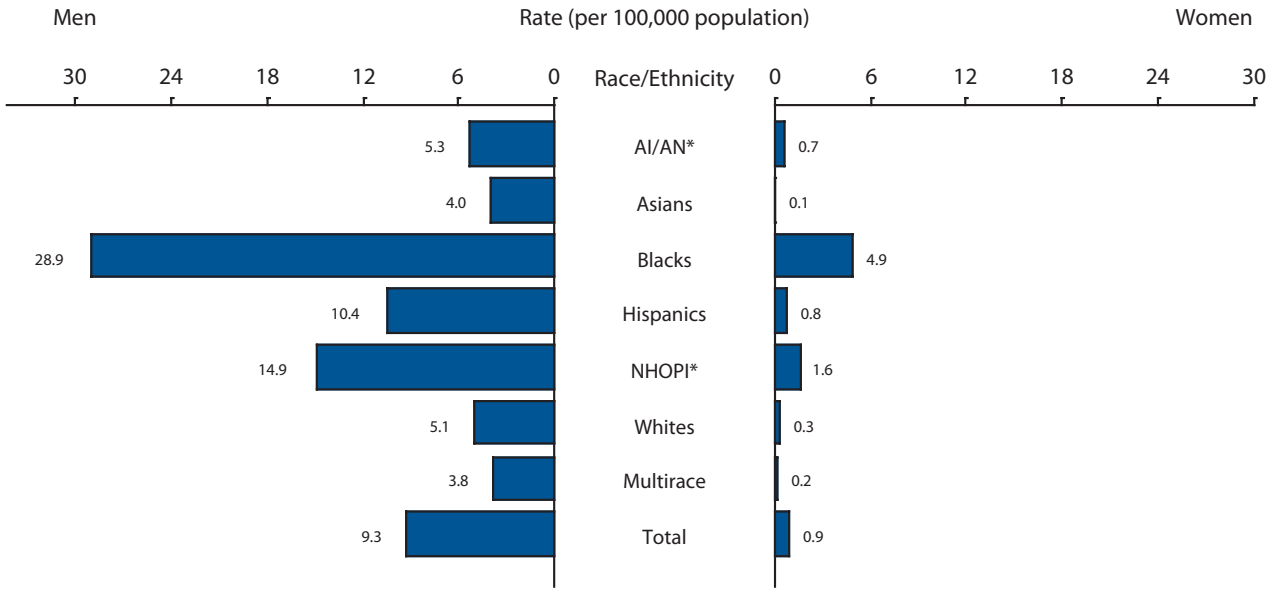
* AI/AN = American Indians/Alaska Natives; NHOPI = Native Hawaiian and Other Pacific Islanders.
NOTE: Includes 47 states and the District of Columbia reporting race/ethnicity data in Office of Management and Budget compliant formats in 2012 (see Appendix "Interpreting STD Surveillance Data").

Figure O. Gonorrhea — Rate Ratios by Race/Ethnicity and Region, United States, 2012



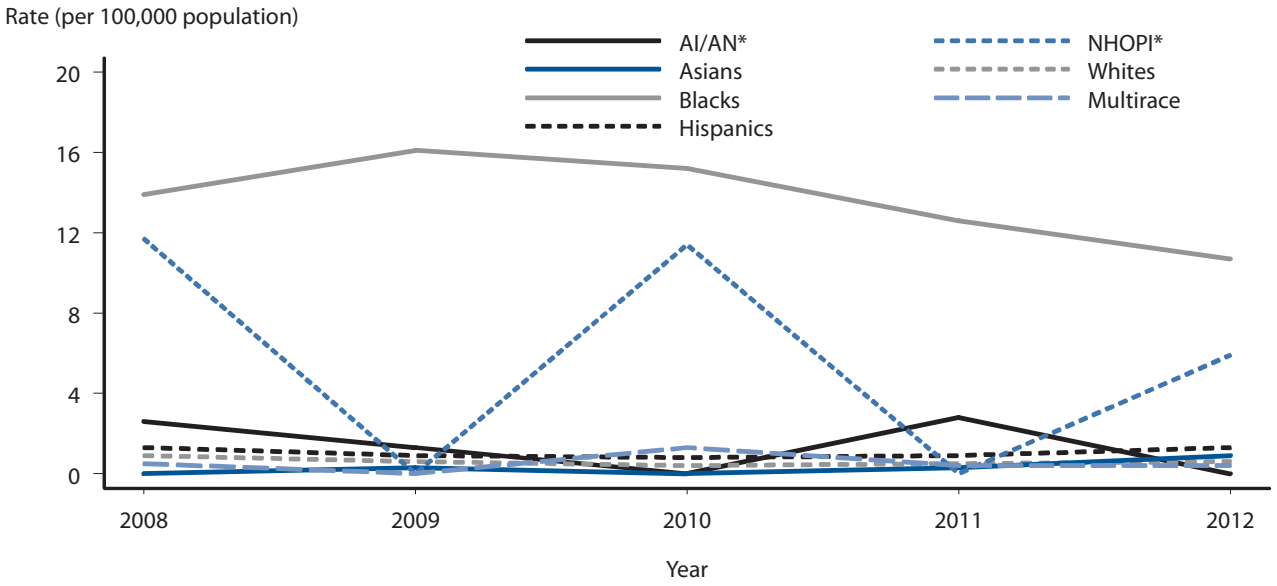
* Rate ratios are calculated as the gonorrhea rate per 100,000 population for a given racial or ethnic minority population divided by the gonorrhea rate per 100,000 population for non-Hispanic whites. Any population with a lower rate of gonorrhea than the non-Hispanic white population will have a rate ratio of less than 1:1.
† Y-axis is log scale.
‡ AI/AN = American Indians/Alaska Natives; NHOPI = Native Hawaiian and Other Pacific Islanders.
NOTE: Includes 47 states and the District of Columbia reporting race/ethnicity data in Office of Management and Budget compliant formats in 2012 (see Appendix "Interpreting STD Surveillance Data").

Figure P. Primary and Secondary Syphilis — Rates by Race/Ethnicity and Sex, United States, 2012



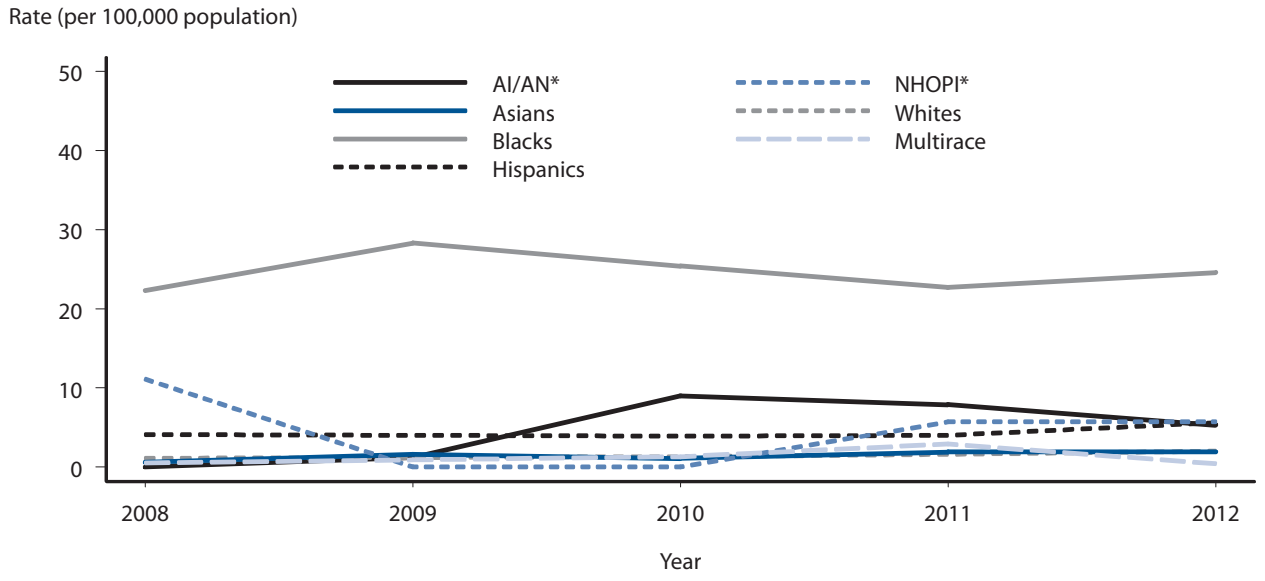
* AI/AN = American Indians/Alaska Natives; NHOPI = Native Hawaiian and Other Pacific Islanders.
NOTE: Includes 47 states and the District of Columbia reporting race/ethnicity data in Office of Management and Budget compliant formats in 2012 (see Appendix "Interpreting STD Surveillance Data").

Figure Q. Primary and Secondary Syphilis — Rates Among Females Aged 15 – 19 Years by Race/Ethnicity, United States, 2008 – 2012



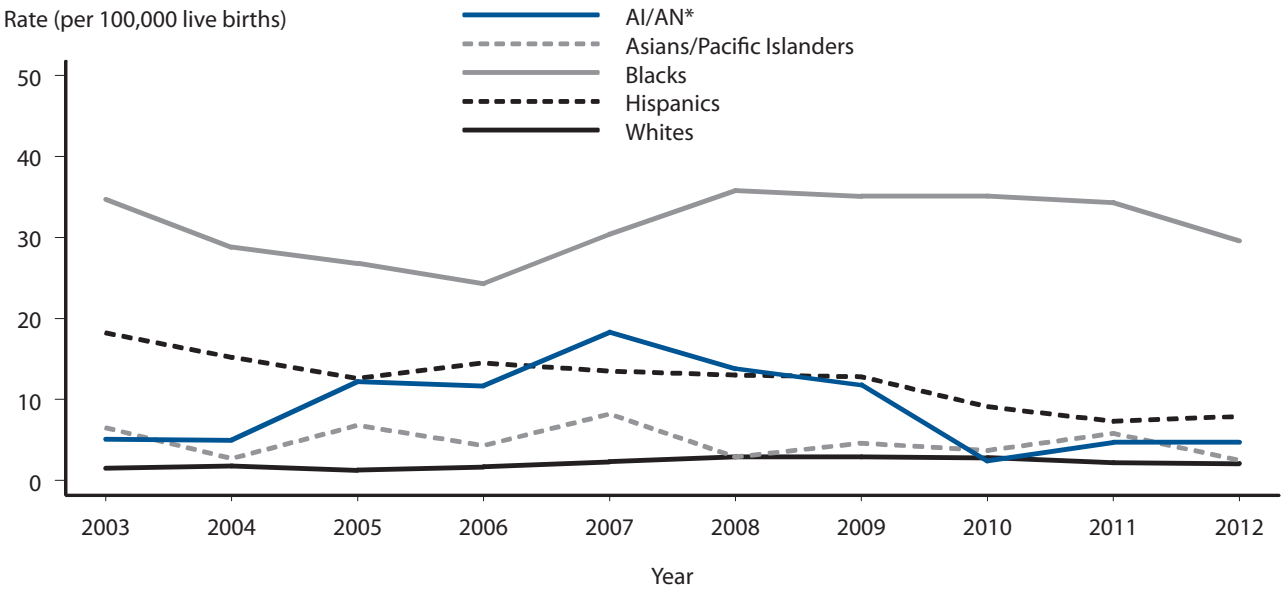
* AI/AN= American Indians/Alaska Natives; NHOPI= Native Hawaiian and Other Pacific Islanders.
NOTE: Includes 38 states and the District of Columbia reporting race/ethnicity data in Office of Management and Budget compliant formats during 2008–2012 (see Appendix "Interpreting STD Surveillance Data").

Figure R. Primary and Secondary Syphilis — Rates Among Males Aged 15 – 19 Years 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 S. Congenital Syphilis — Infants — Rates by Year of Birth and Mother's Race/Ethnicity, United States, 2003 – 2012



* AI/AN= American Indians/Alaska Natives.
NOTE: National Center for Health Statistics bridged race categories are presented to allow the display of data across several years. Cases missing maternal race/ethnicity information were excluded (< 1% of cases).

STDs in Men Who Have Sex with Men

Public Health Impact

Compared to women and men who have sex with women only, MSM are at increased risk for STDs.[1–4] Because STDs and the behaviors associated with acquiring them increase the likelihood of acquiring and transmitting HIV infection,[5] STDs among MSM may be associated with an increase in HIV diagnoses.[6]

Although a number of individual-level risk behaviors (e.g., higher numbers of lifetime sex partners, higher rates of partner change and partner acquisition rates, and unprotected sex) significantly contribute to the ongoing disparities in the sexual health of MSM, other interpersonal and societal-level factors have also been associated with higher rates of sexually transmitted infections, including HIV among MSM.[7] MSM who have lower economic status are particularly vulnerable to poorer health outcomes, especially if they belong to racial and ethnic minority populations.[8,9] For example, studies show that for black MSM, factors such as emotional and social support can drive sexual risk-taking and, in addition, broader societal factors such as power, privilege, and position in society also play a significant role.[10] Similarly, for Hispanic men, the relationship between individual experiences of oppression (e.g., social discrimination and financial hardship) and risk for sexually transmitted infections in the United States has been documented.[11]

With the exception of reported syphilis cases, most nationally notifiable STD surveillance data do not include information on sexual behaviors; therefore, trends in STDs among MSM in the United States are based on findings from sentinel surveillance systems. Furthermore, testing strategies are often suboptimal for detecting STDs in MSM. Testing for gonorrhea and chlamydia in MSM largely focuses on detecting urethral infections, which are more likely to be symptomatic than pharyngeal or rectal infections.[12] Data from enhanced surveillance projects are presented in this section to provide information on STDs in MSM.

STD Surveillance Network (SSuN)—Monitoring Trends in Prevalence of STDs Among MSM Who Visit STD Clinics, 2012

In 2005, SSuN was established to improve the capacity of national, state, and local STD programs to detect, monitor, and respond rapidly to trends in STDs through enhanced collection, reporting, analysis, visualization, and interpretation of disease information.[13] SSuN currently includes 12 collaborating local and state health departments. In 2012, a total of 42 STD clinics at these 12 sites collected enhanced behavioral and demographic information on patients who presented for care to these clinics.[14] For data reported in this section, MSM were defined as men who either reported having a male sex partner or who self-reported as gay/homosexual or bisexual. MSW were defined as men who reported having sex with women only or who did not report the sex of their sex partner, but reported that they considered themselves straight/heterosexual. More detailed information about SSuN methodology can be found in the STD Surveillance Network section of the Appendix, Interpreting STD Surveillance Data.

Gonorrhea and Chlamydial Infection

In 2012, the proportion of MSM who tested positive for gonorrhea and chlamydia at STD clinics varied by SSuN site (Figure T). A larger proportion of MSM who visited SSuN STD clinics tested positive for gonorrhea than tested positive for chlamydia in all cities except Seattle, Birmingham, and Hartford/New Haven (where the proportion for chlamydia was higher).

Across the participating sites, about the same number of MSM were tested for gonorrhea (22,007) and chlamydia (21,767). The median site-specific gonorrhea prevalence was 16.4% (range by site: 9.84%–30.4%). The median site-specific chlamydia prevalence was 12.0% (range by site: 6.4%–22.2%). For this report, a person who tested positive for gonorrhea or chlamydia more than one time in a year was counted only once for each infection.

Co-infection of P&S Syphilis and HIV

In 2012, the proportion of MSM who presented to SSuN clinics with P&S syphilis infection who also were infected with HIV ranged from 18.5% in Los Angeles to 66.7% in Birmingham (Figure U). The median site-specific proportion co-infected with HIV was 44.8%. P&S syphilis was identified by provider diagnosis and HIV was identified by laboratory report, self-report, or provider diagnosis.

HIV status and STDs

When comparing the prevalence of STDs by HIV status in MSM visiting SSuN STD clinics, the prevalence was lower among HIV-negative MSM status than among HIV-positive MSM (Figure V). The prevalence of P&S syphilis was 2.5% among HIV-negative MSM and 9.8% among HIV-positive MSM. Urethral gonorrhea positivity was 10.1% in MSM who were HIV-negative and 15.0% in HIV-positive MSM. Pharyngeal gonorrhea positivity was 7.4% in MSM who were HIV-negative and 10.0% in HIV-positive MSM; rectal gonorrhea positivity was 8.9% in MSM who were HIV-negative and 16.4% in HIV-positive MSM. Urethral chlamydia was 7.1% in MSM who were HIV-negative and 7.6% in HIV-positive MSM; rectal chlamydia positivity was 11.4% in MSM who were HIV-negative and 22.2% in HIV-positive MSM.

Nationally Notifiable Syphilis Surveillance Data

Primary and secondary syphilis among MSM has been increasing at least since 2000. [3, 15] In 33 areas reporting sex of partner data for P&S syphilis cases among MSM increased 15% during 2011 – 2012, a larger increase in previous years. In 2012, MSM accounted for 75% of all P&S syphilis cases in 49 states and the District of Columbia that provided information about sex of sex partners. MSM accounted for more cases than MSW or women in all racial and ethnic groups (Figure 40). More information about syphilis can be found in the Syphilis section of the National Profile.

Gonococcal Isolate Surveillance Project

GISP is a national sentinel surveillance system designed to monitor trends in antimicrobial susceptibilities of *N. gonorrhoeae* strains in the United States.[16] GISP has demonstrated that gonococcal isolates from MSM are more likely to exhibit antimicrobial resistance than isolates from MSW.[4] Overall, the proportion of isolates from MSM in selected STD clinics from GISP sentinel sites has increased steadily, from 4.6% in 1990 to 33.1% in 2012 (Figure W). The reason for this increase is unclear, but might reflect changes in the epidemiology of gonorrhea or in health care seeking behavior of men infected with gonorrhea. The proportion of isolates from MSM varies geographically, with the largest proportion reported from the West Coast (Figure X).

More information on GISP can be found in the Gonorrhea section of the National Profile.

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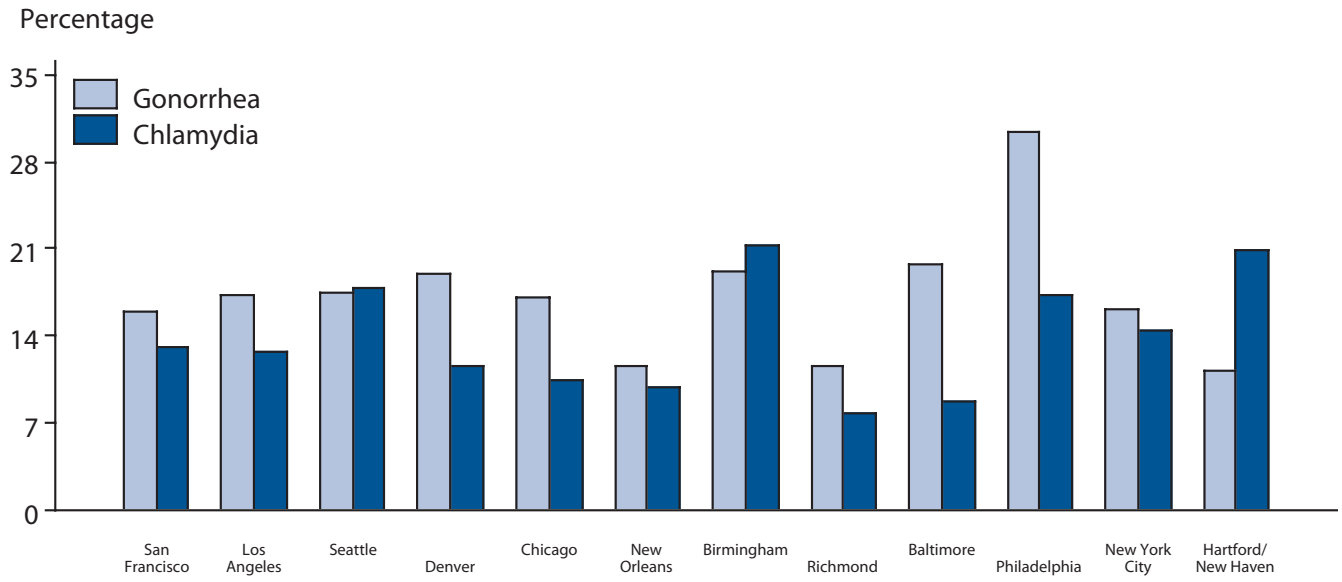
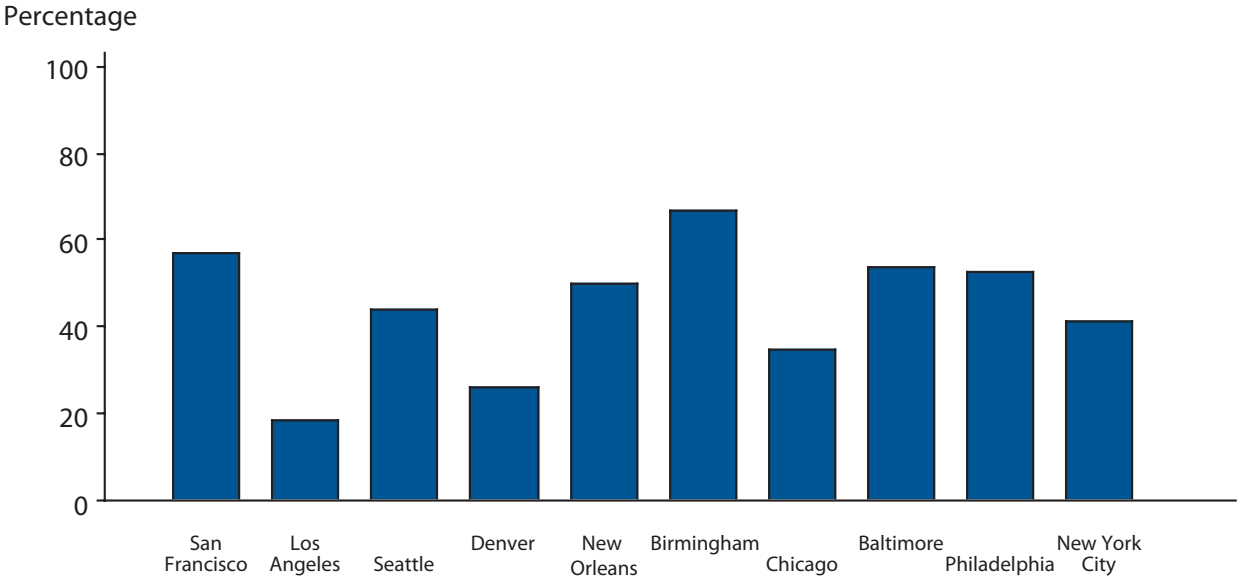
Figure T. Gonorrhea and Chlamydia—Proportion of MSM* Attending STD Clinics Testing Positive for Gonorrhea and Chlamydia, STD Surveillance Network (SSuN), 2012



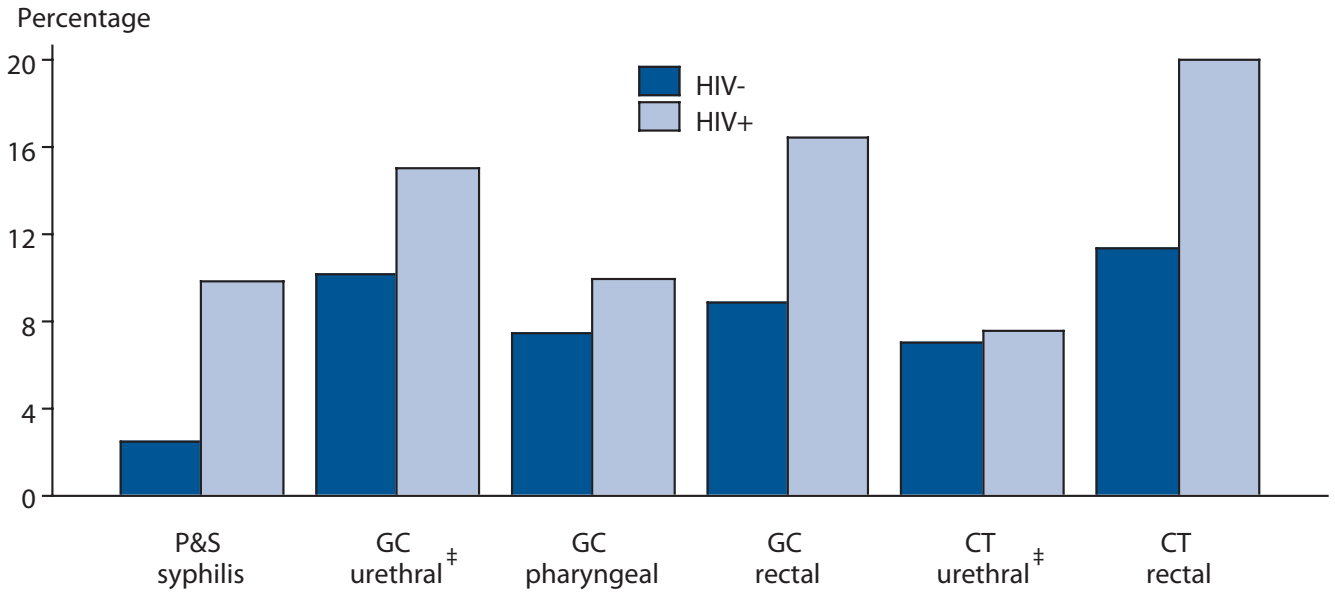
* Among men who have sex with men who were tested for gonorrhea and/or chlamydia

Figure U. Primary and Secondary Syphilis and HIV — Proportion of MSM* Attending STD Clinics with Primary and Secondary Syphilis Who are Co-infected with HIV, STD Surveillance Network (SSuN), 2012



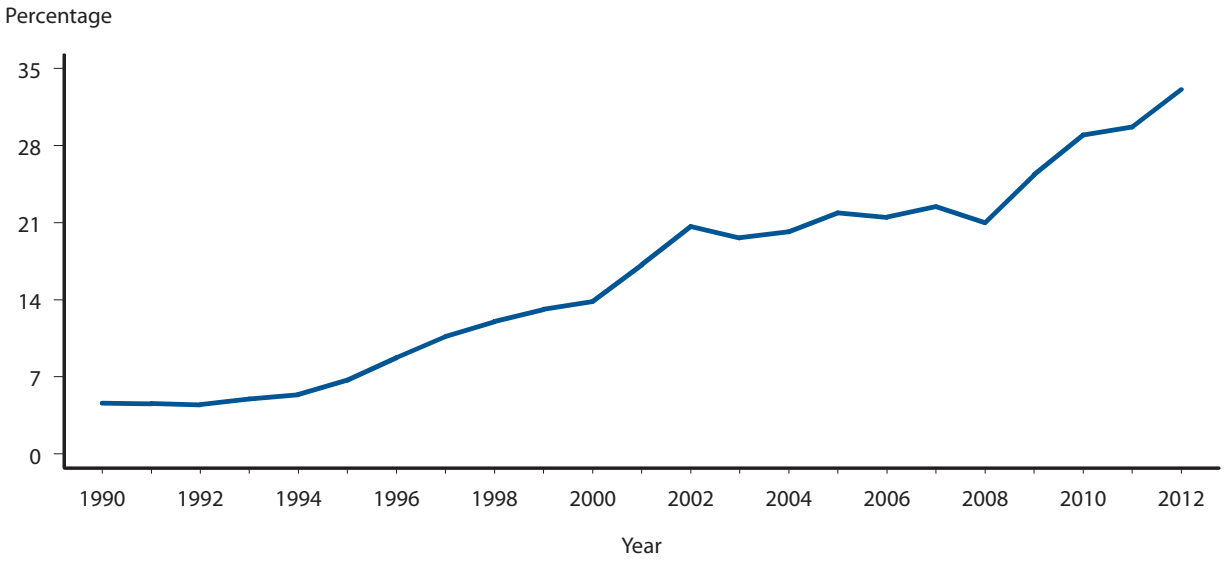
* MSM = men who have sex with men.
NOTE: Includes sites that reported data on at least 25 MSM with primary and secondary syphilis in 2012.

Figure V. Proportion of MSM* Attending STD Clinics with Primary and Secondary Syphilis, Gonorrhea or Chlamydia by HIV Status†, STD Surveillance Network (SSuN), 2012



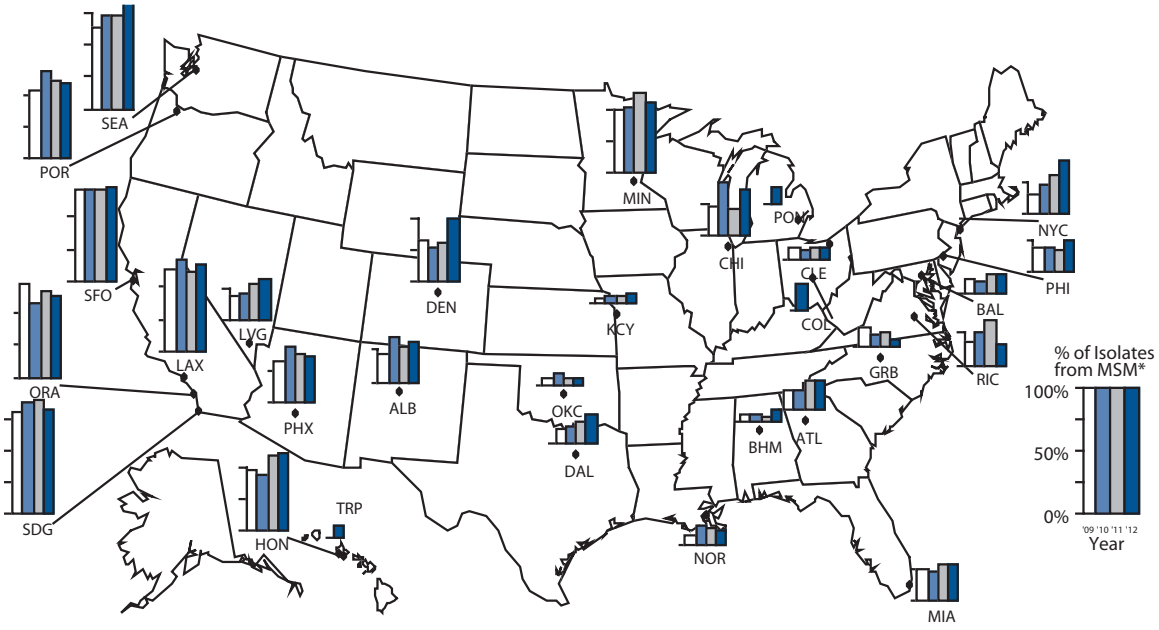
* MSM = men who have sex with men.
† Excludes all persons for whom there was no laboratory documentation or self-report of HIV status.
‡ GC urethral and CT urethral include results from both urethral and urine specimens.

Figure W. Percentage of Urethral *Neisseria gonorrhoeae* Isolates Obtained from MSM* Attending STD Clinics, Gonococcal Isolate Surveillance Project (GISP), 1990 – 2012



* MSM = men who have sex with men.

Figure X. Percentage of Urethral *Neisseria gonorrhoeae* Isolates Obtained from MSM* Attending STD Clinics, by Site, Gonococcal Isolate Surveillance Project (GISP), 2009 – 2012



* MSM = men who have sex with men.

NOTE: Participating sites include ALB = Albuquerque, NM; ATL = Atlanta, GA; BAL = Baltimore, MD; BHM = Birmingham, AL; CHI = Chicago, IL; CLE = Cleveland, OH; COL= Columbus, OH; DAL = Dallas, TX; DEN = Denver, CO; GRB = Greensboro, NC; HON = Honolulu, HI; KCY = Kansas City, MO; LAX = Los Angeles, CA; LVG = Las Vegas, NV; MIA = Miami, FL; MIN = Minneapolis, MN; NOR = New Orleans, LA; NYC = New York City, NY; OKC = Oklahoma City, OK; ORA = Orange County, CA; PHI = Philadelphia, PA; PHX = Phoenix, AZ; PON = Pontiac, MI; POR = Portland, OR; RIC = Richmond, VA; SDG = San Diego, CA; SEA = Seattle, WA; SFO = San Francisco, CA; and TRP = Tripler Army Medical Center, HI.