Sexually Transmitted Disease Surveillance 2016

Centers for Disease Control and Prevention
National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention

This page intentionally left blank.

Sexually Transmitted Disease Surveillance 2016

Division of STD Prevention
September 2017

U.S Department of Health and Human Services
Centers for Disease Control and Prevention
National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention
Division of STD Prevention
Atlanta, Georgia, 30329-4027

This report was prepared by

Surveillance and Data Management Branch

Division of STD Prevention

National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention

Centers for Disease Control and Prevention

Jim Braxton
Darlene Davis
Elaine Flagg
Jeremy Grey
LaZetta Grier
Alesia Harvey
Sarah Kidd
Kristen Kreisel
Eloisa Llata
Rodney Presley
Viani Ramirez
Steven Shapiro
Mark Stenger
Elizabeth Torrone
Hillard Weinstock
Emily Weston

Others contributing to the production and dissemination of this publication

Division of STD Prevention

Diane Ballard
Gail Bolan
Keith Davis
Lori Elmore
Suzanne Haecker
Jaeyoung Hong
Joseph Kang
Rachel Powell
Raul Romaguera
Salina Smith
Guoyu Tao
Jo Valentine

Publication of this report would not have been possible without the contributions of the state and territorial health departments, sexually transmitted disease control programs, and public health laboratories that provided surveillance data to CDC.

Copyright Information

Suggested Citation
Centers for Disease Control and Prevention. *Sexually Transmitted Disease Surveillance 2016*. Atlanta: U.S. Department of Health and Human Services; 2017.

Web Site
The online version of this report is available at https://www.cdc.gov/std/stats.

Selected STD Surveillance and Prevention References and Web Sites

STD Surveillance Reports 1993–2015
https://www.cdc.gov/std/stats/

STD Data in the NCHHSTP Atlas
https://www.cdc.gov/nchhstp/atlas/

STD Data on Wonder
https://wonder.cdc.gov/std.html

STD Data Management & Information Technology
https://www.cdc.gov/std/Program/data-mgmt.htm

STD Fact Sheets
https://www.cdc.gov/std/healthcomm/fact_sheets.htm

STD Treatment Guidelines
https://www.cdc.gov/STD/treatment/

STD Program Evaluation Guidelines
https://www.cdc.gov/std/program/pupestd.htm

STD Program Operation Guidelines
https://www.cdc.gov/std/program/GL-2001.htm

Recommendations for Public Health Surveillance of Syphilis in the United States
https://www.cdc.gov/std/SyphSurvReco.pdf

Behavioral Surveillance
Youth Risk Behavior Surveillance System:
https://www.cdc.gov/healthyyouth/data/yrbs/index.htm

National Survey of Family Growth
https://www.cdc.gov/nchs/nsfg.htm

This page intentionally left blank.

Foreword

Sexually transmitted diseases (STDs) have long been an underestimated opponent in the public health battle. A 1997 Institute of Medicine (IOM) report described STDs as, "hidden epidemics of tremendous health and economic consequence in the United States," and stated that the "scope, impact, and consequences of STDs are under-recognized by the public and healthcare professionals."[1] Since well before this report was published, and nearly two decades later, those facts remain unchanged.

It is estimated that there are 20 million new STDs in the U.S. each year, and half of these are among young people ages 15 to 24 years. Across the nation, at any given time, there are more than 110 million total (new and existing) infections.[2] These infections can lead to long-term health consequences, such as infertility; they can facilitate HIV transmission; and they have stigmatized entire subgroups of Americans.

Yet not that long ago, gonorrhea rates were at historic lows, syphilis was close to elimination, and we were able to point to advances in STD prevention, such as better chlamydia diagnostic tests and more screening, contributing to increases in detection and treatment of chlamydial infections. That progress has since unraveled. The number of reported syphilis cases is climbing after being largely on the decline since 1941, and gonorrhea rates are now increasing. This is especially concerning given that we are slowly running out of treatment options to cure *Neisseria gonorrhoeae*. Many young women continue to have undiagnosed chlamydial infections, putting them at risk for infertility.

Beyond the impact on an individual's health, STDs are also an economic drain on the U.S. healthcare system. Data suggest the direct cost of treating STDs in the U.S. is nearly $16 billion annually.[3] STD public health programs are increasingly facing challenges and barriers in achieving their mission. In 2012, 52% of state and local STD programs experienced budget cuts. This amounts to reductions in clinic hours, contact tracing, and screening for common STDs. CDC estimates that 21 local health department STD clinics closed that year.

It is imperative that federal, state, and local programs employ strategies that maximize long-term population impact by reducing STD incidence and promoting sexual, reproductive, maternal, and infant health. The resurgence of syphilis, and particularly congenital syphilis, is not an arbitrary event, but rather a symptom of a deteriorating public health infrastructure and lack of access to health care. It is exposing hidden, fragile populations in need that are not getting the health care and preventive services they deserve. This points to our need for public health and health care action for each of the cases in this report, as they represent real people, not just numbers.

We also need to modernize surveillance to move beyond counting only those cases in persons who have access to diagnosis and treatment, to develop innovative strategies to understand the burden of disease in those who may not access care, and to improve our surveillance systems to collect the information needed to target prevention activities. Further, it will be important for us to measure and monitor the adverse health consequences of STDs, such as ocular and neurosyphilis, pelvic inflammatory disease, ectopic pregnancy, infertility, HIV, congenital syphilis, and neonatal herpes.

It is my hope that a decade from now, we will be reporting on progress, instead of more health inequity in our society. This is our challenge and our call to effectively respond to the information shared in this report.

Gail Bolan, M.D.
Director, Division of STD Prevention
National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention
U.S. Centers for Disease Control and Prevention

References

1. Eng TR, Butler WT, editors; Institute of Medicine (US). Summary: The hidden epidemic: confronting sexually transmitted diseases. Washington (DC): National Academy Press; 1997. p. 43.
2. Satterwhite CL, Torrone E, Meites E, et al. Sexually transmitted infections among US women and men: prevalence and incidence estimates, 2008. Sex Transm Dis 2013; 40(3):187–193. DOI: 10.1097/OLQ.0b013e318286bb53. Review.
3. Owusu-Edusei K Jr, Chesson HW, Gift TL, et al. The estimated direct medical cost of selected sexually transmitted infections in the United States, 2008. Sex Transm Dis 2013; 40(3):197–201. DOI: 10.1097/OLQ.0b013e318285c6d2.

This page intentionally left blank.

Preface

Sexually Transmitted Disease Surveillance 2016 presents statistics and trends for sexually transmitted diseases (STDs) in the United States through 2016. This annual publication is intended as a reference document for policy makers, program managers, health planners, researchers, and others who are concerned with the public health implications of these diseases. The figures and tables in this edition supersede those in earlier publications of these data.

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

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

The collection of information on race/ethnicity has been standardized since 1997 in the United States from the Office of Management and Budget (OMB). Following a revision in the National Electronic Telecommunication System for Surveillance (NETSS) implementation guide in April 2008, jurisdictions reporting STD data were to collect race according to the OMB standard categories: American Indian or Alaska Native, Asian, Black or African American, Hispanic or Latino, Native Hawaiian or Other Pacific Islander, White, and Multirace. While all states and the District of Columbia collect and report data for all STDs in formats compliant with these standards as of 2016, some jurisdictions only recently adopted this standard and used previous standards to report their case data to CDC in past years. Consequently, historical trend and rate data by race/ethnicity displayed in figures and interpreted in this report for 2012–2016 include only those jurisdictions reporting in the current standard consistently each year from 2012 through 2016.

Sexually Transmitted Disease Surveillance 2016 consists of four sections: the National Profile, the Special Focus Profiles, the Tables, and the Appendix. The National Profile section contains figures that provide an overview of STD morbidity in the United States. The accompanying text identifies major findings and trends for selected STDs. The Special Focus Profiles section contains figures and text that describe STDs in selected populations that are a focus of national and state prevention efforts. The Tables section provides statistical information about STDs at county, metropolitan statistical area, regional, state, and national levels. The Appendix includes information on how to interpret the STD surveillance data used to produce this report, as well as information about *Healthy People 2020* STD objectives and progress toward meeting these objectives, Government Performance and Results Act goals and progress toward meeting these goals, and STD surveillance case definitions.

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

Director, Division of STD Prevention
National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention
Centers for Disease Control and Prevention
1600 Clifton Road NE, Mailstop E-02
Atlanta, Georgia 30329-4027

This page intentionally left blank.

Guide to Acronyms

AI/AN	American Indians/Alaska Natives
CDC	Centers for Disease Control and Prevention
CI	confidence interval
CIA	chemiluminescence immunoassay
CIN2+	cervical intraepithelial neoplasia grades 2 and 3
CS	congenital syphilis
CSF	cerebrospinal fluid
CSTE	Council of State and Territorial Epidemiologists
EIA	enzyme immunoassay
EP	ectopic pregnancy
FTA-ABS	fluorescent treponemal antibody absorbed
GISP	Gonococcal Isolate Surveillance Project
HD	health department
HEDIS	Healthcare Effectiveness Data and Information Set
HMOs	health maintenance organizations
HIV	human immunodeficiency virus
HP2020	*Healthy People 2020*
HPV	human papillomavirus
HSIL	high-grade squamous intraepithelial lesions
HSV	herpes simplex virus
IHC	immunohistochemistry
LSIL	low-grade squamous intraepithelial lesions
MHA-TP	microhemagglutination assay for antibody to *Treponema pallidum*
MICs	minimum inhibitory concentrations
MPC	mucopurulent cervicitis
MSAs	metropolitan statistical areas
MSM	gay, bisexual, and other men who have sex with men
MSM-only	gay, bisexual, and other men who have sex exclusively with men
MSMW	men who have sex with both men and women
MSW	men who have sex with women only
NAATs	nucleic acid amplification tests
NCHHSTP	National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention
NCHS	National Center for Health Statistics
NHOPI	Native Hawaiians/Other Pacific Islanders
NDTI	National Disease and Therapeutic Index
NETSS	National Electronic Telecommunications System for Surveillance
NGU	nongonococcal urethritis
NHANES	National Health and Nutrition Examination Survey
NJTP	National Job Training Program
NNDSS	National Notifiable Diseases Surveillance System
OMB	Office of Management and Budget
P&S	primary and secondary
PCR	polymerase chain reaction
PID	pelvic inflammatory disease
RPR	rapid plasma reagin
SSuN	STD Surveillance Network
STD	sexually transmitted disease
STI	sexually transmitted infection
TP-PA	*T. pallidum* particle agglutination
VDRL	Venereal Disease Research Laboratory
WBC	white blood cell

This page intentionally left blank.

Table of Contents

Figures in the National Profile

Chlamydia

Gonorrhea

Syphilis

Other STDs

Figures in the Special Focus Profiles

STDs in Women and Infants

STDs in Adolescents and Young Adults

STDs in Racial and Ethnic Minorities

STDs in Men who Have Sex with Men

Tables in the National Profile

National Summary

Chlamydia

Gonorrhea

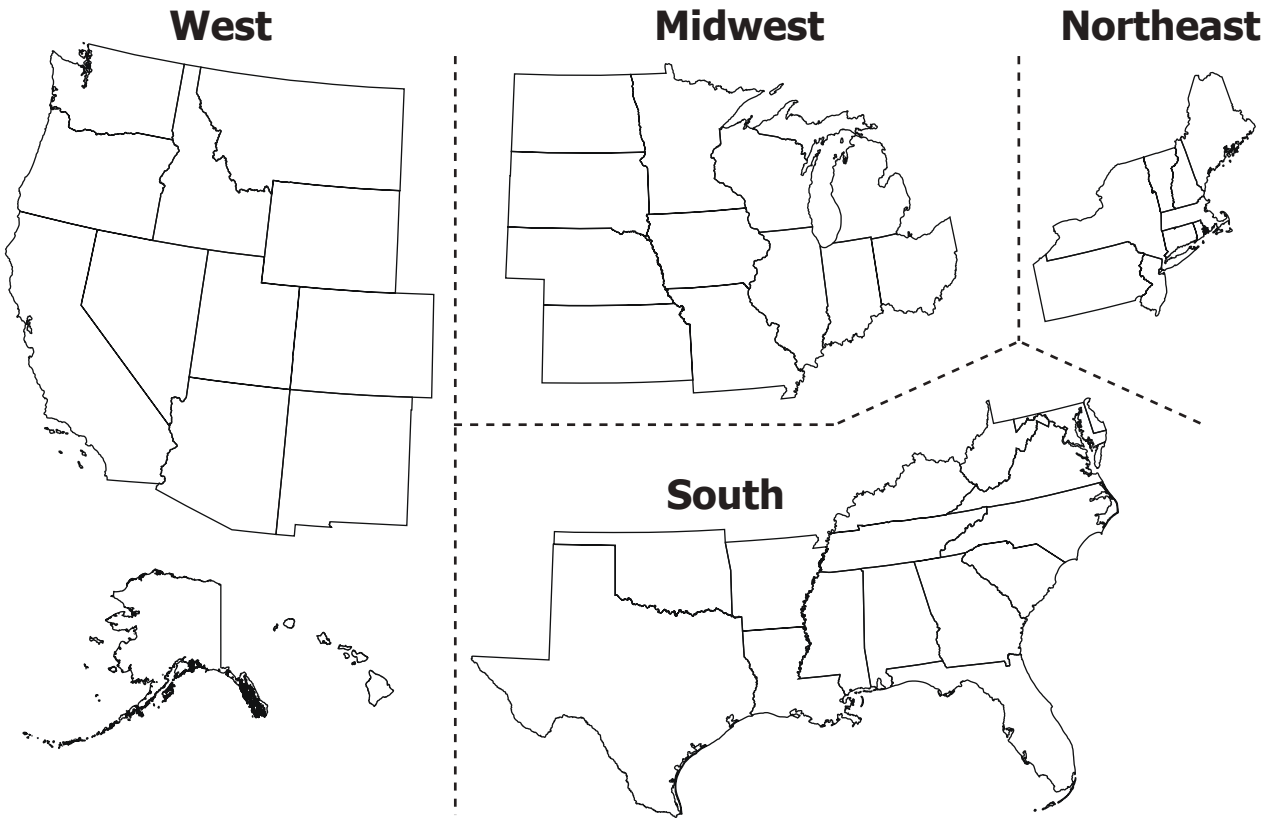
Syphilis

Chancroid

Selected STDs

Appendix

Census Regions of the United States



West
Alaska
Arizona
California
Colorado
Hawaii
Idaho
Montana
Nevada
New Mexico
Oregon
Utah
Washington
Wyoming

Midwest
Illinois
Indiana
Iowa
Kansas
Michigan
Minnesota
Missouri
Nebraska
North Dakota
Ohio
South Dakota
Wisconsin

South
Alabama
Arkansas
Delaware
District of Columbia
Florida
Georgia
Kentucky
Louisiana
Maryland
Mississippi
North Carolina
Oklahoma
South Carolina
Tennessee
Texas
Virginia
West Virginia

Northeast
Connecticut
Maine
Massachusetts
New Hampshire
New Jersey
New York
Pennsylvania
Rhode Island
Vermont

This page intentionally left blank.

National Profile

The National Profile section contains figures that show trends and the distribution of nationally reportable STDs (chlamydia, gonorrhea, syphilis, and chancroid) by age, sex, race/ethnicity, and location for the United States.

National Overview of STDs, 2016

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

This overview summarizes national surveillance data for 2016 on the three notifiable diseases for which there are federally funded control programs: chlamydia, gonorrhea, and syphilis.

Chlamydia

In 2016, a total of 1,598,354 cases of *Chlamydia trachomatis* infection were reported to the CDC, making it the most common notifiable condition in the United States. This case count corresponds to a rate of 497.3 cases per 100,000 population, an increase of 4.7% compared with the rate in 2015. During 2015–2016, rates of reported chlamydia increased in all regions of the United States.

Rates of chlamydia are highest among adolescent and young adult females, the population targeted for routine chlamydia screening. Among young women attending family planning clinics participating in a sentinel surveillance program who were tested for chlamydia, 9.2% of 15–19 year olds and 8.0% of 20–24 year olds were positive. Although rates of reported cases among men are generally lower than rates among women, reflecting the larger number of women screened for this infection, increased availability of urine testing and extragenital testing has resulted in an increased number of men, including gay, bisexual, and other men who have sex with men (collectively referred to as MSM) being tested and diagnosed with a chlamydial infection.

Rates of reported chlamydia varied among different racial and ethnic minority populations. In 2016, rates were highest among Blacks and American Indians/Alaska Natives. However, during 2012–2016, rates decreased 3.5% among Blacks and 6.4% among American Indians/Alaska Natives and increased among Whites, Asians, and Native Hawaiian/Other Pacific Islanders.

Gonorrhea

In 2009, the national rate of reported gonorrhea cases reached an historic low of 98.1 cases per 100,000 population. During 2009–2012, the rate increased slightly each year to 106.7 cases per 100,000 population in 2012 and has increased steadily during 2014–2016. In 2016, 468,514 gonorrhea cases were reported for a rate of 145.8 cases per 100,000 population, an increase of 18.5% from 2015.

During 2015–2016, the rate of reported gonorrhea increased 22.2% among men and 13.8% among women. The magnitude of the increase among men suggests either increased transmission or increased case ascertainment (e.g., through increased extra-genital screening) among MSM or both. The concurrent increases among cases reported among women, suggests parallel increases in heterosexual transmission, increased screening among women, or both.

In 2016, the rate of reported cases of gonorrhea remained highest among Blacks (481.2 cases per 100,000 population) and among American Indians/Alaska Natives (242.9 cases per 100,000 population). During 2012–2016, rates increased among all racial and ethnic groups.

Antimicrobial resistance remains an important consideration in the treatment of gonorrhea. Dual therapy with ceftriaxone and azithromycin is now the only CDC recommended treatment for gonorrhea.[2] In 2016, the percentage of isolates with elevated minimum inhibitory concentrations (MICs) of cefixime and ceftriaxone remained low (0.3% and 0.3%, respectively). During 2013–2016, the percentage of isolates with reduced azithromycin susceptibility increased from 0.6% to 3.6%. Continued monitoring of susceptibility patterns to these antibiotics is critical.

Syphilis

In 2000 and 2001, the national rate of reported primary and secondary (P&S) syphilis cases was 2.1 cases per 100,000 population, the lowest rate since reporting began in 1941. However, the P&S syphilis rate has increased almost every year since 2001. In 2016, 27,814 P&S syphilis cases were reported, representing a national rate of 8.7 cases per 100,000 population and a 17.6% increase from 2015. During 2015–2016, the P&S syphilis rate increased among both men and women in every region of the country; overall, the rate increased 14.7% among men and 35.7% among women.

During 2012–2016, P&S syphilis rates were consistently highest among persons aged 20–29 years, but rates increased in every 5-year age group among those aged 15–64 years. In 2016, rates were highest among Blacks (23.3 per 100,000 population) and Native Hawaiian/Other Pacific Islanders (13.9 per 100,000 population); however, rates increased among all racial and ethnic groups during in 2012–2016.

During 2000–2016, the rise in the P&S syphilis rate was primarily attributable to increased cases among men and, specifically, among MSM. In 2016, men accounted for almost 90% of all cases of P&S syphilis. Of those male cases for whom sex of sex partner was known, 80.6% were MSM. Reported cases of P&S syphilis continued to be characterized by a high rate of HIV co-infection, particularly among MSM. Among 2016 P&S syphilis cases with known HIV-status, 47.0% of MSM were HIV-positive, 10.7% of cases among MSW and 4.1% of cases among women were HIV-positive.

The 2013 rate of congenital syphilis (9.2 cases per 100,000 live births) marked the first increase in congenital syphilis since 2008. During 2013–2014, the rate increased 27.2%, during 2014–2015 the rate increased 6.0%, and then increased 27.6% during 2015–2016. There were 628 cases of congenital syphilis reported in 2016 compared with 492 cases in 2015. In 2016, rates of congenital syphilis were highest among Blacks (43.1 cases per 100,000 live births), followed by American Indians/Alaska Natives (31.6 cases per 100,000 live births), and Hispanics (20.5 cases per 100,000 live births).

References

1. Eng TR, Butler WT, editors; Institute of Medicine. The Hidden Epidemic: Confronting Sexually Transmitted Diseases. Washington DC: The National Academy Press; 1997.
2. Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2015. MMWR Morb Mortal Wkly Rep 2015; 64(No. RR-3): 1–137.

Chlamydia

Background

Chlamydia, caused by infection with *Chlamydia trachomatis*, is the most common notifiable disease in the United States. It is among the most prevalent of all STDs, and since 1994, has comprised the largest proportion of all STDs reported to CDC (Table 1). Studies also demonstrate the high prevalence of chlamydial infections in the general U.S. population, particularly among young women.[1]

Chlamydial infections in women are usually asymptomatic.[2] Untreated infection can result in pelvic inflammatory disease (PID), which is a major cause of infertility, ectopic pregnancy, and chronic pelvic pain. Data from randomized controlled trials of chlamydia screening suggested that screening programs can lead to a reduction in the incidence of PID.[3,4] As with other inflammatory STDs, chlamydial infection could facilitate the transmission of HIV infection.[5] In addition, pregnant women infected with chlamydia can pass the infection to their infants during delivery, potentially resulting in ophthalmia neonatorum, which can lead to blindness, and pneumonia. Because of the large burden of disease and risks associated with infection, CDC recommends annual chlamydia screening for all sexually active women younger than age 25 years and women ≥25 years at increased risk for infection (e.g., women with new or multiple sex partners).[6]

The Healthcare Effectiveness Data and Information Set (HEDIS) contains a measure which assesses chlamydia screening coverage of sexually active young women who receive medical care through commercial or Medicaid managed care organizations. Among sexually-active women aged 16–24 years in commercial health maintenance organization (HMO) plans, chlamydia screening increased from 23.1% in 2001 to 47.4% in 2015. Among sexually-active women aged 16–24 years covered by Medicaid, screening rates increased from 40.4% in 2001 to 58.0% in 2011, then decreased to 55.2% in 2015.[7] Although chlamydia screening has expanded over the past two decades, many women who are at risk are still not being tested—reflecting, in part, the lack of awareness among some health care providers and the limited resources available to support these screenings.

Interpreting Rates of Reported Cases of Chlamydia

Trends in rates of reported cases of chlamydia are influenced by changes in incidence of infection, as well as changes in diagnostic, screening, and reporting practices. As chlamydial infections are usually asymptomatic, the number of infections identified and reported can increase as more people are screened even when incidence is flat or decreasing. During 2000–2011, the expanded use of more sensitive diagnostic tests (e.g., nucleic acid amplification tests [NAATs]) likely increased the number of infections identified and reported independently of increases in incidence. Also, although chlamydia has been a nationally notifiable condition since 1995, it was not until 2000 that all 50 states and the District of Columbia required reporting of chlamydia cases. National case rates prior to 2000 reflect incomplete reporting. The increased use of electronic laboratory reporting over the last decade or so also likely increased the proportion of diagnosed cases reported. Consequently, an increasing chlamydia case rate over time may reflect increases in incidence of infection, screening coverage, and use of more sensitive tests, as well as more complete reporting. Likewise, decreases in chlamydia case rates may suggest decreases in incidence of infection or screening coverage.

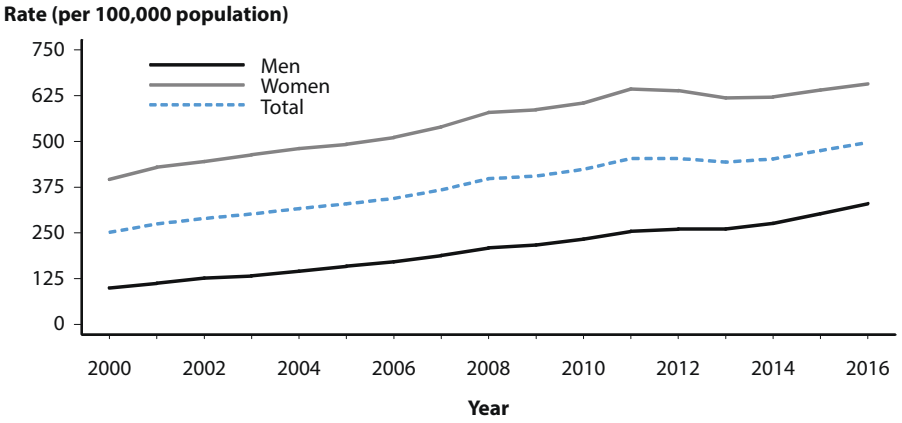
Chlamydia — United States

In 2016, a total of 1,598,354 chlamydial infections were reported to CDC in 50 states and the District of Columbia (Table 1). This case count corresponds to a rate of 497.3 cases per 100,000 population. During 2000–2011, the rate of reported chlamydial infection increased from 251.4 to 453.4 cases per 100,000 population (Figure 1, Table 1). During 2011–2013, the rate of reported cases decreased to 443.5 cases per 100,000 population, followed by an increase in the rate of reported cases over each of the next 3 years. During 2015–2016, the rate increased 4.7%, from 475.0 to 497.3 cases per 100,000 population (Figure 1, Table 1).

Chlamydia by Region

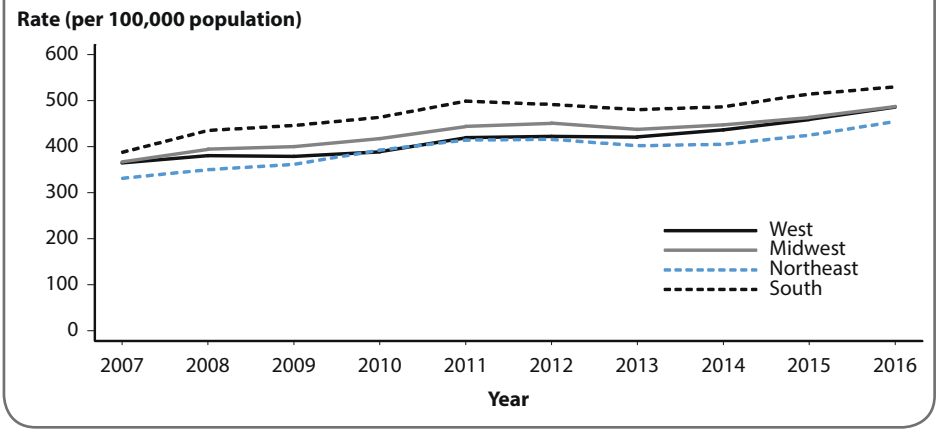
In 2016, rates of reported cases of chlamydia were highest in the South (529.7 cases per 100,000 population, 3.0% increase from 2015), followed by the Midwest (487.5, 5.1% increase from 2015), West (485.9, 5.8% increase from 2015), and Northeast (454.6, 7.0% increase from 2015) (Table 3). During 2007–2012, rates of reported cases of chlamydia increased in all regions (Figure 2). During 2012–2013, rates decreased in the Northeast, Midwest, and South and remained stable in the West. During 2013–2016, rates increased in all regions, with the largest increase occurring in the West (421.1 to 485.9 cases per 100,000 population, 15.4% increase) (Table 3).

Figure 1. Chlamydia — Rates of Reported Cases by Sex, United States, 2000–2016



NOTE: Data collection for chlamydia began in 1984 and chlamydia was made nationally notifiable in 1995; however, chlamydia was not reportable in all 50 states and the District of Columbia until 2000. Refer to the National Notifiable Disease Surveillance System (NNDSS) website for more information: https://wwwn.cdc.gov/nndss/conditions/chlamydia-trachomatis-infection/.

Figure 2. Chlamydia — Rates of Reported Cases by Region, United States, 2007–2016



Chlamydia by State

In 2016, rates of reported cases of chlamydia by state ranged from 260.6 cases per 100,000 population in New Hampshire to 771.6 cases per 100,000 population in Alaska (Figure 3, Table 2); the rate in the District of Columbia was 1,083.4 cases per 100,000 population (Table 3). During 2015–2016, rates of reported chlamydia cases increased in 44 states and the District of Columbia. The rate of reported chlamydia cases in 2016 was above the U.S. total in 21 states.

Chlamydia by Metropolitan Statistical Area

The rate of reported cases of chlamydia in the 50 most populous metropolitan statistical areas (MSAs) increased 6.2% during 2015–2016 (489.6 to 520.1 cases per 100,000 population, respectively) (Table 6). In 2016, 57.5% of chlamydia cases were reported by these MSAs. During 2015–2016, the rate of reported cases of chlamydia in these MSAs increased 3.9% among women (639.8 to 664.5 cases per 100,000 females) and 10.9% among men (331.8 to 368.0 cases per 100,000 males) (Tables 7 and 8).

Chlamydia by County

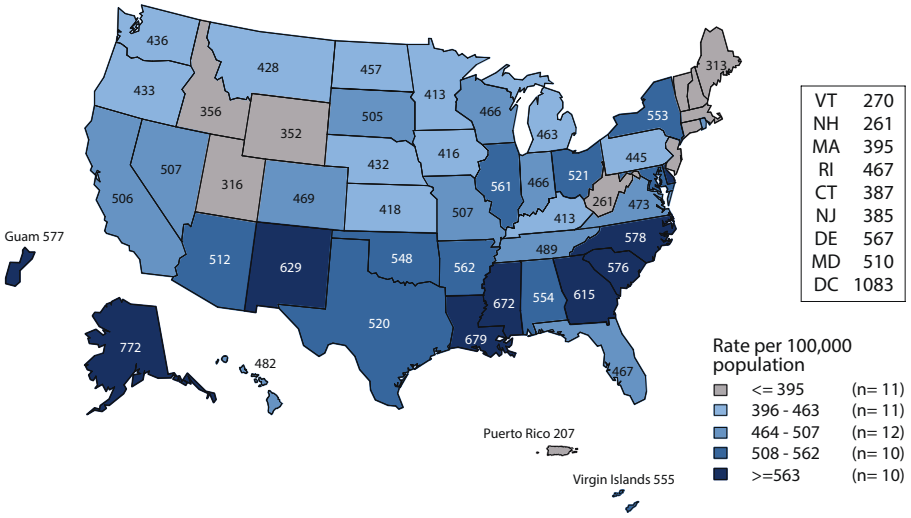
In 2016, 620 (19.7%) of 3,140 counties had rates of reported chlamydia higher than 520 cases per 100,000 population (Figure 4). Seventy counties and independent cities reported 43.4% of all chlamydia cases in 2016 (Table 9). Of the 70 counties and independent cities reporting the highest number of chlamydia cases, 47 (67.1%) were located in the South and West (Table 9).

Chlamydia by Sex

In 2016, 1,072,719 cases of chlamydia were reported among females for a rate of 657.3 cases per 100,000 females (Table 4). After increasing each year during 2000–2011, the rate of reported chlamydia cases among females decreased during 2011–2013, followed by an increase in the rate of reported cases over each of the next three years (Figure 1). The rate among females increased 0.4% during 2013–2014, 3.0% during 2014–2015, and 2.6% during 2015–2016, for a total increase of 6.2% during 2013–2016.

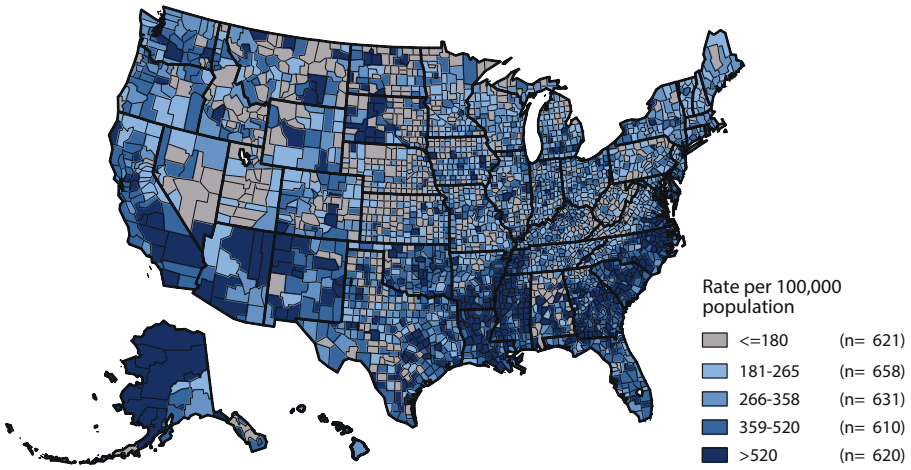
There were 522,870 cases of chlamydia reported among males in 2016 for a rate of 330.5 cases per 100,000 males (Table 5). The rate of reported cases among males increased each year during 2000–2016, with the exception of 2012–2013, where rates remained stable (Figure 1). During 2015–2016 alone, the rate among men increased 9.2%; however, during 2012–2016, rates of reported cases among men increased 26.8% (compared with a 2.9% increase among women) (Tables 4 and 5). This pronounced increase among men could be attributed to either increased transmission or improved case identification (e.g., through

Figure 3. Chlamydia — Rates of Reported Cases by State, United States and Outlying Areas, 2016



NOTE: The total rate of reported cases of chlamydia for the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 494.2 per 100,000 population.

Figure 4. Chlamydia — Rates of Reported Cases by County, United States, 2016



NOTE: Refer to the NCHHSTP Atlas for further county-level rate information: https://www.cdc.gov/nchhstp/atlas.

intensified extra-genital screening efforts) among gay, bisexual, and other men who have sex with men (collectively referred to as MSM). This cannot be assessed, however, as most jurisdictions do not routinely report sex of sex partner or anatomic site of infection.

Despite this considerable increase in men, the rate of reported chlamydia cases among females was still about two times the rate among males in 2016, likely reflecting a larger number of women screened for this infection (Figure 1, Tables 4 and 5). The lower rate among men also suggests that many of the sex partners of women with chlamydia are not receiving a diagnosis of chlamydia or being reported as having chlamydia.

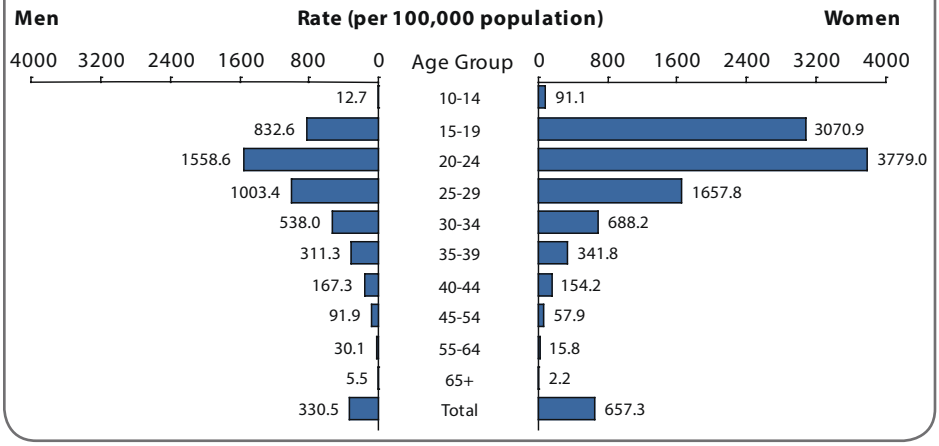
Chlamydia by Age

The rates of reported cases of chlamydia are highest among adolescents and young adults aged 15–24 years (Table 10). In 2016, the age-specific rate of reported cases of chlamydia among 15–19 year olds was 1,929.2 cases per 100,000 population and the rate among 20–24 year olds was 2,643.8 cases per 100,000 population (Table 10).

Among females, the highest age-specific rates of reported cases of chlamydia in 2016 were among those aged 15–19 years (3,070.9 cases per 100,000 females) and 20–24 years (3,779.0 cases per 100,000 females) (Figure 5, Table 10). Within these age groups, rates were highest among women aged 19 years (4,970.1 cases per 100,000 females) and 20 years (4,734.8 cases per 100,000 females) (Table 12). The rate of reported cases among women aged 15–19 and 20–24 years increased over the last two and three years, respectively. The rate among 15–19 year olds increased 2.8% during 2015–2016, with a total increase of 4.1% during 2014–2016 (2,949.3 to 3,070.9 per 100,000 females). The rate among 20–24 year olds increased 0.4% during 2015–2016, with a total increase of 5.1% during 2013–2016 (3594.2 to 3779.0 per 100,000 females) (Table 10).

In 2016, the age-specific rates of reported cases of chlamydia among men, although substantially lower than rates among women, were highest in those aged 20–24 years (1,558.6 cases per 100,000 males) (Figure 5, Table 10). Similar to trends in women, the rate of reported cases among men aged 15–19 and 20–24 years increased over the last two and three years, respectively. The rate among 15–19 year olds increased 8.6% during 2015–2016, with a total increase of 15.3% during 2014–2016 (722.4 to 832.6 per 100,000 males).

Figure 5. Chlamydia — Rates of Reported Cases by Age Group and Sex, United States, 2016



The rate among 20–24 year olds increased 5.5% during 2015–2016, with a total increase of 18.9% during 2013–2016 (1,310.9 to 1,558.6 per 100,000 females) (Table 10).

Chlamydia by Race/Ethnicity

Among the 50 states and the District of Columbia that submitted race and ethnicity data in 2016 according to Office of Management and Budget (OMB) standards (see Section A1.5 in the Appendix), rates of reported cases of chlamydia were highest among Black, American Indian/Alaska Native, and Native Hawaiian/Other Pacific Islander women (Figure R, Table 11B). Overall, the rate of reported cases of chlamydia among Blacks was 5.6 times the rate among Whites (1,125.9 and 199.8 cases per 100,000 population, respectively). The rate among American Indians/Alaska Natives (749.8 cases per 100,000 population) was 3.8 times the rate among Whites. The rate among Native Hawaiians/Other Pacific Islanders (653.4 cases per 100,000 population) was 3.3 times the rate among Whites. The rate among Hispanics (374.6 cases per 100,000 population) was 1.9 times the rate among Whites. The rate among Asians was lower than the rate among Whites (119.3 cases per 100,000 population).

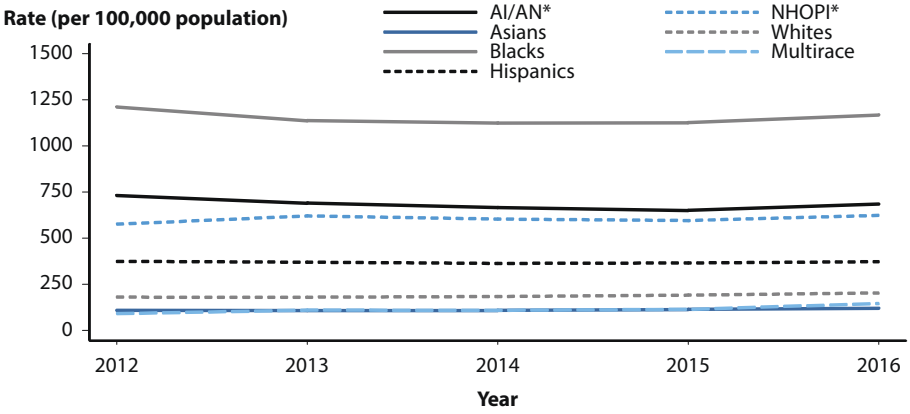
During 2012–2016, 46 states submitted race and ethnicity data according to the OMB standards (see Section A1.5 in the Appendix). During 2012–2016, rates of reported chlamydia cases increased among Whites (12.7%), Asians (10.2%), Native Hawaiians/Other Pacific Islanders (8.3%), and Multirace (60.6%), and decreased in American Indians/Alaska Natives (6.4%) and Blacks (3.5%) (Figure 6). Rates were stable among Hispanics during 2012–2016. During 2015–2016, rates increased among all racial/ethnic groups (Whites: 6.3%, Asians: 5.7%, American Indians/Alaska Natives: 5.3%, Native Hawaiians/Other Pacific Islanders: 4.7%, Blacks: 3.7%, Hispanics 1.9%, and Multirace: 27.6%) (Figure 6).

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

Chlamydia by Reporting Source

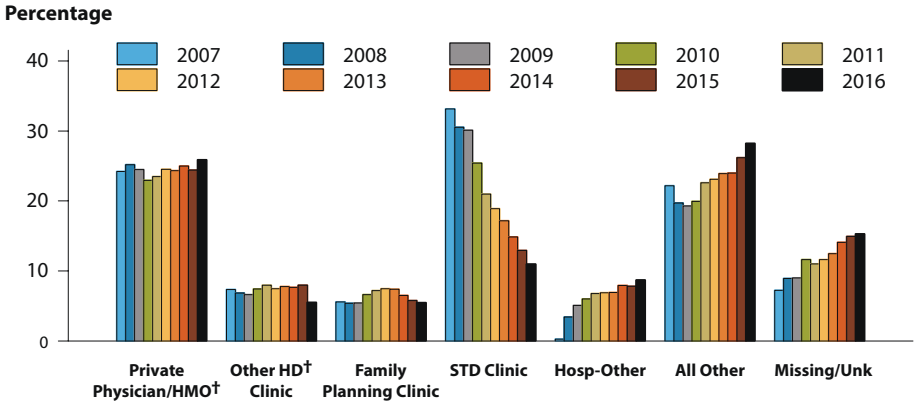
In 2016, 6.4% of chlamydia cases were reported from STD clinics, 78.4% were reported from venues outside of STD clinics, and 15.2% had an unknown source of report (Table A2). Over time, the proportion of male cases reported from STD clinic sites has decreased substantially, from 33.1% in 2007 to 11.0% in 2016 (Figure 7). In 2016, among women, only 4.2% of chlamydia cases were reported through an STD clinic (Table A2). A large proportion of cases among women (33.5%) were reported from private physicians/HMOs in 2016 (Figure 8). Among men, 25.9% of cases were reported from private physicians/HMOs (Figure 7).

Figure 6. Chlamydia — Rates of Reported Cases by Race/Ethnicity, United States, 2012–2016



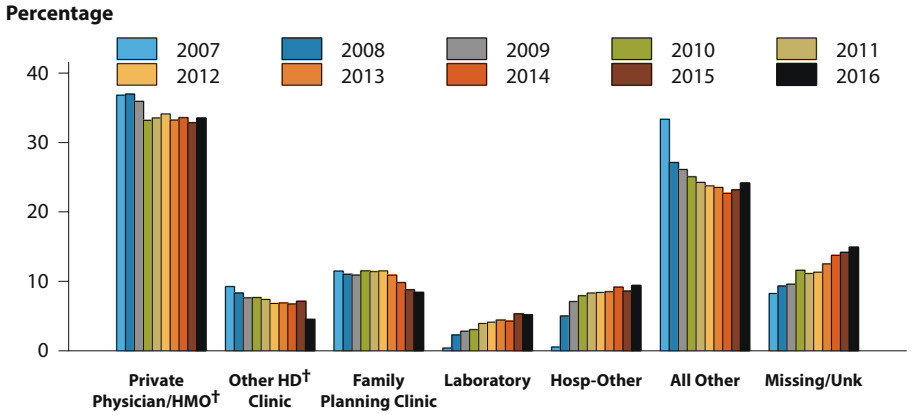
* AI/AN = American Indians/Alaska Natives; NHOPI = Native Hawaiians/Other Pacific Islanders.
NOTE: Includes 46 states reporting race/ethnicity data in Office of Management and Budget compliant formats during 2012–2016 (see Section A1.5 in the Appendix).

Figure 7. Chlamydia — Percentage of Reported Cases Among Men by Reporting Source*, United States, 2007–2016



* Includes the top five reporting sources for chlamydia cases reported among men, plus those with reporting sources listed as "All Other" and "Missing/Unknown".
† HMO = health maintenance organization; HD = health department.
NOTE: All Other includes: Drug Treatment, Tuberculosis Clinic, Correctional Facility, Laboratory, Blood Bank, Labor and Delivery, Prenatal Care, National Job Training Program, School-based Clinic, Mental Health Provider, Indian Health Service, Military, Emergency Room, HIV Counseling and Testing Site, and Other.

Figure 8. Chlamydia — Percentage of Reported Cases Among Women by Reporting Source*, United States, 2007–2016



* Includes the top five reporting sources for chlamydia cases reported among women, plus those with reporting sources listed as "All Other" and "Missing/Unknown".
† HMO = health maintenance organization; HD = health department.
NOTE: All Other includes: Drug Treatment, Tuberculosis Clinic, Correctional Facility, Blood Bank, Labor and Delivery, Prenatal Care, National Job Training Program, School-based Clinic, Mental Health Provider, Indian Health Service, Military, Emergency Room, STD Clinic, HIV Counseling and Testing Site, and Other.

Chlamydia Prevalence in the Population

The National Health and Nutrition Examination Survey (NHANES; see Section A2.4 in the Appendix) is a nationally representative survey of the U.S. civilian, non-institutionalized population that provides an important measure of chlamydia disease burden in respondents aged 14–39 years. During 2007–2012, the overall prevalence of chlamydia among persons aged 14–39 years was 1.7% (95% Confidence Interval [CI]: 1.4–2.0) (Figure 9). Among sexually active females aged 14–24 years, the population targeted for screening, prevalence was 4.7% (95% CI: 3.2–6.1), with the highest prevalence among non-Hispanic Black females (13.5%, 95% CI: 9.2–17.7) (Figure 10).[1]

Chlamydia Positivity in Selected Populations

The STD Surveillance Network (SSuN) is an ongoing collaboration of 10 state, county, and city health departments collecting enhanced clinical and behavioral information among patients attending 30 STD clinics in the SSuN jurisdictions (See Section A2.2 of the Appendix).

In 2016, the proportion of STD clinic patients testing positive for chlamydia varied by age, sex, and sexual behavior. Adolescent men who have sex with women only (MSW) had the highest prevalence (28.9%), either reflecting disproportionate testing of men with urethritis or targeted testing of partners of women diagnosed with chlamydia. Prevalence among all those tested decreased with age, though the variation in prevalence by age was not as pronounced for MSM (Figure 11).

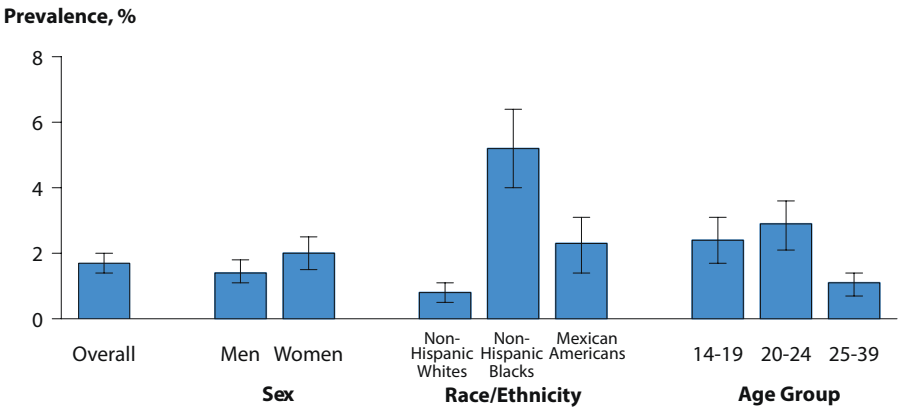
Chlamydia Among Special Populations

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

Chlamydia Summary

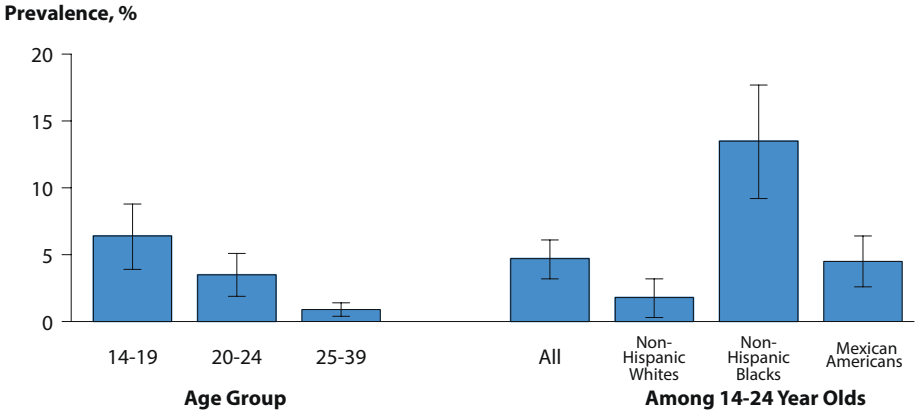
Chlamydia continues to be the most commonly reported nationally notifiable disease, with 1,598,354 cases reported in 2016 and increasing rates of reported cases over each of the last three years. Rates of reported chlamydia cases increased 4.7% during 2015–2016. The Southern region of the U.S. reported the highest rate of chlamydial infection in 2016; the Northeast reported the largest rate

Figure 9. Chlamydia — Prevalence Among Persons Aged 14–39 Years by Sex, Race/Ethnicity, or Age Group, National Health and Nutrition Examination Survey (NHANES), 2007–2012



NOTE: Error bars indicate 95% confidence intervals.
SOURCE: Torrone E, Papp J, Weinstock H. Prevalence of *Chlamydia trachomatis* genital infection among persons aged 14–39 years — United States, 2007–2012. MMWR Morb Mortal Wkly Rep 2014; 63(38):834–838.

Figure 10. Chlamydia — Prevalence Among Sexually-Active Women Aged 14–39 Years by Race/Ethnicity and Age Group, National Health and Nutrition Examination Survey (NHANES), 2007–2012

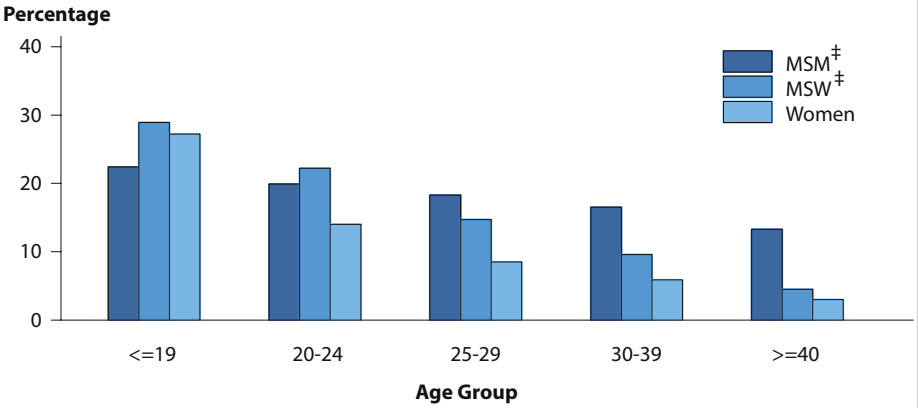


NOTE: Error bars indicate 95% confidence intervals.
SOURCE: Torrone E, Papp J, Weinstock H. Prevalence of *Chlamydia trachomatis* genital infection among persons aged 14–39 years — United States, 2007–2012. MMWR Morb Mortal Wkly Rep 2014; 63(38):834–838.

increase during 2015–2016, at 7.0%. In 2016, the rate of reported cases of chlamydia in women was two times the rate in men. However, during 2012–2016, the rate in men increased 26.8%, whereas the rate in women increased only 2.9%. Potential reasons for this considerable increase in male cases could be due to a true increase in cases or to improved screening coverage in men, especially increased extra-genital screening in MSM.

The facilities reporting chlamydial infections have changed over the last 10 years or so, with most (78.4%) chlamydia cases in 2016 reported from venues outside of STD clinics. The proportion of men being diagnosed with chlamydia in STD clinics decreased 66.8% from 33.1% in 2007 to 11.0% in 2016; in 2016 alone, approximately one-third of chlamydia cases among women were reported from private physicians/HMOs. Racial differences also persist; reported case rates and prevalence estimates among Blacks continue to be substantially higher than among all other racial/ethnic groups. Rates of reported cases of chlamydia were next highest among American Indian/Alaska Native and Native Hawaiian/Other Pacific Islander women. Ultimately, both test positivity and the number of reported cases of *C. trachomatis* infections remain high among most age groups, racial/ethnic groups, geographic areas, and both sexes.

Figure 11. Chlamydia — Proportion* of STD Clinic Patients Testing Positive† by Age Group, Sex, and Sexual Behavior, STD Surveillance Network (SSuN), 2016



* Proportions represent the overall average of the mean value by jurisdiction.
† Results are based on data obtained from patients with known sexual behavior (n=75,114) attending SSuN STD clinics in 2016 in all SSuN jurisdictions, excluding Florida.
‡ MSM = Gay, bisexual, and other men who have sex with men (collectively referred to as MSM); MSW = Men who have sex with women only.
NOTE: See Section A2.2 in the Appendix for SSuN methods.

References

1. Torrone E, Papp J, Weinstock H. Prevalence of *Chlamydia trachomatis* genital infection among persons aged 14–39 years — United States, 2007–2012. MMWR 2014; 63(38): 834–838.
2. Stamm WE. *Chlamydia trachomatis* infections in the adult. In: Holmes, KK, Sparling, PF, Stamm, WE, Piot, P, Wasserheit, JN, Corey, L, Cohen, MS, Watts, DH. Sexually Transmitted Diseases. 4th ed. New York, NY: McGraw-Hill; 2008: 575–606.
3. Scholes D, Stergachis A, Heidrich FE, et al. Prevention of pelvic inflammatory disease by screening for cervical chlamydial infection. N Engl J Med 1996; 334(21): 1362–1366.
4. Oakeshott P, Kerry S, Aghaizu A, et al. Randomised controlled trial of screening for *Chlamydia trachomatis* to prevent pelvic inflammatory disease: the POPI (prevention of pelvic infection) trial. BMJ 2010; 340: c1642.
5. Fleming DT, Wasserheit JN. From epidemiological synergy to public health policy and practice: the contribution of other sexually transmitted diseases to sexual transmission of HIV infection. Sex Transm Infect 1999; 75(1): 3–17.
6. Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2015. MMWR Recomm Rep 2015; 64(RR-3): 1–137. Erratum in: MMWR 2015; 64(33): 924.
7. National Committee for Quality Assurance. The State of Healthcare Quality 2016. Available at: http://www.ncqa.org/report-cards/health-plans/state-of-health-care-quality. Accessed July 27, 2017.

This page intentionally left blank.

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 evidence that gonococcal infections facilitate the transmission of HIV infection.[1] Together, sexual behavior and community prevalence can increase the risk of acquiring gonorrhea. Social determinants of health, such as socioeconomic status, discrimination, and access to quality health care, may contribute to the burden of gonorrhea in a community.[2]

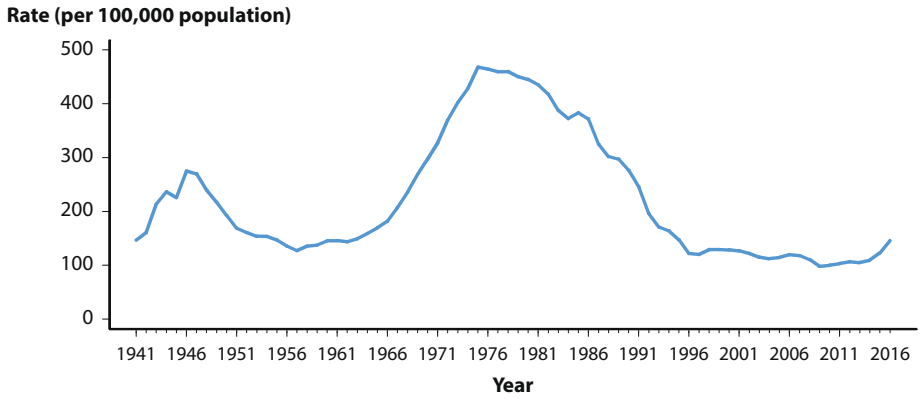
In 2009, the national rate of reported gonorrhea cases reached a historic low of 98.1 cases per 100,000 population (Figure 12, Table 1). However, during 2009–2012, the rate increased slightly each year to 106.7 cases per 100,000 population in 2012. In 2013, the rate decreased slightly to 105.3 cases per 100,000 population, followed by a yearly increase during 2013–2016. In 2016, a total of 468,514 cases were reported for a rate of 145.8 gonorrhea cases per 100,000 population (Figure 12, Table 1).

The increase in the gonorrhea rate during 2015–2016 was observed among both males and females; however, the increase was larger among males (Figure 13). During 2015–2016, the gonorrhea rate increased in all regions and, during 2012–2016, the largest increase was observed in the West (95.7%; 72.6 to 142.1 cases per 100,000 population) (Figure 14, Table 14). The rate of gonorrhea continued to increase among persons in every age group during 2015–2016 (Table 21).

N. gonorrhoeae has progressively developed resistance to each of the antimicrobials used for treatment of gonorrhea. Declining susceptibility to cefixime (an oral cephalosporin antibiotic) resulted in a change to the CDC treatment guidelines, so that dual therapy with ceftriaxone (an injectable cephalosporin) and azithromycin is now the only CDC-recommended treatment regimen for gonorrhea.[3] The emerging threat of cephalosporin resistance highlights the need for continued surveillance of *N. gonorrhoeae* antimicrobial susceptibility.

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

Figure 12. Gonorrhea — Rates of Reported Cases by Year, United States, 1941–2016



NOTE: Data collection for gonorrhea began in 1941; however, gonorrhea became nationally notifiable in 1944. Refer to the National Notifiable Disease Surveillance System (NNDSS) website for more information: https://wwwn.cdc.gov/nndss/conditions/gonorrhea/

Figure 13. Gonorrhea — Rates of Reported Cases by Sex, United States, 2007–2016

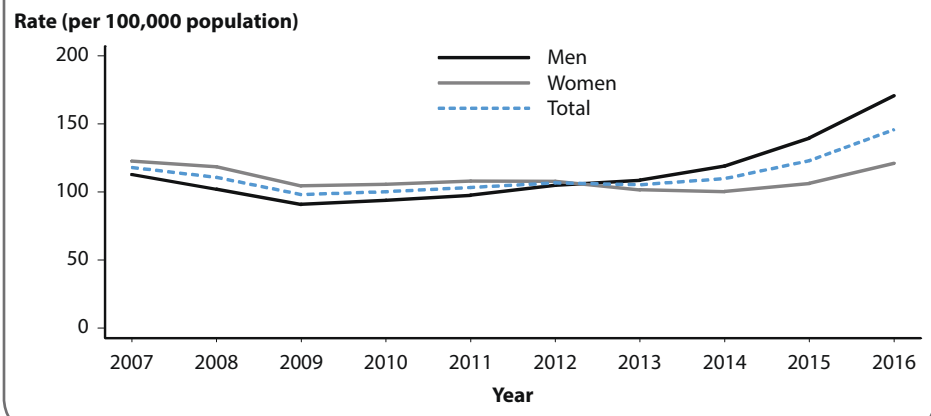
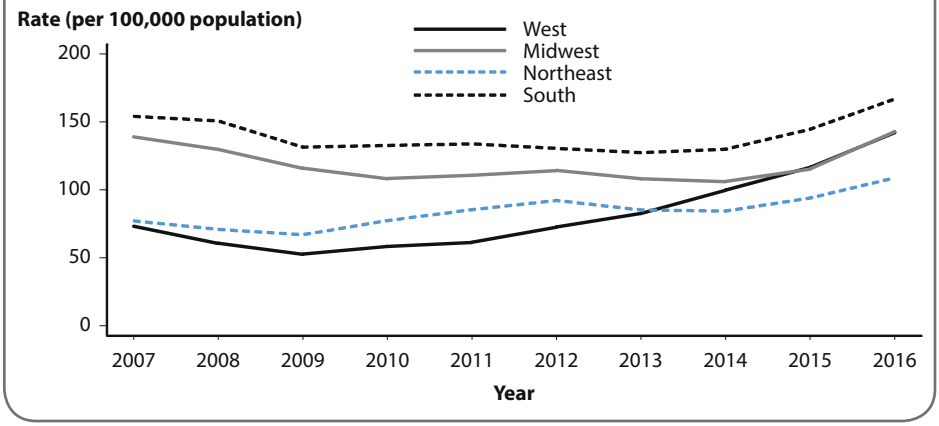


Figure 14. Gonorrhea — Rates of Reported Cases by Region, United States, 2007–2016



Interpreting Rates of Reported Cases of Gonorrhea

Although gonorrhea case reporting is useful for monitoring disease trends, the number of gonorrhea cases reported to CDC is affected by many factors in addition to the actual occurrence of the infection within the population. Changes in the burden of gonorrhea may be masked by changes in screening practices (e.g., screening for chlamydia with tests that also detect *N. gonorrhoeae* infections or increased screening at extra-genital anatomic sites), the use of diagnostic tests with different test performance (e.g., the broader use of nucleic acid amplification tests [NAATs]), and changes in reporting practices. As with other STDs, the reporting of gonorrhea cases to CDC is incomplete.[4] For these reasons, supplemental data on gonorrhea prevalence in persons screened in a variety of settings are useful in assessing the burden of disease in selected populations.

Gonorrhea — United States

In 2016, a total of 468,514 cases of gonorrhea were reported in the United States, yielding a rate of 145.8 cases per 100,000 population (Table 1). During 2015–2016, the rate of reported gonorrhea cases increased 18.5%, and increased 48.6% since the historic low in 2009.

Gonorrhea by Region

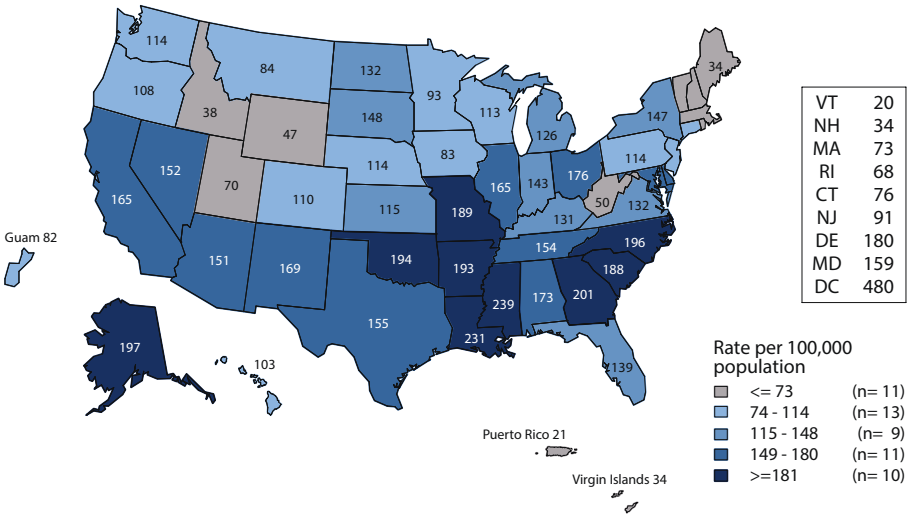
The South had the highest rate of reported gonorrhea cases (166.8 cases per 100,000 population) among the four regions of the United States in 2016, followed by the Midwest (142.9 cases per 100,000 population), the West (142.1 cases per 100,000 population), and the Northeast (108.8 cases per 100,000 population) (Figure 14, Table 14). During 2015–2016, the gonorrhea rate increased in all four regions: 23.8% in the Midwest, 21.9% in the West, 15.7% in the Northeast, and 15.4% in the South (Figure 14, Table 14). During 2012–2016, the rate of gonorrhea in the West increased by 95.7% (72.6 to 142.1 cases per 100,000 population), while other regions had smaller overall increases during this time period (i.e., 27.8% in the South, 25.0% in the Midwest, and 18.0% in the Northeast).

Gonorrhea by State

In 2016, rates of reported gonorrhea cases per 100,000 population ranged by state from 20.1 in Vermont to 239.2 in Mississippi; the gonorrhea rate in the District of Columbia was 479.9 cases per 100,000 population (Figure 15, Table 13).

During 2015–2016, gonorrhea rates increased in 96.1% of states and the District of Columbia and decreased in 3.9% of states (Table 14).

Figure 15. Gonorrhea — Rates of Reported Cases by State, United States and Outlying Areas, 2016



NOTE: The total rate of reported cases of gonorrhea for the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 144.4 per 100,000 population.

Gonorrhea by Metropolitan Statistical Area

The overall rate of reported gonorrhea cases in the 50 most populous metropolitan statistical areas (MSAs) was 162.2 cases per 100,000 population in 2016, representing a 19.6% increase compared with the rate in 2015 (135.6 cases per 100,000 population) (Table 17). In 2016, 61.2% of reported gonorrhea cases were reported by these MSAs. Since 2012, the gonorrhea rate among females in the 50 most populous MSAs has been lower than the rate among males (Tables 18 and 19). In 2016, the rate among females in these MSAs was 120.8 cases per 100,000 females, while the rate among males was 204.7 cases per 100,000 males.

Gonorrhea by County

In 2016, 51.0% of reported gonorrhea cases occurred in just 70 counties or independent cities (Table 20). In 2016, 608 counties (19.5%) in the United States had a rate less than or equal to 16 cases per 100,000 population (Figure 16). The rate ranged from 17 to 38 cases per 100,000 population in 631 counties (20.1%), ranged from 39 to 71 cases per 100,000 population in 635 counties (20.2%), ranged from 72 to 139 cases per 100,000 population in 619 counties (19.7%), and was more than 139 cases per 100,000 population in 647 counties (20.6%). As in previous years, counties with the highest gonorrhea rates were concentrated in the South.

Gonorrhea by Sex

As was observed during 2013–2015, the rate of reported gonorrhea cases among males was higher than the rate among females in 2016 (Figure 13, Tables 15 and 16). During 2015–2016, the gonorrhea rate among males increased 22.2% (139.7 to 170.7 cases per 100,000 males), and the rate among females increased 13.8% (106.3 to 121.0 cases per 100,000 females). During 2012–2016, the rate among males increased 62.6% (105.0 to 170.7 cases per 100,000 males) and the rate among females increased 12.1% (107.9 to 121.0 cases per 100,000 females). The magnitude of the increase among males suggest either increased transmission or increased case ascertainment (e.g., through increased extra-genital screening) among gay, bisexual, and other men who have sex with men (collectively referred to as MSM). However, most jurisdictions do not routinely report sex of sex partner or site of infection for gonorrhea cases, so trends in gonorrhea rates among MSM over time cannot be assessed.

Gonorrhea by Region and Sex

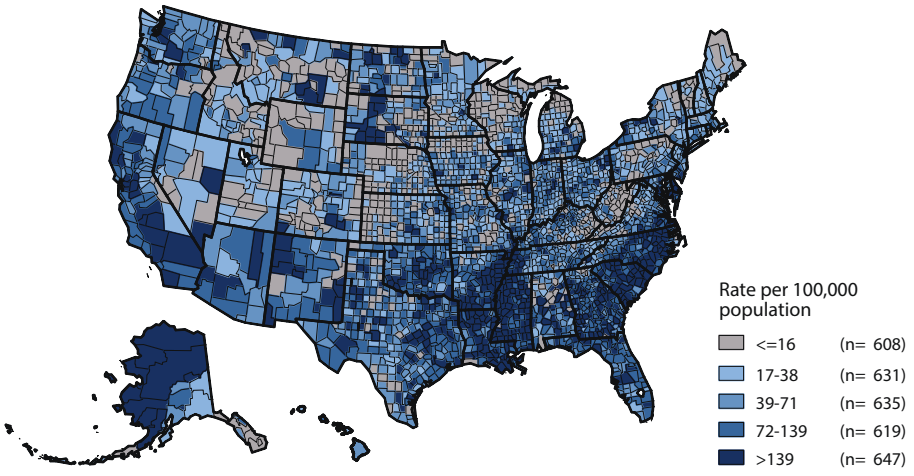
In all regions, the rate of gonorrhea increased among both males and females during 2015–2016 and the rate of increase among males was larger than the rate of increase among females (Tables 15 and 16). The rate of reported gonorrhea cases increased the most in the Midwest (26.7% among males and 21.0% among females) and in the West (24.1% among males and 17.2% among females) (Tables 15 and 16).

Gonorrhea by Age

In 2016, rates of reported gonorrhea cases continued to be highest among adolescents and young adults (Figure 17, Table 21). In 2016, the highest rates among females were observed among those aged 20–24 years (595.5 cases per 100,000 females) and 15–19 years (482.1 cases per 100,000 females). Among males, the rate was highest among those aged 20–24 years (616.8 cases per 100,000 males) and 25–29 years (545.1 cases per 100,000 males).

In 2016, persons aged 15–44 years accounted for 91.9% of reported gonorrhea cases with known age. Among 15–19 year olds, rates decreased by 10.7% during 2012–2015 and increased 11.3% during 2015–2016. During 2015–2016, the gonorrhea rate also increased among other age groups: 10.9% among those aged 20–24 years, 22.2% among those aged 25–29 years, 26.2% among those aged 30–34 years, 30.3% among those aged 35–39 years, and 27.0% among those aged 40–44 years (Figures 18 and 19, Table 21). Among persons aged 15–44 years, increases were observed in all age groups for both men and women during 2015–2016.

Figure 16. Gonorrhea — Rates of Reported Cases by County, United States, 2016



NOTE: Refer to the NCHHSTP Atlas for further county-level rate information: https://www.cdc.gov/nchhstp/atlas/.

Figure 17. Gonorrhea — Rates of Reported Cases by Age Group and Sex, United States, 2016

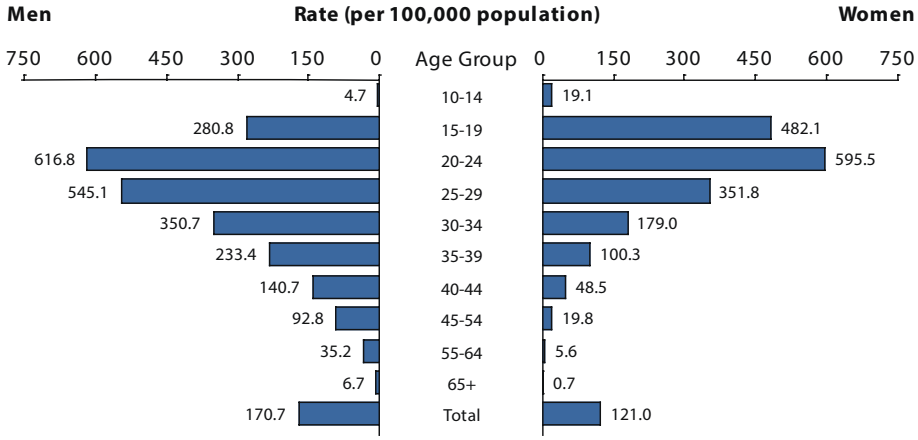


Figure 18. Gonorrhea — Rates of Reported Cases Among Women Aged 15–44 Years by Age Group, United States, 2007–2016

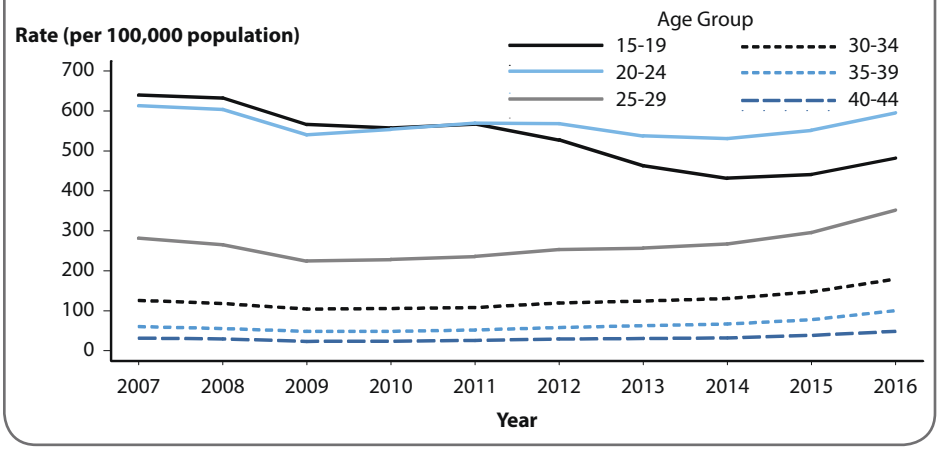
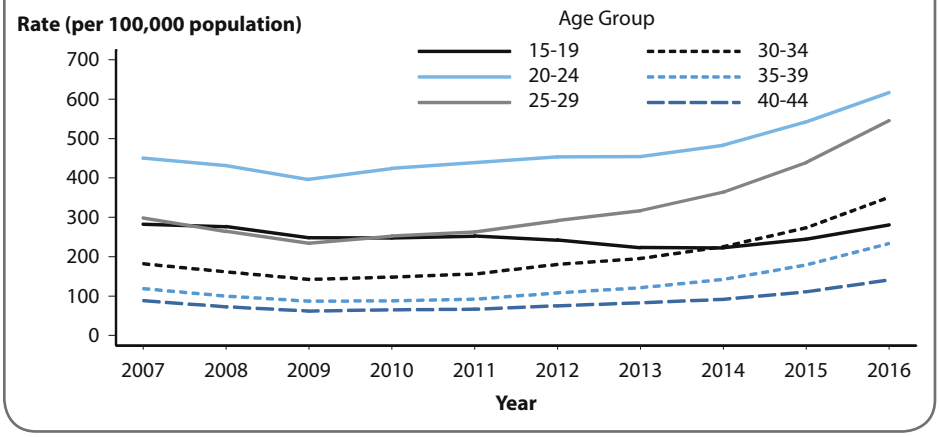


Figure 19. Gonorrhea — Rates of Reported Cases Among Men Aged 15–44 Years by Age Group, United States, 2007–2016



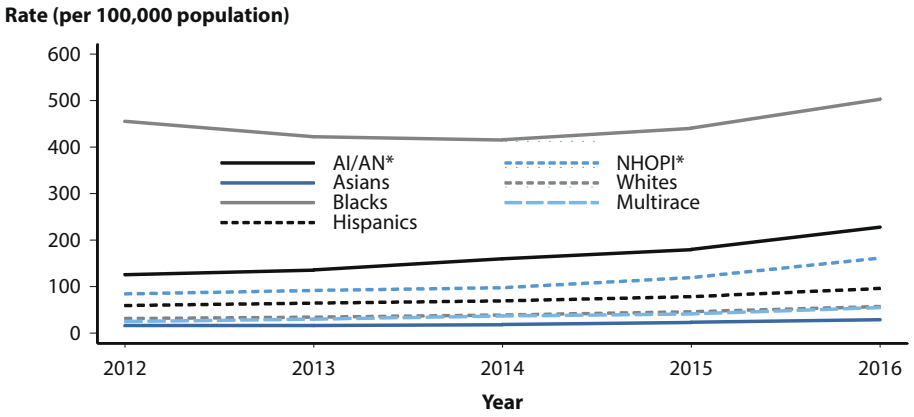
Gonorrhea by Race/Ethnicity

In 2016, among the 50 states and the District of Columbia that submitted data in the race and ethnicity categories according to Office of Management and Budget (OMB) standards (see Section A1.5 in the Appendix), the rate of reported gonorrhea cases remained highest among Blacks (481.2 cases per 100,000 population) (Table 22B). The rate among Blacks was 8.6 times the rate among Whites (55.7 cases per 100,000 population). The gonorrhea rate among American Indians/Alaska Natives (242.9 cases per 100,000 population) was 4.4 times that of Whites, the rate among Native Hawaiians/Other Pacific Islanders (165.8 cases per 100,000 population) was 3.0 times that of Whites, the rate among Hispanics (95.9 cases per 100,000 population) was 1.7 times that of Whites, the rate among Multirace persons (62.3 cases per 100,000 population) was 1.1 times that of Whites, and the rate among Asians (28.3 cases per 100,000 population) was half the rate of Whites (Table 22B).

During 2012–2016, among the 46 states that submitted race and ethnicity data according to OMB standards (see Section A1.5 in the Appendix) for all five years during that period, the gonorrhea rate increased among all race and ethnicity groups: 120.4% among Multirace persons, 91.4% among Native Hawaiians/Other Pacific Islanders, 82.5% among Whites, 81.3% among American Indians/Alaska Natives, 76.7% among Asians, 61.8% among Hispanics, and 10.5% among Blacks (Figure 20).

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

Figure 20. Gonorrhea — Rates of Reported Cases by Race/Ethnicity, United States, 2012–2016



* AI/AN = American Indians/Alaska Natives; NHOPI = Native Hawaiians/Other Pacific Islanders.
NOTE: Includes 46 states reporting race/ethnicity data in Office of Management and Budget compliant formats during 2012–2016 (see Section A1.5 in the Appendix).

Gonorrhea by Reporting Source

In 2016, 10.5% of gonorrhea cases were reported from STD clinics, 75.4% were reported from venues outside of STD clinics, and 14.0% had an unknown source of report (Table A2).

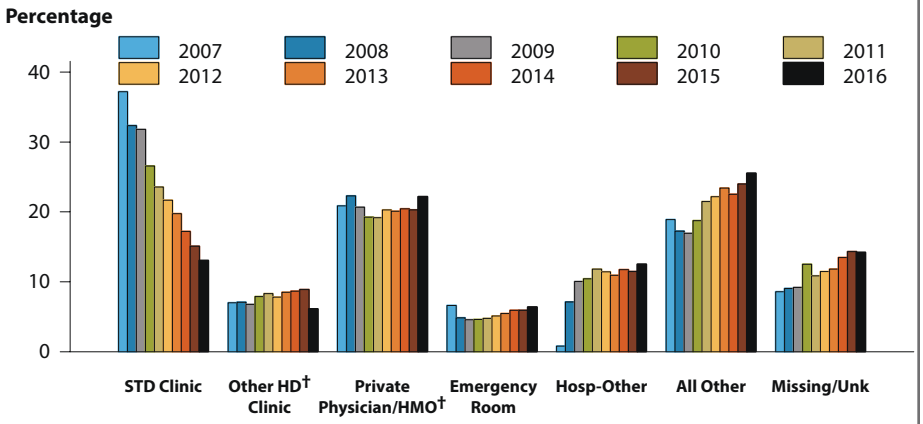
During 2007–2016, the percent of gonorrhea cases reported by STD clinics declined 64.8% among males and 59.3% among females; however, the percent of gonorrhea cases with missing/unknown reporting source increased 65.2% among males and 45.7% among females (Figures 21 and 22). During 2015–2016, the percent of gonorrhea cases reported by STD clinics decreased 13.5% among males and 9.6% among females.

In 2016, among males, private physicians/health maintenance organizations (HMOs) (22.2%) were the most common reporting source, followed by STD clinics (13.1%), other hospital clinics/facilities (12.5%), emergency rooms (6.4%), and other health department clinics (6.1%) (Figure 21). Among females, private physicians/HMOs (26.0%) were the most common reporting source, followed by other hospital clinics/facilities (13.9%), STD clinics (7.0%), family planning clinics (7.0%), and laboratories (5.8%) (Figure 22).

STD Surveillance Network

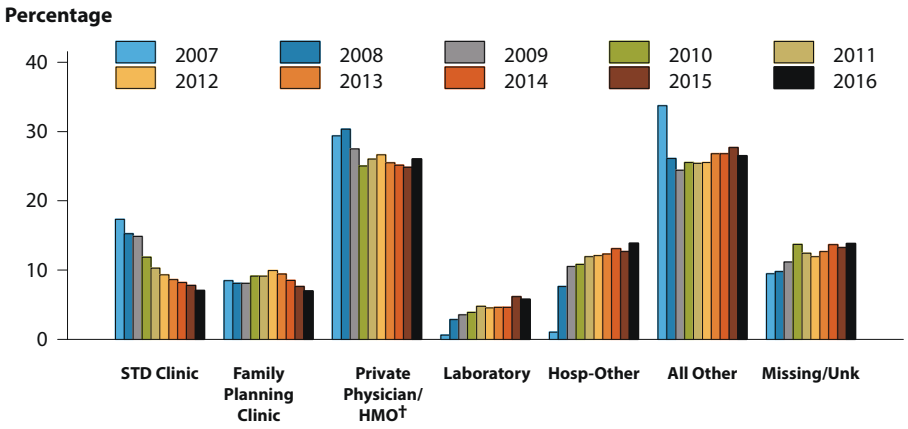
The STD Surveillance Network (SSuN) is an ongoing collaboration of states and independently funded cities collecting enhanced information on a representative sample of gonorrhea case reports received from all reporting sources in their jurisdiction. Enhanced gonorrhea case report data for 2016 were obtained from Cycle 3 of SSuN, which includes 10 jurisdictions randomly sampling cases reported in their jurisdictions. In 2016, SSuN collaborators interviewed 5,177 gonorrhea cases representing 3.6% of all cases reported from participating jurisdictions. The estimated burden of disease represented by men who have sex with men only (MSM-only), men who have sex with both men and women (MSMW), men who have sex with women only (MSW), and women varied substantially across collaborating sites based on weighted analysis (Figure 23). San Francisco had the highest proportion of cases estimated to be MSM-only (81.4%), while Baltimore had the lowest proportion of MSM-only cases at 16.2%. Across all jurisdictions, an estimated 6.7% of gonorrhea cases were attributable to MSMW, which is an important group representing a bridge between MSM-only and heterosexual populations. (Figure 23). In total, across all SSuN sites, 44.7%

Figure 21. Gonorrhea — Percentage of Reported Cases Among Men by Reporting Source*, United States, 2007–2016



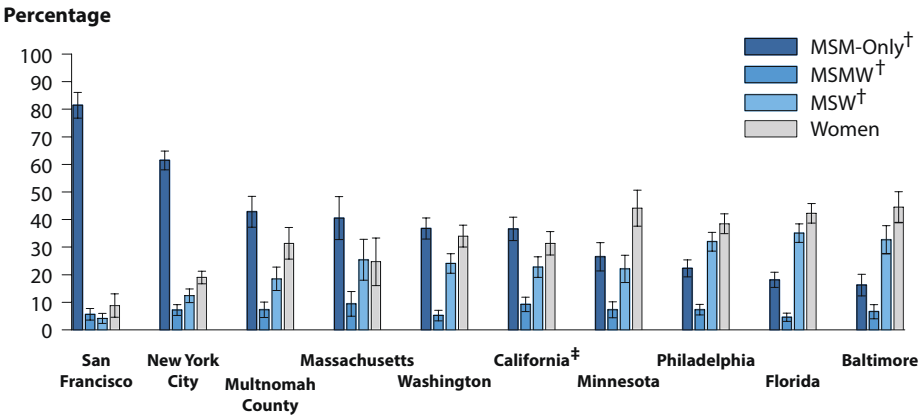
* Includes the top five reporting sources for gonorrhea cases reported among men, plus those with reporting sources listed as "All Other" and "Missing/Unknown".
† HMO = health maintenance organization; HD = health department.
NOTE: All Other includes: Drug Treatment, Tuberculosis Clinic, Correctional Facility, Laboratory, Blood Bank, Labor and Delivery, Prenatal Care, National Job Training Program, School-based Clinic, Mental Health Provider, Indian Health Service, Military, Family Planning, HIV Counseling and Testing Site, and Other.

Figure 22. Gonorrhea — Percentage of Reported Cases Among Women by Reporting Source*, United States, 2007–2016



* Includes the top five reporting sources for gonorrhea cases reported among women, plus those with reporting sources listed as "All Other" and "Missing/Unknown".
† HMO = health maintenance organization.
NOTE: All Other includes: Drug Treatment, Tuberculosis Clinic, Correctional Facility, Blood Bank, Labor and Delivery, Prenatal Care, National Job Training Program, School-based Clinic, Mental Health Provider, Indian Health Service, Military, Emergency Room, Other Health Department Clinic, HIV Counseling and Testing Site, and Other.

Figure 23. Estimated Proportion* of MSM-Only†, MSMW†, MSW†, and Women Among Gonorrhea Cases by Jurisdiction, STD Surveillance Network (SSuN), 2016



* Estimate based on weighted analysis of data obtained from interviews (n=5,177) conducted among a random sample of reported gonorrhea cases during January to December 2016.
† MSM-Only = Men who have sex exclusively with men; MSMW = Men who have sex with both men and women; MSW = Men who have sex with women only.
‡ California data excludes San Francisco (shown separately).
NOTE: See section A2.2 in the Appendix for SSuN methods.

of gonorrhea cases were estimated to be among MSM-only or MSMW, 22.6% among MSW, and 32.7% among women.

Collaborating SSuN jurisdictions also conduct sentinel surveillance on all patients seeking care in selected STD clinics. Sentinel facility data for this report includes information from patients attending STD clinics during 2016 in nine out of the 10 funded jurisdictions. In 2016, the proportion of STD clinic patients who tested positive for gonorrhea varied by age group, sex, and sex of sex partner (Figure 24). Among those attending these clinics, MSM disproportionately had higher positivity rates when compared to MSW and women in all age groups. While positivity rates declined with increasing age for heterosexual males and females, a much slower decline by age was seen in MSM-only.

Additional information about SSuN methodology can be found in Section A2.2 of the Appendix.

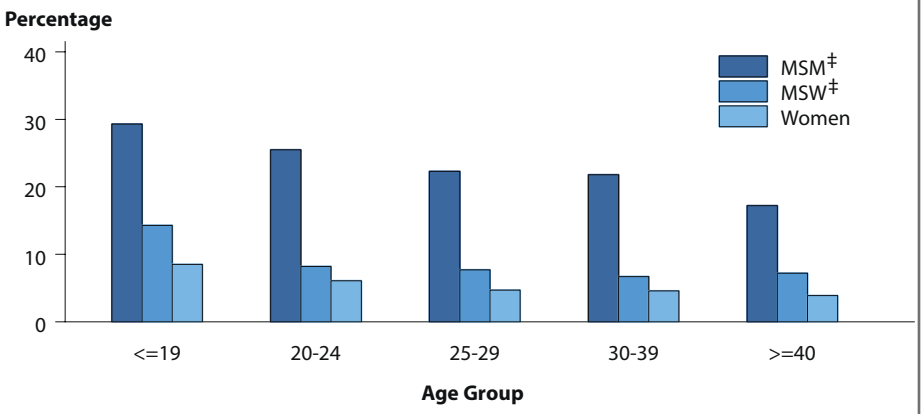
Gonococcal Isolate Surveillance Project

Antimicrobial resistance remains an important consideration in the treatment of gonorrhea.[3,5–7] In 1986, the Gonococcal Isolate Surveillance Project (GISP), a national sentinel surveillance system, was established to monitor trends in antimicrobial susceptibilities of urethral *N. gonorrhoeae* strains in the United States.[7] Data are collected from selected STD clinic sentinel sites and from regional laboratories (Figure 25).

Antimicrobial susceptibility is measured by the minimum inhibitory concentration (MIC), the lowest antimicrobial concentration that inhibits bacterial growth in the laboratory. Increases in MICs demonstrate that the bacteria can survive at higher antimicrobial concentrations in the laboratory. Monitoring of MIC trends is useful because increasing MICs can oftentimes be an early indicator of the emergence of antimicrobial resistance.

Information on the antimicrobial susceptibility criteria used in GISP can be found in Section A2.3 in the Appendix. More information about GISP and additional data can be found at https://www.cdc.gov/std/GISP.

Figure 24. Gonorrhea — Proportion* of STD Clinic Patients Testing Positive† by Age Group, Sex, and Sexual Behavior, STD Surveillance Network (SSuN), 2016



* Proportions represent the overall average of the mean value by jurisdiction.
† Results are based on data obtained from patients with known sexual behavior (n=75,347) attending SSuN STD clinics in 2016 in all SSuN jurisdictions, excluding Florida.
‡ MSM = Gay, bisexual, and other men who have sex with men (collectively referred to as MSM); MSW = Men who have sex with women only.
NOTE: See section A2.2 in the Appendix for SSuN methods.

Figure 25. Location of Participating Sentinel Sites and Regional Laboratories, Gonococcal Isolate Surveillance Project (GISP), United States, 2016

NOTE: Austin is a regional laboratory only.

Ceftriaxone Susceptibility

Susceptibility testing for ceftriaxone began in 1987. During 2006–2016, the percentage of GISP isolates that exhibited elevated ceftriaxone MICs, defined as ≥0.125 µg/ml, fluctuated between 0.05% and 0.4% (Figure 26).

In 2016, 0.3% of isolates had elevated ceftriaxone MICs. Five isolates with decreased ceftriaxone susceptibility (MIC = 0.5 µg/ml) have been previously identified in GISP: one from San Diego, California (1987), two from Cincinnati, Ohio (1992 and 1993), one from Philadelphia, Pennsylvania (1997), and one from Oklahoma City, Oklahoma (2012).

Cefixime Susceptibility

Susceptibility testing for cefixime began in 1992, was discontinued in 2007, and was restarted in 2009. The percentage of isolates with elevated cefixime MICs (≥0.25µg/ ml) declined from 1.4% in 2011 to 0.3% in 2016 (Figure 26).

Azithromycin Susceptibility

Susceptibility testing for azithromycin began in 1992. Figure 27 displays the distribution of azithromycin MICs among GISP isolates collected during 2012–2016. Most isolates had MICs of 0.125–0.5 µg/ml. During 2012–2014, the percentage of isolates with elevated azithromycin MICs (MICs ≥ 2 µg/ml) ranged from 0.02% to 1.0%; during 2014–2016, the percentage increased from 2.4% to 3.6%.

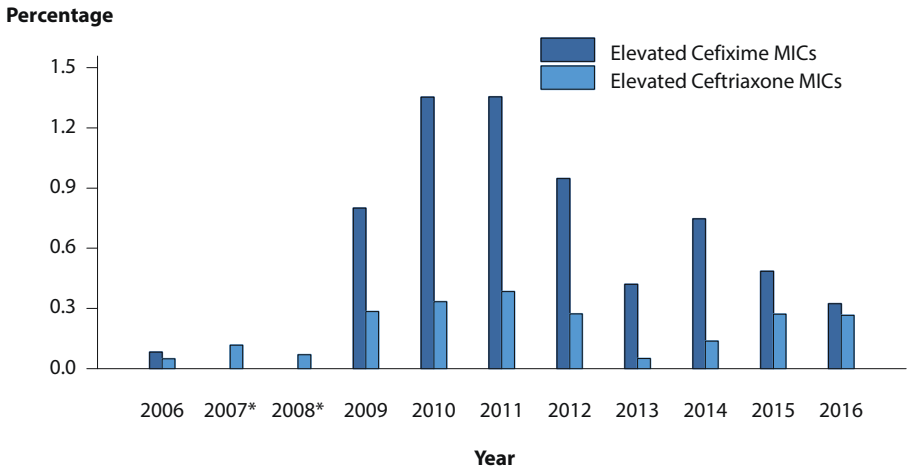
Susceptibility to Other Antimicrobials

In 2016, 44.1% of isolates collected from GISP sites were resistant to penicillin, tetracycline, ciprofloxacin, or some combination of those antimicrobials (Figure 28). Although these antimicrobials are no longer recommended for treatment of gonorrhea, the resistance phenotypes remain common. Conversely, 55.9% of isolates were susceptible to all three of these antimicrobials.

Antimicrobial Treatments Given for Gonorrhea

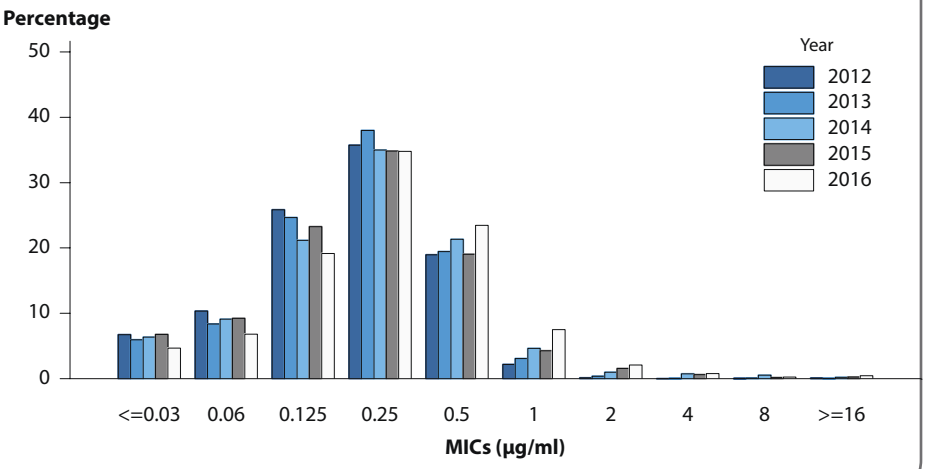
The antimicrobial agents given to GISP patients for gonorrhea therapy are shown in Figure 29. The proportion of patients treated with ceftriaxone 250 mg increased from 84.0% in 2011 to 96.9% in 2016. In 2016, 1.5% of patients were treated with gentamicin 240 mg and 0.1% were treated with cefixime 400mg.

Figure 26. *Neisseria gonorrhoeae* — Percentage of Isolates with Elevated Ceftriaxone Minimum Inhibitory Concentrations (MICs) (≥0.125 µg/ml) and Elevated Cefixime MICs (≥0.25 µg/ml), Gonococcal Isolate Surveillance Project (GISP), 2006–2016



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

Figure 27. *Neisseria gonorrhoeae* — Distribution of Azithromycin Minimum Inhibitory Concentrations (MICs) by Year, Gonococcal Isolate Surveillance Project (GISP), 2012–2016



Gonorrhea Among Special Populations

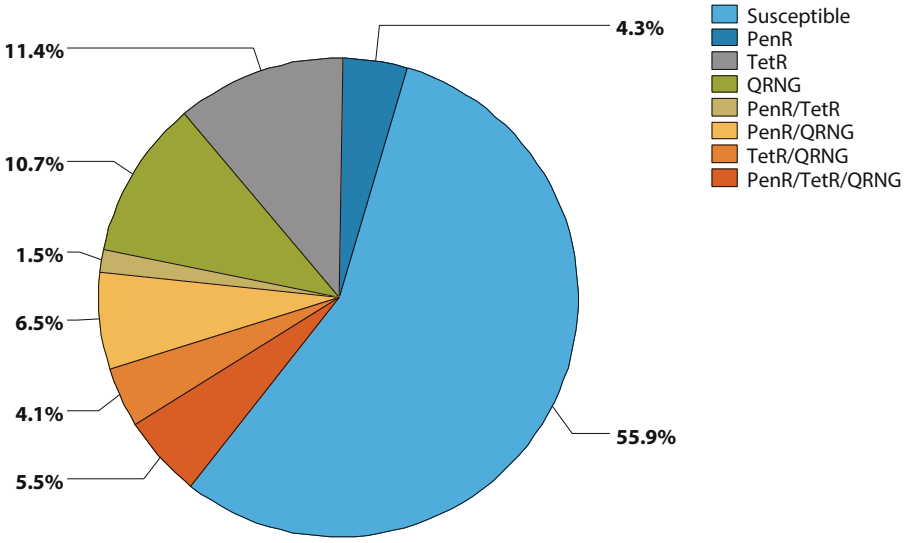
More information about gonorrhea in race/ethnicity groups, females of reproductive age, adolescents, and MSM can be found in the Special Focus Profiles.

Gonorrhea Summary

The national rate of reported gonorrhea cases reached a historic low in 2009, but increased each year during 2009–2012. After a temporary decrease in 2013, the gonorrhea rate increased again during 2014–2016. This increase was largely attributable to increases among men. High gonorrhea rates persist in certain geographic areas, among adolescents and young adults, and in some racial/ethnic groups.

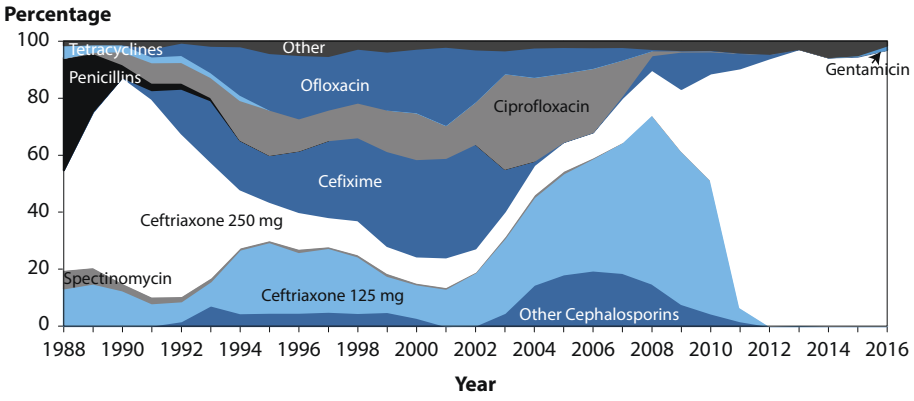
GISP continues to monitor for the emergence of decreased susceptibility and resistance to cephalosporins and azithromycin.

Figure 28. *Neisseria gonorrhoeae* — Distribution of Isolates with Penicillin, Tetracycline, and/or Ciprofloxacin Resistance, Gonococcal Isolate Surveillance Project (GISP), 2016



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

Figure 29. Distribution of Primary Antimicrobial Drugs Used to Treat Gonorrhea Among Participants, Gonococcal Isolate Surveillance Project (GISP), 1988–2016



NOTE: For 2016, "Other" includes azithromycin 2g (0.7%), no therapy (0.1%), and other less frequently used drugs (0.8%).

References

1. Fleming DT, Wasserheit JN. From epidemiological synergy to public health policy and practice: the contribution of other sexually transmitted diseases to sexual transmission of HIV infection. Sex Transm Infect 1999; 75(1): 3–17.
2. Hogben M, Leichliter JS. Social determinants and sexually transmitted disease disparities. Sex Transm Dis 2008; 35(12 Suppl): S13–18.
3. Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2015. MMWR Recomm Rep 2015; 64(No. RR-3): 1–137.
4. Satterwhite CL, Torrone E, Meites E, et al. Sexually transmitted infections among US women and men: prevalence and incidence estimates, 2008. Sex Transm Dis 2013; 40(3): 187–193. DOI: 10.1097/OLQ.0b013e318286bb53. Review.
5. Centers for Disease Control and Prevention. Update to CDC's sexually transmitted diseases treatment guidelines, 2006: fluoroquinolones no longer recommended for treatment of gonococcal infections. MMWR Morb Mortal Wkly Rep 2007; 56(14): 332–336.
6. Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2010. MMWR Recomm Rep 2010; 59(No.RR-12): 1–110.
7. Schwarcz S, Zenilman J, Schnell D, et al. National surveillance of antimicrobial resistance in *Neisseria gonorrhoeae*. JAMA 1990; 264(11): 1413–1417.

This page intentionally left blank.

Syphilis

Background

Syphilis, a genital ulcerative disease caused by the bacterium *Treponema pallidum*, is associated with significant complications if left untreated and can facilitate the transmission and acquisition of HIV infection.[1–3] Additionally, historical data demonstrate that untreated early syphilis in pregnant women, if acquired during the four years before delivery, can lead to infection of the fetus in up to 80% of cases and may result in stillbirth or death of the infant in up to 40% of cases.[4]

In 2000 and 2001, the national rate of reported primary and secondary (P&S) syphilis cases was 2.1 cases per 100,000 population, the lowest rate since reporting began in 1941 (Figure 30, Table 1). However, the P&S syphilis rate has increased almost every year since 2000–2001. In 2016, a total of 27,814 P&S syphilis cases were reported. During 2015–2016, the national P&S syphilis rate increased 17.6% to 8.7 cases per 100,000 population, the highest rate reported since 1993.

During 2000–2016, the rise in the rate of reported P&S syphilis was primarily attributable to increased cases among men and, specifically, among gay, bisexual, and other men who have sex with men (collectively referred to as MSM) (Figures 34 and 35). However, during 2013–2016, the rate increased both among men and women (Tables 28 and 29). During 2015–2016, the rate increased 14.7% among men and 35.7% among women. These increases among women are of particular concern because congenital syphilis cases tend to increase as the rate of P&S syphilis among women increases (Figure 44). During 2015–2016, the national, male, and female P&S syphilis rates increased in every region of the country (Figure 31, Tables 27, 28, and 29). Nationally, P&S syphilis rates increased in every age group among those aged 15 years or older and in every race/ethnicity group during 2015–2016 (Figures 39 and 40, Table 34).

As in recent years, MSM accounted for the majority of reported P&S syphilis cases in 2016 (Figures 35 and 36). Nationally, the highest rates of P&S syphilis in 2016 were observed among men aged 20–34 years, among men in the West, and among Black men (Figure 37, Tables 29, 34 and 35B).

Interpreting Rates of Reported Cases of Syphilis

Left untreated, infection with syphilis can span decades. P&S syphilis are the earliest stages of infection, reflect symptomatic disease, and are indicators of incident infection.[5] For these reasons, trend analyses of syphilis focus on reported cases and rates of reported cases of P&S syphilis. When referring to "P&S syphilis", case counts are the sum of both primary and secondary cases, and "rate of P&S syphilis" refers to this sum per unit population.

Changes in reporting and screening practices can complicate interpretation of trends over time. To minimize the effect of changes in reporting over time, trend data in this report are restricted to jurisdictions that consistently report data of interest (e.g., sex of sex partner) for each year of a given time period. Details of these restrictions are provided in the text and footnotes of the pertinent text and figures.

P&S Syphilis — United States

In 2016, a total of 27,814 cases of P&S syphilis were reported in the United States, yielding a rate of 8.7 cases per 100,000 population (Figure 30, Table 1). This rate represents a 17.6% increase compared with 2015 (7.4 cases per 100,000 population), and a 74.0% increase compared with 2012 (5.0 cases per 100,000 population).

P&S Syphilis by Region

In 2016, the West had the highest rate of reported P&S syphilis cases (11.4 cases per 100,000 population), followed by the South (8.9 cases per 100,000 population), the Northeast (8.0 cases per 100,000 population), and the Midwest (5.7 cases per 100,000 population) (Table 27). During 2015–2016, the P&S syphilis rate increased in every region: 21.3% in the Midwest, 21.2% in the Northeast, 20.0% in the West, and 11.3% in the South (Figure 31, Table 27).

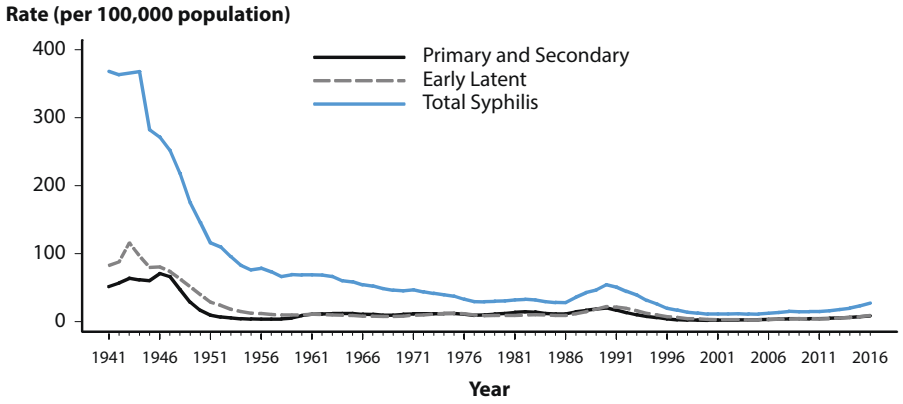
P&S Syphilis by State

In 2016, rates of reported P&S syphilis cases per 100,000 population ranged by state from 1.1 in Alaska to 16.1 in Louisiana (Figure 32, Table 26). The rate of reported P&S syphilis cases in the District of Columbia was 24.0 cases per 100,000 population. During 2015–2016, P&S syphilis rates increased in 82.0% (41/50) of states and the District of Columbia, and remained stable or decreased in 18.0% (9/50) of states (Table 27).

P&S Syphilis by Metropolitan Statistical Area

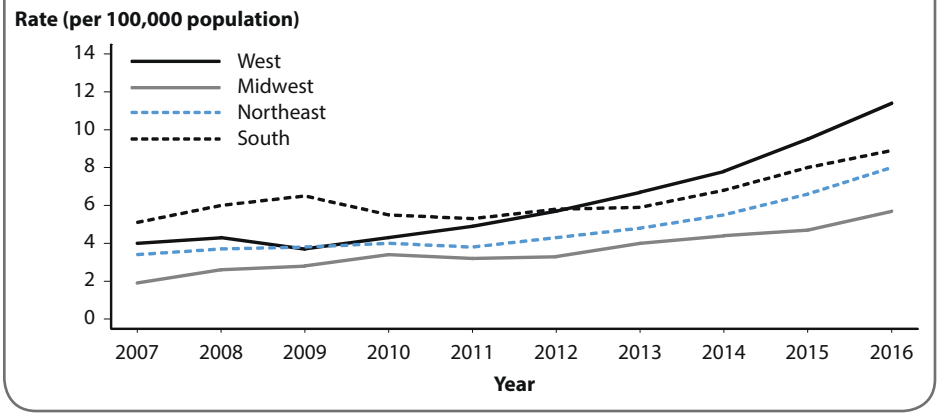
The overall rate of reported P&S syphilis cases in the 50 most populous metropolitan statistical areas (MSAs) was 11.2 cases per 100,000 population in 2016, which represents a 14.3% increase since 2015 (9.8 cases per 100,000 population) (Table 30). Overall, in 2016, 71.3% of reported P&S syphilis cases (73.5% of male cases and 53.0% of

Figure 30. Syphilis — Rates of Reported Cases by Stage of Infection, United States, 1941–2016



NOTE: Data collection for syphilis began in 1941; however, syphilis became nationally notifiable in 1944. Refer to the National Notifiable Disease Surveillance System (NNDSS) website for more information: https://wwwn.cdc.gov/nndss/conditions/syphilis/.

Figure 31. Primary and Secondary Syphilis — Rates of Reported Cases by Region, United States, 2007–2016



female cases) were reported by these 50 MSAs. In 2016, the rate among women in these MSAs was 1.8 cases per 100,000 females, while the rate among men was 21.0 cases per 100,000 males (Tables 31 and 32).

P&S Syphilis by County

In 2016, 64.2% of reported P&S syphilis cases occurred in 70 counties or independent cities (Table 33). Of 3,140 counties in the United States, 484 (15.4%) had a P&S syphilis rate greater than 6.7 cases per 100,000 population, 480 (15.3%) reported a rate from 3.4 to 6.7 cases per 100,000 population, 477 (15.2%) reported a rate from 0.2 to 3.3 cases per 100,000 population, and 1,699 (54.1%) counties reported no cases of P&S syphilis in 2016 (Figure 33).

P&S Syphilis by Sex and Sexual Behavior

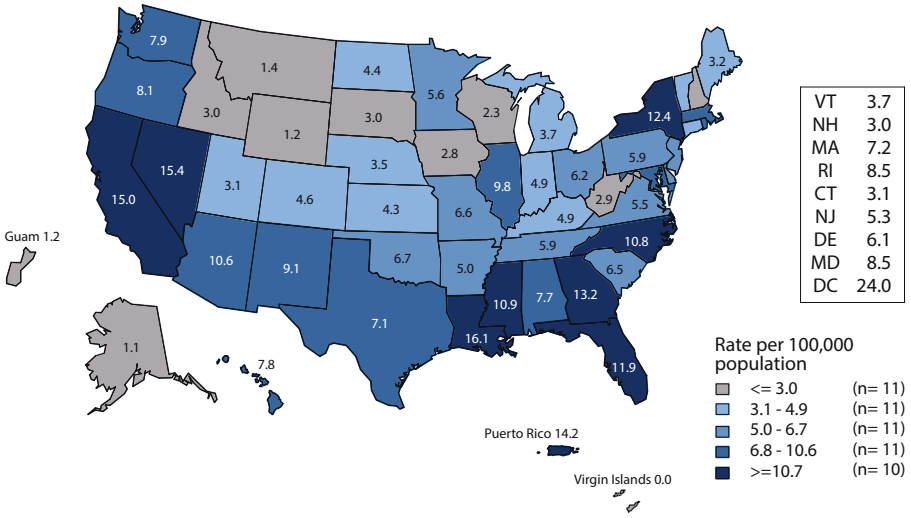
As has been observed in previous years, in 2016 the rate of reported P&S syphilis cases among men (15.6 cases per 100,000 males) was much higher than the rate among women (1.9 cases per 100,000 females), and men accounted for a large majority (88.9%) of P&S syphilis cases (Figure 36, Tables 28 and 29). Among men, the rate of P&S syphilis has increased every year since 2000, and during 2015–2016, the rate among men increased 14.7% (Figure 34, Table 29). In contrast, the P&S syphilis rate among women fluctuated between 0.8 and 1.7 cases per 100,000 females during 2000–2012, but has increased substantially since 2012 (Figure 34, Table 28). During 2012–2016, the P&S syphilis rate among women more than doubled (increased 111.1%). During 2015–2016, the P&S syphilis rate among women increased 35.7%.

These increases in male and female P&S syphilis rates were observed in every region of the country during 2015–2016. Among men, the rate increased 20.5% in the Northeast, 19.8% in the Midwest, 16.1% in the West, and 9.7% in the South (Table 29). Among women, the largest increases were observed in the West (58.8%), followed by the Northeast (28.6%), the South (22.2%) and the Midwest (20.0%) (Table 28).

MSM continued to account for the majority of P&S syphilis cases in 2016 (Figures 35 and 36). Of 27,814 reported P&S syphilis cases in 2016, 16,155 (58.1%) were among MSM, including 14,553 (52.3%) cases among men who had sex with men only and 1,602 (5.8%) cases among men who had sex with both men and women (Figure 36). Overall, 3,880 (13.9%) cases were among men who had sex with women only (MSW), 3,049 (11.0%) were among women, 4,689 (16.9%) were among men without information about sex of sex partner, and 41 (0.1%) were cases reported with unknown sex. Among the 20,035 male cases with information on sex of sex partner, 80.6% occurred among MSM.

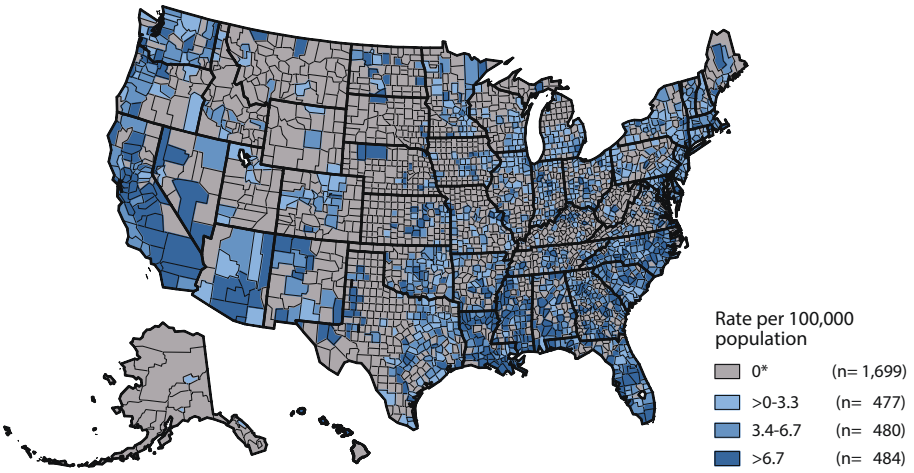
A total of 36 states were able to classify at least 70.0% of reported P&S syphilis cases as MSM, MSW, or women each year during 2012–2016 (Figure 35). In these states, during 2015–2016, the number of cases increased 16.4% among MSM,

Figure 32. Primary and Secondary Syphilis — Rates of Reported Cases by State, United States and Outlying Areas, 2016



NOTE: The total rate of reported cases of primary and secondary syphilis for the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 8.7 per 100,000 population.

Figure 33. Primary and Secondary Syphilis — Rates of Reported Cases by County, United States, 2016



* In 2016, 1,699 (54.1%) of 3,140 counties in the United States reported no cases of primary and secondary syphilis. Refer to the NCHHSTP Atlas for further county-level rate information: https://www.cdc.gov/nchhstp/atlas/.

22.2% among MSW, and 31.0% among women.

P&S Syphilis by Age

As in previous years, in 2016, rates of reported P&S syphilis cases were highest among persons aged 25–29 years and 20–24 years (Figure 37, Table 34). In 2016, the highest rates were observed among men aged 25–29 years (48.5 cases per 100,000 males), 20–24 years (37.9 cases per 100,000 males), and 30–34 years (35.0 cases per 100,000 males). The highest rates among women were among those aged 20–24 years (6.7 cases per 100,000 females) and those aged 25–29 years (5.6 cases per 100,000 females).

During 2015–2016, the overall rate of reported P&S syphilis cases increased in all age groups among those aged 15 years or older (Table 34). Rates increased 13.0% among those aged 15–19 years, 8.1% among those aged 20–24 years, 19.6% among those aged 25–29 years, 20.1% among those aged 30–34 years, 22.1% among those aged 35–39 years, 12.8% among those aged 40–44 years, 13.6% among those aged 45–54 years, 25.0% among those aged 55–64 years, and 50.0% among those aged 65 or older.

In 2016, persons aged 15–44 years accounted for 79.6% of reported P&S syphilis cases with known age. Among both men and women, the P&S syphilis rate increased during 2015–2016 in all age groups among those aged 15–44 years (Figures 38 and 39, Table 34).

P&S Syphilis by Race/Ethnicity

In 2016, all 50 states and the District of Columbia submitted data in the race and ethnicity categories according to the Office of Management and Budget (OMB) standards (see Section A1.5 in the Appendix). Among these, the rate of reported P&S syphilis cases was highest among Blacks (23.1 cases per 100,000 population) (Table 35B). The P&S syphilis rate among Blacks was 4.7 times the rate among Whites (4.9 cases per 100,000 population), the rate among Native Hawaiians/Other Pacific Islanders (12.9 cases per 100,000 population) was 2.6 times the rate among Whites, the rate among Hispanics (10.9 cases per 100,000 population) was 2.2 times the rate among Whites, the rate among American Indians/Alaska Natives (8.0 cases per 100,000 population) was 1.6 times the rate among Whites, and the rate among Asians (3.9 cases per 100,000 population) was 0.8 times the rate among Whites.

Figure 34. Primary and Secondary Syphilis — Rates of Reported Cases by Sex and Male-to-Female Rate Ratios, United States, 1990–2016

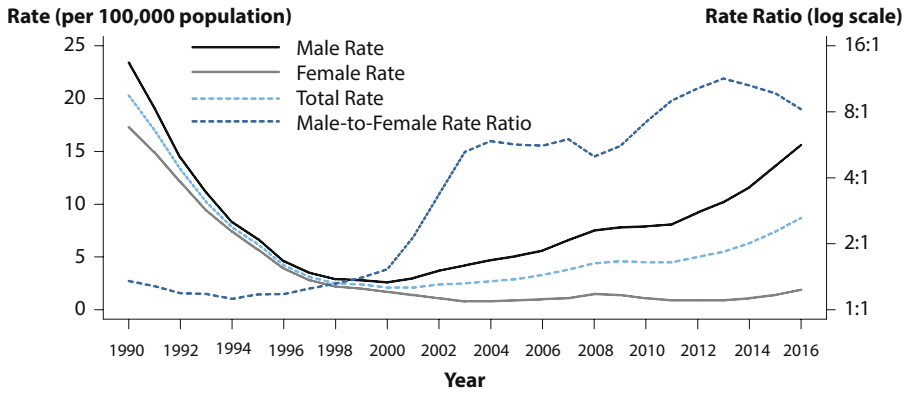
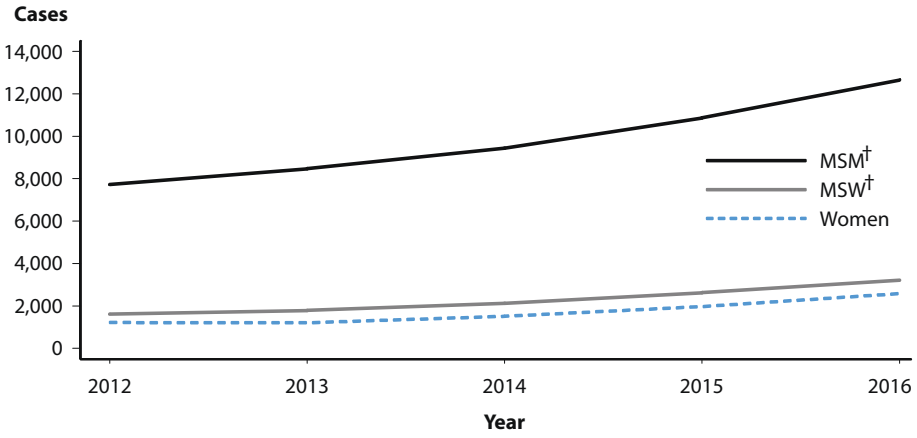
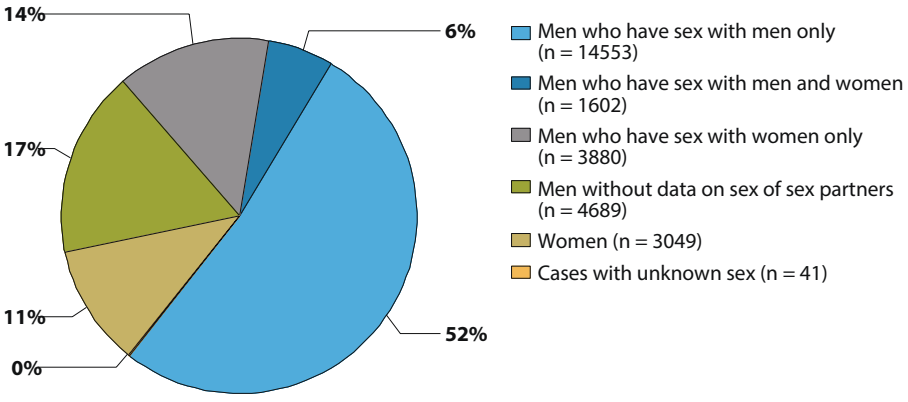


Figure 35. Primary and Secondary Syphilis — Reported Cases by Sex and Sexual Behavior, 36 States*, 2012–2016



* 36 states were able to classify ≥70% of reported cases of primary and secondary syphilis as either MSM†, MSW†, or women for each year during 2012–2016.
† MSM = Gay, bisexual, and other men who have sex with men (collectively referred to as MSM); MSW = Men who have sex with women only.

Figure 36. Primary and Secondary Syphilis — Distribution of Cases by Sex and Sexual Behavior, United States, 2016



During 2012–2016, among the 46 states that submitted race and ethnicity data according to OMB standards (see Section A1.5 in the Appendix) for all five years during that period, the P&S syphilis rate increased among all race/ethnicity groups (Figure 40). Among these 46 states, the greatest increases during 2015–2016 were observed among those who identified as Multiracial (34.3%) and Asians (30.0%), followed by Native Hawaiians/Other Pacific Islanders (26.4%), Hispanics (24.4%), Whites (17.1%), and Blacks (7.9%).

More information on P&S syphilis rates among racial/ethnic groups can be found in the Special Focus Profiles.

P&S Syphilis and HIV Co-infection

Reported cases of P&S syphilis continue to be characterized by a high rate of HIV co-infection, particularly among MSM (Figure 41). Among 2016 P&S syphilis cases with known HIV-status, 47.0% of cases among MSM were HIV-positive, compared with 10.7% of cases among MSW, and 4.1% of cases among women.

P&S Syphilis by Reporting Source

In 2016, 18.4% of P&S syphilis cases were reported from STD clinics, 72.1% were reported from venues outside of STD clinics, and 9.5% of cases had an unknown source of report (Table A2). During 2015–2016, the number of P&S syphilis cases reported by STD clinics and by non-STD clinic settings increased (Figure 42). However, the proportion of P&S syphilis cases that were reported by STD clinics has declined over the last decade from 30.3% of cases in 2007 to 18.4% of cases in 2016. In 2016, private physicians/ health maintenance organizations (HMOs) and STD clinics were the most common reporting sources

Figure 37. Primary and Secondary Syphilis — Rates of Reported Cases by Age Group and Sex, United States, 2016

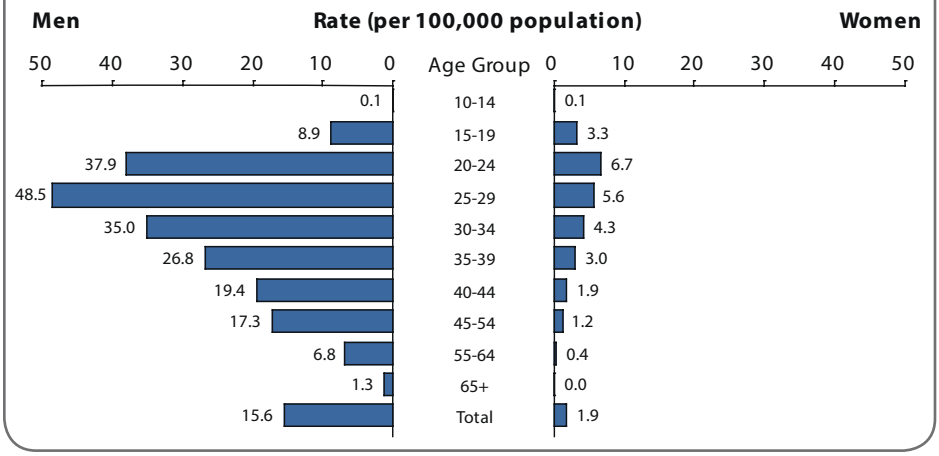
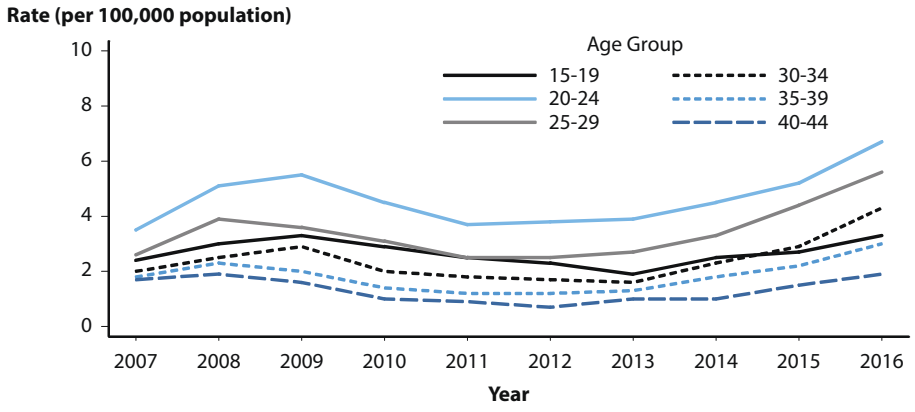


Figure 38. Primary and Secondary Syphilis — Rates of Reported Cases Among Women Aged 15–44 Years by Age Group, United States, 2007–2016



among MSM (29.5% and 23.6%, respectively), MSW (21.4% and 21.6%, respectively), and women (24.6% and 15.3%, respectively) (Figure 43).

Congenital Syphilis

After decreasing from 10.5 to 8.4 reported congenital syphilis cases per 100,000 live births during 2008–2012, the rate of reported congenital syphilis has subsequently increased each year during 2012–2016 (Table 1). In 2016, there were a total of 628 reported cases of congenital syphilis, including 41 syphilitic stillbirths, and the national rate was 15.7 cases per 100,000 live births. This rate represents a 27.6% increase relative to 2015 (12.3 cases per 100,000 live births) and a 86.9% increase relative to 2012 (8.4 cases per 100,000 live births). As has been observed historically, these increases paralleled increases in P&S syphilis among women during 2015–2016 (35.7%) and during 2012–2016 (111.1%) (Figure 44, Table 28).

During 2012–2016, the increase in reported congenital syphilis cases was primarily attributable to an increase in the West. During this time period, the congenital syphilis rate increased 365.5% in the West, 100.0% in the Northeast, 29.9% in the South, and 23.5% in the Midwest (Table 41). During 2015–2016, the congenital syphilis rate increased 42.1% in the Northeast, 41.4% in the West, and 23.6% in the South, and did not change in the Midwest. In 2016, the highest congenital syphilis rates were reported from the West (25.6 cases per 100,000 live births), followed by the South (17.8 cases per 100,000 live births), Midwest (8.4 cases per 100,000 live births), and the Northeast (5.4 cases per 100,000 live births). In addition, rates were highest among Blacks (43.1 cases per 100,000 live births), followed by American Indians/Alaska Natives (31.6 cases per 100,000 live births), Hispanics (20.5 cases per 100,000 live births), Asians/Pacific Islanders (9.2 cases per 100,000 live births), and Whites (5.3 cases per 100,000 live births) (Table 42).

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

In 2016, the total case count of reported syphilis (all stages combined: P&S, early latent, late, late latent, and congenital) was the highest recorded since 1993. The total number of cases of syphilis (all stages) reported to CDC increased 17.8% during 2015–2016 (from 74,707 cases to 88,042 cases) (Table 1). The number of cases of early latent syphilis reported to CDC increased 19.7% (from 24,173 cases to 28,924 cases), and the number of cases of late and late latent syphilis increased 17.2% (from 26,170 cases to 30,676 cases) (Tables 1, 36, and 38).

Syphilis among Special Populations

More information about syphilis and congenital syphilis in racial/ethnic groups, women of reproductive age, adolescents, and MSM can be found in the Special Focus Profiles.

Figure 39. Primary and Secondary Syphilis — Rates of Reported Cases Among Men Aged 15–44 Years by Age Group, United States, 2007–2016

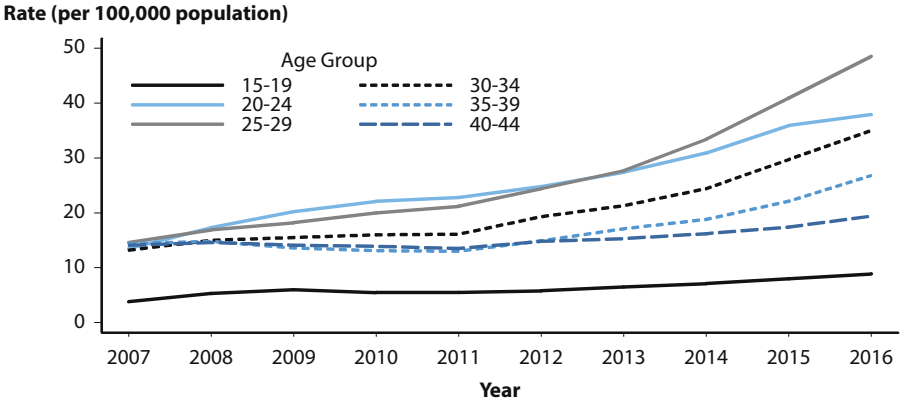
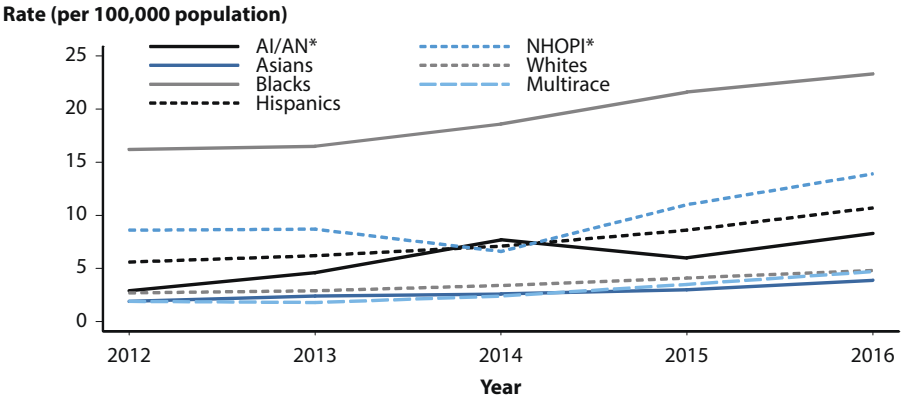


Figure 40. Primary and Secondary Syphilis — Rates of Reported Cases by Race/Ethnicity, United States, 2012–2016

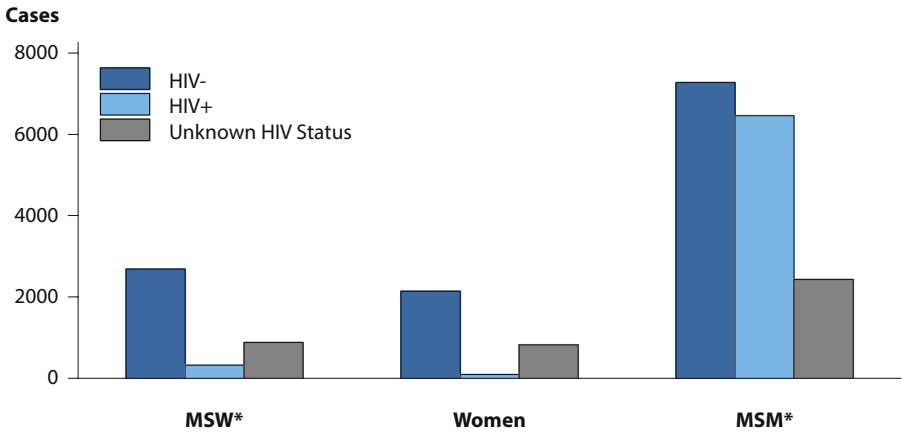


* AI/AN = American Indians/Alaska Natives; NHOPI = Native Hawaiians/Other Pacific Islanders.
NOTE: Includes 46 states reporting race/ethnicity data in Office of Management and Budget compliant formats during 2012–2016 (see Section A1.5 in the Appendix).

Syphilis Summary

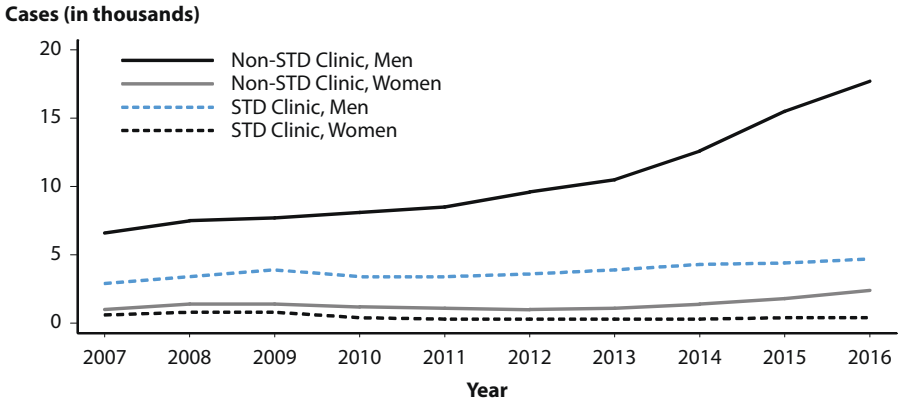
The national rate of reported P&S syphilis cases reached an historic low in 2000 and 2001, but has increased almost every year since then. This increase was largely attributable to an increase among men, and in particular among MSM. However, during 2015–2016, rates increased among both men and women in every region of the country. Rates of reported congenital syphilis cases also increased during 2015–2016. MSM continued to account for the majority of reported P&S syphilis cases in 2016. Nationally, the highest rates of P&S syphilis in 2016 were observed among men aged 20–34 years, among men in the West, and among Black men.

Figure 41. Primary and Secondary Syphilis — Reported Cases by Sex, Sexual Behavior, and HIV Status, United States, 2016



* MSM = Gay, bisexual, and other men who have sex with men (collectively referred to as MSM); MSW = Men who have sex with women only.

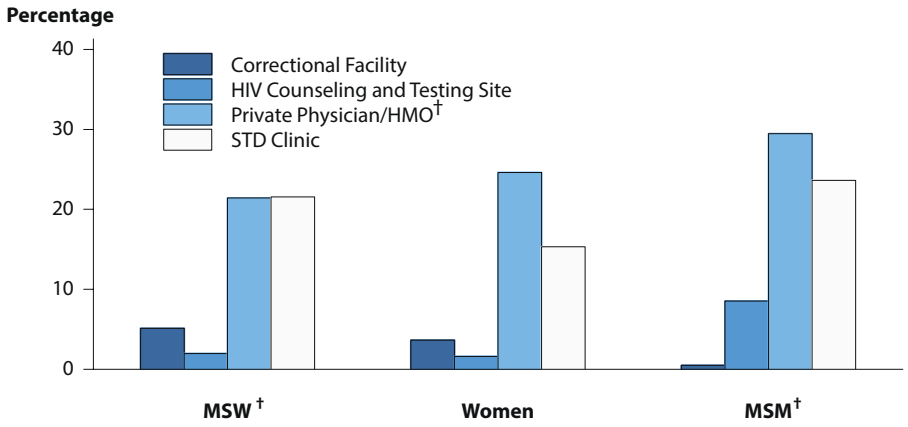
Figure 42. Primary and Secondary Syphilis — Reported Cases by Reporting Source and Sex, United States, 2007–2016



References

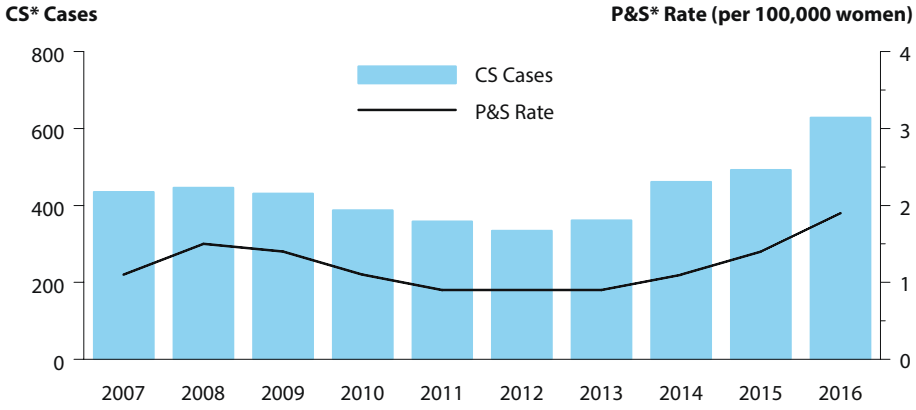
1. Jarzebowski W, Caumes E, Dupin N, et al. Effect of early syphilis infection on plasma viral load and CD4 cell count in human immunodeficiency virus- infected men: results from the FHDH- ANRS CO4 cohort. Arch Intern Med 2012; 172(16): 1237–1243.
2. Buchacz K, Patel P, Taylor M, et al. Syphilis increases HIV viral load and decreases CD4 cell counts in HIV-infected patients with new syphilis infections. AIDS 2004; 18(15): 2075–2079.
3. Fleming DT, Wasserheit JN. From epidemiological synergy to public health policy and practice: the contribution of other sexually transmitted diseases to sexual transmission of HIV infection. Sex Trans Infect 1999; 75(1): 3–17.
4. Ingraham NR. The value of penicillin alone in the prevention and treatment of congenital syphilis. Acta Derm Venereol 1951; 31(Suppl 24): 60–88.
5. Peterman TA, Kahn RH, Ciesielski CA, et al. Misclassification of the stages of syphilis: implications for surveillance. Sex Transm Dis 2005; 32(3):144–149.

Figure 43. Primary and Secondary Syphilis — Percentage of Reported Cases* by Sex, Sexual Behavior, and Selected Reporting Sources, United States, 2016



* Of all primary and secondary cases, 9.5% had a missing or unknown reporting source. Among all cases with a known reporting source, the reporting source categories presented represent 57.6% of cases; 42.4% were reported from sources other than those shown.
† HMO = health maintenance organization; MSM = Gay, bisexual, and other men who have sex with men (collectively referred to as MSM); MSW = Men who have sex with women only.

Figure 44. Congenital Syphilis — Reported Cases by Year of Birth and Rates of Reported Cases of Primary and Secondary Syphilis Among Women, United States, 2007–2016



* CS = Congenital syphilis; P&S = Primary and secondary syphilis.

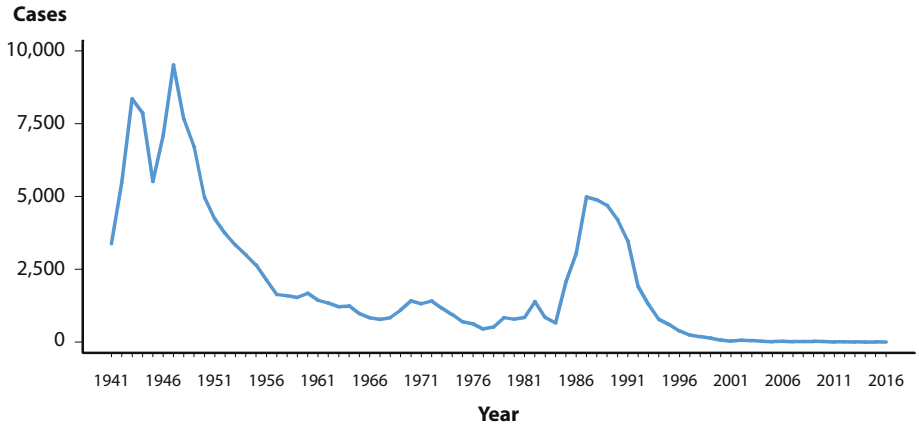
Other Sexually Transmitted Diseases

Chancroid

Chancroid is caused by infection with the bacterium *Haemophilus ducreyi*. Clinical manifestations include genital ulcers and inguinal lymphadenopathy or buboes.[1] Reported cases of chancroid declined steadily between 1987 and 2001 (Figure 45, Table 1). Since then, the number of reported cases has fluctuated somewhat, while still appearing to decline overall. In 2016, a total of 7 cases of chancroid were reported in the United States. Six states reported one or more cases of chancroid in 2016 (Table 43).

Although the overall decline in reported chancroid cases most likely reflects a decline in the incidence of this disease, these data should be interpreted with caution because *Haemophilus ducreyi* is difficult to culture; as a result, this condition may be substantially underdiagnosed.[2,3]

Figure 45. Chancroid — Reported Cases by Year, United States, 1941–2016



NOTE: Data collection for chancroid began in 1941; however, chancroid became nationally notifiable in 1944. Refer to the National Notifiable Disease Surveillance System (NNDSS) website for more information: https://wwwn.cdc.gov/nndss/conditions/chancroid/.

Human Papillomavirus

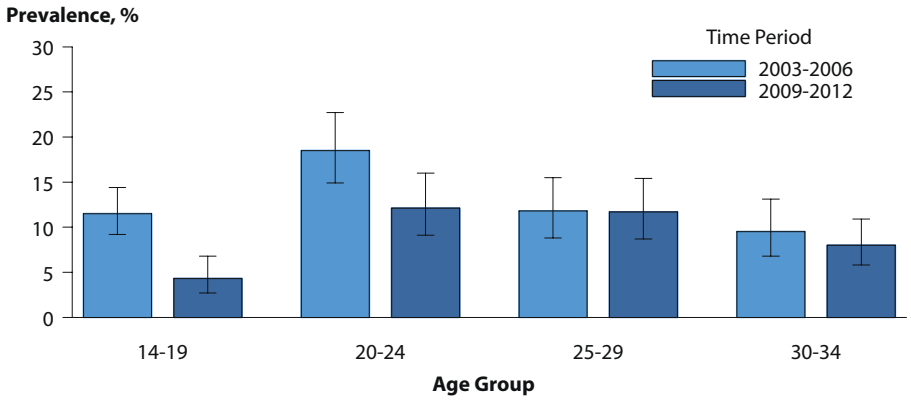
Human papillomavirus (HPV) is the most common sexually transmitted infection in the United States.[4] Over 40 distinct HPV types can infect the genital tract;[5] although most infections are asymptomatic and appear to resolve spontaneously within a few years,[6] prevalence of genital infection with any HPV type was 42.5% among United States adults aged 18–59 years during 2013–2014.[7] Persistent infection with some HPV types can cause cancer and genital warts. HPV types 16 and 18 account for approximately 66% of cervical cancers in the United States,[8] and approximately 25% of low-grade and 50% of high-grade cervical intraepithelial lesions, or dysplasia.[9,10] HPV types 6 and 11 are responsible for approximately 90% of genital warts.[11,12]

Quadrivalent HPV vaccine targets HPV types 6, 11, 16, and 18.[11] This vaccine was licensed in the United States in mid-2006 for females[13] and in late 2009 for males.[14] Although a bivalent vaccine was also licensed for females,[15] almost all HPV vaccine administered in the United States through late 2014 was quadrivalent.[16] A 9-valent vaccine, which protects against the quadrivalent and 5 additional oncogenic HPV types (types 31, 33, 45, 52, and 58), was licensed in late 2014 for males and females.[17] All HPV vaccines have been recommended for routine use in United States females aged 11–12 years, with catch-up vaccination through age 26.[13,17] Since late 2011, routine use of the quadrivalent or 9-valent vaccine has been recommended for males aged 11–12, with catch-up vaccination through age 21.[18] Vaccination through age 26 is recommended for gay, bisexual, and other men who have sex with men (collectively referred to as MSM)[18] and persons who are immunocompromised (including those infected with HIV).[17]

HPV vaccine uptake in the United States remains lower than the Healthy People 2020 goal of 80% coverage.[19] In 2015, a national survey found that 63% of girls aged 13–17 years had received at least 1 dose of the HPV vaccine, and 42% had received all recommended doses in the series.[20] HPV vaccine uptake is lower among boys; 50% of those aged 13–17 years received at least 1 dose, but only 28% received all recommended doses.[20]

HPV infection is not a nationally reportable condition. Cervicovaginal prevalence of quadrivalent HPV vaccine types 6, 11, 16, and/or 18 was estimated using data for females aged 14–34 years from the National Health and Nutrition Examination Survey (NHANES; see Section A2.4 in the Appendix). Prevalence decreased significantly from the pre-vaccine era (2003–2006) to the early post-vaccine era (2009–2012) in specimens from females aged 14–19 and 20–24 years, the age groups most likely to benefit from HPV vaccination (Figure 46).[21] Among those aged 25–34 years, vaccine-type HPV prevalence did not differ significantly between the two time periods, and no differences were observed in the prevalence of non-quadrivalent HPV

Figure 46. Human Papillomavirus — Cervicovaginal Prevalence of Types 6, 11, 16 and 18 Among Females Aged 14–34 Years by Age Group and Time Period, National Health and Nutrition Examination Survey (NHANES), 2003–2006 and 2009–2012



NOTE: Error bars indicate 95% confidence interval.
SOURCE: Markowitz LE, Liu G, Hariri S, et al. Prevalence of HPV After Introduction of the Vaccination Program in the United States. Pediatrics 2016; 137(3):e20151968.

vaccine types by time period for any age group. An NHANES analysis of 2013–2014 HPV prevalence from penile swab specimens found low prevalence of quadrivalent HPV vaccine types in young males, which the authors attributed to male vaccination and/or herd protection from female vaccination.[22]

Health-care claims data from 9 million females aged 15–39 years in the United States with employer-provided private health insurance were used to estimate annual prevalence of cytologically-detected cervical low-grade and high-grade squamous intraepithelial lesions (LSIL and HSIL, respectively) and high-grade histologically-detected cervical intraepithelial neoplasia grades 2 and 3 (CIN2+) during 2007–2014.[23] Analyses were restricted to females who received cervical cancer screening in a given calendar year. Among females aged 15–19 years, LSIL prevalence over the entire period increased (Figure 47A); annual percent change during 2007–2014 was 2.0% (P=0.041). Although prevalence in those aged 15–19 years appeared to decrease somewhat during 2013–2014, additional years of data are needed to appropriately interpret this observation. LSIL prevalence in women aged 20–24 years increased during 2007–2012 (annual percent change = 3.0%, P=0.002), then declined significantly during 2012–2014 (annual percent change = -8.2%, P=0.005). Prevalence of LSIL increased significantly during 2007–2014 for women aged 25–39 years. In contrast to LSIL, prevalence of HSIL and CIN2+ decreased significantly in females aged 15–19 and 20–24 years during 2007–2014 (Figures 47B and 47C). Among those aged 15–19 years, annual percent change in HSIL prevalence during 2007–2014 was -8.3% (P<0.001), while change in CIN2+ prevalence was -19.8% (P=0.004) during 2007–2009 and -12.1% (P=0.002) during 2009–2014. For women aged 20–24 years, annual percent change in HSIL was -5.3% (P<0.001) during 2007–2014; annual percent change in CIN2+ was -6.7% (P=0.001) during 2007–2012 and -12.5% during 2012–2014 (P=0.020). No decreases in HSIL or CIN2+ prevalence were observed in women aged 25–39 years. Decreases in high-grade lesions among young women reflected their greater association with HPV types 16 and 18, compared to low-grade lesions, providing ecologic evidence of population effectiveness of HPV vaccination on clinical sequelae of infection among young, privately-insured US women.

Prevalence of genital warts also has been examined using health-care claims records (Figures 48A and 48B).[24] Prevalence among females aged 15–19 years was stable during 2003–2007, but then significantly declined from 2.9 per 1000 person-years in 2006 to 1.8 in 2010. Among females aged 20–24 years, genital wart prevalence significantly increased during 2003–2007, then was essentially unchanged at 5.4 to 5.5 per 1000 person-years during 2007–2009; although prevalence among women in this age group appeared to decrease in 2010, more years of data are needed to determine whether this observation represents a valid inflection in trend. Prevalence in women aged 25–39 years significantly increased from 2.5 per 1000 person-years in 2003 to 3.7 in 2010, but a potential inflection in trend was also observed in this age group during 2009–2010; as with women aged 20–24, additional years of data are needed to appropriately assess this potential change in trend. Genital wart prevalence significantly increased in males aged 15–39 years during 2003–2010, although for men aged 20–24 years a potential inflection in trend was observed during 2009–2010.

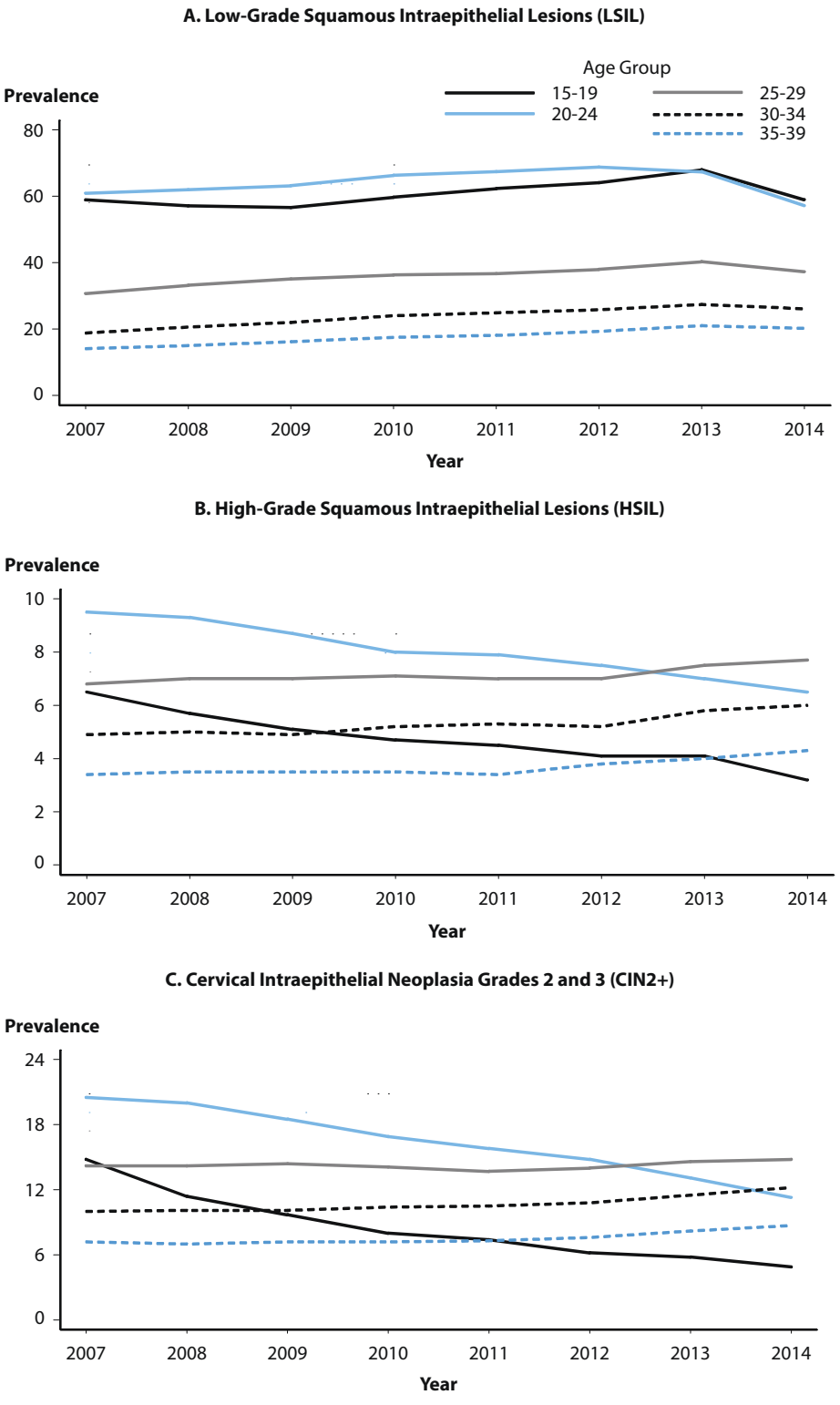
Pelvic Inflammatory Disease

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

Herpes Simplex Virus

Herpes simplex virus (HSV) is among the most prevalent of sexually transmitted infections.[4,25] Although most infections are subclinical,[26] clinical manifestations are characterized by recurrent, painful genital and/or anal lesions.[27] Most genital HSV infections in the United States are caused by HSV type 2

Figure 47. Cervical Low- and High-Grade Squamous Intraepithelial Lesions and Intraepithelial Neoplasia Grades 2 and 3 — Prevalence per 1000 Person-Years Among Female Enrollees in Private Health Plans Aged 15–39 Years, by Age Group and Year, 2007–2014



SOURCE: Flagg EW, Torrone EA, Weinstock H. Ecological Association of Human Papillomavirus Vaccination with Cervical Dysplasia Prevalence in the United States, 2007–2014. Am J Public Health 2016; 106(12):2211–2218.

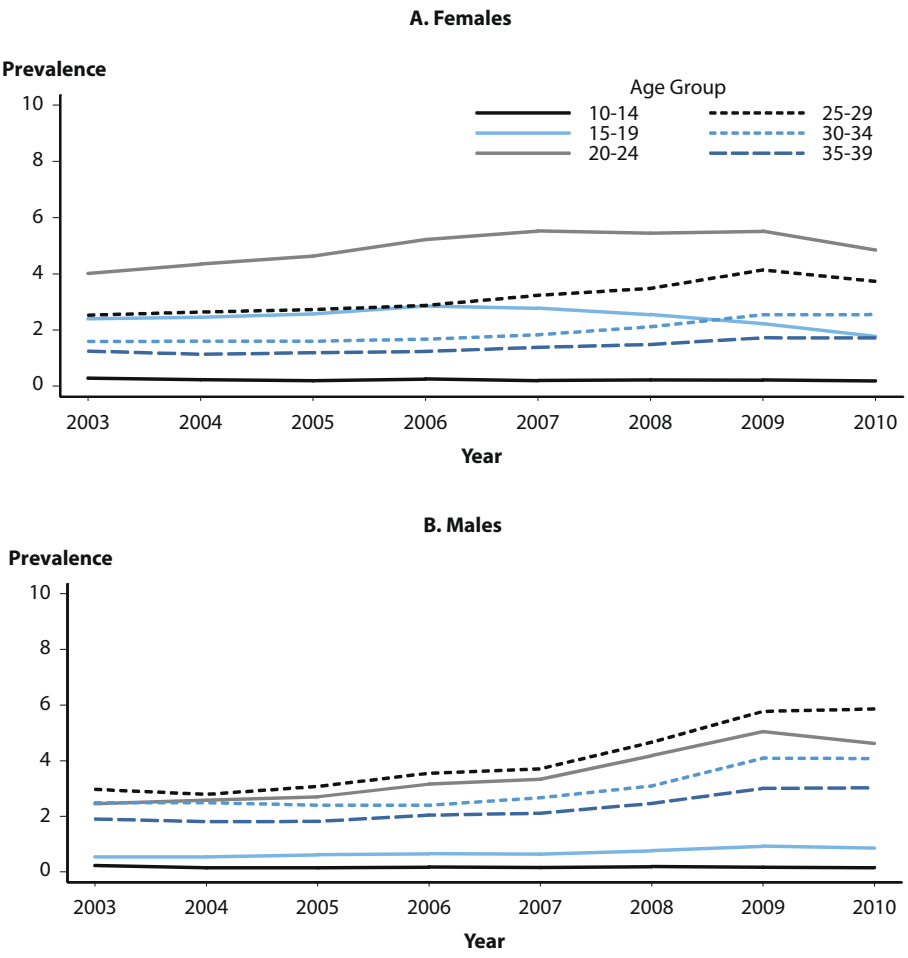
(HSV-2), while HSV type 1 (HSV-1) infections are typically orolabial and acquired during childhood.[26,28]

HSV infection is not a nationally reportable condition. Most persons with genital HSV infection have not received a diagnosis. The overall percentage of HSV-2 seropositive NHANES participants aged 14–49 years who reported never being told by a doctor or health care professional that they had genital herpes did not change significantly between 1988–1994 and 2007–2010, and remained high (90.7% and 87.4%, respectively).[29]

NHANES data on the gender- and race/ethnicity-specific seroprevalence of HSV-2 among those aged 14–49 years were compared across survey years 1988–1994, 1999–2002, 2003–2006, and 2007–2010 (Figure 49). Overall, HSV-2 seroprevalence decreased between 1988–1994 and 2007–2010, from 21.2% to 15.5%.[29] Among non-Hispanic White females, HSV-2 seroprevalence significantly decreased from 19.5% in 1988–1994 to 15.3% in 2007– 2010; HSV-2 seroprevalence remained stable among non-Hispanic Black females, from 52.5% during 1988–1994 to 49.9% during 2007–2010. Similar race/ethnicity differences were observed for males. These data, along with data from NHANES survey years 1976–1980,[30] indicate that non-Hispanic Blacks had higher overall seroprevalence than non-Hispanic Whites in each survey period.

NHANES data also show that among adolescents aged 14–19 years, HSV-1 seroprevalence has significantly decreased by almost 23%, from 39.0% during 1999–2004 to 30.1% during 2005–2010, indicating declining orolabial infection in this age group.[28] HSV-2 seroprevalence in this age group was much lower, less than 2% in both time periods.[28] Other studies have found that genital HSV-1 infections are increasing among young adults.[31,32]

Figure 48. Genital Warts — Prevalence per 1000 Person-Years Among Enrollees in Private Health Plans Aged 10–39 Years by Sex, Age Group, and Year, 2003–2010



SOURCE: Flagg EW, Schwartz R, Weinstock H. Prevalence of Anogenital Warts Among Participants in Private Health Plans in the United States, 2003–2010: Potential Impact of Human Papillomavirus Vaccination. Am J Public Health 2013; 103(8):1428–1435.

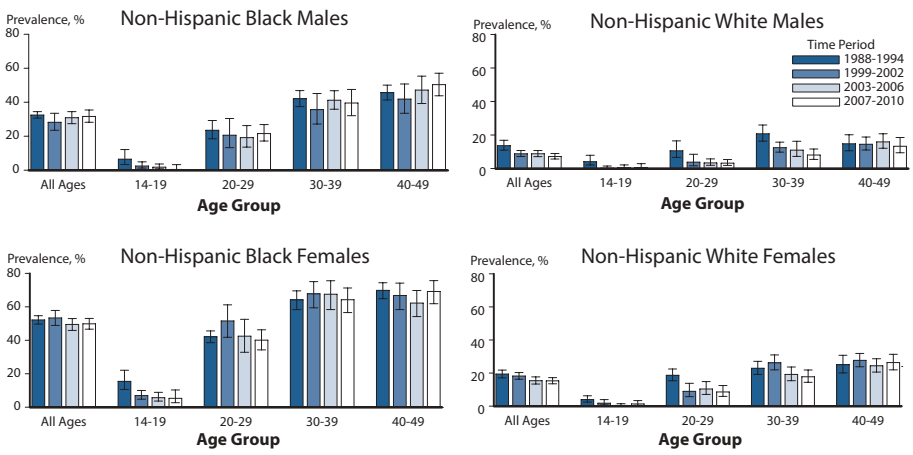
This has been attributed, in part, to the decline in orolabial HSV-1 infections, because those who lack HSV-1 antibodies at sexual debut are more susceptible to genital HSV-1 infection;[28,33] increasingly common oral sex behavior among adolescents and young adults also has been suggested as a contributing factor.[28,34] The absence of HSV-1 antibodies also increases the likelihood of developing symptomatic disease from newly-acquired (i.e., primary) genital HSV-2 infection.[35] Young women may therefore be increasingly likely to first acquire HSV-1 infection genitally, or acquire a primary genital HSV-2 infection during their child-bearing years,[33,36] and first-episode primary HSV infection during pregnancy increases the risk of neonatal HSV transmission.[33,37]

For information on neonatal HSV infections, see Special Focus Profiles, STDs in Women and Infants.

Trichomonas Vaginalis

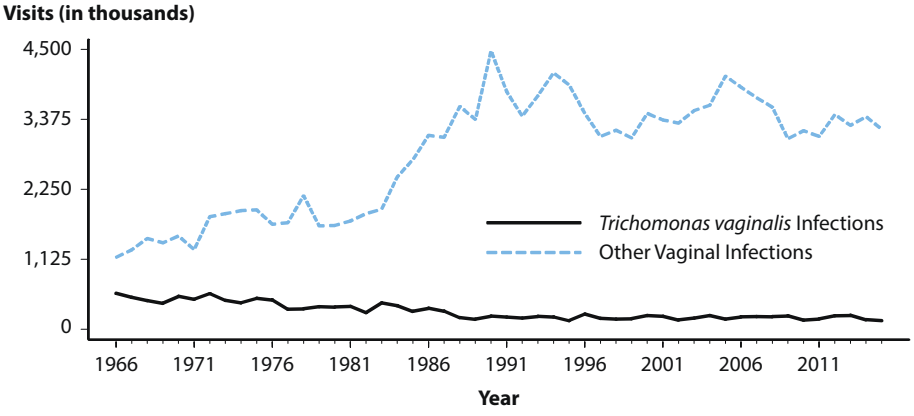
Trichomonas vaginalis is a common sexually transmitted protozoal infection associated with adverse health outcomes such as preterm birth and symptomatic vaginitis.[4,38,39] It is not a nationally reportable condition, and trend data are limited to estimates of initial physician office visits for this condition from the National Disease and Therapeutic Index (NDTI; see Section A2.5 in the Appendix) (Figure 50, Table 44). Visits appear to be fairly stable since the 1990's; the number of initial visits for *Trichomonas vaginalis* infection in 2015 was 139,000. The 2016 NDTI data were not obtained in time to include them in this report. NHANES data from 2001–2004 indicated an overall *Trichomonas vaginalis* infection prevalence of 3.1%, with the highest prevalence of 13.3% observed among non-Hispanic Blacks.[39]

Figure 49. Herpes Simplex Virus Type 2 — Seroprevalence Among Non-Hispanic Whites and Non-Hispanic Blacks by Sex and Age Group, National Health and Nutrition Examination Survey (NHANES), 1988–1994, 1999–2002, 2003–2006, and 2007–2010



NOTE: Error bars indicate 95% confidence interval.
SOURCE: Fanfair RN, Zaidi A, Taylor LD, et al. Trends in Seroprevalence of Herpes Simplex Virus Type 2 Among Non-Hispanic Blacks and Non-Hispanic Whites Aged 14 to 49 Years — United States, 1988 to 2010. Sex Transm Dis 2013; 40(11):860–864.

Figure 50. *Trichomonas vaginalis* and Other Vaginal Infections Among Females — Initial Visits to Physicians' Offices, United States, 1966–2015



NOTE: The relative standard errors for *Trichomonas vaginalis* infection estimates range from 23% to 17% and for other vaginal infection estimates range from 13% to 8%. See Section A2.5 in the Appendix and Table 44.
SOURCE: National Disease and Therapeutic Index, IMS Health, Integrated Promotional Services™, IMS Health Report, 1966–2015. The 2016 data were not obtained in time to include them in this report.

References

1. Lewis DA. Chancroid: Clinical Manifestations, Diagnosis, and Management. Sex Transm Infect 2003; 79:68–71.
2. Schulte JM, Martich FA, Schmid GP. Chancroid in the United States, 1981–1990: Evidence for Underreporting of Cases. MMWR Morb Mortal Wkly Rep Surveill Summ 1992; 41(SS-3):57–61.
3. 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(6):1795–1798.
4. Satterwhite CL, Torrone E, Meites E, et al. Sexually Transmitted Infections among US Women and Men: Prevalence and Incidence Estimates, 2008. Sex Transm Dis 2013; 40(3):187–193.
5. de Villiers E-M, Fauquet C, Broker TR, et al. Classification of Papillomaviruses. Virology 2004; 324:17–27.
6. Insinga RP, Perez G, Wheeler CM, et al. Incident Cervical HPV Infections in Young Women: Transition Probabilities for CIN and Infection Clearance. Cancer Epidemiol Biomarkers Prev 2011; 20(2):287–296.
7. McQuillan G, Kruszon-Moran D, Markowitz LE, et al. Prevalence of HPV in Adults Aged 18–69: United States, 2011–2014. NCHS Data Brief, No 280. Hyattsville, MD: National Center for Health Statistics; 2017.
8. Saraiya M, Unger ER, Thompson TD, et al. US Assessment of HPV types in Cancers: Implications for Current and 9-Valent HPV Vaccines. J Natl Cancer Inst 2015; 107(6):djv086.
9. Clifford GM, Rana RK, Franceschi S, et al. Human Papillomavirus Genotype Distribution in Low-Grade Cervical Lesions: Comparison by Geographic Region and with Cervical Cancer. Cancer Epidemiol Biomarkers Prev 2005; 14(5):1157–1164.
10. Porras C, Rodriguez AC, Hildesheim A, et al. Human Papillomavirus Types by Age in Cervical Cancer Precursors: Predominance of Human Papillomavirus 16 in Young Women. Cancer Epidemiol Biomarkers Prev 2009; 18(3):863–865.
11. Garland SM, Steben M, Sings HL, et al. Natural History of Genital Warts: Analysis of the Placebo Arm of 2 Randomized Phase III Trials of a Quadrivalent Human Papillomavirus (Types 6, 11, 16, and 18) Vaccine. J Infect Dis 2009; 199(6):805–814.
12. Gissmann L, Wolnik L, Ikenberg H, et al. Human Papillomavirus Types 6 and 11 DNA Sequences in Genital and Laryngeal Papillomas and in Some Cervical Cancers. Proc Natl Acad Sci USA 1983; 80(2): 560–563.
13. Markowitz LE, Dunne EF, Saraiya M, et al. Quadrivalent Human Papillomavirus Vaccine. Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Morb Mortal Wkly Rep Recomm Rep 2007; 56(RR-2):1–24.

14. Centers for Disease Control and Prevention. FDA Licensure of Quadrivalent Human Papillomavirus Vaccine (HPV4, Gardasil) for Use in Males and Guidance from the Advisory Committee on Immunization Practices (ACIP). MMWR Morb Mortal Wkly Rep 2010; 59(20):630–632.

15. Centers for Disease Control and Prevention. FDA Licensure of Bivalent Human Papillomavirus Vaccine (HPV2, Cervarix) for Use in Females and Updated HPV Vaccination Recommendations from the Advisory Committee on Immunization Practices (ACIP). MMWR Morb Mortal Wkly Rep 2010; 59(20):626–629.

16. Stokley S, Jeyarajah J, Yankey D, et al. Human Papillomavirus Vaccination Coverage Among Adolescents, 2007–2013, and Postlicensure Vaccine Safety Monitoring, 2006-2014 — United States. MMWR Morb Mortal Wkly Rep 2014; 63(29):620–624.

17. Petrosky E, Bocchini Jr. JA, Hariri S, et al. Use of 9-Valent Human Papillomavirus (HPV) Vaccine: Updated HPV Vaccination Recommendations of the Advisory Committee on Immunization Practices. MMWR Morb Mortal Wkly Rep 2015; 64(11):300–304.

18. Centers for Disease Control and Prevention. Recommendations on the Use of Quadrivalent Human Papillomavirus Vaccine in Males — Advisory Committee on Immunization Practices (ACIP), 2011. MMWR Morb Mortal Wkly Rep 2011; 60(50):1705–1708.

19. HealthyPeople.gov. Healthy People 2020 Topics & Objectives. Immunization and Infectious Diseases. Objectives IID-11.4 and IID-11.5. Available at: https://www.healthypeople.gov/2020/topics-objectives/topic/immunization-and-infectious-diseases/objectives. Accessed July 20, 2016.

20. Reagan-Steiner S, Yankey D, Jeyarajah J, et al. National, Regional, State, and Selected Local Area Vaccination Coverage among Adolescents Aged 13–17 years — United States, 2015. MMWR Morb Mortal Wkly Rep 2016; 65(33):850–858.

21. Markowitz LE, Gui L, Hariri S, et al. Prevalence of HPV After Introduction of the Vaccination Program in the United States. Pediatrics 2016; 137(3):e20151968.

22. Gargano JW, Unger ER, Liu G, et al. Prevalence of Genital Human Papillomavirus in Males, United States, 2013–2014. J Infect Dis 2017; 215(7):1070–1079.

23. Flagg EW, Torrone EA, Weinstock H. Ecological Association of Human Papillomavirus Vaccination with Cervical Dysplasia Prevalence in the United States, 2007–2014. Am J Public Health 2016; 106(12):2211–2218.

24. Flagg EW, Schwartz R, Weinstock H. Prevalence of Anogenital Warts Among Participants in Private Health Plans in the United States, 2003–2010: Potential Impact of Human Papillomavirus Vaccination. Am J Public Health 2013; 103(8):1428–1435.

25. Smith JS, Robinson NJ. Age-Specific Prevalence of Infection with Herpes Simplex Virus Types 2 and 1: A Global Review. J Infect Dis 2002; 186(Suppl 1):S3–S28.

26. Corey L, Wald A. Genital Herpes. In: Holmes KK, Sparling FP, Stamm WE, et al., eds. Sexually Transmitted Diseases. 4th ed. New York, NY: McGraw-Hill; 2008:399–437.

27. Kimberlin DW, Rouse DJ. Genital Herpes. N Engl J Med 2004; 350(19):1970–1977.

28. Bradley H, Markowitz LE, Gibson T, et al. Seroprevalence of Herpes Simplex Virus Types 1 and 2 — United States, 1999–2010. J Infect Dis 2014; 209(3):325–333.

29. Fanfair RN, Zaidi A, Taylor LD, et al. Trends in Seroprevalence of Herpes Simplex Virus Type 2 among Non-Hispanic Blacks and Non-Hispanic Whites Aged 14 to 49 Years — United States, 1988 to 2010. Sex Transm Dis 2013; 40(11):860–864.

30. Xu F, Sternberg MR, Kottiri BJ, et al. Trends in Herpes Simplex Virus Type 1 and Type 2 Seroprevalence in the United States. JAMA 2006; 296(8):964–973.

31. Bernstein DI, Bellamy AR, Hook EW III, et. al. Epidemiology, Clinical Presentation, and Antibody Response to Primary Infection with Herpes Simplex Virus Type 1 and Type 2 in Young Women. Clin Infect Dis 2013; 56:344–351.

32. Roberts CM, Pfister JR, Spear SJ. Increasing Proportion of Herpes Simplex Virus Type 1 as a Cause of Genital Herpes Infection in College Students. Sex Transm Dis 2003; 30(10):797–800.

33. Kimberlin DW. The Scarlet H. J Infect Dis 2014; 209(3):315–317.

34. Copen CE, Chandra A, Martinez G. Prevalence and Timing of Oral Sex with Opposite-sex Partners among Females and Males Aged 15–24 Years: United States, 2007–2010. National Health Statistics Reports; No. 56. Hyattsville, MD: National Center for Health Statistics; 2012.

35. Langenberg AGM, Corey L, Ashley RL, et al. A Prospective Study of New Infections with Herpes Simplex Virus Type 1 and Type 2. N Engl J Med 1999; 341:1432–1438.

36. Sampath A, Maduro G, Schillinger JA. Infant Deaths Due to Herpes Simplex Virus, Congenital Syphilis, and HIV in New York City. Pediatrics 2016; 137(4):e20152387.

37. Brown ZA, Wald A, Morrow RA, et al. Effect of Serologic Status and Cesarean Delivery on Transmission Rates of Herpes Simplex Virus from Mother to Infant. JAMA 2003; 289(2):203–209.

38. French JI, McGregor JA, Parker R. Readily Treatable Reproductive Tract Infections and Preterm Birth among Black Women. Am J Obstet Gynecol 2006; 194:1717–1727.

39. Sutton M, Sternberg M, Koumans EH, et al. The Prevalence of *Trichomonas vaginalis* Infection Among Reproductive-Age Women in the United States, 2001–2004. Clin Infect Dis 2007; 45(10):1319–1326.

Special Focus Profiles

The Special Focus Profiles highlight trends and distribution of STDs in populations of particular interest to STD and HIV prevention programs in state and local health departments: women and infants, adolescents and young adults, racial and ethnic minority groups, and gay, bisexual, and other men who have sex with men (collectively referred to as MSM).

STDs in Women and Infants

Public Health Impact

Women and their infants are uniquely vulnerable to the consequences of sexually transmitted infections (STI). While individual-level determinants, including high-risk behaviors, contribute to disease transmission and acquisition risk, it is widely accepted that social barriers to STD prevention and control efforts also contribute to infectious disease prevalence. A woman's relationship status with her male partner, such as the concurrency of the relationship, may be an important predictor of her sexual health.[1–3] In addition to social factors such as poverty and lack of access to quality STD services, homelessness or unstable housing may influence a woman's sexual risk.[4] For some women, maintaining the relationship with a partner may take a higher priority than STD risk reduction,[5] affecting her sexual and reproductive health, as well as the health of her unborn baby.[6,7] A woman can also be placed at risk for STIs through her partner's sexual encounter with an infected partner. Consequently, even a woman who has only partner may be obliged to practice safer sex, such as using condoms.[8]

Chlamydia and gonorrhea disproportionately affect women because early infection may be asymptomatic and, if untreated, infection may ascend to the upper reproductive tract resulting in pelvic inflammatory disease (PID). Data from prospective studies suggest that about 15% of untreated chlamydial infections progress to clinically diagnosed PID and the risk with untreated gonococcal infection may be even higher.[9–11] PID is a major concern because it can result in inflammation and damage to the fallopian tubes, elevating the risk of infertility and ectopic pregnancy. Tubal factor infertility ranks among the most common causes of infertility, accounting for 30% of female infertility in the United States,[12] and much of this damage results from previous episodes of PID.[13]

An important public health measure for preventing PID, and ultimately tubal factor infertility, is through the prevention and control of *C. trachomatis* and *N. gonorrhoeae*. Strategies to improve the early detection and treatment of chlamydia and gonorrhea, as demonstrated in a number of randomized controlled trials,[14] has been shown to reduce a woman's risk for PID and ultimately protect the fertility of women.

Human papillomavirus (HPV) infections are highly prevalent in the United States, especially among young sexually active adults. Although most HPV infections in women appear to be transient and may not result in clinically significant sequelae, high-risk HPV-type infections can cause abnormal changes in the uterine cervical epithelium, which are detected by cytological examination of Papanicolaou (Pap) smears. Persistent high-risk HPV-type infections may lead to cervical cancer precursors, which, if undetected can result in cancer. Other low-risk HPV-type infections can cause genital warts, low-grade Pap smear abnormalities, and, rarely, recurrent respiratory papillomatosis in infants born to infected mothers.[15] For more information on adolescent and adult HPV infections, see Other STDs.

Impact on Maternal and Fetal Outcomes

Similar to non-pregnant women, a high proportion of pregnant women with chlamydial and gonococcal infections are asymptomatic. Documented sequelae of untreated infections in pregnancy include stillbirth, premature delivery, premature rupture of the membranes, and low birth weight. Maternal infection can also affect the infant, leading to conjunctivitis infections (termed ophthalmia neonatorum in the first four weeks of life), and, in the case of *C. trachomatis*, 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. The clinical presentation of conjunctivitis can be variable and these infections are especially important to treat promptly, as they can lead to visual impairment.[16]

Syphilis has long been known to be an important risk factor for adverse pregnancy outcomes. The consequences of untreated maternal infection include fetal death, preterm birth, and also congenital infection in a proportion of surviving infants resulting in both 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]

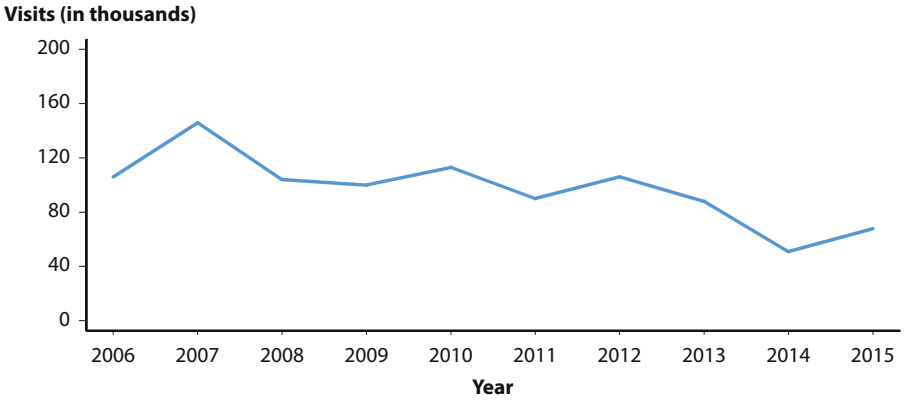
Genital infections with herpes simplex virus (HSV) are extremely common, can cause painful outbreaks, and can have serious consequences for pregnant women and their infants.[18] Neonatal herpes can be a severe illness presenting with pulmonary disease, seizures, fever, and a high case fatality rate following contact with infected cervical or vaginal secretions during delivery. Risk of transmission to the infant is greatest when the mother has a first-episode primary genital infection during pregnancy, especially if she acquires infection towards the end of her pregnancy.[19,20]

Observations

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 United States rates of women diagnosed with PID in both hospital and ambulatory settings.[21–23] The National Disease and Therapeutic Index (NDTI; see Section A2.5 in the Appendix) provides estimates of initial visits to office-based, private physicians for PID. NDTI estimated that from 2006–2015 the number of initial visits to such physicians for PID among women aged 15–44 years have decreased by 35.8% from 106,000 to 68,000 visits (Figure A). The 2016 NDTI data were not obtained in time to include them in this report. Several factors may be contributing to declining PID rates, including increases in chlamydia and gonorrhea screening coverage, more sensitive diagnostic technologies, and availability of single-dose therapies that increase adherence to

Figure A. Pelvic Inflammatory Disease — Initial Visits to Physicians' Offices Among Women Aged 15–44 Years, United States, 2006–2015

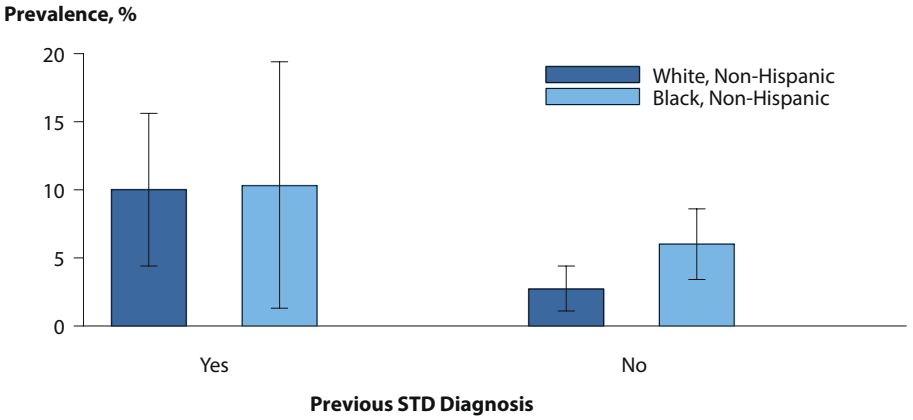


NOTE: The relative standard errors for these estimates are 16%–23%. See section A2.5 in the Appendix and Table 44.
SOURCE: National Disease and Therapeutic Index, IMS Health, Integrated Promotional Services™, IMS Health Report, 1966–2015. The 2016 data were not obtained in time to include them in this report.

treatment.[22–24] While PID is declining nationally, it still causes an enormous amount of unnecessary and expensive morbidity.

Differences in self-reported lifetime diagnosis of PID by race/ethnicity in reproductive age women have been observed in earlier research.[25] Data from the 2013–2014 cycle of the National Health and Nutrition Examination Survey (NHANES) indicates that non-Hispanic Black and non-Hispanic White women reporting a previous STI diagnosis had nearly equal self-reported lifetime PID prevalence (10.0% vs. 10.3%). However, the lifetime prevalence of PID among non-Hispanic Black women was 2.2 times that among non-Hispanic White women if no previous STI was diagnosed (6.0% vs. 2.7%) (Figure B). These findings suggest that PID is associated with previous STI diagnoses and it is therefore important for physicians to screen female patients for chlamydia and gonorrhea to reduce the incidence of PID. The racial disparities observed in PID diagnoses 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.

Figure B. Pelvic Inflammatory Disease — Lifetime Prevalence* Among Sexually Experienced Women† Aged 18–44 Years by Race/ Ethnicity and Previous STI‡ Diagnosis, National Health and Nutrition Examination Survey (NHANES), 2013–2014



* Prevalence estimates based on response to the question, "Have you ever been treated for an infection in your fallopian tubes, uterus or ovaries, also called a pelvic infection, pelvic inflammatory disease, or PID?". Estimates were weighted to be nationally representative of the U.S. population, accounting for unequal probabilities of selection and nonresponse.
† Based on a response of "Yes" to the question, "Have you ever had vaginal, anal, or oral sex?".
‡ STI = sexually transmitted infection. Participants who have been told by a doctor or other healthcare professional in the last 12 months that they had chlamydia or gonorrhea or have ever been told they have herpes, human papillomavirus, or genital warts.
NOTE: Error bars indicate 95% confidence intervals. Prevalence estimates among non-Hispanic Black women with a previous STI diagnosis have a relative standard error >40% but <50%.
SOURCE: Kreisel, K, Torrone, E, Bernstein, K, et al. Prevalence of pelvic inflammatory disease in sexually experienced women of reproductive age — United States, 2013–2014. MMWR Morb Mortal Wkly Rep 2017; 66(3):80–83.

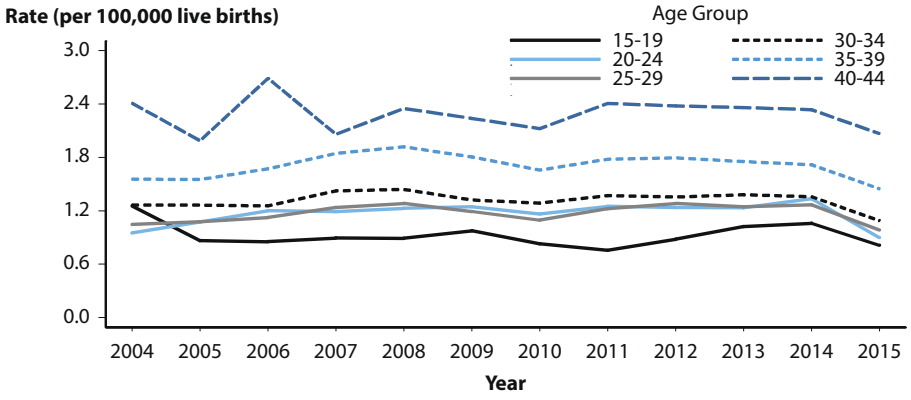
Ectopic Pregnancy

Ectopic pregnancy is a potentially life-threatening condition that requires prompt evaluation and treatment. Up until the early 1990's, a primary data source used to estimate the incidence of ectopic pregnancy was the National Hospital Discharge Survey, a sample of inpatient discharge records from select hospitals. However, the ability to ascertain the number of ectopic pregnancies occurring in the United States has been affected by a shift in clinical management from an inpatient to an outpatient event, making national surveillance data sources unreliable. As a result, alternative surveillance methods, including data from large administrative claims,[26,27] are needed to evaluate trends and assess the continued public health burden of this condition. Data from MarketScan Commercial Claims and Encounters Database, a large administrative claims database of United States commercial health plans, indicate that rates of ectopic pregnancy increased with age and that trends in the rate of ectopic pregnancy among women with live births aged 15–44 years during the period of 2004–2014 were relatively stable across all age groups. However, a potential deflection in the trend is observed from 2014–2015 across all 5-year age groups, for which additional years of data are needed to appropriately assess (Figure C). As in previous years, in 2015, rates of ectopic pregnancy were highest among women in the 35–39 and 40–44 year age groups.

Chlamydia

Chlamydial infections in women are usually asymptomatic and screening is necessary to identify most infections. Routine chlamydia screening of sexually-active young women has been recommended by the CDC since 1993.[28] Rates of reported cases of chlamydia among women increased steadily from the early 1990s, likely reflecting expanded screening coverage and use of more sensitive diagnostic tests (Figure 1, Table 1). During 2011–2013, chlamydia case rates decreased from 643.4 to 619.0 cases per 100,000 females and then increased 6.2% over the next 3 years, resulting in a rate of 657.3 cases per 100,000 females in 2016 (Table 4).

Figure C. Ectopic Pregnancy — Rates Among Commercially Insured Women with Live Births Aged 15–44 Years by Age Group, 2004–2015



SOURCE: MarketScan Commercial Claims and Encounters Database, Truven Health Analytics, Ann Arbor, MI, 2004–2015.

Chlamydia rates are highest among young women, the population targeted for screening (Figure 5, Table 10). During 2015–2016, rates of reported chlamydia cases increased 2.8% and 0.4% among females aged 15–19 and 20–24 years, respectively. Regionally, chlamydia case rates were highest among women in the South, with a rate of 718.6 cases per 100,000 females in 2016 (Table 4). Rates of reported chlamydia cases exceeded gonorrhea case rates among women in all regions (Figures D and E, Tables 4 and 15).

Chlamydia Positivity in Selected Populations

The STD Surveillance Network (SSuN) is an ongoing collaboration of state, county, and city health departments from 10 participating jurisdictions where demographic, clinical, and laboratory data are collected from women aged 15–44 years attending facilities that provide family planning and reproductive health services (See Section A2.2 of the Appendix). Figure F shows chlamydia testing and positivity reported only among facilities that tested more than 100 women and more than 60% of young women aged 14–24 years. In 2016, the overall positivity of chlamydia among women aged 14–24 years was 8.4%, but for women 14–19 years of age, chlamydia positivity was 9.4%. For women between the ages of 14–24 years, chlamydia positivity among non-Hispanic Blacks was almost twice that of non-Hispanic Whites or Hispanics.

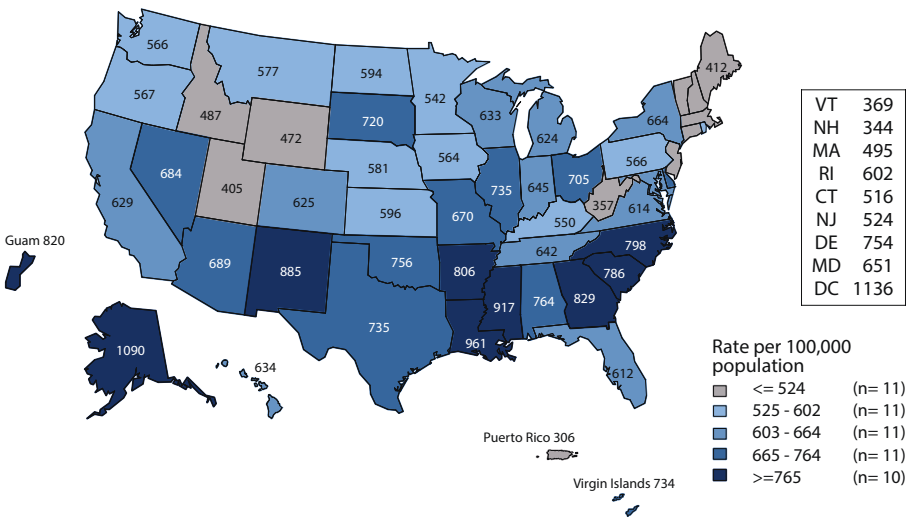
Gonorrhea

Like chlamydia, gonorrhea is often asymptomatic in women. Therefore, 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, rates of reported gonorrhea cases 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. However, more recently, there have been increases in overall cases. (Figure 12, Table 1).

After reaching a 40-year low in 2009 (104.5 cases per 100,000 females), the rate of reported cases of gonorrhea for women increased slightly each year during 2009–2011, and then decreased during 2012–2014 (Figure 13). During 2015–2016, the gonorrhea rate among women increased 13.8% to 121.0 cases per 100,000 females (Figure 13, Table 15).

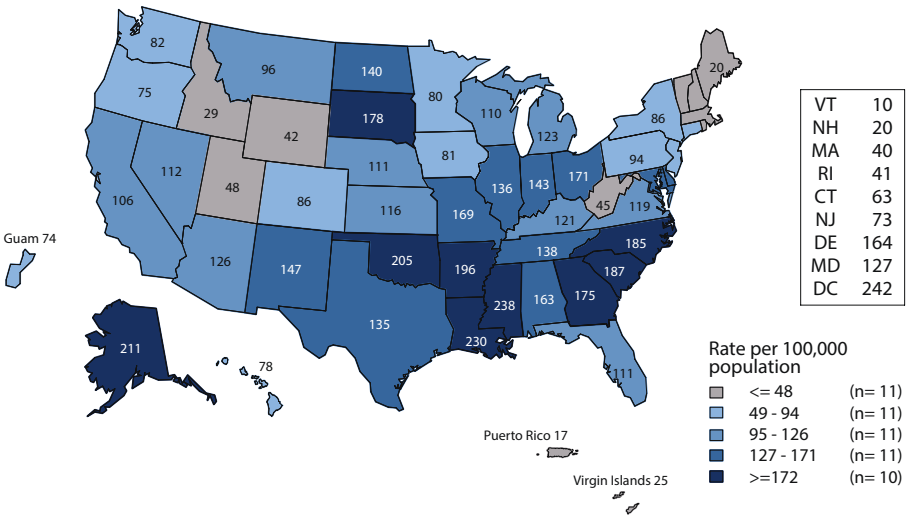
The gonorrhea case rate among women was slightly higher than the rate among men during 2007–2012; however, the rate among men was higher than the rate among women during 2013–2016 (Figure 13, Tables 15 and 16). During 2012–2016, gonorrhea rates among women were highest among those aged 15–24

Figure D. Chlamydia — Rates of Reported Cases Among Women by State, United States and Outlying Areas, 2016



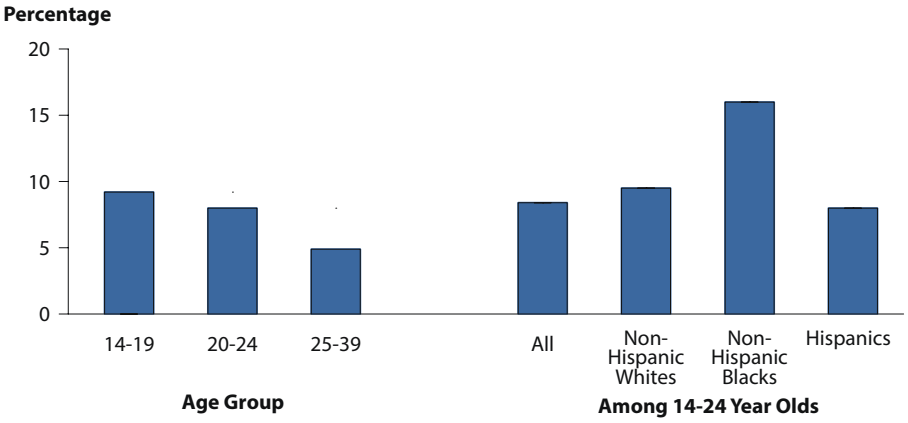
NOTE: The total rate of reported cases of chlamydia among women in the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 653.6 per 100,000 females.

Figure E. Gonorrhea — Rates of Reported Cases Among Women by State, United States and Outlying Areas, 2016



NOTE: The total rate of reported cases of gonorrhea among women in the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 119.8 per 100,000 females.

Figure F. Chlamydia — Positivity* Among Women Aged 14–39 Years by Race/Ethnicity and Age Group in Clinics† Providing Family Planning and Reproductive Health Services, STD Surveillance Network (SSuN), 2016



* Positivity represents the overall average of the mean value by jurisdiction.
† Only clinics that tested >100 women for chlamydia and those with testing coverage >60% were included (n = 58).
NOTE: See section A2.2 in the Appendix for SSuN methods.

years (Figure 17, Table 21). For women in this age group, rates were highest among 19-year olds in 2016 (736.2 cases per 100,000 females) (Table 23).

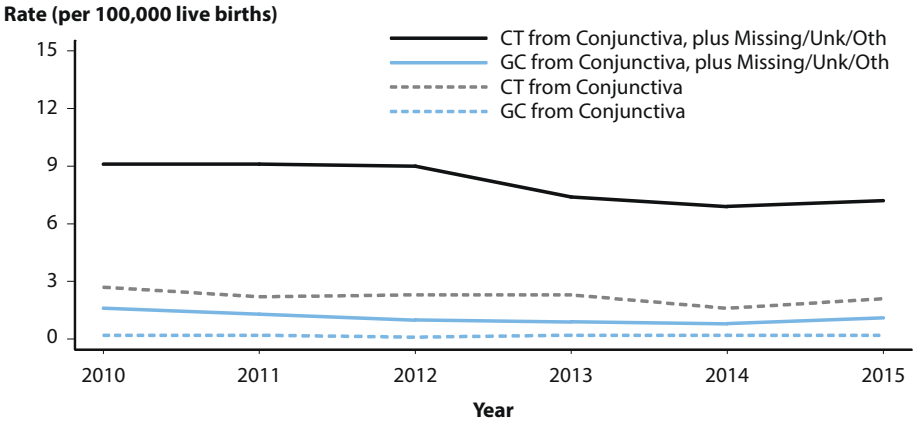
Neonatal Conjunctivitis

During 2010–2015, 563 chlamydia or gonorrhea cases among infants aged <1 year with a specimen source of either 'eye' or 'conjunctiva' (conjunctivitis infections) were reported to CDC.[29] During 2010–2014, the overall reported rate of chlamydial conjunctivitis in infants decreased by 40.7% (2.7 to 1.6 cases per 100,000 live births), followed by an increase of 31.2% during 2014–2015 to 2.1 cases per 100,000 live births (Figure G). The rate of gonococcal conjunctivitis in infants remained relatively constant and low during 2010–2015, at 0.2 cases or less per 100,000 live births each year. The rate of reported cases is heavily influenced by the completeness of reported data on specimen source. Of all cases reported to CDC of chlamydia or gonorrhea in infants aged <1 year during 2010–2015 (n=3,703), nearly 85% did not have a specimen source of either 'eye' or 'conjunctiva'; of those, 52% had a specimen source of 'unknown' (40.1%), 'other-not specified' (8.7%), or was missing (3.2%). When evaluating rates including these cases, the rate of chlamydia and gonorrhea infections follows similar trends but is higher in all years, indicating potential missed cases for surveillance (Figure G).

Congenital Syphilis

Trends in congenital syphilis usually follow trends in primary and secondary (P&S) syphilis among women (Figure 44). After plateauing at a relatively low rate (0.9 cases per 100,000 females) during 2011–2013, the rate of reported P&S syphilis cases has increased each year since then. During 2015–2016, the rate among women increased 35.7% to 1.9 cases per 100,000 females (Figure 44, Table 28).

Figure G. Chlamydia and Gonorrhea — Rates of Reported Cases Among Infants <1 Year of Age by Year and Specimen Source, United States, 2010–2015



NOTE: CT = Chlamydia; GC = Gonorrhea.
SOURCE: Kreisel, K, Weston, E, Braxton, et al. Keeping an eye on chlamydia and gonorrhea conjunctivitis in infants in the United States, 2010–2015. Sex Transm Dis 2017; 44(6): 356–358.

Similarly, the rate of reported congenital syphilis cases has increased each year since 2012 (Figure 44, Table 1). In 2016, there were 628 reported cases of congenital syphilis and the national congenital syphilis rate was 15.7 cases per 100,000 live births, the highest rate reported since 1998. This increase in 2016 represents a 27.6% increase relative to 2015 and an 86.9% increase relative to 2012 (Table 41).

In 2016, the highest rates of P&S syphilis among women and the highest rates of congenital syphilis were observed in the West and in the South (Figures H and I, Tables 28 and 41). The P&S syphilis rates among women increased in every region during 2015–2016. During 2015–2016, the largest increases in the P&S syphilis rates among women were seen in the West (58.8%), followed by the Northeast (28.6%), South (22.2%), and Midwest (20.0%). The congenital syphilis rate increased 42.1% in the Northeast, 41.4% in the West, and 23.6% in the South, and remained stable in the Midwest during 2015–2016 (Table 41).

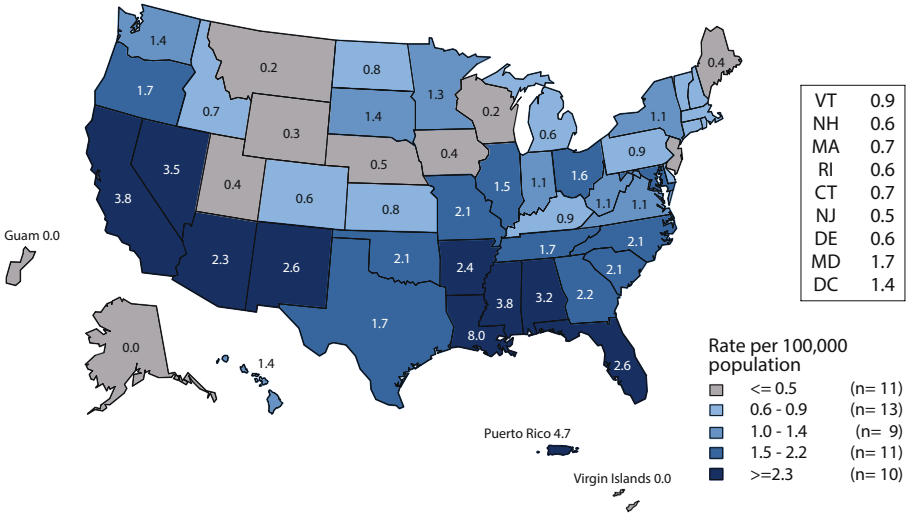
Although most cases of congenital syphilis occur among infants whose mothers have had some prenatal care, late or limited prenatal care has been associated with congenital syphilis. Failure of health care providers to adhere to maternal syphilis screening recommendations also contributes to the occurrence of congenital syphilis.[17]

Neonatal Herpes Simplex Virus

Neonatal HSV infections, although relatively rare, cause significant morbidity and mortality.[18] Most neonatal HSV infections result from perinatal transmission from mother to neonate,[20] but postnatal infection can occur.[30] Although reporting of neonatal HSV infection is required in a few jurisdictions,[31,32] it is not a nationally reportable disease.

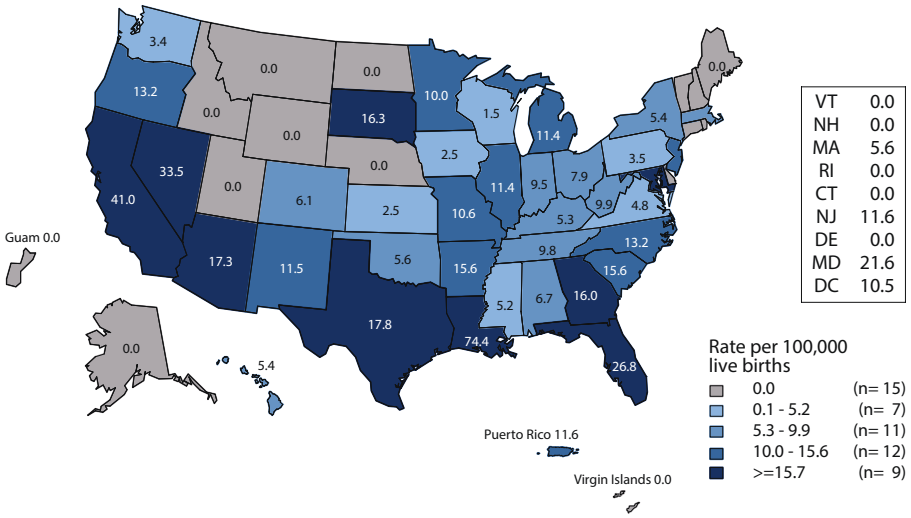
An examination of inpatient records of infants aged 60 days or younger at admission using the Healthcare Cost and Utilization Project Kid's Inpatient Database showed an overall incidence of 9.6 cases per 100,000 live births in 2006.[33] Rates did not vary significantly by region or race/ethnicity; however prevalence was significantly higher among cases for which the expected primary payer was Medicaid (15.1 cases per 100,000 live births) compared with private insurance or managed

Figure H. Primary and Secondary Syphilis — Rates of Reported Cases Among Women by State, United States and Outlying Areas, 2016



NOTE: The total rate of reported cases of primary and secondary syphilis among women in the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 1.9 per 100,000 females.

Figure I. Congenital Syphilis — Rates of Reported Cases Among Infants by Year of Birth and State, United States and Outlying Areas, 2016



NOTE: The total rate of reported cases of congenital syphilis for infants by year of birth for the United States and outlying areas (Guam, Puerto Rico, and Virgin Islands) was 15.7 per 100,000 live births.

health care (5.4 cases per 100,000 live births).

In New York City, 76 cases of neonatal HSV infection were identified through population-based surveillance during a 4.5 year period (April 2006–September 2010), for an average annual incidence of 13.3 cases per 100,000 live births.[34] Forty-one percent of the confirmed cases were infected with HSV type 1. A review of certificates of death or stillbirth issued in New York City during 1981–2013 identified 34 deaths due to neonatal HSV infection, or 0.82 deaths per 100,000 live births.[33]

For information on adolescent and adult HSV infections, see Other STDs.

References

1. Jolly DH, Mueller MP, Chen M, et al. Concurrency and other sexual risk behaviors among black young adults in a southeastern city. AIDS Educ Prev 2016; 28(1):59–76.
2. Dolwick Grieb SM, Davey-Rothwell M, Latkin CA. Concurrent sexual partnerships among urban African American high risk women with main sex partners. AIDS Behav 2012; 16(2):323–333. DOI: 10.1007/s10461-011-9954-6.
3. Hogben M, Leichliter JS. Social determinants and sexually transmitted disease disparities. Sex Transm Dis 2008; 35(12):S13–S18.
4. Kelly J, Cohen J, Grimes B, et al. High rates of herpes simplex virus type 2 infection in homeless women: informing public health strategies. J Womens Health (Larchmt) 2016; 25(8):840–845. DOI: 10.1089/jwh.2015.5579.
5. Tschann JM, Flores E, de Groat CL, et al. Condom negotiation strategies and actual condom use among Latino youth. J Adolesc Health 2010; 47(3):254–262. DOI: 10.1016/j.jadohealth.2010.01.018.
6. Pulerwitz J, Amaro H, De Jong W, et al. Relationship power, condom use and HIV risk among women in the USA. AIDS Care 2002; 14(6):789–800.
7. McCree DH, Rompalo A. Biological and behavioral risk factors associated with STDs/HIV in women: implications for behavioral interventions. In: Aral SO, Douglas JM, Lipshutz JA, eds. Behavioral Interventions for Prevention and Control of Sexually Transmitted Diseases. New York, NY: Springer; 2007:310–324.
8. Swartzendruber A, Zenilman JM, Niccolai LM, et al. It takes 2: partner attributes associated with sexually transmitted infections among adolescents. STD 2013; 40(5):372–378.
9. Haggerty CL, Gottlieb SL, Taylor BD, et al. Risk of sequelae after Chlamydia trachomatis genital infection in women. J Infect Dis 2010; 201:S134–S155.
10. Oakeschott, P, Kerry S, Aghaizu A, et al. Randomised controlled trial of screening for Chlamydia trachomatis to prevent pelvic inflammatory disease: the POPI (prevention of pelvic infection) trial. BMJ 2010; 340:c1642.
11. Price MJ, Ades AE, De Angelis D, et al. Risk of pelvic inflammatory following Chlamydia trachomatis infection: analysis of prospective studies with a multistate model. Am J Epidemiol 2013; 178(3):484–492.
12. Tsevat DG, Wiesenfeld HC, Parks C, et al. Sexually transmitted diseases and infertility. Am J Obstet Gynecol 2017; 216(1):1–9.
13. Ness RB, Trautmann G, Richter HE, et al. Effectiveness of treatment strategies of some women with pelvic inflammatory disease: A randomized trial. Obste Gyneco 2005; 106(3):573–580.

14. Gottlieb SL, Xu F, Brunham RC. Screening and treating chlamydia genital infections to prevent PID: interpretation of findings from randomized controlled trials. Sex Transm Dis 2013; 40(2):97–102.

15. Markowitz LE, Dunne EF, Saraiya M, et al. Human papillomavirus vaccination. Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR Morb Mortal Wkly Rep 2014; 63(RR05):1–30.

16. Kohlhoff, SA, Hammerschlag, MR. Gonococcal and chlamydial infections in infants and children. In: Sexually Transmitted Diseases. 4th ed. New York, NY: McGraw Hill; 2007:1613–1627.

17. Centers for Disease Control and Prevention. Congenital syphilis — United States, 2003–2008. MMWR Morb Mortal Wkly Rep 2010; 59(14):413–417.

18. Kimberlin DW. Herpes simplex virus infections of the newborn. Semin Perinatol 2007; 31(1):19–25.

19. Kimberlin DW. The scarlet H. J Infect Dis 2014; 209(3):315–317.

20. Corey L, Wald A. Maternal and neonatal herpes simplex virus infections. N Engl J Med 2009; 361(14):1376–1385.

21. Sutton MY, Sternberg M, Zaidi A, et al. Trends in pelvic inflammatory disease hospital discharges and ambulatory visits, United States, 1985–2001. Sex Transm Dis 2005; 32(12):778–784.

22. Bohm MK, Newman L, Satterwhite CL, et al. Pelvic inflammatory disease among privately insured women, United States, 2001–2005. Sex Transm Dis 2010; 37(3):131–136.

23. Whiteman MK, Kuklina E, Jamieson DJ, et al. Inpatient hospitalization for gynecologic disorders in the United States. Am J Obstet Gynecol 2010; 202(6):541.e1–6.

24. Owusu Edusei K Jr, Bohm MK, Chesson HW, et al. Chlamydia screening and pelvic inflammatory disease: Insights from exploratory time-series analyses. Am J Prev Med 2010; 38(6):652–657.

25. Leichliter JS., Chandra A., Aral SO. Correlates of self-reported pelvic inflammatory disease treatment in sexually experienced reproductive-aged women in the United States, 1995 and 2006–2010. Sex Transm Dis 2013; 40(5):413–418.

26. Trabert B, Holt VL, Yu O, et al. Population-Based ectopic pregnancy trends, 1993–2007. Am J Prev Med 2011; 40(5):556–560.

27. Hoover KW, Tao G, Kent CK. Trends in the diagnosis and treatment of ectopic pregnancy in the United States. Obstet Gynecol 2010; 115(3):495–502.

28. Centers for Disease Control and Prevention. Recommendations for the prevention and management of Chlamydia trachomatis infections, 1993. MMWR Morb Mortal Wkly Rep 1993; 42(RR-12):1–39.

29. Kreisel, K, Weston, E, Braxton, et al. Keeping an eye on chlamydia and gonorrhea conjunctivitis in infants in the United States, 2010–2015. Sex Transm Dis 2017; 44(6): 356–358.

30. Centers for Disease Control and Prevention. Neonatal herpes simplex virus infection following Jewish ritual circumcisions that included direct orogenital suction — New York City, 2000–2011. MMWR Morb Mortal Wkly Rep 2012; 61(22):405–409.

31. Dinh T-H, Dunne EF, Markowitz LE, et al. Assessing neonatal herpes reporting in the United States, 2000–2005. Sex Transm Dis 2008; 35(1):19–21.

32. Handel S, Klingler EJ, Washburn K, et al. Population-based surveillance for neonatal herpes in New York City, April 2006–September 2010. Sex Transm Dis 2011; 38(8):705–711.

33. Flagg EW, Weinstock H. Incidence of neonatal herpes simplex virus infections in the United States, 2006. Pediatrics 2011; 127(1):e1–8.

34. Sampath A, Maduro G, Schillinger JA. Infant deaths due to herpes simplex virus, congenital syphilis, and HIV in New York City. Pediatrics 2016; 137(4):e20152387.

STDs in Adolescents and Young Adults

Public Health Impact

Incidence and prevalence estimates suggest that young people aged 15–24 years acquire half of all new STDs[1] and that one in four sexually active adolescent females has 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. Cervical ectopy refers to columnar cells, which are typically found within the cervical canal, located on the outer surface of the cervix. Although this is a normal finding in adolescent and young women, these cells are more susceptible to infection. The higher prevalence of STDs among adolescents may also reflect multiple barriers to accessing quality STD prevention and management services, including inability to pay, lack of transportation, long waiting times, conflict between clinic hours and work and school schedules, embarrassment attached to seeking STD services, method of specimen collection, and concerns about confidentiality (e.g., Explanation of Benefits for services received mailed to parents or guardians).[3]

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.[4] Interventions for at-risk adolescents and young adults that address underlying aspects of the social and cultural conditions affecting sexual risk-taking behaviors are needed, as are strategies designed to improve the underlying social conditions themselves.[5,6] In addition, in designing STD programs, consideration should be given to the needs of adolescent and young adult populations including extended hours, optimizing privacy in waiting rooms, and urine based specimen collection.[3]

Observations

Chlamydia

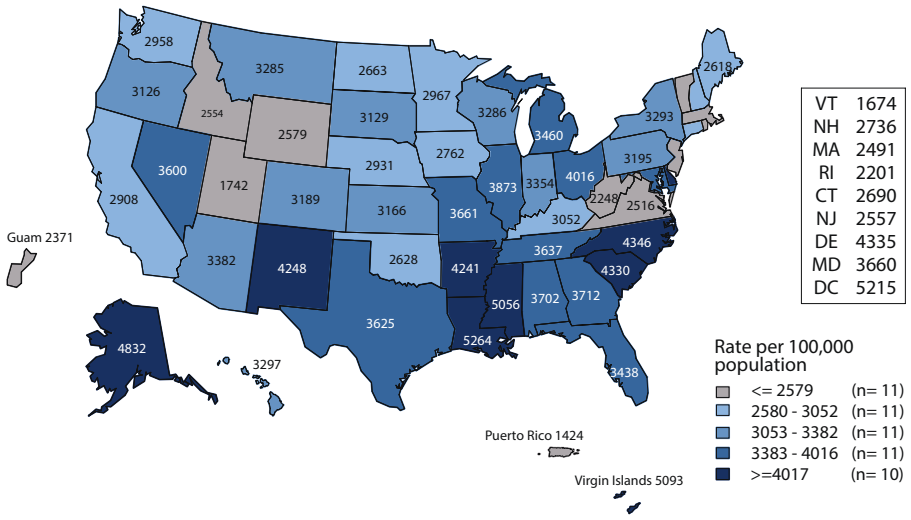
In 2016, there were 1,008,403 reported cases of chlamydial infection among persons aged 15–24 years, representing 63.1% of all reported chlamydia cases. Among those aged 15–19 years, the rate of reported cases of chlamydia increased 4.0% during 2015–2016 (1,854.2 to 1,929.2 cases per 100,000 population) (Table 10). Among those aged 20–24 years, the rate increased 1.9% during 2015–2016 (2,594.5 to 2,643.8 cases per 100,000 population) (Table 10).

Among women aged 15–24 years, the population targeted for chlamydia screening, the overall rate of reported cases of chlamydia was 3,437.5 cases per 100,000 females. Among men aged 15–24 years, the overall rate of reported cases of chlamydia was 1,209.6 cases per 100,000 males. Rates varied by state for both males and females, with the majority of states having the highest reported case rates in the South (Figures J and K).

15–19 Year Old Females — In 2016, the rate of reported chlamydia cases among women aged 15–19 years was 3,070.9 cases per 100,000 females, a 2.8% increase from the 2015 rate of 2,986.5 cases per 100,000 females (Table 10). Increases in rates of reported cases of chlamydia during 2015–2016 were largest among 16–year old and 18–year old women (3.4% and 4.1% increases, respectively) (Table 12). During 2012–2016, the overall rate of reported cases for women aged 15–19 years decreased 7.8% (Table 10).

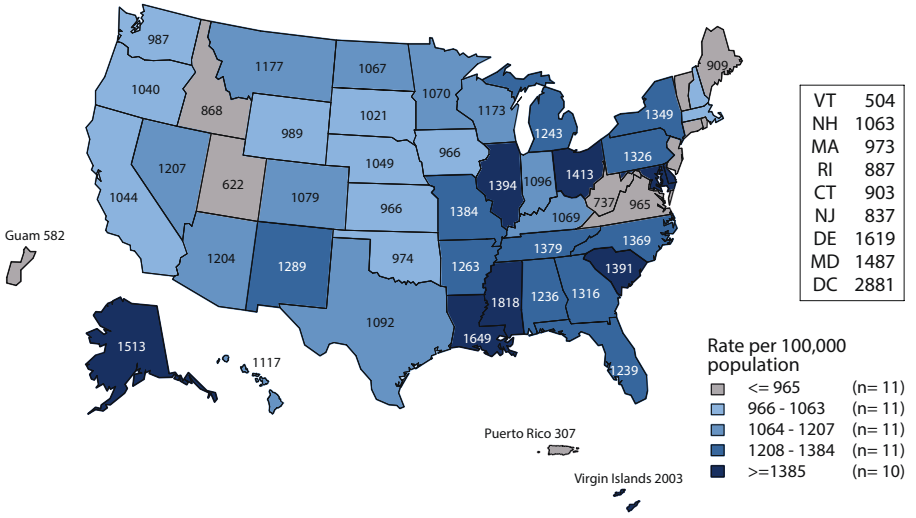
20–24 Year Old Females — In 2016, women aged 20–24 years had the highest rate of reported chlamydia

Figure J. Chlamydia — Rates of Reported Cases Among Women Aged 15–24 Years by State, United States and Outlying Areas, 2016



NOTE: Rates for Guam and the Virgin Islands were calculated by using the 2010 population estimates (see Section A1.2 in the Appendix).

Figure K. Chlamydia — Rates of Reported Cases Among Men Aged 15–24 Years by State, United States and Outlying Areas, 2016



NOTE: Rates for Guam and the Virgin Islands were calculated by using the 2010 population estimates (see Section A1.2 in the Appendix).

cases (3,779.0 cases per 100,000 females) compared with any other age group for either sex (Figure 5, Table 10). During 2015–2016, the overall rate of reported chlamydia cases among women in this age group remained relatively stable; however, this rate increased 4.1% during 2012–2016 (Table 10).

15–19 Year Old Males — In 2016, the rate of reported chlamydia cases among men aged 15–19 years was 832.6 cases per 100,000 males, an 8.6% increase from 2015. During 2012–2016, the rate of reported chlamydia cases for men aged 15–19 years increased 6.0% (Table 10).

20–24 Year Old Males — In 2016, as in previous years, men aged 20–24 years had the highest rate of reported chlamydia cases among all men (1,558.6 cases per 100,000 males). The rate for men in this age group increased 5.5% during 2015–2016 (Table 10). Similarly, during 2012–2016, the rate for men aged 20–24 years increased 17.8% (Table 10).

Gonorrhea

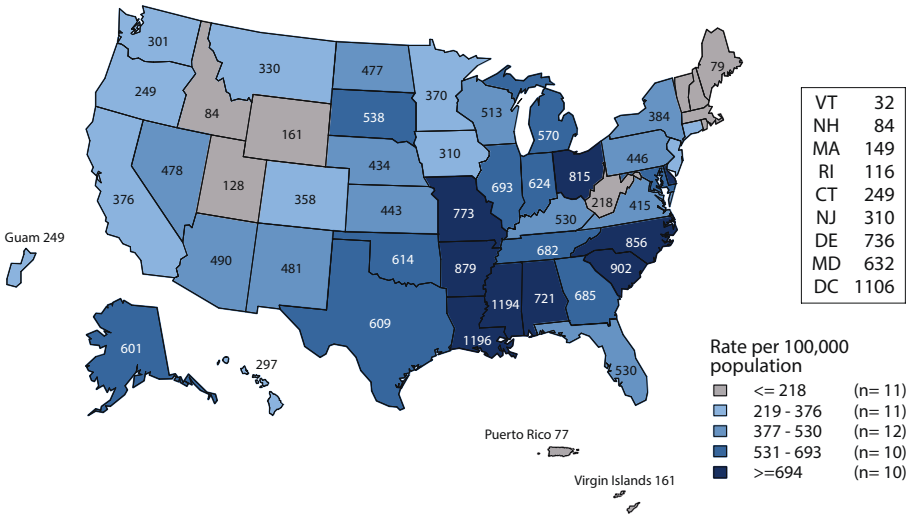
During 2015–2016, the rate of reported gonorrhea cases increased 11.3% for persons aged 15–19 years and 10.9% for persons aged 20–24 years (Table 21). In 2016, among women aged 15–24 years, the rate was 540.8 cases per 100,000 females and among men aged 15–24 years, the rate was 455.3 cases per 100,000 males. For both women and men, rates varied by state. The majority of states with the highest reported case rates were in the South (Figures L and M).

15–19 Year Old Females — In 2016, women aged 15–19 years had the second highest rate of reported gonorrhea cases (482.1 cases per 100,000 females) compared with other age groups among women (Figure 17, Table 21). During 2015–2016, the rate of reported gonorrhea cases for women in this age group increased 9.3% and decreased 8.6% during 2012–2016 (Table 21).

20–24 Year Old Females — In 2016, women aged 20–24 years had the highest rate of reported gonorrhea cases (595.5 cases per 100,000 females) compared with other age groups among women (Figure 17, Table 21). During 2015–2016, the rate of reported gonorrhea for women in this age group increased 7.9% and 4.8% during 2012–2016 (Table 21).

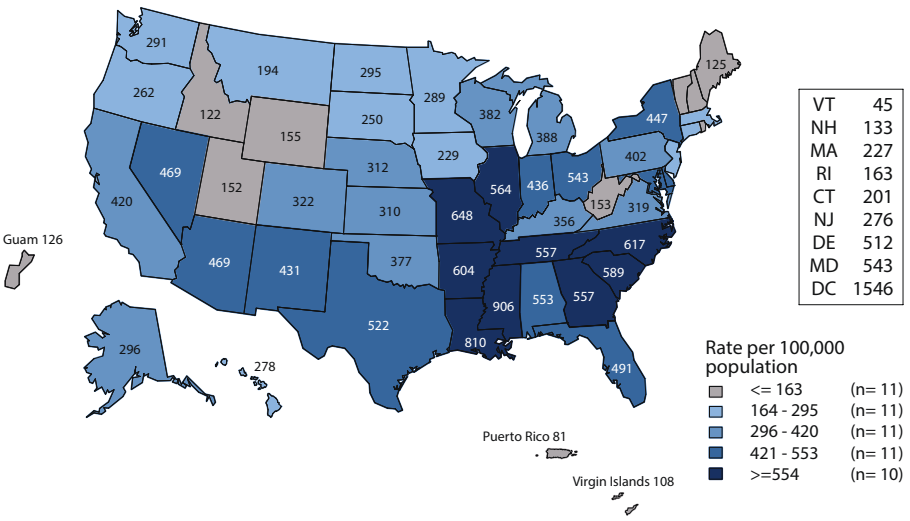
15–19 Year Old Males — In 2016, the rate of reported gonorrhea cases among men aged 15–19 years was

Figure L. Gonorrhea — Rates of Reported Cases Among Women Aged 15–24 Years by State, United States and Outlying Areas, 2016



NOTE: Rates for Guam and the Virgin Islands were calculated by using the 2010 population estimates (see Section A1.2 in the Appendix).

Figure M. Gonorrhea — Rates of Reported Cases Among Men Aged 15–24 Years by State, United States and Outlying Areas, 2016



NOTE: Rates for Guam and the Virgin Islands were calculated by using the 2010 population estimates (see Section A1.2 in the Appendix).

280.8 cases per 100,000 males (Figure 17, Table 21). During 2015–2016, the rate of reported gonorrhea cases for men in this age group increased 14.8% and 15.8% during 2012–2016 (Table 21).

20–24 Year Old Males — In 2016, as in previous years, men aged 20–24 years had the highest rate of reported gonorrhea cases (616.8 cases per 100,000 males) compared with any other age group for either sex (Figure 17, Table 21). During 2015–2016, the rate of reported gonorrhea for men in this age group increased 13.7% and 36.1% during 2012–2016 (Table 21).

Primary and Secondary Syphilis

During 2015–2016, the rate of reported primary and secondary (P&S) syphilis cases increased 13.0% among persons aged 15–19 years and 8.1% among persons aged 20–24 years (Table 34).

15–19 Year Old Females — The rate of reported P&S syphilis cases among women aged 15–19 years decreased each year during 2009–2013 (from 3.3 to 1.9 cases per 100,000 females) (Figure 38, Table 34). However, the rate has subsequently increased each year since then. During 2015–2016, the rate increased 22.2%, from 2.7 to 3.3 cases per 100,000 females (Figure 38, Table 34).

20–24 Year Old Females — In 2016, women aged 20–24 years had the highest rate of P&S syphilis (6.7 cases per 100,000 females) compared with other age groups among women (Figure 37, Table 34). The P&S syphilis rate among women in this age group has increased each year since 2011 (Figure 38, Table 34). During 2015–2016, the rate increased 28.8%.

15–19 Year Old Males — In 2016, the rate of reported P&S syphilis cases among men aged 15–19 years was 8.9 cases per 100,000 males (Figure 37, Table 34). The P&S syphilis rate among men in this age group has increased each year since 2011 (Figure 39, Table 34). During 2015–2016, the rate increased 11.3%.

20–24 Year Old Males — In 2016, men aged 20–24 years had the second highest rate of reported P&S syphilis (37.9 cases per 100,000 males) compared with any other age group for either sex (Figure 37, Table 34). The P&S syphilis rate among men in this age group has increased each year since 2006 (Figure 39, Table 34). During 2015–2016, the rate increased 5.6%.

National Job Training Program

The National Job Training Program (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*.

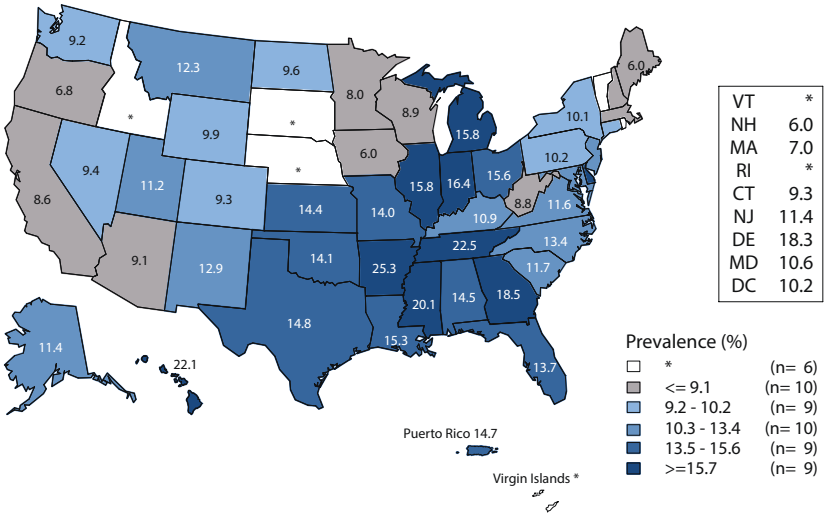
To increase the stability of the estimates, chlamydia or gonorrhea prevalence data are presented when valid test results for 100 or more students per year are available for the population subgroup and state. Additional information about NJTP can be found in Section A2.1 in the Appendix.

Among women entering the program in 45 states, the District of Columbia, and Puerto Rico, the median state-specific chlamydia prevalence in 2016 was 11.4% (range: 6.0% to 25.3%) (Figure N). Among men entering the program in 49 states, the District of Columbia, and Puerto Rico, the median state-specific chlamydia prevalence was 7.1% (range: 2.4% to 12.9%) (Figure O).

Among women entering the program in 45 states, the District of Columbia, and Puerto Rico, the median state-specific gonorrhea prevalence in 2016 was 2.0% (range: 0.0% to 6.7%) (Figure P). Among men entering the

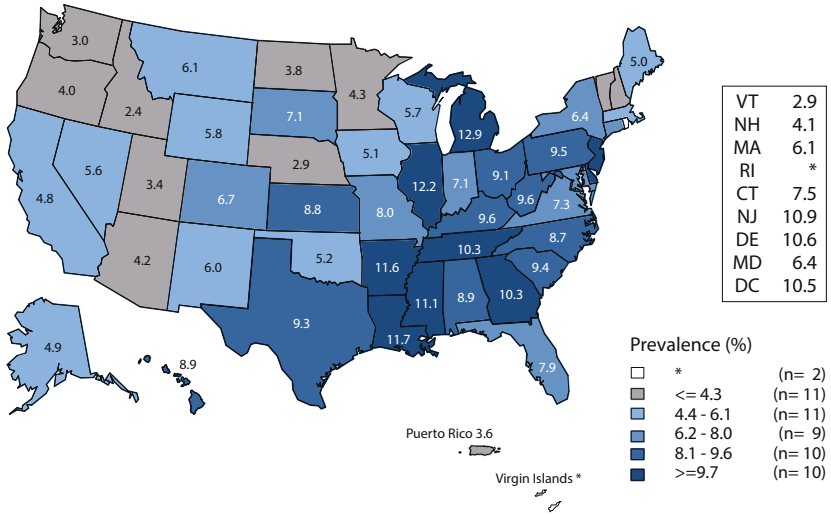
* Laboratory tests are conducted by the Center for Disease Detection, LLC San Antonio, Texas.

Figure N. Chlamydia — Prevalence Among Women Aged 16–24 Years Entering the National Job Training Program (NJTP) by State of Residence, United States and Outlying Areas, 2016



* Fewer than 100 women who resided in these states/areas and entered the NJTP were screened for chlamydia in 2016.
NOTE: See Section A2.1 in the Appendix for more information regarding NJTP methods.

Figure O. Chlamydia — Prevalence Among Men Aged 16–24 Years Entering the National Job Training Program (NJTP) by State of Residence, United States and Outlying Areas, 2016



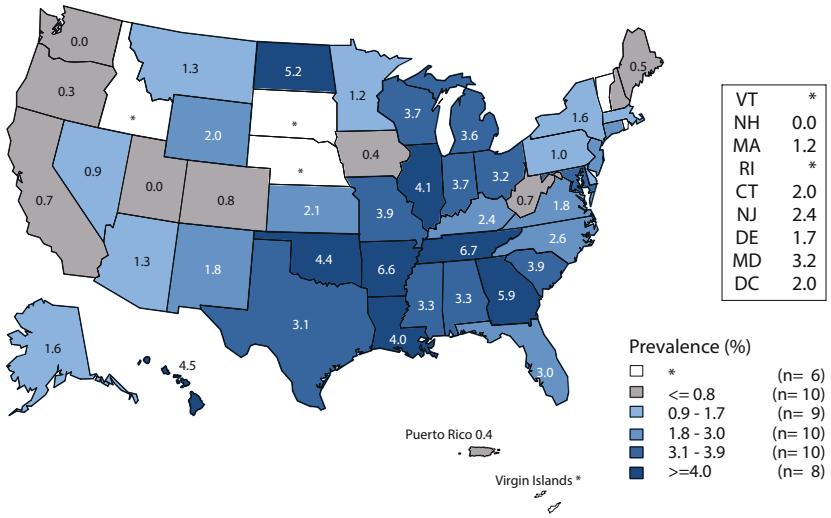
* Fewer than 100 men who resided in these states/areas and entered the NJTP were screened for chlamydia in 2016.
NOTE: See Section A2.1 in the Appendix for more information regarding NJTP methods.

program in 44 states and Puerto Rico, the median state-specific gonorrhea prevalence was 0.5% (range: 0.0% to 2.7%) (Figure Q).

Adolescents and Young Adults Summary

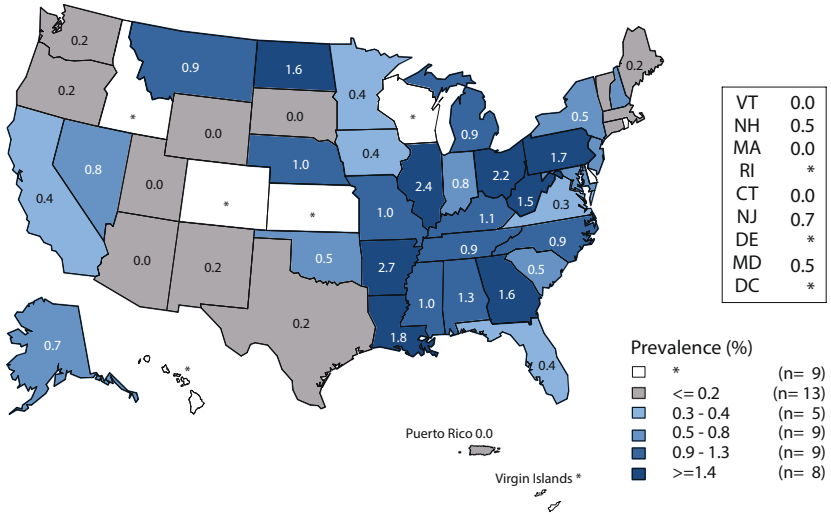
The rate of reported cases of chlamydia, gonorrhea, and P&S syphilis increased for both sexes in both the adolescent (15–19 years) and young adult (20–24 years) age groups during 2012–2016. For chlamydia, rates of reported cases are consistently highest among women aged 15–24 years, likely reflecting targeted screening of young women; however, the rate of reported chlamydia in males increased 14.0% during 2012–2016, while the rate in females decreased 1.4%. Similarly, in 2016, the rate of reported cases of gonorrhea in females aged 15–24 years was higher than in men of the same age group; however, during 2012–2016, the rate of reported gonorrhea in males aged 15–24 years increased 29.9%, while the rate in females decreased 1.4%. Increases in chlamydia and gonorrhea diagnoses among men likely reflect a combination of increased screening among young men, including extra-genital screening, and increased incidence. Conversely, rates of reported cases of P&S syphilis have been consistently higher among adolescent and young adult men compared to women, and during 2012–2016, rates of reported P&S syphilis cases increased substantially in both adolescent and young adult males and females, with 54.2% and 64.5% increases, respectively.

Figure P. Gonorrhea — Prevalence Among Women Aged 16–24 Years Entering the National Job Training Program (NJTP) by State of Residence, United States and Outlying Areas, 2016



* Fewer than 100 women who resided in these states/areas and entered the NJTP were screened for gonorrhea in 2016.
NOTE: See Section A2.1 in the Appendix for more information regarding NJTP methods.

Figure Q. Gonorrhea — Prevalence Among Men Aged 16–24 Years Entering the National Job Training Program (NJTP) by State of Residence, United States and Outlying Areas, 2016



* Fewer than 100 men who resided in these states/areas and entered the NJTP were screened for gonorrhea in 2016.
NOTE: See Section A2.1 in the Appendix for more information regarding NJTP methods.

References

1. Satterwhite CL, Torrone E, Meites E, et al. Sexually transmitted infections among US women and men: prevalence and incidence estimates, 2008. Sex Trans Dis 2013; 40(3)187–193.
2. Forhan SE, Gottlieb SL, Sternberg MR, et al. Prevalence of sexually transmitted infections among female adolescents aged 14 to 19 in the United States. Pediatrics 2009; 124(6):1505–1512.
3. Tilson EC, Sanchez V, Ford CL, et al. Barriers to asymptomatic screening and other STD services for adolescents and young adults: focus group discussions. BMC Public Health 2004; 4(1):21.
4. DiClemente RJ, Salazar LF, Crosby RA. A review of STD/HIV preventive interventions for adolescents: sustaining effects using an ecological approach. J Pediatr Psychol 2007; 32(8):888–906.
5. Sieving RE, Bernat DH, Resnick MD, et al. A clinic-based youth development program to reduce sexual risk behaviors among adolescent girls: prime time pilot study. Health Promot Pract 2012; 13(4):462–471.
6. Upchurch DM, Mason WM, Kusunoki Y, et al. Social and behavioral determinants of self-reported STD among adolescents. Perspect Sex Reprod Health 2004; 36(6):276–287.

This page intentionally left blank.

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.[1,2] Race and Hispanic ethnicity in the United States are population characteristics that are correlated with other factors affecting health status such as unemployment and low educational attainment.[3-5] In 2015, the overall proportion of the United States population living in poverty was 14.7% (or 48.2 million) and decreased slightly from 2014. Although the overall poverty rate is currently stable, many Americans face challenges overcoming inequalities in economic opportunity. The poverty rate in 2015 for Whites was 9.1% (17.7 million), for Blacks it was 24.1% (or 10.0 million), and for Hispanics it was 21.4% (or 13.1 million).[3] Those who cannot afford basic life necessities often have trouble accessing and affording quality sexual health services.[6] People who struggle financially are often experiencing life circumstances that potentially increase their risk for STDs.[6]

Access to quality STD prevention and treatment services is key to reducing STD disparities in the United States. Of the estimated 19 million new cases of sexually transmitted infections that occur each year, approximately half of the cases occur among people aged 15–24 years.[7] Although the overall proportion of adults without health insurance decreased from 13.3% in 2013 to 9.1% (or 29.0 million) in 2015, many people in the United States continue to lack access to health care.[8] Among all races and ethnicities in the United States, Hispanics had the lowest rate of health insurance coverage in 2015 at 83.8%.[8]

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.[9,10] Moreover, the quality of care can differ substantially for minority patients.[11] Inequities in social and economic conditions are reflected in the profound disparities observed in the incidence of STDs among some racial and ethnic minorities.

In communities where STD prevalence is higher because of these factors, persons can experience difficulties reducing their risk for sexually transmitted infections. With each sexual encounter, they can face a greater chance of encountering an infected partner than those in lower prevalence settings.[2] Acknowledging inequities 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 Section A.1 in the Appendix). In many state and local health departments, electronic laboratory reporting is increasingly a primary source of initial case notification. The reports are often missing race and ethnicity of the patient; ascertainment of information on race and Hispanic ethnicity is therefore a function of active follow-up or dependent on previous information available about the patient in existing health department surveillance databases. Prevalence data from population-based surveys, such as the National Health and Nutrition Examination Survey (NHANES) and the National Longitudinal Study of Adolescent Health, confirm the existence of marked STD disparities in some minority populations.[12,13]

Method of Classifying Race and 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. Race/ethnicity data are presented in Office of Management and Budget (OMB) race and ethnicity categories according to the 1997 revised OMB standards.[14] However, the National Center for Health Statistics (NCHS) bridged-race categories are used where OMB categories are not available (i.e., congenital syphilis). As of 2016, all reporting jurisdictions collect and report data in OMB-compliant formats for syphilis, chlamydia, and gonorrhea. Historical trend and rate data by race and Hispanic ethnicity displayed in figures and interpreted in this report for 2012–2016 include only those states and/or reporting jurisdictions (46 jurisdictions for chlamydia, gonorrhea, and syphilis) reporting in the current standard consistently for all years from 2012 through 2016 (See Section A1.5 of the Appendix for additional information on reporting of race and Hispanic ethnicity).

Completeness of Race/ Ethnicity Data in 2016

Chlamydia — 28.8% of chlamydia case reports were missing race or ethnicity data, ranging by jurisdiction from 0.1% to 76.6% (Table A1).

Gonorrhea — 19.0% of gonorrhea case reports were missing information on race or ethnicity, ranging by jurisdiction from 0.1% to 69.9% (Table A1).

Syphilis — 3.8% of all primary and secondary (P&S) syphilis case reports were missing information on race or ethnicity, ranging from no missing cases to 30.4% missing information on race or ethnicity among jurisdictions with 10 or more cases of P&S syphilis (Table A1).

Observations

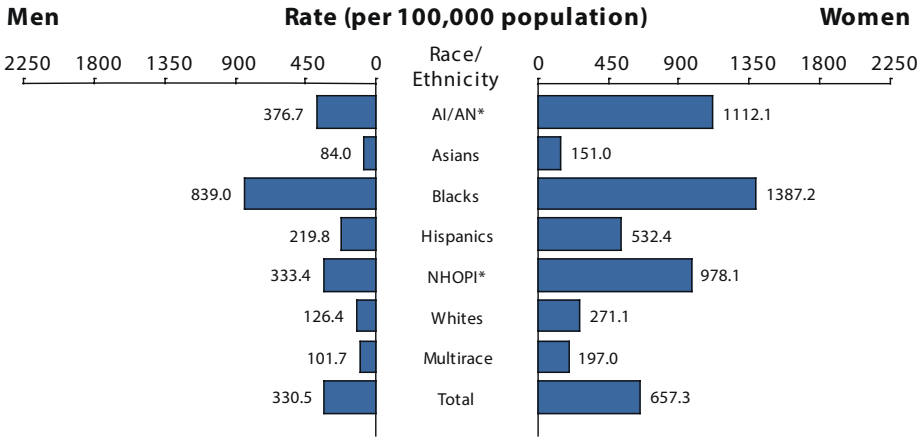
Chlamydia

Among the 46 states that submitted data on race and ethnicity for chlamydia cases each year during 2012–2016 according to the OMB standards, rates of reported chlamydia cases increased during that time frame among Whites (12.7%), Asians (10.2%), Native Hawaiians/Other Pacific Islanders (NHOPI) (8.3%), and Multirace (60.6%), and decreased in American Indians/Alaska Natives (AI/AN) (-6.4%) and Blacks (-3.5%) (Figure 6). Rates were stable among Hispanics during 2012–2016.

In 2016, 50 states and the District of Columbia submitted data on race and ethnicity for chlamydia cases according to the OMB standards.

Blacks — In 2016, the overall rate of reported chlamydia cases among Blacks in the United States was 1,125.9 cases per 100,000 population (Table 11B). The rate of reported chlamydia cases among Black women was 5.1 times the rate among White women (1,387.2 and 271.1 cases per 100,000 females, respectively) (Figure R and Table 11B). The rate of reported chlamydia cases among Black men was 6.6 times the rate among White men (839.0 and 126.4 cases per 100,000 males, respectively). Rates of reported cases of chlamydia were highest for Blacks aged 15–19 and 20–24 years in 2016 (Table 11B). The rate of reported chlamydia cases among Black women aged 15–19 years (6,485.2 cases per 100,000 females) was 4.5 times the rate among White women in the same age group (1,433.3 cases per 100,000 females). The rate of reported chlamydia cases among Black women aged 20–24 years was 3.7 times the rate among White women in the same age group (6,747.6 and 1,836.2 cases per 100,000 females, respectively) (Table 11B).

Figure R. Chlamydia — Rates of Reported Cases by Race/Ethnicity and Sex, United States, 2016



* AI/AN = American Indians/Alaska Natives; NHOPI = Native Hawaiians/Other Pacific Islanders.
NOTE: Includes 50 states and the District of Columbia reporting race/ethnicity data in Office of Management and Budget compliant formats in 2016 (see Section A1.5 in the Appendix).

Similar racial disparities in reported chlamydia rates exist among men. Among men aged 15–19 years, the rate of reported chlamydia cases among Blacks was 8.8 times the rate among Whites (2,337.7 and 266.9 cases per 100,000 males, respectively) (Table 11B). The rate of reported chlamydia cases among Black men aged 20–24 years was 4.9 times the rate among White men of the same age group (3,316.9 and 682.5 cases per 100,000 males, respectively).

American Indians/Alaska Natives — In 2016, the rate of reported chlamydia cases among AI/AN was 749.8 cases per 100,000 population (Table 11B). Overall, the rate of reported chlamydia cases among AI/AN in the United States was 3.8 times the rate among Whites.

Native Hawaiians/Other Pacific Islanders — In 2016, the rate of reported chlamydia cases among NHOPI was 653.4 cases per 100,000 population (Table 11B). The overall rate of reported chlamydia cases among NHOPI was 3.3 times the rate among Whites and 5.5 times the rate among Asians.

Hispanics — In 2016, the rate of reported chlamydia cases among Hispanics was 374.6 cases per 100,000 population, which was 1.9 times the rate among Whites (Table 11B).

Asians — In 2016, the rate of reported chlamydia cases among Asians was 119.3 cases per 100,000 population (Table 11B). The overall rate of reported chlamydia cases among Whites was 1.7 times the rate among Asians.

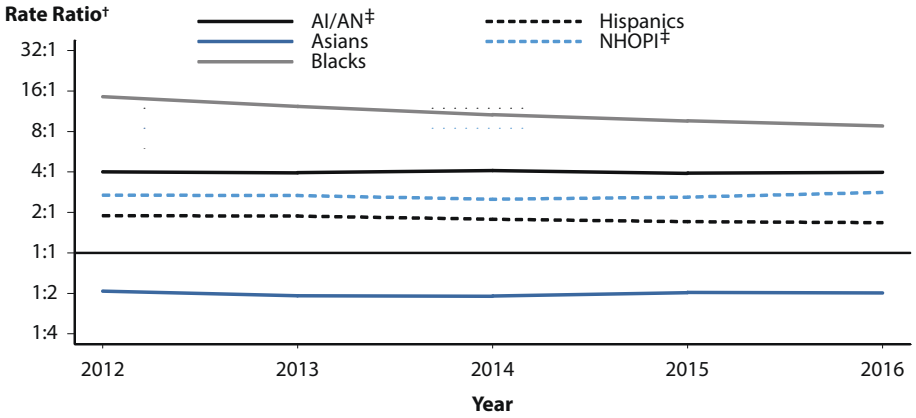
Gonorrhea

Among 46 states submitting race and ethnicity data for gonorrhea cases consistently according to OMB standards each year during 2012–2016, rates of reported gonorrhea cases increased 120.4% among Multirace persons (25.0 to 55.1 cases per 100,000 population), 91.4% among NHOPI (84.4 to 161.5 cases per 100,000 population), 82.5% among Whites (31.4 to 57.3 cases per 100,00 population), 81.3% among AI/AN (125.8 to 228.1 cases per 100,000 population), 76.7% among Asians (16.3 to 28.8 cases per 100,000 population), 61.8% among Hispanics (59.4 to 96.1 cases per 100,000 population), and 10.5% among Blacks (455.3 to 503.2 cases per 100,000 population) (Figure 20).

In 2016, 50 states and the District of Columbia submitted data on race and ethnicity for gonorrhea cases according to the OMB standards.

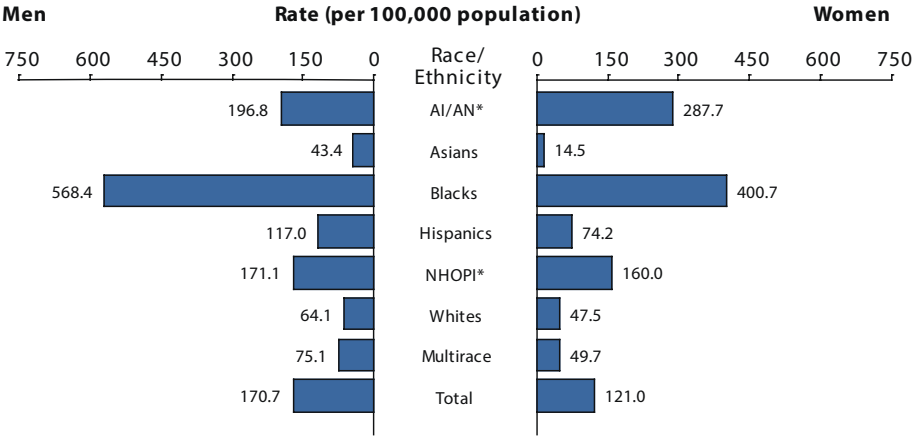
Blacks — In 2016, 51.0% of reported gonorrhea cases with known race and ethnicity occurred among Blacks (excluding cases with missing information on race or ethnicity, and cases whose reported race or ethnicity was Other) (Table 22A). The rate of reported gonorrhea cases among Blacks in 2016 (481.2 cases per 100,000 population) was 8.6 times the rate among Whites (55.7 cases per 100,000 population) (Table 22B). Although the calculated rate ratio for 2016 differs when considering only the 46 jurisdictions that submitted data in race and ethnicity categories according to the OMB standards for each year during 2012–2016, this disparity has decreased slightly in recent years (Figure S). In 2016, this disparity was similar for Black men (8.9 times the rate among White men) and Black women (8.4 times the rate among White women) (Figure T, Table 22B). As in previous years, the disparity in gonorrhea rates for Blacks in 2016 was larger in the Midwest and Northeast than in the South and West (Figure U).

Figure S. Gonorrhea — Rate Ratios* by Race/Ethnicity, United States, 2012–2016



* Rate ratios are calculated as the rate of reported gonorrhea cases per 100,000 population for a given racial or ethnic minority population divided by the rate of reported gonorrhea cases per 100,000 population for Whites. Any population with a lower rate of reported cases of gonorrhea than the 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 Hawaiians/Other Pacific Islanders.
NOTE: Includes 46 states reporting race/ethnicity data in Office of Management and Budget compliant formats during 2012–2016 (see Section A1.5 in the Appendix).

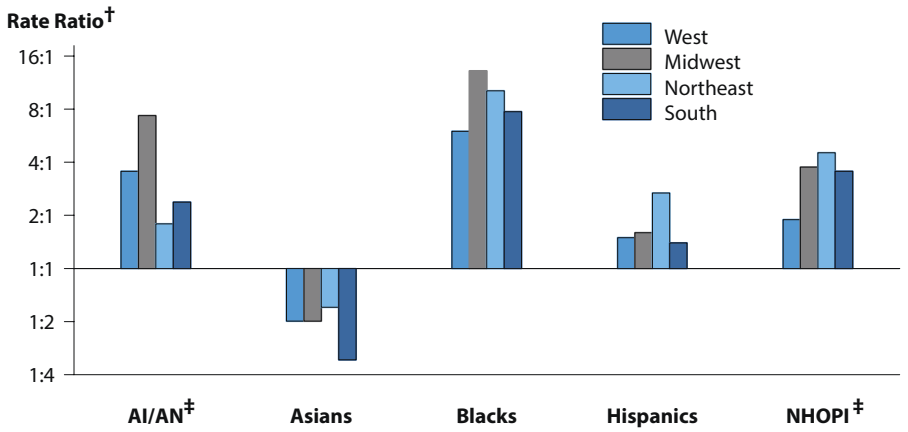
Figure T. Gonorrhea — Rates of Reported Cases by Race/Ethnicity and Sex, United States, 2016



* AI/AN = American Indians/Alaska Natives; NHOPI = Native Hawaiians/Other Pacific Islanders.
NOTE: Includes 50 states and the District of Columbia reporting race/ethnicity data in Office of Management and Budget compliant formats in 2016 (see Section A1.5 in the Appendix).

Considering all race, ethnicity, and age categories, rates of reported gonorrhea cases were highest for Blacks aged 20–24, 15–19, and 25–29 years in 2016 (Table 22B). The rate of reported gonorrhea cases among Black women aged 20–24 years (1,856.5 cases per 100,000 females) was 8.0 times the rate among White women in the same age group (232.0 cases per 100,000 females). The rate of reported gonorrhea cases among Black women aged 15–19 years (1,663.1 cases per 100,000 females) was 10.3 times the rate among White women in the same age group (161.9 cases per 100,000 females). Among Black men aged 20–24 years, the rate

Figure U. Gonorrhea — Rate Ratios* by Race/Ethnicity and Region, United States, 2016



* Rate ratios are calculated as the rate of reported gonorrhea cases per 100,000 population for a given racial or ethnic minority population divided by the rate of reported gonorrhea cases per 100,000 population for Whites. Any population with a lower rate of reported cases of gonorrhea than the 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 Hawaiians/Other Pacific Islanders.
NOTE: Includes 50 states and the District of Columbia reporting race/ethnicity data in Office of Management and Budget compliant formats in 2016 (see Section A1.5 in the Appendix).

of reported gonorrhea cases (1,892.7 cases per 100,000 males) was 9.1 times the rate among White men in the same age group (207.0 cases per 100,000 males). The rate of reported gonorrhea cases among Black men aged 25–29 years (1,641.0 cases per 100,000 males) was 7.4 times the rate among White men in the same age group (222.3 cases per 100,000 males).

American Indians/Alaska Natives — In 2016, the rate of reported gonorrhea cases among AI/AN (242.9 cases per 100,000 population) was 4.4 times the rate among Whites (Table 22B). The disparity between gonorrhea rates for AI/AN and Whites was larger for AI/AN women (6.1 times the rate among White women) than for AI/AN men (3.1 times the rate among White men) (Figure T, Table 22B). The disparity in gonorrhea rates for AI/AN in 2016 was larger in the Midwest than in the West, Northeast, and South (Figure U).

Native Hawaiians/Other Pacific Islanders — In 2016, the rate of reported gonorrhea cases among NHOPI (165.8 cases per 100,000 population) was 3.0 times the rate among Whites (Table 22B). The disparity between gonorrhea rates for NHOPI and Whites was larger for NHOPI women (3.4 times the rate among White women) than NHOPI men (2.7 times the rate among White men) (Figure T, Table 22B). The disparity in gonorrhea rates for NHOPI in 2016 was lower in the West than in the Midwest, Northeast, or South (Figure U).

Hispanics — In 2016, the rate of reported gonorrhea cases among Hispanics was 95.9 cases per 100,000 population, which was 1.7 times the rate among Whites (Table 22B). This disparity was similar for Hispanic women (1.6 times the rate among White women) and Hispanic men (1.8 times the rate among White men) (Figure T, Table 22B). The disparity in gonorrhea rates for Hispanics in 2016 was higher in the Northeast than in the Midwest, South, or West (Figure U).

Asians — In 2016, the rate of reported gonorrhea cases among Asians (28.3 cases per 100,000 population) was 0.5 times the rate among Whites (Table 22B). This difference is larger for Asian women than for Asian men (Figure T, Table 22B). In 2016, rates among Asians were lower than rates among Whites in all four regions of the United States (Figure U).

Primary and Secondary Syphilis

During 2012–2016, 46 states submitted race and ethnicity data for syphilis each year according to the OMB standards. In these states, rates of reported P&S syphilis cases increased 186.2% among AI/AN (2.9 to 8.3 cases per 100,000 population), 147.4% among those who identified as Multirace (1.9 to 4.7 cases per 100,000 population), 105.3% among Asians (1.9 to 3.9 cases per 100,000 population), 91.1% among Hispanics (5.6 to 10.7 cases per 100,000 population), 77.8% among Whites (2.7 to 4.8 cases per 100,000 population), 61.6% among NHOPI (8.6 to 13.9 cases per 100,000 population), and 43.8% among Blacks (16.2 to 23.3 cases per 100,000 population) (Figure 40).

In 2016, all 50 states and the District of Columbia submitted syphilis data by race and ethnicity according to the OMB standards.

Blacks — In 2016, 36.6% of reported P&S syphilis cases with known race and ethnicity occurred among Blacks (excluding cases with missing information on race or ethnicity, and cases whose reported race or ethnicity was Other) (Table 35A). The rate of reported P&S syphilis cases among Blacks in 2016 (23.1 cases per 100,000 population) was 4.7 times

the rate among Whites (4.9 cases per 100,000 population) (Table 35B). The disparity was higher for Black women (7.0 times the rate among White women) than for Black men (4.6 times the rate among White men) (Figure V, Table 35B).

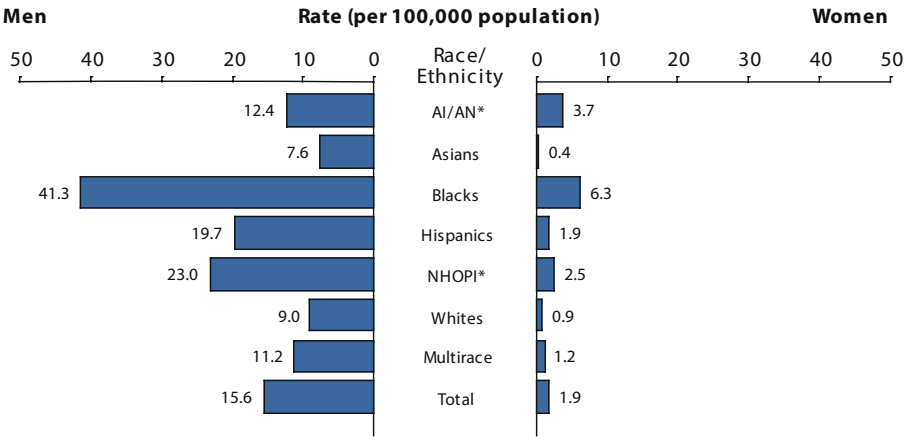
Considering all race, ethnicity, sex, and age categories, rates of reported P&S syphilis cases were highest among Black men aged 20–24 years and 25–29 years in 2016 (Table 35B). The rate of reported P&S syphilis cases among Black men aged 20–24 years (105.0 cases per 100,000 males) was 6.4 times the rate among White men in the same age group (16.4 cases per 100,000 males). The rate of reported P&S syphilis cases among Black men aged 25–29 years (144.6 cases per 100,000 males) was 6.2 times the rate among White men in the same age group (23.5 cases per 100,000 males).

Native Hawaiians/Other Pacific Islanders — In 2016, the rate of reported P&S syphilis cases among NHOPI was 12.9 cases per 100,000 population, which was 2.6 times the rate among Whites (Table 35B). This disparity was similar for NHOPI women (2.8 times the rate among White women) and NHOPI men (2.6 times the rate among White men).

American Indians/Alaska Natives — In 2016, the rate of reported P&S syphilis cases among AI/AN (8.0 cases per 100,000 population) was 1.6 times the rate among Whites (Table 35B). This disparity was larger for AI/AN women (4.1 times the rate among White women) than for AI/AN men (1.4 times the rate among White men).

Hispanics — In 2016, the rate of reported P&S syphilis cases among Hispanics (10.9 cases per 100,000 population) was 2.2 times the rate among Whites (Table 35B). This disparity was similar for Hispanic women (2.1 times the rate among White women) and Hispanic men (2.2 times the rate among White men).

Figure V. Primary and Secondary Syphilis — Rates of Reported Cases by Race/Ethnicity and Sex, United States, 2016



* AI/AN = American Indians/Alaska Natives; NHOPI = Native Hawaiians/Other Pacific Islanders.
NOTE: Includes 50 states and the District of Columbia reporting race/ethnicity data in Office of Management and Budget compliant formats in 2016 (see Section A1.5 in the Appendix).

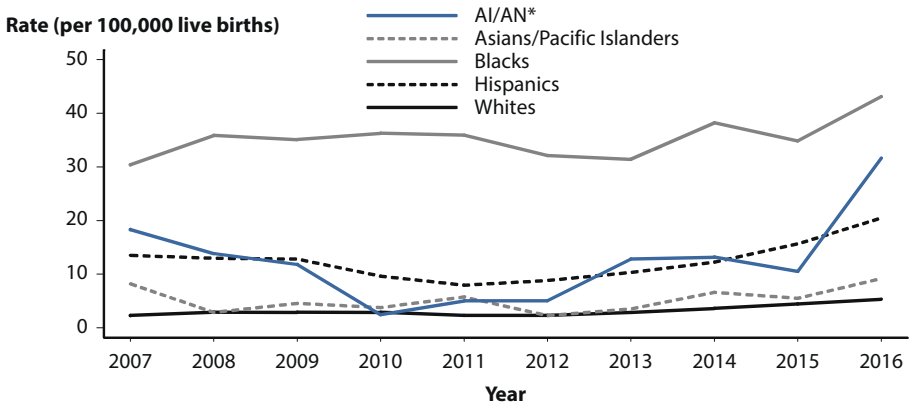
Asians — In 2016, the rate of reported P&S syphilis cases among Asians was 3.9 cases per 100,000 population, which was 0.8 times the rate among Whites (Table 35B). This difference was larger for Asian women (0.4 times the rate among White women) than for Asian men (0.8 times the rate among White men).

Congenital Syphilis

Race and ethnicity for cases of congenital syphilis is based on the mother's race and ethnicity. During 2015–2016, rates of reported congenital syphilis cases increased in all race and ethnicity groups. Rates increased 201% among AI/AN, 67.3% among Asians/Pacific Islanders, 31.4% among Hispanics, 23.5% among Blacks, and 17.8% among Whites (Figure W, Table 42).

In 2016, 43.0% of congenital syphilis cases with known race and ethnicity occurred among Blacks (excluding cases with missing information on race or ethnicity, and cases whose reported race or ethnicity was 'Other') (Table 42). The rate of reported cases of congenital syphilis among Blacks in 2016 (43.1 cases per 100,000 live births) was 8.1 times the rate among Whites (5.3 cases per 100,000 live births). The rate of reported cases of congenital syphilis was 31.6 cases per 100,000 live births among AI/AN (6.0 times the rate among Whites), 20.5 cases per 100,000 live births among Hispanics (3.9 times the rate among Whites), and 9.2 cases per 100,000 live births among Asians/Pacific Islanders (1.7 times the rate among Whites).

Figure W. Congenital Syphilis — Rates of Reported Cases by Year of Birth and Race/Ethnicity of Mother, United States, 2007–2016



* 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.

References

1. Newman LM, Berman SM. Epidemiology of STD Disparities in African American Communities. Sex Transm Dis 2008; 35(12):S4–S12.
2. Hogben M, Leichliter JS. Social determinants and sexually transmitted disease disparities. Sex Transm Dis 2008; 35(12 Suppl):S13–18.
3. U.S. Census Bureau, Current Population Survey, 2016 Annual Social and Economic Supplement. Available at: https://www.census.gov/data/tables/time-series/demo/income-poverty/cps-pov/pov-01.2015.html#par_textimage_10 Accessed July 31, 2017.
4. Harling G, Subramanian SV, Barnighausen T, et al. Socioeconomic disparities in sexually transmitted infections among young adults in the United States: Examining the interaction between Income and race/ethnicity. Sex Transm Dis 2013; 40(7):575–581.
5. Centers for Disease Control and Prevention. CDC Health Disparities and Inequalities Report — United States 2013. MMWR Morb Mortal Wkly Rep 2013; 62(Suppl 3).
6. Institute of Medicine. The Hidden Epidemic: Confronting Sexually Transmitted Diseases. Washington, DC: National Academy Press; 1997.
7. Satterwhite CL, Torrone E, Meites E, et al. Sexually transmitted infections among US women and men: prevalence and incidence estimates, 2008. Sex Transm Dis 2013; 40(3):187–193.
8. Barnett JC, Vornovitsky MS. Current Population Reports, P60-257(RV), Health Insurance Coverage in the United States: 2015. Washington, DC: U.S. Government Printing Office; 2016.
9. Pérez-Escamilla R. Health care access among Latinos: Implications for social and health care reform. J Hispanic High Educ 2010: 9(1):43–60.
10. Berk ML, Schur CL. The effect of fear on access to care among undocumented Latino immigrants. J Immigr Health 2001; 3(3):151–156.
11. Institute of Medicine. Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care. Washington, DC: National Academies Press; 2002.
12. Datta SD, Sternberg M, Johnson RE, et al. Gonorrhea and chlamydia in the United States among persons 14 to 39 years of age, 1999 to 2002. Ann Intern Med 2007; 147(2):89–96.
13. Miller WC, Ford CA, Morris M, et al. Prevalence of chlamydial and gonococcal infections among young adults in the United States. JAMA 2004; 291(18):2229–2236.
14. Office of Management and Budget. Provisional guidance on the implementation of the 1997 standards for federal data on race and ethnicity. Available at: https://www.whitehouse.gov/omb/fedreg_1997standards Accessed July 29, 2013.

STDs in Men Who Have Sex with Men

Public Health Impact

The incidence of many STDs in gay, bisexual, and other men who have sex with men (collectively referred to as MSM) – including primary and secondary (P&S) syphilis and antimicrobial-resistant gonorrhea – is greater than that reported in women and men who have sex with women only (MSW).[1-6] In addition to the negative effects of untreated STDs, elevated STD burden is of concern because it may indicate high risk for subsequent HIV infection. Annual increases in reported STD cases could reflect increased frequency of behaviors that transmit both STDs and HIV (e.g., condomless anal sex), and having an STD increases the risk of acquisition or transmission of HIV.[7-14]

The relatively high incidence of STD infection among MSM may be related to multiple factors, including individual behaviors and sexual network characteristics.[15-17] The number of lifetime or recent sex partners, rate of partner exchange, and frequency of condomless sex each influence an individual's probability of exposure to STDs.[15] However, MSM network characteristics such as high prevalence of STDs, interconnectedness and concurrency of sex partners, and possibly limited access to health care also affect the risk of acquiring an STD.[15, 18] Furthermore, experiences of stigma – verbal harassment, discrimination, or physical assault based on attraction to men – are associated with increased sexual risk behavior among MSM.[19]

Disparities among MSM reflect those observed in the general population, with disproportionate incidence of STDs reported among racial and ethnic minority MSM, MSM of lower socioeconomic status, and young MSM.[20-24] The higher burden of STDs among MSM with these characteristics, relative to the general population of MSM, may suggest distinct mixing patterns in their sexual networks, reduced access to screening and treatment, and differential experiences of stigma and discrimination, rather than greater numbers of sexual partners or frequency of condomless sex.[15, 21-22, 24-26] Disparities may also be more pronounced for racial and ethnic minority MSM who are also unemployed, young, and/or of lower socioeconomic status.[26-27]

With the exception of reported syphilis cases, nationally notifiable STD surveillance data do not routinely include information on sexual behaviors and these data are missing for the majority of gonorrhea and chlamydia cases reported to CDC. Therefore, trends in STDs among MSM in the United States are based on findings from sentinel and enhanced surveillance systems. Testing strategies are also evolving to include more extragenital STD screening, which may increase detection of asymptomatic infections. Until recently, testing for gonorrhea and chlamydia in MSM largely focused on detecting urethral infections, which are more likely to be symptomatic than pharyngeal or rectal infections.[28]

For data reported in this chapter, MSM were defined as men who either reported having one or more male sex partners 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. Data presented in this chapter are derived from the National Notifiable Diseases Surveillance System (NNDSS), the Gonococcal Isolate Surveillance Project (GISP), and the STD Surveillance Network (SSuN), a sentinel and enhanced surveillance project established in 2005 to provide supplemental information on STDs.

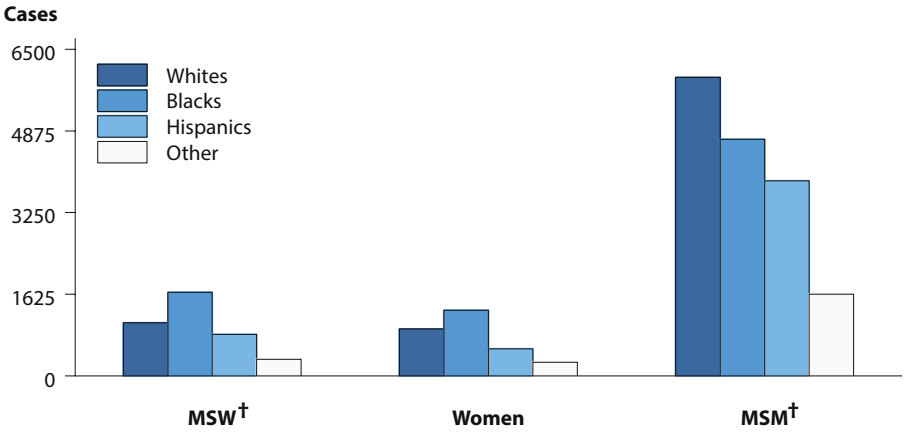
Nationally Notifiable Syphilis Surveillance Data

MSM accounted for 80.6% of male P&S syphilis cases with information about sex of sex partners in 2016 (Figure 36). Of MSM P&S syphilis cases, 36.8% were White, 29.1% were Black, and 24.0% were Hispanic (Figure X). Relative to the percentage of the US population that is White (62.3%), Black (12.3%), and Hispanic (17.1%), this represents a significant inequality in the burden of disease for non-White MSM, which was also evident among MSW and women.[30] In addition, among MSM P&S syphilis cases with known HIV status in 2016, 47.0% were also reported to be HIV-positive (Figure 41).

In 2016, 44 areas (43 states and the District of Columbia) provided data to classify at least 70% of cases as MSM, MSW, or women. Among these areas, estimated rates of P&S syphilis cases in MSM ranged from 0 cases per 100,000 MSM in Wyoming to 861 cases per 100,000 MSM in Mississippi, with 26 states (59%) estimated to have rates between 200 and 400 cases per 100,000 MSM (Figure Y).

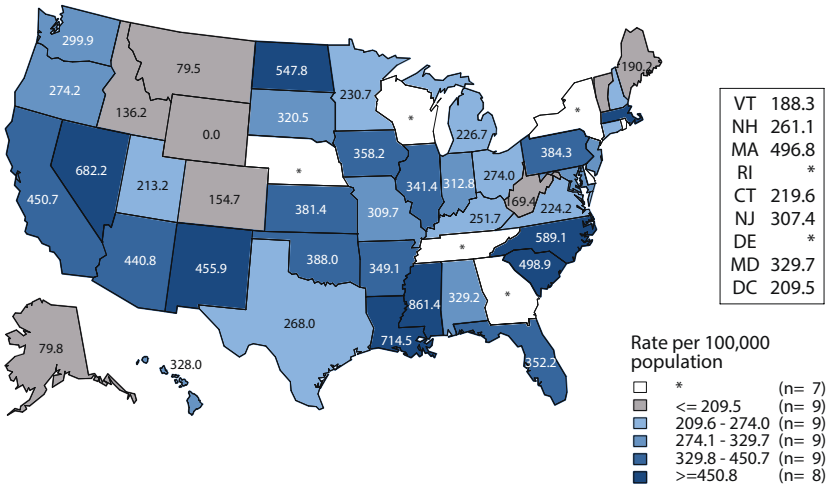
When examining reported P&S syphilis cases over time, 36 states were able to classify at least 70% of reported P&S syphilis cases as MSM, MSW, or women each year during 2012–2016. In these states, cases among MSM increased 16.4% during 2015–2016 and 63.7% during 2012–2016 (Figure 35). However, the percentage of P&S syphilis cases that were attributed to MSM in those states fell slightly from 73.2% in 2012 to 68.6% in 2016.

Figure X. Primary and Secondary Syphilis — Reported Cases* by Sex, Sexual Behavior, and Race/Ethnicity, United States, 2016



* Of all reported cases of primary and secondary syphilis, 16.9% were among men without data on sex of sex partner, and <1% were cases with unknown sex; 4.6% of all cases had missing or unknown race/ethnicity. Cases with missing or unknown race/ethnicity are included in the "Other" category.
† MSM = Gay, bisexual, and other men who have sex with men (collectively referred to as MSM); MSW = Men who have sex with women only.

Figure Y. Primary and Secondary Syphilis — Estimated Rates of Reported Cases Among MSM† by State, United States, 2016



* States reporting less than 70% of cases identified as MSM†, MSW†, or women in 2016 are suppressed.
† MSM = Gay, bisexual, and other men who have sex with men (collectively referred to as MSM); MSW = Men who have sex with women only.
NOTE: Estimates based on reported P&S syphilis cases among MSM in 2016 (numerator) and a published method of estimating the population size of MSM (denominator) by state. See Section A1.2 in the Appendix for information on estimating MSM population sizes for rate denominators.

A description of the methods for estimating MSM population sizes for rate denominators can be found in Section A1.2 of the Appendix. More information about syphilis can be found in the Syphilis section of the National Profile.

Gonococcal Isolate Surveillance Project

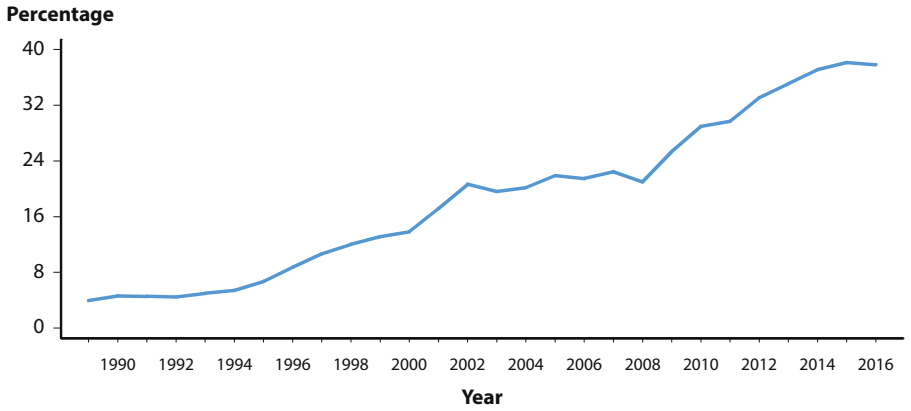
GISP is a national sentinel surveillance system designed to monitor trends in antimicrobial susceptibilities of *Neisseria gonorrhoeae* strains in the United States.[31] Overall, the proportion of isolates collected in selected STD clinics participating in GISP that were from MSM increased steadily, from 3.9% in 1989 to 38.1% in 2015 and decreased to 37.8% in 2016 (Figure Z). The reason for this increase over time is unclear, but might reflect changes in the epidemiology of gonorrhea or in health care seeking behavior of men infected with gonorrhea. GISP has demonstrated that gonococcal isolates from MSM are more likely to exhibit antimicrobial resistance than isolates from MSW.[3, 4] During 2007–2016, the proportion of isolates with elevated ceftriaxone minimum inhibitory concentrations (MICs) (≥0.125 µg/ml) was higher in isolates from MSM than from MSW (Figure AA). Information on the antimicrobial susceptibility criteria used in GISP can be found in Section A2.3 of the Appendix. More information about GISP and additional data can be found at https://www.cdc.gov/std/GISP.

STD Surveillance Network

SSuN is an ongoing collaboration of state, county and city health departments collecting enhanced provider- and patient-based information among a random sample of reported gonorrhea cases, as well as clinical and behavioral information among all patients attending STD clinics in collaborating jurisdictions.[29] Data for 2016 were obtained from 29 STD clinics in SSuN jurisdictions.

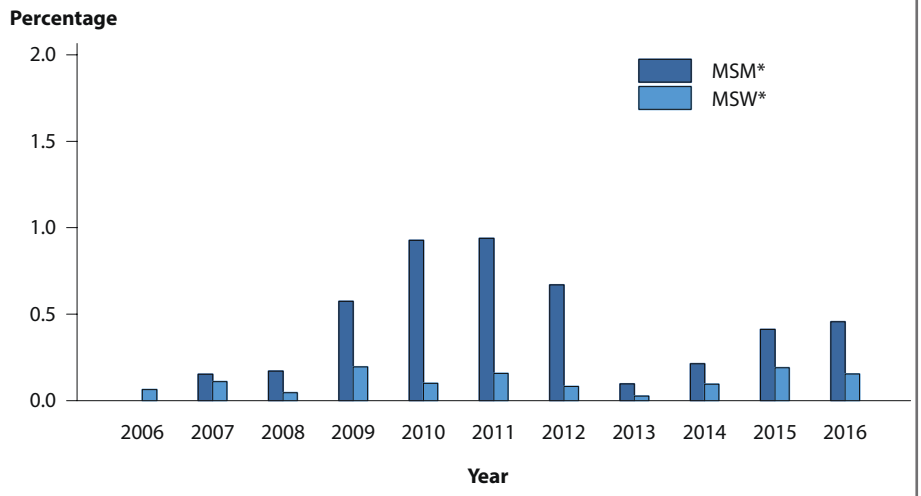
Additional information about SSuN can be found in Section A2.2 of the Appendix.

Figure Z. *Neisseria gonorrhoeae* — Percentage of Urethral Isolates Obtained from MSM* Attending STD Clinics, Gonococcal Isolate Surveillance Project (GISP), 1989–2016



* MSM = Gay, bisexual, and other men who have sex with men (collectively referred to as MSM).

Figure AA. *Neisseria gonorrhoeae* — Percentage of Urethral Isolates with Elevated Ceftriaxone Minimum Inhibitory Concentrations (MICs) (≥0.125 µg/ml) by Reported Sex of Sex Partner, Gonococcal Isolate Surveillance Project (GISP), 2006–2016



* MSM = Gay, bisexual, and other men who have sex with men (collectively referred to as MSM); MSW = Men who have sex with women only.

Gonorrhea, 2010–2015

The number of diagnosed and reported gonorrhea cases among MSM was estimated at the county level based on patient interviews conducted among a random sample of all cases reported to six health departments continuously collaborating in the STD Surveillance Network between January 2010 and June 2013, and again July through December 2015. Estimates of the size of the MSM population in each county were obtained from published estimates and used to estimate the incidence of reported gonorrhea by year among MSM in the six collaborating SSuN sites.[32, 33] Estimated gonorrhea incidence among MSM increased 151.0% across the study period from 1,368.6 cases per 100,000 MSM in 2010 to 3,434.7 cases per 100,000 MSM in 2015 (Figure BB). Over the same time period, estimated gonorrhea rates among women and MSW also increased, but by a significantly smaller proportion (39.8% and 31.7%, respectively).[33]

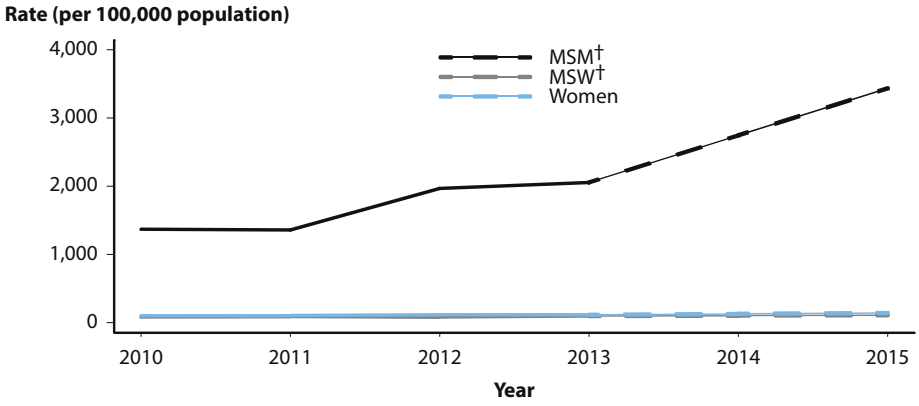
Gonorrhea and Chlamydia in STD Clinics, 2016

In 2016, 25,880 unique MSM presented for care in the 29 STD clinics in nine SSuN jurisdictions. In total, 22,418 unique MSM were tested for urogenital gonorrhea and/or chlamydia (22,404 for gonorrhea, 22,152 for chlamydia). The proportion of men tested for urogenital infections was similar across SSuN jurisdictions, though the proportion who tested positive (positivity) varied by SSuN jurisdiction (Figure CC). In general, urogenital gonorrhea positivity was higher than urogenital chlamydia positivity (except in Massachusetts and Multnomah County); median site-specific positivity for gonorrhea was 8.8% (range by jurisdiction: 2.8%–15.3%) and for chlamydia was 6.3% (range: 4.8%–10.3%).

A total of 17,489 unique MSM were tested for rectal gonorrhea and/or chlamydia in 2016 (17,467 for gonorrhea, 17,445 for chlamydia) (Figure DD). In most jurisdictions, similar proportions of MSM were tested for rectal gonorrhea and chlamydia, likely reflecting use of dual diagnostic tests. Compared to urogenital testing, a lower proportion of MSM were tested for rectal infection. The median site-specific positivity for rectal gonorrhea was 15.9% (range: 9.9%–30.3%) and for rectal chlamydia was 17.2% (range: 12.3%–20.0%).

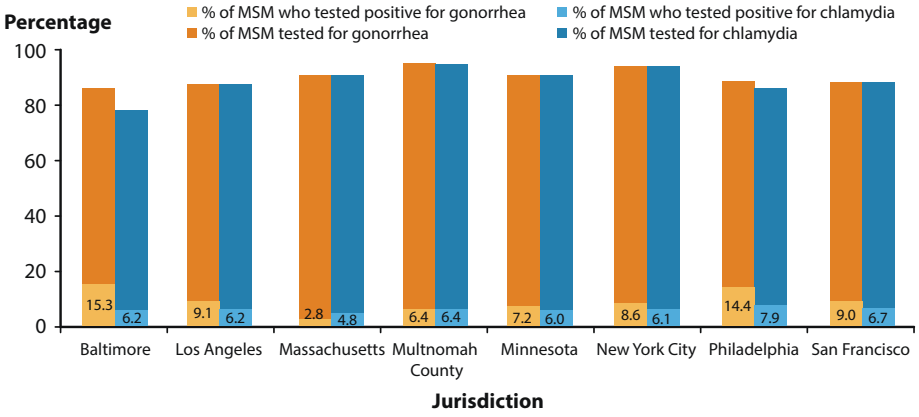
During 2016, 15,680 MSM were tested at the oropharyngeal site for gonorrhea (Figure EE). The median site-specific positivity for oropharyngeal gonorrhea was 8.8% (range by jurisdiction: 1.0%–16.1%). Oropharyngeal chlamydia data are not shown as some of the SSuN jurisdictions do not offer routine

Figure BB. Gonorrhea — Estimated* Rates of Reported Gonorrhea Cases by MSM†, MSW†, and Women, STD Surveillance Network (SSuN)‡, 2010–2015



* Estimates based on interviews among a random sample of reported cases of gonorrhea (N=14,080); cases weighted for analysis.
† MSM = Gay, bisexual, and other men who have sex with men (collectively referred to as MSM); MSW = Men who have sex with women only.
‡ Sites include Baltimore, Philadelphia, New York City, Washington State, San Francisco, and California (excluding San Francisco).
NOTE: Data not available for 2014; 2013–2015 trend interpolated shown in dashed line; trends lines overlap for MSW and Women in this figure. See section A2.2 in the Appendix for SSuN methods.
SOURCE: Stenger M, Pathela P, Anschuetz G, et al. Increases in the rate of *Neisseria gonorrhoeae* among gay, bisexual and other men who have sex with men (MSM) — findings from the STD Surveillance Network 2010–2015. Sex Transm Dis 2017; 44(7):393–397.

Figure CC. Gonorrhea and Chlamydia — Proportion* of MSM† Attending STD Clinics Testing Positive for Urogenital‡ Gonorrhea and Chlamydia by Jurisdiction, STD Surveillance Network (SSuN), 2016



* Results based on data obtained from 22,404 patients tested for urogenital gonorrhea and 22,152 patients tested for urogenital chlamydia attending SSuN STD clinics in 2016; data from Florida and Seattle were not available.
† MSM = Gay, bisexual, and other men who have sex with men (collectively referred to as MSM).
‡ Urogenital includes results from both urethral and urine specimens.
NOTE: See section A2.2 in the Appendix for SSuN methods.

testing for oropharyngeal chlamydia infections.

HIV Status and STDs in STD Clinics, 2016

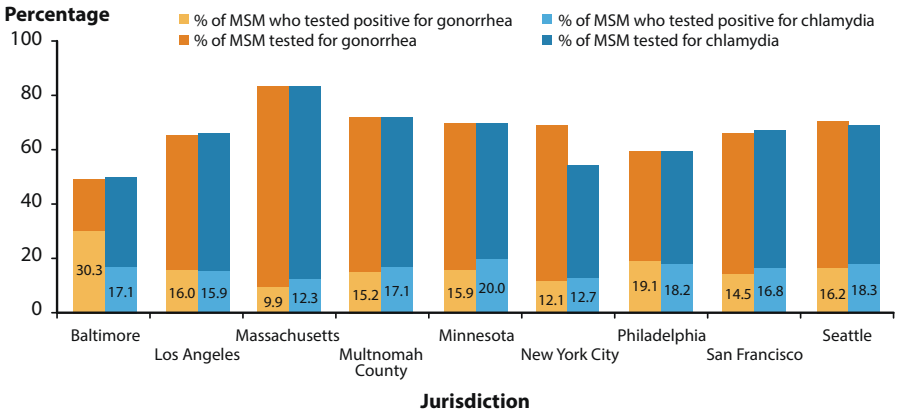
Among HIV-positive MSM visiting SSuN STD clinics in 2016, urogenital chlamydia positivity was 8.6% and urogenital gonorrhea positivity was 14.0% (compared to 6.7% and 9.0%, respectively, among HIV-negative MSM) (Figure FF). Among HIV-positive MSM, 7.4% were diagnosed with P&S syphilis compared to 3.1% of HIV-negative MSM. Percentages represent the overall average of the mean value by jurisdiction.

Summary

The number of reported P&S syphilis cases among MSM continued to rise in 2016 and the majority of P&S syphilis cases remained among MSM. Estimated rates of reported gonorrhea incidence increased among MSM in SSuN jurisdictions in recent years. Furthermore, the proportion of GISP isolates with elevated MICs to antimicrobials currently used to treat gonorrhea was higher among MSM than among MSW.

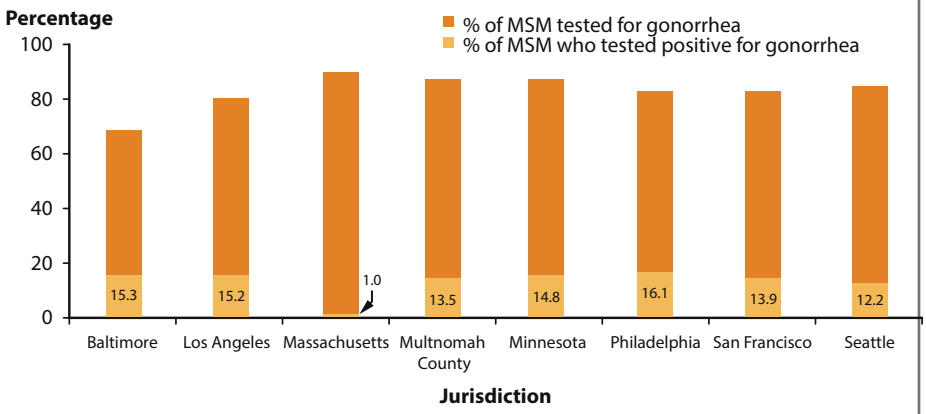
Beyond STD burden in the general MSM population, the data indicated heterogeneity of STD prevalence among MSM according to geography, race and ethnicity, and HIV status. State-specific P&S syphilis rate estimates among MSM varied from 0 to over 800 cases per 100,000 MSM and the prevalence of diagnosed STDs among MSM differed by SSuN jurisdiction. Reported P&S syphilis was disproportionately prevalent among Black and Hispanic MSM, and data from MSM who attended SSuN clinics suggested that P&S syphilis, urogenital gonorrhea, and urogenital chlamydia may be more prevalent among MSM living with diagnosed HIV infection than among HIV-negative MSM.

Figure DD. Gonorrhea and Chlamydia — Proportion* of MSM† Attending STD Clinics Testing Positive for Rectal Gonorrhea and Chlamydia by Jurisdiction, STD Surveillance Network (SSuN), 2016



* Results based on data obtained from 17,467 patients tested for rectal gonorrhea and 17,445 patients tested for rectal chlamydia attending SSuN STD clinics in 2016; data from Florida were not available.
† MSM = Gay, bisexual, and other men who have sex with men (collectively referred to as MSM).
NOTE: See section A2.2 in the Appendix for SSuN methods.

Figure EE. Gonorrhea — Proportion* of MSM† Attending STD Clinics Testing Positive for Oropharyngeal Gonorrhea by Jurisdiction, STD Surveillance Network (SSuN), 2016

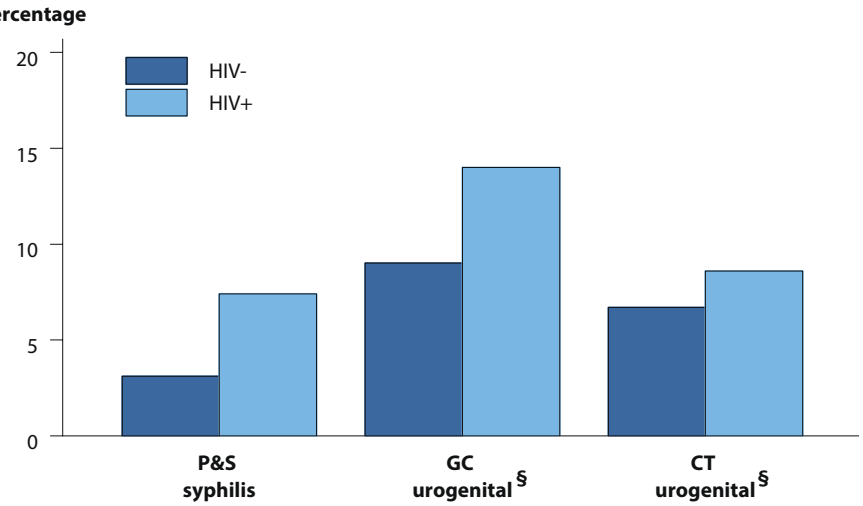


* Results based on data obtained from 15,190 patients tested for oropharyngeal gonorrhea attending SSuN STD clinics in 2016; data from Florida and New York city were not available.
† MSM = Gay, bisexual, and other men who have sex with men (collectively referred to as MSM).
NOTE: See section A2.2 in the Appendix for SSuN methods.

References

1. An Q, Wejnert C, Bernstein K, et al. Syphilis screening and diagnosis among men who have sex with men, 2008–2014, 20 US cities. JAIDS 2017; 75(Suppl 3):S363–S369.
2. de Voux A, Kidd S, Grey JA, et al. State-specific rates of primary and secondary syphilis among men who have sex with men — United States, 2015. MMWR Morb Mortal Wkly Rep 2017; 66(13):349–354.
3. Kirkcaldy RD, Harvey A, Papp JR, et al. *Neisseria gonorrhoeae* antimicrobial susceptibility surveillance — the Gonococcal Isolate Surveillance Project, 27 sites, United States, 2014. MMWR Surveill Summ 2016; 65(SS-7):1–19.
4. Kirkcaldy RD, Zaidi A, Hook EW 3rd, et al. *Neisseria gonorrhoeae* antimicrobial resistance among men who have sex with men and men who have sex exclusively with women: The Gonococcal Isolate Surveillance Project, 2005–2010. Ann Intern Med 2013; 158(5 Pt 1):321–328.
5. Patton ME, Su JR, Nelson R, et al. Primary and secondary syphilis — United States, 2005–2013. MMWR Morb Mortal Wkly Rep 2014; 63(18):402–406.
6. Peterman TA, Su J, Bernstein KT, et al. Syphilis in the United States: on the rise? Expert Rev Anti Infect Ther 2015; 13(2):161–168.
7. Solomon MM, Mayer KH. Evolution of the syphilis epidemic among men who have sex with men. Sex Health 2014; 12(2):96–102.
8. Buchacz K, Patel P, Taylor M, et al. Syphilis increases HIV viral load and decreases CD4 cell counts in HIV-infected patients with new syphilis infections. AIDS 2004; 18(15):2075–2079.
9. Fleming DT, Wasserheit JN. From epidemiologic synergy to public health policy and practice: the contribution of other sexually transmitted diseases to sexual transmission of HIV infection. Sex Transm Infect 1999; 75(1):3–17.
10. Jarzebowski W, Caumes E, Dupin N, et al. Effect of early syphilis infection on plasma viral load and CD4 cell count in human immunodeficiency virus- infected men: results from the FHDH-ANRS CO4 cohort. Arch Intern Med 2012; 172(16):1237–1243.
11. Katz DA, Dombrowski JC, Bell TR, et al. HIV incidence among men who have sex with men after diagnosis with sexually transmitted infections. Sex Transm Dis 2016; 43(4):249–254.
12. Kelley CF, Vaughan AS, Luisi N, et al. The effect of high rates of bacterial sexually transmitted infections on HIV incidence in a cohort of black and white men who have sex with men in Atlanta, Georgia. AIDS Res Hum Retroviruses 2015; 31(6):587–592.
13. Pathela P, Braunstein SL, Blank S, et al. HIV incidence among men with and those without sexually transmitted rectal infections: estimates from matching against and HIV case registry. Clin Infect Dis 2013; 57(8):1203–1209.

Figure FF. Proportion* of MSM† Attending STD Clinics with Primary and Secondary Syphilis‡, Urogenital§ Gonorrhea, or Urogenital§ Chlamydia by HIV Status‖, STD Surveillance Network (SSuN), 2016



* Proportions represent the overall average of the mean value by jurisdiction.
† MSM = Gay, bisexual, and other men who have sex with men (collectively referred to as MSM).
‡ Includes SSuN jurisdictions that reported data on at least 20 patients with a diagnosis of primary and secondary syphilis in 2016.
§ Urogenital includes results from both urethral and urine specimens.
‖ Excludes all persons for whom there was no laboratory documentation or self-report of HIV status.
NOTE: See section A2.2 in the Appendix for SSuN methods.

14. Solomon MM, Mayer KH, Glidden DV, et al. Syphilis predicts HIV incidence among men and transgender women who have sex with men in a preexposure prophylaxis trial. Clin Infect Dis 2014; 59(7):1020–1026.
15. Glick SN, Morris M, Foxman B, et al. A comparison of sexual behavior patterns among men who have sex with men and heterosexual men and women. J Acquir Immune Defic Syndr 2012; 60(1):83–90.
16. Paz-Bailey G, Mendoza MCB, Finlayson T, et al. Trends in condom use among MSM in the United States: the role of antiretroviral therapy and seroadaptive strategies. AIDS 2016; 30(12):1985–1990.
17. Spicknall IH, Gift TL, Bernstein KT, et al. Sexual networks and infection transmission networks among men who have sex with men as causes of disparity and targets of prevention. Sex Transm Infect 2017; 93(5):307–308.
18. Alvy LM, McKirnan DJ, Du Bois SN, et al. Health care disparities and behavioral health among men who have sex with men. J Gay Lesbian Soc Serv 2011; 23(4):507–522.
19. Balaji AB, Bowles KE, Hess KL, et al. Association between enacted stigma and HIV-related risk behavior among MSM, National HIV Behavioral Surveillance System, 2011. AIDS Behav 2017; 21(1):227–237.
20. Brewer TH, Schillinger J, Lewis FM, et al. Infectious syphilis among adolescent and young adult men: implications for human immunodeficiency virus transmission and public health interventions. Sex Transm Dis 2011; 38(5):367–371.
21. Jeffries WL, Marks G, Lauby J. Homophobia is associated with sexual behavior that increases risk of acquiring and transmitting HIV infection among black men who have sex with men. AIDS Behav 2013; 17(4):1442–1453.
22. McKirnan DJ, Du Bois SN, Alvy LM, et al. Health care access and health behaviors among men who have sex with men: the cost of health disparities. Health Educ Behav 2013; 40(1):32–41.
23. Su JR, Beltrami JF, Zaidi AA, et al. Primary and secondary syphilis among black and Hispanic men who have sex with men: case report data from 27 States. Ann Intern Med 2011; 155(3):145–151.
24. Díaz RM, Ayala G, Bein E. Sexual risk as an outcome of social oppression: data from a probability sample of Latino gay men in three US cities. Cultur Divers Ethnic Minor Psychol 2004; 10(3):255–267.
25. Millett GA, Flores SA, Peterson JL, et al. Explaining disparities in HIV infection among black and white men who have sex with men: a meta-analysis of HIV risk behaviors. AIDS 2007; 21(15):2083–2091.
26. Sullivan PS, Peterson J, Rosenberg ES, et al. Understanding racial HIV/STI disparities in black and white men who have sex with men: a multilevel approach. PLoS One 2014; 9(3):e90514.
27. Mayer KH, Wang L, Koblin B, et al. Concomitant socioeconomic, behavioral, and biological factors associated with the disproportionate HIV infection burden among black men who have sex with men in 6 US cities. PLoS One 2014; 9(1):e87298.
28. Patton ME, Kidd S, Llata E, et al. Extragenital gonorrhea and chlamydia testing and infection among men who have sex with men — STD Surveillance Network, United States, 2010–2012. Clin Infect Dis 2014; 58(11):1564–1570.
29. Rietmeijer K, Donnelly J, Bernstein K, et al. Here comes the SSuN — early experiences with the STD Surveillance Network. Pub Health Rep 2009; 124(Suppl 2):72–77.
30. 2011–2015 American Community Survey 5-Year Summary File. Table DP05 — ACS demographic and housing estimates. Washington, DC: US Census Bureau; 2016.
31. Schwarcz S, Zenilman J, Schnell D, et al. National surveillance of antimicrobial resistance in *Neisseria gonorrhoeae*. JAMA 1990; 264(11):1413–1417.
32. Grey JA, Bernstein KT, Sullivan PS, et al. Estimating the population sizes of men who have sex with men in US states and counties using data from the American Community Survey. JMIR Public Health Surveill 2016; 2(1):e14.
33. Stenger M, Pathela P, Anschuetz G, et al. Increases in the rate of *Neisseria gonorrhoeae* among gay, bisexual and other men who have sex with men (MSM) — findings from the STD Surveillance Network 2010–2015. Sex Transm Dis 2017; 44(7):393–397.

Tables

Table 1. Sexually Transmitted Diseases — Reported Cases and Rates of Reported Cases per 100,000 Population, United States, 1941–2016

	Syphilis															
	All Stages†		Primary and Secondary		Early Latent		Late and Late Latent‡		Congenital		Chlamydia		Gonorrhea		Chancroid	
Year*	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate§	Cases	Rate	Cases	Rate	Cases	Rate
1941	485,560	368.2	68,231	51.7	109,018	82.6	202,984	153.9	17,600	651.1	NR	—	193,468	146.7	3,384	2.5
1942	479,601	363.4	75,312	57.0	116,245	88.0	202,064	153.1	16,918	566.0	NR	—	212,403	160.9	5,477	4.1
1943	575,593	447.0	82,204	63.8	149,390	116.0	251,958	195.7	16,164	520.7	NR	—	275,070	213.6	8,354	6.4
1944	467,755	367.9	78,443	61.6	123,038	96.7	202,848	159.6	13,578	462.0	NR	—	300,676	236.5	7,878	6.1
1945	359,114	282.3	77,007	60.5	101,719	79.9	142,187	111.8	12,339	431.7	NR	—	287,181	225.8	5,515	4.3
1946	363,647	271.7	94,957	70.9	107,924	80.6	125,248	93.6	12,106	354.9	NR	—	368,020	275.0	7,091	5.2
1947	355,592	252.3	93,545	66.4	104,124	73.9	122,089	86.6	12,200	319.6	NR	—	380,666	270.0	9,515	6.7
1948	314,313	218.2	68,174	47.3	90,598	62.9	123,312	85.6	13,931	383.0	NR	—	345,501	239.8	7,661	5.3
1949	256,463	175.3	41,942	28.7	75,045	51.3	116,397	79.5	13,952	382.4	NR	—	317,950	217.3	6,707	4.6
1950	217,558	146.0	23,939	16.7	59,256	39.7	113,569	70.2	13,377	368.3	NR	—	286,746	192.5	4,977	3.3
1951	174,924	116.1	14,485	9.6	43,316	28.7	98,311	65.2	11,094	290.4	NR	—	254,470	168.9	4,233	2.8
1952	167,762	110.2	10,449	6.9	36,454	24.0	105,238	69.1	8,553	218.8	NR	—	244,957	160.8	3,738	2.5
1953	148,573	95.9	8,637	5.6	28,295	18.3	98,870	63.8	7,675	193.9	NR	—	238,340	153.9	3,338	2.2
1954	130,697	82.9	7,147	4.5	23,861	15.1	89,123	56.5	6,676	164.0	NR	—	242,050	153.5	3,003	1.9
1955	122,392	76.2	6,454	4.0	20,054	12.5	86,526	53.8	5,354	130.7	NR	—	236,197	147.0	2,649	1.7
1956	130,201	78.7	6,392	3.9	19,783	12.0	95,097	57.5	5,491	130.4	NR	—	224,346	135.7	2,135	1.3
1957	123,758	73.5	6,576	3.9	17,796	10.6	91,309	54.2	5,288	123.0	NR	—	214,496	127.4	1,637	1.0
1958	113,884	66.4	7,176	4.2	16,556	9.7	83,027	48.4	4,866	114.6	NR	—	232,386	135.6	1,595	0.9
1959	120,824	69.2	9,799	5.6	17,025	9.8	86,740	49.7	5,130	119.7	NR	—	240,254	137.6	1,537	0.9
1960	122,538	68.8	16,145	9.1	18,017	10.1	81,798	45.9	4,416	103.7	NR	—	258,933	145.4	1,680	0.9
1961	124,658	68.8	19,851	11.0	19,486	10.8	79,304	43.8	4,163	97.5	NR	—	264,158	145.8	1,438	0.8
1962	126,245	68.7	21,067	11.5	19,585	10.7	79,533	43.3	4,070	97.7	NR	—	263,714	143.6	1,344	0.7
1963	124,137	66.5	22,251	11.9	18,235	9.8	78,076	41.8	4,031	98.4	NR	—	278,289	149.0	1,220	0.7
1964	114,325	60.4	22,969	12.1	17,781	9.4	68,629	36.3	3,516	87.3	NR	—	300,666	158.9	1,247	0.7
1965	112,842	58.9	23,338	12.2	17,458	9.1	67,317	35.1	3,564	94.8	NR	—	324,925	169.5	982	0.5
1966	105,159	54.2	21,414	11.0	15,950	8.2	63,541	32.7	3,170	87.9	NR	—	351,738	181.2	838	0.4
1967	102,581	52.2	21,053	10.7	15,554	7.9	61,975	31.5	2,894	82.2	NR	—	404,836	205.9	784	0.4
1968	96,271	48.4	19,019	9.6	15,150	7.6	58,564	29.4	2,381	68.0	NR	—	464,543	233.4	845	0.4
1969	92,162	45.7	19,130	9.5	15,402	7.6	54,587	27.1	2,074	57.6	NR	—	534,872	265.4	1,104	0.5
1970	91,382	44.8	21,982	10.8	16,311	8.0	50,348	24.7	1,953	52.3	NR	—	600,072	294.2	1,416	0.7
1971	95,997	46.4	23,783	11.5	19,417	9.4	49,993	24.2	2,052	57.7	NR	—	670,268	324.1	1,320	0.6
1972	91,149	43.6	24,429	11.7	20,784	9.9	43,456	20.8	1,758	54.0	NR	—	767,215	366.6	1,414	0.7
1973	87,469	41.4	24,825	11.7	23,584	11.2	37,054	17.5	1,527	48.7	NR	—	842,621	398.7	1,165	0.6
1974	83,771	39.3	25,385	11.9	25,124	11.8	31,854	14.9	1,138	36.0	NR	—	906,121	424.7	945	0.4
1975	80,356	37.3	25,561	11.9	26,569	12.3	27,096	12.6	916	29.1	NR	—	999,937	464.1	700	0.3
1976	71,761	33.0	23,731	10.9	25,363	11.7	21,905	10.1	626	19.8	NR	—	1,001,994	460.6	628	0.3
1977	64,621	29.4	20,399	9.3	21,329	9.7	22,313	10.2	463	13.9	NR	—	1,002,219	456.0	455	0.2
1978	64,875	29.2	21,656	9.8	19,628	8.8	23,038	10.4	434	13.0	NR	—	1,013,436	456.3	521	0.2
1979	67,049	29.9	24,874	11.1	20,459	9.1	21,301	9.5	332	9.5	NR	—	1,004,058	447.1	840	0.4
1980	68,832	30.3	27,204	12.0	20,297	8.9	20,979	9.2	277	7.7	NR	—	1,004,029	442.1	788	0.3
1981	72,799	31.7	31,266	13.6	21,033	9.2	20,168	8.8	287	7.9	NR	—	990,864	431.8	850	0.4
1982	75,579	32.6	33,613	14.5	21,894	9.5	19,779	8.5	259	7.0	NR	—	960,633	414.7	1,392	0.6

Continued on next page.

Table 1. Sexually Transmitted Diseases — Reported Cases and Rates of Reported Cases per 100,000 Population, United States, 1941–2016 (continued)

	Syphilis															
	All Stages†		Primary and Secondary		Early Latent		Late and Late Latent‡		Congenital		Chlamydia		Gonorrhea		Chancroid	
Year*	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate§	Cases	Rate	Cases	Rate	Cases	Rate
1983	74,637	31.9	32,698	14.0	23,738	10.2	17,896	7.7	239	6.6	NR	—	900,435	385.1	847	0.4
1984	69,872	29.6	28,607	12.1	23,131	9.8	17,829	7.6	305	8.3	7,594	6.5	878,556	372.5	665	0.3
1985	67,563	28.4	27,131	11.4	21,689	9.1	18,414	7.7	329	8.7	25,848	17.4	911,419	383.0	2,067	0.9
1986	67,779	28.2	27,667	11.5	21,656	9.0	18,046	7.5	410	10.9	58,001	35.2	892,229	371.5	3,045	1.3
1987	87,286	36.0	35,585	14.7	28,233	11.7	22,988	9.5	480	12.6	91,913	50.8	787,532	325.0	4,986	2.1
1988	104,546	42.8	40,474	16.6	35,968	14.7	27,363	11.2	741	19.0	157,854	87.1	738,160	301.9	4,891	2.0
1989	115,089	46.6	45,826	18.6	45,394	18.4	22,032	8.9	1,837	45.5	200,904	102.5	733,294	297.1	4,697	1.9
1990	135,590	54.3	50,578	20.3	55,397	22.2	25,750	10.3	3,865	92.9	323,663	160.2	690,042	276.4	4,212	1.7
1991	128,719	50.9	42,950	17.0	53,855	21.3	27,490	10.9	4,424	107.6	381,228	179.7	621,918	245.8	3,476	1.4
1992	114,730	44.7	34,009	13.3	49,929	19.5	26,725	10.4	4,067	100.0	409,694	182.3	502,858	196.0	1,906	0.7
1993	102,612	39.5	26,527	10.2	41,919	16.1	30,746	11.8	3,420	85.5	405,332	178.0	444,649	171.1	1,292	0.5
1994	82,713	31.4	20,641	7.8	32,017	12.2	27,603	10.5	2,452	62.0	451,785	192.5	419,602	163.9	782	0.3
1995	69,359	26.0	16,543	6.2	26,657	10.0	24,296	9.1	1,863	47.8	478,577	187.8	392,651	147.5	607	0.2
1996	53,240	19.8	11,405	4.2	20,187	7.5	20,366	7.6	1,282	32.9	492,631	190.6	328,169	121.8	386	0.1
1997	46,716	17.1	8,556	3.1	16,631	6.1	20,447	7.5	1,082	27.9	537,904	205.5	327,665	120.2	246	0.1
1998	38,289	13.9	7,007	2.5	12,696	4.6	17,743	6.4	843	21.4	614,250	231.8	356,492	129.2	189	0.1
1999	35,386	12.7	6,617	2.4	11,534	4.1	16,655	6.0	580	14.6	662,647	247.2	360,813	129.3	110	0.0
2000	31,618	11.2	5,979	2.1	9,465	3.4	15,594	5.5	580	14.3	709,452	251.4	363,136	128.7	78	0.0
2001	32,286	11.3	6,103	2.1	8,701	3.0	16,976	5.9	506	12.6	783,242	274.5	361,705	126.8	38	0.0
2002	32,919	11.4	6,862	2.4	8,429	2.9	17,168	6.0	460	11.4	834,555	289.4	351,852	122.0	48	0.0
2003	34,289	11.8	7,177	2.5	8,361	2.9	18,319	6.3	432	10.6	877,478	301.7	335,104	115.2	54	0.0
2004	33,423	11.4	7,980	2.7	7,768	2.6	17,300	5.9	375	9.1	929,462	316.5	330,132	112.4	30	0.0
2005	33,288	11.2	8,724	2.9	8,176	2.8	16,049	5.4	339	8.2	976,445	329.4	339,593	114.6	17	0.0
2006	36,958	12.3	9,756	3.3	9,186	3.1	17,644	5.9	372	8.7	1,030,911	344.3	358,366	119.7	19	0.0
2007	40,925	13.6	11,466	3.8	10,768	3.6	18,256	6.1	435	10.1	1,108,374	367.5	355,991	118.0	23	0.0
2008	46,292	15.2	13,500	4.4	12,401	4.1	19,945	6.6	446	10.5	1,210,523	398.1	336,742	110.7	25	0.0
2009	44,832	14.6	13,997	4.6	13,066	4.3	17,338	5.6	431	10.4	1,244,180	405.3	301,174	98.1	28	0.0
2010	45,844	14.8	13,774	4.5	13,604	4.4	18,079	5.9	387	9.7	1,307,893	423.6	309,341	100.2	24	0.0
2011	46,040	14.8	13,970	4.5	13,136	4.2	18,576	6.0	358	9.1	1,412,791	453.4	321,849	103.3	8	0.0
2012	49,915	15.9	15,667	5.0	14,503	4.6	19,411	6.2	334	8.4	1,422,976	453.3	334,826	106.7	15	0.0
2013	56,484	17.9	17,375	5.5	16,929	5.4	21,819	6.9	361	9.2	1,401,906	443.5	333,004	105.3	10	0.0
2014	63,453	19.9	19,999	6.3	19,452	6.1	23,541	7.4	461	11.6	1,441,789	452.2	350,062	109.8	6	0.0
2015	74,707	23.2	23,872	7.4	24,173	7.5	26,170	8.1	492	12.3	1,526,658	475.0	395,216	123.0	11	0.0
2016	88,042	27.4	27,814	8.7	28,924	9.0	30,676	9.5	628	15.7	1,598,354	497.3	468,514	145.8	7	0.0

* For 1941–1946, data were reported for the federal fiscal year ending June 30 of the year indicated. From 1947 to the present, data were reported for the calendar year ending December 31. For 1941–1958, data for Alaska and Hawaii were not included.

† Includes stage of syphilis not stated.

‡ Late and late latent syphilis includes late latent syphilis, latent syphilis of unknown duration, neurosyphilis, late syphilis with clinical manifestations other than neurosyphilis, and late syphilis with clinical manifestations (including late benign syphilis and cardiovascular syphilis).

§ Rates include all cases of congenitally acquired syphilis per 100,000 live births. As of 1995, cases of congenital syphilis are obtained in hardcopy and electronic format on the basis of case reporting form CDC 73.126.

NR = No report.

NOTE: Adjustments to the number of cases reported from state health departments were made for hardcopy forms and for electronic data submissions through June 7, 2017. The number of cases and the rates shown here supersede those published in previous reports. See Section A1.1 in the Appendix for more information. Cases and rates shown in this table exclude the outlying areas of Guam, Puerto Rico, and Virgin Islands. Case definitions have changed over time. See Section Appendix C.1 in the Appendix for more information.

Table 2. Chlamydia — Reported Cases and Rates of Reported Cases by State, Ranked by Rates, United States, 2016

Rank*	State	Cases	Rate per 100,000 Population
1	Alaska	5,698	771.6
2	Louisiana	31,727	679.3
3	Mississippi	20,112	672.1
4	New Mexico	13,108	628.6
5	Georgia	62,776	614.6
6	North Carolina	58,006	577.6
7	South Carolina	28,179	575.5
8	Delaware	5,365	567.2
9	Arkansas	16,737	562.0
10	Illinois	72,201	561.4
11	Alabama	26,901	553.6
12	New York	109,433	552.8
13	Oklahoma	21,449	548.4
14	Ohio	60,496	520.9
15	Texas	142,952	520.4
16	Arizona	34,923	511.5
17	Maryland	30,658	510.4
18	Missouri	30,843	507.0
19	Nevada	14,649	506.7
20	California	198,155	506.2
21	South Dakota	4,331	504.5
	U.S. TOTAL†	**1,598,354**	**497.3**
22	Tennessee	32,304	489.4
23	Hawaii	6,902	482.1
24	Virginia	39,666	473.2
25	Colorado	25,569	468.6
26	Florida	94,742	467.4
27	Rhode Island	4,936	467.3
28	Wisconsin	26,894	466.0
29	Indiana	30,847	466.0
30	Michigan	45,936	462.9
31	North Dakota	3,455	456.5
32	Pennsylvania	56,930	444.7
33	Washington	31,254	435.9
34	Oregon	17,425	432.5
35	Nebraska	8,197	432.3
36	Montana	4,416	427.5
37	Kansas	12,160	417.6
38	Iowa	12,983	415.6
39	Minnesota	22,685	413.2
40	Kentucky	18,286	413.2
41	Massachusetts	26,807	394.5
42	Connecticut	13,911	387.4
43	New Jersey	34,519	385.3
44	Idaho	5,897	356.3
45	Wyoming	2,060	351.5
46	Utah	9,457	315.7
47	Maine	4,156	312.6
48	Vermont	1,690	269.9
49	West Virginia	4,821	261.4
50	New Hampshire	3,467	260.6

* States were ranked by rate, then by case count, then in alphabetical order, with rates shown rounded to the nearest tenth.

† Total includes cases reported by the District of Columbia with 7,283 cases and a rate of 1,083.4, but excludes outlying areas (Guam with 934 cases and rate of 577.3, Puerto Rico with 7,198 cases and rate of 207.2, and Virgin Islands with 571 cases and rate of 554.6).

Table 3. Chlamydia — Reported Cases and Rates of Reported Cases by State/Area and Region in Alphabetical Order, United States and Outlying Areas, 2012–2016

State/Area	Cases					Rates per 100,000 Population				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Alabama	30,621	29,464	29,010	26,359	26,901	635.0	609.6	598.2	542.5	553.6
Alaska	5,462	5,774	5,789	5,660	5,698	746.7	785.4	785.8	766.5	771.6
Arizona	30,444	30,564	32,397	32,387	34,923	464.6	461.2	481.3	474.3	511.5
Arkansas	16,611	15,447	15,605	16,166	16,737	563.3	522.0	526.1	542.8	562.0
California	167,695	167,346	176,308	189,170	198,155	440.8	436.6	454.4	483.3	506.2
Colorado	21,631	20,386	21,863	23,857	25,569	417.0	387.0	408.2	437.2	468.6
Connecticut	13,065	12,775	13,382	13,126	13,911	363.9	355.2	372.1	365.5	387.4
Delaware	4,438	5,213	4,473	4,605	5,365	483.9	563.1	478.1	486.8	567.2
District of Columbia	6,808	6,414	5,293	7,894	7,283	1,076.7	992.2	803.3	1,174.3	1,083.4
Florida	77,644	80,182	84,194	90,468	94,742	401.9	410.1	423.2	446.3	467.4
Georgia	52,418	51,070	51,945	57,639	62,776	528.4	511.1	514.4	564.3	614.6
Hawaii	6,340	6,640	6,419	7,074	6,902	455.4	472.9	452.2	494.1	482.1
Idaho	4,550	5,428	5,442	5,631	5,897	285.1	336.7	333.0	340.3	356.3
Illinois	67,701	63,797	66,536	69,610	72,201	525.8	495.2	516.6	541.3	561.4
Indiana	29,505	28,023	28,519	28,886	30,847	451.3	426.5	432.3	436.4	466.0
Iowa	11,377	10,953	11,804	12,085	12,983	370.1	354.4	379.9	386.9	415.6
Kansas	11,135	11,012	11,116	11,464	12,160	385.8	380.5	382.8	393.7	417.6
Kentucky	17,273	17,134	17,664	17,444	18,286	394.3	389.8	400.2	394.2	413.2
Louisiana	27,353	28,739	28,955	32,325	31,727	594.4	621.3	622.7	692.1	679.3
Maine	3,413	3,438	3,530	3,965	4,156	256.8	258.8	265.4	298.3	312.6
Maryland	26,534	26,723	27,424	27,450	30,658	450.9	450.7	458.9	457.0	510.4
Massachusetts	23,550	23,210	21,271	24,100	26,807	354.3	346.8	315.3	354.7	394.5
Michigan	47,566	44,835	44,256	46,486	45,936	481.3	453.1	446.6	468.5	462.9
Minnesota	18,056	18,742	19,907	21,243	22,685	335.7	345.8	364.8	387.0	413.2
Mississippi	23,054	17,464	19,605	17,371	20,112	772.3	583.8	654.8	580.5	672.1
Missouri	27,835	27,328	27,981	28,948	30,843	462.2	452.1	461.5	475.8	507.0
Montana	3,827	3,818	4,193	4,184	4,416	380.7	376.1	409.6	405.1	427.5
Nebraska	6,748	7,301	7,499	7,956	8,197	363.7	390.7	398.6	419.6	432.3
Nevada	11,137	11,781	11,841	12,925	14,649	403.7	422.2	417.1	447.1	506.7
New Hampshire	3,072	3,119	3,586	3,095	3,467	232.6	235.7	270.3	232.6	260.6
New Jersey	27,271	28,327	29,904	31,337	34,519	307.6	318.3	334.6	349.8	385.3
New Mexico	11,898	12,249	11,558	12,632	13,108	570.5	587.4	554.2	605.8	628.6
New York	100,546	95,803	98,814	103,615	109,433	513.8	487.5	500.4	523.4	552.8
North Carolina	50,596	48,416	47,147	64,376	58,006	518.8	491.6	474.1	641.0	577.6
North Dakota	2,908	2,932	3,451	3,159	3,455	415.6	405.3	466.7	417.3	456.5
Ohio	53,141	53,121	54,858	56,726	60,496	460.3	459.1	473.2	488.5	520.9
Oklahoma	16,843	18,278	20,662	21,025	21,449	441.5	474.7	532.8	537.5	548.4
Oregon	13,454	14,181	15,508	16,305	17,425	345.0	360.8	390.6	404.7	432.5
Pennsylvania	54,993	52,056	50,536	53,460	56,930	430.9	407.5	395.2	417.6	444.7
Rhode Island	4,313	4,312	4,349	4,575	4,936	410.6	410.1	412.2	433.1	467.3
South Carolina	27,149	25,594	28,087	27,538	28,179	574.7	536.0	581.2	562.4	575.5
South Dakota	3,924	3,927	4,166	3,949	4,331	470.9	464.8	488.3	460.0	504.5
Tennessee	32,525	30,370	30,793	31,272	32,304	503.8	467.5	470.2	473.8	489.4
Texas	127,036	129,861	131,219	141,158	142,952	487.5	491.0	486.8	513.9	520.4
Utah	7,615	7,535	8,223	8,633	9,457	266.7	259.7	279.4	288.2	315.7
Vermont	1,724	1,842	2,237	1,901	1,690	275.4	294.0	357.0	303.7	269.9
Virginia	34,963	33,316	36,048	35,349	39,666	427.1	403.3	432.9	421.7	473.2
Washington	24,596	24,950	26,577	28,699	31,254	356.6	357.9	376.4	400.2	435.9
West Virginia	4,790	5,139	4,719	4,958	4,821	258.2	277.1	255.0	268.9	261.4
Wisconsin	23,726	23,572	23,154	24,381	26,894	414.3	410.5	402.1	422.4	466.0
Wyoming	2,102	2,005	1,972	2,037	2,060	364.7	344.1	337.6	347.5	351.5
U.S. TOTAL	**1,422,976**	**1,401,906**	**1,441,789**	**1,526,658**	**1,598,354**	**453.3**	**443.5**	**452.2**	**475.0**	**497.3**
Northeast	231,947	224,882	227,609	239,174	255,849	416.0	402.0	405.3	424.9	454.6
Midwest	303,622	295,543	303,247	314,893	331,028	451.0	437.5	447.6	463.7	487.5
South	576,656	568,824	582,843	623,397	641,964	491.8	480.5	486.6	514.4	529.7
West	310,751	312,657	328,090	349,194	369,513	422.3	421.1	436.4	459.2	485.9
Guam	1,031	937	839	881	934	644.7	584.2	521.1	544.5	577.3
Puerto Rico	6,227	5,969	4,899	5,295	7,198	169.8	165.1	138.1	152.4	207.2
Virgin Islands	802	775	791	743	571	761.8	739.9	759.3	721.7	554.6
OUTLYING AREAS	**8,060**	**7,681**	**6,529**	**6,919**	**8,703**	**205.0**	**198.0**	**171.2**	**185.1**	**232.8**
TOTAL	**1,431,036**	**1,409,587**	**1,448,318**	**1,533,577**	**1,607,057**	**450.2**	**440.5**	**448.9**	**471.6**	**494.2**

Table 4. Chlamydia Among Women — Reported Cases and Rates of Reported Cases by State/Area and Region in Alphabetical Order, United States and Outlying Areas, 2012–2016

State/Area	Cases					Rates per 100,000 Population				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Alabama	22,099	21,096	20,619	18,674	19,131	889.8	847.8	825.0	745.2	763.5
Alaska	3,670	3,899	3,940	3,786	3,807	1,047.9	1,115.4	1,127.5	1,083.6	1,089.6
Arizona	22,087	21,950	22,747	22,299	23,693	670.4	658.9	671.5	648.9	689.4
Arkansas	12,247	11,334	11,625	12,088	12,216	816.1	752.7	770.4	797.7	806.2
California	114,396	112,460	115,339	121,387	123,906	598.2	583.7	590.5	616.1	628.9
Colorado	15,476	14,336	14,906	16,151	16,945	598.9	546.8	559.4	595.4	624.6
Connecticut	9,464	9,210	9,512	9,089	9,495	514.2	500.0	516.4	494.2	516.3
Delaware	3,181	3,714	3,084	3,118	3,678	672.9	777.3	638.6	638.8	753.5
District of Columbia	4,426	3,992	3,709	4,632	4,018	1,328.0	1,173.4	1,071.1	1,309.9	1,136.2
Florida	55,628	56,688	58,800	62,048	63,415	563.6	567.4	578.2	598.4	611.6
Georgia	37,456	36,559	36,871	40,302	43,377	738.9	715.3	713.1	769.9	828.6
Hawaii	4,452	4,646	4,469	4,720	4,480	644.9	669.0	637.1	668.3	634.4
Idaho	3,206	3,885	3,895	3,963	4,022	402.2	482.6	477.3	479.7	486.8
Illinois	48,575	45,764	46,516	47,268	48,128	740.9	698.1	709.1	722.1	735.3
Indiana	21,633	20,307	20,586	20,385	21,664	651.8	609.0	615.0	607.1	645.2
Iowa	8,194	7,895	8,385	8,372	8,872	528.7	507.1	536.1	532.6	564.4
Kansas	8,440	8,323	8,276	8,325	8,688	581.8	573.2	568.1	571.0	595.9
Kentucky	12,366	12,086	12,404	12,140	12,345	556.3	541.5	553.7	540.5	549.6
Louisiana	20,507	21,258	21,297	23,351	22,942	872.7	900.2	896.4	978.3	961.2
Maine	2,420	2,404	2,478	2,735	2,795	356.5	354.5	365.0	403.4	412.2
Maryland	19,295	19,049	19,162	18,612	20,145	635.9	623.7	622.1	601.3	650.8
Massachusetts	16,319	15,851	14,000	15,588	17,299	476.4	459.7	402.9	445.6	494.5
Michigan	34,510	32,056	31,470	32,425	31,497	685.7	636.5	624.2	642.8	624.4
Minnesota	12,568	12,950	13,484	14,112	14,967	464.3	474.9	491.2	511.4	542.3
Mississippi	16,771	12,676	14,008	12,335	14,123	1,092.1	824.9	909.9	800.7	916.8
Missouri	19,745	19,303	19,549	19,926	20,757	643.0	626.7	632.8	643.1	669.9
Montana	2,655	2,701	2,878	2,846	2,962	530.8	534.5	564.9	554.1	576.7
Nebraska	4,628	4,945	5,110	5,409	5,527	495.9	526.8	540.9	568.8	581.2
Nevada	7,628	8,183	8,039	8,743	9,849	557.7	591.0	569.2	607.0	683.8
New Hampshire	2,150	2,187	2,452	2,089	2,316	321.6	326.5	365.2	310.4	344.2
New Jersey	20,231	20,771	21,556	22,274	24,021	445.5	456.0	471.0	485.7	523.8
New Mexico	8,724	9,033	8,395	9,227	9,306	828.6	858.9	797.5	877.4	884.9
New York	68,337	64,454	65,114	66,164	67,602	677.9	637.2	640.6	649.7	663.8
North Carolina	39,140	37,146	35,494	47,178	41,085	782.9	735.9	696.0	915.9	797.6
North Dakota	1,898	1,923	2,202	2,028	2,187	551.9	544.2	610.9	551.0	594.2
Ohio	38,879	38,293	39,033	39,825	41,797	658.8	647.8	659.4	671.9	705.2
Oklahoma	12,341	13,065	14,855	14,904	14,933	641.1	672.3	758.7	754.9	756.4
Oregon	9,425	9,932	10,545	11,075	11,542	478.8	500.2	525.6	544.0	566.9
Pennsylvania	37,569	35,657	34,170	35,201	37,030	575.0	545.9	523.0	538.4	566.4
Rhode Island	3,091	3,044	3,037	3,064	3,278	570.3	561.5	558.5	562.9	602.2
South Carolina	20,497	19,103	20,581	19,743	19,783	844.7	779.2	828.8	784.3	785.9
South Dakota	2,801	2,793	2,942	2,831	3,072	674.9	664.2	694.1	663.8	720.3
Tennessee	22,732	21,057	21,203	21,112	21,714	687.3	632.6	631.6	624.1	641.9
Texas	96,405	96,923	96,959	102,141	101,618	735.3	728.7	714.3	738.5	734.7
Utah	5,149	5,050	5,414	5,704	6,031	362.8	350.2	370.0	383.1	405.1
Vermont	1,296	1,319	1,613	1,352	1,171	408.5	415.5	507.7	425.8	368.8
Virginia	24,670	23,167	24,754	23,859	26,146	592.4	551.8	585.1	560.3	614.0
Washington	17,271	17,452	18,193	19,047	20,276	499.8	500.2	515.1	531.2	565.5
West Virginia	3,405	3,624	3,356	3,449	3,330	362.2	386.1	358.4	369.6	356.9
Wisconsin	16,727	16,448	16,063	16,660	18,382	580.1	569.0	554.3	573.7	633.0
Wyoming	1,492	1,387	1,352	1,387	1,356	528.8	486.0	472.5	482.9	472.1
U.S. TOTAL	**1,018,272**	**993,348**	**1,006,441**	**1,045,143**	**1,072,719**	**638.7**	**619.0**	**621.6**	**640.4**	**657.3**
Northeast	160,877	154,897	153,932	157,556	165,007	562.0	539.7	534.4	546.0	571.8
Midwest	218,598	211,000	213,616	217,566	225,538	639.9	615.9	621.9	632.2	655.4
South	423,166	412,537	418,781	439,686	443,999	708.3	684.1	685.9	711.7	718.6
West	215,631	214,914	220,112	230,335	238,175	584.6	577.5	583.6	604.0	624.5
Guam	726	700	595	618	654	921.9	885.8	749.6	774.4	819.5
Puerto Rico	5,102	4,766	3,770	3,950	5,551	267.1	252.7	204.4	217.4	305.5
Virgin Islands	592	579	590	563	405	1,056.8	1,037.1	1,060.7	1,020.6	734.1
OUTLYING AREAS	**6,420**	**6,045**	**4,955**	**5,131**	**6,610**	**314.0**	**299.1**	**250.4**	**262.9**	**338.6**
TOTAL	**1,024,692**	**999,393**	**1,011,396**	**1,050,274**	**1,079,329**	**634.6**	**615.0**	**617.1**	**636.0**	**653.6**

NOTE: Cases reported with unknown sex are not included in this table.

Table 5. Chlamydia Among Men — Reported Cases and Rates of Reported Cases by State/Area and Region in Alphabetical Order, United States and Outlying Areas, 2012–2016

State/Area	Cases					Rates per 100,000 Population				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Alabama	8,295	8,201	8,318	7,549	7,585	354.7	349.7	354.0	320.8	322.3
Alaska	1,792	1,875	1,849	1,871	1,891	470.0	486.3	477.4	480.9	486.1
Arizona	8,354	8,610	9,650	10,028	11,217	256.4	261.3	288.6	295.7	330.7
Arkansas	4,360	4,104	3,964	4,078	4,521	301.0	282.3	272.0	278.8	309.1
California	52,983	54,679	60,687	67,475	73,625	280.1	286.8	314.9	347.0	378.7
Colorado	6,155	6,050	6,957	7,706	8,624	236.4	228.6	258.5	280.9	314.3
Connecticut	3,524	3,481	3,757	3,926	4,268	201.4	198.4	214.1	224.1	243.6
Delaware	1,257	1,499	1,389	1,487	1,687	282.9	334.6	306.8	324.8	368.5
District of Columbia	2,345	2,400	1,555	3,108	3,112	784.2	783.7	497.4	975.5	976.8
Florida	22,009	23,300	25,239	28,332	31,275	233.0	243.7	259.6	286.1	315.8
Georgia	14,521	14,063	14,736	17,212	19,338	299.3	288.1	299.1	345.6	388.3
Hawaii	1,888	1,994	1,950	2,352	2,421	269.0	281.0	271.6	324.2	333.8
Idaho	1,344	1,528	1,547	1,663	1,869	168.3	189.3	189.0	200.7	225.5
Illinois	18,977	17,943	19,908	21,966	24,008	300.3	283.6	315.0	347.9	380.2
Indiana	7,850	7,708	7,921	8,492	9,174	243.9	238.2	243.8	260.3	281.3
Iowa	3,183	3,058	3,419	3,712	4,111	208.8	199.4	221.6	239.2	264.9
Kansas	2,695	2,689	2,840	3,139	3,472	187.8	186.5	196.2	215.9	238.8
Kentucky	4,851	4,989	5,194	5,273	5,590	224.8	230.6	239.0	242.0	256.5
Louisiana	6,846	7,481	7,655	8,974	8,784	304.0	330.4	336.6	392.9	384.6
Maine	990	1,031	1,050	1,230	1,356	152.2	158.6	161.2	188.9	208.2
Maryland	7,193	7,654	8,237	8,780	10,479	252.4	266.2	284.4	301.6	360.0
Massachusetts	7,193	7,341	7,197	8,406	9,433	223.4	226.2	220.0	255.0	286.2
Michigan	12,962	12,683	12,723	14,015	14,417	267.2	261.0	261.3	287.3	295.5
Minnesota	5,430	5,791	6,414	7,122	7,703	203.2	215.0	236.5	260.9	282.2
Mississippi	6,281	4,788	5,588	5,018	5,955	433.4	329.2	384.2	345.6	410.2
Missouri	8,090	8,025	8,432	9,022	10,086	274.1	270.8	283.5	302.2	337.9
Montana	1,172	1,116	1,314	1,338	1,454	232.1	218.9	255.6	257.6	280.0
Nebraska	2,093	2,196	2,357	2,531	2,649	226.9	236.2	251.6	267.8	280.3
Nevada	3,508	3,590	3,786	4,152	4,777	252.2	255.4	265.4	286.2	329.3
New Hampshire	922	932	1,130	1,006	1,150	141.4	142.6	172.4	153.0	174.9
New Jersey	6,958	7,476	8,272	9,025	10,435	160.9	172.1	189.6	206.4	238.7
New Mexico	3,170	3,209	3,148	3,400	3,794	307.0	310.5	304.8	329.0	367.1
New York	32,147	31,273	33,634	37,346	41,722	338.8	327.9	351.0	388.6	434.1
North Carolina	11,354	11,254	11,638	17,195	16,918	238.9	234.4	240.2	351.5	345.8
North Dakota	1,010	1,009	1,249	1,131	1,268	283.9	272.7	329.5	290.9	326.1
Ohio	14,262	14,828	15,825	16,901	18,699	252.8	262.0	278.9	297.2	328.8
Oklahoma	4,498	5,213	5,802	6,121	6,516	238.0	273.3	302.2	316.0	336.4
Oregon	4,028	4,243	4,953	5,223	5,876	208.6	218.2	252.2	262.0	294.8
Pennsylvania	17,388	16,360	16,315	18,201	19,840	279.1	262.1	260.9	290.5	316.7
Rhode Island	1,222	1,268	1,312	1,511	1,656	240.4	248.9	256.6	295.1	323.5
South Carolina	6,588	6,432	7,376	7,705	8,286	286.8	276.9	314.0	323.9	348.3
South Dakota	1,123	1,134	1,224	1,118	1,259	268.5	267.2	285.1	258.8	291.5
Tennessee	9,754	9,311	9,587	10,158	10,584	309.8	294.0	300.3	315.7	329.0
Texas	30,532	31,980	34,110	38,539	40,992	235.8	243.2	254.9	282.6	300.6
Utah	2,466	2,485	2,808	2,929	3,424	171.7	170.3	189.8	194.3	227.2
Vermont	428	523	622	549	518	138.6	169.2	201.4	177.9	167.9
Virginia	10,247	10,112	11,244	11,460	13,395	254.8	248.9	274.6	277.8	324.7
Washington	7,325	7,498	8,384	9,651	10,975	212.8	215.3	237.5	269.2	306.1
West Virginia	1,385	1,514	1,363	1,509	1,491	151.3	165.4	149.1	165.6	163.7
Wisconsin	6,999	7,114	7,077	7,703	8,487	246.2	249.4	247.5	268.6	296.0
Wyoming	610	617	619	643	704	207.3	207.5	207.7	215.1	235.5
U.S. TOTAL	**402,557**	**405,652**	**433,325**	**478,981**	**522,870**	**260.6**	**260.6**	**276.1**	**302.7**	**330.5**
Northeast	70,772	69,685	73,289	81,200	90,378	260.8	255.8	268.0	296.1	329.5
Midwest	84,674	84,178	89,389	96,852	105,333	255.4	252.9	267.7	289.2	314.5
South	152,316	154,295	162,995	182,498	196,508	264.8	265.7	277.6	307.2	330.8
West	94,795	97,494	107,652	118,431	130,651	258.3	263.2	287.3	312.4	344.6
Guam	305	234	244	263	280	375.8	287.6	298.9	320.8	341.6
Puerto Rico	1,125	1,203	1,126	1,319	1,647	64.0	69.6	66.1	79.6	99.4
Virgin Islands	210	196	201	180	166	426.3	400.7	414.0	376.7	347.4
OUTLYING AREAS	**1,640**	**1,633**	**1,571**	**1,762**	**2,093**	**86.9**	**87.8**	**85.6**	**98.6**	**117.1**
TOTAL	**404,197**	**407,285**	**434,896**	**480,743**	**524,963**	**258.5**	**258.6**	**273.9**	**300.4**	**328.1**

NOTE: Cases reported with unknown sex are not included in this table.

Table 6. Chlamydia — Reported Cases and Rates of Reported Cases in Selected Metropolitan Statistical Areas (MSAs)* in Alphabetical Order, United States, 2012–2016

MSAs	Cases					Rates per 100,000 Population				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Atlanta-Sandy Springs-Roswell, GA	26,470	16,429†	25,744	19,106†	33,273	485.0	297.5†	458.5	334.6†	582.6
Austin-Round Rock, TX	9,810	10,138	10,920	11,679	12,299	534.8	538.4	561.9	583.7	614.7
Baltimore-Columbia-Towson, MD	13,578	13,749	14,095	14,016	15,829	493.2	496.2	505.9	501.0	565.8
Birmingham-Hoover, AL	6,868	6,552	6,309	5,839	1,179†	604.2	574.6	551.6	509.7	102.9†
Boston-Cambridge-Newton, MA-NH	16,339	16,127	14,264†	14,378†	15,880†	352.1	344.3	301.4†	301.2†	332.6†
Buffalo-Cheektowaga-Niagara Falls, NY	6,010	5,724	5,841	5,900	6,252	529.9	504.7	514.0	519.7	550.7
Charlotte-Concord-Gastonia, NC-SC	11,548	11,418	11,766	16,284	14,314	502.8	488.9	494.3	671.1	589.9
Chicago-Naperville-Elgin, IL-IN-WI	51,329	47,837	51,457	54,248	56,478	539.0	501.6	538.6	568.0	591.3
Cincinnati, OH-KY-IN	10,234	10,207	10,516	11,219	11,392	480.8	477.5	489.2	519.9	528.0
Cleveland-Elyria, OH	12,339	12,126	11,363	11,312	12,475	598.0	587.3	550.6	548.9	605.3
Columbus, OH	8,946	9,734	10,258	11,327	12,113	460.2	494.8	514.3	560.3	599.2
Dallas-Fort Worth-Arlington, TX	31,697	30,684	30,549	35,900	32,771	473.0	450.5	439.3	505.4	461.4
Denver-Aurora-Lakewood, CO	12,764	12,131	13,346	13,942	14,282	482.5	449.7	484.6	495.4	507.5
Detroit-Warren-Dearborn, MI	24,229	22,567	21,012	22,238	21,966	564.5	525.4	489.0	516.9	510.6
Hartford-West Hartford-East Hartford, CT	4,562†	4,311	4,713	4,689	4,898	375.7†	354.8	388.1	387.1	404.4
Houston-The Woodlands-Sugar Land, TX	26,807	29,120	30,554	32,823	35,594	434.0	461.3	470.8	493.1	534.7
Indianapolis-Carmel-Anderson, IN	12,714	11,835	11,952	11,544	12,794	659.1	605.7	606.3	580.4	643.3
Jacksonville, FL	6,813	7,138	7,391	8,012	8,434	494.5	511.8	520.8	552.7	581.9
Kansas City, MO-KS	10,152	9,513	9,866	10,240	11,043	498.0	463.0	476.4	490.5	529.0
Las Vegas-Henderson-Paradise, NV	8,587	9,286	9,485	10,049	11,362	429.2	457.9	458.3	475.2	537.3
Los Angeles-Long Beach-Anaheim, CA	60,231	59,386	64,263	68,285	71,943	461.4	452.2	484.6	511.9	539.3
Louisville-Jefferson County, KY-IN	6,658	6,384	6,751	6,735	6,881	532.1	505.8	531.7	526.8	538.2
Memphis, TN-MS-AR	12,744	10,763	10,554	10,342	10,365	949.8	802.2	785.7	769.4	771.1
Miami-Fort Lauderdale-West Palm Beach, FL	20,933	22,821	24,599	26,746	28,070	363.2	391.6	414.8	444.9	466.9
Milwaukee-Waukesha-West Allis, WI	10,929	10,754	10,303	10,645	11,891	697.5	685.1	655.3	675.6	754.6
Minneapolis-St. Paul-Bloomington, MN-WI	12,144†	12,227†	13,589	14,709†	15,584	354.9†	353.5†	388.8	417.3†	442.2
Nashville-Davidson-Murfreesboro-Franklin, TN	7,151	7,356	7,878	8,066	8,196	414.1	418.5	439.5	440.7	447.8
New Orleans-Metairie, LA	7,118	8,134	8,595	9,291	9,626	580.1	655.5	686.6	735.7	762.2
New York-Newark-Jersey City, NY-NJ-PA	92,763	89,211	93,515	97,835	105,463	467.7	447.2	465.4	484.8	522.6
Oklahoma City, OK	5,640	6,190	7,293	7,633	7,693	435.0	469.1	545.6	561.9	566.3
Orlando-Kissimmee-Sanford, FL	9,928	10,230	11,001	12,026	12,492	446.5	451.1	473.9	503.8	523.3
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	35,513	34,741	33,376	34,910	38,182	590.0	575.7	551.6	575.1	629.0
Phoenix-Mesa-Scottsdale, AZ	20,358	20,164	21,576	21,795	23,567	470.2	458.4	480.6	476.4	515.2
Pittsburgh, PA	8,994	8,605	8,059	8,604	8,623	381.0	364.5	342.1	365.7	366.5
Portland-Vancouver-Hillsboro, OR-WA	7,797	8,536	9,283	9,982	11,052	340.5	368.8	395.3	417.8	462.6
Providence-Warwick, RI-MA	5,941	5,828	5,695†	5,907†	6,668†	371.0	363.3	353.9†	366.2†	413.4†
Raleigh, NC	5,373	4,966	5,126	6,911	6,493	452.1	408.9	412.4	542.6	509.8
Richmond, VA	7,224	6,817	7,817	7,878	8,592	586.4	547.2	620.4	619.7	675.8
Riverside-San Bernardino-Ontario, CA	20,994	19,819	19,560	20,778	20,081	482.6	452.4	440.4	462.8	447.3
Sacramento-Roseville-Arden-Arcade, CA	9,852	9,771	9,674	10,621	10,892	448.5	441.0	431.0	467.0	478.9
Salt Lake City, UT	4,041	3,947	4,423	4,751	5,264	359.6	346.1	383.5	406.0	449.8
San Antonio-New Braunfels, TX	13,023	13,335	11,573	14,465	15,149	582.9	585.5	497.0	606.7	635.4
San Diego-Carlsbad, CA	16,524	14,706	15,754	17,378	18,937	520.1	458.0	482.7	526.7	573.9
San Francisco-Oakland-Hayward, CA	17,171	18,254	20,377	23,519	24,894	385.4	404.2	443.6	505.1	534.6
San Jose-Sunnyvale-Santa Clara, CA	4,676	6,717	6,278	6,898	7,166	246.8	349.9	321.5	348.9	362.5
Seattle-Tacoma-Bellevue, WA	12,965	12,971	13,861	15,257	16,886	365.0	359.3	377.5	408.6	452.3
St. Louis, MO-IL	14,843	14,783	14,711	14,961	15,512	530.9	527.8	524.2	532.1	551.7
Tampa-St. Petersburg-Clearwater, FL	12,274	12,752	12,952	13,472	13,996	431.7	444.2	444.2	452.8	470.4
Virginia Beach-Norfolk-Newport News, VA-NC	12,409	11,852	12,192	11,281	13,223	730.0	694.2	710.2	654.0	766.6
Washington-Arlington-Alexandria, DC-VA-MD-WV	23,872	23,531	18,342	18,890	21,269	407.3	395.5	304.0	309.8	348.8
SELECTED MSAs TOTAL	**811,879**	**792,177**	**820,371**	**865,316**	**919,278**	**474.2**	**458.3**	**469.1**	**489.6**	**520.1**

***** MSAs were selected on the basis of the largest population in the 2010 U.S. Census.

† The variable used to identify county, which is used to classify cases into MSAs, was complete for ≤95% of cases in a state contributing data to this MSA. See Appendix A1.4 for more information.

Table 7. Chlamydia Among Women — Reported Cases and Rates of Reported Cases in Selected Metropolitan Statistical Areas (MSAs)* in Alphabetical Order, United States, 2012–2016

MSAs	Cases					Rates per 100,000 Population				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Atlanta-Sandy Springs-Roswell, GA	18,298	11,221†	17,564	12,640†	22,235	652.7	395.0†	607.2	429.0†	754.6
Austin-Round Rock, TX	6,909	6,691	7,513	7,779	7,827	755.2	712.3	773.7	777.8	782.6
Baltimore-Columbia-Towson, MD	9,933	9,848	9,780	9,453	10,359	696.7	686.9	678.0	652.7	715.3
Birmingham-Hoover, AL	4,866	4,486	4,300	3,940	861†	826.1	759.2	724.5	662.3	144.7†
Boston-Cambridge-Newton, MA-NH	11,234	10,791	9,243†	9,137†	9,987†	469.9	447.5	379.6†	372.0†	406.7†
Buffalo-Cheektowaga-Niagara Falls, NY	4,317	4,024	4,077	4,035	4,142	737.4	688.0	696.2	690.1	708.4
Charlotte-Concord-Gastonia, NC-SC	8,731	8,605	8,633	11,672	10,033	740.1	717.0	705.1	935.2	803.9
Chicago-Naperville-Elgin, IL-IN-WI	36,701	34,216	35,696	36,547	37,102	754.3	702.5	730.9	749.1	760.5
Cincinnati, OH-KY-IN	7,750	7,527	7,724	8,050	8,052	713.0	690.0	703.9	731.0	731.2
Cleveland-Elyria, OH	8,877	8,550	7,914	7,815	8,601	829.5	799.4	740.8	732.5	806.2
Columbus, OH	6,280	6,749	6,895	7,704	8,027	635.3	674.7	680.3	750.2	781.6
Dallas-Fort Worth-Arlington, TX	24,018	22,744	22,213	25,902	22,719	707.6	658.7	628.6	717.3	629.2
Denver-Aurora-Lakewood, CO	9,117	8,447	9,020	9,265	9,360	686.4	624.1	652.7	656.7	663.4
Detroit-Warren-Dearborn, MI	17,460	16,152	14,822	15,410	14,957	789.8	730.5	670.3	696.5	676.0
Hartford-West Hartford-East Hartford, CT	3,301†	3,109	3,349	3,226	3,307	529.8†	499.0	538.2	520.0	533.0
Houston-The Woodlands-Sugar Land, TX	20,858	22,027	22,832	23,828	25,470	672.3	695.0	699.6	711.6	760.6
Indianapolis-Carmel-Anderson, IN	8,899	8,149	8,398	7,816	8,604	902.5	816.1	832.9	768.7	846.2
Jacksonville, FL	4,812	5,131	5,238	5,637	5,757	680.7	717.4	719.3	758.6	774.8
Kansas City, MO-KS	7,295	6,795	6,991	7,108	7,544	701.5	649.2	662.4	668.8	709.9
Las Vegas-Henderson-Paradise, NV	5,942	6,571	6,486	6,885	7,697	597.1	650.5	627.4	650.6	727.3
Los Angeles-Long Beach-Anaheim, CA	39,470	38,456	40,401	42,385	43,278	597.1	578.5	600.7	626.6	639.8
Louisville-Jefferson County, KY-IN	4,884	4,574	4,827	4,686	4,735	762.7	708.1	742.6	716.8	724.3
Memphis, TN-MS-AR	9,367	7,717	7,758	7,238	7,324	1,342.7	1,105.5	1,109.2	1,033.5	1,045.8
Miami-Fort Lauderdale-West Palm Beach, FL	14,692	15,645	16,473	17,461	17,881	495.4	521.9	539.6	563.6	577.1
Milwaukee-Waukesha-West Allis, WI	7,760	7,463	7,183	7,242	8,013	964.7	926.6	890.0	895.8	991.2
Minneapolis-St. Paul-Bloomington, MN-WI	8,326†	8,293†	8,957	9,497†	9,958	481.1†	474.2†	507.0	533.5†	559.4
Nashville-Davidson-Murfreesboro-Franklin, TN	4,928	5,084	5,278	5,322	5,374	557.8	565.0	574.5	567.4	573.0
New Orleans-Metairie, LA	5,326	6,062	6,301	6,710	6,843	843.9	948.7	975.3	1,028.6	1,049.0
New York-Newark-Jersey City, NY-NJ-PA	63,588	60,539	62,097	62,905	65,594	620.5	587.7	598.4	603.9	629.7
Oklahoma City, OK	3,951	4,430	5,255	5,420	5,308	601.6	662.5	775.0	786.4	770.2
Orlando-Kissimmee-Sanford, FL	7,373	7,503	8,021	8,505	8,593	649.6	648.3	675.8	696.6	703.8
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	24,166	23,532	22,317	22,967	24,813	776.5	754.4	713.7	732.2	791.1
Phoenix-Mesa-Scottsdale, AZ	14,396	14,206	14,841	14,607	15,621	661.6	642.4	656.9	634.3	678.4
Pittsburgh, PA	6,325	6,046	5,509	5,681	5,551	519.7	497.4	454.6	469.9	459.2
Portland-Vancouver-Hillsboro, OR-WA	5,359	5,809	6,158	6,559	7,076	462.8	496.1	518.4	542.7	585.5
Providence-Warwick, RI-MA	4,256	4,124	3,945†	3,989†	4,501†	515.3	498.7	475.6†	479.9†	541.5†
Raleigh, NC	3,691	3,490	3,502	4,685	4,244	606.8	561.5	550.1	718.3	650.7
Richmond, VA	5,083	4,792	5,311	5,330	5,725	798.4	744.7	815.9	811.1	871.2
Riverside-San Bernardino-Ontario, CA	15,296	14,536	13,988	14,693	13,893	700.5	661.1	626.6	651.4	616.0
Sacramento-Roseville-Arden-Arcade, CA	7,122	6,915	6,686	7,284	7,282	635.9	611.8	583.6	627.3	627.1
Salt Lake City, UT	2,679	2,541	2,873	3,067	3,275	479.6	448.0	500.3	526.4	562.1
San Antonio-New Braunfels, TX	9,436	9,576	8,158	10,005	10,466	832.1	829.5	690.9	828.4	866.6
San Diego-Carlsbad, CA	11,102	9,684	10,211	11,154	11,690	702.5	606.3	628.9	680.1	712.7
San Francisco-Oakland-Hayward, CA	10,391	10,845	11,509	12,508	12,900	460.5	474.3	494.3	530.5	547.1
San Jose-Sunnyvale-Santa Clara, CA	3,260	4,530	4,100	4,328	4,445	345.9	474.6	422.3	440.8	452.7
Seattle-Tacoma-Bellevue, WA	8,460	8,411	8,751	9,306	10,085	474.8	465.4	476.5	498.4	540.2
St. Louis, MO-IL	10,351	10,364	10,271	10,158	10,417	717.8	717.6	709.9	701.1	719.0
Tampa-St. Petersburg-Clearwater, FL	8,738	8,948	9,066	9,269	9,360	596.5	604.2	602.5	603.7	609.6
Virginia Beach-Norfolk-Newport News, VA-NC	8,771	8,259	8,425	7,677	8,791	1,015.2	952.5	966.9	877.4	1,004.8
Washington-Arlington-Alexandria, DC-VA-MD-WV	16,349	15,768	12,501	12,517	13,635	544.5	518.1	405.0	401.3	437.2
SELECTED MSAs TOTAL	**570,494**	**549,975**	**559,361**	**577,004**	**599,312**	**653.1**	**623.8**	**626.7**	**639.8**	**664.5**

* MSAs were selected on the basis of the largest population in the 2010 U.S. Census.

† The variable used to identify county, which is used to classify cases into MSAs, was complete for ≤95% of cases in a state contributing data to this MSA. See Appendix A1.4 for more information.

NOTE: Cases reported with unknown sex are not included in this table.

Table 8. Chlamydia Among Men — Reported Cases and Rates of Reported Cases in Selected Metropolitan Statistical Areas (MSAs)* in Alphabetical Order, United States, 2012–2016

MSAs	Cases					Rates per 100,000 Population				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Atlanta-Sandy Springs-Roswell, GA	7,917	5,061†	7,979	6,429†	11,000	298.3	188.7†	293.2	232.6†	397.9
Austin-Round Rock, TX	2,890	2,592	3,372	3,871	4,444	314.3	274.7	346.8	386.8	444.1
Baltimore-Columbia-Towson, MD	3,608	3,889	4,294	4,514	5,446	271.8	290.9	319.6	334.6	403.6
Birmingham-Hoover, AL	1,985	2,031	1,990	1,886	306†	362.5	369.7	361.6	342.4	55.6†
Boston-Cambridge-Newton, MA-NH	5,086	5,328	4,988†	5,211†	5,861†	226.0	234.4	217.2†	224.8†	252.8†
Buffalo-Cheektowaga-Niagara Falls, NY	1,693	1,700	1,764	1,865	2,110	308.5	309.5	320.3	338.8	383.3
Charlotte-Concord-Gastonia, NC-SC	2,794	2,804	3,125	4,607	4,278	250.2	247.0	270.4	391.0	363.1
Chicago-Naperville-Elgin, IL-IN-WI	14,518	13,553	15,679	17,517	19,320	311.8	290.4	335.7	374.9	413.5
Cincinnati, OH-KY-IN	2,482	2,676	2,787	3,168	3,333	238.3	255.7	264.9	299.9	315.5
Cleveland-Elyria, OH	3,462	3,576	3,449	3,497	3,874	348.5	359.4	346.5	351.8	389.7
Columbus, OH	2,666	2,985	3,363	3,623	4,086	279.0	308.7	342.8	364.2	410.8
Dallas-Fort Worth-Arlington, TX	7,669	7,916	8,313	9,941	10,006	231.9	235.7	243.0	284.7	286.5
Denver-Aurora-Lakewood, CO	3,647	3,684	4,326	4,677	4,922	276.9	274.1	315.2	333.3	350.7
Detroit-Warren-Dearborn, MI	6,718	6,350	6,153	6,795	6,992	322.8	304.7	295.0	325.2	334.6
Hartford-West Hartford-East Hartford, CT	1,245†	1,181	1,333	1,443	1,541	210.5†	199.4	225.1	244.2	260.8
Houston-The Woodlands-Sugar Land, TX	5,944	7,078	7,700	8,939	10,004	193.3	225.1	238.6	270.2	302.4
Indianapolis-Carmel-Anderson, IN	3,802	3,681	3,544	3,723	4,185	403.2	385.3	368.0	383.0	430.6
Jacksonville, FL	2,001	1,989	2,138	2,367	2,672	298.2	292.7	309.4	335.1	378.2
Kansas City, MO-KS	2,857	2,718	2,875	3,132	3,499	286.1	269.7	283.1	305.6	341.5
Las Vegas-Henderson-Paradise, NV	2,644	2,708	2,986	3,139	3,646	262.9	266.1	288.3	297.1	345.1
Los Angeles-Long Beach-Anaheim, CA	20,633	20,831	23,766	25,764	28,299	320.3	321.3	363.6	391.8	430.4
Louisville-Jefferson County, KY-IN	1,744	1,781	1,896	2,031	2,131	285.4	289.0	305.9	325.1	341.1
Memphis, TN-MS-AR	3,377	3,046	2,795	3,104	3,035	524.3	473.2	434.1	482.2	471.4
Miami-Fort Lauderdale-West Palm Beach, FL	6,238	7,134	8,086	9,270	10,172	223.0	252.0	281.1	318.1	349.1
Milwaukee-Waukesha-West Allis, WI	3,169	3,284	3,111	3,394	3,860	415.5	429.7	406.6	442.3	503.1
Minneapolis-St. Paul-Bloomington, MN-WI	3,813†	3,933†	4,623	5,206†	5,614	225.4†	229.9†	267.5	298.4†	321.8
Nashville-Davidson-Murfreesboro-Franklin, TN	2,185	2,271	2,598	2,744	2,822	259.1	264.6	297.3	307.5	316.2
New Orleans-Metairie, LA	1,792	2,072	2,294	2,581	2,783	300.7	344.2	378.7	422.7	455.8
New York-Newark-Jersey City, NY-NJ-PA	29,065	28,546	31,310	34,799	39,725	303.3	295.8	322.3	356.3	406.8
Oklahoma City, OK	1,688	1,760	2,036	2,213	2,385	263.8	270.4	309.1	330.7	356.4
Orlando-Kissimmee-Sanford, FL	2,555	2,708	2,964	3,511	3,896	234.7	243.9	261.2	301.0	334.1
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	11,314	11,178	11,010	11,912	13,315	389.2	383.4	376.5	406.1	453.9
Phoenix-Mesa-Scottsdale, AZ	5,960	5,957	6,735	7,173	7,944	276.8	272.3	302.0	315.7	349.7
Pittsburgh, PA	2,668	2,550	2,541	2,909	3,062	233.3	222.6	222.1	254.3	267.6
Portland-Vancouver-Hillsboro, OR-WA	2,437	2,723	3,124	3,416	3,970	215.3	238.1	269.2	289.3	336.2
Providence-Warwick, RI-MA	1,683	1,702	1,744†	1,913†	2,163†	217.1	218.9	223.6†	244.7†	276.6†
Raleigh, NC	1,673	1,474	1,622	2,226	2,248	288.3	248.6	267.5	358.3	361.8
Richmond, VA	2,129	2,011	2,503	2,540	2,827	357.6	333.9	410.9	413.5	460.3
Riverside-San Bernardino-Ontario, CA	5,683	5,271	5,542	6,070	6,141	262.3	241.5	250.8	271.8	274.9
Sacramento-Roseville-Arden-Arcade, CA	2,712	2,846	2,976	3,322	3,580	251.9	262.2	270.9	298.5	321.6
Salt Lake City, UT	1,362	1,406	1,550	1,684	1,989	241.0	245.2	267.7	286.6	338.5
San Antonio-New Braunfels, TX	3,587	3,757	3,412	4,459	4,683	326.1	334.5	297.2	379.1	398.1
San Diego-Carlsbad, CA	5,418	5,013	5,508	6,190	7,195	339.3	310.6	335.9	373.0	433.6
San Francisco-Oakland-Hayward, CA	6,739	7,370	8,823	10,961	11,936	306.5	330.5	389.4	476.9	519.3
San Jose-Sunnyvale-Santa Clara, CA	1,353	2,186	2,163	2,565	2,717	142.1	226.5	220.3	257.8	273.1
Seattle-Tacoma-Bellevue, WA	4,505	4,560	5,110	5,951	6,799	254.5	253.0	278.5	318.8	364.3
St. Louis, MO-IL	4,474	4,411	4,429	4,762	5,091	330.5	325.1	325.8	349.4	373.6
Tampa-St. Petersburg-Clearwater, FL	3,532	3,752	3,835	4,195	4,632	256.3	270.0	271.8	291.3	321.7
Virginia Beach-Norfolk-Newport News, VA-NC	3,631	3,584	3,748	3,595	4,406	434.3	426.5	443.4	423.0	518.4
Washington-Arlington-Alexandria, DC-VA-MD-WV	7,461	7,725	5,813	6,359	7,595	261.1	265.8	197.2	213.5	255.0
SELECTED MSAs TOTAL	**240,208**	**240,342**	**259,825**	**287,163**	**318,540**	**286.5**	**283.8**	**303.4**	**331.8**	**368.0**

* MSAs were selected on the basis of the largest population in the 2010 U.S. Census.

† The variable used to identify county, which is used to classify cases into MSAs, was complete for ≤95% of cases in a state contributing data to this MSA. See Appendix A1.4 for more information.

NOTE: Cases reported with unknown sex are not included in this table.

Table 9. Chlamydia — Reported Cases and Rates of Reported Cases in Counties and Independent Cities* Ranked by Number of Reported Cases, United States, 2016

Rank*	County/Independent City	Cases	Rate per 100,000 Population	Cumulative Percentage
1	Los Angeles County, CA	59,116	581.3	3
2	Cook County, IL	41,056	783.8	6
3	Harris County, TX	27,847	613.6	8
4	Maricopa County, AZ	22,134	531.1	9
5	Philadelphia County, PA	19,992	1,275.5	10
6	Kings County, NY	19,900	754.7	11
7	San Diego County, CA	18,937	573.9	13
8	Bronx County, NY	17,043	1,171.0	14
9	New York County, NY	15,216	925.3	15
10	Wayne County, MI	14,082	800.4	15
11	Bexar County, TX	13,724	723.2	16
12	Queens County, NY	12,904	551.7	17
13	Orange County, CA	12,827	404.7	18
14	Miami-Dade County, FL	12,687	471.1	19
15	Dallas County, TX	12,216	478.4	20
16	San Bernardino County, CA	11,495	540.1	20
17	Clark County, NV	11,362	537.3	21
18	Milwaukee County, WI	10,751	1,122.5	22
19	Cuyahoga County, OH	10,090	803.4	22
20	Broward County, FL	9,928	523.5	23
21	Marion County, IN	9,815	1,045.2	23
22	Franklin County, OH	9,712	775.9	24
23	King County, WA	9,422	445.0	25
24	Tarrant County, TX	9,230	465.6	25
25	Travis County, TX	8,618	732.5	26
26	Riverside County, CA	8,586	363.7	26
27	Sacramento County, CA	8,525	567.8	27
28	Orange County, FL	8,354	648.5	27
29	Fulton County, GA	8,292	820.5	28
30	San Francisco County, CA	8,175	945.3	28
31	Alameda County, CA	8,166	498.5	29
32	Hillsborough County, FL	8,066	597.9	29
33	Mecklenburg County, NC	7,969	770.6	30
34	Shelby County, TN	7,838	835.5	30
35	Hennepin County, MN	7,575	619.3	31
36	Baltimore (City), MD	7,394	1,189.0	31
37	Santa Clara County, CA	6,979	363.9	32
38	Hamilton County, OH	6,915	856.2	32
39	Prince George's County, MD	6,753	742.5	33
40	Duval County, FL	6,634	726.6	33
41	Fresno County, CA	6,473	664.0	33
42	Collin County, TX	6,364	696.2	34
43	Kern County, CA	6,307	714.9	34
44	Denver County, CO	6,300	923.0	35
45	Allegheny County, PA	6,020	489.2	35
46	Pima County, AZ	5,819	576.1	35
47	DeKalb County, GA	5,799	789.1	36
48	Essex County, NJ	5,726	718.1	36
49	St. Louis County, MO	5,698	567.9	36
50	Jackson County, MO	5,585	812.2	37
51	Wake County, NC	5,502	537.2	37
52	Palm Beach County, FL	5,455	383.4	37
53	Honolulu County, HI	5,399	540.6	38
54	Oklahoma County, OK	5,273	678.8	38
55	Jefferson County, KY	5,221	683.7	38
56	Contra Costa County, CA	5,205	462.0	39
57	Erie County, NY	5,201	563.7	39
58	Salt Lake County, UT	5,106	461.1	39
59	Multnomah County, OR	5,065	640.9	40
60	Pierce County, WA	4,965	588.3	40
61	Bernalillo County, NM	4,759	703.3	40
62	Middlesex County, MA	4,729	298.3	41
63	Monroe County, NY	4,706	627.8	41
64	Orleans Parish, LA	4,632	1,188.9	41
65	Guilford County, NC	4,594	887.6	42
66	Suffolk County, NY	4,506	300.1	42
67	Davidson County, TN	4,476	659.3	42
68	Etowah County, AL	4,348	4,219.0	42
69	Hartford County, CT	4,219	471.0	43
70	Baltimore County, MD	4,190	504.1	43

* The top 70 counties and independent cities ranked in descending order by number of cases reported in 2016 then by rate are displayed.
NOTE: Relative rankings of counties may be impacted by completeness of the variable used to identify county. In 2016, the variable used to identify county was complete for ≤95% of cases in Alabama and Massachusetts. See Appendix A1.4 for more information.

Table 10. Chlamydia — Reported Cases and Rates of Reported Cases by Age Group and Sex, United States, 2012–2016

Age Group	Cases				Rates per 100,000 Population*			
	Total	Male	Female	Unknown Sex	Total	Male	Female	
0–4	774	272	495	7	3.9	2.7	5.1	2012
5–9	151	17	134	0	0.7	0.2	1.3	
10–14	14,355	1,655	12,673	27	69.5	15.7	125.5	
15–19	433,239	86,150	346,430	659	2,028.2	785.8	3,331.7	
20–24	554,173	152,772	400,629	772	2,453.9	1,322.8	3,630.9	
25–29	224,014	77,666	146,037	311	1,046.9	716.2	1,383.8	
30–34	97,736	38,011	59,594	131	467.4	362.2	572.1	
35–39	43,660	18,274	25,313	73	224.0	188.1	259.0	
40–44	23,882	11,596	12,245	41	113.6	110.9	115.9	
45–54	20,321	11,332	8,961	28	45.9	52.0	39.9	
55–64	4,950	2,783	2,161	6	12.8	15.0	10.8	
65+	1,134	602	525	7	2.6	3.2	2.2	
Unknown Age	4,587	1,427	3,075	85				
TOTAL	**1,422,976**	**402,557**	**1,018,272**	**2,147**	**453.3**	**260.6**	**638.7**	
0–4	681	266	402	13	3.4	2.6	4.1	2013
5–9	145	20	123	2	0.7	0.2	1.2	
10–14	12,585	1,554	11,001	30	60.9	14.7	108.9	
15–19	395,612	78,404	316,438	770	1,869.7	722.9	3,068.4	
20–24	553,658	153,102	399,545	1,011	2,428.8	1,310.9	3,594.2	
25–29	233,429	82,190	150,733	506	1,081.7	749.9	1,419.3	
30–34	103,675	41,017	62,414	244	487.6	384.0	589.8	
35–39	46,991	20,157	26,720	114	239.7	206.0	272.1	
40–44	24,774	12,200	12,501	73	118.8	117.8	119.2	
45–54	21,511	12,180	9,299	32	49.1	56.5	41.9	
55–64	5,424	3,154	2,259	11	13.8	16.6	11.1	
65+	1,377	750	616	11	3.1	3.8	2.5	
Unknown Age	2,044	658	1,297	89				
TOTAL	**1,401,906**	**405,652**	**993,348**	**2,906**	**443.5**	**260.6**	**619.0**	
0–4	603	200	388	15	3.0	2.0	4.0	2014
5–9	181	26	152	3	0.9	0.2	1.5	
10–14	11,406	1,342	10,041	23	55.2	12.7	99.2	
15–19	381,717	77,908	303,294	515	1,811.9	722.4	2,949.3	
20–24	566,385	159,804	405,876	705	2,472.0	1,361.3	3,632.7	
25–29	253,825	91,729	161,793	303	1,154.4	821.8	1,494.4	
30–34	113,208	45,990	67,060	158	525.9	425.5	625.6	
35–39	52,536	22,894	29,545	97	263.7	230.3	296.0	
40–44	27,426	13,711	13,662	53	133.2	134.2	131.7	
45–54	24,773	14,318	10,424	31	57.0	66.8	47.3	
55–64	6,527	3,911	2,603	13	16.3	20.2	12.5	
65+	1,449	871	570	8	3.1	4.3	2.2	
Unknown Age	1,753	621	1,033	99				
TOTAL	**1,441,789**	**433,325**	**1,006,441**	**2,023**	**452.2**	**276.1**	**621.6**	
0–4	518	196	322	0	2.6	1.9	3.3	2015
5–9	148	18	130	0	0.7	0.2	1.3	
10–14	10,642	1,216	9,394	32	51.6	11.6	93.0	
15–19	391,396	82,775	307,937	684	1,854.2	766.6	2,986.5	
20–24	589,963	172,313	416,772	878	2,594.5	1,476.8	3,764.4	
25–29	280,429	104,679	175,291	459	1,248.5	917.5	1,586.0	
30–34	123,866	52,019	71,653	194	571.5	477.7	664.3	
35–39	59,905	27,180	32,621	104	294.0	267.2	319.8	
40–44	30,379	15,210	15,118	51	150.3	151.6	148.4	
45–54	28,833	17,011	11,764	58	66.8	79.9	53.7	
55–64	7,756	4,901	2,840	15	19.0	24.9	13.4	
65+	1,596	1,043	546	7	3.3	4.9	2.0	
Unknown Age	1,227	420	755	52				
TOTAL	**1,526,658**	**478,981**	**1,045,143**	**2,534**	**475.0**	**302.7**	**640.4**	
0–4	597	225	368	4	3.0	2.2	3.8	2016
5–9	188	25	161	2	0.9	0.2	1.6	
10–14	10,571	1,341	9,206	24	51.3	12.7	91.1	
15–19	407,230	89,899	316,639	692	1,929.2	832.6	3,070.9	
20–24	601,173	181,857	418,388	928	2,643.8	1,558.6	3,779.0	
25–29	298,176	114,484	183,222	470	1,327.5	1,003.4	1,657.8	
30–34	133,062	58,583	74,226	253	613.9	538.0	688.2	
35–39	66,669	31,671	34,872	126	327.2	311.3	341.8	
40–44	32,548	16,784	15,705	59	161.0	167.3	154.2	
45–54	32,316	19,569	12,683	64	74.8	91.9	57.9	
55–64	9,321	5,942	3,354	25	22.8	30.1	15.8	
65+	1,772	1,161	597	14	3.7	5.5	2.2	
Unknown Age	4,731	1,329	3,298	104				
TOTAL	**1,598,354**	**522,870**	**1,072,719**	**2,765**	**497.3**	**330.5**	**657.3**	

* No population data are available for unknown sex and age; therefore, rates are not calculated.

NOTE: This table should be used only for age comparisons. Cases in the 0–4 age group may include cases due to perinatal transmission.

Table 11A. Chlamydia — Reported Cases by Race/Ethnicity, Age Group, and Sex, United States*, 2016

Age Group	American Indians/ Alaska Natives			Asians			Blacks			Native Hawaiians/ Other Pacific Islanders		
	Total†	Male	Female	Total†	Male	Female	Total†	Male	Female	Total†	Male	Female
0–4	3	1	2	1	0	1	134	53	81	5	3	2
5–9	7	0	7	3	0	3	50	8	42	2	0	2
10–14	177	13	164	37	4	33	4,113	683	3,426	9	2	7
15–19	4,332	862	3,470	2,823	442	2,375	131,081	35,461	95,551	789	127	662
20–24	5,887	1,411	4,475	7,339	1,917	5,416	170,169	57,223	112,858	1,356	299	1,055
25–29	3,714	977	2,737	4,696	1,806	2,883	81,647	33,340	48,261	773	237	536
30–34	1,907	553	1,354	2,567	1,119	1,444	32,095	15,546	16,530	371	128	243
35–39	902	269	633	1,381	625	754	14,804	8,080	6,713	198	75	123
40–44	408	129	279	821	418	401	6,580	4,017	2,560	72	28	44
45–54	335	142	192	813	456	352	6,120	4,040	2,075	65	33	32
55–64	80	34	46	237	132	105	1,906	1,253	651	13	9	4
65+	10	5	5	38	22	16	261	179	81	1	0	1
Unknown Age	6	4	2	25	10	15	550	174	371	3	0	3
TOTAL	**17,768**	**4,400**	**13,366**	**20,781**	**6,951**	**13,798**	**449,510**	**160,057**	**289,200**	**3,657**	**941**	**2,714**

Age Group	Whites			Multirace			Hispanics			Other/ Unknown		
	Total†	Male	Female	Total†	Male	Female	Total†	Male	Female	Total†	Male	Female
0–4	105	33	72	5	4	1	67	26	41	277	105	168
5–9	29	6	23	0	0	0	27	4	23	70	7	61
10–14	1,881	105	1,775	86	3	83	1,411	173	1,238	2,857	358	2,480
15–19	95,731	15,715	79,975	2,830	485	2,344	50,984	9,993	40,968	118,660	26,814	91,294
20–24	154,572	43,536	110,984	3,552	958	2,591	77,237	20,639	56,552	181,061	55,874	124,457
25–29	73,929	28,222	45,677	1,731	778	952	41,273	14,517	26,724	90,413	34,607	55,452
30–34	33,089	14,843	18,240	834	487	347	19,960	8,024	11,918	42,239	17,883	24,150
35–39	16,352	8,113	8,236	380	230	150	10,529	4,319	6,198	22,123	9,960	12,065
40–44	7,825	4,254	3,570	179	113	65	5,130	2,279	2,837	11,533	5,546	5,949
45–54	8,685	6,019	2,661	229	188	41	4,244	2,307	1,932	11,825	6,384	5,398
55–64	2,625	2,012	612	55	44	11	851	446	404	3,554	2,012	1,521
65+	531	393	138	4	4	0	119	79	40	808	479	316
Unknown Age	255	85	163	2	0	2	190	54	134	3,700	1,002	2,608
TOTAL	**395,609**	**123,336**	**272,126**	**9,887**	**3,294**	**6,587**	**212,022**	**62,860**	**149,009**	**489,120**	**161,031**	**325,919**

* Includes 50 states and the District of Columbia reporting race/ethnicity data in the Office of Management and Budget compliant formats in 2016.
† Total includes cases reported with unknown sex.
NOTE: These tables should be used only for race/ethnicity comparisons. See Table 10 for age-specific cases and rates and Tables 3–5 for total and sex-specific cases and rates. Cases in the 0–4 age group may include cases due to perinatal transmission.

Table 11B. Chlamydia — Rates of Reported Cases per 100,000 Population by Race/Ethnicity, Age Group, and Sex, United States*, 2016

Age Group	American Indians/ Alaska Natives			Asians			Blacks			Native Hawaiians/ Other Pacific Islanders		
	Total†	Male	Female	Total†	Male	Female	Total†	Male	Female	Total†	Male	Female
0–4	1.8	1.2	2.4	0.1	0.0	0.2	4.9	3.8	6.0	12.4	14.3	10.3
5–9	4.0	0.0	8.1	0.3	0.0	0.6	1.8	0.6	3.0	4.9	0.0	9.9
10–14	100.4	14.5	189.1	3.6	0.8	6.5	146.3	47.9	247.0	22.3	9.8	35.1
15–19	2,378.1	930.0	3,878.3	274.9	85.3	466.8	4,383.6	2,337.7	6,485.2	1,943.2	606.5	3,366.6
20–24	2,956.3	1,382.0	4,611.6	583.1	300.1	873.9	5,008.3	3,316.9	6,747.6	2,890.0	1,243.3	4,612.8
25–29	2,026.3	1,047.6	3,040.3	316.4	249.6	379.1	2,621.1	2,164.0	3,065.4	1,485.7	879.1	2,138.1
30–34	1,171.7	682.1	1,657.6	170.6	157.4	181.9	1,159.1	1,167.8	1,149.8	761.0	512.2	1,022.8
35–39	609.0	365.2	850.1	97.7	95.1	99.8	567.7	653.8	489.3	466.8	347.7	590.0
40–44	284.6	182.7	383.5	58.1	63.3	53.3	257.9	335.1	189.2	193.2	148.7	238.6
45–54	108.4	94.8	120.5	34.0	40.9	27.6	115.5	162.4	73.8	93.3	95.3	91.4
55–64	28.9	26.1	31.4	12.3	15.1	9.9	41.3	59.5	25.9	24.0	34.0	14.4
65+	4.1	4.5	3.7	1.9	2.5	1.4	6.2	10.6	3.2	2.2	0.0	4.1
Unknown Age												
TOTAL	**749.8**	**376.7**	**1,112.1**	**119.3**	**84.0**	**151.0**	**1,125.9**	**839.0**	**1,387.2**	**653.4**	**333.4**	**978.1**

Age Group	Whites			Multirace			Hispanics		
	Total†	Male	Female	Total†	Male	Female	Total†	Male	Female
0–4	1.1	0.7	1.5	0.5	0.8	0.2	1.3	1.0	1.6
5–9	0.3	0.1	0.5	0.0	0.0	0.0	0.5	0.2	0.9
10–14	17.3	1.9	33.5	11.1	0.8	21.8	28.6	6.9	51.1
15–19	834.7	266.9	1,433.3	413.2	139.8	693.6	1,081.1	414.0	1,779.8
20–24	1,244.2	682.5	1,836.2	591.5	318.9	863.4	1,604.7	826.1	2,443.1
25–29	585.2	439.7	734.9	374.8	351.1	396.2	910.8	608.7	1,244.9
30–34	267.8	238.1	298.0	217.6	269.4	171.4	448.4	345.0	560.5
35–39	141.0	138.8	143.2	116.9	150.7	87.0	248.1	197.5	301.4
40–44	66.0	71.4	60.5	64.0	85.9	43.9	130.4	114.4	146.2
45–54	30.9	43.1	18.9	46.7	81.0	15.9	64.9	69.9	59.7
55–64	9.0	14.1	4.1	14.1	23.7	5.4	19.8	21.5	18.2
65+	1.4	2.4	0.7	1.2	2.6	0.0	3.2	4.8	1.9
Unknown Age									
TOTAL	**199.8**	**126.4**	**271.1**	**150.2**	**101.7**	**197.0**	**374.6**	**219.8**	**532.4**

* Includes 50 states and the District of Columbia reporting race/ethnicity data in the Office of Management and Budget compliant formats in 2016.
† Total includes cases reported with unknown sex.
NOTE: These tables should be used only for race/ethnicity comparisons. See Table 10 for age-specific cases and rates and Tables 3–5 for total and sex-specific cases and rates. Cases in the 0–4 age group may include cases due to perinatal transmission. No population data exist for unknown sex, unknown age, or unknown race; therefore rates are not calculated.

Table 12. Chlamydia Among Women Aged 15–24 Years — Reported Cases and Rates of Reported Cases by Age, United States, 2012–2016

	Age	Cases	Rate per 100,000 Population
2012	15	24,453	1,207.2
	16	45,041	2,212.8
	17	69,465	3,346.4
	18	99,459	4,699.5
	19	108,012	5,036.6
	20	104,425	4,727.7
	21	96,456	4,266.0
	22	81,292	3,593.9
	23	65,473	3,011.7
	24	52,983	2,489.8
2013	15	21,680	1,070.3
	16	40,528	1,994.3
	17	61,666	3,018.5
	18	90,330	4,332.6
	19	102,234	4,806.0
	20	99,556	4,617.4
	21	93,713	4,219.8
	22	81,884	3,600.6
	23	68,600	3,013.5
	24	55,792	2,548.7
2014	15	20,096	987.4
	16	38,507	1,891.0
	17	58,940	2,880.9
	18	87,040	4,224.2
	19	98,711	4,688.0
	20	98,480	4,581.9
	21	94,204	4,323.2
	22	82,581	3,679.3
	23	71,535	3,112.0
	24	59,076	2,567.1
2015	15	19,643	945.9
	16	37,786	1,847.7
	17	60,149	2,935.4
	18	89,481	4,339.6
	19	100,878	4,854.1
	20	99,861	4,703.6
	21	95,927	4,427.2
	22	84,740	3,855.7
	23	73,686	3,254.1
	24	62,558	2,697.2
2016	15	19,704	948.8
	16	39,066	1,910.3
	17	61,406	2,996.7
	18	93,174	4,518.7
	19	103,289	4,970.1
	20	100,524	4,734.8
	21	96,723	4,463.9
	22	84,813	3,859.0
	23	73,054	3,226.2
	24	63,274	2,728.0

NOTE: This table should be used only for age comparisons. Cases reported with unknown sex are not included in this table.

Table 13. Gonorrhea — Reported Cases and Rates of Reported Cases by State, Ranked by Rates, United States, 2016

Rank*	State	Cases	Rate per 100,000 Population
1	Mississippi	7,157	239.2
2	Louisiana	10,782	230.8
3	Georgia	20,553	201.2
4	Alaska	1,454	196.9
5	North Carolina	19,687	196.0
6	Oklahoma	7,574	193.6
7	Arkansas	5,732	192.5
8	Missouri	11,479	188.7
9	South Carolina	9,194	187.8
10	Delaware	1,702	179.9
11	Ohio	20,487	176.4
12	Alabama	8,408	173.0
13	New Mexico	3,516	168.6
14	California	64,551	164.9
15	Illinois	21,199	164.8
16	Maryland	9,523	158.5
17	Texas	42,472	154.6
18	Tennessee	10,179	154.2
19	Nevada	4,380	151.5
20	Arizona	10,330	151.3
21	South Dakota	1,269	147.8
22	New York	29,000	146.5
	U.S. TOTAL†	**468,514**	**145.8**
23	Indiana	9,451	142.8
24	Florida	28,162	138.9
25	Virginia	11,084	132.2
26	North Dakota	1,000	132.1
27	Kentucky	5,812	131.3
28	Michigan	12,450	125.5
29	Kansas	3,353	115.2
30	Pennsylvania	14,603	114.1
31	Washington	8,174	114.0
32	Nebraska	2,156	113.7
33	Wisconsin	6,498	112.6
34	Colorado	5,975	109.5
35	Oregon	4,353	108.0
36	Hawaii	1,467	102.5
37	Minnesota	5,104	93.0
38	New Jersey	8,162	91.1
39	Montana	867	83.9
40	Iowa	2,600	83.2
41	Connecticut	2,731	76.1
42	Massachusetts	4,980	73.3
43	Utah	2,100	70.1
44	Rhode Island	716	67.8
45	West Virginia	919	49.8
46	Wyoming	275	46.9
47	Idaho	635	38.4
48	New Hampshire	456	34.3
49	Maine	451	33.9
50	Vermont	126	20.1

* States were ranked by rate, then by case count, then in alphabetical order, with rates shown rounded to the nearest tenth.

† Total includes cases reported by the District of Columbia with 3,226 cases and a rate of 479.9, but excludes outlying areas (Guam with 133 cases and rate of 82.2, Puerto Rico with 744 cases and rate of 21.4, and Virgin Islands with 35 cases and rate of 34.0).

Table 14. Gonorrhea — Reported Cases and Rates of Reported Cases by State/Area and Region in Alphabetical Order, United States and Outlying Areas, 2012–2016

State/Area	Cases					Rates per 100,000 Population				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Alabama	9,270	8,377	7,677	7,196	8,408	192.2	173.3	158.3	148.1	173.0
Alaska	726	1,128	1,341	1,113	1,454	99.3	153.4	182.0	150.7	196.9
Arizona	5,809	6,412	7,750	8,245	10,330	88.6	96.8	115.1	120.8	151.3
Arkansas	4,307	4,007	4,539	4,780	5,732	146.0	135.4	153.0	160.5	192.5
California	33,579	38,166	45,408	54,135	64,551	88.3	99.6	117.0	138.3	164.9
Colorado	2,822	2,820	3,170	4,387	5,975	54.4	53.5	59.2	80.4	109.5
Connecticut	2,133	2,860	2,333	2,088	2,731	59.4	79.5	64.9	58.1	76.1
Delaware	899	1,390	1,279	1,310	1,702	98.0	150.1	136.7	138.5	179.9
District of Columbia	2,402	2,478	1,883	2,742	3,226	379.9	383.3	285.8	407.9	479.9
Florida	19,462	20,818	20,944	24,125	28,162	100.7	106.5	105.3	119.0	138.9
Georgia	15,326	14,252	13,770	15,982	20,553	154.5	142.6	136.4	156.5	201.2
Hawaii	815	718	1,020	1,239	1,467	58.5	51.1	71.9	86.5	102.5
Idaho	167	211	443	472	635	10.5	13.1	27.1	28.5	38.4
Illinois	18,149	16,464	15,970	17,130	21,199	141.0	127.8	124.0	133.2	164.8
Indiana	7,338	7,144	7,289	7,843	9,451	112.2	108.7	110.5	118.5	142.8
Iowa	2,006	1,472	1,641	2,247	2,600	65.3	47.6	52.8	71.9	83.2
Kansas	2,228	2,161	2,568	2,536	3,353	77.2	74.7	88.4	87.1	115.2
Kentucky	4,283	4,315	4,353	4,678	5,812	97.8	98.2	98.6	105.7	131.3
Louisiana	8,873	8,669	9,002	10,282	10,782	192.8	187.4	193.6	220.1	230.8
Maine	456	245	237	417	451	34.3	18.4	17.8	31.4	33.9
Maryland	5,686	5,989	6,108	6,858	9,523	96.6	101.0	102.2	114.2	158.5
Massachusetts	2,628	3,106	3,817	3,817	4,980	39.5	46.4	56.6	56.2	73.3
Michigan	12,584	10,569	9,688	10,330	12,450	127.3	106.8	97.8	104.1	125.5
Minnesota	3,082	3,873	4,073	4,097	5,104	57.3	71.5	74.6	74.6	93.0
Mississippi	6,875	5,096	5,625	5,775	7,157	230.3	170.4	187.9	193.0	239.2
Missouri	7,889	7,546	7,387	8,942	11,479	131.0	124.8	121.8	147.0	188.7
Montana	108	224	434	844	867	10.7	22.1	42.4	81.7	83.9
Nebraska	1,429	1,385	1,459	1,703	2,156	77.0	74.1	77.5	89.8	113.7
Nevada	2,264	2,714	3,188	3,630	4,380	82.1	97.3	112.3	125.6	151.5
New Hampshire	147	121	226	245	456	11.1	9.1	17.0	18.4	34.3
New Jersey	7,486	7,014	6,636	7,228	8,162	84.4	78.8	74.2	80.7	91.1
New Mexico	1,883	1,918	2,246	2,489	3,516	90.3	92.0	107.7	119.4	168.6
New York	22,571	19,919	20,758	25,561	29,000	115.3	101.4	105.1	129.1	146.5
North Carolina	14,318	13,666	14,415	19,809	19,687	146.8	138.8	145.0	197.2	196.0
North Dakota	335	492	694	684	1,000	47.9	68.0	93.8	90.4	132.1
Ohio	16,493	16,619	16,237	16,564	20,487	142.9	143.6	140.0	142.6	176.4
Oklahoma	4,441	5,303	6,137	6,542	7,574	116.4	137.7	158.2	167.3	193.6
Oregon	1,464	1,729	2,320	3,232	4,353	37.5	44.0	58.4	80.2	108.0
Pennsylvania	15,390	13,874	12,710	12,791	14,603	120.6	108.6	99.4	99.9	114.1
Rhode Island	507	454	590	580	716	48.3	43.2	55.9	54.9	67.8
South Carolina	7,638	7,194	8,253	8,206	9,194	161.7	150.7	170.8	167.6	187.8
South Dakota	707	784	892	1,048	1,269	84.8	92.8	104.6	122.1	147.8
Tennessee	9,098	7,376	7,199	8,386	10,179	140.9	113.5	109.9	127.1	154.2
Texas	32,473	33,835	35,322	39,717	42,472	124.6	127.9	131.0	144.6	154.6
Utah	479	951	1,441	1,562	2,100	16.8	32.8	49.0	52.1	70.1
Vermont	99	97	84	155	126	15.8	15.5	13.4	24.8	20.1
Virginia	6,885	6,952	8,250	8,099	11,084	84.1	84.2	99.1	96.6	132.2
Washington	3,238	4,369	6,221	7,171	8,174	46.9	62.7	88.1	100.0	114.0
West Virginia	831	1,063	841	769	919	44.8	57.3	45.5	41.7	49.8
Wisconsin	4,704	4,599	4,078	5,260	6,498	82.1	80.1	70.8	91.1	112.6
Wyoming	44	66	116	175	275	7.6	11.3	19.9	29.9	46.9
U.S. TOTAL	**334,826**	**333,004**	**350,062**	**395,216**	**468,514**	**106.7**	**105.3**	**109.8**	**123.0**	**145.8**
Northeast	51,417	47,690	47,391	52,882	61,225	92.2	85.2	84.4	94.0	108.8
Midwest	76,944	73,108	71,976	78,384	97,046	114.3	108.2	106.2	115.4	142.9
South	153,067	150,780	155,597	175,256	202,166	130.5	127.4	129.9	144.6	166.8
West	53,398	61,426	75,098	88,694	108,077	72.6	82.7	99.9	116.6	142.1
Guam	92	92	99	147	133	57.5	57.4	61.5	90.9	82.2
Puerto Rico	345	356	454	620	744	9.4	9.8	12.8	17.8	21.4
Virgin Islands	136	58	84	52	35	129.2	55.4	80.6	50.5	34.0
OUTLYING AREAS	**573**	**506**	**637**	**819**	**912**	**14.6**	**13.0**	**16.7**	**21.9**	**24.4**
TOTAL	**335,399**	**333,510**	**350,699**	**396,035**	**469,426**	**105.5**	**104.2**	**108.7**	**121.8**	**144.4**

Table 15. Gonorrhea Among Women — Reported Cases and Rates of Reported Cases by State/Area and Region in Alphabetical Order, United States and Outlying Areas, 2012–2016

State/Area	Cases					Rates per 100,000 Population				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Alabama	5,187	4,668	4,090	3,629	4,088	208.9	187.6	163.6	144.8	163.1
Alaska	385	589	665	567	738	109.9	168.5	190.3	162.3	211.2
Arizona	2,827	3,102	3,564	3,505	4,315	85.8	93.1	105.2	102.0	125.6
Arkansas	2,432	2,160	2,527	2,510	2,964	162.1	143.4	167.5	165.6	195.6
California	13,045	14,258	16,009	18,404	20,914	68.2	74.0	82.0	93.4	106.2
Colorado	1,362	1,243	1,318	1,832	2,323	52.7	47.4	49.5	67.5	85.6
Connecticut	1,153	1,419	1,108	851	1,165	62.6	77.0	60.1	46.3	63.3
Delaware	496	763	693	641	799	104.9	159.7	143.5	131.3	163.7
District of Columbia	1,006	953	858	874	857	301.8	280.1	247.8	247.2	242.3
Florida	9,570	9,718	9,228	10,078	11,488	97.0	97.3	90.7	97.2	110.8
Georgia	7,921	7,060	6,552	7,322	9,156	156.3	138.1	126.7	139.9	174.9
Hawaii	299	264	350	446	551	43.3	38.0	49.9	63.2	78.0
Idaho	63	87	196	197	237	7.9	10.8	24.0	23.8	28.7
Illinois	9,837	8,574	7,559	7,698	8,920	150.1	130.8	115.2	117.6	136.3
Indiana	4,139	3,796	3,819	3,984	4,811	124.7	113.8	114.1	118.6	143.3
Iowa	1,170	812	862	1,122	1,267	75.5	52.2	55.1	71.4	80.6
Kansas	1,339	1,222	1,464	1,262	1,695	92.3	84.2	100.5	86.6	116.3
Kentucky	2,328	2,331	2,270	2,242	2,716	104.7	104.4	101.3	99.8	120.9
Louisiana	5,080	4,927	5,049	5,535	5,493	216.2	208.6	212.5	231.9	230.1
Maine	240	119	98	143	134	35.4	17.5	14.4	21.1	19.8
Maryland	2,878	2,841	2,793	3,090	3,944	94.9	93.0	90.7	99.8	127.4
Massachusetts	1,076	1,168	1,215	1,027	1,390	31.4	33.9	35.0	29.4	39.7
Michigan	7,194	5,865	5,129	5,191	6,201	142.9	116.5	101.7	102.9	122.9
Minnesota	1,676	2,037	1,802	1,675	2,214	61.9	74.7	65.6	60.7	80.2
Mississippi	3,834	2,726	2,987	3,131	3,665	249.7	177.4	194.0	203.2	237.9
Missouri	4,209	3,944	3,620	4,187	5,228	137.1	128.0	117.2	135.1	168.7
Montana	58	127	221	462	493	11.6	25.1	43.4	89.9	96.0
Nebraska	784	694	770	870	1,055	84.0	73.9	81.5	91.5	110.9
Nevada	982	1,203	1,294	1,402	1,611	71.8	86.9	91.6	97.3	111.9
New Hampshire	61	52	91	65	132	9.1	7.8	13.6	9.7	19.6
New Jersey	3,798	3,484	3,082	3,110	3,338	83.6	76.5	67.3	67.8	72.8
New Mexico	857	823	961	1,087	1,542	81.4	78.3	91.3	103.4	146.6
New York	10,021	8,020	7,077	8,593	8,709	99.4	79.3	69.6	84.4	85.5
North Carolina	8,093	7,547	7,759	10,064	9,527	161.9	149.5	152.2	195.4	185.0
North Dakota	207	301	385	375	516	60.2	85.2	106.8	101.9	140.2
Ohio	9,706	9,176	8,735	8,466	10,130	164.5	155.2	147.6	142.8	170.9
Oklahoma	2,652	3,000	3,451	3,580	4,052	137.8	154.4	176.3	181.3	205.2
Oregon	528	566	786	1,158	1,519	26.8	28.5	39.2	56.9	74.6
Pennsylvania	8,360	7,206	6,164	5,889	6,135	128.0	110.3	94.3	90.1	93.8
Rhode Island	232	192	218	172	221	42.8	35.4	40.1	31.6	40.6
South Carolina	4,416	4,050	4,527	4,401	4,709	182.0	165.2	182.3	174.8	187.1
South Dakota	446	464	557	621	757	107.5	110.3	131.4	145.6	177.5
Tennessee	4,721	3,617	3,419	3,809	4,681	142.7	108.7	101.8	112.6	138.4
Texas	17,151	17,206	17,253	17,843	18,620	130.8	129.4	127.1	129.0	134.6
Utah	132	373	565	507	717	9.3	25.9	38.6	34.1	48.2
Vermont	54	46	35	85	32	17.0	14.5	11.0	26.8	10.1
Virginia	3,734	3,678	4,361	4,007	5,056	89.7	87.6	103.1	94.1	118.7
Washington	1,230	1,704	2,504	2,797	2,943	35.6	48.8	70.9	78.0	82.1
West Virginia	438	539	461	365	422	46.6	57.4	49.2	39.1	45.2
Wisconsin	2,640	2,455	2,046	2,557	3,189	91.6	84.9	70.6	88.1	109.8
Wyoming	19	39	61	86	120	6.7	13.7	21.3	29.9	41.8
U.S. TOTAL	**172,066**	**163,208**	**162,608**	**173,514**	**197,499**	**107.9**	**101.7**	**100.4**	**106.3**	**121.0**
Northeast	24,995	21,706	19,088	19,935	21,256	87.3	75.6	66.3	69.1	73.7
Midwest	43,347	39,340	36,748	38,008	45,983	126.9	114.8	107.0	110.4	133.6
South	81,937	77,784	78,278	83,121	92,237	137.1	129.0	128.2	134.5	149.3
West	21,787	24,378	28,494	32,450	38,023	59.1	65.5	75.6	85.1	99.7
Guam	46	43	47	67	59	58.4	54.4	59.2	84.0	73.9
Puerto Rico	157	120	161	259	313	8.2	6.4	8.7	14.3	17.2
Virgin Islands	92	41	54	28	14	164.2	73.4	97.1	50.8	25.4
OUTLYING AREAS	**295**	**204**	**262**	**354**	**386**	**14.4**	**10.1**	**13.2**	**18.1**	**19.8**
TOTAL	**172,361**	**163,412**	**162,870**	**173,868**	**197,885**	**106.7**	**100.6**	**99.4**	**105.3**	**119.8**

NOTE: Cases reported with unknown sex are not included in this table.

Table 16. Gonorrhea Among Men — Reported Cases and Rates of Reported Cases by State/Area and Region in Alphabetical Order, United States and Outlying Areas, 2012–2016

State/Area	Cases					Rates per 100,000 Population				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Alabama	4,034	3,680	3,563	3,519	4,265	172.5	156.9	151.6	149.5	181.2
Alaska	341	539	676	546	716	89.4	139.8	174.5	140.4	184.0
Arizona	2,981	3,310	4,186	4,724	6,011	91.5	100.5	125.2	139.3	177.2
Arkansas	1,873	1,843	2,007	2,270	2,768	129.3	126.8	137.7	155.2	189.2
California	20,431	23,849	29,310	35,644	43,259	108.0	125.1	152.1	183.3	222.5
Colorado	1,460	1,577	1,852	2,555	3,652	56.1	59.6	68.8	93.1	133.1
Connecticut	978	1,440	1,219	1,237	1,564	55.9	82.1	69.5	70.6	89.3
Delaware	403	627	586	669	903	90.7	140.0	129.4	146.1	197.2
District of Columbia	1,386	1,519	1,011	1,817	2,298	463.5	496.0	323.4	570.3	721.3
Florida	9,892	11,049	11,686	14,039	16,661	104.7	115.5	120.2	141.8	168.2
Georgia	7,301	7,075	7,137	8,631	11,378	150.5	144.9	144.9	173.3	228.5
Hawaii	516	454	669	793	914	73.5	64.0	93.2	109.3	126.0
Idaho	104	124	247	275	396	13.0	15.4	30.2	33.2	47.8
Illinois	8,283	7,872	8,386	9,335	12,255	131.1	124.4	132.7	147.8	194.1
Indiana	3,188	3,347	3,465	3,854	4,636	99.1	103.4	106.6	118.2	142.1
Iowa	836	660	779	1,122	1,332	54.8	43.0	50.5	72.3	85.8
Kansas	889	939	1,104	1,274	1,658	61.9	65.1	76.3	87.6	114.1
Kentucky	1,948	1,966	2,068	2,430	3,006	90.3	90.9	95.2	111.5	137.9
Louisiana	3,793	3,742	3,953	4,747	5,289	168.4	165.3	173.8	207.9	231.6
Maine	216	126	137	274	316	33.2	19.4	21.0	42.1	48.5
Maryland	2,806	3,145	3,304	3,755	5,573	98.4	109.4	114.1	129.0	191.4
Massachusetts	1,551	1,932	2,590	2,768	3,575	48.2	59.5	79.2	84.0	108.5
Michigan	5,372	4,694	4,551	5,129	6,245	110.8	96.6	93.5	105.1	128.0
Minnesota	1,395	1,835	2,260	2,420	2,881	52.2	68.1	83.3	88.6	105.5
Mississippi	3,039	2,370	2,637	2,638	3,486	209.7	162.9	181.3	181.7	240.1
Missouri	3,680	3,602	3,767	4,755	6,251	124.7	121.5	126.7	159.3	209.4
Montana	50	97	213	381	374	9.9	19.0	41.4	73.4	72.0
Nebraska	641	674	686	833	1,097	69.5	72.5	73.2	88.1	116.1
Nevada	1,280	1,509	1,892	2,218	2,763	92.0	107.4	132.6	152.9	190.5
New Hampshire	86	69	135	180	324	13.2	10.6	20.6	27.4	49.3
New Jersey	3,673	3,514	3,544	4,108	4,810	85.0	80.9	81.2	94.0	110.0
New Mexico	1,025	1,095	1,284	1,401	1,971	99.3	105.9	124.3	135.6	190.7
New York	12,529	11,844	13,624	16,893	20,224	132.0	124.2	142.2	175.8	210.4
North Carolina	6,180	6,113	6,652	9,744	10,160	130.0	127.3	137.3	199.2	207.7
North Dakota	127	191	309	309	484	35.7	51.6	81.5	79.5	124.5
Ohio	6,787	7,443	7,502	8,098	10,357	120.3	131.5	132.2	142.4	182.1
Oklahoma	1,789	2,303	2,685	2,962	3,521	94.7	120.7	139.8	152.9	181.8
Oregon	936	1,163	1,532	2,073	2,834	48.5	59.8	78.0	104.0	142.2
Pennsylvania	7,025	6,659	6,543	6,892	8,449	112.8	106.7	104.6	110.0	134.9
Rhode Island	275	262	372	408	495	54.1	51.4	72.7	79.7	96.7
South Carolina	3,196	3,133	3,689	3,781	4,436	139.1	134.9	157.0	158.9	186.5
South Dakota	259	320	335	427	512	61.9	75.4	78.0	98.8	118.5
Tennessee	4,368	3,758	3,778	4,577	5,497	138.7	118.7	118.4	142.3	170.8
Texas	15,286	16,410	18,035	21,792	23,779	118.1	124.8	134.8	159.8	174.4
Utah	347	578	876	1,055	1,383	24.2	39.6	59.2	70.0	91.8
Vermont	45	51	49	70	94	14.6	16.5	15.9	22.7	30.5
Virginia	3,145	3,272	3,879	4,085	5,996	78.2	80.5	94.7	99.0	145.4
Washington	2,008	2,665	3,717	4,374	5,231	58.3	76.5	105.3	122.0	145.9
West Virginia	393	524	380	404	497	42.9	57.2	41.6	44.3	54.6
Wisconsin	2,064	2,140	2,027	2,697	3,302	72.6	75.0	70.9	94.1	115.1
Wyoming	25	27	55	88	155	8.5	9.1	18.5	29.4	51.9
U.S. TOTAL	**162,235**	**169,130**	**186,943**	**221,070**	**270,033**	**105.0**	**108.7**	**119.1**	**139.7**	**170.7**
Northeast	26,378	25,897	28,213	32,830	39,851	97.2	95.1	103.2	119.7	145.3
Midwest	33,521	33,717	35,171	40,253	51,010	101.1	101.3	105.3	120.2	152.3
South	70,832	72,529	77,050	91,860	109,513	123.2	124.9	131.2	154.6	184.4
West	31,504	36,987	46,509	56,127	69,659	85.9	99.9	124.1	148.1	183.8
Guam	46	49	52	80	74	56.7	60.2	63.7	97.6	90.3
Puerto Rico	188	236	293	359	431	10.7	13.6	17.2	21.7	26.0
Virgin Islands	44	17	30	24	21	89.3	34.8	61.8	50.2	43.9
OUTLYING AREAS	**278**	**302**	**375**	**463**	**526**	**14.7**	**16.2**	**20.4**	**25.9**	**29.4**
TOTAL	**162,513**	**169,432**	**187,318**	**221,533**	**270,559**	**103.9**	**107.6**	**118.0**	**138.4**	**169.1**

NOTE: Cases reported with unknown sex are not included in this table.

Table 17. Gonorrhea — Reported Cases and Rates of Reported Cases in Selected Metropolitan Statistical Areas (MSAs)* in Alphabetical Order, United States, 2012–2016

MSAs	Cases					Rates per 100,000 Population				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Atlanta-Sandy Springs-Roswell, GA	8,299	5,452†	7,256	6,471†	11,670	152.1	98.7†	129.2	113.3†	204.3
Austin-Round Rock, TX	2,204	2,570	2,860	3,199	3,670	120.2	136.5	147.2	159.9	183.4
Baltimore-Columbia-Towson, MD	2,974	3,233	3,459	4,179	5,854	108.0	116.7	124.2	149.4	209.3
Birmingham-Hoover, AL	2,340	2,130	1,957	2,088	316†	205.9	186.8	171.1	182.3	27.6†
Boston-Cambridge-Newton, MA-NH	1,995	2,372	2,716†	2,487†	3,002†	43.0	50.6	57.4†	52.1†	62.9†
Buffalo-Cheektowaga-Niagara Falls, NY	2,172	1,232	1,342	1,982	2,180	191.5	108.6	118.1	174.6	192.0
Charlotte-Concord-Gastonia, NC-SC	3,172	3,058	3,645	4,673	4,749	138.1	130.9	153.1	192.6	195.7
Chicago-Naperville-Elgin, IL-IN-WI	14,304	12,793	12,630	13,529	16,634	150.2	134.1	132.2	141.6	174.2
Cincinnati, OH-KY-IN	3,227	3,229	3,346	3,713	4,096	151.6	151.1	155.7	172.1	189.8
Cleveland-Elyria, OH	4,203	4,155	3,802	3,428	4,205	203.7	201.2	184.2	166.3	204.0
Columbus, OH	2,859	3,220	3,260	3,676	4,821	147.1	163.7	163.4	181.8	238.5
Dallas-Fort Worth-Arlington, TX	7,842	8,354	9,195	11,334	11,092	117.0	122.7	132.2	159.6	156.2
Denver-Aurora-Lakewood, CO	2,055	1,828	2,016	2,838	3,848	77.7	67.8	73.2	100.8	136.7
Detroit-Warren-Dearborn, MI	8,062	6,564	5,311	5,494	6,816	187.8	152.8	123.6	127.7	158.4
Hartford-West Hartford-East Hartford, CT	744	1,065	894	726†	963†	61.3	87.6	73.6	59.9†	79.5†
Houston-The Woodlands-Sugar Land, TX	7,582	7,783	8,299	9,290	10,378	122.7	123.3	127.9	139.6	155.9
Indianapolis-Carmel-Anderson, IN	3,738	3,616	3,759	3,716	4,808	193.8	185.1	190.7	186.8	241.8
Jacksonville, FL	1,948	2,321	2,608	2,740	3,168	141.4	166.4	183.8	189.0	218.6
Kansas City, MO-KS	2,919	2,696	2,642	2,943	4,009	143.2	131.2	127.6	141.0	192.1
Las Vegas-Henderson-Paradise, NV	1,968	2,256	2,653	2,975	3,653	98.4	111.2	128.2	140.7	172.7
Los Angeles-Long Beach-Anaheim, CA	13,102	14,449	17,130	19,867	25,438	100.4	110.0	129.2	148.9	190.7
Louisville-Jefferson County, KY-IN	2,040	2,063	1,962	2,187	2,957	163.0	163.4	154.5	171.1	231.3
Memphis, TN-MS-AR	4,498	3,086	2,625	3,143	3,746	335.2	230.0	195.4	233.8	278.7
Miami-Fort Lauderdale-West Palm Beach, FL	5,291	5,801	6,128	6,905	7,984	91.8	99.5	103.3	114.8	132.8
Milwaukee-Waukesha-West Allis, WI	3,277	3,179	2,584	3,719	4,454	209.1	202.5	164.4	236.0	282.7
Minneapolis-St. Paul-Bloomington, MN-WI	2,534†	3,188†	3,341	3,289	4,123	74.0†	92.2†	95.6	93.3	117.0
Nashville-Davidson-Murfreesboro-Franklin, TN	1,900	1,806	1,922	2,200	2,695	110.0	102.7	107.2	120.2	147.2
New Orleans-Metairie, LA	2,198	2,448	2,667	2,929	3,414	179.1	197.3	213.0	231.9	270.3
New York-Newark-Jersey City, NY-NJ-PA	21,310	19,319	20,054	23,721	26,186	107.5	96.8	99.8	117.5	129.7
Oklahoma City, OK	1,947	2,352	2,366	2,403	2,953	150.2	178.2	177.0	176.9	217.4
Orlando-Kissimmee-Sanford, FL	2,328	2,514	2,571	3,073	3,393	104.7	110.9	110.8	128.7	142.1
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	11,026	10,557	9,618	9,724	11,394	183.2	174.9	158.9	160.2	187.7
Phoenix-Mesa-Scottsdale, AZ	4,526	4,918	5,944	6,495	8,086	104.5	111.8	132.4	142.0	176.8
Pittsburgh, PA	3,048	2,827	2,602	2,422	2,601	129.1	119.7	110.4	102.9	110.5
Portland-Vancouver-Hillsboro, OR-WA	1,183	1,199	1,499	2,386	3,177	51.7	51.8	63.8	99.9	133.0
Providence-Warwick, RI-MA	643	593	913†	834†	1,108†	40.2	37.0	56.7†	51.7†	68.7†
Raleigh, NC	1,532	1,384	1,408	2,018	1,915	128.9	114.0	113.3	158.5	150.4
Richmond, VA	1,671	1,658	2,173	2,200	3,198	135.6	133.1	172.5	173.0	251.5
Riverside-San Bernardino-Ontario, CA	3,031	3,273	4,292	4,904	5,958	69.7	74.7	96.6	109.2	132.7
Sacramento-Roseville-Arden-Arcade, CA	2,324	2,597	2,616	3,317	3,402	105.8	117.2	116.6	145.9	149.6
Salt Lake City, UT	342	690	1,026	1,078	1,462	30.4	60.5	89.0	92.1	124.9
San Antonio-New Braunfels, TX	3,672	3,352	3,155	4,160	4,779	164.4	147.2	135.5	174.5	200.5
San Diego-Carlsbad, CA	2,620	2,825	3,420	3,691	4,989	82.5	88.0	104.8	111.9	151.2
San Francisco-Oakland-Hayward, CA	5,263	5,681	7,110	9,330	10,669	118.1	125.8	154.8	200.4	229.1
San Jose-Sunnyvale-Santa Clara, CA	1,020	1,145	1,552	1,857	1,976	53.8	59.6	79.5	93.9	100.0
Seattle-Tacoma-Bellevue, WA	2,323	2,990	3,931	4,766	5,149	65.4	82.8	107.1	127.7	137.9
St. Louis, MO-IL	4,810	4,492	4,346	5,257	6,558	172.0	160.4	154.9	187.0	233.2
Tampa-St. Petersburg-Clearwater, FL	3,422	3,660	3,455	3,916	4,408	120.4	127.5	118.5	131.6	148.2
Virginia Beach-Norfolk-Newport News, VA-NC	2,630	2,581	3,206	3,300	4,320	154.7	151.2	186.8	191.3	250.5
Washington-Arlington-Alexandria, DC-VA-MD-WV	5,369	5,616	2,974	3,008	4,335	91.6	94.4	49.3	49.3	71.1
SELECTED MSAs TOTAL	**205,487**	**202,170**	**212,240**	**239,580**	**286,759**	**120.0**	**117.0**	**121.4**	**135.6**	**162.2**

* MSAs were selected on the basis of the largest population in the 2010 U.S. Census.

† The variable used to identify county, which is used to classify cases into MSAs, was complete for ≤95% of cases in a state contributing data to this MSA. See Appendix A1.4 for more information.

Table 18. Gonorrhea Among Women — Reported Cases and Rates of Reported Cases in Selected Metropolitan Statistical Areas (MSAs)* in Alphabetical Order, United States, 2012–2016

MSAs	Cases					Rates per 100,000 Population				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Atlanta-Sandy Springs-Roswell, GA	3,907	2,458†	3,030	2,578†	4,696	139.4	86.5†	104.7	87.5†	159.4
Austin-Round Rock, TX	993	1,078	1,213	1,039	1,162	108.5	114.8	124.9	103.9	116.2
Baltimore-Columbia-Towson, MD	1,527	1,542	1,608	1,964	2,492	107.1	107.5	111.5	135.6	172.1
Birmingham-Hoover, AL	1,280	1,099	970	999	160†	217.3	186.0	163.4	167.9	26.9†
Boston-Cambridge-Newton, MA-NH	738	828	844†	601†	720†	30.9	34.3	34.7†	24.5†	29.3†
Buffalo-Cheektowaga-Niagara Falls, NY	1,173	594	664	959	985	200.4	101.6	113.4	164.0	168.5
Charlotte-Concord-Gastonia, NC-SC	1,778	1,700	1,962	2,419	2,296	150.7	141.7	160.2	193.8	184.0
Chicago-Naperville-Elgin, IL-IN-WI	7,464	6,374	5,662	5,696	6,481	153.4	130.9	115.9	116.8	132.8
Cincinnati, OH-KY-IN	2,051	1,932	1,913	2,020	2,183	188.7	177.1	174.3	183.4	198.2
Cleveland-Elyria, OH	2,426	2,328	2,021	1,745	2,134	226.7	217.6	189.2	163.6	200.0
Columbus, OH	1,514	1,500	1,473	1,638	2,105	153.2	150.0	145.3	159.5	205.0
Dallas-Fort Worth-Arlington, TX	4,157	3,921	4,153	4,963	4,577	122.5	113.6	117.5	137.4	126.8
Denver-Aurora-Lakewood, CO	965	724	780	1,096	1,403	72.7	53.5	56.4	77.7	99.4
Detroit-Warren-Dearborn, MI	4,406	3,614	2,698	2,592	3,190	199.3	163.5	122.0	117.2	144.2
Hartford-West Hartford-East Hartford, CT	422	543	425	310†	412†	67.7	87.2	68.3	50.0†	66.4†
Houston-The Woodlands-Sugar Land, TX	4,039	4,033	4,151	4,113	4,422	130.2	127.2	127.2	122.8	132.1
Indianapolis-Carmel-Anderson, IN	1,957	1,761	1,828	1,791	2,264	198.5	176.4	181.3	176.1	222.7
Jacksonville, FL	983	1,121	1,288	1,237	1,402	139.1	156.7	176.9	166.5	188.7
Kansas City, MO-KS	1,585	1,424	1,361	1,409	1,875	152.4	136.0	128.9	132.6	176.4
Las Vegas-Henderson-Paradise, NV	847	1,015	1,039	1,129	1,341	85.1	100.5	100.5	106.7	126.7
Los Angeles-Long Beach-Anaheim, CA	4,359	4,578	5,029	5,778	7,083	65.9	68.9	74.8	85.4	104.7
Louisville-Jefferson County, KY-IN	1,096	1,079	992	1,012	1,278	171.2	167.0	152.6	154.8	195.5
Memphis, TN-MS-AR	2,418	1,550	1,371	1,469	1,818	346.6	222.0	196.0	209.8	259.6
Miami-Fort Lauderdale-West Palm Beach, FL	2,198	2,225	2,123	2,252	2,606	74.1	74.2	69.5	72.7	84.1
Milwaukee-Waukesha-West Allis, WI	1,814	1,655	1,298	1,850	2,208	225.5	205.5	160.8	228.8	273.1
Minneapolis-St. Paul-Bloomington, MN-WI	1,322†	1,641†	1,388	1,229	1,676	76.4†	93.8†	78.6	69.0	94.2
Nashville-Davidson-Murfreesboro-Franklin, TN	858	838	790	888	1,129	97.1	93.1	86.0	94.7	120.4
New Orleans-Metairie, LA	1,186	1,317	1,339	1,423	1,527	187.9	206.1	207.2	218.1	234.1
New York-Newark-Jersey City, NY-NJ-PA	9,157	7,615	6,544	7,349	7,134	89.3	73.9	63.1	70.6	68.5
Oklahoma City, OK	1,081	1,305	1,310	1,267	1,558	164.6	195.1	193.2	183.8	226.1
Orlando-Kissimmee-Sanford, FL	1,087	1,114	1,109	1,254	1,326	95.8	96.3	93.4	102.7	108.6
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	5,581	5,052	4,461	4,277	4,640	179.3	162.0	142.7	136.4	147.9
Phoenix-Mesa-Scottsdale, AZ	2,118	2,318	2,658	2,708	3,259	97.3	104.8	117.6	117.6	141.5
Pittsburgh, PA	1,857	1,715	1,415	1,239	1,153	152.6	141.1	116.8	102.5	95.4
Portland-Vancouver-Hillsboro, OR-WA	393	325	382	764	1,005	33.9	27.8	32.2	63.2	83.2
Providence-Warwick, RI-MA	294	261	325†	260†	368†	35.6	31.6	39.2†	31.3†	44.3†
Raleigh, NC	807	677	638	857	785	132.7	108.9	100.2	131.4	120.4
Richmond, VA	908	957	1,194	1,141	1,473	142.6	148.7	183.4	173.6	224.2
Riverside-San Bernardino-Ontario, CA	1,562	1,576	1,966	2,208	2,515	71.5	71.7	88.1	97.9	111.5
Sacramento-Roseville-Arden-Arcade, CA	1,212	1,323	1,246	1,538	1,463	108.2	117.0	108.8	132.5	126.0
Salt Lake City, UT	88	263	376	325	480	15.8	46.4	65.5	55.8	82.4
San Antonio-New Braunfels, TX	1,865	1,624	1,445	1,785	1,981	164.5	140.7	122.4	147.8	164.0
San Diego-Carlsbad, CA	847	827	1,038	1,018	1,479	53.6	51.8	63.9	62.1	90.2
San Francisco-Oakland-Hayward, CA	1,493	1,491	1,836	2,101	2,183	66.2	65.2	78.9	89.1	92.6
San Jose-Sunnyvale-Santa Clara, CA	372	446	557	642	614	39.5	46.7	57.4	65.4	62.5
Seattle-Tacoma-Bellevue, WA	732	988	1,412	1,662	1,556	41.1	54.7	76.9	89.0	83.3
St. Louis, MO-IL	2,467	2,313	2,087	2,436	2,911	171.1	160.2	144.3	168.1	200.9
Tampa-St. Petersburg-Clearwater, FL	1,701	1,774	1,619	1,676	1,815	116.1	119.8	107.6	109.2	118.2
Virginia Beach-Norfolk-Newport News, VA-NC	1,402	1,341	1,711	1,701	2,118	162.3	154.7	196.4	194.4	242.1
Washington-Arlington-Alexandria, DC-VA-MD-WV	2,355	2,278	1,163	1,064	1,489	78.4	74.8	37.7	34.1	47.7
SELECTED MSAs TOTAL	**98,842**	**92,055**	**89,905**	**95,471**	**108,930**	**113.1**	**104.4**	**100.7**	**105.9**	**120.8**

* MSAs were selected on the basis of the largest population in the 2010 U.S. Census.

† The variable used to identify county, which is used to classify cases into MSAs, was complete for ≤95% of cases in a state contributing data to this MSA. See Appendix A1.4 for more information.

NOTE: Cases reported with unknown sex are not included in this table.

Table 19. Gonorrhea Among Men — Reported Cases and Rates of Reported Cases in Selected Metropolitan Statistical Areas (MSAs)* in Alphabetical Order, United States, 2012–2016

MSAs	Cases					Rates per 100,000 Population				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Atlanta-Sandy Springs-Roswell, GA	4,329	2,952†	4,177	3,885†	6,960	163.1	110.1†	153.5	140.5†	251.8
Austin-Round Rock, TX	1,196	1,295	1,635	2,144	2,499	130.1	137.2	168.2	214.2	249.7
Baltimore-Columbia-Towson, MD	1,447	1,690	1,840	2,202	3,359	109.0	126.4	137.0	163.2	249.0
Birmingham-Hoover, AL	1,057	1,029	979	1,075	152†	193.0	187.3	177.9	195.2	27.6†
Boston-Cambridge-Newton, MA-NH	1,257	1,541	1,870†	1,881†	2,274†	55.9	67.8	81.4†	81.1†	98.1†
Buffalo-Cheektowaga-Niagara Falls, NY	999	638	678	1,023	1,195	182.1	116.2	123.1	185.8	217.1
Charlotte-Concord-Gastonia, NC-SC	1,384	1,356	1,683	2,251	2,451	123.9	119.4	145.6	191.0	208.0
Chicago-Naperville-Elgin, IL-IN-WI	6,819	6,407	6,947	7,780	10,133	146.4	137.3	148.7	166.5	216.9
Cincinnati, OH-KY-IN	1,176	1,297	1,431	1,693	1,913	112.9	123.9	136.0	160.2	181.1
Cleveland-Elyria, OH	1,777	1,827	1,781	1,683	2,071	178.9	183.6	178.9	169.3	208.4
Columbus, OH	1,345	1,720	1,787	2,038	2,716	140.8	177.9	182.2	204.9	273.1
Dallas-Fort Worth-Arlington, TX	3,682	4,426	5,033	6,357	6,498	111.4	131.8	147.1	182.0	186.1
Denver-Aurora-Lakewood, CO	1,090	1,104	1,236	1,742	2,445	82.8	82.1	90.1	124.1	174.2
Detroit-Warren-Dearborn, MI	3,642	2,942	2,606	2,894	3,622	175.0	141.2	125.0	138.5	173.3
Hartford-West Hartford-East Hartford, CT	322	522	466	416†	551†	54.5	88.1	78.7	70.4†	93.2†
Houston-The Woodlands-Sugar Land, TX	3,543	3,749	4,146	5,167	5,930	115.2	119.3	128.5	156.2	179.2
Indianapolis-Carmel-Anderson, IN	1,772	1,854	1,927	1,920	2,542	187.9	194.0	200.1	197.5	261.5
Jacksonville, FL	965	1,198	1,316	1,501	1,764	143.8	176.3	190.5	212.5	249.7
Kansas City, MO-KS	1,334	1,272	1,281	1,534	2,134	133.6	126.2	126.1	149.7	208.3
Las Vegas-Henderson-Paradise, NV	1,119	1,239	1,612	1,837	2,306	111.3	121.8	155.6	173.9	218.3
Los Angeles-Long Beach-Anaheim, CA	8,712	9,849	12,071	14,066	18,060	135.2	151.9	184.7	213.9	274.6
Louisville-Jefferson County, KY-IN	940	969	961	1,170	1,670	153.8	157.2	155.1	187.3	267.3
Memphis, TN-MS-AR	2,080	1,536	1,254	1,674	1,926	323.0	238.6	194.8	260.0	299.2
Miami-Fort Lauderdale-West Palm Beach, FL	3,093	3,564	3,999	4,651	5,374	110.6	125.9	139.0	159.6	184.4
Milwaukee-Waukesha-West Allis, WI	1,463	1,521	1,281	1,864	2,241	191.8	199.0	167.4	242.9	292.1
Minneapolis-St. Paul-Bloomington, MN-WI	1,209†	1,546†	1,942	2,058	2,439	71.5†	90.4†	112.4	118.0	139.8
Nashville-Davidson-Murfreesboro-Franklin, TN	1,034	968	1,130	1,312	1,566	122.6	112.8	129.3	147.0	175.5
New Orleans-Metairie, LA	1,012	1,131	1,328	1,506	1,887	169.8	187.9	219.2	246.7	309.1
New York-Newark-Jersey City, NY-NJ-PA	12,124	11,639	13,448	16,290	18,976	126.5	120.6	138.4	166.8	194.3
Oklahoma City, OK	866	1,047	1,056	1,136	1,394	135.3	160.8	160.3	169.7	208.3
Orlando-Kissimmee-Sanford, FL	1,241	1,399	1,461	1,818	2,067	114.0	126.0	128.8	155.9	177.2
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	5,439	5,501	5,152	5,439	6,736	187.1	188.7	176.2	185.4	229.6
Phoenix-Mesa-Scottsdale, AZ	2,407	2,600	3,286	3,780	4,824	111.8	118.9	147.4	166.4	212.3
Pittsburgh, PA	1,191	1,110	1,187	1,182	1,448	104.1	96.9	103.7	103.3	126.6
Portland-Vancouver-Hillsboro, OR-WA	790	874	1,116	1,621	2,172	69.8	76.4	96.2	137.3	184.0
Providence-Warwick, RI-MA	349	331	587†	572†	740†	45.0	42.6	75.3†	73.2†	94.6†
Raleigh, NC	724	707	770	1,161	1,130	124.8	119.2	127.0	186.9	181.9
Richmond, VA	761	701	978	1,058	1,712	127.8	116.4	160.6	172.3	278.7
Riverside-San Bernardino-Ontario, CA	1,467	1,695	2,321	2,692	3,437	67.7	77.7	105.0	120.5	153.9
Sacramento-Roseville-Arden-Arcade, CA	1,104	1,271	1,362	1,771	1,934	102.6	117.1	124.0	159.1	173.8
Salt Lake City, UT	254	427	650	753	982	44.9	74.5	112.3	128.1	167.1
San Antonio-New Braunfels, TX	1,807	1,728	1,710	2,375	2,798	164.3	153.9	149.0	201.9	237.9
San Diego-Carlsbad, CA	1,766	1,995	2,354	2,668	3,498	110.6	123.6	143.5	160.8	210.8
San Francisco-Oakland-Hayward, CA	3,746	4,167	5,261	7,201	8,441	170.4	186.9	232.2	313.3	367.3
San Jose-Sunnyvale-Santa Clara, CA	626	699	995	1,212	1,361	65.8	72.4	101.3	121.8	136.8
Seattle-Tacoma-Bellevue, WA	1,591	2,002	2,519	3,104	3,593	89.9	111.1	137.3	166.3	192.5
St. Louis, MO-IL	2,340	2,178	2,256	2,802	3,646	172.8	160.5	166.0	205.6	267.5
Tampa-St. Petersburg-Clearwater, FL	1,721	1,871	1,823	2,240	2,592	124.9	134.6	129.2	155.6	180.0
Virginia Beach-Norfolk-Newport News, VA-NC	1,226	1,239	1,489	1,595	2,195	146.7	147.5	176.2	187.7	258.3
Washington-Arlington-Alexandria, DC-VA-MD-WV	3,001	3,330	1,811	1,943	2,838	105.0	114.6	61.4	65.2	95.3
SELECTED MSAs TOTAL	**106,339**	**109,653**	**121,989**	**143,737**	**177,192**	**126.8**	**129.5**	**142.5**	**166.1**	**204.7**

* MSAs were selected on the basis of the largest population in the 2010 U.S. Census.

† The variable used to identify county, which is used to classify cases into MSAs, was complete for ≤95% of cases in a state contributing data to this MSA. See Appendix A1.4 for more information.

NOTE: Cases reported with unknown sex are not included in this table.

Table 20. Gonorrhea — Reported Cases and Rates of Reported Cases in Counties and Independent Cities* Ranked by Number of Reported Cases, United States, 2016

Rank*	County/Independent City	Cases	Rate per 100,000 Population	Cumulative Percentage
1	Los Angeles County, CA	22,376	220.0	4
2	Cook County, IL	13,608	259.8	7
3	Harris County, TX	8,496	187.2	9
4	Maricopa County, AZ	7,701	184.8	11
5	Philadelphia County, PA	6,967	444.5	12
6	New York County, NY	6,329	384.9	13
7	Kings County, NY	5,840	221.5	15
8	San Francisco County, CA	5,278	610.3	16
9	San Diego County, CA	4,989	151.2	17
10	Wayne County, MI	4,949	281.3	18
11	Dallas County, TX	4,597	180.0	19
12	Bexar County, TX	4,480	236.1	20
13	Milwaukee County, WI	4,298	448.8	21
14	Franklin County, OH	4,243	339.0	22
15	Marion County, IN	4,030	429.2	23
16	Fulton County, GA	3,838	379.8	23
17	Cuyahoga County, OH	3,744	298.1	24
18	Bronx County, NY	3,682	253.0	25
19	Clark County, NV	3,653	172.7	26
20	Broward County, FL	3,632	191.5	27
21	Baltimore (City), MD	3,534	568.3	27
22	San Bernardino County, CA	3,377	158.7	28
23	King County, WA	3,355	158.5	29
24	Tarrant County, TX	3,134	158.1	29
25	Miami-Dade County, FL	3,064	113.8	30
26	Orange County, CA	3,062	96.6	31
27	Alameda County, CA	3,045	185.9	31
28	Shelby County, TN	2,924	311.7	32
29	Hamilton County, OH	2,866	354.9	33
30	Sacramento County, CA	2,854	190.1	33
31	Queens County, NY	2,808	120.0	34
32	Travis County, TX	2,787	236.9	34
33	Mecklenburg County, NC	2,778	268.6	35
34	Duval County, FL	2,713	297.1	36
35	St. Louis County, MO	2,623	261.4	36
36	Riverside County, CA	2,581	109.3	37
37	Jackson County, MO	2,480	360.7	37
38	Orange County, FL	2,476	192.2	38
39	Hennepin County, MN	2,455	200.7	38
40	Jefferson County, KY	2,447	320.4	39
41	St. Louis (City), MO	2,369	750.4	39
42	Hillsborough County, FL	2,365	175.3	40
43	DeKalb County, GA	2,315	315.0	40
44	Monroe County, NY	2,207	294.4	41
45	Oklahoma County, OK	2,206	284.0	41
46	Collin County, TX	2,058	225.1	42
47	Allegheny County, PA	2,018	164.0	42
48	Fresno County, CA	1,997	204.8	43
49	Denver County, CO	1,975	289.4	43
50	Multnomah County, OR	1,966	248.8	43
51	Orleans Parish, LA	1,956	502.0	44
52	Santa Clara County, CA	1,936	100.9	44
53	Davidson County, TN	1,874	276.0	45
54	Erie County, NY	1,874	203.1	45
55	Prince George's County, MD	1,832	201.4	45
56	Kern County, CA	1,790	202.9	46
57	Etowah County, AL	1,778	1725.3	46
58	Guilford County, NC	1,768	341.6	47
59	Essex County, NJ	1,759	220.6	47
60	Tulsa County, OK	1,723	269.5	47
61	Wake County, NC	1,618	158.0	48
62	Contra Costa County, CA	1,574	139.7	48
63	Bernalillo County, NM	1,567	231.6	48
64	Pinellas County, FL	1,561	164.3	49
65	Bell County, TX	1,466	437.7	49
66	Salt Lake County, UT	1,434	129.5	49
67	Montgomery County, OH	1,415	265.8	50
68	Douglas County, NE	1,402	254.9	50
69	Richmond (City), VA	1,383	627.8	50
70	Baltimore County, MD	1,321	158.9	50

* The top 70 counties and independent cities ranked in descending order by number of cases reported in 2016 then by rate are displayed.

NOTE: Relative rankings of counties may be impacted by completeness of the variable used to identify county. In 2016, the variable used to identify county was complete for ≤95% of cases in Alabama, Connecticut, and Massachusetts. See Appendix A1.4 for more information.

Table 21. Gonorrhea — Reported Cases and Rates of Reported Cases by Age Group and Sex, United States, 2012–2016

Age Group	Cases				Rates per 100,000 Population*			
	Total	Male	Female	Unknown Sex	Total	Male	Female	
0–4	198	72	122	4	1.0	0.7	1.2	2012
5–9	68	16	52	0	0.3	0.2	0.5	
10–14	3,136	573	2,559	4	15.2	5.4	25.3	
15–19	81,548	26,578	54,852	118	381.8	242.4	527.5	
20–24	115,224	52,351	62,711	162	510.2	453.3	568.4	
25–29	58,441	31,631	26,722	88	273.1	291.7	253.2	
30–34	31,420	18,936	12,436	48	150.3	180.4	119.4	
35–39	16,193	10,493	5,670	30	83.1	108.0	58.0	
40–44	10,965	7,858	3,089	18	52.1	75.1	29.2	
45–54	12,383	9,773	2,594	16	28.0	44.8	11.5	
55–64	3,230	2,642	586	2	8.4	14.2	2.9	
65+	644	537	105	2	1.5	2.9	0.4	
Unknown Age	1,376	775	568	33				
TOTAL	**334,826**	**162,235**	**172,066**	**525**	**106.7**	**105.0**	**107.9**	
0–4	172	60	111	1	0.9	0.6	1.1	2013
5–9	75	11	64	0	0.4	0.1	0.6	
10–14	2,637	508	2,122	7	12.8	4.8	21.0	
15–19	72,092	24,212	47,749	131	340.7	223.2	463.0	
20–24	113,035	53,055	59,760	220	495.9	454.3	537.6	
25–29	62,102	34,718	27,266	118	287.8	316.8	256.7	
30–34	34,065	20,855	13,143	67	160.2	195.2	124.2	
35–39	18,034	11,850	6,145	39	92.0	121.1	62.6	
40–44	11,817	8,590	3,192	35	56.7	82.9	30.4	
45–54	13,823	11,087	2,714	22	31.6	51.4	12.2	
55–64	3,802	3,176	621	5	9.7	16.8	3.1	
65+	825	696	128	1	1.8	3.6	0.5	
Unknown Age	525	312	193	20				
TOTAL	**333,004**	**169,130**	**163,208**	**666**	**105.3**	**108.7**	**101.7**	
0–4	154	47	105	2	0.8	0.5	1.1	2014
5–9	53	7	46	0	0.3	0.1	0.5	
10–14	2,450	440	2,005	5	11.9	4.2	19.8	
15–19	68,468	23,981	44,399	88	325.0	222.4	431.7	
20–24	116,200	56,714	59,329	157	507.2	483.1	531.0	
25–29	69,587	40,602	28,899	86	316.5	363.8	266.9	
30–34	38,393	24,349	13,988	56	178.3	225.3	130.5	
35–39	20,803	14,129	6,654	20	104.4	142.1	66.7	
40–44	12,687	9,349	3,320	18	61.6	91.5	32.0	
45–54	15,322	12,388	2,917	17	35.3	57.8	13.2	
55–64	4,549	3,859	680	10	11.4	20.0	3.3	
65+	911	790	121	0	2.0	3.9	0.5	
Unknown Age	485	288	145	52				
TOTAL	**350,062**	**186,943**	**162,608**	**511**	**109.8**	**119.1**	**100.4**	
0–4	148	47	98	3	0.7	0.5	1.0	2015
5–9	78	11	66	1	0.4	0.1	0.7	
10–14	2,312	385	1,923	4	11.2	3.7	19.0	
15–19	72,001	26,401	45,477	123	341.1	244.5	441.1	
20–24	124,592	63,289	61,105	198	547.9	542.4	551.9	
25-29	82,867	50,089	32,662	116	368.9	439.0	295.5	
30–34	45,681	29,751	15,867	63	210.7	273.2	147.1	
35–39	26,137	18,198	7,897	42	128.3	178.9	77.4	
40–44	15,042	11,116	3,898	28	74.4	110.8	38.3	
45–54	18,779	15,379	3,375	25	43.5	72.2	15.4	
55–64	6,035	5,175	849	11	14.8	26.2	4.0	
65+	1,191	1,032	158	1	2.5	4.9	0.6	
Unknown Age	353	197	139	17				
TOTAL	**395,216**	**221,070**	**173,514**	**632**	**123.0**	**139.7**	**106.3**	
0–4	187	72	113	2	0.9	0.7	1.2	2016
5–9	98	16	81	1	0.5	0.2	0.8	
10–14	2,436	498	1,929	9	11.8	4.7	19.1	
15–19	80,172	30,316	49,710	146	379.8	280.8	482.1	
20–24	138,130	71,967	65,930	233	607.5	616.8	595.5	
25–29	101,283	62,189	38,881	213	450.9	545.1	351.8	
30–34	57,646	38,193	19,306	147	265.9	350.7	179.0	
35–39	34,058	23,744	10,230	84	167.2	233.4	100.3	
40–44	19,104	14,116	4,935	53	94.5	140.7	48.5	
45–54	24,142	19,762	4,330	50	55.9	92.8	19.8	
55–64	8,138	6,947	1,178	13	19.9	35.2	5.6	
65+	1,599	1,403	191	5	3.3	6.7	0.7	
Unknown Age	1,521	810	685	26				
TOTAL	**468,514**	**270,033**	**197,499**	**982**	**145.8**	**170.7**	**121.0**	

* No population data are available for unknown sex and age; therefore, rates are not calculated.

NOTE: This table should be used only for age comparisons. Cases in the 0–4 age group may include cases due to perinatal transmission.

Table 22A. Gonorrhea — Reported Cases by Race/Ethnicity, Age Group, and Sex, United States*, 2016

Age Group	American Indians/ Alaska Natives			Asians			Blacks			Native Hawaiians/ Other Pacific Islanders		
	Total†	Male	Female	Total†	Male	Female	Total†	Male	Female	Total†	Male	Female
0–4	1	0	1	1	1	0	63	25	38	1	1	0
5–9	3	0	3	0	0	0	32	7	25	0	0	0
10–14	29	3	26	11	3	8	1,306	307	998	3	1	2
15–19	810	237	573	397	184	212	40,280	15,755	24,503	150	46	104
20–24	1,606	599	1,007	1,221	789	430	63,737	32,652	31,051	256	104	152
25–29	1,433	588	845	1,230	940	287	40,771	25,282	15,461	210	122	88
30–34	872	386	486	789	637	152	19,653	13,525	6,106	126	76	50
35–39	463	195	268	511	402	109	10,708	7,867	2,833	90	62	27
40–44	217	104	113	326	263	61	5,659	4,497	1,156	46	32	14
45–54	257	135	122	335	292	41	6,787	5,841	943	33	26	7
55–64	57	44	13	86	67	19	2,405	2,140	264	13	13	0
65+	8	7	1	25	17	8	432	401	30	0	0	0
Unknown Age	1	1	0	2	2	0	281	145	135	0	0	0
TOTAL	**5,757**	**2,299**	**3,458**	**4,934**	**3,597**	**1,327**	**192,114**	**108,444**	**83,543**	**928**	**483**	**444**

Age Group	Whites			Multirace			Hispanics			Other/ Unknown		
	Total†	Male	Female	Total†	Male	Female	Total†	Male	Female	Total†	Male	Female
0–4	35	12	23	2	1	1	27	8	19	57	24	31
5–9	21	4	17	0	0	0	19	1	18	23	4	18
10–14	271	25	246	14	1	13	262	46	216	540	112	420
15–19	12,795	3,758	9,033	708	204	504	8,056	3,198	4,854	16,976	6,934	9,927
20–24	27,243	13,202	14,025	1,194	576	615	15,976	9,122	6,839	26,897	14,923	11,811
25–29	25,018	14,266	10,736	862	570	291	12,414	8,217	4,180	19,345	12,204	6,993
30–34	16,660	10,314	6,337	602	474	128	7,475	5,244	2,219	11,469	7,537	3,828
35–39	10,272	6,786	3,482	305	239	64	4,515	3,285	1,225	7,194	4,908	2,222
40–44	6,018	4,288	1,728	151	125	23	2,395	1,813	577	4,292	2,994	1,263
45–54	8,306	6,790	1,514	210	187	23	2,504	2,022	477	5,710	4,469	1,203
55–64	2,965	2,567	397	49	48	1	549	440	108	2,014	1,628	376
65+	593	512	79	5	5	0	75	65	10	461	396	63
Unknown Age	114	57	55	1	1	0	32	11	20	1,090	593	475
TOTAL	**110,311**	**62,581**	**47,672**	**4,103**	**2,431**	**1,663**	**54,299**	**33,472**	**20,762**	**96,068**	**56,726**	**38,630**

* Includes 50 states and the District of Columbia reporting race/ethnicity data in the Office of Management and Budget compliant formats in 2016.
† Total includes cases reported with unknown sex.
NOTE: These tables should be used only for race/ethnicity comparisons. See Table 21 for age-specific cases and rates and Tables 14–16 for total and sex-specific cases and rates. Cases in the 0–4 age group may include cases due to perinatal transmission.

Table 22B. Gonorrhea — Rates of Reported Cases per 100,000 Population by Race/Ethnicity, Age Group, and Sex, United States*, 2016

Age Group	American Indians/ Alaska Natives			Asians			Blacks			Native Hawaiians/ Other Pacific Islanders		
	Total†	Male	Female	Total†	Male	Female	Total†	Male	Female	Total†	Male	Female
0–4	0.6	0.0	1.2	0.1	0.2	0.0	2.3	1.8	2.8	2.5	4.8	0.0
5–9	1.7	0.0	3.5	0.0	0.0	0.0	1.1	0.5	1.8	0.0	0.0	0.0
10–14	16.5	3.4	30.0	1.1	0.6	1.6	46.5	21.6	72.0	7.4	4.9	10.0
15–19	444.7	255.7	640.4	38.7	35.5	41.7	1,347.0	1,038.6	1,663.1	369.4	219.7	528.9
20–24	806.5	586.7	1,037.7	97.0	123.5	69.4	1,875.9	1,892.7	1,856.5	545.6	432.5	664.6
25–29	781.8	630.5	938.6	82.9	129.9	37.7	1,308.8	1,641.0	982.0	403.6	452.5	351.0
30–34	535.8	476.1	595.0	52.4	89.6	19.1	709.8	1,016.0	424.7	258.5	304.1	210.4
35–39	312.6	264.7	359.9	36.2	61.1	14.4	410.6	636.6	206.5	212.2	287.4	129.5
40–44	151.4	147.3	155.3	23.1	39.8	8.1	221.8	375.2	85.4	123.4	169.9	75.9
45–54	83.2	90.1	76.6	14.0	26.2	3.2	128.1	234.8	33.6	47.4	75.1	20.0
55–64	20.6	33.8	8.9	4.5	7.7	1.8	52.1	101.6	10.5	24.0	49.1	0.0
65+	3.3	6.3	0.7	1.2	2.0	0.7	10.3	23.7	1.2	0.0	0.0	0.0
Unknown Age												
TOTAL	**242.9**	**196.8**	**287.7**	**28.3**	**43.4**	**14.5**	**481.2**	**568.4**	**400.7**	**165.8**	**171.1**	**160.0**

Age Group	Whites			Multirace			Hispanics		
	Total†	Male	Female	Total†	Male	Female	Total†	Male	Female
0–4	0.4	0.2	0.5	0.2	0.2	0.2	0.5	0.3	0.8
5–9	0.2	0.1	0.3	0.0	0.0	0.0	0.4	0.0	0.7
10–14	2.5	0.4	4.6	1.8	0.3	3.4	5.3	1.8	8.9
15–19	111.6	63.8	161.9	103.4	58.8	149.1	170.8	132.5	210.9
20–24	219.3	207.0	232.0	198.8	191.8	204.9	331.9	365.1	295.4
25–29	198.0	222.3	172.7	186.6	257.2	121.1	274.0	344.5	194.7
30–34	134.8	165.4	103.5	157.1	262.2	63.2	167.9	225.5	104.4
35–39	88.6	116.1	60.6	93.8	156.5	37.1	106.4	150.2	59.6
40–44	50.8	72.0	29.3	54.0	95.0	15.5	60.9	91.0	29.7
45–54	29.6	48.6	10.7	42.8	80.6	8.9	38.3	61.3	14.7
55–64	10.1	17.9	2.6	12.6	25.8	0.5	12.8	21.2	4.9
65+	1.6	3.1	0.4	1.5	3.3	0.0	2.0	4.0	0.5
Unknown Age									
TOTAL	**55.7**	**64.1**	**47.5**	**62.3**	**75.1**	**49.7**	**95.9**	**117.0**	**74.2**

* Includes 50 states and the District of Columbia reporting race/ethnicity data in the Office of Management and Budget compliant formats in 2016.
† Total includes cases reported with unknown sex.
NOTE: These tables should be used only for race/ethnicity comparisons. See Table 21 for age-specific cases and rates and Tables 14–16 for total and sex-specific cases and rates. Cases in the 0–4 age group may include cases due to perinatal transmission. No population data exist for unknown sex, unknown age, or unknown race; therefore rates are not calculated.

Table 23. Gonorrhea Among Women Aged 15–24 Years — Reported Cases and Rates of Reported Cases by Age, United States, 2012–2016

	Age	Cases	Rate per 100,000 Population
2012	15	4,241	209.4
	16	7,316	359.4
	17	11,006	530.2
	18	15,580	736.2
	19	16,709	779.1
	20	15,849	717.5
	21	15,029	664.7
	22	12,800	565.9
	23	10,449	480.6
	24	8,584	403.4
2013	15	3,776	186.4
	16	6,503	320.0
	17	9,374	458.8
	18	13,393	642.4
	19	14,703	691.2
	20	14,420	668.8
	21	13,394	603.1
	22	12,272	539.6
	23	10,819	475.3
	24	8,855	404.5
2014	15	3,487	171.3
	16	6,188	303.9
	17	8,830	431.6
	18	12,196	591.9
	19	13,698	650.5
	20	13,801	642.1
	21	13,324	611.5
	22	12,031	536.0
	23	10,746	467.5
	24	9,427	409.6
2015	15	3,477	167.4
	16	6,090	297.8
	17	9,117	444.9
	18	12,769	619.3
	19	14,024	674.8
	20	13,835	651.7
	21	13,331	615.2
	22	12,597	573.2
	23	11,271	497.7
	24	10,071	434.2
2016	15	3,678	177.1
	16	6,573	321.4
	17	9,855	480.9
	18	14,304	693.7
	19	15,300	736.2
	20	14,657	690.4
	21	14,149	653.0
	22	13,540	616.1
	23	12,245	540.8
	24	11,339	488.9

NOTE: This table should be used only for age comparisons. Cases reported with unknown sex are not included in this table.

Table 24. All Stages of Syphilis* — Reported Cases and Rates of Reported Cases by State/Area and Region in Alphabetical Order, United States and Outlying Areas, 2012–2016

State/Area	Cases					Rates per 100,000 Population				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Alabama	705	679	475	657	905	14.6	14.0	9.8	13.5	18.6
Alaska	34	35	45	24	24	4.6	4.8	6.1	3.3	3.3
Arizona	787	962	1,459	1,496	1,904	12.0	14.5	21.7	21.9	27.9
Arkansas	468	527	390	500	567	15.9	17.8	13.1	16.8	19.0
California	8,016	9,973	11,443	14,449	17,602	21.1	26.0	29.5	36.9	45.0
Colorado	503	475	355	553	739	9.7	9.0	6.6	10.1	13.5
Connecticut	121	133	169	220	217	3.4	3.7	4.7	6.1	6.0
Delaware	106	146	110	110	149	11.6	15.8	11.8	11.6	15.8
District of Columbia	589	609	281	322	568	93.1	94.2	42.6	47.9	84.5
Florida	4,483	5,022	6,103	7,132	8,332	23.2	25.7	30.7	35.2	41.1
Georgia	2,434	2,990	3,384	4,156	4,112	24.5	29.9	33.5	40.7	40.3
Hawaii	43	87	106	163	215	3.1	6.2	7.5	11.4	15.0
Idaho	54	42	46	102	127	3.4	2.6	2.8	6.2	7.7
Illinois	2,424	2,661	2,796	3,290	4,039	18.8	20.7	21.7	25.6	31.4
Indiana	531	543	475	699	778	8.1	8.3	7.2	10.6	11.8
Iowa	143	226	239	232	276	4.7	7.3	7.7	7.4	8.8
Kansas	129	196	200	240	303	4.5	6.8	6.9	8.2	10.4
Kentucky	390	395	447	433	570	8.9	9.0	10.1	9.8	12.9
Louisiana	1,780	2,006	2,173	2,466	2,599	38.7	43.4	46.7	52.8	55.6
Maine	22	21	23	38	64	1.7	1.6	1.7	2.9	4.8
Maryland	1,243	1,361	1,475	1,870	1,842	21.1	23.0	24.7	31.1	30.7
Massachusetts	806	990	813	1,263	1,447	12.1	14.8	12.1	18.6	21.3
Michigan	786	1,068	1,095	1,089	1,092	8.0	10.8	11.0	11.0	11.0
Minnesota	335	541	631	653	853	6.2	10.0	11.6	11.9	15.5
Mississippi	456	293	642	760	925	15.3	9.8	21.4	25.4	30.9
Missouri	426	609	771	778	955	7.1	10.1	12.7	12.8	15.7
Montana	3	8	9	20	24	0.3	0.8	0.9	1.9	2.3
Nebraska	35	95	96	81	120	1.9	5.1	5.1	4.3	6.3
Nevada	445	523	893	915	1,313	16.1	18.7	31.5	31.7	45.4
New Hampshire	65	79	79	84	100	4.9	6.0	6.0	6.3	7.5
New Jersey	883	968	1,172	1,306	1,620	10.0	10.9	13.1	14.6	18.1
New Mexico	234	247	283	332	470	11.2	11.8	13.6	15.9	22.5
New York	5,312	6,173	7,129	7,795	9,456	27.1	31.4	36.1	39.4	47.8
North Carolina	1,037	1,153	1,998	2,741	2,653	10.6	11.7	20.1	27.3	26.4
North Dakota	14	25	51	42	61	2.0	3.5	6.9	5.5	8.1
Ohio	1,141	1,096	1,229	1,348	1,599	9.9	9.5	10.6	11.6	13.8
Oklahoma	256	383	414	521	696	6.7	9.9	10.7	13.3	17.8
Oregon	424	527	582	783	810	10.9	13.4	14.7	19.4	20.1
Pennsylvania	1,349	1,486	1,523	1,788	2,037	10.6	11.6	11.9	14.0	15.9
Rhode Island	93	94	160	163	234	8.9	8.9	15.2	15.4	22.2
South Carolina	624	753	750	834	974	13.2	15.8	15.5	17.0	19.9
South Dakota	29	61	95	71	57	3.5	7.2	11.1	8.3	6.6
Tennessee	1,068	980	977	1,241	1,448	16.5	15.1	14.9	18.8	21.9
Texas	7,057	7,044	7,804	8,250	9,564	27.1	26.6	28.9	30.0	34.8
Utah	101	172	149	169	259	3.5	5.9	5.1	5.6	8.6
Vermont	12	10	12	15	37	1.9	1.6	1.9	2.4	5.9
Virginia	906	1,001	702	1,023	1,301	11.1	12.1	8.4	12.2	15.5
Washington	709	711	854	1,109	1,414	10.3	10.2	12.1	15.5	19.7
West Virginia	24	39	55	109	151	1.3	2.1	3.0	5.9	8.2
Wisconsin	268	257	285	262	423	4.7	4.5	5.0	4.5	7.3
Wyoming	12	9	6	10	17	2.1	1.5	1.0	1.7	2.9
U.S. TOTAL	**49,915**	**56,484**	**63,453**	**74,707**	**88,042**	**15.9**	**17.9**	**19.9**	**23.2**	**27.4**
Northeast	8,663	9,954	11,080	12,672	15,212	15.5	17.8	19.7	22.5	27.0
Midwest	6,261	7,378	7,963	8,785	10,556	9.3	10.9	11.8	12.9	15.5
South	23,626	25,381	28,180	33,125	37,356	20.1	21.4	23.5	27.3	30.8
West	11,365	13,771	16,230	20,125	24,918	15.4	18.5	21.6	26.5	32.8
Guam	27	24	13	22	13	16.9	15.0	8.1	13.6	8.0
Puerto Rico	704	811	960	1,267	1,184	19.2	22.4	27.1	36.5	34.1
Virgin Islands	2	9	6	25	2	1.9	8.6	5.8	24.3	1.9
OUTLYING AREAS	**733**	**844**	**979**	**1,314**	**1,199**	**18.6**	**21.8**	**25.7**	**35.1**	**32.1**
TOTAL	**50,648**	**57,328**	**64,432**	**76,021**	**89,241**	**15.9**	**17.9**	**20.0**	**23.4**	**27.4**

* See Section A1.9 in the Appendix for definition.

Table 25. All Stages of Syphilis* — Reported Cases and Rates of Reported Cases in Selected Metropolitan Statistical Areas (MSAs)† in Alphabetical Order, United States, 2012–2016

MSAs	Cases					Rates per 100,000 Population				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Atlanta-Sandy Springs-Roswell, GA	1,822	2,257	2,669	3,105	3,219	33.4	40.9	47.5	54.4	56.4
Austin-Round Rock, TX	478	500	680	623	825	26.1	26.6	35.0	31.1	41.2
Baltimore-Columbia-Towson, MD	726	732	815	1,005	1,025	26.4	26.4	29.3	35.9	36.6
Birmingham-Hoover, AL	226	236	157	197	245‡	19.9	20.7	13.7	17.2	21.4‡
Boston-Cambridge-Newton, MA-NH	570	758	596‡	811‡	997‡	12.3	16.2	12.6‡	17.0‡	20.9‡
Buffalo-Cheektowaga-Niagara Falls, NY	70	115	130	180	141	6.2	10.1	11.4	15.9	12.4
Charlotte-Concord-Gastonia, NC-SC	310	360	530	731	848	13.5	15.4	22.3	30.1	34.9
Chicago-Naperville-Elgin, IL-IN-WI	2,269	2,499	2,559	3,060	3,805	23.8	26.2	26.8	32.0	39.8
Cincinnati, OH-KY-IN	529	437	381	319	268	24.9	20.4	17.7	14.8	12.4
Cleveland-Elyria, OH	140	111	199	229	376	6.8	5.4	9.6	11.1	18.2
Columbus, OH	316	342	441	517	578	16.3	17.4	22.1	25.6	28.6
Dallas-Fort Worth-Arlington, TX	2,141	2,093	2,231	2,261	2,661	32.0	30.7	32.1	31.8	37.5
Denver-Aurora-Lakewood, CO	434	382	298	426	552	16.4	14.2	10.8	15.1	19.6
Detroit-Warren-Dearborn, MI	607	830	791	773	738	14.1	19.3	18.4	18.0	17.2
Hartford-West Hartford-East Hartford, CT	21	43	52	84	55	1.7	3.5	4.3	6.9	4.5
Houston-The Woodlands-Sugar Land, TX	2,246	1,891	2,316	2,568	2,817	36.4	30.0	35.7	38.6	42.3
Indianapolis-Carmel-Anderson, IN	336	340	285	408	415	17.4	17.4	14.5	20.5	20.9
Jacksonville, FL	177	189	270	435	445	12.8	13.6	19.0	30.0	30.7
Kansas City, MO-KS	164	320	406	365	434	8.0	15.6	19.6	17.5	20.8
Las Vegas-Henderson-Paradise, NV	403	438	830	826	1,194	20.1	21.6	40.1	39.1	56.5
Los Angeles-Long Beach-Anaheim, CA	3,540	4,537	4,738	5,812	7,095	27.1	34.6	35.7	43.6	53.2
Louisville-Jefferson County, KY-IN	201	210	239	270	379	16.1	16.6	18.8	21.1	29.6
Memphis, TN-MS-AR	591	578	475	575	760	44.0	43.1	35.4	42.8	56.5
Miami-Fort Lauderdale-West Palm Beach, FL	2,591	2,740	3,313	3,635	4,093	45.0	47.0	55.9	60.5	68.1
Milwaukee-Waukesha-West Allis, WI	159	153	184	147	228	10.1	9.7	11.7	9.3	14.5
Minneapolis-St. Paul-Bloomington, MN-WI	313	487	585	592	742	9.1	14.1	16.7	16.8	21.1
Nashville-Davidson-Murfreesboro-Franklin, TN	271	239	305	359	383	15.7	13.6	17.0	19.6	20.9
New Orleans-Metairie, LA	547	634	723	757	843	44.6	51.1	57.8	59.9	66.8
New York-Newark-Jersey City, NY-NJ-PA	5,670	6,506	7,476	8,166	10,103	28.6	32.6	37.2	40.5	50.1
Oklahoma City, OK	148	213	231	264	406	11.4	16.1	17.3	19.4	29.9
Orlando-Kissimmee-Sanford, FL	499	631	782	915	1,183	22.4	27.8	33.7	38.3	49.6
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	1,119	1,333	1,273	1,393	1,646	18.6	22.1	21.0	22.9	27.1
Phoenix-Mesa-Scottsdale, AZ	624	713	1,065	1,125	1,501	14.4	16.2	23.7	24.6	32.8
Pittsburgh, PA	128	95	154	273	236	5.4	4.0	6.5	11.6	10.0
Portland-Vancouver-Hillsboro, OR-WA	410	475	470	587	650	17.9	20.5	20.0	24.6	27.2
Providence-Warwick, RI-MA	125	138	204‡	230‡	288‡	7.8	8.6	12.7‡	14.3‡	17.9‡
Raleigh, NC	150	179	315	409	381	12.6	14.7	25.3	32.1	29.9
Richmond, VA	194	204	145	207	305	15.7	16.4	11.5	16.3	24.0
Riverside-San Bernardino-Ontario, CA	775	803	950	1,165	1,554	17.8	18.3	21.4	26.0	34.6
Sacramento-Roseville-Arden-Arcade, CA	249	289	371	607	609	11.3	13.0	16.5	26.7	26.8
Salt Lake City, UT	74	136	109	122	187	6.6	11.9	9.5	10.4	16.0
San Antonio-New Braunfels, TX	983	1,167	1,017	988	1,126	44.0	51.2	43.7	41.4	47.2
San Diego-Carlsbad, CA	717	792	987	1,208	1,419	22.6	24.7	30.2	36.6	43.0
San Francisco-Oakland-Hayward, CA	1,595	1,892	2,106	2,352	2,419	35.8	41.9	45.8	50.5	52.0
San Jose-Sunnyvale-Santa Clara, CA	233	276	304	359	501	12.3	14.4	15.6	18.2	25.3
Seattle-Tacoma-Bellevue, WA	559	539	590	759	968	15.7	14.9	16.1	20.3	25.9
St. Louis, MO-IL	280	338	412	417	528	10.0	12.1	14.7	14.8	18.8
Tampa-St. Petersburg-Clearwater, FL	582	632	806	956	1,128	20.5	22.0	27.6	32.1	37.9
Virginia Beach-Norfolk-Newport News, VA-NC	296	302	220	375	516	17.4	17.7	12.8	21.7	29.9
Washington-Arlington-Alexandria, DC-VA-MD-WV	1,374	1,543	811	1,057	1,104	23.4	25.9	13.4	17.3	18.1
SELECTED MSAs TOTAL	**38,982**	**43,647**	**47,996**	**55,004**	**64,919**	**22.8**	**25.3**	**27.4**	**31.1**	**36.7**

* See Section A1.9 in the Appendix for definition.

† MSAs were selected on the basis of the largest population in the 2010 U.S. Census.

‡ The variable used to identify county, which is used to classify cases into MSAs, was complete for ≤95% of cases in a state contributing data to this MSA. See Appendix A1.4 for more information.

Table 26. Primary and Secondary Syphilis — Reported Cases and Rates of Reported Cases by State, Ranked by Rates, United States, 2016

Rank*	State	Cases	Rate per 100,000 Population
1	Louisiana	750	16.1
2	Nevada	444	15.4
3	California	5,891	15.0
4	Georgia	1,350	13.2
5	New York	2,455	12.4
6	Florida	2,406	11.9
7	Mississippi	326	10.9
8	North Carolina	1,082	10.8
9	Arizona	721	10.6
10	Illinois	1,260	9.8
11	New Mexico	189	9.1
	U.S. TOTAL†	**27,814**	**8.7**
12	Rhode Island	90	8.5
13	Maryland	509	8.5
14	Oregon	327	8.1
15	Washington	565	7.9
16	Hawaii	112	7.8
17	Alabama	376	7.7
18	Massachusetts	489	7.2
19	Texas	1,955	7.1
20	Oklahoma	264	6.7
21	Missouri	400	6.6
22	South Carolina	316	6.5
23	Ohio	716	6.2
24	Delaware	58	6.1
25	Tennessee	390	5.9
26	Pennsylvania	755	5.9
27	Minnesota	306	5.6
28	Virginia	459	5.5
29	New Jersey	472	5.3
30	Arkansas	150	5.0
31	Kentucky	219	4.9
32	Indiana	326	4.9
33	Colorado	250	4.6
34	North Dakota	33	4.4
35	Kansas	124	4.3
36	Michigan	365	3.7
37	Vermont	23	3.7
38	Nebraska	67	3.5
39	Maine	42	3.2
40	Utah	92	3.1
41	Connecticut	110	3.1
42	South Dakota	26	3.0
43	Idaho	50	3.0
44	New Hampshire	40	3.0
45	West Virginia	53	2.9
46	Iowa	89	2.8
47	Wisconsin	132	2.3
48	Montana	14	1.4
49	Wyoming	7	1.2
50	Alaska	8	1.1

* States were ranked by rate, then by case count, then in alphabetical order, with rates shown rounded to the nearest tenth.

† Total includes cases reported by the District of Columbia with 161 cases and a rate of 24.0, but excludes outlying areas (Guam with 2 cases and rate of 1.2, Puerto Rico with 493 cases and rate of 14.2, and Virgin Islands with 0 cases and rate of 0.0).

Table 27. Primary and Secondary Syphilis — Reported Cases and Rates of Reported Cases by State/Area and Region in Alphabetical Order, United States and Outlying Areas, 2012–2016

State/Area	Cases					Rates per 100,000 Population				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Alabama	216	183	161	280	376	4.5	3.8	3.3	5.8	7.7
Alaska	11	23	15	8	8	1.5	3.1	2.0	1.1	1.1
Arizona	202	287	577	589	721	3.1	4.3	8.6	8.6	10.6
Arkansas	173	177	121	134	150	5.9	6.0	4.1	4.5	5.0
California	2,953	3,532	3,835	4,908	5,891	7.8	9.2	9.9	12.5	15.0
Colorado	208	163	186	245	250	4.0	3.1	3.5	4.5	4.6
Connecticut	55	56	86	92	110	1.5	1.6	2.4	2.6	3.1
Delaware	38	52	47	41	58	4.1	5.6	5.0	4.3	6.1
District of Columbia	165	168	116	95	161	26.1	26.0	17.6	14.1	24.0
Florida	1,369	1,513	1,740	2,083	2,406	7.1	7.7	8.7	10.3	11.9
Georgia	937	1,017	1,234	1,413	1,350	9.4	10.2	12.2	13.8	13.2
Hawaii	23	46	68	91	112	1.7	3.3	4.8	6.4	7.8
Idaho	26	15	12	57	50	1.6	0.9	0.7	3.4	3.0
Illinois	804	798	863	1,085	1,260	6.2	6.2	6.7	8.4	9.8
Indiana	224	215	168	285	326	3.4	3.3	2.5	4.3	4.9
Iowa	70	106	72	75	89	2.3	3.4	2.3	2.4	2.8
Kansas	24	51	60	87	124	0.8	1.8	2.1	3.0	4.3
Kentucky	150	122	158	145	219	3.4	2.8	3.6	3.3	4.9
Louisiana	339	423	575	696	750	7.4	9.1	12.4	14.9	16.1
Maine	17	10	16	28	42	1.3	0.8	1.2	2.1	3.2
Maryland	431	456	449	509	509	7.3	7.7	7.5	8.5	8.5
Massachusetts	316	360	301	418	489	4.8	5.4	4.5	6.2	7.2
Michigan	295	487	421	403	365	3.0	4.9	4.2	4.1	3.7
Minnesota	118	193	257	246	306	2.2	3.6	4.7	4.5	5.6
Mississippi	150	78	189	219	326	5.0	2.6	6.3	7.3	10.9
Missouri	157	251	352	307	400	2.6	4.2	5.8	5.0	6.6
Montana	2	5	8	13	14	0.2	0.5	0.8	1.3	1.4
Nebraska	8	41	50	45	67	0.4	2.2	2.7	2.4	3.5
Nevada	113	205	357	335	444	4.1	7.3	12.6	11.6	15.4
New Hampshire	36	28	36	40	40	2.7	2.1	2.7	3.0	3.0
New Jersey	229	233	297	372	472	2.6	2.6	3.3	4.2	5.3
New Mexico	101	78	126	118	189	4.8	3.7	6.0	5.7	9.1
New York	1,224	1,459	1,727	2,006	2,455	6.3	7.4	8.7	10.1	12.4
North Carolina	347	404	733	1,196	1,082	3.6	4.1	7.4	11.9	10.8
North Dakota	4	12	13	11	33	0.6	1.7	1.8	1.5	4.4
Ohio	425	436	568	560	716	3.7	3.8	4.9	4.8	6.2
Oklahoma	83	118	151	209	264	2.2	3.1	3.9	5.3	6.7
Oregon	212	267	272	345	327	5.4	6.8	6.9	8.6	8.1
Pennsylvania	494	471	532	655	755	3.9	3.7	4.2	5.1	5.9
Rhode Island	44	45	71	77	90	4.2	4.3	6.7	7.3	8.5
South Carolina	225	271	250	294	316	4.8	5.7	5.2	6.0	6.5
South Dakota	18	44	53	39	26	2.2	5.2	6.2	4.5	3.0
Tennessee	266	214	237	349	390	4.1	3.3	3.6	5.3	5.9
Texas	1,627	1,475	1,636	1,680	1,955	6.2	5.6	6.1	6.1	7.1
Utah	42	74	47	65	92	1.5	2.6	1.6	2.2	3.1
Vermont	6	3	5	9	23	1.0	0.5	0.8	1.4	3.7
Virginia	285	315	289	334	459	3.5	3.8	3.5	4.0	5.5
Washington	302	284	344	445	565	4.4	4.1	4.9	6.2	7.9
West Virginia	8	15	28	52	53	0.4	0.8	1.5	2.8	2.9
Wisconsin	91	95	86	79	132	1.6	1.7	1.5	1.4	2.3
Wyoming	4	1	4	5	7	0.7	0.2	0.7	0.9	1.2
U.S. TOTAL	**15,667**	**17,375**	**19,999**	**23,872**	**27,814**	**5.0**	**5.5**	**6.3**	**7.4**	**8.7**
Northeast	2,421	2,665	3,071	3,697	4,476	4.3	4.8	5.5	6.6	8.0
Midwest	2,238	2,729	2,963	3,222	3,844	3.3	4.0	4.4	4.7	5.7
South	6,809	7,001	8,114	9,729	10,824	5.8	5.9	6.8	8.0	8.9
West	4,199	4,980	5,851	7,224	8,670	5.7	6.7	7.8	9.5	11.4
Guam	6	6	7	2	2	3.8	3.7	4.3	1.2	1.2
Puerto Rico	306	385	484	531	493	8.3	10.6	13.6	15.3	14.2
Virgin Islands	0	2	2	8	0	0.0	1.9	1.9	7.8	0.0
OUTLYING AREAS	**312**	**393**	**493**	**541**	**495**	**7.9**	**10.1**	**12.9**	**14.5**	**13.2**
TOTAL	**15,979**	**17,768**	**20,492**	**24,413**	**28,309**	**5.0**	**5.6**	**6.4**	**7.5**	**8.7**

Table 28. Primary and Secondary Syphilis Among Women — Reported Cases and Rates of Reported Cases by State/Area and Region in Alphabetical Order, United States and Outlying Areas, 2012–2016

State/Area	Cases					Rates per 100,000 Population				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Alabama	38	22	17	37	80	1.5	0.9	0.7	1.5	3.2
Alaska	1	2	1	1	0	0.3	0.6	0.3	0.3	0.0
Arizona	16	27	50	47	80	0.5	0.8	1.5	1.4	2.3
Arkansas	49	44	23	26	37	3.3	2.9	1.5	1.7	2.4
California	116	210	318	476	744	0.6	1.1	1.6	2.4	3.8
Colorado	3	4	6	6	16	0.1	0.2	0.2	0.2	0.6
Connecticut	9	8	7	15	12	0.5	0.4	0.4	0.8	0.7
Delaware	2	3	2	2	3	0.4	0.6	0.4	0.4	0.6
District of Columbia	6	19	5	6	5	1.8	5.6	1.4	1.7	1.4
Florida	134	137	137	210	266	1.4	1.4	1.3	2.0	2.6
Georgia	66	87	96	94	113	1.3	1.7	1.9	1.8	2.2
Hawaii	2	0	2	1	10	0.3	0.0	0.3	0.1	1.4
Idaho	2	0	0	9	6	0.3	0.0	0.0	1.1	0.7
Illinois	73	66	81	84	95	1.1	1.0	1.2	1.3	1.5
Indiana	22	18	11	28	36	0.7	0.5	0.3	0.8	1.1
Iowa	7	10	6	5	6	0.5	0.6	0.4	0.3	0.4
Kansas	2	4	14	17	12	0.1	0.3	1.0	1.2	0.8
Kentucky	13	17	22	23	21	0.6	0.8	1.0	1.0	0.9
Louisiana	127	115	132	189	192	5.4	4.9	5.6	7.9	8.0
Maine	2	1	3	6	3	0.3	0.1	0.4	0.9	0.4
Maryland	45	61	49	58	54	1.5	2.0	1.6	1.9	1.7
Massachusetts	15	17	23	25	24	0.4	0.5	0.7	0.7	0.7
Michigan	30	29	31	34	31	0.6	0.6	0.6	0.7	0.6
Minnesota	7	12	21	39	37	0.3	0.4	0.8	1.4	1.3
Mississippi	34	19	17	32	58	2.2	1.2	1.1	2.1	3.8
Missouri	12	19	34	54	66	0.4	0.6	1.1	1.7	2.1
Montana	0	1	2	1	1	0.0	0.2	0.4	0.2	0.2
Nebraska	1	4	4	3	5	0.1	0.4	0.4	0.3	0.5
Nevada	4	14	23	23	50	0.3	1.0	1.6	1.6	3.5
New Hampshire	0	1	4	3	4	0.0	0.1	0.6	0.4	0.6
New Jersey	19	13	16	26	24	0.4	0.3	0.3	0.6	0.5
New Mexico	9	20	14	11	27	0.9	1.9	1.3	1.0	2.6
New York	45	44	49	59	115	0.4	0.4	0.5	0.6	1.1
North Carolina	37	36	68	112	109	0.7	0.7	1.3	2.2	2.1
North Dakota	0	1	5	0	3	0.0	0.3	1.4	0.0	0.8
Ohio	85	63	76	68	94	1.4	1.1	1.3	1.1	1.6
Oklahoma	6	13	15	21	41	0.3	0.7	0.8	1.1	2.1
Oregon	6	12	22	35	35	0.3	0.6	1.1	1.7	1.7
Pennsylvania	34	26	47	52	62	0.5	0.4	0.7	0.8	0.9
Rhode Island	1	1	5	4	3	0.2	0.2	0.9	0.7	0.6
South Carolina	34	39	23	37	52	1.4	1.6	0.9	1.5	2.1
South Dakota	1	15	34	7	6	0.2	3.6	8.0	1.6	1.4
Tennessee	31	22	34	23	56	0.9	0.7	1.0	0.7	1.7
Texas	269	179	242	230	230	2.1	1.3	1.8	1.7	1.7
Utah	0	2	1	2	6	0.0	0.1	0.1	0.1	0.4
Vermont	0	0	0	0	3	0.0	0.0	0.0	0.0	0.9
Virginia	21	17	17	17	47	0.5	0.4	0.4	0.4	1.1
Washington	9	13	18	30	51	0.3	0.4	0.5	0.8	1.4
West Virginia	2	4	6	9	10	0.2	0.4	0.6	1.0	1.1
Wisconsin	11	9	7	0	7	0.4	0.3	0.2	0.0	0.2
Wyoming	0	0	0	1	1	0.0	0.0	0.0	0.3	0.3
U.S. TOTAL	**1,458**	**1,500**	**1,840**	**2,298**	**3,049**	**0.9**	**0.9**	**1.1**	**1.4**	**1.9**
Northeast	125	111	154	190	250	0.4	0.4	0.5	0.7	0.9
Midwest	251	250	324	339	398	0.7	0.7	0.9	1.0	1.2
South	914	834	905	1,126	1,374	1.5	1.4	1.5	1.8	2.2
West	168	305	457	643	1,027	0.5	0.8	1.2	1.7	2.7
Guam	1	5	2	0	0	1.3	6.3	2.5	0.0	0.0
Puerto Rico	20	35	30	70	86	1.0	1.9	1.6	3.9	4.7
Virgin Islands	0	1	1	4	0	0.0	1.8	1.8	7.3	0.0
OUTLYING AREAS	**21**	**41**	**33**	**74**	**86**	**1.0**	**2.0**	**1.7**	**3.8**	**4.4**
TOTAL	**1,479**	**1,541**	**1,873**	**2,372**	**3,135**	**0.9**	**0.9**	**1.1**	**1.4**	**1.9**

NOTE: Cases reported with unknown sex are not included in this table.

Table 29. Primary and Secondary Syphilis Among Men — Reported Cases and Rates of Reported Cases by State/Area and Region in Alphabetical Order, United States and Outlying Areas, 2012–2016

State/Area	Cases					Rates per 100,000 Population				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Alabama	178	161	144	243	296	7.6	6.9	6.1	10.3	12.6
Alaska	10	21	14	7	8	2.6	5.4	3.6	1.8	2.1
Arizona	186	260	527	542	641	5.7	7.9	15.8	16.0	18.9
Arkansas	124	133	98	108	113	8.6	9.1	6.7	7.4	7.7
California	2,823	3,319	3,515	4,430	5,143	14.9	17.4	18.2	22.8	26.5
Colorado	205	159	180	239	234	7.9	6.0	6.7	8.7	8.5
Connecticut	46	48	79	77	98	2.6	2.7	4.5	4.4	5.6
Delaware	36	49	45	39	55	8.1	10.9	9.9	8.5	12.0
District of Columbia	159	149	106	83	152	53.2	48.7	33.9	26.1	47.7
Florida	1,235	1,376	1,602	1,873	2,140	13.1	14.4	16.5	18.9	21.6
Georgia	870	930	1,138	1,319	1,237	17.9	19.1	23.1	26.5	24.8
Hawaii	21	46	66	90	102	3.0	6.5	9.2	12.4	14.1
Idaho	24	15	12	48	44	3.0	1.9	1.5	5.8	5.3
Illinois	731	731	782	1,001	1,165	11.6	11.6	12.4	15.9	18.4
Indiana	202	197	157	257	290	6.3	6.1	4.8	7.9	8.9
Iowa	63	96	66	70	83	4.1	6.3	4.3	4.5	5.3
Kansas	22	47	46	70	112	1.5	3.3	3.2	4.8	7.7
Kentucky	137	105	136	122	198	6.3	4.9	6.3	5.6	9.1
Louisiana	212	308	443	507	558	9.4	13.6	19.5	22.2	24.4
Maine	15	9	13	22	39	2.3	1.4	2.0	3.4	6.0
Maryland	386	395	400	451	455	13.5	13.7	13.8	15.5	15.6
Massachusetts	301	343	277	391	464	9.3	10.6	8.5	11.9	14.1
Michigan	265	458	390	369	334	5.5	9.4	8.0	7.6	6.8
Minnesota	111	178	235	207	267	4.2	6.6	8.7	7.6	9.8
Mississippi	116	59	172	187	268	8.0	4.1	11.8	12.9	18.5
Missouri	145	232	318	253	334	4.9	7.8	10.7	8.5	11.2
Montana	2	4	6	12	13	0.4	0.8	1.2	2.3	2.5
Nebraska	7	37	46	42	62	0.8	4.0	4.9	4.4	6.6
Nevada	109	191	334	312	394	7.8	13.6	23.4	21.5	27.2
New Hampshire	36	27	32	37	36	5.5	4.1	4.9	5.6	5.5
New Jersey	210	220	281	346	448	4.9	5.1	6.4	7.9	10.2
New Mexico	92	58	112	107	162	8.9	5.6	10.8	10.4	15.7
New York	1,175	1,408	1,675	1,933	2,319	12.4	14.8	17.5	20.1	24.1
North Carolina	310	368	665	1,084	973	6.5	7.7	13.7	22.2	19.9
North Dakota	4	11	8	11	30	1.1	3.0	2.1	2.8	7.7
Ohio	340	373	492	492	622	6.0	6.6	8.7	8.7	10.9
Oklahoma	77	105	136	188	223	4.1	5.5	7.1	9.7	11.5
Oregon	206	255	250	310	292	10.7	13.1	12.7	15.6	14.7
Pennsylvania	460	445	485	602	693	7.4	7.1	7.8	9.6	11.1
Rhode Island	43	44	66	73	87	8.5	8.6	12.9	14.3	17.0
South Carolina	191	232	227	257	264	8.3	10.0	9.7	10.8	11.1
South Dakota	17	29	19	32	20	4.1	6.8	4.4	7.4	4.6
Tennessee	235	192	203	326	334	7.5	6.1	6.4	10.1	10.4
Texas	1,358	1,296	1,394	1,450	1,725	10.5	9.9	10.4	10.6	12.6
Utah	42	72	46	63	86	2.9	4.9	3.1	4.2	5.7
Vermont	6	3	5	9	20	1.9	1.0	1.6	2.9	6.5
Virginia	264	298	272	316	403	6.6	7.3	6.6	7.7	9.8
Washington	293	271	326	414	514	8.5	7.8	9.2	11.5	14.3
West Virginia	6	11	22	43	43	0.7	1.2	2.4	4.7	4.7
Wisconsin	80	86	79	79	125	2.8	3.0	2.8	2.8	4.4
Wyoming	4	1	4	4	6	1.4	0.3	1.3	1.3	2.0
U.S. TOTAL	**14,190**	**15,861**	**18,146**	**21,547**	**24,724**	**9.2**	**10.2**	**11.6**	**13.6**	**15.6**
Northeast	2,292	2,547	2,913	3,490	4,204	8.4	9.3	10.7	12.7	15.3
Midwest	1,987	2,475	2,638	2,883	3,444	6.0	7.4	7.9	8.6	10.3
South	5,894	6,167	7,203	8,596	9,437	10.2	10.6	12.3	14.5	15.9
West	4,017	4,672	5,392	6,578	7,639	10.9	12.6	14.4	17.4	20.2
Guam	5	1	5	2	2	6.2	1.2	6.1	2.4	2.4
Puerto Rico	286	350	454	461	407	16.3	20.2	26.6	27.8	24.6
Virgin Islands	0	1	1	4	0	0.0	2.0	2.1	8.4	0.0
OUTLYING AREAS	**291**	**352**	**460**	**467**	**409**	**15.4**	**18.9**	**25.1**	**26.1**	**22.9**
TOTAL	**14,481**	**16,213**	**18,606**	**22,014**	**25,133**	**9.3**	**10.3**	**11.7**	**13.8**	**15.7**

NOTE: Cases reported with unknown sex are not included in this table.

Table 30. Primary and Secondary Syphilis — Reported Cases and Rates of Reported Cases in Selected Metropolitan Statistical Areas (MSAs)* in Alphabetical Order, United States, 2012–2016

MSAs	Cases					Rates per 100,000 Population				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Atlanta-Sandy Springs-Roswell, GA	745	789	996	1,097	1,018	13.7	14.3	17.7	19.2	17.8
Austin-Round Rock, TX	154	145	227	203	317	8.4	7.7	11.7	10.1	15.8
Baltimore-Columbia-Towson, MD	307	288	282	343	332	11.2	10.4	10.1	12.3	11.9
Birmingham-Hoover, AL	73	69	58	74	115	6.4	6.1	5.1	6.5	10.0
Boston-Cambridge-Newton, MA-NH	204	268	227	271†	320†	4.4	5.7	4.8	5.7†	6.7†
Buffalo-Cheektowaga-Niagara Falls, NY	27	38	49	92	63	2.4	3.4	4.3	8.1	5.5
Charlotte-Concord-Gastonia, NC-SC	116	134	220	333	378	5.1	5.7	9.2	13.7	15.6
Chicago-Naperville-Elgin, IL-IN-WI	759	763	811	1,047	1,202	8.0	8.0	8.5	11.0	12.6
Cincinnati, OH-KY-IN	166	166	153	93	81	7.8	7.8	7.1	4.3	3.8
Cleveland-Elyria, OH	44	32	80	72	156	2.1	1.5	3.9	3.5	7.6
Columbus, OH	159	167	250	274	316	8.2	8.5	12.5	13.6	15.6
Dallas-Fort Worth-Arlington, TX	391	445	508	476	542	5.8	6.5	7.3	6.7	7.6
Denver-Aurora-Lakewood, CO	183	135	153	192	187	6.9	5.0	5.6	6.8	6.6
Detroit-Warren-Dearborn, MI	235	394	317	284	253	5.5	9.2	7.4	6.6	5.9
Hartford-West Hartford-East Hartford, CT	9	14	26	44	32	0.7	1.2	2.1	3.6	2.6
Houston-The Woodlands-Sugar Land, TX	537	363	414	439	411	8.7	5.7	6.4	6.6	6.2
Indianapolis-Carmel-Anderson, IN	150	146	109	172	158	7.8	7.5	5.5	8.6	7.9
Jacksonville, FL	44	40	69	91	118	3.2	2.9	4.9	6.3	8.1
Kansas City, MO-KS	65	155	220	191	201	3.2	7.5	10.6	9.1	9.6
Las Vegas-Henderson-Paradise, NV	97	164	318	305	398	4.8	8.1	15.4	14.4	18.8
Los Angeles-Long Beach-Anaheim, CA	1,049	1,299	1,407	1,832	2,123	8.0	9.9	10.6	13.7	15.9
Louisville-Jefferson County, KY-IN	81	71	83	87	149	6.5	5.6	6.5	6.8	11.7
Memphis, TN-MS-AR	110	105	94	121	173	8.2	7.8	7.0	9.0	12.9
Miami-Fort Lauderdale-West Palm Beach, FL	705	762	821	884	925	12.2	13.1	13.8	14.7	15.4
Milwaukee-Waukesha-West Allis, WI	43	54	52	39	50	2.7	3.4	3.3	2.5	3.2
Minneapolis-St. Paul-Bloomington, MN-WI	116	181	243	228	261	3.4	5.2	7.0	6.5	7.4
Nashville-Davidson-Murfreesboro-Franklin, TN	88	57	74	116	115	5.1	3.2	4.1	6.3	6.3
New Orleans-Metairie, LA	66	103	221	218	235	5.4	8.3	17.7	17.3	18.6
New York-Newark-Jersey City, NY-NJ-PA	1,315	1,491	1,721	2,037	2,551	6.6	7.5	8.6	10.1	12.6
Oklahoma City, OK	54	78	91	113	162	4.2	5.9	6.8	8.3	11.9
Orlando-Kissimmee-Sanford, FL	168	201	239	299	384	7.6	8.9	10.3	12.5	16.1
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	369	396	446	458	639	6.1	6.6	7.4	7.5	10.5
Phoenix-Mesa-Scottsdale, AZ	162	219	416	452	574	3.7	5.0	9.3	9.9	12.5
Pittsburgh, PA	61	39	78	150	100	2.6	1.7	3.3	6.4	4.2
Portland-Vancouver-Hillsboro, OR-WA	209	240	206	261	263	9.1	10.4	8.8	10.9	11.0
Providence-Warwick, RI-MA	58	65	93	111†	115†	3.6	4.1	5.8	6.9†	7.1†
Raleigh, NC	56	70	129	168	137	4.7	5.8	10.4	13.2	10.8
Richmond, VA	64	70	68	73	104	5.2	5.6	5.4	5.7	8.2
Riverside-San Bernardino-Ontario, CA	166	203	288	341	445	3.8	4.6	6.5	7.6	9.9
Sacramento-Roseville-Arden-Arcade, CA	151	147	162	265	272	6.9	6.6	7.2	11.7	12.0
Salt Lake City, UT	34	65	39	49	69	3.0	5.7	3.4	4.2	5.9
San Antonio-New Braunfels, TX	329	310	247	237	243	14.7	13.6	10.6	9.9	10.2
San Diego-Carlsbad, CA	331	333	371	493	524	10.4	10.4	11.4	14.9	15.9
San Francisco-Oakland-Hayward, CA	744	814	767	830	872	16.7	18.0	16.7	17.8	18.7
San Jose-Sunnyvale-Santa Clara, CA	105	146	120	134	222	5.5	7.6	6.1	6.8	11.2
Seattle-Tacoma-Bellevue, WA	248	211	235	311	397	7.0	5.8	6.4	8.3	10.6
St. Louis, MO-IL	95	108	153	112	215	3.4	3.9	5.5	4.0	7.6
Tampa-St. Petersburg-Clearwater, FL	230	226	320	393	436	8.1	7.9	11.0	13.2	14.7
Virginia Beach-Norfolk-Newport News, VA-NC	106	102	85	117	206	6.2	6.0	5.0	6.8	11.9
Washington-Arlington-Alexandria, DC-VA-MD-WV	358	418	226	230	273	6.1	7.0	3.7	3.8	4.5
SELECTED MSAs TOTAL	**12,136**	**13,299**	**14,982**	**17,252**	**19,832**	**7.1**	**7.7**	**8.6**	**9.8**	**11.2**

* MSAs were selected on the basis of the largest population in the 2010 U.S. Census.

† The variable used to identify county, which is used to classify cases into MSAs, was complete for ≤95% of cases in a state contributing data to this MSA. See Appendix A1.4 for more information.

Table 31. Primary and Secondary Syphilis Among Women — Reported Cases and Rates of Reported Cases in Selected Metropolitan Statistical Areas (MSAs)* in Alphabetical Order, United States, 2012–2016

MSAs	Cases					Rates per 100,000 Population				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Atlanta-Sandy Springs-Roswell, GA	33	52	58	61	61	1.2	1.8	2.0	2.1	2.1
Austin-Round Rock, TX	8	6	14	16	17	0.9	0.6	1.4	1.6	1.7
Baltimore-Columbia-Towson, MD	39	46	42	49	46	2.7	3.2	2.9	3.4	3.2
Birmingham-Hoover, AL	7	5	5	8	25	1.2	0.8	0.8	1.3	4.2
Boston-Cambridge-Newton, MA-NH	5	10	14	13†	9†	0.2	0.4	0.6	0.5†	0.4†
Buffalo-Cheektowaga-Niagara Falls, NY	1	2	1	0	1	0.2	0.3	0.2	0.0	0.2
Charlotte-Concord-Gastonia, NC-SC	15	6	6	16	25	1.3	0.5	0.5	1.3	2.0
Chicago-Naperville-Elgin, IL-IN-WI	77	65	76	86	88	1.6	1.3	1.6	1.8	1.8
Cincinnati, OH-KY-IN	63	31	33	21	11	5.8	2.8	3.0	1.9	1.0
Cleveland-Elyria, OH	5	2	5	1	12	0.5	0.2	0.5	0.1	1.1
Columbus, OH	14	18	34	27	48	1.4	1.8	3.4	2.6	4.7
Dallas-Fort Worth-Arlington, TX	56	41	63	56	62	1.6	1.2	1.8	1.6	1.7
Denver-Aurora-Lakewood, CO	3	3	4	6	11	0.2	0.2	0.3	0.4	0.8
Detroit-Warren-Dearborn, MI	27	25	23	26	26	1.2	1.1	1.0	1.2	1.2
Hartford-West Hartford-East Hartford, CT	3	0	2	9	2	0.5	0.0	0.3	1.5	0.3
Houston-The Woodlands-Sugar Land, TX	97	59	64	58	49	3.1	1.9	2.0	1.7	1.5
Indianapolis-Carmel-Anderson, IN	10	9	5	12	15	1.0	0.9	0.5	1.2	1.5
Jacksonville, FL	4	5	9	8	26	0.6	0.7	1.2	1.1	3.5
Kansas City, MO-KS	1	9	23	41	39	0.1	0.9	2.2	3.9	3.7
Las Vegas-Henderson-Paradise, NV	2	6	17	17	40	0.2	0.6	1.6	1.6	3.8
Los Angeles-Long Beach-Anaheim, CA	26	50	67	108	144	0.4	0.8	1.0	1.6	2.1
Louisville-Jefferson County, KY-IN	9	11	14	10	12	1.4	1.7	2.2	1.5	1.8
Memphis, TN-MS-AR	22	17	22	13	25	3.2	2.4	3.1	1.9	3.6
Miami-Fort Lauderdale-West Palm Beach, FL	63	65	44	75	66	2.1	2.2	1.4	2.4	2.1
Milwaukee-Waukesha-West Allis, WI	5	5	6	0	1	0.6	0.6	0.7	0.0	0.1
Minneapolis-St. Paul-Bloomington, MN-WI	7	9	19	37	31	0.4	0.5	1.1	2.1	1.7
Nashville-Davidson-Murfreesboro-Franklin, TN	1	4	5	4	12	0.1	0.4	0.5	0.4	1.3
New Orleans-Metairie, LA	9	10	18	29	25	1.4	1.6	2.8	4.4	3.8
New York-Newark-Jersey City, NY-NJ-PA	57	46	52	69	123	0.6	0.4	0.5	0.7	1.2
Oklahoma City, OK	1	5	7	14	27	0.2	0.7	1.0	2.0	3.9
Orlando-Kissimmee-Sanford, FL	15	9	8	14	21	1.3	0.8	0.7	1.1	1.7
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	30	24	39	43	49	1.0	0.8	1.2	1.4	1.6
Phoenix-Mesa-Scottsdale, AZ	14	22	42	39	56	0.6	1.0	1.9	1.7	2.4
Pittsburgh, PA	5	2	6	11	11	0.4	0.2	0.5	0.9	0.9
Portland-Vancouver-Hillsboro, OR-WA	9	9	9	19	20	0.8	0.8	0.8	1.6	1.7
Providence-Warwick, RI-MA	1	3	8	8†	6†	0.1	0.4	1.0	1.0†	0.7†
Raleigh, NC	5	9	6	13	10	0.8	1.4	0.9	2.0	1.5
Richmond, VA	10	4	2	4	15	1.6	0.6	0.3	0.6	2.3
Riverside-San Bernardino-Ontario, CA	3	7	15	17	47	0.1	0.3	0.7	0.8	2.1
Sacramento-Roseville-Arden-Arcade, CA	5	10	11	26	34	0.4	0.9	1.0	2.2	2.9
Salt Lake City, UT	0	1	1	1	5	0.0	0.2	0.2	0.2	0.9
San Antonio-New Braunfels, TX	59	44	47	43	43	5.2	3.8	4.0	3.6	3.6
San Diego-Carlsbad, CA	12	10	20	17	20	0.8	0.6	1.2	1.0	1.2
San Francisco-Oakland-Hayward, CA	28	40	34	46	50	1.2	1.7	1.5	2.0	2.1
San Jose-Sunnyvale-Santa Clara, CA	3	9	12	10	32	0.3	0.9	1.2	1.0	3.3
Seattle-Tacoma-Bellevue, WA	6	10	10	6	15	0.3	0.6	0.5	0.3	0.8
St. Louis, MO-IL	9	6	17	14	24	0.6	0.4	1.2	1.0	1.7
Tampa-St. Petersburg-Clearwater, FL	29	31	41	44	48	2.0	2.1	2.7	2.9	3.1
Virginia Beach-Norfolk-Newport News, VA-NC	5	5	8	5	22	0.6	0.6	0.9	0.6	2.5
Washington-Arlington-Alexandria, DC-VA-MD-WV	15	35	7	10	8	0.5	1.2	0.2	0.3	0.3
SELECTED MSAs TOTAL	**933**	**912**	**1,095**	**1,280**	**1,615**	**1.1**	**1.0**	**1.2**	**1.4**	**1.8**

* MSAs were selected on the basis of the largest population in the 2010 U.S. Census.

† The variable used to identify county, which is used to classify cases into MSAs, was complete for ≤95% of cases in a state contributing data to this MSA. See Appendix A1.4 for more information.

NOTE: Cases reported with unknown sex are not included in this table.

Table 32. Primary and Secondary Syphilis Among Men — Reported Cases and Rates of Reported Cases in Selected Metropolitan Statistical Areas (MSAs)* in Alphabetical Order, United States, 2012–2016

MSAs	Cases					Rates per 100,000 Population				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Atlanta-Sandy Springs-Roswell, GA	712	737	938	1,036	957	26.8	27.5	34.5	37.5	34.6
Austin-Round Rock, TX	146	139	213	187	300	15.9	14.7	21.9	18.7	30.0
Baltimore-Columbia-Towson, MD	268	242	240	294	286	20.2	18.1	17.9	21.8	21.2
Birmingham-Hoover, AL	66	64	53	66	90	12.1	11.6	9.6	12.0	16.3
Boston-Cambridge-Newton, MA-NH	199	258	213	257†	311†	8.8	11.4	9.3	11.1†	13.4†
Buffalo-Cheektowaga-Niagara Falls, NY	26	36	48	92	62	4.7	6.6	8.7	16.7	11.3
Charlotte-Concord-Gastonia, NC-SC	101	128	214	317	353	9.0	11.3	18.5	26.9	30.0
Chicago-Naperville-Elgin, IL-IN-WI	682	697	735	961	1,114	14.6	14.9	15.7	20.6	23.8
Cincinnati, OH-KY-IN	103	135	120	72	70	9.9	12.9	11.4	6.8	6.6
Cleveland-Elyria, OH	39	30	75	71	144	3.9	3.0	7.5	7.1	14.5
Columbus, OH	145	149	216	247	268	15.2	15.4	22.0	24.8	26.9
Dallas-Fort Worth-Arlington, TX	335	404	445	420	480	10.1	12.0	13.0	12.0	13.7
Denver-Aurora-Lakewood, CO	180	132	149	186	176	13.7	9.8	10.9	13.3	12.5
Detroit-Warren-Dearborn, MI	208	369	294	258	227	10.0	17.7	14.1	12.3	10.9
Hartford-West Hartford-East Hartford, CT	6	14	24	35	30	1.0	2.4	4.1	5.9	5.1
Houston-The Woodlands-Sugar Land, TX	440	304	350	381	362	14.3	9.7	10.8	11.5	10.9
Indianapolis-Carmel-Anderson, IN	140	137	104	160	143	14.8	14.3	10.8	16.5	14.7
Jacksonville, FL	40	35	60	83	92	6.0	5.2	8.7	11.7	13.0
Kansas City, MO-KS	64	146	197	150	162	6.4	14.5	19.4	14.6	15.8
Las Vegas-Henderson-Paradise, NV	95	158	301	288	358	9.4	15.5	29.1	27.3	33.9
Los Angeles-Long Beach-Anaheim, CA	1,019	1,248	1,340	1,724	1,978	15.8	19.2	20.5	26.2	30.1
Louisville-Jefferson County, KY-IN	72	60	69	77	137	11.8	9.7	11.1	12.3	21.9
Memphis, TN-MS-AR	88	88	72	108	148	13.7	13.7	11.2	16.8	23.0
Miami-Fort Lauderdale-West Palm Beach, FL	642	697	777	809	859	23.0	24.6	27.0	27.8	29.5
Milwaukee-Waukesha-West Allis, WI	38	49	46	39	49	5.0	6.4	6.0	5.1	6.4
Minneapolis-St. Paul-Bloomington, MN-WI	109	169	223	191	228	6.4	9.9	12.9	10.9	13.1
Nashville-Davidson-Murfreesboro-Franklin, TN	87	53	69	112	103	10.3	6.2	7.9	12.5	11.5
New Orleans-Metairie, LA	57	93	203	189	210	9.6	15.4	33.5	31.0	34.4
New York-Newark-Jersey City, NY-NJ-PA	1,254	1,438	1,666	1,954	2,407	13.1	14.9	17.1	20.0	24.6
Oklahoma City, OK	53	73	84	99	135	8.3	11.2	12.8	14.8	20.2
Orlando-Kissimmee-Sanford, FL	153	192	231	285	363	14.1	17.3	20.4	24.4	31.1
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	339	372	407	415	590	11.7	12.8	13.9	14.1	20.1
Phoenix-Mesa-Scottsdale, AZ	148	197	374	413	518	6.9	9.0	16.8	18.2	22.8
Pittsburgh, PA	56	37	72	139	89	4.9	3.2	6.3	12.1	7.8
Portland-Vancouver-Hillsboro, OR-WA	200	231	197	242	243	17.7	20.2	17.0	20.5	20.6
Providence-Warwick, RI-MA	57	62	84	103†	109†	7.4	8.0	10.8	13.2†	13.9†
Raleigh, NC	51	61	123	155	127	8.8	10.3	20.3	24.9	20.4
Richmond, VA	54	66	66	69	87	9.1	11.0	10.8	11.2	14.2
Riverside-San Bernardino-Ontario, CA	163	196	273	324	398	7.5	9.0	12.4	14.5	17.8
Sacramento-Roseville-Arden-Arcade, CA	144	137	151	239	238	13.4	12.6	13.7	21.5	21.4
Salt Lake City, UT	34	64	38	48	64	6.0	11.2	6.6	8.2	10.9
San Antonio-New Braunfels, TX	270	266	200	194	200	24.5	23.7	17.4	16.5	17.0
San Diego-Carlsbad, CA	318	323	351	476	504	19.9	20.0	21.4	28.7	30.4
San Francisco-Oakland-Hayward, CA	713	773	731	783	820	32.4	34.7	32.3	34.1	35.7
San Jose-Sunnyvale-Santa Clara, CA	102	137	108	124	190	10.7	14.2	11.0	12.5	19.1
Seattle-Tacoma-Bellevue, WA	242	201	225	305	382	13.7	11.2	12.3	16.3	20.5
St. Louis, MO-IL	86	102	136	98	191	6.4	7.5	10.0	7.2	14.0
Tampa-St. Petersburg-Clearwater, FL	201	195	278	349	388	14.6	14.0	19.7	24.2	26.9
Virginia Beach-Norfolk-Newport News, VA-NC	101	97	77	112	178	12.1	11.5	9.1	13.2	20.9
Washington-Arlington-Alexandria, DC-VA-MD-WV	343	383	219	219	264	12.0	13.2	7.4	7.4	8.9
SELECTED MSAs TOTAL	**11,189**	**12,374**	**13,879**	**15,955**	**18,182**	**13.3**	**14.6**	**16.2**	**18.4**	**21.0**

* MSAs were selected on the basis of the largest population in the 2010 U.S. Census.

† The variable used to identify county, which is used to classify cases into MSAs, was complete for ≤95% of cases in a state contributing data to this MSA. See Appendix A1.4 for more information.

NOTE: Cases reported with unknown sex are not included in this table.

Table 33. Primary and Secondary Syphilis — Reported Cases and Rates of Reported Cases in Counties and Independent Cities* Ranked by Number of Reported Cases, United States, 2016

Rank*	County/Independent City	Cases	Rate per 100,000 Population	Cumulative Percentage
1	Los Angeles County, CA	1,814	17.8	6
2	Cook County, IL	1,018	19.4	10
3	New York County, NY	719	43.7	12
4	Maricopa County, AZ	542	13.0	14
5	Miami-Dade County, FL	537	19.9	16
6	San Diego County, CA	524	15.9	18
7	San Francisco County, CA	522	60.4	20
8	Kings County, NY	497	18.8	22
9	Philadelphia County, PA	428	27.3	23
10	Fulton County, GA	410	40.6	25
11	Clark County, NV	398	18.8	26
12	Bronx County, NY	396	27.2	28
13	Fresno County, CA	390	40.0	29
14	Harris County, TX	357	7.9	30
15	Dallas County, TX	333	13.0	31
16	Orange County, CA	309	9.7	33
17	Orange County, FL	297	23.1	34
18	Mecklenburg County, NC	295	28.5	35
19	Broward County, FL	295	15.6	36
20	King County, WA	293	13.8	37
21	Queens County, NY	287	12.3	38
22	Franklin County, OH	286	22.8	39
23	Riverside County, CA	279	11.8	40
24	Travis County, TX	278	23.6	41
25	San Joaquin County, CA	266	36.6	42
26	DeKalb County, GA	265	36.1	43
27	Kern County, CA	257	29.1	44
28	Sacramento County, CA	228	15.2	45
29	Bexar County, TX	224	11.8	45
30	Hillsborough County, FL	217	16.1	46
31	Santa Clara County, CA	217	11.3	47
32	Baltimore (City), MD	197	31.7	48
33	Pinellas County, FL	187	19.7	48
34	Alameda County, CA	184	11.2	49
35	Hennepin County, MN	170	13.9	50
36	San Bernardino County, CA	166	7.8	50
37	Multnomah County, OR	165	20.9	51
38	Wayne County, MI	158	9.0	51
39	Shelby County, TN	149	15.9	52
40	Orleans Parish, LA	143	36.7	52
41	Jackson County, MO	141	20.5	53
42	Cuyahoga County, OH	139	11.1	53
43	Marion County, IN	138	14.7	54
44	Oklahoma County, OK	129	16.6	54
45	Wake County, NC	127	12.4	55
46	El Paso County, TX	126	15.1	55
47	Tarrant County, TX	125	6.3	56
48	Bernalillo County, NM	120	17.7	56
49	Jefferson County, KY	117	15.3	57
50	Prince George's County, MD	110	12.1	57
51	Pima County, AZ	108	10.7	57
52	Caddo Parish, LA	107	42.6	58
53	Denver County, CO	107	15.7	58
54	Gwinnett County, GA	107	11.9	58
55	Hudson County, NJ	103	15.3	59
56	East Baton Rouge Parish, LA	102	22.8	59
57	Duval County, FL	102	11.2	60
58	Jefferson County, AL	100	15.1	60
59	Middlesex County, MA	99	6.2	60
60	Essex County, NJ	98	12.3	61
61	Guilford County, NC	96	18.5	61
62	Palm Beach County, FL	93	6.5	61
63	Cobb County, GA	88	11.9	62
64	Allegheny County, PA	87	7.1	62
65	Contra Costa County, CA	86	7.6	62
66	St. Louis (City), MO	85	26.9	63
67	Alachua County, FL	84	32.3	63
68	Stanislaus County, CA	83	15.4	63
69	Honolulu County, HI	83	8.3	63
70	Richland County, SC	80	19.7	64

* The top 70 counties and independent cities ranked in descending order by number of cases reported in 2016 then by rate are displayed.

NOTE: Relative rankings of counties may be impacted by completeness of the variable used to identify county. In 2016, the variable used to identify county was complete for ≤95% of cases in Massachusetts. See Appendix A1.4 for more information.

Table 34. Primary and Secondary Syphilis — Reported Cases and Rates of Reported Cases by Age Group and Sex, United States, 2012–2016

Age Group	Cases				Rates per 100,000 Population*			
	Total	Male	Female	Unknown Sex	Total	Male	Female	
0–4	1	1	0	0	0.0	0.0	0.0	2012
5–9	0	0	0	0	0.0	0.0	0.0	
10–14	9	5	4	0	0.0	0.0	0.0	
15–19	880	640	238	2	4.1	5.8	2.3	
20–24	3,280	2,859	418	3	14.5	24.8	3.8	
25–29	2,911	2,641	266	4	13.6	24.4	2.5	
30–34	2,209	2,023	182	4	10.6	19.3	1.7	
35–39	1,563	1,443	120	0	8.0	14.9	1.2	
40–44	1,618	1,544	70	4	7.7	14.8	0.7	
45–54	2,439	2,310	128	1	5.5	10.6	0.6	
55–64	614	586	27	1	1.6	3.2	0.1	
65+	123	121	2	0	0.3	0.6	0.0	
Unknown Age	20	17	3	0				
TOTAL	**15,667**	**14,190**	**1,458**	**19**	**5.0**	**9.2**	**0.9**	
0–4	5	2	3	0	0.0	0.0	0.0	2013
5–9	0	0	0	0	0.0	0.0	0.0	
10–14	23	14	9	0	0.1	0.1	0.1	
15–19	900	700	200	0	4.3	6.5	1.9	
20–24	3,642	3,204	435	3	16.0	27.4	3.9	
25–29	3,329	3,037	286	6	15.4	27.7	2.7	
30–34	2,447	2,272	172	3	11.5	21.3	1.6	
35–39	1,800	1,674	125	1	9.2	17.1	1.3	
40–44	1,693	1,587	105	1	8.1	15.3	1.0	
45–54	2,614	2,495	119	0	6.0	11.6	0.5	
55–64	750	716	34	0	1.9	3.8	0.2	
65+	162	152	10	0	0.4	0.8	0.0	
Unknown Age	10	8	2	0				
TOTAL	**17,375**	**15,861**	**1,500**	**14**	**5.5**	**10.2**	**0.9**	
0–4	0	0	0	0	0.0	0.0	0.0	2014
5–9	0	0	0	0	0.0	0.0	0.0	
10–14	12	4	8	0	0.1	0.0	0.1	
15–19	1,023	761	262	0	4.9	7.1	2.5	
20–24	4,137	3,632	503	2	18.1	30.9	4.5	
25–29	4,092	3,727	361	4	18.6	33.4	3.3	
30–34	2,887	2,635	248	4	13.4	24.4	2.3	
35–39	2,045	1,868	177	0	10.3	18.8	1.8	
40–44	1,758	1,654	103	1	8.5	16.2	1.0	
45–54	2,966	2,830	135	1	6.8	13.2	0.6	
55–64	897	860	36	1	2.2	4.5	0.2	
65+	176	169	7	0	0.4	0.8	0.0	
Unknown Age	6	6	0	0				
TOTAL	**19,999**	**18,146**	**1,840**	**13**	**6.3**	**11.6**	**1.1**	
0–4	2	0	1	1	0.0	0.0	0.0	2015
5–9	1	0	1	0	0.0	0.0	0.0	
10–14	9	1	8	0	0.0	0.0	0.1	
15–19	1,148	865	283	0	5.4	8.0	2.7	
20–24	4,766	4,186	573	7	21.0	35.9	5.2	
25–29	5,168	4,671	491	6	23.0	40.9	4.4	
30–34	3,549	3,234	311	4	16.4	29.7	2.9	
35–39	2,482	2,249	229	4	12.2	22.1	2.2	
40–44	1,897	1,744	152	1	9.4	17.4	1.5	
45–54	3,488	3,294	190	4	8.1	15.5	0.9	
55–64	1,153	1,099	54	0	2.8	5.6	0.3	
65+	207	202	5	0	0.4	1.0	0.0	
Unknown Age	2	2	0	0				
TOTAL	**23,872**	**21,547**	**2,298**	**27**	**7.4**	**13.6**	**1.4**	
0–4	2	0	2	0	0.0	0.0	0.0	2016
5–9	2	1	1	0	0.0	0.0	0.0	
10–14	15	6	9	0	0.1	0.1	0.1	
15–19	1,298	957	340	1	6.1	8.9	3.3	
20–24	5,172	4,418	744	10	22.7	37.9	6.7	
25–29	6,177	5,538	624	15	27.5	48.5	5.6	
30–34	4,278	3,806	464	8	19.7	35.0	4.3	
35–39	3,043	2,729	311	3	14.9	26.8	3.0	
40–44	2,140	1,944	193	3	10.6	19.4	1.9	
45–54	3,953	3,691	261	1	9.2	17.3	1.2	
55–64	1,418	1,338	80	0	3.5	6.8	0.4	
65+	279	269	10	0	0.6	1.3	0.0	
Unknown Age	37	27	10	0				
TOTAL	**27,814**	**24,724**	**3,049**	**41**	**8.7**	**15.6**	**1.9**	

* No population data are available for unknown sex and age; therefore, rates are not calculated.
NOTE: This table should be used only for age comparisons.

Table 35A. Primary and Secondary Syphilis — Reported Cases by Race/Ethnicity, Age Group, and Sex, United States*, 2016

Age Group	American Indians/ Alaska Natives			Asians			Blacks			Native Hawaiians/ Other Pacific Islanders		
	Total†	Male	Female	Total†	Male	Female	Total†	Male	Female	Total†	Male	Female
0–4	0	0	0	0	0	0	2	0	2	0	0	0
5–9	0	0	0	0	0	0	0	0	0	0	0	0
10–14	0	0	0	1	1	0	12	4	8	0	0	0
15–19	9	6	3	28	26	2	614	412	201	4	2	2
20–24	39	31	8	107	99	8	2,184	1,811	367	16	14	2
25–29	47	34	13	151	144	6	2,522	2,227	287	15	15	0
30–34	35	25	10	121	114	7	1,406	1,241	162	9	9	0
35–39	20	14	6	86	77	9	835	733	100	10	7	3
40–44	9	6	3	75	69	5	470	418	51	8	8	0
45–54	26	24	2	86	85	1	835	736	98	10	10	0
55–64	5	5	0	16	14	2	269	243	26	0	0	0
65+	0	0	0	3	3	0	46	43	3	0	0	0
Unknown Age	0	0	0	0	0	0	27	19	8	0	0	0
TOTAL	**190**	**145**	**45**	**674**	**632**	**40**	**9,222**	**7,887**	**1,313**	**72**	**65**	**7**

Age Group	Whites			Multirace			Hispanics			Other/ Unknown		
	Total†	Male	Female	Total†	Male	Female	Total†	Male	Female	Total†	Male	Female
0–4	0	0	0	0	0	0	0	0	0	0	0	0
5–9	0	0	0	0	0	0	2	1	1	0	0	0
10–14	0	0	0	0	0	0	1	1	0	1	0	1
15–19	268	207	61	11	7	4	304	253	51	60	44	16
20–24	1,230	1,047	183	88	74	14	1,291	1,148	139	217	194	23
25–29	1,698	1,507	188	94	85	9	1,374	1,270	103	276	256	18
30–34	1,377	1,216	160	78	72	4	1,054	948	105	198	181	16
35–39	1,150	1,029	121	34	31	3	742	690	52	166	148	17
40–44	940	863	77	39	34	5	497	458	38	102	88	14
45–54	1,996	1,886	110	45	43	2	712	675	37	243	232	11
55–64	841	803	38	14	14	0	181	171	10	92	88	4
65+	180	176	4	2	2	0	33	31	2	15	14	1
Unknown Age	8	7	1	0	0	0	1	1	0	1	0	1
TOTAL	**9,688**	**8,741**	**943**	**405**	**362**	**41**	**6,192**	**5,647**	**538**	**1,371**	**1,245**	**122**

* Includes 50 states and the District of Columbia reporting race/ethnicity data in the Office of Management and Budget compliant formats in 2016.
† Total includes cases reported with unknown sex.
NOTE: These tables should be used only for race/ethnicity comparisons. See Table 34 for age-specific cases and rates and Tables 27–29 for total and sex-specific cases and rates.

Table 35B. Primary and Secondary Syphilis — Rates of Reported Cases per 100,000 Population by Race/Ethnicity, Age Group, and Sex, United States*, 2016

Age Group	American Indians/ Alaska Natives			Asians			Blacks			Native Hawaiians/ Other Pacific Islanders		
	Total†	Male	Female	Total†	Male	Female	Total†	Male	Female	Total†	Male	Female
0–4	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0
5–9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10–14	0.0	0.0	0.0	0.1	0.2	0.0	0.4	0.3	0.6	0.0	0.0	0.0
15–19	4.9	6.5	3.4	2.7	5.0	0.4	20.5	27.2	13.6	9.9	9.6	10.2
20–24	19.6	30.4	8.2	8.5	15.5	1.3	64.3	105.0	21.9	34.1	58.2	8.7
25–29	25.6	36.5	14.4	10.2	19.9	0.8	81.0	144.6	18.2	28.8	55.6	0.0
30–34	21.5	30.8	12.2	8.0	16.0	0.9	50.8	93.2	11.3	18.5	36.0	0.0
35–39	13.5	19.0	8.1	6.1	11.7	1.2	32.0	59.3	7.3	23.6	32.5	14.4
40–44	6.3	8.5	4.1	5.3	10.4	0.7	18.4	34.9	3.8	21.5	42.5	0.0
45–54	8.4	16.0	1.3	3.6	7.6	0.1	15.8	29.6	3.5	14.4	28.9	0.0
55–64	1.8	3.8	0.0	0.8	1.6	0.2	5.8	11.5	1.0	0.0	0.0	0.0
65+	0.0	0.0	0.0	0.1	0.3	0.0	1.1	2.5	0.1	0.0	0.0	0.0
Unknown Age												
TOTAL	**8.0**	**12.4**	**3.7**	**3.9**	**7.6**	**0.4**	**23.1**	**41.3**	**6.3**	**12.9**	**23.0**	**2.5**

Age Group	Whites			Multirace			Hispanics		
	Total†	Male	Female	Total†	Male	Female	Total†	Male	Female
0–4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
5–9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10–14	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
15–19	2.3	3.5	1.1	1.6	2.0	1.2	6.4	10.5	2.2
20–24	9.9	16.4	3.0	14.7	24.6	4.7	26.8	46.0	6.0
25–29	13.4	23.5	3.0	20.4	38.4	3.7	30.3	53.3	4.8
30–34	11.1	19.5	2.6	20.4	39.8	2.0	23.7	40.8	4.9
35–39	9.9	17.6	2.1	10.5	20.3	1.7	17.5	31.6	2.5
40–44	7.9	14.5	1.3	14.0	25.8	3.4	12.6	23.0	2.0
45–54	7.1	13.5	0.8	9.2	18.5	0.8	10.9	20.4	1.1
55–64	2.9	5.6	0.3	3.6	7.5	0.0	4.2	8.2	0.5
65+	0.5	1.1	0.0	0.6	1.3	0.0	0.9	1.9	0.1
Unknown Age									
TOTAL	**4.9**	**9.0**	**0.9**	**6.2**	**11.2**	**1.2**	**10.9**	**19.7**	**1.9**

* Includes 50 states and the District of Columbia reporting race/ethnicity data in the Office of Management and Budget compliant formats in 2016.
† Total includes cases reported with unknown sex.
NOTE: These tables should be used only for race/ethnicity comparisons. See Table 34 for age-specific cases and rates and Tables 27–29 for total and sex-specific cases and rates. No population data exist for unknown sex, unknown age, or unknown race; therefore rates are not calculated.

Table 36. Early Latent Syphilis — Reported Cases and Rates of Reported Cases by State/Area and Region in Alphabetical Order, United States and Outlying Areas, 2012–2016

State/Area	Cases					Rates per 100,000 Population				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Alabama	237	202	144	177	293	4.9	4.2	3.0	3.6	6.0
Alaska	8	8	25	13	13	1.1	1.1	3.4	1.8	1.8
Arizona	147	207	311	361	488	2.2	3.1	4.6	5.3	7.1
Arkansas	152	163	152	216	280	5.2	5.5	5.1	7.3	9.4
California	2,519	2,844	3,396	4,435	5,289	6.6	7.4	8.8	11.3	13.5
Colorado	194	195	164	212	274	3.7	3.7	3.1	3.9	5.0
Connecticut	52	55	62	97	84	1.4	1.5	1.7	2.7	2.3
Delaware	38	30	33	47	57	4.1	3.2	3.5	5.0	6.0
District of Columbia	244	243	142	200	355	38.6	37.6	21.6	29.8	52.8
Florida	1,384	1,540	1,886	2,288	2,634	7.2	7.9	9.5	11.3	13.0
Georgia	639	863	1,078	1,477	1,263	6.4	8.6	10.7	14.5	12.4
Hawaii	9	22	25	56	89	0.6	1.6	1.8	3.9	6.2
Idaho	21	6	12	24	33	1.3	0.4	0.7	1.5	2.0
Illinois	690	809	819	889	1,138	5.4	6.3	6.4	6.9	8.8
Indiana	148	157	129	220	247	2.3	2.4	2.0	3.3	3.7
Iowa	15	63	82	69	59	0.5	2.0	2.6	2.2	1.9
Kansas	54	84	92	153	178	1.9	2.9	3.2	5.3	6.1
Kentucky	139	167	169	164	189	3.2	3.8	3.8	3.7	4.3
Louisiana	343	276	372	439	568	7.5	6.0	8.0	9.4	12.2
Maine	2	6	7	10	6	0.2	0.5	0.5	0.8	0.5
Maryland	361	387	529	594	598	6.1	6.5	8.9	9.9	10.0
Massachusetts	231	350	282	355	538	3.5	5.2	4.2	5.2	7.9
Michigan	150	204	243	282	290	1.5	2.1	2.5	2.8	2.9
Minnesota	96	139	159	185	251	1.8	2.6	2.9	3.4	4.6
Mississippi	253	184	336	405	490	8.5	6.2	11.2	13.5	16.4
Missouri	135	220	240	247	276	2.2	3.6	4.0	4.1	4.5
Montana	0	2	1	5	6	0.0	0.2	0.1	0.5	0.6
Nebraska	8	14	19	5	19	0.4	0.7	1.0	0.3	1.0
Nevada	214	232	389	439	510	7.8	8.3	13.7	15.2	17.6
New Hampshire	9	21	22	16	33	0.7	1.6	1.7	1.2	2.5
New Jersey	410	539	612	714	755	4.6	6.1	6.8	8.0	8.4
New Mexico	68	67	76	71	118	3.3	3.2	3.6	3.4	5.7
New York	1,413	1,945	2,307	2,802	3,504	7.2	9.9	11.7	14.2	17.7
North Carolina	244	236	468	753	799	2.5	2.4	4.7	7.5	8.0
North Dakota	0	2	22	17	12	0.0	0.3	3.0	2.2	1.6
Ohio	171	211	265	326	389	1.5	1.8	2.3	2.8	3.3
Oklahoma	146	237	198	222	339	3.8	6.2	5.1	5.7	8.7
Oregon	94	127	149	214	250	2.4	3.2	3.8	5.3	6.2
Pennsylvania	484	581	641	770	982	3.8	4.5	5.0	6.0	7.7
Rhode Island	24	22	49	38	63	2.3	2.1	4.6	3.6	6.0
South Carolina	336	415	467	496	613	7.1	8.7	9.7	10.1	12.5
South Dakota	3	5	23	11	14	0.4	0.6	2.7	1.3	1.6
Tennessee	255	267	236	312	337	3.9	4.1	3.6	4.7	5.1
Texas	1,767	1,902	1,984	2,471	2,872	6.8	7.2	7.4	9.0	10.5
Utah	8	47	41	31	61	0.3	1.6	1.4	1.0	2.0
Vermont	6	2	7	6	14	1.0	0.3	1.1	1.0	2.2
Virginia	303	354	274	410	602	3.7	4.3	3.3	4.9	7.2
Washington	181	204	198	293	446	2.6	2.9	2.8	4.1	6.2
West Virginia	10	10	23	40	51	0.5	0.5	1.2	2.2	2.8
Wisconsin	86	62	91	95	150	1.5	1.1	1.6	1.6	2.6
Wyoming	2	1	1	1	5	0.3	0.2	0.2	0.2	0.9
U.S. TOTAL	**14,503**	**16,929**	**19,452**	**24,173**	**28,924**	**4.6**	**5.4**	**6.1**	**7.5**	**9.0**
Northeast	2,631	3,521	3,989	4,808	5,979	4.7	6.3	7.1	8.5	10.6
Midwest	1,556	1,970	2,184	2,499	3,023	2.3	2.9	3.2	3.7	4.5
South	6,851	7,476	8,491	10,711	12,340	5.8	6.3	7.1	8.8	10.2
West	3,465	3,962	4,788	6,155	7,582	4.7	5.3	6.4	8.1	10.0
Guam	1	3	1	2	1	0.6	1.9	0.6	1.2	0.6
Puerto Rico	222	270	375	565	570	6.1	7.5	10.6	16.3	16.4
Virgin Islands	0	2	0	7	2	0.0	1.9	0.0	6.8	1.9
OUTLYING AREAS	**223**	**275**	**376**	**574**	**573**	**5.7**	**7.1**	**9.9**	**15.4**	**15.3**
TOTAL	**14,726**	**17,204**	**19,828**	**24,747**	**29,497**	**4.6**	**5.4**	**6.1**	**7.6**	**9.1**

Table 37. Early Latent Syphilis — Reported Cases and Rates of Reported Cases in Selected Metropolitan Statistical Areas (MSAs)* in Alphabetical Order, United States, 2012–2016

MSAs	Cases					Rates per 100,000 Population				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Atlanta-Sandy Springs-Roswell, GA	491	672	863	1,067	1,053	9.0	12.2	15.4	18.7	18.4
Austin-Round Rock, TX	170	220	207	242	291	9.3	11.7	10.7	12.1	14.5
Baltimore-Columbia-Towson, MD	206	216	296	344	358	7.5	7.8	10.6	12.3	12.8
Birmingham-Hoover, AL	74	71	46	60	75†	6.5	6.2	4.0	5.2	6.5†
Boston-Cambridge-Newton, MA-NH	158	278	208	235†	408†	3.4	5.9	4.4	4.9†	8.5†
Buffalo-Cheektowaga-Niagara Falls, NY	11	15	19	37	29	1.0	1.3	1.7	3.3	2.6
Charlotte-Concord-Gastonia, NC-SC	70	74	129	206	264	3.0	3.2	5.4	8.5	10.9
Chicago-Naperville-Elgin, IL-IN-WI	630	751	734	814	1,058	6.6	7.9	7.7	8.5	11.1
Cincinnati, OH-KY-IN	78	70	98	92	74	3.7	3.3	4.6	4.3	3.4
Cleveland-Elyria, OH	13	14	31	37	63	0.6	0.7	1.5	1.8	3.1
Columbus, OH	49	71	82	130	149	2.5	3.6	4.1	6.4	7.4
Dallas-Fort Worth-Arlington, TX	604	550	644	932	1,038	9.0	8.1	9.3	13.1	14.6
Denver-Aurora-Lakewood, CO	177	166	145	175	212	6.7	6.2	5.3	6.2	7.5
Detroit-Warren-Dearborn, MI	113	152	163	206	194	2.6	3.5	3.8	4.8	4.5
Hartford-West Hartford-East Hartford, CT	9	19	16	31	20	0.7	1.6	1.3	2.6	1.7
Houston-The Woodlands-Sugar Land, TX	419	348	444	522	585	6.8	5.5	6.8	7.8	8.8
Indianapolis-Carmel-Anderson, IN	102	104	91	143	165	5.3	5.3	4.6	7.2	8.3
Jacksonville, FL	57	73	69	162	137	4.1	5.2	4.9	11.2	9.5
Kansas City, MO-KS	61	111	132	133	140	3.0	5.4	6.4	6.4	6.7
Las Vegas-Henderson-Paradise, NV	207	218	375	413	470	10.3	10.8	18.1	19.5	22.2
Los Angeles-Long Beach-Anaheim, CA	1,393	1,520	1,619	2,052	2,403	10.7	11.6	12.2	15.4	18.0
Louisville-Jefferson County, KY-IN	72	85	82	90	118	5.8	6.7	6.5	7.0	9.2
Memphis, TN-MS-AR	188	188	143	195	246	14.0	14.0	10.6	14.5	18.3
Miami-Fort Lauderdale-West Palm Beach, FL	831	885	1,094	1,220	1,282	14.4	15.2	18.4	20.3	21.3
Milwaukee-Waukesha-West Allis, WI	57	43	69	66	108	3.6	2.7	4.4	4.2	6.9
Minneapolis-St. Paul-Bloomington, MN-WI	91	131	155	170	226	2.7	3.8	4.4	4.8	6.4
Nashville-Davidson-Murfreesboro-Franklin, TN	50	62	83	82	72	2.9	3.5	4.6	4.5	3.9
New Orleans-Metairie, LA	90	81	122	171	242	7.3	6.5	9.7	13.5	19.2
New York-Newark-Jersey City, NY-NJ-PA	1,668	2,299	2,681	3,210	4,008	8.4	11.5	13.3	15.9	19.9
Oklahoma City, OK	79	124	107	114	195	6.1	9.4	8.0	8.4	14.4
Orlando-Kissimmee-Sanford, FL	136	175	180	266	377	6.1	7.7	7.8	11.1	15.8
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	408	497	512	616	736	6.8	8.2	8.5	10.1	12.1
Phoenix-Mesa-Scottsdale, AZ	120	150	240	268	381	2.8	3.4	5.3	5.9	8.3
Pittsburgh, PA	46	45	63	111	125	1.9	1.9	2.7	4.7	5.3
Portland-Vancouver-Hillsboro, OR-WA	101	117	124	170	226	4.4	5.1	5.3	7.1	9.5
Providence-Warwick, RI-MA	35	28	64	48†	71†	2.2	1.7	4.0	3.0†	4.4†
Raleigh, NC	31	41	77	115	135	2.6	3.4	6.2	9.0	10.6
Richmond, VA	78	75	68	98	162	6.3	6.0	5.4	7.7	12.7
Riverside-San Bernardino-Ontario, CA	138	159	223	311	379	3.2	3.6	5.0	6.9	8.4
Sacramento-Roseville-Arden-Arcade, CA	38	33	74	137	133	1.7	1.5	3.3	6.0	5.8
Salt Lake City, UT	7	37	31	23	43	0.6	3.2	2.7	2.0	3.7
San Antonio-New Braunfels, TX	269	381	308	258	339	12.0	16.7	13.2	10.8	14.2
San Diego-Carlsbad, CA	236	211	299	343	461	7.4	6.6	9.2	10.4	14.0
San Francisco-Oakland-Hayward, CA	528	656	839	964	919	11.9	14.5	18.3	20.7	19.7
San Jose-Sunnyvale-Santa Clara, CA	44	60	58	96	135	2.3	3.1	3.0	4.9	6.8
Seattle-Tacoma-Bellevue, WA	142	167	143	221	303	4.0	4.6	3.9	5.9	8.1
St. Louis, MO-IL	89	125	139	138	151	3.2	4.5	5.0	4.9	5.4
Tampa-St. Petersburg-Clearwater, FL	176	176	227	258	364	6.2	6.1	7.8	8.7	12.2
Virginia Beach-Norfolk-Newport News, VA-NC	90	112	90	167	245	5.3	6.6	5.2	9.7	14.2
Washington-Arlington-Alexandria, DC-VA-MD-WV	497	520	286	320	355	8.5	8.7	4.7	5.2	5.8
SELECTED MSAs TOTAL	**11,427**	**13,376**	**14,992**	**18,279**	**21,723**	**6.7**	**7.7**	**8.6**	**10.3**	**12.3**

* MSAs were selected on the basis of the largest population in the 2010 U.S. Census.

† The variable used to identify county, which is used to classify cases into MSAs, was complete for ≤95% of cases in a state contributing data to this MSA. See Appendix A1.4 for more information.

Table 38. Late and Late Latent Syphilis* — Reported Cases and Rates of Reported Cases by State/Area and Region in Alphabetical Order, United States and Outlying Areas, 2012–2016

State/Area	Cases					Rates per 100,000 Population				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Alabama	248	292	167	197	232	5.1	6.0	3.4	4.1	4.8
Alaska	14	3	5	3	3	1.9	0.4	0.7	0.4	0.4
Arizona	424	455	558	532	680	6.5	6.9	8.3	7.8	10.0
Arkansas	132	175	110	145	131	4.5	5.9	3.7	4.9	4.4
California	2,509	3,539	4,110	4,966	6,216	6.6	9.2	10.6	12.7	15.9
Colorado	101	117	5	96	211	1.9	2.2	0.1	1.8	3.9
Connecticut	14	22	21	30	23	0.4	0.6	0.6	0.8	0.6
Delaware	29	63	30	21	34	3.2	6.8	3.2	2.2	3.6
District of Columbia	180	196	23	26	51	28.5	30.3	3.5	3.9	7.6
Florida	1,693	1,934	2,429	2,723	3,233	8.8	9.9	12.2	13.4	15.9
Georgia	842	1,090	1,055	1,245	1,478	8.5	10.9	10.4	12.2	14.5
Hawaii	11	19	13	14	13	0.8	1.4	0.9	1.0	0.9
Idaho	6	21	22	21	44	0.4	1.3	1.3	1.3	2.7
Illinois	902	1,031	1,087	1,285	1,623	7.0	8.0	8.4	10.0	12.6
Indiana	159	171	170	189	197	2.4	2.6	2.6	2.9	3.0
Iowa	58	57	84	88	127	1.9	1.8	2.7	2.8	4.1
Kansas	51	61	48	0	0	1.8	2.1	1.7	0.0	0.0
Kentucky	99	102	117	123	159	2.3	2.3	2.7	2.8	3.6
Louisiana	1,065	1,267	1,180	1,277	1,233	23.1	27.4	25.4	27.3	26.4
Maine	3	5	0	0	16	0.2	0.4	0.0	0.0	1.2
Maryland	439	504	481	749	719	7.5	8.5	8.0	12.5	12.0
Massachusetts	258	276	227	486	416	3.9	4.1	3.4	7.2	6.1
Michigan	334	368	416	393	424	3.4	3.7	4.2	4.0	4.3
Minnesota	120	209	215	220	289	2.2	3.9	3.9	4.0	5.3
Mississippi	53	31	116	136	107	1.8	1.0	3.9	4.5	3.6
Missouri	133	135	178	220	271	2.2	2.2	2.9	3.6	4.5
Montana	1	1	0	2	4	0.1	0.1	0.0	0.2	0.4
Nebraska	18	40	26	31	34	1.0	2.1	1.4	1.6	1.8
Nevada	117	84	142	133	347	4.2	3.0	5.0	4.6	12.0
New Hampshire	19	30	21	28	27	1.4	2.3	1.6	2.1	2.0
New Jersey	243	196	263	220	381	2.7	2.2	2.9	2.5	4.3
New Mexico	64	100	80	141	160	3.1	4.8	3.8	6.8	7.7
New York	2,667	2,758	3,073	2,975	3,484	13.6	14.0	15.6	15.0	17.6
North Carolina	444	509	791	783	756	4.6	5.2	8.0	7.8	7.5
North Dakota	10	11	16	14	16	1.4	1.5	2.2	1.8	2.1
Ohio	526	431	381	445	483	4.6	3.7	3.3	3.8	4.2
Oklahoma	27	28	59	83	90	0.7	0.7	1.5	2.1	2.3
Oregon	117	133	159	218	227	3.0	3.4	4.0	5.4	5.6
Pennsylvania	365	431	346	356	295	2.9	3.4	2.7	2.8	2.3
Rhode Island	25	27	40	48	81	2.4	2.6	3.8	4.5	7.7
South Carolina	56	66	28	41	36	1.2	1.4	0.6	0.8	0.7
South Dakota	8	12	16	21	15	1.0	1.4	1.9	2.4	1.7
Tennessee	545	497	502	575	713	8.4	7.7	7.7	8.7	10.8
Texas	3,585	3,593	4,110	4,047	4,666	13.8	13.6	15.2	14.7	17.0
Utah	51	51	61	73	106	1.8	1.8	2.1	2.4	3.5
Vermont	0	5	0	0	0	0.0	0.8	0.0	0.0	0.0
Virginia	317	329	137	276	235	3.9	4.0	1.6	3.3	2.8
Washington	226	223	310	366	400	3.3	3.2	4.4	5.1	5.6
West Virginia	6	14	4	17	45	0.3	0.8	0.2	0.9	2.4
Wisconsin	91	100	108	88	140	1.6	1.7	1.9	1.5	2.4
Wyoming	6	7	1	4	5	1.0	1.2	0.2	0.7	0.9
U.S. TOTAL	**19,411**	**21,819**	**23,541**	**26,170**	**30,676**	**6.2**	**6.9**	**7.4**	**8.1**	**9.5**
Northeast	3,594	3,750	3,991	4,143	4,723	6.4	6.7	7.1	7.4	8.4
Midwest	2,410	2,626	2,745	2,994	3,619	3.6	3.9	4.1	4.4	5.3
South	9,760	10,690	11,339	12,464	13,918	8.3	9.0	9.5	10.3	11.5
West	3,647	4,753	5,466	6,569	8,416	5.0	6.4	7.3	8.6	11.1
Guam	20	14	5	16	10	12.5	8.7	3.1	9.9	6.2
Puerto Rico	175	154	101	166	117	4.8	4.3	2.8	4.8	3.4
Virgin Islands	2	5	4	10	0	1.9	4.8	3.8	9.7	0.0
OUTLYING AREAS	**197**	**173**	**110**	**192**	**127**	**5.0**	**4.5**	**2.9**	**5.1**	**3.4**
TOTAL	**19,608**	**21,992**	**23,651**	**26,362**	**30,803**	**6.2**	**6.9**	**7.3**	**8.1**	**9.5**

* Late and late latent syphilis includes late latent syphilis, latent syphilis of unknown duration, and late syphilis with clinical manifestations (including late benign syphilis and cardiovascular syphilis).

Table 39. Late and Late Latent Syphilis* — Reported Cases and Rates of Reported Cases in Selected Metropolitan Statistical Areas (MSAs)† in Alphabetical Order, United States, 2012–2016

MSAs	Cases					Rates per 100,000 Population				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Atlanta-Sandy Springs-Roswell, GA	573	782	804	926‡	1,135	10.5	14.2	14.3	16.2‡	19.9
Austin-Round Rock, TX	154	134	246	175	212	8.4	7.1	12.7	8.7	10.6
Baltimore-Columbia-Towson, MD	203	218	225	306	321	7.4	7.9	8.1	10.9	11.5
Birmingham-Hoover, AL	79	96	53	62	52‡	7.0	8.4	4.6	5.4	4.5‡
Boston-Cambridge-Newton, MA-NH	207	211	158‡	303‡	267‡	4.5	4.5	3.3‡	6.3‡	5.6‡
Buffalo-Cheektowaga-Niagara Falls, NY	32	62	62	51	49	2.8	5.5	5.5	4.5	4.3
Charlotte-Concord-Gastonia, NC-SC	122	151	180	190	199	5.3	6.5	7.6	7.8	8.2
Chicago-Naperville-Elgin, IL-IN-WI	853	963	988	1,169	1,529	9.0	10.1	10.3	12.2	16.0
Cincinnati, OH-KY-IN	275	191	124	129	105	12.9	8.9	5.8	6.0	4.9
Cleveland-Elyria, OH	82	64	88	120	157	4.0	3.1	4.3	5.8	7.6
Columbus, OH	101	98	101	105	109	5.2	5.0	5.1	5.2	5.4
Dallas-Fort Worth-Arlington, TX	1,132	1,081	1,065	837	1,069	16.9	15.9	15.3	11.8	15.1
Denver-Aurora-Lakewood, CO	74	81	0	59	150	2.8	3.0	0.0	2.1	5.3
Detroit-Warren-Dearborn, MI	252	277	299	274	282	5.9	6.4	7.0	6.4	6.6
Hartford-West Hartford-East Hartford, CT	3	10‡	10	8	3	0.2	0.8‡	0.8	0.7	0.2
Houston-The Woodlands-Sugar Land, TX	1,265	1,154	1,430	1,592	1,805	20.5	18.3	22.0	23.9	27.1
Indianapolis-Carmel-Anderson, IN	84	90	83	93	87	4.4	4.6	4.2	4.7	4.4
Jacksonville, FL	73	75	128	179	181	5.3	5.4	9.0	12.3	12.5
Kansas City, MO-KS	38	54	54	40	87	1.9	2.6	2.6	1.9	4.2
Las Vegas-Henderson-Paradise, NV	98	54	133	102	315	4.9	2.7	6.4	4.8	14.9
Los Angeles-Long Beach-Anaheim, CA	1,091	1,705	1,678	1,901	2,529	8.4	13.0	12.7	14.3	19.0
Louisville-Jefferson County, KY-IN	48	52	70	92	112	3.8	4.1	5.5	7.2	8.8
Memphis, TN-MS-AR	291	283	236	256	334	21.7	21.1	17.6	19.0	24.8
Miami-Fort Lauderdale-West Palm Beach, FL	1,032	1,075	1,370	1,519	1,859	17.9	18.4	23.1	25.3	30.9
Milwaukee-Waukesha-West Allis, WI	59	56	63	42	70	3.8	3.6	4.0	2.7	4.4
Minneapolis-St. Paul-Bloomington, MN-WI	105	175	187	192	251	3.1	5.1	5.4	5.4	7.1
Nashville-Davidson-Murfreesboro-Franklin, TN	133	120	148	161	196	7.7	6.8	8.3	8.8	10.7
New Orleans-Metairie, LA	386	442	370	362	357	31.5	35.6	29.6	28.7	28.3
New York-Newark-Jersey City, NY-NJ-PA	2,679	2,707	3,052	2,909	3,521	13.5	13.6	15.2	14.4	17.4
Oklahoma City, OK	15‡	11	31	32	47	1.2‡	0.8	2.3	2.4	3.5
Orlando-Kissimmee-Sanford, FL	192	250	362	343	416	8.6	11.0	15.6	14.4	17.4
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	338	439	311	314	265	5.6	7.3	5.1	5.2	4.4
Phoenix-Mesa-Scottsdale, AZ	332	335	397	393	534	7.7	7.6	8.8	8.6	11.7
Pittsburgh, PA	21	11	13	11	11	0.9	0.5	0.6	0.5	0.5
Portland-Vancouver-Hillsboro, OR-WA	99	118	140	154	158	4.3	5.1	6.0	6.4	6.6
Providence-Warwick, RI-MA	32	45	47‡	71‡	102‡	2.0	2.8	2.9‡	4.4‡	6.3‡
Raleigh, NC	63	68	109	124	106	5.3	5.6	8.8	9.7	8.3
Richmond, VA	51	58	9	36	35	4.1	4.7	0.7	2.8	2.8
Riverside-San Bernardino-Ontario, CA	465	433	432	508	707	10.7	9.9	9.7	11.3	15.7
Sacramento-Roseville-Arden-Arcade, CA	59	107	134	203	197	2.7	4.8	6.0	8.9	8.7
Salt Lake City, UT	33	34	39	50	75	2.9	3.0	3.4	4.3	6.4
San Antonio-New Braunfels, TX	366	457	448	483	531	16.4	20.1	19.2	20.3	22.3
San Diego-Carlsbad, CA	144	245	310	366	425	4.5	7.6	9.5	11.1	12.9
San Francisco-Oakland-Hayward, CA	321	421	497	550	621	7.2	9.3	10.8	11.8	13.3
San Jose-Sunnyvale-Santa Clara, CA	84	69	125	128	142	4.4	3.6	6.4	6.5	7.2
Seattle-Tacoma-Bellevue, WA	169	161	211	224	268	4.8	4.5	5.7	6.0	7.2
St. Louis, MO-IL	95	104	119	165	160	3.4	3.7	4.2	5.9	5.7
Tampa-St. Petersburg-Clearwater, FL	171	227	254	297	326	6.0	7.9	8.7	10.0	11.0
Virginia Beach-Norfolk-Newport News, VA-NC	100	86	45	90	65	5.9	5.0	2.6	5.2	3.8
Washington-Arlington-Alexandria, DC-VA-MD-WV	517	599	295	500	473	8.8	10.1	4.9	8.2	7.8
SELECTED MSAs TOTAL	**15,191**	**16,739**	**17,733**	**19,196**	**23,007**	**8.9**	**9.7**	**10.1**	**10.9**	**13.0**

* Late and late latent syphilis includes late latent syphilis, latent syphilis of unknown duration, and late syphilis with clinical manifestations (including late benign syphilis and cardiovascular syphilis).

† MSAs were selected on the basis of the largest population in the 2010 U.S. Census.

‡ The variable used to identify county, which is used to classify cases into MSAs, was complete for ≤95% of cases in a state contributing data to this MSA. See Appendix A1.4 for more information.

Table 40. Congenital Syphilis — Reported Cases and Rates of Reported Cases by State†, Ranked by Rates, United States, 2016

Rank*	State†	Cases	Rate per 100,000 Live Births
1	Louisiana	48	74.4
2	California	206	41.0
3	Nevada	12	33.5
4	Florida	59	26.8
5	Maryland	16	21.6
6	Texas	71	17.8
7	Arizona	15	17.3
8	South Dakota	2	16.3
9	Georgia	21	16.0
	U.S. TOTAL‡	**628**	**15.7**
10	South Carolina	9	15.6
11	Arkansas	6	15.6
12	North Carolina	16	13.2
13	Oregon	6	13.2
14	New Jersey	12	11.6
15	New Mexico	3	11.5
16	Michigan	13	11.4
17	Illinois	18	11.4
18	Missouri	8	10.6
19	Minnesota	7	10.0
20	West Virginia	2	9.9
21	Tennessee	8	9.8
22	Indiana	8	9.5
	HP 2020 TARGET		**9.1**
23	Ohio	11	7.9
24	Alabama	4	6.7
25	Colorado	4	6.1
26	Oklahoma	3	5.6
27	Massachusetts	4	5.6
28	New York	13	5.4
29	Hawaii	1	5.4
30	Kentucky	3	5.3
31	Mississippi	2	5.2
32	Virginia	5	4.8
33	Pennsylvania	5	3.5
34	Washington	3	3.4
35	Kansas	1	2.5
36	Iowa	1	2.5
37	Wisconsin	1	1.5
	Alaska	0	0.0
	Connecticut	0	0.0
	Delaware	0	0.0
	Idaho	0	0.0
	Maine	0	0.0
	Montana	0	0.0
	Nebraska	0	0.0
	New Hampshire	0	0.0
	North Dakota	0	0.0
	Rhode Island	0	0.0
	Utah	0	0.0
	Vermont	0	0.0
	Wyoming	0	0.0

* States were ranked by rate, then by case count, then in alphabetical order, with rates shown rounded to the nearest tenth.
† Mother's state of residence was used to assign case.
‡ Total includes cases reported by the District of Columbia with 1 case, but excludes outlying areas (Guam with 0 cases, Puerto Rico with 4 cases, and Virgin Islands with 0 cases).

Table 41. Congenital Syphilis — Reported Cases and Rates of Reported Cases by Year of Birth, State/Area*, and Region in Alphabetical Order, United States and Outlying Areas, 2012–2016

State/Area*	Cases					Rates per 100,000 Live Births				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Alabama	4	2	3	3	4	6.8	3.4	5.0	5.0	6.7
Alaska	1	1	0	0	0	8.9	8.7	0.0	0.0	0.0
Arizona	14	13	13	14	15	16.2	15.2	15.0	16.1	17.3
Arkansas	11	12	7	5	6	28.7	31.7	18.2	13.0	15.6
California	35	58	102	140	206	6.9	11.7	20.3	27.8	41.0
Colorado	0	0	0	0	4	0.0	0.0	0.0	0.0	6.1
Connecticut	0	0	0	1	0	0.0	0.0	0.0	2.8	0.0
Delaware	1	1	0	1	0	9.1	9.2	0.0	9.1	0.0
District of Columbia	0	2	0	1	1	0.0	21.5	0.0	10.5	10.5
Florida	37	35	48	38	59	17.4	16.2	21.8	17.3	26.8
Georgia	16	20	17	21	21	12.3	15.5	13.0	16.0	16.0
Hawaii	0	0	0	2	1	0.0	0.0	0.0	10.8	5.4
Idaho	1	0	0	0	0	4.4	0.0	0.0	0.0	0.0
Illinois	28	23	27	31	18	17.6	14.7	17.0	19.6	11.4
Indiana	0	0	8	5	8	0.0	0.0	9.5	5.9	9.5
Iowa	0	0	1	0	1	0.0	0.0	2.5	0.0	2.5
Kansas	0	0	0	0	1	0.0	0.0	0.0	0.0	2.5
Kentucky	2	4	3	1	3	3.6	7.2	5.3	1.8	5.3
Louisiana	33	40	46	54	48	52.7	63.3	71.3	83.7	74.4
Maine	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Maryland	12	14	16	18	16	16.5	19.5	21.6	24.4	21.6
Massachusetts	1	4	3	4	4	1.4	5.6	4.2	5.6	5.6
Michigan	7	9	15	11	13	6.2	7.9	13.1	9.6	11.4
Minnesota	1	0	0	2	7	1.5	0.0	0.0	2.9	10.0
Mississippi	0	0	1	0	2	0.0	0.0	2.6	0.0	5.2
Missouri	1	3	1	4	8	1.3	4.0	1.3	5.3	10.6
Montana	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Nebraska	1	0	1	0	0	3.9	0.0	3.7	0.0	0.0
Nevada	1	2	5	8	12	2.9	5.7	13.9	22.3	33.5
New Hampshire	1	0	0	0	0	8.1	0.0	0.0	0.0	0.0
New Jersey	1	0	0	0	12	1.0	0.0	0.0	0.0	11.6
New Mexico	1	2	1	2	3	3.7	7.6	3.8	7.7	11.5
New York	8	11	22	12	13	3.3	4.6	9.2	5.0	5.4
North Carolina	2	4	6	9	16	1.7	3.4	5.0	7.4	13.2
North Dakota	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Ohio	19	18	15	17	11	13.7	13.0	10.8	12.2	7.9
Oklahoma	0	0	6	7	3	0.0	0.0	11.2	13.1	5.6
Oregon	1	0	2	6	6	2.2	0.0	4.4	13.2	13.2
Pennsylvania	6	3	4	7	5	4.2	2.1	2.8	4.9	3.5
Rhode Island	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
South Carolina	7	1	5	3	9	12.2	1.8	8.7	5.2	15.6
South Dakota	0	0	3	0	2	0.0	0.0	24.4	0.0	16.3
Tennessee	2	2	2	5	8	2.5	2.5	2.5	6.1	9.8
Texas	78	74	74	52	71	20.4	19.1	18.5	13.0	17.8
Utah	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Vermont	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Virginia	1	3	2	3	5	1.0	2.9	1.9	2.9	4.8
Washington	0	0	2	5	3	0.0	0.0	2.3	5.6	3.4
West Virginia	0	0	0	0	2	0.0	0.0	0.0	0.0	9.9
Wisconsin	0	0	0	0	1	0.0	0.0	0.0	0.0	1.5
Wyoming	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
U.S. TOTAL	**334**	**361**	**461**	**492**	**628**	**8.4**	**9.2**	**11.6**	**12.3**	**15.7**
Northeast	17	18	29	24	34	2.7	2.9	4.6	3.8	5.4
Midwest	57	53	71	70	70	6.8	6.4	8.5	8.4	8.4
South	206	214	236	221	274	13.7	14.2	15.3	14.4	17.8
West	54	76	125	177	250	5.5	7.9	12.8	18.1	25.6
Guam	0	1	0	2	0	0.0	30.4	0.0	58.9	0.0
Puerto Rico	1	2	0	5	4	2.6	5.5	0.0	14.5	11.6
Virgin Islands	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
OUTLYING AREAS	**1**	**3**	**0**	**7**	**4**	**2.3**	**7.3**	**0.0**	**17.9**	**10.2**
TOTAL	**335**	**364**	**461**	**499**	**632**	**8.4**	**9.2**	**11.4**	**12.4**	**15.7**

* Mother's state of residence was used to assign case.

Table 42. Congenital Syphilis — Reported Cases and Rates of Reported Cases per 100,000 Live Births by Year of Birth and Race/Ethnicity of Mother, United States, 2012–2016

Year of Birth	Whites		Blacks		Hispanics		Asians/ Pacific Islanders		American Indians/ Alaska Natives		Other		Unknown		Total	
	Cases	Rates	Cases	Rates	Cases	Rates	Cases	Rates	Cases	Rates	Cases	Rates	Cases	Rates	Cases	Rates
2012	50	2.3	189	32.1	80	8.8	6	2.3	2	5.1	3	NA	4	NA	334	8.4
2013	62	2.9	185	31.4	93	10.3	9	3.5	5	12.8	3	NA	4	NA	361	9.2
2014	79	3.6	227	38.2	112	12.3	18	6.6	5	13.2	9	NA	11	NA	461	11.6
2015	97	4.5	207	34.9	143	15.6	15	5.5	4	10.5	7	NA	19	NA	492	12.3
2016	116	5.3	256	43.1	187	20.5	25	9.2	12	31.6	7	NA	25	NA	628	15.7

NA = Not applicable.

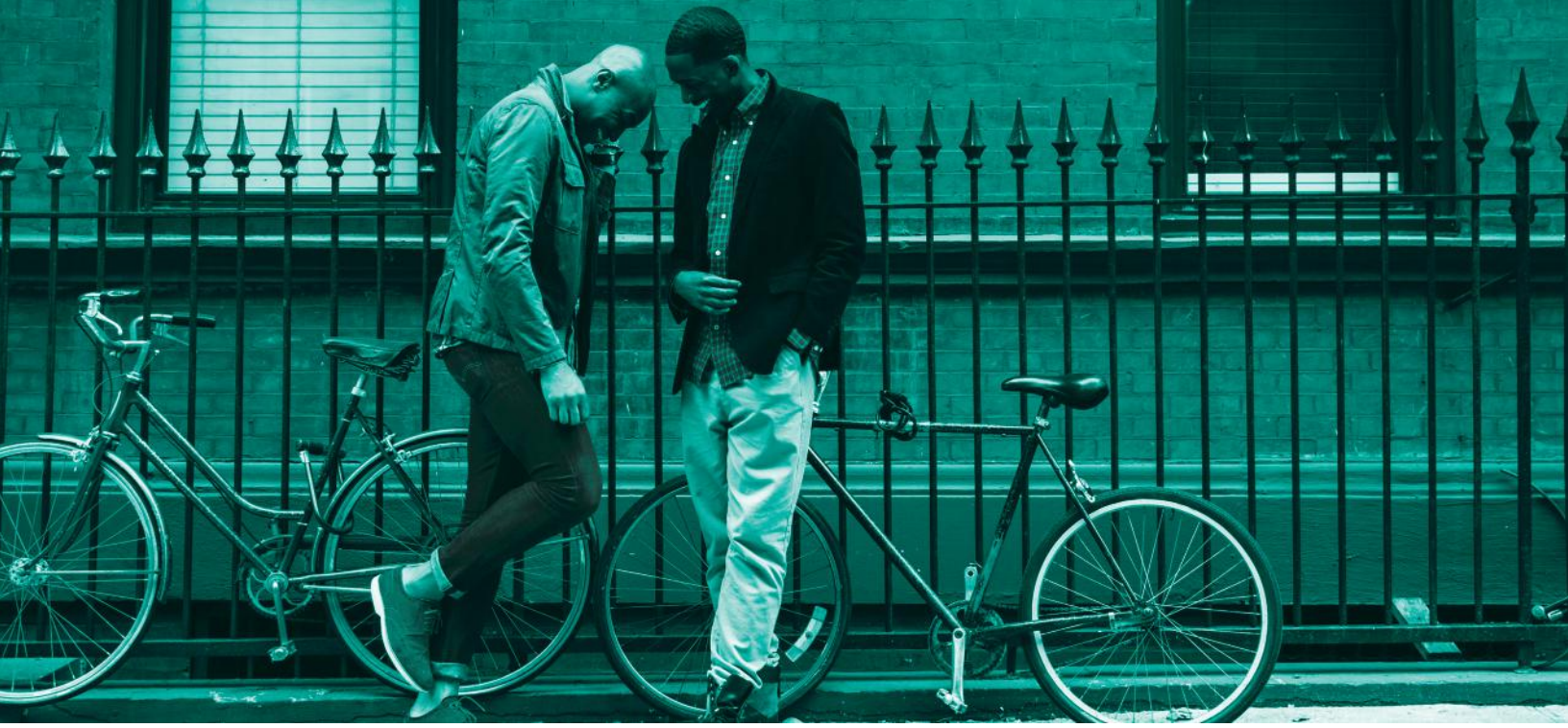
Table 43. Chancroid — Reported Cases and Rates of Reported Cases by State/Area in Alphabetical Order, United States and Outlying Areas, 2012–2016

State/Area	Cases					Rates per 100,000 Population				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
Alabama	1	1	0	0	1	0.0	0.0	0.0	0.0	0.0
Alaska	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Arizona	0	0	0	1	0	0.0	0.0	0.0	0.0	0.0
Arkansas	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
California	7	6	4	2	2	0.0	0.0	0.0	0.0	0.0
Colorado	0	0	0	0	1	0.0	0.0	0.0	0.0	0.0
Connecticut	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Delaware	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
District of Columbia	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Florida	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Georgia	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Hawaii	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Idaho	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Illinois	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Indiana	1	0	0	1	0	0.0	0.0	0.0	0.0	0.0
Iowa	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Kansas	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Kentucky	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Louisiana	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Maine	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Maryland	1	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Massachusetts	1	2	1	3	1	0.0	0.0	0.0	0.0	0.0
Michigan	2	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Minnesota	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Mississippi	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Missouri	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Montana	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Nebraska	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Nevada	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
New Hampshire	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
New Jersey	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
New Mexico	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
New York	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
North Carolina	1	0	0	0	1	0.0	0.0	0.0	0.0	0.0
North Dakota	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Ohio	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Oklahoma	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Oregon	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Pennsylvania	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Rhode Island	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
South Carolina	0	0	0	0	1	0.0	0.0	0.0	0.0	0.0
South Dakota	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Tennessee	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Texas	0	1	1	2	0	0.0	0.0	0.0	0.0	0.0
Utah	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Vermont	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Virginia	1	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Washington	0	0	0	1	0	0.0	0.0	0.0	0.0	0.0
West Virginia	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Wisconsin	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Wyoming	0	0	0	1	0	0.0	0.0	0.0	0.2	0.0
U.S. TOTAL	**15**	**10**	**6**	**11**	**7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Guam	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Puerto Rico	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Virgin Islands	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
OUTLYING AREAS	**0**	**0**	**0**	**0**	**0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
TOTAL	**15**	**10**	**6**	**11**	**7**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Table 44. Selected STDs and Complications — Initial Visits to Physicians' Offices, National Disease and Therapeutic Index, United States, 1966–2015

Year	*Trichomonas vaginalis* Infections*	Other Vaginal Infections*	Pelvic Inflammatory Disease†
1966	579,000	1,155,000	NA
1967	515,000	1,277,000	NA
1968	463,000	1,460,000	NA
1969	421,000	1,390,000	NA
1970	529,000	1,500,000	NA
1971	484,000	1,281,000	NA
1972	574,000	1,810,000	NA
1973	466,000	1,858,000	NA
1974	427,000	1,907,000	NA
1975	500,000	1,919,000	NA
1976	473,000	1,690,000	NA
1977	324,000	1,713,000	NA
1978	329,000	2,149,000	NA
1979	363,000	1,662,000	NA
1980	358,000	1,670,000	423,000
1981	369,000	1,742,000	283,000
1982	268,000	1,859,000	374,000
1983	424,000	1,932,000	424,000
1984	381,000	2,450,000	381,000
1985	291,000	2,728,000	425,000
1986	338,000	3,118,000	457,000
1987	293,000	3,087,000	403,000
1988	191,000	3,583,000	431,000
1989	165,000	3,374,000	413,000
1990	213,000	4,474,000	358,000
1991	198,000	3,822,000	377,000
1992	182,000	3,428,000	335,000
1993	207,000	3,755,000	407,000
1994	199,000	4,123,000	332,000
1995	141,000	3,927,000	262,000
1996	245,000	3,472,000	286,000
1997	176,000	3,100,000	260,000
1998	164,000	3,200,000	233,000
1999	171,000	3,077,000	250,000
2000	222,000	3,470,000	254,000
2001	210,000	3,365,000	244,000
2002	150,000	3,315,000	197,000
2003	179,000	3,516,000	123,000
2004	221,000	3,602,000	132,000
2005	165,000	4,071,000	176,000
2006	200,000	3,891,000	106,000
2007	205,000	3,723,000	146,000
2008	204,000	3,571,000	104,000
2009	216,000	3,063,000	100,000
2010	149,000	3,192,000	113,000
2011	168,000	3,102,000	90,000
2012	219,000	3,452,000	106,000
2013	225,000	3,278,000	88,000
2014	155,000	3,419,000	51,000
2015	139,000	3,215,000	68,000

* Females only.
† Females aged 15–44 years only.
NA = Not available.
NOTE: Standard errors for estimates under 100,000 are not available. The relative standard errors for estimates 100,000-299,999 are from 19% to 23%; 300,000-599,999 are from 16% to 19%; 600,000-999,999 are from 13% to 16%; and 1,000,000-5,000,000 are from 7% to 13%.
SOURCE: National Disease and Therapeutic Index, IMS Health, Integrated Promotional Services. IMS Health report, 1966–2015. The 2016 data were not obtained in time to include them in this report. See Section A2.5 in the Appendix for more information.



Appendix

A. Interpreting STD Surveillance Data

Sexually Transmitted Disease Surveillance 2016 presents surveillance information derived from the official statistics for the reported occurrence of nationally notifiable STDs in the United States, including data from sentinel surveillance and national surveys.

A1. Nationally Notifiable STD Surveillance

Nationally notifiable STD surveillance data are collected and compiled from reports sent by the STD control programs and health departments in all 50 states, the District of Columbia, selected cities, United States dependencies and possessions, and independent nations in free association with the United States to the Division of STD Prevention, National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention (CDC). Included among the dependencies, possessions, and independent nations are Guam, Puerto Rico, and the Virgin Islands. These entities are identified as "outlying areas" of the United States in selected figures and tables.

A1.1 Reporting Formats

STD morbidity data presented in this report are compiled from a combination of data reported on standardized hard copy reporting forms and electronic data received through the National Electronic Telecommunications System for Surveillance (NETSS).

Summary Report Forms

The following hard copy forms were used to report national STD morbidity data:

1. FORM CDC 73.998: *Monthly Surveillance Report of Early Syphilis*. This monthly hard copy reporting form was used during 1984–2002 to report summary data for primary and secondary (P&S) syphilis and early latent syphilis by county and state.

2. FORM CDC 73.688: *Sexually Transmitted Disease Morbidity Report*. This quarterly hard copy reporting form was used during 1963–2002 to report summary data for all stages of syphilis, congenital syphilis, gonorrhea, chancroid, chlamydia, and other STDs by sex and source of report (private versus public) for all 50 states, the District of Columbia, 64 selected cities (including San Juan, Puerto Rico), and outlying areas of the United States.

   Note: Chlamydial infection became a nationally notifiable condition in 1995 and the form was modified to support reporting of chlamydia that year. Congenital syphilis was dropped from this aggregate form in 1995 and replaced by the case-specific CDC 73.126 form described later in this section.

3. FORM CDC 73.2638: *Report of Civilian Cases of Primary & Secondary Syphilis, Gonorrhea, and Chlamydia by Reporting Source, Sex, Race/Ethnicity, and Age Group*. This annual hard copy form was used during 1981–2002 to report summary data for P&S syphilis, gonorrhea, and chlamydia by age, race, sex, and source (public versus private) for all 50 states, seven large cities (Baltimore, Chicago, New York City, Los Angeles, Philadelphia, San Francisco, and the District of Columbia), and outlying areas of the United States.

   Note: Chlamydial infection became a nationally notifiable condition in 1995, and the form was modified to support reporting of chlamydia that year.

4. FORM CDC 73.126: *Congenital Syphilis (CS) Case Investigation and Reporting*. This case-specific hard copy form was first used in 1983 and continues to be used to report detailed case-specific data for congenital syphilis in some areas.

National Electronic Telecommunications System for Surveillance

Notifiable STD data reported electronically through NETSS make up the nationally notifiable disease information published in CDC's *Morbidity and Mortality Weekly Report*.

As of December 31, 2003, all 50 states and the District of Columbia had converted from summary hard copy reporting to electronic submission of line-listed (i.e., case-specific) STD data through NETSS (41 reporting areas submitted congenital syphilis surveillance data through NETSS in 2016). Puerto Rico converted to electronic reporting in 2006 for all STDs excluding congenital syphilis. Guam and the Virgin Islands continue to report STD data through summary hard copy forms.

Surveillance data and updates sent to CDC through NETSS and on hard copy forms through June 7, 2017, are included in this report. The data presented in the figures and tables in this report supersede those in all earlier publications.

A1.2 Population Denominators and Rate Calculations

2000–2016 Rates and Population

For those figures and tables presenting race using the 1997 Office of Management and Budget (OMB) standards, non-bridged-race data provided directly by the United States Census Bureau were used to calculate race. The latest available year for population estimates at the time this report was written was 2015. Thus, 2015 population estimates were used to calculate 2016 rates.

Once published, the 2016 population estimates will be used to calculate 2016 rates in the *Sexually Transmitted Disease Surveillance 2017*.

Population estimates for Puerto Rico were obtained from the U.S. Census Bureau Web site at: https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.

Population estimates for Guam and the Virgin Islands were obtained from the U.S. Census Bureau International Programs Web site at: https://www.census.gov/population/international/data/idb/informationGateway.php.

The 2016 rates by age and sex for Guam and the Virgin Islands were calculated using 2010 population estimates available at: https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml.

Because of the use of the updated population data, rates for 2000–2015 may be different from those presented in previous STD surveillance reports.

Several figures throughout this report depict state- or county-specific rates of reported cases of STDs. Rates were grouped and displayed by quintiles in Figures 3, 4, 15, 16, 32, D, E, H, I, J, K, L, M, N, O, P, Q, and Y. Rates were grouped and displayed in 4 categories – zero cases and tertiles – in Figure 33.

1990–1999 Rates and Population

The population counts for 1990 through 1999 incorporated the bridged single-race estimates of the April 1, 2000, U.S. resident population. These files were prepared by the U.S. Census Bureau with support from the National Cancer Institute.

1981–1989 Rates and Population

Rates were calculated by using U.S. Census Bureau population estimates for 1981 through 1989.[1,2]

1941–1980 Rates and Population

Rates for 1941 through 1980 were based on population estimates from the U.S. Census Bureau and are currently maintained by CDC's Division of STD Prevention.

1941–2016 Congenital Syphilis Rates and Live Births

The congenital syphilis data in Table 1 of this report represent the number of congenital syphilis cases per 100,000 live births for all years during 1941–2016. Previous publications presented congenital syphilis rates per 100,000 population during 1941–1994 and rates for cases diagnosed at younger than 1 year of age per 100,000 live births during 1995–2005. To allow for trends in congenital syphilis rates to be compared for the period of 1941 through 2016, live births now are used as the denominator for congenital syphilis and case counts are no longer limited to those diagnosed within the first year of life. Congenital syphilis morbidity is assigned by year of birth. Rates of congenital syphilis for 1963 through 1988 were calculated by using published live birth data.[3] Congenital syphilis rates for 1989 through 2014 were calculated by using live birth data based on information coded by the states and provided to the National Center for Health Statistics (NCHS) through the Vital Statistics Cooperative Program. Rates for 2015 and 2016 were calculated by using live birth data for 2014.

2010–2015 Gay, Bisexual, and Other Men Who Have Sex with Men Rates and Population

Figures BB and Y show rates of reported cases of gonorrhea and P&S syphilis among gay, bisexual, and other men who have sex with men (collectively referred to as MSM). Population estimates of MSM are based on a method that combines published estimates of the prevalence of same-sex behavior among adult men with housing and population data from the American Community Survey 5-year summary file (2011–2015).[4-7] County-specific estimates begin with MSM prevalence estimates that are determined by their urbanicity according to the NCHS urban-rural classification scheme for counties and their United States region.[8] Estimates are then multiplied by a modified ratio of each county's percentage of male same-sex households to the total percentage of male same-sex households among all counties at the same level of urbanicity and within the same region. Thus, the final estimate for each county reflects what would be expected based on the county's geography, urban-rural classification, and observed concentration of households with a male head of household and a male partner.

A1.3 Reporting Practices

Although most state and local STD programs generally adhere to the national notifiable STD case definitions collaboratively developed by the Council of State and Territorial Epidemiologists (CSTE) and CDC, differences in policies and systems for collecting surveillance data may exist. Thus, comparisons of case numbers and rates between jurisdictions should be interpreted with caution. However, because case definitions and surveillance activities within a given area remain relatively stable over time, trends should be minimally affected by these differences.

A1.4 Reporting of Surveillance Data by Metropolitan Statistical Area

Sexually Transmitted Disease Surveillance 2016 continues the presentation of STD incidence data and rates for the 50 metropolitan statistical areas (MSA) with the largest populations according to 2010 United States census data. MSAs are defined by the OMB to provide nationally consistent definitions for collecting, tabulating, and publishing federal statistics for a set of geographic areas.[9] An MSA is associated with at least one urbanized area that has a population of at least 50,000. The MSA comprises the central county or counties containing the central county, plus adjacent, outlying counties that have a high degree of social and economic integration with the central county as measured through commuting. The title of an MSA includes the name of the principal city with the largest 2010 census population. If there are multiple principal cities, the names of the second largest and third largest principal cities appear in the title in order of descending population size.

Reported cases are assigned to MSAs based on the reported county; cases reported with a missing a value for the county variable cannot be assigned to an MSA. Consequently, if a jurisdiction reports cases missing values for the county variable, reported rates for MSAs in their jurisdiction may be incomplete. Additionally, relative rankings of case counts by counties may be impacted by completeness of the variable used to identify county. Table A1 reports the percentage of cases reported with missing county information in each state for P&S syphilis, chlamydia, and gonorrhea.

The MSA concept has been used as a statistical representation of the social and economic links between urban cores and outlying, integrated areas. However, MSAs do not equate to an urban-rural classification; all counties included in MSAs and many other counties contain both urban and rural territory and populations. STD programs that treat all parts of an MSA as if they were as urban as the densely settled core ignore the rural conditions that may exist in some parts of the area. In short, MSAs are not intended to be a general purpose geographic framework for nonstatistical activities or for use in program funding formulas.

For more information on the MSA definitions used in this report, go to:
https://www.census.gov/programs-surveys/metro-micro.html.

A1.5 Reporting of Data for Race/Ethnicity

In April 2008, the NETSS record layout was updated to conform to the OMB's current government-wide standard for race/ethnicity data. The OMB standards were first issued in 1997.[10] Beginning with the publication of *Sexually Transmitted Disease Surveillance 2012*, the race/ethnicity data are presented according to the current standard categories: American Indian or Alaska Native, Asian, Black or African American, Hispanic or Latino, Native Hawaiian or Other Pacific Islander, White and Multirace. For this report, jurisdictions are considered to be OMB compliant for a condition if ≥97% of cases for that condition are reported using current OMB standards. As of reporting year 2016, all jurisdictions were compliant with the current OMB race/ethnicity standards for chlamydia, gonorrhea, and P&S syphilis.

For chlamydia and gonorrhea figures showing trends for 2012–2016, data are included for all jurisdictions except five not consistently reporting race/ethnicity data according to the current standard categories for the five consecutive years (Alaska, Maryland, Michigan, New York, and the District of Columbia). For P&S syphilis figures showing trends for 2012– 2016, data are included for all jurisdictions except five not consistently reporting race/ethnicity data according to the current standard categories for the five consecutive years (Alaska, Maryland, New York, Utah, and the District of Columbia).

A1.6 Management of Unknown, Missing, or Invalid Data for Age Group, Race/Ethnicity, and Sex

The percentage of unknown, missing, or invalid data for age group, race/ethnicity, and sex varies from year to year, state to state, and by disease for reported STDs (Table A1).

Prior to the publication of *Sexually Transmitted Disease Surveillance 2010*, when the percentage of unknown, missing, or invalid values for age group, race/ethnicity, and sex exceeded 50% for any state, the state's incidence and population data were excluded from the tables that presented data stratified by one or more of these variables. For the states for which 50% or more of their data were valid for age group, race/ethnicity, and sex, the values for unknown, missing, or invalid data were redistributed on the basis of the state's distribution of known age group, race/ethnicity, and sex data. Beginning with the publication of *Sexually Transmitted Disease Surveillance 2010*, redistribution methodology is not applied to any of the data. The counts presented in this report are summations of all valid data reported in reporting year 2016.

As a result, rate data that are stratified by one or more of these variables reflect rates based on reported data only.

A1.7 Classification of STD Morbidity Reporting Sources

Before 1996, states classified the source of case reports as either private source (including private physicians, hospitals, and institutions) or public source (primarily STD clinics). As states began reporting morbidity data electronically in 1996, the classification categories for source of case reports expanded to include the following data sources: STD clinics, HIV counseling and testing sites, drug treatment clinics, family planning clinics, prenatal/obstetrics clinics, tuberculosis clinics, private physicians/health maintenance organizations (HMOs), hospitals (inpatient), emergency rooms, correctional facilities, laboratories, blood banks, the National Job Training Program (NJTP), school-based clinics, mental health providers, the military, the Indian Health Service, and other unspecified sources. Figures 7, 8, 21, and 22 display trends in the proportion of cases reported in 2016 categorized by reporting source. Categories displayed vary across these figures and include the five most commonly reported sources for the population included in the figure, along with trends for all other reporting sources combined into the "All Other" category, and trends in the proportion of cases with unknown reporting source.

A1.8 Interpreting Chlamydia Case Reporting

Trends in rates of reported cases of chlamydia are influenced by changes in incidence of infection, as well as changes in diagnostic, screening, and reporting practices. As chlamydial infections are usually asymptomatic, the number of infections identified and reported can increase as more people are screened even when incidence is flat or decreasing. During 2000–2011, the expanded use of more sensitive diagnostic tests (e.g., nucleic acid amplification tests [NAATs]) likely increased the number of infections identified and reported independently of increases in incidence. Also, although chlamydia has been a nationally notifiable condition since 1994, it was not until 2000 that all 50 states and the District of Columbia required reporting of chlamydia cases. National case rates prior to 2000 reflect incomplete reporting. The increased use of electronic laboratory reporting over the last decade or so also likely increased the proportion of diagnosed cases reported. Consequently, an increasing chlamydia case rate over time may reflect increases in incidence of infection, screening coverage, and use of more sensitive tests, as well as more complete reporting. Likewise, decreases in chlamydia case rates may suggest decreases in incidence of infection or screening coverage.

A1.9 Syphilis Morbidity Reporting

The category of "total syphilis" or "all stages of syphilis" includes primary syphilis, secondary syphilis, early latent syphilis, late latent syphilis, late syphilis with clinical manifestations (including late benign syphilis and cardiovascular syphilis), and congenital syphilis.

Although neurosyphilis can occur at almost any stage of syphilis, during 1996–2005 it was classified and reported as one of several mutually exclusive stages of syphilis. Beginning in 2005, neurosyphilis was no longer classified or reported as a distinct stage of syphilis.

A1.10 Congenital Syphilis Morbidity Reporting

In 1988, the surveillance case definition for congenital syphilis was changed. This case definition has greater sensitivity than the former definition.[11] In addition, many state and local STD programs have greatly enhanced active case finding for congenital syphilis since 1988. For these reasons, as well as because of increasing morbidity, the number of reported cases increased dramatically during 1989–1991. All reporting areas had implemented the new case definition for reporting congenital syphilis by January 1, 1992. In addition to changing the case definition for congenital syphilis, CDC introduced a new data collection form (CDC 73.126) in 1990 (revised February 2013). Since 1995, the data collected on this form have been used for reporting congenital syphilis cases and associated rates. This form is used to collect individual case information, which allows more thorough analysis of case characteristics. For the purpose of analyzing race/ethnicity, cases are classified by the race/ethnicity of the mother. Similarly, since 1995, congenital syphilis cases are reported by state and city of residence of the mother.

Congenital syphilis reporting may be delayed as a result of case investigation and validation. Cases for previous years are added to CDC's surveillance databases throughout the year. Congenital syphilis data reported after publication of the current annual STD surveillance report will appear in subsequent reports and are assigned by the case patient's year of birth.

A2. Other Sources of Surveillance Data

A2.1 National Job Training Program

Chlamydia and gonorrhea prevalence was calculated for men and women entering the NJTP. 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. The majority of NJTP's chlamydia screening tests are conducted by a single national contract laboratory, which provides these data to CDC. Gonorrhea screening tests for male and female students in many training centers are conducted by local laboratories; these data are not available to CDC. Test results for students at centers that submit specimens to the national contract laboratory are included only if the number of gonorrhea tests submitted is greater than 90% of the number of chlamydia tests submitted from the same center for the same period. Prevalence data for state-specific figures were published with permission from the Department of Labor. Prevalence data are presented in figures N, O, P, and Q.

A2.2 STD Surveillance Network

In 2005, CDC established the STD Surveillance Network (SSuN) as a collaborative network of state, county and/or city health departments following protocols to conduct sentinel and enhanced STD surveillance activities. The purpose of SSuN is to improve the capacity of national, state and local STD programs to detect, monitor, and respond to trends in STDs through enhanced collection, reporting, analysis, visualization, and interpretation of disease information.

Cycle 3 (2013–2018) of SSuN provides funding to 10 jurisdictions to conduct two core STD surveillance activities including; (1) sentinel facility component, providing clinical and demographic information on a full census of patients attending categorical STD clinics and women aged 15–44 years presenting for care in reproductive health settings, and, (2) population component, conducting enhanced health department look-back, provider, and patient investigations on a probability sample of all persons diagnosed and reported with gonorrhea. Funded jurisdictions for both core activities in SSuN Cycle 3 include Baltimore City (Maryland), California (excluding San Francisco County), Florida, Massachusetts, Minnesota, Multnomah County (Oregon), Philadelphia City (Pennsylvania), New York City (New York), San Francisco County (California), and Washington State.

In both the facility and population components of SSuN Cycle 3, unique patients can be anonymously identified using non-identifying IDs to provide longitudinal information. In the facility component, the primary unit of analysis is the patient visit, which is merged with multiple laboratory, diagnostic, and treatment observations. In the population component, the primary unit of analysis is a reported episode of gonorrhea for a unique person merged with multiple laboratory observations, health department disease registry history, provider-based clinical information, and patient demographic and behavioral interview data. For analysis in the population component, cases in the probability sample are weighted to reflect study design and to adjust for non-response by demographic category of the patient. Weighted analyses provide estimates of case and person characteristics representative of all reported cases in the collaborating jurisdictions.

MSM are defined in all SSuN data collection activities as men who either reported having sex with another man in the preceding 2–3 months, reported current history of male sex partners, and/or those who reported that they considered themselves gay/homosexual or bisexual. Men who have sex with women (MSW) are defined as men who reported having sex with women only or who did not report the sex of their sex partners but reported that they considered themselves to be straight/heterosexual.

Data presented in this report from the facility component of SSuN are from nine participating jurisdictions (Baltimore City [Maryland], California [excluding San Francisco County], Massachusetts, Minnesota, Multnomah County [Oregon], New York City [New York], Philadelphia City [Pennsylvania], San Francisco County [California] and Washington State). Figures 11, 24, CC, DD, EE, and FF are based on STD clinic data and Figure F is based on data from facilities that provide family planning and reproductive health services. Data presented in this report from the population component of SSuN include Figures 23 and BB. Figure 23 presents data collected January–December 2016 showing the proportion of cases attributable to MSM, men who have sex with both men and women (MSMW), MSW, and women for all SSuN jurisdictions. Figure BB presents data collected January 2010–June 2013 and June–December 2015 for six SSuN jurisdictions collaborating in both SSuN Cycle 2 and SSuN Cycle 3 (Baltimore City [Maryland], California [excluding San Francisco County], New York City [New York], Philadelphia City [Pennsylvania], San Francisco County [California], and Washington State).

A2.3 Gonococcal Isolate Surveillance Project

Data on antimicrobial susceptibility in *Neisseria gonorrhoeae* were collected through the Gonococcal Isolate Surveillance Project (GISP), a sentinel system of selected STD clinics located at 25–30 GISP sentinel sites and regional laboratories in the United States. For more details on findings from GISP, go to: https://www.cdc.gov/std/GISP/.

For 2016, the antimicrobial agents tested by GISP were ceftriaxone, cefixime, azithromycin, ciprofloxacin, penicillin, tetracycline, and gentamicin.

The antimicrobial susceptibility criteria used in GISP for 2016 are as follows:

- Ceftriaxone, minimum inhibitory concentration (MIC) ≥0.5 µg/ml (decreased susceptibility)*
- Ceftriaxone, MIC ≥0.125 µg/ml (elevated MICs)*
- Cefixime, MIC ≥0.5 µg/ml (decreased susceptibility)*
- Cefixime, MIC ≥0.25 µg/ml (elevated MICs)*
- Azithromycin, MIC ≥2.0 µg/ml (elevated MICs)*
- Ciprofloxacin, MIC ≥1.0 µg/ml (resistance)
- Ciprofloxacin, MIC 0.125–0.5 µg/ml (intermediate resistance)
- Penicillin, MIC ≥2.0 µg/ml (resistance)
- Tetracycline, MIC ≥2.0 µg/ml (resistance)
- Gentamicin (MIC values correlated with susceptibility and resistance have not been established).

The majority of these criteria are also recommended by the Clinical and Laboratory Standards Institute (CLSI).[12]

* The CLSI criteria for decreased susceptibility and resistance to ceftriaxone, cefixime, gentamicin, and azithromycin and for susceptibility to azithromycin have not been established for *N. gonorrhoeae*.

A2.4 National Health and Nutrition Examination Survey

The National Health and Nutrition Examination Survey (NHANES) is a series of cross-sectional surveys designed to provide national statistics on the health and nutritional status of the general household population in the United States. Data are collected through household interviews, standardized physical examinations, and the collection of biological samples in special mobile examination centers. In 1999, NHANES became a continuous survey with data released every two years. The sampling plan of the survey is a stratified, multistage, probability cluster design that selects a sample representative of the United States civilian, non-institutionalized population. For more information, see: https://www.cdc.gov/nchs/nhanes.htm.

A2.5 National Disease and Therapeutic Index

The information on the number of initial visits to private physicians' offices for STDs was based on analysis of data from the National Disease and Therapeutic Index (NDTI) (machine-readable files or summary statistics for 1966 through 2015; the 2016 NDTI data were not obtained in time to include them in this report). NDTI is a probability sample survey of private physicians' clinical management practices. For more information on this database, contact IMS Health, e-mail: ServiceCenter@us.imshealth.com; Telephone: (800) 523–5334.

References

1. U.S. Census Bureau. United States population estimates by age, sex and race: 1980–1988. In: Current population reports [Series P-25, No. 1045]. Washington, DC: U.S. Government Printing Office; 1990.
2. U.S. Census Bureau. United States population estimates by age, sex and race: 1989. In: Current population reports [Series P-25, No. 1057]. Washington, DC: U.S. Government Printing Office; 1990.
3. Centers for Disease Control and Prevention. Vital statistics of the United States 1988. vol.1 — natality. Hyattsville (MD): U.S. Department of Health and Human Services; 1990.
4. American Community Survey. 5-year summary file, 2011–2015. US Census Bureau: 2016.
5. Grey JA, Bernstein KT, Sullivan PS, et al. Estimating the population sizes of men who have sex with men in US states and counties using data from the American Community Survey. JMIR Public Health Surveill 2016; 2(1):e14.
6. Oster AM, Sternberg M, Lansky A, et al. Population size estimates for men who have sex with men and persons who inject drugs. J Urban Health 2015; 92(4):733–743.
7. Purcell DW, Johnson CH, Lansky A, et al. Estimating the population size of men who have sex with men in the United States to obtain HIV and syphilis rates. Open AIDS J 2012; 6(Suppl 1):98–107.
8. Ingram DD, Franco SJ. 2013 NCHS urban-rural classification scheme for counties. National Center for Health Statistics. Vital Health Stat 2014; 2(166):1–81.
9. Office of Management and Budget. Standards for defining metropolitan and micropolitan statistical areas. Federal Register 2000; 65(249):82228–82238.
10. Office of Management and Budget. Revisions to the Standards for Classification of Federal Data on Race and Ethnicity. Federal Register Notice. October 30, 1997.
11. Kaufman RE, Jones OG, Blount JH, et al. Questionnaire survey of reported early congenital syphilis: problems in diagnosis, prevention, and treatment. Sex Transm Dis 1977; 4(4):135–139.
12. Clinical and Laboratory Standards Institute. Performance standards for antimicrobial susceptibility testing; twenty-fifth informational supplement. M100-S25, 35(3). Wayne (PA): Clinical and Laboratory Standards Institute; 2015.

Table A1. Selected STDs — Percentage of Unknown, Missing, or Invalid Values for Selected Variables by State and by Nationally Notifiable STD, 2016

State	Primary and Secondary Syphilis				
	Percentage Unknown Race/ Ethnicity	Percentage Unknown Age	Percentage Unknown Sex	Percentage Unknown Sex Partner	Percentage Unknown County
Alabama	0.3	8.8	0.0	32.2	4.5
Alaska*	0.0	0.0	0.0	12.5	0.0
Arizona	1.9	0.0	0.0	6.8	0.0
Arkansas	1.3	0.0	0.0	4.7	0.0
California	6.2	0.0	0.1	16.0	0.0
Colorado	3.6	0.0	0.0	6.4	0.0
Connecticut	0.0	0.0	0.0	20.0	0.9
Delaware	6.9	0.0	0.0	84.5	0.0
District of Columbia	30.4	0.0	2.5	26.7	NA
Florida	2.6	0.0	0.0	12.1	0.0
Georgia	1.4	0.0	0.0	28.4	0.0
Hawaii	5.4	0.0	0.0	19.6	0.0
Idaho	8.0	0.0	0.0	22.0	0.0
Illinois	1.8	0.0	0.0	26.8	0.0
Indiana	0.3	0.0	0.0	6.1	0.0
Iowa	1.1	0.0	0.0	9.0	0.0
Kansas	0.0	0.0	0.0	6.5	0.0
Kentucky	0.0	0.0	0.0	16.0	0.0
Louisiana	0.0	0.0	0.0	4.4	0.0
Maine	0.0	0.0	0.0	28.6	0.0
Maryland	1.8	0.0	0.0	12.4	0.0
Massachusetts	4.7	0.0	0.2	13.5	9.2
Michigan	1.6	0.0	0.0	5.2	0.0
Minnesota	3.3	0.0	0.7	4.9	0.0
Mississippi	3.4	0.0	0.0	4.0	0.0
Missouri	0.0	0.0	0.0	6.3	0.0
Montana	0.0	0.0	0.0	14.3	0.0
Nebraska	7.5	0.0	0.0	43.3	0.0
Nevada	1.4	0.0	0.0	7.4	0.2
New Hampshire	10.0	0.0	0.0	2.5	0.0
New Jersey	4.4	0.0	0.0	30.5	0.0
New Mexico	14.8	0.0	0.0	7.9	0.0
New York	7.7	0.1	0.9	31.6	0.0
North Carolina	0.1	0.0	0.0	6.2	0.0
North Dakota	9.1	0.0	0.0	12.1	0.0
Ohio	0.0	0.0	0.0	8.2	0.0
Oklahoma	0.0	0.0	0.0	0.4	0.0
Oregon	4.6	0.0	0.0	16.8	0.0
Pennsylvania	6.5	0.0	0.0	9.4	0.0
Rhode Island	13.3	0.0	0.0	41.1	0.0
South Carolina	3.8	0.0	0.0	2.8	0.0
South Dakota	0.0	0.0	0.0	3.8	0.0
Tennessee	0.0	0.0	0.0	58.7	0.0
Texas	0.6	0.0	0.0	6.0	0.1
Utah	0.0	0.0	0.0	5.4	0.0
Vermont	0.0	0.0	0.0	4.3	0.0
Virginia	8.7	0.0	2.0	12.9	0.0
Washington	5.8	0.0	0.0	4.2	0.0
West Virginia	0.0	0.0	0.0	5.7	0.0
Wisconsin	7.6	0.0	0.0	50.0	0.0
Wyoming*	14.3	0.0	0.0	100.0	0.0
U.S. TOTAL	**3.8**	**0.1**	**0.1**	**15.9**	**0.2**

Continued on next page.

Table A1. Selected STDs — Percentage of Unknown, Missing, or Invalid Values for Selected Variables by State and by Nationally Notifiable STD, 2016 (continued)

State	Gonorrhea				Chlamydia			
	Percentage Unknown Race/ Ethnicity	Percentage Unknown Age	Percentage Unknown Sex	Percentage Unknown County	Percentage Unknown Race/ Ethnicity	Percentage Unknown Age	Percentage Unknown Sex	Percentage Unknown County
Alabama	31.3	14.2	0.7	26.5	38.6	13.1	0.7	25.4
Alaska*	0.1	0.0	0.0	0.3	0.1	0.0	0.0	0.4
Arizona	17.8	0.0	0.0	0.0	29.3	0.0	0.0	0.0
Arkansas	0.6	0.0	0.0	0.0	0.4	0.0	0.0	0.0
California	21.8	0.2	0.6	0.0	41.5	0.2	0.3	0.0
Colorado	30.1	0.0	0.0	0.1	46.2	0.0	0.0	0.2
Connecticut	30.9	0.1	0.1	5.7	66.4	0.1	1.1	3.0
Delaware	4.1	0.0	0.0	0.0	4.8	0.0	0.0	0.0
District of Columbia	69.9	0.6	2.2	NA	76.6	0.7	2.1	NA
Florida	9.7	0.0	0.0	0.0	15.4	0.0	0.1	0.0
Georgia	26.5	0.1	0.1	3.7	38.0	0.1	0.1	3.9
Hawaii	36.1	0.1	0.1	0.1	47.9	0.1	0.0	0.1
Idaho	24.7	0.0	0.3	0.0	39.4	0.0	0.1	0.0
Illinois	18.8	0.0	0.1	0.0	20.4	0.0	0.1	0.0
Indiana	7.4	0.0	0.0	0.0	11.5	0.0	0.0	0.0
Iowa	3.4	0.0	0.0	0.0	6.0	0.0	0.0	0.0
Kansas	9.6	0.0	0.0	0.0	33.3	0.0	0.0	0.0
Kentucky	24.6	0.1	1.5	0.0	35.1	0.1	1.9	0.0
Louisiana	0.2	0.0	0.0	0.2	0.2	0.0	0.0	0.3
Maine	1.8	0.9	0.2	0.9	31.6	0.0	0.1	1.4
Maryland	23.4	0.0	0.1	0.0	40.0	0.0	0.1	0.0
Massachusetts	36.1	0.1	0.3	14.4	67.4	0.1	0.3	17.2
Michigan	24.2	0.1	0.0	0.0	28.6	0.1	0.0	0.0
Minnesota	17.3	0.1	0.2	2.9	24.4	0.1	0.1	4.0
Mississippi	19.6	0.0	0.1	0.0	25.9	0.0	0.2	0.0
Missouri	8.9	0.0	0.0	0.0	13.8	0.0	0.0	0.0
Montana	1.3	0.0	0.0	0.0	1.4	0.1	0.0	0.0
Nebraska	16.2	0.0	0.2	0.0	26.5	0.1	0.3	0.0
Nevada	36.6	0.0	0.1	0.5	44.9	0.0	0.2	0.9
New Hampshire	21.1	0.0	0.0	0.0	25.5	0.0	0.0	0.0
New Jersey	38.8	0.6	0.2	1.1	52.1	0.4	0.2	1.0
New Mexico	21.3	0.0	0.1	0.0	27.1	0.0	0.1	0.0
New York	24.9	0.1	0.2	0.0	38.4	0.1	0.1	0.0
North Carolina	15.5	0.0	0.0	0.0	20.3	0.0	0.0	0.0
North Dakota	3.0	0.0	0.0	0.0	9.6	0.0	0.0	0.0
Ohio	18.6	0.0	0.0	2.0	25.0	0.1	0.0	2.5
Oklahoma	9.9	0.0	0.0	0.0	13.6	0.0	0.0	0.0
Oregon	9.7	0.0	0.0	0.1	27.2	0.0	0.0	0.0
Pennsylvania	22.8	0.0	0.1	0.0	33.3	0.0	0.1	0.0
Rhode Island	14.4	0.1	0.0	1.3	23.1	0.0	0.0	0.5
South Carolina	20.7	0.0	0.5	0.0	27.3	0.0	0.4	0.0
South Dakota	1.8	0.0	0.0	0.0	10.5	0.0	0.0	0.0
Tennessee	1.1	0.0	0.0	0.0	1.8	0.0	0.0	0.0
Texas	17.0	0.1	0.2	0.4	22.3	0.1	0.2	0.4
Utah	6.4	0.0	0.0	0.1	6.4	0.0	0.0	0.1
Vermont	0.8	0.0	0.0	0.0	4.0	0.0	0.1	0.0
Virginia	26.1	0.1	0.3	0.3	36.0	0.2	0.3	0.2
Washington	13.1	0.1	0.0	0.0	19.2	0.1	0.0	0.0
West Virginia	11.8	0.0	0.0	0.0	26.6	0.0	0.0	0.0
Wisconsin	23.8	0.0	0.1	0.0	19.6	0.0	0.1	0.0
Wyoming*	26.2	0.0	0.0	0.0	37.1	0.0	0.0	0.0
U.S. TOTAL	**19.0**	**0.3**	**0.2**	**1.0**	**28.8**	**0.3**	**0.2**	**1.1**

* Percentages for primary and secondary syphilis are based on less than 10 cases.
NA = Not applicable.
NOTE: For all categories, unknown included cases reported as unknown or missing. In addition, unknown race/ethnicity included cases reported in non-OMB compliant categories.

Table A2. Reported Cases of STDs by Reporting Source and Sex, United States, 2016

Disease	Non-STD Clinic			STD Clinic			Total		
	Male	Female	Total*	Male	Female	Total*	Male†	Female†	Total‡
Chlamydia	385,522	868,276	1,255,933	57,357	44,552	102,022	522,870	1,072,719	1,598,354
Gonorrhea	196,422	156,304	353,487	35,286	13,909	49,248	270,033	197,499	468,514
Primary Syphilis	5,969	608	6,584	1,784	108	1,894	8,565	793	9,369
Secondary Syphilis	11,691	1,757	13,465	2,903	320	3,226	16,159	2,256	18,445
Early Latent Syphilis	18,547	2,969	21,571	3,815	561	4,382	24,919	3,939	28,924
Late and Late Latent Syphilis§	16,489	5,861	22,386	2,245	648	2,895	22,785	7,850	30,676
Chancroid	4	1	5	0	0	0	6	1	7

* Total includes cases reported with unknown sex.
† Total includes cases reported with unknown reporting source.
‡ Total includes cases reported with unknown sex and reporting source.
§ Late and late latent syphilis includes late latent syphilis and late syphilis with clinical manifestations (including late benign syphilis and cardiovascular syphilis).

This page intentionally left blank.

B. National Objectives and Goals

B1. *Healthy People 2020* Objectives

For three decades, Healthy People has provided a comprehensive set of national 10-year health promotion and disease prevention objectives aimed at improving the health of all Americans.[1] It is grounded in the principle that establishing objectives and providing benchmarks to track and monitor progress over time can motivate, guide, and focus action.

Healthy People 2020 (HP2020) continues in the tradition of its ambitious, yet achievable, 10-year agenda for improving the Nation's health. HP2020 is the result of a multiyear process that reflects input from a diverse group of individuals and organizations. HP2020 is organized into 42 topic areas, with more than 1,200 measures designed to drive action that will support its four overarching goals:

- Attain high-quality, longer lives free of preventable disease, disability, injury, and premature death.
- Achieve health equity, eliminate disparities, and improve the health of all groups.
- Create social and physical environments that promote good health for all.
- Promote quality of life, healthy development, and healthy behaviors across all life stages.

The topic area, Sexually Transmitted Diseases, contains objectives and measures related to STDs. Baselines, HP2020 targets, and annual progress toward the targets are reported in Table B1. The year 2020 targets for the diseases addressed in this report are as follows: primary and secondary (P&S) syphilis (males), 6.8 cases per 100,000 males; P&S syphilis (females), 1.4 cases per 100,000 females; congenital syphilis, 9.1 cases per 100,000 live births; gonorrhea (females aged 15–44 years), 257.0 cases per 100,000 females and gonorrhea (males aged 15–44 years), 198.0 cases per 100,000 males. The majority of the STD-related HP2020 targets were set using a standard percentage improvement with a standard default of a "10 percent improvement over the baseline."

B2. Government Performance and Results Act of 1993

The Government Performance and Results Act (GPRA) of 1993 was enacted by Congress to increase confidence in the capability of the federal government to increase the effectiveness and accountability of federal programs, to improve service delivery, to provide federal agencies a uniform tool for internal management, and to help Congress make decisions.

GPRA requires each agency to have a performance plan with long-term outcomes and annual, measurable performance goals and to report on these plans annually, comparing results with annual goals. There are two GPRA goals for STD: reducing pelvic inflammatory disease (PID) and eliminating congenital syphilis. Each of these goals has specific measures of progress, which are outlined in Table B2.

References

1. U.S. Department of Health and Human Services. Healthy People 2020 (Healthy People 2020 Web site). Available at https://www.healthypeople.gov/2020/default. Accessed on August 4, 2017.

Table B1. *Healthy People 2020* (HP 2020) Sexually Transmitted Diseases Objectives

	HP2020 Objectives	Baseline Year	Baseline	2014	2015	2016	2020 Target
1	**Reduce the proportion of adolescents and young adults with *Chlamydia trachomatis* infections**						
	a. Among females aged 15 to 24 years attending family planning clinics	2008	7.4%	N/A	8.6%	8.4%	6.7%
	b. Among females aged 24 years and under enrolled in a National Job Training Program	2008	12.8%	12.8%	12.7%	11.4%	11.5%
	c. Among males aged 24 years and under enrolled in a National Job Training Program	2008	7.0%	7.0%	7.5%	7.1%	6.3%
2	**Increase the proportion of sexually active females aged 24 years and under enrolled in Medicaid plans who are screened for genital Chlamydia infections during the measurement year**						
	a. Females aged 16 to 20 years	2008	52.7%	52.3%	51.2%	N/A	70.9%
	b. Females aged 21 to 24 years	2008	59.4%	62.0%	60.1%	N/A	80.0%
3	**Increase the proportion of sexually active females aged 24 years and under enrolled in commercial health insurance plans who are screened for genital Chlamydia infections during the measurement year**						
	a. Females aged 16 to 20 years	2008	40.1%	42.7%	42.4%	N/A	61.3%
	b. Females aged 21 to 24 years	2008	43.5%	52.1%	52.4%	N/A	74.6%
4	**Reduce the proportion of females aged 15 to 44 years who have ever required treatment for pelvic inflammatory disease (PID)**	2006–2010	4.2%	N/A	3.0%	N/A	3.8%
5	**Reduce gonorrhea rates**						
	a. Females aged 15 to 44 years	2008	279.9	248.1	263.4	297.1	251.9
	b. Males aged 15 to 44 years	2008	216.5	262.8	307.6	370.2	194.8
6	**Reduce sustained domestic transmission of primary and secondary syphilis**						
	a. Among females	2008	1.4	1.1	1.4	1.9	1.3
	b. Among males	2008	7.4	11.6	13.7	15.6	6.7
7	**Reduce congenital syphilis**	2008	10.7	11.6	12.4	15.7	9.6
8	**Reduce the proportion of young adults with genital herpes infection due to herpes simplex type 2**	2005–2008	10.5%	8.3%*	N/A	N/A	9.5%

HP2020 Objective	Data Source
1a	STD Surveillance Network (SSuN), CDC
1b, 1c	National Job Training Program (NJTP)
2a, 2b	Healthcare Effectiveness Data and Information Set (HEDIS), National Committee for Quality Assurance (NCQA)
3a, 3b	Healthcare Effectiveness Data and Information Set (HEDIS), National Committee for Quality Assurance (NCQA)
4	National Survey of Family Growth (NSFG), CDC
5a, 5b	National Notifiable Disease Surveillance System (NNDSS), CDC
6a, 6b	National Notifiable Disease Surveillance System (NNDSS), CDC
7	National Notifiable Disease Surveillance System (NNDSS), CDC
8	National Health and Nutrition Examination Survey (NHANES), CDC

NOTE: Data presented in this table reflect data reported to HP2020 in current and prior years. Data for years prior to 2016 may not match estimates presented in other sections of this report. More information about HP2020 is available at: https://www.healthypeople.gov/

* 2011–2012

Table B2. Government Performance and Results Act (GPRA) Sexually Transmitted Diseases Goals, Measures, and Target

GPRA Goals	Actual			Target
	2014	2015	2016	2017
Goal 1: Reduction in PID (as measured by initial visits to physicians in women 15–44 years of age)	98,800	68,000	N/A	86,423
a. Proportion of high-risk women aged 16–20 infected with chlamydia*	13.9%	13.4%	12.3%	11.7%
b. Proportion of high-risk women aged 21–24 infected with chlamydia*†	7.3%	8.5%	7.4%	8.3%
c. Rate of gonorrhea/100,000 population in women aged 16–20	523.9	537.0	586.0	523.9
d. Rate of gonorrhea/100,000 population in women aged 21–24	508.1	523.9	573.0	511.8
e. Black: white ratio of gonorrhea in women aged 16–24	10.3	9.5	8.4	10.1
f. Proportion of sexually active females aged 16–20 years enrolled in Medicaid who are screened for chlamydia infections	52.3%	51.2%	N/A	62.5%
g. Proportion of sexually active females aged 21–24 years enrolled in Medicaid who are screened for chlamydia infections	62.0%	60.1%	N/A	66.0%
h. Proportion of sexually active females aged 16–20 years enrolled in commercial health insurance plans who are screened for chlamydia infections	42.7%	42.4%	N/A	43.5%
i. Proportion of sexually active females aged 21–24 years enrolled in commercial health insurance plans who are screened for chlamydia infections	52.1%	52.4%	N/A	52.7%
Goal 2: Elimination of Congenital Syphilis				
a. Incidence of P&S syphilis/100,000 population in women aged 15–44	2.6	3.2	4.2	0.8
b. Incidence of congenital syphilis/100,000 live births	11.5	12.4	15.7	6.2
c. Proportion of pregnant women that are screened for syphilis at least one month before delivery	85.9%	84.0%	N/A	84.0%

GPRA Goals	Data Source
1	National Disease and Therapeutic Index (IMS Health)
1a, 1b	National Job Training Program (NJTP)
1c, 1d, 1e	National Notifiable Disease Surveillance System (NNDSS), CDC
1f, 1g, 1h, 1i	Healthcare Effectiveness Data and Information Set (HEDIS), National Committee for Quality Assurance (NCQA)
2a, 2b	National Notifiable Disease Surveillance System (NNDSS),CDC
2c	MarketScan Commercial Claims and Encounters Database, Truven Health Analytics

NOTE: Data presented in this table reflect data reported to GPRA in current and prior years. Data for years prior to 2016 may not match estimates presented in other sections of this report.
* Median state-specific chlamydia prevalence/positivity among states with >100 females in this age group entering the National Job Training Program.
† In FY 2013 CDC improved the calculation of these data to increase the stability of estimate over time. Data for 2010 and later years reflect this improved calculation method.
GPRA = Government Performance and Results Act; PID = pelvic inflammatory disease; P&S = primary and secondary.

This page intentionally left blank.

C. STD Surveillance Case Definitions

C1. Case Definitions For Nationally Notifiable Infectious Diseases

The Council of State and Territorial Epidemiologists (CSTE) recommends that state health departments report cases of selected diseases to CDC's National Notifiable Diseases Surveillance System (NNDSS). Case definitions are periodically revised using CSTE's Position Statements and provide uniform criteria of nationally notifiable conditions for reporting purposes. The most current surveillance case definitions for nationally notifiable STDs are listed below. Please see the NNDSS website (https://wwwn.cdc.gov/nndss/case-definitions.html) for historical case definitions.

C1.1 Chancroid (Revised 9/96)

Clinical description

A sexually transmitted disease characterized by painful genital ulceration and inflammatory inguinal adenopathy. The disease is caused by infection with *Haemophilus ducreyi*.

Laboratory criteria for diagnosis

- Isolation of *H. ducreyi* from a clinical specimen.

Case classification

Probable: a clinically compatible case with both a) no evidence of *Treponema pallidum* infection by darkfield microscopic examination of ulcer exudate or by a serologic test for syphilis performed ≥7 days after onset of ulcers and b) either a clinical presentation of the ulcer(s) not typical of disease caused by herpes simplex virus (HSV) or a culture negative for HSV.

Confirmed: a clinically compatible case that is laboratory confirmed.

C1.2 *Chlamydia trachomatis* Infection (Revised 6/09)

Clinical description

Infection with *Chlamydia trachomatis* may result in urethritis, epididymitis, cervicitis, acute salpingitis, or other syndromes when sexually transmitted; however, the infection is often asymptomatic in women. Perinatal infections may result in inclusion conjunctivitis and pneumonia in newborns. Other syndromes caused by *C. trachomatis* include lymphogranuloma venereum (see Lymphogranuloma Venereum) and trachoma.

Laboratory criteria for diagnosis

- Isolation of *C. trachomatis* by culture or
- Demonstration of *C. trachomatis* in a clinical specimen by detection of antigen or nucleic acid

Case classification

Confirmed: a case that is laboratory confirmed.

C1.3 Gonorrhea (Effective 1/14)

Clinical description

A sexually transmitted infection commonly manifested by urethritis, cervicitis, proctitis, salpingitis, or pharyngitis. Infection may be asymptomatic.

Laboratory criteria for diagnosis

- Observation of gram-negative intracellular diplococci in a urethral smear obtained from a male or an endocervical smear obtained from a female, or
- Isolation of typical gram-negative, oxidase-positive diplococci by culture (presumptive *Neisseria gonorrhoeae*) from a clinical specimen, or
- Demonstration of *N. gonorrhoeae* in a clinical specimen by detection of antigen or nucleic acid

Case classification

Probable: demonstration of gram-negative intracellular diplococci in a urethral smear obtained from a male or an endocervical smear obtained from a female.

Confirmed: a person with laboratory isolation of typical gram-negative, oxidase-positive diplococci by culture (presumptive *Neisseria gonorrhoeae*) from a clinical specimen, or demonstration of *N. gonorrhoeae* in a clinical specimen by detection of antigen or detection of nucleic acid via nucleic acid amplification (e.g., PCR) or hybridization with a nucleic acid probe.

C1.4 Syphilis (Effective 1/14)

Syphilis is a complex sexually transmitted disease that has a highly variable clinical course. Adherence to the following surveillance case definitions will facilitate understanding the epidemiology of this disease across the U.S.

Syphilis, primary (Effective 1/14)

Clinical description

A stage of infection with *Treponema pallidum* characterized by one or more ulcerative lesions (e.g. chancre), which might differ considerably in clinical appearance.

Laboratory criteria for diagnosis

Demonstration of *T. pallidum* in clinical specimens by darkfield microscopy, or by polymerase chain reaction (PCR) or equivalent direct molecular methods.

Case classification

Probable: a case that meets the clinical description of primary syphilis with a reactive serologic test (nontreponemal: Venereal Disease Research Laboratory [VDRL], rapid plasma reagin [RPR], or equivalent serologic methods; treponemal: fluorescent treponemal antibody absorbed [FTA-ABS], *T. pallidum* particle agglutination [TP-PA], enzyme immunoassay [EIA], chemiluminescence immunoassay [CIA], or equivalent serologic methods). These treponemal tests supersede older testing technologies, including microhemagglutination assay for antibody to *T. pallidum* [MHA-TP].

Confirmed: a case that meets the clinical description of primary syphilis that is laboratory confirmed.

Syphilis, secondary (Effective 1/14)

Clinical description

A stage of infection caused by *T. pallidum* characterized by localized or diffuse mucocutaneous lesions (e.g., rash – such as non-pruritic macular, maculopapular, popular, or pustular lesions), often with generalized lymphadenopathy. Other symptoms can include mucous patches, condyloma lata, and alopecia. The primary ulcerative lesion may still be present. Because of the wide array of symptoms possibly indicating secondary syphilis, serologic tests for syphilis and a thorough sexual history and physical examination are crucial to determining if a case should be classified as secondary syphilis.

Laboratory criteria for diagnosis

Demonstration of *T. pallidum* in clinical specimens by darkfield microscopy, or by polymerase chain reaction (PCR) or equivalent direct molecular methods.

Case classification

Probable: a case that meets the clinical description of secondary syphilis with a nontreponemal (VDRL, RPR, or equivalent serologic methods) titer ≥4 and a reactive treponemal test (FTA-ABS, TP-PA, EIA, CIA, or equivalent serologic methods).

Confirmed: a case that meets the clinical description of secondary syphilis (with at least one sign or symptom) that is laboratory confirmed.

Syphilis, early latent (Effective 1/14)

Clinical description

A subcategory of latent syphilis (a stage of infection caused by *T. pallidum* in which organisms persist in the body of the infected person without causing symptoms or signs) when initial infection has occurred within the previous 12 months.

Case classification

Probable: A person with no clinical signs or symptoms of syphilis who has one of the following:

- No past diagnosis of syphilis, and a reactive nontreponemal test (e.g., VDRL, RPR, or equivalent serologic methods), and a reactive treponemal test (e.g., FTA-ABS, TP-PA, EIA, CIA, or equivalent serologic methods), or
- A current nontreponemal test titer demonstrating fourfold or greater increase from the last nontreponemal test titer

AND evidence of having acquired the infection within the previous 12 months based on one or more of the following criteria:

- Documented seroconversion or fourfold or greater increase in titer of a nontreponemal test during the previous 12 months
- Documented seroconversion of a treponemal test during the previous 12 months
- A history of symptoms consistent with primary or secondary syphilis during the previous 12 months
- A history of sexual exposure to a partner within the previous 12 months who had primary, secondary, or early latent syphilis (documented independently as duration <12 months)
- Only sexual contact was within the last 12 months (sexual debut).

There is no confirmed case classification for early latent syphilis.

Syphilis, late latent (Effective 1/14)

Clinical description

A subcategory of latent syphilis (a stage of infection caused by *T. pallidum* in which organisms persist in the body of the infected person without causing symptoms or signs) when initial infection has occurred >12 months previously.

Case classification

Probable: a person with no clinical signs or symptoms of syphilis who has one of the following:

- No past diagnosis of syphilis, and a reactive nontreponemal test (e.g., VDRL, RPR, or equivalent serologic methods), and a reactive treponemal test (e.g., FTA-ABS, TP-PA, EIA, CIA, or equivalent serologic methods), or
- A past history of syphilis therapy and a current nontreponemal test titer demonstrating fourfold or greater increase from the last nontreponemal test titer.

AND who has no evidence of having acquired the disease within the preceding 12 months (see Syphilis, early latent).

There is no confirmed case classification for late latent syphilis.

Neurosyphilis (Effective 1/14)

Neurosyphilis can occur at any stage of syphilis. If the patient has neurologic manifestations of syphilis, the case should be reported with the appropriate stage of infection (as if neurologic manifestations were not present) and neurologic manifestations should be noted in the case report data. If no other stage is appropriate, the case should be staged as "late, with clinical manifestations".

Neurosyphilis can apply to all stages of infection of syphilis listed, including: primary syphilis, secondary syphilis, early latent syphilis, late latent syphilis, and late syphilis with clinical manifestations.

Clinical description

Infection of the central nervous system with *T. pallidum*, as evidenced by manifestations including syphilitic meningitis, meningovascular syphilis, optical involvement including interstitial keratitis and uveitis, general paresis, including dementia, and tabes dorsalis.

Laboratory criteria for diagnosis

- A reactive VDRL in cerebrospinal fluid (CSF) and either (1) a reactive treponemal serologic test for syphilis (e.g., FTA- ABS, TP-PA, EIA, CIA, or equivalent serologic methods) or (2) a reactive nontreponemal serologic test for syphilis (VDRL, RPR, or equivalent serologic method).

Case classification

Probable: syphilis of any stage with a negative VDRL test in CSF specimen and either (1) a reactive treponemal serologic test for syphilis (e.g., FTA-ABS, TP-PA, EIA, CIA, or equivalent serologic methods) or (2) a reactive non-treponemal serologic test for syphilis (VDRL, RPR, or equivalent serologic method), and both of the following:

- Elevated CSF protein (>50 mg/dL2) or leukocyte count (>5 white blood cells/cubic millimeter CSF) in the absence of other known causes of these abnormalities, and
- Clinical symptoms or signs consistent with neurosyphilis without other known causes for these clinical abnormalities.

Confirmed: syphilis of any stage that meets the laboratory criteria for neurosyphilis.

Syphilis, late with clinical manifestations (including late benign syphilis and cardiovascular syphilis) (Effective 1/14)

Clinical description

Clinical manifestations of late syphilis may include inflammatory lesions of the cardiovascular system (e.g., aortitis, coronary vessel disease), skin (e.g., gummatous lesions) bone (e.g., osteitis) or other tissue. Rarely, other structures (e.g., the upper and lower respiratory tracts, mouth, eye, abdominal organs, reproductive organs, lymph nodes, and skeletal muscle) may be involved. Late syphilis usually becomes clinically manifest only after a period of 15–30 years of untreated infection. If only neurologic manifestations of syphilis (e.g., tabes dorsalis, dementia) are present and infection occurred more than 12 months ago, the case should be reported as "late syphilis".

Laboratory criteria for diagnosis

Demonstration of *T. pallidum* in late lesions by special stains (although organisms are rarely visualized in late lesions), or equivalent methods, or by polymerase chain reaction (PCR) or equivalent direct molecular methods.

Case classification

Probable: characteristic abnormalities or lesions of the cardiovascular system (e.g., aortitis, coronary vessel disease), skin (e.g., gummatous lesions), bone (e.g., osteitis), or other tissue and a reactive treponemal test (e.g., FTA-ABS, TP-PA, EIA, CIA, or equivalent serologic methods), in the absence of other known causes of these abnormalities. CSF abnormalities and clinical symptoms or signs consistent with neurologic manifestations of syphilis might be present.

Confirmed: a case that meets the clinical description of late syphilis that is laboratory confirmed.

Syphilis, Congenital (Revised 1/15)

Clinical description

A condition caused by infection in utero with *Treponema pallidum*. A wide spectrum of severity exists, from inapparent infection to severe cases that are clinically apparent at birth. An infant or child (aged less than 2 years) may have signs such as hepatosplenomegaly, rash, condyloma lata, snuffles, jaundice (nonviral hepatitis), pseudoparalysis, anemia, or edema (nephrotic syndrome and/or malnutrition). An older child may have stigmata (e.g., interstitial keratitis, nerve deafness, anterior bowing of shins, frontal bossing, mulberry molars, Hutchinson teeth, saddle nose, rhagades, or Clutton joints).

Laboratory criteria for diagnosis

- Demonstration of *T. pallidum* by darkfield microscopy of lesions, body fluids, or neonatal nasal discharge, or
- Polymerase chain reaction (PCR) or other equivalent direct molecular methods of lesions, placenta, umbilical cord, or autopsy material, or
- Immunohistochemistry (IHC), or special stains (e.g., silver staining) of specimens from lesions, neonatal nasal discharge, placenta, umbilical cord, or autopsy material.

Case classification

Probable: a condition affecting an infant whose mother had untreated or inadequately treated* syphilis at delivery, regardless of signs in the infant, or an infant or child who has a reactive non-treponemal test for syphilis (Venereal Disease Research Laboratory [VDRL], rapid plasma reagin [RPR], or equivalent serologic methods) AND any one of the following:

- Any evidence of congenital syphilis on physical examination (see Clinical description)
- Any evidence of congenital syphilis on radiographs of long bones
- A reactive cerebrospinal fluid (CSF) venereal disease research laboratory (VDRL) test
- In a nontraumatic lumbar puncture, an elevated CSF leukocyte (white blood cell, WBC) count or protein (without other cause):

* Adequate treatment is defined as completion of a penicillin-based regimen, in accordance with CDC treatment guidelines, appropriate for stage of infection, initiated 30 or more days before delivery.

Suggested parameters for abnormal CSF WBC and protein values:

- During the first 30 days of life, a CSF WBC count of >15 WBC/mm3 or a CSF protein >120 mg/dL.
- After the first 30 days of life, a CSF WBC count of >5 WBC mm3 or a CSF protein >40 mg/dL, regardless of CSF serology.
- The treating clinician should be consulted to interpret the CSF values for the specific patient.

Confirmed: a case that is laboratory confirmed.

Syphilitic Stillbirth

Clinical case definition

A fetal death that occurs after a 20-week gestation or in which the fetus weighs greater than 500 g and the mother had untreated or inadequately treated* syphilis at delivery.

Comment

Congenital and acquired syphilis may be difficult to distinguish when a child is seropositive after infancy. Signs of congenital syphilis may not be obvious, and stigmata may not yet have developed. Abnormal values for CSF VDRL, WBC cell count, and protein may be found in either congenital or acquired syphilis. Findings on radiographs of long bones may help because radiographic changes in the metaphysis and epiphysis are considered classic signs of congenitally acquired syphilis. While maternal antibodies can complicate interpretation of serologic tests in an infant, reactive tests past 18 months of age are considered to reflect the status of the child. The decision may ultimately be based on maternal history and clinical judgment. In a young child, the possibility of sexual abuse should be considered as a cause of acquired rather than congenital syphilis, depending on the clinical picture. For reporting purposes, congenital syphilis includes cases of congenitally acquired syphilis among infants and children as well as syphilitic stillbirths.

* Adequate treatment is defined as completion of a penicillin-based regimen, in accordance with CDC treatment guidelines, appropriate for stage of infection, initiated 30 or more days before delivery.

C2. Case Definitions For Non-Notifiable Infectious Diseases

Although the conditions below are not currently nationally notifiable, they may be reportable in some jurisdictions. To provide uniform criteria for those jurisdictions, case definitions are provided by CSTE. Case definitions are periodically revised. The most current surveillance case definitions for non-notifiable STDs are listed below. Please see the NNDSS website (https://wwwn.cdc.gov/nndss/case-definitions.html) for historical case definitions.

C2.1 Genital Herpes (Herpes Simplex Virus) (Revised 9/96)

Clinical description

A condition characterized by visible, painful genital or anal lesions.

Laboratory criteria for diagnosis

- Isolation of herpes simplex virus from cervix, urethra, or anogenital lesion, or
- Demonstration of virus by antigen detection technique in clinical specimens from cervix, urethra, or anogenital lesion, or
- Demonstration of multinucleated giant cells on a Tzanck smear of scrapings from an anogenital lesion.

Case classification

Probable: a clinically compatible case (in which primary and secondary syphilis have been excluded by appropriate serologic tests and darkfield microscopy, when available) with either a diagnosis of genital herpes based on clinical presentation (without laboratory confirmation) or a history of one or more previous episodes of similar genital lesions.

Confirmed: a clinically compatible case that is laboratory confirmed.

Comment

Genital herpes should be reported only once per patient. The first diagnosis for a patient with no previous diagnosis should be reported.

C2.2 Genital Warts (Revised 9/96)

Clinical description

An infection characterized by the presence of visible, exophytic (raised) growths on the internal or external genitalia, perineum, or perianal region.

Laboratory criteria for diagnosis

- Histopathologic changes characteristic of human papillomavirus infection in specimens obtained by biopsy or exfoliative cytology or
- Demonstration of virus by antigen or nucleic acid detection in a lesion biopsy.

Case classification

Probable: a clinically compatible case without histopathologic diagnosis and without microscopic or serologic evidence that the growth is the result of secondary syphilis.

Confirmed: a clinically compatible case that is laboratory confirmed.

Comment

Genital warts should be reported only once per patient. The first diagnosis for a patient with no previous diagnosis should be reported.

C2.3 Granuloma Inguinale

Clinical description

A slowly progressive ulcerative disease of the skin and lymphatics of the genital and perianal area caused by infection with *Calymmatobacterium granulomatis*. A clinically compatible case would have one or more painless or minimally painful granulomatous lesions in the anogenital area.

Laboratory criteria for diagnosis

Demonstration of intracytoplasmic Donovan bodies in Wright or Giemsa-stained smears or biopsies of granulation tissue.

Case classification

Confirmed: a clinically compatible case that is laboratory confirmed.

C2.4 Lymphogranuloma Venereum

Clinical description

Infection with L1, L2, or, L3 serovars of *Chlamydia trachomatis* may result in a disease characterized by genital lesions, suppurative regional lymphadenopathy, or hemorrhagic proctitis. The infection is usually sexually transmitted.

Laboratory criteria for diagnosis

Isolation of *C. trachomatis*, serotype L1, L2, or L3 from clinical specimen, or

- Demonstration by immunofluorescence of inclusion bodies in leukocytes of an inguinal lymph node (bubo) aspirate, or
- Positive microimmunofluorescent serologic test for a lymphogranuloma venereum strain of *C. trachomatis*.

Case classification

Probable: a clinically compatible case with one or more tender fluctuant inguinal lymph nodes or characteristic proctogenital lesions with supportive laboratory findings of a single *C. trachomatis* complement fixation titer of >64.

Confirmed: a clinically compatible case that is laboratory confirmed.

C2.5 Mucopurulent Cervicitis (Revised 9/96)

Clinical description

Cervical inflammation that is not the result of infection with *Neisseria gonorrhoeae* or *Trichomonas vaginalis*. Cervical inflammation is defined by the presence of one of the following criteria:

- Mucopurulent secretion (from the endocervix) that is yellow or green when viewed on a white, cotton-tipped swab (positive swab test)
- Induced endocervical bleeding (bleeding when the first swab is placed in the endocervix).

Laboratory criteria for diagnosis

No evidence of *N. gonorrhoeae* by culture, Gram stain, or antigen or nucleic acid detection, and no evidence of *T. vaginalis* on wet mount.

Case classification

Confirmed: a clinically compatible case in a female who does not have either gonorrhea or trichomoniasis.

Comment

Mucopurulent cervicitis (MPC) is a clinical diagnosis of exclusion. The syndrome may result from infection with any of several agents (see *Chlamydia trachomatis*). If gonorrhea, trichomoniasis, and chlamydia are excluded, a clinically compatible illness should be classified as MPC. An illness in a female that meets the case definition of MPC and *C. trachomatis* infection should be classified as chlamydia.

C2.6 Nongonococcal Urethritis (Revised 9/96)

Clinical description

Urethral inflammation that is not the result of infection with *Neisseria gonorrhoeae*. Urethral inflammation may be diagnosed by the presence of one of the following criteria:

- A visible abnormal urethral discharge, or
- A positive leukocyte esterase test from a male aged <60 years who does not have a history of kidney disease or bladder infection, prostate enlargement, urogenital anatomic anomaly, or recent urinary tract instrumentation, or
- Microscopic evidence of urethritis (≥5 white blood cells per high-power field) on a Gram stain of a urethral smear.

Laboratory criteria for diagnosis

No evidence of *N. gonorrhoeae* infection by culture, Gram stain, or antigen or nucleic acid detection.

Case classification

Confirmed: a clinically compatible case in a male in whom gonorrhea is not found, either by culture, Gram stain, or antigen or nucleic acid detection.

Comment

Nongonococcal urethritis (NGU) is a clinical diagnosis of exclusion. The syndrome may result from infection with any of several agents (see *Chlamydia trachomatis*). If gonorrhea and chlamydia are excluded, a clinically compatible illness should be classified as NGU. An illness in a male that meets the case definition of NGU and *C. trachomatis* infection should be classified as chlamydia.

C2.7 Pelvic Inflammatory Disease (Revised 9/96)

Clinical case definition

A clinical syndrome resulting from the ascending spread of microorganisms from the vagina and endocervix to the endometrium, fallopian tubes, and/or contiguous structures. In a female who has lower abdominal pain and who has not been diagnosed as having an established cause other than pelvic inflammatory disease (PID) (e.g., ectopic pregnancy, acute appendicitis, and functional pain), all the following clinical criteria must be present:

- Lower abdominal tenderness, and
- Tenderness with motion of the cervix, and
- Adnexal tenderness.

In addition to the preceding criteria, at least one of the following findings must also be present:

- Meets the surveillance case definition of *C. trachomatis* infection or gonorrhea
- Temperature >100.4 F (>38.0 C)
- Leukocytosis >10,000 white blood cells/mm3
- Purulent material in the peritoneal cavity obtained by culdocentesis or laparoscopy
- Pelvic abscess or inflammatory complex detected by bimanual examination or by sonography
- Patient is a sexual contact of a person known to have gonorrhea, chlamydia, or nongonococcal urethritis.

Case classification

Confirmed: a case that meets the clinical case definition.

Comment

For reporting purposes, a clinician's report of PID should be counted as a case.

Contributors

We gratefully acknowledge the contributions of state STD project directors, STD program managers, state and territorial epidemiologists, and laboratory directors. The persons listed were in the positions shown as of August 24, 2017.

State/City/Outlying Area	STD Project Directors	STD Program Managers	State Epidemiologists	Laboratory Directors
Alabama	Anthony Merriweather	Anthony Merriweather	Mary McIntyre	Sharon Massingale
Alaska	Susan Jones	Donna Cecere	Joe McLaughlin	Bernard Jilly
Arizona	Roxanne Ereth	Roxanne Ereth	Kenneth Komatsu	Victor Waddell
Arkansas	Rene Montgomery	Brandi Roberts	Dirk Haselow	Glen Baker
California	Heidi Bauer	Romni Neiman	Gilberto Chavez	Paul Kimsey
Los Angeles	Michael Green	Sonali Kulkarni	Gilberto Chavez	Nicole Green
San Francisco	Susan Philip	Trang Nguyen	Gilberto Chavez	Severin Gose (Acting)
Colorado	Melanie Mattson	Rebecca Jordan-Yehle	Lisa Miller	Hugh Maguire (Acting)
Connecticut	Lynn Sosa	Heidi Jenkins	Matthew Cartter	Jafar Razeq
Delaware	Catherine Mosley	Catherine Mosley	Tabatha Offutt-Powell	Sergio Huerta
District of Columbia	Michael Kharfen	Travis Gayles	John Davies-Cole	Morris Blaylock (Acting)
Florida	Craig Wilson	Lisa Thompson	Anna Likos	Carina Blackmore
Georgia	Michelle Allen	LaTasha Terry	Cherie Drenzek	Elizabeth Franko
Hawaii	Peter Whiticar	Gerald "Luke" Hasty, Jr.	Sarah Park	A. Christian Whelen
Idaho	Aimee Shipman	Kimberly Matulonis	Christine Hahn	Christopher Ball
Illinois	Danny Brikshavana	Danny Brikshavana	Constance Austin	E. Matt Charles (Acting)
Chicago	Irina Tabidze	Irina Tabidze	Constance Austin	Massimo Pacilli (QA Manager)
Indiana	Dennis L. Stover	Caitlin Conrad	Pamela Pontones	Judith Lovchik
Iowa	Randy Mayer	George Walton	Patricia Quinlisk	Christopher Atchison
Kansas	Stephanie Green	Stephanie Green	Charles Hunt	N. Myron Gunsalus
Kentucky	Robert Brawley	Chang Lee	Doug Thoroughman	Jeremy Hart
Louisiana	DeAnn Gruber	Chaquetta Johnson	Raoult Ratard	Stephen Martin
Maine	Jayson Hunt	Emer Smith	Siiri Bennett	Kenneth Pote
Maryland	Kenneth Ruby	Marcia Pearlowitz	David Blythe	Robert Myers
Baltimore	Glen Olthoff	Hilda Ndirangu	David Blythe	n/a
Massachusetts	Kathleen Roosevelt	David Goudreau	Alfred DeMaria	Michael Pentella
Michigan	Patricia Villegas	Kristine Judd-Tuinier	Sarah Lyon-Callo	Sandip Shah
Minnesota	Krissie Guerard	Krissie Guerard	Ruth Lynfield	Joanne Bartkus
Mississippi	James Stewart	David Peyton	Thomas Dobbs	Daphne Ware
Missouri	Nicole Massey	Craig Highfill	George Turabelidze	Bill Whitmar
Montana	Cara Murolo	Cara Murolo	Carol Ballew	Ron Paul
Nebraska	Jeri Weberg-Bryce	Jeri Weberg-Bryce	Thomas Safranek	Peter Iwen
Nevada	Andrea Rivers	Elizabeth Kessler	Ihsan Azzam	Yashpal Agrawal (Interim)
New Hampshire	Lindsay Pierce	Lisa Ouellette	Benjamin Chan	Christine Bean
New Jersey	Connie Meyers	Amelia Hamarman	Christina Tan	Onesia Bishop
New Mexico	Andrew Gans	Janine Waters	Michael Landen	Lixia Liu
New York	Alison Muse	Margaret Carroll	Debra Blog	Jill Taylor
New York City	Susan Blank	Kate Washburn	Debra Blog	Jennifer Rakeman
North Carolina	Jacquelyn Clymore	Roger Follas		Scott Zimmerman
North Dakota	Lindsey VanderBusch	Lindsey VanderBusch	Tracy Miller	Myra Kosse
Ohio	Amanda Dennison	Amanda Dennison	Mary DiOrio	Quanta Brown (Acting)
Oklahoma	Jan Fox	Kristen Eberly	Kristy Bradley	S. Terrance Dunn
Oregon	Annick Benson-Scott	Ruth Helsley	Katrina Hedberg	John Fontana
Pennsylvania	Beth Butler	Kristine King	Sharon Watkins	James Lute (Acting)
Philadelphia	Greta Anschuetz	Cherie Walker-Baban	Sharon Watkins	Kerry Buchs

State/City/Outlying Area	STD Project Directors	STD Program Managers	State Epidemiologists	Laboratory Directors
Rhode Island	Thomas Bertrand	Valentina Adamova	Utpala Bandy	Ewa King
South Carolina	Ali B. Mansaray	Bernard Gilliard	Linda Bell	Shahiedy Shahied
South Dakota	Amanda Gill	Amanda Gill	Lon Kightlinger	Timothy Southern
Tennessee	Carolyn Wester	Parul Patel	Tim Jones	Richard Steece
Texas	Shelley Lucas	Tammy Foskey	Linda Gaul	Grace Kubin
Utah	Erin Fratto	Ameila Self	Allyn Nakashima	Robyn Atkinson-Dunn
Vermont	Daniel Daltry	Daniel Daltry	Patsy Kelso/Lori Cragin	Mary Celotti
Virginia	Jeff Stover	Oana Vasiliu	Laurie Forlano	Denise Toney
Washington	Mark Aubin	Mark Aubin	Scott Lindquist/Cathy Wasserman	Romesh Gautom
West Virginia	Pamela Reynolds	Pamela Reynolds	Loretta Haddy	Sharon Lee Cibrik
Wisconsin	Stephanie Smiley	Anthony Wade	Jeffrey Davis	Peter Shult (Acting)
Wyoming	Debi Nelson-Anderson	Brittany Wardle	Tracy Murphy	Sarah Buss
American Samoa	Fara M. Utu	Fetaui V. Saelua	Scott Anesi	Mary Matau
Federated States of Micronesia	Mayleen Ekiek	Mayleen Ekiek	Afeke Kambui	Kessler Lakutak/ Herbert Johnny/ Kasian Otoko/ Maria Marfel
Government of the Marshall Islands	Francyne Wase-Jacklick	Adela Sibok	Lokkas Lakmij	Anne Chang Gum
Northern Marianas (CNMI)	John Dax Moreno	John Dax Moreno	Paul White	Philip Dauterman
Guam	Josephine O'Mallan	Bernadette P. Schumann	Robert Haddock	Josephine O'Mallan
Puerto Rico	Sandra Miranda de Leon	Raymond Perez Rivera	Brenda Rivera-Garcia	Myriam Garcia-Negron
Republic of Palau	Sherilynn Madraisau	Columbo Sakuma	Tmong Cheryl Udui	Francis Termeteet
Virgin Islands	Vanessa Farrell	Vanessa Farrell	Esther Ellis	Joseph Mark

This page intentionally left blank.

This page intentionally left blank.

MEDIA MAIL
POSTAGE & FEES PAID
CDC
Permit No. G-284

U.S. Department of Health & Human Services
Centers for Disease Control and Prevention, MS E-63
Atlanta, Georgia 30329-4027

OFFICIAL BUSINESS
Penalty for Private Use $300