Sexually Transmitted Disease Surveillance 2018

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

Sexually Transmitted Disease Surveillance 2018

Division of STD Prevention
October 2019

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

Virginia Bowen
Jim Braxton
Darlene Davis
Elaine Flagg
Jeremy Grey
LaZetta Grier
Alesia Harvey
Sarah Kidd
Kristen Kreisel
Eloisa Llata
Kerry Mauk
Melissa Pagaoa
Viani Picchetti
Rodney Presley
Philip Ricks
Steven Shapiro
Sancta St. Cyr
Mark Stenger
Elizabeth Torrone
Hillard Weinstock
Emily Weston
Niketta Womack

Others contributing to the production and dissemination of this publication

Division of STD Prevention

Tranita Anderson
Diane Ballard
Gail Bolan
Keith Davis
Jaeyoung Hong
Britney Johnson
Ellen Kersh
Neeraja Lakshmipathy
Jennifer Ludovic
Nikki Mayes
Mary McFarlane
Alejandro Perez
Cau Pham
Tiffani Phelps
Raul Romaguera
Salina Smith
Guoyu Tao
Jo Valentine

National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention
Daniel Johnson
Jacqueline Petty
Rachel Wingard

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

Suggested Citation
Centers for Disease Control and Prevention. *Sexually Transmitted Disease Surveillance 2018*. Atlanta: U.S. Department of Health and Human Services; 2019. DOI: 10.15620/cdc.79370.

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 1997–2017
https://www.cdc.gov/std/stats/archive.htm

STD Data in the NCHHSTP AtlasPlus
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

Gonococcal Isolate Surveillance Project (GISP)
https://www.cdc.gov/std/gisp/default.htm

STD Surveillance Network (SSuN)
https://www.cdc.gov/std/ssun/default.htm

National Health and Nutrition Examination Survey (NHANES)
https://www.cdc.gov/nchs/nhanes/index.htm

This page intentionally left blank.

Foreword

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 two decades later, those facts remain unchanged.

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.

Half of STDs are among young people aged 15 to 24 years.[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. Beyond the impact on an individual's health, STDs are also an economic drain on the US healthcare system, costing billions annually.[3] To complicate the matter, STD public health programs are increasingly facing challenges and barriers in achieving their mission.

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 in future years, 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
US 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.
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.
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 2018 presents statistics and trends for STDs in the United States through 2018. 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 and programs that monitor STDs in various settings, including the National Job Training Program, the STD Surveillance Network, and the Gonococcal Isolate Surveillance Project; and (3) national surveys and other data collection systems implemented by federal and private organizations.

Four STDs are nationally notifiable, chlamydia, gonorrhea, syphilis, and chancroid, and state and local STD control programs provide CDC with case reports for these conditions. These case reports are the data source for many of the figures and most of the statistical tables in this publication; however, it is important to note that these case reports reflect only a portion of STDs occurring in the US population. First, other common STDs, such as human papillomavirus (HPV) and herpes simplex virus (HSV) are not nationally notifiable diseases. Additionally, STDs are often asymptomatic and may not be diagnosed; therefore, case report data underestimate the number of infections that occurred.

In January 2018, a revised case definition for syphilis went into effect, including changing the stage previously termed "early latent syphilis" to "syphilis, early non-primary non-secondary". This change in terminology more accurately reflects this stage of infection, as neurologic symptoms, including ocular syphilis, can occur at this stage. Additionally, the stages of "late latent syphilis" and "late syphilis with clinical manifestations" were removed and "syphilis, unknown duration or late" was added. More information on syphilis morbidity reporting and the current case definition can be found in Appendices A and C of this report.

Sexually Transmitted Disease Surveillance 2018 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, Congressional Budget Justification 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 US12–2
Atlanta, Georgia 30329–4027

This page intentionally left blank.

Guide to Acronyms

ACIP	Advisory Committee on Immunization Practices
AI/AN	American Indians/Alaska Natives
ARLN	Antibiotic Resistance Laboratory Network
APC	annual percent change
AS	American Samoa
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
CT	chlamydia
ED	emergency department
EIA	enzyme immunoassay
EP	ectopic pregnancy
FDA	Food and Drug Administration
FTA-ABS	fluorescent treponemal antibody absorbed
GC	gonorrhea
GISP	Gonococcal Isolate Surveillance Project
GU	Guam
HCUP	Healthcare Cost and Utilization 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
HSV	herpes simplex virus
HSV-1	herpes simplex virus type 1
HSV-2	herpes simplex virus type 2
IHC	immunohistochemistry
MHA-TP	microhemagglutination assay for antibody to *Treponema pallidum*
MICs	minimum inhibitory concentrations
MP	Northern Mariana Islands
MPC	mucopurulent cervicitis
MSAs	metropolitan statistical areas
MSM	gay, bisexual, and other men who have sex 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
NEDSS	National Electronic Disease Surveillance System
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
PR	Puerto Rico
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
VI	Virgin Islands
WBC	white blood cell

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

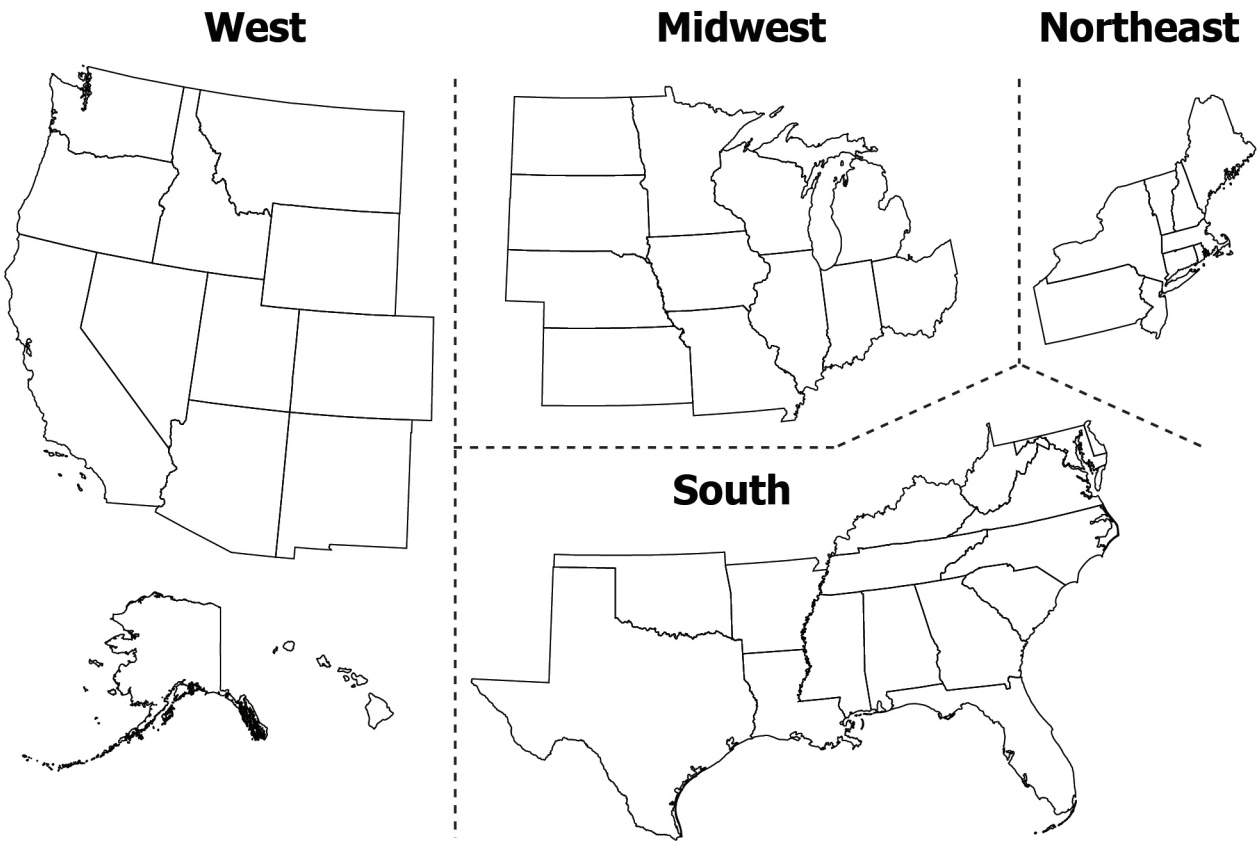
Syphilis

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 notifiable STDs (chlamydia, gonorrhea, syphilis, and chancroid) by age, sex, race/Hispanic ethnicity, and location for the United States.

National Overview of STDs, 2018

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 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 take sexual histories as a part of routine preventive exams to assess patients' risks and identify STD testing and treatment opportunities. Parents can talk to their children about STDs and sexual health. Individuals can discuss ways to protect their health with sexual partners, including using condoms consistently and correctly. 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 report provides trends in STDs to inform prevention and control strategies. This overview summarizes national surveillance data for 2018 on the three notifiable diseases for which there are federally funded control programs: chlamydia, gonorrhea, and syphilis.

Chlamydia

In 2018, a total of 1,758,668 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 539.9 cases per 100,000 population, an increase of 2.9% compared with the rate in 2017. During 2017–2018, rates of reported chlamydia increased among both males and females, in all regions of the United States, and among all racial/Hispanic ethnicity groups.

Rates of reported chlamydia are highest among adolescent and young adults. In 2018, almost two-thirds of all reported chlamydia cases were among persons aged 15–24 years. Among females aged 15–24 years, the population targeted for chlamydia screening, the overall rate of reported cases of chlamydia was 3,693.6 cases per 100,000 females, an increase of 1.0% from 2017 and of 11.8% from 2014.

Although rates of reported cases among men are generally lower than rates among women, reflecting the larger number of women screened for this infection, rates among men

increased 37.8% during 2014–2018. Increases in rates among men may reflect an increased number of men, including gay, bisexual, and other men who have sex with men (MSM) being tested and diagnosed with a chlamydial infection due to increased availability of urine testing and extragenital screening, increased transmission among men, or both.

Gonorrhea

In 2018, a total of 583,405 cases of gonorrhea were reported to the CDC, making it the second most common notifiable condition in the United States. Rates of reported gonorrhea have increased 82.6% since the historic low in 2009. During 2017–2018, the overall rate of reported gonorrhea increased 5.0%, and rates increased among both males and females, in all regions of the United States, and among all racial/Hispanic ethnicity groups.

Since 2013, the rate of reported gonorrhea has been higher among men compared to women. Among men, the rate of reported gonorrhea increased 6.0% during 2017–2018 and 78.7% during 2014–2018, while rates among women increased 3.6% during 2017–2018 and 45.2% during 2014–2018. The higher case rate among men and the magnitude of recent increases suggests either increased transmission, increased case ascertainment (e.g., through increased extra-genital screening among MSM), or both. The concurrent increase in cases reported among women suggests parallel increases in heterosexual transmission, increased screening among women, or both.

Gonorrhea can quickly develop resistance to antibiotics used to treat infection, and in 2018, more than half of all infections were estimated to be resistant to at least one antibiotic. Since 2009, almost all circulating strains in the United States, based on gonococcal isolates collected through sentinel surveillance, remain susceptible to ceftriaxone, the primary treatment for gonorrhea;[2] only 0.2% of isolates displayed elevated ceftriaxone minimum inhibitory concentrations in 2018. Continued monitoring of susceptibility patterns to antibiotics is critical to inform treatment gonorrhea guidelines.

Syphilis

In 2018, 115,045 cases of all stages of syphilis were reported, including 35,063 cases of primary and secondary (P&S) syphilis, the most infectious stages of the disease. Since reaching a historic low in 2000 and 2001, the rate of P&S syphilis has increased almost every year, increasing 14.9% during 2017–2018. Rates increased among both males and females, in all regions of the United States, and among all racial/Hispanic ethnicity groups.

Since 2000, rates of P&S syphilis have increased among men, primarily attributable to increases in cases among MSM. Similar to past years, in 2018, MSM accounted for the majority (53.5%) of all reported cases of P&S syphilis and, of these, 41.6% were known to be living with diagnosed HIV. Although rates of P&S syphilis are lower among women, rates have increased substantially in recent years, increasing 30.4% during 2017–2018 and 172.7% during 2014–2018, suggesting a rapidly growing heterosexual epidemic.

The 2013 rate of congenital syphilis (9.2 cases per 100,000 live births) marked the first increase in congenital syphilis since 2008. Since 2013, the rate of congenital syphilis has increased each year. In 2018, 1,306 cases of congenital syphilis were reported. Although the majority of cases were reported from a few states, 41 states reported at least one case of congenital syphilis in 2018. The national rate of 33.1 cases per 100,000 live births in 2018 represents a 39.7% increase relative to 2017 and a 185.3% increase relative to 2014. During 2017–2018 the number of syphilitic stillbirths increased (from 64 to 78 stillbirths), as did the number of congenital syphilis related infant deaths (from 13 to 16 deaths).

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.
2. Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2015. *MMWR Recomm 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 civilian, non-institutionalized US 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.[6] 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).[7]

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 48.9% in 2017. Among sexually-active women aged 16–24 years covered by Medicaid, screening rates increased from 40.4% in 2001 to 57.6% in 2017.[8] 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.

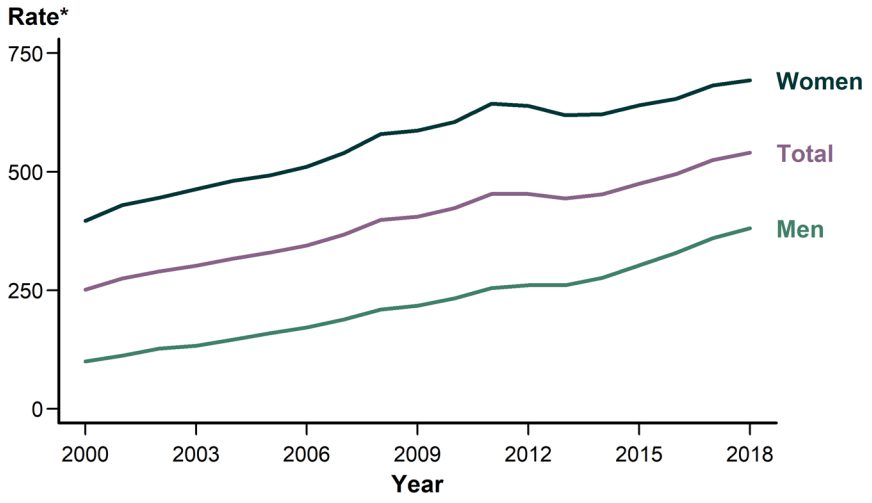
Chlamydia — United States

In 2018, a total of 1,758,668 chlamydial infections were reported to CDC in 50 states and the District of Columbia (Table 1). This case count corresponds to a rate of 539.9 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 five years. During 2017–2018, the rate increased 2.9%, from 524.6 to 539.9 cases per 100,000 population (Figure 1, Table 1).

Chlamydia by Region

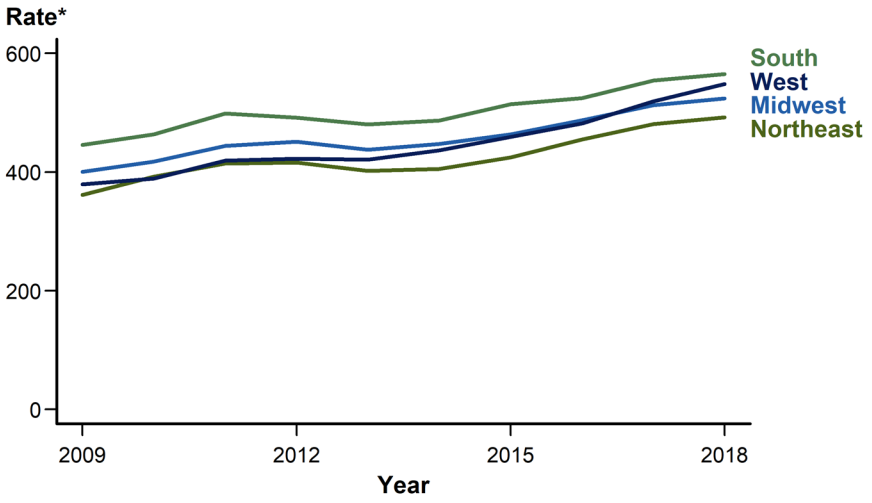
In 2018, rates of reported cases of chlamydia were highest in the South (565.2 cases per 100,000 population, 1.9% increase from 2017), followed by the West (548.5, 5.6% increase from 2017), Midwest (524.0, 2.2% increase from 2017), and Northeast (492.1, 2.3% increase from 2017) (Table 3). During 2009–2018, 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. Rates started increasing in 2013, and have increased in all regions over each of the last five years. During 2014–2018, the largest increase occurred in the West (436.4 to 548.5 cases per 100,000 population, 25.7% increase) (Figure 2, Table 3).

Figure 1. Chlamydia — Rates of Reported Cases by Sex, United States, 2000–2018



* Per 100,000.
NOTE: See sections A1.3 and A1.8 in the Appendix for more information on chlamydia case reporting and interpreting trends in chlamydia case reports.

Figure 2. Chlamydia — Rates of Reported Cases by Region, United States, 2009–2018



* Per 100,000.

Chlamydia by State

In 2018, rates of reported cases of chlamydia by state ranged from 198.2 cases per 100,000 population in West Virginia to 832.5 cases per 100,000 population in Alaska (Figure 3, Table 2); the rate for the District of Columbia was 1,298.9 cases per 100,000 population (Table 3). During 2017–2018, rates of reported chlamydia cases increased in 40 states. The rate of reported chlamydia cases in 2018 was above the US total in 21 states (Table 2).

Chlamydia by Metropolitan Statistical Area

The overall rate of reported cases of chlamydia for the 50 most populous metropolitan statistical areas (MSAs) increased 3.0% during 2017–2018 (from 555.7 to 572.1 cases per 100,000 population) (Table 6). In 2018, 58.5% of chlamydia cases were reported by these MSAs. During 2017–2018, the rate of reported cases of chlamydia in these MSAs increased 1.3% among females (from 697.0 to 706.0 cases per 100,000 females) and 6.0% among males (from 406.7 to 430.9 cases per 100,000 males) (Tables 7 and 8).

Chlamydia by County

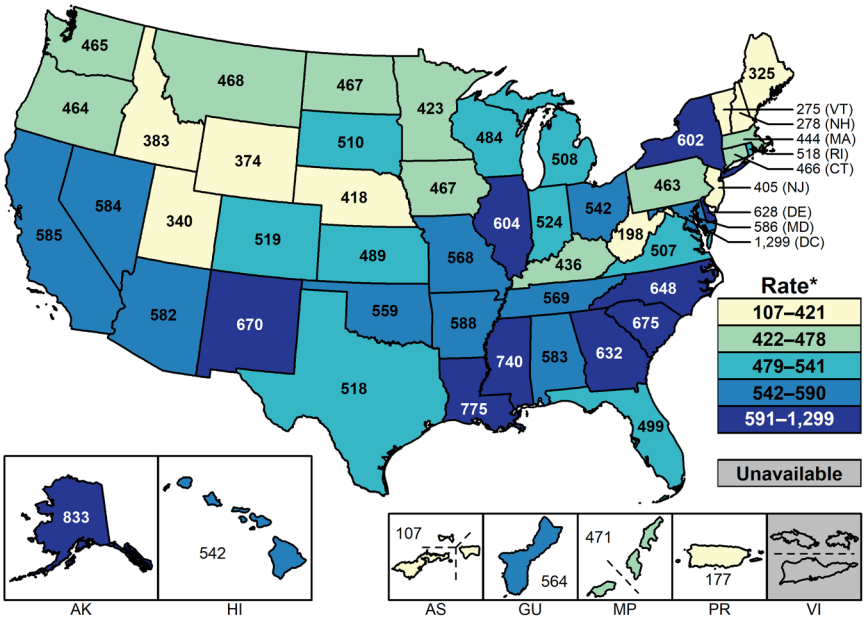
In 2018, 628 (20.0%) of 3,142 counties had rates of reported chlamydia at or higher than 560 cases per 100,000 population (Figure 4). Seventy counties and independent cities reported 44% of all chlamydia cases in 2018 (Table 9). Of the 70 counties and independent cities reporting the highest number of chlamydia cases, 47 (67.1%) were located in the South and West (Table 9).

Chlamydia by Sex

In 2018, 1,145,063 cases of chlamydia were reported among females for a rate of 692.7 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 five years (Figure 1, Table 4). The total rate increase during 2014–2018 among females was 11.4%.

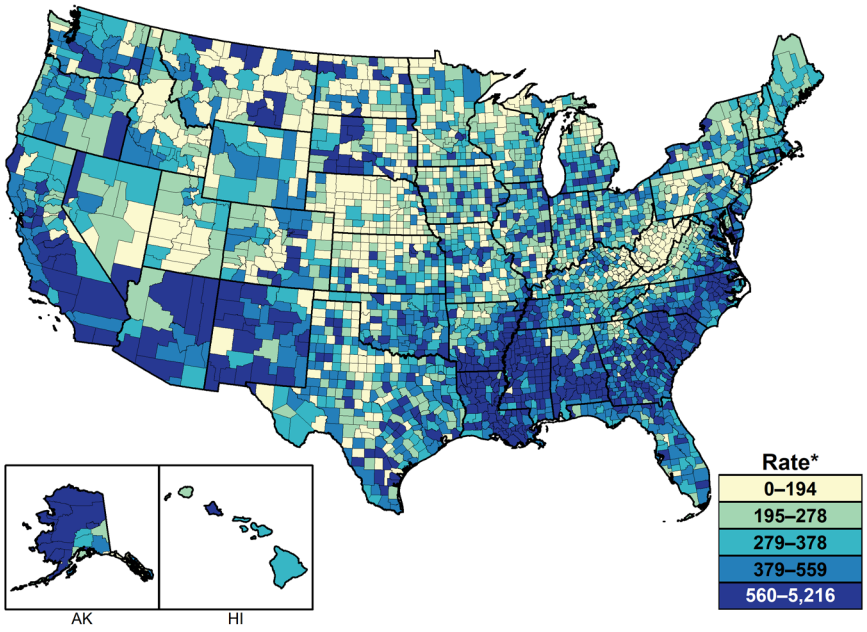
Among males, 610,447 cases of chlamydia were reported in 2018 for a rate of 380.6 cases per 100,000 males (Table 5). The rate of reported cases among males increased each year

Figure 3. Chlamydia — Rates of Reported Cases by State and Territory, United States, 2018



* Per 100,000.
NOTE: See Section A1.11 in the Appendix for more information on interpreting reported rates in US territories.

Figure 4. Chlamydia — Rates of Reported Cases by County, United States, 2018



* Per 100,000.
NOTE: See section A1.5 in the Appendix for more information on county-level rates.

during 2000–2018, with the exception of 2012–2013, when rates remained stable (Figure 1). During 2017–2018 alone, the rate among males increased 5.7%; during 2014–2018, rates of reported cases among males increased 37.8% (Tables 4 and 5). This pronounced increase among males could be attributed to either increased transmission or improved case identification (e.g., through intensified extra-genital screening efforts) among gay, bisexual, and other men who have sex with men (MSM). This cannot be assessed, however, as most jurisdictions do not routinely report sex of sex partners or anatomic site of infection for cases of chlamydia.

Despite this considerable increase in males, the rate of reported chlamydia cases among females was still about two times the rate among males in 2018, likely reflecting a larger number of females screened for this infection (Figure 1, Tables 4 and 5). The lower rate among males also suggests that many of the sex partners of females 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 were highest among adolescents and young adults aged 15–24 years during 2014–2018 (Table 10). In 2018, the age-specific rate of reported cases of chlamydia among 15–19 year olds was 2,110.6 cases per 100,000 population and the rate among 20–24 year olds was 2,899.2 cases per 100,000 population (Table 10).

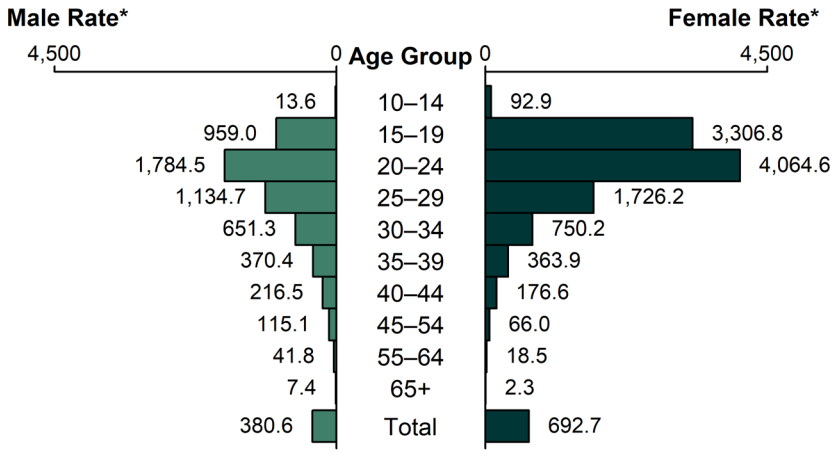
In 2018, 97.4% of all reported chlamydia cases in females were among those aged 15–44 years (Table 10). The highest age-specific rates of reported cases of chlamydia in 2018 were among those aged 15–19 years (3,306.8 cases per 100,000 females) and 20–24 years (4,064.6 cases per 100,000 females) (Figure 5, Table

10). Within these age groups, rates were highest among women aged 19 years (5,485.8 cases per 100,000 females) and 20 years (5,309.8 cases per 100,000 females) (Table 12A).

Increases have been observed in recent years in rates of reported cases of chlamydia among all age groups in females aged 15–44 years (Figure 6). The rate among 15–19 year old females increased 1.3% during 2017–2018, with a total increase of 12.1% during 2014–2018 (2,949.3 to 3,306.8 cases per 100,000 females) (Table 10). The rate among 20–24 year old females increased 0.8% during 2017–2018, with a total increase of 11.9% during 2014–2018 (3,632.7 to 4,064.6 cases per 100,000 females) (Table 10).

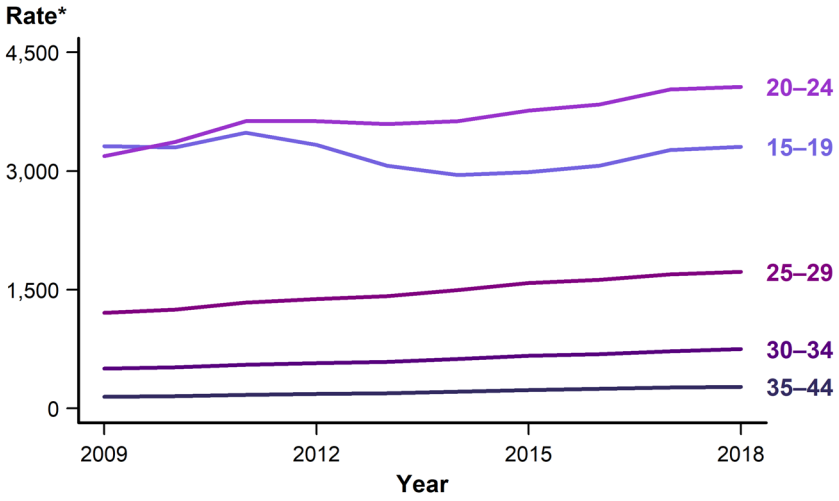
In 2018, 94.0% of all reported chlamydia cases in males were among those aged 15–44 years (Table 10). The age-specific rates of reported cases of chlamydia among males, although substantially lower than rates among females, were highest in those aged 20–24 years (1,784.5 cases per 100,000 males) (Figure 5, Table 10). Similar to trends in females, increases have been observed in rates of reported cases of chlamydia among all age groups in males aged 15–44 years, although for males these increases have been more pronounced (Figure 7). The rate among 15–19 year olds increased 3.7% during 2017–2018, with a total increase of 32.8% during 2014–2018 (from 722.4 to 959.0 cases per 100,000 males). The rate among 20–24 year old males increased 3.3% during 2017–2018, with a total increase of 31.1% during 2014–2018 (1,361.3 to 1,784.5 cases per 100,000 males) (Table 10).

Figure 5. Chlamydia — Rates of Reported Cases by Age Group and Sex, United States, 2018



* Per 100,000.

Figure 6. Chlamydia — Rates of Reported Cases Among Females Aged 15–44 Years by Age Group, United States, 2009–2018



* Per 100,000.

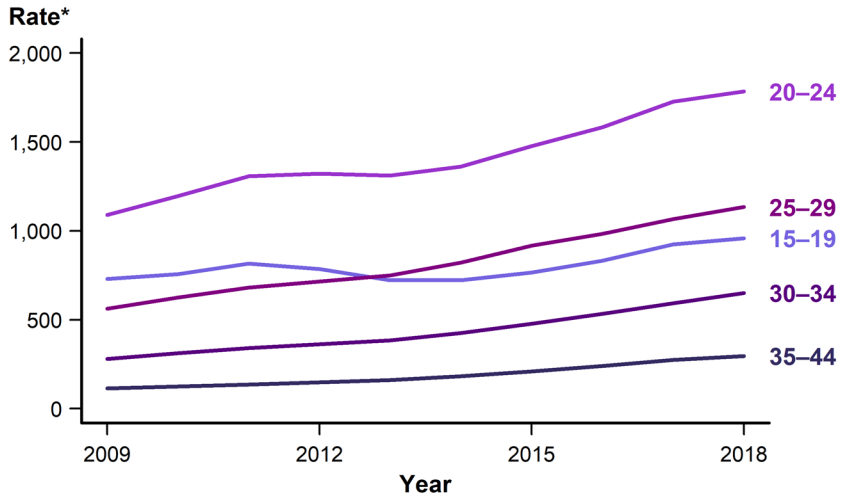
Chlamydia by Race/Hispanic Ethnicity

In 2018, rates of reported cases of chlamydia were highest among Black, American Indian/Alaska Native (AI/AN), and Native Hawaiian/Other Pacific Islander (NHOPI) persons (Figure S, Table 11B). Overall, the rate of reported cases of chlamydia among Blacks was 5.6 times the rate among Whites (1,192.5 and 212.1 cases per 100,000 population, respectively). The rate among AI/ANs (784.8 cases per 100,000 population) was 3.7 times the rate among Whites. The rate among NHOPIs (700.8 cases per 100,000 population) was 3.3 times the rate among Whites. The rate among Hispanics (392.5 cases per 100,000 population) was 1.9 times the rate among Whites. The rate among Asians (132.1 cases per 100,000 population) was 0.6 times the rate among Whites.

During 2014–2018, rates of reported chlamydia cases increased among all racial/Hispanic ethnicity groups, with AI/ANs increasing 7.0%, Hispanics 8.1%, Blacks 9.0%, Whites 17.6%, NHOPIs 20.1%, Asians 29.3%, and Multirace 59.7% (Figure 8). During 2017–2018, rates increased among some racial/Hispanic ethnicity groups (Whites: 0.3%, AI/ANs: 1.1%, Blacks: 2.5%, Asians: 5.7%, and Multirace: 16.4%), and decreased among others (NHOPIs: -0.4% and Hispanics: -0.4%).

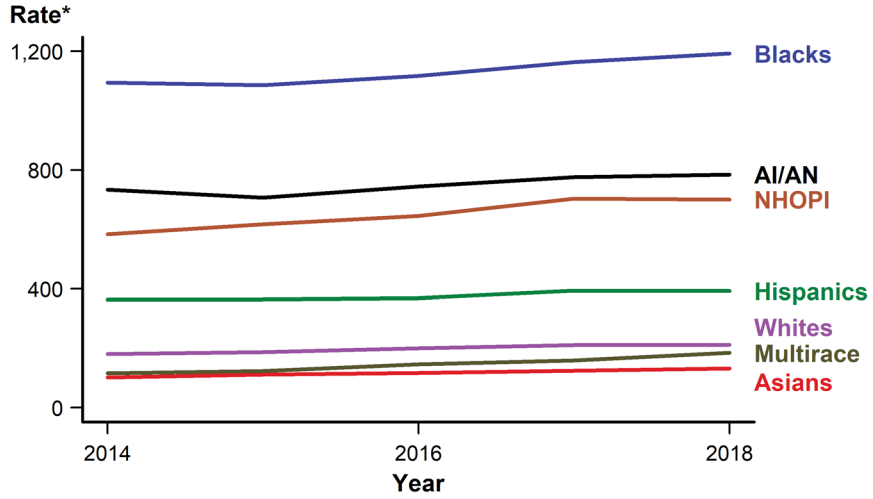
More information on chlamydia rates among race/Hispanic ethnicity groups can be found in the Special Focus Profiles, STDs in Racial and Ethnic Minorities.

Figure 7. Chlamydia — Rates of Reported Cases Among Males Aged 15–44 Years by Age Group, United States, 2009–2018



* Per 100,000.

Figure 8. Chlamydia — Rates of Reported Cases by Race/Hispanic Ethnicity, United States, 2014–2018



* Per 100,000.

NOTE: See Section A1.5 in the Appendix for information on reporting STD case data for race/Hispanic ethnicity.

ACRONYMS: AI/AN = American Indians/Alaska Natives; NHOPI = Native Hawaiians/Other Pacific Islanders.

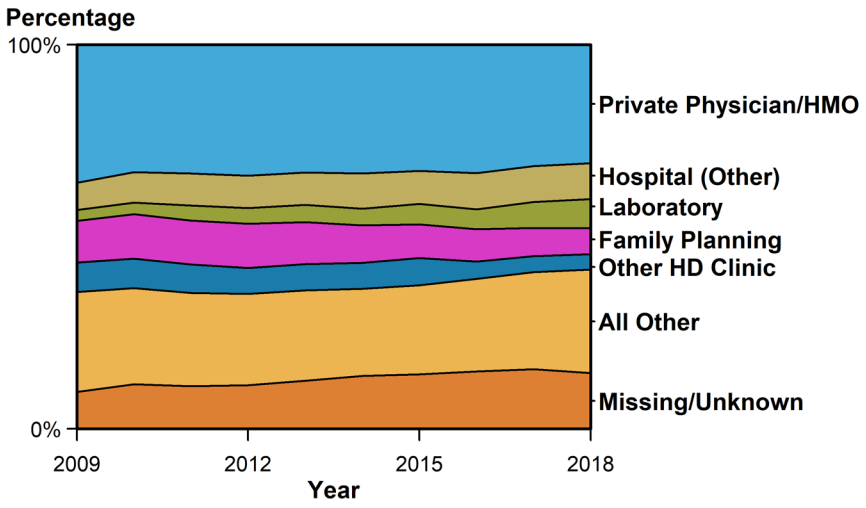
Chlamydia by Reporting Source

In 2018, 5.2% of chlamydia cases were reported from STD clinics, 80.2% were reported from venues outside of STD clinics, and 14.6% had an unknown reporting source (Table A2). In 2018, among females, only 3.5% of chlamydia cases were reported through an STD clinic, with a large proportion of cases (30.9%) being reported from a private physician/HMO (Figure 9 and Table A2). Over time, the proportion of male cases reported from STD clinic sites has decreased substantially, from 30.1% in 2009 to 8.6% in 2018 (Figure 10). Nearly one quarter (24.0%) of male cases were reported from a private physician/HMO.

Chlamydia Prevalence in the Population

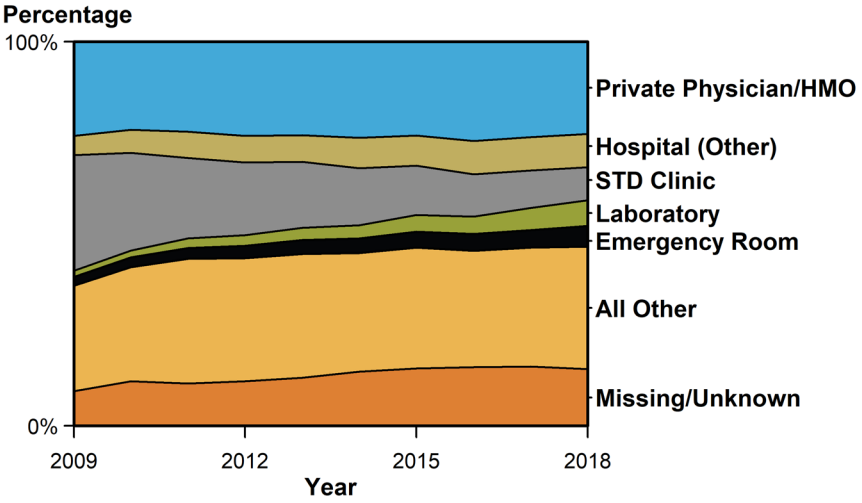
The National Health and Nutrition Examination Survey (NHANES; see Section A2.4 in the Appendix) is a nationally representative survey of the US civilian, non-institutionalized population that provides an important measure of chlamydia disease burden in respondents aged 14–39 years. During 2013–2016, the overall prevalence of chlamydia among persons aged 14–39 years was 1.7% (95% Confidence Interval [CI]: 1.3–2.1) (Figure 11). Among sexually-active females aged 14–24 years, the population targeted for screening, prevalence was 4.3% (95% CI: 2.7–5.8), with the highest prevalence among Mexican American females (10.0%, 95% CI: 4.0–15.9) (Figure 12).

Figure 9. Chlamydia — Percentage of Reported Cases Among Females by Reporting Source*, United States, 2009–2018



* See section A1.7 in the Appendix for information on classification of reporting sources and a full list of reporting sources.
ACRONYMS: HMO = Health maintenance organization; HD = Health department.

Figure 10. Chlamydia — Percentage of Reported Cases Among Males by Reporting Source*, United States, 2009–2018



* See section A1.7 in the Appendix for information on classification of reporting sources and a full list of reporting sources.
ACRONYMS: HMO = Health maintenance organization.

Chlamydia Positivity in Selected Populations

The STD Surveillance Network (SSuN) is an ongoing collaboration of state, county, and city health departments conducting sentinel and enhanced surveillance activities. These include collecting enhanced clinical and behavioral information among all patients attending selected STD clinics, among women aged 15–44 years in selected reproductive health clinics, and conducting enhanced patient and provider investigations on a representative sample of gonorrhea cases diagnosed and reported from all reporting sources in their jurisdiction (See Section A2.2 of the Appendix).

In 2018, the proportion of STD clinic patients testing positive for chlamydia varied by sex and sex of sex partners, as well as age. Women and men who have sex with women only (MSW) aged ≤19 years had the highest positivity; positivty was nearly equal at 30.6% and 30.5%, respectively (Figure 13). Positivity among all those tested decreased with age, though the decrease in positivity by age was not as pronounced for MSM (Figure 13). The overall positivity, represented by the average of the mean value by the contributing SSuN jurisdictions, was 16.9% for MSM, 13.8% for MSW, and 10.9% for women.

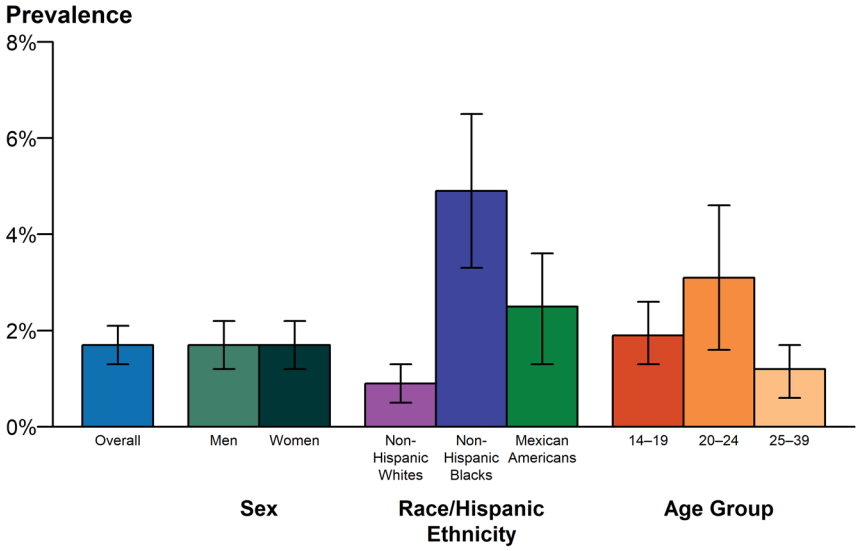
Chlamydia Among Special Populations

More information on chlamydia among females of reproductive age, adolescents and young adults, MSM, and racial and ethnic minorities can be found in the Special Focus Profiles.

Chlamydia Summary

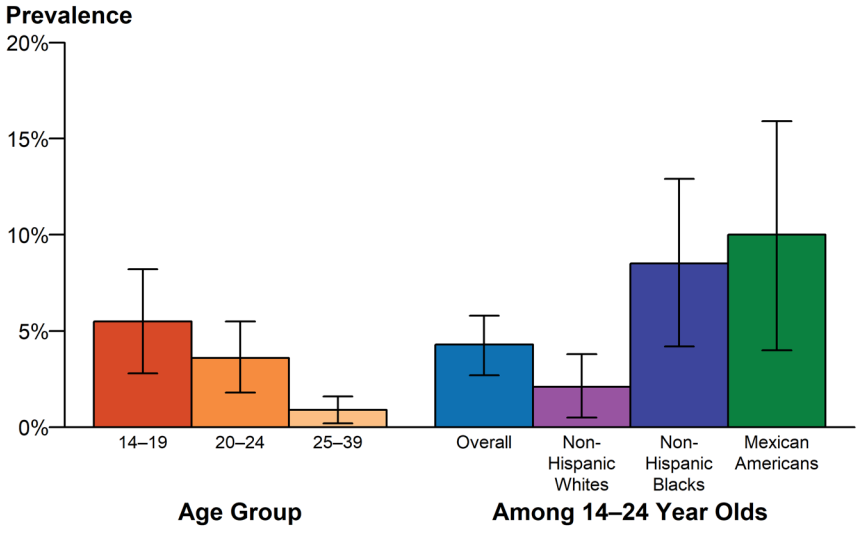
Chlamydia continues to be the most commonly reported nationally notifiable disease, with 1,758,668 cases reported in 2018 and increasing rates of reported cases over each of the last five years. While the rate of reported chlamydia cases increased just 2.9% during 2017–2018, the rate increased 19.4% during 2014–2018. The Southern region of the US reported the highest rate of chlamydial infection in 2018; the West reported the largest rate increase during 2017–2018. In 2018, similar to prior years, the rate of reported cases of chlamydia in females was nearly two times the rate in males. However, during 2014–2018, the rate in males

Figure 11. Chlamydia — National Estimates of Prevalence Among Persons Aged 14–39 Years by Sex, Race/Hispanic Ethnicity, or Age Group, National Health and Nutrition Examination Survey (NHANES), 2013–2016



NOTE: Error bars indicate 95% confidence intervals. Overall prevalence estimates include all race/Hispanic ethnicity groups, including those not shown separately.
ADAPTED FROM: 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 12. Chlamydia — National Estimates of Prevalence Among Sexually-Active Females Aged 14–39 Years by Race/Hispanic Ethnicity and Age Group, National Health and Nutrition Examination Survey (NHANES), 2013–2016



NOTE: Error bars indicate 95% confidence intervals. Overall prevalence estimates include all race/Hispanic ethnicity groups, including those not shown separately.
ADAPTED FROM: 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.

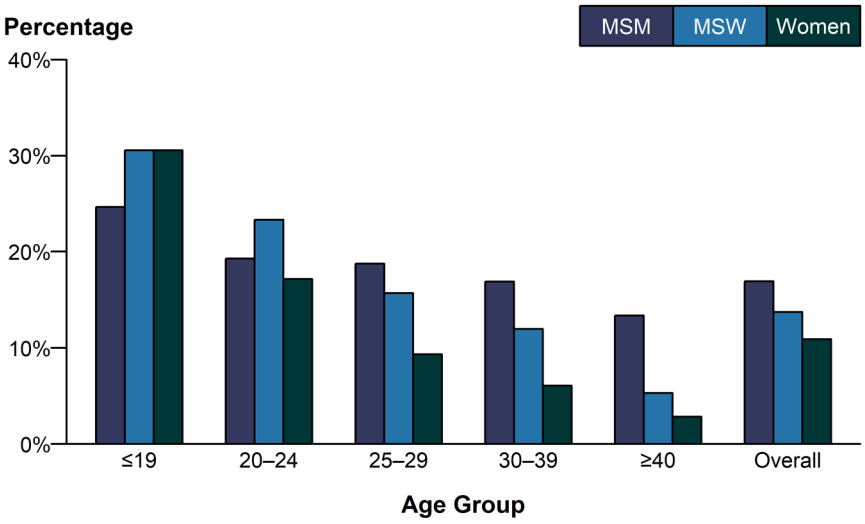
increased 37.8%, whereas the rate in females increased only 11.4%. Potential reasons for this considerable increase in male cases could be due to a true increase in infections or to improved screening coverage in males, especially increased extra-genital screening in MSM, or both.

The facilities reporting chlamydial infections have changed over the last 10 years with most (80.2%) chlamydia cases in 2018 reported from venues outside of STD clinics. The proportion of males being diagnosed with chlamydia in STD clinics decreased 71.4% from 30.1% in 2009 to 8.6% in 2018. In females, approximately one-third of chlamydia cases were reported in 2018 from a private physician/HMO, while only 3.5% were reported from STD clinics. Racial differences also persist. Reported case rates among Blacks continue to be substantially higher than among all other racial/Hispanic ethnicity groups, although rates have increased substantially among all racial/Hispanic ethnicity groups over the last five years. Ultimately, both test positivity and the number of reported cases of *C. trachomatis* infections remain high among younger age groups, and most racial/Hispanic ethnicity groups, geographic areas, and both sexes.

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 Morb Mortal Wkly Rep.* 2014;63(38):834–838.
2. Stamm WE. *Chlamydia trachomatis* infections in the adult. In: Holmes KK, Sparling PF, Stamm WE, et al., eds. *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. 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.

Figure 13. Chlamydia — Proportion of STD Clinic Patients Testing Positive* by Age Group and Sex and Sex of Sex Partners, STD Surveillance Network (SSuN), 2018



* Results are based on unique patients with known sex of sex partners (n=83,691) attending SSuN STD clinics who were tested ≥1 time for chlamydia in 2018.
NOTE: See Section A2.2 in the Appendix for SSuN methods.
ACRONYMS: MSM = Gay, bisexual, and other men who have sex with men; MSW = Men who have sex with women only.

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. Hammerschlag MR, Chandler JW, Alexander ER, et al. Longitudinal studies of chlamydial infection in the first year of life. *Pediatr Infect Dis.* 1982;1(6):395–401.
7. Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2015. *MMWR Recomm Rep.* 2015;64(No. RR–3):1–137.
8. National Committee for Quality Assurance. The State of Healthcare Quality: Chlamydia Screening in Women (CHL). Available at: https://www.ncqa.org/hedis/measures/chlamydia-screening-in-women/. Accessed July 24, 2019.

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 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]

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 in 2015 to the current CDC-recommended regimen of ceftriaxone (an injectable cephalosporin) and azithromycin.[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.

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.

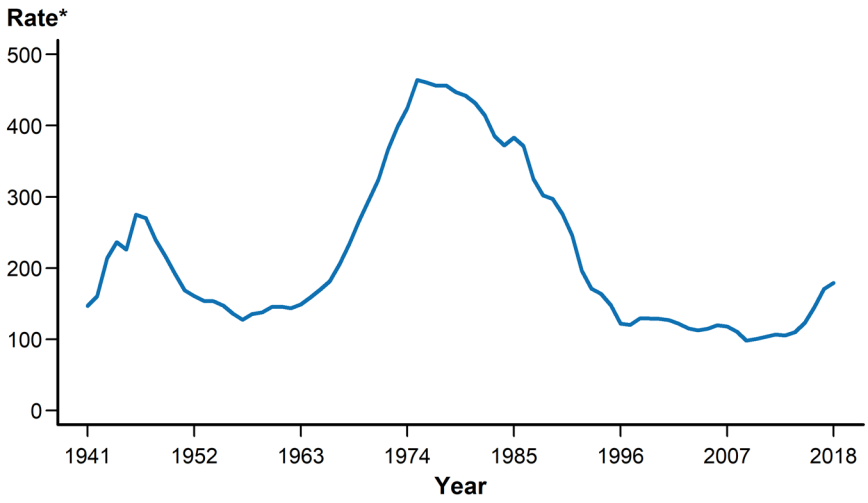
Gonorrhea — United States

In 2018, a total of 583,405 cases of gonorrhea were reported in the United States, yielding a rate of 179.1 cases per 100,000 population (Figure 14, Table 1). During 2017–2018, the rate of reported gonorrhea cases increased 5.0%, and increased 82.6% since the historic low in 2009.

Gonorrhea by Region

The South had the highest rate of reported gonorrhea cases (194.4 cases per 100,000 population) among the four regions of the United States in 2018, followed by the Midwest (184.5 cases per 100,000 population), the West (179.7 cases per 100,000 population), and the Northeast (138.4 cases per 100,000 population) (Figure 15, Table 14). During 2017–2018, the gonorrhea rate increased in all four

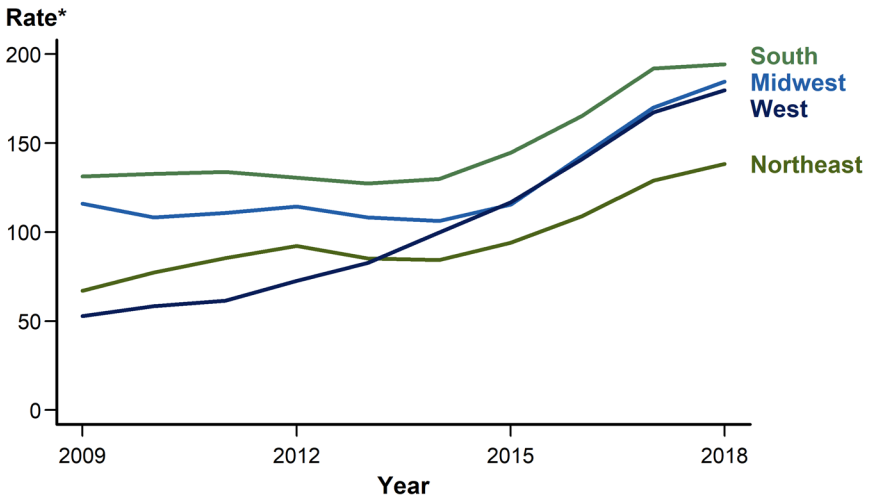
Figure 14. Gonorrhea — Rates of Reported Cases by Year, United States, 1941–2018



* Per 100,000.

NOTE: See section A1.3 in the Appendix for more information on gonorrhea case reporting.

Figure 15. Gonorrhea — Rates of Reported Cases by Region, United States, 2009–2018



* Per 100,000.

regions: 8.5% in the Midwest, 7.4% in the West, 7.3% in the Northeast, and 1.3% in the South (Figure 15, Table 14). During 2014–2018, the rate of gonorrhea in the West increased by 79.9% (99.9 to 179.7 cases per 100,000 population) and the rate in the Midwest increased by 73.7% (106.2 to 184.5 cases per 100,000 population), while the Northeast and South had lower overall increases during this time period (64.0% and 49.7%, respectively).

Gonorrhea by State

In 2018, rates of reported gonorrhea cases per 100,000 population ranged by state from 43.0 in Vermont to 326.7 in Mississippi; the gonorrhea rate in the District of Columbia was 611.0 cases per 100,000 population (Figure 16, Tables 13 and 14).

During 2017–2018, gonorrhea rates increased in 40 states (78.4%) and decreased in 10 states and the District of Columbia (21.6%) (Table 14).

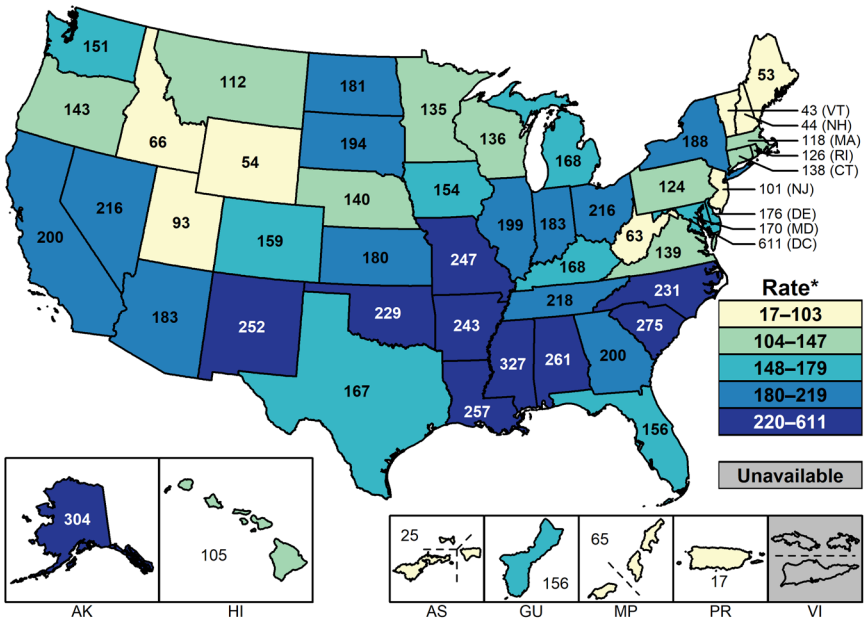
Gonorrhea by Metropolitan Statistical Area

The overall rate of reported gonorrhea cases in the 50 most populous metropolitan statistical areas (MSAs) was 194.9 cases per 100,000 population in 2018, representing a 2.9% increase compared with the rate in 2017 (189.4 cases per 100,000 population) (Table 17). In 2018, 60.1% of reported gonorrhea cases were reported by these MSAs. Since 2014, the gonorrhea rate among females in the 50 most populous MSAs has been lower than the rate among males (Tables 18 and 19). In 2018, the rate among females in these MSAs was 139.0 cases per 100,000 females, while the rate among males was 252.5 cases per 100,000 males.

Gonorrhea by County

In 2018, 93.4% of all counties in the United States reported at least one case of gonorrhea; however, 49.0% of reported gonorrhea cases occurred in just 70 counties or independent cities (Figure 17). The rate ranged from 0.0 to 30.0 cases per 100,000 population in 627 counties (20.0%), from 31.0 to 60.0 cases per 100,000 population in 625 counties (20.0%), from 61.0 to 102.0 cases per 100,000 population in

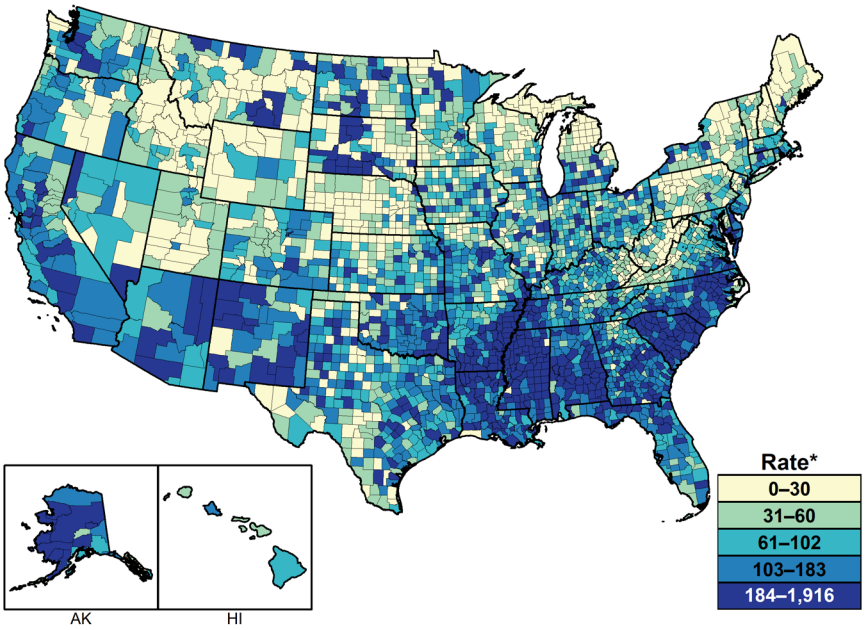
Figure 16. Gonorrhea — Rates of Reported Cases by State and Territory, United States, 2018



* Per 100,000.

NOTE: See Section A1.11 in the Appendix for more information on interpreting reported rates in US territories.

Figure 17. Gonorrhea — Rates of Reported Cases by County, United States, 2018



* Per 100,000.
NOTE: See section A1.4 in the Appendix for more information on county-level rates.

629 counties (20.0%), from 103.0 to 183.0 cases per 100,000 population in 628 counties (20.0%), and was 184.0 cases per 100,000 population or more in 633 counties (20.1%). As in previous years, counties with the highest gonorrhea rates were concentrated in the South.

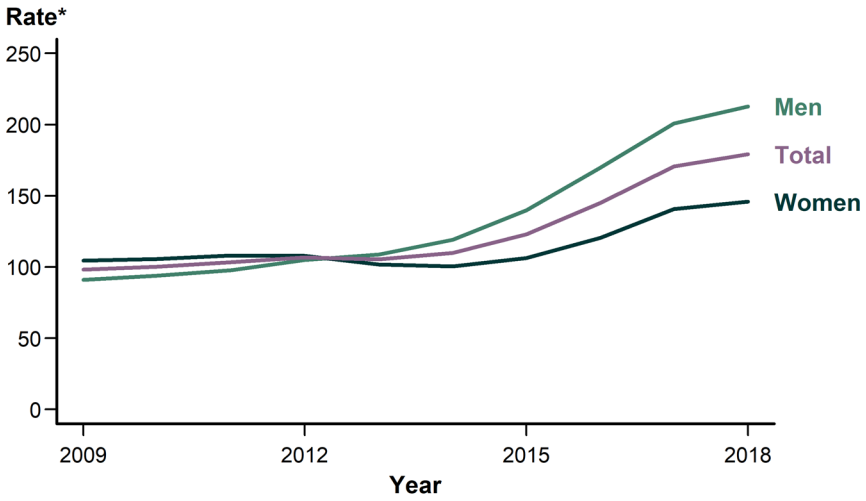
Gonorrhea by Sex

As was observed during 2014–2017, the rate of reported gonorrhea cases among males was higher than the rate among females in 2018 (Figure 18, Tables 15 and 16). During 2017–2018, the gonorrhea rate among males increased 6.0% (200.8 to 212.8 cases per 100,000 males) and the rate among females increased 3.6% (140.7 to 145.8 cases per 100,000 females). During 2014–2018, the rate among males increased 78.7% (119.1 to 212.8 cases per 100,000 males) and the rate among females increased 45.2% (100.4 to 145.8 cases per 100,000 females). The magnitude of the increase among males suggests 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 (MSM). However, most jurisdictions do not routinely report sex of sex partners or site of infection for gonorrhea cases, so national trends in gonorrhea rates among MSM over time cannot be assessed.

Gonorrhea by Region and Sex

In most regions, the rate of gonorrhea increased among both males and females during 2017–2018 and during 2014–2018 (Tables 15 and 16). The rate of reported gonorrhea cases among females increased the most in the West (8.7% during 2017–2018 and 71.0% during 2014–2018) and Midwest (7.1% during 2017–2018 and 57.5% during 2014–2018) with smaller increases in the Northeast (3.1% during 2017–2018 and 30.8% during 2014–2018) and South (33.2% during 2014–2018) (Table 15). The rate of reported gonorrhea cases among males increased the most in the Midwest (10.1% during 2017–2018 and 90.8% during 2014–2018) and Northeast (9.3% during 2017–2018 and 86.2% during 2014–2018); however, increases were all also reported in the West (6.6% during 2017–2018 and 85.0% during 2014–2018) and South (2.4% during

Figure 18. Gonorrhea — Rates of Reported Cases by Sex, United States, 2009–2018



* Per 100,000.

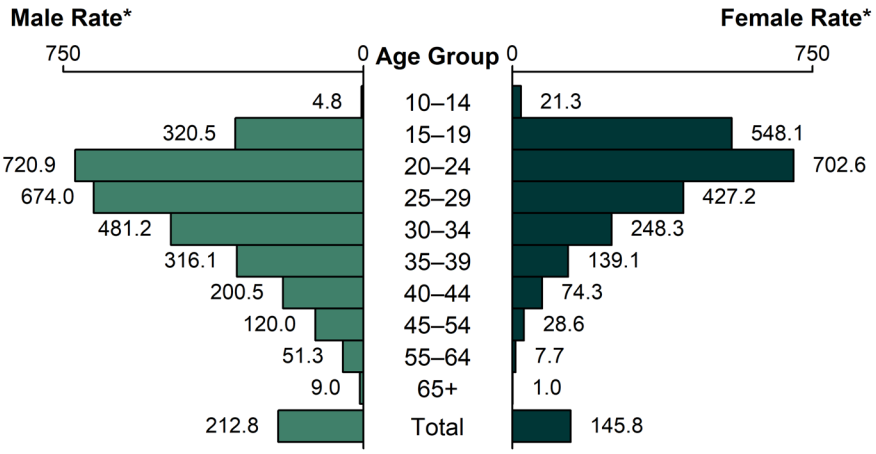
2017–2018 and 66.3% during 2014–2018) (Table 16).

Gonorrhea by Age

In 2018, rates of reported gonorrhea cases continued to be highest among adolescents and young adults (Figure 19, Table 21). In 2018, the highest rates among females were observed among those aged 20–24 years (702.6 cases per 100,000 females) and 15–19 years (548.1 cases per 100,000 females). Among males, the rate was highest among those aged 20–24 years (720.9 cases per 100,000 males) and 25–29 years (674.0 cases per 100,000 males).

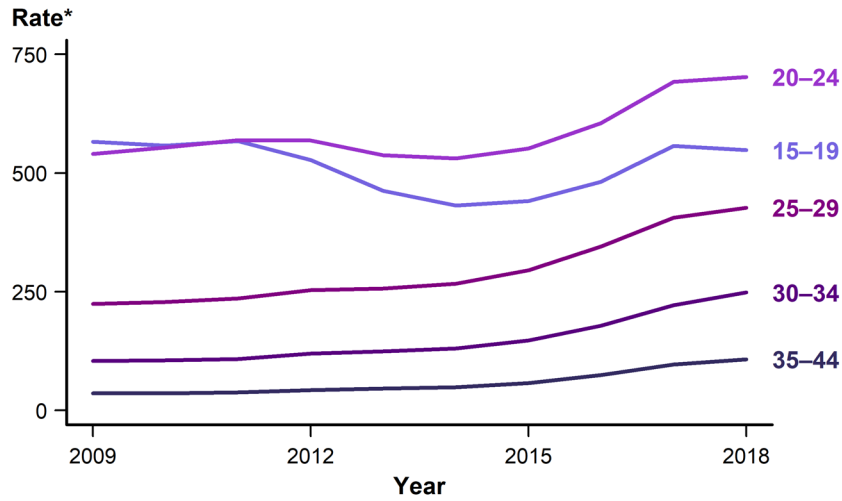
In 2018, persons aged 15–44 years accounted for 91.6% of reported gonorrhea cases with known age (Table 21). Among 15–19 year olds, rates decreased 1.3% during 2017–2018. However, the gonorrhea rate increased among the following age groups during 2017–2018: 1.2% among those aged 20–24 years, 6.2% among those aged 25–29 years, 12.4% among those aged 30–34 years, 10.5% among those aged 35–39 years, and 11.8% among those aged 40–44 years (Table 21). Increases in rates were observed in most age groups for both males and females during 2017–2018. However, rates decreased 1.7% among females aged 15–19 years (557.3 to 548.1 cases per 100,000 females) and 0.9% among males aged 15–19 years (323.3 to 320.5 cases per 100,000 males) (Figures 20 and 21).

Figure 19. Gonorrhea — Rates of Reported Cases by Age Group and Sex, United States, 2018



* Per 100,000.

Figure 20. Gonorrhea — Rates of Reported Cases Among Females Aged 15–44 Years by Age Group, United States, 2009–2018



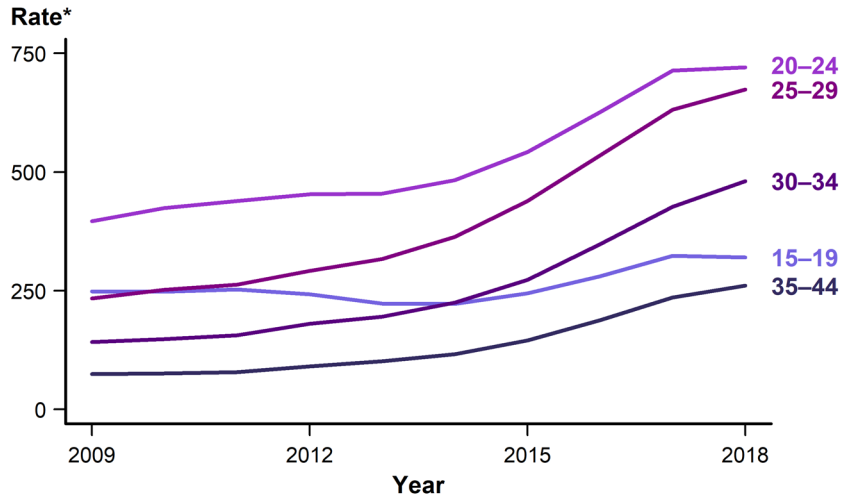
* Per 100,000.

Gonorrhea by Race/Hispanic Ethnicity

In 2018, the rate of reported gonorrhea cases remained highest among Blacks (548.9 cases per 100,000 population) (Table 22B). The rate among Blacks was 7.7 times the rate among Whites (71.1 cases per 100,000 population). The gonorrhea rate among American Indians/Alaska Natives (AI/AN) (329.5 cases per 100,000 population) was 4.6 times that of Whites, the rate among Native Hawaiians/Other Pacific Islanders (NHOPI) (181.4 cases per 100,000 population) was 2.6 times that of Whites, the rate among Hispanics (115.9 cases per 100,000 population) was 1.6 times that of Whites, the rate among Multirace persons (94.4 cases per 100,000 population) was 1.3 times that of Whites, and the rate among Asians (35.1 cases per 100,000 population) was half the rate of Whites (Table 22B).

During 2014–2018, for all five years during that period, the gonorrhea rate increased among all race/Hispanic ethnicity groups: 119.5% among Multirace persons, 99.4% among

Figure 21. Gonorrhea — Rates of Reported Cases Among Males Aged 15–44 Years by Age Group, United States, 2009–2018



* Per 100,000.

Asians, 90.3% among NHOPI, 89.1% among Whites, 84.2% among AI/AN, 66.0% among Hispanics, and 38.8% among Blacks (Figure 22).

More information on gonorrhea rates among race/Hispanic ethnicity groups can be found in the Special Focus Profiles, STDs in Racial and Ethnic Minorities.

Gonorrhea by Reporting Source

In 2018, 8.4% of gonorrhea cases were reported from STD clinics, 77.7% were reported from venues outside of STD clinics, and 13.9% had an unknown reporting source (Table A2).

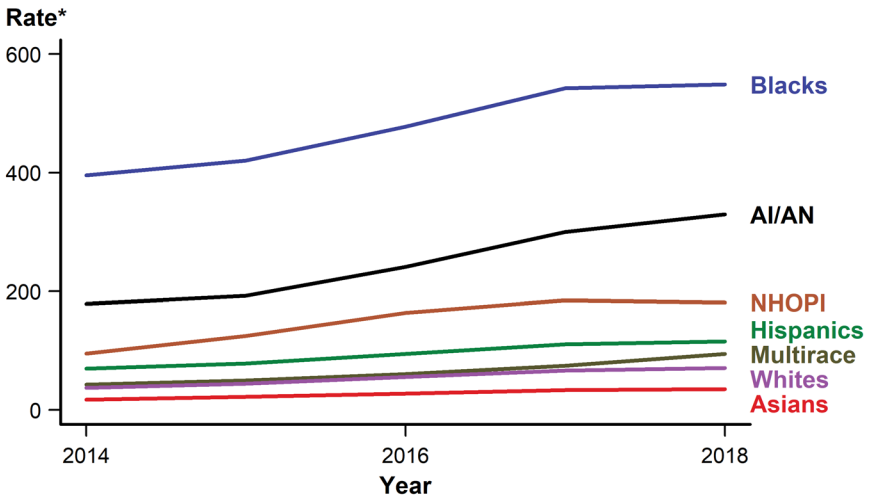
During 2009–2018, the percent of gonorrhea cases reported by STD clinics declined 42.6% among females and 19.8% among males; however, the percent of gonorrhea cases with missing/unknown reporting source increased 80.4% among females and 277.3% among males (Figures 23 and 24). During 2017–2018, the percent of gonorrhea cases reported by STD clinics decreased 7.5% among females and 4.9% among males.

In 2018, the largest proportion of cases among females were reported by private physicians/health maintenance organizations (HMOs) (24.1%), followed by other hospital clinics/facilities (13.6%), laboratories (9.0%), emergency rooms (6.0%), and STD clinics (5.8%) (Figure 23). Among males, private physicians/HMOs (20.7%) were the most common reporting source, followed by other hospital clinics/facilities (12.3%), STD clinics (10.3%), emergency rooms (7.1%), and laboratories (6.9%) (Figure 24).

STD Surveillance Network

The STD Surveillance Network (SSuN) is an ongoing collaboration of state, county, and city health departments conducting sentinel and enhanced surveillance activities. These include collecting enhanced clinical and behavioral information among all patients attending selected STD clinics, among women aged 15–44 years in selected reproductive health clinics, and conducting enhanced patient and provider investigations on a representative sample of gonorrhea cases diagnosed and reported from all reporting sources in their jurisdiction.

Figure 22. Gonorrhea — Rates of Reported Cases by Race/Hispanic Ethnicity, United States, 2014–2018

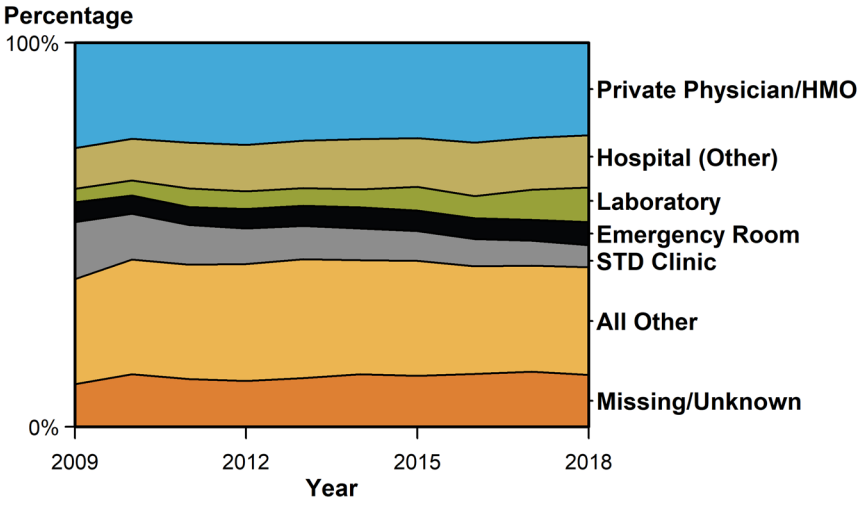


* Per 100,000.

NOTE: See Section A1.5 in the Appendix for information on reporting STD case data for race/Hispanic ethnicity.

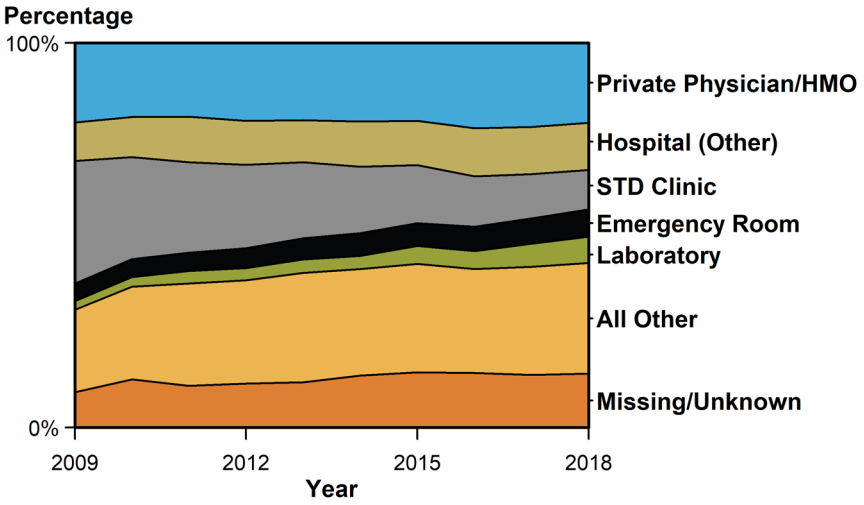
ACRONYMS: AI/AN = American Indians/Alaska Natives; NHOPI = Native Hawaiians/Other Pacific Islanders.

Figure 23. Gonorrhea — Percentage of Reported Cases Among Females by Reporting Source*, United States, 2009–2018



* See section A1.7 in the Appendix for information on classification of reporting sources and a full list of reporting sources.
ACRONYMS: HMO = Health maintenance organization.

Figure 24. Gonorrhea — Percentage of Reported Cases Among Males by Reporting Source*, United States, 2009–2018



* See section A1.7 in the Appendix for information on classification of reporting sources and a full list of reporting sources.
ACRONYMS: HMO = Health maintenance organization.

Enhanced gonorrhea case report data for 2018 were obtained from Cycle 3 of SSuN, which includes 10 jurisdictions randomly sampling all cases reported in their jurisdictions. In 2018, SSuN collaborators interviewed 6,842 gonorrhea cases, representing 4.3% of all cases reported from participating jurisdictions. The estimated burden of disease represented by men who have sex with men (MSM; including men who have sex with both men and women), men who have sex with women only (MSW), and women varied substantially across collaborating sites based on weighted analysis (Figure 25). San Francisco had the highest proportion of cases estimated to be MSM (86.4%), while Baltimore had the lowest proportion of MSM cases (20.1%). In total, across all SSuN sites, 42.5% of gonorrhea cases were estimated to be among MSM, 25.1% among MSW, and 32.4% among women.

Among six jurisdictions participating in SSuN continuously from 2010 to 2018, estimated rates of gonorrhea among MSM, MSW, and women were calculated by extending published estimates of the MSM population and are presented in Figure 26.[5,6] The estimated gonorrhea case rate among MSM increased 375.5% during 2010–2018 from 1,368.6 cases per 100,000 MSM in 2010 to 6,508.0 cases per 100,000 MSM in 2018. Over the same time period, case rates among MSW and women also increased by 69.3% and 95.2%, respectively.

Collaborating SSuN jurisdictions also conduct sentinel surveillance on all patients seeking care in selected STD clinics. In 2018, the proportion of STD clinic patients who tested positive for gonorrhea varied by sex and sex of sex partners, as well as age group (Figure 27). The overall prevalence, represented by the average of the mean value by nine of the 10 SSuN jurisdictions, where data was available, was 20.5% for MSM, 9.1% for MSW, and 5.4% for women. Among those attending these clinics, MSM disproportionately had higher positivity rates when compared to MSW and women in all age groups. Although overall gonorrhea positivity rates declined with increasing age for women, MSM, and MSW, a slower decline by age was observed in MSM <40 years of age.

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

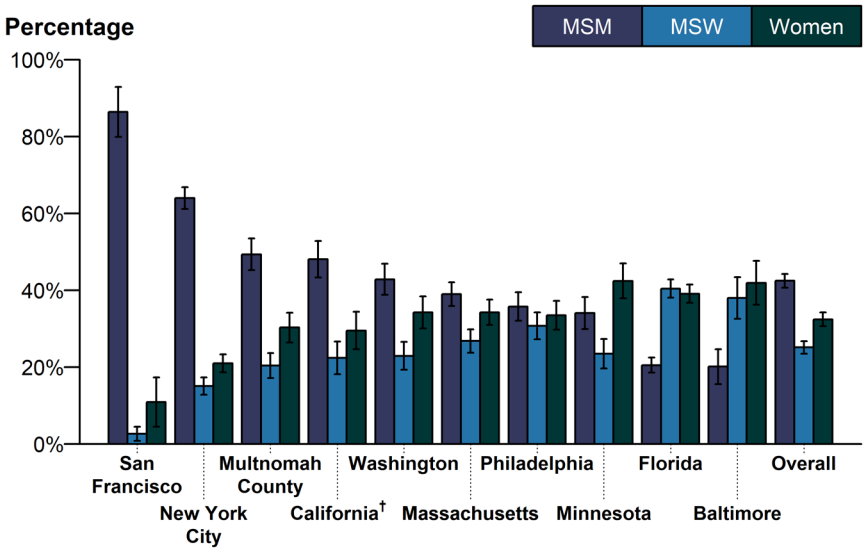
Gonococcal Isolate Surveillance Project

Antimicrobial resistance remains an important consideration in the treatment of gonorrhea.[3,7-9] In 1986, the Gonococcal Isolate Surveillance Project (GISP), a national sentinel surveillance system, was established to monitor trends in antimicrobial susceptibilities of urethral *N. gonorrhoeae* strains in the United States.[7] Data are collected from selected STD clinic sentinel sites and from regional laboratories (Figure 28).

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 25. Estimated Proportion* of MSM, MSW, and Women Among Gonorrhea Cases by Jurisdiction, STD Surveillance Network (SSuN), 2018



* Estimate based on weighted analysis of data obtained from interviews (n=6,842) conducted among a random sample of reported gonorrhea cases during January to December 2018.

† California data exclude San Francisco (shown separately).

NOTE: See section A2.2 in the Appendix for SSuN methods.

ACRONYMS: MSM = Gay, bisexual, and other men who have sex with men; MSW = Men who have sex with women only.

Ceftriaxone Susceptibility

Susceptibility testing for ceftriaxone began in 1987. During 2009–2018, the percentage of GISP isolates that exhibited elevated ceftriaxone MICs, defined as ≥0.125 µg/mL, fluctuated between 0.1% and 0.4% (Figure 29). In 2018, 0.2% 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 (≥0.25 µg/mL) declined from 1.4% in 2011 to 0.3% in 2018 (Figure 29).

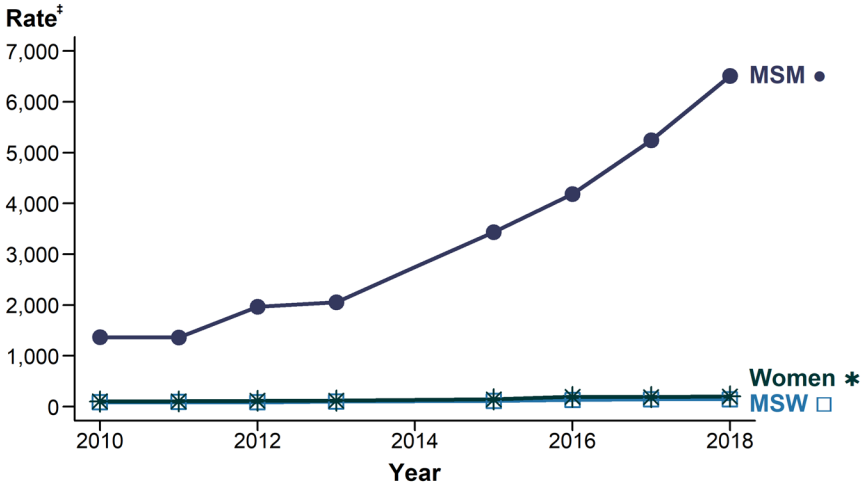
Azithromycin Susceptibility

Susceptibility testing for azithromycin began in 1992. Figure 29 displays the distribution of azithromycin MICs among GISP isolates collected during 2009–2018. Most isolates had MICs of 0.125–0.5 µg/mL. During 2012–2014, the percentage of isolates with elevated azithromycin MICs (≥2 µg/mL) ranged from 0.3% to 2.5% with a sharp increase during 2013–2014 (from 0.6% to 2.5%); during 2014–2018, the percentage increased from 2.5% to 4.6%.

Susceptibility to Other Antimicrobials

Susceptibility testing for gentamicin began in 2015. Between 2015 and 2017, 66.7–75.3% of all tested isolates had an MIC value of 8 µg/mL (Figure 30). Starting in 2018, the range of MIC values tested in GISP was expanded to include MICs as low as 0.25 µg/mL and as high as 64 µg/mL. In 2018, 0.02% of all tested isolates had an MIC above 16 µg/mL.

Figure 26. Gonorrhea — Estimated* Rates of Reported Gonorrhea Cases by MSM, MSW, and Women, STD Surveillance Network (SSuN)†, 2010–2018



* Estimates based on interviews among a random sample of reported cases of gonorrhea (n=21,417); cases weighted for analysis. Data not available for 2014; 2013–2015 trend interpolated; trends lines overlap for MSW and women in this figure.

† Sites include Baltimore, Philadelphia, New York City, Washington State, San Francisco, and California (excluding San Francisco).

‡ Per 100,000.

ADAPTED FROM: 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.

ACRONYMS: MSM = Gay, bisexual, and other men who have sex with men; MSW = Men who have sex with women only.

In 2018, 31.2% of isolates collected from GISP sites were resistant to ciprofloxacin, 25.6% to tetracycline, and 13.7% to penicillin (Figure 31). Although these antimicrobials are no longer recommended for treatment of gonorrhea, the resistance phenotypes remain common. The different susceptibility patterns seen in GISP in 2018 are shown in Figure 32. Panel A demonstrates the percentage of isolates with resistance or elevated MICs to various numbers of antimicrobials. Panel B further highlights the specific combinations of resistance or elevated MICs across antimicrobials (vertical bars).

The overall percentage of reduced susceptibility for each antimicrobial (horizontal bars) are the same percentages seen for 2018 in Figure 31. Of all the isolates collected in GISP in 2018, 4.5% demonstrated resistance or elevated MICs to at least three antibiotics tested with the majority of the combinations including tetracycline, penicillin and ciprofloxacin; no isolates with elevated azithromycin MICs had elevated ceftriaxone MICs (Figure 32). In 2018, 48.7% of all tested isolates were susceptible to all antibiotics tested.

Antimicrobial Treatments Given for Gonorrhea

The antimicrobial agents given to GISP patients for gonorrhea therapy are shown in Figure 33. The proportion of patients treated with ceftriaxone 250 mg increased from 84.0% in 2011 to 98.1% in 2017 but decreased slightly to 96.5% in 2018. Patients treated with gentamicin 240 mg increased from 0.2% in 2015 to 1.4% in 2018 and patients treated with cefixime 400mg decreased from 0.3% in 2015 to 0.1% in 2018.

In 2018, based on weighted analysis of SSuN jurisdictions with documented treatment information (i.e., antimicrobials and dosages) for ≥80% of cases, 85.8% (95% CI: 84.1–87.5) of reported patients with gonorrhea in SSuN jurisdictions received the recommended treatment for uncomplicated gonorrhea (Figure 34). The proportion of reported patients that received the recommended dual treatment ranged from 83.8% (95% CI: 81.9–85.6) in Florida to 95.5% (95% CI: 92.9–98.1) in San Francisco, California.

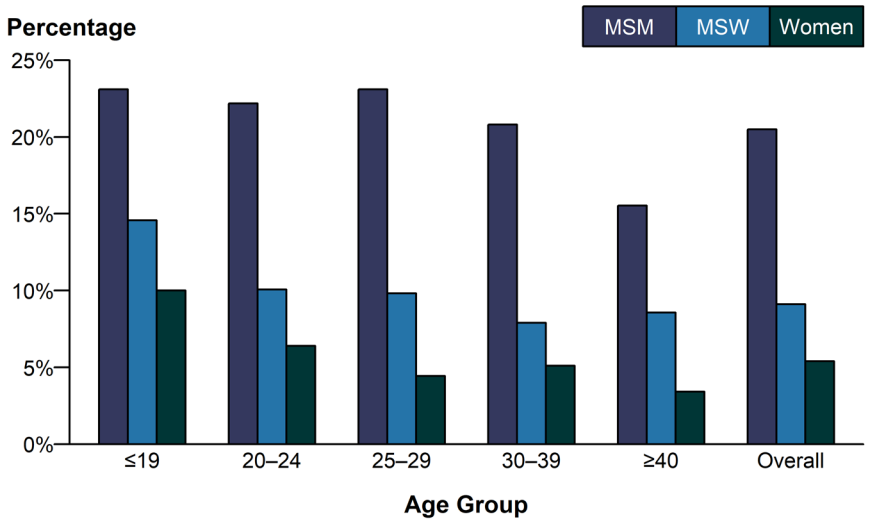
Gonorrhea Among Special Populations

More information about gonorrhea in race/Hispanic ethnicity groups, females of reproductive age, adolescents, young adults, 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 2014–2018. This increase was largely attributable to increases among men. Enhanced

Figure 27. Gonorrhea — Proportion of STD Clinic Patients* Testing Positive by Age Group and Sex and Sex of Sex Partners, STD Surveillance Network (SSuN), 2018

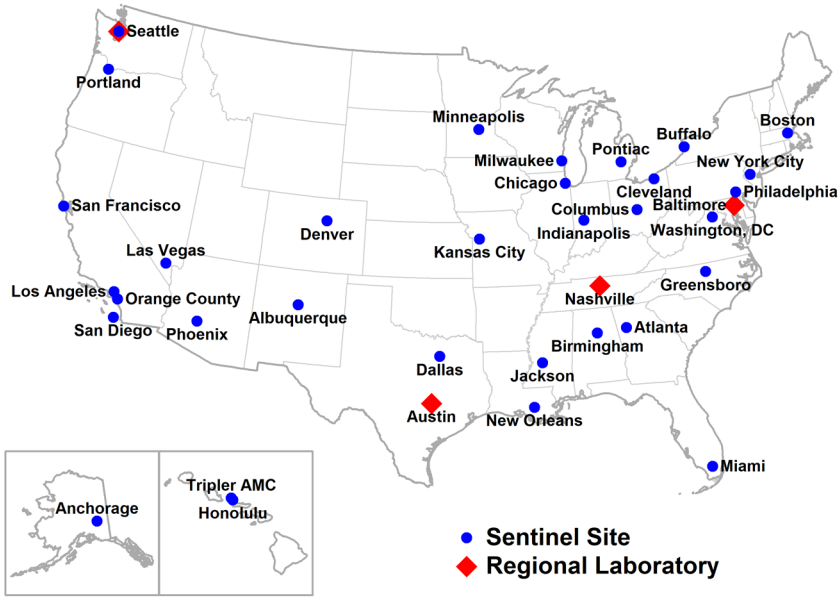


* Results are based on data obtained from unique patients with known sex of sex partners (n=77,314) attending SSuN STD clinics who were tested ≥1 time for gonorrhea in 2018.

NOTE: See section A2.2 in the Appendix for SSuN methods.

ACRONYMS: MSM = Gay, bisexual, and other men who have sex with men; MSW = Men who have sex with women only.

Figure 28. Location of Participating Sentinel Sites and Regional Laboratories, Gonococcal Isolate Surveillance Project (GISP), United States, 2018



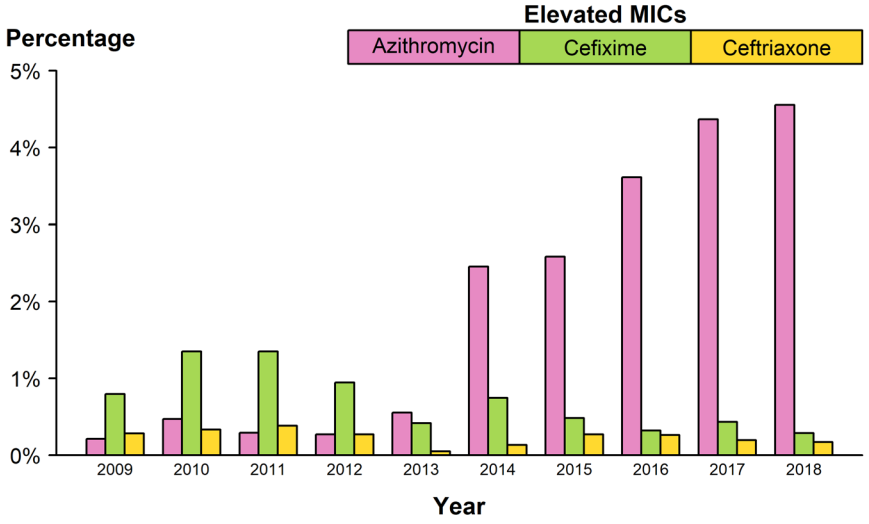
NOTE: Seattle is both a sentinel site and a regional laboratory.

surveillance data suggest the largest increases are among MSM. However, high gonorrhea rates persist in certain geographic areas, among adolescents and young adults, and in some racial/Hispanic ethnicity groups. Continued surveillance for antimicrobial resistant gonorrhea is critical to monitor for the emergence of reduced susceptibility and resistance to cephalosporins and azithromycin.

References

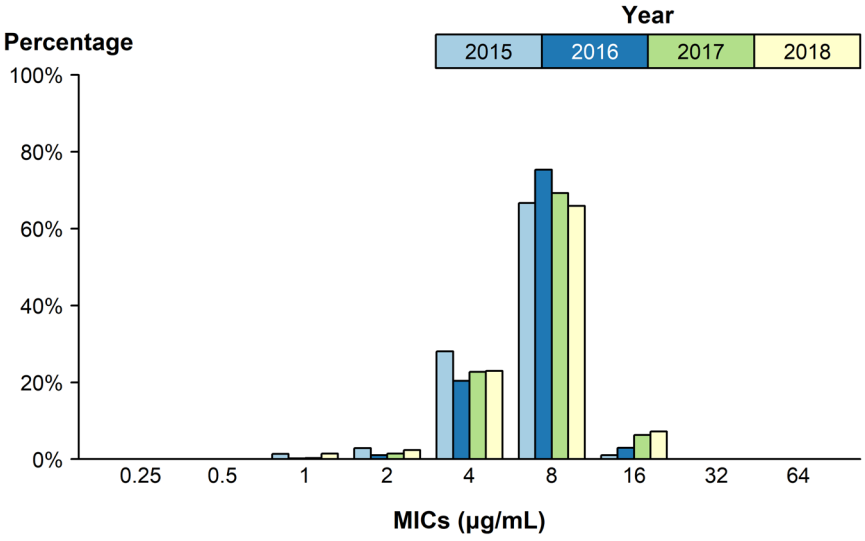
1. Fleming DT, Wasserheit JN. From epidemiological synergy to public health policy and practice: The contribution of other sexually transmitted diseases to sexual transmission of HIV infection. *Sex Transm Infect.* 1999;75(1):3–17.
2. Hogben M, Leichliter JS. Social determinants and sexually transmitted 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. 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. 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.
7. 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.
8. Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2010. *MMWR Recomm Rep*. 2010;59(No. RR–12):1–110.
9. Schwarcz S, Zenilman J, Schnell D, et al. National surveillance of antimicrobial resistance in *Neisseria gonorrhoeae*. *JAMA*. 1990;264(111):1413–1417.

Figure 29. *Neisseria gonorrhoeae* — Percentage of Isolates with Elevated Minimum Inhibitory Concentrations (MICs) to Azithromycin, Cefixime, and Ceftriaxone, Gonococcal Isolate Surveillance Project (GISP), 2009–2018



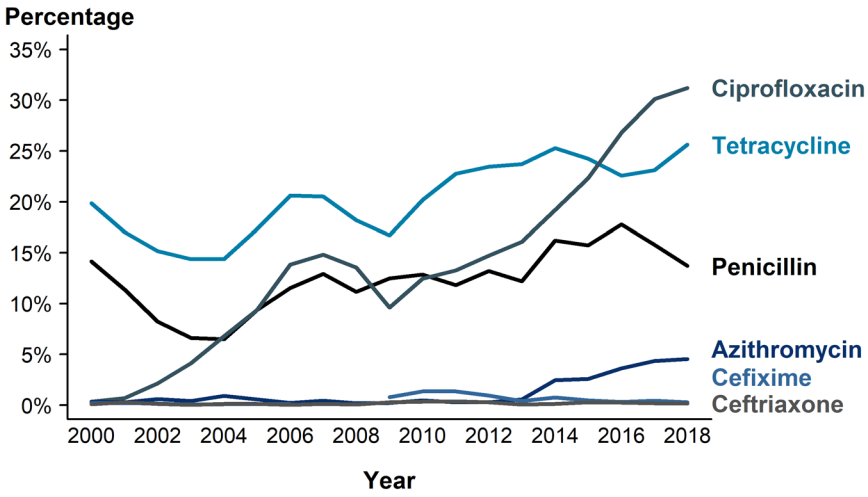
NOTE: Elevated MIC = Azithromycin: ≥2.0 µg/mL; Cefixime: ≥0.25 µg/mL; Ceftriaxone: ≥0.125 µg/mL.

Figure 30. *Neisseria gonorrhoeae* — Distribution of Gentamicin Minimum Inhibitory Concentrations (MICs) by Year, Gonococcal Isolate Surveillance Project (GISP), 2015–2018*



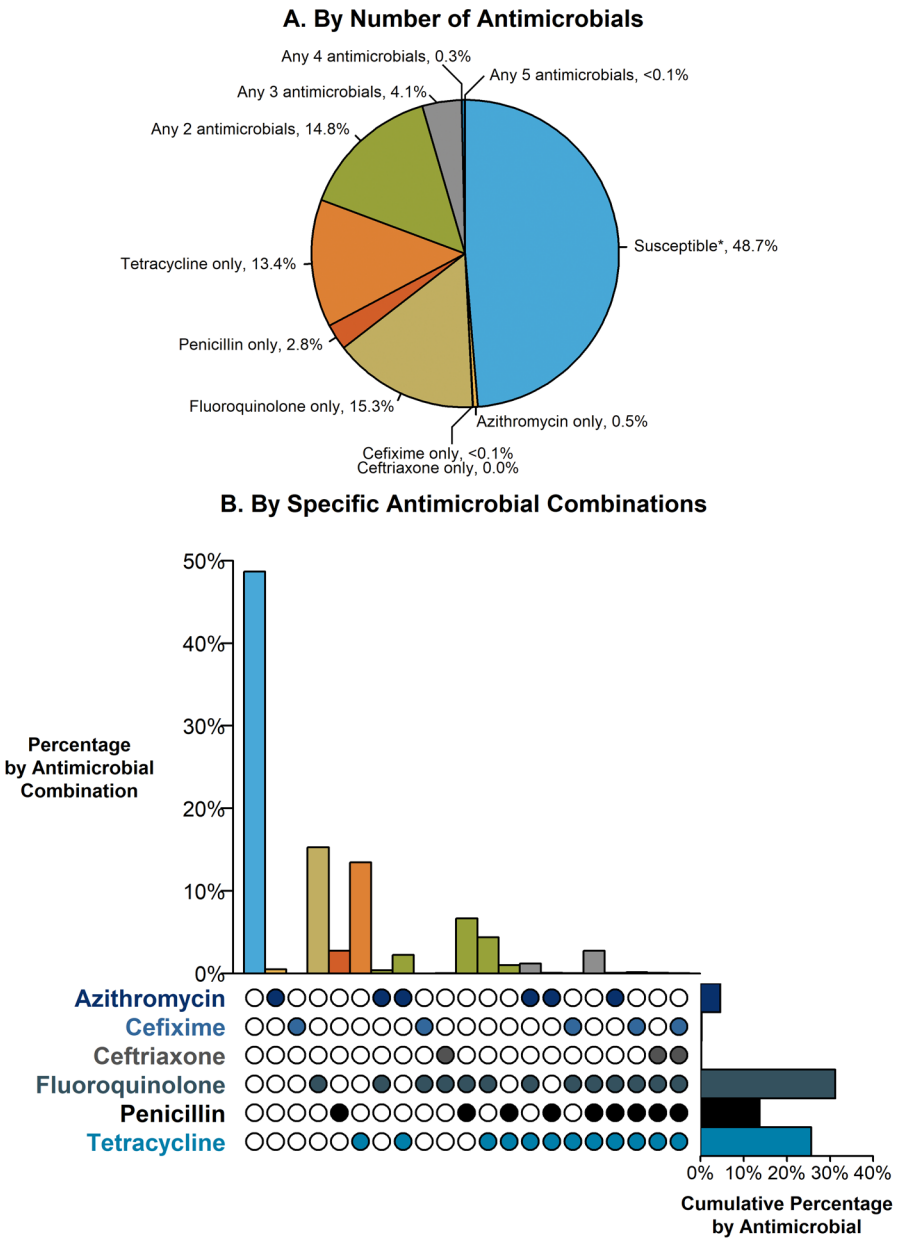
* In 2018, the antibiotic susceptibility testing range for gentamicin was expanded from MICs of 1 µg/mL–32 µg/mL in previous years to 0.25 µg/mL–64 µg/mL

Figure 31. *Neisseria gonorrhoeae* — Prevalence of Tetracycline, Penicillin, or Fluoroquinolone Resistance* or Elevated Cefixime, Ceftriaxone, or Azithromycin Minimum Inhibitory Concentrations (MICs)†, by Year — Gonococcal Isolate Surveillance Project (GISP), 2000–2018



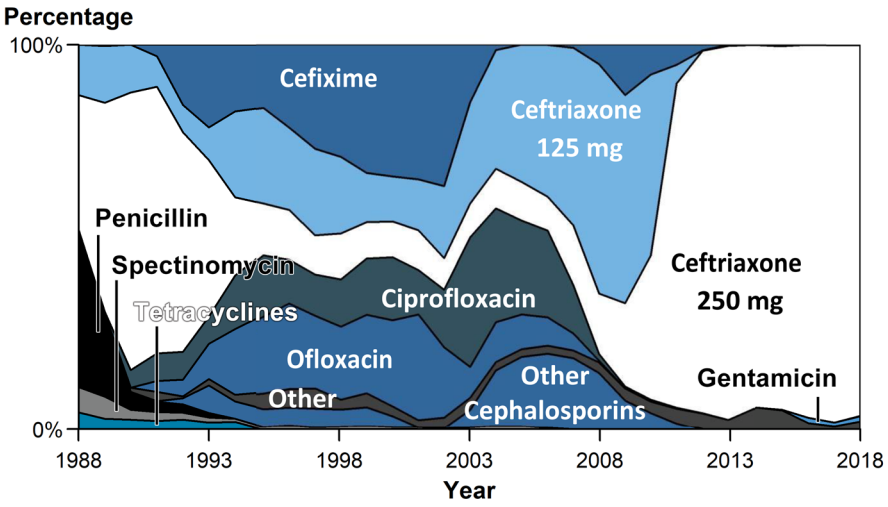
* Resistance = Fluoroquinolone (ciprofloxacin): MIC ≥ 1.0 µg/mL; Penicillin: MIC ≥ 2.0 µg/mL or Beta-lactamase positive; Tetracycline: MIC ≥ 2.0 µg/mL.
† Elevated MICs = Azithromycin: MIC ≥ 1.0 µg/mL (2000–2004), MIC ≥ 2.0 µg/mL (2005–2018); Ceftriaxone: MIC ≥ 0.125 µg/mL; Cefixime: MIC ≥ 0.25 µg/mL.
NOTE: Cefixime susceptibility was not tested in 2007 and 2008.

Figure 32. Resistance or Elevated MIC Patterns of *Neisseria gonorrhoeae* Isolates to Antimicrobials, Gonococcal Isolate Surveillance Project (GISP), 2018



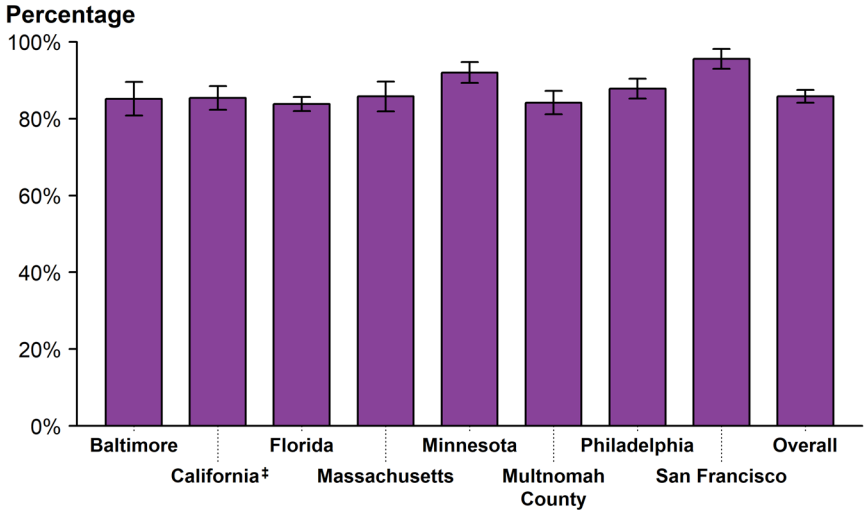
* Susceptible category only includes isolates with penicillin, tetracycline, and fluoroquinolone MIC values that are considered susceptible and isolates with ceftriaxone, cefixime, and azithromycin MIC values that are not considered elevated.
NOTE: Elevated MIC = Ceftriaxone: MIC ≥ 0.125 µg/mL; Cefixime: MIC ≥ 0.25 µg/mL; Azithromycin: MIC ≥ 2.0 µg/mL. Resistance = Tetracycline: MIC ≥ 2.0 µg/mL; Fluoroquinolone: MIC ≥ 1.0 µg/mL; Penicillin: MIC ≥ 2.0 µg/mL or Beta-lactamase positive. In Panel B, a filled circle reflects resistance or elevated MIC to a specific antimicrobial; only antimicrobial combinations with non-zero percentages are shown.
ACRONYMS: MIC = Minimum Inhibitory Concentration.

Figure 33. Distribution of Primary Antimicrobial Drug Used to Treat Gonorrhea Among Participants, Gonococcal Isolate Surveillance Project (GISP), 1988–2018



NOTE: For 2018, "Other" includes azithromycin 2g (0.3%), no therapy documented (0.5%), and other less frequently used drugs (1.2%).

Figure 34. Gonorrhea — Estimated Proportion of Cases Treated by Recommended Treatment Regimen* and Jurisdiction†, STD Surveillance Network (SSuN), 2018



* In 2018, the recommended treatment for uncomplicated gonorrhea was treatment with 250 mg dose of ceftriaxone plus 1 g dose of azithromycin.

† Includes SSuN jurisdictions with all treatment information documented for ≥80% of cases.

‡ California data exclude San Francisco.

NOTE: See section A2.2 in the Appendix for SSuN methods.

ADAPTED FROM: Weston EJ, Workowski K, Torrone E, et al. Adherence to CDC recommendations for the treatment of uncomplicated gonorrhea – STD Surveillance Network (SSuN), United States, 2016. *MMWR Morb Mortal Wkly Rep.* 2018; 67:473–76.

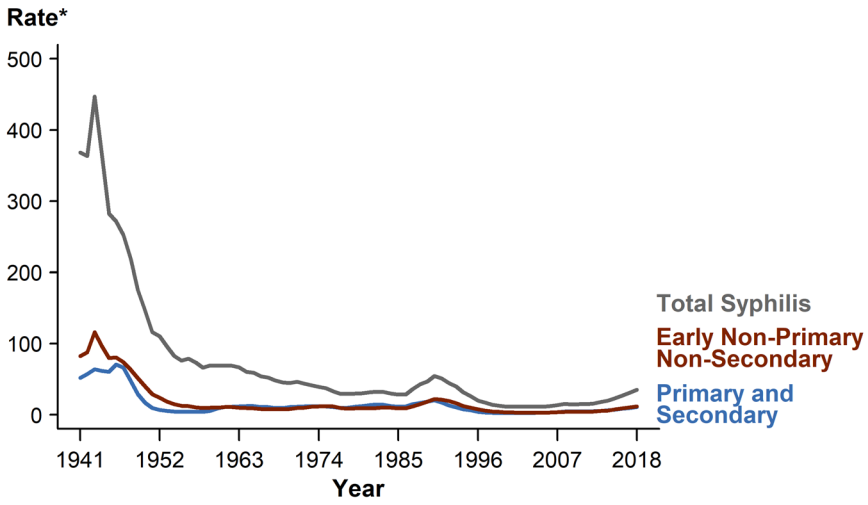
Syphilis

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 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 infant death 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 35, Table 1). However, the P&S syphilis rate has increased almost every year since 2001. This rise in the rate of reported P&S syphilis has been primarily attributable to increased cases among men and, specifically, among gay, bisexual, and other men who have sex with men (MSM). MSM account for the majority of P&S syphilis cases and estimated rates are substantially higher among MSM compared with women or men who have sex with women only (MSW).[5] The number of cases among MSM has continued to increase, but within the last five years, cases among MSW and women have increased substantially as well. The increase in syphilis among women is of particular concern because it is associated with a striking and concurrent increase in congenital syphilis. These recent trends highlight the importance of national syphilis surveillance to understand the current epidemiology of syphilis in the United States and to focus prevention efforts.

Figure 35. Syphilis — Rates of Reported Cases by Stage of Infection, United States, 1941–2018



* Per 100,000.

NOTE: See section A1.3 in the Appendix for more information on syphilis case reporting.

Interpreting Rates of Reported Cases of Syphilis

Left untreated, infection with syphilis can span decades, progressing through multiple stages of infection. Case counts of all stages of syphilis represent the total burden of disease in the United States. The primary and secondary syphilis stages are the earliest stages of infection, reflect symptomatic disease, and are indicators of incident infection.[6] For these reasons, trend analyses of syphilis primarily 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 partners) for each year of a given time period. Details of these restrictions are provided in the pertinent text and figures.

Additionally, the case definitions for syphilis stages have changed over time, including a revision that took effect in January 2018. See Appendix A1.9 for more information on syphilis morbidity reporting and Appendix C1.4 for current syphilis case definition.

Syphilis — All Stages (P&S, Early Non-Primary Non-Secondary, Unknown Duration or Late, and Congenital)

In 2018, the total case count of reported syphilis (all stages combined: P&S, early non-primary non-secondary, unknown duration or late, and congenital) was the highest recorded since 1991. The total number of reported cases of syphilis (all stages) increased 13.3% during 2017–2018 (from 101,584 cases to 115,045 cases) (Table 1). The number of reported cases of P&S syphilis increased 14.4% (from 30,644 to

35,063), the number of reported cases of early non-primary non-secondary syphilis increased 13.3% (from 34,013 cases to 38,539 cases), the number of reported cases of unknown duration or late syphilis increased 11.5% (from 35,992 cases to 40,137 cases), and the number of reported cases of congenital syphilis increased 39.7% (from 935 to 1,306) (Table 1).

P&S Syphilis — United States

In 2018, a total of 35,063 cases of P&S syphilis were reported in the United States, yielding a rate of 10.8 cases per 100,000 population (Figure 35, Table 1). This rate represents a 14.9% increase compared with 2017 (9.4 cases per 100,000 population), and a 71.4% increase compared with 2014 (6.3 cases per 100,000 population).

P&S Syphilis by Region

In 2018, the West had the highest rate of reported P&S syphilis cases (15.0 cases per 100,000 population), followed by the South (11.1 cases per 100,000 population), the Northeast (8.7 cases per 100,000 population), and the Midwest (7.1 cases per 100,000 population) (Table 27). During 2017–2018, the P&S syphilis rate increased 16.4% in the Midwest, 15.6% in the South, 15.4% in the West, and 10.1% in the Northeast (Figure 36, Table 27).

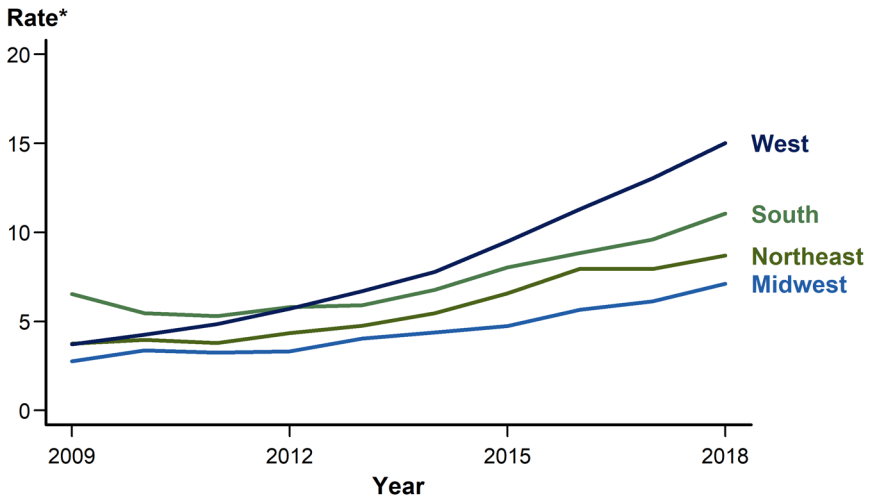
P&S Syphilis by State

In 2018, rates of reported P&S syphilis cases per 100,000 population ranged by state from 1.8 in Vermont to 22.7 in Nevada (Figure 37, Table 26). The rate of reported P&S syphilis cases in the District of Columbia was 40.2 cases per 100,000 population. During 2017–2018, P&S syphilis rates increased in 74% (37/50) of states and the District of Columbia, and remained stable or decreased in 26% (13/50) of states (Table 27).

P&S Syphilis by Metropolitan Statistical Area

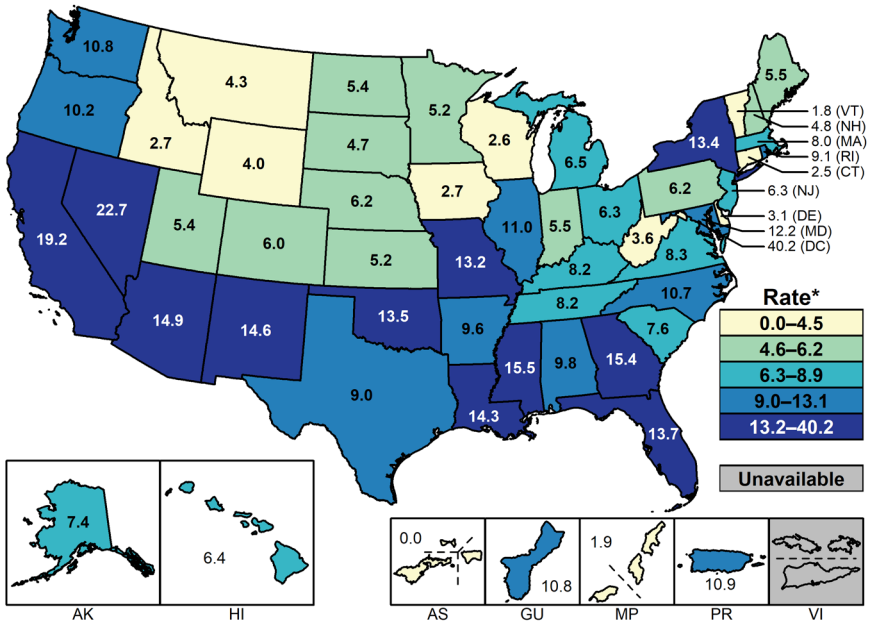
The overall rate of reported P&S syphilis cases in the 50 most populous metropolitan statistical areas (MSAs) was 13.5 cases per 100,000 population in 2018, which

Figure 36. Primary and Secondary Syphilis — Rates of Reported Cases by Region, United States, 2009–2018



* Per 100,000.

Figure 37. Primary and Secondary Syphilis — Rates of Reported Cases by State and Territory, United States, 2018



* Per 100,000.

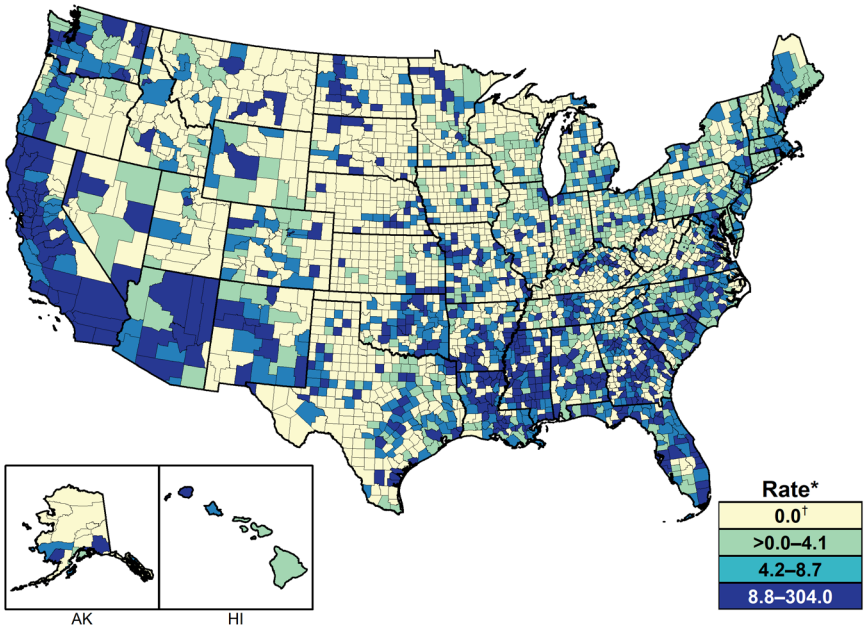
NOTE: Section A1.11 in the Appendix for more information on interpreting reported rates in US territories.

represents a 12.5% increase since 2017 (12.0 cases per 100,000 population) (Table 30). Overall, in 2018, 69.2% of reported P&S syphilis cases (71.9% of male cases and 53.0% of female cases) were reported by these 50 MSAs. The rate among women in these MSAs was 2.9 cases per 100,000 females, while the rate among men was 24.5 cases per 100,000 males (Tables 31 and 32).

P&S Syphilis by County

In 2018, 61.5% of reported P&S syphilis cases occurred in 70 counties or independent cities (Table 33). Of 3,142 counties in the United States, 556 (17.7%) had a P&S syphilis rate of 8.8 cases per 100,000 population or greater, 557 (17.7%) reported a rate from 4.2 to 8.7 cases per 100,000 population, 531 (17.0%) reported a rate from >0.0 to 4.1 cases per 100,000 population, and 1,498 (47.7%) counties reported no cases of P&S syphilis in 2018 (Figure 38).

Figure 38. Primary and Secondary Syphilis — Rates of Reported Cases by County, United States, 2018



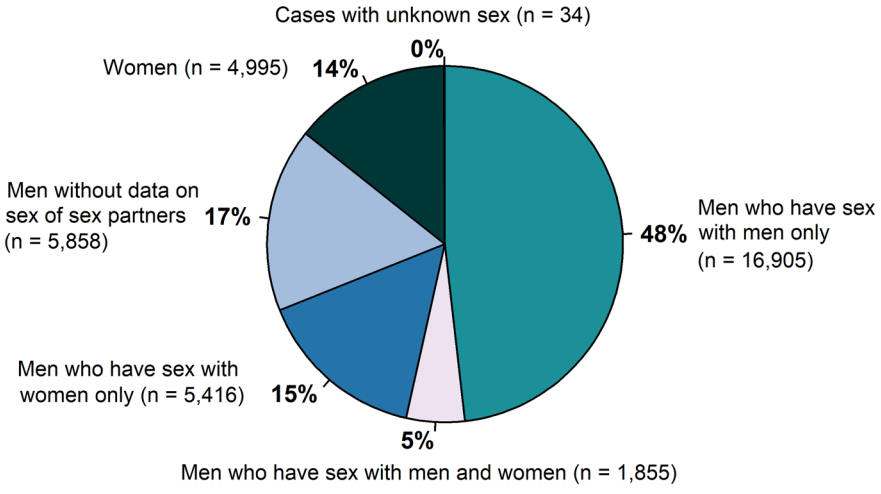
* Per 100,000.

† In 2018, 1,498 (47.7%) of 3,142 counties in the United States reported no cases of primary and secondary syphilis. See section A1.4 in the Appendix for more information on county-level rates.

P&S Syphilis by Sex and Sex of Sex Partners

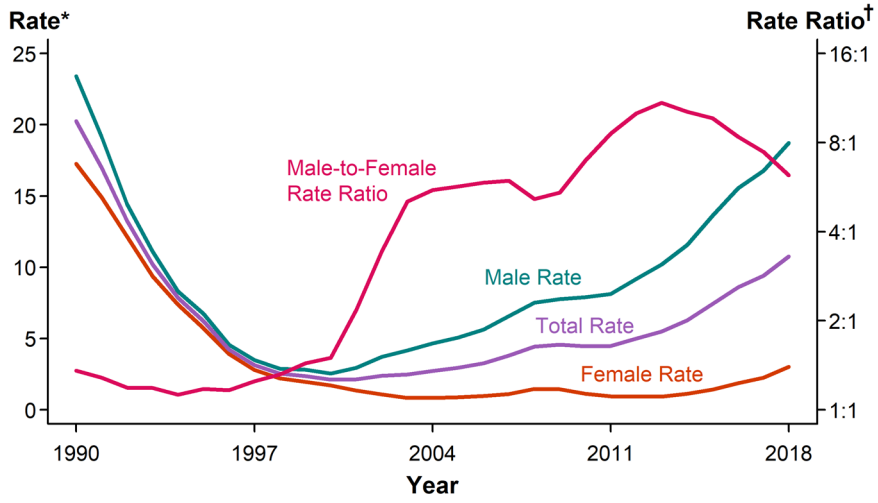
As has been observed in previous years, in 2018, the rate of reported P&S syphilis cases among men (18.7 cases per 100,000 males) was much higher than the rate among women (3.0 cases per 100,000 females), and men accounted for a large majority (85.7%) of P&S syphilis cases (Figure 39, Tables 28 and 29). Among men, the rate of P&S syphilis has increased every year since 2000, and during 2017–2018, the rate among men increased 11.3% (Figure 40, Table 29). In contrast, the P&S syphilis rate among women fluctuated between 0.8 and 1.7 cases per 100,000 females during 2000–2013, but has increased substantially since 2013 (Figure 40, Table 28). During 2014–2018, the P&S syphilis rate among women more than doubled (172.7% increase). During 2017–2018, the P&S syphilis rate among women increased 30.4%.

Figure 39. Primary and Secondary Syphilis — Distribution of Cases by Sex and Sex of Sex Partners, United States, 2018



These increases in male and female P&S syphilis rates were observed in every region of the country during 2017–2018. Among men, the rate increased 13.5% in the Midwest, 12.4% in the South, 11.5% in the

Figure 40. Primary and Secondary Syphilis — Rates of Reported Cases by Sex and Male-to-Female Rate Ratios, United States, 1990–2018



* Per 100,000.
† Log scale.

West, and 7.2% in the Northeast (Table 29). Among women, the largest increases were observed in the West (41.2%), followed by the Northeast (40.0%), the South (30.8%) and the Midwest (30.8%) (Table 28).

MSM continued to account for the majority of P&S syphilis cases in 2018 (Figures 39 and 41). Of 35,063 reported P&S syphilis cases in 2018, 18,760 (53.5%) were among MSM, including 16,905 (48.2%) cases among men who had sex with men only and 1,855 (5.3%) cases among men who had sex with both men and women (Figure 39). Overall, 5,416 (15.4%) cases were among MSW, 4,995 (14.2%) were among women, 5,858 (16.7%) were among men without information about sex of sex partners, and 34 (0.1%) were cases reported with unknown sex. Among the 24,176 male cases with information on sex of sex partners, 77.6% occurred among MSM.

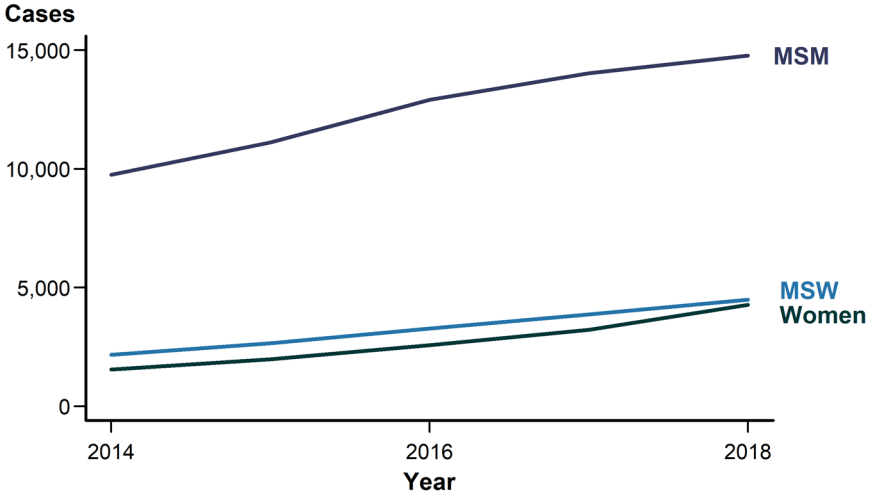
A total of 36 states were able to classify at least 70.0% of reported P&S syphilis cases as MSM, MSW, or women each year during 2014–2018 (Figure 41). In these states, during 2017–2018, the number of cases increased 5.3% among MSM, 16.3% among MSW, and 32.9% among women.

P&S Syphilis by Age

As in previous years, in 2018, rates of reported P&S syphilis cases were highest among persons aged 25–29 years (Figure 42, Table 34). In 2018, the highest rates were observed among men aged 25–29 years (55.7 cases per 100,000 males), 30–34 years (45.8 cases per 100,000 males), and 20–24 years (44.6 cases per 100,000 males). The highest rates among women were among those aged 20–24 years (10.0 cases per 100,000 females) and those aged 25–29 years (9.4 cases per 100,000 females).

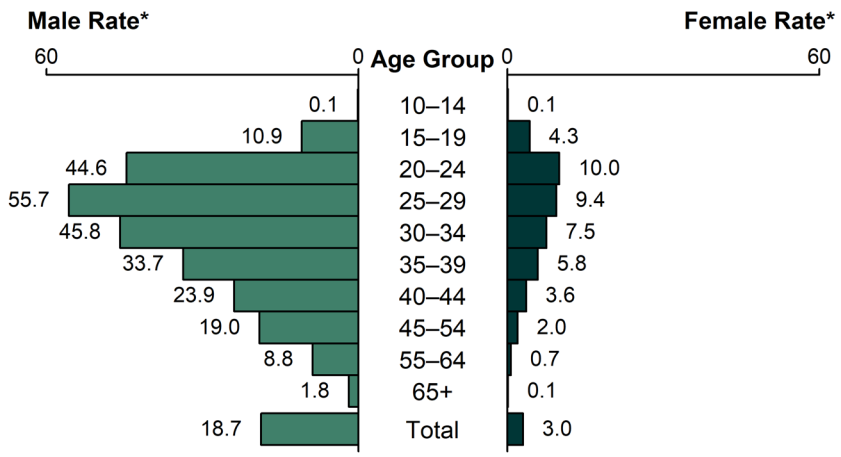
During 2017–2018, the overall rate of reported P&S syphilis cases increased in all age groups among those aged 15 years or older (Figures 43 and 44, Table 34). Rates increased 14.9% among those aged 15–19 years, 10.3% among those aged 20–24 years, 12.6% among those aged 25–29 years, 21.2% among those aged

Figure 41. Primary and Secondary Syphilis — Reported Cases by Sex and Sex of Sex Partners, 36 States*, 2014–2018



* 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 2014–2018.
ACRONYMS: MSM = Gay, bisexual, and other men who have sex with men; MSW = Men who have sex with women only.

Figure 42. Primary and Secondary Syphilis — Rates of Reported Cases by Age Group and Sex, United States, 2018



* Per 100,000.

30–34 years, 17.2% among those aged 35–39 years, 17.1% among those aged 40–44 years, 7.2% among those aged 45–54 years, 21.1% among those aged 55–64 years, and 28.6% among those aged 65 or older.

In 2018, persons aged 15–44 years accounted for 80.6% of reported P&S syphilis cases with known age.

P&S Syphilis by Race/ Hispanic Ethnicity

In 2018, the rate of reported P&S syphilis cases was highest among Blacks (28.1 cases per 100,000 population) (Table 35B). The P&S syphilis rate among Blacks was 4.7 times the rate among Whites (6.0 cases per 100,000 population), the rate among Native Hawaiians/Other Pacific Islanders (NHOPI) (16.3 cases per 100,000 population) was 2.7 times the rate among Whites, the rate among American Indian/ Alaska Natives (AI/AN) (15.5 cases per 100,000 population) was 2.6 times the rate among Whites, the rate among Hispanics (13.0 cases per 100,000 population) was 2.2 times the rate among Whites, and the rate among Asians (4.6 cases per 100,000 population) was 0.8 times the rate among Whites.

During 2014–2018, the P&S syphilis rate increased among all race/ Hispanic ethnicity groups (Figure 45). The greatest increases during 2017–2018 were observed among AI/ AN (40.9%) and those who identified as Multirace (22.1%), followed by NHOPI (19.0%), Whites (11.1%), Blacks (17.1%), Hispanics (13.0%), and Asians (9.5%).

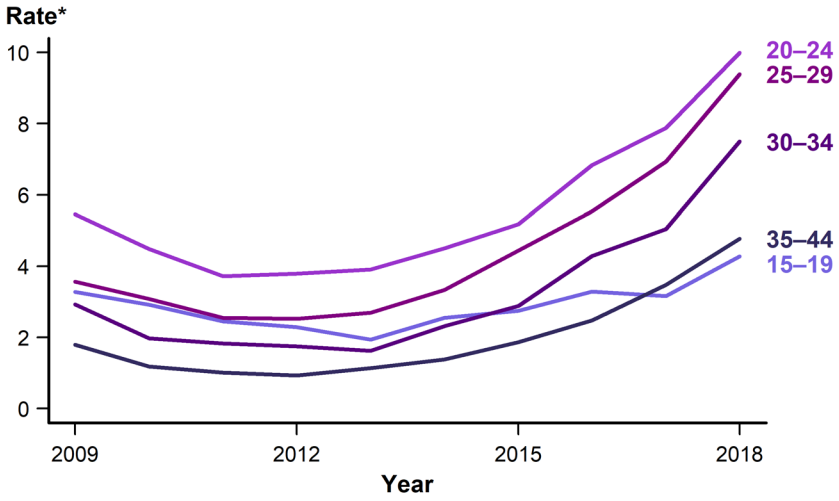
P&S Syphilis and HIV Co-infection

Reported cases of P&S syphilis continue to be characterized by a high rate of HIV co-infection, particularly among MSM (Figure 46). Among 2018 P&S syphilis cases with known HIV status, 41.6% of cases among MSM were HIV-positive, compared with 7.9% of cases among MSW, and 4.0% of cases among women.

P&S Syphilis by Reporting Source

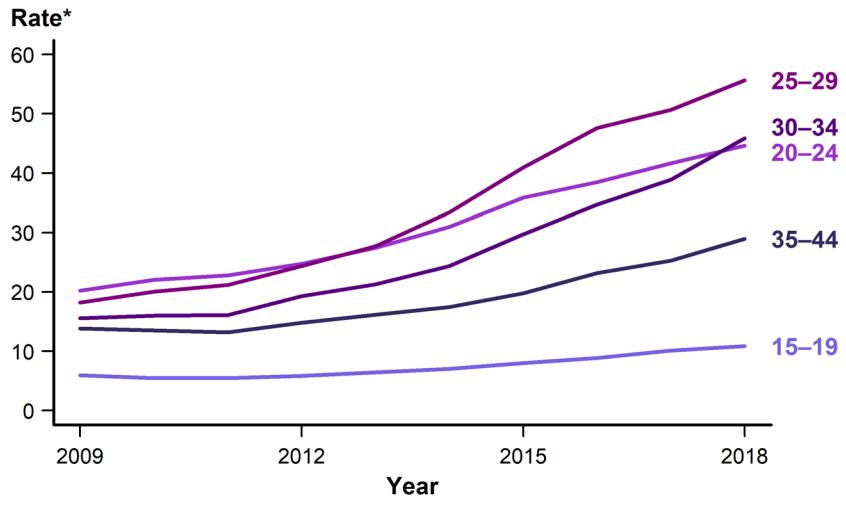
In 2018, 16.3% of P&S syphilis cases were reported from STD clinics, 71.2% were reported from venues outside of STD clinics, and 12.5% of cases had an unknown reporting source (Table A2). During 2017–2018, the number of P&S syphilis cases reported by STD clinics and by non-STD clinic settings increased (Figure 47). However, the proportion of P&S syphilis cases that were reported by STD clinics has

Figure 43. Primary and Secondary Syphilis — Rates of Reported Cases Among Females Aged 15–44 Years by Age Group, United States, 2009–2018



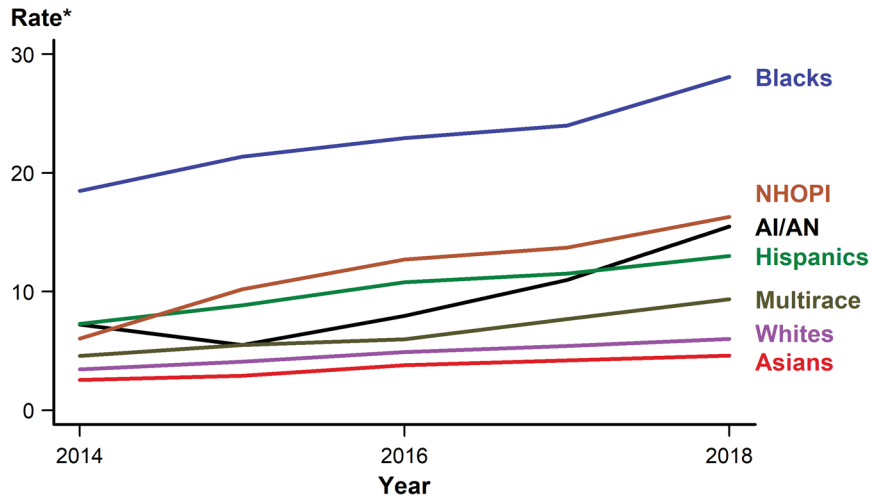
* Per 100,000.

Figure 44. Primary and Secondary Syphilis — Rates of Reported Cases Among Males Aged 15–44 Years by Age Group, United States, 2009–2018



* Per 100,000.

Figure 45. Primary and Secondary Syphilis — Rates of Reported Cases by Race/Hispanic Ethnicity, United States, 2014–2018



* Per 100,000.
NOTE: See Section A1.5 in the Appendix for information on reporting STD case data for race/Hispanic ethnicity.
ACRONYMS: AI/AN = American Indians/Alaska Natives; NHOPI = Native Hawaiians/Other Pacific Islanders.

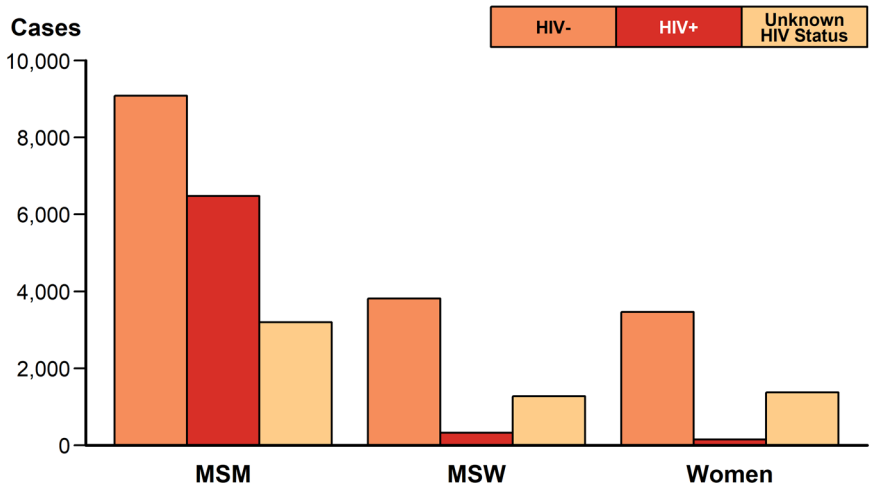
declined by nearly half over the last decade from 31.1% of cases in 2008 to 16.3% of cases in 2018. In 2018, private physicians/health maintenance organizations (HMOs) and STD clinics were the most common reporting sources for all reported P&S syphilis cases, regardless of sex of sex partners. Of cases reported among MSM, private physicians/HMOs and STD clinics reported 30.4% and 22.4% of cases, respectively. Of cases reported among MSW, they reported 22.6% and 18.5%, respectively, and of cases reported among women, they reported 25.8% and 12.2%, respectively (Figure 48).

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 since 2012 (Table 1). In 2018, there were a total of 1,306 reported cases of congenital syphilis, including 78 syphilitic stillbirths and 16 infant deaths, and a national rate of 33.1 cases per 100,000 live births. This rate represents a 39.7% increase relative to 2017 (23.7 cases per 100,000 live births) and a 185.3% increase relative to 2014 (11.6 cases per 100,000 live births). As has been observed historically, this increase in the congenital syphilis rate has paralleled increases in P&S syphilis among all women and reproductive-aged women during 2014–2018 (172.7% and 165.4% increases, respectively) (Figure 49, Table 28).

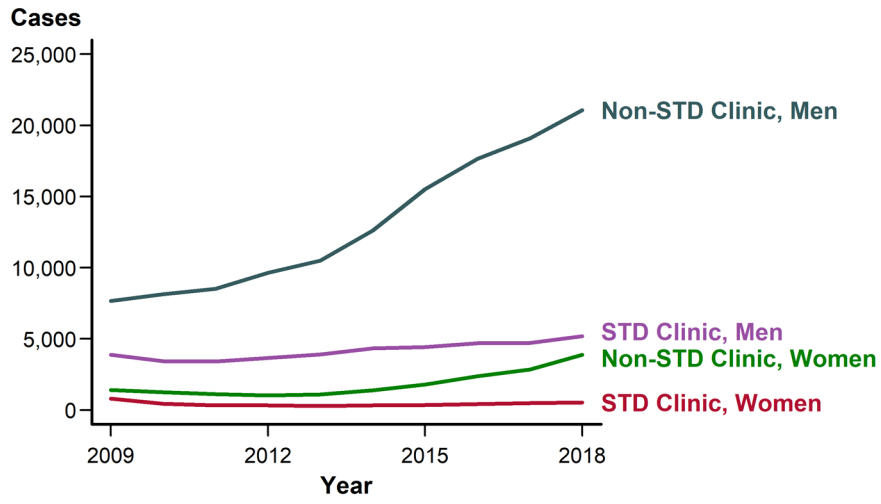
During 2014–2018, the increase in reported congenital syphilis cases was primarily attributable to increases in the West and South. During this period, the congenital syphilis rate increased 278.9% in the West, 190.3% in the South, 84.8% in the Northeast, and 45.9% in the Midwest (Table 41). During 2017–2018, the congenital syphilis rate increased 49.5% in the South, 44.1% in the Northeast, 30.5% in the Midwest, and 29.3% in the West. In 2018, the highest congenital syphilis rates were reported from the West (48.5 cases per 100,000 live births), followed by the South (44.7 cases per 100,000 live births), Midwest (12.4 cases per 100,000 live births), and the Northeast (8.5 cases per 100,000 live births). In addition, rates were highest among Blacks (86.6 cases per 100,000 live births) and AI/AN (79.2 cases per 100,000 live births), followed by Hispanics

Figure 46. Primary and Secondary Syphilis — Reported Cases by Sex and Sex of Sex Partners and HIV Status, United States, 2018



ACRONYMS: MSM = Gay, bisexual, and other men who have sex with men; MSW = Men who have sex with women only.

Figure 47. Primary and Secondary Syphilis — Reported Cases by Reporting Source and Sex, United States, 2009–2018



(44.7 cases per 100,000 live births), Whites (13.5 cases per 100,000 live births), and Asians/Pacific Islanders (9.2 cases per 100,000 live births) (Table 42).

Syphilis among Special Populations

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

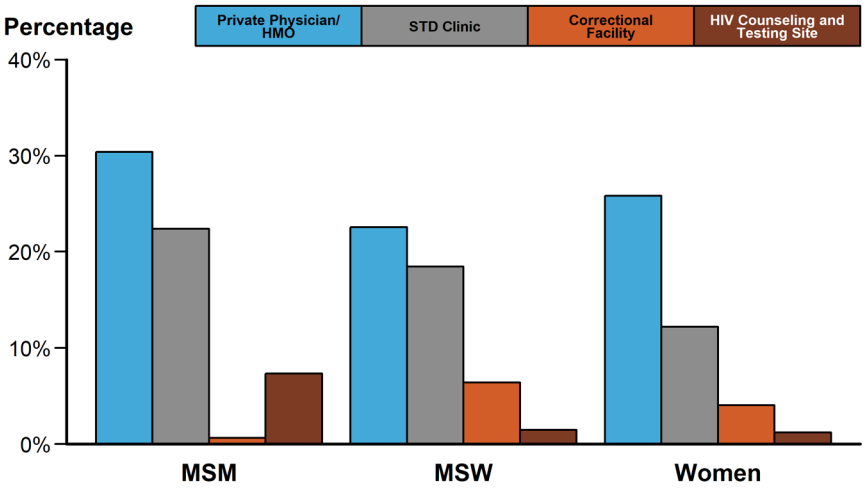
Syphilis Summary

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, in the last five years, rates have increased among both men and women, and the P&S syphilis rate among women has almost tripled. Rates of reported congenital syphilis cases also increased substantially during 2014–2018 and during 2017–2018. MSM continued to account for the majority of reported P&S syphilis cases in 2018. Nationally, the highest rates of P&S syphilis in 2018 were observed among men aged 20–34 years, among men in the West, and among Black men.

References

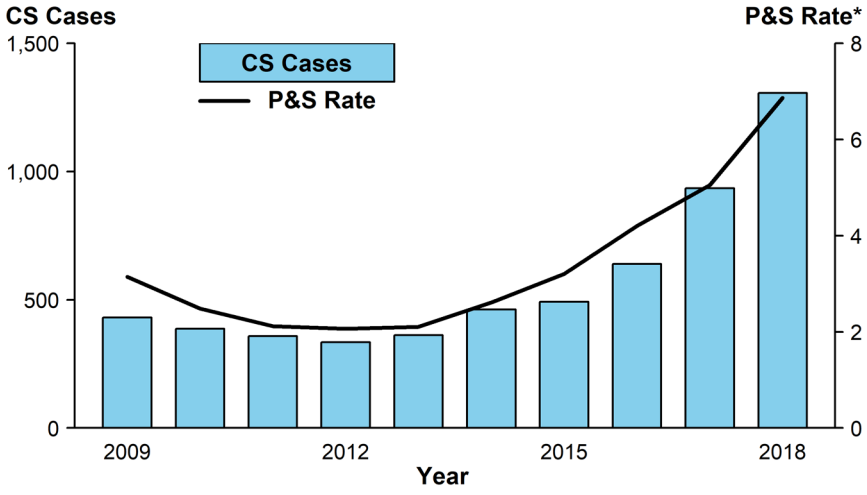
1. Jarzebowski W, Caumes E, Dupin N, et al. Effect of early syphilis infection on plasma viral load and CD4 cell count in human immunodeficiency virus- infected men: Results from the FHDH- ANRS CO4 cohort. *Arch Intern Med.* 2012;172(16):1237–1243.
2. Buchacz K, Patel P, Taylor M, et al. Syphilis increases 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 Transm 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. 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.
6. 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 48. Primary and Secondary Syphilis — Percentage of Reported Cases* by Sex and Sex of Sex Partners and Selected Reporting Sources, United States, 2018



* Of all primary and secondary syphilis cases, 12.5% had a missing or unknown reporting source. Among all cases with a known reporting source, the reporting source categories presented represent 55.4% of cases.
ACRONYMS: HMO = Health maintenance organization; MSM = Gay, bisexual, and other men who have sex with men; MSW = Men who have sex with women only.

Figure 49. Congenital Syphilis — Reported Cases by Year of Birth and Rates of Reported Cases of Primary and Secondary Syphilis Among Females Aged 15–44 Years, United States, 2009–2018



* Per 100,000.
ACRONYMS: CS = Congenital syphilis; P&S = Primary and secondary syphilis.

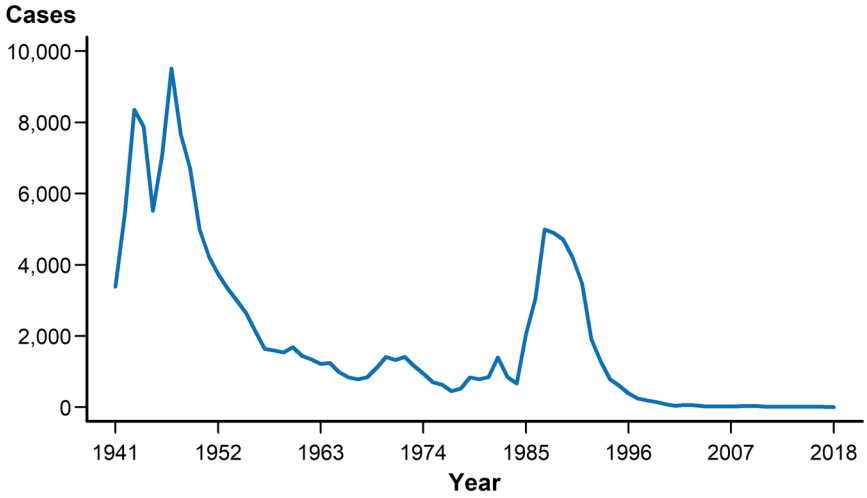
Other STDs

Chancroid

Chancroid is caused by anogenital infection with the bacterium *Haemophilus ducreyi*. Clinical manifestations of chancroid include anogenital ulcers, and inguinal lymphadenopathy or buboes in up to 50% of cases.[1] Reported cases of chancroid peaked in 1947 and then declined rapidly through 1957, presumably due to the increasing use of antibiotics such as sulfonamides and penicillin, which were introduced in the late 1930s and early 1940s (Figure 50, Table 1).[2,3] Numerous localized outbreaks, some of which were linked to commercial sex work, were identified during 1981–1990.[4,5] Chancroid has declined since 1987; since 2000, the annual number of reported cases has been less than 100, and since 2011, the annual number of reported cases has been less than 20. In 2018, only three cases of chancroid were reported in the United States (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 *H. ducreyi* is difficult to culture and no molecular assays have been cleared by the Food and Drug Administration (FDA) for use in the United States.[6]

Figure 50. Chancroid — Reported Cases by Year, United States, 1941–2018



NOTE: See section A1.3 in the Appendix for more information on chancroid case reporting.

Human Papillomavirus

Human papillomavirus (HPV) is a common sexually transmitted infection in the United States.[7] Over 40 distinct HPV types can infect the genital tract,[8] although most infections are asymptomatic and appear to resolve spontaneously within a few years.[9] Prevalence of genital infection with any HPV type was 42.5% among civilian, non-institutionalized adults aged 18–59 years in the United States during 2013–2014.[10] Among sexually active non-Hispanic Whites and non-Hispanic Blacks, prevalence was significantly higher in males.[11] Persistent infection with some HPV types can cause cancer and genital warts.[12] HPV types 16 and 18 account for approximately 66% of cervical cancers in the United States,[13] and approximately 25% of low-grade and 50% of high-grade cervical intraepithelial lesions, or dysplasia.[14,15] HPV types 6 and 11 are responsible for approximately 90% of genital warts.[16,17]

Quadrivalent HPV vaccine, which targets HPV types 6, 11, 16, and 18, was licensed in the United States in mid-2006 for females[18] and in late 2009 for males.[19] Although a bivalent vaccine was also licensed for females,[20] almost all HPV vaccine administered in the United States through late 2014 was quadrivalent.[21] 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.[22] All HPV vaccines have been recommended for routine use in United States females aged 11–12 years, with catch-up vaccination through age 26.[18,22] 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;[22-24] in June 2019, this age limit was extended to 26 years.[25] Vaccination through age 26 has been recommended since late 2011 for gay, bisexual, and other men who have sex with men (MSM) and persons who are immunocompromised (including those infected with HIV).[22-24] In October 2018, the FDA extended licensing approval of the 9-valent vaccine for women and men aged 27–45 years,[26] and in June 2019 the CDC's Advisory Committee on Immunization Practices (ACIP) recommended that unvaccinated adults aged 27–45 years discuss receiving the HPV vaccine with their health care providers.[25]

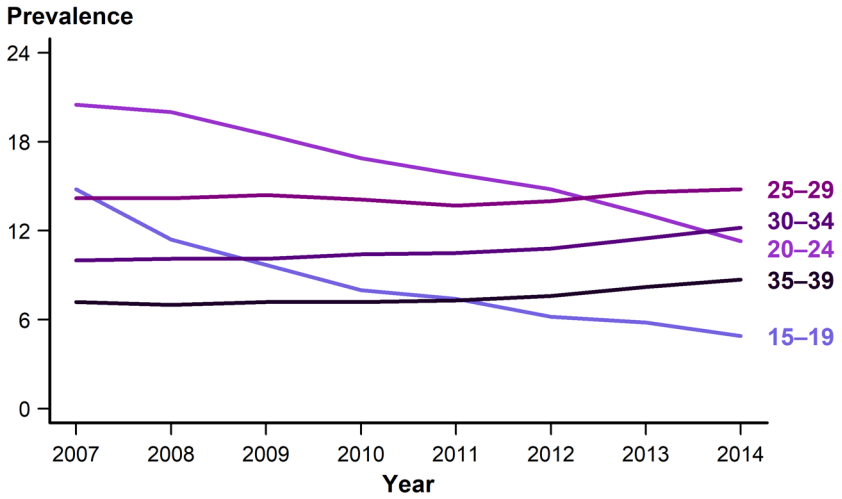
HPV vaccine uptake in the United States remains lower than the *Healthy People 2020* goal of 80% coverage.[27] A national survey conducted in 2018 found that 70% of girls aged 13–17 years had received at least one dose of the HPV vaccine, and 54% had received all doses in the series[28] based on recommendations published in late 2016.[24] Among boys, 66% of those aged 13–17 years received at least one dose and 49% received all recommended doses.[28]

A recent meta-analysis that included data from over 60 million individuals from 14 high-income countries, including the United States, showed a substantial impact of HPV vaccination on: genital HPV infections among adolescent girls and young women; high-grade cervical lesions among young women; and anogenital warts among adolescent boys and girls, and among young men and women.[29] Although HPV infection is not a nationally notifiable condition in the United States, cervicovaginal prevalence of any quadrivalent HPV vaccine type has been estimated for civilian, non-institutionalized females aged 14–34 years using data from the National Health and Nutrition Examination Survey (NHANES; see Section A2.4 in the Appendix).[30] Prevalence decreased significantly from 2003–2006 (the pre-vaccine era) to 2011–2014 in specimens from females aged 14–19 years (from 11.5% to 3.3%) and 20–24 years (from 18.5% to 7.2%); these were the age groups most likely to benefit from HPV vaccination. Among women aged 25–34 years, vaccine-type HPV prevalence did not differ significantly between the two time periods. 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.[31]

Health-care claims data from adolescents and adults with employer-provided private health insurance in the United States were used to examine the population effectiveness of HPV vaccination on clinical sequelae of HPV infection. Annual prevalence of high-grade histologically-detected cervical intraepithelial neoplasia grades 2 and 3 (CIN2+) during 2007–2014 was estimated using claims from 9 million females aged 15–39 years who received cervical cancer screening in a given calendar year.[32] Prevalence of CIN2+ decreased significantly in females aged 15–19 and 20–24 years (Figure 51). Among those aged 15–19 years, annual percent change (APC) in CIN2+ prevalence was -19.8% during 2007–2009 and -12.1% during 2009–2014. For women aged 20–24 years, APC was -6.7% during 2007–2012, and -12.5% during 2012–2014. No decreases in CIN2+ prevalence were observed among women aged 25–39 years. The observed decreases in high-grade cervical lesions only among young women provide ecologic evidence of population effectiveness of HPV vaccination on clinical sequelae of infection among privately-insured women in the United States.

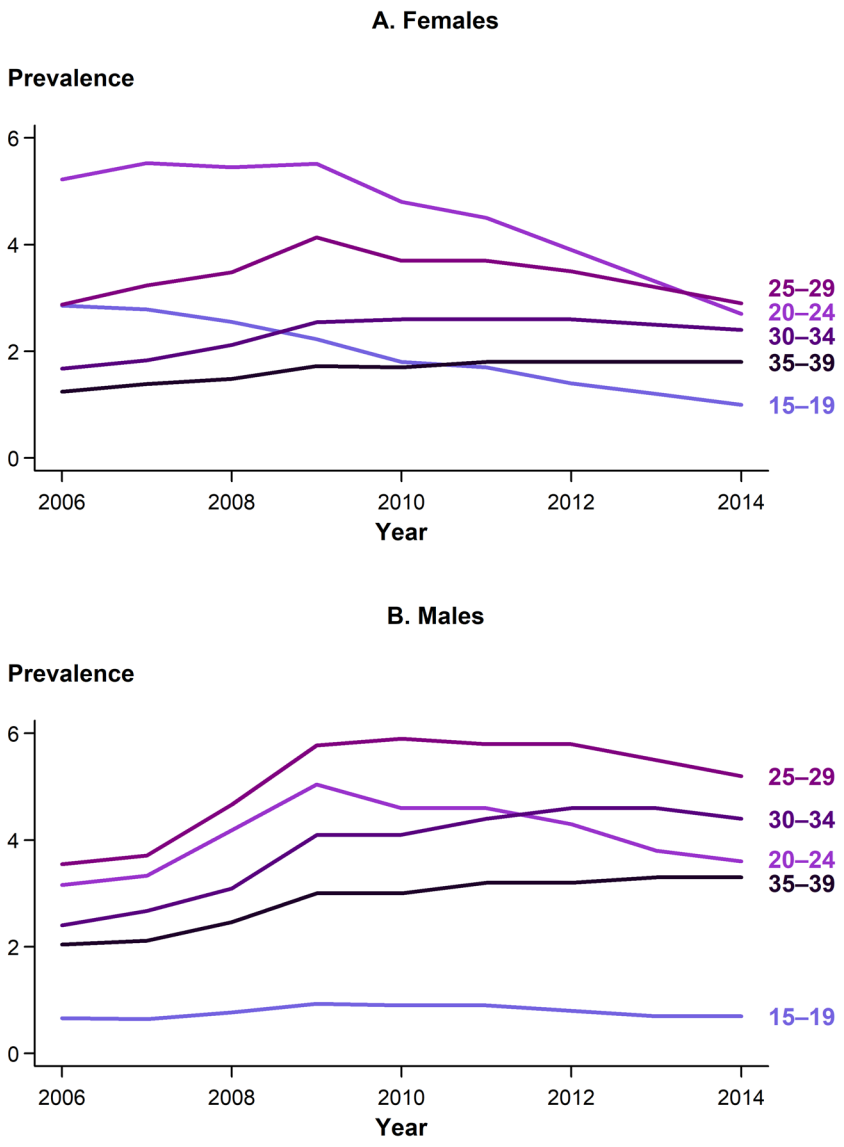
Prevalence of anogenital warts was examined using health-care claims of privately-insured females and males aged 15–39 years during 2006–2014 (Figures 52A and 52B).[33] Prevalence among adolescent females aged 15–19 years declined non-significantly during 2006–2008, and then significantly decreased through 2014 (APC=-14.1). Among women aged 20–24 years, anogenital wart prevalence was stable during 2006–2009, but declined significantly during 2009–2014 (APC=-12.9). Prevalence among women aged 25–29 years also decreased significantly from 2009–2014 (APC=-6.0). Prevalence increased or was stable during the entire period for women

Figure 51. Cervical 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.

Figure 52. Anogenital Warts — Prevalence per 1000 Person-Years Among Enrollees in Private Health Plans Aged 15–39 Years by Sex, Age Group, and Year, 2006–2014



SOURCE: Flagg EW, Torrone EA. Declines in anogenital warts among age groups most likely to be impacted by human papillomavirus vaccination, United States, 2006–2014. *Am J Public Health.* 2018;108(1):112–119.

aged 30–39 years. These declines in anogenital wart prevalence among females aged 15–29 years extend the observations of a previous study using claims from 2003 through 2010, in which decreased prevalence was found only among adolescent females aged 15–19 years.[34] The observed declines in prevalence among increasingly older age groups would be expected from including more years of observation after the initiation of routine HPV vaccination for females in 2006. Among males, anogenital wart prevalence increased significantly during 2006–2009 for all age groups except those aged 15–19 years.[33] From 2009 to 2014, rates decreased somewhat among male adolescents aged 15–19 years (APC=-5.4), but decreased significantly among men aged 20–24 years (APC=-6.5). Among those aged 25–29 years, prevalence declined non-significantly during 2010–2014 (APC=-1.7); prevalence increased or was stable throughout the entire period for men aged 30–39 years. The decreased prevalence observed among men aged 20–24 years is unlikely to be due to male vaccination for several reasons. Almost all men in this age group were aged 19 years or older since 2011, when HPV vaccine was first recommended for routine use in United States males[23] and vaccination coverage in adult males through 2014 was extremely low.[35] Also, the most likely sexual partners for men in this age group were females of a similar age or younger;[36,37] therefore, the observed declines in anogenital wart prevalence among young men are consistent with herd protection from vaccination among females.

A study conducted in 27 clinics participating in the STD Surveillance Network (SSuN; see Section A2.2 in the Appendix) observed significant declines in prevalence of anogenital warts during 2010–2016 among women and men who have sex with women only (MSW) aged less than 40 years, and among MSM of all ages.[38] Although some of the observed declines may be due to HPV vaccination, changes over time in the population of STD clinic patients or clinical practices, such as a decrease in physical examinations resulting in fewer anogenital warts diagnoses, may partially account for these findings.

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.[7,39] Although most infections are subclinical,[40] clinical manifestations are characterized by recurrent, painful genital and/or anal lesions.[41] Most genital HSV infections in the United States are caused by HSV type 2 (HSV-2), while HSV type 1 (HSV-1) infections are typically orolabial and acquired during childhood;[40,42] however, the prevalence of genital HSV-1 infections appears to be increasing among young adults.[43,44]

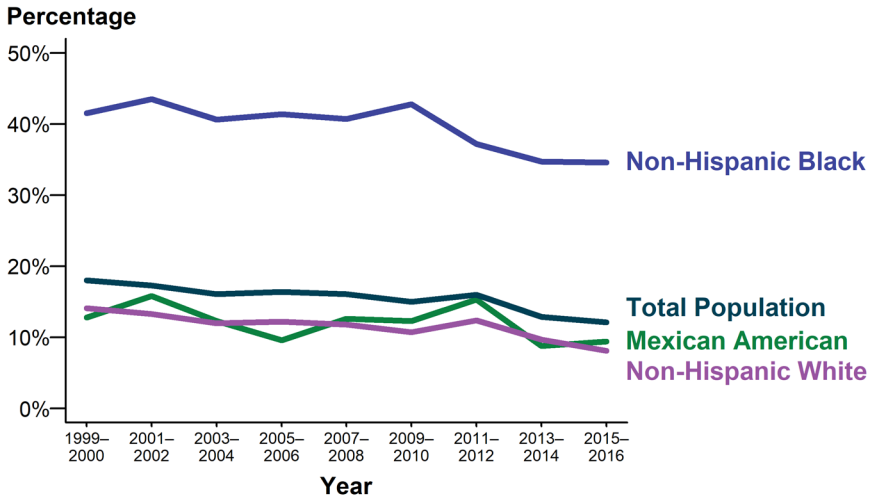
Genital HSV infection is not a nationally notifiable condition. Most persons with genital HSV infection have not received a diagnosis.[45] The overall percentage of the HSV-2 seropositive NHANES population aged 14–49 years who reported never being told by a doctor or healthcare professional that they had genital herpes did not change significantly between 1988–1994 and 2007–2010, and remained high (90.7% and 87.4%, respectively).[45]

NHANES data indicate the seroprevalence of HSV-2 in the civilian, non-institutionalized United States population has decreased from 1999–2000 to 2015–2016; age-adjusted seroprevalence declined from 18.0% in 1999–2000 to 12.1% in 2015–2016 (Figure 53).[46] Although these declines were observed among all race/Hispanic ethnicity groups, HSV-2 seroprevalence was highest among non-Hispanic Blacks throughout the entire time period.

A recent analysis of NHANES data showed that among men who reported having been diagnosed with genital HSV, 25.2% were HSV-1 positive and HSV-2 negative during 1999–2010; this percentage did not change significantly during 2011–2016.[47] In contrast, the percentage of diagnosed women who were HSV-1 positive and HSV-2 negative significantly increased from 16.5% during 1999–2010 to 31.6% during 2011–2016, while HSV-2 seropositivity in women decreased significantly, from 77.6% to 63.3%. These findings indicate the percentage of genital HSV infections associated with HSV-1 has increased among women in the United States since 2010.

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.[42] HSV-2 seroprevalence in this age group was much lower, less than 2% in both time periods.[42] Other studies have found that genital HSV-1 infections are increasing among young adults.[43,44] 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.[42,48] Increasingly common oral sex behavior among adolescents and young adults also has been suggested as a contributing factor.[42,49] The absence of HSV-1 antibodies also increases the likelihood of developing symptomatic disease from newly-acquired (i.e., primary) genital HSV-2 infection.[50] 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,[48,51] and first-episode primary genital HSV infection during pregnancy increases the risk

Figure 53. Herpes Simplex Virus Type 2 — National Estimates of Trends in Age-Adjusted Seroprevalence Among Persons Aged 14–49 Years by Race/Hispanic Ethnicity, National Health and Nutrition Examination Survey (NHANES), 1999–2000 through 2015–2016



NOTE: Age-adjusted by the direct method to the 2000 US Census population, using age groups 14–19, 20–29, 30–39, and 40–49 years. Total population includes all race/Hispanic ethnicity groups, including those not shown separately.
SOURCE: McQuillan G, Kruszon-Moran D, Flagg EW, et al. Prevalence of herpes simplex virus type 1 and type 2 in persons aged 14–49: United States, 2015–2016. NCHS data brief, no 304. Hyattsville, MD: National Center for Health Statistics. 2018.

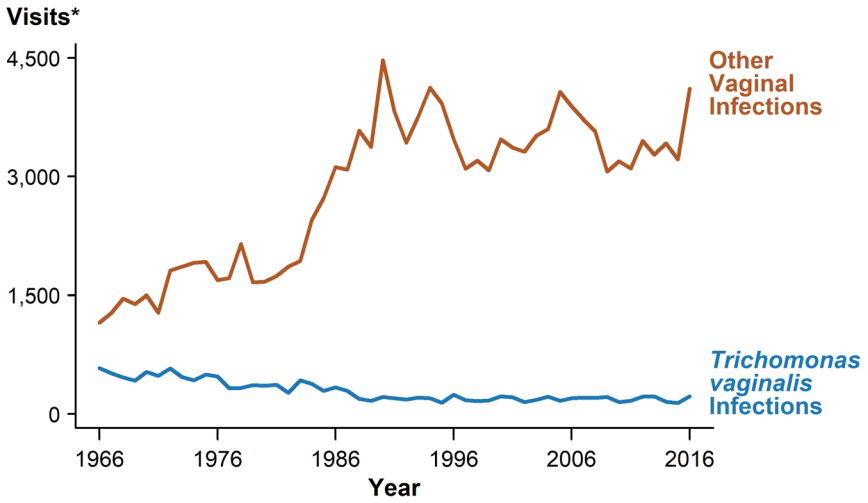
of neonatal HSV transmission.[48,52] Another analysis of NHANES data found that among pregnant women with three or fewer lifetime sex partners, seronegativity for both HSV-1 and HSV-2 increased from 1999–2006 to 2007–2014,[53] raising the possibility that pregnant women with fewer sex partners may have increased risk of acquiring genital HSV during pregnancy and vertically transmitting HSV to their neonates.

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.[7,54-55] It is not a nationally notifiable 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 54, Table 44). Visits appear to be fairly stable since the 1990's; the number of initial visits for *T. vaginalis* infection in 2016 was 222,000. NHANES data during 2013–2016 indicated prevalence of *T. vaginalis* in urine specimens obtained from participants aged 14–59 years was 0.5% among males and 2.1% among females; highest prevalences were observed among non-Hispanic Black males (3.4%) and females (9.6%).[56] An analysis of NHANES data during 2001–2004 from cervicovaginal swab specimens also found higher *T. vaginalis* prevalence among non-Hispanic Black females.[57]

Figure 54. *Trichomonas vaginalis* and Other Vaginal Infections Among Females — Initial Visits to Physicians' Offices, United States, 1966–2016



* In thousands.

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, 1966–2016.

References

1. Lewis DA. Epidemiology, clinical features, diagnosis and treatment of *Haemophilus ducreyi* — a disappearing pathogen? *Expert Rev Anti Infect Ther.* 2014;12(6):687–696.
2. Steen R. Eradicating chancroid. *Bull World Health Organ.* 2001;79:818–826.
3. Hall L. "The Cinderella of medicine": Sexually-transmitted diseases in Britain in the nineteenth and twentieth centuries. *Genitourin Med.* 1993;69:314–319.
4. Schmid GP, Sanders LL, Blount JH, et al. Chancroid in the United States. Reestablishment of an old disease. *JAMA.* 1987;258(22):3265–3268.
5. Schulte JM, Martich FA, Schmid GP. Chancroid in the United States, 1981–1990: Evidence for underreporting of cases. *MMWR Surveill Summ.* 1992;41(No. SS–3):57–61.
6. Centers for Disease Control and Prevention. Sexually transmitted diseases treatment guidelines, 2015. *MMWR Recomm Rep.* 2015;64(No. RR–3):26–27.
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. de Villiers E-M, Fauquet C, Broker TR, et al. Classification of papillomaviruses. *Virology.* 2004;324:17–27.
9. 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.

10. 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.

11. Lewis RM, Markowitz LE, Gargano JW, et al. Prevalence of genital human papillomavirus among sexually experienced males and females aged 14–59 years, United States, 2013–2014. *J Infect Dis*. 2018;217(6):869–877.

12. Doorbar J, Quint W, Banks L, et al. The biology and life-cycle of human papillomaviruses. *Vaccine*. 2012;30(Suppl 5):F55–F70.

13. 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.

14. 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.

15. 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.

16. 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.

17. 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.

18. Markowitz LE, Dunne EF, Saraiya M, et al. Quadrivalent human papillomavirus vaccine. Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep*. 2007;56(No. RR–2):1–24.

19. 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.

20. 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.

21. 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.

22. 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.

23. 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.

24. Meites E, Kempe A, Markowitz LE. Use of a 2-dose schedule for human papillomavirus vaccination — updated recommendations of the Advisory Committee on Immunization Practices. *MMWR Morb Mortal Wkly Rep*. 2016;65(49):1405–1408.

25. Meites E, Szilagyi PG, Chesson HW, et al. Human papillomavirus vaccination for adults: Updated recommendations of the Advisory Committee on Immunization Practices. *MMWR Morb Mortal Wkly Rep*. 2019;68(32):698–702.

26. US Food and Drug Administration. "Supplement Approval Letter — Biologics License Application (BLA) for Human Papillomavirus 9-valent Vaccine, Recombinant (GARDASIL® 9)". Letter to Merck Sharp & Dohme Corp. October 5, 2018. US Food and Drug Administration. 2018. https://www.fda.gov/media/117053/download. Accessed July 2, 2019.

27. HealthyPeople.gov. Objectives IID-11.4 and IID-11.5. *Healthy People 2020 Topics & Objectives. Immunization and Infectious Diseases* 2019; https://www.healthypeople.gov/2020/topics-objectives/topic/immunization-and-infectious-diseases/objectives. Accessed July 2, 2019.

28. Walker TY, Elam-Evans LD, Yankey D, et al. National, regional, state, and selected local area vaccination coverage among adolescents aged 13–17 years — United States, 2018. *MMWR Morb Mortal Wkly Rep.* 2019;68(33):718–723.

29. Drolet M, Benard E, Perez N, et al. Population-level impact and herd effects following the introduction of human papillomavirus vaccination programmes: Updated systematic review and meta-analysis. *Lancet* 2019;394(10197):497–509.

30. Oliver SE, Unger ER, Lewis R, et al. Prevalence of human papillomavirus among females after vaccine introduction — National Health and Nutrition Examination Survey, United States, 2003–2014. *J Infect Dis.* 2017;216(5):594–603.

31. 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.

32. 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.

33. Flagg EW, Torrone EA. Declines in anogenital warts among age groups most likely to be impacted by human papillomavirus vaccination, United States, 2006–2014. *Am J Public Health*. 2018;108(1):112–119.

34. 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.

35. Williams WW, Lu P-J, O'Halloran A, et al. Surveillance of vaccination coverage among adult populations — United States, 2014. *MMWR Surveill Summ*. 2016;65(No. SS–1):1–36.

36. Ford K, Sohn W, Lepkowsk J. American adolescents: Sexual mixing patterns, bridge partners, and concurrency. *Sex Transm Dis.* 2002;29(1):13–19.

37. Aral SO, Hughes JP, Stoner B, et al. Sexual mixing patterns in the spread of gonococcal and chlamydial infections. *Am J Public Health*. 1999;89(6):825–833.

38. Mann LM, Llata E, Flagg EW, et al. Trends in the prevalence of anogenital warts among patients at sexually transmitted disease clinics — Sexually Transmitted Disease Surveillance Network, United States, 2010–2016. *J Infect Dis*. 2019;219(9):1389–1397.

39. 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.

40. 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.

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

42. 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.

43. 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(3):344–351.

44. 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.

45. 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.

46. McQuillan G, Kruszon-Moran D, Flagg EW, et al. Prevalence of herpes simplex virus type 1 and type 2 in persons aged 14–49: United States, 2015–2016. NCHS data brief, no 304. Hyattsville, MD: National Center for Health Statistics. 2018.

47. Flagg EW, Torrone EA. Seroprevalence of herpes simplex virus type 1 and type 2 infections among adults diagnosed with genital herpes: United States, 1999–2016. *Sex Transm Dis*. 2018;45(Suppl 2):S51.

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

49. 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.

50. 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.

51. 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.

52. 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.

53. Patton ME, Bernstein K, Liu G, et al. Seroprevalence of herpes simplex virus types 1 and 2 among pregnant women and sexually active, non-pregnant women in the United States. *Clin Infect Dis*. 2018;67(10):1535–1542.

54. 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.

55. Patel EU, Gaydos CA, Packman ZR, et al. Prevalence and correlates of *Trichomonas vaginalis* infection among men and women in the United States. *Clin Infect Dis*. 2018;67(2):211–217.

56. Flagg EW, Meites E, Phillips C, et al. Prevalence of *Trichomonas vaginalis* among males and females aged 14–59 years: United States, 2013–2016. *Sex Transm Dis*. 2019; Published ahead of print. DOI: 10.1097/olq.0000000000001013.

57. 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 (MSM).

STDs in Women and Infants

Background

Complications of sexually transmitted infections disproportionately affect women of all ages, with important implications for women of reproductive age. Undiagnosed and untreated STDs can lead to pelvic inflammatory disease (PID), ectopic pregnancy, as well as adverse fetal and neonatal outcomes. STD-related morbidity disproportionately occurs in women for a number of reasons. Women are biologically more susceptible than men to the acquisition of some STDs and more likely to suffer from complications. It is also important to note that STDs are often asymptomatic in women, delaying diagnosis and treatment until there is a symptomatic complication. A female's sexual and reproductive health can also be interrelated to her particular social, cultural, and economic environment, creating conditions for risky sexual behaviors. Several factors, including the use of alcohol or recreational drugs inhibiting the ability to negotiate safer sexual practices, diminished gender power, high-levels of concurrency, poverty, homelessness or unstable housing, and partner violence may contribute to the challenges women face in protecting their sexual well-being.[1-5] In some circumstances, maintaining the relationship with a partner may take a higher priority than STD risk reduction, affecting her reproductive health, as well as the health of her unborn baby.[6] A woman can also be placed at risk for STDs through her partner's sexual encounter with an infected partner. Consequently, even a female who has only one partner may be obliged to practice safer sex, such as using condoms.[7]

Impact on Women and Fertility

Human Papillomavirus

Human papillomavirus (HPV) is a common sexually transmitted infection in the United States.[8,9] Although most HPV infections in women appear to be transient and may not result in clinically significant sequelae,[10] high-risk HPV-type infections can cause abnormal changes in the uterine cervical epithelium,[10,11] which are detected by cytological examination of Papanicolaou (Pap) smears.[12] Persistent high-risk HPV-type

infections may lead to cervical cancer precursors, which if undetected can result in cancer,[11] and excisional treatment of cervical lesions can increase risk for future preterm delivery.[13] Other low-risk HPV-type infections can cause genital warts,[11,14] low-grade Pap smear abnormalities,[11,15] laryngeal papillomas,[16] and, rarely, recurrent respiratory papillomatosis in children born to infected mothers.[17,18]

Starting in 2006, HPV vaccines have been recommended for routine use in United States females aged 11–12 years, with catch-up vaccination through age 26.[19,20] HPV vaccination also has been recommended for routine use in males since 2011.[20-23] In October 2018, the Food and Drug Administration (FDA) extended licensing approval of the vaccine for women and men aged 27–45 years,[24] and in June 2019 the CDC's Advisory Committee on Immunization Practices (ACIP) recommended that unvaccinated adults aged 27–45 years discuss receiving the HPV vaccine with their health care providers.[23] For more information on HPV vaccination, see Other STDs.

A recent meta-analysis that included data from over 60 million individuals from 14 high-income countries, including the United States, showed a substantial impact of HPV vaccination on genital HPV infections and anogenital warts among adolescent girls and young women, and high-grade cervical lesions among young women.[25] Cervicovaginal prevalence of any quadrivalent HPV vaccine type has been estimated for civilian, non-institutionalized, females aged 14–34 years using data from the National Health and Nutrition Examination Survey (NHANES).[26] Prevalence decreased significantly from 2003–2006 (the pre-vaccine era) to 2011–2014 in specimens from females aged 14–19 years and 20–24 years, the age groups most likely to benefit from HPV vaccination. For more information on HPV infections, see Other STDs.

Chlamydia

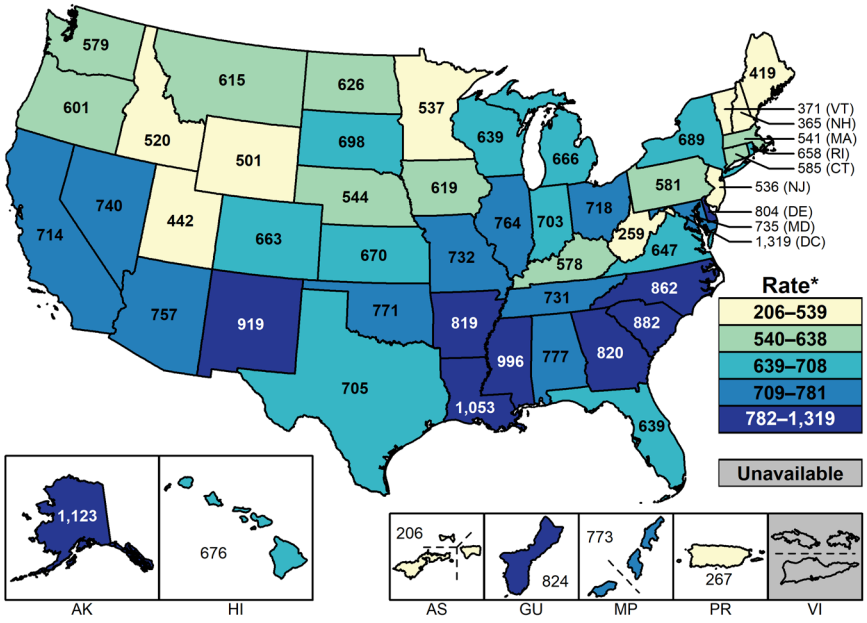
Chlamydial infections in women are usually asymptomatic and screening is necessary to identify most infections. Routine chlamydia screening of sexually-active young women has been recommended by the CDC since 1993.[27] Rates of reported cases of chlamydia among women increased steadily from the early 1990s, likely reflecting expanded screening coverage and use of more sensitive diagnostic tests (Table 1). During 2011–2013, chlamydia case rates decreased from 643.4 to 619.0 cases per 100,000 females and then increased 11.9% over the next five years, resulting in a rate of 692.7 cases per 100,000 females in 2018 (Figure 1, Table 4).

Chlamydia rates are highest among young women, the population targeted for screening (Figures 5 and 6, Table 10). During 2017–2018, rates of reported chlamydia cases increased 1.3% and 0.8% among females aged 15–19 and 20–24 years, respectively (Figure 6). Regionally, among all women, chlamydia case rates were highest among women in the South, with a rate of 744.2 cases per 100,000 females in 2018 (Table 4). Rates of reported chlamydia cases exceeded gonorrhea case rates among women in all regions (Figures A and C, 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,

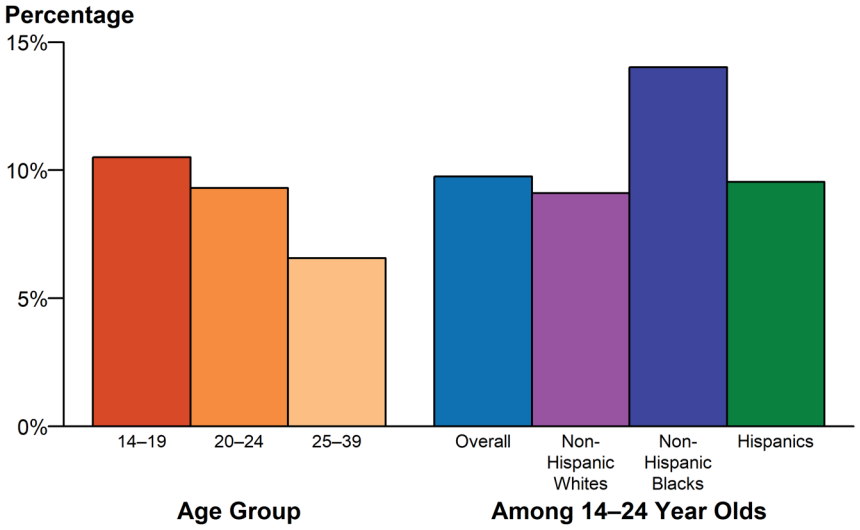
Figure A. Chlamydia — Rates of Reported Cases Among Females by State and Territory, United States, 2018



* Per 100,000.

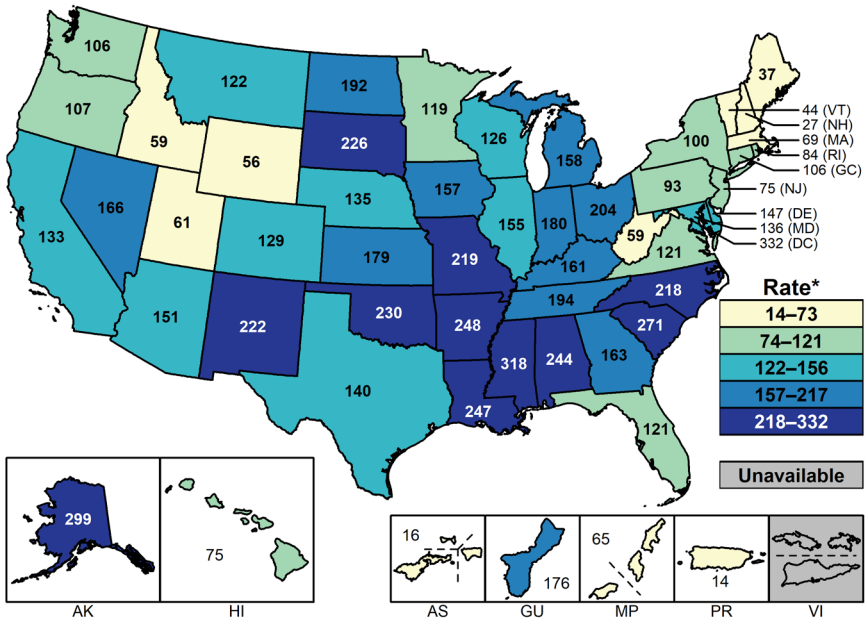
NOTE: See Sections A1.11 in the Appendix for more information on interpreting reported rates in US territories.

Figure B. Chlamydia — Positivity Among Females Aged 14–39 Years by Race/Hispanic Ethnicity and Age Group in Clinics* Providing Family Planning and Reproductive Health Services, STD Surveillance Network (SSuN), 2018



* Includes clinics (n=26) that tested >100 females for chlamydia in 2018 and testing coverage was >60%.
NOTE: See section A2.2 in the Appendix for SSuN methods.

Figure C. Gonorrhea — Rates of Reported Cases Among Females by State and Territory, United States, 2018



* Per 100,000.
NOTE: See Sections A1.11 in the Appendix for more information on interpreting reported rates in US territories.

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). However, in the summer of 2018, data collection in these clinic settings ended and the results presented here only include data obtained from January through June 2018. Figure B shows chlamydia testing and positivity reported only among facilities that tested more than 100 females and more than 60% of young females aged 14–24 years. In 2018, the overall positivity of chlamydia among females aged 14–24 years was 9.8%, but for females 14–19 years of age, chlamydia positivity was 10.5%. For females between the ages of 14–24 years, chlamydia positivity among non-Hispanic Blacks was about 1.5 times those 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 14, 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 females increased slightly each year during 2009–2011, and then decreased during 2012–2014 (Figure 18). During 2015–2018, the gonorrhea rate among women increased 37.2% to 145.8 cases per 100,000 females (Figure 18, Table 15).

The gonorrhea case rate among females was slightly higher than the rate among males during 2009–2012; however, the rate among males was higher than the rate among females during 2013–2018 (Figure 18, Tables 15 and 16). During 2014–2018, gonorrhea rates among females were highest among those aged 15–24 years (Figure 20, Table 21). For women in this age group, rates were highest among 19-year olds in 2018 (877.3 cases per 100,000 females) (Table 23).

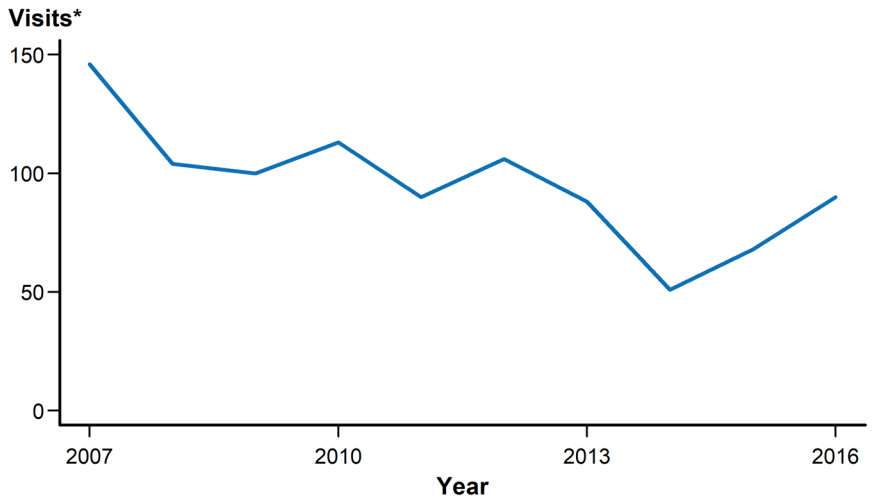
Pelvic Inflammatory Disease

Data from studies suggest that as much as 10% of untreated chlamydial infections progress to clinically diagnosed PID and the risk with untreated gonococcal infection may be even higher.[28-30] 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,[31] and much of this damage results from previous episodes of PID.[32] An important public health measure for preventing PID, and ultimately tubal factor infertility, is through the prevention and control of *Chlamydia trachomatis* and *Neisseria gonorrhoeae*. Strategies to improve the early detection and treatment of chlamydia, as demonstrated in randomized controlled trials,[29,33] has been shown to reduce a woman's risk for PID and ultimately protect the fertility of women.

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. 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 during 2007–2016 the number of initial visits to such physicians for PID among women aged 15–44 years decreased by 38.3% from 146,000 to 90,000 visits (Figure D). Similar declines have been observed in nationally representative data of emergency department (ED) visits from the Healthcare Cost and Utilization Project (HCUP), the largest collection of all-payer encounter level inpatient, ED, and ambulatory services data in the United States. According to an analysis using HCUP's Nationwide Emergency Department Sample (NEDS), the percentage of ED visits with a PID diagnosis decreased during 2006–2013 among females aged 15–44 years, with the largest decreases among females aged 15–19 years (Figure E).[34] It is not entirely clear what may be driving these declines, though several factors have been suggested, including earlier identification and treatment of chlamydia and gonorrhea infection and availability of single-dose therapies that increase adherence to treatment.[35-37] While PID is declining nationally, it is still a major cause of morbidity in women.

Differences in self-reported lifetime diagnosis of PID by race/Hispanic ethnicity in reproductive age women have been observed in earlier research.[38] Data from the 2013–2014 cycle of NHANES indicates that non-Hispanic Black and non-Hispanic White women reporting a previous STI diagnosis had nearly equal self-reported lifetime PID prevalence (10.3% vs. 10.0%) (Figure F).[39] 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%

Figure D. Pelvic Inflammatory Disease — Initial Visits to Physicians' Offices Among Females Aged 15–44 Years, United States, 2007–2016

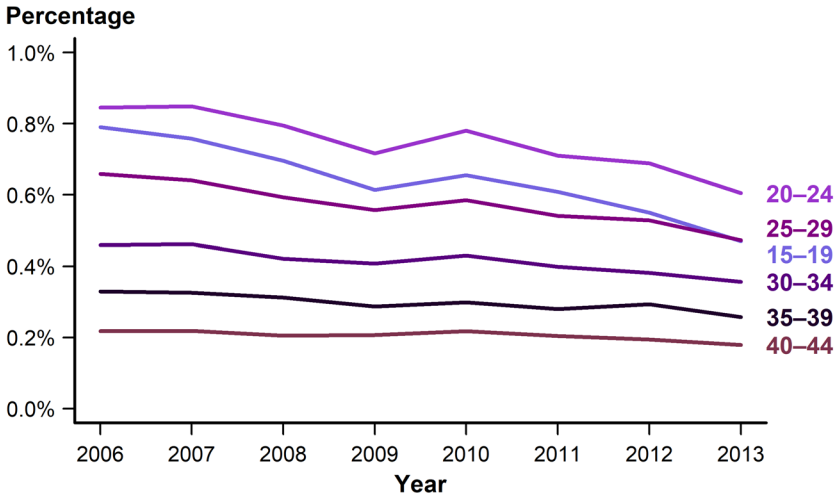


* In thousands.

NOTE: The relative standard errors for these estimates are 23%–16%. See section A2.5 in the Appendix and Table 44.

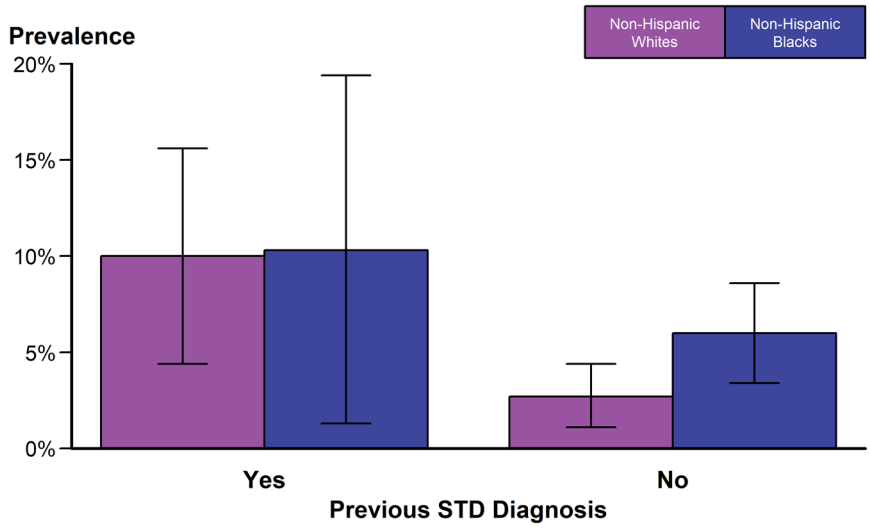
SOURCE: National Disease and Therapeutic Index, IMS Health, Integrated Promotional Services™, IMS Health Report, 1966–2016.

Figure E. Estimated Percentage of Acute Pelvic Inflammatory Disease Emergency Department Visits Among Females Aged 15–44 Years by Age Group and Year, United States, 2006–2013



SOURCE: Kreisel, K, Flagg, EW, Torrone E. Trends in pelvic inflammatory disease emergency department visits, United States, 2006–2013. *Am J Obstet Gynecol.* 2018; 218(1): 117.e1–117.e10.

Figure F. Pelvic Inflammatory Disease — National Estimates of Lifetime Prevalence Among Sexually Experienced Women Aged 18–44 Years by Race/Hispanic Ethnicity and Previous STD Diagnosis, National Health and Nutrition Examination Survey (NHANES), 2013–2014



NOTE: Error bars indicate 95% confidence intervals. Prevalence estimates among non-Hispanic Black women with a previous STD 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.

vs. 2.7%). 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.

Impact on Pregnancy and Fetal Outcomes

The sexually transmitted infections implicated in adverse pregnancy outcomes are broad and include viral, bacterial and protozoal infections. The spectrum of reproductive outcomes following STIs not only threatens the health of women and their ability to reproduce but can extend to detrimental effects on the fetus and neonates of infected individuals. Access to care and the provider's ability to assess risk, screen, and treat STIs are critical factors in improving obstetrical outcomes.

Ectopic Pregnancy

Ectopic pregnancy, defined as implantation of a fertilized ovum on any tissue other than the lining of the uterus, is a potentially life-threatening condition that requires prompt evaluation and treatment. 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 inpatient hospital surveillance data sources unreliable. As a result, alternative surveillance methods, including data from large administrative claims,[39,40] or emergency departments have been used to evaluate trends and assess the continued public health burden of this condition. Data from MarketScan Commercial Claims and Encounters Database, a large administrative

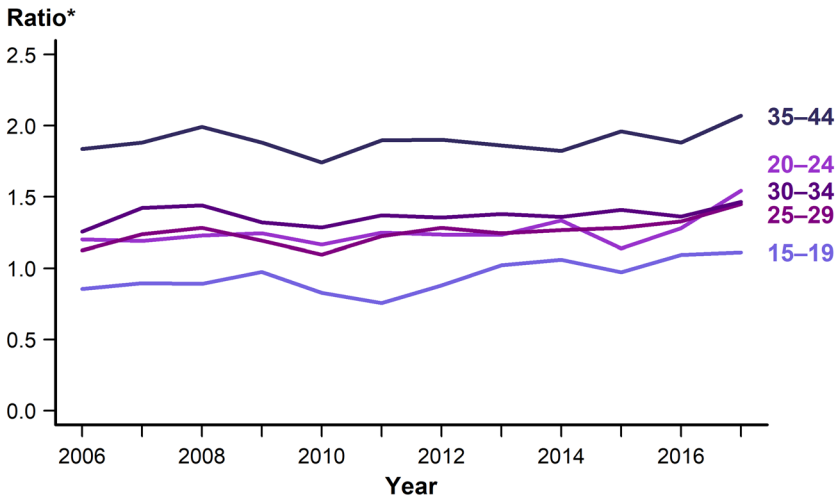
claims database of United States commercial health plans, indicate that the ratio of ectopic pregnancy diagnoses to all live births among women with live births aged 15–44 years during the period of 2006–2017 have marginally increased across all age groups (Figure G). As in previous years, in 2017, rates of ectopic pregnancy were highest among women in the 35–44 year age groups.

Neonatal Conjunctivitis

Maternal infection with *C. trachomatis* or *N. gonorrhoeae* 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 may be 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.[41]

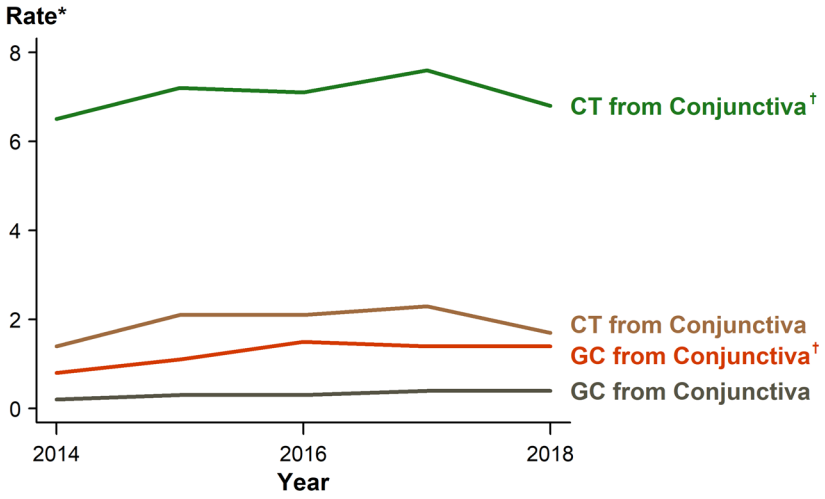
During 2014–2018, 438 chlamydia or gonorrhea cases among infants aged <1 year with a specimen source of either 'eye' or 'conjunctiva' (conjunctivitis infections) were reported to CDC. The overall reported rate of chlamydial conjunctivitis in infants was relatively stable during 2014–2018, ranging from 1.4 to 2.3 cases per 100,000 live births (Figure H). Similarly, the rate of gonococcal conjunctivitis in infants remained relatively constant and low during 2014–2018, ranging from 0.2–0.4 cases per 100,000 live births. 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 2014–2018 (n=2,348), 81.3% did not have a specimen source of either 'eye' or 'conjunctiva'; of those, 62.3% had a specimen source

Figure G. Ectopic Pregnancy — Ratio* Among Commercially Insured Females with Live Births Aged 15–44 Years by Age Group, 2006–2017



* Ratios represent the number of ectopic pregnancy diagnoses per 100,000 live births.
SOURCE: MarketScan Commercial Claims and Encounters Database, Truven Health Analytics, Ann Arbor, MI, 2006–2017.

Figure H. Chlamydia and Gonorrhea — Rates of Reported Cases Among Infants <1 Year of Age by Year and Specimen Source, United States, 2014–2018



* Per 100,000 live births.
† Includes cases with specimen source reported as missing, unknown, or other.
ADAPTED FROM: Kreisel K, Weston E, Braxton J, 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.
ACRONYMS: CT = Chlamydia; GC = Gonorrhea.

of 'unknown' (46.6%), 'other-not specified' (10.6%), or was missing (5.1%). 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 H).

Congenital Syphilis

Syphilis is an important risk factor for adverse pregnancy outcomes. The consequences of untreated maternal infection can include fetal and infant death, preterm birth, and congenital infection in a proportion of surviving infants, resulting in both physical and mental developmental disabilities. Most cases of congenital syphilis are preventable if women are screened for syphilis and treated early during prenatal care.

Trends in congenital syphilis usually mirror trends in primary and secondary (P&S) syphilis among reproductive-aged women. After plateauing at a relatively low rate (0.9 cases per 100,000 females) during 2011–2013, the rate of reported cases of P&S syphilis among all women has increased each year since then (Figure 49). During 2014–2018, the rate among women increased 172.7%, from 1.1 to 3.0 cases per 100,000 females (Table 28). During this same period, the rate among reproductive-aged women (women aged 15–44 years) increased 165.4%, from 2.6 to 6.9 cases per 100,000 females aged 15–44 years (Figure 49).

Similarly, the rate of reported congenital syphilis cases has increased each year since 2012 (Table 1). In 2018, there were 1,306 reported cases of congenital syphilis, with a rate of 33.1 cases per 100,000 live births, the highest rate reported since 1995. This increase in 2018 represents a 39.7% increase relative to 2017 and a 291.0% increase relative to 2012 (Table 41).

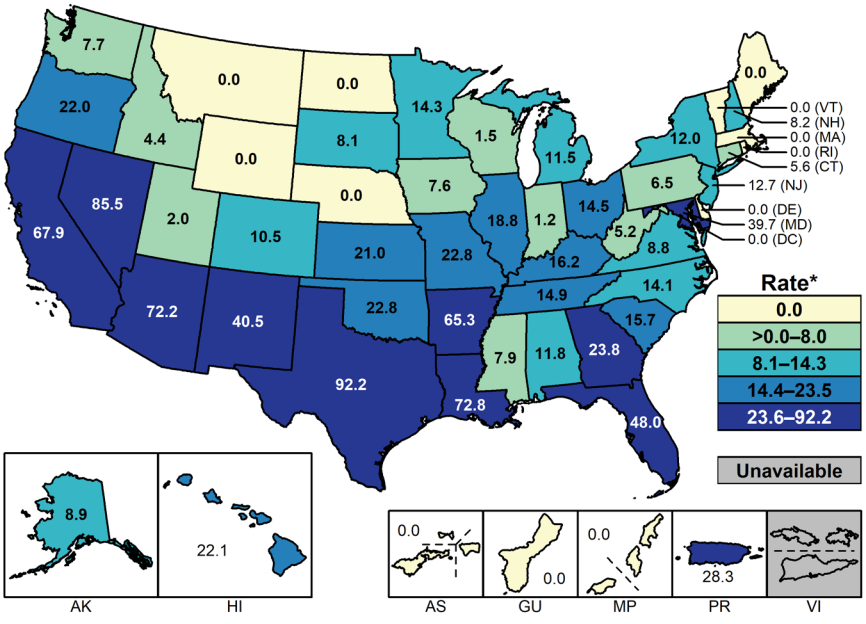
In 2018, the highest rates of reported P&S syphilis cases among women and the highest rates of reported congenital syphilis cases were observed in the West and in the South (Figures I and J, Tables 28 and 41). The rate of P&S syphilis among women increased in every region during 2017–2018. During 2017–2018, the largest rate increase among women occurred in the West (41.2%), followed by the Northeast (40.0%), South (30.8%), and Midwest (30.8%) (Table 28). The congenital syphilis rate increased 49.5% in the South, 44.1% in the Northeast, 30.5% in the Midwest, and 29.3% in the West during 2017–2018 (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 prenatal syphilis screening recommendations, as well as acquisition of infection during pregnancy after the initial screening test, also contribute to the occurrence of congenital syphilis.

Neonatal Herpes Simplex Virus

Herpes simplex virus (HSV) is among the most prevalent of sexually transmitted infections,[8] and can have serious consequences for pregnant women and their infants.[42] Most genital HSV infections in the United States are caused by HSV type 2 (HSV-2), while HSV type 1 (HSV-1) infections are typically orolabial and acquired during childhood.[43,44] NHANES data show that HSV-1 seroprevalence has significantly decreased among adolescents, indicating declining orolabial infection;[44] HSV-2 seroprevalence in this age group was much lower.[44] Those who lack HSV-1 antibodies at sexual debut are more susceptible to genital HSV-1 infection,[44,45] and are also at increased risk of developing symptomatic disease from newly-

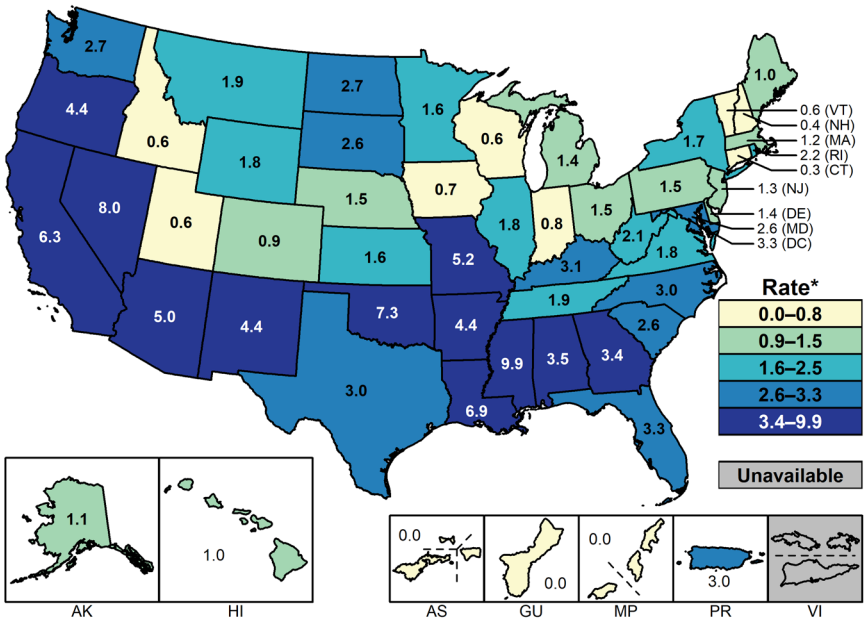
Figure I. Congenital Syphilis — Rates of Reported Cases by State and Territory, United States, 2018



* Per 100,000 live births.

NOTE: See Section A1.11 in the Appendix for more information on interpreting rates for US territories.

Figure J. Primary and Secondary Syphilis — Rates of Reported Cases Among Females by State and Territory, United States, 2018



* Per 100,000.

NOTE: See Sections A1.11 in the Appendix for more information on interpreting reported rates in US territories.

acquired (i.e., primary) genital HSV-2 infection.[46] 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;[45,47] first-episode primary genital HSV infection during pregnancy increases the risk of neonatal HSV transmission,[45,48] particularly if the mother acquires infection towards the end of her pregnancy.[45,49] Another analysis of NHANES data found that among pregnant women with three or fewer lifetime sex partners, seronegativity for both HSV-1 and HSV-2 increased from 1999–2006 to 2007–2014,[50] raising the possibility that pregnant women with fewer sex partners may have increased risk of acquiring genital HSV during pregnancy and vertically transmitting HSV to their neonates. For more information on genital HSV infections, see Other STDs.

Neonatal HSV infections, although relatively rare, cause significant morbidity and mortality.[42] Neonatal herpes can be a severe illness presenting with vesicular lesions on the skin, eye, or mouth, seizures, respiratory collapse, and/or liver failure, following contact with infected cervical or vaginal secretions during delivery.[42,49] Most neonatal HSV infections result from perinatal transmission from mother to neonate,[49] but postnatal infection can occur.[51] Although reporting of neonatal HSV infection is required in a few jurisdictions,[52,53] it is not a nationally reportable disease.

An examination of inpatient records of infants aged 60 days or younger at admission using the HCUP Kid's Inpatient Database (KID) showed an overall incidence of 9.6 cases per 100,000 live births in 2006.[54] Rates did not vary significantly by region or by race/Hispanic 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 health care (5.4 cases per 100,000 live births). A recent study using the HCUP National Inpatient Sample (NIS) found that incidence of neonatal HSV infection per 100,000 live births significantly increased from 2003 to 2014, from 7.9 during 2003–2005 to 10.0 during 2012–2014.[55]

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.[47] Forty-one percent of the confirmed cases were infected with HSV-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.[53]

Summary

STDs are an important health priority and their substantial morbidity and mortality related to sequelae can often be overlooked in women. This is particularly true for reproductive aged women and their infants. The overall rate of reported female chlamydia cases has increased 11.4% over the last four years, much of that attributed to increased screening and more complete national reporting. Gonorrhea infections among females have also increased 45.2% to 145.8 cases per 100,000 females in recent years. Surveillance data continues to show that numbers and rates of chlamydia and gonorrhea cases are highest in females between the ages of 15 and 24, and certain races/

ethnicities are disproportionately impacted. Despite increases in reported cases of chlamydia and gonorrhea, available data suggest an overall decline in the incidence of PID, largely attributed to an increase in effective screening and treatment of chlamydial and gonococcal infections in adolescents and young women. In contrast to declining PID rates, data suggests rates of ectopic pregnancy have marginally increased over time.

Mother to child transmission of STDs can result in serious adverse consequences. Potential adverse neonatal outcomes include neonatal ophthalmia, neonatal pneumonia, and prematurity. The rate of congenital syphilis in the United States has increased every year since 2013. In 2018, there were 935 reported cases of congenital syphilis and the national congenital syphilis rate was 23.7 cases per 100,000 live births, the highest rate in two decades. Despite current recommended STD screening during pregnancy, some women may not have their infections treated during pregnancy because of a lack of or limited prenatal care.

References

1. Hess KL, Javanbakht M, Brown JM, et al. Intimate partner violence and sexually transmitted infections among young adult women. *Sex Transm Dis*. 2012;39: 366–71.
2. Sharpe TT, Voute C, Rose MA, et al. Social determinants of HIV/AIDS and sexually transmitted diseases among Black women: Implications for health equity. *J of Women's Health*. 2012;21:249–254.
3. Hogben M, Leichliter JS. Social determinants and sexually transmitted disease disparities. *Sex Transm Dis*. 2008;35(Suppl 12):S13–18.
4. 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.
5. 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.
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. 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.
8. 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.
9. 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.
10. 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.
11. Doorbar J, Quint W, Banks L, et al. The biology and life-cycle of human papillomaviruses. *Vaccine*. 2012;30(Suppl 5):F55–F70.
12. Saslow D, Solomon D, Lawson HW, et al. American Cancer Society, American Society for Colposcopy and Cervical Pathology, and American Society for Clinical Pathology screening guidelines for the prevention and early detection of cervical cancer. *J Low Genit Tract Dis*. 2012;16(3):175–204.
13. Wright TC, Massad S, Dunton CJ, et al. 2006 consensus guidelines for the management of women with cervical intraepithelial neoplasia or adenocarcinoma in situ. *Am J Obstet Gynecol*. 2007;197(4):340–345.
14. 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.
15. 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.
16. 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.
17. Donne AJ, Clarke R. Recurrent respiratory papillomatosis: An uncommon but potentially devastating effect of human papillomavirus in children. *Int J STD AIDS*. 2010;21(6):381–385.
18. Armstrong LR, Preston EJ, Reichert M, et al. Incidence and prevalence of recurrent respiratory papillomatosis among children in Atlanta and Seattle. *Clin Infect Dis*. 2000;31(1):107–109.
19. Markowitz LE, Dunne EF, Saraiya M, et al. Quadrivalent human papillomavirus vaccine. Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep*. 2007;56(No. RR–2):1–24.
20. 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.
21. 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.
22. Meites E, Kempe A, Markowitz LE. Use of a 2-dose schedule for human papillomavirus vaccination — updated recommendations of the Advisory Committee on Immunization Practices. *MMWR Morb Mortal Wkly Rep*. 2016;65(49):1405–1408.
23. Meites E, Szilagyi PG, Chesson HW, et al. Human papillomavirus vaccination for adults: Updated recommendations of the Advisory Committee on Immunization Practices. *MMWR Morb Mortal Wkly Rep.* 2019;68(32):698–702.
24. US Food and Drug Administration. "Supplement Approval Letter — Biologics License Application (BLA) for Human Papillomavirus 9-valent Vaccine, Recombinant (GARDASIL® 9)". Letter to Merck Sharp & Dohme Corp. October 5, 2018. US Food and Drug Administration. 2018. https://www.fda.gov/media/117053/download. Accessed July 2, 2019.
25. Drolet M, Benard E, Perez N, et al. Population-level impact and herd effects following the introduction of human papillomavirus vaccination programmes: updated systematic review and meta-analysis. *Lancet*. 2019;394(10197):497–509.
26. Oliver SE, Unger ER, Lewis R, et al. Prevalence of human papillomavirus among females after vaccine introduction — National Health and Nutrition Examination Survey, United States, 2003–2014. *J Infect Dis*. 2017;216(5):594–603.
27. Centers for Disease Control and Prevention. Recommendations for the prevention and management of *Chlamydia trachomatis* infections, 1993. *MMWR Recomm Rep*. 1993;42(No. RR–12):1–39.
28. 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.
29. 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.

30. Price MJ, Ades AE, De Angelis D, et al. Risk of pelvic inflammatory disease following *Chlamydia trachomatis* infection: Analysis of prospective studies with a multistate model. *Am J Epidemiol*. 2013;178(3):484–492.

31. Tsevat DG, Wiesenfeld HC, Parks C, et al. Sexually transmitted diseases and infertility. *Am J Obstet Gynecol*. 2017;216(1):1–9.

32. 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.

33. 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.

34. Kreisel K, Flagg EW, Torrone E. Trends in pelvic inflammatory disease emergency department visits, United States, 2006–2013. *Am J Obstet Gynecol*. 2018;218:117.e111–110.

35. 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.

36. 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.e541–546.

37. 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.

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

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

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

41. 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.

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

43. 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.

44. 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.

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

46. 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.

47. 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.

48. 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.

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

50. Patton ME, Bernstein K, Liu G, et al. Seroprevalence of herpes simplex virus types 1 and 2 among pregnant women and sexually active, non-pregnant women in the United States. *Clin Infect Dis*. 2018;67(10):1535–1542.

51. 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.

52. 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.

53. 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.

54. Flagg EW, Weinstock H. Incidence of neonatal herpes simplex virus infections in the United States, 2006. *Pediatrics*. 2011;127(1):e1–e8.

55. Donda K, Sharma M, Amponsah JK, et al. Trends in the incidence, mortality, and cost of neonatal herpes simplex virus hospitalizations in the United States from 2003 to 2014. *J Perinatol*. 2019;39(5):697–707.

STDs in Adolescents and Young Adults

Background

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 adult females, 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 clinic hours, optimizing privacy in waiting rooms, and urine based specimen collection.[3]

Chlamydia

In 2018, there were 1,087,277 reported cases of chlamydial infection among persons aged 15–24 years, representing 61.8% of all reported chlamydia cases. Among those aged 15–19 years, the rate of reported cases of chlamydia increased 1.8% during 2017–2018 (from 2,072.3 to 2,110.6 cases per 100,000 population) (Table 10). Among those aged 20–24 years, the rate increased 1.6% during 2017–2018 (from 2,853.7 to 2,899.2 cases per 100,000 population) (Table 10).

Among females aged 15–24 years, the population targeted for chlamydia screening, the overall rate of reported cases of chlamydia in 2018 was 3,693.6 cases per 100,000 females (Table 12A). While this was only a 1.0% rate increase from 2017 (3,655.5 cases per 100,000 females), it was an 11.8% increase from 2014 (3,305.2 cases per 100,000 females). Among males aged 15–24 years, the overall rate of reported cases of chlamydia (1,382.0 cases per 100,000 males) increased 3.5% from 2017 (1,335.6 cases per 100,000 males) and 30.9% from 2014 (1,055.4 cases per 100,000 males) (Table 12B). Rates varied by state for both males and females. The majority of states having the highest reported case rates were in the South (Figures K and L).

15–19 Year Old Females — In 2018, the rate of reported chlamydia cases among females aged 15–19 years was 3,306.8 cases per 100,000 females, a 1.3% increase from the 2017 rate of 3,264.8 cases per 100,000 females (Figures 5 and 6, Table 10). Increases in rates of reported cases of chlamydia during 2017–2018 were largest among 18–year old women (2.9%) (Table 12A). During 2014–2018, the overall rate of reported cases for females aged 15–19 years increased 12.1% (Table 10).

20–24 Year Old Females — In 2018, women aged 20–24 years had the highest rate of reported chlamydia cases (4,064.6 cases per 100,000 females) compared with any other age group for either sex (Figures 5 and 6, Table 10). The rate of reported chlamydia cases among women aged 20–24 years remained relatively stable during 2017–2018 (0.8% increase); however, within this age group, females aged 20 years had an increase of 3.3% (Table 12A). During 2014–2018, the rate of reported chlamydia cases in 20–24 year old females increased 11.9% (Table 10).

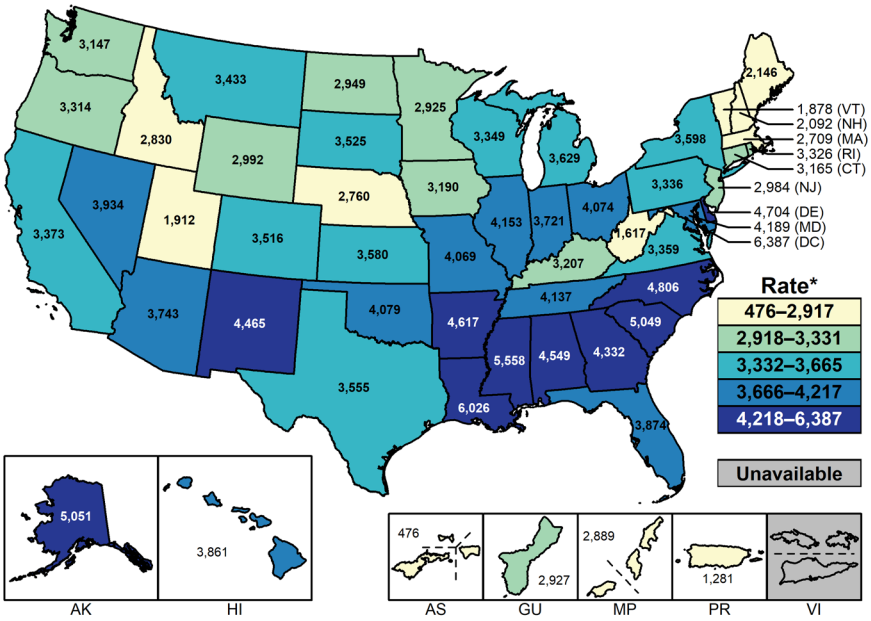
15–19 Year Old Males — In 2018, the rate of reported chlamydia cases among males aged 15–19 years (959.0 cases per 100,000 males) increased 3.7% from 2017. During 2014–2018, the rate of reported chlamydia cases for males aged 15–19 years increased 32.8% (Figures 5 and 7, Table 10).

20–24 Year Old Males — In 2018, as in previous years, men aged 20–24 years had the highest rate of reported chlamydia cases among all males (1,784.5 cases per 100,000 males). The rate for men in this age group increased 3.3% during 2017–2018 and 31.1% during 2014–2018 (Figures 5 and 7, Table 10).

Gonorrhea

During 2017–2018, the rate of reported gonorrhea cases decreased

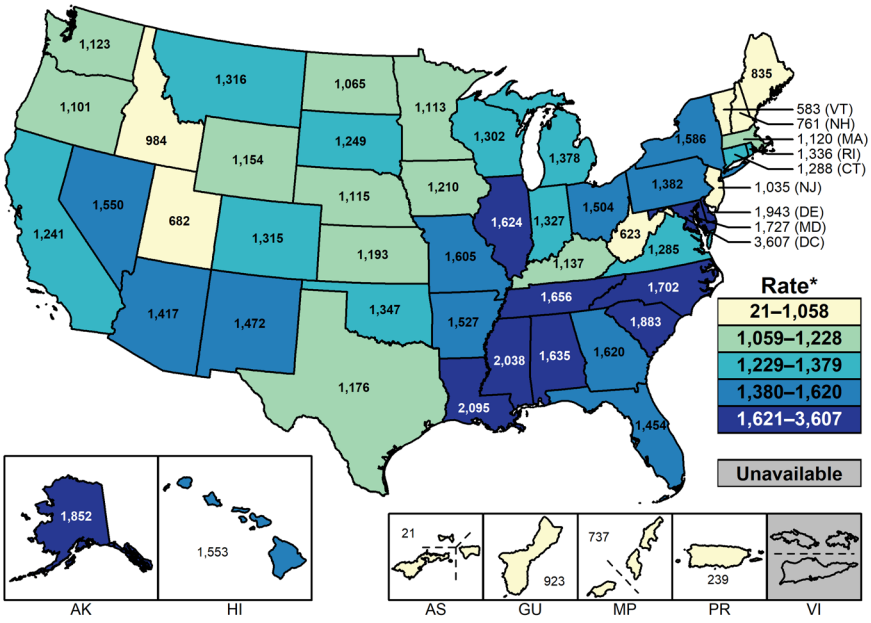
Figure K. Chlamydia — Rates of Reported Cases Among Females Aged 15–24 Years by State and Territory, United States, 2018



* Per 100,000.

NOTE: See Sections A1.2 and A1.11 in the Appendix for more information on interpreting and estimating reported rates in US territories.

Figure L. Chlamydia — Rates of Reported Cases Among Males Aged 15–24 Years by State and Territory, United States, 2018



* Per 100,000.

NOTE: See Sections A1.2 and A1.11 in the Appendix for more information on interpreting and estimating reported rates in US territories.

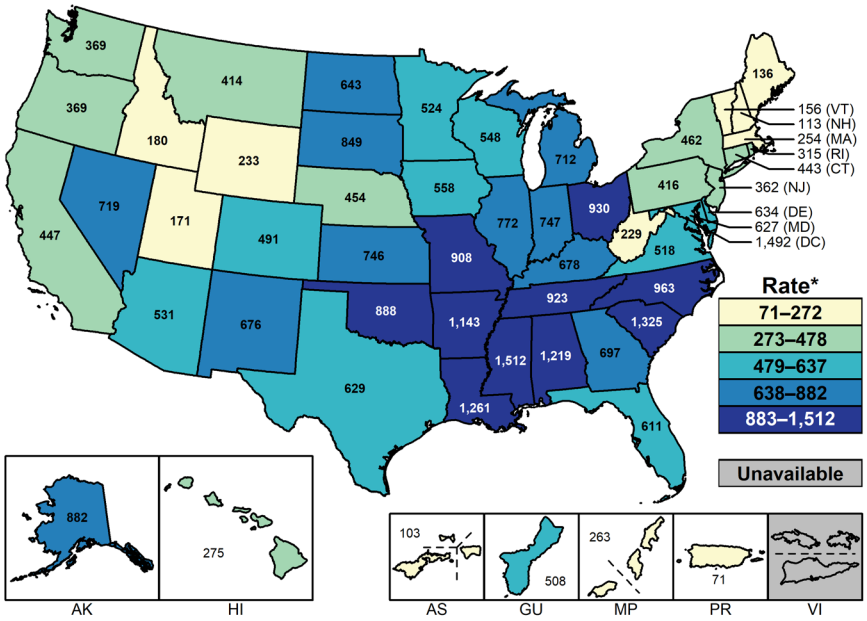
1.3% for persons aged 15–19 years and increased 1.2% for persons aged 20–24 years (Table 21). In 2018, among females aged 15–24 years, the rate was 627.0 cases per 100,000 females (Table 23). This was only a 0.1% increase from 2017 (626.3 cases per 100,000 females) but a 29.7% increase from 2014 (483.4 cases per 100,000 females). Among males aged 15–24 years, the rate was 525.6 cases per 100,000 males in 2018. This was only a 0.4% increase from 2017 (523.5 cases per 100,000 males) but a 46.7% increase from 2014 (358.3 cases per 100,000 males). For both females and males, rates varied by state. The majority of states with the highest reported case rates were in the South (Figures M and N).

15–19 Year Old Females — In 2018, females aged 15–19 years had the second highest rate of reported gonorrhea cases (548.1 cases per 100,000 females) compared with other age groups among females (Figures 19 and 20, Table 21). During 2017–2018, the rate of reported gonorrhea cases for females in this age group decreased 1.7% but increased 27.0% during 2014–2018 (Table 21).

20–24 Year Old Females — In 2018, women aged 20–24 years had the highest rate of reported gonorrhea cases (702.6 cases per 100,000 females) compared with other age groups among females (Figures 19 and 20, Table 21). During 2017–2018, the rate of reported gonorrhea for women in this age group only increased 1.5% but increased 32.3% during 2014–2018 (Table 21).

15–19 Year Old Males — In 2018, the rate of reported gonorrhea cases among males aged 15–19 years was 320.5 cases per 100,000 males (Figures 19 and 21, Table 21). During 2017–2018, the rate of reported gonorrhea cases for males in this age group decreased 0.9% but increased 44.1% during 2014–2018 (Table 21).

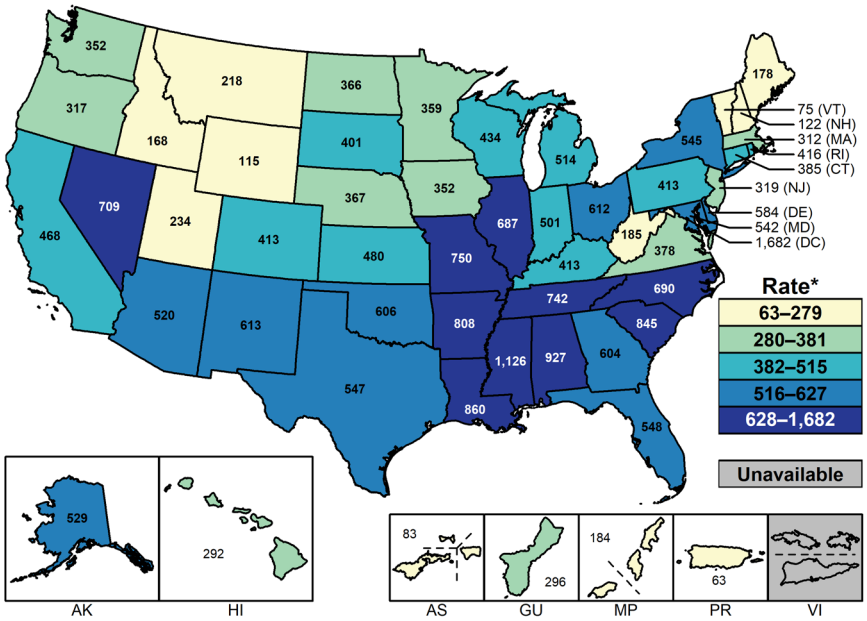
Figure M. Gonorrhea — Rates of Reported Cases Among Females Aged 15–24 Years by State and Territory, United States, 2018



* Per 100,000.

NOTE: See Sections A1.2 and A1.11 in the Appendix for more information on interpreting and estimating reported rates in US territories.

Figure N. Gonorrhea — Rates of Reported Cases Among Males Aged 15–24 Years by State and Territory, United States, 2018



* Per 100,000.

NOTE: See Sections A1.2 and A1.11 in the Appendix for more information on interpreting and estimating reported rates in US territories.

20–24 Year Old Males — In 2018, as in previous years, men aged 20–24 years had the highest rate of reported gonorrhea cases (720.9 cases per 100,000 males) compared with any other age group for either sex (Figures 19 and 21, Table 21). During 2017–2018, the rate of reported gonorrhea for men in this age group only increased 1.0% but increased 49.2% during 2014–2018 (Table 21).

Primary and Secondary Syphilis

In 2018, the rate of reported primary and secondary (P&S) syphilis among females aged 15–24 years was 7.2 cases per 100,000 females, a 28.6% increase from 2017 (5.6 cases per 100,000 females) and a 100.0% increase from 2014 (3.6 cases per 100,000 females). Among males aged 15–24 years in 2018, the rate was 28.2 cases per 100,000 males, a 7.2% increase from 2017 (26.3 cases per 100,000 males) and a 44.6% increase from 2014 (19.5 cases per 100,000 males). During 2017–2018, the rate of reported P&S syphilis cases increased 14.9% among persons aged 15–19 years and 10.3% among persons aged 20–24 years (Table 34).

15–19 Year Old Females — In 2018, the rate of reported P&S syphilis cases among females aged 15–19 years increased 34.4% from 2017 (from 3.2 to 4.3 cases per 100,000 females) and 72.0% from 2014 (2.5 cases per 100,000 females) (Figures 42 and 43, Table 34).

20–24 Year Old Females — In 2018, women aged 20–24 years had the highest rate of P&S syphilis (10.0 cases per 100,000 females) compared with other age groups among females (Figures 42 and 43, Table 34). The P&S syphilis rate among women in this age group has increased each year since 2011 and has increased 122% (4.5 cases per 100,000 females) (Figure 43, Table 34). During 2017–2018, the rate increased 26.6%.

15–19 Year Old Males — In 2018, the rate of reported P&S syphilis cases among males aged 15–19 years was 10.9 cases per 100,000 males (Figures 42 and 44, Table 34). The P&S syphilis rate among males in this age group has increased each year since 2011, with an increase of 53.5% from 2014 (7.1 cases per 100,000 males) and 7.9% from 2017 (10.1 cases per 100,000 males) (Figure 44, Table 34).

20–24 Year Old Males — In 2018, the rate of reported P&S syphilis among males aged 20–24 years was 44.6 cases per 100,000 males (Figures 42 and 44, Table 34). The P&S syphilis rate among men in this age group has increased each year since 2006, with a 44.3% increase from 2014 (30.9 cases per 100,000 males) and 7.0% from 2017 (41.7 cases per 100,000 males) (Figure 44, Table 34).

Other STDs

Human papillomavirus

Human papillomavirus (HPV) is a common sexually transmitted infection in the United States.[1] Starting in 2006, HPV vaccines have been recommended for routine use in United States females aged 11–12 years, with catch-up vaccination through age 26.[7,8] Since late 2011, routine use of the HPV vaccine has been recommended for males aged 11–12 years, with catch-up vaccination through age 21;[8-10] this age limit was recently extended to 26 years.[11] Vaccination through age 26 has been recommended for gay, bisexual, and other men who have sex with men (MSM) and persons who are immunocompromised (including those infected with HIV).[8] In October 2018, the Food and Drug Administration (FDA) extended licensing approval of the vaccine for women and men aged 27–45 years,[12] and in June 2019, the CDC's Advisory Committee on Immunization Practices (ACIP) recommended that unvaccinated adults aged 27–45 years discuss receiving the HPV vaccine with their health care providers.[11] For more information on HPV vaccination, see Other STDs.

A recent meta-analysis that included data from over 60 million individuals from 14 high-income countries, including the United States, showed a substantial impact of HPV vaccination on: genital HPV infections among adolescent girls and young women; high-grade cervical lesions among young women; and anogenital warts among adolescent boys and girls, and among young men and women.[13] Cervicovaginal prevalence of any quadrivalent HPV vaccine type has been estimated for civilian, non-institutionalized females aged 14–34 years using data from the National Health and Nutrition Examination Survey (NHANES; see Section A2.4 in the Appendix).[14] Prevalence decreased significantly from 2003–2006 (the pre-vaccine era) to 2011–2014 in specimens from females aged 14–19 years and 20–24 years, the age groups most likely to benefit from HPV vaccination.

Health-care claims data from adolescents and adults with employer-provided private health insurance in the United States were used to examine the population effectiveness of HPV vaccination on two clinical sequelae of HPV infection: high-grade histologically-detected cervical intraepithelial neoplasia grades 2 and 3 (CIN2+),[15] and anogenital warts.[16] Prevalence of CIN2+ and of anogenital warts decreased significantly during 2007–2014 among females aged 15–19 and 20–24 years (Figures 51 and 52A); prevalence of anogenital warts also decreased significantly during 2009–2014 among women aged 25–29 years (Figure 52A). These declines provide ecologic evidence of population effectiveness of HPV vaccination in females. Anogenital wart prevalence also decreased significantly during 2009–2014 among men aged 20–24 years (Figure 52B); these declines among young men are consistent with herd protection from vaccination among females.

For more information on HPV infections, see Other STDs.

Herpes simplex virus

Herpes simplex virus (HSV) is among the most prevalent of sexually transmitted infections.[1,17] Most genital HSV infections in the United States are caused by HSV type 2 (HSV-2), while HSV type 1 (HSV-1) infections are typically orolabial and acquired during childhood.[18,19] NHANES data have shown 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.[19] HSV-2 seroprevalence in this age group was much lower in both time periods.[19]

Other studies have found that genital HSV-1 infections are increasing among young adults.[20-22] 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.[19,23] Increasingly common oral sex behavior among adolescents and young adults also has been suggested as a contributing factor.[19,24]

NHANES data have shown that among pregnant women with three or fewer lifetime sex partners, seronegativity for both HSV-1 and HSV-2 increased from 1999–2006 to 2007–2014,[25] raising the possibility that pregnant women with fewer sex partners may have increased risk of acquiring genital HSV during pregnancy and vertically transmitting HSV to their neonates.

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

National Job Training Program

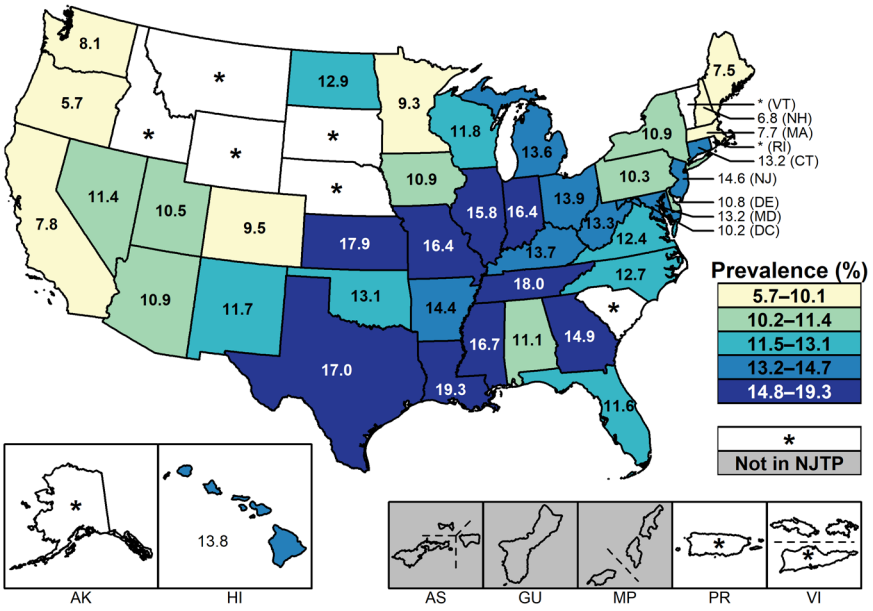
The National Job Training Program (NJTP) is an educational program for socioeconomically disadvantaged youth aged 16–24 years and is administered at more than 100 sites throughout the country. The NJTP screens participants for chlamydia and gonorrhea within two days of entry to the program. All of NJTP's chlamydia screening tests and the majority of gonorrhea screening tests are conducted by a single national contract laboratory (Center for Disease Detection, LLC, San Antonio, Texas).

To increase the stability of the 2018 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 females aged 16–24 years entering the program in 2018 in 41 states and the District of Columbia, the median state-specific chlamydia prevalence was 12.5% (range: 5.7% to 19.3%) (Figure O). Among males aged 16–24 years entering the program in 2018 in all 50 states, the District of Columbia, and Puerto Rico, the median state-specific chlamydia prevalence was 6.6% (range: 1.0% to 13.3%) (Figure P).

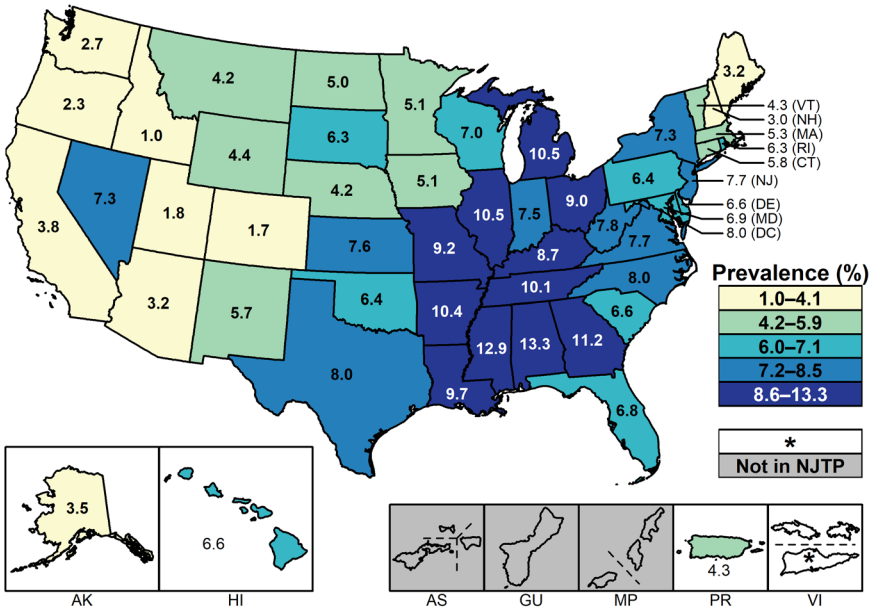
Among females aged 16–24 years entering the program in 41 states and the District of Columbia, the median state-specific gonorrhea prevalence in 2018 was 2.2% (range: 0.4% to 7.6%) (Figure Q). Among males aged 16–24 years entering the program in 46 states, the District of Columbia, and Puerto Rico, the median state-specific

Figure O. Chlamydia — Prevalence Among Females Aged 16–24 Years Entering the National Job Training Program (NJTP) by State and Territory of Residence, United States, 2018



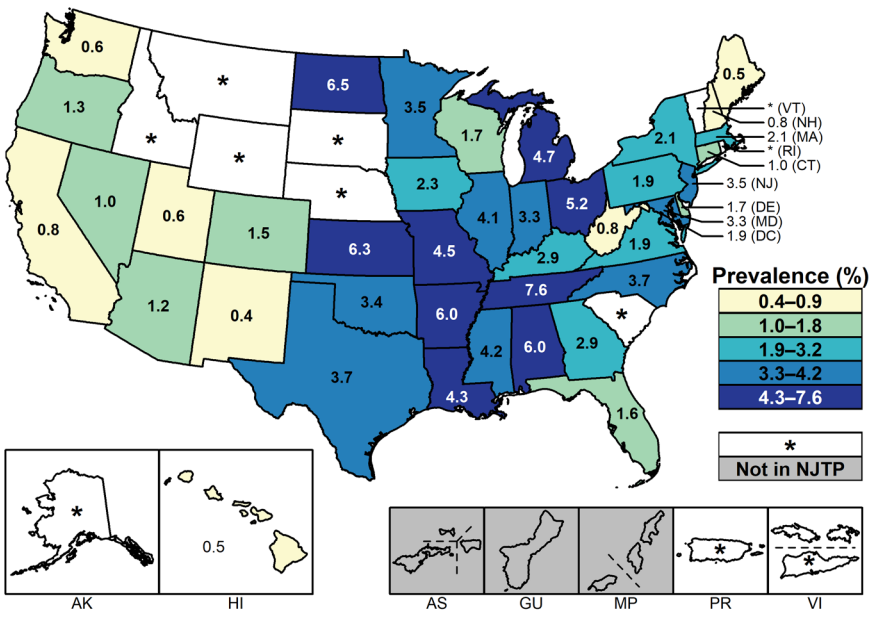
* Fewer than 100 females who resided in these states/territories and entered the NJTP were screened for chlamydia in 2018.
NOTE: See Section A2.1 in the Appendix for more information regarding NJTP methods.

Figure P. Chlamydia — Prevalence Among Males Aged 16–24 Years Entering the National Job Training Program (NJTP) by State and Territory of Residence, United States, 2018



* Fewer than 100 males who resided in these states/territories and entered the NJTP were screened for chlamydia in 2018.
NOTE: See Section A2.1 in the Appendix for more information regarding NJTP methods.

Figure Q. Gonorrhea — Prevalence Among Females Aged 16–24 Years Entering the National Job Training Program (NJTP) by State and Territory of Residence, United States, 2018



* Fewer than 100 females who resided in these states/territories and entered the NJTP were screened for gonorrhea in 2018.
NOTE: See Section A2.1 in the Appendix for more information regarding NJTP methods.

gonorrhea prevalence in 2018 was 0.7% (range: 0.0% to 4.8%) (Figure R).

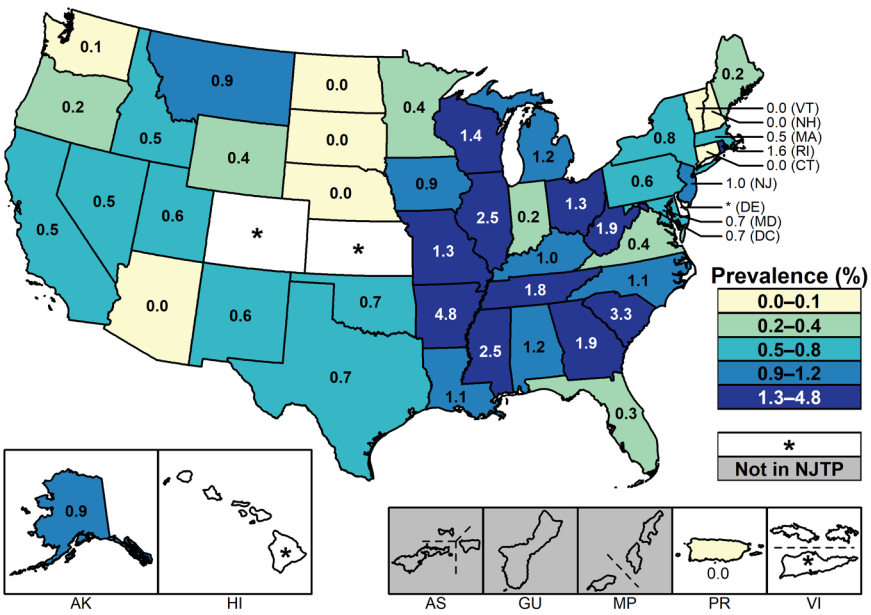
Summary

The rate of reported cases of chlamydia, gonorrhea, and P&S syphilis increased for both sexes in 15–24 year olds during 2017–2018. For chlamydia, rates of reported cases are consistently highest among females aged 15–24 years, likely reflecting targeted screening of young women; however, rates of reported gonorrhea cases are consistently highest among males aged 15–24 years. These high rates among males aged 15–24 years likely reflect a combination of recent increased screening efforts in young men, including extra-genital screening, as well as increased incidence. Although rates of reported chlamydia and gonorrhea increased only marginally among both sexes during 2017–2018, the increases observed before 2017 were much more striking. The rate of reported chlamydia in females and males aged 15–24 years increased 1.0% and 3.5%, respectively, during 2017–2018; however, increases of 11.8% and 30.9% were noted during 2014–2018 for females and males aged 15–24 years, respectively. Similarly, the rate of reported gonorrhea in females and males aged 15–24 years increased 0.1% and 0.4%, respectively, during 2017–2018; however, increases of 29.7% and 46.7% were noted during 2014–2018 for females and males aged 15–24 years, respectively. Whether these smaller increases in the past year compared to the past five years indicate a slowing to the increasing trend of rates of chlamydia and gonorrhea cannot be assessed with current data, and will take further years of case surveillance to determine. Similar to gonorrhea, rates of reported cases of P&S syphilis have been consistently higher among adolescent and young adult males compared to females; however, the largest increase in P&S syphilis has been observed in females aged 15–24 years. Rates of reported P&S syphilis cases increased 28.6% and 7.2% during 2017–2018 and increased 100.0% and 44.6% during 2014–2018 for females and males aged 15–24 years, respectively.

References

1. 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.
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 selfreported STD among adolescents. *Perspect Sex Reprod Health*. 2004;36(6):276–287.
7. Markowitz LE, Dunne EF, Saraiya M, et al. Quadrivalent human papillomavirus vaccine. Recommendations of the Advisory Committee on Immunization Practices (ACIP). *MMWR Recomm Rep*. 2007;56(No. RR–2):1–24.
8. 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.
9. 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.

Figure R. Gonorrhea — Prevalence Among Males Aged 16–24 Years Entering the National Job Training Program (NJTP) by State and Territory of Residence, United States, 2018



* Fewer than 100 males who resided in these states/territories and entered the NJTP were screened for gonorrhea in 2018.
NOTE: See Section A2.1 in the Appendix for more information regarding NJTP methods.

10. Meites E, Kempe A, Markowitz LE. Use of a 2-dose schedule for human papillomavirus vaccination — updated recommendations of the Advisory Committee on Immunization Practices. *MMWR Morb Mortal Wkly Rep*. 2016;65(49):1405–1408.
11. Meites E, Szilagyi PG, Chesson HW, et al. Human papillomavirus vaccination for adults: Updated recommendations of the Advisory Committee on Immunization Practices. *MMWR Morb Mortal Wkly Rep.* 2019; 68(32):698–702.
12. US Food and Drug Administration. "Supplement Approval Letter — Biologics License Application (BLA) for Human Papillomavirus 9-valent Vaccine, Recombinant (GARDASIL® 9)". Letter to Merck Sharp & Dohme Corp. October 5, 2018. US Food and Drug Administration. 2018. https://www.fda.gov/media/117053/download. Accessed July 2, 2019.
13. Drolet M, Benard E, Perez N, et al. Population-level impact and herd effects following the introduction of human papillomavirus vaccination programmes: Updated systematic review and meta-analysis. *Lancet*. 2019;394(10197):497–509.
14. Oliver SE, Unger ER, Lewis R, et al. Prevalence of human papillomavirus among females after vaccine introduction — National Health and Nutrition Examination Survey, United States, 2003–2014. *J Infect Dis*. 2017;216(5):594–603.
15. 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.
16. Flagg EW, Torrone EA. Declines in anogenital warts among age groups most likely to be impacted by human papillomavirus vaccination, United States, 2006–2014. *Am J Public Health*. 2018;108(1):112–119.
17. 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.
18. 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.
19. 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.
20. 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(3):344–351.
21. 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.
22. Flagg EW, Torrone EA. Seroprevalence of herpes simplex virus type 1 and type 2 infections among adults diagnosed with genital herpes: United States, 1999–2016. *Sex Transm Dis*. 2018;45(Suppl 2):S51.
23. Kimberlin DW. The scarlet H. *J Infect Dis*. 2014;209(3):315–317.
24. 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.
25. Patton ME, Bernstein K, Liu G, et al. Seroprevalence of herpes simplex virus types 1 and 2 among pregnant women and sexually active, non-pregnant women in the United States. *Clin Infect Dis*. 2018;67(10):1535–1542.

STDs in Racial and Ethnic Minorities

Background

Disparities continue to persist in rates of STDs among some racial minority or Hispanic groups when compared with rates among Whites.[1,2] This is also true across a wide variety of other health status indicators, providing evidence that race and Hispanic ethnicity in the United States are population characteristics strongly correlated with other factors affecting overall health status, such as income, employment, insurance coverage, and educational attainment.[3-5] In 2017, the most recent year for which national data on poverty and insurance status are available, the overall proportion of the United States population living in poverty was 12.3% (or 39.7 million), a decrease of 0.4 percent from 2016. Although the overall poverty rate declined over the last few years, many Americans continue to face systemic challenges to achieving their full economic potential; the poverty rate in 2017 for Whites was 8.7% (16.9 million), for Blacks it was 21.2% (8.9 million), and for Hispanics it was 18.3% (10.7 million). Significant differences by race/Hispanic ethnicity in the proportion of the population living in poverty persisted in 2017 and were even more acute for family households headed by women (25.7% versus 9.3% for all family households), regardless of other factors.[3] Those who cannot afford basic necessities often have trouble accessing and affording quality health care, including sexual health services.[6]

Access to, and routine use of, quality health care including STD prevention and treatment is key to reducing STD disparities in the United States. Of the estimated 19 million new cases of STIs that occur each year, approximately half of all cases occur among people aged 15–24 years.[7] However, the overall proportion of adults without health insurance decreased from 13.3% in 2013 to 8.8% (or 28.2 million) in 2016 and remains unchanged at 8.8% (28.5 million) in 2017. By age groupings, the highest proportion of the population lacking health insurance in 2017 were 19–25 and 26–34 year olds (14.0% and 15.6%, respectively), demonstrating that many people in the United States continue to struggle to afford full, routine access to health care.[8] Among all races or ethnic groups in the United States, Hispanics had the lowest rate of health insurance coverage in 2017 at 84.0% (unchanged from 2016).[8]

Even when health care is readily available to racial and ethnic minority populations, fear and distrust of health care institutions can negatively affect the health care-seeking experience. Social and cultural discrimination, language barriers, provider bias, or the perception that these may exist, likely discourage some people from seeking care.[9,10] Moreover, the quality of care can differ substantially for minority patients.[11] Broader inequities in social and economic conditions for minority communities are reflected in the profound disparities observed in the incidence of STDs by race/Hispanic ethnicity.

In communities where STD prevalence is higher because of these and other factors, people may experience difficulties reducing their risk for STIs. With each sexual encounter, they face a greater chance of encountering an infected partner than those in lower prevalence settings do, regardless of similar sexual behavior patterns.[2] Acknowledging inequities in STD rates by race and Hispanic ethnicity is a critical first step toward empowering affected groups and the public health community to collaborate in addressing systemic inequities in the burden of disease — with the ultimate goal of minimizing the health impacts of STDs on individuals and populations.

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 becoming the primary source of initial case notifications. Laboratory reports are often missing race and Hispanic 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 disparities in some minority populations (see Other STDs below) for both nationally notifiable and non-nationally notifiable STDs.[12,13]

Method of Classifying Race/Hispanic Ethnicity

Interpretation of racial and ethnic disparities among persons with STDs is influenced by data collection methods and by the categories by which these data are displayed. Race/Hispanic ethnicity data in this report are presented in Office of Management and Budget (OMB) race and Hispanic ethnicity categories according to the 1997 revised OMB standards.[14] As of 2018, most reporting jurisdictions are locally compliant with OMB standards and report in the standard categories, including the ability to collect more than one race per person. However,

a small number of jurisdictions reported race in pre-1997 categories; while other jurisdictions continued to be unable to report more than one race per person in 2018. All race/Hispanic ethnicity data reported by jurisdictions are summarized in tables, charts and interpretative text in this report *regardless of local compliance with the 1997 OMB standards*. No redistribution of cases is done; cases missing race/Hispanic ethnicity are not included in the calculation of rates by race/Hispanic ethnicity. Caution should be used in interpreting and comparing rates for individual race groups or by Hispanic ethnicity. Because missing cases are excluded, rates presented underestimate the likely actual rate of reported cases for specific groups. See Section A1.5 of the Appendix for additional information on reporting of race/Hispanic ethnicity.

Completeness of Race/Hispanic Ethnicity Data in 2018

Chlamydia — 28.5% of chlamydia case reports were missing race/Hispanic ethnicity data, ranging by jurisdiction from 0.1% to 94.4% (Table A1).

Gonorrhea — 19.6% of gonorrhea case reports were missing information on race/Hispanic ethnicity, ranging by jurisdiction from 0.0% to 92.0% (Table A1).

Syphilis — 4.5% of all primary and secondary (P&S) syphilis case reports were missing information on race/Hispanic ethnicity, ranging by jurisdiction from 0.0% to 46.7% missing (Table A1).

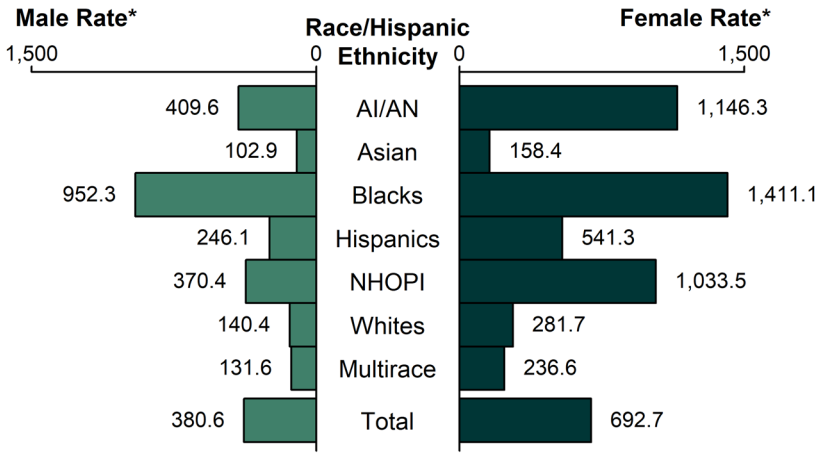
Chlamydia

During 2014–2018, rates of reported chlamydia cases increased among all racial and Hispanic ethnicity groups. Specifically, rates increased 7.0% among American Indians/Alaska Natives (AI/AN), 8.1% among Hispanics, 9.0% among Blacks, 17.6% among Whites, 20.1% among Native Hawaiians/Other Pacific Islanders (NHOPI), 29.3% among Asians, and 59.7% among Multirace (Figure 8).

Blacks — In 2018, the overall rate of reported chlamydia cases among Blacks in the United States was 1,192.5 cases per 100,000 population (Figure 8, Table 11B). The rate of reported chlamydia cases among Black females was five times the rate among White females (1,411.1 and 281.7 cases per 100,000 population, respectively; Figure S and Table 11B). The rate of reported chlamydia cases among Black males was 6.8 times the rate among White males (952.3 and 140.4 cases per 100,000 population, respectively). Rates of reported cases of chlamydia were highest for Blacks aged 15–19 and 20–24 years in 2018 (Table 11B). The rate of reported chlamydia cases among Black females aged 15–19 years (6,817.3 cases per 100,000 population) was 4.5 times the rate among White females in the same age group (1,520.1 cases per 100,000 population). The rate of reported chlamydia cases among Black females aged 20–24 years was 3.7 times the rate among White females in the same age group (7,087.7 and 1,935.8 cases per 100,000 population, respectively). Among females aged 15–24 years, the population targeted for screening, rates were highest among Blacks in all US regions (Figure T).

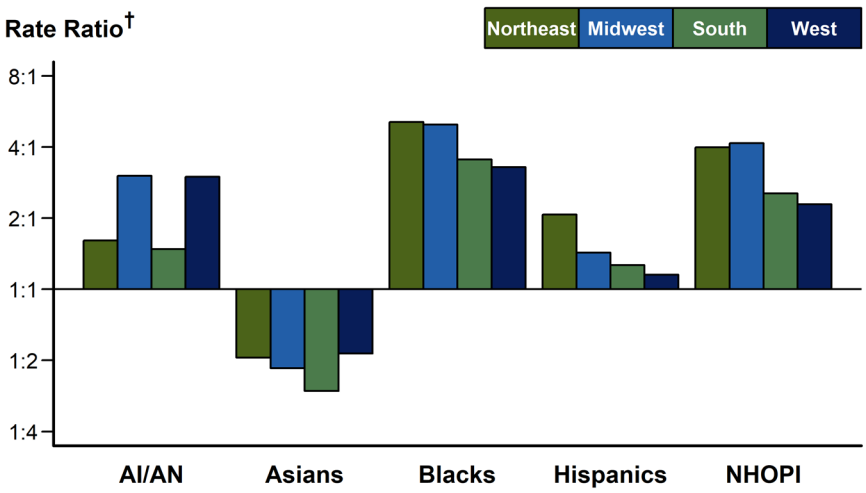
Similar racial disparities in reported chlamydia rates exist among males. Among males aged 15–19 years, the rate of reported chlamydia cases among Blacks was 9.1 times the rate among Whites (2,668.6 and 293.0 cases per 100,000 population, respectively; Table 11B). The rate of reported chlamydia cases among Black males aged 20–24 years was 5.3 times the rate among White males of the same age group (3,867.1 and 732.6 cases per 100,000 population, respectively).

Figure S. Chlamydia — Rates of Reported Cases by Race/Hispanic Ethnicity and Sex, United States, 2018



* Per 100,000.
NOTE: See Section A1.5 in the Appendix for information on race/Hispanic ethnicity in STD case reporting.
ACRONYMS: AI/AN = American Indians/Alaska Natives; NHOPI = Native Hawaiians/Other Pacific Islanders.

Figure T. Chlamydia — Rate Ratios* Among Females Aged 15–24 Years by Race/Hispanic Ethnicity and Region, United States, 2018



* For the rate ratios, Whites are the reference population.

† Y-axis is log scale.

NOTE: See Section A1.5 in the Appendix for information on reporting STD case data for race/Hispanic ethnicity.

ACRONYMS: AI/AN = American Indians/Alaska Natives; NHOPI = Native Hawaiians/Other Pacific Islanders.

American Indians/Alaska Natives — In 2018, the rate of reported chlamydia cases among AI/AN was 784.8 cases per 100,000 population (Table 11B). Overall, the rate of reported chlamydia cases among AI/AN in the United States was 3.7 times the rate among Whites.

Native Hawaiians/Other Pacific Islanders — In 2018, the rate of reported chlamydia cases among NHOPI was 700.8 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 5.3 times the rate among Asians.

Hispanics — In 2018, the rate of reported chlamydia cases among Hispanics was 392.6 cases per 100,000 population, which was 1.9 times the rate among Whites (Table 11B).

Asians — In 2018, the rate of reported chlamydia cases among Asians was 132.1 cases per 100,000 population (Table 11B). The overall rate of reported chlamydia cases among Whites was 1.6 times the rate among Asians.

Gonorrhea

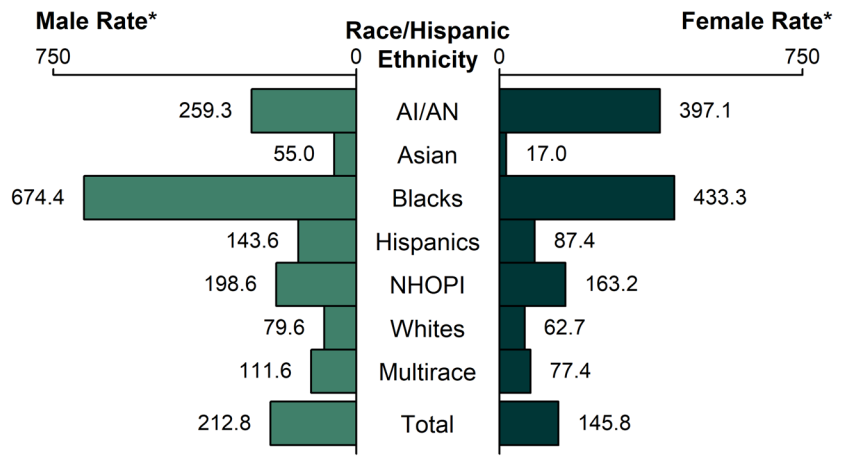
During 2014–2018, rates of reported gonorrhea cases increased 119.5% among Multirace persons (43.0 to 94.4 cases per 100,000 population), 99.4% among Asians (17.6 to 35.1 cases per 100,000 population), 90.3% among NHOPI (95.3 to 181.4 cases per 100,000 population), 89.1% among Whites (37.6 to 71.1 cases per 100,000 population), 84.2% among AI/AN (178.9 to 329.5 cases per 100,000 population), 66.0% among Hispanics (69.8 to 115.9 cases per 100,000 population), and 38.8% among Blacks (395.4 to 548.9 cases per 100,000 population) (Figure 22).

Blacks — In 2018, the overall rate of reported gonorrhea cases among Blacks in the United States was 7.7 times the rate among Whites (Table 22B). This disparity was similar for Black males (8.5 times the rate among White males) and Black females (6.9 times the rate among White females) (Figure U, Table 22B). As in previous years, the disparity in gonorrhea rates for Blacks in 2018 was larger in the Midwest and Northeast than in the South and West (Figure V).

Considering Hispanic ethnicity and all race and age categories, rates of reported gonorrhea cases were highest for Blacks aged 20–24, 15–19, and 25–29 years in 2018 (Table 22B). The rate of reported gonorrhea cases among Black females aged 20–24 years (2,040.3 cases per 100,000 population) was 6.9 times the rate among White females in the same age group (297.5 cases per 100,000 population). The rate of reported gonorrhea cases among Black females aged 15–19 years (1,756.4 cases per 100,000 population) was 8.8 times the rate among White females in the same age group (200.1 cases per 100,000 population). Among Black males aged 20–24 years, the rate of reported gonorrhea cases (2,212.1 cases per 100,000 population) was 9.4 times the rate among White males in the same age group (236.3 cases per 100,000 population). The rate of reported gonorrhea cases among Black males aged 25–29 years (1,860.7 cases per 100,000 population) was 7.0 times the rate among White males in the same age group (265.5 cases per 100,000 population).

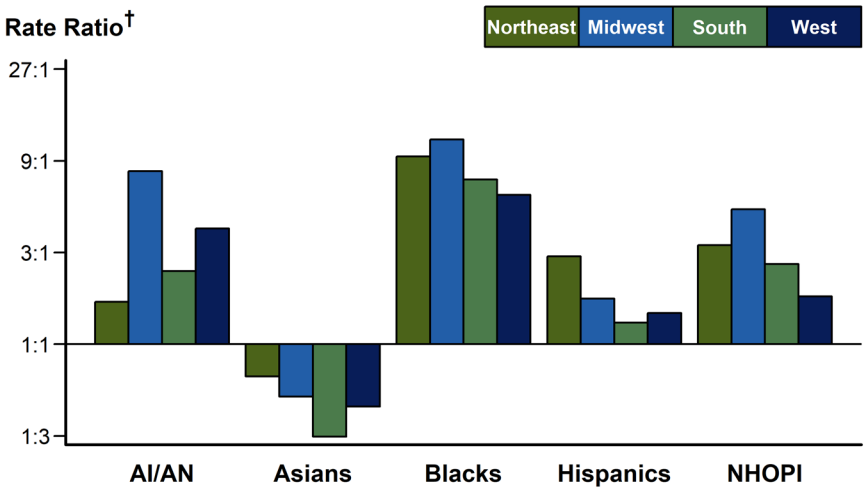
American Indians/Alaska Natives — In 2018, the rate of reported gonorrhea cases among AI/AN (329.5 cases per 100,000 population) was 4.6 times the rate among Whites (Table 22B). The disparity between gonorrhea rates for AI/AN and Whites was larger for AI/AN females (6.3 times the rate among White females)

Figure U. Gonorrhea — Rates of Reported Cases by Race/Hispanic Ethnicity and Sex, United States, 2018



* Per 100,000.
NOTE: See Section A1.5 in the Appendix for information on race/Hispanic ethnicity in STD case reporting.
ACRONYMS: AI/AN = American Indians/Alaska Natives; NHOPI = Native Hawaiians/Other Pacific Islanders.

Figure V. Gonorrhea — Rate Ratios* by Race/Hispanic Ethnicity and Region, United States, 2018



* For the rate ratios, Whites are the reference population.
† Y-axis is log scale.
NOTE: See Section A1.5 in the Appendix for information on race/Hispanic ethnicity in STD case reporting.
ACRONYMS: AI/AN = American Indians/Alaska Natives; NHOPI = Native Hawaiians/Other Pacific Islanders.

than for AI/AN males (3.3 times the rate among White males) (Figure U, Table 22B). The disparity in gonorrhea rates for AI/AN in 2018 was larger in the Midwest than in the West, Northeast, and South (Figure V).

Native Hawaiians/Other Pacific Islanders — In 2018, the rate of reported gonorrhea cases among NHOPI (181.4 cases per 100,000 population) was 2.6 times the rate among Whites (Table 22B). This disparity was similar for NHOPI females (2.6 times the rate among White females) and NHOPI males (2.5 times the rate among White males) (Figure U, Table 22B). The disparity in gonorrhea rates for NHOPI in 2018 was higher in the Midwest than in the West, Northeast, and South (Figure V).

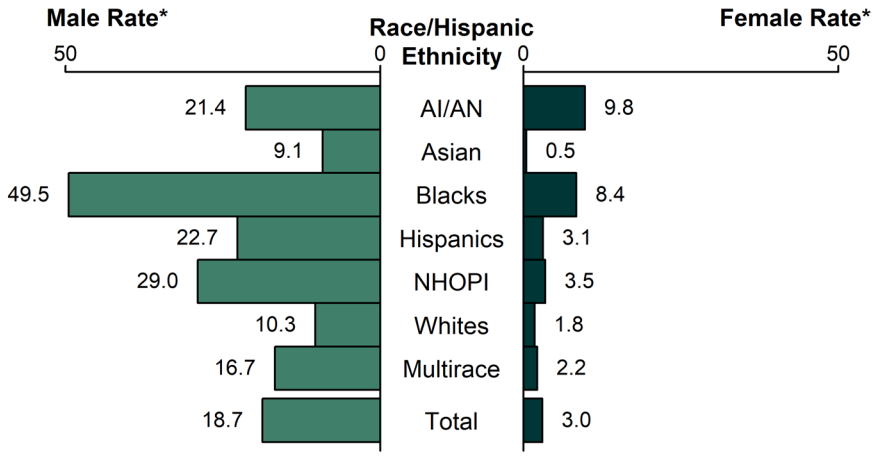
Hispanics — In 2018, the rate of reported gonorrhea cases among Hispanics was 115.9 cases per 100,000 population, which was 1.6 times the rate among Whites (Table 22B). This disparity was similar for Hispanic females (1.4 times the rate among White females) and Hispanic males (1.8 times the rate among White males) (Figure U, Table 22B). The disparity in gonorrhea rates for Hispanics in 2018 was higher in the Northeast than in the Midwest, South, and West (Figure V).

Asians — In 2018, the rate of reported gonorrhea cases among Asians (35.1 cases per 100,000 population) was 0.5 times the rate among Whites (Table 22B). This difference was larger for Asian females (0.3 times the rate among White females) than for Asian males (0.7 times the rate among White males) (Figure U, Table 22B). In 2018, gonorrhea rates among Asians were lower than rates among Whites in all four regions of the United States (Figure V).

Primary and Secondary Syphilis

During 2014–2018, rates of reported P&S syphilis cases increased for all race/Hispanic ethnicity groups, more than doubling for some groups (Figure 45). The rate of reported P&S syphilis cases increased 171.7% among NHOPI (6.0 to 16.3 cases per 100,000 population), 115.3% among AI/AN (7.2 to 15.5 cases per 100,000 population), 104.3% among those who identified as Multirace (4.6 to 9.4 cases per 100,000 population), 78.1% among Hispanics (7.3 to 13.0 cases per 100,000 population), 76.9% among Asians (2.6 to 4.6 cases per 100,000 population), 71.4% among Whites (3.5 to 6.0 cases per 100,000 population), and 51.9% among Blacks (18.5 to 28.1 cases per 100,000 population). Across all race/Hispanic ethnicity groups, MSM accounted for the highest proportion of P&S syphilis cases (Figure Z).

Figure W. Primary and Secondary Syphilis — Rates of Reported Cases by Race/Hispanic Ethnicity and Sex, United States, 2018



* Per 100,000.

NOTE: See Section A1.5 in the Appendix for information on reporting STD case data for race/Hispanic ethnicity.

ACRONYMS: AI/AN = American Indians/Alaska Natives; NHOPI = Native Hawaiians/Other Pacific Islanders

Blacks — In 2018, 34.7% of reported P&S syphilis cases with known race/Hispanic ethnicity information occurred among Blacks (Table 35A). The rate of reported P&S syphilis cases among Blacks was 4.7 times the rate among Whites (28.1 versus 6.0 cases per 100,000 population, respectively) (Table 35B). This disparity was similar for Black females and males (Figure W). Similar disparities were seen in all regions of the United States (Figure X).

Hispanics — In 2018, 23.3% of reported P&S syphilis cases with known race/Hispanic ethnicity information occurred among Hispanics (Table 35A). The rate of reported P&S syphilis cases among Hispanics was 2.2 times the rate among Whites (13.0 versus 6.0 cases per 100,000 population, respectively) (Table 35B). This disparity was greater for Hispanic males (2.2 times the rate among White males) than Hispanic females (1.7 times the rate among White females) (Figure W).

Native Hawaiians/Other Pacific Islanders — In 2018, the rate of reported P&S syphilis cases among NHOPI was 2.7 times the rate among Whites (16.3 versus 6.0 cases per 100,000 population, respectively) (Table 35B). This disparity was greater for NHOPI males (2.8 times the rate among White males) than NHOPI females (1.9 times the rate among White females) (Figure W).

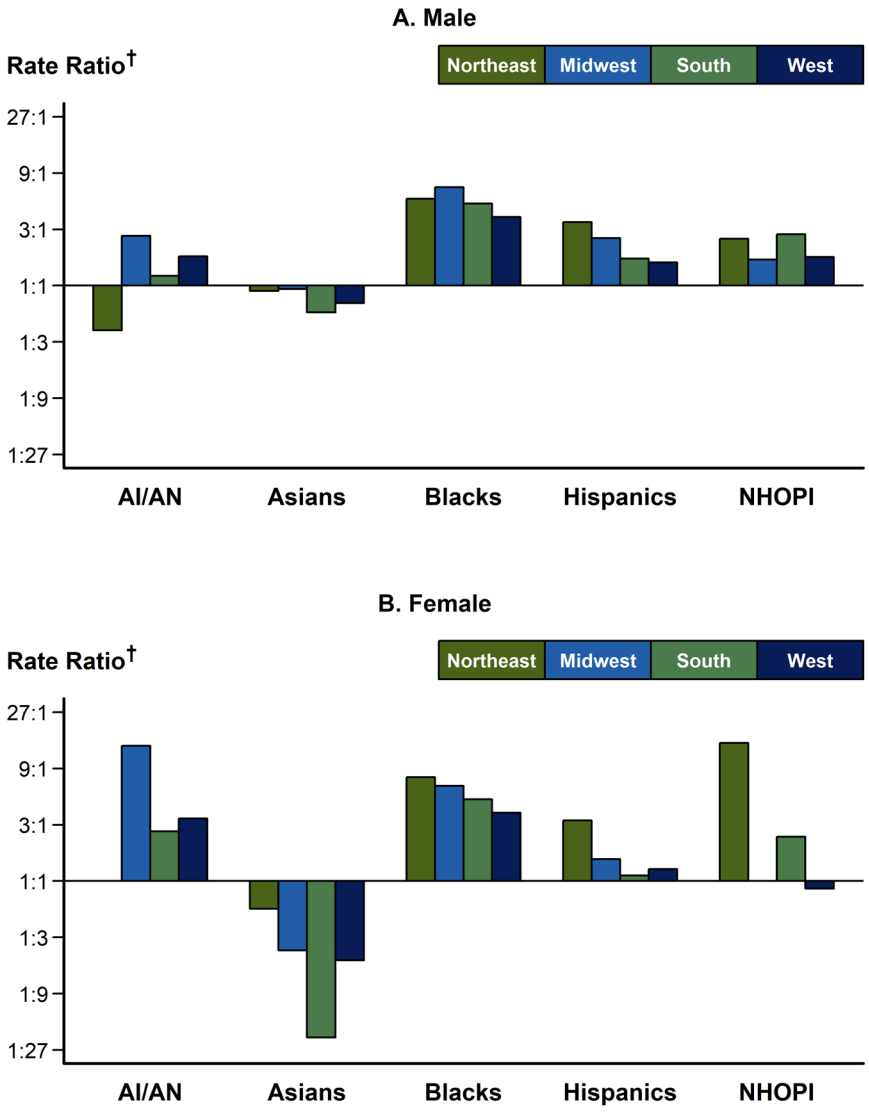
American Indians/Alaska Natives — In 2018, the rate of reported P&S syphilis cases among AI/AN was 2.6 times the rate among Whites (15.5 versus 6.0 cases per 100,000 population, respectively) (Table 35B). This disparity was greater for AI/AN females (5.4 times the rate among White females) than for AI/AN males (2.1 times the rate among White males) (Figure W).

Asians — In 2018, the rate of reported P&S syphilis cases among Asians was 0.8 times the rate among Whites (4.6 versus 6.0 cases per 100,000 population, respectively) (Table 35B). This disparity was greater for Asian females (0.3 times the rate among White females) than for Asian males (0.9 times the rate among White males) (Figure W). Similar disparities were seen in all regions of the United States (Figure X).

Congenital Syphilis

Race/Hispanic ethnicity for cases of congenital syphilis are assigned according to the mother's race/Hispanic ethnicity information. During 2014–2018, rates of reported congenital syphilis cases increased for all race/Hispanic ethnicity groups (Figure Y). The rate of reported congenital syphilis increased 500.0% among AI/AN (13.2 to 79.2 cases per 100,000 live births), 275.0% among Whites (3.6 to 13.5 cases per 100,000 live births), 263.4% among Hispanics (12.3 to 44.7 cases per 100,000 live births), 126.7% among Blacks (38.2 to 86.6 cases per 100,000 live births), and 31.4% among Asian/Pacific Islanders (7.0 to 9.2 cases per 100,000 live births).

Figure X. Primary and Secondary Syphilis — Rate Ratios* by Sex, Race/Hispanic Ethnicity, and Region, United States, 2018



* For the rate ratios, Whites are the reference population.
† Y-axis is log scale.
NOTE: See Section A1.5 in the Appendix for information on reporting STD case data for race/Hispanic ethnicity.
ACRONYMS: AI/AN = American Indians/Alaska Natives; NHOPI = Native Hawaiians/Other Pacific Islanders.

In 2018, 40.4% of reported congenital syphilis cases with known race/Hispanic ethnicity information occurred among Blacks, 32.6% occurred among Hispanics, and 22.7% occurred among Whites (Table 42). Disparities persist across race/Hispanic ethnicity groups. The rate of reported cases of congenital syphilis among Blacks was 6.4 times the rate among Whites (86.6 versus 13.5 cases per 100,000 live births, respectively). The rate of reported cases of congenital syphilis among AI/AN (79.2 cases per 100,000 live births) was 5.9 times the rate among Whites, the rate among Hispanics (44.7 cases per 100,000 live births) was 3.3 times the rate among Whites, and the rate among Asians/Pacific Islanders (9.2 cases per 100,000 live births) was 0.7 times the rate among Whites.

Other STDs

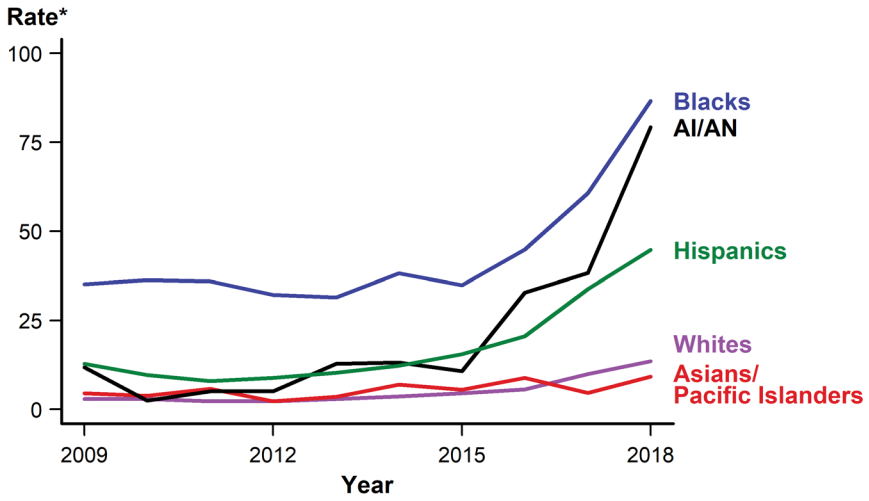
Data from the National Health and Nutrition Examination Survey (NHANES; see Section A2.4 in the Appendix) indicate the seroprevalence of herpes simplex virus type 2 (HSV-2) among the civilian, non-institutionalized population in the United States has decreased from 1999–2000 to 2015–2016 for all race/Hispanic ethnicity groups (Figure 53);[15] however, HSV-2 seroprevalence was highest among non-Hispanic Blacks throughout the entire time period. For more information on HSV infections, see Other STDs.

Trichomonas vaginalis prevalence in urine specimens obtained from NHANES participants aged 14–59 years during 2013–2016 indicated a prevalence of 0.5% among males and 2.1% among females; highest rates were observed among non-Hispanic Black males (3.4%) and females (9.6%).[16] An analysis of NHANES data from 2001–2004 from cervicovaginal swab specimens also found higher *T. vaginalis* prevalence among non-Hispanic Black females.[17] For more information on *T. vaginalis* infections, see Other STDs.

Summary

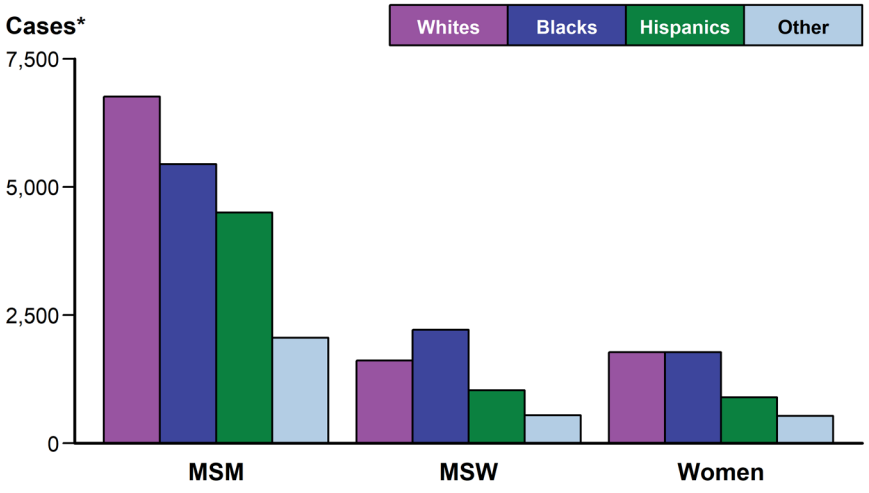
Inequities in the burden of disease for chlamydia, gonorrhea, syphilis and other STDs by race/Hispanic ethnicity continue to persist at unacceptable levels in the United States. These disparities are not explained by individual or population-level behavioral differences; rather they result in large measure from stubbornly entrenched systemic, societal, and cultural barriers to STD diagnoses, treatment and preventive services accessible to some groups

Figure Y. Congenital Syphilis — Rates of Reported Cases by Year of Birth and Race/Hispanic Ethnicity of Mother, United States, 2009–2018



* Per 100,000 live births.
NOTE: National Center for Health Statistics bridged race categories are presented to allow the display of data across several years. See Section A1.5 in the Appendix for information on reporting STD case data for race/Hispanic ethnicity.
ACRONYMS: AI/AN = American Indians/Alaska Natives.

Figure Z. Primary and Secondary Syphilis — Reported Cases* by Sex and Sex of Sex Partners and Race/Hispanic Ethnicity, United States, 2018



* Of all reported cases of primary and secondary syphilis, 16.7% were among men without data on sex of sex partners, and <0.1% were cases with unknown sex; 6.1% of all cases had missing or unknown race/Hispanic ethnicity. Cases with missing or unknown race/Hispanic ethnicity are included in the "Other" category.
NOTE: See Section A1.5 in the Appendix for information on reporting STD case data for race/Hispanic ethnicity.
ACRONYMS: MSM = Gay, bisexual, and other men who have sex with men; MSW = Men who have sex with women only.

on a routine basis. While incremental progress has been achieved in recent years in reducing the magnitude of disparities in some STDs, especially for Blacks, much more needs to be done to address these issues through individual, group, and structural-level health care interventions. Continued monitoring of differences across groups in reported case incidence is also critical to the success of these efforts, including a sharpened focus on ascertainment of race/Hispanic ethnicity in categories congruent with the 1997 OMB guidance for persons diagnosed and reported with STDs.[14]

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(Suppl 12):S13–18.
3. Semega JL, Fontenot KR, Kollar MA. U.S. Census Bureau, Current Population Reports, P60–259, Income and Poverty in the United States: 2016. Washington, DC: U.S. Government Printing Office;2017. Available at: https://www.census.gov/content/dam/Census/library/publications/2018/demo/p60-263.pdf. Accessed July30, 2019.
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. *Summary: 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. Berchick ER, Hood E, Barnett JC. Current Population Reports, P60–264, Health Insurance Coverage in the United States: 2017. Washington, DC: U.S. Government Printing Office;2017. Available at: https://www.census.gov/content/dam/Census/library/publications/2018/demo/p60-264.pdf Accessed July 30, 2019.

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. In:1997. Available at: https://www.whitehouse.gov/wp-content/uploads/2017/11/Provisional-Guidance-jan16-2001-1.pdf. Accessed August 1, 2019.

15. McQuillan G, Kruszon-Moran D, Flagg EW, et al. Prevalence of herpes simplex virus type 1 and type 2 in persons aged 14–49: United States, 2015–2016. NCHS data brief, no 304. Hyattsville, MD: National Center for Health Statistics. 2018.

16. Flagg EW, Meites E, Phillips C, et al. Prevalence of *Trichomonas vaginalis* among males and females aged 14–59 years: United States, 2013–2016. *Sex Transm Dis*. Published online 27 May 2019. DOI: 10.1097/OLQ.0000000000001013.

17. 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.

STDs in Men Who Have Sex with Men

Background

The incidence of many STDs in gay, bisexual, and other men who have sex with men (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 healthcare 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 minority and Hispanic 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] Furthermore, disparities may be more pronounced for racial minority and Hispanic 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 sex of sex partners, 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 partners, 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).

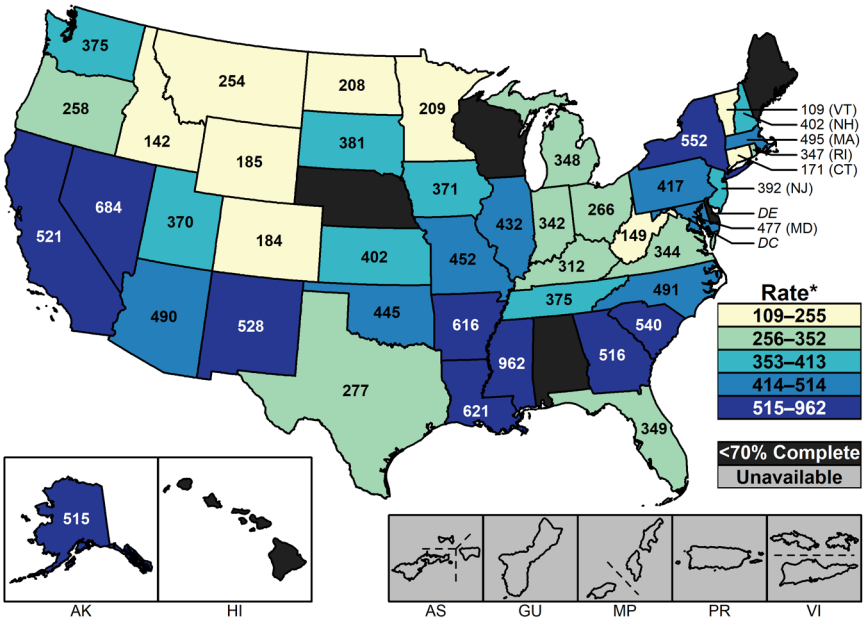
Nationally Notifiable Diseases Surveillance System

MSM accounted for 64.3% of reported P&S syphilis cases among women or men with information about sex of sex partners in 2018 (Figure 39). Among men exclusively, MSM accounted for 77.6% of reported cases with information on sex of sex partners. Of MSM P&S syphilis cases, 36.0% were White, 29.0% were Black, and 24.0% were Hispanic (Figure Z). Relative to the percentage of the US population that is White (60.4%), Black (12.5%), and Hispanic (18.3%),[29] this represents a higher burden of disease for non-White MSM, which was also evident among MSW and women. In addition, among MSM P&S syphilis cases with known HIV status in 2017, 35.5% were also reported to be HIV-positive (Figure 46).

In 2018, 44 states 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 108.9 cases per 100,000 MSM in Vermont to 962.3 cases per 100,000 MSM in Mississippi, with 28 states (64%) estimated to have rates between 200 and 500 cases per 100,000 MSM (Figure AA).

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 2014–2018. In these states, cases among MSM increased 5.3% during 2017–2018 and 51.5% during 2014–2018 (Figure 41). However, despite the increase in cases, the percentage of P&S syphilis cases that were attributed to MSM in those states decreased from 72.4% in 2014 to 62.7% in 2018 due to larger relative

Figure AA. Primary and Secondary Syphilis — Estimated Rates of Reported Cases Among MSM by State, United States, 2018



* Per 100,000.

NOTE: States reporting less than 70% of cases identified as MSM, MSW, or women in 2018 are suppressed. See Section A1.2 in the Appendix for information on estimating MSM population sizes for rate denominators.

ACRONYMS: MSM = Gay, bisexual, and other men who have sex with men; MSW = Men who have sex with women only.

increases in reported P&S syphilis cases among MSW and women.

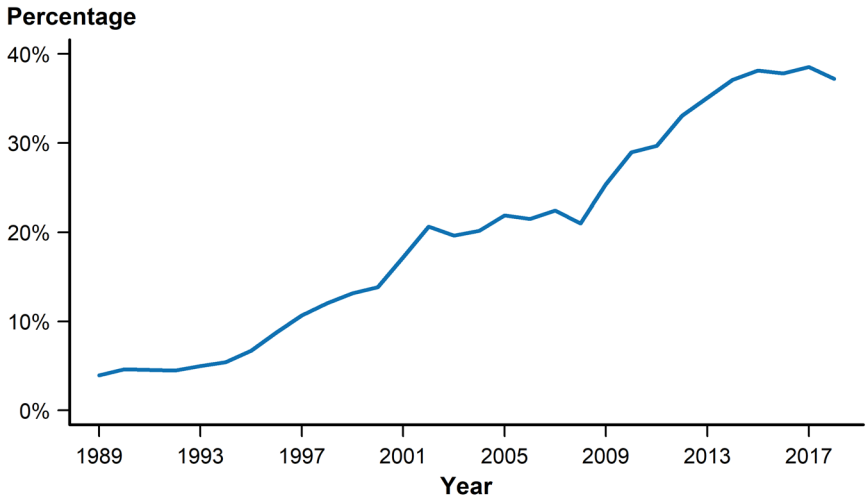
A description of the methods for estimating MSM population sizes for syphilis rate denominators can be found in Section A1.2 of the Appendix. More information about syphilis can be found in the Syphilis section of the National Profile.

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.[3] 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 a high of 38.5% in 2017 (Figure BB). In 2018, this proportion was 37.2%. The reason for this increase over time is unclear, but might reflect changes in the epidemiology of gonorrhea or in healthcare-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] In 2018, the proportion of isolates with elevated azithromycin minimum inhibitory concentrations (MICs) (≥2.0 µg/mL) and elevated ceftriaxone MICs (≥0.125 µg/mL) was higher in isolates from MSM than from MSW (Figure CC). For azithromycin, 8.2% of isolates from MSM had elevated MICs compared to 2.4% in MSW. For ceftriaxone, the proportion was slightly higher at 0.22% in MSM compared to 0.16% in MSW.

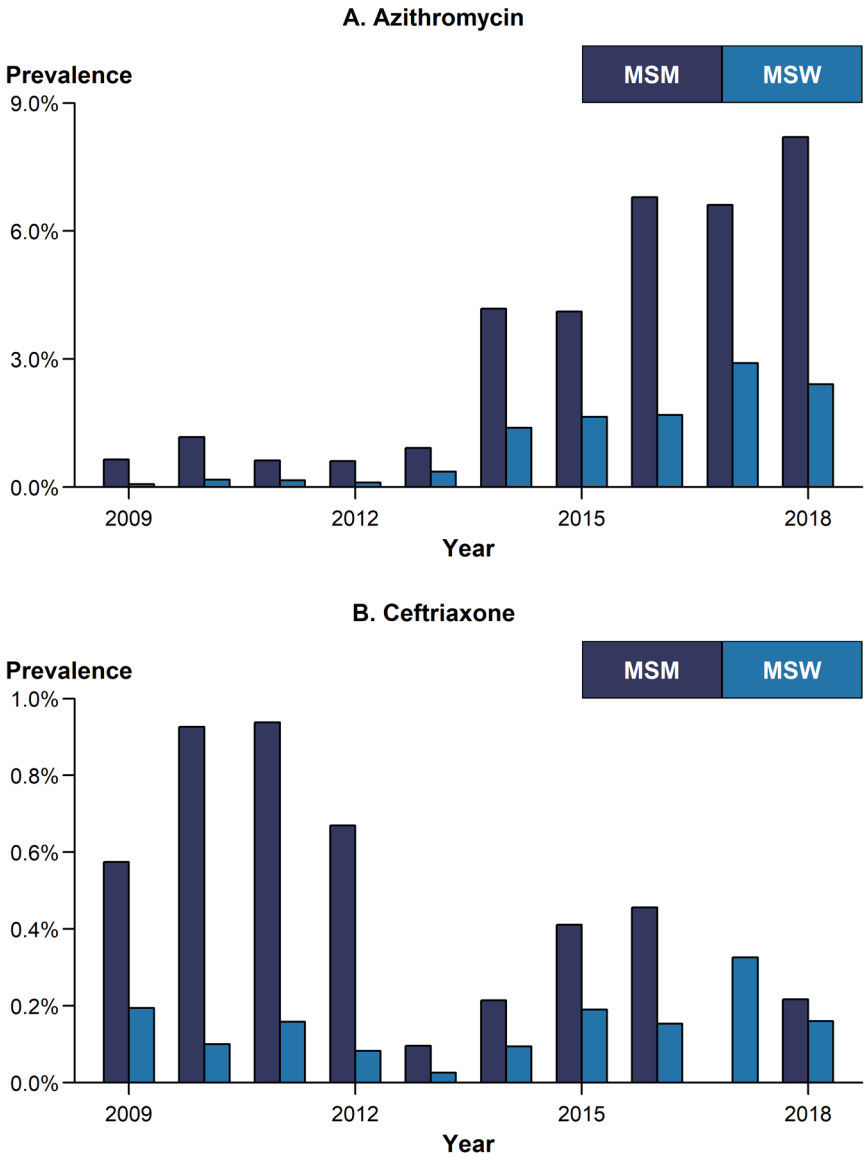
Information on the antimicrobial susceptibility criteria used in GISP can be found in Section A2.3 of the Appendix. More information about GISP and additional data can be found at: https://www.cdc.gov/std/GISP.

Figure BB. *Neisseria gonorrhoeae* — Percentage of Urethral Isolates Obtained from MSM Attending STD Clinics, Gonococcal Isolate Surveillance Project (GISP), 1989–2018



ACRONYMS: MSM = Gay, bisexual, and other men who have sex with men.

Figure CC. *Neisseria gonorrhoeae* — Percentage of Urethral Isolates with Elevated Minimum Inhibitory Concentrations (MICs) to Azithromycin* and Ceftriaxone† by Sex and Sex of Sex Partners, Gonococcal Isolate Surveillance Project (GISP), 2009–2018



* Elevated Azithromycin MIC: ≥2.0 µg/mL.
† Elevated Ceftriaxone MIC: ≥0.125 µg/mL.
ACRONYMS: MSM = Gay, bisexual, and other men who have sex with men; MSW = Men who have sex with women only.

STD Surveillance Network

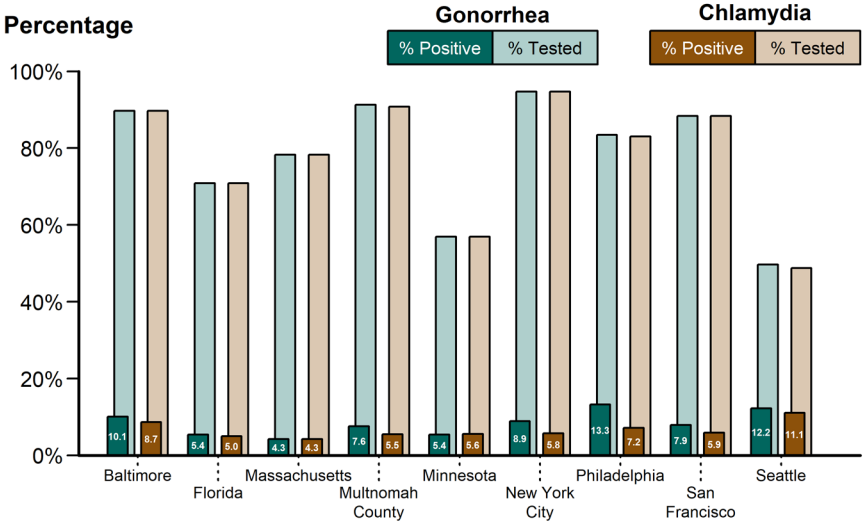
The STD Surveillance Network (SSuN) is an ongoing collaboration of state, county, and city health departments conducting sentinel and enhanced surveillance activities. These include collecting enhanced clinical and behavioral information among all patients attending selected STD clinics, among women aged 15–44 years in selected reproductive health clinics, and conducting enhanced patient and provider investigations on a representative sample of gonorrhea cases diagnosed and reported from all reporting sources in their jurisdiction (See Section A2.2 of the Appendix). Estimated rates of reported gonorrhea among MSM based on SSuN data are provided in the Gonorrhea section of the National Profile (Figure 25).

Urethral and Extragenital Gonorrhea and Chlamydia in STD Clinics, 2018

In 2018, 31,650 unique MSM presented for care in 18 STD clinics in nine SSuN jurisdictions. In total, 26,159 unique MSM were tested for urogenital gonorrhea and/or chlamydia (26,151 for gonorrhea and 26,087 for chlamydia) (Figure DD). Urogenital testing varied between jurisdictions, with the proportion tested for urogenital gonorrhea ranging from 49.7%–94.7% and the proportion tested for urogenital chlamydia ranging from 48.7% to 94.7%. However, the proportion tested for urogenital gonorrhea and for urogenital chlamydia was similar within each jurisdiction. When examining positivity among MSM tested for each disease, urogenital gonorrhea positivity was higher than urogenital chlamydia positivity in seven of the nine jurisdictions: Baltimore, Miami, Multnomah County, New York City, Philadelphia, San Francisco, and Seattle. Urogenital chlamydia positivity was equal or higher than urogenital gonorrhea positivity in Massachusetts and Minnesota. The median urogenital positivity for gonorrhea among MSM was 7.9% (range: 4.3%–13.3%) and for chlamydia was 5.8% (range: 4.3%–11.1%) across the nine jurisdictions.

In 2018, there were 20,838 unique MSM tested for rectal gonorrhea and/

Figure DD. Gonorrhea and Chlamydia — Proportion* of MSM STD Clinic Patients Tested and Testing Positive† for Urogenital Gonorrhea and Chlamydia by Jurisdiction, STD Surveillance Network (SSuN), 2018



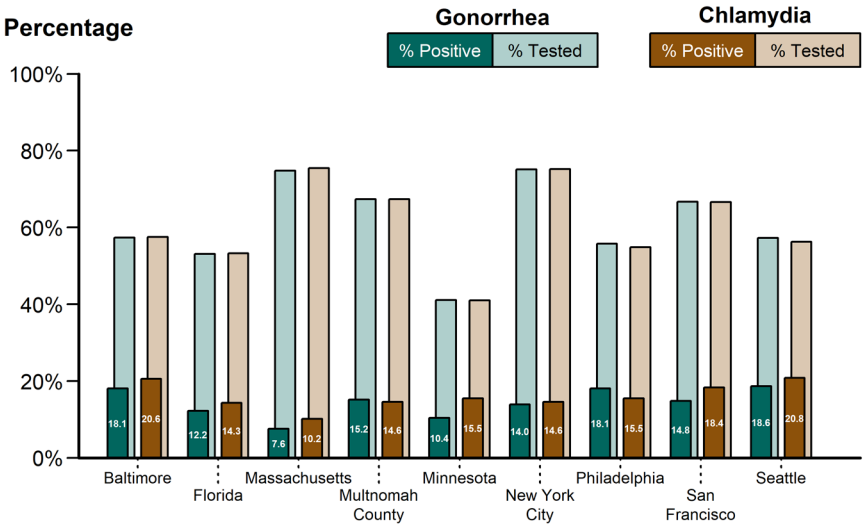
* Results based on data obtained from unique patients with known sex of sex partners tested for urogenital gonorrhea (n=26,151) and for urogenital chlamydia (n=26,087) ≥1 time in 2018.

† Percent positive among those tested for urogenital gonorrhea or chlamydia.

NOTE: See section A2.2 in the Appendix for SSuN methods.

ACRONYMS: MSM = Gay, bisexual, and other men who have sex with men.

Figure EE. Gonorrhea and Chlamydia — Proportion* of MSM STD Clinic Patients Tested and Testing Positive† for Rectal Gonorrhea and Chlamydia by Jurisdiction, STD Surveillance Network (SSuN), 2018



* Results based on data obtained from unique patients with known sex of sex partners tested for rectal gonorrhea (n=20,798) and for rectal chlamydia (n=20,755) ≥1 time in 2018.

† Percent positive among those tested for rectal gonorrhea or chlamydia.

NOTE: See section A2.2 in the Appendix for SSuN methods.

ACRONYMS: MSM = Gay, bisexual, and other men who have sex with men.

or chlamydia (20,798 for gonorrhea and 20,755 for chlamydia) (Figure EE). When compared to urogenital testing, rectal testing occurs less frequently in the majority of jurisdictions. The median positivity for rectal gonorrhea among MSM was 14.8% (range: 7.6%–18.1%) and for rectal chlamydia was 16.1% (range: 10.2%–20.8%) in SSuN jurisdictions.

During 2018, 23,739 MSM were tested at the pharyngeal site for gonorrhea and/or chlamydia (23,695 for gonorrhea and 21,767 for chlamydia) in eight of the 10 SSuN jurisdictions where data was available (Figure FF). Pharyngeal testing varied between 52.2%–86.5% for gonorrhea and between 68.2–76.6% for chlamydia. Among MSM who were tested at the pharyngeal site for gonorrhea, the median positivity was 12.9% (range: 8.0%–19.8%). In contrast, MSM tested at the pharyngeal site for chlamydia was 2.7% (range: 2.0%–3.1%). Pharyngeal chlamydia testing data was not available for Minnesota.

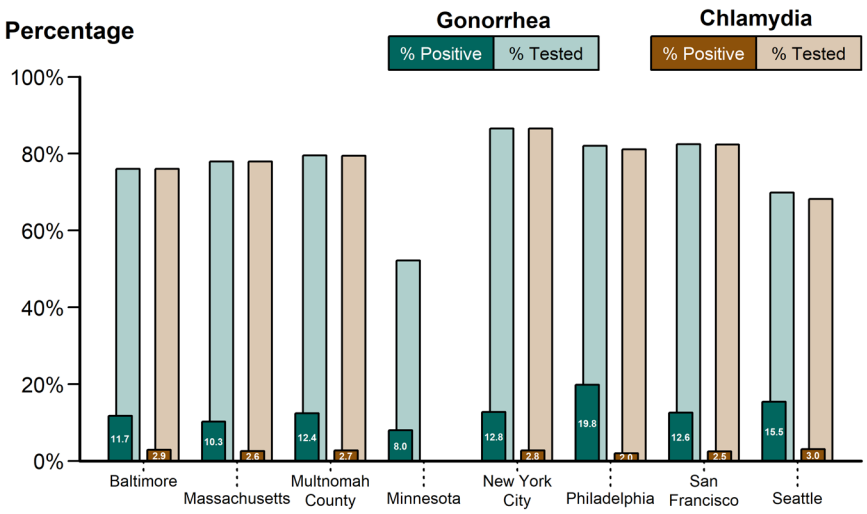
HIV Status and STDs in STD Clinics, 2018

Among HIV-positive MSM attending SSuN STD clinics in seven of the 10 SSuN jurisdictions in 2018, urogenital chlamydia positivity was 6.1% and urogenital gonorrhea positivity was 12.7% (compared to 6.7% and 7.6%, respectively, among HIV-negative MSM) (Figure GG). Among HIV-positive MSM, 7.0% were diagnosed with P&S syphilis compared to 3.4% of HIV-negative MSM. Percentages represent the overall average of the mean value by jurisdiction.

Anogenital Warts in STD Clinics, 2010–2016

Human papillomavirus (HPV) is a common sexually transmitted infection in the United States.[31] MSM are at elevated risk for clinical sequelae of HPV infection, including

Figure FF. Gonorrhea and Chlamydia — Proportion* of MSM STD Clinic Patients Tested and Testing Positive† for Pharyngeal Gonorrhea and Chlamydia by Jurisdiction, STD Surveillance Network (SSuN), 2018



* Results based on data obtained from unique patients with known sex of sex partners tested for pharyngeal gonorrhea (n=23,695) and for pharyngeal chlamydia (n=21,767) ≥1 time in 2018.

† Percent positive among those tested for pharyngeal gonorrhea or chlamydia.

NOTE: See section A2.2 in the Appendix for SSuN methods.

ACRONYMS: MSM = Gay, bisexual, and other men who have sex with men.

anal intraepithelial neoplasia, anal cancer, and anogenital warts.[32,33] Since late 2011, routine use of HPV vaccine has been recommended for males aged 11–12 years, with catch-up vaccination through age 21;[34-36] this age limit was recently extended to 26 years.[37] Vaccination through age 26 has been recommended since late 2011 for MSM and persons who are immunocompromised (including those infected with HIV).[34] For more information on HPV infections and HPV vaccination, see Other STDs.

An analysis of data from 27 clinics participating in SSuN observed significant declines in prevalence of anogenital warts during 2010–2016 among MSM of all ages.[38] Although some of the observed declines may be due to HPV vaccination, changes over time in attributes of STD clinic patients or clinical practices, such as a decrease in physical examinations resulting in fewer anogenital warts diagnoses, may partially account for these findings.

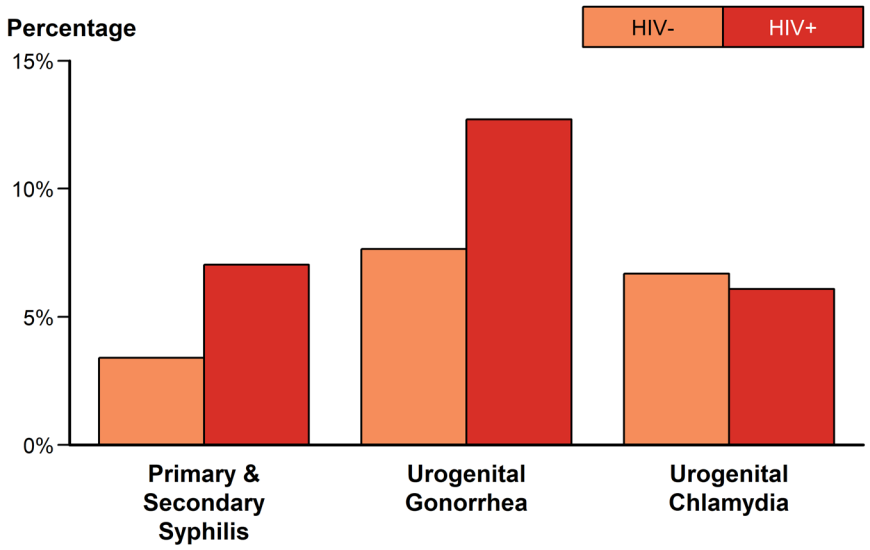
Summary

The number of reported P&S syphilis cases among MSM continued to rise in 2018, and the majority of P&S syphilis cases remained among MSM. 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/Hispanic ethnicity, and HIV status. State-specific P&S syphilis rate estimates among MSM varied from 108.9 to 962.3 cases per 100,000 MSM. 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 and urogenital gonorrhea may be more prevalent among MSM living with diagnosed HIV infection than among HIV-negative MSM.

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(No. 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 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.
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.

Figure GG. Proportion of MSM Attending STD Clinics with Primary and Secondary Syphilis*, Urogenital Gonorrhea, or Urogenital Chlamydia by Known HIV Status, STD Surveillance Network (SSuN), 2018



* Includes SSuN jurisdictions that reported data on at least 20 patients with a diagnosis of primary and secondary syphilis in 2018.
NOTE: See section A2.2 in the Appendix for SSuN methods.
ACRONYMS: MSM = Gay, bisexual, and other men who have sex with men.

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.
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. U.S. Census Bureau. Annual Estimates of the Resident Population by Sex, Race, and Hispanic Origin for the United States, States, and Counties: April 1, 2010 to July 1, 2018, Table PEPSR6H; generated by Jeremy Grey; using American FactFinder. 2019. Available at: https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml. Accessed August 1, 2019.
30. 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.
31. 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.

32. Jin F, Prestage GP, Kippax SC, et al. Risk factors for genital and anal warts in a prospective cohort of HIV-negative homosexual men: the HIM study. *Sex Transm Dis*. 2007;34(7):488–493.

33. Chin-Hong PV, Palefsky JM. Natural history and clinical management of anal human papillomavirus disease in men and women infected with human immunodeficiency virus. *Clin Infect Dis*. 2002;35(9):1127–1134.

34. 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.

35. 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.

36. Meites E, Kempe A, Markowitz LE. Use of a 2-dose schedule for human papillomavirus vaccination — updated recommendations of the Advisory Committee on Immunization Practices. *MMWR Morb Mortal Wkly Rep*. 2016;65(49):1405–1408.

37. Meites E, Szilagyi PG, Chesson HW, et al. Human papillomavirus vaccination for adults: Updated recommendations of the Advisory Committee on Immunization Practices. *MMWR Morb Mortal Wkly Rep*. 2019; 68(32):698–702.

38. Mann LM, Llata E, Flagg EW, et al. Trends in the prevalence of anogenital warts among patients at sexually transmitted disease clinics — Sexually Transmitted Disease Surveillance Network, United States, 2010–2016. *J Infect Dis*. 2019;219(9):1389–1397

Tables

Table 1. Sexually Transmitted Diseases — Reported Cases and Rates of Reported Cases*, United States, 1941–2018

	Syphilis															
	All Stages‡		Primary and Secondary		Early Latent		Unk. Duration or Late§		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
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

Continued on next page.

Table 1. Sexually Transmitted Diseases — Reported Cases and Rates of Reported Cases*, United States, 1941–2018 (continued)

	Syphilis															
	All Stages‡		Primary and Secondary		Early Latent		Unk. Duration or Late§		Congenital		Chlamydia		Gonorrhea		Chancroid	
Year†	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate‖	Cases	Rate	Cases	Rate	Cases	Rate
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	56,485	17.9	17,375	5.5	16,929	5.4	21,819	6.9	362	9.2	1,401,906	443.5	333,004	105.3	10	0.0
2014	63,454	19.9	19,999	6.3	19,452	6.1	23,541	7.4	462	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	12.4	1,526,658	475.0	395,216	123.0	11	0.0
2016	88,053	27.3	27,814	8.6	28,924	9.0	30,676	9.5	639	16.2	1,598,354	494.7	468,514	145.0	7	0.0
2017	101,584	31.2	30,644	9.4	34,013	10.4	35,992	11.1	935	23.7	1,708,569	524.6	555,608	170.6	7	0.0
2018	115,045	35.3	35,063	10.8	38,539	11.8	40,137	12.3	1,306	33.1	1,758,668	539.9	583,405	179.1	3	0.0

* Per 100,000.

† 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.

§ The case classification of 'Unknown duration or late syphilis' went into effect in January of 2018. Prior to 2018, cases in this category include cases classified as late latent syphilis, latent syphilis of unknown duration, late syphilis with clinical manifestations, and neurosyphilis. See Appendix A1.9 for a detailed explanation of changes to the syphilis case definition.

‖ 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 19, 2019. The number of cases and the rates shown here supersede those published in previous reports. See Appendix A1.1 for more information. Cases and rates shown in this table exclude US territories. Case definitions have changed over time. See Section 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, 2018

Rank*	State	Cases	Rate per 100,000 Population
1	Alaska	6,159	832.5
2	Louisiana	36,293	774.8
3	Mississippi	22,086	740.1
4	South Carolina	33,910	674.9
5	New Mexico	14,000	670.5
6	North Carolina	66,553	647.8
7	Georgia	65,936	632.2
8	Delaware	6,038	627.7
9	Illinois	77,325	604.0
10	New York	119,571	602.4
11	Arkansas	17,663	587.9
12	Maryland	35,482	586.3
13	California	231,415	585.3
14	Nevada	17,508	584.0
15	Alabama	28,437	583.4
16	Arizona	40,807	581.6
17	Tennessee	38,212	569.0
18	Missouri	34,728	568.1
19	Oklahoma	21,974	559.0
20	Ohio	63,220	542.3
21	Hawaii	7,735	541.8
	US TOTAL†	**1,758,668**	**539.9**
22	Indiana	34,926	523.9
23	Colorado	29,124	519.4
24	Rhode Island	5,487	517.8
25	Texas	146,510	517.6
26	South Dakota	4,432	509.6
27	Michigan	50,592	507.8
28	Virginia	42,965	507.3
29	Florida	104,758	499.2
30	Kansas	14,231	488.5
31	Wisconsin	28,027	483.6
32	Montana	4,917	468.1
33	Iowa	14,682	466.7
34	North Dakota	3,525	466.6
35	Connecticut	16,732	466.3
36	Washington	34,449	465.2
37	Oregon	19,224	464.0
38	Pennsylvania	59,340	463.4
39	Massachusetts	30,460	444.0
40	Kentucky	19,440	436.4
41	Minnesota	23,569	422.6
42	Nebraska	8,026	418.0
43	New Jersey	36,514	405.5
44	Idaho	6,572	382.8
45	Wyoming	2,169	374.4
46	Utah	10,541	339.8
47	Maine	4,345	325.2
48	New Hampshire	3,734	278.1
49	Vermont	1,712	274.5
50	West Virginia	3,599	198.2

* 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 9,014 cases and a rate of 1,298.9 cases per 100,000 population, but excludes territories.

Table 3. Chlamydia — Reported Cases and Rates of Reported Cases by State/Territory and Region in Alphabetical Order, United States, 2014–2018

State/Territory	Cases					Rates per 100,000 Population				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Alabama	29,010	26,359	26,901	29,935	28,437	598.2	542.5	553.1	614.1	583.4
Alaska	5,789	5,660	5,698	5,934	6,159	785.8	766.5	768.0	802.1	832.5
Arizona	32,397	32,387	34,923	39,598	40,807	481.3	474.3	503.9	564.4	581.6
Arkansas	15,605	16,166	16,737	17,320	17,663	526.1	542.8	560.1	576.5	587.9
California	176,308	189,170	198,155	218,785	231,415	454.4	483.3	504.9	553.4	585.3
Colorado	21,863	23,857	25,569	26,995	29,124	408.2	437.2	461.5	481.4	519.4
Connecticut	13,382	13,126	13,911	17,750	16,732	372.1	365.5	389.0	494.7	466.3
Delaware	4,473	4,605	5,365	5,392	6,038	478.1	486.8	563.5	560.5	627.7
District of Columbia	5,293	7,894	7,283	9,107	9,014	803.3	1,174.3	1,069.2	1,312.3	1,298.9
Florida	84,194	90,468	94,742	100,018	104,758	423.2	446.3	459.6	476.6	499.2
Georgia	51,945	57,639	62,776	65,104	65,936	514.4	564.3	608.9	624.2	632.2
Hawaii	6,419	7,074	6,902	6,850	7,735	452.2	494.1	483.1	479.8	541.8
Idaho	5,442	5,631	5,897	6,200	6,572	333.0	340.3	350.4	361.1	382.8
Illinois	66,536	69,610	72,201	75,518	77,325	516.6	541.3	564.0	589.9	604.0
Indiana	28,519	28,886	30,847	34,278	34,926	432.3	436.4	465.0	514.2	523.9
Iowa	11,804	12,085	12,983	13,893	14,682	379.9	386.9	414.2	441.6	466.7
Kansas	11,116	11,464	12,160	13,554	14,231	382.8	393.7	418.3	465.3	488.5
Kentucky	17,664	17,444	18,286	19,320	19,440	400.2	394.2	412.1	433.7	436.4
Louisiana	28,955	32,325	31,727	34,756	36,293	622.7	692.1	677.7	742.0	774.8
Maine	3,530	3,965	4,156	4,555	4,345	265.4	298.3	312.1	341.0	325.2
Maryland	27,424	27,450	30,658	33,416	35,482	458.9	457.0	509.6	552.1	586.3
Massachusetts	21,271	24,100	26,807	29,315	30,460	315.3	354.7	393.5	427.3	444.0
Michigan	44,256	46,486	45,936	50,595	50,592	446.6	468.5	462.7	507.9	507.8
Minnesota	19,907	21,243	22,685	23,539	23,569	364.8	387.0	411.0	422.1	422.6
Mississippi	19,605	17,371	20,112	21,149	22,086	654.8	580.5	672.9	708.7	740.1
Missouri	27,981	28,948	30,843	32,683	34,728	461.5	475.8	506.2	534.6	568.1
Montana	4,193	4,184	4,416	4,560	4,917	409.6	405.1	423.6	434.1	468.1
Nebraska	7,499	7,956	8,197	8,595	8,026	398.6	419.6	429.8	447.6	418.0
Nevada	11,841	12,925	14,649	16,260	17,508	417.1	447.1	498.3	542.4	584.0
New Hampshire	3,586	3,095	3,467	4,412	3,734	270.3	232.6	259.7	328.6	278.1
New Jersey	29,904	31,337	34,519	35,239	36,514	334.6	349.8	385.9	391.3	405.5
New Mexico	11,558	12,632	13,108	13,560	14,000	554.2	605.8	629.9	649.4	670.5
New York	98,814	103,615	109,433	116,814	119,571	500.4	523.4	554.2	588.5	602.4
North Carolina	47,147	64,376	58,006	62,876	66,553	474.1	641.0	571.7	612.0	647.8
North Dakota	3,451	3,159	3,455	3,278	3,525	466.7	417.3	455.8	433.9	466.6
Ohio	54,858	56,726	60,496	61,389	63,220	473.2	488.5	520.9	526.6	542.3
Oklahoma	20,662	21,025	21,449	21,752	21,974	532.8	537.5	546.7	553.4	559.0
Oregon	15,508	16,305	17,425	18,634	19,224	390.6	404.7	425.7	449.8	464.0
Pennsylvania	50,536	53,460	56,930	56,447	59,340	395.2	417.6	445.3	440.8	463.4
Rhode Island	4,349	4,575	4,936	5,282	5,487	412.2	433.1	467.2	498.5	517.8
South Carolina	28,087	27,538	28,179	32,235	33,910	581.2	562.4	568.0	641.6	674.9
South Dakota	4,166	3,949	4,331	4,437	4,432	488.3	460.0	500.4	510.2	509.6
Tennessee	30,793	31,272	32,304	35,087	38,212	470.2	473.8	485.7	522.4	569.0
Texas	131,219	141,158	142,952	151,533	146,510	486.8	513.9	513.1	535.4	517.6
Utah	8,223	8,633	9,457	10,135	10,541	279.4	288.2	309.9	326.7	339.8
Vermont	2,237	1,901	1,690	1,858	1,712	357.0	303.7	270.6	297.9	274.5
Virginia	36,048	35,349	39,666	42,374	42,965	432.9	421.7	471.6	500.3	507.3
Washington	26,577	28,699	31,254	32,231	34,449	376.4	400.2	428.8	435.2	465.2
West Virginia	4,719	4,958	4,821	4,140	3,599	255.0	268.9	263.3	228.0	198.2
Wisconsin	23,154	24,381	26,894	27,740	28,027	402.1	422.4	465.4	478.6	483.6
Wyoming	1,972	2,037	2,060	2,142	2,169	337.6	347.5	351.8	369.7	374.4
US TOTAL	**1,441,789**	**1,526,658**	**1,598,354**	**1,708,569**	**1,758,668**	**452.2**	**475.0**	**494.7**	**524.6**	**539.9**
Northeast	227,609	239,174	255,849	271,672	277,895	405.3	424.9	455.2	481.1	492.1
Midwest	303,247	314,893	331,028	349,499	357,283	447.6	463.7	487.2	512.6	524.0
South	582,843	623,397	641,964	685,514	698,870	486.6	514.4	524.8	554.4	565.2
West	328,090	349,194	369,513	401,884	424,620	436.4	459.2	482.0	519.2	548.5
American Samoa	NR	NR	NR	NR	55	—	—	—	—	106.8
Guam	839	881	934	1,107	944	521.1	544.5	559.6	661.5	564.1
Northern Mariana Islands	NR	NR	NR	NR	246	—	—	—	—	470.7
Puerto Rico	4,899	5,295	7,198	5,961	5,942	138.1	152.4	211.0	177.8	177.3
Virgin Islands	791	743	571	458	NR	759.3	721.7	530.1	427.0	—
TERRITORIES	**6,529**	**6,919**	**8,703**	**7,526**	**7,187**	**171.2**	**185.1**	**236.1**	**207.5**	**198.4**
TOTAL	**1,448,318**	**1,533,577**	**1,607,057**	**1,716,095**	**1,765,855**	**448.9**	**471.6**	**491.7**	**521.1**	**536.2**

NR = No report.

NOTE: See Section A1.11 in the Appendix for more information on interpreting case counts and rates in US territories.

Table 4. Chlamydia Among Females — Reported Cases and Rates of Reported Cases by State/Territory and Region in Alphabetical Order, United States, 2014–2018

State/Territory	Cases					Rates per 100,000 Population				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Alabama	20,619	18,674	19,131	20,993	19,537	825.0	745.2	762.9	834.7	776.8
Alaska	3,940	3,786	3,807	3,941	3,965	1,127.5	1,083.6	1,076.1	1,116.4	1,123.2
Arizona	22,747	22,299	23,693	26,453	26,717	671.5	648.9	679.2	749.8	757.3
Arkansas	11,625	12,088	12,216	12,453	12,513	770.4	797.7	803.5	814.9	818.8
California	115,339	121,387	123,906	135,040	142,006	590.5	616.1	627.2	679.0	714.0
Colorado	14,906	16,151	16,945	17,251	18,474	559.4	595.4	615.1	619.5	663.4
Connecticut	9,512	9,089	9,495	11,487	10,751	516.4	494.2	518.6	625.5	585.4
Delaware	3,084	3,118	3,678	3,562	3,992	638.6	638.8	748.5	717.5	804.1
District of Columbia	3,709	4,632	4,018	4,754	4,812	1,071.1	1,309.9	1,122.5	1,303.3	1,319.2
Florida	58,800	62,048	63,415	66,173	68,509	578.2	598.4	601.5	616.8	638.6
Georgia	36,871	40,302	43,377	44,080	43,903	713.1	769.9	820.0	823.3	820.0
Hawaii	4,469	4,720	4,480	4,424	4,811	637.1	668.3	630.1	621.8	676.2
Idaho	3,895	3,963	4,022	4,198	4,452	477.3	479.7	479.0	490.1	519.8
Illinois	46,516	47,268	48,128	49,336	49,746	709.1	722.1	739.3	757.9	764.2
Indiana	20,586	20,385	21,664	23,595	23,768	615.0	607.1	644.1	698.1	703.3
Iowa	8,385	8,372	8,872	9,261	9,793	536.1	532.6	563.1	585.8	619.4
Kansas	8,276	8,325	8,688	9,472	9,794	568.1	571.0	595.3	648.2	670.3
Kentucky	12,404	12,140	12,345	13,035	13,055	553.7	540.5	548.6	576.8	577.7
Louisiana	21,297	23,351	22,942	24,544	25,225	896.4	978.3	959.0	1,024.9	1,053.3
Maine	2,478	2,735	2,795	2,959	2,854	365.0	403.4	411.7	434.3	418.9
Maryland	19,162	18,612	20,145	21,957	22,912	622.1	601.3	649.4	704.2	734.8
Massachusetts	14,000	15,588	17,299	18,716	19,096	402.9	445.6	493.4	530.3	541.0
Michigan	31,470	32,425	31,497	34,120	33,687	624.2	642.8	624.5	674.5	665.9
Minnesota	13,484	14,112	14,967	15,338	15,021	491.2	511.4	539.9	547.8	536.5
Mississippi	14,008	12,335	14,123	14,740	15,325	909.9	800.7	917.1	958.2	996.3
Missouri	19,549	19,926	20,757	21,701	22,787	632.8	643.1	669.4	697.5	732.4
Montana	2,878	2,846	2,962	3,030	3,206	564.9	554.1	572.1	581.0	614.7
Nebraska	5,110	5,409	5,527	5,660	5,233	540.9	568.8	577.9	588.4	544.0
Nevada	8,039	8,743	9,849	10,473	11,057	569.2	607.0	671.8	700.9	740.0
New Hampshire	2,452	2,089	2,316	2,917	2,474	365.2	310.4	343.7	430.4	365.0
New Jersey	21,556	22,274	24,021	23,811	24,688	471.0	485.7	524.9	516.6	535.6
New Mexico	8,395	9,227	9,306	9,328	9,683	797.5	877.4	886.0	885.1	918.8
New York	65,114	66,164	67,602	70,379	70,348	640.6	649.7	665.5	689.2	688.9
North Carolina	35,494	47,178	41,085	43,580	45,450	696.0	915.9	788.0	826.6	862.1
North Dakota	2,202	2,028	2,187	2,127	2,303	610.9	551.0	592.7	577.8	625.7
Ohio	39,033	39,825	41,797	42,132	42,674	659.4	671.9	705.7	708.6	717.8
Oklahoma	14,855	14,904	14,933	15,183	15,282	758.7	754.9	754.3	765.5	770.5
Oregon	10,545	11,075	11,542	12,203	12,567	525.6	544.0	558.5	583.9	601.4
Pennsylvania	34,170	35,201	37,030	36,201	37,938	523.0	538.4	567.7	554.0	580.6
Rhode Island	3,037	3,064	3,278	3,454	3,584	558.5	562.9	603.3	634.2	658.0
South Carolina	20,581	19,743	19,783	22,343	22,822	828.8	784.3	774.8	863.8	882.3
South Dakota	2,942	2,831	3,072	3,094	3,008	694.1	663.8	715.8	718.4	698.4
Tennessee	21,203	21,112	21,714	23,348	25,151	631.6	624.1	637.0	678.7	731.1
Texas	96,959	102,141	101,618	105,995	100,417	714.3	738.5	724.2	744.2	705.0
Utah	5,414	5,704	6,031	6,606	6,808	370.0	383.1	398.0	428.9	442.0
Vermont	1,613	1,352	1,171	1,242	1,171	507.7	425.8	370.4	393.8	371.3
Virginia	24,754	23,859	26,146	27,606	27,849	585.1	560.3	611.6	641.5	647.2
Washington	18,193	19,047	20,276	20,515	21,432	515.1	531.2	556.0	554.1	578.9
West Virginia	3,356	3,449	3,330	2,775	2,374	358.4	369.6	359.9	302.5	258.8
Wisconsin	16,063	16,660	18,382	18,667	18,617	554.3	573.7	632.7	640.9	639.2
Wyoming	1,352	1,387	1,356	1,399	1,422	472.5	482.9	473.2	492.8	500.9
US TOTAL	**1,006,441**	**1,045,143**	**1,072,719**	**1,127,651**	**1,145,063**	**621.6**	**640.4**	**653.9**	**682.1**	**692.7**
Northeast	153,932	157,556	165,007	171,166	172,904	534.4	546.0	572.8	591.4	597.5
Midwest	213,616	217,566	225,538	234,503	236,431	621.9	632.2	655.5	679.3	684.9
South	418,781	439,686	443,999	467,121	469,128	685.9	711.7	711.8	741.0	744.2
West	220,112	230,335	238,175	254,861	266,600	583.6	604.0	619.4	656.7	687.0
American Samoa	NR	NR	NR	NR	53	—	—	—	—	206.0
Guam	595	618	654	753	670	749.6	774.4	806.8	926.6	824.5
Northern Mariana Islands	NR	NR	NR	NR	189	—	—	—	—	772.6
Puerto Rico	3,770	3,950	5,551	4,702	4,697	204.4	217.4	310.5	267.2	267.0
Virgin Islands	590	563	405	318	NR	1,060.7	1,020.6	720.9	567.6	—
TERRITORIES	**4,955**	**5,131**	**6,610**	**5,773**	**5,609**	**250.4**	**262.9**	**343.4**	**304.4**	**296.6**
TOTAL	**1,011,396**	**1,050,274**	**1,079,329**	**1,133,424**	**1,150,672**	**617.1**	**636.0**	**650.3**	**677.9**	**688.2**

NR = No report.

NOTE: Cases reported with unknown sex are not included in this table. See Section A1.11 in the Appendix for more information on interpreting case counts and rates in US territories.

Table 5. Chlamydia Among Males — Reported Cases and Rates of Reported Cases by State/Territory and Region in Alphabetical Order, United States, 2014–2018

State/Territory	Cases					Rates per 100,000 Population				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Alabama	8,318	7,549	7,585	8,837	8,807	354.0	320.8	322.0	374.5	373.2
Alaska	1,849	1,871	1,891	1,993	2,189	477.4	480.9	487.2	515.3	565.9
Arizona	9,650	10,028	11,217	13,055	13,972	288.6	295.7	325.8	374.3	400.5
Arkansas	3,964	4,078	4,521	4,866	5,147	272.0	278.8	308.0	329.7	348.7
California	60,687	67,475	73,625	83,273	88,787	314.9	347.0	377.7	423.8	451.9
Colorado	6,957	7,706	8,624	9,744	10,650	258.5	280.9	309.6	345.2	377.3
Connecticut	3,757	3,926	4,268	5,618	5,829	214.1	224.1	244.5	320.7	332.7
Delaware	1,389	1,487	1,687	1,830	2,031	306.8	324.8	366.2	393.1	436.3
District of Columbia	1,555	3,108	3,112	4,279	4,135	497.4	975.5	962.8	1,299.8	1,256.1
Florida	25,239	28,332	31,275	33,811	36,219	259.6	286.1	310.6	329.6	353.1
Georgia	14,736	17,212	19,338	20,837	21,691	299.1	345.6	385.2	410.5	427.4
Hawaii	1,950	2,352	2,421	2,426	2,911	271.6	324.2	337.4	338.8	406.5
Idaho	1,547	1,663	1,869	1,990	2,102	189.0	200.7	221.6	231.3	244.3
Illinois	19,908	21,966	24,008	26,089	27,555	315.0	347.9	381.6	414.6	437.9
Indiana	7,921	8,492	9,174	10,673	11,131	243.8	260.3	280.6	324.7	338.6
Iowa	3,419	3,712	4,111	4,631	4,889	221.6	239.2	263.7	296.0	312.4
Kansas	2,840	3,139	3,472	4,082	4,437	196.2	215.9	239.8	281.1	305.6
Kentucky	5,194	5,273	5,590	6,194	6,249	239.0	242.0	255.7	282.3	284.8
Louisiana	7,655	8,974	8,784	10,212	11,068	336.6	392.9	383.7	446.0	483.4
Maine	1,050	1,230	1,356	1,596	1,491	161.2	188.9	207.8	243.8	227.8
Maryland	8,237	8,780	10,479	11,449	12,539	284.4	301.6	359.6	390.2	427.3
Massachusetts	7,197	8,406	9,433	10,517	11,231	220.0	255.0	285.4	315.8	337.2
Michigan	12,723	14,015	14,417	16,420	16,844	261.3	287.3	295.1	334.8	343.5
Minnesota	6,414	7,122	7,703	8,183	8,527	236.5	260.9	280.4	294.7	307.1
Mississippi	5,588	5,018	5,955	6,363	6,723	384.2	345.6	411.0	440.1	465.0
Missouri	8,432	9,022	10,086	10,982	11,941	283.5	302.2	337.1	365.8	397.7
Montana	1,314	1,338	1,454	1,528	1,710	255.6	257.6	277.1	288.9	323.3
Nebraska	2,357	2,531	2,649	2,927	2,789	251.6	267.8	278.6	305.5	291.1
Nevada	3,786	4,152	4,777	5,741	6,381	265.4	286.2	324.1	381.8	424.3
New Hampshire	1,130	1,006	1,150	1,494	1,259	172.4	153.0	174.0	224.7	189.3
New Jersey	8,272	9,025	10,435	11,362	11,817	189.6	206.4	238.9	258.4	268.8
New Mexico	3,148	3,400	3,794	4,229	4,313	304.8	329.0	368.1	408.9	417.1
New York	33,634	37,346	41,722	46,349	49,175	351.0	388.6	435.2	480.9	510.2
North Carolina	11,638	17,195	16,918	19,295	21,103	240.2	351.5	343.0	385.8	421.9
North Dakota	1,249	1,131	1,268	1,151	1,222	329.5	290.9	326.0	297.2	315.5
Ohio	15,825	16,901	18,699	19,257	20,546	278.9	297.2	328.5	337.1	359.6
Oklahoma	5,802	6,121	6,516	6,569	6,692	302.2	316.0	335.2	337.3	343.6
Oregon	4,953	5,223	5,876	6,412	6,638	252.2	262.0	289.9	312.3	323.3
Pennsylvania	16,315	18,201	19,840	20,184	21,350	260.9	290.5	316.9	321.8	340.4
Rhode Island	1,312	1,511	1,656	1,825	1,903	256.6	295.1	322.8	354.4	369.5
South Carolina	7,376	7,705	8,286	9,807	10,976	314.0	323.9	344.1	402.3	450.3
South Dakota	1,224	1,118	1,259	1,343	1,424	285.1	258.8	288.6	306.0	324.4
Tennessee	9,587	10,158	10,584	11,736	13,057	300.3	315.7	326.4	358.2	398.6
Texas	34,110	38,539	40,992	45,170	45,450	254.9	282.6	296.4	321.2	323.2
Utah	2,808	2,929	3,424	3,516	3,733	189.8	194.3	222.9	225.1	239.0
Vermont	622	549	518	611	527	201.4	177.9	167.9	198.2	171.0
Virginia	11,244	11,460	13,395	14,311	14,924	274.6	277.8	323.8	343.5	358.2
Washington	8,384	9,651	10,975	11,713	13,006	237.5	269.2	301.4	316.3	351.2
West Virginia	1,363	1,509	1,491	1,365	1,224	149.1	165.6	164.6	151.9	136.2
Wisconsin	7,077	7,703	8,487	9,058	9,386	247.5	268.6	295.4	314.2	325.6
Wyoming	619	643	704	741	747	207.7	215.1	235.5	250.8	252.8
US TOTAL	**433,325**	**478,981**	**522,870**	**577,644**	**610,447**	**276.1**	**302.7**	**328.7**	**360.1**	**380.6**
Northeast	73,289	81,200	90,378	99,556	104,582	268.0	296.1	329.8	361.6	379.9
Midwest	89,389	96,852	105,333	114,796	120,691	267.7	289.2	314.1	341.1	358.6
South	162,995	182,498	196,508	216,931	228,035	277.6	307.2	327.8	357.9	376.2
West	107,652	118,431	130,651	146,361	157,139	287.3	312.4	342.0	379.2	407.1
American Samoa	NR	NR	NR	NR	2	—	—	—	—	7.8
Guam	244	263	280	354	274	298.9	320.8	326.2	411.2	318.2
Northern Mariana Islands	NR	NR	NR	NR	57	—	—	—	—	205.0
Puerto Rico	1,126	1,319	1,647	1,255	1,240	66.1	79.6	101.4	78.8	77.9
Virgin Islands	201	180	166	140	NR	414.0	376.7	322.1	273.2	—
TERRITORIES	**1,571**	**1,762**	**2,093**	**1,749**	**1,573**	**85.6**	**98.6**	**118.8**	**101.1**	**90.8**
TOTAL	**434,896**	**480,743**	**524,963**	**579,393**	**612,020**	**273.9**	**300.4**	**326.4**	**357.3**	**377.5**

NR = No report.

NOTE: Cases reported with unknown sex are not included in this table. See Section A1.11 in the Appendix for more information on interpreting case counts and rates in US territories.

Table 6. Chlamydia — Reported Cases and Rates of Reported Cases in Selected Metropolitan Statistical Areas (MSAs)* in Alphabetical Order, United States, 2014–2018

MSAs	Cases					Rates per 100,000 Population				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Atlanta-Sandy Springs-Roswell, GA	25,744	19,106†	33,273	34,189	32,883†	458.5	334.6†	574.7	581.0	558.8†
Austin-Round Rock, TX	10,920	11,679	12,299	13,015	12,845	561.9	583.7	598.1	615.1	607.1
Baltimore-Columbia-Towson, MD	14,095	14,016	15,829	16,766	17,466	505.9	501.0	565.5	597.0	622.0
Birmingham-Hoover, AL	6,309	5,839	4,982‡	7,388	6,391	551.6	509.7	434.2‡	642.5	555.8
Boston-Cambridge-Newton, MA-NH	14,264†	14,378†	15,880†	18,232†	21,110	301.4†	301.2†	331.2†	377.0†	436.5
Buffalo-Cheektowaga-Niagara Falls, NY	5,841	5,900	6,252	6,584	6,443	514.0	519.7	551.9	579.1	566.7
Charlotte-Concord-Gastonia, NC-SC	11,766	16,284	14,314	15,901	16,983	494.3	671.1	578.5	629.7	672.5
Chicago-Naperville-Elgin, IL-IN-WI	51,457	54,248	56,478	59,342	60,221	538.6	568.0	593.7	622.5	631.7
Cincinnati, OH-KY-IN	10,516	11,219	11,392	11,205	11,220	489.2	519.9	526.2	514.2	514.9
Cleveland-Elyria, OH	11,363	11,312	12,475	13,773	13,771	550.6	548.9	606.9	669.0	668.9
Columbus, OH	10,258	11,327	12,113	11,921	12,511	514.3	560.3	593.3	573.5	601.9
Dallas-Fort Worth-Arlington, TX	30,549	35,900	32,771	37,263	36,756	439.3	505.4	453.1	503.6	496.7
Denver-Aurora-Lakewood, CO	13,346	13,942	14,282	15,520	16,928	484.6	495.4	500.6	537.4	586.1
Detroit-Warren-Dearborn, MI	21,012	22,238	21,966	24,278	24,101	489.0	516.9	511.1	562.9	558.8
Hartford-West Hartford-East Hartford, CT	4,713	4,689	4,898	6,153†	5,735†	388.1	387.1	405.9	508.4†	473.9†
Houston-The Woodlands-Sugar Land, TX	30,554	32,823	35,594	35,807	35,960	470.8	493.1	525.6	519.5	521.7
Indianapolis-Carmel-Anderson, IN	11,952	11,544	12,794	13,701	13,709	606.3	580.4	638.3	675.4	675.8
Jacksonville, FL	7,391	8,012	8,434	8,763	9,133	520.8	552.7	570.6	582.3	606.9
Kansas City, MO-KS	9,866	10,240	11,043	11,868	12,859	476.4	490.5	524.7	557.5	604.0
Las Vegas-Henderson-Paradise, NV	9,485	10,049	11,362	11,898	13,695	458.3	475.2	527.1	539.8	621.3
Los Angeles-Long Beach-Anaheim, CA	64,263	68,285	71,943	78,312	82,143	484.6	511.9	540.5	586.4	615.1
Louisville-Jefferson County, KY-IN	6,751	6,735	6,881	7,086	6,311	531.7	526.8	536.1	547.6	487.7
Memphis, TN-MS-AR	10,554	10,342	10,365	11,718	12,555	785.7	769.4	771.9	869.1	931.2
Miami-Fort Lauderdale-West Palm Beach, FL	24,599	26,746	28,070	29,430	30,742	414.8	444.9	462.7	477.9	499.2
Milwaukee-Waukesha-West Allis, WI	10,303	10,645	11,891	12,187	12,441	655.3	675.6	756.2	773.2	789.3
Minneapolis-St. Paul-Bloomington, MN-WI	13,589†	14,709†	15,584	16,901	16,617	388.8†	417.3†	438.9	469.4	461.5
Nashville-Davidson-Murfreesboro-Franklin, TN	7,878	8,066	8,196	8,928	10,056	439.5	440.7	439.4	469.1	528.4
New Orleans-Metairie, LA	8,595	9,291	9,626	9,850	10,558	686.6	735.7	758.6	772.1	827.6
New York-Newark-Jersey City, NY-NJ-PA	93,515	97,835	105,463	112,808	115,654	465.4	484.8	523.3	555.1	569.1
Oklahoma City, OK	7,293	7,633	7,693	8,198	8,449	545.6	561.9	560.2	592.5	610.6
Orlando-Kissimmee-Sanford, FL	11,001	12,026	12,492	13,870	14,774	473.9	503.8	511.7	552.6	588.6
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	33,376	34,910	38,182	38,661	38,884	551.6	575.1	629.0	634.2	637.8
Phoenix-Mesa-Scottsdale, AZ	21,576	21,795	23,567	26,939	28,252	480.6	476.4	505.6	568.7	596.4
Pittsburgh, PA	8,059	8,604	8,623	7,801	8,623	342.1	365.7	368.1	334.3	369.6
Portland-Vancouver-Hillsboro, OR-WA	9,283	9,982	11,052	11,461	11,830	395.3	417.8	455.8	467.2	482.2
Providence-Warwick, RI-MA	5,695†	5,907†	6,668†	6,977†	7,537	353.9†	366.2†	412.9†	430.4†	464.9
Raleigh, NC	5,126	6,911	6,493	7,243	7,710	412.4	542.6	498.3	542.5	577.5
Richmond, VA	7,817	7,878	8,592	8,562	8,845	620.4	619.7	670.4	661.6	683.4
Riverside-San Bernardino-Ontario, CA	19,560	20,778	20,081	24,294	24,786	440.4	462.8	443.5	530.4	541.1
Sacramento-Roseville-Arden-Arcade, CA	9,674	10,621	10,892	12,408	14,107	431.0	467.0	474.3	533.7	606.8
Salt Lake City, UT	4,423	4,751	5,264	5,516	5,472	383.5	406.0	443.8	458.5	454.8
San Antonio-New Braunfels, TX	11,573	14,465	15,149	14,580	12,199	497.0	606.7	623.5	589.3	493.1
San Diego-Carlsbad, CA	15,754	17,378	18,937	20,832	21,912	482.7	526.7	570.8	624.1	656.5
San Francisco-Oakland-Hayward, CA	20,377	23,519	24,894	27,850	29,286	443.6	505.1	532.0	589.1	619.5
San Jose-Sunnyvale-Santa Clara, CA	6,278	6,898	7,166	7,877	8,553	321.5	348.9	362.1	394.2	428.0
Seattle-Tacoma-Bellevue, WA	13,861	15,257	16,886	17,832	18,744	377.5	408.6	444.5	461.1	484.7
St. Louis, MO-IL	14,711	14,961	15,512	16,469	17,222	524.2	532.1	552.6	586.6	613.5
Tampa-St. Petersburg-Clearwater, FL	12,952	13,472	13,996	14,512	15,454	444.2	452.8	461.6	469.4	499.9
Virginia Beach-Norfolk-Newport News, VA-NC	12,192	11,281	13,223	13,571	14,137	710.2	654.0	765.7	786.6	819.4
Washington-Arlington-Alexandria, DC-VA-MD-WV	18,342	18,890	21,269	33,134	34,211	304.0	309.8	346.9	533.0	550.3
SELECTED MSAs TOTAL	**820,371**	**865,316**	**923,081**	**999,374**	**1,028,784**	**469.1**	**489.6**	**518.8**	**555.7**	**572.1**

* MSAs were selected on the basis of the largest population in the 2010 US 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 Section A1.4 in the Appendix for more information.

‡ 2016 county data for Alabama have been corrected and may not match previous reports.

NOTE: County was misclassified in the 2017 District of Columbia STD morbidity data resulting in inaccurate county-level case counts and rates.

Table 7. Chlamydia Among Females — Reported Cases and Rates of Reported Cases in Selected Metropolitan Statistical Areas (MSAs)* in Alphabetical Order, United States, 2014–2018

MSAs	Cases					Rates per 100,000 Population				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Atlanta-Sandy Springs-Roswell, GA	17,564	12,640†	22,235	22,204	21,168†	607.2	429.0†	743.6	730.5	696.4†
Austin-Round Rock, TX	7,513	7,779	7,827	8,216	7,820	773.7	777.8	761.8	778.6	741.1
Baltimore-Columbia-Towson, MD	9,780	9,453	10,359	11,007	11,145	678.0	652.7	714.5	757.0	766.5
Birmingham-Hoover, AL	4,300	3,940	3,386‡	4,985	4,126	724.5	662.3	568.9‡	835.2	691.2
Boston-Cambridge-Newton, MA-NH	9,243†	9,137†	9,987†	11,314†	12,904	379.6†	372.0†	405.1†	455.2†	519.2
Buffalo-Cheektowaga-Niagara Falls, NY	4,077	4,035	4,142	4,383	4,233	696.2	690.1	710.1	748.2	722.6
Charlotte-Concord-Gastonia, NC-SC	8,633	11,672	10,033	10,810	11,340	705.1	935.2	786.8	831.3	872.0
Chicago-Naperville-Elgin, IL-IN-WI	35,696	36,547	37,102	38,191	38,003	730.9	749.1	764.1	785.1	781.2
Cincinnati, OH-KY-IN	7,724	8,050	8,052	7,848	7,747	703.9	731.0	729.4	706.5	697.4
Cleveland-Elyria, OH	7,914	7,815	8,601	9,167	9,098	740.8	732.5	809.0	861.2	854.8
Columbus, OH	6,895	7,704	8,027	7,864	8,121	680.3	750.2	774.2	744.9	769.2
Dallas-Fort Worth-Arlington, TX	22,213	25,902	22,719	25,893	24,762	628.6	717.3	617.7	689.0	658.9
Denver-Aurora-Lakewood, CO	9,020	9,265	9,360	9,652	10,514	652.7	656.7	654.8	668.2	727.9
Detroit-Warren-Dearborn, MI	14,822	15,410	14,957	16,198	15,818	670.3	696.5	677.4	731.7	714.5
Hartford-West Hartford-East Hartford, CT	3,349	3,226	3,307	3,945†	3,722†	538.2	520.0	535.5	636.9†	600.9†
Houston-The Woodlands-Sugar Land, TX	22,832	23,828	25,470	25,253	24,769	699.6	711.6	747.1	728.0	714.0
Indianapolis-Carmel-Anderson, IN	8,398	7,816	8,604	9,090	9,102	832.9	768.7	839.5	876.6	877.7
Jacksonville, FL	5,238	5,637	5,757	5,905	6,152	719.3	758.6	759.4	765.5	797.6
Kansas City, MO-KS	6,991	7,108	7,544	7,947	8,461	662.4	668.8	703.9	733.4	780.9
Las Vegas-Henderson-Paradise, NV	6,486	6,885	7,697	7,642	8,619	627.4	650.6	712.5	691.9	780.3
Los Angeles-Long Beach-Anaheim, CA	40,401	42,385	43,278	46,649	48,445	600.7	626.6	641.1	689.1	715.6
Louisville-Jefferson County, KY-IN	4,827	4,686	4,735	4,741	4,198	742.6	716.8	721.7	717.0	634.9
Memphis, TN-MS-AR	7,758	7,238	7,324	8,164	8,657	1,109.2	1,033.5	1,046.4	1,161.4	1,231.6
Miami-Fort Lauderdale-West Palm Beach, FL	16,473	17,461	17,881	18,277	18,770	539.6	563.6	572.6	577.3	592.8
Milwaukee-Waukesha-West Allis, WI	7,183	7,242	8,013	8,155	8,181	890.0	895.8	994.2	1,009.8	1,013.0
Minneapolis-St. Paul-Bloomington, MN-WI	8,957†	9,497†	9,958	10,694	10,265	507.0†	533.5†	555.8	589.0	565.4
Nashville-Davidson-Murfreesboro-Franklin, TN	5,278	5,322	5,374	5,846	6,487	574.5	567.4	562.0	600.6	666.4
New Orleans-Metairie, LA	6,301	6,710	6,843	6,665	6,953	975.3	1,028.6	1,044.5	1,010.1	1,053.7
New York-Newark-Jersey City, NY-NJ-PA	62,097	62,905	65,594	68,082	68,215	598.4	603.9	630.7	649.2	650.5
Oklahoma City, OK	5,255	5,420	5,308	5,669	5,786	775.0	786.4	762.5	808.7	825.4
Orlando-Kissimmee-Sanford, FL	8,021	8,505	8,593	9,252	9,778	675.8	696.6	688.5	721.2	762.2
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	22,317	22,967	24,813	24,713	24,445	713.7	732.2	791.6	784.9	776.4
Phoenix-Mesa-Scottsdale, AZ	14,841	14,607	15,621	17,504	18,009	656.9	634.3	665.8	734.9	756.1
Pittsburgh, PA	5,509	5,681	5,551	4,923	5,443	454.6	469.9	461.8	411.2	454.6
Portland-Vancouver-Hillsboro, OR-WA	6,158	6,559	7,076	7,178	7,388	518.4	542.7	577.2	579.2	596.2
Providence-Warwick, RI-MA	3,945†	3,989†	4,501†	4,622†	4,980	475.6†	479.9†	541.6†	554.1†	597.1
Raleigh, NC	3,502	4,685	4,244	4,721	5,017	550.1	718.3	634.9	690.4	733.7
Richmond, VA	5,311	5,330	5,725	5,653	5,780	815.9	811.1	863.5	844.8	863.8
Riverside-San Bernardino-Ontario, CA	13,988	14,693	13,893	16,830	17,013	626.6	651.4	610.5	731.6	739.6
Sacramento-Roseville-Arden-Arcade, CA	6,686	7,284	7,282	8,123	9,184	583.6	627.3	620.5	683.9	773.3
Salt Lake City, UT	2,873	3,067	3,275	3,520	3,426	500.3	526.4	554.6	587.7	572.1
San Antonio-New Braunfels, TX	8,158	10,005	10,466	9,924	8,140	690.9	828.4	850.9	793.4	650.8
San Diego-Carlsbad, CA	10,211	11,154	11,690	12,791	13,410	628.9	680.1	708.7	771.1	808.5
San Francisco-Oakland-Hayward, CA	11,509	12,508	12,900	13,965	14,362	494.3	530.5	544.7	584.3	600.9
San Jose-Sunnyvale-Santa Clara, CA	4,100	4,328	4,445	4,754	5,171	422.3	440.8	453.4	480.8	522.9
Seattle-Tacoma-Bellevue, WA	8,751	9,306	10,085	10,454	10,535	476.5	498.4	530.8	541.1	545.3
St. Louis, MO-IL	10,271	10,158	10,417	11,016	11,421	709.9	701.1	720.8	762.1	790.1
Tampa-St. Petersburg-Clearwater, FL	9,066	9,269	9,360	9,743	10,288	602.5	603.7	598.4	611.6	645.8
Virginia Beach-Norfolk-Newport News, VA-NC	8,425	7,677	8,791	8,873	9,140	966.9	877.4	1,002.4	1,012.3	1,042.7
Washington-Arlington-Alexandria, DC-VA-MD-WV	12,501	12,517	13,635	20,072	20,831	405.0	401.3	434.6	631.7	655.6
SELECTED MSAs TOTAL	**559,361**	**577,004**	**601,837**	**639,087**	**647,342**	**626.7**	**639.8**	**663.0**	**697.0**	**706.0**

* MSAs were selected on the basis of the largest population in the 2010 US 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 Section A1.4 in the Appendix for more information.

‡ 2016 county data for Alabama have been corrected and may not match previous reports.

NOTE: Cases reported with unknown sex are not included in this table. County was misclassified in the 2017 District of Columbia STD morbidity data resulting in inaccurate county-level case counts and rates.

Table 8. Chlamydia Among Males — Reported Cases and Rates of Reported Cases in Selected Metropolitan Statistical Areas (MSAs)* in Alphabetical Order, United States, 2014–2018

MSAs	Cases					Rates per 100,000 Population				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Atlanta-Sandy Springs-Roswell, GA	7,979	6,429†	11,000	11,888	11,533†	293.2	232.6†	392.9	417.9	405.4†
Austin-Round Rock, TX	3,372	3,871	4,444	4,775	4,964	346.8	386.8	431.9	450.2	468.0
Baltimore-Columbia-Towson, MD	4,294	4,514	5,446	5,755	6,297	319.6	334.6	403.7	425.0	465.0
Birmingham-Hoover, AL	1,990	1,886	1,573‡	2,377	2,231	361.6	342.4	284.9‡	429.9	403.5
Boston-Cambridge-Newton, MA-NH	4,988†	5,211†	5,861†	6,887†	8,165	217.2†	224.8†	251.7†	292.9†	347.3
Buffalo-Cheektowaga-Niagara Falls, NY	1,764	1,865	2,110	2,201	2,210	320.3	338.8	384.0	399.4	401.1
Charlotte-Concord-Gastonia, NC-SC	3,125	4,607	4,278	5,085	5,631	270.4	391.0	356.7	415.1	459.7
Chicago-Naperville-Elgin, IL-IN-WI	15,679	17,517	19,320	21,071	22,204	335.7	374.9	414.8	451.3	475.6
Cincinnati, OH-KY-IN	2,787	3,168	3,333	3,352	3,467	264.9	299.9	314.1	313.8	324.6
Cleveland-Elyria, OH	3,449	3,497	3,874	4,606	4,673	346.5	351.8	390.3	463.2	469.9
Columbus, OH	3,363	3,623	4,086	4,057	4,390	342.8	364.2	406.7	396.6	429.1
Dallas-Fort Worth-Arlington, TX	8,313	9,941	10,006	11,342	11,936	243.0	284.7	281.4	311.5	327.8
Denver-Aurora-Lakewood, CO	4,326	4,677	4,922	5,868	6,414	315.2	333.3	345.8	406.4	444.3
Detroit-Warren-Dearborn, MI	6,153	6,795	6,992	8,048	8,246	295.0	325.2	334.6	383.4	392.8
Hartford-West Hartford-East Hartford, CT	1,333	1,443	1,541	1,982†	1,987†	225.1	244.2	261.5	335.5†	336.3†
Houston-The Woodlands-Sugar Land, TX	7,700	8,939	10,004	10,434	11,106	238.6	270.2	297.4	304.8	324.4
Indianapolis-Carmel-Anderson, IN	3,544	3,723	4,185	4,604	4,593	368.0	383.0	427.3	464.3	463.2
Jacksonville, FL	2,138	2,367	2,672	2,854	2,974	309.4	335.1	371.1	389.0	405.4
Kansas City, MO-KS	2,875	3,132	3,499	3,921	4,398	283.1	305.6	338.8	375.1	420.7
Las Vegas-Henderson-Paradise, NV	2,986	3,139	3,646	4,228	5,038	288.3	297.1	339.1	384.5	458.2
Los Angeles-Long Beach-Anaheim, CA	23,766	25,764	28,299	31,501	33,493	363.6	391.8	431.4	478.4	508.7
Louisville-Jefferson County, KY-IN	1,896	2,031	2,131	2,323	2,073	305.9	325.1	339.7	367.2	327.6
Memphis, TN-MS-AR	2,795	3,104	3,035	3,546	3,897	434.1	482.2	472.1	549.5	603.9
Miami-Fort Lauderdale-West Palm Beach, FL	8,086	9,270	10,172	11,141	11,965	281.1	318.1	345.6	372.3	399.8
Milwaukee-Waukesha-West Allis, WI	3,111	3,394	3,860	4,021	4,248	406.6	442.3	503.6	523.1	552.7
Minneapolis-St. Paul-Bloomington, MN-WI	4,623†	5,206†	5,614	6,192	6,335	267.5†	298.4†	319.1	346.9	354.9
Nashville-Davidson-Murfreesboro-Franklin, TN	2,598	2,744	2,822	3,081	3,565	297.3	307.5	310.4	331.4	383.5
New Orleans-Metairie, LA	2,294	2,581	2,783	3,185	3,605	378.7	422.7	453.4	517.1	585.3
New York-Newark-Jersey City, NY-NJ-PA	31,310	34,799	39,725	44,597	47,384	322.3	356.3	407.3	453.5	481.8
Oklahoma City, OK	2,036	2,213	2,385	2,529	2,663	309.1	330.7	352.3	370.4	390.0
Orlando-Kissimmee-Sanford, FL	2,964	3,511	3,896	4,616	4,992	261.2	301.0	326.5	376.2	406.9
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	11,010	11,912	13,315	13,889	14,401	376.5	406.1	453.5	471.2	488.6
Phoenix-Mesa-Scottsdale, AZ	6,735	7,173	7,944	9,354	10,133	302.0	315.7	343.1	397.1	430.2
Pittsburgh, PA	2,541	2,909	3,062	2,876	3,172	222.1	254.3	268.5	253.2	279.2
Portland-Vancouver-Hillsboro, OR-WA	3,124	3,416	3,970	4,271	4,426	269.2	289.3	331.1	351.8	364.6
Providence-Warwick, RI-MA	1,744†	1,913†	2,163†	2,350†	2,547	223.6†	244.7†	276.0†	298.6†	323.6
Raleigh, NC	1,622	2,226	2,248	2,522	2,693	267.5	358.3	354.3	387.2	413.5
Richmond, VA	2,503	2,540	2,827	2,797	2,992	410.9	413.5	456.9	447.5	478.7
Riverside-San Bernardino-Ontario, CA	5,542	6,070	6,141	7,415	7,730	250.8	271.8	272.7	325.2	339.0
Sacramento-Roseville-Arden-Arcade, CA	2,976	3,322	3,580	4,255	4,838	270.9	298.5	318.9	374.2	425.4
Salt Lake City, UT	1,550	1,684	1,989	1,991	2,046	267.7	286.6	333.9	329.5	338.6
San Antonio-New Braunfels, TX	3,412	4,459	4,683	4,652	4,030	297.2	379.1	390.4	380.3	329.5
San Diego-Carlsbad, CA	5,508	6,190	7,195	8,017	8,475	335.9	373.0	431.3	477.5	504.8
San Francisco-Oakland-Hayward, CA	8,823	10,961	11,936	13,788	14,790	389.4	476.9	516.5	589.9	632.8
San Jose-Sunnyvale-Santa Clara, CA	2,163	2,565	2,717	3,109	3,373	220.3	257.8	272.1	307.9	334.1
Seattle-Tacoma-Bellevue, WA	5,110	5,951	6,799	7,375	8,200	278.5	318.8	358.0	381.1	423.7
St. Louis, MO-IL	4,429	4,762	5,091	5,450	5,801	325.8	349.4	373.9	400.2	425.9
Tampa-St. Petersburg-Clearwater, FL	3,835	4,195	4,632	4,768	5,166	271.8	291.3	315.5	318.2	344.8
Virginia Beach-Norfolk-Newport News, VA-NC	3,748	3,595	4,406	4,593	4,959	443.4	423.0	518.4	541.2	584.3
Washington-Arlington-Alexandria, DC-VA-MD-WV	5,813	6,359	7,595	12,856	13,275	197.2	213.5	253.6	423.0	436.8
SELECTED MSAs TOTAL	**259,825**	**287,163**	**319,807**	**358,395**	**379,724**	**303.4**	**331.8**	**367.0**	**406.7**	**430.9**

* MSAs were selected on the basis of the largest population in the 2010 US 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 Section A1.4 in the Appendix for more information.

‡ 2016 county data for Alabama have been corrected and may not match previous reports.

NOTE: Cases reported with unknown sex are not included in this table. County was misclassified in the 2017 District of Columbia STD morbidity data resulting in inaccurate county-level case counts and rates.

Table 9. Chlamydia — Reported Cases and Rates of Reported Cases in Counties and Independent Cities* Ranked by Number of Reported Cases, United States, 2018

Rank*	County/Independent City	Cases	Rate per 100,000 Population	Cumulative Percentage
1	Los Angeles County, CA	67,878	667.9	4
2	Cook County, IL	43,271	830.3	6
3	Harris County, TX	27,415	589.2	8
4	Maricopa County, AZ	26,464	614.4	9
5	San Diego County, CA	21,912	656.5	11
6	Kings County, NY	21,656	817.6	12
7	Philadelphia County, PA	20,206	1,278.2	13
8	Dallas County, TX	18,088	690.9	14
9	Bronx County, NY	17,689	1,202.4	15
10	New York County, NY	17,218	1,034.3	16
11	Wayne County, MI	15,114	861.9	17
12	Orange County, CA	14,265	447.1	18
13	Queens County, NY	14,059	596.1	18
14	Clark County, NV	13,695	621.3	19
15	Miami-Dade County, FL	13,395	486.8	20
16	San Bernardino County, CA	13,333	618.0	21
17	Sacramento County, CA	11,457	748.5	21
18	Riverside County, CA	11,453	472.6	22
19	Broward County, FL	11,322	584.9	23
20	Milwaukee County, WI	11,195	1,175.8	23
21	Cuyahoga County, OH	11,025	883.0	24
22	Bexar County, TX	10,544	538.3	25
23	Marion County, IN	10,408	1,095.5	25
24	King County, WA	10,233	467.5	26
25	Franklin County, OH	10,161	786.5	26
26	Orange County, FL	9,885	732.8	27
27	Shelby County, TN	9,724	1,037.8	27
28	Alameda County, CA	9,701	583.3	28
29	Tarrant County, TX	9,575	466.1	29
30	San Francisco County, CA	9,491	1,073.2	29
31	Mecklenburg County, NC	9,182	852.7	30
32	Washington, D.C.	9,014	1,298.9	30
33	Travis County, TX	8,992	733.0	31
34	Hillsborough County, FL	8,782	623.5	31
35	Fulton County, GA	8,376	804.3	32
36	Santa Clara County, CA	8,315	429.0	32
37	Baltimore (City), MD	8,013	1,310.1	33
38	Prince George's County, MD	8,013	877.9	33
39	Hennepin County, MN	7,866	628.3	33
40	Denver County, CO	7,466	1,059.6	34
41	Fresno County, CA	7,129	720.6	34
42	Duval County, FL	7,112	758.3	35
43	Hamilton County, OH	6,954	854.5	35
44	Kern County, CA	6,948	777.9	35
45	Suffolk County, MA	6,934	869.0	36
46	Pima County, AZ	6,688	653.9	36
47	Wake County, NC	6,482	604.5	37
48	Essex County, NJ	6,479	801.6	37
49	St. Louis County, MO	6,450	647.1	37
50	Jackson County, MO	6,437	921.0	38
51	Contra Costa County, CA	6,189	539.4	38
52	Palm Beach County, FL	6,025	409.5	38
53	Pierce County, WA	5,848	667.0	39
54	Oklahoma County, OK	5,820	738.6	39
55	DeKalb County, GA	5,792	768.9	39
56	Honolulu County, HI	5,721	578.7	40
57	El Paso County, TX	5,700	678.2	40
58	Allegheny County, PA	5,660	462.8	40
59	Multnomah County, OR	5,501	681.2	41
60	Erie County, NY	5,449	588.7	41
61	Middlesex County, MA	5,411	337.6	41
62	Davidson County, TN	5,372	777.2	42
63	Monroe County, NY	5,347	715.2	42
64	Salt Lake County, UT	5,286	465.5	42
65	Guilford County, NC	5,140	975.4	43
66	Suffolk County, NY	5,127	343.4	43
67	Jefferson County, AL	5,121	776.9	43
68	Bernalillo County, NM	5,050	746.2	43
69	Orleans Parish, LA	4,974	1,264.7	44
70	Hartford County, CT	4,858	542.6	44

* The top 70 counties and independent cities ranked in descending order by number of cases reported in 2018 then by rate are displayed.
NOTE: Relative rankings of counties may be impacted by completeness of the variable used to identify county. In 2018, the variable used to identify county was complete for ≤95% of cases in Connecticut, Georgia, Hawaii, and South Dakota. See Section A1.4 in the Appendix for more information.

Table 10. Chlamydia — Reported Cases and Rates of Reported Cases by Age Group and Sex, United States, 2014–2018

	Age Group	Cases				Rates per 100,000 Population*		
		Total	Male	Female	Unknown Sex	Total	Male	Female
2014	0–4	603	200	388	15	3.0	2.0	4.0
	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**
2015	0–4	518	196	322	0	2.6	1.9	3.3
	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**
2016	0–4	597	225	368	4	3.0	2.2	3.8
	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	91.2
	15–19	407,230	89,899	316,639	692	1,927.3	832.3	3,065.8
	20–24	601,173	181,857	418,388	928	2,686.1	1,582.6	3,842.0
	25–29	298,176	114,484	183,222	470	1,302.6	984.3	1,627.3
	30–34	133,062	58,583	74,226	253	610.8	534.1	686.1
	35–39	66,669	31,671	34,872	126	320.9	305.2	335.4
	40–44	32,548	16,784	15,705	59	165.2	171.7	158.3
	45–54	32,316	19,569	12,683	64	75.5	92.7	58.5
	55–64	9,321	5,942	3,354	25	22.5	29.7	15.6
	65+	1,772	1,161	597	14	3.6	5.3	2.2
	Unknown Age	4,731	1,329	3,298	104			
	TOTAL	**1,598,354**	**522,870**	**1,072,719**	**2,765**	**494.7**	**328.7**	**653.9**
2017	0–4	514	188	323	3	2.6	1.8	3.3
	5–9	167	9	158	0	0.8	0.1	1.6
	10–14	10,726	1,252	9,454	20	51.6	11.8	92.9
	15–19	437,904	99,864	337,290	750	2,072.3	924.6	3,264.8
	20–24	631,207	195,971	434,050	1,186	2,853.7	1,726.7	4,030.4
	25–29	321,857	127,007	194,267	583	1,377.2	1,067.1	1,694.0
	30–34	144,451	65,690	78,502	259	657.4	592.4	721.3
	35–39	74,202	36,427	37,621	154	349.5	343.1	354.4
	40–44	36,332	19,310	16,940	82	185.0	198.0	171.3
	45–54	36,229	22,431	13,713	85	85.5	107.3	63.9
	55–64	11,356	7,490	3,840	26	27.0	37.0	17.7
	65+	2,178	1,461	698	19	4.3	6.5	2.5
	Unknown Age	1,446	544	795	107			
	TOTAL	**1,708,569**	**577,644**	**1,127,651**	**3,274**	**524.6**	**360.1**	**682.1**
2018	0–4	496	186	300	10	2.5	1.8	3.1
	5–9	144	19	125	0	0.7	0.2	1.3
	10–14	10,905	1,438	9,450	17	52.5	13.6	92.9
	15–19	446,008	103,582	341,635	791	2,110.6	959.0	3,306.8
	20–24	641,269	202,528	437,732	1,009	2,899.2	1,784.5	4,064.6
	25–29	333,561	135,059	197,966	536	1,427.3	1,134.7	1,726.2
	30–34	154,132	72,222	81,645	265	701.5	651.3	750.2
	35–39	78,094	39,320	38,635	139	367.8	370.4	363.9
	40–44	38,657	21,111	17,462	84	196.8	216.5	176.6
	45–54	38,323	24,067	14,173	83	90.4	115.1	66.0
	55–64	12,536	8,474	4,029	33	29.9	41.8	18.5
	65+	2,331	1,676	640	15	4.6	7.4	2.3
	Unknown Age	2,212	765	1,271	176			
	TOTAL	**1,758,668**	**610,447**	**1,145,063**	**3,158**	**539.9**	**380.6**	**692.7**

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

NOTE: Cases in the 0–4 age group may include cases due to perinatal transmission.

Table 11A. Chlamydia — Reported Cases by Race/Hispanic Ethnicity, Age Group, and Sex, United States, 2018

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	5	3	2	3	0	3	101	44	57	2	0	2
5–9	4	0	4	1	0	1	41	5	36	0	0	0
10–14	159	14	145	41	3	38	4,111	678	3,433	13	0	13
15–19	4,416	868	3,539	3,530	532	2,996	139,846	40,167	99,598	839	126	710
20–24	5,889	1,388	4,493	8,338	2,362	5,967	175,267	63,118	112,044	1,484	358	1,126
25–29	3,921	1,092	2,824	5,201	2,380	2,814	92,982	40,198	52,725	874	255	618
30–34	2,247	713	1,528	3,039	1,538	1,495	37,778	19,462	18,295	435	150	285
35–39	1,223	408	813	1,727	840	885	17,124	9,765	7,340	216	94	122
40–44	514	166	347	976	539	437	7,607	4,839	2,761	92	51	41
45–54	358	137	221	1,029	581	448	6,960	4,845	2,110	59	30	29
55–64	102	49	53	320	177	142	2,368	1,589	778	19	8	11
65+	17	7	10	73	51	22	352	255	97	5	1	4
Unknown Age	6	3	2	34	9	25	248	120	115	4	1	3
TOTAL	**18,861**	**4,848**	**13,981**	**24,312**	**9,012**	**15,273**	**484,785**	**185,085**	**299,389**	**4,042**	**1,074**	**2,964**

Age Group	Whites			Multirace			Hispanics			Other/ Unknown		
	Total*	Male	Female	Total*	Male	Female	Total*	Male	Female	Total*	Male	Female
0–4	98	37	61	1	1	0	56	28	28	230	73	147
5–9	20	2	18	2	0	2	20	1	19	56	11	45
10–14	1,830	131	1,699	116	5	111	1,462	182	1,280	3,173	425	2,731
15–19	100,212	16,921	83,231	3,538	627	2,910	55,594	11,069	44,475	138,033	33,272	104,176
20–24	156,960	44,878	111,981	4,489	1,201	3,287	81,588	22,447	59,078	207,254	66,776	139,756
25–29	77,681	30,430	47,199	2,284	1,009	1,272	45,337	17,032	28,249	105,281	42,663	62,265
30–34	37,837	17,630	20,180	1,129	676	453	22,479	9,893	12,565	49,188	22,160	26,844
35–39	19,425	9,947	9,464	557	388	167	12,083	5,654	6,417	25,739	12,224	13,427
40–44	9,522	5,400	4,113	296	221	75	6,139	3,087	3,040	13,511	6,808	6,648
45–54	10,623	7,546	3,071	316	286	30	5,151	3,022	2,115	13,827	7,620	6,149
55–64	3,929	3,145	779	89	78	11	1,143	693	448	4,566	2,735	1,807
65+	733	596	137	8	7	1	151	104	47	992	655	322
Unknown Age	757	254	495	3	3	0	195	65	129	965	310	502
TOTAL	**419,627**	**136,917**	**282,428**	**12,828**	**4,502**	**8,319**	**231,398**	**73,277**	**157,890**	**562,815**	**195,732**	**364,819**

* Total includes cases reported with unknown sex.

NOTE: These tables should be used only for race/Hispanic 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* by Race/Hispanic Ethnicity, Age Group, and Sex, United States, 2018

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	3.0	3.6	2.5	0.3	0.0	0.6	3.7	3.2	4.2	4.9	0.0	10.0
5–9	2.3	0.0	4.7	0.1	0.0	0.2	1.5	0.4	2.6	0.0	0.0	0.0
10–14	90.0	15.6	166.4	3.9	0.6	7.3	146.0	47.5	246.9	31.5	0.0	63.6
15–19	2,445.7	945.2	3,988.2	327.9	98.3	559.5	4,714.8	2,668.6	6,817.3	2,061.6	603.8	3,580.8
20–24	3,131.2	1,447.2	4,875.1	646.1	361.7	935.8	5,454.9	3,867.1	7,087.7	3,375.6	1,596.6	5,227.5
25–29	1,992.9	1,086.0	2,935.5	328.7	305.8	349.9	2,740.6	2,371.7	3,105.5	1,686.0	948.4	2,476.8
30–34	1,341.2	848.9	1,828.9	190.7	201.3	180.2	1,325.6	1,406.1	1,248.1	866.4	583.9	1,162.6
35–39	797.8	535.3	1,054.8	114.4	119.1	110.0	628.1	753.0	513.6	473.6	402.2	548.6
40–44	366.2	240.2	486.9	67.9	80.4	56.9	306.3	414.3	209.8	237.7	259.1	215.6
45–54	119.5	94.0	143.6	40.4	49.0	32.9	132.6	196.8	75.7	82.8	85.4	80.4
55–64	35.2	36.0	34.4	15.7	19.2	12.7	49.1	72.1	29.7	32.1	27.7	36.3
65+	6.2	5.7	6.7	3.2	5.2	1.7	7.7	13.8	3.5	9.5	4.0	14.2
Unknown Age												
TOTAL	**784.8**	**409.6**	**1,146.3**	**132.1**	**102.9**	**158.4**	**1,192.5**	**952.3**	**1,411.1**	**700.8**	**370.4**	**1,033.5**

Age Group	Whites			Multirace			Hispanics		
	Total†	Male	Female	Total†	Male	Female	Total†	Male	Female
0–4	1.0	0.7	1.3	0.1	0.2	0.0	1.1	1.1	1.1
5–9	0.2	0.0	0.4	0.2	0.0	0.4	0.4	0.0	0.7
10–14	17.1	2.4	32.6	14.0	1.2	27.3	28.3	6.9	50.5
15–19	890.7	293.0	1,520.1	492.5	172.2	821.3	1,134.9	442.3	1,856.0
20–24	1,317.8	732.6	1,935.8	705.8	373.7	1,044.8	1,687.1	898.5	2,527.0
25–29	605.6	465.8	749.8	434.2	392.4	473.1	946.0	678.2	1,238.3
30–34	305.7	281.6	329.9	278.2	351.2	212.3	496.4	416.0	584.5
35–39	161.5	164.1	158.6	157.8	233.7	89.3	273.5	247.2	301.2
40–44	85.0	95.9	73.8	102.8	163.2	49.2	151.4	149.8	152.4
45–54	39.6	56.5	22.8	62.7	120.4	11.3	74.7	86.9	61.9
55–64	13.2	21.7	5.1	21.3	39.3	5.0	24.3	30.4	18.5
65+	1.9	3.4	0.6	2.1	4.1	0.5	3.6	5.7	2.0
Unknown Age									
TOTAL	**212.1**	**140.4**	**281.7**	**184.9**	**131.6**	**236.6**	**392.6**	**246.1**	**541.3**

* Per 100,000.

† Total includes cases reported with unknown sex.

NOTE: These tables should be used only for race/Hispanic 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 other/unknown race; therefore rates are not calculated.

Table 12A. Chlamydia — Reported Cases and Rates of Reported Cases Among Females Aged 15–24 Years by Age, United States, 2014–2018

	Cases					Rates per 100,000 Females				
Ages	**2014**	**2015**	**2016**	**2017**	**2018**	**2014**	**2015**	**2016**	**2017**	**2018**
15	20,096	19,643	19,704	20,247	19,518	987.4	945.9	958.9	1,004.4	968.3
16	38,507	37,786	39,066	40,681	40,001	1,891.0	1,847.7	1,874.5	1,968.3	1,935.4
17	58,940	60,149	61,406	65,496	66,329	2,880.9	2,935.4	2,988.7	3,120.8	3,160.5
18	87,040	89,481	93,174	98,907	101,783	4,224.2	4,339.6	4,521.3	4,774.1	4,912.9
19	98,711	100,878	103,289	111,959	114,004	4,688.0	4,854.1	4,980.6	5,387.4	5,485.8
20	98,480	99,861	100,524	107,397	110,939	4,581.9	4,703.6	4,812.4	5,140.2	5,309.8
21	94,204	95,927	96,723	100,160	102,127	4,323.2	4,427.2	4,532.8	4,759.7	4,853.2
22	82,581	84,740	84,813	86,678	86,274	3,679.3	3,855.7	3,892.5	4,030.4	4,011.6
23	71,535	73,686	73,054	75,046	73,729	3,112.0	3,254.1	3,304.7	3,416.6	3,356.6
24	59,076	62,558	63,274	64,769	64,663	2,567.1	2,697.2	2,777.9	2,906.1	2,901.4
Total	**709,170**	**724,709**	**735,027**	**771,340**	**779,367**	**3,305.2**	**3,389.3**	**3,464.1**	**3,655.5**	**3,693.6**

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

Table 12B. Chlamydia — Reported Cases and Rates of Reported Cases Among Males Aged 15–24 Years by Age, United States, 2014–2018

	Cases					Rates per 100,000 Males				
Ages	**2014**	**2015**	**2016**	**2017**	**2018**	**2014**	**2015**	**2016**	**2017**	**2018**
15	3,921	3,773	4,074	4,144	4,088	184.2	173.6	190.2	197.4	194.8
16	8,813	9,286	9,997	10,782	10,573	413.6	434.1	458.3	500.1	490.4
17	15,276	16,244	17,690	19,665	19,972	714.2	757.2	822.6	894.7	908.7
18	21,737	23,232	25,214	28,502	30,184	1,004.0	1,077.5	1,168.1	1,313.8	1,391.3
19	28,161	30,240	32,924	36,771	38,765	1,268.1	1,384.4	1,517.5	1,688.0	1,779.5
20	32,581	34,896	37,391	41,038	43,337	1,435.6	1,557.6	1,701.6	1,876.1	1,981.2
21	34,115	36,611	38,743	42,212	43,800	1,476.4	1,598.7	1,719.6	1,906.6	1,978.3
22	33,793	35,981	37,628	40,515	41,619	1,427.2	1,543.1	1,634.5	1,784.7	1,833.3
23	31,260	33,768	35,462	37,373	38,096	1,302.6	1,414.2	1,514.0	1,611.7	1,642.9
24	28,055	31,057	32,633	34,833	35,676	1,173.2	1,284.4	1,361.8	1,476.7	1,512.4
Total	**237,712**	**255,088**	**271,756**	**295,835**	**306,110**	**1,055.4**	**1,135.5**	**1,219.0**	**1,335.6**	**1,382.0**

NOTE: 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, 2018

Rank*	State	Cases	Rate per 100,000 Population
1	Mississippi	9,749	326.7
2	Alaska	2,247	303.7
3	South Carolina	13,801	274.7
4	Alabama	12,742	261.4
5	Louisiana	12,043	257.1
6	New Mexico	5,268	252.3
7	Missouri	15,090	246.8
8	Arkansas	7,300	243.0
9	North Carolina	23,725	230.9
10	Oklahoma	8,998	228.9
11	Tennessee	14,627	217.8
12	Nevada	6,475	216.0
13	Ohio	25,146	215.7
14	California	79,192	200.3
15	Georgia	20,867	200.1
16	Illinois	25,422	198.6
17	South Dakota	1,689	194.2
18	New York	37,262	187.7
19	Arizona	12,870	183.4
20	Indiana	12,193	182.9
21	North Dakota	1,369	181.2
22	Kansas	5,256	180.4
	US TOTAL†	**583,405**	**179.1**
23	Delaware	1,691	175.8
24	Maryland	10,305	170.3
25	Kentucky	7,470	167.7
26	Michigan	16,688	167.5
27	Texas	47,231	166.9
28	Colorado	8,894	158.6
29	Florida	32,644	155.6
30	Iowa	4,839	153.8
31	Washington	11,207	151.3
32	Oregon	5,913	142.7
33	Nebraska	2,696	140.4
34	Virginia	11,776	139.0
35	Connecticut	4,959	138.2
36	Wisconsin	7,882	136.0
37	Minnesota	7,542	135.2
38	Rhode Island	1,336	126.1
39	Pennsylvania	15,887	124.1
40	Massachusetts	8,076	117.7
41	Montana	1,181	112.4
42	Hawaii	1,495	104.7
43	New Jersey	9,067	100.7
44	Utah	2,895	93.3
45	Idaho	1,134	66.0
46	West Virginia	1,143	62.9
47	Wyoming	311	53.7
48	Maine	710	53.1
49	New Hampshire	594	44.2
50	Vermont	268	43.0

* 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 4,240 cases and a rate of 611.0 cases per 100,000 population, but excludes territories.

Table 14. Gonorrhea — Reported Cases and Rates of Reported Cases by State/Territory and Region in Alphabetical Order, United States, 2014–2018

State/Territory	Cases					Rates per 100,000 Population				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Alabama	7,677	7,196	8,408	11,948	12,742	158.3	148.1	172.9	245.1	261.4
Alaska	1,341	1,113	1,454	2,189	2,247	182.0	150.7	196.0	295.9	303.7
Arizona	7,750	8,245	10,330	12,502	12,870	115.1	120.8	149.0	178.2	183.4
Arkansas	4,539	4,780	5,732	6,710	7,300	153.0	160.5	191.8	223.3	243.0
California	45,408	54,135	64,551	75,348	79,192	117.0	138.3	164.5	190.6	200.3
Colorado	3,170	4,387	5,975	8,478	8,894	59.2	80.4	107.8	151.2	158.6
Connecticut	2,333	2,088	2,731	3,913	4,959	64.9	58.1	76.4	109.1	138.2
Delaware	1,279	1,310	1,702	1,784	1,691	136.7	138.5	178.8	185.5	175.8
District of Columbia	1,883	2,742	3,226	4,563	4,240	285.8	407.9	473.6	657.5	611.0
Florida	20,944	24,125	28,162	31,683	32,644	105.3	119.0	136.6	151.0	155.6
Georgia	13,770	15,982	20,553	22,667	20,867	136.4	156.5	199.3	217.3	200.1
Hawaii	1,020	1,239	1,467	1,358	1,495	71.9	86.5	102.7	95.1	104.7
Idaho	443	472	635	987	1,134	27.1	28.5	37.7	57.5	66.0
Illinois	15,970	17,130	21,199	23,859	25,422	124.0	133.2	165.6	186.4	198.6
Indiana	7,289	7,843	9,451	11,835	12,193	110.5	118.5	142.5	177.5	182.9
Iowa	1,641	2,247	2,600	3,758	4,839	52.8	71.9	82.9	119.5	153.8
Kansas	2,568	2,536	3,353	4,545	5,256	88.4	87.1	115.3	156.0	180.4
Kentucky	4,353	4,678	5,812	7,417	7,470	98.6	105.7	131.0	166.5	167.7
Louisiana	9,002	10,282	10,782	12,017	12,043	193.6	220.1	230.3	256.5	257.1
Maine	237	417	451	620	710	17.8	31.4	33.9	46.4	53.1
Maryland	6,108	6,858	9,523	10,978	10,305	102.2	114.2	158.3	181.4	170.3
Massachusetts	3,817	3,817	4,980	7,737	8,076	56.6	56.2	73.1	112.8	117.7
Michigan	9,688	10,330	12,450	15,742	16,688	97.8	104.1	125.4	158.0	167.5
Minnesota	4,073	4,097	5,104	6,519	7,542	74.6	74.6	92.5	116.9	135.2
Mississippi	5,625	5,775	7,157	9,258	9,749	187.9	193.0	239.5	310.2	326.7
Missouri	7,387	8,942	11,479	13,086	15,090	121.8	147.0	188.4	214.0	246.8
Montana	434	844	867	782	1,181	42.4	81.7	83.2	74.4	112.4
Nebraska	1,459	1,703	2,156	2,653	2,696	77.5	89.8	113.1	138.2	140.4
Nevada	3,188	3,630	4,380	5,520	6,475	112.3	125.6	149.0	184.1	216.0
New Hampshire	226	245	456	513	594	17.0	18.4	34.2	38.2	44.2
New Jersey	6,636	7,228	8,162	9,439	9,067	74.2	80.7	91.3	104.8	100.7
New Mexico	2,246	2,489	3,516	4,489	5,268	107.7	119.4	169.0	215.0	252.3
New York	20,758	25,561	29,000	34,099	37,262	105.1	129.1	146.9	171.8	187.7
North Carolina	14,415	19,809	19,687	22,871	23,725	145.0	197.2	194.0	222.6	230.9
North Dakota	694	684	1,000	966	1,369	93.8	90.4	131.9	127.9	181.2
Ohio	16,237	16,564	20,487	23,967	25,146	140.0	142.6	176.4	205.6	215.7
Oklahoma	6,137	6,542	7,574	9,081	8,998	158.2	167.3	193.0	231.0	228.9
Oregon	2,320	3,232	4,353	5,022	5,913	58.4	80.2	106.3	121.2	142.7
Pennsylvania	12,710	12,791	14,603	15,244	15,887	99.4	99.9	114.2	119.0	124.1
Rhode Island	590	580	716	1,087	1,336	55.9	54.9	67.8	102.6	126.1
South Carolina	8,253	8,206	9,194	12,623	13,801	170.8	167.6	185.3	251.2	274.7
South Dakota	892	1,048	1,269	1,290	1,689	104.6	122.1	146.6	148.3	194.2
Tennessee	7,199	8,386	10,179	12,426	14,627	109.9	127.1	153.0	185.0	217.8
Texas	35,322	39,717	42,472	47,409	47,231	131.0	144.6	152.4	167.5	166.9
Utah	1,441	1,562	2,100	2,543	2,895	49.0	52.1	68.8	82.0	93.3
Vermont	84	155	126	203	268	13.4	24.8	20.2	32.5	43.0
Virginia	8,250	8,099	11,084	12,596	11,776	99.1	96.6	131.8	148.7	139.0
Washington	6,221	7,171	8,174	9,915	11,207	88.1	100.0	112.2	133.9	151.3
West Virginia	841	769	919	1,296	1,143	45.5	41.7	50.2	71.4	62.9
Wisconsin	4,078	5,260	6,498	7,661	7,882	70.8	91.1	112.4	132.2	136.0
Wyoming	116	175	275	412	311	19.9	29.9	47.0	71.1	53.7
US TOTAL	**350,062**	**395,216**	**468,514**	**555,608**	**583,405**	**109.8**	**123.0**	**145.0**	**170.6**	**179.1**
Northeast	47,391	52,882	61,225	72,855	78,159	84.4	94.0	108.9	129.0	138.4
Midwest	71,976	78,384	97,046	115,881	125,812	106.2	115.4	142.8	170.0	184.5
South	155,597	175,256	202,166	237,327	240,352	129.9	144.6	165.3	191.9	194.4
West	75,098	88,694	108,077	129,545	139,082	99.9	116.6	141.0	167.3	179.7
American Samoa	NR	NR	NR	NR	13	—	—	—	—	25.2
Guam	99	147	133	202	261	61.5	90.9	79.7	120.7	156.0
Northern Mariana Islands	NR	NR	NR	NR	34	—	—	—	—	65.1
Puerto Rico	454	620	744	588	557	12.8	17.8	21.8	17.5	16.6
Virgin Islands	84	52	35	15	NR	80.6	50.5	32.5	14.0	—
TERRITORIES	**637**	**819**	**912**	**805**	**865**	**16.7**	**21.9**	**24.7**	**22.2**	**23.9**
TOTAL	**350,699**	**396,035**	**469,426**	**556,413**	**584,270**	**108.7**	**121.8**	**143.6**	**168.9**	**177.4**

NR = No report.

NOTE: See Section A1.11 in the Appendix for more information on interpreting case counts and rates in US territories.

Table 15. Gonorrhea Among Females — Reported Cases and Rates of Reported Cases by State/Territory and Region in Alphabetical Order, United States, 2014–2018

State/Territory	Cases					Rates per 100,000 Population				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Alabama	4,090	3,629	4,088	5,693	6,134	163.6	144.8	163.0	226.4	243.9
Alaska	665	567	738	1,090	1,057	190.3	162.3	208.6	308.8	299.4
Arizona	3,564	3,505	4,315	5,219	5,332	105.2	102.0	123.7	147.9	151.1
Arkansas	2,527	2,510	2,964	3,525	3,788	167.5	165.6	195.0	230.7	247.9
California	16,009	18,404	20,914	24,599	26,425	82.0	93.4	105.9	123.7	132.9
Colorado	1,318	1,832	2,323	3,465	3,589	49.5	67.5	84.3	124.4	128.9
Connecticut	1,108	851	1,165	1,660	1,938	60.1	46.3	63.6	90.4	105.5
Delaware	693	641	799	757	728	143.5	131.3	162.6	152.5	146.6
District of Columbia	858	874	857	1,287	1,211	247.8	247.2	239.4	352.8	332.0
Florida	9,228	10,078	11,488	12,769	12,936	90.7	97.2	109.0	119.0	120.6
Georgia	6,552	7,322	9,156	9,873	8,718	126.7	139.9	173.1	184.4	162.8
Hawaii	350	446	551	476	531	49.9	63.2	77.5	66.9	74.6
Idaho	196	197	237	357	509	24.0	23.8	28.2	41.7	59.4
Illinois	7,559	7,698	8,920	9,750	10,064	115.2	117.6	137.0	149.8	154.6
Indiana	3,819	3,984	4,811	5,931	6,083	114.1	118.6	143.0	175.5	180.0
Iowa	862	1,122	1,267	1,887	2,476	55.1	71.4	80.4	119.4	156.6
Kansas	1,464	1,262	1,695	2,269	2,615	100.5	86.6	116.1	155.3	179.0
Kentucky	2,270	2,242	2,716	3,478	3,643	101.3	99.8	120.7	153.9	161.2
Louisiana	5,049	5,535	5,493	5,978	5,904	212.5	231.9	229.6	249.6	246.5
Maine	98	143	134	225	250	14.4	21.1	19.7	33.0	36.7
Maryland	2,793	3,090	3,944	4,629	4,227	90.7	99.8	127.1	148.5	135.6
Massachusetts	1,215	1,027	1,390	2,495	2,431	35.0	29.4	39.6	70.7	68.9
Michigan	5,129	5,191	6,201	7,604	7,981	101.7	102.9	122.9	150.3	157.8
Minnesota	1,802	1,675	2,214	2,939	3,345	65.6	60.7	79.9	105.0	119.5
Mississippi	2,987	3,131	3,665	4,563	4,888	194.0	203.2	238.0	296.6	317.8
Missouri	3,620	4,187	5,228	5,997	6,803	117.2	135.1	168.6	192.7	218.7
Montana	221	462	493	427	638	43.4	89.9	95.2	81.9	122.3
Nebraska	770	870	1,055	1,285	1,302	81.5	91.5	110.3	133.6	135.4
Nevada	1,294	1,402	1,611	1,972	2,477	91.6	97.3	109.9	132.0	165.8
New Hampshire	91	65	132	179	184	13.6	9.7	19.6	26.4	27.1
New Jersey	3,082	3,110	3,338	3,731	3,446	67.3	67.8	72.9	80.9	74.8
New Mexico	961	1,087	1,542	2,073	2,343	91.3	103.4	146.8	196.7	222.3
New York	7,077	8,593	8,709	9,649	10,202	69.6	84.4	85.7	94.5	99.9
North Carolina	7,759	10,064	9,527	11,013	11,480	152.2	195.4	182.7	208.9	217.8
North Dakota	385	375	516	528	708	106.8	101.9	139.8	143.4	192.3
Ohio	8,735	8,466	10,130	11,736	12,146	147.6	142.8	171.0	197.4	204.3
Oklahoma	3,451	3,580	4,052	4,721	4,556	176.3	181.3	204.7	238.0	229.7
Oregon	786	1,158	1,519	1,920	2,244	39.2	56.9	73.5	91.9	107.4
Pennsylvania	6,164	5,889	6,135	5,947	6,050	94.3	90.1	94.1	91.0	92.6
Rhode Island	218	172	221	357	457	40.1	31.6	40.7	65.5	83.9
South Carolina	4,527	4,401	4,709	6,470	7,016	182.3	174.8	184.4	250.1	271.2
South Dakota	557	621	757	722	974	131.4	145.6	176.4	167.6	226.1
Tennessee	3,419	3,809	4,681	5,667	6,681	101.8	112.6	137.3	164.7	194.2
Texas	17,253	17,843	18,620	20,963	19,982	127.1	129.0	132.7	147.2	140.3
Utah	565	507	717	865	942	38.6	34.1	47.3	56.2	61.2
Vermont	35	85	32	87	140	11.0	26.8	10.1	27.6	44.4
Virginia	4,361	4,007	5,056	5,734	5,208	103.1	94.1	118.3	133.2	121.0
Washington	2,504	2,797	2,943	3,488	3,922	70.9	78.0	80.7	94.2	105.9
West Virginia	461	365	422	618	542	49.2	39.1	45.6	67.4	59.1
Wisconsin	2,046	2,557	3,189	3,696	3,670	70.6	88.1	109.8	126.9	126.0
Wyoming	61	86	120	224	158	21.3	29.9	41.9	78.9	55.7
US TOTAL	**162,608**	**173,514**	**197,499**	**232,587**	**241,074**	**100.4**	**106.3**	**120.4**	**140.7**	**145.8**
Northeast	19,088	19,935	21,256	24,330	25,098	66.3	69.1	73.8	84.1	86.7
Midwest	36,748	38,008	45,983	54,344	58,167	107.0	110.4	133.6	157.4	168.5
South	78,278	83,121	92,237	107,738	107,642	128.2	134.5	147.9	170.9	170.7
West	28,494	32,450	38,023	46,175	50,167	75.6	85.1	98.9	119.0	129.3
American Samoa	NR	NR	NR	NR	4	—	—	—	—	15.5
Guam	47	67	59	97	143	59.2	84.0	72.8	119.4	176.0
Northern Mariana Islands	NR	NR	NR	NR	16	—	—	—	—	65.4
Puerto Rico	161	259	313	230	238	8.7	14.3	17.5	13.1	13.5
Virgin Islands	54	28	14	5	NR	97.1	50.8	24.9	8.9	—
TERRITORIES	**262**	**354**	**386**	**332**	**401**	**13.2**	**18.1**	**20.1**	**17.5**	**21.2**
TOTAL	**162,870**	**173,868**	**197,885**	**232,919**	**241,475**	**99.4**	**105.3**	**119.2**	**139.3**	**144.4**

NR = No report.

NOTE: Cases reported with unknown sex are not included in this table. See Section A1.11 in the Appendix for more information on interpreting case counts and rates in US territories.

Table 16. Gonorrhea Among Males — Reported Cases and Rates of Reported Cases by State/Territory and Region in Alphabetical Order, United States, 2014–2018

State/Territory	Cases					Rates per 100,000 Population				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Alabama	3,563	3,519	4,265	6,214	6,560	151.6	149.5	181.1	263.3	278.0
Alaska	676	546	716	1,099	1,189	174.5	140.4	184.5	284.1	307.4
Arizona	4,186	4,724	6,011	7,256	7,509	125.2	139.3	174.6	208.0	215.3
Arkansas	2,007	2,270	2,768	3,184	3,511	137.7	155.2	188.6	215.7	237.9
California	29,310	35,644	43,259	50,577	52,553	152.1	183.3	221.9	257.4	267.5
Colorado	1,852	2,555	3,652	5,013	5,305	68.8	93.1	131.1	177.6	188.0
Connecticut	1,219	1,237	1,564	2,246	3,003	69.5	70.6	89.6	128.2	171.4
Delaware	586	669	903	1,027	958	129.4	146.1	196.0	220.6	205.8
District of Columbia	1,011	1,817	2,298	3,254	2,989	323.4	570.3	710.9	988.5	908.0
Florida	11,686	14,039	16,661	18,904	19,704	120.2	141.8	165.4	184.3	192.1
Georgia	7,137	8,631	11,378	12,741	12,075	144.9	173.3	226.6	251.0	237.9
Hawaii	669	793	914	882	959	93.2	109.3	127.4	123.2	133.9
Idaho	247	275	396	629	622	30.2	33.2	46.9	73.1	72.3
Illinois	8,386	9,335	12,255	14,057	15,351	132.7	147.8	194.8	223.4	244.0
Indiana	3,465	3,854	4,636	5,899	6,101	106.6	118.2	141.8	179.5	185.6
Iowa	779	1,122	1,332	1,870	2,363	50.5	72.3	85.4	119.5	151.0
Kansas	1,104	1,274	1,658	2,276	2,641	76.3	87.6	114.5	156.8	181.9
Kentucky	2,068	2,430	3,006	3,906	3,762	95.2	111.5	137.5	178.0	171.4
Louisiana	3,953	4,747	5,289	6,039	6,139	173.8	207.9	231.0	263.8	268.1
Maine	137	274	316	392	459	21.0	42.1	48.4	59.9	70.1
Maryland	3,304	3,755	5,573	6,346	6,074	114.1	129.0	191.2	216.3	207.0
Massachusetts	2,590	2,768	3,575	5,206	5,578	79.2	84.0	108.1	156.3	167.5
Michigan	4,551	5,129	6,245	8,121	8,700	93.5	105.1	127.8	165.6	177.4
Minnesota	2,260	2,420	2,881	3,568	4,187	83.3	88.6	104.9	128.5	150.8
Mississippi	2,637	2,638	3,486	4,681	4,846	181.3	181.7	240.6	323.7	335.2
Missouri	3,767	4,755	6,251	7,088	8,287	126.7	159.3	208.9	236.1	276.0
Montana	213	381	374	355	543	41.4	73.4	71.3	67.1	102.7
Nebraska	686	833	1,097	1,366	1,393	73.2	88.1	115.4	142.6	145.4
Nevada	1,892	2,218	2,763	3,539	3,985	132.6	152.9	187.4	235.3	265.0
New Hampshire	135	180	324	334	410	20.6	27.4	49.0	50.2	61.7
New Jersey	3,544	4,108	4,810	5,699	5,617	81.2	94.0	110.1	129.6	127.8
New Mexico	1,284	1,401	1,971	2,412	2,925	124.3	135.6	191.2	233.2	282.8
New York	13,624	16,893	20,224	24,383	27,025	142.2	175.8	210.9	253.0	280.4
North Carolina	6,652	9,744	10,160	11,857	12,245	137.3	199.2	206.0	237.1	244.8
North Dakota	309	309	484	438	661	81.5	79.5	124.4	113.1	170.7
Ohio	7,502	8,098	10,357	12,231	13,000	132.2	142.4	182.0	214.1	227.5
Oklahoma	2,685	2,962	3,521	4,360	4,442	139.8	152.9	181.1	223.9	228.1
Oregon	1,532	2,073	2,834	3,095	3,663	78.0	104.0	139.8	150.8	178.4
Pennsylvania	6,543	6,892	8,449	9,285	9,821	104.6	110.0	134.9	148.1	156.6
Rhode Island	372	408	495	729	879	72.7	79.7	96.5	141.6	170.7
South Carolina	3,689	3,781	4,436	6,122	6,744	157.0	158.9	184.2	251.1	276.7
South Dakota	335	427	512	568	715	78.0	98.8	117.4	129.4	162.9
Tennessee	3,778	4,577	5,497	6,758	7,946	118.4	142.3	169.5	206.3	242.6
Texas	18,035	21,792	23,779	26,344	27,117	134.8	159.8	171.9	187.3	192.8
Utah	876	1,055	1,383	1,672	1,953	59.2	70.0	90.0	107.1	125.1
Vermont	49	70	94	116	126	15.9	22.7	30.5	37.6	40.9
Virginia	3,879	4,085	5,996	6,779	6,525	94.7	99.0	144.9	162.7	156.6
Washington	3,717	4,374	5,231	6,425	7,279	105.3	122.0	143.7	173.5	196.5
West Virginia	380	404	497	678	601	41.6	44.3	54.9	75.4	66.9
Wisconsin	2,027	2,697	3,302	3,961	4,208	70.9	94.1	114.9	137.4	146.0
Wyoming	55	88	155	188	153	18.5	29.4	51.8	63.6	51.8
US TOTAL	**186,943**	**221,070**	**270,033**	**322,169**	**341,401**	**119.1**	**139.7**	**169.7**	**200.8**	**212.8**
Northeast	28,213	32,830	39,851	48,390	52,918	103.2	119.7	145.4	175.8	192.2
Midwest	35,171	40,253	51,010	61,443	67,607	105.3	120.2	152.1	182.5	200.9
South	77,050	91,860	109,513	129,194	132,238	131.2	154.6	182.7	213.1	218.2
West	46,509	56,127	69,659	83,142	88,638	124.1	148.1	182.3	215.4	229.6
American Samoa	NR	NR	NR	NR	9	—	—	—	—	34.9
Guam	52	80	74	105	118	63.7	97.6	86.2	122.0	137.1
Northern Mariana Islands	NR	NR	NR	NR	18	—	—	—	—	64.7
Puerto Rico	293	359	431	356	318	17.2	21.7	26.5	22.4	20.0
Virgin Islands	30	24	21	10	NR	61.8	50.2	40.8	19.5	—
TERRITORIES	**375**	**463**	**526**	**471**	**463**	**20.4**	**25.9**	**29.9**	**27.2**	**26.7**
TOTAL	**187,318**	**221,533**	**270,559**	**322,640**	**341,864**	**118.0**	**138.4**	**168.2**	**199.0**	**210.8**

NR = No report.

NOTE: Cases reported with unknown sex are not included in this table. See Section A1.11 in the Appendix for more information on interpreting case counts and rates in US territories.

Table 17. Gonorrhea — Reported Cases and Rates of Reported Cases in Selected Metropolitan Statistical Areas (MSAs)* in Alphabetical Order, United States, 2014–2018

MSAs	Cases					Rates per 100,000 Population				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Atlanta-Sandy Springs-Roswell, GA	7,256	6,471†	11,670	12,373	10,383†	129.2	113.3†	201.6	210.3	176.4†
Austin-Round Rock, TX	2,860	3,199	3,670	4,414	4,336	147.2	159.9	178.5	208.6	204.9
Baltimore-Columbia-Towson, MD	3,459	4,179	5,854	6,892	5,998	124.2	149.4	209.2	245.4	213.6
Birmingham-Hoover, AL	1,957	2,088	2,025‡	3,486	3,360	171.1	182.3	176.5‡	303.2	292.2
Boston-Cambridge-Newton, MA-NH	2,716†	2,487†	3,002†	4,385†	5,362	57.4†	52.1†	62.6†	90.7†	110.9
Buffalo-Cheektowaga-Niagara Falls, NY	1,342	1,982	2,180	2,448	2,553	118.1	174.6	192.4	215.3	224.6
Charlotte-Concord-Gastonia, NC-SC	3,645	4,673	4,749	5,411	5,762	153.1	192.6	191.9	214.3	228.2
Chicago-Naperville-Elgin, IL-IN-WI	12,630	13,529	16,634	18,558	19,578	132.2	141.6	174.9	194.7	205.4
Cincinnati, OH-KY-IN	3,346	3,713	4,096	4,716	4,985†	155.7	172.1	189.2	216.4	228.8†
Cleveland-Elyria, OH	3,802	3,428	4,205	5,843	5,400	184.2	166.3	204.6	283.8	262.3
Columbus, OH	3,260	3,676	4,821	5,197	5,657	163.4	181.8	236.1	250.0	272.1
Dallas-Fort Worth-Arlington, TX	9,195	11,334	11,092	12,846	13,245	132.2	159.6	153.3	173.6	179.0
Denver-Aurora-Lakewood, CO	2,016	2,838	3,848	5,408	5,270	73.2	100.8	134.9	187.2	182.5
Detroit-Warren-Dearborn, MI	5,311	5,494	6,816	8,668	8,817	123.6	127.7	158.6	201.0	204.4
Hartford-West Hartford-East Hartford, CT	894	726†	963†	1,831	1,983†	73.6	59.9†	79.8†	151.3	163.8†
Houston-The Woodlands-Sugar Land, TX	8,299	9,290	10,378	10,789	10,831	127.9	139.6	153.2	156.5	157.1
Indianapolis-Carmel-Anderson, IN	3,759	3,716	4,808	5,430	4,902	190.7	186.8	239.9	267.7	241.6
Jacksonville, FL	2,608	2,740	3,168	3,721	4,054	183.8	189.0	214.3	247.2	269.4
Kansas City, MO-KS	2,642	2,943	4,009	5,274	5,657	127.6	141.0	190.5	247.7	265.7
Las Vegas-Henderson-Paradise, NV	2,653	2,975	3,653	4,430	5,294	128.2	140.7	169.5	201.0	240.2
Los Angeles-Long Beach-Anaheim, CA	17,130	19,867	25,438	29,669	31,206	129.2	148.9	191.1	222.2	233.7
Louisville-Jefferson County, KY-IN	1,962	2,187	2,957	3,413	2,663†	154.5	171.1	230.4	263.8	205.8†
Memphis, TN-MS-AR	2,625	3,143	3,746	4,653	5,458	195.4	233.8	279.0	345.1	404.8
Miami-Fort Lauderdale-West Palm Beach, FL	6,128	6,905	7,984	8,848	9,618	103.3	114.8	131.6	143.7	156.2
Milwaukee-Waukesha-West Allis, WI	2,584	3,719	4,454	4,910	4,748	164.4	236.0	283.2	311.5	301.2
Minneapolis-St. Paul-Bloomington, MN-WI	3,341	3,289	4,123	5,260	5,834	95.6	93.3	116.1	146.1	162.0
Nashville-Davidson-Murfreesboro-Franklin, TN	1,922	2,200	2,695	2,706	3,102	107.2	120.2	144.5	142.2	163.0
New Orleans-Metairie, LA	2,667	2,929	3,414	3,638	3,584	213.0	231.9	269.1	285.2	280.9
New York-Newark-Jersey City, NY-NJ-PA	20,054	23,721	26,186	32,018	34,772	99.8	117.5	129.9	157.6	171.1
Oklahoma City, OK	2,366	2,403	2,953	3,418	3,596	177.0	176.9	215.0	247.0	259.9
Orlando-Kissimmee-Sanford, FL	2,571	3,073	3,393	4,290	4,307	110.8	128.7	139.0	170.9	171.6
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	9,618	9,724	11,394	12,096	12,123	158.9	160.2	187.7	198.4	198.9
Phoenix-Mesa-Scottsdale, AZ	5,944	6,495	8,086	9,433	9,448	132.4	142.0	173.5	199.1	199.4
Pittsburgh, PA	2,602	2,422	2,601	2,370	2,629	110.4	102.9	111.0	101.6	112.7
Portland-Vancouver-Hillsboro, OR-WA	1,499	2,386	3,177	3,444	4,238	63.8	99.9	131.0	140.4	172.8
Providence-Warwick, RI-MA	913†	834†	1,108†	1,561†	1,956	56.7†	51.7†	68.6†	96.3†	120.7
Raleigh, NC	1,408	2,018	1,915	2,491	2,554	113.3	158.5	147.0	186.6	191.3
Richmond, VA	2,173	2,200	3,198	3,200	2,977	172.5	173.0	249.5	247.3	230.0
Riverside-San Bernardino-Ontario, CA	4,292	4,904	5,958	7,329	7,977	96.6	109.2	131.6	160.0	174.1
Sacramento-Roseville-Arden-Arcade, CA	2,616	3,317	3,402	4,057	4,402	116.6	145.9	148.1	174.5	189.3
Salt Lake City, UT	1,026	1,078	1,462	1,693	1,933	89.0	92.1	123.3	140.7	160.7
San Antonio-New Braunfels, TX	3,155	4,160	4,779	4,891	4,304	135.5	174.5	196.7	197.7	174.0
San Diego-Carlsbad, CA	3,420	3,691	4,989	5,973	6,184	104.8	111.9	150.4	179.0	185.3
San Francisco-Oakland-Hayward, CA	7,110	9,330	10,669	12,169	12,642	154.8	200.4	228.0	257.4	267.4
San Jose-Sunnyvale-Santa Clara, CA	1,552	1,857	1,976	2,528	2,230	79.5	93.9	99.9	126.5	111.6
Seattle-Tacoma-Bellevue, WA	3,931	4,766	5,149	6,667	7,190	107.1	127.7	135.5	172.4	185.9
St. Louis, MO-IL	4,346	5,257	6,558	6,699	7,260	154.9	187.0	233.6	238.6	258.6
Tampa-St. Petersburg-Clearwater, FL	3,455	3,916	4,408	4,661	4,352	118.5	131.6	145.4	150.8	140.8
Virginia Beach-Norfolk-Newport News, VA-NC	3,206	3,300	4,320	4,785	4,505	186.8	191.3	250.2	277.4	261.1
Washington-Arlington-Alexandria, DC-VA-MD-WV	2,974	3,008	4,335	9,682	9,313	49.3	49.3	70.7	155.7	149.8
SELECTED MSAs TOTAL	**212,240**	**239,580**	**288,468**	**340,672**	**350,532**	**121.4**	**135.6**	**162.1**	**189.4**	**194.9**

* MSAs were selected on the basis of the largest population in the 2010 US 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 Section A1.4 in the Appendix for more information.

‡ 2016 county data for Alabama have been corrected and may not match previous reports.

NOTE: County was misclassified in the 2017 District of Columbia STD morbidity data resulting in inaccurate county-level case counts and rates.

Table 18. Gonorrhea Among Females — Reported Cases and Rates of Reported Cases in Selected Metropolitan Statistical Areas (MSAs)* in Alphabetical Order, United States, 2014–2018

MSAs	Cases					Rates per 100,000 Population				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Atlanta-Sandy Springs-Roswell, GA	3,030	2,578†	4,696	4,723	3,683†	104.7	87.5†	157.0	155.4	121.2†
Austin-Round Rock, TX	1,213	1,039	1,162	1,522	1,326	124.9	103.9	113.1	144.2	125.7
Baltimore-Columbia-Towson, MD	1,608	1,964	2,492	3,059	2,538	111.5	135.6	171.9	210.4	174.6
Birmingham-Hoover, AL	970	999	943‡	1,644	1,494	163.4	167.9	158.4‡	275.4	250.3
Boston-Cambridge-Newton, MA-NH	844†	601†	720†	1,242†	1,255	34.7†	24.5†	29.2†	50.0†	50.5
Buffalo-Cheektowaga-Niagara Falls, NY	664	959	985	1,157	1,138	113.4	164.0	168.9	197.5	194.3
Charlotte-Concord-Gastonia, NC-SC	1,962	2,419	2,296	2,554	2,632	160.2	193.8	180.1	196.4	202.4
Chicago-Naperville-Elgin, IL-IN-WI	5,662	5,696	6,481	6,997	6,943	115.9	116.8	133.5	143.8	142.7
Cincinnati, OH-KY-IN	1,913	2,020	2,183	2,481	2,576†	174.3	183.4	197.7	223.3	231.9†
Cleveland-Elyria, OH	2,021	1,745	2,134	3,043	2,719	189.2	163.6	200.7	285.9	255.5
Columbus, OH	1,473	1,638	2,105	2,165	2,311	145.3	159.5	203.0	205.1	218.9
Dallas-Fort Worth-Arlington, TX	4,153	4,963	4,577	5,504	5,343	117.5	137.4	124.5	146.5	142.2
Denver-Aurora-Lakewood, CO	780	1,096	1,403	2,083	1,920	56.4	77.7	98.1	144.2	132.9
Detroit-Warren-Dearborn, MI	2,698	2,592	3,190	4,008	3,867	122.0	117.2	144.5	181.0	174.7
Hartford-West Hartford-East Hartford, CT	425	310†	412†	796	776†	68.3	50.0†	66.7†	128.5	125.3†
Houston-The Woodlands-Sugar Land, TX	4,151	4,113	4,422	4,422	4,439	127.2	122.8	129.7	127.5	128.0
Indianapolis-Carmel-Anderson, IN	1,828	1,791	2,264	2,533	2,345	181.3	176.1	220.9	244.3	226.1
Jacksonville, FL	1,288	1,237	1,402	1,643	1,784	176.9	166.5	184.9	213.0	231.3
Kansas City, MO-KS	1,361	1,409	1,875	2,448	2,479	128.9	132.6	174.9	225.9	228.8
Las Vegas-Henderson-Paradise, NV	1,039	1,129	1,341	1,518	1,958	100.5	106.7	124.1	137.4	177.3
Los Angeles-Long Beach-Anaheim, CA	5,029	5,778	7,083	8,808	9,187	74.8	85.4	104.9	130.1	135.7
Louisville-Jefferson County, KY-IN	992	1,012	1,278	1,493	1,198†	152.6	154.8	194.8	225.8	181.2†
Memphis, TN-MS-AR	1,371	1,469	1,818	2,304	2,552	196.0	209.8	259.7	327.8	363.1
Miami-Fort Lauderdale-West Palm Beach, FL	2,123	2,252	2,606	2,699	2,816	69.5	72.7	83.4	85.2	88.9
Milwaukee-Waukesha-West Allis, WI	1,298	1,850	2,208	2,346	2,195	160.8	228.8	274.0	290.5	271.8
Minneapolis-St. Paul-Bloomington, MN-WI	1,388	1,229	1,676	2,256	2,412	78.6	69.0	93.5	124.3	132.8
Nashville-Davidson-Murfreesboro-Franklin, TN	790	888	1,129	1,036	1,236	86.0	94.7	118.1	106.4	127.0
New Orleans-Metairie, LA	1,339	1,423	1,527	1,512	1,414	207.2	218.1	233.1	229.1	214.3
New York-Newark-Jersey City, NY-NJ-PA	6,544	7,349	7,134	8,210	8,565	63.1	70.6	68.6	78.3	81.7
Oklahoma City, OK	1,310	1,267	1,558	1,771	1,757	193.2	183.8	223.8	252.6	250.6
Orlando-Kissimmee-Sanford, FL	1,109	1,254	1,326	1,569	1,633	93.4	102.7	106.2	122.3	127.3
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	4,461	4,277	4,640	4,544	4,413	142.7	136.4	148.0	144.3	140.2
Phoenix-Mesa-Scottsdale, AZ	2,658	2,708	3,259	3,807	3,752	117.6	117.6	138.9	159.8	157.5
Pittsburgh, PA	1,415	1,239	1,153	948	1,035	116.8	102.5	95.9	79.2	86.4
Portland-Vancouver-Hillsboro, OR-WA	382	764	1,005	1,208	1,478	32.2	63.2	82.0	97.5	119.3
Providence-Warwick, RI-MA	325†	260†	368†	559†	687	39.2†	31.3†	44.3†	67.0†	82.4
Raleigh, NC	638	857	785	1,101	1,126	100.2	131.4	117.4	161.0	164.7
Richmond, VA	1,194	1,141	1,473	1,432	1,319	183.4	173.6	222.2	214.0	197.1
Riverside-San Bernardino-Ontario, CA	1,966	2,208	2,515	3,101	3,255	88.1	97.9	110.5	134.8	141.5
Sacramento-Roseville-Arden-Arcade, CA	1,246	1,538	1,463	1,613	1,891	108.8	132.5	124.7	135.8	159.2
Salt Lake City, UT	376	325	480	549	578	65.5	55.8	81.3	91.7	96.5
San Antonio-New Braunfels, TX	1,445	1,785	1,981	2,228	1,804	122.4	147.8	161.1	178.1	144.2
San Diego-Carlsbad, CA	1,038	1,018	1,479	1,593	2,091	63.9	62.1	89.7	96.0	126.1
San Francisco-Oakland-Hayward, CA	1,836	2,101	2,183	2,646	2,719	78.9	89.1	92.2	110.7	113.8
San Jose-Sunnyvale-Santa Clara, CA	557	642	614	772	663	57.4	65.4	62.6	78.1	67.0
Seattle-Tacoma-Bellevue, WA	1,412	1,662	1,556	2,011	2,137	76.9	89.0	81.9	104.1	110.6
St. Louis, MO-IL	2,087	2,436	2,911	2,969	3,173	144.3	168.1	201.4	205.4	219.5
Tampa-St. Petersburg-Clearwater, FL	1,619	1,676	1,815	1,955	1,786	107.6	109.2	116.0	122.7	112.1
Virginia Beach-Norfolk-Newport News, VA-NC	1,711	1,701	2,118	2,340	2,082	196.4	194.4	241.5	267.0	237.5
Washington-Arlington-Alexandria, DC-VA-MD-WV	1,163	1,064	1,489	3,031	2,931	37.7	34.1	47.5	95.4	92.2
SELECTED MSAs TOTAL	**89,905**	**95,471**	**109,713**	**127,953**	**127,411**	**100.7**	**105.9**	**120.9**	**139.5**	**139.0**

* MSAs were selected on the basis of the largest population in the 2010 US 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 Section A1.4 in the Appendix for more information.

‡ 2016 county data for Alabama have been corrected and may not match previous reports.

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

Table 19. Gonorrhea Among Males — Reported Cases and Rates of Reported Cases in Selected Metropolitan Statistical Areas (MSAs) in Alphabetical Order, United States, 2014–2018

MSAs	Cases					Rates per 100,000 Population				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Atlanta-Sandy Springs-Roswell, GA	4,177	3,885†	6,960	7,622	6,658†	153.5	140.5†	248.6	267.9	234.0†
Austin-Round Rock, TX	1,635	2,144	2,499	2,882	2,994	168.2	214.2	242.9	271.7	282.3
Baltimore-Columbia-Towson, MD	1,840	2,202	3,359	3,833	3,457	137.0	163.2	249.0	283.1	255.3
Birmingham-Hoover, AL	979	1,075	1,068‡	1,827	1,841	177.9	195.2	193.4‡	330.4	333.0
Boston-Cambridge-Newton, MA-NH	1,870†	1,881†	2,274†	3,120†	4,075	81.4†	81.1†	97.6†	132.7†	173.3
Buffalo-Cheektowaga-Niagara Falls, NY	678	1,023	1,195	1,291	1,415	123.1	185.8	217.5	234.3	256.8
Charlotte-Concord-Gastonia, NC-SC	1,683	2,251	2,451	2,856	3,127	145.6	191.0	204.4	233.2	255.3
Chicago-Naperville-Elgin, IL-IN-WI	6,947	7,780	10,133	11,514	12,632	148.7	166.5	217.6	246.6	270.6
Cincinnati, OH-KY-IN	1,431	1,693	1,913	2,233	2,409†	136.0	160.2	180.3	209.0	225.5†
Cleveland-Elyria, OH	1,781	1,683	2,071	2,800	2,681	178.9	169.3	208.7	281.6	269.6
Columbus, OH	1,787	2,038	2,716	3,032	3,346	182.2	204.9	270.3	296.4	327.1
Dallas-Fort Worth-Arlington, TX	5,033	6,357	6,498	7,331	7,885	147.1	182.0	182.8	201.3	216.5
Denver-Aurora-Lakewood, CO	1,236	1,742	2,445	3,325	3,350	90.1	124.1	171.8	230.3	232.0
Detroit-Warren-Dearborn, MI	2,606	2,894	3,622	4,648	4,947	125.0	138.5	173.3	221.4	235.7
Hartford-West Hartford-East Hartford, CT	466	416†	551†	1,033	1,203†	78.7	70.4†	93.5†	174.8	203.6†
Houston-The Woodlands-Sugar Land, TX	4,146	5,167	5,930	6,343	6,370	128.5	156.2	176.3	185.3	186.1
Indianapolis-Carmel-Anderson, IN	1,927	1,920	2,542	2,892	2,551	200.1	197.5	259.5	291.6	257.3
Jacksonville, FL	1,316	1,501	1,764	2,076	2,270	190.5	212.5	245.0	283.0	309.4
Kansas City, MO-KS	1,281	1,534	2,134	2,826	3,178	126.1	149.7	206.6	270.3	304.0
Las Vegas-Henderson-Paradise, NV	1,612	1,837	2,306	2,905	3,330	155.6	173.9	214.4	264.2	302.8
Los Angeles-Long Beach-Anaheim, CA	12,071	14,066	18,060	20,803	21,963	184.7	213.9	275.3	315.9	333.6
Louisville-Jefferson County, KY-IN	961	1,170	1,670	1,910	1,444†	155.1	187.3	266.2	301.9	228.2†
Memphis, TN-MS-AR	1,254	1,674	1,926	2,347	2,905	194.8	260.0	299.6	363.7	450.1
Miami-Fort Lauderdale-West Palm Beach, FL	3,999	4,651	5,374	6,146	6,801	139.0	159.6	182.6	205.4	227.3
Milwaukee-Waukesha-West Allis, WI	1,281	1,864	2,241	2,560	2,551	167.4	242.9	292.4	333.1	331.9
Minneapolis-St. Paul-Bloomington, MN-WI	1,942	2,058	2,439	2,993	3,414	112.4	118.0	138.6	167.7	191.3
Nashville-Davidson-Murfreesboro-Franklin, TN	1,130	1,312	1,566	1,670	1,866	129.3	147.0	172.3	179.6	200.7
New Orleans-Metairie, LA	1,328	1,506	1,887	2,126	2,170	219.2	246.7	307.5	345.2	352.3
New York-Newark-Jersey City, NY-NJ-PA	13,448	16,290	18,976	23,737	26,170	138.4	166.8	194.6	241.4	266.1
Oklahoma City, OK	1,056	1,136	1,394	1,647	1,839	160.3	169.7	205.9	241.2	269.4
Orlando-Kissimmee-Sanford, FL	1,461	1,818	2,067	2,720	2,674	128.8	155.9	173.2	221.7	217.9
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	5,152	5,439	6,736	7,540	7,695	176.2	185.4	229.4	255.8	261.1
Phoenix-Mesa-Scottsdale, AZ	3,286	3,780	4,824	5,602	5,669	147.4	166.4	208.3	237.8	240.7
Pittsburgh, PA	1,187	1,182	1,448	1,422	1,592	103.7	103.3	127.0	125.2	140.1
Portland-Vancouver-Hillsboro, OR-WA	1,116	1,621	2,172	2,236	2,754	96.2	137.3	181.1	184.2	226.9
Providence-Warwick, RI-MA	587†	572†	740†	1,001†	1,266	75.3†	73.2†	94.4†	127.2†	160.9
Raleigh, NC	770	1,161	1,130	1,390	1,428	127.0	186.9	178.1	213.4	219.3
Richmond, VA	978	1,058	1,712	1,743	1,648	160.6	172.3	276.7	278.8	263.7
Riverside-San Bernardino-Ontario, CA	2,321	2,692	3,437	4,207	4,708	105.0	120.5	152.6	184.5	206.5
Sacramento-Roseville-Arden-Arcade, CA	1,362	1,771	1,934	2,433	2,490	124.0	159.1	172.3	213.9	219.0
Salt Lake City, UT	650	753	982	1,144	1,355	112.3	128.1	164.8	189.3	224.3
San Antonio-New Braunfels, TX	1,710	2,375	2,798	2,663	2,494	149.0	201.9	233.2	217.7	203.9
San Diego-Carlsbad, CA	2,354	2,668	3,498	4,365	4,079	143.5	160.8	209.7	260.0	242.9
San Francisco-Oakland-Hayward, CA	5,261	7,201	8,441	9,482	9,840	232.2	313.3	365.3	405.7	421.0
San Jose-Sunnyvale-Santa Clara, CA	995	1,212	1,361	1,756	1,565	101.3	121.8	136.3	173.9	155.0
Seattle-Tacoma-Bellevue, WA	2,519	3,104	3,593	4,654	5,049	137.3	166.3	189.2	240.5	260.9
St. Louis, MO-IL	2,256	2,802	3,646	3,726	4,085	166.0	205.6	267.8	273.6	299.9
Tampa-St. Petersburg-Clearwater, FL	1,823	2,240	2,592	2,704	2,566	129.2	155.6	176.6	180.5	171.3
Virginia Beach-Norfolk-Newport News, VA-NC	1,489	1,595	2,195	2,423	2,408	176.2	187.7	258.3	285.5	283.7
Washington-Arlington-Alexandria, DC-VA-MD-WV	1,811	1,943	2,838	6,613	6,338	61.4	65.2	94.8	217.6	208.6
SELECTED MSAs TOTAL	**121,989**	**143,737**	**178,108**	**212,152**	**222,545**	**142.5**	**166.1**	**204.4**	**240.7**	**252.5**

* MSAs were selected on the basis of the largest population in the 2010 US 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 Section A1.4 in the Appendix for more information.

‡ 2016 county data for Alabama have been corrected and may not match previous reports.

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, 2018

Rank*	County/Independent City	Cases	Rate per 100,000 Population	Cumulative Percentage
1	Los Angeles County, CA	27,266	268.3	5
2	Cook County, IL	16,117	309.3	7
3	New York County, NY	9,067	544.7	9
4	Maricopa County, AZ	8,888	206.4	11
5	Harris County, TX	8,730	187.6	12
6	Kings County, NY	7,574	285.9	13
7	Dallas County, TX	7,326	279.8	15
8	Philadelphia County, PA	7,205	455.8	16
9	Wayne County, MI	6,287	358.5	17
10	San Diego County, CA	6,184	185.3	18
11	San Francisco County, CA	5,887	665.7	19
12	Clark County, NV	5,294	240.2	20
13	Bronx County, NY	5,204	353.7	21
14	Franklin County, OH	4,921	380.9	22
15	Cuyahoga County, OH	4,552	364.6	22
16	Milwaukee County, WI	4,547	477.6	23
17	King County, WA	4,406	201.3	24
18	Shelby County, TN	4,328	461.9	25
19	Miami-Dade County, FL	4,309	156.6	25
20	Washington, D.C.	4,240	611.0	26
21	Riverside County, CA	4,084	168.5	27
22	Marion County, IN	4,013	422.4	27
23	Orange County, CA	3,940	123.5	28
24	San Bernardino County, CA	3,893	180.4	29
25	Bexar County, TX	3,884	198.3	30
26	Broward County, FL	3,846	198.7	30
27	Sacramento County, CA	3,806	248.7	31
28	Queens County, NY	3,796	160.9	31
29	Alameda County, CA	3,777	227.1	32
30	Baltimore (City), MD	3,596	587.9	33
31	Hamilton County, OH	3,577	439.5	33
32	Duval County, FL	3,492	372.3	34
33	Jackson County, MO	3,443	492.6	35
34	Travis County, TX	3,409	277.9	35
35	Fulton County, GA	3,368	323.4	36
36	Hennepin County, MN	3,308	264.2	36
37	Tarrant County, TX	3,212	156.3	37
38	Mecklenburg County, NC	3,192	296.4	37
39	Orange County, FL	2,937	217.7	38
40	Jefferson County, AL	2,809	426.1	38
41	St. Louis County, MO	2,791	280.0	39
42	Oklahoma County, OK	2,752	349.3	39
43	Denver County, CO	2,704	383.8	40
44	Multnomah County, OR	2,477	306.7	40
45	Suffolk County, MA	2,464	308.8	41
46	Kern County, CA	2,311	258.8	41
47	Hillsborough County, FL	2,292	162.7	41
48	Bernalillo County, NM	2,287	337.9	42
49	St. Louis (City), MO	2,280	738.8	42
50	Erie County, NY	2,249	243.0	43
51	Fresno County, CA	2,246	227.0	43
52	DeKalb County, GA	2,188	290.5	43
53	Santa Clara County, CA	2,179	112.4	44
54	Jefferson County, KY	2,158	279.8	44
55	Wake County, NC	2,143	199.9	44
56	Orleans Parish, LA	2,114	537.5	45
57	Tulsa County, OK	2,086	322.8	45
58	Allegheny County, PA	2,060	168.4	46
59	Contra Costa County, CA	2,057	179.3	46
60	Prince George's County, MD	2,020	221.3	46
61	Essex County, NJ	2,011	248.8	47
62	Guilford County, NC	1,970	373.8	47
63	Pima County, AZ	1,925	188.2	47
64	Pierce County, WA	1,917	218.6	48
65	Salt Lake County, UT	1,907	167.9	48
66	Davidson County, TN	1,880	272.0	48
67	Monroe County, NY	1,867	249.7	49
68	Richland County, SC	1,834	445.6	49
69	Hartford County, CT	1,806	201.7	49
70	Lucas County, OH	1,799	417.5	49

* The top 70 counties and independent cities ranked in descending order by number of cases reported in 2018 then by rate are displayed.
NOTE: Relative rankings of counties may be impacted by completeness of the variable used to identify county. In 2018, the variable used to identify county was complete for ≤95% of cases in Connecticut, Georgia, Hawaii, Kentucky, and South Dakota. See Section A1.4 in the Appendix for more information.

Table 21. Gonorrhea — Reported Cases and Rates of Reported Cases by Age Group and Sex, United States, 2014–2018

	Age Group	Cases				Rates per 100,000 Population*		
		Total	Male	Female	Unknown Sex	Total	Male	Female
2014	0–4	154	47	105	2	0.8	0.5	1.1
	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**
2015	0–4	148	47	98	3	0.7	0.5	1.0
	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**
2016	0–4	187	72	113	2	0.9	0.7	1.2
	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	379.4	280.7	481.3
	20–24	138,130	71,967	65,930	233	617.2	626.3	605.4
	25–29	101,283	62,189	38,881	213	442.5	534.7	345.3
	30–34	57,646	38,193	19,306	147	264.6	348.2	178.5
	35–39	34,058	23,744	10,230	84	163.9	228.8	98.4
	40–44	19,104	14,116	4,935	53	97.0	144.4	49.7
	45–54	24,142	19,762	4,330	50	56.4	93.6	20.0
	55–64	8,138	6,947	1,178	13	19.6	34.7	5.5
	65+	1,599	1,403	191	5	3.2	6.4	0.7
	Unknown Age	1,521	810	685	26			
	TOTAL	**468,514**	**270,033**	**197,499**	**982**	**145.0**	**169.7**	**120.4**
2017	0–4	203	56	144	3	1.0	0.5	1.5
	5–9	110	19	90	1	0.5	0.2	0.9
	10–14	2,725	507	2,212	6	13.1	4.8	21.7
	15–19	92,608	34,918	57,573	117	438.2	323.3	557.3
	20–24	155,862	81,036	74,578	248	704.7	714.0	692.5
	25–29	121,880	75,123	46,577	180	521.5	631.2	406.1
	30–34	71,603	47,342	24,157	104	325.9	426.9	222.0
	35–39	43,792	30,277	13,448	67	206.3	285.2	126.7
	40–44	24,108	17,753	6,331	24	122.7	182.0	64.0
	45–54	29,428	23,803	5,580	45	69.4	113.9	26.0
	55–64	10,867	9,311	1,538	18	25.9	46.0	7.1
	65+	2,063	1,818	233	12	4.1	8.1	0.8
	Unknown Age	359	206	126	27			
	TOTAL	**555,608**	**322,169**	**232,587**	**852**	**170.6**	**200.8**	**140.7**
2018	0–4	224	77	142	5	1.1	0.8	1.5
	5–9	111	13	98	0	0.5	0.1	1.0
	10–14	2,683	509	2,168	6	12.9	4.8	21.3
	15–19	91,373	34,614	56,628	131	432.4	320.5	548.1
	20–24	157,708	81,813	75,663	232	713.0	720.9	702.6
	25–29	129,385	80,216	48,991	178	553.6	674.0	427.2
	30–34	80,507	53,362	27,026	119	366.4	481.2	248.3
	35–39	48,399	33,556	14,769	74	228.0	316.1	139.1
	40–44	26,953	19,552	7,353	48	137.2	200.5	74.3
	45–54	31,270	25,092	6,132	46	73.8	120.0	28.6
	55–64	12,091	10,399	1,675	17	28.8	51.3	7.7
	65+	2,332	2,036	283	13	4.6	9.0	1.0
	Unknown Age	369	162	146	61			
	TOTAL	**583,405**	**341,401**	**241,074**	**930**	**179.1**	**212.8**	**145.8**

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

NOTE: Cases in the 0–4 age group may include cases due to perinatal transmission.

Table 22A. Gonorrhea — Reported Cases by Race/Hispanic Ethnicity, Age Group, and Sex, United States, 2018

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	0	0	0	65	18	47	0	0	0
5–9	3	0	3	0	0	0	43	3	40	0	0	0
10–14	28	2	26	14	3	11	1,336	297	1,038	3	1	2
15–19	1,002	279	721	515	217	298	43,237	17,561	25,660	128	44	84
20–24	1,872	649	1,222	1,446	957	485	68,405	36,106	32,254	272	124	148
25–29	1,900	764	1,135	1,612	1,277	334	50,009	31,538	18,436	272	170	101
30–34	1,415	587	827	1,111	894	214	26,045	18,205	7,823	155	91	64
35–39	854	372	481	696	578	118	13,978	10,467	3,506	109	62	47
40–44	403	175	228	441	370	71	7,410	5,895	1,508	52	37	15
45–54	323	161	162	461	398	63	8,378	7,190	1,183	46	39	6
55–64	89	58	30	127	95	32	3,599	3,229	367	7	6	1
65+	25	19	6	34	23	11	588	541	47	2	2	0
Unknown Age	3	2	1	6	4	2	49	26	19	0	0	0
TOTAL	**7,920**	**3,069**	**4,844**	**6,463**	**4,816**	**1,639**	**223,142**	**131,076**	**91,928**	**1,046**	**576**	**468**

Age Group	Whites			Multirace			Hispanics			Other/ Unknown		
	Total*	Male	Female	Total*	Male	Female	Total*	Male	Female	Total*	Male	Female
0–4	50	19	31	3	1	2	30	9	21	73	29	39
5–9	22	5	17	0	0	0	22	3	19	21	2	19
10–14	364	34	330	28	0	28	256	44	212	654	128	521
15–19	14,951	3,991	10,955	988	280	708	9,239	3,442	5,791	21,313	8,800	12,411
20–24	31,718	14,478	17,211	1,717	767	946	18,184	10,053	8,117	34,094	18,679	15,280
25–29	31,051	17,345	13,687	1,465	927	535	15,978	10,763	5,191	27,098	17,432	9,572
30–34	23,351	13,919	9,416	1,015	747	268	10,230	7,372	2,846	17,185	11,547	5,568
35–39	14,851	9,392	5,451	592	448	143	6,367	4,702	1,655	10,952	7,535	3,368
40–44	8,406	5,621	2,775	294	238	55	3,572	2,689	877	6,375	4,527	1,824
45–54	10,588	8,306	2,273	346	314	31	3,440	2,827	606	7,688	5,857	1,808
55–64	4,314	3,729	583	91	85	6	840	720	120	3,024	2,477	536
65+	856	771	84	12	12	0	121	105	16	694	563	119
Unknown Age	62	33	24	1	1	0	47	27	20	201	69	80
TOTAL	**140,584**	**77,643**	**62,837**	**6,552**	**3,820**	**2,722**	**68,326**	**42,756**	**25,491**	**129,372**	**77,645**	**51,145**

* Total includes cases reported with unknown sex.

NOTE: These tables should be used only for race/Hispanic 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* by Race/Hispanic Ethnicity, Age Group, and Sex, United States, 2018

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	2.5	0.0	0.0	0.0	2.4	1.3	3.5	0.0	0.0	0.0
5–9	1.7	0.0	3.5	0.0	0.0	0.0	1.5	0.2	2.9	0.0	0.0	0.0
10–14	15.8	2.2	29.8	1.3	0.6	2.1	47.4	20.8	74.6	7.3	4.8	9.8
15–19	554.9	303.8	812.5	47.8	40.1	55.6	1,457.7	1,166.7	1,756.4	314.5	210.8	423.6
20–24	995.4	676.7	1,325.9	112.0	146.6	76.1	2,129.0	2,212.1	2,040.3	618.7	553.0	687.1
25–29	965.7	759.8	1,179.8	101.9	164.1	41.5	1,474.0	1,860.7	1,085.9	524.7	632.3	404.8
30–34	844.6	698.9	989.8	69.7	117.0	25.8	913.9	1,315.3	533.7	308.7	354.2	261.1
35–39	557.1	488.0	624.0	46.1	82.0	14.7	512.7	807.1	245.3	239.0	265.3	211.3
40–44	287.1	253.3	319.9	30.7	55.2	9.2	298.3	504.7	114.6	134.4	188.0	78.9
45–54	107.8	110.5	105.3	18.1	33.6	4.6	159.6	292.0	42.4	64.6	111.0	16.6
55–64	30.7	42.6	19.5	6.2	10.3	2.9	74.6	146.4	14.0	11.8	20.8	3.3
65+	9.2	15.5	4.0	1.5	2.4	0.9	12.8	29.2	1.7	3.8	8.1	0.0
Unknown Age												
TOTAL	**329.5**	**259.3**	**397.1**	**35.1**	**55.0**	**17.0**	**548.9**	**674.4**	**433.3**	**181.4**	**198.6**	**163.2**

Age Group	Whites			Multirace			Hispanics		
	Total†	Male	Female	Total†	Male	Female	Total†	Male	Female
0–4	0.5	0.4	0.6	0.3	0.2	0.4	0.6	0.3	0.8
5–9	0.2	0.1	0.3	0.0	0.0	0.0	0.4	0.1	0.7
10–14	3.4	0.6	6.3	3.4	0.0	6.9	5.0	1.7	8.4
15–19	132.9	69.1	200.1	137.5	76.9	199.8	188.6	137.6	241.7
20–24	266.3	236.3	297.5	270.0	238.7	300.7	376.0	402.4	347.2
25–29	242.1	265.5	217.4	278.5	360.5	199.0	333.4	428.6	227.6
30–34	188.7	222.3	154.0	250.1	388.1	125.6	225.9	310.0	132.4
35–39	123.5	154.9	91.4	167.7	269.9	76.5	144.1	205.6	77.7
40–44	75.1	99.8	49.8	102.1	175.7	36.1	88.1	130.5	44.0
45–54	39.5	62.1	16.9	68.7	132.2	11.6	49.9	81.3	17.7
55–64	14.5	25.7	3.8	21.7	42.8	2.7	17.9	31.5	5.0
65+	2.2	4.4	0.4	3.1	7.0	0.0	2.9	5.8	0.7
Unknown Age									
TOTAL	**71.1**	**79.6**	**62.7**	**94.4**	**111.6**	**77.4**	**115.9**	**143.6**	**87.4**

* Per 100,000.

† Total includes cases reported with unknown sex.

NOTE: These tables should be used only for race/Hispanic 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 other/unknown race; therefore rates are not calculated.

Table 23A. Gonorrhea — Reported Cases and Rates of Reported Cases Among Females Aged 15–24 Years by Age, United States, 2014–2018

	Cases					Rates per 100,000 Females				
Ages	**2014**	**2015**	**2016**	**2017**	**2018**	**2014**	**2015**	**2016**	**2017**	**2018**
15	3,487	3,477	3,678	3,976	3,750	171.3	167.4	179.0	197.2	186.0
16	6,188	6,090	6,573	7,600	6,921	303.9	297.8	315.4	367.7	334.9
17	8,830	9,117	9,855	11,479	11,047	431.6	444.9	479.7	547.0	526.4
18	12,196	12,769	14,304	16,429	16,679	591.9	619.3	694.1	793.0	805.1
19	13,698	14,024	15,300	18,089	18,231	650.5	674.8	737.8	870.4	877.3
20	13,801	13,835	14,657	16,950	17,477	642.1	651.7	701.7	811.3	836.5
21	13,324	13,331	14,149	15,968	16,556	611.5	615.2	663.1	758.8	786.8
22	12,031	12,597	13,540	14,933	14,912	536.0	573.2	621.4	694.4	693.4
23	10,746	11,271	12,245	14,046	13,670	467.5	497.7	553.9	639.5	622.3
24	9,427	10,071	11,339	12,681	13,048	409.6	434.2	497.8	569.0	585.5
Total	**103,728**	**106,582**	**115,640**	**132,151**	**132,291**	**483.4**	**498.5**	**545.0**	**626.3**	**627.0**

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

Table 23B. Gonorrhea — Reported Cases and Rates of Reported Cases Among Males Aged 15–24 Years by Age, United States, 2014–2018

	Cases					Rates per 100,000 Males				
Ages	**2014**	**2015**	**2016**	**2017**	**2018**	**2014**	**2015**	**2016**	**2017**	**2018**
15	1,169	1,222	1,294	1,335	1,333	54.9	56.2	60.4	63.6	63.5
16	2,427	2,645	3,078	3,374	3,189	113.9	123.6	141.1	156.5	147.9
17	4,250	4,825	5,504	6,301	6,185	198.7	224.9	256.0	286.7	281.4
18	7,001	7,778	8,945	10,482	10,356	323.4	360.8	414.4	483.2	477.4
19	9,134	9,931	11,495	13,426	13,551	411.3	454.6	529.8	616.3	622.1
20	10,684	11,394	12,949	15,085	15,280	470.7	508.6	589.3	689.6	698.5
21	11,498	12,668	14,178	15,985	16,089	497.6	553.2	629.3	722.0	726.7
22	11,707	13,171	14,754	16,484	16,421	494.4	564.9	640.9	726.1	723.3
23	11,675	13,085	15,060	16,663	16,968	486.5	548.0	643.0	718.6	731.8
24	11,150	12,971	15,026	16,819	17,055	466.3	536.4	627.0	713.0	723.0
Total	**80,695**	**89,690**	**102,283**	**115,954**	**116,427**	**358.3**	**399.2**	**458.8**	**523.5**	**525.6**

NOTE: 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/Territory and Region in Alphabetical Order, United States, 2014–2018

State/Territory	Cases					Rates per 100,000 Population				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Alabama	475	657	905	1,202	1,285	9.8	13.5	18.6	24.7	26.4
Alaska	45	24	24	28	113	6.1	3.3	3.2	3.8	15.3
Arizona	1,459	1,496	1,905	2,424	3,249	21.7	21.9	27.5	34.5	46.3
Arkansas	390	500	567	726	964	13.1	16.8	19.0	24.2	32.1
California	11,443	14,449	17,603	21,804	25,256	29.5	36.9	44.8	55.1	63.9
Colorado	355	553	739	817	1,084	6.6	10.1	13.3	14.6	19.3
Connecticut	169	220	217	283	264	4.7	6.1	6.1	7.9	7.4
Delaware	110	110	149	194	129	11.8	11.6	15.7	20.2	13.4
District of Columbia	281	322	568	845	763	42.6	47.9	83.4	121.8	109.9
Florida	6,103	7,132	8,333	8,951	10,700	30.7	35.2	40.4	42.7	51.0
Georgia	3,384	4,156	4,112	4,310	4,928	33.5	40.7	39.9	41.3	47.3
Hawaii	106	163	215	165	210	7.5	11.4	15.1	11.6	14.7
Idaho	46	102	127	151	134	2.8	6.2	7.5	8.8	7.8
Illinois	2,796	3,290	4,039	3,838	4,471	21.7	25.6	31.6	30.0	34.9
Indiana	475	699	778	788	985	7.2	10.6	11.7	11.8	14.8
Iowa	239	232	276	290	286	7.7	7.4	8.8	9.2	9.1
Kansas	200	240	303	338	495	6.9	8.2	10.4	11.6	17.0
Kentucky	447	433	572	722	881	10.1	9.8	12.9	16.2	19.8
Louisiana	2,173	2,466	2,599	2,856	2,747	46.7	52.8	55.5	61.0	58.6
Maine	23	38	64	132	147	1.7	2.9	4.8	9.9	11.0
Maryland	1,475	1,870	1,842	2,059	2,536	24.7	31.1	30.6	34.0	41.9
Massachusetts	813	1,263	1,446	1,474	1,305	12.1	18.6	21.2	21.5	19.0
Michigan	1,095	1,089	1,092	1,267	1,691	11.0	11.0	11.0	12.7	17.0
Minnesota	631	653	853	934	918	11.6	11.9	15.5	16.7	16.5
Mississippi	642	760	925	937	1,454	21.4	25.4	30.9	31.4	48.7
Missouri	771	778	955	1,337	1,913	12.7	12.8	15.7	21.9	31.3
Montana	9	20	24	85	104	0.9	1.9	2.3	8.1	9.9
Nebraska	96	81	121	118	219	5.1	4.3	6.3	6.1	11.4
Nevada	893	915	1,313	1,684	2,000	31.5	31.7	44.7	56.2	66.7
New Hampshire	79	84	100	109	137	6.0	6.3	7.5	8.1	10.2
New Jersey	1,172	1,306	1,620	1,867	1,777	13.1	14.6	18.1	20.7	19.7
New Mexico	283	332	470	510	812	13.6	15.9	22.6	24.4	38.9
New York	7,129	7,795	9,456	9,877	10,183	36.1	39.4	47.9	49.8	51.3
North Carolina	1,998	2,741	2,655	2,949	2,987	20.1	27.3	26.2	28.7	29.1
North Dakota	51	42	61	78	84	6.9	5.5	8.0	10.3	11.1
Ohio	1,229	1,348	1,600	1,900	1,908	10.6	11.6	13.8	16.3	16.4
Oklahoma	414	521	696	953	1,138	10.7	13.3	17.7	24.2	29.0
Oregon	582	783	810	848	1,032	14.7	19.4	19.8	20.5	24.9
Pennsylvania	1,523	1,788	2,037	2,235	2,414	11.9	14.0	15.9	17.5	18.9
Rhode Island	160	163	234	221	284	15.2	15.4	22.2	20.9	26.8
South Carolina	750	834	974	1,096	1,152	15.5	17.0	19.6	21.8	22.9
South Dakota	95	71	57	75	74	11.1	8.3	6.6	8.6	8.5
Tennessee	977	1,241	1,448	1,453	1,725	14.9	18.8	21.8	21.6	25.7
Texas	7,805	8,250	9,564	12,127	12,969	29.0	30.0	34.3	42.8	45.8
Utah	149	169	259	299	423	5.1	5.6	8.5	9.6	13.6
Vermont	12	15	37	26	29	1.9	2.4	5.9	4.2	4.6
Virginia	702	1,023	1,304	1,758	2,038	8.4	12.2	15.5	20.8	24.1
Washington	854	1,109	1,414	1,751	1,912	12.1	15.5	19.4	23.6	25.8
West Virginia	55	109	151	123	185	3.0	5.9	8.2	6.8	10.2
Wisconsin	285	262	423	551	509	5.0	4.5	7.3	9.5	8.8
Wyoming	6	10	17	19	42	1.0	1.7	2.9	3.3	7.2
US TOTAL	**63,454**	**74,707**	**88,053**	**101,584**	**115,045**	**19.9**	**23.2**	**27.3**	**31.2**	**35.3**
Northeast	11,080	12,672	15,211	16,224	16,540	19.7	22.5	27.1	28.7	29.3
Midwest	7,963	8,785	10,558	11,514	13,553	11.8	12.9	15.5	16.9	19.9
South	28,181	33,125	37,364	43,261	48,581	23.5	27.3	30.5	35.0	39.3
West	16,230	20,125	24,920	30,585	36,371	21.6	26.5	32.5	39.5	47.0
American Samoa	NR	NR	NR	NR	0	—	—	—	—	0.0
Guam	13	22	13	21	30	8.1	13.6	7.8	12.5	17.9
Northern Mariana Islands	NR	NR	NR	NR	2	—	—	—	—	3.8
Puerto Rico	960	1,267	1,185	1,055	1,088	27.1	36.5	34.7	31.5	32.5
Virgin Islands	6	25	2	0	NR	5.8	24.3	1.9	0.0	—
TERRITORIES	**979**	**1,314**	**1,200**	**1,076**	**1,120**	**25.7**	**35.1**	**32.6**	**29.7**	**30.9**
TOTAL	**64,433**	**76,021**	**89,253**	**102,660**	**116,165**	**20.0**	**23.4**	**27.3**	**31.2**	**35.3**

* See Section A1.9 in the Appendix for definition. See Section A1.11 in the Appendix for more information on interpreting case counts and rates in US territories.
NR = No report.

Table 25. All Stages of Syphilis* — Reported Cases and Rates of Reported Cases in Selected Metropolitan Statistical Areas (MSAs)† in Alphabetical Order, United States, 2014–2018

MSAs	Cases					Rates per 100,000 Population				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Atlanta-Sandy Springs-Roswell, GA	2,669	3,106	3,219	3,281	3,559	47.5	54.4	55.6	55.8	60.5
Austin-Round Rock, TX	681	623	825	1,012	985	35.0	31.1	40.1	47.8	46.6
Baltimore-Columbia-Towson, MD	816	1,015	1,031	1,084	1,392	29.3	36.3	36.8	38.6	49.6
Birmingham-Hoover, AL	157	197	248§	314	344	13.7	17.2	21.6§	27.3	29.9
Boston-Cambridge-Newton, MA-NH	597	827‡	1,000‡	1,068	973	12.6	17.3‡	20.9‡	22.1	20.1
Buffalo-Cheektowaga-Niagara Falls, NY	135	182	146	176	162	11.9	16.0	12.9	15.5	14.2
Charlotte-Concord-Gastonia, NC-SC	533	732	851	876	843	22.4	30.2	34.4	34.7	33.4
Chicago-Naperville-Elgin, IL-IN-WI	2,559	3,060	3,805	3,536	4,096	26.8	32.0	40.0	37.1	43.0
Cincinnati, OH-KY-IN	381	319	269	326	430	17.7	14.8	12.4	15.0	19.7
Cleveland-Elyria, OH	199	229	378	430	358	9.6	11.1	18.4	20.9	17.4
Columbus, OH	441	518	578	700	564	22.1	25.6	28.3	33.7	27.1
Dallas-Fort Worth-Arlington, TX	2,231	2,261	2,661	3,849	3,938	32.1	31.8	36.8	52.0	53.2
Denver-Aurora-Lakewood, CO	298	426	552	618	793	10.8	15.1	19.3	21.4	27.5
Detroit-Warren-Dearborn, MI	804	790	751	802	1,155	18.7	18.4	17.5	18.6	26.8
Hartford-West Hartford-East Hartford, CT	52	84	55	66	77	4.3	6.9	4.6	5.5	6.4
Houston-The Woodlands-Sugar Land, TX	2,316	2,568	2,817	3,244	3,644	35.7	38.6	41.6	47.1	52.9
Indianapolis-Carmel-Anderson, IN	285	408	415	457	521	14.5	20.5	20.7	22.5	25.7
Jacksonville, FL	270	435	445	644	686	19.0	30.0	30.1	42.8	45.6
Kansas City, MO-KS	406	365	434	470	795	19.6	17.5	20.6	22.1	37.3
Las Vegas-Henderson-Paradise, NV	830	826	1,194	1,504	1,700	40.1	39.1	55.4	68.2	77.1
Los Angeles-Long Beach-Anaheim, CA	4,739	5,813	7,098	8,705	9,783	35.7	43.6	53.3	65.2	73.3
Louisville-Jefferson County, KY-IN	239	270	381	421	508	18.8	21.1	29.7	32.5	39.3
Memphis, TN-MS-AR	475	575	762	661	786	35.4	42.8	56.7	49.0	58.3
Miami-Fort Lauderdale-West Palm Beach, FL	3,314	3,640	4,102	4,279	5,106	55.9	60.5	67.6	69.5	82.9
Milwaukee-Waukesha-West Allis, WI	184	148	228	295	242	11.7	9.4	14.5	18.7	15.4
Minneapolis-St. Paul-Bloomington, MN-WI	585	592	742	791	719	16.7	16.8	20.9	22.0	20.0
Nashville-Davidson-Murfreesboro-Franklin, TN	305	359	383	363	577	17.0	19.6	20.5	19.1	30.3
New Orleans-Metairie, LA	736	765	849	855	916	58.8	60.6	66.9	67.0	71.8
New York-Newark-Jersey City, NY-NJ-PA	7,481	8,172	10,116	10,577	10,752	37.2	40.5	50.2	52.0	52.9
Oklahoma City, OK	231	264	406	534	540	17.3	19.4	29.6	38.6	39.0
Orlando-Kissimmee-Sanford, FL	784	916	1,183	1,196	1,391	33.8	38.4	48.5	47.7	55.4
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	1,273	1,393	1,647	1,820	1,775	21.0	22.9	27.1	29.9	29.1
Phoenix-Mesa-Scottsdale, AZ	1,065	1,126	1,501	1,882	2,504	23.7	24.6	32.2	39.7	52.9
Pittsburgh, PA	154	273	236	192	244	6.5	11.6	10.1	8.2	10.5
Portland-Vancouver-Hillsboro, OR-WA	473	604	665	654	794	20.1	25.3	27.4	26.7	32.4
Providence-Warwick, RI-MA	205	233	288‡	295‡	341	12.7	14.4‡	17.8‡	18.2	21.0
Raleigh, NC	317	410	384	438	450	25.5	32.2	29.5	32.8	33.7
Richmond, VA	145	207	305	394	480	11.5	16.3	23.8	30.4	37.1
Riverside-San Bernardino-Ontario, CA	950	1,165	1,554	1,960	2,587	21.4	26.0	34.3	42.8	56.5
Sacramento-Roseville-Arden-Arcade, CA	371	609	611	807	1,092	16.5	26.8	26.6	34.7	47.0
Salt Lake City, UT	109	122	188	203	270	9.5	10.4	15.8	16.9	22.4
San Antonio-New Braunfels, TX	1,017	988	1,126	1,445	1,485	43.7	41.4	46.3	58.4	60.0
San Diego-Carlsbad, CA	987	1,209	1,419	1,722	1,802	30.2	36.6	42.8	51.6	54.0
San Francisco-Oakland-Hayward, CA	2,111	2,355	2,427	2,947	3,104	46.0	50.6	51.9	62.3	65.7
San Jose-Sunnyvale-Santa Clara, CA	304	360	504	661	872	15.6	18.2	25.5	33.1	43.6
Seattle-Tacoma-Bellevue, WA	590	759	968	1,185	1,238	16.1	20.3	25.5	30.6	32.0
St. Louis, MO-IL	412	417	528	782	877	14.7	14.8	18.8	27.9	31.2
Tampa-St. Petersburg-Clearwater, FL	807	958	1,129	1,061	1,258	27.7	32.2	37.2	34.3	40.7
Virginia Beach-Norfolk-Newport News, VA-NC	220	375	516	566	658	12.8	21.7	29.9	32.8	38.1
Washington-Arlington-Alexandria, DC-VA-MD-WV	811	1,058	1,107	2,295	2,437	13.4	17.4	18.1	36.9	39.2
SELECTED MSAs TOTAL	**48,054**	**55,106**	**65,027**	**74,443**	**82,603**	**27.5**	**31.2**	**36.5**	**41.4**	**45.9**

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

† MSAs were selected on the basis of the largest population in the 2010 US 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 Section A1.4 in the Appendix for more information.

§ 2016 county data for Alabama have been corrected and may not match previous reports.

NOTE: County was misclassified in the 2017 District of Columbia STD morbidity data resulting in inaccurate county-level case counts and rates.

Table 26. Primary and Secondary Syphilis — Reported Cases and Rates of Reported Cases by State, Ranked by Rates, United States, 2018

Rank*	State	Cases	Rate per 100,000 Population
1	Nevada	682	22.7
2	California	7,607	19.2
3	Mississippi	464	15.5
4	Georgia	1,607	15.4
5	Arizona	1,047	14.9
6	New Mexico	304	14.6
7	Louisiana	669	14.3
8	Florida	2,880	13.7
9	Oklahoma	531	13.5
10	New York	2,654	13.4
11	Missouri	806	13.2
12	Maryland	737	12.2
13	Illinois	1,408	11.0
14	Washington	802	10.8
	US TOTAL†	**35,063**	**10.8**
15	North Carolina	1,098	10.7
16	Oregon	424	10.2
17	Alabama	477	9.8
18	Arkansas	288	9.6
19	Rhode Island	96	9.1
20	Texas	2,538	9.0
21	Virginia	702	8.3
22	Tennessee	553	8.2
23	Kentucky	366	8.2
24	Massachusetts	552	8.0
25	South Carolina	384	7.6
26	Alaska	55	7.4
27	Michigan	649	6.5
28	Hawaii	92	6.4
29	Ohio	740	6.3
30	New Jersey	570	6.3
31	Pennsylvania	797	6.2
32	Nebraska	119	6.2
33	Colorado	337	6.0
34	Maine	74	5.5
35	Indiana	367	5.5
36	Utah	169	5.4
37	North Dakota	41	5.4
38	Minnesota	292	5.2
39	Kansas	152	5.2
40	New Hampshire	64	4.8
41	South Dakota	41	4.7
42	Montana	45	4.3
43	Wyoming	23	4.0
44	West Virginia	65	3.6
45	Delaware	30	3.1
46	Iowa	86	2.7
47	Idaho	46	2.7
48	Wisconsin	152	2.6
49	Connecticut	91	2.5
50	Vermont	11	1.8

* 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 279 cases and a rate of 40.2 cases per 100,000 population, but excludes territories.

Table 27. Primary and Secondary Syphilis — Reported Cases and Rates of Reported Cases by State/Territory and Region in Alphabetical Order, United States, 2014–2018

State/Territory	Cases					Rates per 100,000 Population				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Alabama	161	280	376	424	477	3.3	5.8	7.7	8.7	9.8
Alaska	15	8	8	13	55	2.0	1.1	1.1	1.8	7.4
Arizona	577	589	721	943	1,047	8.6	8.6	10.4	13.4	14.9
Arkansas	121	134	150	234	288	4.1	4.5	5.0	7.8	9.6
California	3,835	4,908	5,891	6,708	7,607	9.9	12.5	15.0	17.0	19.2
Colorado	186	245	250	292	337	3.5	4.5	4.5	5.2	6.0
Connecticut	86	92	110	110	91	2.4	2.6	3.1	3.1	2.5
Delaware	47	41	58	57	30	5.0	4.3	6.1	5.9	3.1
District of Columbia	116	95	161	274	279	17.6	14.1	23.6	39.5	40.2
Florida	1,740	2,083	2,406	2,390	2,880	8.7	10.3	11.7	11.4	13.7
Georgia	1,234	1,413	1,350	1,489	1,607	12.2	13.8	13.1	14.3	15.4
Hawaii	68	91	112	94	92	4.8	6.4	7.8	6.6	6.4
Idaho	12	57	50	64	46	0.7	3.4	3.0	3.7	2.7
Illinois	863	1,085	1,260	1,225	1,408	6.7	8.4	9.8	9.6	11.0
Indiana	168	285	326	319	367	2.5	4.3	4.9	4.8	5.5
Iowa	72	75	89	101	86	2.3	2.4	2.8	3.2	2.7
Kansas	60	87	124	133	152	2.1	3.0	4.3	4.6	5.2
Kentucky	158	145	219	262	366	3.6	3.3	4.9	5.9	8.2
Louisiana	575	696	750	679	669	12.4	14.9	16.0	14.5	14.3
Maine	16	28	42	65	74	1.2	2.1	3.2	4.9	5.5
Maryland	449	509	509	573	737	7.5	8.5	8.5	9.5	12.2
Massachusetts	301	418	489	538	552	4.5	6.2	7.2	7.8	8.0
Michigan	421	403	365	480	649	4.2	4.1	3.7	4.8	6.5
Minnesota	257	246	306	292	292	4.7	4.5	5.5	5.2	5.2
Mississippi	189	219	326	310	464	6.3	7.3	10.9	10.4	15.5
Missouri	352	307	400	507	806	5.8	5.0	6.6	8.3	13.2
Montana	8	13	14	48	45	0.8	1.3	1.3	4.6	4.3
Nebraska	50	45	67	43	119	2.7	2.4	3.5	2.2	6.2
Nevada	357	335	444	587	682	12.6	11.6	15.1	19.6	22.7
New Hampshire	36	40	40	43	64	2.7	3.0	3.0	3.2	4.8
New Jersey	297	372	472	499	570	3.3	4.2	5.3	5.5	6.3
New Mexico	126	118	189	193	304	6.0	5.7	9.1	9.2	14.6
New York	1,727	2,006	2,455	2,355	2,654	8.7	10.1	12.4	11.9	13.4
North Carolina	733	1,196	1,082	1,138	1,098	7.4	11.9	10.7	11.1	10.7
North Dakota	13	11	33	44	41	1.8	1.5	4.4	5.8	5.4
Ohio	568	560	716	832	740	4.9	4.8	6.2	7.1	6.3
Oklahoma	151	209	264	373	531	3.9	5.3	6.7	9.5	13.5
Oregon	272	345	327	352	424	6.9	8.6	8.0	8.5	10.2
Pennsylvania	532	655	755	793	797	4.2	5.1	5.9	6.2	6.2
Rhode Island	71	77	90	71	96	6.7	7.3	8.5	6.7	9.1
South Carolina	250	294	316	361	384	5.2	6.0	6.4	7.2	7.6
South Dakota	53	39	26	33	41	6.2	4.5	3.0	3.8	4.7
Tennessee	237	349	390	488	553	3.6	5.3	5.9	7.3	8.2
Texas	1,636	1,680	1,955	2,233	2,538	6.1	6.1	7.0	7.9	9.0
Utah	47	65	92	117	169	1.6	2.2	3.0	3.8	5.4
Vermont	5	9	23	13	11	0.8	1.4	3.7	2.1	1.8
Virginia	289	334	459	536	702	3.5	4.0	5.5	6.3	8.3
Washington	344	445	565	677	802	4.9	6.2	7.8	9.1	10.8
West Virginia	28	52	53	62	65	1.5	2.8	2.9	3.4	3.6
Wisconsin	86	79	132	173	152	1.5	1.4	2.3	3.0	2.6
Wyoming	4	5	7	4	23	0.7	0.9	1.2	0.7	4.0
US TOTAL	**19,999**	**23,872**	**27,814**	**30,644**	**35,063**	**6.3**	**7.4**	**8.6**	**9.4**	**10.8**
Northeast	3,071	3,697	4,476	4,487	4,909	5.5	6.6	8.0	7.9	8.7
Midwest	2,963	3,222	3,844	4,182	4,853	4.4	4.7	5.7	6.1	7.1
South	8,114	9,729	10,824	11,883	13,668	6.8	8.0	8.8	9.6	11.1
West	5,851	7,224	8,670	10,092	11,633	7.8	9.5	11.3	13.0	15.0
American Samoa	NR	NR	NR	NR	0	—	—	—	—	0.0
Guam	7	2	2	13	18	4.3	1.2	1.2	7.8	10.8
Northern Mariana Islands	NR	NR	NR	NR	1	—	—	—	—	1.9
Puerto Rico	484	531	493	411	365	13.6	15.3	14.5	12.3	10.9
Virgin Islands	2	8	0	0	NR	1.9	7.8	0.0	0.0	—
TERRITORIES	**493**	**541**	**495**	**424**	**384**	**12.9**	**14.5**	**13.4**	**11.7**	**10.6**
TOTAL	**20,492**	**24,413**	**28,309**	**31,068**	**35,447**	**6.4**	**7.5**	**8.7**	**9.4**	**10.8**

NR = No report.

NOTE: See Section A1.11 in the Appendix for more information on interpreting case counts and rates in US territories.

Table 28. Primary and Secondary Syphilis Among Females — Reported Cases and Rates of Reported Cases by State/Territory and Region in Alphabetical Order, United States, 2014–2018

State/Territory	Cases					Rates per 100,000 Population				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Alabama	17	37	80	70	88	0.7	1.5	3.2	2.8	3.5
Alaska	1	1	0	1	4	0.3	0.3	0.0	0.3	1.1
Arizona	50	47	80	158	177	1.5	1.4	2.3	4.5	5.0
Arkansas	23	26	37	64	68	1.5	1.7	2.4	4.2	4.4
California	318	476	744	902	1,255	1.6	2.4	3.8	4.5	6.3
Colorado	6	6	16	18	25	0.2	0.2	0.6	0.6	0.9
Connecticut	7	15	12	13	5	0.4	0.8	0.7	0.7	0.3
Delaware	2	2	3	6	7	0.4	0.4	0.6	1.2	1.4
District of Columbia	5	6	5	7	12	1.4	1.7	1.4	1.9	3.3
Florida	137	210	266	321	356	1.3	2.0	2.5	3.0	3.3
Georgia	96	94	113	139	184	1.9	1.8	2.1	2.6	3.4
Hawaii	2	1	10	6	7	0.3	0.1	1.4	0.8	1.0
Idaho	0	9	6	15	5	0.0	1.1	0.7	1.8	0.6
Illinois	81	84	95	85	120	1.2	1.3	1.5	1.3	1.8
Indiana	11	28	36	27	26	0.3	0.8	1.1	0.8	0.8
Iowa	6	5	6	9	11	0.4	0.3	0.4	0.6	0.7
Kansas	14	17	12	16	24	1.0	1.2	0.8	1.1	1.6
Kentucky	22	23	21	41	70	1.0	1.0	0.9	1.8	3.1
Louisiana	132	189	192	186	166	5.6	7.9	8.0	7.8	6.9
Maine	3	6	3	9	7	0.4	0.9	0.4	1.3	1.0
Maryland	49	58	54	47	81	1.6	1.9	1.7	1.5	2.6
Massachusetts	23	25	24	26	41	0.7	0.7	0.7	0.7	1.2
Michigan	31	34	31	34	69	0.6	0.7	0.6	0.7	1.4
Minnesota	21	39	37	38	44	0.8	1.4	1.3	1.4	1.6
Mississippi	17	32	58	88	152	1.1	2.1	3.8	5.7	9.9
Missouri	34	54	66	93	161	1.1	1.7	2.1	3.0	5.2
Montana	2	1	1	9	10	0.4	0.2	0.2	1.7	1.9
Nebraska	4	3	5	7	14	0.4	0.3	0.5	0.7	1.5
Nevada	23	23	50	75	119	1.6	1.6	3.4	5.0	8.0
New Hampshire	4	3	4	4	3	0.6	0.4	0.6	0.6	0.4
New Jersey	16	26	24	34	58	0.3	0.6	0.5	0.7	1.3
New Mexico	14	11	27	19	46	1.3	1.0	2.6	1.8	4.4
New York	49	59	115	121	171	0.5	0.6	1.1	1.2	1.7
North Carolina	68	112	109	127	160	1.3	2.2	2.1	2.4	3.0
North Dakota	5	0	3	5	10	1.4	0.0	0.8	1.4	2.7
Ohio	76	68	94	112	92	1.3	1.1	1.6	1.9	1.5
Oklahoma	15	21	41	67	144	0.8	1.1	2.1	3.4	7.3
Oregon	22	35	35	52	92	1.1	1.7	1.7	2.5	4.4
Pennsylvania	47	52	62	76	99	0.7	0.8	1.0	1.2	1.5
Rhode Island	5	4	3	7	12	0.9	0.7	0.6	1.3	2.2
South Carolina	23	37	52	56	67	0.9	1.5	2.0	2.2	2.6
South Dakota	34	7	6	4	11	8.0	1.6	1.4	0.9	2.6
Tennessee	34	23	56	47	67	1.0	0.7	1.6	1.4	1.9
Texas	242	230	230	313	424	1.8	1.7	1.6	2.2	3.0
Utah	1	2	6	4	10	0.1	0.1	0.4	0.3	0.6
Vermont	0	0	3	1	2	0.0	0.0	0.9	0.3	0.6
Virginia	17	17	47	60	77	0.4	0.4	1.1	1.4	1.8
Washington	18	30	51	70	100	0.5	0.8	1.4	1.9	2.7
West Virginia	6	9	10	21	19	0.6	1.0	1.1	2.3	2.1
Wisconsin	7	0	7	12	18	0.2	0.0	0.2	0.4	0.6
Wyoming	0	1	1	0	5	0.0	0.3	0.3	0.0	1.8
US TOTAL	**1,840**	**2,298**	**3,049**	**3,722**	**4,995**	**1.1**	**1.4**	**1.9**	**2.3**	**3.0**
Northeast	154	190	250	291	398	0.5	0.7	0.9	1.0	1.4
Midwest	324	339	398	442	600	0.9	1.0	1.2	1.3	1.7
South	905	1,126	1,374	1,660	2,142	1.5	1.8	2.2	2.6	3.4
West	457	643	1,027	1,329	1,855	1.2	1.7	2.7	3.4	4.8
American Samoa	NR	NR	NR	NR	0	—	—	—	—	0.0
Guam	2	0	0	2	0	2.5	0.0	0.0	2.5	0.0
Northern Mariana Islands	NR	NR	NR	NR	0	—	—	—	—	0.0
Puerto Rico	30	70	86	66	52	1.6	3.9	4.8	3.8	3.0
Virgin Islands	1	4	0	0	NR	1.8	7.3	0.0	0.0	—
TERRITORIES	**33**	**74**	**86**	**68**	**52**	**1.7**	**3.8**	**4.5**	**3.6**	**2.8**
TOTAL	**1,873**	**2,372**	**3,135**	**3,790**	**5,047**	**1.1**	**1.4**	**1.9**	**2.3**	**3.0**

NR = No report.

NOTE: Cases reported with unknown sex are not included in this table. See Section A1.11 in the Appendix for more information on interpreting case counts and rates in US territories.

Table 29. Primary and Secondary Syphilis Among Males — Reported Cases and Rates of Reported Cases by State/Territory and Region in Alphabetical Order, United States, 2014–2018

State/Territory	Cases					Rates per 100,000 Population				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Alabama	144	243	296	354	389	6.1	10.3	12.6	15.0	16.5
Alaska	14	7	8	12	51	3.6	1.8	2.1	3.1	13.2
Arizona	527	542	641	785	870	15.8	16.0	18.6	22.5	24.9
Arkansas	98	108	113	170	220	6.7	7.4	7.7	11.5	14.9
California	3,515	4,430	5,143	5,804	6,349	18.2	22.8	26.4	29.5	32.3
Colorado	180	239	234	274	312	6.7	8.7	8.4	9.7	11.1
Connecticut	79	77	98	97	84	4.5	4.4	5.6	5.5	4.8
Delaware	45	39	55	51	23	9.9	8.5	11.9	11.0	4.9
District of Columbia	106	83	152	264	264	33.9	26.1	47.0	80.2	80.2
Florida	1,602	1,873	2,140	2,069	2,524	16.5	18.9	21.3	20.2	24.6
Georgia	1,138	1,319	1,237	1,350	1,421	23.1	26.5	24.6	26.6	28.0
Hawaii	66	90	102	88	85	9.2	12.4	14.2	12.3	11.9
Idaho	12	48	44	49	41	1.5	5.8	5.2	5.7	4.8
Illinois	782	1,001	1,165	1,140	1,287	12.4	15.9	18.5	18.1	20.5
Indiana	157	257	290	292	341	4.8	7.9	8.9	8.9	10.4
Iowa	66	70	83	92	75	4.3	4.5	5.3	5.9	4.8
Kansas	46	70	112	117	128	3.2	4.8	7.7	8.1	8.8
Kentucky	136	122	198	221	296	6.3	5.6	9.1	10.1	13.5
Louisiana	443	507	558	493	503	19.5	22.2	24.4	21.5	22.0
Maine	13	22	39	54	67	2.0	3.4	6.0	8.3	10.2
Maryland	400	451	455	526	656	13.8	15.5	15.6	17.9	22.4
Massachusetts	277	391	464	512	499	8.5	11.9	14.0	15.4	15.0
Michigan	390	369	334	446	580	8.0	7.6	6.8	9.1	11.8
Minnesota	235	207	267	252	248	8.7	7.6	9.7	9.1	8.9
Mississippi	172	187	268	222	312	11.8	12.9	18.5	15.4	21.6
Missouri	318	253	334	414	645	10.7	8.5	11.2	13.8	21.5
Montana	6	12	13	39	35	1.2	2.3	2.5	7.4	6.6
Nebraska	46	42	62	36	105	4.9	4.4	6.5	3.8	11.0
Nevada	334	312	394	512	563	23.4	21.5	26.7	34.0	37.4
New Hampshire	32	37	36	39	61	4.9	5.6	5.4	5.9	9.2
New Jersey	281	346	448	465	511	6.4	7.9	10.3	10.6	11.6
New Mexico	112	107	162	174	258	10.8	10.4	15.7	16.8	24.9
New York	1,675	1,933	2,319	2,214	2,483	17.5	20.1	24.2	23.0	25.8
North Carolina	665	1,084	973	1,011	937	13.7	22.2	19.7	20.2	18.7
North Dakota	8	11	30	39	31	2.1	2.8	7.7	10.1	8.0
Ohio	492	492	622	720	648	8.7	8.7	10.9	12.6	11.3
Oklahoma	136	188	223	306	387	7.1	9.7	11.5	15.7	19.9
Oregon	250	310	292	298	332	12.7	15.6	14.4	14.5	16.2
Pennsylvania	485	602	693	717	698	7.8	9.6	11.1	11.4	11.1
Rhode Island	66	73	87	64	84	12.9	14.3	17.0	12.4	16.3
South Carolina	227	257	264	305	317	9.7	10.8	11.0	12.5	13.0
South Dakota	19	32	20	29	30	4.4	7.4	4.6	6.6	6.8
Tennessee	203	326	334	441	486	6.4	10.1	10.3	13.5	14.8
Texas	1,394	1,450	1,725	1,920	2,114	10.4	10.6	12.5	13.7	15.0
Utah	46	63	86	113	159	3.1	4.2	5.6	7.2	10.2
Vermont	5	9	20	12	9	1.6	2.9	6.5	3.9	2.9
Virginia	272	316	403	471	617	6.6	7.7	9.7	11.3	14.8
Washington	326	414	514	606	701	9.2	11.5	14.1	16.4	18.9
West Virginia	22	43	43	41	46	2.4	4.7	4.7	4.6	5.1
Wisconsin	79	79	125	161	134	2.8	2.8	4.4	5.6	4.6
Wyoming	4	4	6	4	18	1.3	1.3	2.0	1.4	6.1
US TOTAL	**18,146**	**21,547**	**24,724**	**26,885**	**30,034**	**11.6**	**13.6**	**15.5**	**16.8**	**18.7**
Northeast	2,913	3,490	4,204	4,174	4,496	10.7	12.7	15.3	15.2	16.3
Midwest	2,638	2,883	3,444	3,738	4,252	7.9	8.6	10.3	11.1	12.6
South	7,203	8,596	9,437	10,215	11,512	12.3	14.5	15.7	16.9	19.0
West	5,392	6,578	7,639	8,758	9,774	14.4	17.4	20.0	22.7	25.3
American Samoa	NR	NR	NR	NR	0	—	—	—	—	0.0
Guam	5	2	2	11	18	6.1	2.4	2.3	12.8	20.9
Northern Mariana Islands	NR	NR	NR	NR	1	—	—	—	—	3.6
Puerto Rico	454	461	407	345	311	26.6	27.8	25.1	21.7	19.5
Virgin Islands	1	4	0	0	NR	2.1	8.4	0.0	0.0	—
TERRITORIES	**460**	**467**	**409**	**356**	**330**	**25.1**	**26.1**	**23.2**	**20.6**	**19.1**
TOTAL	**18,606**	**22,014**	**25,133**	**27,241**	**30,364**	**11.7**	**13.8**	**15.6**	**16.8**	**18.7**

NR = No report.

NOTE: Cases reported with unknown sex are not included in this table. See Section A1.11 in the Appendix for more information on interpreting case counts and rates in US territories.

Table 30. Primary and Secondary Syphilis — Reported Cases and Rates of Reported Cases in Selected Metropolitan Statistical Areas (MSAs)* in Alphabetical Order, United States, 2014–2018

MSAs	Cases					Rates per 100,000 Population				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Atlanta-Sandy Springs-Roswell, GA	996	1,097	1,018	1,095	1,094	17.7	19.2	17.6	18.6	18.6
Austin-Round Rock, TX	227	203	317	359	294	11.7	10.1	15.4	17.0	13.9
Baltimore-Columbia-Towson, MD	282	343	332	342	446	10.1	12.3	11.9	12.2	15.9
Birmingham-Hoover, AL	58	74	109‡	122	124	5.1	6.5	9.5‡	10.6	10.8
Boston-Cambridge-Newton, MA-NH	227	271†	320†	373	390	4.8	5.7†	6.7†	7.7	8.1
Buffalo-Cheektowaga-Niagara Falls, NY	49	92	63	60	53	4.3	8.1	5.6	5.3	4.7
Charlotte-Concord-Gastonia, NC-SC	220	333	378	355	333	9.2	13.7	15.3	14.1	13.2
Chicago-Naperville-Elgin, IL-IN-WI	811	1,047	1,202	1,140	1,280	8.5	11.0	12.6	12.0	13.4
Cincinnati, OH-KY-IN	153	93	81	103	158	7.1	4.3	3.7	4.7	7.3
Cleveland-Elyria, OH	80	72	156	180	116	3.9	3.5	7.6	8.7	5.6
Columbus, OH	250	274	316	353	241	12.5	13.6	15.5	17.0	11.6
Dallas-Fort Worth-Arlington, TX	508	476	542	699	739	7.3	6.7	7.5	9.4	10.0
Denver-Aurora-Lakewood, CO	153	192	187	216	241	5.6	6.8	6.6	7.5	8.3
Detroit-Warren-Dearborn, MI	317	284	253	291	466	7.4	6.6	5.9	6.7	10.8
Hartford-West Hartford-East Hartford, CT	26	44	32	32	30	2.1	3.6	2.7	2.6	2.5
Houston-The Woodlands-Sugar Land, TX	414	439	411	386	647	6.4	6.6	6.1	5.6	9.4
Indianapolis-Carmel-Anderson, IN	109	172	158	186	173	5.5	8.6	7.9	9.2	8.5
Jacksonville, FL	69	91	118	194	219	4.9	6.3	8.0	12.9	14.6
Kansas City, MO-KS	220	191	201	214	355	10.6	9.1	9.6	10.1	16.7
Las Vegas-Henderson-Paradise, NV	318	305	398	519	554	15.4	14.4	18.5	23.5	25.1
Los Angeles-Long Beach-Anaheim, CA	1,407	1,832	2,123	2,365	2,800	10.6	13.7	15.9	17.7	21.0
Louisville-Jefferson County, KY-IN	83	87	149	150	219	6.5	6.8	11.6	11.6	16.9
Memphis, TN-MS-AR	94	121	173	153	201	7.0	9.0	12.9	11.3	14.9
Miami-Fort Lauderdale-West Palm Beach, FL	821	884	925	919	1,079	13.8	14.7	15.2	14.9	17.5
Milwaukee-Waukesha-West Allis, WI	52	39	50	79	64	3.3	2.5	3.2	5.0	4.1
Minneapolis-St. Paul-Bloomington, MN-WI	243	228	261	248	238	7.0	6.5	7.3	6.9	6.6
Nashville-Davidson-Murfreesboro-Franklin, TN	74	116	115	160	227	4.1	6.3	6.2	8.4	11.9
New Orleans-Metairie, LA	221	218	235	210	236	17.7	17.3	18.5	16.5	18.5
New York-Newark-Jersey City, NY-NJ-PA	1,721	2,037	2,551	2,461	2,693	8.6	10.1	12.7	12.1	13.3
Oklahoma City, OK	91	113	162	219	252	6.8	8.3	11.8	15.8	18.2
Orlando-Kissimmee-Sanford, FL	239	299	384	318	366	10.3	12.5	15.7	12.7	14.6
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	446	458	639	636	594	7.4	7.5	10.5	10.4	9.7
Phoenix-Mesa-Scottsdale, AZ	416	452	574	775	819	9.3	9.9	12.3	16.4	17.3
Pittsburgh, PA	78	150	100	71	91	3.3	6.4	4.3	3.0	3.9
Portland-Vancouver-Hillsboro, OR-WA	206	261	263	255	300	8.8	10.9	10.8	10.4	12.2
Providence-Warwick, RI-MA	93	111†	115†	98	127	5.8	6.9†	7.1†	6.0	7.8
Raleigh, NC	129	168	137	136	173	10.4	13.2	10.5	10.2	13.0
Richmond, VA	68	73	104	124	210	5.4	5.7	8.1	9.6	16.2
Riverside-San Bernardino-Ontario, CA	288	341	445	495	622	6.5	7.6	9.8	10.8	13.6
Sacramento-Roseville-Arden-Arcade, CA	162	265	272	343	474	7.2	11.7	11.8	14.8	20.4
Salt Lake City, UT	39	49	69	87	119	3.4	4.2	5.8	7.2	9.9
San Antonio-New Braunfels, TX	247	237	243	329	284	10.6	9.9	10.0	13.3	11.5
San Diego-Carlsbad, CA	371	493	524	585	555	11.4	14.9	15.8	17.5	16.6
San Francisco-Oakland-Hayward, CA	767	830	872	1,030	1,035	16.7	17.8	18.6	21.8	21.9
San Jose-Sunnyvale-Santa Clara, CA	120	134	222	217	296	6.1	6.8	11.2	10.9	14.8
Seattle-Tacoma-Bellevue, WA	235	311	397	440	501	6.4	8.3	10.5	11.4	13.0
St. Louis, MO-IL	153	112	215	278	345	5.5	4.0	7.7	9.9	12.3
Tampa-St. Petersburg-Clearwater, FL	320	393	436	364	457	11.0	13.2	14.4	11.8	14.8
Virginia Beach-Norfolk-Newport News, VA-NC	85	117	206	170	209	5.0	6.8	11.9	9.9	12.1
Washington-Arlington-Alexandria, DC-VA-MD-WV	226	230	273	640	720	3.7	3.8	4.5	10.3	11.6
SELECTED MSAs TOTAL	**14,982**	**17,252**	**19,826**	**21,574**	**24,259**	**8.6**	**9.8**	**11.1**	**12.0**	**13.5**

* MSAs were selected on the basis of the largest population in the 2010 US 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 Section A1.4 in the Appendix for more information.

‡ 2016 county data for Alabama have been corrected and may not match previous reports.

Table 31. Primary and Secondary Syphilis Among Females — Reported Cases and Rates of Reported Cases in Selected Metropolitan Statistical Areas (MSAs)* in Alphabetical Order, United States, 2014–2018

MSAs	Cases					Rates per 100,000 Population				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Atlanta-Sandy Springs-Roswell, GA	58	61	61	78	97	2.0	2.1	2.0	2.6	3.2
Austin-Round Rock, TX	14	16	17	29	29	1.4	1.6	1.7	2.7	2.7
Baltimore-Columbia-Towson, MD	42	49	46	39	54	2.9	3.4	3.2	2.7	3.7
Birmingham-Hoover, AL	5	8	25‡	21	23	0.8	1.3	4.2‡	3.5	3.9
Boston-Cambridge-Newton, MA-NH	14	13†	9†	13	24	0.6	0.5†	0.4†	0.5	1.0
Buffalo-Cheektowaga-Niagara Falls, NY	1	0	1	6	4	0.2	0.0	0.2	1.0	0.7
Charlotte-Concord-Gastonia, NC-SC	6	16	25	31	43	0.5	1.3	2.0	2.4	3.3
Chicago-Naperville-Elgin, IL-IN-WI	76	86	88	79	103	1.6	1.8	1.8	1.6	2.1
Cincinnati, OH-KY-IN	33	21	11	11	18	3.0	1.9	1.0	1.0	1.6
Cleveland-Elyria, OH	5	1	12	23	10	0.5	0.1	1.1	2.2	0.9
Columbus, OH	34	27	48	45	33	3.4	2.6	4.6	4.3	3.1
Dallas-Fort Worth-Arlington, TX	63	56	62	75	101	1.8	1.6	1.7	2.0	2.7
Denver-Aurora-Lakewood, CO	4	6	11	15	19	0.3	0.4	0.8	1.0	1.3
Detroit-Warren-Dearborn, MI	23	26	26	20	46	1.0	1.2	1.2	0.9	2.1
Hartford-West Hartford-East Hartford, CT	2	9	2	8	2	0.3	1.5	0.3	1.3	0.3
Houston-The Woodlands-Sugar Land, TX	64	58	49	63	97	2.0	1.7	1.4	1.8	2.8
Indianapolis-Carmel-Anderson, IN	5	12	15	12	9	0.5	1.2	1.5	1.2	0.9
Jacksonville, FL	9	8	26	50	41	1.2	1.1	3.4	6.5	5.3
Kansas City, MO-KS	23	41	39	43	59	2.2	3.9	3.6	4.0	5.4
Las Vegas-Henderson-Paradise, NV	17	17	40	55	93	1.6	1.6	3.7	5.0	8.4
Los Angeles-Long Beach-Anaheim, CA	67	108	144	177	273	1.0	1.6	2.1	2.6	4.0
Louisville-Jefferson County, KY-IN	14	10	12	16	21	2.2	1.5	1.8	2.4	3.2
Memphis, TN-MS-AR	22	13	25	21	40	3.1	1.9	3.6	3.0	5.7
Miami-Fort Lauderdale-West Palm Beach, FL	44	75	66	71	102	1.4	2.4	2.1	2.2	3.2
Milwaukee-Waukesha-West Allis, WI	6	0	1	5	7	0.7	0.0	0.1	0.6	0.9
Minneapolis-St. Paul-Bloomington, MN-WI	19	37	31	24	16	1.1	2.1	1.7	1.3	0.9
Nashville-Davidson-Murfreesboro-Franklin, TN	5	4	12	10	21	0.5	0.4	1.3	1.0	2.2
New Orleans-Metairie, LA	18	29	25	36	25	2.8	4.4	3.8	5.5	3.8
New York-Newark-Jersey City, NY-NJ-PA	52	69	123	119	152	0.5	0.7	1.2	1.1	1.4
Oklahoma City, OK	7	14	27	39	70	1.0	2.0	3.9	5.6	10.0
Orlando-Kissimmee-Sanford, FL	8	14	21	24	17	0.7	1.1	1.7	1.9	1.3
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	39	43	49	63	79	1.2	1.4	1.6	2.0	2.5
Phoenix-Mesa-Scottsdale, AZ	42	39	56	128	131	1.9	1.7	2.4	5.4	5.5
Pittsburgh, PA	6	11	11	6	4	0.5	0.9	0.9	0.5	0.3
Portland-Vancouver-Hillsboro, OR-WA	9	19	20	31	37	0.8	1.6	1.6	2.5	3.0
Providence-Warwick, RI-MA	8	8†	6†	8	14	1.0	1.0†	0.7†	1.0	1.7
Raleigh, NC	6	13	10	17	29	0.9	2.0	1.5	2.5	4.2
Richmond, VA	2	4	15	18	29	0.3	0.6	2.3	2.7	4.3
Riverside-San Bernardino-Ontario, CA	15	17	47	67	118	0.7	0.8	2.1	2.9	5.1
Sacramento-Roseville-Arden-Arcade, CA	11	26	34	43	127	1.0	2.2	2.9	3.6	10.7
Salt Lake City, UT	1	1	5	0	3	0.2	0.2	0.8	0.0	0.5
San Antonio-New Braunfels, TX	47	43	43	54	49	4.0	3.6	3.5	4.3	3.9
San Diego-Carlsbad, CA	20	17	20	31	41	1.2	1.0	1.2	1.9	2.5
San Francisco-Oakland-Hayward, CA	34	46	50	58	85	1.5	2.0	2.1	2.4	3.6
San Jose-Sunnyvale-Santa Clara, CA	12	10	32	29	80	1.2	1.0	3.3	2.9	8.1
Seattle-Tacoma-Bellevue, WA	10	6	15	5	25	0.5	0.3	0.8	0.3	1.3
St. Louis, MO-IL	17	14	24	34	50	1.2	1.0	1.7	2.4	3.5
Tampa-St. Petersburg-Clearwater, FL	41	44	48	42	37	2.7	2.9	3.1	2.6	2.3
Virginia Beach-Norfolk-Newport News, VA-NC	8	5	22	24	18	0.9	0.6	2.5	2.7	2.1
Washington-Arlington-Alexandria, DC-VA-MD-WV	7	10	8	19	41	0.2	0.3	0.3	0.6	1.3
SELECTED MSAs TOTAL	**1,095**	**1,280**	**1,615**	**1,935**	**2,646**	**1.2**	**1.4**	**1.8**	**2.1**	**2.9**

* MSAs were selected on the basis of the largest population in the 2010 US 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 Section A1.4 in the Appendix for more information.

‡ 2016 county data for Alabama have been corrected and may not match previous reports.

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

Table 32. Primary and Secondary Syphilis Among Males — Reported Cases and Rates of Reported Cases in Selected Metropolitan Statistical Areas (MSAs)* in Alphabetical Order, United States, 2014–2018

MSAs	Cases					Rates per 100,000 Population				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Atlanta-Sandy Springs-Roswell, GA	938	1,036	957	1,017	995	34.5	37.5	34.2	35.7	35.0
Austin-Round Rock, TX	213	187	300	330	265	21.9	18.7	29.2	31.1	25.0
Baltimore-Columbia-Towson, MD	240	294	286	303	392	17.9	21.8	21.2	22.4	28.9
Birmingham-Hoover, AL	53	66	84‡	101	101	9.6	12.0	15.2‡	18.3	18.3
Boston-Cambridge-Newton, MA-NH	213	257†	311†	360	357	9.3	11.1†	13.4†	15.3	15.2
Buffalo-Cheektowaga-Niagara Falls, NY	48	92	62	54	49	8.7	16.7	11.3	9.8	8.9
Charlotte-Concord-Gastonia, NC-SC	214	317	353	324	290	18.5	26.9	29.4	26.5	23.7
Chicago-Naperville-Elgin, IL-IN-WI	735	961	1,114	1,061	1,176	15.7	20.6	23.9	22.7	25.2
Cincinnati, OH-KY-IN	120	72	70	92	140	11.4	6.8	6.6	8.6	13.1
Cleveland-Elyria, OH	75	71	144	157	106	7.5	7.1	14.5	15.8	10.7
Columbus, OH	216	247	268	308	208	22.0	24.8	26.7	30.1	20.3
Dallas-Fort Worth-Arlington, TX	445	420	480	624	638	13.0	12.0	13.5	17.1	17.5
Denver-Aurora-Lakewood, CO	149	186	176	201	222	10.9	13.3	12.4	13.9	15.4
Detroit-Warren-Dearborn, MI	294	258	227	271	420	14.1	12.3	10.9	12.9	20.0
Hartford-West Hartford-East Hartford, CT	24	35	30	24	27	4.1	5.9	5.1	4.1	4.6
Houston-The Woodlands-Sugar Land, TX	350	381	362	323	550	10.8	11.5	10.8	9.4	16.1
Indianapolis-Carmel-Anderson, IN	104	160	143	174	164	10.8	16.5	14.6	17.5	16.5
Jacksonville, FL	60	83	92	144	178	8.7	11.7	12.8	19.6	24.3
Kansas City, MO-KS	197	150	162	171	296	19.4	14.6	15.7	16.4	28.3
Las Vegas-Henderson-Paradise, NV	301	288	358	464	461	29.1	27.3	33.3	42.2	41.9
Los Angeles-Long Beach-Anaheim, CA	1,340	1,724	1,978	2,188	2,527	20.5	26.2	30.2	33.2	38.4
Louisville-Jefferson County, KY-IN	69	77	137	134	198	11.1	12.3	21.8	21.2	31.3
Memphis, TN-MS-AR	72	108	148	132	161	11.2	16.8	23.0	20.5	24.9
Miami-Fort Lauderdale-West Palm Beach, FL	777	809	859	848	977	27.0	27.8	29.2	28.3	32.6
Milwaukee-Waukesha-West Allis, WI	46	39	49	74	57	6.0	5.1	6.4	9.6	7.4
Minneapolis-St. Paul-Bloomington, MN-WI	223	191	228	222	222	12.9	10.9	13.0	12.4	12.4
Nashville-Davidson-Murfreesboro-Franklin, TN	69	112	103	150	206	7.9	12.5	11.3	16.1	22.2
New Orleans-Metairie, LA	203	189	210	174	211	33.5	31.0	34.2	28.3	34.3
New York-Newark-Jersey City, NY-NJ-PA	1,666	1,954	2,407	2,322	2,540	17.1	20.0	24.7	23.6	25.8
Oklahoma City, OK	84	99	135	180	182	12.8	14.8	19.9	26.4	26.7
Orlando-Kissimmee-Sanford, FL	231	285	363	294	349	20.4	24.4	30.4	24.0	28.4
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	407	415	590	573	515	13.9	14.1	20.1	19.4	17.5
Phoenix-Mesa-Scottsdale, AZ	374	413	518	647	688	16.8	18.2	22.4	27.5	29.2
Pittsburgh, PA	72	139	89	65	87	6.3	12.1	7.8	5.7	7.7
Portland-Vancouver-Hillsboro, OR-WA	197	242	243	224	263	17.0	20.5	20.3	18.5	21.7
Providence-Warwick, RI-MA	84	103†	109†	90	113	10.8	13.2†	13.9†	11.4	14.4
Raleigh, NC	123	155	127	119	144	20.3	24.9	20.0	18.3	22.1
Richmond, VA	66	69	87	103	176	10.8	11.2	14.1	16.5	28.2
Riverside-San Bernardino-Ontario, CA	273	324	398	428	504	12.4	14.5	17.7	18.8	22.1
Sacramento-Roseville-Arden-Arcade, CA	151	239	238	300	346	13.7	21.5	21.2	26.4	30.4
Salt Lake City, UT	38	48	64	87	116	6.6	8.2	10.7	14.4	19.2
San Antonio-New Braunfels, TX	200	194	200	275	235	17.4	16.5	16.7	22.5	19.2
San Diego-Carlsbad, CA	351	476	504	554	514	21.4	28.7	30.2	33.0	30.6
San Francisco-Oakland-Hayward, CA	731	783	820	970	948	32.3	34.1	35.5	41.5	40.6
San Jose-Sunnyvale-Santa Clara, CA	108	124	190	188	216	11.0	12.5	19.0	18.6	21.4
Seattle-Tacoma-Bellevue, WA	225	305	382	434	475	12.3	16.3	20.1	22.4	24.5
St. Louis, MO-IL	136	98	191	244	295	10.0	7.2	14.0	17.9	21.7
Tampa-St. Petersburg-Clearwater, FL	278	349	388	322	420	19.7	24.2	26.4	21.5	28.0
Virginia Beach-Norfolk-Newport News, VA-NC	77	112	178	144	190	9.1	13.2	20.9	17.0	22.4
Washington-Arlington-Alexandria, DC-VA-MD-WV	219	219	264	618	674	7.4	7.4	8.8	20.3	22.2
SELECTED MSAs TOTAL	**13,879**	**15,955**	**18,176**	**19,606**	**21,584**	**16.2**	**18.4**	**20.9**	**22.2**	**24.5**

* MSAs were selected on the basis of the largest population in the 2010 US 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 Section A1.4 in the Appendix for more information.

‡ 2016 county data for Alabama have been corrected and may not match previous reports.

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, 2018

Rank*	County/Independent City	Cases	Rate per 100,000 Population	Cumulative Percentage
1	Los Angeles County, CA	2,350	23.1	7
2	Cook County, IL	1,090	20.9	10
3	Maricopa County, AZ	784	18.2	12
4	New York County, NY	686	41.2	14
5	Harris County, TX	565	12.1	16
6	San Francisco County, CA	561	63.4	17
7	San Diego County, CA	555	16.6	19
8	Clark County, NV	554	25.1	20
9	Miami-Dade County, FL	544	19.8	22
10	Kings County, NY	496	18.7	23
11	Fulton County, GA	460	44.2	25
12	Bronx County, NY	459	31.2	26
13	Orange County, CA	450	14.1	27
14	Broward County, FL	445	23.0	29
15	Sacramento County, CA	417	27.2	30
16	Philadelphia County, PA	408	25.8	31
17	King County, WA	392	17.9	32
18	Dallas County, TX	368	14.1	33
19	Queens County, NY	356	15.1	34
20	San Bernardino County, CA	316	14.6	35
21	Riverside County, CA	306	12.6	36
22	Wayne County, MI	299	17.1	37
23	Santa Clara County, CA	291	15.0	38
24	Tarrant County, TX	284	13.8	38
25	Kern County, CA	280	31.4	39
26	Washington, D.C.	279	40.2	40
27	Orange County, FL	278	20.6	41
28	Baltimore (City), MD	277	45.3	41
29	Bexar County, TX	273	13.9	42
30	San Joaquin County, CA	270	36.2	43
31	DeKalb County, GA	249	33.1	44
32	Mecklenburg County, NC	249	23.1	44
33	Travis County, TX	239	19.5	45
34	Hillsborough County, FL	239	17.0	46
35	Jackson County, MO	233	33.3	46
36	Alameda County, CA	222	13.3	47
37	Franklin County, OH	213	16.5	48
38	Multnomah County, OR	195	24.1	48
39	Fresno County, CA	195	19.7	49
40	Oklahoma County, OK	192	24.4	49
41	Duval County, FL	191	20.4	50
42	Pinellas County, FL	191	19.7	50
43	Jefferson County, KY	180	23.3	51
44	Bernalillo County, NM	169	25.0	51
45	Stanislaus County, CA	167	30.5	52
46	Contra Costa County, CA	162	14.1	52
47	Suffolk County, MA	157	19.7	53
48	Orleans Parish, LA	156	39.7	53
49	Shelby County, TN	156	16.6	54
50	Wake County, NC	156	14.5	54
51	Hennepin County, MN	156	12.5	55
52	Tulsa County, OK	154	23.8	55
53	Prince George's County, MD	153	16.8	56
54	Sonoma County, CA	142	28.2	56
55	Marion County, IN	141	14.8	56
56	Davidson County, TN	139	20.1	57
57	Monroe County, NY	139	18.6	57
58	Denver County, CO	132	18.7	57
59	St. Louis County, MO	132	13.2	58
60	St. Louis (City), MO	131	42.4	58
61	Pima County, AZ	128	12.5	59
62	Middlesex County, MA	124	7.7	59
63	Salt Lake County, UT	119	10.5	59
64	Hamilton County, OH	117	14.4	60
65	Jefferson County, AL	112	17.0	60
66	Durham County, NC	111	35.6	60
67	Gwinnett County, GA	109	11.8	61
68	Spokane County, WA	106	20.9	61
69	Nueces County, TX	105	29.1	61
70	Baltimore County, MD	103	12.4	61

* The top 70 counties and independent cities ranked in descending order by number of cases reported in 2018 then by rate are displayed.
NOTE: Relative rankings of counties may be impacted by completeness of the variable used to identify county. See Section A1.4 in the Appendix for more information.

Table 34. Primary and Secondary Syphilis — Reported Cases and Rates of Reported Cases by Age Group and Sex, United States, 2014–2018

	Age Group	Cases				Rates per 100,000 Population*		
		Total	Male	Female	Unknown Sex	Total	Male	Female
2014	0–4	0	0	0	0	0.0	0.0	0.0
	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**
2015	0–4	2	0	1	1	0.0	0.0	0.0
	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**
2016	0–4	2	0	2	0	0.0	0.0	0.0
	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	23.1	38.4	6.8
	25–29	6,177	5,538	624	15	27.0	47.6	5.5
	30–34	4,278	3,806	464	8	19.6	34.7	4.3
	35–39	3,043	2,729	311	3	14.6	26.3	3.0
	40–44	2,140	1,944	193	3	10.9	19.9	1.9
	45–54	3,953	3,691	261	1	9.2	17.5	1.2
	55–64	1,418	1,338	80	0	3.4	6.7	0.4
	65+	279	269	10	0	0.6	1.2	0.0
	Unknown Age	37	27	10	0			
	TOTAL	**27,814**	**24,724**	**3,049**	**41**	**8.6**	**15.5**	**1.9**
2017	0–4	5	0	5	0	0.0	0.0	0.1
	5–9	1	0	1	0	0.0	0.0	0.0
	10–14	20	6	14	0	0.1	0.1	0.1
	15–19	1,421	1,092	327	2	6.7	10.1	3.2
	20–24	5,580	4,728	848	4	25.2	41.7	7.9
	25–29	6,838	6,033	795	10	29.3	50.7	6.9
	30–34	4,870	4,313	549	8	22.2	38.9	5.0
	35–39	3,580	3,145	431	4	16.9	29.6	4.1
	40–44	2,290	2,005	282	3	11.7	20.6	2.9
	45–54	4,091	3,753	334	4	9.7	18.0	1.6
	55–64	1,586	1,468	117	1	3.8	7.2	0.5
	65+	349	329	19	1	0.7	1.5	0.1
	Unknown Age	13	13	0	0			
	TOTAL	**30,644**	**26,885**	**3,722**	**37**	**9.4**	**16.8**	**2.3**
2018	0–4	2	1	1	0	0.0	0.0	0.0
	5–9	0	0	0	0	0.0	0.0	0.0
	10–14	20	9	11	0	0.1	0.1	0.1
	15–19	1,618	1,175	442	1	7.7	10.9	4.3
	20–24	6,140	5,061	1,076	3	27.8	44.6	10.0
	25–29	7,712	6,625	1,077	10	33.0	55.7	9.4
	30–34	5,907	5,084	816	7	26.9	45.8	7.5
	35–39	4,200	3,574	621	5	19.8	33.7	5.8
	40–44	2,690	2,328	358	4	13.7	23.9	3.6
	45–54	4,398	3,973	423	2	10.4	19.0	2.0
	55–64	1,929	1,782	145	2	4.6	8.8	0.7
	65+	437	412	25	0	0.9	1.8	0.1
	Unknown Age	10	10	0	0			
	TOTAL	**35,063**	**30,034**	**4,995**	**34**	**10.8**	**18.7**	**3.0**

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

Table 35A. Primary and Secondary Syphilis — Reported Cases by Race/Hispanic Ethnicity, Age Group, and Sex, United States, 2018

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	1	1	0	0	0
5–9	0	0	0	0	0	0	0	0	0	0	0	0
10–14	0	0	0	0	0	0	11	4	7	0	0	0
15–19	26	15	11	26	23	3	703	493	210	4	4	0
20–24	59	43	16	169	158	11	2,411	1,934	476	21	16	5
25–29	69	44	25	184	176	8	3,022	2,588	429	21	19	2
30–34	74	56	18	154	145	9	1,945	1,705	237	17	15	2
35–39	60	39	21	97	91	6	1,247	1,073	170	11	10	1
40–44	35	23	12	73	69	4	643	549	91	5	5	0
45–54	36	23	13	103	100	3	946	836	109	11	11	0
55–64	12	9	3	26	25	1	396	358	38	4	4	0
65+	1	1	0	13	12	1	91	78	13	0	0	0
Unknown Age	0	0	0	1	1	0	2	2	0	0	0	0
TOTAL	**372**	**253**	**119**	**846**	**800**	**46**	**11,419**	**9,621**	**1,781**	**94**	**84**	**10**

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	0	0	0	0	0	0
10–14	3	2	1	0	0	0	4	3	1	2	0	2
15–19	353	248	105	26	20	6	393	307	85	87	65	22
20–24	1,468	1,177	290	126	100	26	1,496	1,295	200	390	338	52
25–29	2,079	1,708	370	132	120	12	1,753	1,564	185	452	406	46
30–34	1,909	1,560	349	118	109	9	1,343	1,196	144	347	298	48
35–39	1,468	1,227	241	93	75	18	960	844	116	264	215	48
40–44	1,085	929	155	52	49	3	627	558	69	170	146	24
45–54	2,154	1,958	195	72	69	3	807	736	71	269	240	29
55–64	1,102	1,032	68	25	25	0	229	205	24	135	124	11
65+	246	241	5	5	5	0	48	43	5	33	32	1
Unknown Age	4	4	0	0	0	0	3	3	0	0	0	0
TOTAL	**11,871**	**10,086**	**1,779**	**649**	**572**	**77**	**7,663**	**6,754**	**900**	**2,149**	**1,864**	**283**

* Total includes cases reported with unknown sex.

NOTE: These tables should be used only for race/Hispanic ethnicity comparisons. See Table 34 for age-specific cases and rates and Tables 27–29 for total and sex-specific cases and rates. Primary and secondary syphilis reported among children aged 0–4 may represent the misclassification of congenitally-acquired syphilis. Cases reported as congenitally-acquired syphilis (congenital syphilis) can be found in Table 40.

Table 35B. Primary and Secondary Syphilis — Rates of Reported Cases* by Race/Hispanic Ethnicity, Age Group, and Sex, United States, 2018

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	0.1	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	0.0	0.0	0.0	0.4	0.3	0.5	0.0	0.0	0.0
15–19	14.4	16.3	12.4	2.4	4.3	0.6	23.7	32.8	14.4	9.8	19.2	0.0
20–24	31.4	44.8	17.4	13.1	24.2	1.7	75.0	118.5	30.1	47.8	71.4	23.2
25–29	35.1	43.8	26.0	11.6	22.6	1.0	89.1	152.7	25.3	40.5	70.7	8.0
30–34	44.2	66.7	21.5	9.7	19.0	1.1	68.2	123.2	16.2	33.9	58.4	8.2
35–39	39.1	51.2	27.2	6.4	12.9	0.7	45.7	82.7	11.9	24.1	42.8	4.5
40–44	24.9	33.3	16.8	5.1	10.3	0.5	25.9	47.0	6.9	12.9	25.4	0.0
45–54	12.0	15.8	8.4	4.0	8.4	0.2	18.0	34.0	3.9	15.4	31.3	0.0
55–64	4.1	6.6	1.9	1.3	2.7	0.1	8.2	16.2	1.5	6.8	13.9	0.0
65+	0.4	0.8	0.0	0.6	1.2	0.1	2.0	4.2	0.5	0.0	0.0	0.0
Unknown Age												
TOTAL	**15.5**	**21.4**	**9.8**	**4.6**	**9.1**	**0.5**	**28.1**	**49.5**	**8.4**	**16.3**	**29.0**	**3.5**

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	0.1	0.1	0.0
15–19	3.1	4.3	1.9	3.6	5.5	1.7	8.0	12.3	3.5
20–24	12.3	19.2	5.0	19.8	31.1	8.3	30.9	51.8	8.6
25–29	16.2	26.1	5.9	25.1	46.7	4.5	36.6	62.3	8.1
30–34	15.4	24.9	5.7	29.1	56.6	4.2	29.7	50.3	6.7
35–39	12.2	20.2	4.0	26.4	45.2	9.6	21.7	36.9	5.4
40–44	9.7	16.5	2.8	18.1	36.2	2.0	15.5	27.1	3.5
45–54	8.0	14.7	1.5	14.3	29.0	1.1	11.7	21.2	2.1
55–64	3.7	7.1	0.4	6.0	12.6	0.0	4.9	9.0	1.0
65+	0.6	1.4	0.0	1.3	2.9	0.0	1.1	2.4	0.2
Unknown Age									
TOTAL	**6.0**	**10.3**	**1.8**	**9.4**	**16.7**	**2.2**	**13.0**	**22.7**	**3.1**

* Per 100,000.

† Total includes cases reported with unknown sex.

NOTE: These tables should be used only for race/Hispanic ethnicity comparisons. See Table 34 for age-specific cases and rates and Tables 27–29 for total and sex-specific cases and rates. Primary and secondary syphilis reported among children aged 0–4 may represent the misclassification of congenitally-acquired syphilis. Cases reported as congenitally-acquired syphilis (congenital syphilis) can be found in Table 40. No population data exist for unknown sex, unknown age, or other/unknown race; therefore rates are not calculated.

Table 36. Early Non-Primary Non-Secondary Syphilis — Reported Cases and Rates of Reported Cases by State/Territory and Region in Alphabetical Order, United States, 2014–2018

State/Territory	Cases					Rates per 100,000 Population				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Alabama	144	177	293	425	447	3.0	3.6	6.0	8.7	9.2
Alaska	25	13	13	9	41	3.4	1.8	1.8	1.2	5.5
Arizona	311	361	488	620	898	4.6	5.3	7.0	8.8	12.8
Arkansas	152	216	280	328	364	5.1	7.3	9.4	10.9	12.1
California	3,396	4,435	5,289	7,028	7,708	8.8	11.3	13.5	17.8	19.5
Colorado	164	212	274	281	362	3.1	3.9	4.9	5.0	6.5
Connecticut	62	97	84	145	77	1.7	2.7	2.3	4.0	2.1
Delaware	33	47	57	49	36	3.5	5.0	6.0	5.1	3.7
District of Columbia	142	200	355	341	336	21.6	29.8	52.1	49.1	48.4
Florida	1,886	2,288	2,634	3,033	3,939	9.5	11.3	12.8	14.5	18.8
Georgia	1,078	1,477	1,263	1,218	1,517	10.7	14.5	12.2	11.7	14.5
Hawaii	25	56	89	58	87	1.8	3.9	6.2	4.1	6.1
Idaho	12	24	33	41	33	0.7	1.5	2.0	2.4	1.9
Illinois	819	889	1,138	1,192	1,464	6.4	6.9	8.9	9.3	11.4
Indiana	129	220	247	250	359	2.0	3.3	3.7	3.7	5.4
Iowa	82	69	59	91	85	2.6	2.2	1.9	2.9	2.7
Kansas	92	153	178	202	291	3.2	5.3	6.1	6.9	10.0
Kentucky	169	164	189	236	294	3.8	3.7	4.3	5.3	6.6
Louisiana	372	439	568	623	576	8.0	9.4	12.1	13.3	12.3
Maine	7	10	6	36	43	0.5	0.8	0.5	2.7	3.2
Maryland	529	594	598	683	857	8.9	9.9	9.9	11.3	14.2
Massachusetts	282	355	538	549	620	4.2	5.2	7.9	8.0	9.0
Michigan	243	282	290	330	407	2.5	2.8	2.9	3.3	4.1
Minnesota	159	185	251	313	286	2.9	3.4	4.5	5.6	5.1
Mississippi	336	405	490	555	937	11.2	13.5	16.4	18.6	31.4
Missouri	240	247	276	423	546	4.0	4.1	4.5	6.9	8.9
Montana	1	5	6	23	25	0.1	0.5	0.6	2.2	2.4
Nebraska	19	5	19	26	37	1.0	0.3	1.0	1.4	1.9
Nevada	389	439	510	498	512	13.7	15.2	17.3	16.6	17.1
New Hampshire	22	16	33	37	41	1.7	1.2	2.5	2.8	3.1
New Jersey	612	714	755	865	788	6.8	8.0	8.4	9.6	8.8
New Mexico	76	71	118	120	161	3.6	3.4	5.7	5.7	7.7
New York	2,307	2,802	3,504	3,914	4,097	11.7	14.2	17.7	19.7	20.6
North Carolina	468	753	799	771	797	4.7	7.5	7.9	7.5	7.8
North Dakota	22	17	12	12	13	3.0	2.2	1.6	1.6	1.7
Ohio	265	326	389	454	481	2.3	2.8	3.3	3.9	4.1
Oklahoma	198	222	339	478	342	5.1	5.7	8.6	12.2	8.7
Oregon	149	214	250	205	299	3.8	5.3	6.1	4.9	7.2
Pennsylvania	641	770	982	1,100	1,192	5.0	6.0	7.7	8.6	9.3
Rhode Island	49	38	63	71	71	4.6	3.6	6.0	6.7	6.7
South Carolina	467	496	613	687	732	9.7	10.1	12.4	13.7	14.6
South Dakota	23	11	14	19	9	2.7	1.3	1.6	2.2	1.0
Tennessee	236	312	337	412	472	3.6	4.7	5.1	6.1	7.0
Texas	1,984	2,471	2,872	3,680	4,245	7.4	9.0	10.3	13.0	15.0
Utah	41	31	61	85	101	1.4	1.0	2.0	2.7	3.3
Vermont	7	6	14	13	18	1.1	1.0	2.2	2.1	2.9
Virginia	274	410	602	659	668	3.3	4.9	7.2	7.8	7.9
Washington	198	293	446	588	599	2.8	4.1	6.1	7.9	8.1
West Virginia	23	40	51	34	55	1.2	2.2	2.8	1.9	3.0
Wisconsin	91	95	150	199	163	1.6	1.6	2.6	3.4	2.8
Wyoming	1	1	5	4	11	0.2	0.2	0.9	0.7	1.9
US TOTAL	**19,452**	**24,173**	**28,924**	**34,013**	**38,539**	**6.1**	**7.5**	**9.0**	**10.4**	**11.8**
Northeast	3,989	4,808	5,979	6,730	6,947	7.1	8.5	10.6	11.9	12.3
Midwest	2,184	2,499	3,023	3,511	4,141	3.2	3.7	4.4	5.1	6.1
South	8,491	10,711	12,340	14,212	16,614	7.1	8.8	10.1	11.5	13.4
West	4,788	6,155	7,582	9,560	10,837	6.4	8.1	9.9	12.3	14.0
American Samoa	NR	NR	NR	NR	0	—	—	—	—	0.0
Guam	1	2	1	3	3	0.6	1.2	0.6	1.8	1.8
Northern Mariana Islands	NR	NR	NR	NR	0	—	—	—	—	0.0
Puerto Rico	375	565	570	527	577	10.6	16.3	16.7	15.7	17.2
Virgin Islands	0	7	2	0	NR	0.0	6.8	1.9	0.0	—
TERRITORIES	**376**	**574**	**573**	**530**	**580**	**9.9**	**15.4**	**15.5**	**14.6**	**16.0**
TOTAL	**19,828**	**24,747**	**29,497**	**34,543**	**39,119**	**6.1**	**7.6**	**9.0**	**10.5**	**11.9**

NR = No report.

NOTE: See Section A1.11 in the Appendix for more information on interpreting case counts and rates in US territories.

Table 37. Early Non-Primary Non-Secondary Syphilis — Reported Cases and Rates of Reported Cases in Selected Metropolitan Statistical Areas (MSAs)* in Alphabetical Order, United States, 2014–2018

MSAs	Cases					Rates per 100,000 Population				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Atlanta-Sandy Springs-Roswell, GA	863	1,067	1,053	1,027	1,197	15.4	18.7	18.2	17.5	20.3
Austin-Round Rock, TX	207	242	291	424	388	10.7	12.1	14.2	20.0	18.3
Baltimore-Columbia-Towson, MD	296	344	358	337	454	10.6	12.3	12.8	12.0	16.2
Birmingham-Hoover, AL	46	60	79‡	124	135	4.0	5.2	6.9‡	10.8	11.7
Boston-Cambridge-Newton, MA-NH	208	235†	408†	429	479	4.4	4.9†	8.5†	8.9	9.9
Buffalo-Cheektowaga-Niagara Falls, NY	19	37	29	32	44	1.7	3.3	2.6	2.8	3.9
Charlotte-Concord-Gastonia, NC-SC	129	206	264	259	258	5.4	8.5	10.7	10.3	10.2
Chicago-Naperville-Elgin, IL-IN-WI	734	814	1,058	1,091	1,369	7.7	8.5	11.1	11.4	14.4
Cincinnati, OH-KY-IN	98	92	74	83	117	4.6	4.3	3.4	3.8	5.4
Cleveland-Elyria, OH	31	37	63	73	58	1.5	1.8	3.1	3.5	2.8
Columbus, OH	82	130	149	183	167	4.1	6.4	7.3	8.8	8.0
Dallas-Fort Worth-Arlington, TX	644	932	1,038	1,256	1,334	9.3	13.1	14.4	17.0	18.0
Denver-Aurora-Lakewood, CO	145	175	212	213	283	5.3	6.2	7.4	7.4	9.8
Detroit-Warren-Dearborn, MI	163	206	194	196	265	3.8	4.8	4.5	4.5	6.1
Hartford-West Hartford-East Hartford, CT	16	31	20	31	20	1.3	2.6	1.7	2.6	1.7
Houston-The Woodlands-Sugar Land, TX	444	522	585	740	1,026	6.8	7.8	8.6	10.7	14.9
Indianapolis-Carmel-Anderson, IN	91	143	165	161	223	4.6	7.2	8.2	7.9	11.0
Jacksonville, FL	69	162	137	191	202	4.9	11.2	9.3	12.7	13.4
Kansas City, MO-KS	132	133	140	158	247	6.4	6.4	6.7	7.4	11.6
Las Vegas-Henderson-Paradise, NV	375	413	470	451	447	18.1	19.5	21.8	20.5	20.3
Los Angeles-Long Beach-Anaheim, CA	1,619	2,052	2,403	3,119	3,565	12.2	15.4	18.1	23.4	26.7
Louisville-Jefferson County, KY-IN	82	90	118	143	166	6.5	7.0	9.2	11.1	12.8
Memphis, TN-MS-AR	143	195	246	244	256	10.6	14.5	18.3	18.1	19.0
Miami-Fort Lauderdale-West Palm Beach, FL	1,094	1,220	1,282	1,569	2,071	18.4	20.3	21.1	25.5	33.6
Milwaukee-Waukesha-West Allis, WI	69	66	108	130	93	4.4	4.2	6.9	8.2	5.9
Minneapolis-St. Paul-Bloomington, MN-WI	155	170	226	280	214	4.4	4.8	6.4	7.8	5.9
Nashville-Davidson-Murfreesboro-Franklin, TN	83	82	72	102	179	4.6	4.5	3.9	5.4	9.4
New Orleans-Metairie, LA	122	171	242	244	271	9.7	13.5	19.1	19.1	21.2
New York-Newark-Jersey City, NY-NJ-PA	2,681	3,210	4,008	4,405	4,522	13.3	15.9	19.9	21.7	22.3
Oklahoma City, OK	107	114	195	270	179	8.0	8.4	14.2	19.5	12.9
Orlando-Kissimmee-Sanford, FL	180	266	377	359	490	7.8	11.1	15.4	14.3	19.5
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	512	616	736	835	796	8.5	10.1	12.1	13.7	13.1
Phoenix-Mesa-Scottsdale, AZ	240	268	381	440	697	5.3	5.9	8.2	9.3	14.7
Pittsburgh, PA	63	111	125	109	129	2.7	4.7	5.3	4.7	5.5
Portland-Vancouver-Hillsboro, OR-WA	124	170	226	187	266	5.3	7.1	9.3	7.6	10.8
Providence-Warwick, RI-MA	64	48†	71†	92	91	4.0	3.0†	4.4†	5.7	5.6
Raleigh, NC	77	115	135	130	105	6.2	9.0	10.4	9.7	7.9
Richmond, VA	68	98	162	157	162	5.4	7.7	12.6	12.1	12.5
Riverside-San Bernardino-Ontario, CA	223	311	379	513	605	5.0	6.9	8.4	11.2	13.2
Sacramento-Roseville-Arden-Arcade, CA	74	137	133	194	244	3.3	6.0	5.8	8.3	10.5
Salt Lake City, UT	31	23	43	55	71	2.7	2.0	3.6	4.6	5.9
San Antonio-New Braunfels, TX	308	258	339	485	553	13.2	10.8	14.0	19.6	22.4
San Diego-Carlsbad, CA	299	343	461	550	535	9.2	10.4	13.9	16.5	16.0
San Francisco-Oakland-Hayward, CA	839	964	919	1,218	1,264	18.3	20.7	19.6	25.8	26.7
San Jose-Sunnyvale-Santa Clara, CA	58	96	135	200	233	3.0	4.9	6.8	10.0	11.7
Seattle-Tacoma-Bellevue, WA	143	221	303	424	422	3.9	5.9	8.0	11.0	10.9
St. Louis, MO-IL	139	138	151	245	233	5.0	4.9	5.4	8.7	8.3
Tampa-St. Petersburg-Clearwater, FL	227	258	364	296	392	7.8	8.7	12.0	9.6	12.7
Virginia Beach-Norfolk-Newport News, VA-NC	90	167	245	270	244	5.2	9.7	14.2	15.6	14.1
Washington-Arlington-Alexandria, DC-VA-MD-WV	286	320	355	820	893	4.7	5.2	5.8	13.2	14.4
SELECTED MSAs TOTAL	**14,992**	**18,279**	**21,727**	**25,544**	**28,654**	**8.6**	**10.3**	**12.2**	**14.2**	**15.9**

* MSAs were selected on the basis of the largest population in the 2010 US 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 Section A1.4 in the Appendix for more information.

‡ 2016 county data for Alabama have been corrected and may not match previous reports.

Table 38. Unknown Duration or Late Syphilis* — Reported Cases and Rates of Reported Cases by State/Territory and Region in Alphabetical Order, United States, 2014–2018

State/Territory	Cases					Rates per 100,000 Population				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Alabama	167	197	232	347	354	3.4	4.1	4.8	7.1	7.3
Alaska	5	3	3	6	16	0.7	0.4	0.4	0.8	2.2
Arizona	558	532	680	829	1,243	8.3	7.8	9.8	11.8	17.7
Arkansas	110	145	131	156	287	3.7	4.9	4.4	5.2	9.6
California	4,110	4,966	6,216	7,787	9,609	10.6	12.7	15.8	19.7	24.3
Colorado	5	96	211	240	378	0.1	1.8	3.8	4.3	6.7
Connecticut	21	30	23	28	94	0.6	0.8	0.6	0.8	2.6
Delaware	30	21	34	88	63	3.2	2.2	3.6	9.1	6.5
District of Columbia	23	26	51	230	148	3.5	3.9	7.5	33.1	21.3
Florida	2,429	2,723	3,233	3,435	3,773	12.2	13.4	15.7	16.4	18.0
Georgia	1,055	1,245	1,478	1,580	1,773	10.4	12.2	14.3	15.1	17.0
Hawaii	13	14	13	10	27	0.9	1.0	0.9	0.7	1.9
Idaho	22	21	44	46	54	1.3	1.3	2.6	2.7	3.1
Illinois	1,087	1,285	1,623	1,399	1,570	8.4	10.0	12.7	10.9	12.3
Indiana	170	189	197	211	258	2.6	2.9	3.0	3.2	3.9
Iowa	84	88	127	96	112	2.7	2.8	4.1	3.1	3.6
Kansas	48	0	0	3	44	1.7	0.0	0.0	0.1	1.5
Kentucky	117	123	159	218	212	2.7	2.8	3.6	4.9	4.8
Louisiana	1,180	1,277	1,233	1,495	1,456	25.4	27.3	26.3	31.9	31.1
Maine	0	0	16	31	30	0.0	0.0	1.2	2.3	2.2
Maryland	481	749	719	783	913	8.0	12.5	12.0	12.9	15.1
Massachusetts	227	486	416	387	133	3.4	7.2	6.1	5.6	1.9
Michigan	416	393	424	447	622	4.2	4.0	4.3	4.5	6.2
Minnesota	215	220	289	327	330	3.9	4.0	5.2	5.9	5.9
Mississippi	116	136	107	71	50	3.9	4.5	3.6	2.4	1.7
Missouri	178	220	271	397	544	2.9	3.6	4.4	6.5	8.9
Montana	0	2	4	13	34	0.0	0.2	0.4	1.2	3.2
Nebraska	26	31	34	48	63	1.4	1.6	1.8	2.5	3.3
Nevada	142	133	347	575	775	5.0	4.6	11.8	19.2	25.9
New Hampshire	21	28	27	29	31	1.6	2.1	2.0	2.2	2.3
New Jersey	263	220	381	489	406	2.9	2.5	4.3	5.4	4.5
New Mexico	80	141	160	196	337	3.8	6.8	7.7	9.4	16.1
New York	3,073	2,975	3,484	3,592	3,404	15.6	15.0	17.6	18.1	17.1
North Carolina	791	783	756	1,015	1,075	8.0	7.8	7.5	9.9	10.5
North Dakota	16	14	16	22	30	2.2	1.8	2.1	2.9	4.0
Ohio	381	445	483	596	667	3.3	3.8	4.2	5.1	5.7
Oklahoma	59	83	90	95	253	1.5	2.1	2.3	2.4	6.4
Oregon	159	218	227	283	299	4.0	5.4	5.5	6.8	7.2
Pennsylvania	346	356	295	335	416	2.7	2.8	2.3	2.6	3.2
Rhode Island	40	48	81	79	117	3.8	4.5	7.7	7.5	11.0
South Carolina	28	41	36	40	27	0.6	0.8	0.7	0.8	0.5
South Dakota	16	21	15	20	23	1.9	2.4	1.7	2.3	2.6
Tennessee	502	575	713	543	688	7.7	8.7	10.7	8.1	10.2
Texas	4,110	4,047	4,666	6,035	5,819	15.2	14.7	16.7	21.3	20.6
Utah	61	73	106	97	152	2.1	2.4	3.5	3.1	4.9
Vermont	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Virginia	137	276	235	551	659	1.6	3.3	2.8	6.5	7.8
Washington	310	366	400	480	504	4.4	5.1	5.5	6.5	6.8
West Virginia	4	17	45	25	64	0.2	0.9	2.5	1.4	3.5
Wisconsin	108	88	140	176	193	1.9	1.5	2.4	3.0	3.3
Wyoming	1	4	5	11	8	0.2	0.7	0.9	1.9	1.4
US TOTAL	**23,541**	**26,170**	**30,676**	**35,992**	**40,137**	**7.4**	**8.1**	**9.5**	**11.1**	**12.3**
Northeast	3,991	4,143	4,723	4,970	4,631	7.1	7.4	8.4	8.8	8.2
Midwest	2,745	2,994	3,619	3,742	4,456	4.1	4.4	5.3	5.5	6.5
South	11,339	12,464	13,918	16,707	17,614	9.5	10.3	11.4	13.5	14.2
West	5,466	6,569	8,416	10,573	13,436	7.3	8.6	11.0	13.7	17.4
American Samoa	NR	NR	NR	NR	0	—	—	—	—	0.0
Guam	5	16	10	5	9	3.1	9.9	6.0	3.0	5.4
Northern Mariana Islands	NR	NR	NR	NR	1	—	—	—	—	1.9
Puerto Rico	101	166	117	110	138	2.8	4.8	3.4	3.3	4.1
Virgin Islands	4	10	0	0	NR	3.8	9.7	0.0	0.0	—
TERRITORIES	**110**	**192**	**127**	**115**	**148**	**2.9**	**5.1**	**3.4**	**3.2**	**4.1**
TOTAL	**23,651**	**26,362**	**30,803**	**36,107**	**40,285**	**7.3**	**8.1**	**9.4**	**11.0**	**12.2**

* The case classification of 'Unknown duration or late syphilis' went into effect in January 2018. During 2014–2017, cases in this category include cases classified as late latent syphilis and late syphilis with clinical manifestations. See Appendix A1.9 for a detailed explanation of changes to the syphilis case definition.
NR = No report.
NOTE: See Section A1.11 in the Appendix for more information on interpreting case counts and rates in US territories.

Table 39. Unknown Duration or Late Syphilis* — Reported Cases and Rates of Reported Cases in Selected Metropolitan Statistical Areas (MSAs)† in Alphabetical Order, United States, 2014–2018

MSAs	Cases					Rates per 100,000 Population				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Atlanta-Sandy Springs-Roswell, GA	804	927§	1,135	1,146	1,249	14.3	16.2§	19.6	19.5	21.2
Austin-Round Rock, TX	246	175	212	226	295	12.7	8.7	10.3	10.7	13.9
Baltimore-Columbia-Towson, MD	226	316	327	389	470	8.1	11.3	11.7	13.9	16.7
Birmingham-Hoover, AL	53	62	57‡	68	85	4.6	5.4	5.0‡	5.9	7.4
Boston-Cambridge-Newton, MA-NH	159§	319§	271§	266	104	3.4§	6.7§	5.7§	5.5	2.2
Buffalo-Cheektowaga-Niagara Falls, NY	67	53	54	83	65	5.9	4.7	4.8	7.3	5.7
Charlotte-Concord-Gastonia, NC-SC	183	191	201	252	247	7.7	7.9	8.1	10.0	9.8
Chicago-Naperville-Elgin, IL-IN-WI	988	1,169	1,529	1,288	1,424	10.3	12.2	16.1	13.5	14.9
Cincinnati, OH-KY-IN	124	129	105	136	149	5.8	6.0	4.8	6.2	6.8
Cleveland-Elyria, OH	88	120	159	176	181	4.3	5.8	7.7	8.5	8.8
Columbus, OH	101	106	109	155	149	5.1	5.2	5.3	7.5	7.2
Dallas-Fort Worth-Arlington, TX	1,065	837	1,069	1,854	1,773	15.3	11.8	14.8	25.1	24.0
Denver-Aurora-Lakewood, CO	0	59	150	185	268	0.0	2.1	5.3	6.4	9.3
Detroit-Warren-Dearborn, MI	312	291	295	312	412	7.3	6.8	6.9	7.2	9.6
Hartford-West Hartford-East Hartford, CT	10	8	3	3	27	0.8	0.7	0.2	0.2	2.2
Houston-The Woodlands-Sugar Land, TX	1,430	1,592	1,805	2,060	1,857	22.0	23.9	26.7	29.9	26.9
Indianapolis-Carmel-Anderson, IN	83	93	87	106	125	4.2	4.7	4.3	5.2	6.2
Jacksonville, FL	128	179	181	249	254	9.0	12.3	12.2	16.5	16.9
Kansas City, MO-KS	54	40	87	92	183	2.6	1.9	4.1	4.3	8.6
Las Vegas-Henderson-Paradise, NV	133	102	315	513	675	6.4	4.8	14.6	23.3	30.6
Los Angeles-Long Beach-Anaheim, CA	1,679	1,902	2,532	3,164	3,338	12.7	14.3	19.0	23.7	25.0
Louisville-Jefferson County, KY-IN	70	92	112	127	121	5.5	7.2	8.7	9.8	9.4
Memphis, TN-MS-AR	236	256	336	257	322	17.6	19.0	25.0	19.1	23.9
Miami-Fort Lauderdale-West Palm Beach, FL	1,371	1,524	1,868	1,745	1,920	23.1	25.3	30.8	28.3	31.2
Milwaukee-Waukesha-West Allis, WI	63	43	70	84	85	4.0	2.7	4.5	5.3	5.4
Minneapolis-St. Paul-Bloomington, MN-WI	187	192	251	261	265	5.4	5.4	7.1	7.2	7.4
Nashville-Davidson-Murfreesboro-Franklin, TN	148	161	196	101	168	8.3	8.8	10.5	5.3	8.8
New Orleans-Metairie, LA	383	370	363	391	394	30.6	29.3	28.6	30.6	30.9
New York-Newark-Jersey City, NY-NJ-PA	3,057	2,915	3,534	3,687	3,506	15.2	14.4	17.5	18.1	17.3
Oklahoma City, OK	31	32	47	42	104	2.3	2.4	3.4	3.0	7.5
Orlando-Kissimmee-Sanford, FL	364	344	416	509	522	15.7	14.4	17.0	20.3	20.8
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD	311	314	266	342	380	5.1	5.2	4.4	5.6	6.2
Phoenix-Mesa-Scottsdale, AZ	397	394	534	645	945	8.8	8.6	11.5	13.6	19.9
Pittsburgh, PA	13	11	11	12	23	0.6	0.5	0.5	0.5	1.0
Portland-Vancouver-Hillsboro, OR-WA	143	171	173	207	221	6.1	7.2	7.1	8.4	9.0
Providence-Warwick, RI-MA	48§	74§	102§	105§	123	3.0§	4.6§	6.3§	6.5§	7.6
Raleigh, NC	111	125	109	169	170	8.9	9.8	8.4	12.7	12.7
Richmond, VA	9	36	35	111	107	0.7	2.8	2.7	8.6	8.3
Riverside-San Bernardino-Ontario, CA	432	508	707	911	1,319	9.7	11.3	15.6	19.9	28.8
Sacramento-Roseville-Arden-Arcade, CA	134	205	199	264	361	6.0	9.0	8.7	11.4	15.5
Salt Lake City, UT	39	50	76	61	80	3.4	4.3	6.4	5.1	6.6
San Antonio-New Braunfels, TX	448	483	531	612	585	19.2	20.3	21.9	24.7	23.6
San Diego-Carlsbad, CA	310	367	425	576	697	9.5	11.1	12.8	17.3	20.9
San Francisco-Oakland-Hayward, CA	502	553	629	691	800	10.9	11.9	13.4	14.6	16.9
San Jose-Sunnyvale-Santa Clara, CA	125	129	145	237	339	6.4	6.5	7.3	11.9	17.0
Seattle-Tacoma-Bellevue, WA	211	224	268	321	314	5.7	6.0	7.1	8.3	8.1
St. Louis, MO-IL	119	165	160	254	295	4.2	5.9	5.7	9.0	10.5
Tampa-St. Petersburg-Clearwater, FL	255	299	326	392	393	8.7	10.0	10.8	12.7	12.7
Virginia Beach-Norfolk-Newport News, VA-NC	45	90	65	122	201	2.6	5.2	3.8	7.1	11.7
Washington-Arlington-Alexandria, DC-VA-MD-WV	295	501	474	827	816	4.9	8.2	7.7	13.3	13.1
SELECTED MSAs TOTAL	**17,790**	**19,298**	**23,111**	**26,786**	**28,906**	**10.2**	**10.9**	**13.0**	**14.9**	**16.1**

* The case classification of 'Unknown duration or late syphilis' went into effect in January 2018. During 2014–2017, cases in this category include cases classified as late latent syphilis and late syphilis with clinical manifestations. See Appendix A1.9 for a detailed explanation of changes to the syphilis case definition.

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

‡ 2016 county data for Alabama have been corrected and may not match previous reports.

§ 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 Section A1.4 in the Appendix for more information.

Table 40. Congenital Syphilis — Reported Cases and Rates of Reported Cases by State, Ranked by Rates, United States, 2018

Rank*	State†	Cases	Rate per 100,000 Live Births
1	Texas	367	92.2
2	Nevada	31	85.5
3	Louisiana	46	72.8
4	Arizona	61	72.2
5	California	332	67.9
6	Arkansas	25	65.3
7	Florida	108	48.0
8	New Mexico	10	40.5
9	Maryland	29	39.7
	US TOTAL‡	**1,306**	**33.1**
10	Georgia	31	23.8
11	Oklahoma	12	22.8
12	Missouri	17	22.8
13	Hawaii	4	22.1
14	Oregon	10	22.0
15	Kansas	8	21.0
16	Illinois	29	18.8
17	Kentucky	9	16.2
18	South Carolina	9	15.7
19	Tennessee	12	14.9
20	Ohio	20	14.5
21	Minnesota	10	14.3
22	North Carolina	17	14.1
23	New Jersey	13	12.7
24	New York	28	12.0
25	Alabama	7	11.8
26	Michigan	13	11.5
27	Colorado	7	10.5
28	Alaska	1	8.9
29	Virginia	9	8.8
30	New Hampshire	1	8.2
31	South Dakota	1	8.1
32	Mississippi	3	7.9
33	Washington	7	7.7
34	Iowa	3	7.6
35	Pennsylvania	9	6.5
36	Connecticut	2	5.6
37	West Virginia	1	5.2
38	Idaho	1	4.4
39	Utah	1	2.0
40	Wisconsin	1	1.5
41	Indiana	1	1.2
	Delaware	0	0.0
	Maine	0	0.0
	Massachusetts	0	0.0
	Montana	0	0.0
	Nebraska	0	0.0
	North Dakota	0	0.0
	Rhode Island	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 0 cases and a rate of 0.0 cases per 100,000 live births, but excludes territories.

Table 41. Congenital Syphilis — Reported Cases and Rates of Reported Cases by Year of Birth, State/Territory* and Region in Alphabetical Order, United States, 2014–2018

State/Territory	Cases					Rates per 100,000 Live Births				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Alabama	3	3	4	6	7	5.0	5.0	6.8	10.1	11.8
Alaska	0	0	0	0	1	0.0	0.0	0.0	0.0	8.9
Arizona	13	14	16	32	61	15.0	16.4	18.9	37.9	72.2
Arkansas	7	5	6	8	25	18.2	12.9	15.7	20.9	65.3
California	102	140	207	281	332	20.3	28.5	42.3	57.5	67.9
Colorado	0	0	4	4	7	0.0	0.0	6.0	6.0	10.5
Connecticut	0	1	0	0	2	0.0	2.8	0.0	0.0	5.6
Delaware	0	1	0	0	0	0.0	9.0	0.0	0.0	0.0
District of Columbia	0	1	1	0	0	0.0	10.4	10.1	0.0	0.0
Florida	48	38	60	93	108	21.8	16.9	26.7	41.3	48.0
Georgia	17	21	21	23	31	13.0	16.0	16.1	17.7	23.8
Hawaii	0	2	1	3	4	0.0	10.9	5.5	16.6	22.1
Idaho	0	0	0	0	1	0.0	0.0	0.0	0.0	4.4
Illinois	27	31	18	22	29	17.0	19.6	11.7	14.2	18.8
Indiana	8	5	8	8	1	9.5	5.9	9.6	9.6	1.2
Iowa	1	0	1	2	3	2.5	0.0	2.5	5.1	7.6
Kansas	0	0	1	0	8	0.0	0.0	2.6	0.0	21.0
Kentucky	3	1	5	6	9	5.3	1.8	9.0	10.8	16.2
Louisiana	46	54	48	59	46	71.3	83.5	76.0	93.4	72.8
Maine	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Maryland	16	18	16	20	29	21.6	24.5	21.9	27.3	39.7
Massachusetts	3	4	3	0	0	4.2	5.6	4.2	0.0	0.0
Michigan	15	11	13	10	13	13.1	9.7	11.5	8.8	11.5
Minnesota	0	2	7	2	10	0.0	2.9	10.0	2.9	14.3
Mississippi	1	0	2	1	3	2.6	0.0	5.3	2.6	7.9
Missouri	1	4	8	10	17	1.3	5.3	10.7	13.4	22.8
Montana	0	0	0	1	0	0.0	0.0	0.0	8.1	0.0
Nebraska	1	0	1	1	0	3.7	0.0	3.8	3.8	0.0
Nevada	5	8	12	24	31	13.9	22.0	33.1	66.2	85.5
New Hampshire	0	0	0	0	1	0.0	0.0	0.0	0.0	8.2
New Jersey	0	0	12	14	13	0.0	0.0	11.7	13.6	12.7
New Mexico	1	2	3	1	10	3.8	7.7	12.1	4.0	40.5
New York	22	12	13	16	28	9.2	5.1	5.5	6.8	12.0
North Carolina	6	9	18	25	17	5.0	7.4	14.9	20.7	14.1
North Dakota	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Ohio	15	17	12	18	20	10.8	12.2	8.7	13.0	14.5
Oklahoma	6	7	3	7	12	11.2	13.2	5.7	13.3	22.8
Oregon	2	6	6	8	10	4.4	13.1	13.2	17.6	22.0
Pennsylvania	4	7	5	7	9	2.8	5.0	3.6	5.0	6.5
Rhode Island	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
South Carolina	5	3	9	8	9	8.7	5.2	15.7	14.0	15.7
South Dakota	3	0	2	3	1	24.4	0.0	16.3	24.4	8.1
Tennessee	2	5	8	10	12	2.5	6.1	9.9	12.4	14.9
Texas	75	52	71	179	367	18.8	12.9	17.8	45.0	92.2
Utah	0	0	0	0	1	0.0	0.0	0.0	0.0	2.0
Vermont	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Virginia	2	3	8	12	9	1.9	2.9	7.8	11.7	8.8
Washington	2	5	3	6	7	2.3	5.6	3.3	6.6	7.7
West Virginia	0	0	2	2	1	0.0	0.0	10.5	10.5	5.2
Wisconsin	0	0	1	3	1	0.0	0.0	1.5	4.5	1.5
Wyoming	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
US TOTAL	**462**	**492**	**639**	**935**	**1,306**	**11.6**	**12.4**	**16.2**	**23.7**	**33.1**
Northeast	29	24	33	37	53	4.6	3.8	5.3	5.9	8.5
Midwest	71	70	72	79	103	8.5	8.4	8.7	9.5	12.4
South	237	221	282	459	685	15.4	14.3	18.4	29.9	44.7
West	125	177	252	360	465	12.8	18.4	26.3	37.5	48.5
American Samoa	NR	NR	NR	NR	0	—	—	—	—	0.0
Guam	0	2	0	0	0	0.0	59.4	0.0	0.0	0.0
Northern Mariana Islands	NR	NR	NR	NR	0	—	—	—	—	0.0
Puerto Rico	0	5	5	7	8	0.0	16.0	17.7	24.8	28.3
Virgin Islands	0	0	0	0	NR	0.0	0.0	0.0	0.0	—
TERRITORIES	**0**	**7**	**5**	**7**	**8**	**0.0**	**19.5**	**15.2**	**21.3**	**23.3**
TOTAL	**462**	**499**	**644**	**942**	**1,314**	**11.5**	**12.4**	**16.2**	**23.7**	**33.0**

* Mother's state/territory of residence was used to assign case.
NR = No report.
NOTE: See Section A1.11 in the Appendix for more information on interpreting case counts and rates in US territories.

Table 42. Congenital Syphilis — Reported Cases and Rates of Reported Cases* by Year of Birth and Race/Hispanic Ethnicity of Mother, United States, 2014–2018

Year of Birth	American Indians/Alaska Natives		Asians/Pacific Islanders		Blacks		Whites	
	Cases	Rates	Cases	Rates	Cases	Rates	Cases	Rates
2014	5	13.2	19	7.0	227	38.2	79	3.6
2015	4	10.7	15	5.5	207	34.8	97	4.5
2016	12	32.8	25	8.9	264	44.8	119	5.6
2017	14	38.2	13	4.6	357	60.6	210	9.9
2018	29	79.2	26	9.2	510	86.6	286	13.5

Year of Birth	Other		Hispanics		Unknown		Total	
	Cases	Rates	Cases	Rates	Cases	Rates	Cases	Rates
2014	9		112	12.3	11		462	11.6
2015	7		143	15.5	19		492	12.4
2016	8		189	20.6	22		639	16.2
2017	12		310	33.8	19		935	23.7
2018	13		411	44.7	31		1,306	33.1

* Per 100,000 live births.

NOTE: No population data exist for other or unknown race; therefore, rates are not calculated.

Table 43. Chancroid — Reported Cases and Rates of Reported Cases by State/Territory in Alphabetical Order, United States, 2014–2018

State/Territory	Cases					Rates per 100,000 Population				
	2014	2015	2016	2017	2018	2014	2015	2016	2017	2018
Alabama	0	0	1	0	0	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	1	0	0	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	4	2	2	1	1	0.0	0.0	0.0	0.0	0.0
Colorado	0	0	1	0	0	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	0	1	0	0	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	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Massachusetts	1	3	1	2	0	0.0	0.0	0.0	0.0	0.0
Michigan	0	0	0	1	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	0	0	1	1	0	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	1	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	1	2	0	2	1	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	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Washington	0	1	0	0	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	1	0	0	0	0.0	0.2	0.0	0.0	0.0
US TOTAL	**6**	**11**	**7**	**7**	**3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
American Samoa	NR	NR	NR	NR	0	—	—	—	—	0.0
Guam	0	0	0	0	0	0.0	0.0	0.0	0.0	0.0
Northern Mariana Islands	NR	NR	NR	NR	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	NR	0.0	0.0	0.0	0.0	—
TERRITORIES	**0**	**0**	**0**	**0**	**0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
TOTAL	**6**	**11**	**7**	**7**	**3**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

NR = No report.
NOTE: See Section A1.11 in the Appendix for more information on interpreting case counts and rates in US territories.

Table 44. Selected STDs and Complications — Initial Visits to Physicians' Offices, National Disease and Therapeutic Index (NDTI), United States, 1966–2016

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
2016	222,000	4,112,000	90,000

* 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 23% to 19%; 300,000–599,999 are from 19% to 16%; 600,000–999,999 are from 16% to 13%; and 1,000,000–5,000,000 are from 13% to 7%.
SOURCE: National Disease and Therapeutic Index, IMS Health, Integrated Promotional Services. IMS Health report, 1966–2016.

Appendix

A. Interpreting STD Surveillance Data

Sexually Transmitted Disease Surveillance 2018 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, Northern Mariana Islands, American Samoa, and the Virgin Islands. Selected tables and figures include data from these entities, identified as territories of the United States; however, the majority of national case counts and rates exclude data from these territories.

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) and via HL7 messaging using National Electronic Disease Surveillance System (NEDSS) standards.

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 territories 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 territories 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

As of December 31, 2003, all 50 states and the District of Columbia converted from summary hard copy reporting to electronic submission of line-listed (i.e., case-specific) data for chlamydia, gonorrhea, syphilis, and chancroid through NETSS. Though most of these areas report congenital syphilis and syphilitic stillbirths electronically, nine areas relied upon hard copy forms for reporting congenital syphilis and syphilitic stillbirths in 2018. Puerto Rico converted to electronic reporting in 2006 for all STDs, excluding congenital syphilis. American Samoa, Guam, Northern Mariana Islands, and the Virgin Islands continue to report STD data through summary hard copy forms.

Surveillance data sent to CDC through NETSS and on hard copy forms through June 19, 2019 are included in this report. The data presented in the figures and tables in this report supersede those in all earlier publications.

National Electronic Disease Surveillance System

In 2018, jurisdictions had the ability to transmit STD case notifications to CDC via HL7 messaging using NEDSS standards. Surveillance data sent to CDC via HL7 messaging from three jurisdictions (Connecticut, Idaho, and Oregon) are included in this report.

A1.2 Population Denominators and Rate Calculations

2000–2018 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 rates. The latest available year for population estimates at the time this report was written was 2017. Thus, 2017 population estimates were used to calculate 2018 rates.

Once published, the 2018 population estimates will be used to calculate 2018 rates in *Sexually Transmitted Disease Surveillance 2019*.

Population estimates for Puerto Rico were obtained from the US Census Bureau Web site at: https://factfinder.census.gov

Population estimates for American Samoa, Guam, Northern Mariana Islands, and the Virgin Islands were obtained from the US Census Bureau International Programs Web site at: www.census.gov/programs-surveys/international-programs.html.

The 2018 rates by age and sex for American Samoa, Guam, Northern Mariana Islands, and the Virgin Islands were calculated using the latest 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 2000–2017 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, 16, 17, 37, A, C, I, J, K, L, M, N, O, P, Q, R, and AA. Rates were grouped and displayed in 4 categories—zero cases and tertiles—in Figure 38.

1990–1999 Rates and Population

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

1981–1989 Rates and Population

Rates were calculated by using US 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 US Census Bureau and are currently maintained by CDC's Division of STD Prevention.

1941–2018 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 1941–2018. 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 2018, 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 2018 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 2018 were calculated by using live birth data for 2016.

2010–2018 Gay, Bisexual, and Other Men Who Have Sex with Men Rates and Population

Figures 26 and AA show rates of reported cases of gonorrhea and P&S syphilis among gay, bisexual, and other men who have sex with men (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 (2013–2017).[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. State-level estimates are then aggregated from the county-specific estimates.

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.

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

A1.4 Reporting of Surveillance Data by Geographic Areas

Metropolitan statistical area

Sexually Transmitted Disease Surveillance 2018 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.

County

Figures 4, 17, and 38 show county-level maps with rates of reported cases of chlamydia, gonorrhea, and P&S syphilis, respectively. Such county-level maps can be produced through NCHHSTP AtlasPlus, an interactive tool that allows users to create customized tables, maps, and charts using over 15 years of CDC's surveillance data on HIV, viral hepatitis, STD, and tuberculosis. Through the Map function, users can create custom maps to observe trends in the

number of cases or rates of specific STDs by state or county. For more information on county-level rates, go to https://www.cdc.gov/nchhstp/atlas.

A1.5 Reporting of Data for Race/Hispanic Ethnicity

In April 2008, the NETSS record layout was updated to conform to the OMB's current government-wide standard for race/Hispanic ethnicity data. The OMB standards were first issued in 1997.[10] Beginning with the publication of *Sexually Transmitted Disease Surveillance 2012*, the race/Hispanic ethnicity data are presented according to the current 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. As of 2018, most reporting jurisdictions are locally compliant with current OMB standards and report in the current OMB standard race categories, including Multirace. However, a small number of jurisdictions reported race in pre-1997 single race categories, while other jurisdictions were using current OMB standards categories but were unable to report more than one race per person in 2018.

For this report, all race/Hispanic ethnicity data reported by jurisdictions are summarized in tables, charts, and interpretative text *regardless of local compliance with the 1997 OMB standards*. A small number of cases reported in the legacy 'Asian/Pacific Islander' category from non-compliant jurisdictions are re-coded to 'Unknown' because these cases cannot be properly re-coded into an appropriate current OMB standards category of 'Asian' or 'Native Hawaiian/Other Pacific Islander.' No redistribution of cases is done; cases missing race and/or Hispanic ethnicity are not included in the calculation of rates by race/Hispanic ethnicity. As a consequence, rate data presented in this report underestimate actual case incidence in these population categories by a roughly similar proportion to the overall percentage of cases with missing/unknown race and Hispanic ethnicity.

Figures T, V, and X show rate ratios by race/Hispanic ethnicity and region. Rate ratios are calculated as the rate of reported gonorrhea cases per 100,000 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.

All states and reporting jurisdictions are encouraged to continue efforts to upgrade local surveillance systems to be fully compliant with OMB standards for the collection of race and Hispanic ethnicity, to redouble efforts to ascertain complete information for all cases, and to implement CDC's HL7 case reporting guides at the earliest opportunity.

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

The percentage of unknown, missing, or invalid data for age group, race/Hispanic 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/Hispanic 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/Hispanic 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/Hispanic 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 2018.

As a result, rate data that are stratified by one or more of these variables reflect rates based on reported data only; caution should be used in interpreting specific rate data points as these may underestimate reported case incidence by race/Hispanic ethnicity due to the exclusion of cases missing these important demographic data.

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 9, 10, 23, and 24 display trends in the proportion of cases reported in 2018 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 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 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 surveillance case definition for syphilis has changed over time. Beginning in 2018, the category of "total syphilis" or "all stages of syphilis" includes: primary, secondary, early non-primary non-secondary, unknown duration or late, congenital syphilis, and syphilitic stillbirth. However, in previous years, "total syphilis" or "all stages of syphilis" have included different case classifications. For example, in the 1990 syphilis case definition, "total syphilis" or "all stages of syphilis" included: primary, secondary, latent, early latent, late latent, latent unknown duration, neurosyphilis, syphilitic stillbirth, and congenital syphilis. See Section C1.4 in the Appendix for information on current syphilis case definitions. More information on syphilis case definition changes over time can be found at: https://wwwn.cdc.gov/nndss/conditions/syphilis/case-definition/2018/.

A1.10 Congenital Syphilis Morbidity Reporting

In 1988, the surveillance case definition for congenital syphilis was changed, resulting in a more sensitive definition.[11] At the same time, many state and local STD programs began to greatly enhance active case finding for congenital syphilis. These surveillance changes, in addition to rising morbidity, led to a dramatic increase in the number of congenital syphilis cases reported during 1989–1991. By January 1, 1992, the new congenital syphilis case definition was fully implemented by all reporting areas. In addition to changing the case definition, CDC introduced a new congenital syphilis data collection form (CDC 73.126) in 1990; this was later revised in February 2013. Since 1995, congenital syphilis cases are reported by state and city of residence of the mother and by the reported race/Hispanic ethnicity 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 infant's year of birth.

A1.11 Interpreting Surveillance Data from Territories

There are a number of issues affecting the STD surveillance data reported to CDC from the US territories, including test kit stock-outs, resulting in an inability to test or screen for undetermined periods of time, as well as a variety of data collection, entry, and transmission issues. As such, the data likely underestimate the total STD burden in these areas and should be interpreted cautiously.

In figures showing rates for US states and territories (Figures 3, 16, 37, A, C, I, J, K, L, M, and N), 2018 data from the Virgin Islands were not included as full data were not able to be obtained in time to include them in this report.

Data from American Samoa, Guam, and Northern Mariana Islands were not included in Figures O, P, Q, and R, as they do not participate in the NJTP.

In Figure AA, data from American Samoa, Guam, Northern Mariana Islands, Puerto Rico, and the Virgin Islands were not available.

A2. Other Sources of Surveillance Data

A2.1 National Job Training Program

Chlamydia and gonorrhea prevalence was calculated for males and females 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 O, P, Q, and R.

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 common 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 data collection, reporting, analysis, visualization, and interpretation of disease information.

Cycle 3 (2013–2018) of SSuN provided funding to 10 jurisdictions to conduct two core sentinel and enhanced STD surveillance activities. SSuN Cycle 3 sentinel surveillance activities included abstraction of clinical and demographic information on a full census of patients attending 30 STD clinics, and, through June 2018, among women 15–44 years of age presenting for care in facilities that provide family planning and reproductive health services. SSuN Cycle 3 enhanced surveillance activities included conducting health department registry matching, as well as provider and patient investigations on a probability sample of all persons diagnosed and reported with gonorrhea. Funded jurisdictions for 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 components of SSuN Cycle 3, unique persons (diagnosed and reported with gonorrhea or seeking care in participating clinical facilities) were longitudinally followed using unique, coded IDs to provide information on repeat infections and/or care seeking behaviors. The primary unit of analysis for sentinel surveillance activities in clinical facilities is unique persons. These data are merged with multiple laboratory, diagnostic, and treatment observations to provide a comprehensive picture of services and diagnoses received for each individual patient. For enhanced, case-based surveillance activities in SSuN Cycle 3, the primary unit of analysis is a diagnosed and reported episode (case) of gonorrhea from any provider type or setting within the funded jurisdiction. Case data also included a unique person identifier, which allowed merging with multiple laboratory observations, matching with other health department disease registries, querying provider-based clinical information, and unique patient demographic and behavioral data obtained through direct patient interviews. For analysis in the population component, cases in the probability sample were weighted to reflect study design and to adjust for non-response by demographic category of the patient. Weighted analysis provides estimates of case-level and person-level characteristics representative of all reported cases in the funded jurisdictions.

MSM are defined in all SSuN data collection activities as men who: a) reported having sex with another man in the preceding 2–3 months, and/or, b) 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 exclusively, or who did not report the sex of their sex partners but reported that they considered themselves to be straight/heterosexual.

Data presented in figures in this report from the sentinel surveillance component of SSuN Cycle 3 include data from nine of the 10 participating jurisdictions (Baltimore [Maryland], Miami [Florida], Boston [Massachusetts], Minneapolis [Minnesota], Multnomah County [Oregon], New York City [New York], Philadelphia [Pennsylvania], San Francisco [California], and Seattle [Washington]), except for Figure GG which includes data from the seven jurisdictions which provided data on P&S syphilis diagnoses (Baltimore [Maryland], Miami [Florida], Minneapolis [Minnesota], Multnomah County [Oregon], New York City [New York], San Francisco [California], and Seattle [Washington]).

Data presented in figures in this report from the population component of SSuN Cycle 3 for 2018 include gonorrhea cases sampled from all funded jurisdictions. Trend data across previous cycles of SSuN (Figure 26) include only those jurisdictions participating in both Cycles 2 and 3 (Baltimore, California [excluding San Francisco], Philadelphia, New York City, San Francisco 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 2018, the antimicrobial agents tested by GISP were ceftriaxone, cefixime, azithromycin, ciprofloxacin, penicillin, tetracycline, and gentamicin.

The antimicrobial susceptibility criteria used in GISP for 2018 are as follows:

- Ceftriaxone, minimum inhibitory concentration (MIC) ≥0.5 µg/ml (decreased susceptibility)*
- Ceftriaxone, MIC ≥0.125 µg/ml (elevated MIC)*
- Cefixime, MIC ≥0.5 µg/ml (decreased susceptibility)*
- Cefixime, MIC ≥0.25 µg/ml (elevated MIC)*
- Azithromycin, MIC ≥2.0 µg/ml (elevated MIC)*
- 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]

* As of December 2018, the CLSI criteria for resistance to ceftriaxone, cefixime, gentamicin, and azithromycin and for susceptibility to azithromycin and gentamicin 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 2016. 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. US Census Bureau. *United States population estimates by age, sex and race: 1980–1988*. Washington, DC: US Government Printing Office;1990.
2. US Census Bureau. *United States population estimates by age, sex and race: 1989*. Washington, DC: US Government Printing Office;1990.
3. Centers for Disease Control and Prevention. *Vital statistics of the United States 1988. vol.1 — natality*. Hyattsville, MD: US Department of Health and Human Services;1990.
4. American Community Survey. 5-year summary file, 2013–2017. In: US Census Bureau; 2018.
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 2(166). 2014.
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*. 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. In. 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, 2018

State	Primary and Secondary Syphilis				
	Percentage Unknown Race/Hispanic Ethnicity	Percentage Unknown Age	Percentage Unknown Sex	Percentage Unknown Sex of Sex Partners	Percentage Unknown County
Alabama	0.2	0.2	0.0	39.4	0.0
Alaska	0.0	0.0	0.0	3.6	0.0
Arizona	1.1	0.0	0.0	9.1	0.0
Arkansas	0.7	0.0	0.0	7.3	0.0
California	7.9	0.1	0.0	13.6	0.0
Colorado	2.7	0.0	0.0	15.4	0.3
Connecticut	9.9	0.0	2.2	26.4	4.4
Delaware	46.7	0.0	0.0	36.7	0.0
District of Columbia	20.1	0.0	1.1	29.4	0.0
Florida	6.7	0.0	0.0	14.1	0.0
Georgia	3.2	0.0	0.1	28.1	0.2
Hawaii	38.0	0.0	0.0	34.8	2.2
Idaho	2.2	0.0	0.0	23.9	0.0
Illinois	3.7	0.0	0.1	20.3	0.0
Indiana	0.5	0.0	0.0	4.1	0.0
Iowa	0.0	0.0	0.0	4.7	0.0
Kansas	0.0	0.0	0.0	9.2	0.7
Kentucky	1.9	0.0	0.0	19.9	0.0
Louisiana	0.0	0.0	0.0	2.8	0.0
Maine	8.1	0.0	0.0	93.2	2.7
Maryland	0.1	0.0	0.0	12.2	0.0
Massachusetts	7.8	0.0	2.2	13.0	0.4
Michigan	0.2	0.0	0.0	8.0	0.2
Minnesota	2.4	0.0	0.0	8.9	0.0
Mississippi	0.9	0.0	0.0	3.7	0.0
Missouri	0.5	0.0	0.0	13.3	0.0
Montana	2.2	0.0	0.0	20.0	0.0
Nebraska	8.4	0.0	0.0	30.3	0.0
Nevada	2.3	0.0	0.0	13.6	1.8
New Hampshire	10.9	0.0	0.0	14.1	0.0
New Jersey	5.1	0.0	0.2	12.8	0.0
New Mexico	12.5	0.0	0.0	12.2	0.0
New York	4.3	0.0	0.0	23.8	0.0
North Carolina	0.1	0.0	0.1	10.3	0.0
North Dakota	12.2	0.0	0.0	19.5	0.0
Ohio	0.8	0.0	0.0	9.9	0.0
Oklahoma	0.2	0.0	0.0	5.6	0.0
Oregon	7.8	0.0	0.0	16.3	0.0
Pennsylvania	7.0	0.0	0.0	8.2	0.0
Rhode Island	15.6	0.0	0.0	16.7	0.0
South Carolina	1.3	0.0	0.0	4.7	0.0
South Dakota	0.0	0.0	0.0	7.3	0.0
Tennessee	0.2	0.0	0.0	7.8	0.0
Texas	2.7	0.1	0.0	29.4	0.4
Utah	1.2	0.0	0.0	11.8	1.2
Vermont	0.0	0.0	0.0	36.4	0.0
Virginia	0.6	0.0	1.1	10.4	0.0
Washington	5.7	0.0	0.1	4.0	0.0
West Virginia	0.0	0.0	0.0	12.3	0.0
Wisconsin	1.3	0.0	0.0	63.2	2.6
Wyoming	8.7	0.0	0.0	26.1	0.0
U.S. TOTAL	**4.5**	**0.0**	**0.1**	**15.9**	**0.1**

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, 2018 (continued)

State	Gonorrhea				Chlamydia			
	Percentage Unknown Race/Hispanic Ethnicity	Percentage Unknown Age	Percentage Unknown Sex	Percentage Unknown County	Percentage Unknown Race/Hispanic Ethnicity	Percentage Unknown Age	Percentage Unknown Sex	Percentage Unknown County
Alabama	33.1	0.3	0.4	0.0	39.1	0.3	0.3	0.0
Alaska	5.1	0.0	0.0	0.1	7.5	0.0	0.1	0.3
Arizona	19.4	0.0	0.2	0.0	29.8	0.0	0.3	0.0
Arkansas	10.1	0.0	0.0	0.0	11.0	0.0	0.0	0.0
California	23.1	0.2	0.3	0.0	34.9	0.3	0.3	0.0
Colorado	22.6	0.0	0.0	0.0	32.1	0.0	0.0	0.0
Connecticut	57.2	0.1	0.4	8.6	76.4	0.2	0.9	5.4
Delaware	20.2	0.0	0.3	0.1	32.6	0.1	0.2	0.0
District of Columbia	92.0	0.2	0.9	0.0	94.4	0.7	0.7	0.0
Florida	12.1	0.0	0.0	0.0	18.3	0.0	0.0	0.0
Georgia	22.5	0.1	0.4	5.3	37.1	0.1	0.5	5.8
Hawaii	50.9	0.4	0.3	11.4	58.0	0.1	0.2	7.5
Idaho	25.2	0.0	0.3	0.0	31.8	0.0	0.3	0.0
Illinois	12.2	0.0	0.0	0.0	16.4	0.0	0.0	0.0
Indiana	7.9	0.0	0.1	0.2	12.8	0.0	0.1	0.2
Iowa	3.0	0.0	0.0	0.0	6.3	0.0	0.0	0.0
Kansas	12.3	0.0	0.0	0.0	30.0	0.0	0.0	0.0
Kentucky	44.5	0.3	0.9	5.0	50.5	0.2	0.7	4.9
Louisiana	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.1
Maine	4.5	0.4	0.1	0.3	28.6	20.0	0.0	0.0
Maryland	17.4	0.0	0.0	0.0	35.3	0.0	0.1	0.0
Massachusetts	33.1	0.4	0.8	1.9	59.0	0.2	0.4	4.0
Michigan	15.2	0.0	0.0	0.2	20.4	0.0	0.1	0.1
Minnesota	15.1	0.0	0.1	1.4	18.1	0.0	0.1	1.7
Mississippi	23.5	0.0	0.2	0.0	31.5	0.0	0.2	0.0
Missouri	9.0	0.0	0.0	0.0	13.0	0.0	0.0	0.0
Montana	1.9	0.2	0.0	0.0	1.7	0.3	0.0	0.1
Nebraska	10.7	0.0	0.0	0.0	19.3	0.0	0.0	0.0
Nevada	36.1	0.0	0.2	0.6	45.1	0.0	0.4	0.4
New Hampshire	10.6	0.0	0.0	0.0	25.4	0.0	0.0	0.0
New Jersey	40.3	0.0	0.0	0.1	56.0	0.0	0.0	0.0
New Mexico	30.4	0.0	0.0	0.0	38.4	0.0	0.0	0.0
New York	25.0	0.0	0.1	0.0	40.4	0.1	0.0	0.0
North Carolina	14.8	0.0	0.0	0.0	20.2	0.0	0.0	0.0
North Dakota	7.1	0.0	0.0	0.0	10.4	0.0	0.0	0.0
Ohio	14.9	0.0	0.0	1.5	21.2	0.0	0.0	1.7
Oklahoma	6.2	0.0	0.0	0.0	8.7	0.0	0.0	0.0
Oregon	10.6	0.0	0.1	0.0	25.1	0.0	0.1	0.0
Pennsylvania	22.0	0.0	0.1	0.0	30.8	0.0	0.1	0.0
Rhode Island	15.2	0.0	0.0	0.1	13.3	0.0	0.0	0.5
South Carolina	32.6	0.0	0.3	0.1	38.7	0.0	0.3	0.1
South Dakota	1.5	0.0	0.0	10.7	8.7	0.0	0.0	5.1
Tennessee	1.6	0.0	0.0	0.0	2.1	0.0	0.0	0.0
Texas	24.1	0.1	0.3	0.5	31.1	0.1	0.4	0.4
Utah	4.7	0.0	0.0	0.1	6.2	0.0	0.0	0.0
Vermont	19.0	0.0	0.7	0.0	23.7	0.1	0.8	0.0
Virginia	15.7	0.0	0.4	0.0	27.6	0.1	0.4	0.0
Washington	11.1	0.0	0.1	0.0	18.9	0.0	0.0	0.0
West Virginia	15.0	0.0	0.0	0.0	18.7	0.0	0.0	0.0
Wisconsin	10.9	0.0	0.1	0.0	10.8	0.0	0.1	0.0
Wyoming	4.5	0.0	0.0	0.0	34.9	0.0	0.0	0.0
U.S. TOTAL	**19.6**	**0.1**	**0.2**	**0.6**	**28.5**	**0.1**	**0.2**	**0.6**

NOTE: For all categories, unknown included cases reported as unknown or missing.

Table A2. Reported Cases of STDs by Reporting Source and Sex, United States, 2018

Disease	Non-STD Clinic			STD Clinic			Total		
	Male	Female	Total*	Male	Female	Total*	Male†	Female†	Total‡
Chlamydia	467,861	939,649	1,409,760	52,463	39,512	92,140	610,447	1,145,063	1,758,668
Gonorrhea	258,366	194,513	453,535	35,142	13,871	49,077	341,401	241,074	583,405
Primary Syphilis	7,742	1,130	8,875	2,017	156	2,173	11,280	1,498	12,793
Secondary Syphilis	13,332	2,744	16,080	3,166	383	3,550	18,754	3,497	22,270
Early Non-Primary Non-Secondary Syphilis	24,081	4,568	28,663	4,031	708	4,741	32,619	5,891	38,539
Syphilis, Unknown Duration or Late	19,014	8,150	27,173	2,338	701	3,040	28,872	11,232	40,137
Chancroid	2	0	2	0	0	0	3	0	3

* 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.

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), 6.7 cases per 100,000 males; P&S syphilis (females), 1.3 cases per 100,000 females; congenital syphilis, 9.6 cases per 100,000 live births; gonorrhea (females aged 15–44 years), 251.9 cases per 100,000 females and gonorrhea (males aged 15–44 years), 194.8 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.

STD has national level performance measures and CDC contextual indicators for a long term objective reported in CDC's Congressional Budget Justification, fulfilling this requirement. The long term objective is to reduce pelvic inflammatory disease (PID), which has specific measures of progress outlined in Table B2.

References

1. US Department of Health and Human Services. Healthy People 2020 (Healthy People 2020 Web site). https://www.healthypeople.gov/. Accessed August 16, 2019.

Table B1. *Healthy People 2020* (HP2020) Sexually Transmitted Diseases Objectives

	HP2020 Objectives	Baseline Year	Baseline	2016	2017	2018	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%	8.4%	9.6%	9.8%*	6.7%
	b. Among females aged 24 years and under enrolled in a National Job Training Program	2008	12.8%	11.4%	11.8%	12.5%	11.5%
	c. Among males aged 24 years and under enrolled in a National Job Training Program	2008	7.0%	7.1%	6.6%	6.6%	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%	56.4%	54.2%	N/A	70.9%
	b. Females aged 21 to 24 years	2008	59.4%	64.9%	63.7%	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%	44.3%	45.8%	N/A	61.3%
	b. Females aged 21 to 24 years	2008	43.5%	54.8%	56.4%	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	3.2%†	N/A	3.8%
5	**Reduce gonorrhea rates**						
	a. Females aged 15 to 44 years	2008	279.9	297.1	350.0	360.3	251.9
	b. Males aged 15 to 44 years	2008	216.5	370.2	440.4	462.7	194.8
6	**Reduce sustained domestic transmission of primary and secondary syphilis**						
	a. Among females	2008	1.4	1.9	2.3	3.0	1.3
	b. Among males	2008	7.4	15.6	16.9	18.7	6.7
7	**Reduce congenital syphilis**	2008	10.7	15.7	23.3	33.1	9.6
8	**Reduce the proportion of young adults with genital herpes infection due to herpes simplex type 2**	2005–2008	10.5%	7.6%‡	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, 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, 6a, 6b, 7	National Notifiable Disease Surveillance System (NNDSS), CDC
8	National Health and Nutrition Examination Survey (NHANES), CDC

* Results based on data obtained from January through June 2018.
† 2015–2017.
‡ 2015–2016.
NOTE: Data presented in this table reflect data reported to HP2020 in current and prior years. More information about HP2020 is available at: https://www.healthypeople.gov/

Table B2. Congressional Budget Justification Sexually Transmitted Diseases Goals, Measures, and Target

Congressional Budget Justification Goals	Actual			Target
	2016	2017	2018	2020
Contextual Indicators				
2.7.6e. Proportion of sexually active females aged 16–24 years enrolled in Medicaid who are screened for chlamydia infections	60.0%	60.7%*	N/A	60.0%
2.7.6f. Proportion of sexually active females aged 16–24 years enrolled in commercial health insurance plans who are screened for chlamydia infections	50.1%	51.5%*	N/A	50.1%
2.7.7. Reduce the rate† of symptomatic gonorrhea cases in men	146.1	148.3	173.4	148.3
Performance Measures for Long Term Objective: Reduce pelvic inflammatory disease in the US				
2.7.5. Increase the proportion of gonorrhea patients who are treated with a CDC-recommended antibiotic regimen for gonorrhea	81.3%	82.4%	85.8%	87.6%
2.9.1. Reduce the incidence of P&S syphilis/100,000 population in women aged 15–44	4.2	5.1	6.9	0.8
2.9.2. Reduce the incidence of congenital syphilis/100,000 live births	15.7	23.3	33.1	6.2
2.9.3. Increase the percentage of pregnant women that are screened for syphilis at least one month before delivery	89.5%	89.9%	N/A	87.2%
2.9.4. Increase the proportion of potential congenital syphilis cases averted	75.0%	72.0%	N/A	75.0%
2.9.5. Reduce the rate of increase of P&S syphilis	18.0%	11.0%	15.0%	9.0%

Goals	Data Source
2.7.6e, 2.7.6f	Healthcare Effectiveness Data and Information Set (HEDIS), National Committee for Quality Assurance (NCQA)
2.7.5, 2.7.7	STD Surveillance Network (SSuN), CDC
2.9.1, 2.9.2, 2.9.4, 2.9.5	National Notifiable Disease Surveillance System (NNDSS), CDC
2.9.3	MarketScan Commercial Claims and Encounters Database, Truven Health Analytics

P&S = primary and secondary.
* Proportion based on average screening coverage across plans, weighted by the number of sexually-active women in each plan.
† Per 100,000.

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 (Effective 1/10)

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 *N. 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., polymerase chain reaction [PCR]) or hybridization with a nucleic acid probe.

C1.4 Syphilis (Effective 1/18)

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

Syphilis, primary (Effective 1/18)

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

Confirmatory:

- Demonstration of *T. pallidum* by darkfield microscopy in a clinical specimen that was not obtained from the oropharynx and is not potentially contaminated by stool, OR
- Demonstration of *T. pallidum* by polymerase chain reaction (PCR) or equivalent direct molecular methods in any clinical specimen.

Supportive:

- A reactive nontreponemal serologic test (Venereal Disease Research Laboratory [VDRL], rapid plasma reagin [RPR], or equivalent serologic methods), OR
- A reactive treponemal serologic test (*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].

Case classification

Probable: a case that meets the clinical description of primary syphilis and the supportive laboratory criteria.

Confirmed: a case that meets the clinical description of primary syphilis and the supportive confirmatory criteria.

Syphilis, secondary (Effective 1/18)

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, papular, 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 and signs possibly indicating secondary syphilis, serologic tests for syphilis and a physical examination are crucial to determining if a case should be classified as secondary syphilis.

Laboratory criteria for diagnosis

Confirmatory:

- Demonstration of *T. pallidum* by darkfield microscopy in a clinical specimen that was not obtained from the oropharynx and is not potentially contaminated by stool, OR
- Demonstration of *T. pallidum* by polymerase chain reaction (PCR) or equivalent direct molecular methods in any clinical specimen.

Supportive:

- A reactive nontreponemal serologic test (VDRL, RPR, or equivalent serologic methods), AND
- A reactive treponemal serologic test (TP-PA, EIA, CIA, or equivalent serologic methods).

Case classification

Probable: a case that meets the clinical description of secondary syphilis and the supportive laboratory criteria.

Confirmed: a case that meets the clinical description of secondary syphilis and the confirmatory laboratory criteria.

Syphilis, early non-primary non-secondary (Effective 1/18)

Clinical description

A stage of infection caused by *T. pallidum* in which initial infection has occurred within the previous 12 months, but there are no signs or symptoms of primary or secondary syphilis.

Laboratory criteria for diagnosis

Supportive:

- A current nontreponemal test titer demonstrating fourfold or greater increase from the last nontreponemal test titer, unless there is evidence that this increase was not sustained for >2 weeks.

Case classification

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

- No prior history of syphilis, AND a current reactive nontreponemal test (e.g., VDRL, RPR, or equivalent serologic methods), AND a current reactive treponemal test (e.g., TP-PA, EIA, CIA, or equivalent serologic methods), OR
- A prior history of syphilis and meets the supportive laboratory criteria.

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, unless there is evidence that this increase was not sustained for >2 weeks
- 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
- Meets epidemiologic criteria.

Epidemiological criteria:

- A history of sexual exposure to a partner within the previous 12 months who had primary, secondary, or early non-primary non-secondary syphilis (documented independently as duration <12 months).
- Only sexual contact (sexual debut) was within the previous 12 months.

Syphilis, unknown duration or late (Effective 1/18)

Clinical description

A stage of infection caused by *T. pallidum* in which initial infection has occurred >12 months previously or in which there is insufficient evidence to conclude that infection was acquired during the previous 12 months.

Case classification

Probable: a person with no clinical signs or symptoms of primary or secondary syphilis who meets one of the following sets of criteria:

- No prior history of syphilis, and a current reactive nontreponemal test (e.g., VDRL, RPR, or equivalent serologic methods), and a current reactive treponemal test (e.g., TP-PA, EIA, CIA, or equivalent serologic methods), OR
- A prior history of syphilis, and a current nontreponemal test titer demonstrating fourfold or greater increase from the last nontreponemal test titer, unless there is evidence that this increase was not sustained for >2 weeks, OR
- Clinical signs or symptoms and laboratory results that meet the likely or verified criteria for neurologic, ocular, otic, or late clinical manifestations syphilis (see below)
- AND who has no evidence of having acquired the disease within the preceding 12 months (see Syphilis, early non-primary non-secondary).

Comments: Although cases of syphilis of unknown duration are grouped together with late syphilis for the purposes of surveillance, the conservative clinical and public health responses to these cases will differ when there is uncertainty about the duration of infection. When faced with uncertainty, clinicians should act conservatively and treat unknown duration syphilis as if it were late infection, with three doses of benzathine penicillin. In contrast, the most conservative approach for STD control programs would be to manage cases of syphilis of unknown duration as early non-primary non-secondary infections and search for partners who may have been recently infected. Because this would not be feasible for most STD control programs, programs should consider prioritizing cases of syphilis of unknown duration with higher nontreponemal titers (e.g., 1:32 or higher) for investigation and partner services. Although nontreponemal titers cannot reliably distinguish between early infection (<12 months duration) and late infection (>12 months duration), nontreponemal titers usually are higher early in the course of syphilis infection.

Syphilis, Congenital (Effective 1/18)

Clinical description

A condition caused by infection in utero with *T. 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
- PCR or other equivalent direct molecular methods of lesions, neonatal nasal discharge, placenta, umbilical cord, or autopsy material, OR
- Immunohistochemistry (IHC), or special stains (e.g., silver staining) of specimens from lesions, 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 (VDRL, 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 CSF VDRL test.
- In a non-traumatic lumbar puncture, an elevated CSF leukocyte (white blood cell [WBC]) count or protein (without other cause):
    - Suggested parameters for abnormal CSF WBC and protein values:
        1. During the first 30 days of life, a CSF WBC count of >15 WBC/mm3 or a CSF protein >120 mg/dL is abnormal.
        2. 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.

* 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.

Confirmed: a case that is laboratory confirmed.

Comments: 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 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.

Syphilitic Stillbirth (Effective 1/18)

Clinical case definition

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

* 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.

Comments: For reporting purposes, congenital syphilis includes cases of congenitally acquired syphilis among infants and children as well as syphilitic stillbirths.

Comments: Additional information to be collected on clinical manifestations of reported syphilis cases (Effective 1/18)

Syphilis is a systemic infection that, if untreated, can cause a variety of clinical manifestations, including:

- Signs and symptoms of primary and secondary syphilis (see above case definitions).
- Latent infections (i.e., those lacking any signs or symptoms).
- Neurologic, ocular, or otic manifestations (neurosyphilis, ocular syphilis, or otosyphilis), which can occur at any stage of syphilis.
- Late clinical manifestations (tertiary syphilis), which generally occur after 15–30 years of untreated infection.

The following provides guidance for reporting neurologic, ocular, otic, and late clinical manifestations of syphilis. Cases should be reported according to stage of infection, as defined above (e.g., primary syphilis; secondary syphilis; early non-primary, non-secondary syphilis; or unknown duration or late syphilis) and the clinical manifestations should be reported in the case report data, as defined below.

Neurologic manifestations:

Neurologic manifestations (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.

Clinical description

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

Classification of neurologic manifestations (neurosyphilis)

Possible: a person with a reactive nontreponemal test (e.g., VDRL, RPR, or equivalent serologic methods) and a reactive treponemal test (e.g., TP-PA, EIA, CIA or equivalent serologic methods) and clinical symptoms or signs that are consistent with neurosyphilis without other known causes for these clinical abnormalities.

Likely: a person with a reactive nontreponemal test (e.g., VDRL, RPR, or equivalent serologic methods) and a reactive treponemal test (e.g., TP-PA, EIA, CIA or equivalent serologic methods) with both of the following:

- Clinical symptoms or signs that are consistent with neurosyphilis without other known causes for these clinical abnormalities, AND
- Elevated CSF protein (>50 mg/dL2) or leukocyte count (>5 WBC/mm3 CSF) in the absence of other known causes of these abnormalities.

Verified: a person with a reactive nontreponemal test (e.g., VDRL, RPR, or equivalent serologic methods) and a reactive treponemal test (e.g., TP-PA, EIA, CIA or equivalent serologic methods) with both of the following:

- Clinical symptoms or signs that are consistent with neurosyphilis without other known causes for these clinical abnormalities, AND
- A reactive VDRL in CSF in the absence of grossly bloody contamination of the CSF.

Ocular Manifestations:

Ocular manifestations (ocular syphilis) can occur at any stage of syphilis. If the patient has ocular manifestations of syphilis, the case should be reported with the appropriate stage of infection (as if ocular manifestations were not present) and ocular manifestations should be noted in the case report data.

Clinical description

Infection of any eye structure with *T. pallidum*, as evidenced by manifestations including posterior uveitis, panuveitis, anterior uveitis, optic neuropathy, and retinal vasculitis. Ocular syphilis may lead to decreased visual acuity including permanent blindness.

Classification of ocular manifestations (ocular syphilis)

Possible: a person with a reactive nontreponemal test (e.g., VDRL, RPR, or equivalent serologic methods) and a reactive treponemal test (e.g., TP-PA, EIA, CIA or equivalent serologic methods) and clinical symptoms or signs consistent with ocular syphilis without other known causes for these clinical abnormalities.

Likely: a person with a reactive nontreponemal test (e.g., VDRL, RPR, or equivalent serologic methods) and a reactive treponemal test (e.g., TP-PA, EIA, CIA or equivalent serologic methods) and both of the following:

- Clinical symptoms or signs consistent with ocular syphilis without other known causes for these clinical abnormalities, AND
- Findings on exam by an ophthalmologist that are consistent with ocular syphilis in the absence of other known causes for these abnormalities.

Verified: a person with a reactive nontreponemal test (e.g., VDRL, RPR, or equivalent serologic methods) and a reactive treponemal test (e.g., TP-PA, EIA, CIA or equivalent serologic methods) and both of the following:

- Clinical symptoms or signs consistent with ocular syphilis without other known causes for these clinical abnormalities, AND
- Demonstration of *T. pallidum* in aqueous or vitreous fluid by darkfield microscopy, or by PCR or equivalent direct molecular methods.

Otic Manifestations:

Otic manifestations can occur at any stage of syphilis. If the patient has otic manifestations of syphilis, the case should be reported with the appropriate stage of infection (as if otic manifestations were not present) and otic manifestations should be noted in the case report data.

Clinical description

Infection of the cochleovestibular system with *T. pallidum*, as evidenced by manifestations including sensorineural hearing loss, tinnitus, and vertigo.

Classification of otic manifestations (otosyphilis)

Possible: a person with a reactive nontreponemal test (e.g., VDRL, RPR, or equivalent serologic methods) and a reactive treponemal test (e.g., TP-PA, EIA, CIA or equivalent serologic methods) and clinical symptoms or signs consistent with otosyphilis without other known causes for these clinical abnormalities.

Likely: a person with a reactive nontreponemal test (e.g., VDRL, RPR, or equivalent serologic methods) and a reactive treponemal test (e.g., TP-PA, EIA, CIA or equivalent serologic methods) and both of the following:

- Clinical symptoms or signs consistent with otosyphilis without other known causes for these clinical abnormalities, AND
- Findings on exam by an otolaryngologist that are consistent with otosyphilis in the absence of other known causes for these abnormalities.

Verified: a person with a reactive nontreponemal test (e.g., VDRL, RPR, or equivalent serologic methods) and a reactive treponemal test (e.g., TP-PA, EIA, CIA or equivalent serologic methods) and both of the following:

- Clinical symptoms or signs consistent with otosyphilis without other known causes for these clinical abnormalities, AND
- Demonstration of *T. pallidum* in inner ear fluid by darkfield microscopy, or by PCR or equivalent direct molecular detection methods.

Late Clinical Manifestations:

Late clinical manifestations of syphilis usually develop only after a period of 15–30 years of untreated infection. Therefore, if the patient has late clinical manifestations of syphilis, the case should be reported with the appropriate stage of infection (for the vast majority of cases, unknown duration or late syphilis) and late clinical manifestations should be noted in the case report data.

Clinical description

Late clinical manifestations of syphilis (tertiary 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. In addition, certain neurologic manifestations (e.g., general paresis and tabes dorsalis) are also late clinical manifestations of syphilis.

Classification of late clinical manifestations of syphilis (tertiary syphilis)

Likely: a person with a reactive nontreponemal test (e.g., VDRL, RPR, or equivalent serologic methods) and a reactive treponemal test (e.g., TP-PA, EIA, CIA or equivalent serologic methods) with either of the following:

- 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, in the absence of other known causes of these abnormalities, OR
- Clinical signs and symptoms consistent with late neurologic manifestations of syphilis (e.g., general paresis, including dementia, or tabes dorsalis) in a case that meets the criteria for likely neurologic manifestations of syphilis (see above).

Verified: a person with a reactive nontreponemal test (e.g., VDRL, RPR, or equivalent serologic methods) and a reactive treponemal test (e.g., TP-PA, EIA, CIA or equivalent serologic methods) and either of the following:

- 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 in the absence of other known causes of these abnormalities, in combination with either demonstration of *T. pallidum* in late lesions by special stains or equivalent methods, or by PCR or equivalent direct molecular methods, or demonstration of pathologic changes that are consistent with *T. pallidum* infection on histologic examination of late lesions, OR

Clinical signs and symptoms consistent with late neurologic manifestations of syphilis (e.g., general paresis, including dementia, or tabes dorsalis) in a case that meets the criteria for verified neurologic manifestations of syphilis (see above).

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 *C. 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 *N. 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), OR
- 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 *C. 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 *N. 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 *C. 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 WBC/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 23, 2019.

State/City/Territory	STD Project Directors	STD Program Managers	State Epidemiologists	Laboratory Directors
Alabama	Anthony Merriweather	Thomas Lee	Sherri L. Davidson	Sharon Massingale
Alaska	Susan Jones	Tracy Smith	Joe McLaughlin	Bernard Jilly
Arizona	Rebecca Scranton	Rebecca Scranton	Kenneth Komatsu	Victor Waddell
Arkansas	Tiffany Vance	Brandi Roberts	Dirk Haselow	Glen Baker
California	James Watt	James Watt	Gil F. Chavez	Katya Ledin
Los Angeles	Mario Perez	Leo Moore	Gil F. Chavez	Nicole Green
San Francisco	Susan Philip	Trang Nguyen	Gil F. Chavez	Godfred Masinde
Colorado	Daniel Shodell	Yesenia Mendez	Rachel K. Herlihy	Scott Bookman
Connecticut	Lynn Sosa	Linda Ferraro	Matthew Cartter	Jafar Razeq
Delaware	Catherine Mosley	Catherine Mosley	Tabatha Offutt-Powell	Sergio Huerta
District of Columbia	Michael Kharfen	Adam Visconti	John Davies-Cole	Anthony Tran
Florida	Craig Wilson	Craig Wilson	Carina Blackmore	Carina Blackmore
Georgia	LaTasha Terry	Mildred Banks	Cherie Drenzek	Elizabeth Franko
Hawaii	Peter Whiticar	Gerald "Luke" Hasty, Jr.	Sarah Park	Edward Desmond
Idaho	Aimee Shipman	Kimberly Matulonis	Christine Hahn	Christopher Ball
Illinois	Danny Brikshavana	Danny Brikshavana	Jennifer Layden	Matt Charles
Chicago	Irina Tabidze	Tammy Rutledge	Jennifer Layden	Massimo Pacilli/Raj Rajendra
Indiana	Caitlin Conrad	Caitlin Conrad	Pamela Pontones	Judith Lovchik
Iowa	Randy Mayer	George Walton	Caitlin Pedati	Michael Pentella
Kansas	Jennifer VandeVelde	Jennifer VandeVelde	Farah Ahmed	N. Myron Gunsalus
Kentucky	Robert Brawley	Chang Lee	Douglas Thoroughman	Jeremy Hart
Louisiana	DeAnn Gruber	Chaquetta Johnson	Raoult Ratard	Richard Tulley
Maine	Jayson Hunt	Emer Smith	Siiri Bennett	Kenneth Pote
Maryland	Kenneth Ruby	Marcia Pearlowitz	David Blythe	Robert Myers
Baltimore	Adena Greenbaum	LaNisha Childs	David Blythe	Irish Brown-Plowden
Massachusetts	Kathleen Roosevelt	Betsy John/Lauren Molotnikov	Larry Madoff	Sandra Smole
Michigan	Kathryn Macomber	Kristine Judd-Tuinier	Sarah Lyon-Callo	Sandip Shah
Minnesota	Christine Jones	Peggy Darrett-Brewer	Ruth Lynfield	Joanne Bartkus
Mississippi	Kendra Johnson	Christie Lewis	Paul Byers	Daphne Ware
Missouri	Christine Smith	Craig Highfill	George Turabelidze	Bill Whitmar
Montana	Cara Murolo	Cara Murolo	Laura Williamson	Ron Paul
Nebraska	Jeri Weberg-Bryce	Jeri Weberg-Bryce	Tom Safranek	Peter Iwen
Nevada	Kellie Ducker	Elizabeth Kessler	Melissa Peek-Bullock	Stephanie Van Hooser
New Hampshire	Lindsay Pierce	Lorlette Moir/Hannah Bowen	Benjamin Chan	Christine Bean
New Jersey	Greta Anschuetz	Greta Anschuetz	Christina Tan	Thomas J. Kirn
New Mexico	Andrew Gans	Janine Waters	Michael Landen	Twila Kunde
New York	Rachel Hart-Malloy	Margaret Carroll	Debra Blog	Jill Taylor
New York City	Susan Blank	Kate Washburn	Debra Blog	Jennifer Rakeman
North Carolina	Jacquelyn Clymore	Roger Follas	Zack Moore	Dee Pettit
North Dakota	Lindsey VanderBusch	Lindsey VanderBusch	Tracy Miller	Christie Massen
Ohio	Laurie Rickert	Karen Nicosia	Sietske de Fijter	Quanta Brown
Oklahoma	Kristen Eberly	Sally Bouse	Laurence Burnsed	Samuel T. Dunn
Oregon	Annick Benson-Scott	Joshua Ferrer	Thomas Jeanne	John Fontana
Pennsylvania	Beth Butler	Kristine King	Sharon Watkins	Dongxiang Xia
Philadelphia	Steven Alles	Cherie Walker-Baban	Sharon Watkins	Kerry Buchs

State/City/Territory	STD Project Directors	STD Program Managers	State Epidemiologists	Laboratory Directors
Rhode Island	Thomas Bertrand	Katharine Howe	Utpala Bandy	Ewa King
South Carolina	Ali Mansaray	Bernard Gilliard	Linda Bell	Robert Brent Dixon
South Dakota	Angela Jackley	Amanda Gill	Joshua Clayton	Timothy Southern
Tennessee	Leo Parker	Parul Patel	Tim Jones	Richard Steece
Texas	Shelley Lucas	Sydney Minnerly	Linda Gaul	Grace Kubin
Utah	Scott White	Kassy Keen	Angela Dunn	Robyn Atkinson-Dunn
Vermont	Daniel Daltry	Daniel Daltry	Patsy Kelso/Lori Cragin	Mary Celotti
Virginia	Diana Prat	Oana Vasiliu	Lilian Peake	Denise Toney
Washington	Elisabeth Crutsinger-Perry	Emalie Huriaux	Scott Lindquist/Cathy Wasserman	Romesh Gautom
West Virginia	Loretta Haddy	Pamela Reynolds	Maria del Rosario	Sharon Lee Cibrik
Wisconsin	Stephanie Smiley	Anthony Wade	Jon Meiman	James Schauer
Wyoming	Debi Anderson	Vacant	Alexia Harrist	Shawna Dereemer
American Samoa	Fara M. Utu	Ina Sagaga	Afili Tufa	June Vaifanua-Leo
Federated States of Micronesia	Mayleen Ekiek	Mayleen Ekiek	Marcus Samo	Maria Marfel, Kasian Otoko, Maopa Raikabula, William Nena
Government of the Marshall Islands	Mailynn K. Lang	Adela Sibok	Jill McGready	Paul Lalita
Northern Mariana Islands	Vicenta Tenorio	Vicenta Tenorio	Paul White	Philip Dauterman
Guam	Bernadette P. Schumann	Vince Aguon	Ann Pobustky	AnneMarie Santos
Puerto Rico	Greduvel Duran Guzman	Javier Vazquez Melendez	Carmen Deseda	Gonzalo Gonzalez
Republic of Palau	Sherilynn Madraisau	Connie B. Olikong	Tmong Cheryl Udui	Clarette Matlab, Francis Termeteet
Virgin Islands	Jason Henry	Vacant	Esther Ellis	Brett Ellis

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 US12–2
Atlanta, Georgia 30329–4027

OFFICIAL BUSINESS
Penalty for Private Use $300