

**Syphilis Surveillance Supplemental Slides, 2016–2020**

**Technical Notes**

**Division of STD Prevention**

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Division of STD Prevention

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**Background**

In the United States, the national rate of primary and secondary (P&S) syphilis has increased steadily since 2001.1 In 2020, 41,655 cases of P&S syphilis were reported in the United States for a national rate of 12.7 cases per 100,000 persons. Although the COVID-19 pandemic impacted trends in sexually transmitted disease (STD) surveillance in 2020, including a reduction in the number of identified and reported P&S syphilis cases during the initial shelter-in-place orders, rates of reported P&S syphilis ultimately increased 6.8% during 2019–2020 (11.9 to 12.7 cases per 100,000 persons) and increased 47.7% during 2016–2020 (8.6 to 12.7 cases per 100,000 persons).

*Syphilis Surveillance Supplemental Slides, 2016–2020* provides surveillance data on selected reported behaviors among P&S syphilis cases in the United States during 2016–2020, stratified by region, race/Hispanic ethnicity, and sex and sex of sex partners. The figures in these supplemental slides supersede those in earlier publications of these data. The supplemental slides and data points are available at: <https://www.cdc.gov/std/statistics/syphilis-supplement/default.htm>.

*Syphilis Surveillance Supplemental Slides, 2016–2020* are best viewed as a companion to *Sexually Transmitted Disease Surveillance 2020*,1 which includes descriptions of trends in the number of syphilis cases and rates over time, as well as comparison of syphilis rates and trends among demographic groups. Both of these publications are intended as reference documents for policy makers, program managers, researchers, and others who are concerned with syphilis and its public health implications.

# **Methods**

**Data source**

P&S syphilis case notification data were extracted from the National Notifiable Diseases Surveillance System (NNDSS), the system through which the Centers for Disease Control and Prevention (CDC) receives syphilis and other STD case notifications from state, local, and territorial health departments. Case notification data include demographic information and, for cases interviewed or investigated by public health staff, also include additional information about behaviors and characteristics, such as information about sexual behaviors and substance use within the past 12 months.

**Calculation of proportions**

Although P&S syphilis cases are typically prioritized by STD control programs for case investigation and are more likely to be reported with behavioral data compared to cases with other stages of syphilis, some P&S syphilis case notifications are submitted with missing or unknown behavioral data. For the figures in these slides, the proportion of cases reporting each behavior or characteristic was calculated among cases with known data for that variable (i.e., cases with unknown data for each variable were excluded from the analysis). The numerators and denominators used to calculate the proportions presented in the slides are included in the data points file.

**Geography**

Data presented in this report are limited to cases reported by the 50 states and District of Columbia, and do not include cases reported by territories and outlying areas of the United States. For the figures in these supplemental slides, trends are presented stratified by geographic region. Regions were defined according to census regions of the United States: the West (Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming); Midwest (Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin); South (Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia); and Northeast (Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont).

**Race/Hispanic Ethnicity**

STD case notifications are reported with information on both race and Hispanic ethnicity. For the figures in these supplemental slides, race/Hispanic ethnicity is categorized first by reported Hispanic ethnicity, then by reported race. Therefore, cases categorized as Hispanic/Latino can be of any race; cases categorized into a race group include both non-Hispanic persons and persons of unknown Hispanic ethnicity. Figures displays trends among Hispanic persons, non-Hispanic White persons, and non-Hispanic African American/Black persons. Non-Hispanic persons of other races or reported with unknown race are displayed in a single group. For more information on reporting of race/Hispanic ethnicity for STD case notifications, including changes over time, see: <https://www.cdc.gov/std/statistics/2020/technical-notes.htm>

**Sex and Sex of Sex Partners**

For the figures in these supplemental slides, trends are presented stratified by sex and sex of sex partners. Male cases were categorized as gay, bisexual, or other men who have sex with men (MSM) if they reported having sex with any male partner in the last 12 months, including men who also reported sex with female partners in the last 12 months. Male cases were categorized as men who have sex with women only (MSW) if they reported having sex with only female partners in the last 12 months. Data for male cases reported with unknown sex of sex partners are not included in this report.

**Reported substance use behaviors, sexual behaviors, and incarceration history**

***Substance use*:** For the figures in these supplemental slides, trends in the proportion of cases that reported using cocaine, crack, heroin, injection drugs, or methamphetamines in the past 12 months are presented. Injection drug use is collected and reported as a “yes/no” question; therefore, the proportion of cases with reported injection drug use was calculated among those cases reported with a “yes” response or a “no” response. For the remaining substance use variables (e.g., crack, heroin, etc.), some reporting jurisdictions collected data in a “check all that apply” format and did not routinely report “no” responses to these variables. Therefore, for these variables, missing data could indicate either (1) the case reported that they did not use that substance, or (2) it is unknown if the case used that substance. For this reason, for each of the substance variables other than injection drug use, missing and unknown responses for the variable were considered to be “no” responses and were included in the denominator if there was indication that the jurisdiction reported the variable in a “check all that apply” manner (e.g., the case had a “yes” response for another substance use variable and did not have a “no” response to any of substance use variables).

***Sexual behaviors:*** For the figures in these supplemental slides, trends in the proportion of cases that reported sex with an anonymous partner, sex while intoxicated and/or high on drugs, sex with a person who injects drugs (PWID), or exchange of drugs/money for sex are presented. Additionally, for female cases, trends in the proportion that reported having had sex with a person who is known to her to be an MSM are presented. The time period for all sexual behaviors is “in the past 12 months.” For each behavior, the proportion of cases reporting the behavior was calculated among cases with known data for the variable; cases with unknown data for the variable were excluded from the analysis.

***Incarceration history:*** For the figures in these supplemental slides, trends in the proportion of cases that reported having been incarcerated within past 12 month are presented. The proportion of cases reporting incarceration history was calculated among cases with known data for this variable; cases with unknown data for the variable were excluded from the analysis.

**Interpreting Trends**

*Interpreting trends in proportions*

Trends in the proportion of reported P&S syphilis cases with reported behaviors should be interpreted in the context of overall case burden and trends during this time period. Specifically, it is important to note that during 2016–2020, the number of cases among MSM, MSW, MSU, and women increased, and most P&S syphilis cases occurred among MSM. Therefore, it is possible that trends in the ***proportion*** of cases reporting a specific behavior differ from trends in the ***number*** of cases reporting this behavior; the proportion of cases that reported a behavior could have remained stable while the number of cases reporting that behavior increased. For this reason, both numbers and proportions are included in the data points file for reference.

*Impact of missing data*

The proportions in this report are calculated among persons with complete information on specific behaviors, and missingness could be related to the behavior (e.g., persons who use heroin may face challenges maintaining a stable residence and are more difficult to contact). Therefore, estimates may be biased towards populations easier to contact (e.g., non-substance using populations) resulting in an underestimate of some behaviors. To provide context for trends in proportions reporting specific behaviors, these Technical Notes include a table providing trends in the proportion of cases with complete information for each behavior stratified by sex and sex of sex partners.

*Impact of the COVID-19 pandemic*

COVID-19 significantly affected trends in STDs during 2020, resulting in likely underreporting of infections and possibly increased STD transmission. Before preventive measures to reduce the spread of COVID-19 were put in place in the United States, the weekly number of diagnosed and reported P&S syphilis case counts were all higher in 2020 compared to 2019. Unsurprisingly, the number of reported P&S syphilis cases rapidly fell during initial shelter-in-place orders in March and April 2020, likely due to reduced screening, difficulties maintaining public health STD prevention activities, and social distancing measures. Beginning in May 2020, cases P&S syphilis began increasing and by the end of 2020, the total number of reported cases of P&S syphilis had increased 7% compared to 2019. More information on the impact of COVID-19 on trends in STD surveillance is available: <https://www.cdc.gov/std/statistics/2020/impact.htm>

Additionally, COVID-19 may have impacted observed trends in reported behaviors among P&S syphilis cases. For example, it is possible that there were changes in behaviors among persons with P&S syphilis related to COVID-19, such as reduced frequency of anonymous sex due to social distancing or reduced substance use due to shelter-in-place orders. Additionally, syphilis case investigations were likely affected by public health staff redirection to address COVID-19 (e.g., reduced attempts to contact P&S syphilis cases for interview), resulting in fewer cases with complete behavioral information. Among women and MSW, the proportion of cases with complete information decreased during 2019-2020 for most behaviors; however, these decreases were similar to those seen in previous years. (Table) Among MSM, the proportion of cases with complete information for specific behaviors remained mostly unchanged during 2019-2020.

**Additional Resources**

For additional STD surveillance data and information, please see the following:

* 2020 STD Surveillance Report, available at <https://www.cdc.gov/std/statistics/2020/default.htm>
* NCHHSTP AtlasPlus, an interactive tool for accessing STD surveillance data, as well as HIV/AIDS, TB, and viral hepatitis data; available at: <https://www.cdc.gov/nchhstp/atlas/>
* National Notifiable Diseases Surveillance System overview, available at: <https://wwwn.cdc.gov/nndss/>
* Current syphilis case definition (in effect beginning in 2018), available at: <https://wwwn.cdc.gov/nndss/conditions/syphilis/case-definition/2018/>

**References**

1. Centers for Disease Control and Prevention. *Sexually Transmitted Disease Surveillance 2020.* Atlanta: U.S. Department of Health and Human Services; 2021. Available at: <https://www.cdc.gov/std/statistics/2020/default.htm>

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| **Table. Proportion of primary and secondary syphilis cases with complete information for selected substance use and sexual behaviors, and incarceration history by sex and sex of sex partners, United States, 2016–2020** | | | | | | | | | | | | | | |
|  | 2016 | |  | 2017 | |  | 2018 | |  | 2019 | |  | 2020 | |
| **Reported behavior\*** | # of cases with complete information / # of cases | % with complete information |  | # of cases with complete information / # of cases | % with complete information |  | # of cases with complete information / # of cases | % with complete information |  | # of cases with complete information / # of cases | % with complete information |  | # of cases with complete information / # of cases | % with complete information |
| **Cocaine use** | | | | | | | | | | | | | | |
| Women | 2,334/3,049 | 76.5% |  | 2,721/3,722 | 73.1% |  | 3,594/4,995 | 72.0% |  | 4,335/6,493 | 66.8% |  | 4,957/7,901 | 62.7% |
| MSW | 3,117/3,880 | 80.3% |  | 3,602/4,548 | 79.2% |  | 4,203/5,416 | 77.6% |  | 5,530/7,289 | 75.9% |  | 5,743/7,801 | 73.6% |
| MSM | 13,115/16,155 | 81.2% |  | 14,184/17,736 | 80.0% |  | 14,995/18,760 | 79.9% |  | 13,977/18,381 | 76.0% |  | 13,675/17,968 | 76.1% |
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| **Crack use** | | | | | | | | | | | | | | |
| Women | 2,332/3,049 | 76.5% |  | 2,717/3,722 | 73.0% |  | 3,595/4,995 | 72.0% |  | 4,330/6,493 | 66.7% |  | 4,947/7,901 | 62.6% |
| MSW | 3,116/3,880 | 80.3% |  | 3,602/4,548 | 79.2% |  | 4,194/5,416 | 77.4% |  | 5,517/7,289 | 75.7% |  | 5,721/7,801 | 73.3% |
| MSM | 13,101/16,155 | 81.1% |  | 14,175/17,736 | 79.9% |  | 14,984/18,760 | 79.9% |  | 13,959/18,381 | 75.9% |  | 13,663/17,968 | 76.0% |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Heroin use** | | | | | | | | | | | | | | |
| Women | 2,334/3,049 | 76.5% |  | 2,727/3,722 | 73.3% |  | 3,603/4,995 | 72.1% |  | 4,347/6,493 | 66.9% |  | 4,975/7,901 | 63.0% |
| MSW | 3,114/3,880 | 80.3% |  | 3,613/4,548 | 79.4% |  | 4,207/5,416 | 77.7% |  | 5,537/7,289 | 76.0% |  | 5,750/7,801 | 73.7% |
| MSM | 13,108/16,155 | 81.1% |  | 14,177/17,736 | 79.9% |  | 14,989/18,760 | 79.9% |  | 13,969/18,381 | 76.0% |  | 13,669/17,968 | 76.1% |
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| **Injection drug use** | | | | | | | | | | | | | | |
| Women | 2,214/3,049 | 72.6% |  | 2,677/3,722 | 71.9% |  | 3,407/4,995 | 68.2% |  | 4,154/6,493 | 64.0% |  | 4,798/7,901 | 60.7% |
| MSW | 3,166/3,880 | 81.6% |  | 3,635/4,548 | 79.9% |  | 4,210/5,416 | 77.7% |  | 5,700/7,289 | 78.2% |  | 6,136/7,801 | 78.7% |
| MSM | 13,299/16,155 | 82.3% |  | 14,529/17,736 | 81.9% |  | 15,117/18,760 | 80.6% |  | 14,054/18,381 | 76.5% |  | 13,755/17,968 | 76.6% |
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| **Methamphetamine use** | | | | | | | | | | | | | | |
| Women | 2,343/3,049 | 76.8% |  | 2,762/3,722 | 74.2% |  | 3,643/4,995 | 72.9% |  | 4,416/6,493 | 68.0% |  | 5,055/7,901 | 64.0% |
| MSW | 3,133/3,880 | 80.7% |  | 3,640/4,548 | 80.0% |  | 4,232/5,416 | 78.1% |  | 5,576/7,289 | 76.5% |  | 5,797/7,801 | 74.3% |
| MSM | 13,150/16,155 | 81.4% |  | 14,211/17,736 | 80.1% |  | 15,042/18,760 | 80.2% |  | 14,024/18,381 | 76.3% |  | 13,732/17,968 | 76.4% |
| \*Within the past 12 months  **ACRONYMS:** MSM = Gay, bisexual, and other men who have sex with men; MSW = Men who have sex with women only | | | | | | | | | | | | | | |
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| **Table (cont). Proportion of primary and secondary syphilis cases with complete information for selected substance use and sexual behaviors, and incarceration history by sex and sex of sex partners, United States, 2016–2020** | | | | | | | | | | | | | | |
|  | 2016 | |  | 2017 | |  | 2018 | |  | 2019 | |  | 2020 | |
| **Reported behavior\*** | # of cases with complete information / # of cases | % with complete information |  | # of cases with complete information / # of cases | % with complete information |  | # of cases with complete information / # of cases | % with complete information |  | # of cases with complete information/# of cases | % with complete information |  | # of cases with complete information/# of cases | % with complete information |
| **Exchanged sex for drugs/money** | | | | | | | | | | | | | | |
| Women | 2,449/3,049 | 80.3% |  | 2,863/3,722 | 76.9% |  | 3,662/4,995 | 73.3% |  | 4,359/6,493 | 67.1% |  | 4,956/7,901 | 62.7% |
| MSW | 3,457/3,880 | 89.1% |  | 3,972/4,548 | 87.3% |  | 4,587/5,416 | 84.7% |  | 5,930/7,289 | 81.4% |  | 6,313/7,801 | 80.9% |
| MSM | 14,419/16,155 | 89.3% |  | 15,636/17,736 | 88.2% |  | 15,925/18,760 | 84.9% |  | 14,769/18,381 | 80.3% |  | 14,014/17,968 | 78.0% |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Sex with an anonymous partner** | | | | | | | | | | | | | | |
| Women | 2,406/3,049 | 78.9% |  | 2,849/3,722 | 76.5% |  | 3,496/4,995 | 70.0% |  | 4,450/6,493 | 68.5% |  | 5,077/7,901 | 64.3% |
| MSW | 3,312/3,880 | 85.4% |  | 3,848/4,548 | 84.6% |  | 4,435/5,416 | 81.9% |  | 6,065/7,289 | 83.2% |  | 6,446/7,801 | 82.6% |
| MSM | 13,957/16,155 | 86.4% |  | 15,113/17,736 | 85.2% |  | 14,638/18,760 | 78.0% |  | 14,927/18,381 | 81.2% |  | 14,239/17,968 | 79.2% |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Sex while intoxicated/high on drugs** | | | | | | | | | | | | | | |
| Women | 2,401/3,049 | 78.7% |  | 2,844/3,722 | 76.4% |  | 3,470/4,995 | 69.5% |  | 4,256/6,493 | 65.5% |  | 4,873/7,901 | 61.7% |
| MSW | 3,347/3,880 | 86.3% |  | 3,879/4,548 | 85.3% |  | 4,413/5,416 | 81.5% |  | 5,728/7,289 | 78.6% |  | 6,138/7,801 | 78.7% |
| MSM | 13,941/16,155 | 86.3% |  | 15,233/17,736 | 85.9% |  | 15,157/18,760 | 80.8% |  | 14,374/18,381 | 78.2% |  | 13,868/17,968 | 77.2% |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Sex with a person who injects drugs** | | | | | | | | | | | | | | |
| Women | 2,188/3,049 | 71.8% |  | 2,615/3,722 | 70.3% |  | 3,287/4,995 | 65.8% |  | 3,980/6,493 | 61.3% |  | 4,490/7,901 | 56.8% |
| MSW | 3,052/3,880 | 78.7% |  | 3,499/4,548 | 76.9% |  | 3,993/5,416 | 73.7% |  | 5,331/7,289 | 73.1% |  | 5,755/7,801 | 73.8% |
| MSM | 12,855/16,155 | 79.6% |  | 14,049/17,736 | 79.2% |  | 14,363/18,760 | 76.6% |  | 13,028/18,381 | 70.9% |  | 12,550/17,968 | 69.8% |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Sex with an MSM** | | | | | | | | | | | | | | |
| Women | 2,139/3,049 | 70.2% |  | 2,495/3,722 | 67.0% |  | 3,174/4,995 | 63.5% |  | 3,803/6,493 | 58.6% |  | 4,275/7,901 | 54.1% |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| **Incarceration history** | | | | | | | | | | | | | | |
| Women | 2,398/3,049 | 78.6% |  | 2,840/3,722 | 76.3% |  | 3,614/4,995 | 72.4% |  | 4,199/6,493 | 64.7% |  | 4,779/7,901 | 60.5% |
| MSW | 3,348/3,880 | 86.3% |  | 3,894/4,548 | 85.6% |  | 4,482/5,416 | 82.8% |  | 5,655/7,289 | 77.6% |  | 6,021/7,801 | 77.2% |
| MSM | 13,870/16,155 | 85.9% |  | 14,820/17,736 | 83.6% |  | 15,322/18,760 | 81.7% |  | 13,804/18,381 | 75.1% |  | 13,487/17,968 | 75.1% |
| \*Within the past 12 months  **ACRONYMS:** MSM = Gay, bisexual, and other men who have sex with men; MSW = Men who have sex with women only | | | | | | | | | | | | | | |