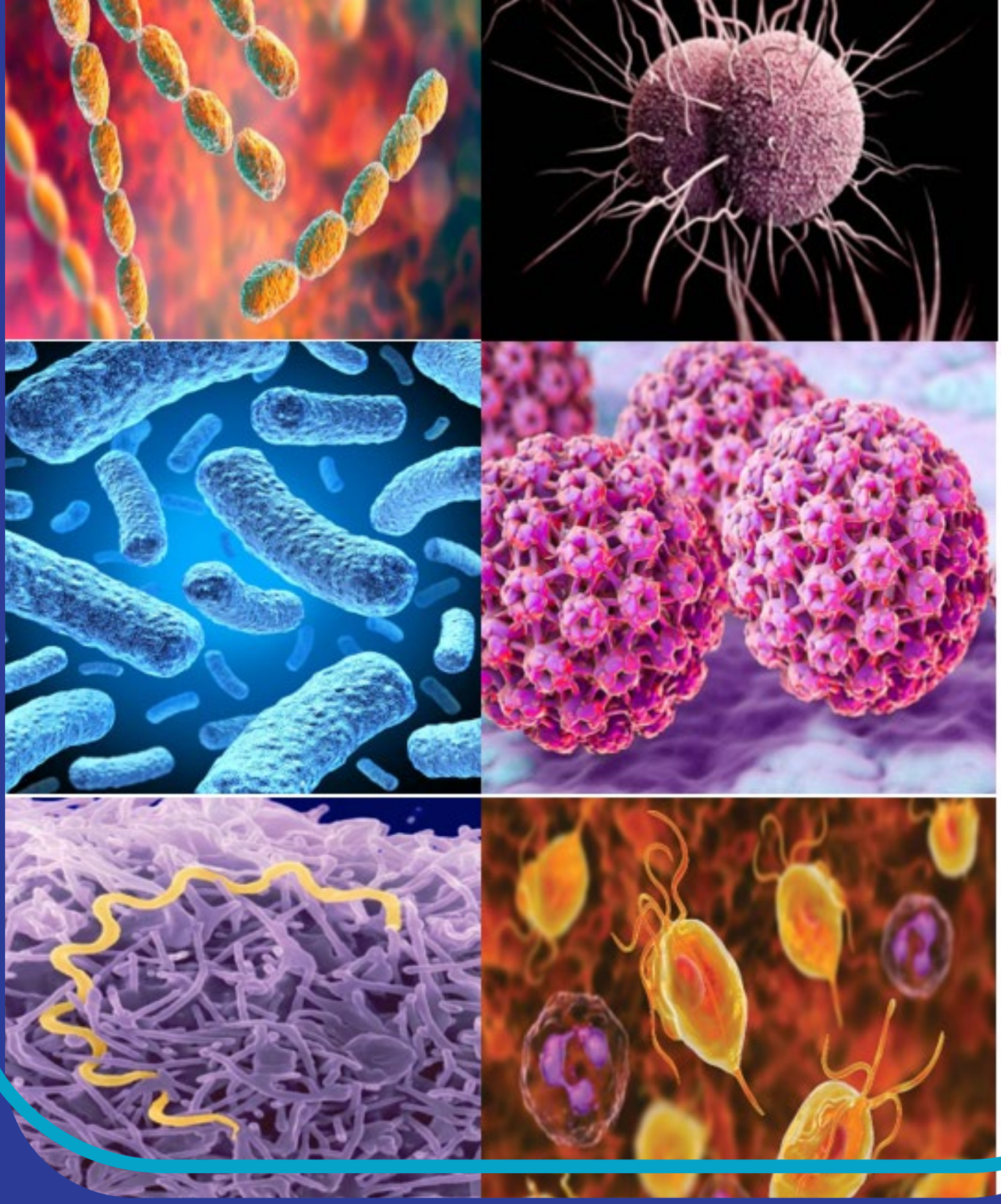
Division of HIV/STD/Viral Hepatitis

December 2022



Indiana STD Epidemiologic Profile, 2020

Indiana Department of Health

Section 1: Acknowledgements

STD EPIDEMIOLOGIC PROFILE, 2020
INDIANA DEPARTMENT OF HEALTH

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Section 2: Table of Contents

Section 3: Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
BIC	Benzathine penicillin G
CDC	Center for Disease Control and Prevention
CS	Congenital Syphilis
CSTE	Council of State and Territorial Epidemiologists
CT	Chlamydia
DIS	Disease Intervention Specialists
GC	Gonorrhea
HBV	Hepatitis B Virus
HCV	Hepatitis C Virus
IAC	Indiana Administrative Code
IDOH	Indiana Department of Health
MSM	Men who have Sex with Men
MSMW	Men who have Sex with Men and Women
MSW	Men who have Sex with Women
NBS	NEDSS Based System
PID	Pelvic Inflammatory Disease
P&S	Primary and Secondary Syphilis
STD	Sexually Transmitted Disease

Section 4: Definitions

Age Group – Indiana STD age groups include Under 18, 18-24, 25-34, 35-44, 45-54, 55-64, and 65+.

Chlamydia – A common STD that can cause infection among both men and women.[1]

Congenital Syphilis – Disease that occurs when a mother with syphilis passes the infection on to her baby during pregnancy.[2]

Early Non-Primary Non-Secondary Syphilis – Surveillance stage of infection of syphilis in which initial infection has occurred within the previous 12 months, but there are no signs or symptoms of primary or secondary syphilis.[3]

Epidemiologic Profile – Document that describes the burden of disease on the population of an area in terms of sociodemographic, geographic, behavioral, and clinical characteristics of persons with the disease.[4]

Epidemiology – The study of distribution and determinants of health-related states among specified populations and the application of that study to the control of health problems.[5]

Ethnicity – The ethnicity groups within this profile are: Hispanic and Non Hispanic.

Gonorrhea – An STD that can cause infection in the genitals, rectum, and throat.[6]

HIV (Human Immunodeficiency Virus) – A virus that attacks the body's immune system and can lead to AIDS (acquired immunodeficiency syndrome) if left untreated.[7]

Latent Syphilis – This clinical stage is a period when there are no visible signs or symptoms.[8]

Morbidity – Any departure, subjective or objective, from a state of physiological or psychological well-being. In practice, morbidity encompasses disease, injury, and disability.[9]

NBS (National Electronic Disease Surveillance System [NEDSS] Base System) – A CDC-developed integrated information system that helps local, state, and territorial public health departments manage reportable disease data and send notifiable disease data to CDC. NBS provides a tool to support the public health investigation workflow and to process, analyze, and share disease-related health information. NBS also provides reporting jurisdictions with a NEDSS-compatible information system to transfer epidemiologic, laboratory, and clinical data efficiently and securely over the Internet.[10]

Percentage – A proportion of the whole, in which the whole is 100.[11]

Primary Syphilis – This stage will include a single sore or multiple sores located where syphilis entered your body (i.e., penis, vagina, anus, rectum, and lips or in the mouth).[8]

Race – The race groups within this profile are: Asian, American Indian/Alaska Native, Black/African American, Native Hawaiian/Pacific Islander, and White.

Rate – An expression of the relative frequency with which an event occurs among a defined population per unit of time, calculated as the number of new cases or deaths during a specific period divided by either person-time or the average (mid-interval) population.[12]

Secondary Syphilis – This stage may include a skin rash and/or sore in the mouth, vagina, or anus. The rash can be on the palms of your hands and/or the bottoms of your feet and look rough, red, or reddish-brown.[8]

Surveillance – The ongoing systematic collection, analysis, and interpretation of health-related data essential to planning, implementation, and evaluation of public health practice.[13]

Syphilis – A sexually transmitted disease that can cause serious health problems without treatment. Infection develops in stages (primary, secondary, latent, and tertiary).[8]

Tertiary Syphilis – This clinical stage of syphilis can affect different organ systems (heart and blood vessels, and the brain and nervous system) and occurs 10-30 years after an infection began. The disease damages your internal organs and can result in death.[8]

Trend – Movement or change in frequency over time, usually upward or downward.[12]

Late or Unknown Duration Syphilis – The surveillance stage of syphilis 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.[3]

Section 5: Executive Summary

The Indiana 2020 STD Epidemiology Profile presents an analysis for sexually transmitted diseases (STDs) reported to Indiana through 2020. The goal of this profile is to provide descriptive information about STDs in the Indiana general population. This 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 the disease presented.

Data for this profile were gathered in October 2021, from the NEDSS Based System (NBS), a database application provided by the Center of Disease Control and Prevention (CDC) to the state for use in managing the data received for notifiable communicable diseases. In accordance with the Communicable Disease Reporting Rule, Title 410, Article 1, Rule 2.5 of the Indiana Administrative Code (IAC), the Indiana Department of Health (IDOH) requires hospitals, medical labs, private and public health providers, and clinics to provide prompt reporting of all reactive syphilis and positive chlamydia and gonorrhea results to their local or the state health department.[14]

According to 410 IAC 1-2.5-66, a sexually transmitted disease is defined as local or systemic communicable diseases due to infectious agents, generally transmitted person-to-person by sexual intercourse or genital mucosal contact, including, but not limited to the following.[14]

1. HIV
2. HBV
3. Gonorrhea
4. Chlamydia
5. Syphilis
6. Chancroid
7. Granuloma inguinale

IDOH uses the Council for State and Territorial Epidemiologists (CSTE) case definitions to standardize classifying an individual as a case based on clinical features and laboratory findings. A written form of the CSTE case definitions can be found in the *Additional Resources* section or at the links below:

Chancroid: https://ndc.services.cdc.gov/case-definitions/chancroid-1996/

Chlamydia: https://ndc.services.cdc.gov/case-definitions/chlamydia-trachomatis-infection-2010/

Congenital Syphilis: https://ndc.services.cdc.gov/case-definitions/congenital-syphilis-2015/

Gonorrhea: https://ndc.services.cdc.gov/case-definitions/gonorrhea-2014/

Primary Syphilis: https://ndc.services.cdc.gov/case-definitions/syphilis-2018/

Secondary Syphilis: https://ndc.services.cdc.gov/case-definitions/syphilis-2018/

Early Non-Primary Non-Secondary Syphilis: https://ndc.services.cdc.gov/case-definitions/syphilis-2018/

Unknown Duration or Late Syphilis: https://ndc.services.cdc.gov/case-definitions/syphilis-2018/

Section 6: List of Figures

Section 7: List of Tables

SUMMARY OF THE INDIANA STD EPIDEMIOLOGIC PROFILE, 2020:

The data used for this profile represent information from Jan. 1 to Dec. 31, 2020, and were obtained from Indiana's disease surveillance system, NBS. STD data are collected from medical laboratories, private and public health providers, clinics, and disease intervention specialists (DIS). The case definitions for this report come from 2018 or prior CDC case definitions for all STDs and congenital syphilis. In 2015, STD surveillance programs in CDC's funded project areas completed an assessment on surveillance practices. The assessment found that most jurisdictions de-duplicate gonorrhea and chlamydia cases within 30 days.[15] Indiana also uses the 30-days mark to de-duplicate cases and determine if a patient is re-infected. Indiana's 92 counties are divided into 11 STD districts (see figure 1).

Due to Covid-19 and limited staffing, STD cases were re-prioritized in 2020 to investigate syphilis and, when able, gonorrhea. Unknown values in this report include missing data on sex, race, ethnicity, age, and sexual orientation.

Chlamydia

In 2020, a total of 33,361 cases of chlamydia were reported in Indiana, making it the most common notifiable STD in Indiana. This case count corresponds to a rate of 491.6 cases per 100,000 people (figure 2), which is a 6.8% decrease in cases from 2019. This deviates from the previous trend, which has seen an increasing rate of chlamydia cases since 2004.

Rates of chlamydia are highest among females ages 18-24 and 25-34. Females represent 68% of all chlamydia cases reported in Indiana (figure 4), with 55.7% being 18-24 years old and 25.9% being 25-34 years old (figure 5). Chlamydia rates are also highest amongst African Americans Hoosiers who had a rate of 1484.0 cases per 100,000 people compared to a rate of 231.7 cases per 100,000 people among White Hoosiers (figure 6). Analysis on sexual orientation could not be performed with the reprioritization of STD investigations due to the COVID-19 pandemic.

Gonorrhea

In 2020, a total of 14,190 cases of gonorrhea were reported in Indiana. This case count corresponds to a rate of 209.1 cases per 100,000 people, which is a 14.9% increase in cases from 2019 (figure 8). This increase follows the trend Indiana has seen in gonorrhea cases since 2010.

Gonorrhea rates continue to be highest among males, who represent 50.3% of all gonorrhea cases reported in 2020 (figure 10). Rates were previously higher amongst women, but this trend began to shift in 2019 and continued in 2020. Cases are higher among heterosexual males (28%) when compared to gay/bisexual males (4.3%). However, 67.7% of male gonorrhea cases have sexual orientation marked as *unknown*. Males and females ages 18-34 make up 76.1% of cases reported, and cases increased 13.8% from 2019 to 2020 among those ages 35-44 (figure 11).

Adult syphilis

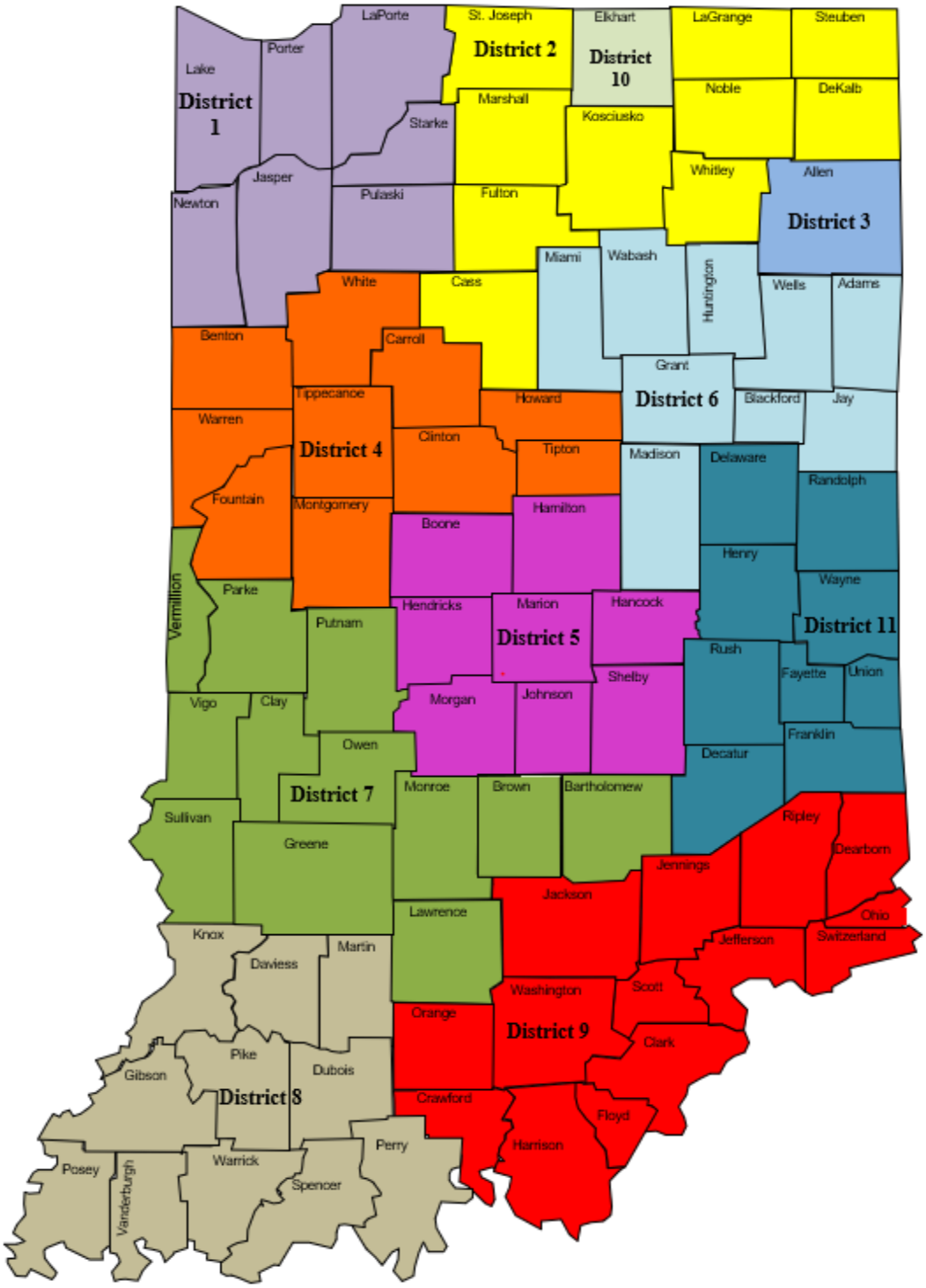
In 2020, a total of 1,340 cases of adult syphilis were reported in Indiana. Of those 1,340 cases, 522 (39%) were P&S syphilis cases. This case count corresponds to a rate of 7.7 cases per 100,000 people, which is a 53.1% increase in cases from 2019 (figure 15).

P&S syphilis rates continue to be highest among males who represent 83.7% of all P&S syphilis cases reported in 2020 (figure 17). However, female P&S syphilis cases have increased ~109% since 2016 (figure 21). The most reported risk factors among P&S syphilis cases in 2020 included incarceration (~13%), injection drug use (~6%), methamphetamine (~8%), and sex while intoxicated/high (~20%) (table 8).

Congenital syphilis

In 2020, a total of eight cases of congenital syphilis were reported in Indiana (figure 21). This is a 38% decrease from the cases reported in 2019. Marion County reported the most cases (n=<5). There was a total of 265 women with syphilis (all stages) in 2020, and 54 were pregnant. Of those 54 pregnant women, 48 (89%) potential congenital syphilis cases were averted.

Figure 1: Indiana STD District Map



INDIANA'S SOCIODEMOGRAPHIC INFORMATION

In 2020, the U.S. Census Bureau estimated that Indiana ranked 17th nationally in population. According to the U.S. Census, the estimated population in Indiana in 2020 was 6,785,644 up 2.3% from 2016. The most populated counties are in the northern and central parts of the state. The most populated county in Indiana is Marion, with a population of 976,770 people, and the least populated is Ohio County with 5,930 people. Of the 92 counties in Indiana, 38 have fewer than 30,000 people, while 17 counties contain more than 100,000 people. White Hoosiers comprise most of the population at 84.5%, followed by Black/African American Hoosiers at 10.1%. Hispanic or Latino Hoosiers make up 7.5% of the total population in Indiana. In 2020, females outnumbered males (50.4% vs. 49.6%). There is a 21.5-year difference in county median age (ranging from 28.8 to 50.3). The overall median age for the state is 38 years old. Of the total population reported, 11.6% of Hoosiers living in Indiana were experiencing poverty in 2020 and 10.3% were uninsured in 2019*, which is comparable to national figures. Below are tables that show the demographic breakdown of Indiana's population in 2020.[16]

Table 1: Population size and percentage, by STD District – Indiana, 2020

STD District	Population Size	Percentage
District 1	866,621	12.8%
District 2	656,746	9.7%
District 3	385,892	5.7%
District 4	434,852	6.4%
District 5	1,931,499	28.5%
District 6	396,481	5.8%
District 7	555,704	8.2%
District 8	476,534	7.0%
District 9	526,678	7.8%
District 10	206,842	3.0%
District 11	347,795	5.1%
Total	6,785,644	100%

Table 2: Population size and percentage, by Race – Indiana, 2020

Race	Population Size	Percentage
White	5,733,020	84.5%
Black/African American	686,041	10.1%
American Indian	29,455	0.4%
Asian	179,531	2.6%
Native Hawaiian	4,819	0.1%
Two or More Races	152,778	2.3%
Total	6,785,644	100%

Table 3: Population size and percentage, by Ethnicity – Indiana, 2020

Ethnicity	Population Size	Percentage
Hispanic	508,910	7.5%
Non-Hispanic	6,276,734	92.5%
Total	6,785,644	100%

Table 4: Population size and percentage, by Sex – Indiana, 2020

Sex	Population Size	Percentage
Male	3,367,242	49.6%
Female	3,418,402	50.4%
Total	6,785,644	100%

Table 5: Population size and percentage, by Age Group – Indiana, 2020

Age Group	Population Size	Percentage
Under 18	1,594,263	23.5%
18-24	655,411	9.7%
25-34	888,417	13.1%
35-44	849,193	12.5%
45-54	826,520	12.2%
55-64	882,885	13%
65+	1,088,955	16%
Total	6,785,644	100%

Table 6: Percent of population living in poverty and median household income – Indiana, United States 2020

Location	Percent of Population Living in Poverty	Median Household Income
Indiana	11.6%	$60,794
United States	11.9%	$67,340

Table 7: Percent of population that is without insurance – Indiana, United States, 2019*

Location	Percent of Population that is Without Insurance
Indiana	10.3%
United States	10.8%

**Date for 2020 has not been released yet for percentage of people with health insurance*

Section 10: Chlamydia

Disease Background

Chlamydia is caused by the bacteria *Chlamydia trachomatis* and is the most common STD reported in the United States and in Indiana. Anyone who has sex can get chlamydia through unprotected vaginal, anal, or oral sex. However, sexually active young people are at a higher risk of getting chlamydia. Gay, bisexual, and other men who have sex with men (MSM) are also at risk since chlamydia can spread through oral and anal sex.[1]

Most people who have chlamydia have no symptoms; however, untreated chlamydia can damage the reproductive system. Chlamydia that goes untreated in women can spread to the uterus and fallopian tubes. This can cause pelvic inflammatory disease (PID). PID can lead to long-term pelvic pain, infertility, and potentially deadly ectopic pregnancy. Although rare, untreated chlamydia in men can prevent a man from being able to have children.[1]

Women who do have symptoms may experience the following: abnormal vaginal discharge, and a burning sensation when urinating. Men who have symptoms may experience discharge from their penis, a burning sensation when urinating, and pain and swelling in one or both testicles. Men and women can also get chlamydia in their rectum. Symptoms in the rectal area are uncommon; however, they can cause rectal pain, discharge, and bleeding.[1]

Annual screening is recommended for sexually active women younger than 25 years of age or women 25 years and older with risk factors, such as new or multiple sex partners, or a sex partner who has a STD. In addition, pregnant women, MSM, and persons living with HIV should consider routine STD screening.[17]

In 2020, 1,579,885 cases of *chlamydia trachomatis* infection were reported to the CDC, making it the most common notifiable STD in the United States for that year. The case counts correspond to a rate of 481.3 cases per 100,000 people, a decrease of 13% compared to the rate in 2019. Rates of reported chlamydia were highest among adolescents and young adults; almost two-thirds (61%) of reported chlamydia cases were among persons aged 15-24 years.[18]

Per the CDC, decreases in rates of reported chlamydia in 2020 are unlikely due to a reduction in new infections.[18] Case rates are heavily influenced by screening coverage since the infection is usually asymptomatic. COVID-19 likely influenced 2020 chlamydia case counts as preventive health care clinics limited in-person visits to patients with symptoms or were closed entirely. Chlamydia cases decreased substantially in March and April 2020 when compared to the number of cases in 2019, and the deficit persisted throughout the year.[18]

Testing

Laboratory tests are used to diagnose chlamydia. Patients may be asked to provide a urine sample or vaginal sample (for women).[19] Additional information on tests can be found here: https://www.cdc.gov/std/laboratory/2014labrec/2014-lab-rec.pdf

Treatment

The CDC recommends Doxycycline 100 mg orally two times/day for seven days to treat chlamydial infections among adolescents and adults. Alternate treatment regimens include Azithromycin 1g orally in a single dose or Levofloxacin 500 mg orally once daily for seven days.[7] Additional information on treatment regimens options can be found here: https://www.cdc.gov/std/treatment-guidelines/chlamydia.htm.

Chlamydia in Indiana

There were 33,361 reported chlamydia cases in 2020. This case count corresponds to a rate of 491.6 cases per 100,000 people, which is 6.8% decrease in cases from 2019. Within the past five years, there has been an 8.1% increase in reported chlamydia cases in Indiana.

Rates of chlamydia are highest among females ages 18-24 and 25-34. Females represent 68% of all chlamydia cases reported in Indiana (figure 4), with 55.7% being 18-24 years old and 25.9% being 25-34 years old (figure 5). Chlamydia rates are also highest amongst African Americans Hoosiers who had a rate of 1,484.0 cases per 100,000 people compared to a rate of 231.7 cases per 100,000 people among White Hoosiers (figure 6). STD Districts 3 and 5 chlamydia rates were higher than the state rate (figure 3). In addition, chlamydia rates decreased among Hispanic and Non-Hispanic Hoosiers from 2019 to 2020 (figure 7). Analysis on sexual orientation could not be performed with the reprioritization of STD investigations during COVID-19.

Figure 2: Chlamydia Rates of Reported Cases, United States vs. Indiana, 2016-2020

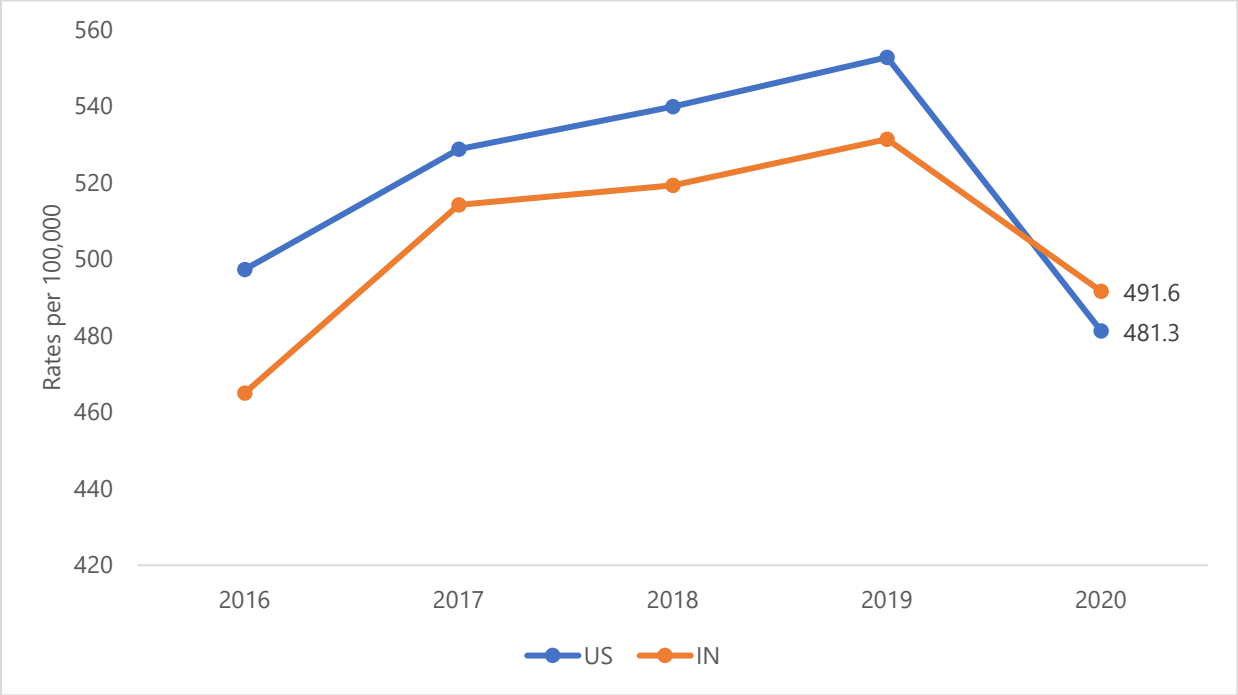


Figure 2 shows the 5-year trend in the U.S. compared to Indiana. Although Indiana's chlamydia rates are lower than the national rates, the trends continue to align.

Figure 3: Chlamydia Rates of Reported Cases, by STD District Geographical Regions, 2020

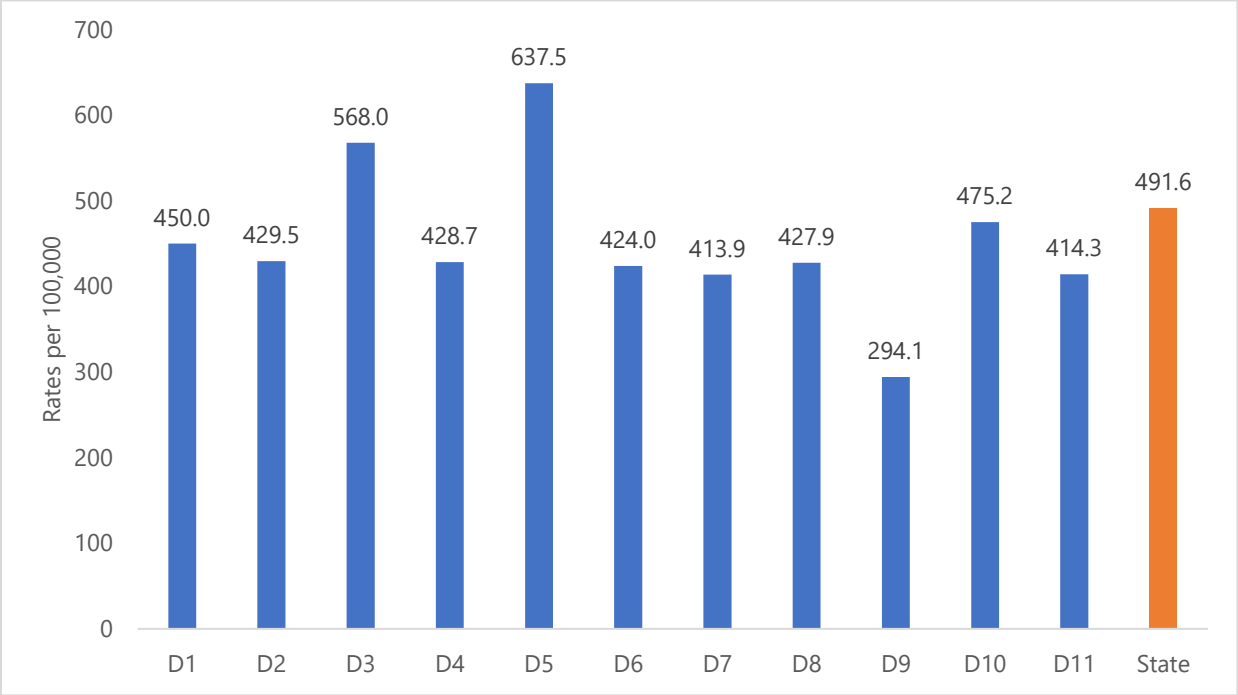


Figure 3 shows chlamydia rates broken down by STD district and include the overall state rate. District 3 and District 5 chlamydia rates are higher than the other districts and the state rate. These districts also contain the third and first most populous counties in Indiana, respectively.

Figure 4: Chlamydia Rates of Reported Cases, by Sex, 2016-2020

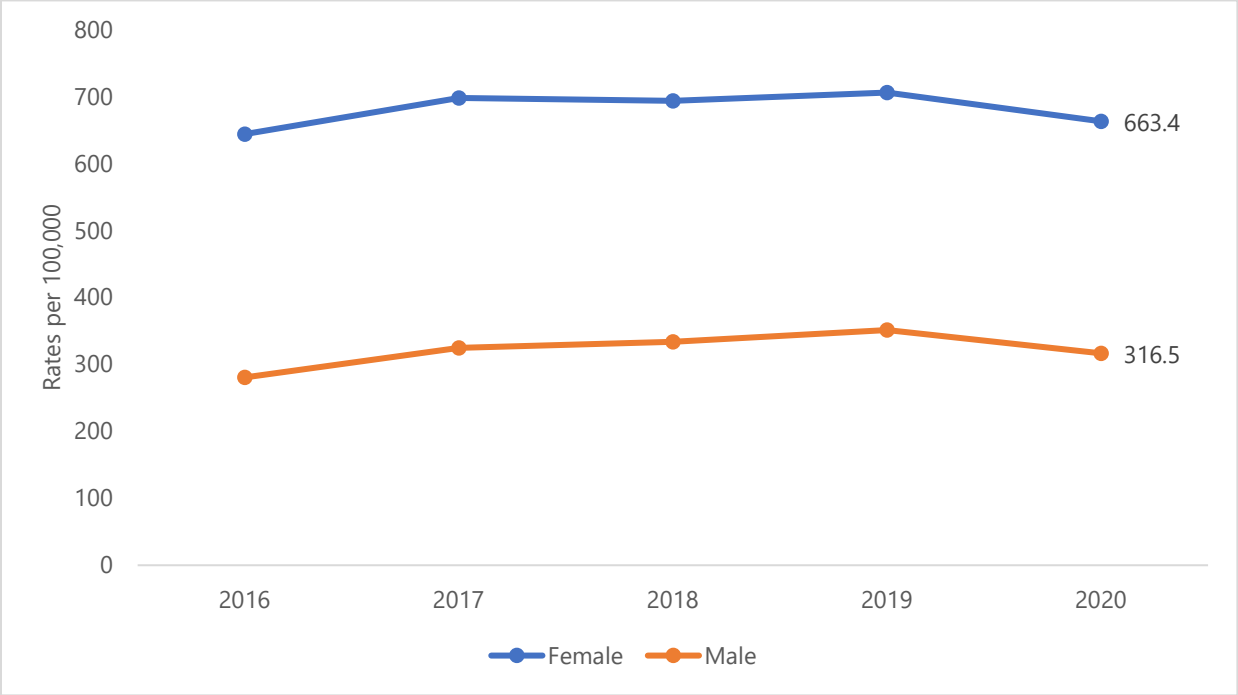


Figure 4 shows chlamydia rates broken down by sex. Historically, chlamydia rates have been higher among females and this trend is continuing.

Figure 5: Chlamydia Rates of Reported Cases, by Age, 2016-2020

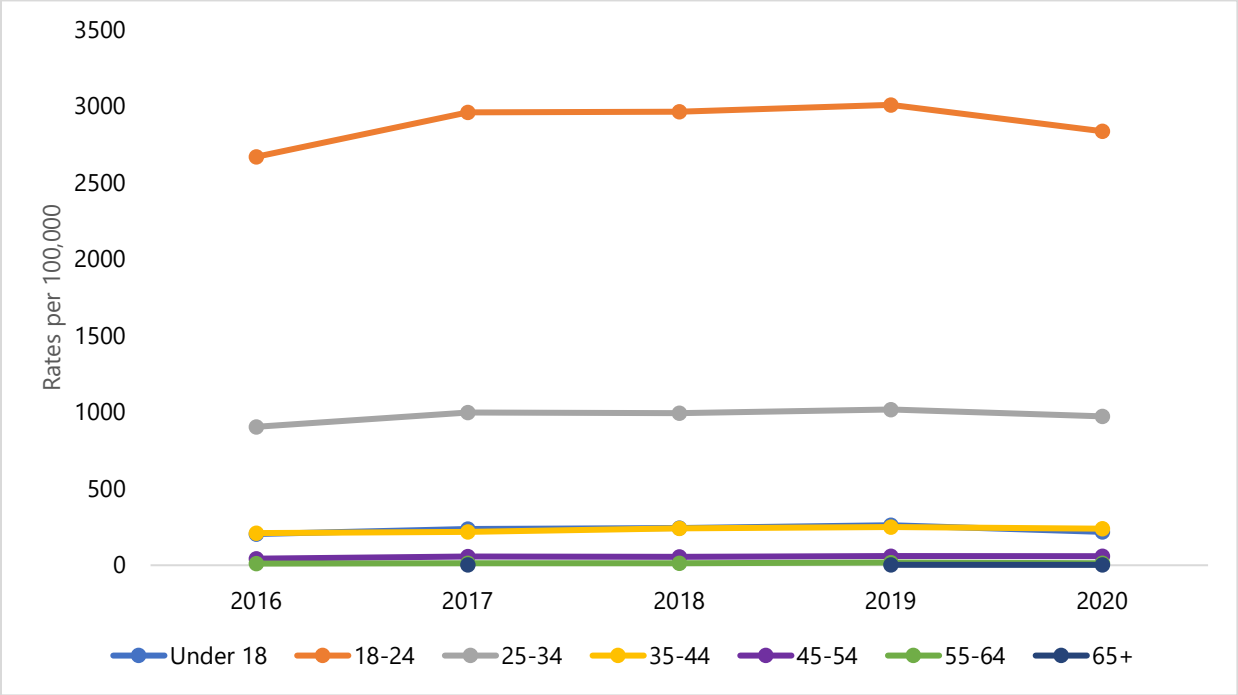


Figure 5 shows chlamydia rates broken down by age groups. Those aged 18-24 continue to have the highest rates of chlamydia followed by ages 25-34. Rates calculated with counts less than 20 are considered unstable and were excluded.

Table 8: Chlamydia Rates of Reported Cases, by Age, 2020

Year	Under 18	18-24	25-34	35-44	45-54	55-64	65+
2020	218.5	2835.8	972.1	238.7	60.1	12.3	2.4

Table 8 provides 2020 rates previously presented in *Figure 5*.

Figure 6: Chlamydia Rates of Reported Cases, by Race, 2016-2020

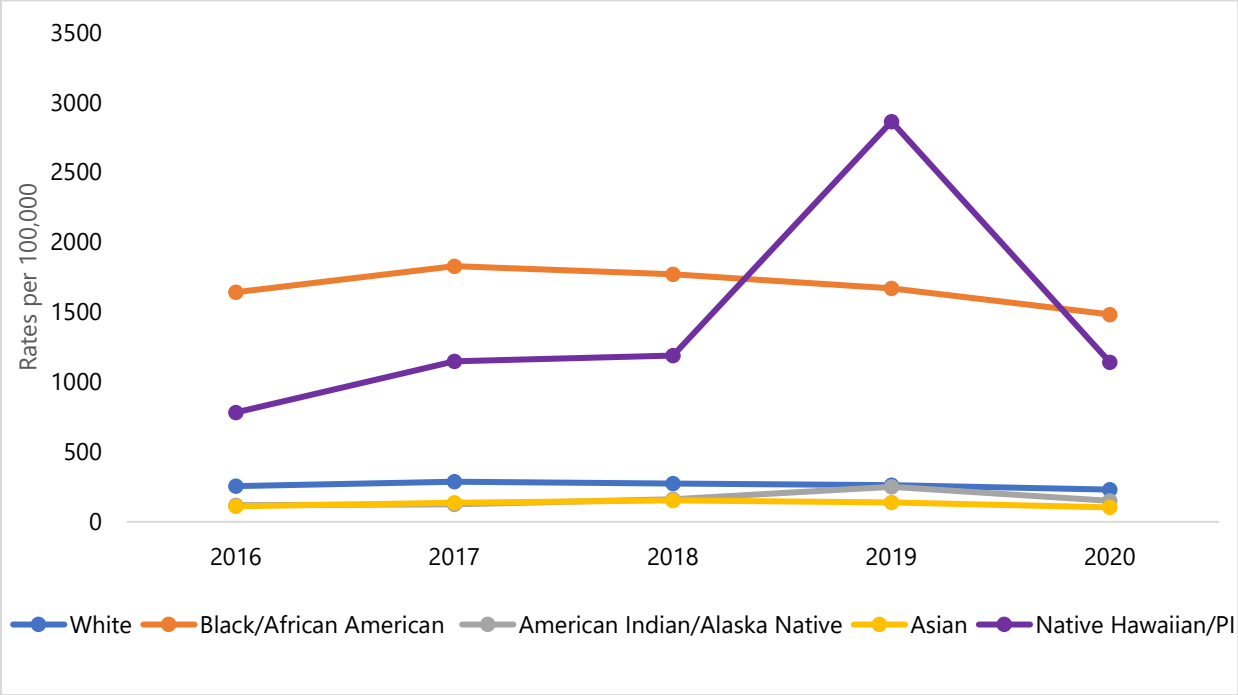


Figure 6 shows chlamydia rates broken down by race. Black/African Americans and Native Hawaiian/Pacific Islander Hoosiers continue to have the highest rates of chlamydia in Indiana. Rates calculated with counts less than 20 are considered unstable and were excluded.

Table 9: Chlamydia Rates of Reported Cases, by Race, 2020

Year	American Indian/Alaska Native	Asian	Black/African American	Native Hawaiian/PI	White
2020	149.4	103.6	1484.0	1140.6	230.6

Table 9 provides 2020 rates previously presented in *Figure 6*.

Figure 7: Chlamydia Rates of Reported Cases, by Ethnicity, 2016-2020

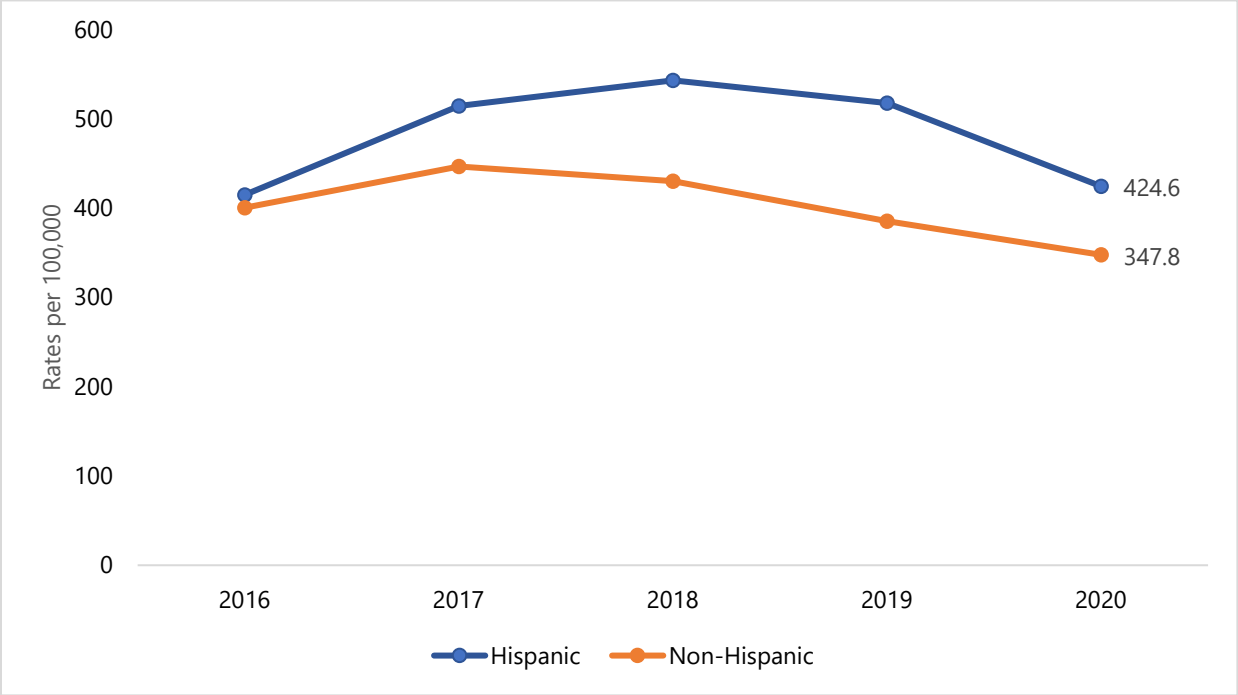


Figure 7 shows chlamydia rates broken down by ethnicity (Hispanic and Non-Hispanic).

Section 11: Gonorrhea

Disease Background

Gonorrhea is caused by the bacterium *Neisseria gonorrhoeae* and is the second most reported STD in the United States and Indiana. Gonorrhea can cause infection in the genitals, rectum, and throat and is very common, especially among young people ages 15-24 years. [6]

Most people who have gonorrhea have no symptoms; however, gonorrhea can lead to serious health problems if left untreated. Women who have symptoms may experience painful or burning sensation when urinating; increased vaginal discharge; and vaginal bleeding between periods. Men who have symptoms may experience a burning sensation when urinating; a white, yellow, or green discharge from the penis; and painful or swollen testicles. Rectal symptoms in both men and women may include discharge, anal itching, soreness, bleeding, and painful bowel movements. Pregnant women with gonorrhea can give the infection to their baby during childbirth.[6]

Sexually active gay or bisexual men and sexually active women aged 25 years and younger should be tested annually for gonorrhea.[6] In addition, pregnant women, persons living with HIV, and women aged 25 years and older if at increased risk should also be tested annually.[17]

In 2020, 677,769 cases of gonorrhea were reported to the CDC, making it the second most common notifiable STD in the United States for that year. The overall rate of reported gonorrhea in 2020 was 206.5, an increase of 5.7% from 2019. During 2019-2020, rates increased among both males and females in the Midwest, Northeast, and Southern regions of the United States. The greatest increase in reported gonorrhea rates were among non-Hispanic Black/African American persons and non-Hispanic persons of multiple races.[18]

In March and April 2020, the weekly number of cases of reported gonorrhea was lower compared to counts in 2019; however, the number of reported gonorrhea cases increased later in the year. Rates of reported gonorrhea increased in 36 states and two U.S. territories in 2020.[18]

Testing

A urine sample can be used to diagnose gonorrhea. Healthcare providers may collect samples from the throat and rectum for patients engaging in oral and/or anal sex. In addition, healthcare providers may use a swab to collect a sample from a man's urethra and a woman's cervix.[6] Additional information on tests can be found here: https://www.cdc.gov/std/laboratory/2014labrec/2014-lab-rec.pdf[19]

Treatment

Gonorrhea has developed resistance to nearly all the antibiotics used for its treatment. Antibiotic resistance is the ability of bacteria to resist the effects of the drugs used to treat them, allowing bacterial growth and persistence of infection. [20] The CDC released new recommendations for gonorrhea treatment in July 2021 as antimicrobial resistance in gonorrhea continues to be a concern.[21] The new treatment guidelines recommend Ceftriaxone 500mg IM in a single dose for 24

persons weighing <150kg. For persons weighing >/= 150kg, 1g Ceftriaxone should be administered. If chlamydial infection has not been excluded, chlamydia should be treated with doxycycline 100 mg orally two times/day for seven days.[22] Alternate treatment regimens for gonorrhea can be found online here: https://www.cdc.gov/std/treatment-guidelines/gonorrhea-adults.htm.

Gonorrhea in Indiana

There were 14,190 reported gonorrhea cases in 2020. This case count corresponds to a rate of 209.1 cases per 100,000 people, which is a 14.9% increase from 2019. Within the past five years, there has been a 50.1% increase in reported gonorrhea cases in Indiana. In 2020, gonorrhea cases were mostly seen among the Black/African American Hoosiers and made up 45% of reported cases in Indiana.

Gonorrhea rates continue to be highest among males who represent 50.3% of all gonorrhea cases reported in 2020 (figure 10). Rates were previously higher amongst women, but this trend began to shift in 2019 and continued in 2020. Cases are higher among heterosexual males (28%) when compared to gay/bisexual males (4.3%). However, 67.7% of male gonorrhea cases have sexual orientation marked as *unknown*. Males and females ages 18-34 make up 76.1% of cases reported, and cases increased 13.8% from 2019 to 2020 among those ages 35-44 (figure 11). STD Districts 1, 2, 3 and 5 reported the most gonorrhea cases (>1,000) in 2020. Gonorrhea rates in STD Districts 3 and 5 were higher than the state's gonorrhea rate (figure 9). In addition, rates increased among Hispanic and Non-Hispanic Hoosiers from 2019 to 2020 (figure 13).

Figure 8: Gonorrhea Rates of Reported Cases, United States vs. Indiana, 2016-2020

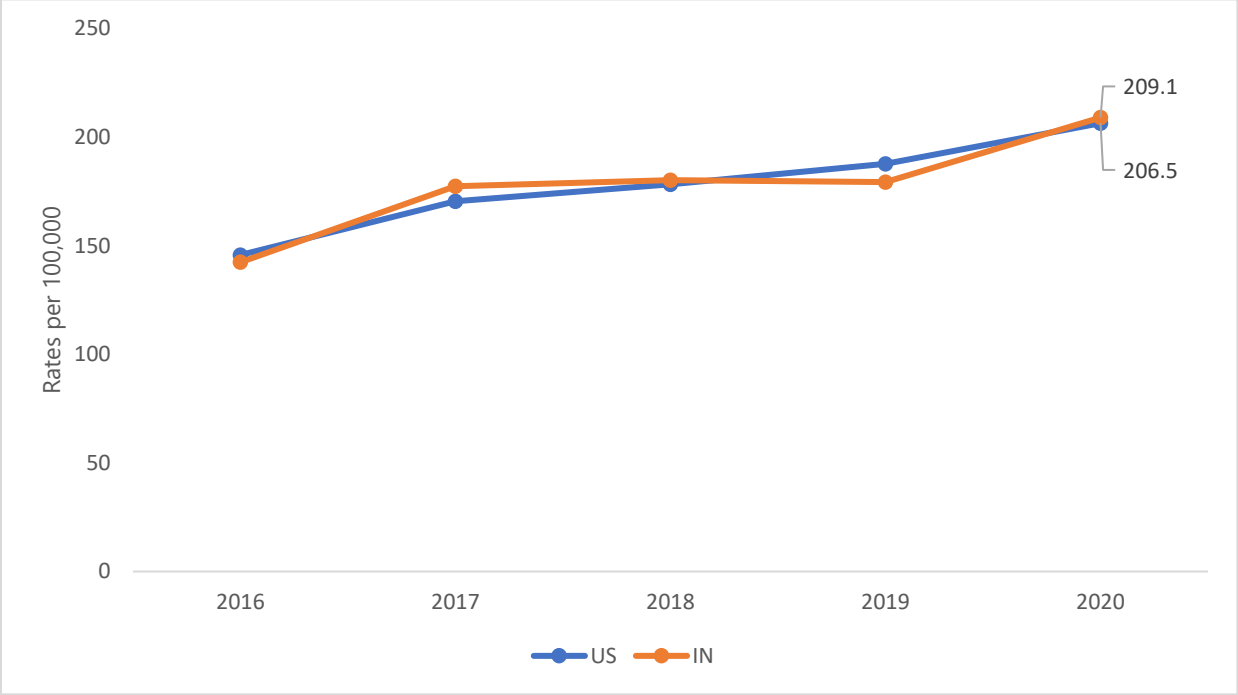


Figure 8 shows the five-year trend of gonorrhea in the U.S. compared to Indiana. Indiana's gonorrhea rates continue to overlap with U.S. gonorrhea rates.

Figure 9: Gonorrhea Rates of Reported Cases, by STD District Geographical Regions, 2020

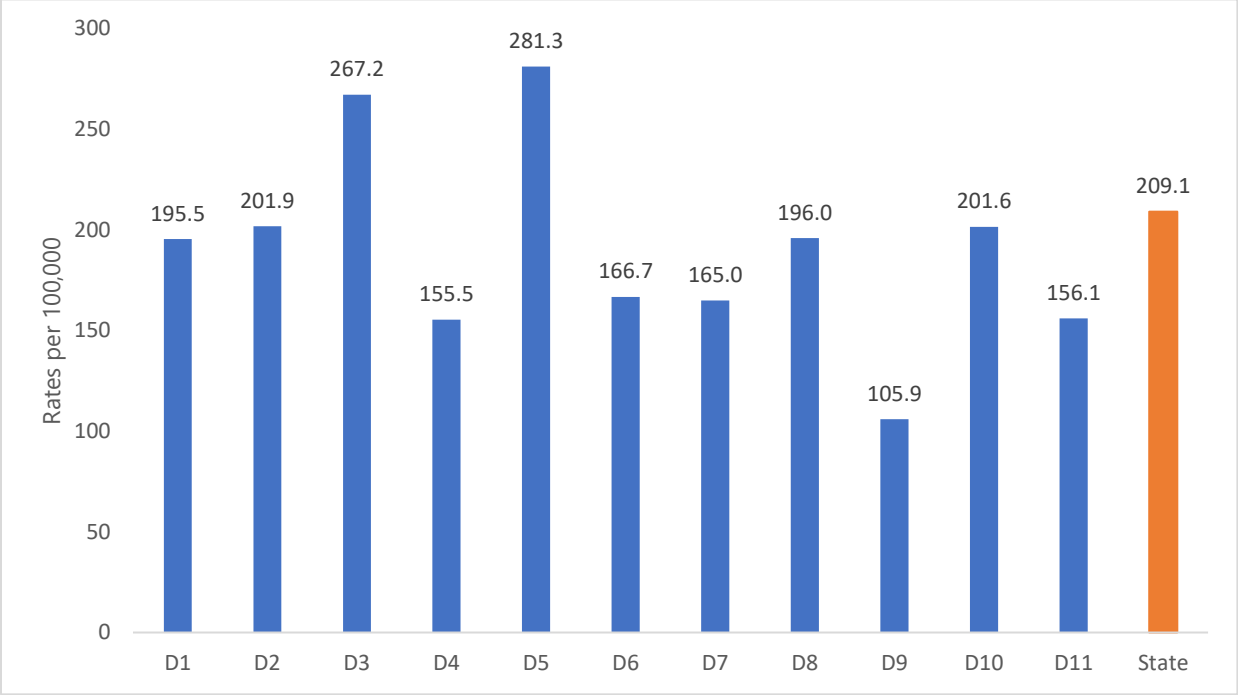


Figure 9 shows gonorrhea rates broken down by STD district and include the overall state rate. District 3 and District 5 gonorrhea rates are higher than the other districts and the state rate. These districts also contain the third and first most populous counties in Indiana, respectively.

Figure 10: Gonorrhea Rates of Reported Cases, by Sex, 2016-2020

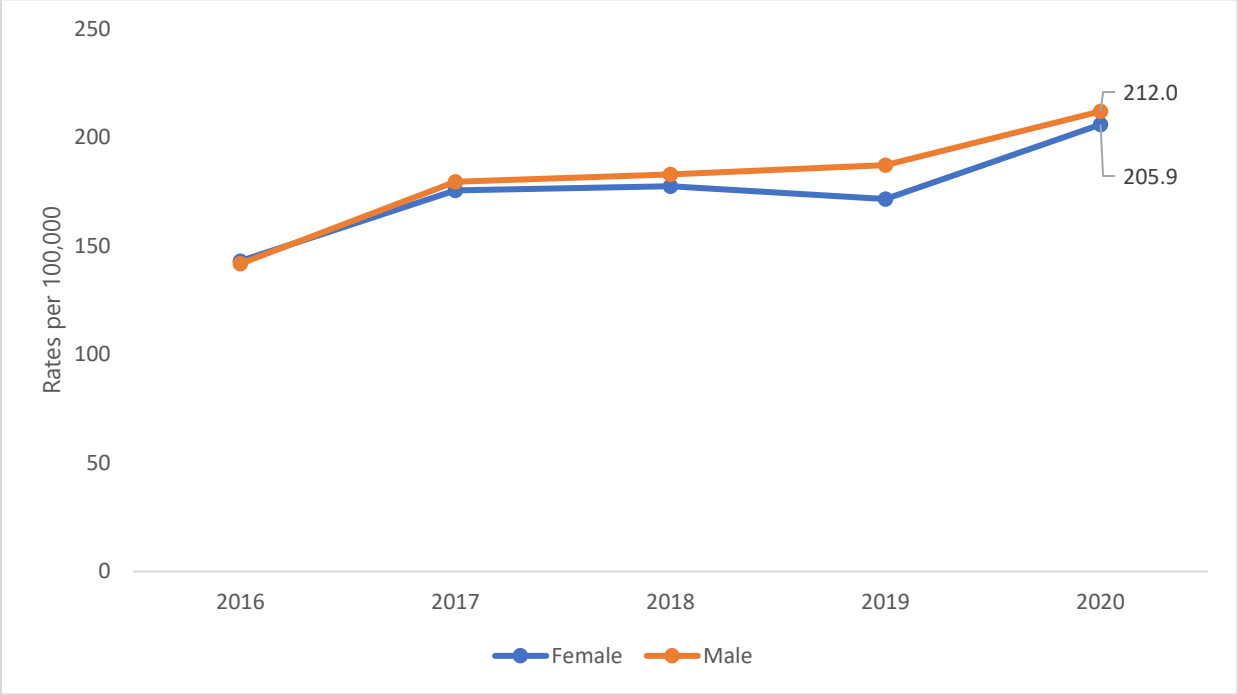


Figure 10 shows gonorrhea rates broken down by sex. Prior to 2019, the rates were almost the same for both sexes. However, in 2019, men saw an increase in gonorrhea rates while women saw a decrease. Both sexes' rates increased in 2020.

Figure 11: Gonorrhea Rates of Reported Cases, by Age, 2016-2020

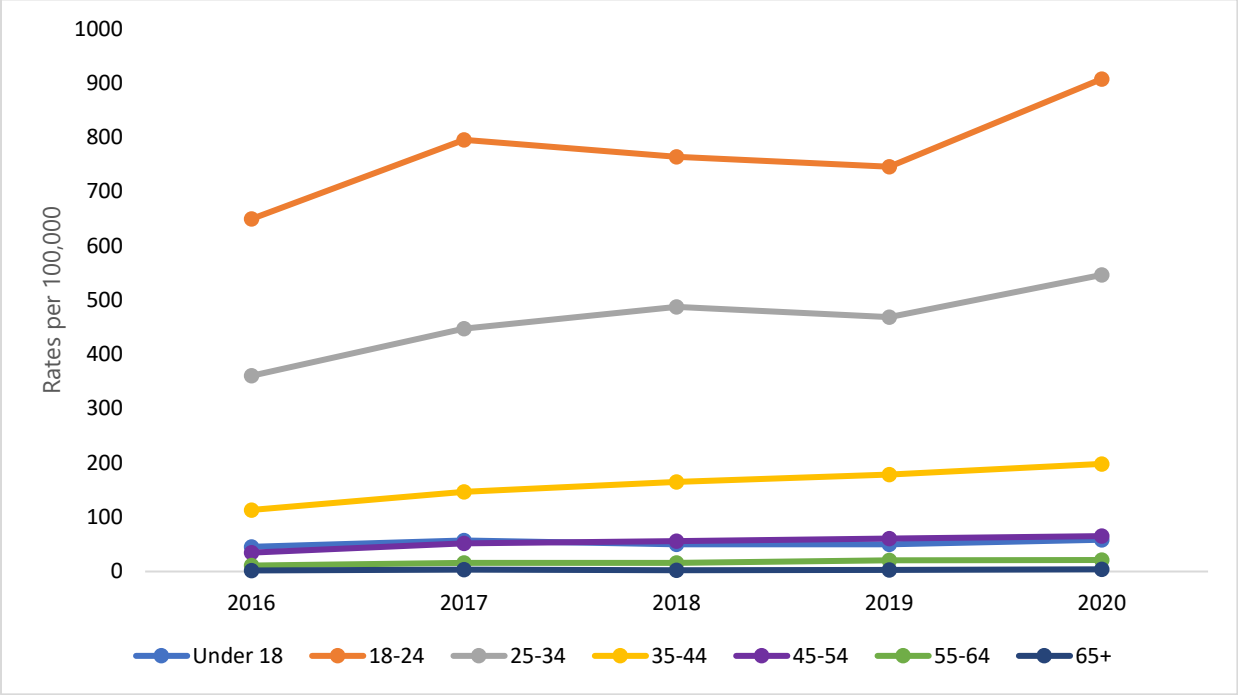


Figure 11 shows gonorrhea rates broken down by age group. Those aged 18-24 continue to have the highest rates of gonorrhea followed by ages 25-34 and 35-44. Rates calculated with counts less than 20 are considered unstable and were excluded.

Table 10: Gonorrhea Rates of Reported Cases, by Age, 2020

Year	Under 18	18-24	25-34	35-44	45-54	55-64	65+
2020	58.5	907.5	546.5	198.3	65.2	21.2	4.0

Table 10 provides 2020 rates previously presented in *Figure 11.*

Figure 12: Gonorrhea Rates of Reported Cases, by Race, 2016-2020

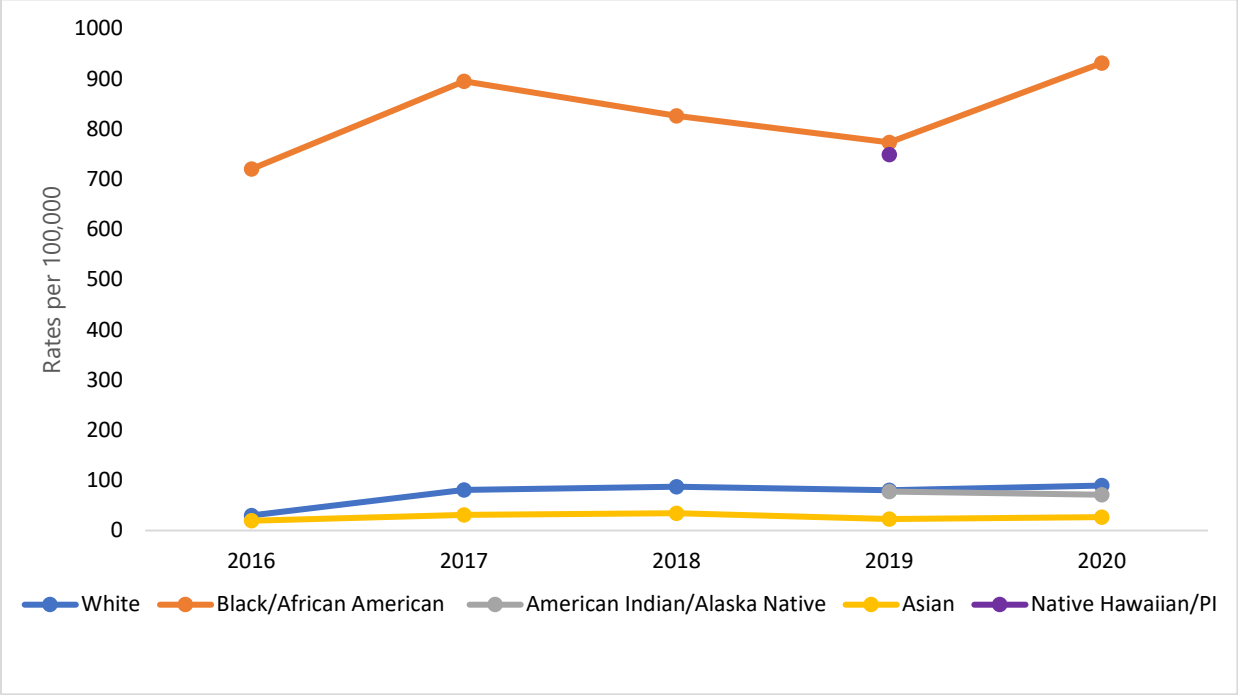


Figure 12 shows gonorrhea rates broken down by race. African Americans and Native Hawaiian/Pacific Islander Hoosiers continue to have the highest rates of gonorrhea in Indiana. Rates calculated with counts less than 20 are considered unstable and were excluded.

Table 11: Gonorrhea Rates of Reported Cases, by Race, 2020

Year	American Indian/Alaska Native	Asian	Black/African American	Native Hawaiian/PI	White
2020	71.3	26.7	931.6	352.7*	89.6

Table 9 provides 2020 rates previously presented in *Figure 6*.

*Rates were calculated with counts less than 20 and are considered unstable.

Figure 13: Gonorrhea Rates of Reported Cases, by Ethnicity, 2016-2020

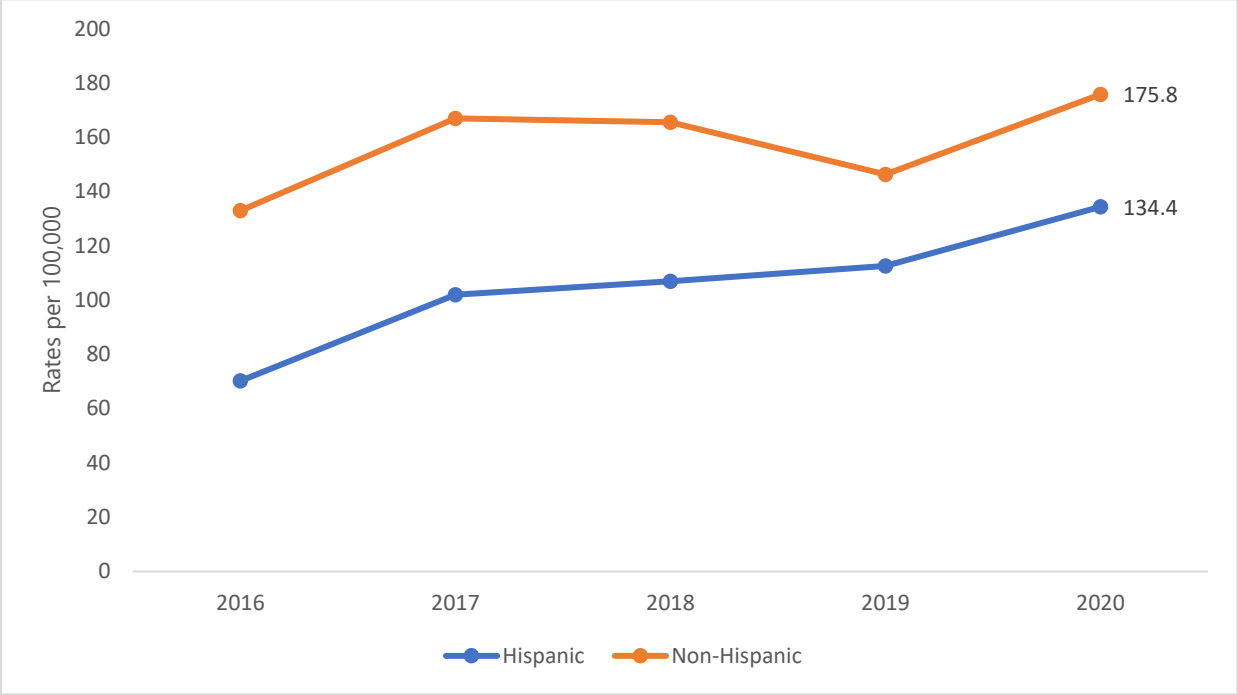


Figure 13 shows gonorrhea rates broken down by ethnicity (Hispanic and Non-Hispanic).

Disease Background

Syphilis is an STD caused by the bacterium *Treponema pallidum* and spread by direct contact with a syphilis sore during vaginal, anal, or oral sex. The infection develops in stages; there are clinical and surveillance stages (see figure 14). Clinical stages include primary, secondary, early latent, late latent, and tertiary. Surveillance stages include primary, secondary, early non-primary non-secondary, and unknown or late duration. Each stage, clinical or surveillance, has different signs and symptoms (present or absent) and time periods. Syphilis is most infectious during the primary and secondary stages and is transmitted through vaginal, anal, or oral sex without a condom with a partner who has syphilis.[8]

During the primary stage of syphilis, there may be a single sore or multiple sores. The sore(s) is located where syphilis entered your body and usually occur in, on, or around the penis, vagina, anus, rectum, and lips or in the mouth. Sores are usually (but not always) firm, round, and painless. The sore(s) usually last three to six weeks and heals regardless of whether you receive treatment. Treatment is required to stop the infection from moving to the secondary stage. [8]

During the secondary stage, skin rashes and/or sores may appear in the mouth, vagina, or anus. The rash can appear when the primary sore is healing or several weeks after the sore has healed. The rash can appear on the palms of hands or bottoms of feet and look rough, red, or reddish-brown. The rash usually will not itch and is sometimes unnoticeable. Other symptoms of secondary syphilis include fever, swollen lymph glands, sore throat, patchy hair loss, headaches, weight loss, muscle aches, and fatigue. The symptoms from this stage will go away whether you receive treatment. Without treatment, the infection will move to the latent and possibly tertiary stages of syphilis.[8]

During the early latent and late latent stages, there are no visible signs or symptoms. Without treatment, syphilis can remain in the body for years. Most people with untreated syphilis do not develop tertiary syphilis. However, it can affect many different organs systems such as: the heart and blood vessels and the brain and nervous system. Tertiary syphilis can occur 10-30 years after an infection begins, damages internal organs, and can result in death. Without treatment, syphilis can spread to the brain and nervous system (neurosyphilis), the eye (ocular syphilis), or the ear (otosyphilis), and this can occur during any stage (days or weeks after infected or even years later).

Regular screening is recommended for asymptomatic women at increased risk (located in a geographical area where syphilis case counts are high or a history of incarceration, exchanging sex for money or drugs, or unstable housing) and asymptomatic men who have sex with women (MSW) at increased risk (same risks previously mention and being a male younger than 29 years). MSM, persons living with HIV, and transgender and gender diverse people should also be screened annually.[8]

In 2020, 133,945 cases of all stages of syphilis were reported, including 41,655 cases of P&S syphilis. P&S syphilis rates increased 6.8% from 2019 to 2020. Rates increased among both males and

females and in the Midwest, Northeast, and South regions of the United States. The greatest increase in P&S syphilis was among non-Hispanic, American Indian/Alaska Native person and non-Hispanic persons of multiple races. Syphilis rates among MSM are disproportionately impacted, accounting for 53% of all male P&S syphilis cases in 2020. Although rates of P&S syphilis are lower among women, rates have increased in recent years, increasing 21% from 2019 to 2020.[18]

Testing

Blood tests are often used to test for syphilis. Some providers will diagnose syphilis by testing fluid from a syphilis sore.[8] Darkfield examinations and molecular tests for detecting *T. pallidum* directly from lesion exudate or tissue are the definitive method for diagnosing early syphilis and congenital syphilis. However, *T. pallidum* direct-detection molecular NAATs are not commercially available. Therefore, certain laboratories provide locally developed and validated PCR tests for detecting *T. pallidum* DNA. A presumptive diagnosis of syphilis requires two laboratory serologic tests: a non-treponemal test and a treponemal test.[23] Additional information on the syphilis test types and testing algorithms can be found here: https://www.cdc.gov/std/treatment-guidelines/syphilis.htm[23]

Treatment

A single injection of long-acting Benzathine penicillin G (BIC) can cure the early stages of syphilis. This includes primary, secondary, or early latent syphilis. CDC recommends three doses of long-acting BIC at weekly intervals for late latent syphilis or late or unknown duration syphilis. Treatment will cure the infection and prevent further damage, but it will not repair damage already done.[23]

Primary & Secondary Syphilis in Indiana

In 2020, a total of 1,340 cases of adult syphilis were reported in Indiana. Of those 1,340 cases, 522 (39%) were P&S syphilis cases. This case count corresponds to a rate of 7.7 cases per 100,000 people, which is a 53.1% increase since 2019. Within the past five years, there has been a 121.2% increase in reported P&S cases in Indiana.

While males continue to have the highest rates of P&S syphilis (83.7%) in Indiana, reported cases among females have increased ~109% since 2016. In addition, African American Hoosiers continue to have higher rates of P&S syphilis when compared to White Hoosiers. Of the 11 STD Districts in Indiana, nine had an increase in cases reported from 2019 to 2020 (table 12). Table 13 also shows the most reported risk factors for P&S syphilis in 2020.

Table 12: Percentage Change of P&S Syphilis from 2019 to 2020 by District

District Number	Percent Change
1	+16.3%
2	+111%
3	+88%
4	+90%
5	+61.9%
6	+250%
7	+233%
8	-44%
9	+4.9%
10	+450%
11	-17.6%

Table 13: Most Reported Risk Factors for P&S Syphilis, Indiana 2020

Risk Factors (Last 12 Months)	Yes
Been Incarcerated	67 (~13%)
Had Sex While Intoxicated/High	102 (~20%)
Injection Drug Use	31 (~6%)
Methamphetamine	41 (~8%)

CAUTION

The next page includes graphic photos.

Figure 14: CSTE Depiction of Syphilis Clinical and Surveillance Stages

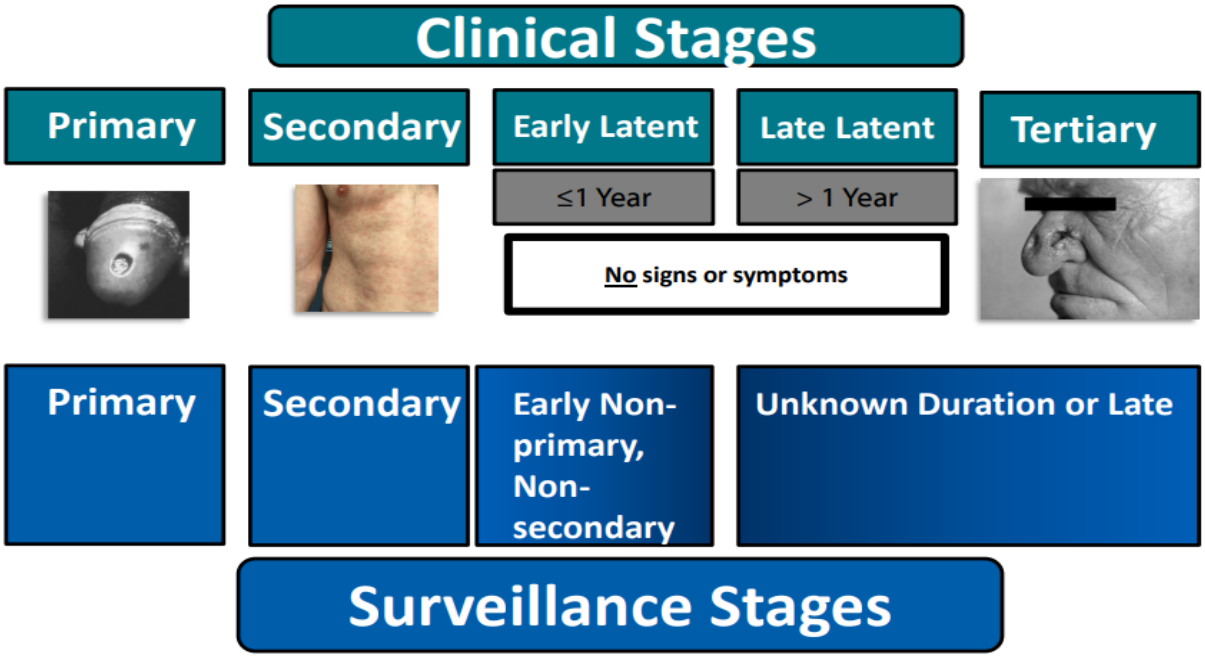


Figure 14 is a slide from the CSTE Adult Syphilis staging webinar that depicts the difference between syphilis clinical stages and surveillance stages. The image shows where each stage type overlaps. [24]

Figure 15: Primary & Secondary Syphilis Rates of Reported Cases, United States vs. Indiana, 2016-2020

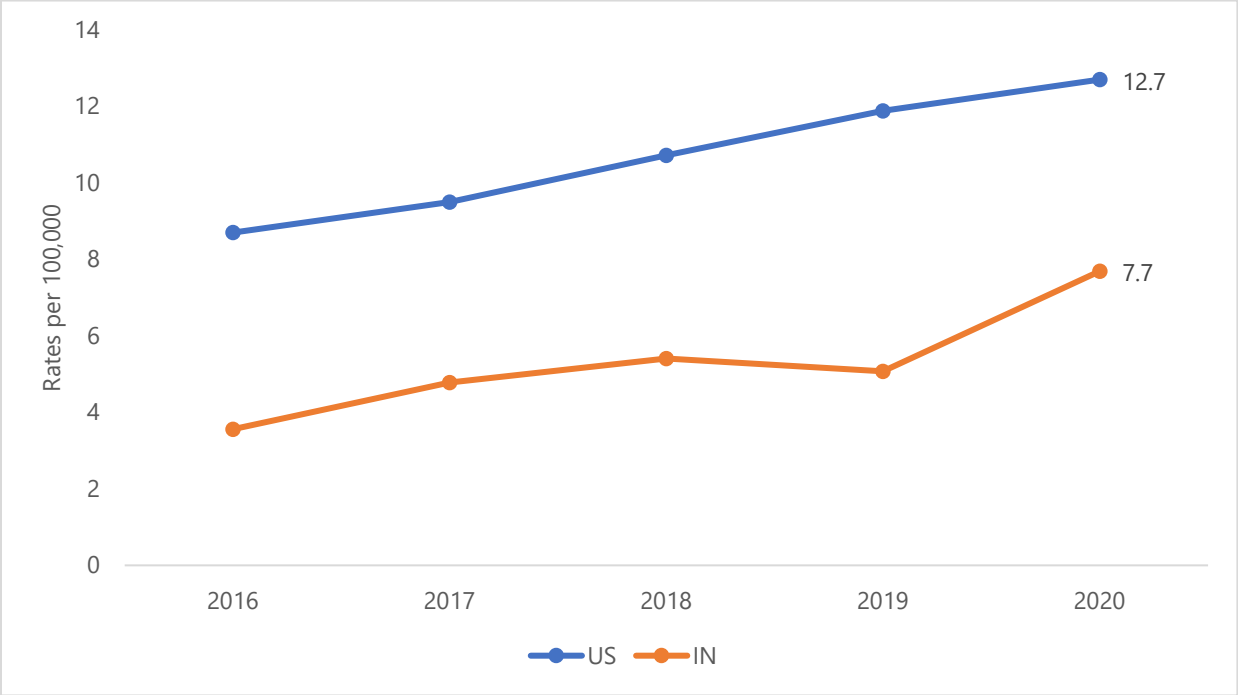


Figure 15 shows the 5-year trend of P&S in the U.S. compared to Indiana. Indiana's P&S saw a decrease in 2019 but increased from a rate of 5.1 in 2019 to a rate of 7.7 in 2020.

Figure 16: Primary & Secondary Syphilis Rates of Reported Cases, by District, 2020

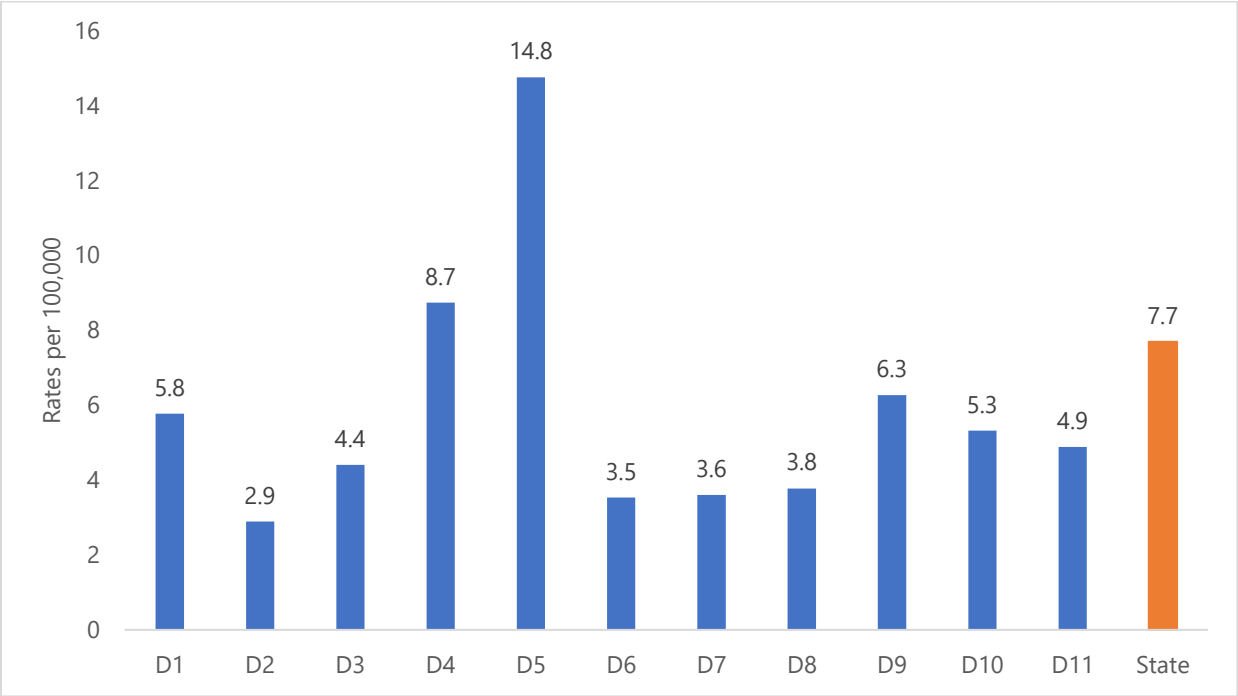


Figure 16 shows P&S rates broken down by STD district and include the overall state rate. District 4 and District 5 P&S rates are higher than the other districts and the state rate.

Figure 17: Primary & Secondary Syphilis Rates of Reported Cases, by Sex, 2016-2020

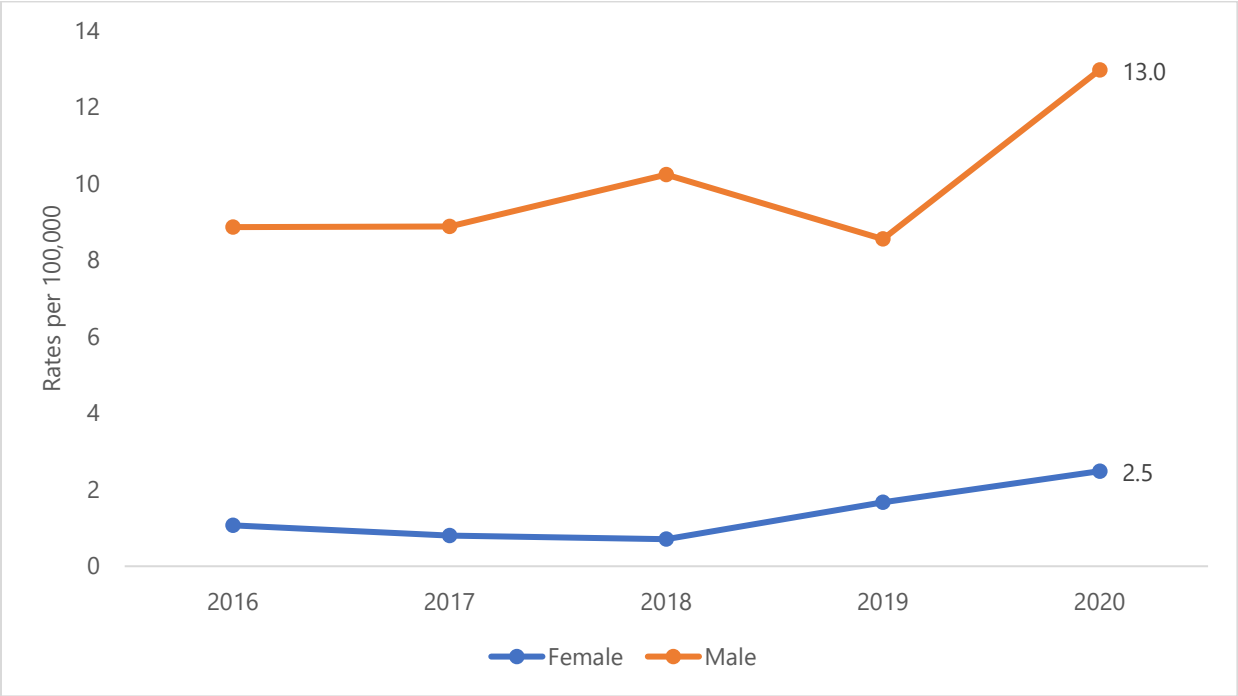


Figure 17 shows P&S rates broken down by sex. Prior to 2019, rates among females were declining. However, in 2019, females saw an increase in P&S rates while males saw a decrease. Both sexes' rates increased in 2020.

Figure 18: Primary & Secondary Syphilis Rates of Reported Cases, by Age, 2016-2020

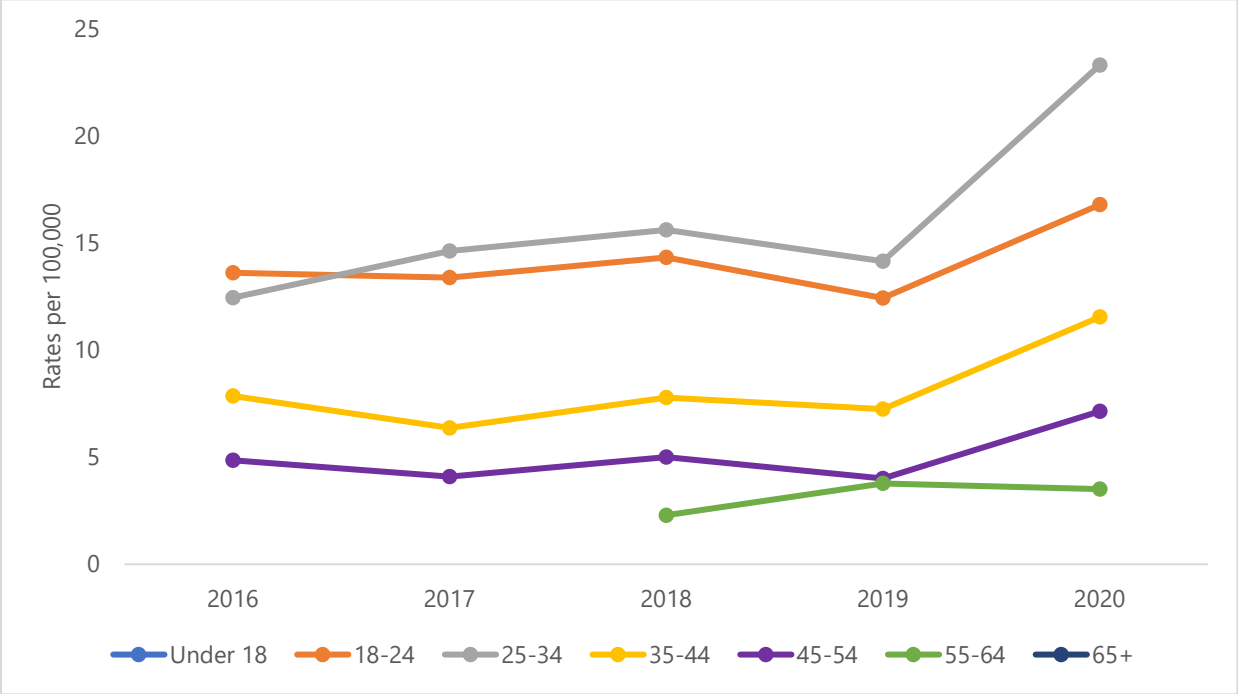


Figure 18 shows P&S rates broken down by age groups. Those aged 25-34 and 35-44 continue to have the highest rates of P&S. Rates calculated with counts less than 20 are considered unstable and were excluded.

Table 14: Primary & Secondary Syphilis Rates of Reported Cases, by Age, 2020

Year	Under 18	18-24	25-34	35-44	45-54	55-64	65+
2020	0.6*	16.8	23.3	11.5	7.1	3.5	0.7*

Table 14 provides 2020 rates previously presented in *Figure 18*.

*Rates were calculated with counts less than 20 and are considered unstable.

Figure 19: Primary & Secondary Syphilis Rates of Reported Cases, by Race, 2016-2020

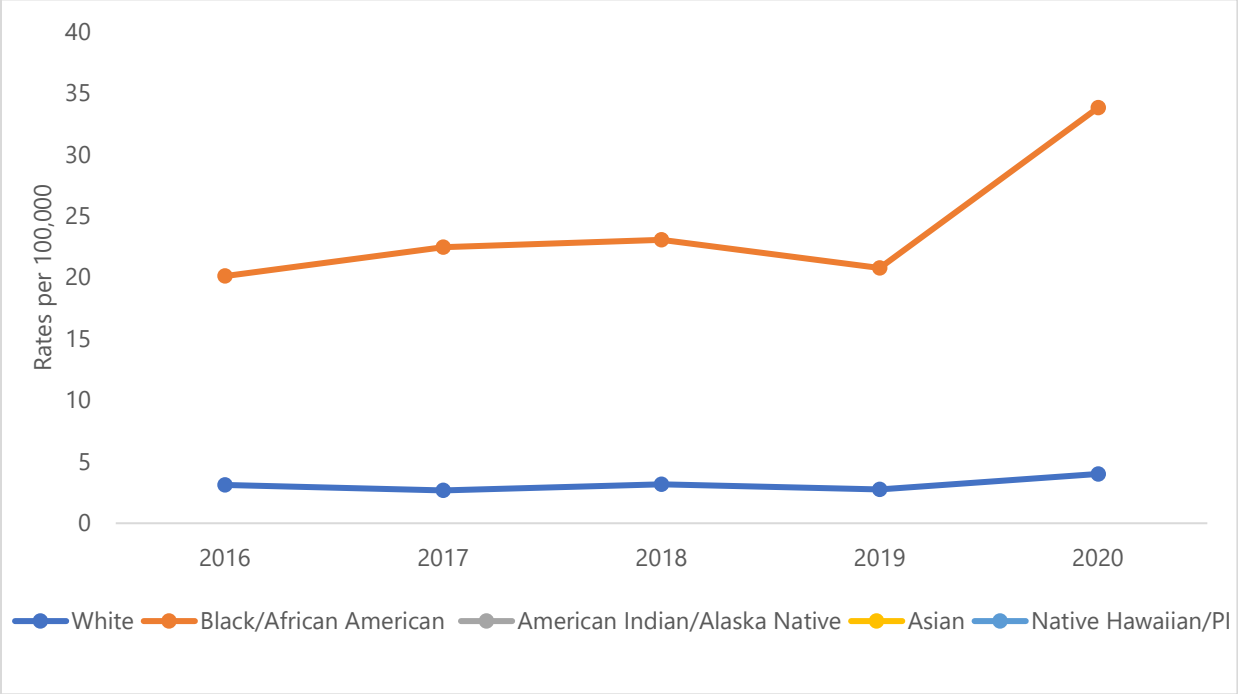


Figure 19 shows P&S rates broken down by race. African Americans and Native Hawaiian/Pacific Islander Hoosiers continue to have the highest rates of P&S in Indiana. Rates calculated with counts fewer than 20 are considered unstable and were excluded.

Table 15: Primary & Secondary Syphilis Rates of Reported Cases, by Race, 2020

Year	American Indian/Alaska Native	Asian	Black/African American	Native Hawaiian/PI	White
2020	3.4*	0.6*	33.8	41.5*	4.0

Table 9 provides 2020 rates previously presented in *Figure 6.*

*Rates were calculated with counts less than 20 and are considered unstable.

Figure 20: Primary & Secondary Syphilis Rates of Reported Cases, by Ethnicity, 2016-2020

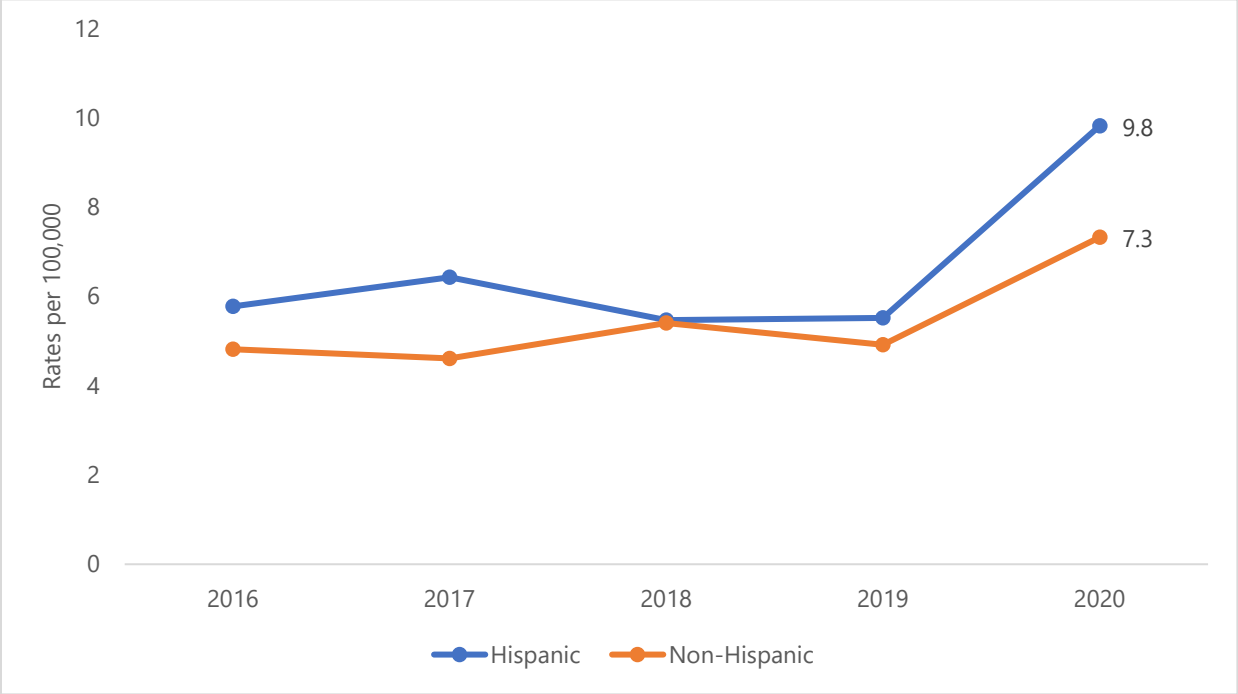


Figure 20 shows P&S rates broken down by ethnicity (Hispanic and Non-Hispanic).

Pregnant women with syphilis can give the infection to their baby during pregnancy, leading to congenital syphilis (CS). CS can cause miscarriage, stillbirth, prematurity, low birth weight, or death shortly after birth. Babies born with CS can have deformed bones; severe anemia; an enlarged liver and spleen; jaundice; brain and nerve problems, like blindness and deafness; meningitis; and skin rashes. Not all babies with CS will have symptoms at birth; however, without treatment, the baby may develop serious health problems. These health problems usually develop within the first few weeks after birth, but they can also occur years later. Babies who do not get treatment for CS and develop symptoms later can die from the infection. They may also be developmentally delayed or have seizures.[2]

Congenital syphilis cases have more than tripled in recent years, with 2,148 cases of congenital syphilis being reported in 2020. This also includes 149 congenital syphilis-related stillbirths and infant deaths. Nationally there was an 15% increase in the congenital syphilis rate from 2019 to 2020 (57.3 cases per 100,000 live births). These increases mirror increases in syphilis among reproductive aged women (aged 15-44 years). In 2020, there were 5,726 cases of syphilis (all stages) diagnosed among pregnant women, an increase of 16% from 2019.[18]

Testing

All pregnant women should be tested for syphilis at the first prenatal visit, at 28 weeks gestation and at delivery if high risk (lives in a community with high syphilis morbidity or is at risk for syphilis acquisition during pregnancy, drug misuse, STDs during pregnancy, multiple partners, a new partner, partner with STDs).[17] Congenital syphilis cases can be diagnosed based on maternal or infant criteria being met. Information on criteria for both can be found here: https://cdn.ymaws.com/www.cste.org/resource/resmgr/std/CSTE_CS_classification_webin.pdf[25]

Additional information on recommended testing for congenital syphilis can be found here: https://www.cdc.gov/std/treatment-guidelines/congenital-syphilis.htm[26]

Treatment

Babies who have congenital syphilis, should receive treatment immediately or they can develop serious health problems. For confirmed or highly probable congenital syphilis cases, the CDC recommends Aqueous crystalline penicillin G 100,000-150,000 units/kg body weight/day, administered as 50,000 units/kg body weight/dose by IV every 12 hours during the first seven days of life and every eight hours thereafter for a total of 10 days or Procaine penicillin G 50,000 units/kg body weight/dose IM in a single daily dose for 10 days.

For possible congenital syphilis cases, the CDC recommendations are the same in addition to Benzathine penicillin G 50,000 units/kg body weight/dose IM in a single dose as another treatment option. This treatment option is also recommended for congenital syphilis with a case status of *less likely*. [26]

Congenital Syphilis in Indiana

In 2020, a total of eight congenital syphilis cases were reported in Indiana. This is a 38% decrease from the cases reported in 2019. There was a total of 259 women with syphilis (all stages) in 2020, and 51 were pregnant. Of those 51 pregnant women, 43 (84.3%) potential congenital syphilis cases were averted.

Marion County reported the most cases (n=<5). White, non-Hispanic, female Hoosiers had the highest count (n=5) of mother's giving birth to babies with congenital syphilis. Most mothers' marital status was single/never married (n=7), and all but one received prenatal care (n=7). Of the women who received prenatal care, five began their prenatal care during the first trimester and were tested for syphilis at their first visit.

Figure 21: Congenital Syphilis Reported Cases, 2016-2020

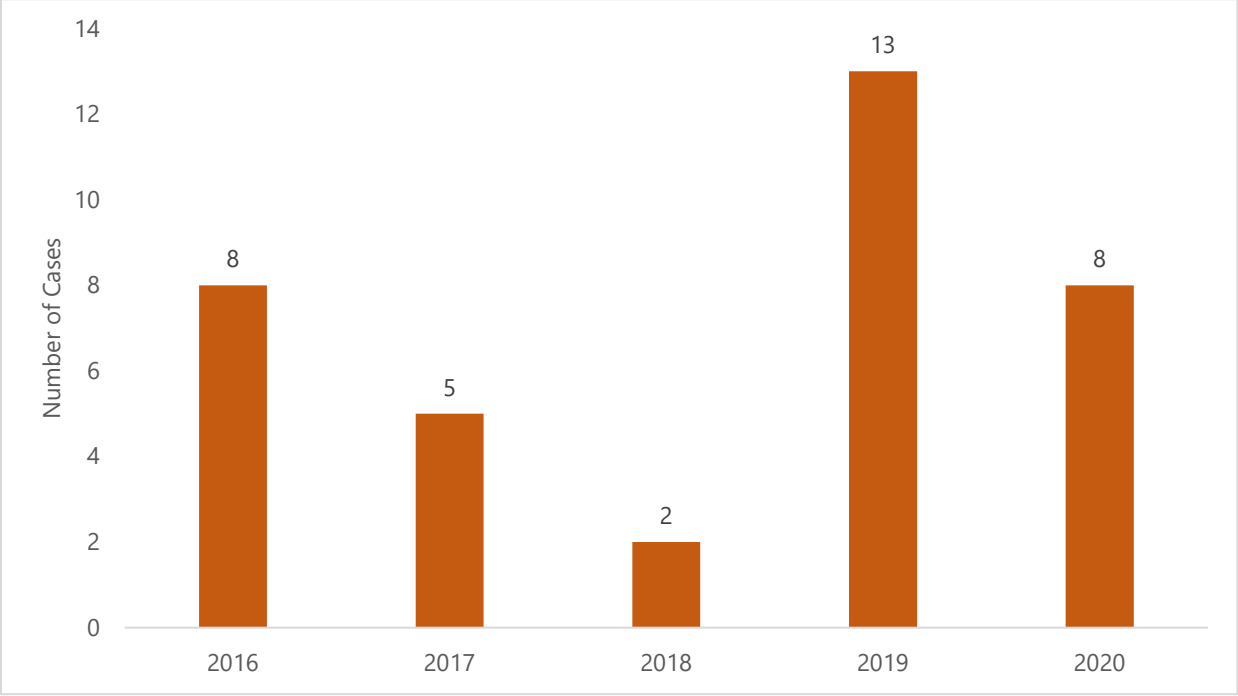


Figure 21 shows congenital syphilis case counts for the past five years.

Figure 22: Female Adult Syphilis Reported Cases, 2016-2020

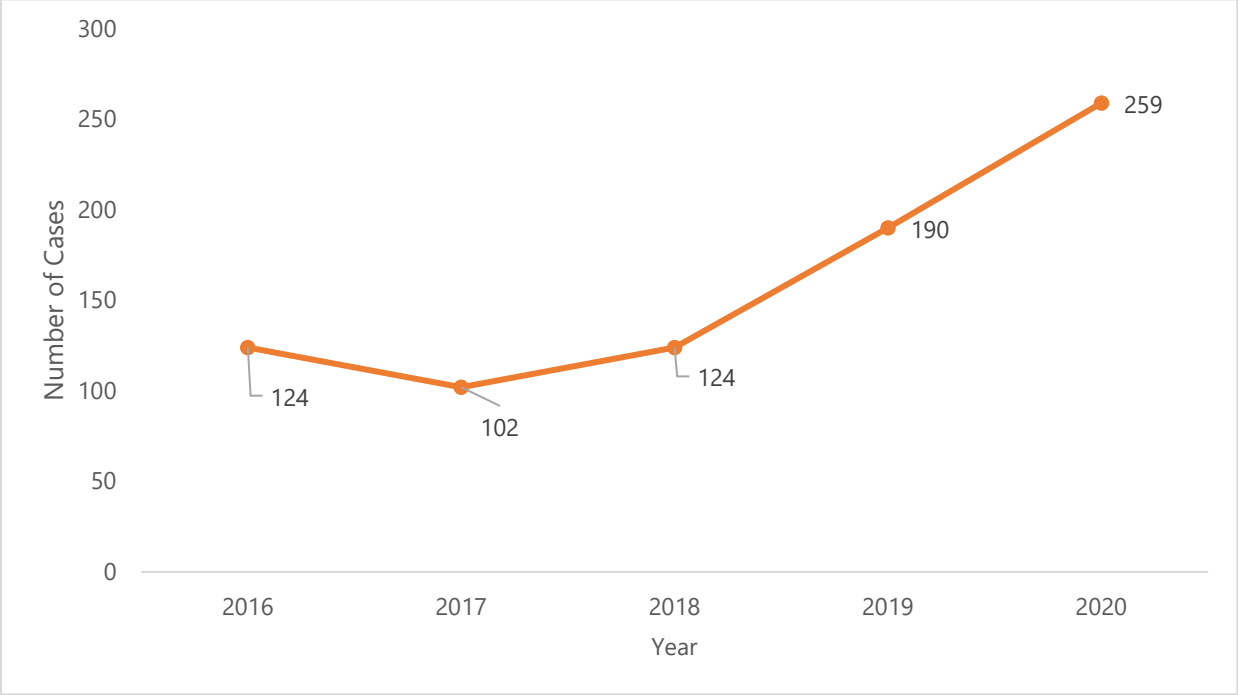


Figure 22 shows reported syphilis cases (all stages) among females for the past five years.

Figure 23: Heterosexual Male Adult Syphilis Reported Cases, 2016-2020

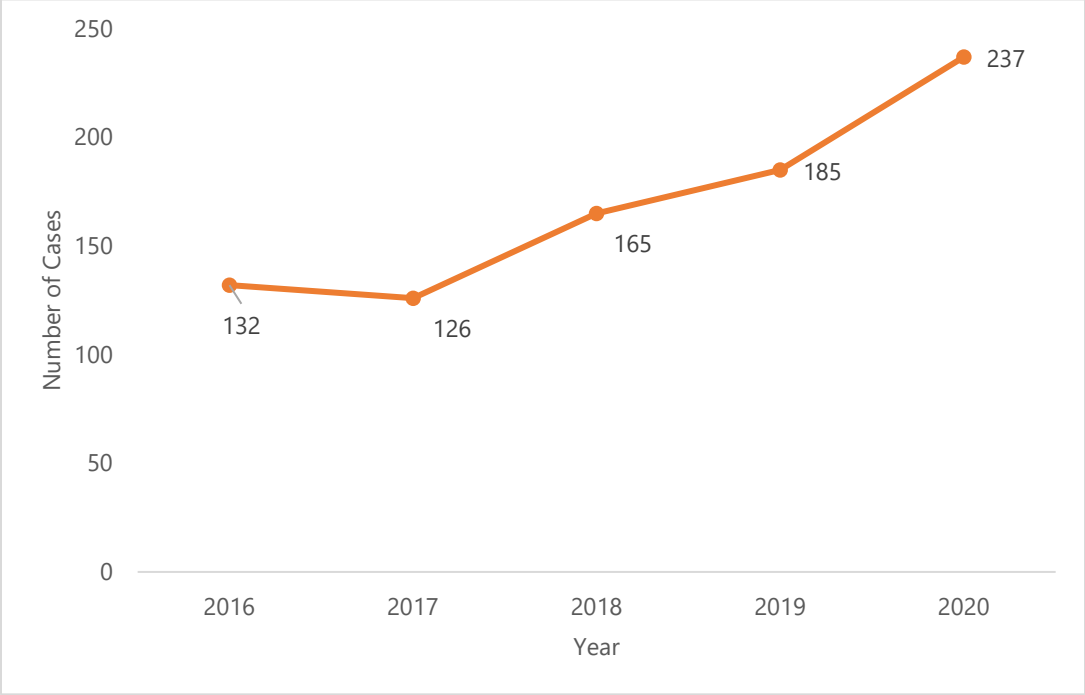


Figure 23 shows reported syphilis cases (all stages) among heterosexual males for the past five years.

Race

Black/African Americans and Native Hawaiian/Pacific Islanders Hoosiers had the highest rates for all STDs in 2020. In addition, gonorrhea cases in 2020 were mostly seen among Black/African American Hoosiers and made up 45% of reported cases in Indiana. This is especially concerning because Black/African American Hoosiers make up roughly 10% of Indiana's population. Black/African American Hoosiers were disproportionally affected by gonorrhea, especially in areas in the northern and southern parts of the state (St. Joseph, Elkhart, and Vanderburgh Counties) – where rates of disease from 2020 were the highest. The state averages nearly 1,000 cases of gonorrhea per 100,00 population for Black/African American Hoosiers, with rates in the top three counties being well above this, at 1,667 (St. Joseph), 1,332 (Elkhart), and 1,282 (Vanderburgh) cases per 100,000 population, respectively. This is especially concerning as gonorrhea is becoming increasingly difficult to treat due to resistance to the antibiotic drugs prescribed to treat it.

Sexual Orientation

MSM are disproportionately impacted by syphilis, HIV, and other STDs.[27] From 2019 to 2020, reported chlamydia and gonorrhea cases among MSM decreased but P&S syphilis cases among MSM increased ~48%. Reported chlamydia cases also decreased among heterosexual males and men who have sex with men and women (MSMW) from 2019 to 2020. However, reported gonorrhea and P&S syphilis cases among these groups increased. Heterosexual males had the largest percentage change with a 60% in reported P&S syphilis cases from 2019 to 2020. This data suggests that infectious syphilis is becoming more common among non-MSM.

Table 16: Percent Changes in Reported STD Cases among Males, 2019-2020 in Indiana

Disease	MSM	MSMW	Heterosexual Males
Chlamydia	-19.1%	-19.2%	-13.3%
Gonorrhea	-16.1%	+6%	+13.7%
P&S Syphilis	+47.7%	+31.4%	+60%

County Data

Allen, Lake, and Marion County are the most populous counties in Indiana[28] and had the highest rate of all STDs in the state. All rates, excluding P&S for Allen County, were above the state rates (table 9).

Table 17: 2020 STD Rates in Allen, Lake, and Marion Counties and Indiana State

Disease	Allen County	Lake County	Marion County	Indiana State
Chlamydia	695.1	565.1	1,015.7	491.6
Gonorrhea	307.5	266.5	488.3	209.1
P&S Syphilis	4.8	8.2	26.5	7.7

Table 9 shows the rates of STDs in Allen, Lake, and Marion Counties and the state rate.

Specific ZIP codes within Allen, Lake, and Marion Counties have higher cases of STDs when compared to other ZIP codes in the same counties. Non-white residences make up a majority of the population in all these ZIP codes. In addition, almost all have at least 20% of residences living in poverty.[29]

In 2020, Allen County reported the following number of STD cases:

- 2,470 chlamydia cases
- 1,031 gonorrhea cases
- 54 adult syphilis cases (17 P&S syphilis cases)

The three ZIP codes with the highest cases reported for all diseases include 46806, 46816, and 46803 (table 18).

Table 18: 2020 Allen County ZIP Codes with Highest Cases of STDs, by Race, Poverty and Median Household Income

Zip Code	All Reported STD Cases	Black/African American	Asian	Hispanic	White	Poverty Level	Median Household Income
46806	613	41.9%	--	21.8%	26%	25.4%	$32,368
46816	306	30.6%	16.2%	--	33.9%	15.2%	$40,386
46803	280	40.4%	--	20%	31.9%	44.4%	$23,094

Table 18 shows ZIP codes with the highest reported STDs in Allen County in 2020. The table also shows the median household income, percentage of residences in poverty, and the race and ethnicity demographic breakdown for these ZIP codes.[29]

In 2020, Lake County reported the following number of STDs:

- 2,818 chlamydia cases
- 1,329 gonorrhea cases
- 86 adult syphilis cases (41 P&S syphilis cases)

The three ZIP codes with the highest cases reported for all diseases include 46404, 46410, and 46312 (table 19).

Table 19: 2020 Lake County ZIP Codes with Highest Cases of STDs, by Race, Poverty and Median Household Income

Zip Code	All Reported STD Cases	Black/African American	Hispanic	White	Two or More	Poverty	Median Household Income
46404	436	91.7%	4.8%	--	1.9%	27.1%	$33,030
46410	401	44.2%	15.6%	35.1%	--	8.1%	$61,000
46312	341	35.6%	57.5%	6.3%	--	26%	$35,396

Table 19 shows ZIP codes with the highest reported STDs in Lake County in 2020. The table also shows the median household income, percentage of residences in poverty, and the race and ethnicity demographic breakdown for these ZIP codes..[29]

In 2020, Marion County reported the following number of STDs:

- 9,925 chlamydia cases
- 4,772 gonorrhea cases
- 668 adult syphilis cases (259 P&S syphilis cases)

The three ZIP codes with the highest cases reported for all diseases include 46226, 46218, and 46222 (table 20).

Table 20: 2020 Marion County ZIP Codes with Highest Cases of STDs, by Race

Zip Code	All Reported STD Cases	Black/African American	Hispanic	White	Poverty	Median Household Income
46226	1,185	51.7%	26.3%	21.3%	21.3%	$36,688
46218	1,139	70.4%	6.8%	20.3%	25.2%	$26,615
46222	928	38.7%	27.9%	27.5%	21.4%	$38,110

Table 20 shows ZIP codes with the highest reported STDs in Marion County in 2020. The table also shows the median household income, percentage of residences in poverty, and the race and ethnicity demographic breakdown for these ZIP codes.[29]

Section 15: Co-infections

According to the CDC, people with an STD are more likely to get HIV than someone who is STD-free.[30] Additionally, having a sore or break in the skin from an STD may allow HIV to enter the body more easily.[30]

Although uncommon, hepatitis C (HCV) can be transmitted through sexual activity. Having a std, having sex with multiple partners, and engaging in anal sex appear to increase a person's risk for HCV. The behavioral risk factors for STDs and hepatitis B (HBV) are also similar.[31] The IDOH STD and Viral Hepatitis program areas define a coinfection as *two or more infections that are co-occurring and/or may have resulted from a single exposure*.

HIV Coinfections

HIV is a virus that attacks the body's immune system and if not treated can lead to AIDS (acquired immunodeficiency syndrome). There is currently no effective cure for HIV, but HIV can be controlled with proper medical care.[7]

In 2020, there were 448 cases of new HIV reported in Indiana (rate of 6.6 per 100,000). Of 448 cases, 19 (4.2%) were co-infected with P&S syphilis.

Viral Hepatitis Coinfections

HBV is a vaccine-preventable liver infection caused by the hepatitis B virus. HBV is spread when blood, semen, or other body fluids from an infected person enters the body of someone who is not infected.[32] HCV is a liver infection caused by the hepatitis C virus. HCV is spread through contact with blood from an infected person.[33]

In 2020, there were 980 cases of new HBV reported in Indiana (rate of 14 per 100,000). Of those 980 cases, 98 were acute HBV cases and 872 were chronic HBV cases. Of the 872 chronic HBV cases reported, <5 cases were co-infected with P&S syphilis.

In 2020, there were 5,204 cases of new HCV reported in Indiana (rate of 77 per 100,000). Of those 5,204 cases, 264 were acute HCV cases and 4,924 were chronic HCV cases. Of all HCV cases reported, six were co-infected with P&S syphilis (one acute HCV and five chronic HCV).

Section 16: Evaluation

EVALUATION

Thank you for viewing the 2020 STD Epidemiologic Profile. Please consider taking the evaluation survey below for feedback and suggestions for the next profile.
https://redcap.isdh.in.gov/surveys/?s=FHN97M473HLWR9HJ

CSTE Case Definitions[34]

Chancroid

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 greater than or equal to seven 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

Chlamydia
***This is the 2010 Case Definition**

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 and trachoma.

Laboratory Criteria

- 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 meets laboratory evidence

Congenital Syphilis

Clinical Description: A condition caused by infection in utero with *Treponema pallidum*. A side 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 or shins, frontal bossing, mulberry molars, Hutchinson teeth, saddle nose, rhagades, or Clutton joints.

Laboratory Criteria for Diagnosis

Demonstration of *Treponema pallidum* by:

- Darkfield microscopy of lesions, body flies, or neonatal nasal discharge, or
- Polymerase chain reaction (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) or 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 (Venereal Disease Research Laboratory [VDRL], rapid plasma reagin (RPR), or equivalent serologic methods) **AND** any one of the following:

- Any evidence of congenital syphilis on physical examination (see clinical description)
- Any evidence of congenital syphilis on radiographs of long bones
- A reactive cerebrospinal fluid (CSF) venereal disease research laboratory test (VDRL) test
- In a nontraumatic 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:
    - During the first 30 days of life, a CSF WBC count of >15 WBC/mm3 or a CSF protein >120 mg/dL
    - After the first 30 days of life, a CSF WBC count of >5 WBC/mm3 or a CSF protein >40 mg/dL, regardless of CSF serology. The treating clinician should be consulted to interpret the CSF values for the specific patient.
- Syphilitic stillbirth: A fetal death that occurs after a 20-week gestation or in which the fetus weighs greater than 500 g and the mother had untreated or inadequately treated* syphilis at delivery.
- *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.

Gonorrhea

Clinical Description: A sexually transmitted disease 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 endocervical smear obtain 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 endocervical smear obtain from a female

Confirmed: A person with laboratory isolation of typical gram-negative, oxidase-positive diplococcic by culture (presumptive *Neisseria gonorrhoeae*) from a clinical specimen, or demonstrations of *N. gonorrhoeae* in a clinical specimen by detection of antigen or detection of nucleic acid amplification (e.g., Polymerase Chain Reaction [PCR]) or hybridization with nucleic acid probe

Primary Syphilis

Clinical Description: A stage of infection with *Treponema pallidum* characterized by one or more ulcerative lesions (e.g., chancre), which might different considerable 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

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 confirmatory laboratory criteria

Secondary Syphilis

Clinical Description: A stage of infection caused by *T. pallidum* characterized by local or diffuse mucocutaneous lesions (e.g., rash – such as non-pruritic macular, maculopapular, papular, or pustular lesions), often with generalized lymphadenopathy. Other signs can include mucous patches, condyloma lata, and alopecia. The primary ulcerative may still be present*

*Because of the wide array of symptoms and signs possibly indicating secondary syphilis, serologic tests for syphilis and physical examination are crucial.

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 regain (RPR), or equivalent serologic methods), **AND**
- A reactive treponemal serologic test (*T. pallidum* particle agglutination [TP-PA], enzyme immunoassay [EIA], chemiluminescence immunoassay [CIA], or equivalent serologic methods

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 confirmatory laboratory criteria

Early non-primary non-secondary

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

A current nontreponemal test titer demonstrating fourfold increase from the last nontreponemal test titer unless there is evidence that this increase was not sustained for > two 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., VDL, 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

Unknown duration or late

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 and 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.

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, clinicals 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, program should consider prioritizing cases of syphilis of unknown duration with high 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.

Comments

Additional information to be collected on clinical manifestations of reported syphilis cases

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 cerebrospinal fluid (CSF) protein (>50 mg/dL2) or leukocyte count (>5 white blood cells/cubic millimeter CSF) in the absence of other known causes of these abnormalities.

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 polymerase chain reaction (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 polymerase chain reaction (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 polymerase chain reaction (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).

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