



Department of
Health

Tennessee STD Epidemiological Profile 2019

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Executive Summary

This report presents 2019 surveillance data for Sexually Transmitted Diseases (STD) in Tennessee. The report focuses on new reported cases of chlamydia, gonorrhea, and syphilis in the state. The purpose of this report is to effectively present the STD epidemic in Tennessee to assist with education, outcome monitoring, and program planning.

All data reported are based on information received by Tennessee Department of Health (TDH) as of November 2, 2020. The data in this report reflect five year trends between 2015 and 2019 for all categories of data.

Data are presented in the form of total counts, rates per 100,000 persons, and percentages of the total. Data are also stratified by various categories, including gender, race and ethnicity, and age. Rates are equal to counts divided by the total population times 100,000 and are presented alongside totals to account for differences in total population, such as between racial and ethnic groups. Data release limitations were set to ensure that the information cannot be used to inadvertently identify an individual. Rates where the numerator is less than 20 cases should be interpreted with caution because of the low reliability of rates based on a small number of cases. The data in this edition supersede those in earlier publication of the data.

Key Findings

- During 2015–2019, the number and rate of reported cases of chlamydia, gonorrhea and primary and secondary (P&S) syphilis increased.
- In 2019, there were 41,501 chlamydia infections reported for a rate of 607.7 cases per 100,000 population, 16,183 gonorrhea infections reported for a rate of 237.0 cases per 100,000, and 683 cases of P&S syphilis reported for a rate of 10.0 cases per 100,000.
- During 2015–2019, non-Hispanic Blacks had highest rate of chlamydia, gonorrhea, and P&S syphilis infections as compared to non-Hispanic whites and Hispanics.
- In 2019, Shelby was the public health region with the highest rate of chlamydia (1,096.9 cases per 100,000 population) and gonorrhea (454.8 cases per 100,000 population). Davidson had the highest rate of P&S syphilis (26.7 cases per 100,000 population).
- In 2019, men accounted for the majority (84%) of P&S syphilis cases.
- Among men, men who have sex with men only (MSM) accounted for the majority of P&S syphilis cases. Of the 683 reported P&S syphilis cases in 2019, 304 (44%) were among MSM, and 55 (8%) among men who have sex with men and women (MSMW). Of the total P&S syphilis cases in Tennessee in a year, the percentage of P&S syphilis cases in women has more than doubled from 2015 to 2019.

- In 2019, there were 15 reported cases of congenital syphilis, yielding a rate of 18.6 cases per 100,000 live births in the state.

Background

Tennessee is a mid-sized state that consists of 95 counties and borders eight other states. TDH's Central Office (CO), located in Nashville, partners with all of the state's counties, which are divided into thirteen public health regions. Six of the most populous counties operate as stand-alone metropolitan public health regions, and the remaining 89 counties are divided into seven rural health regions. The rural counties are considered to be an extension of TDH, whereas TDH partners with the metropolitan regions through contractual agreements.

Population: Tennessee was home to 6,829,174 people in 2019, which accounts for approximately 2% of the population in the United States.¹ With a growth rate of 4%, similar to the national rate, the population of Tennessee increased by 238,004 people between 2015 and 2019.¹ The geographic areas with the largest percentages of the population include the Memphis/Shelby County, Nashville/Davidson County, and the Mid-Cumberland public health region.

Women of Reproductive Age: In 2019, 51.2% (3,496,935) of the population were women, of which 38.1% (1,333,861) were of reproductive age, between 15–44 years of age.² There were 80,431 live births in 2019.³

LGBT: It is estimated that 159,631 (3.1%) of adults in Tennessee identify as lesbian, gay, bisexual or transgender (LGBT) compared to 4.5% in the United States.⁴ Approximately, 10,898 same-sex couple households were estimated in Tennessee in the last census decennial. Data on LGBT are limited.

Age: The median age in Tennessee in 2019 was 39 years, same as that of the U.S. median age. The age distribution in Tennessee roughly reflects that of the U.S. population in general.⁵

Race and Ethnicity: In 2019, 74% of the population in Tennessee was non-Hispanic white, followed by 17% non-Hispanic Black and 6% Hispanic. Other racial groups make up the remaining 5% of the population, with the largest category being Asian (2%).⁵

Income and Poverty: The median household income in Tennessee in 2019 was \$53,320, compared to the national median income of \$62,843.⁶ There are noticeable racial and ethnic disparities in household income in Tennessee. White households had a median income of \$60,249 in 2019, while Black and Hispanic households had median incomes of \$40,768 and \$46,126 respectively.⁷ The overall poverty rate in Tennessee in 2019 was 14%. The highest rates of poverty, between 25 and 40%, were primarily in rural regions of Tennessee, including the East, West, and Upper Cumberland regions.^{6,8}

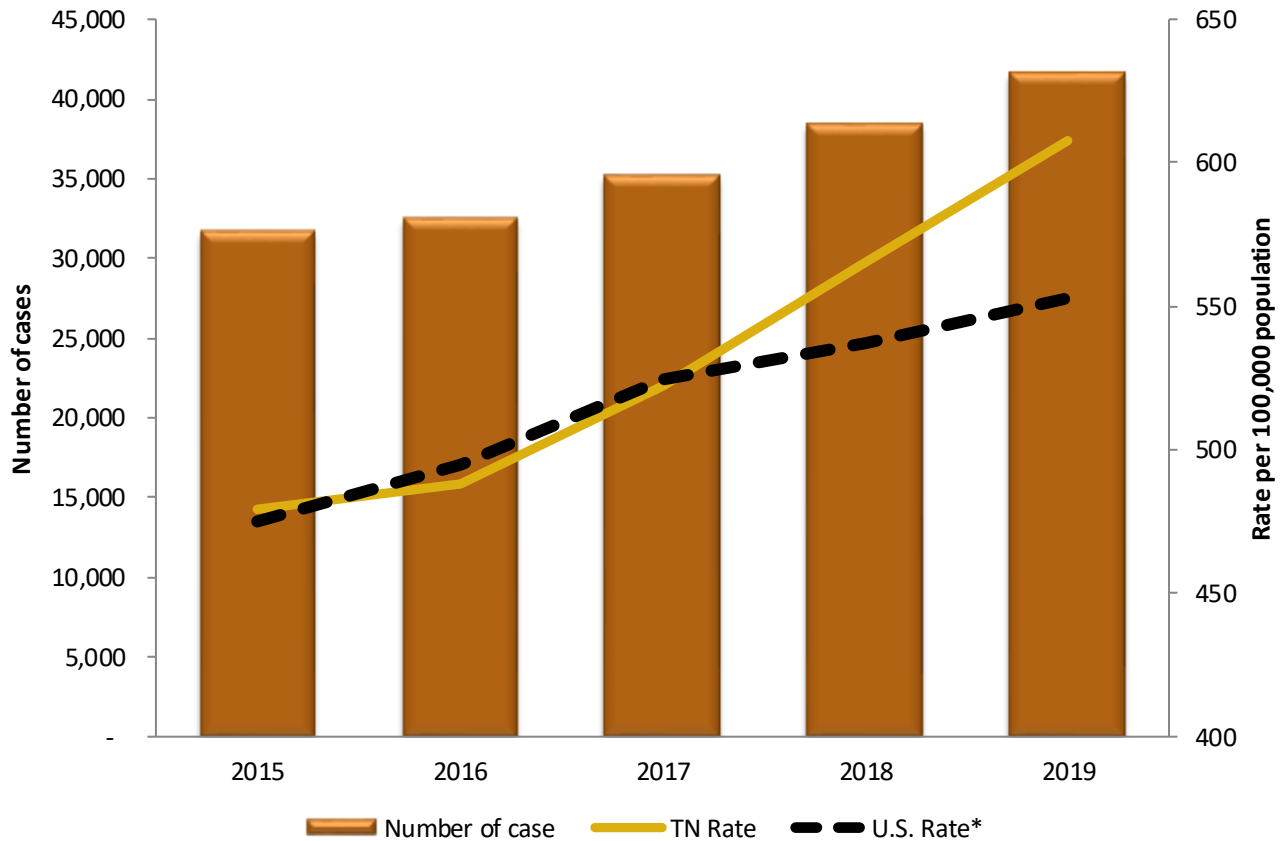
Reporting Laws and Regulations

The Tennessee Department of Health's (TDH) STD Prevention Program manages the Tennessee STD case surveillance registry. Chlamydia, gonorrhea, and syphilis are reportable conditions by law and medical labs are required to send all positive STD-related laboratory reports to TDH. Laboratory results are reported by providers and laboratories either by paper, electronic files (i.e., Excel files via secure email), and/or via Electronic Laboratory Reporting. These are reported to TDH within one week of identification. In accordance with T.C.A. §37-1-403, any physician or other person diagnosing or treating any sexually transmitted disease set out in T.C.A. §68-10-112, or venereal herpes in children 13 years of age or younger, should immediately make a confidential written report of the case to TDH.

In addition to the laboratory results, case report forms containing demographic characteristics, STD risk factors, and treatment information are collected. This information is then stored in the Patient Reporting Investigation Surveillance Manager (PRISM) and is used to create yearly epidemiological reports. TDH's Reportable Disease regulations can be found at <https://www.tn.gov/health/cedep/reportable-diseases.html>.

Chlamydia

Figure 1: Chlamydia — Number and Rate of Reported Cases, Tennessee and U.S., 2015–2019



*U.S. rates are from the CDC STD Surveillance 2019 report.

Table 1: Chlamydia — Number and Rate of Reported Cases, Tennessee and U.S., 2015–2019

	2015	2016	2017	2018	2019
Number of cases	31,607	32,487	35,088	38,282	41,501
TN Rate	479.3	488.4	522.5	565.5	607.7
U.S. Rate*	475.0	494.7	524.6	537.5	552.8

All rates per 100,000 population.

*U.S. rates are from the CDC STD Surveillance 2019 report.

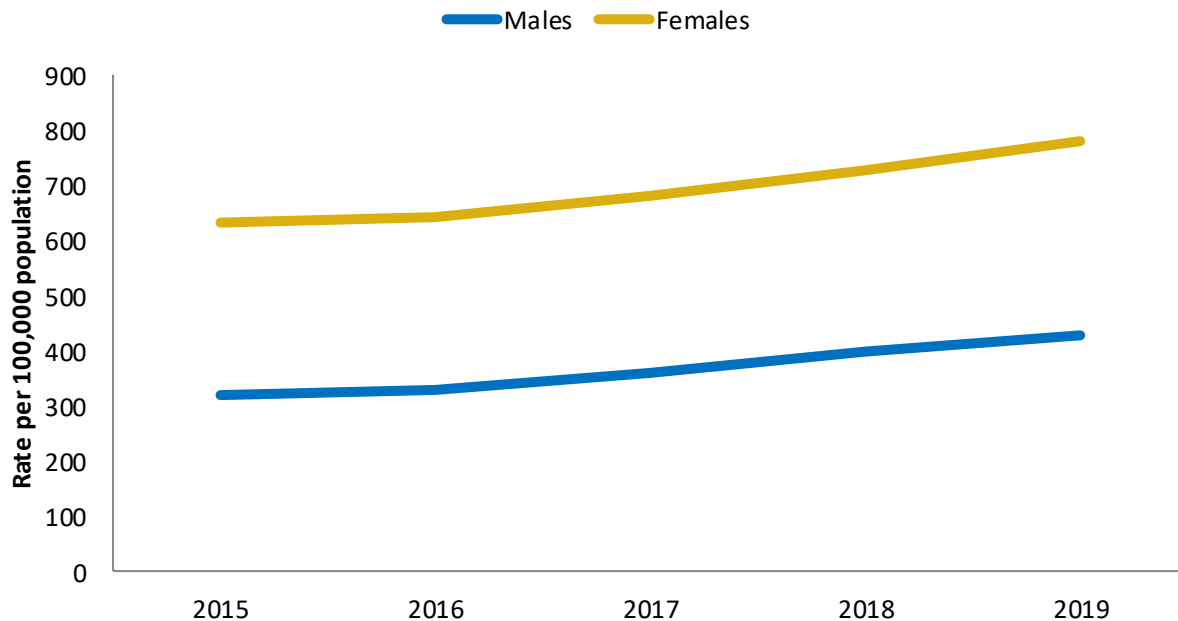
The rate and number of reported cases of chlamydia increased from 2015–2019 in Tennessee. In 2019, 41,501 chlamydia infections were reported to TDH. This cases count corresponds to a rate of 607.7 cases per 100,000 population, which was higher than the national rate of 552.8 cases per 100,000 population.

Table 2: Chlamydia — Number and Rate of Reported Cases by Gender, Tennessee, 2015–2019

Gender	2015		2016		2017		2018		2019	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total cases	31,607	479.3	32,487	488.4	35,088	522.5	38,282	565.5	41,501	607.7
Males	10,259	319.0	10,646	328.3	11,738	358.3	13,085	396.3	14,243	427.4
Females	21,348	631.7	21,837	640.6	23,347	678.7	25,193	726.5	27,254	779.4

All rates are per 100,000 population.

Figure 2: Chlamydia — Rate of Reported Cases by Gender, Tennessee, 2015–2019



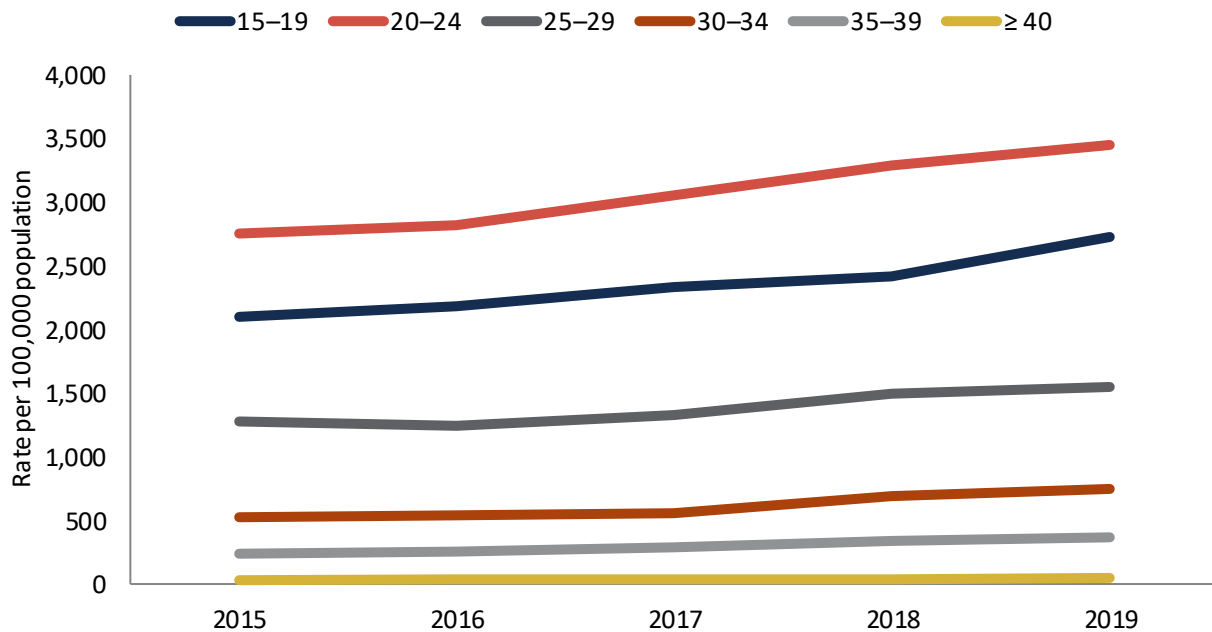
In 2019, 27,254 cases of chlamydia were reported among females for a rate of 779.4 cases per 100,000 females. The rate among males was lower, with 14,243 cases reported for a rate of 427.4 cases per 100,000 males. For both males and females, the rates have steadily increased during 2015–2019.

Table 3: Chlamydia — Number and Rate of Reported Cases by Age Group, Tennessee, 2015–2019

Age group (years)	2015		2016		2017		2018		2019	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total cases	31,607	479.3	32,487	488.4	35,088	522.5	38,282	565.5	41,501	607.7
15–19	8,807	2,099.1	9,237	2,189.1	9,947	2,340.6	10,635	2,420.0	11,569	2,726.7
20–24	12,709	2,753.8	12,802	2,814.3	13,644	3,051.9	14,413	3,295.6	15,349	3,449.8
25–29	5,689	1,273.7	5,779	1,243.1	6,396	1,323.3	7,199	1,486.8	7,700	1,548.4
30–34	2,236	524.7	2,284	534.7	2,421	559.6	2,997	696.0	3,380	747.2
35–39	981	238.1	1,085	258.1	1,208	282.6	1,434	330.9	1,598	366.9
≥ 40	962	30.2	1,036	32.2	1,216	37.4	1,333	40.5	1,594	48.0

All rates are per 100,000 population.

Figure 3: Chlamydia — Rate of Reported Cases by Age Group, Tennessee, 2015–2019



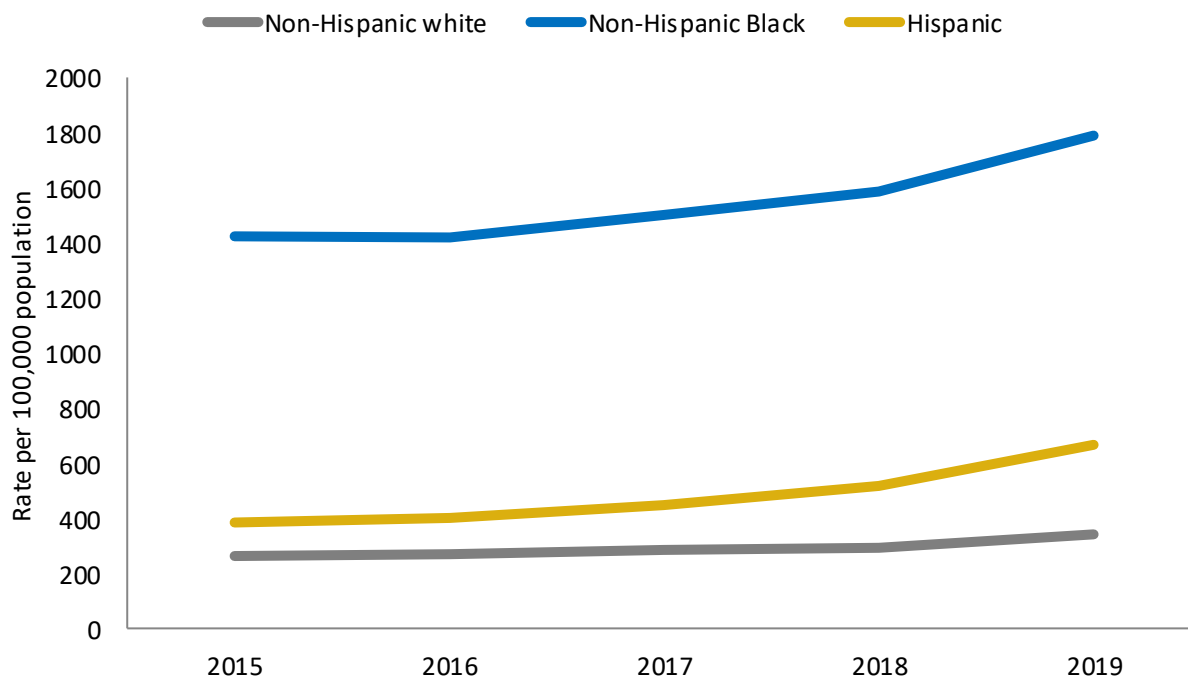
In 2019, the highest rates of chlamydia infections were reported among individuals 20–24 years old, followed by 15–19 year-olds. Among 20–24 year-olds, 15,349 cases were reported for a rate of 3,449.8 cases per 100,000 individuals aged 20–24. Among 15–19 year-olds, 11,569 cases were reported for a rate of 2,726.7 cases per 100,000 individuals aged 15–19. The rate of chlamydia increased among all age groups from 2015–2019.

Table 4: Chlamydia — Number and Rate of Reported Cases by Race and Ethnicity, Tennessee, 2015–2019

Race/Ethnicity	2015		2016		2017		2018		2019	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total cases	31,607	479.3	32,487	488.4	35,088	522.5	38,282	565.5	41,501	607.7
Non-Hispanic white	12,901	262.7	13,475	272.9	14,224	286.6	15,380	293.8	17,139	341.4
Non-Hispanic Black	15,773	1,424.6	15,840	1,419.1	16,950	1,504.4	18,070	1,588.2	20,426	1,788.9
Hispanic	1,296	384.3	1,401	401.7	1,646	449	1,920	514.9	2,608	666.4

All rates are per 100,000 population.

Figure 4: Chlamydia — Rate of Reported Cases by Race and Ethnicity, Tennessee, 2015–2019



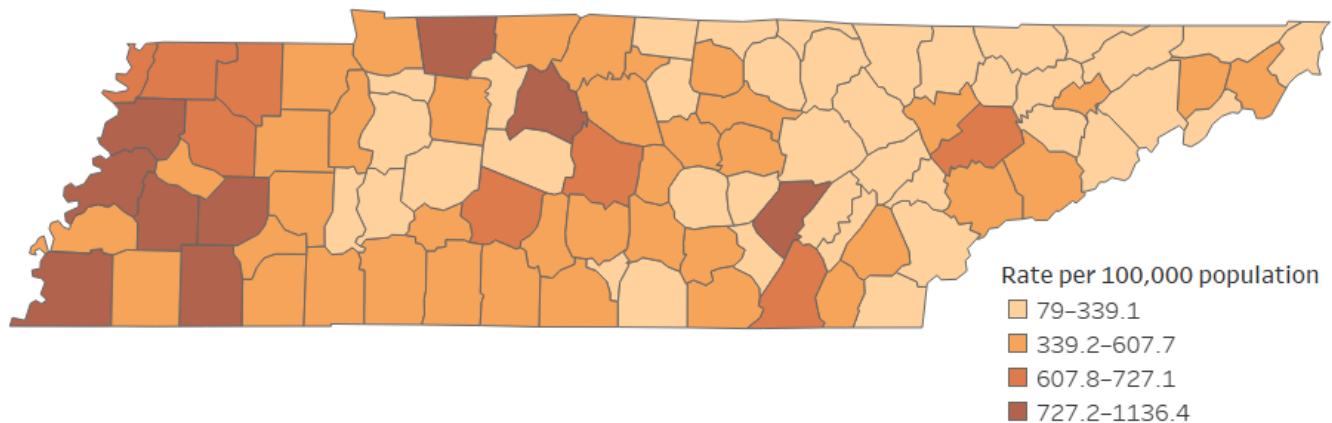
In the last five years, non-Hispanic Blacks had highest rate of chlamydial infections in the state. In 2019, 20,426 cases of chlamydia were reported among non-Hispanic Blacks for a rate of 1,788.9 cases per 100,000, as compared to 341.4 cases per 100,000 among non-Hispanic whites and 666.4 cases per 100,000 among Hispanics.

Table 5: Chlamydia — Number and Rate of Reported Cases by Public Health Region, Tennessee, 2015–2019

Regions/Metros	2015		2016		2017		2018		2019	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total cases	31,607	479.3	32,487	488.4	35,088	522.5	38,282	565.5	41,501	607.7
Northeast	874	249.7	947	269.7	1,017	289.2	1,166	330.6	1,172	331.2
East	2,110	278.9	2,193	288.1	2,242	292.6	2,515	326.4	2,494	321.3
Southeast	1,124	340.2	1,132	341.3	1,178	353.9	1,292	384.9	1,433	422.8
Upper-Cumberland	864	249.9	1,103	316.7	1,163	330.1	1,093	307.1	1,212	336.3
Mid-Cumberland	4,951	407.4	5,023	403.4	5,779	452.5	6,157	471.2	7,154	536.3
South Central	1,316	334.9	1,375	346.1	1,582	392.9	1,693	414.6	1,930	466.6
West	2,561	482.6	2,703	510.8	2,875	545.9	2,909	551.7	3,117	592.2
Shelby	8,120	867.4	7,871	842.2	9,004	961	9,770	1044.1	10,280	1096.9
Davidson	4,453	656.5	4,544	663.9	4,567	660.7	5,383	777.2	5,906	850.8
Knox	2,191	485.3	2,418	530.1	2,600	562.9	2,679	575.8	2,876	611.5
Hamilton	1,867	528	2,069	578.4	1,922	531.5	2,243	615.7	2,511	682.7
Madison	784	803.2	730	747.5	725	742.5	936	959.0	907	925.7
Sullivan	392	250.2	379	241.9	434	276.2	446	282.9	509	321.4

All rates are per 100,000 population.

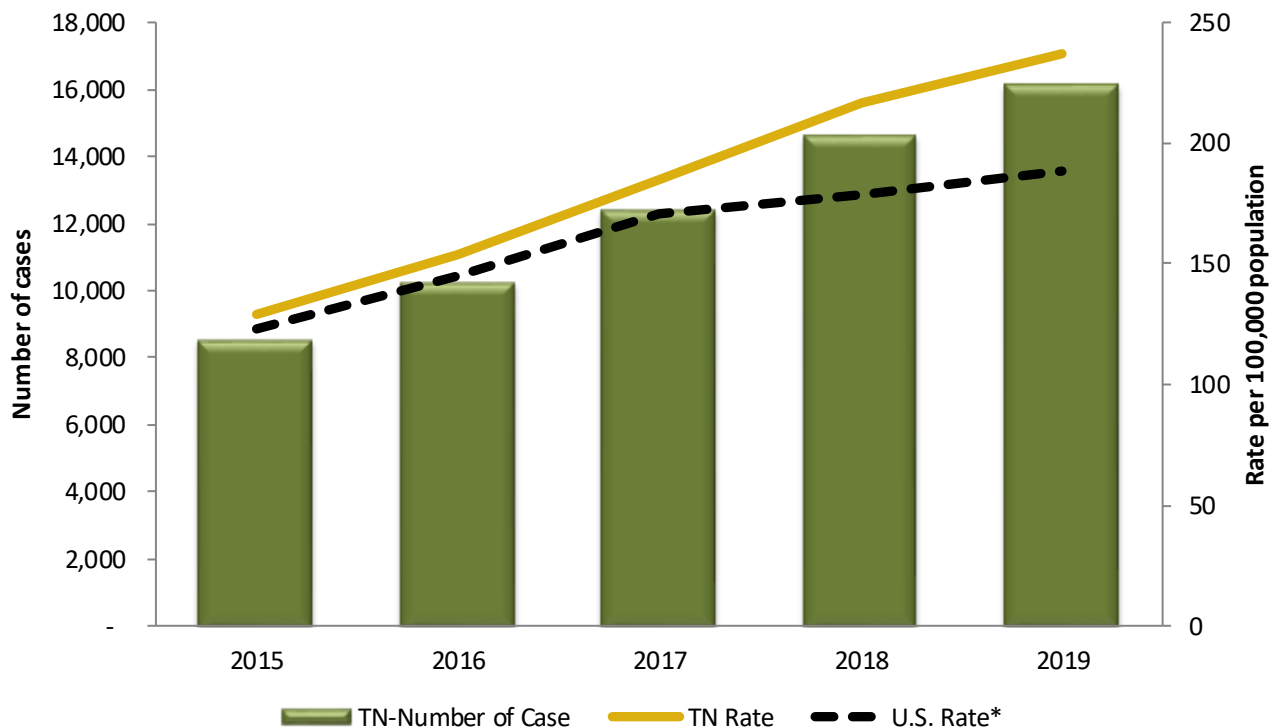
Figure 5: Chlamydia — Rate of Reported Cases by County, Tennessee, 2019



In 2019, rates of reported cases of chlamydia by Public Health Region ranged from 79.2 cases per 100,000 population in Pickett to 1,136.4 cases per 100,000 population in Montgomery. The counties with the highest rates of reported cases of chlamydia were Montgomery (1,136.4/100,000), Shelby (1,096.9 /100,000), Haywood (953.5/100,000), Madison (925.7/100,000), Bledsoe (909.5/100,000), Hardeman (858.3/100,000), and Davidson (850.8/100,000).

Gonorrhea

Figure 6: Gonorrhea — Number and Rate of Reported Cases, Tennessee and U.S., 2015–2019



*U.S. rates are from the CDC STD Surveillance 2019 report.

Table 6: Gonorrhea — Number and Rate of Reported Cases, Tennessee and U.S., 2015–2019

	2015	2016	2017	2018	2019
TN-Number of cases	8,509	10,245	12,425	14,666	16,183
TN Rate	129.0	154.0	185.0	216.6	237.0
U.S. Rate*	123.0	145.0	170.6	178.3	188.4

All rates per 100,000 population.

*U.S. rates are from the CDC STD Surveillance 2019 report.

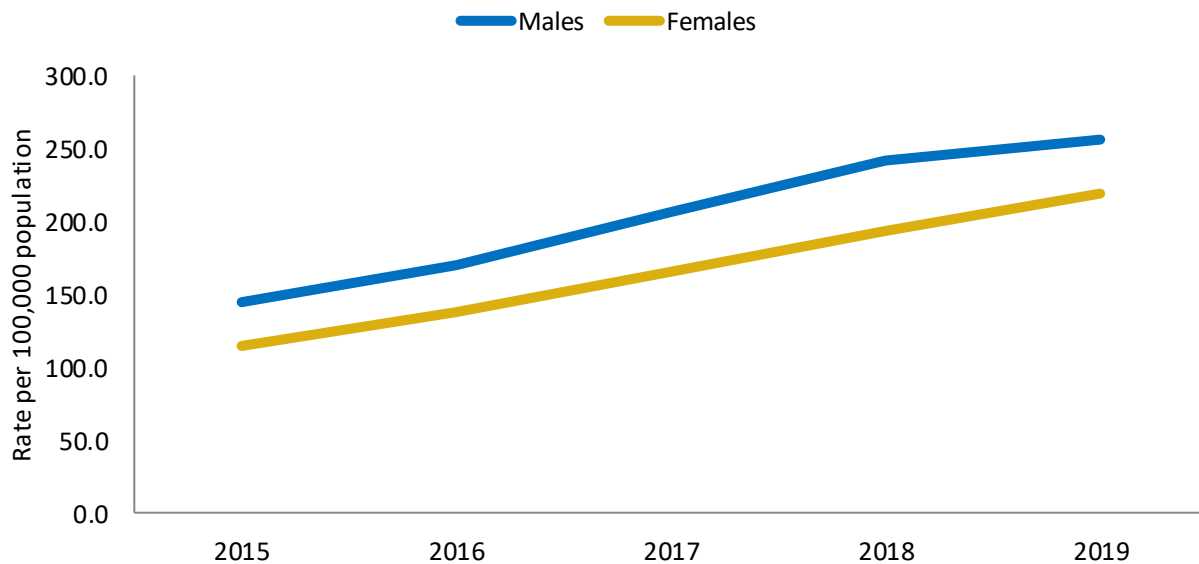
The rate and number of reported cases of gonorrhea increased from 2015–2019. Similarly, the national rate of gonorrhea has increased in the last five years, but Tennessee had higher rates of reported cases of gonorrhea compared to the United States during the last five years. In 2019, 16,183 gonorrhea infections were reported for a rate of 237.0 cases per 100,000 population, which was higher than the U.S. rate of 188.4 cases per 100,000 population.

Table 7: Gonorrhea — Number and Rate of Reported Cases by Gender, Tennessee, 2015–2019

Gender	2015		2016		2017		2018		2019	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total cases	8,509	129.0	10,245	154.0	12,425	185.0	14,666	216.6	16,183	237.0
Males	4,644	144.4	5,529	170.5	6,757	206.3	7,962	241.1	8,527	255.9
Females	3,865	114.4	4,715	138.3	5,667	164.7	6,704	193.3	7,656	218.9

All rates are per 100,000 population.

Figure 7: Gonorrhea — Rate of Reported Cases by Gender, Tennessee, 2015–2019



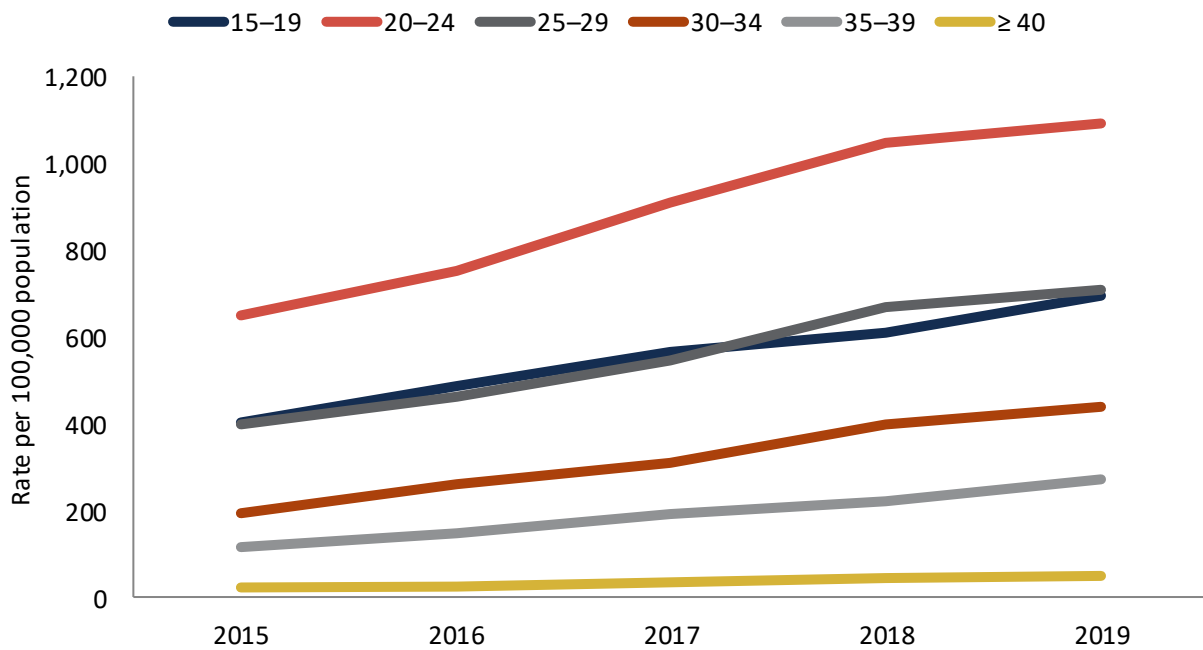
In 2019, 8,527 cases of gonorrhea were reported among males for a rate of 255.9 cases per 100,000 males. The rate among females was lower, with 7,656 cases reported for a rate of 218.9 cases per 100,000 females. For both, males and females, the rates increased from 2015–2019.

Table 8: Gonorrhea — Number and Rate of Reported Cases by Age Group, Tennessee, 2015–2019

Age group (years)	2015		2016		2017		2018		2019	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total cases	8,509	129.0	10,245	154.0	12,425	185.0	14,666	216.6	16,183	237.0
15–19	1,688	402.3	2,052	486.3	2,403	565.4	2,675	608.7	2,946	694.4
20–24	2,995	649.0	3,424	752.7	4,063	908.8	4,574	1,045.9	4,856	1,091.4
25–29	1,777	397.9	2,138	459.9	2,637	545.6	3,228	666.7	3,521	708.0
30–34	823	193.1	1,104	258.5	1,346	311.1	1,720	399.4	1,983	438.4
35–39	474	115.0	626	148.9	811	189.7	966	222.9	1,181	271.2
≥ 40	702	22.0	832	25.8	1,092	33.6	1,413	42.9	1,618	48.7

All rates are per 100,000 population.

Figure 8: Gonorrhea — Rate of Reported Cases by Age group, Tennessee, 2015–2019



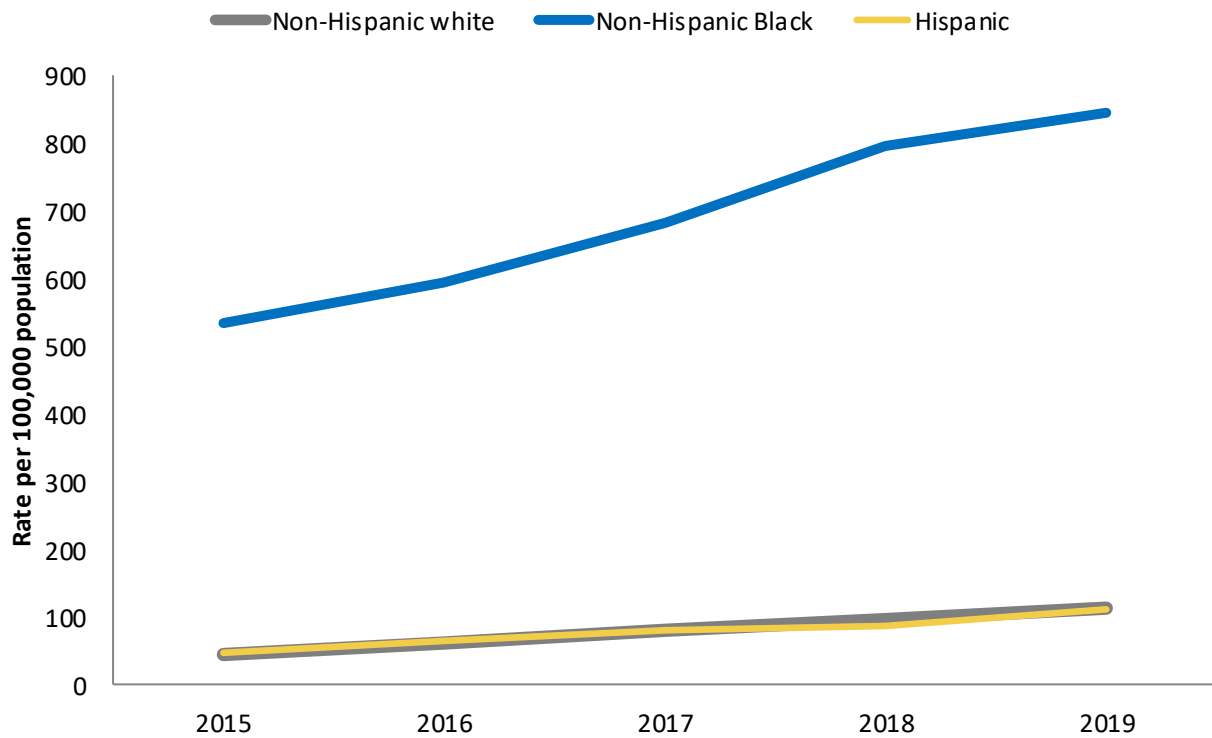
In 2019, individuals 20–24 years old had the highest rates of gonorrhea infections with 1,091.4 cases per 100,000 individuals aged 20–24. From 2015–2017, the second highest rates of gonorrhea were among 15–19 year-olds, however in 2018 and 2019, 25–29 year-olds had the second highest gonorrhea rates in the state, with a rate of 708.0 cases per 100,000 individuals aged 25–29 in 2019. The rate of gonorrhea increased among all age groups from 2015–2019.

Table 9: Gonorrhea — Number and Rate of Reported Cases by Race and Ethnicity, Tennessee, 2015–2019

Race/Ethnicity	2015		2016		2017		2018		2019	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total cases	8,509	129.0	10,245	154.0	12,425	185.0	14,666	216.6	16,183	237.0
Non-Hispanic white	2,167	44.1	2,968	60.1	3,891	78.4	4,847	97.1	5,650	112.6
Non-Hispanic Black	5,910	533.8	6,631	594.1	7,678	681.5	9,035	797.0	9,643	844.6
Hispanic	157	46.6	227	65.1	293	79.9	332	87.2	434	110.9

All rates are per 100,000 population.

Figure 9: Gonorrhea — Rate of Reported Cases by Race and Ethnicity, Tennessee, 2015–2019



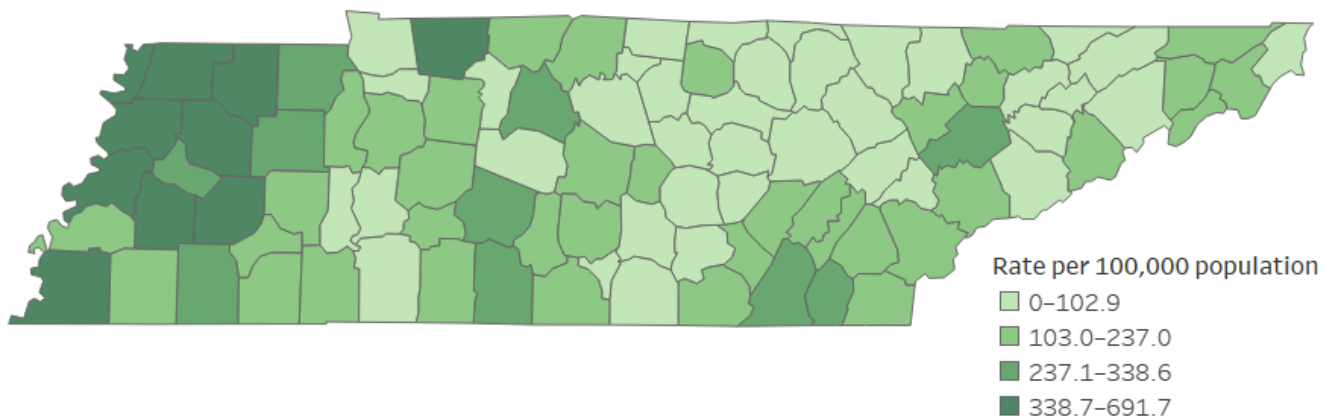
Non-Hispanic Blacks had highest rate of gonorrhea infections in the state from 2015–2019. In 2019, 9,643 cases of gonorrhea were reported among non-Hispanic Blacks for a rate of 844.6 cases per 100,000, as compared to 112.6 cases per 100,000 among non-Hispanic whites and 110.9 cases per 100,000 among Hispanics.

Table 10: Gonorrhea — Number and Rate of Reported Cases by Public Health Region, Tennessee, 2015–2019

Regions/Metros	2015		2016		2017		2018		2019	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total cases	8,509	129.0	10,245	154.0	12,425	185.0	14,666	216.6	16,183	237.0
Northeast	115	32.9	116	33	142	40.4	318	90.2	469	132.5
East	226	29.9	408	53.6	583	76.1	777	100.9	773	99.6
Southeast	275	83.2	413	124.5	404	121.4	512	152.5	573	169.0
Upper-Cumberland	86	24.9	166	47.7	372	105.6	223	62.7	338	93.8
Mid-Cumberland	990	81.5	1,346	108.1	1,705	133.5	1,812	138.7	2,086	156.4
South Central	273	69.5	293	73.7	321	79.7	494	121.0	743	179.6
West	497	93.7	681	128.7	900	170.9	1,280	242.8	1,526	289.9
Shelby	2,582	275.8	2,934	313.9	3,694	394.3	4,354	465.3	4,262	454.8
Davidson	1,537	226.6	1,895	276.9	1,656	239.6	1,882	271.7	2,350	338.5
Knox	795	176.1	940	206.1	1,333	288.6	1,329	285.6	1,369	291.1
Hamilton	838	237	749	209.4	928	256.6	1,024	281.1	1,107	301.0
Madison	233	238.7	241	246.8	311	318.5	523	535.8	373	380.7
Sullivan	62	39.6	63	40.2	76	48.4	138	87.5	214	135.1

All rates are per 100,000 population.

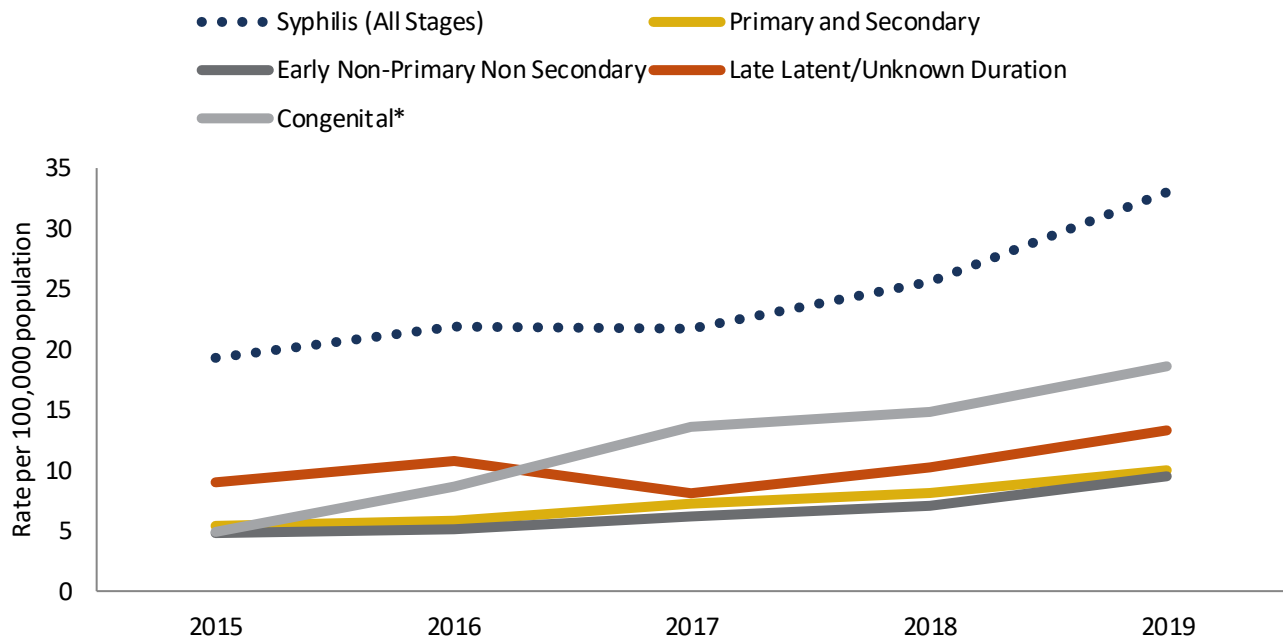
Figure 10: Gonorrhea — Rate of Reported Cases by County, Tennessee, 2019



In 2019, rates of reported cases of gonorrhea by Public Health Region ranged from 93.8 cases per 100,000 population in the Upper Cumberland region to 454.8 cases per 100,000 population in the Shelby region. The counties with the highest rates of reported cases of gonorrhea were Obion (691.7/100,000) and Lake (470.4/100,000).

Syphilis

Figure 11: Syphilis — Rate of Reported Cases by Disease Stage, Tennessee, 2015–2019



Rates are per 100,000 population. Congenital syphilis rates are per 100,000 live births.

*Congenital syphilis cases are based on case report year.

Table 11: Syphilis — Number and Rate of Reported Cases by Disease Stage, Tennessee, 2015–2019

Stage of Infection	2015		2016		2017		2018		2019	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Syphilis (All Stages)	1,272	19.3	1,459	21.9	1,456	21.7	1,730	25.6	2,253	33.0
Primary and Secondary	356	5.4	390	5.9	489	7.3	553	8.2	683	10.0
Early Non-Primary Non-Secondary*	316	4.8	341	5.1	411	6.1	474	7.0	646	9.5
Late Latent/Unknown Duration*	594	9.0	721	10.8	544	8.1	691	10.2	909	13.3
Congenital**	4	4.9	7	8.7	11	13.6	12	14.9	15	18.6

Rates are per 100,000 population. Congenital syphilis rates are per 100,000 live births.

Note: Rates based on counts of < 20 are unreliable. Interpret with caution.

*In 2018 CDC changed naming of early latent and late latent stages to these.

** Congenital syphilis cases are based on case report year.

In 2019, there were a total of 2,253 reported cases of syphilis in Tennessee. Overall, the number and rate of total cases of syphilis have increased since 2015. The rates for cases of primary and secondary, early non-primary non-secondary, late latent/unknown duration, and congenital syphilis increased from 2015–2019.

Table 12: Syphilis (All Stages)* — Number and Rate of Reported Cases by Public Health Region, Tennessee, 2015–2019

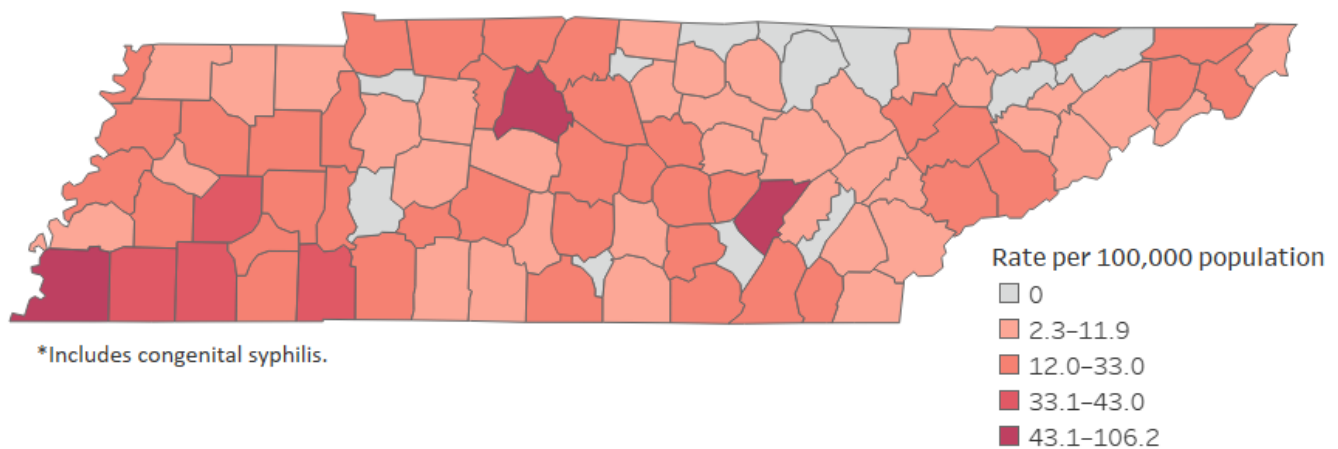
Regions/Metros	2015		2016		2017		2018		2019	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total cases	1,272	19.3	1,459	21.9	1,456	21.7	1,730	25.6	2,253	33.0
Northeast	23	6.6	10	2.8	28	8.0	29	8.2	43	12.1
East	42	5.6	80	10.5	60	7.8	61	7.9	74	9.5
Southeast	23	7.0	28	8.4	35	10.5	29	8.6	51	15.0
Upper-Cumberland	13	3.8	18	5.2	25	7.1	31	8.7	40	11.1
Mid-Cumberland	129	10.6	140	11.2	167	13.1	210	16.1	216	16.2
South Central	20	5.1	28	7.0	33	8.2	42	10.3	58	14.0
West	31	5.8	29	5.5	45	8.5	49	9.3	101	19.2
Shelby	532	56.8	693	74.1	590	63.0	634	67.8	929	99.1
Davidson	268	39.5	264	38.6	236	34.1	399	57.6	495	71.3
Knox	109	24.1	92	20.2	103	22.3	102	21.9	99	21.0
Hamilton	53	15.0	66	18.4	104	28.8	85	23.3	86	23.4
Madison	20	20.5	17	17.4	20	20.5	45	46.1	42	42.9
Sullivan	9	5.7	4	2.6	9	5.7	14	8.9	19	12.0

All rates are per 100,000 population.

Note: Rates based on counts of < 20 are unreliable. Interpret with caution.

*Includes congenital syphilis.

Figure 12: Syphilis (All Stages)* — Rate of Reported Cases by County Tennessee, 2019

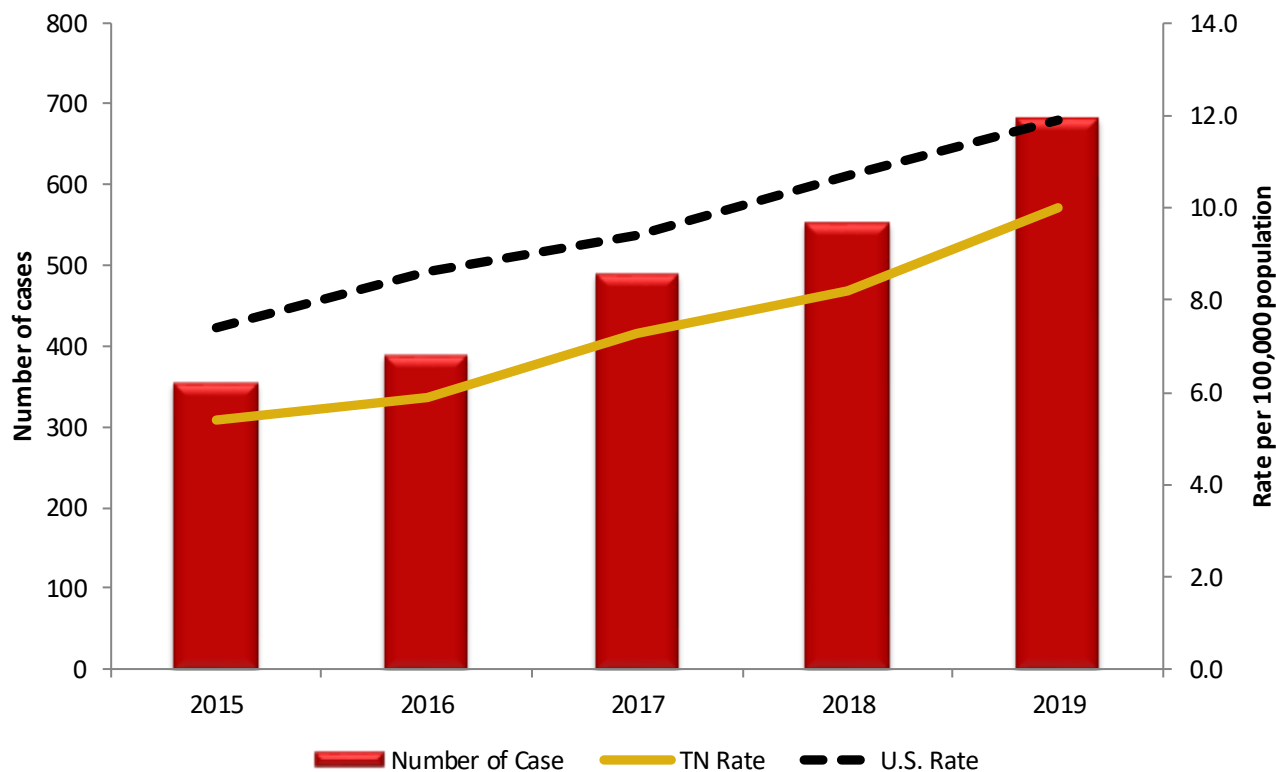


*Includes congenital syphilis.

In 2019, rates of reported cases of syphilis by Public Health Region ranged from 9.5 cases per 100,000 population in the East region to 99.1 per 100,000 population in the Shelby region. The counties with the highest rates of reported cases of total syphilis were Bledsoe (106.2 /100,000), Shelby (99.1 /100,000), and Davidson (71.3/100,000).

Primary and Secondary (P&S) Syphilis

Figure 13: Primary and Secondary Syphilis — Number and Rate of Reported Cases, Tennessee and U.S., 2015–2019



*U.S. rates are from the CDC STD Surveillance 2019 report.

Table 13: Primary and Secondary Syphilis — Number and Rate of Reported Cases, Tennessee and U.S., 2015–2019

	2015	2016	2017	2018	2019
Number of Case	356	390	489	553	683
TN Rate	5.4	5.9	7.3	8.2	10.0
U.S. Rate*	7.4	8.6	9.4	10.7	11.9

All rates are per 100,000 population.

*U.S. rates are from the CDC STD Surveillance 2019 report.

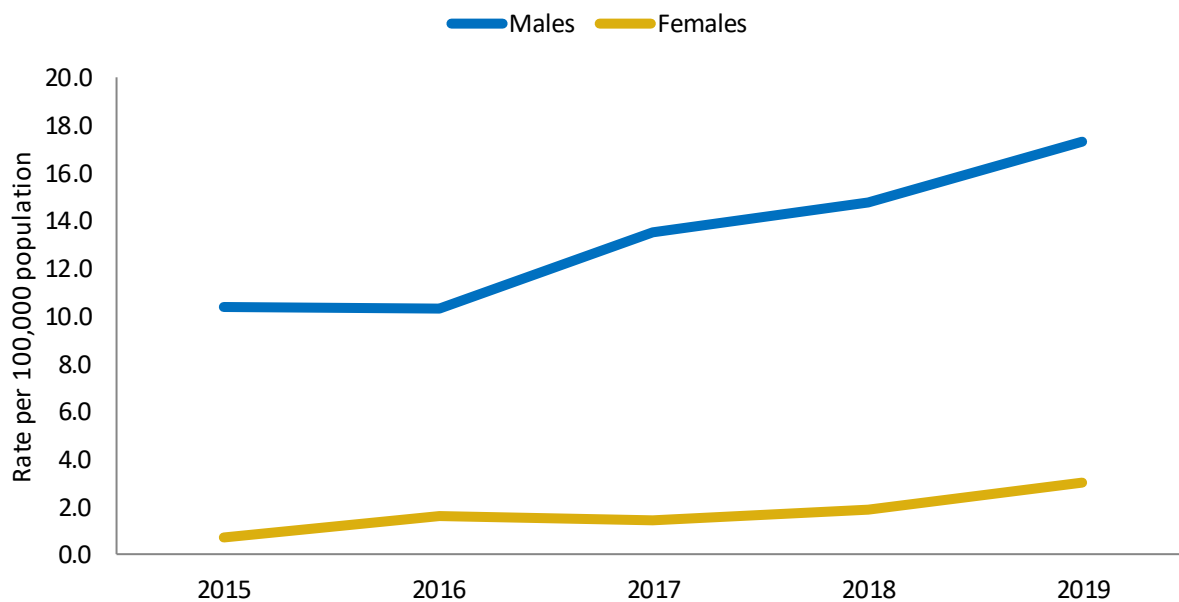
The rate and number of reported cases of P&S syphilis increased from 2015–2019 in Tennessee but remained lower than the U.S. rate. In 2019, 683 cases of P&S syphilis were reported for a rate of 10.0 cases per 100,000 population, which was lower than the U.S. rate of 11.9 cases per 100,000 population.

Table 14: Primary and Secondary Syphilis — Number and Rate of Reported Cases by Gender, Tennessee, 2015–2019

Gender	2015		2016		2017		2018		2019	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total cases	356	5.4	390	5.9	489	7.3	553	8.2	683	10.0
Males	333	10.4	335	10.3	441	13.5	487	14.7	577	17.3
Females	23	0.7	55	1.6	48	1.4	66	1.9	106	3.0

All rates are per 100,000 population.

Figure 14: Primary and Secondary Syphilis — Rate of Reported Cases by Gender, Tennessee, 2015–2019



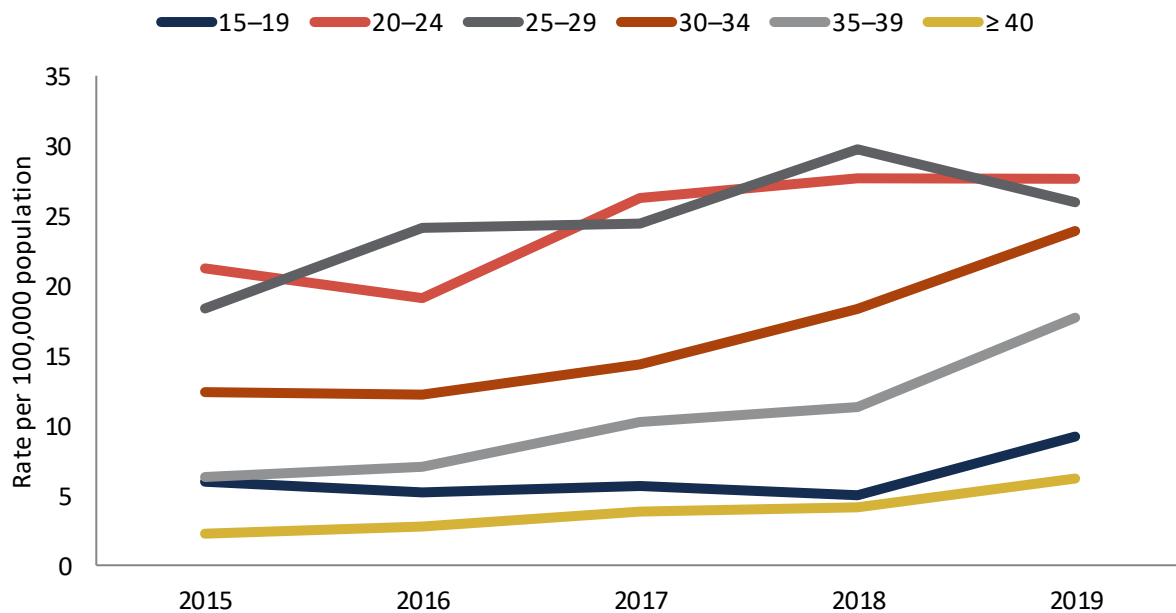
In 2019, 577 cases of P&S syphilis were reported among males for a rate of 17.3 cases per 100,000 males. The rate among females was significantly lower, with 106 cases reported for a rate of 3.0 cases per 100,000 females. From 2015–2019, the rate of cases of P&S syphilis has nearly doubled, from 5.4 cases per 100,000 males to 10.0 cases per 100,000 population.

Table 15: Primary & Secondary Syphilis — Number and Rate of Reported Cases by Age Group, Tennessee, 2015–2019

Age group (years)	2015		2016		2017		2018		2019	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total cases	356	5.4	390	5.9	489	7.3	553	8.2	683	10.0
15–19	25	6.0	22	5.2	24	5.6	22	5.0	39	9.2
20–24	98	21.2	87	19.1	117	26.2	121	27.7	123	27.6
25–29	82	18.4	112	24.1	118	24.4	144	29.7	129	25.9
30–34	53	12.4	52	12.2	62	14.3	79	18.3	108	23.9
35–39	26	6.3	30	7.1	44	10.3	49	11.3	77	17.7
≥ 40	72	2.3	87	2.7	124	3.8	138	4.2	207	6.2

All rates are per 100,000 population.

Figure 15: Primary & Secondary Syphilis — Rate of Reported Cases by Age Group, Tennessee, 2015–2019



In 2019, 123 cases of P&S syphilis infections were reported among individuals 20–24 years old, for a rate of 27.6. The state’s second highest rate of P&S syphilis (25.9 cases per 100,000) was among 25–29 years old in 2019. The state’s third highest rate of P&S syphilis (23.9 cases per 100,000) was among 30–34 years old in 2019. The rate among this age group has almost doubled from 2015–2019.

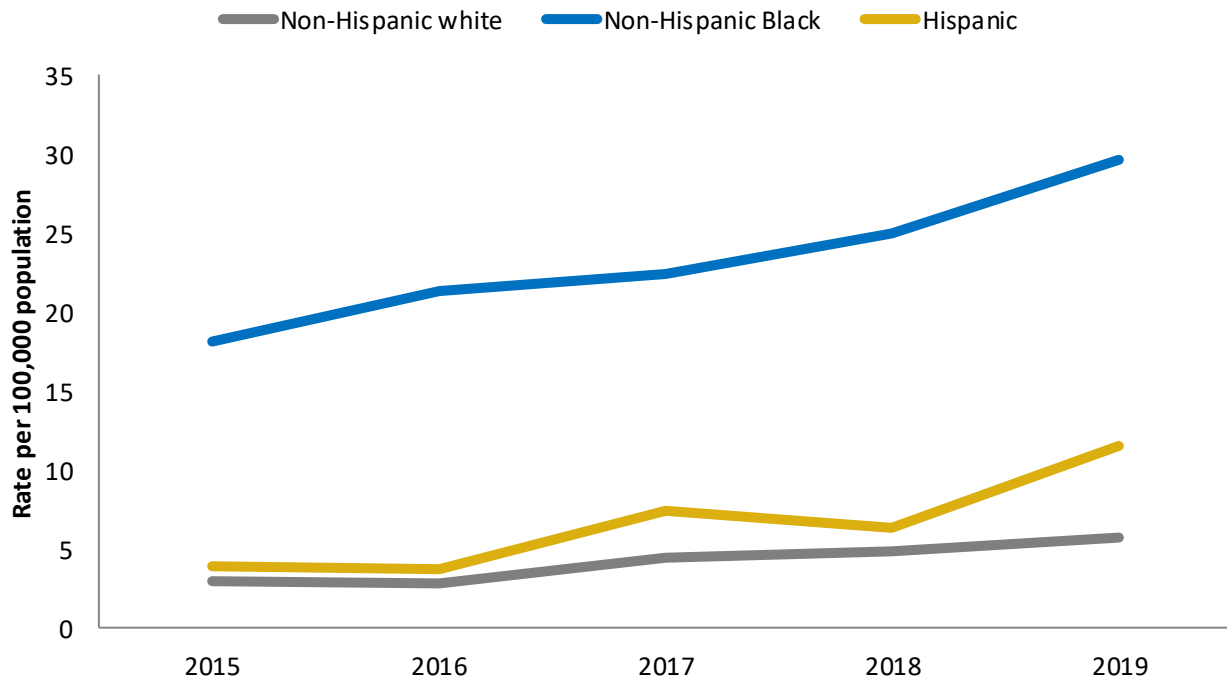
Table 16: Primary & Secondary Syphilis — Number and Rate of Reported Cases by Race and Ethnicity, Tennessee, 2015–2019

Race/Ethnicity	2015		2016		2017		2018		2019	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total cases	356	5.4	390	5.9	489	7.3	553	8.2	683	10.0
Non-Hispanic white	140	2.9	138	2.8	216	4.4	240	4.8	288	5.7
Non-Hispanic Black	200	18.1	238	21.3	252	22.4	283	25.0	338	29.6
Hispanic	13	3.9	13	3.7	27	7.4	24	6.3	45	11.5

All rates are per 100,000 population.

Note: Rates based on counts of < 20 are unreliable. Interpret with caution.

Figure 16: Primary & Secondary Syphilis — Rate of Reported Cases by Race and Ethnicity, Tennessee, 2015–2019



Non-Hispanic Blacks had highest rate of P&S syphilis infections in the state from 2015–2019. In 2019, 338 cases of P&S syphilis were reported among non-Hispanic Blacks for a rate of 29.6 cases per 100,000, as compared to 5.7 cases per 100,000 among non-Hispanic whites and 11.5 cases per 100,000 among Hispanics. The rate of P&S syphilis increased among all race and ethnic groups from 2015–2019 and almost tripled among Hispanics.

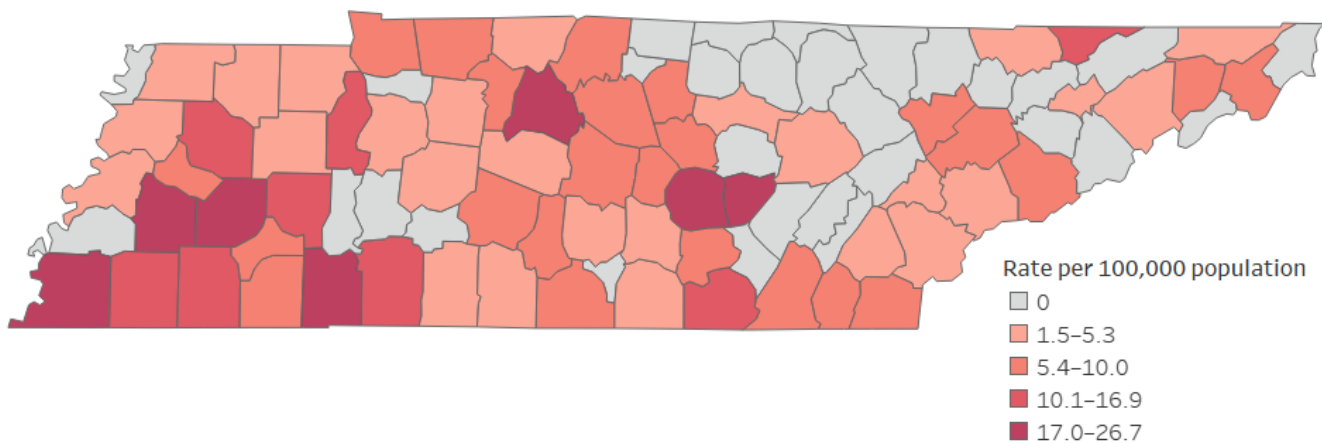
Table 17: Primary & Secondary Syphilis — Number and Rate of Reported Cases by Public Health Region, Tennessee, 2015–2019

Regions/Metros	2015		2016		2017		2018		2019	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total cases	356	5.4	390	5.9	489	7.3	553	8.2	683	10.0
Northeast	7	2	<5	0.6	8	2.3	10	2.8	14	4.0
East	20	2.6	23	3	24	3.1	12	1.6	22	2.8
Southeast	<5	1.2	5	1.5	12	3.6	10	3.0	14	4.1
Upper-Cumberland	13	3.8	18	5.2	25	7.1	16	4.5	17	4.7
Mid-Cumberland	41	3.4	48	3.9	69	5.4	105	8.0	84	6.3
South Central	8	2	16	4	17	4.2	24	5.9	26	6.3
West	8	1.5	5	0.9	11	2.1	8	1.5	43	8.2
Shelby	107	11.4	150	16.0	135	14.4	156	16.7	198	21.1
Davidson	90	13.3	73	10.7	107	15.5	140	20.2	185	26.7
Knox	36	8.0	21	4.6	38	8.2	25	5.4	26	5.5
Hamilton	25	7.1	28	7.8	43	11.9	24	6.6	28	7.6
Madison	11	11.3	11	11.3	8	8.2	17	17.4	20	20.4
Sullivan	<5	2.6	<5	0.6	5	3.2	6	3.8	6	3.8

All rates are per 100,000 population.

Note: Rates based on counts of < 20 are unreliable. Interpret with caution.

Figure 17: Primary and Secondary Syphilis — Rate of Reported Cases by County, Tennessee, 2019



In 2019, rates of reported cases of P&S syphilis by Public Health Region ranged from 2.8 cases per 100,000 population in the East region to 26.7 cases per 100,000 population in the Davidson region. The counties with the highest rates of reported cases of P&S syphilis were Davidson (26.7/100,000), Hardin (23.4/100,000), Shelby (21.1/100,000), and Madison (20.4/100,000).

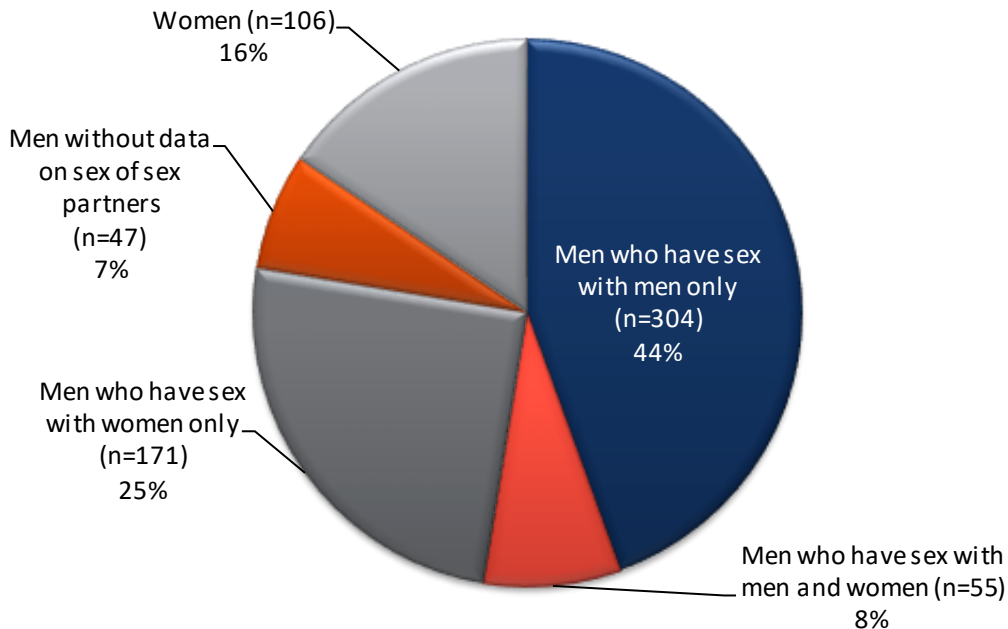
Syphilis by Sexual Behavior

Table 18: Primary and Secondary Syphilis — Distribution of Cases by Gender and Sexual Behavior, Tennessee, 2015–2019

Gender and Sexual Behavior	2015		2016		2017		2018		2019	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Total cases	356	-	390	-	489	-	553	-	683	-
MSM	216	61%	202	52%	274	56%	300	54%	304	44%
MSMW	25	7%	27	7%	44	9%	33	6%	55	8%
MSW	64	18%	79	20%	94	19%	108	20%	171	25%
Men without data on sex of sex partners	28	8%	27	7%	29	6%	45	8%	47	7%
Women	23	6%	55	14%	48	10%	67	12%	106	16%

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

Figure 18: Primary and Secondary Syphilis — Distribution of Cases by Gender and Sexual Behavior, Tennessee, 2019



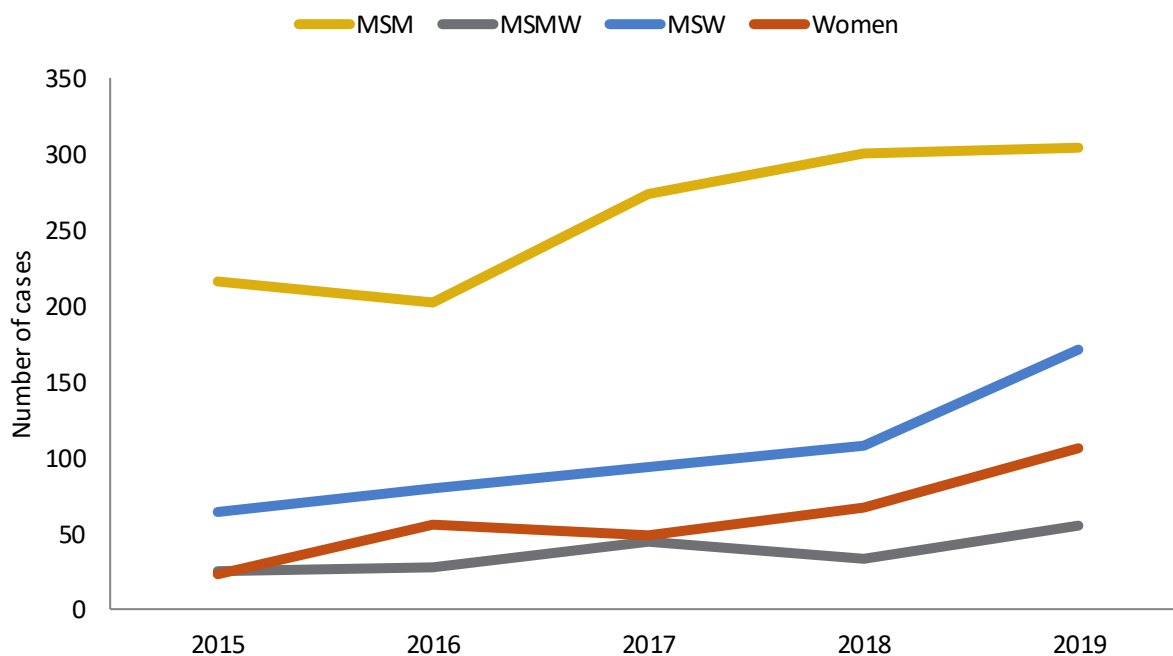
In 2019, men accounted for 84% of P&S syphilis cases and among MSM accounted for the majority of P&S syphilis cases. Of the 683 reported P&S syphilis cases in 2019, 304 (44%) were among MSM, and 55 (8%) among MSMW. Of the total P&S syphilis cases in Tennessee in a year, the percentage of P&S syphilis cases in women has more than doubled from 2015–2019.

Table 19: Primary and Secondary Syphilis — Number of Cases by Gender and Sexual Behavior, Tennessee, 2015–2019

Gender and Sexual Behavior	2015 Cases	2016 Cases	2017 Cases	2018 Cases	2019 Cases
Total cases	356	390	489	553	683
MSM	216	202	274	300	304
MSMW	25	27	44	33	55
MSW	64	79	94	108	171
Women	23	55	48	67	106

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

Figure 19: Primary and Secondary Syphilis — Number of Cases by Gender and Sexual Behavior, Tennessee, 2015–2019



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

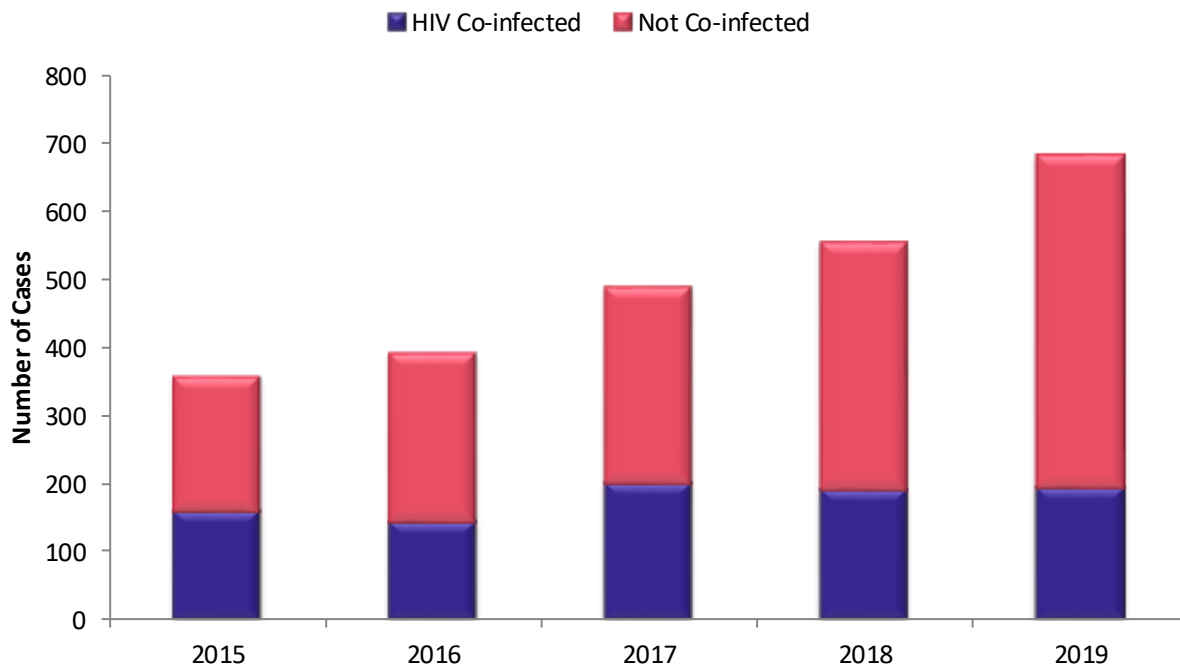
During 2015–2019, the number of P&S syphilis among women increased from 23 cases to 106 cases, which is a 361% increase. During the same period, the number of P&S syphilis among men who have sex with men and women increased from 25 cases to 55 cases, which is a 120% increase.

Syphilis and Human Immunodeficiency Virus (HIV) Co-infections

Table 20: Primary and Secondary Syphilis — Number of Reported Cases Co-infected with HIV, Tennessee, 2015–2019

	2015		2016		2017		2018		2019	
	Cases	%	Cases	%	Cases	%	Cases	%	Cases	%
Total cases	356	-	390	-	489	-	553	-	683	-
HIV co-infected	158	44%	142	36%	200	41%	189	34%	192	28%

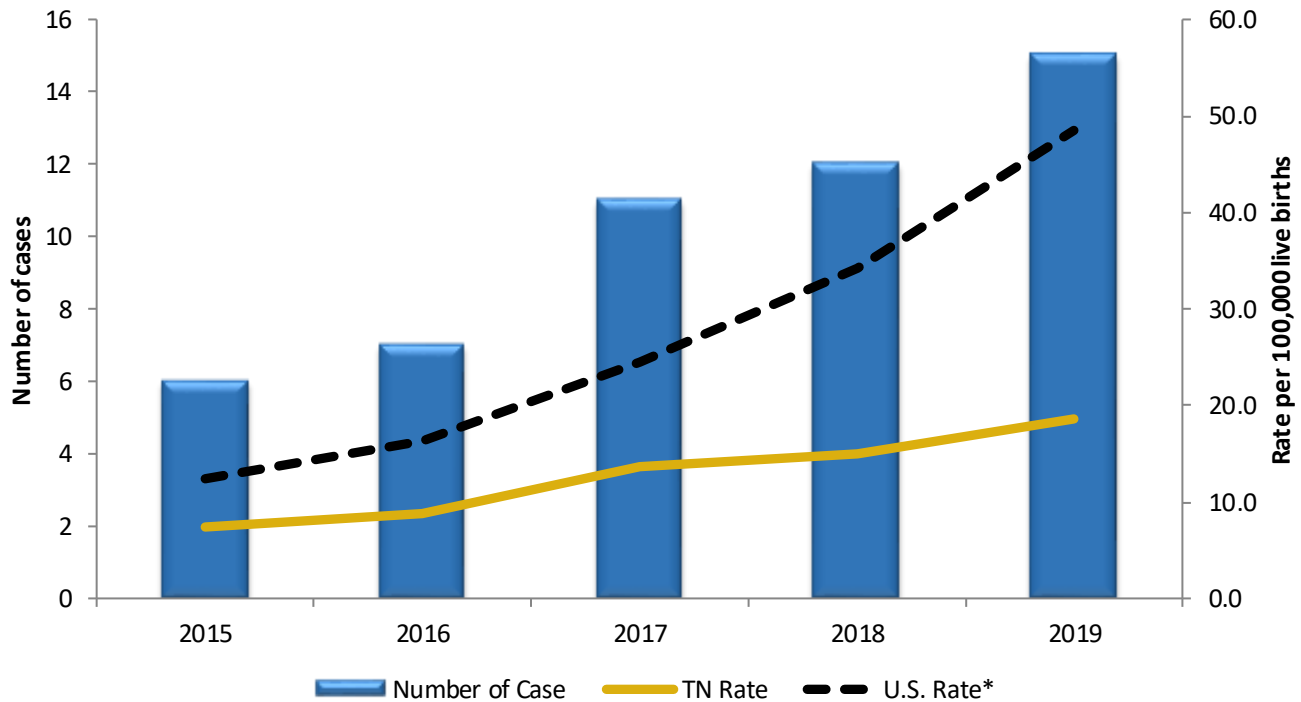
Figure 20: Primary and Secondary Syphilis — Reported Cases by HIV Co-infection, Tennessee, 2015–2019



The proportion of P&S syphilis cases co-infected with HIV has decreased since 2015. In 2019, of the 683 P&S syphilis cases, 28% (192) were co-infected with HIV.

Congenital Syphilis

Figure 21: Congenital Syphilis — Number and Rate of Reported Cases by Year of Diagnoses, Tennessee and U.S., 2015–2019



*U.S. rates are from the CDC STD Surveillance 2019 report.

Table 21: Congenital Syphilis — Number and Rate of Reported Cases by Year of Diagnoses, Tennessee and U.S., 2015–2019

	2015	2016	2017	2018	2019
Number of cases	6	7	11	12	15
TN Rate	7.4	8.7	13.6	14.9	18.6
U.S. Rate*	12.4	16.2	24.4	34.3	48.5

All rates per 100,000 live births.

Note: Rates based on counts of < 20 are unreliable. Interpret with caution.

*U.S. rates are from the CDC STD Surveillance 2019 report.

In 2019, there were 15 reported cases of congenital syphilis, yielding a rate of 18.6 cases per 100,000 live births in the state. During 2015–2019 Tennessee’s congenital syphilis rate remained lower than the national rate, but increasing since 2015.

Table 22: Congenital Syphilis — Number and Rate of Reported Congenital Cases by Year of Diagnoses and P&S Syphilis among Women Aged 15–44 Years, Tennessee and U.S., 2015–2019

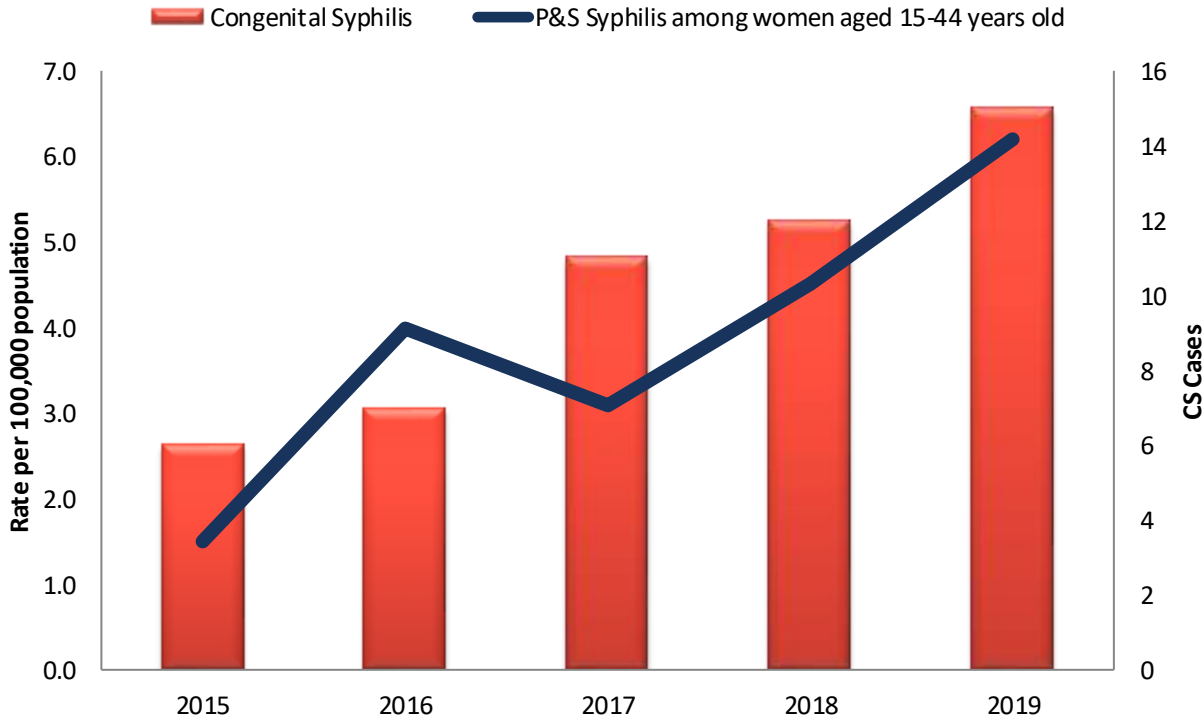
	2015		2016		2017		2018		2019	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total P&S Syphilis among Women*	23	0.7	55	1.6	48	1.4	66	1.9	106	3.0
P&S Syphilis among women aged 15-44 years old*	20	1.5	52	4.0	41	3.1	59	4.5	83	6.2
Congenital Syphilis**	6	7.4	7	8.7	11	13.6	12	14.9	15	18.6

Note: Rates based on counts of < 20 are unreliable. Interpret with caution.

*Rates are per 100,000 population.

** Rates are per 100,000 live births.

Figure 22: Congenital Syphilis — Number of Reported Congenital Cases by Year of Diagnoses and Rate of P&S Syphilis among Women Aged 15–44 Years, Tennessee, 2015–2019



From 2015–2019, the increase in congenital syphilis cases paralleled an increase in P&S syphilis among reproductive-aged women.

Technical Notes

About this Report:

This report provides an overview of the reported STD cases in Tennessee, using current surveillance data, and presents statistics and trends from the reporting period based on core surveillance activities in the state.

The surveillance information in this report is based on case report data received and stored in the Patient Reporting Investigation Surveillance Manager (PRISM) from 2015–2019; however it is important to note that these case reports reflect only a portion of STDs occurring in the state's population. STDs are often asymptomatic and may not be diagnosed; therefore, case report data underestimate the number of infections that occurred.

The case definitions used are those defined by the Council of State and Territorial Epidemiologists (CSTE). Case definitions are periodically revised via CSTE's Position Statements and provide uniform criteria of nationally notifiable conditions for reporting purposes. Please see the NNDSS website (<https://wwwn.cdc.gov/nndss/case-definitions.html>) for case definitions.

Reporting Delay: Delays exist between the time a STD infection is diagnosed and the time the infection is reported to TDH. The data in this report represent all information reported to TDH through November 2, 2020. However, the case counts may change as new information is received and may differ from other reports. Therefore, data from recent years should be considered provisional. The figures and tables in this edition supersede those in earlier publication of the data.

Place of Residence: STD diagnoses are presented based on an individual's residence at the time of the most recent laboratory results.

Population: Population estimates for Tennessee were obtained from the U.S. Census Bureau website. Because of the use of the updated population data, rates from 2015–2019 may be different from those presented in previous STD epidemiological profiles.

Small Numbers: Data release limitations are set to ensure that the information cannot be used to inadvertently identify an individual. Please interpret rates where the numerator is less than 20 cases with caution because of the low reliability of rates based on a small number of cases.

Public Health Regions: Tennessee's 95 counties are divided into thirteen public health regions. A map showing the public health region is located in Appendix A.

Acknowledgements

The authors would like to thank the central office and public health regional STD surveillance staff throughout the state of Tennessee, without whom, an accurate accounting of the STD epidemic in Tennessee would not be possible. The authors also thank the Grand Regional Consultants, Diana Saia, Darnell Brooks, Lauren O. Buford, the ICCR (Interstate Communications Control Records) clerk, Alfred Webb, and the CDC Consultant, Lavonne Cole, for their dedication to ensure the accuracy of STD data. Additionally, we would like to thank Tennessee Department of Health's STD Prevention and HIV Surveillance and Epidemiology programs for providing valuable data collection, guidance, and support.

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Glossary

Case: A condition of a disease or infection diagnosed according to a standard case definition.

Case rate: The frequency of a defined event in a specified population for a given time period, usually expressed as the number of cases per 100,000 people in a population. Case rates provide a measure of the effect of illness relative to the size of the population. Case rate is calculated by dividing the number of cases in the population of interest by the total number of people in the population. Then multiply by 100,000 to get the rate per 100,000 people.

Chlamydia: A curable bacterial sexually transmitted disease caused by *Chlamydia trachomatis*. The infection may result in urethritis, epididymitis, cervicitis, acute salpingitis, or other syndromes; however, it can often be asymptomatic in women. Perinatal infections may result in inclusion conjunctivitis and pneumonia in newborns.

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

Date of diagnosis: The date of diagnoses refers to the date a laboratory makes a diagnosis based on the analysis of a specimen.

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

Gonorrhea: A curable bacterial sexually transmitted disease caused by *Neisseria gonorrhoeae*. The infection is commonly manifested by urethritis, cervicitis, proctitis, salpingitis, or pharyngitis. Infection may be asymptomatic.

HIV (human immunodeficiency virus): The virus that causes AIDS. Persons with HIV in their system are referred to as HIV infected.

Percentage: A proportion of the whole, in which the whole is 100.

Primary syphilis: A stage of infection with *Treponema pallidum* categorized as infectious. This stage is characterized by one or more ulcerative lesions (e.g., chancre), which might differ considerably in clinical appearance.

Secondary syphilis: A stage of infection with the bacterium *Treponema Pallidum* categorized as infectious. This stage is characterized by localized or diffuse mucocutaneous lesions, often with generalized lymphadenopathy. Other symptoms can include mucous patches, condyloma lata, and alopecia.

Surveillance: In a public health context, refers to the intentional collection of data on diseases or other important health conditions in order to monitor where the condition occurs, trends over time and to determine the risk factors associated with the condition.

Syphilis: A curable bacterial sexually transmitted disease caused by *Treponema pallidum*. It is composed of four stages of infection that include primary, secondary, early non-primary non-secondary, and unknown duration or late. In January 2018, a revised case definition for syphilis went into effect, including changing the stage previously termed “early latent syphilis” to “syphilis, early non-primary non-secondary”. Additionally, the stages of “late latent syphilis” and “late syphilis with clinical manifestations” were removed and “syphilis, unknown duration or late” was added.

Trend: A long-term movement or change in frequency over time, usually upward or downward; may be presented as a line graph.

Unknown duration or late syphilis: A stage of infection caused by *Treponema 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.

Abbreviations

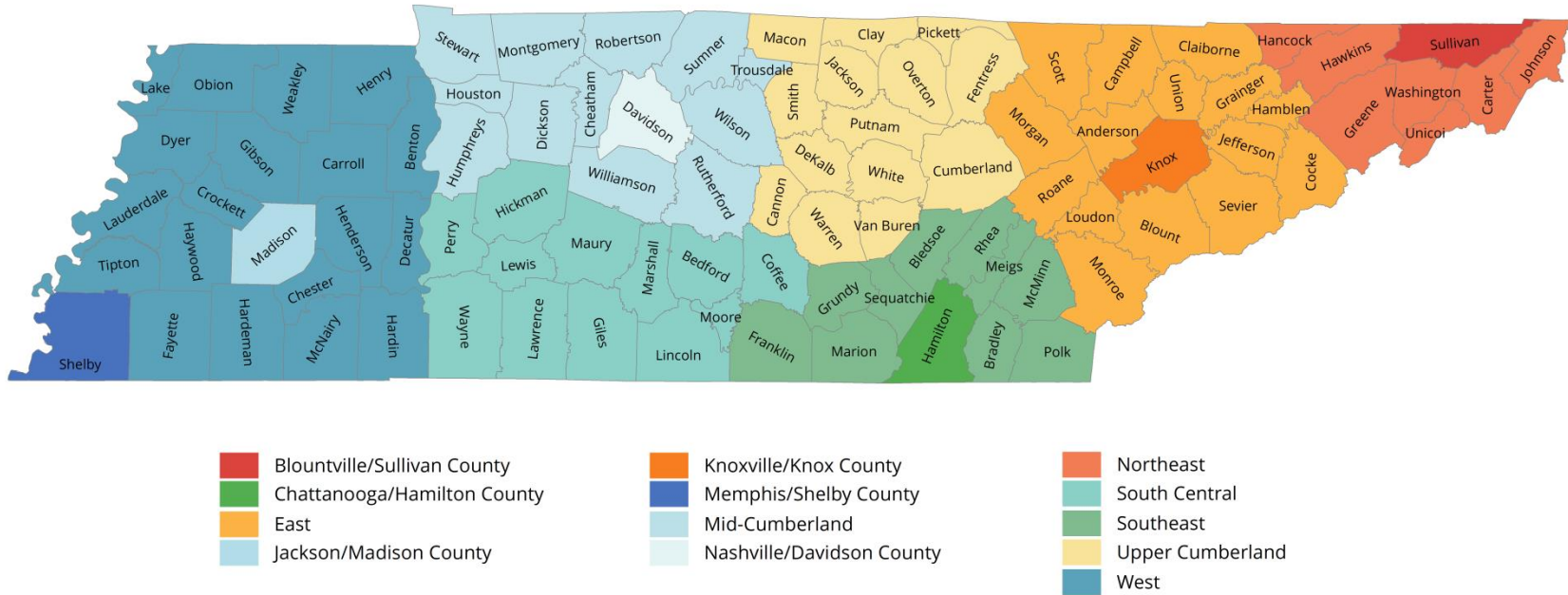
CDC: Centers for Disease Control and Prevention
CSTE: Council of State and Territorial Epidemiologist
CT: Chlamydia
CS: congenital syphilis
GC: Gonorrhea
HIV: human immunodeficiency virus
MSM: gay, bisexual and other men who have sex with men only
MSMW: men who have sex with both men and women
MSW: men who have sex with women only
NNDSS: National Notifiable Disease Surveillance System
P&S: primary and secondary
PRISM: Patient Reporting Investigating Surveillance Manager
TDH: Tennessee Department of Health
STD: sexually transmitted disease

References

1. U.S. Census Bureau, Population Division. Annual Estimates of the Resident Population for the United States, Regions, States, and Puerto Rico: April 1, 2010 to July 1, 2019 (NST-EST2019-01). In: State Population Totals and Components of Change: 2010-2019. Washington, D.C.: U.S. Census Bureau; 2019.
2. U.S. Census Bureau, Population Division. Annual Estimates of the Resident Population for Selected Age Groups by Sex for the United States, States, Counties and Puerto Rico Commonwealth and Municipals: April 1, 2010 to July 1, 2019. Washington, D.C.: U.S. Census Bureau; 2019.
3. Tennessee Department of Health, Division of Vital Records and Statistics. General Health Data: Birth Statistics. <https://www.tn.gov/health/health-program-areas/statistics/health-data/birth-statistics.html>. Accessed April 30, 2021.
4. Gary J. Gates. Vermont Leads States in LGBT Identification. State of the States. Gallup Politics. February 6, 2017. Accessed December 13, 2018.
5. U.S. Census Bureau, Population Division. Annual Estimates of the Resident Population by Sex, Race, and Hispanic Origin for the United States, States, and Counties: April 1, 2010 to July 1, 2019. Washington, D.C.: U.S. Census Bureau; 2019.
6. United States Census Bureau. Quick Facts-Tennessee. <https://www.census.gov>. Updated July 1, 2019. Accessed January 4, 2021.
7. U.S. Census Bureau, Population Division. 2019 American Community Survey 1-Year Estimates. Washington, D.C.: U.S. Census Bureau; 2019.
8. Tennessee Advisory Commission on Intergovernmental Relations., Roehrich-Patrick L, Moreo B. Just How Rural or Urban Are Tennessee's 95 Counties. Nashville, Tennessee; 2016:1-39.

Appendix A: Tennessee Public Health Regions

Map 1. Public Health Regions, Tennessee



Appendix B: Regional data

Table 23: STDs, Nashville (Davidson County), Tennessee, 2019

	Chlamydia		Gonorrhea		Syphilis -All Stages		P&S Syphilis	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total cases	5,906	850.8	2,350	338.5	495	71.3	185	26.7
Male	2,269	658.9	1,457	423.1	404	117.3	166	48.2
Female	3,636	1010.6	893	248.2	91	25.3	19	5.3
< 15	30	24.5	9	7.4	< 5	3.3	0	0.0
15-19	1,298	3,339.4	338	896.6	11	28.3	< 5	10.3
20-24	2,047	4,148.5	652	1,321.4	49	99.3	20	40.5
25-29	1,331	1,781.2	552	738.7	108	144.5	41	54.9
30-34	611	898.1	319	468.9	93	136.7	35	51.4
35-39	282	528.1	191	357.7	69	129.2	26	48.7
≥ 40	307	106.8	289	100.6	161	56.0	59	20.5
Non-Hispanic white	1,776	454.2	578	147.8	190	48.6	82	21.0
Non-Hispanic Black	3,192	1,712.6	1,536	824.1	225	120.7	80	42.9
Hispanic	747	1,034.4	118	163.4	63	87.2	18	24.9

Source: Patient Reporting Investigation Surveillance Manager (PRISM), 2019.

All stages of syphilis column include congenital cases. P&S refers to primary and secondary stages of syphilis.

Hispanics can be any race reported.

Rates are per 100,000 population. Rates were calculated using the 1-year U.S. Census Bureau 2019 Population estimates.

Counts < 5 have been suppressed.

Table 24: STDs, Chattanooga (Hamilton County), Tennessee, 2019

	Chlamydia		Gonorrhea		Syphilis -All Stages		P&S Syphilis	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total cases	2,511	682.7	1,107	301.0	86	23.4	28	7.6
Male	830	467.5	565	318.2	66	37.2	22	12.4
Female	1,681	883.5	542	284.9	20	10.5	6	3.2
< 15	18	28.3	< 5	4.7	0	0.0	0	0.0
15-19	722	3,351.1	196	909.7	< 5	4.6	0	0.0
20-24	884	3,921.7	273	1,211.1	8	35.5	< 5	8.9
25-29	493	1,757.1	275	980.1	12	42.8	5	17.8
30-34	226	866.5	161	617.3	13	49.8	5	19.2
35-39	72	304.1	87	367.5	7	29.6	< 5	12.7
≥ 40	96	52.7	112	61.5	45	24.7	13	7.1
Non-Hispanic white	842	322.9	302	115.8	42	16.1	18	6.9
Non-Hispanic Black	1,464	2,094.1	778	1,112.9	35	50.1	7	10.0
Hispanic	174	784.1	20	90.1	7	31.5	< 5	13.5

Source: Patient Reporting Investigation Surveillance Manager (PRISM), 2019.

All stages of syphilis column include congenital cases. P&S refers to primary and secondary stages of syphilis.

Hispanics can be any race reported.

Rates are per 100,000 population. Rates were calculated using the 1-year U.S. Census Bureau 2019 Population estimates.

Counts < 5 have been suppressed.

Table 25: STDs, Knoxville (Knox County), Tennessee, 2019

	Chlamydia		Gonorrhea		Syphilis -All Stages		P&S Syphilis	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total cases	2,876	611.5	1,369	291.1	99	21.0	26	5.5
Male	1,162	508.0	713	311.7	84	36.7	22	9.6
Female	1,713	709.1	655	271.1	15	6.2	< 5	1.7
< 15	34	41.8	< 5	4.9	0	0.0	0	0.0
15-19	750	2,419.7	200	645.3	< 5	12.9	< 5	9.7
20-24	1,068	2,592.1	389	944.1	9	21.8	< 5	9.7
25-29	493	1,442.1	273	798.5	17	49.7	< 5	8.8
30-34	261	850.9	184	599.8	19	61.9	6	19.6
35-39	119	384.4	133	429.6	14	45.2	< 5	3.2
≥ 40	150	67.9	185	83.7	36	16.3	9	4.1
Non-Hispanic white	1,428	370.4	574	148.9	61	15.8	15	3.9
Non-Hispanic Black	1,035	2,528.3	678	1,656.2	32	78.2	10	24.4
Hispanic	145	675.5	41	191.0	< 5	18.6	0	0.0

Source: Patient Reporting Investigation Surveillance Manager (PRISM), 2019.

All stages of syphilis column include congenital cases. P&S refers to primary and secondary stages of syphilis.

Hispanics can be any race reported.

Rates are per 100,000 population. Rates were calculated using the 1-year U.S. Census Bureau 2019 Population estimates.

Counts < 5 have been suppressed.

Table 26: STDs, Jackson (Madison County), Tennessee, 2019

	Chlamydia		Gonorrhea		Syphilis -All Stages		P&S Syphilis	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total cases	907	925.7	373	380.7	42	42.9	20	20.4
Male	319	687.3	193	415.8	34	73.3	19	40.9
Female	588	1,140.2	180	349.0	8	15.5	< 5	1.9
< 15	9	49.6	< 5	22.1	0	0.0	0	0.0
15-19	331	4,687.1	74	1,047.9	5	70.8	< 5	28.3
20-24	314	4,647.0	116	1,716.7	8	118.4	6	88.8
25-29	135	2,000.9	95	1,408.0	8	118.6	< 5	59.3
30-34	81	1,400.2	44	760.6	5	86.4	< 5	51.9
35-39	23	406.5	16	282.8	< 5	53.0	< 5	35.3
≥ 40	14	29.3	24	50.2	13	27.2	< 5	6.3
Non-Hispanic white	170	312.1	64	117.5	13	23.9	6	11.0
Non-Hispanic Black	675	1,841.7	290	791.3	28	76.4	14	38.2
Hispanic	17	426.1	8	200.5	< 5	25.1	0	0.0

Source: Patient Reporting Investigation Surveillance Manager (PRISM), 2019.

All stages of syphilis column include congenital cases. P&S refers to primary and secondary stages of syphilis.

Hispanics can be any race reported.

Rates are per 100,000 population. Rates were calculated using the 1-year U.S. Census Bureau 2019 Population estimates.

Counts < 5 have been suppressed.

Table 27: STDs, Memphis (Shelby County), Tennessee, 2019

	Chlamydia		Gonorrhea		Syphilis -All Stages		P&S Syphilis	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total cases	10,280	1,096.9	4,262	454.8	929	99.1	198	21.1
Male	3,122	702.2	2,150	483.5	671	150.9	154	34.6
Female	7,155	1,452.7	2,112	428.8	258	52.4	44	8.9
< 15	106	54.2	38	19.4	10	5.1	0	0.0
15-19	3,140	5,240.1	1,083	1,807.3	54	90.1	19	31.7
20-24	3,669	5,924.3	1,382	2,231.5	206	332.6	50	80.7
25-29	1,870	2,497.9	821	1,096.7	197	263.2	38	50.8
30-34	770	1,161.1	392	591.1	133	200.6	24	36.2
35-39	379	621.3	234	383.6	95	155.7	17	27.9
≥ 40	345	82.7	311	74.5	234	56.1	50	12.0
Non-Hispanic white	788	238.4	244	73.8	90	27.2	16	4.8
Non-Hispanic Black	8,642	1,717.4	3,800	755.2	787	156.4	169	33.6
Hispanic	397	639.0	59	95.0	38	61.2	10	16.1

Source: Patient Reporting Investigation Surveillance Manager (PRISM), 2019.

All stages of syphilis column include congenital cases. P&S refers to primary and secondary stages of syphilis.

Hispanics can be any race reported.

Rates are per 100,000 population. Rates were calculated using the 1-year U.S. Census Bureau 2019 Population estimates.

Counts < 5 have been suppressed.

Table 28: STDs, Blountville (Sullivan County), Tennessee, 2019

	Chlamydia		Gonorrhea		Syphilis -All Stages		P&S Syphilis	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total cases	509	321.4	214	135.1	19	12.0	6	3.8
Male	182	236.2	116	150.5	15	19.5	6	7.8
Female	327	402.3	98	120.6	< 5	4.9	0	0.0
< 15	5	20.2	0	0.0	0	0.0	0	0.0
15-19	157	1,809.6	26	299.7	< 5	11.5	< 5	11.5
20-24	203	2,368.7	56	653.4	< 5	35.0	0	0.0
25-29	62	620.9	43	430.6	< 5	30.0	0	0.0
30-34	37	414.0	25	279.7	< 5	22.4	< 5	11.2
35-39	22	257.1	18	210.3	< 5	23.4	< 5	11.7
≥ 40	23	25.9	46	51.7	8	9.0	< 5	3.4
Non-Hispanic white	425	288.2	169	114.6	18	12.2	5	3.4
Non-Hispanic Black	56	1,584.6	38	1075.3	< 5	28.3	< 5	28.3
Hispanic	19	590.1	5	155.3	0	0.0	0	0.0

Source: Patient Reporting Investigation Surveillance Manager (PRISM), 2019.

All stages of syphilis column include congenital cases. P&S refers to primary and secondary stages of syphilis.

Hispanics can be any race reported.

Rates are per 100,000 population. Rates were calculated using the 1-year U.S. Census Bureau 2019 Population estimates.

Counts < 5 have been suppressed.

Table 29: STDs, East Public Health Region, Tennessee, 2019

	Chlamydia		Gonorrhea		Syphilis -All Stages		P&S Syphilis	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total cases	2,494	321.3	773	99.6	74	9.5	22	2.8
Male	771	201.8	380	99.5	58	15.2	20	5.2
Female	1,723	436.9	393	99.7	16	4.1	< 5	0.5
< 15	15	11.6	< 5	0.8	< 5	0.8	0	0.0
15-19	678	1,505.1	107	237.5	< 5	4.4	< 5	2.2
20-24	896	2,103.1	185	434.2	13	30.5	5	11.7
25-29	486	1,001.1	178	366.6	11	22.7	< 5	8.2
30-34	194	453.1	93	217.2	12	28.0	< 5	7.0
35-39	122	284.9	83	193.8	10	23.4	< 5	4.7
≥ 40	103	24.2	126	29.6	25	5.9	7	1.6
Non-Hispanic white	2,052	292.0	639	90.9	61	8.7	20	2.8
Non-Hispanic Black	226	1,330.0	102	600.2	5	29.4	0	0.0
Hispanic	195	549.5	24	67.6	6	16.9	< 5	5.6

Source: Patient Reporting Investigation Surveillance Manager (PRISM), 2019.

All stages of syphilis column include congenital cases. P&S refers to primary and secondary stages of syphilis.

Hispanics can be any race reported.

Rates are per 100,000 population. Rates were calculated using the 1-year U.S. Census Bureau 2019 Population estimates.

Counts < 5 have been suppressed.

Table 30: STDs, Mid-Cumberland Public Health Region, Tennessee, 2019

	Chlamydia		Gonorrhea		Syphilis -All Stages		P&S Syphilis	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total cases	7,154	536.3	2,086	156.4	216	16.2	84	6.3
Male	2,565	389.9	1,173	178.3	187	28.4	78	11.9
Female	4,589	678.8	913	135.1	29	4.3	6	0.9
< 15	33	12.1	5	1.8	0	0.0	0	0.0
15-19	1,926	2,138.4	333	369.7	6	6.7	5	5.6
20-24	3,004	3,349.7	716	798.4	36	40.1	14	15.6
25-29	1,279	1,380.4	483	521.3	43	46.4	12	13.0
30-34	468	526.8	242	272.4	31	34.9	9	10.1
35-39	210	223.5	130	138.4	32	34.1	14	14.9
≥ 40	234	38.6	177	29.2	68	11.2	30	4.9
Non-Hispanic white	3,762	364.6	839	81.3	106	10.3	48	4.7
Non-Hispanic Black	2,628	1,852.4	1,116	786.6	78	55.0	26	18.3
Hispanic	544	610.5	89	99.9	29	32.5	8	9.0

Source: Patient Reporting Investigation Surveillance Manager (PRISM), 2019.

All stages of syphilis column include congenital cases. P&S refers to primary and secondary stages of syphilis.

Hispanics can be any race reported.

Rates are per 100,000 population. Rates were calculated using the 1-year U.S. Census Bureau 2019 Population estimates.

Counts < 5 have been suppressed.

Table 31: STDs, Northeast Public Health Region, Tennessee, 2019

	Chlamydia		Gonorrhea		Syphilis -All Stages		P&S Syphilis	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total cases	1,172	331.2	469	132.5	43	12.1	14	4.0
Male	410	235.0	245	140.4	34	19.5	12	6.9
Female	762	424.6	224	124.8	9	5.0	< 5	1.1
< 15	< 5	7.4	< 5	1.8	0	0.0	0	0.0
15-19	327	1,565.6	62	296.8	0	0.0	0	0.0
20-24	479	2,035.8	152	646.0	6	25.5	< 5	4.3
25-29	185	816.7	103	454.7	10	44.1	< 5	17.7
30-34	84	424.3	66	333.4	< 5	10.1	< 5	5.1
35-39	48	245.7	37	189.4	6	30.7	< 5	15.4
≥ 40	45	23.3	48	24.8	19	9.8	5	2.6
Non-Hispanic white	956	294.2	384	118.2	40	12.3	14	4.3
Non-Hispanic Black	156	1,693.4	68	738.2	< 5	32.6	0	0.0
Hispanic	37	360.5	11	107.2	0	0.0	0	0.0

Source: Patient Reporting Investigation Surveillance Manager (PRISM), 2019.

All stages of syphilis column include congenital cases. P&S refers to primary and secondary stages of syphilis.

Hispanics can be any race reported.

Rates are per 100,000 population. Rates were calculated using the 1-year U.S. Census Bureau 2019 Population estimates.

Counts < 5 have been suppressed.

Table 32: STDs, South Central Public Health Region, Tennessee, 2019

	Chlamydia		Gonorrhea		Syphilis -All Stages		P&S Syphilis	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total cases	1,930	466.6	743	179.6	58	14.0	26	6.3
Male	628	307.7	359	175.9	41	20.1	20	9.8
Female	1,302	621.3	384	183.3	17	8.1	6	2.9
< 15	16	20.3	< 5	2.5	0	0.0	0	0.0
15-19	568	2,273.6	86	344.2	0	0.0	0	0.0
20-24	677	2,948.7	203	884.2	10	43.6	5	21.8
25-29	362	1,302.7	181	651.3	14	50.4	5	18.0
30-34	169	657.7	125	486.5	11	42.8	7	27.2
35-39	70	273.0	67	261.3	7	27.3	< 5	15.6
≥ 40	68	32.7	79	38.0	16	7.7	5	2.4
Non-Hispanic white	1,310	373.6	442	126.1	32	9.1	16	4.6
Non-Hispanic Black	481	1,691.8	273	956.7	21	73.9	10	35.2
Hispanic	129	585.1	22	99.8	< 5	18.1	0	0.0

Source: Patient Reporting Investigation Surveillance Manager (PRISM), 2019.

All stages of syphilis column include congenital cases. P&S refers to primary and secondary stages of syphilis.

Hispanics can be any race reported.

Rates are per 100,000 population. Rates were calculated using the 1-year U.S. Census Bureau 2019 Population estimates.

Counts < 5 have been suppressed.

Table 33: STDs, Southeast Public Health Region, Tennessee, 2019

	Chlamydia		Gonorrhea		Syphilis -All Stages		P&S Syphilis	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total cases	1,433	422.8	573	169.0	51	15.0	14	4.1
Male	543	323.9	302	180.1	45	26.8	13	7.8
Female	890	519.6	271	158.2	6	3.5	< 5	0.6
< 15	11	19.1	< 5	1.7	0	0.0	0	0.0
15-19	364	1,672.2	76	349.1	< 5	4.6	0	0.0
20-24	517	2,468.0	153	730.4	5	23.9	< 5	14.3
25-29	278	1,293.3	138	642.0	< 5	14.0	0	0.0
30-34	124	645.5	96	499.7	12	62.5	5	26.0
35-39	74	381.8	49	252.8	7	36.1	< 5	10.3
≥ 40	65	36.4	60	33.6	23	12.9	< 5	2.2
Non-Hispanic white	1,072	356.3	437	145.3	33	11.0	11	3.7
Non-Hispanic Black	256	1,990.4	120	933.0	13	101.1	< 5	7.8
Hispanic	83	543.6	14	91.7	< 5	19.6	< 5	13.1

Source: Patient Reporting Investigation Surveillance Manager (PRISM), 2019.

All stages of syphilis column include congenital cases. P&S refers to primary and secondary stages of syphilis.

Hispanics can be any race reported.

Rates are per 100,000 population. Rates were calculated using the 1-year U.S. Census Bureau 2019 Population estimates.

Counts < 5 have been suppressed.

Table 34: STDs, Upper Cumberland Public Health Region, Tennessee, 2019

	Chlamydia		Gonorrhea		Syphilis -All Stages		P&S Syphilis	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total cases	1,212	336.3	338	93.8	40	11.1	17	4.7
Male	369	207.2	153	85.9	27	15.2	12	6.7
Female	843	462.5	185	101.5	13	7.1	5	2.7
< 15	11	17.8	< 5	1.6	< 5	1.6	0	0.0
15-19	320	1,491.7	38	177.1	< 5	4.7	< 5	4.7
20-24	457	1,994.8	97	423.4	< 5	4.4	< 5	4.4
25-29	223	981.5	86	378.5	8	35.2	6	26.4
30-34	98	487.8	48	238.9	8	39.8	< 5	10.0
35-39	57	285.6	32	160.4	< 5	15.0	0	0.0
≥ 40	46	24.0	36	18.8	18	9.4	7	3.7
Non-Hispanic white	1,076	327.2	312	94.9	35	10.6	17	5.2
Non-Hispanic Black	67	1,190.1	20	355.2	< 5	71.0	0	0.0
Hispanic	68	396.5	6	35.0	< 5	5.8	0	0.0

Source: Patient Reporting Investigation Surveillance Manager (PRISM), 2019.

All stages of syphilis column include congenital cases. P&S refers to primary and secondary stages of syphilis.

Hispanics can be any race reported.

Rates are per 100,000 population. Rates were calculated using the 1-year U.S. Census Bureau 2019 Population estimates.

Counts < 5 have been suppressed.

Table 35: STDs, West Public Health Region, Tennessee, 2019

	Chlamydia		Gonorrhea		Syphilis -All Stages		P&S Syphilis	
	Cases	Rate	Cases	Rate	Cases	Rate	Cases	Rate
Total cases	3,117	592.2	1,526	289.9	101	19.2	43	8.2
Male	1,073	413.6	721	277.9	67	25.8	33	12.7
Female	2,044	765.7	805	301.6	34	12.7	10	3.7
< 15	18	19.3	8	8.6	0	0.0	0	0.0
15-19	988	2,994.1	327	991.0	10	30.3	< 5	9.1
20-24	1,133	3,545.9	481	1505.4	21	65.7	12	37.6
25-29	503	1,530.5	293	891.5	19	57.8	7	21.3
30-34	257	853.9	188	624.6	15	49.8	7	23.3
35-39	120	387.3	104	335.7	9	29.0	< 5	6.5
≥ 40	98	357.5	125	456.0	27	98.5	12	43.8
Non-Hispanic white	1,482	361.4	666	162.4	44	10.7	20	4.9
Non-Hispanic Black	1,548	1,796.4	824	956.2	52	60.3	20	23.2
Hispanic	53	314.5	17	100.9	< 5	23.7	< 5	11.9

Source: Patient Reporting Investigation Surveillance Manager (PRISM), 2019.

All stages of syphilis column include congenital cases. P&S refers to primary and secondary stages of syphilis.

Hispanics can be any race reported.

Rates are per 100,000 population. Rates were calculated using the 1-year U.S. Census Bureau 2019 Population estimates.

Counts < 5 have been suppressed.