

Sexually Transmitted Disease Surveillance in South Dakota

15 September 2017

South Dakota Department of Health



Table of Contents

Summary	2
Conclusion.....	2
Summary of state and national STD cases and rates	3
Gonorrhea	5
Chlamydia	9
Syphilis	12
Diagnosis of sexually transmitted diseases	15
Treatment of sexually transmitted diseases	15
Prevention of sexually transmitted diseases	15
Screening recommendations and considerations	16
Expedited partner therapy	17
Behaviors that contribute to sexually transmitted diseases in high school students	18
Youth risk behavioral survey (YRBS) sexual behavior questions	23
Case definitions for gonorrhea, chlamydia and syphilis	24
South Dakota Department of Health STD testing and counseling locations	28
List of Tables and Figures	28
References	29

Definitions of sexually transmitted disease (STD):

- “Any disease that may be acquired as a result of sexual intercourse or other intimate contact with an infected individual.” *Taber’s Cyclopedic Medical Dictionary 20th Edition.*
- “About 25 miscellaneous diseases with a variety of causal agents, having in common the fact all are transmitted from person to person by direct contact, and the responsible pathogen usually resides in the genital tract and/or in the blood or other body fluids. The epidemiologically important STDs in North America include syphilis, gonorrhea, genital herpes, chlamydia, human papilloma virus infection and HIV/AIDS. Synonym: sexually transmitted infection (STI); venereal disease (obsolete).” *John Last, 2007. A Dictionary of Public Health.*

For more information or a copy of this report please see the South Dakota Department of Health website

<https://doh.sd.gov/diseases/infectious/std/>

Summary

Sexually transmitted diseases (STD) are personal health issues and growing public health problems in South Dakota. STDs are the most commonly reported infectious diseases in South Dakota, and they are increasing. Gonorrhea has increased five-fold over the past decade, chlamydia has doubled since 2003, and syphilis has increased 10-fold from over the past decade. Although these increases might be partially explained by better clinical screening programs and more sensitive laboratory technologies, the upward trend is real and concerning. STDs amplify the risk of HIV transmission and contribute to infertility. This report summarizes South Dakota STD data, trends, demographics and national context. Key points include:

- Sexually transmitted diseases are increasing in South Dakota.
- South Dakota had the 19th highest gonorrhea rate, 22nd highest chlamydia rate and 27th highest syphilis rate in the United States in 2015.
- South Dakota has the lowest male-to-female gonorrhea ratio in the United States.
- American Indian STD rates are higher than the rest of the population.
- Over 60% of South Dakota's male syphilis cases were male-to-male sexual transmission.
- 37% of South Dakota high school students have had sexual intercourse and 12.6% have had 4 or more sexual partners.
- Prevention measures include abstinence, monogamy, condoms and screening.
- Expedited partner therapy is encouraged and should be considered.

Conclusion

Sexually transmitted disease rates have been increasing in South Dakota during the past decade. STD prevention should be directed to individuals and groups at highest risk, including young people less than 25 years of age. Areas and demographic groups with high STD rates should be assisted in developing local prevention programs.

Summary of state and national STD cases and rates

Annual STD cases for South Dakota residents are reported in Table 1, and county STD cases and rates for the five-year period from 2012-2016 are shown in Table 2. National and state STD case counts, rates and rankings for 2015 are reported in Table 3. South Dakota aggregate race and sex rates are shown in Figure 1.

Table 1. Sexually transmitted disease cases reported in South Dakota, 2007-2016

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Total	Median
Gonorrhea	254	382	345	467	602	707	789	880	1,055	1,269	6,750	655
Chlamydia	2,612	2,919	3,015	3,187	3,412	3,925	3,947	4,129	3,877	4,331	35,354	3,645
Syphilis*	11	4	2	4	0	21	49	79	48	40	258	16

*Early syphilis (primary, secondary and early latent) and congenital syphilis

Table 2. STD cases and average annual rates* by county, South Dakota 2012-2016

*cases per 100,000 population per year.

Counties with 1 or 2 cases are shown as ≤2.

County	Gonorrhea		Chlamydia		Syphilis (P&S)	
	Cases	Rate*	Cases	Rate*	Cases	Rate*
Aurora	4	29.1	19	138.4	0	0
Beadle	20	22.0	344	378.7	0	0
Bennett	59	344.0	164	956.3	0	0
Bon Homme	3	8.5	59	168.0	0	0
Brookings	26	15.6	568	341.0	3	1.8
Brown	58	30.2	639	332.7	≤2	1.0
Brule	13	49.0	59	222.3	≤2	3.8
Buffalo	38	365.9	161	1,550.3	0	0
Butte	13	25.2	150	291.3	0	0
Campbell	0	0	5	72.2	0	0
Charles Mix	126	271.3	408	878.6	4	8.6
Clark	≤2	11.0	34	186.6	0	0
Clay	32	45.9	276	396.2	4	5.7
Codington	38	27.2	467	334.3	4	2.9
Corson	140	669.5	415	1,984.7	74	353.9
Custer	11	26.1	128	303.1	0	0
Davison	66	66.4	357	359.1	5	5.0
Day	10	35.8	62	221.9	0	0
Deuel	0	0	26	120.6	0	0
Dewey	295	1,042.0	682	2,409.0	16	56.5
Douglas	≤2	13.5	7	47.1	3	20.2
Edmunds	≤2	5.0	15	75.3	0	0
Fall River	15	43.8	82	239.6	0	0
Faulk	≤2	17.0	7	59.4	0	0
Grant	8	22.1	51	140.9	≤2	2.8
Gregory	≤2	9.5	32	151.8	0	0
Haakon	5	54.1	11	119.1	0	0
Hamlin	3	10.0	37	123.6	0	0
Hand	0	0	16	95.7	0	0
Hanson	0	0	13	76.0	0	0
Harding	0	0	6	96.0	0	0
Hughes	74	83.9	373	422.9	≤2	1.1
Hutchinson	5	13.9	43	119.4	0	0
Hyde	0	0	9	128.9	0	0
Jackson	33	201.6	131	800.2	0	0

County	Gonorrhea		Chlamydia		Syphilis (P&S)	
	Cases	Rate*	Cases	Rate*	Cases	Rate*
Jerauld	≤2	10.0	11	109.6	0	0
Jones	3	61.5	15	307.7	0	0
Kingsbury	7	27.6	43	169.5	0	0
Lake	3	4.9	108	174.6	≤2	1.6
Lawrence	28	22.7	503	408.0	0	0
Lincoln	64	24.8	477	185.1	5	1.9
Lyman	60	309.5	149	768.6	≤2	5.2
Marshall	6	25.6	37	158.0	3	12.8
McCook	12	42.5	39	138.1	0	0
McPherson	0	0	6	49.4	0	0
Meade	44	32.7	450	333.9	≤2	1.5
Mellette	24	228.6	72	685.7	0	0
Miner	≤2	17.3	13	112.3	0	0
Minnehaha	1,248	136.5	5,046	551.8	118	12.9
Moody	17	53.4	95	298.4	0	0
Oglala Lakota	520	731.5	1,647	2,316.8	8	11.3
Pennington	913	168.7	3,021	558.2	6	1.1
Perkins	0	0	10	65.9	0	0
Potter	1	8.5	15	128.2	0	0
Roberts	39	75.2	529	1,019.9	3	5.8
Sanborn	≤2	8.6	22	188.4	0	0
Spink	4	12.1	53	160.7	0	0
Stanley	5	33.5	55	368.8	0	0
Sully	≤2	13.9	6	83.4	0	0
Todd	350	708.4	985	1,993.5	≤2	4.0
Tripp	7	25.4	74	268.5	0	0
Turner	5	12.1	51	123.3	≤2	4.8
Union	30	39.9	119	158.4	≤2	2.7
Walworth	25	90.7	130	471.8	8	29.0
Yankton	42	37.0	349	307.7	≤2	0.9
Ziebach	57	403.4	117	828.0	0	0
South Dakota	4,623	108.1	20,103	470.1	280	6.5

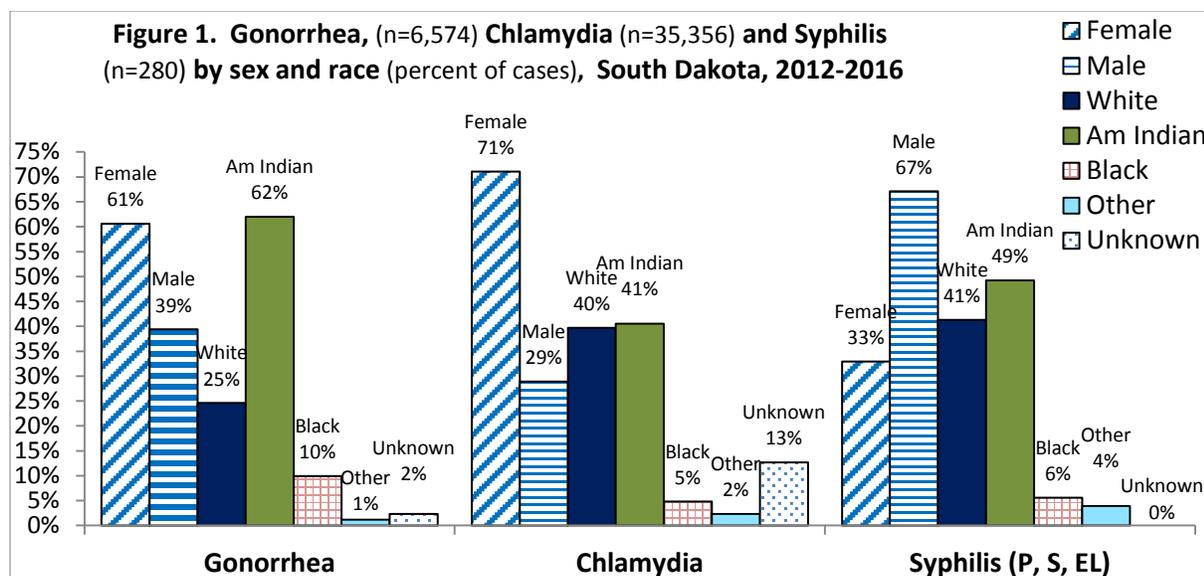
Table 3. Sexually transmitted diseases – reported cases and rates* of reported cases by state, ranked by rates, United States, 2015 ⁽¹⁾

(*Rate per 100,000 population)

Gonorrhea			
Rank	State	Cases	Rate*
1	Louisiana	10,282	221.1
2	North Carolina	19,809	199.2
3	Mississippi	5,775	192.9
4	South Carolina	8,206	169.8
5	Oklahoma	6,542	168.7
6	Arkansas	4,780	161.1
7	Georgia	15,982	158.3
8	Alaska	1,113	151.1
9	Alabama	7,196	148.4
10	Missouri	8,942	147.5
11	Texas	39,717	147.3
12	Ohio	16,564	142.9
13	Delaware	1,310	140.0
14	California	54,135	139.5
15	Illinois	17,130	133.0
16	New York	25,561	129.4
17	Tennessee	8,386	128.0
18	Nevada	3,630	127.9
	United States	395,216	123.9
19	South Dakota	1,048	122.8
20	Arizona	8,245	122.5
21	Florida	24,125	121.3
22	New Mexico	2,489	119.3
23	Indiana	7,843	118.9
24	Maryland	6,858	114.8
25	Kentucky	4,678	106.0
26	Michigan	10,330	104.2
27	Washington	7,171	101.6
28	Pennsylvania	12,791	100.0
29	Virginia	8,099	97.3
30	North Dakota	684	92.5
31	Wisconsin	5,260	91.4
32	Nebraska	1,703	90.5
33	Kansas	2,536	87.3
34	Hawaii	1,239	87.3
35	Montana	844	82.5
36	Colorado	4,387	81.9
37	Oregon	3,232	81.4
38	New Jersey	7,228	80.9
39	Minnesota	4,097	75.1
40	Iowa	2,247	72.3
41	Connecticut	2,088	58.1
42	Massachusetts	3,817	56.6
43	Rhode Island	580	55.0
44	Utah	1,562	53.1
45	West Virginia	769	41.6
46	Maine	417	31.4
47	Wyoming	175	30.0
48	Idaho	472	28.9
49	Vermont	155	24.7
50	New Hampshire	245	18.5

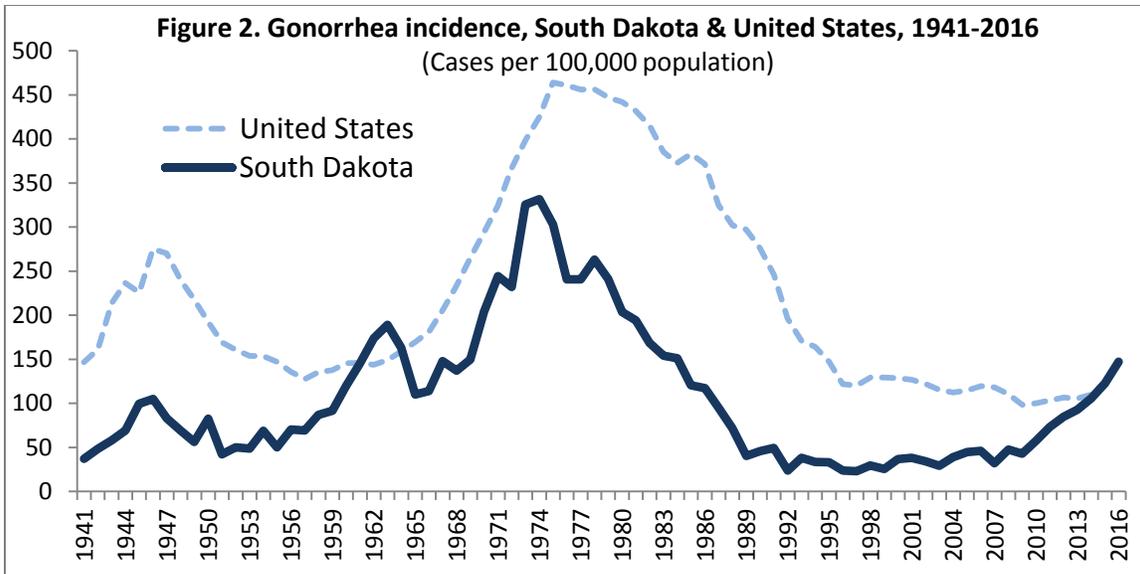
Chlamydia			
Rank	State	Cases	Rate*
1	Alaska	5,660	768.3
2	Louisiana	32,325	695.2
3	North Carolina	64,376	647.4
4	New Mexico	12,632	605.7
5	Mississippi	17,371	580.2
6	Georgia	57,639	570.8
7	South Carolina	27,538	569.9
8	Arkansas	16,166	545.0
9	Alabama	26,359	543.6
10	Oklahoma	21,025	542.2
11	Illinois	69,610	540.4
12	New York	103,615	524.7
13	Texas	141,158	523.6
14	Hawaii	7,074	498.3
15	Delaware	4,605	492.2
16	Ohio	56,726	489.3
17	California	189,170	487.5
18	Arizona	32,387	481.1
	United States	1,526,658	478.8
19	Tennessee	31,272	477.5
20	Missouri	28,948	477.4
21	Michigan	46,486	469.1
22	South Dakota	3,949	462.9
23	Maryland	27,450	459.3
24	Nevada	12,925	455.3
25	Florida	90,468	454.8
26	Colorado	23,857	445.4
27	Indiana	28,886	437.9
28	Rhode Island	4,575	433.6
29	North Dakota	3,159	427.2
30	Virginia	35,349	424.5
31	Wisconsin	24,381	423.5
32	Nebraska	7,956	422.9
33	Pennsylvania	53,460	418.1
34	Oregon	16,305	410.7
35	Montana	4,184	408.8
36	Washington	28,699	406.4
37	Kentucky	17,444	395.2
38	Kansas	11,464	394.8
39	Minnesota	21,243	389.3
40	Iowa	12,085	388.9
41	Connecticut	13,126	364.9
42	Massachusetts	24,100	357.3
43	New Jersey	31,337	350.6
44	Wyoming	2,037	348.7
45	Idaho	5,631	344.5
46	Vermont	1,901	303.4
47	Maine	3,965	298.1
48	Utah	8,633	293.3
49	West Virginia	4,958	268.0
50	New Hampshire	3,095	233.3

Syphilis (primary & secondary)			
Rank	State	Cases	Rate*
1	Louisiana	696	15.0
2	Georgia	1,413	14.0
3	California	4,908	12.6
4	North Carolina	1,196	12.0
5	Nevada	335	11.8
6	Florida	2,083	10.5
7	New York	2,006	10.2
8	Arizona	589	8.7
9	Oregon	345	8.7
10	Maryland	509	8.5
11	Illinois	1,085	8.4
	United States	23,872	7.5
12	Mississippi	219	7.3
13	Rhode Island	77	7.3
14	Hawaii	91	6.4
15	Washington	445	6.3
16	Texas	1,680	6.2
17	Massachusetts	418	6.2
18	South Carolina	294	6.1
19	Alabama	280	5.8
20	New Mexico	118	5.7
21	Oklahoma	209	5.4
22	Tennessee	349	5.3
23	Pennsylvania	655	5.1
24	Missouri	307	5.1
25	Ohio	560	4.8
26	Colorado	245	4.6
27	South Dakota	39	4.6
28	Arkansas	134	4.5
29	Minnesota	246	4.5
30	Delaware	41	4.4
31	Indiana	285	4.3
32	New Jersey	372	4.2
33	Michigan	403	4.1
34	Virginia	334	4.0
35	Idaho	57	3.5
36	Kentucky	145	3.3
37	New Hampshire	40	3.0
38	Kansas	87	3.0
39	West Virginia	52	2.8
40	Connecticut	92	2.6
41	Iowa	75	2.4
42	Nebraska	45	2.4
43	Utah	65	2.2
44	Maine	28	2.1
45	North Dakota	11	1.5
46	Vermont	9	1.4
47	Wisconsin	79	1.4
48	Montana	13	1.3
49	Alaska	8	1.1
50	Wyoming	5	0.9

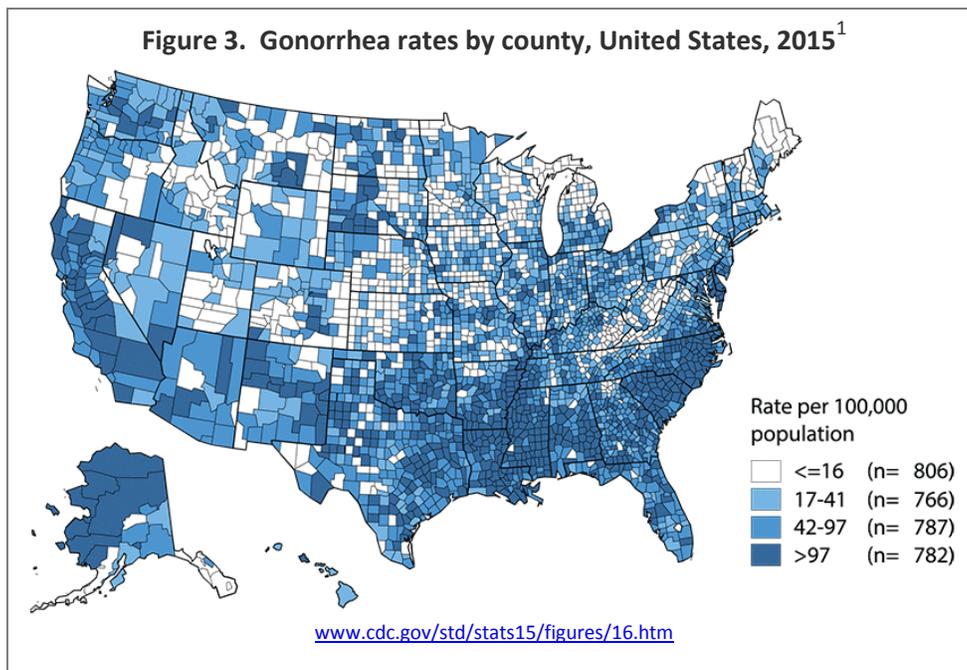


GONORRHEA. Gonorrhea is a bacterial disease caused by *Neisseria gonorrhoeae* infections of the reproductive and urinary tracts. Gonorrhea can also infect the mouth, throat, eyes and anus, and may spread to the blood or joints. Transmission of gonorrhea occurs during contact with secretions from mucus membranes of infected individuals – almost always during sexual activity. Neonatal transmission may occur when an infected mother gives birth. Classic gonorrhea symptoms in women include burning during urination and increased vaginal discharge. Symptoms usually appear two to five days after exposure, but can take as long as 30 days to manifest. Although female gonorrhea infections are sometimes asymptomatic or mild, severe and permanent complications may result. Untreated infections may lead to chronic pelvic pain, internal abscesses, damaged fallopian tubes, infertility or ectopic pregnancy. Male gonorrhea is sometimes asymptomatic, but often causes stinging while urinating, a whitish-greenish urethral discharge and epididymitis which may cause male infertility. Gonorrhea infection amplifies the risk of contracting and transmitting HIV.

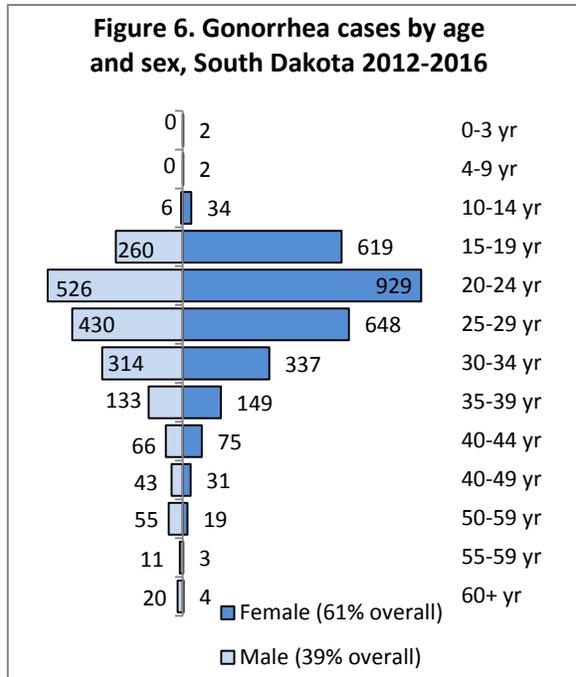
During the past 80 years the number of gonorrhea cases reported in South Dakota peaked in 1974, when gonorrhea was diagnosed by Gram stain and culture, with 2,254 cases reported. Thereafter, gonorrhea decreased dramatically to fewer than 200 cases annually during the 1990s. Since the 1960s South Dakota’s annual incidence of gonorrhea has been well below the national rate; however, during recent years South Dakota’s incidence surpassed the national rate (Figure 2). A decade ago, in 2006, South Dakota had the 39th highest gonorrhea rate (47.3 cases per 100,000) in the United States⁽¹⁾, but by 2015, our ranking had increased to 19th, and by 2016 our incidence rate had tripled to 147.1 cases per 100,000 population. Since 2007, gonorrhea has been increasing every year reaching 1,269 cases in 2016, which was the highest number of cases in 35 years.



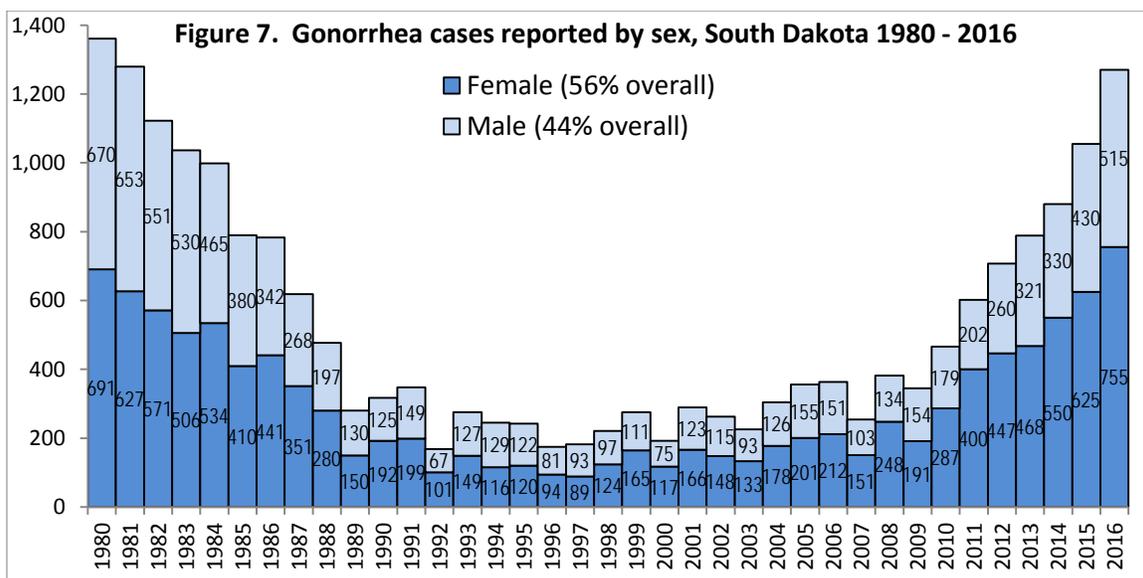
In 2015, which is the most recent year with available nationally published data, 87.8% of 3,140 US counties reported at least one case of gonorrhea. Five South Dakota counties ranked in the top 25 county incidence rates out of 3,140 counties in the United States⁽²⁾: Dewey County 1st (1,289 cases per 100,000 population), Oglala Lakota 5th (858 incidence), Todd 7th (799 incidence), Ziebach 18th (460 incidence), and Bennett 22nd (437 incidence). Our two largest counties, Minnehaha and Pennington ranked 406th (162 incidence) and 308th (186 incidence), respectively. Nineteen South Dakota counties reported no gonorrhea cases in 2015 (Figure 3).



Typically female gonorrhea cases reported exceed male cases in South Dakota. Since 1980 there have been only five years when more male cases than female cases were reported: 1981, 1983, 1994, 1995 and 1997 (Figure 7). In 2015, the most recent year of nationally published data, South Dakota had the lowest male-to-female gonorrhea ratio in the United States⁽¹⁾. South Dakota's male gonorrhea incidence was 99.5 cases per 100,000 population, whereas the female incidence was 146.5, which is a ratio of 0.68. The national male-to-female gonorrhea ratio was 1.37. Only 12 states had male-to-female gonorrhea ratios less than 1.0. This low ratio suggests that South Dakota males may be under-reported, under-diagnosed, under-screened or may actually have less disease.

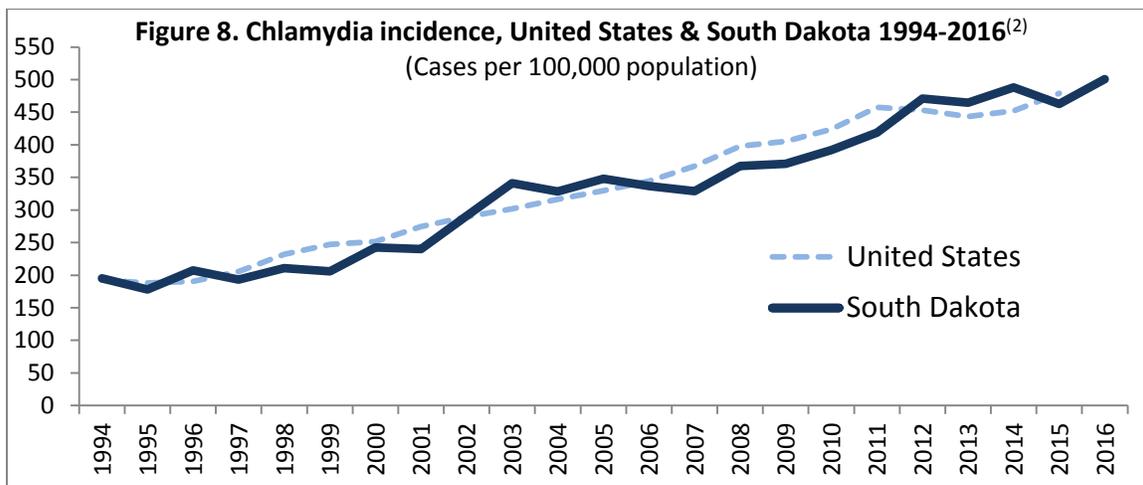


During the five year period, 2012-2015, American Indian cases accounted for 62.0% of South Dakota's gonorrhea cases, 24.6% of cases were White race, 9.9% were Black race, 1.2% other races and 2.3% were individuals of unknown race (Figure 1). Although race status is self-designated by the case patients themselves, race classifications are often ambiguous, ephemeral and sometimes inaccurate. In 2015, South Dakota's American Indian gonorrhea incidence, 827 cases per 100,000 population, was highest in the United States among state American Indian rates. The overall national American Indian gonorrhea incidence was 179 cases per 100,000 population.⁽²⁾ The three states with the highest American Indian gonorrhea rates were South Dakota (827 incidence) and our neighboring states North Dakota (700 incidence) and Montana (664 incidence).

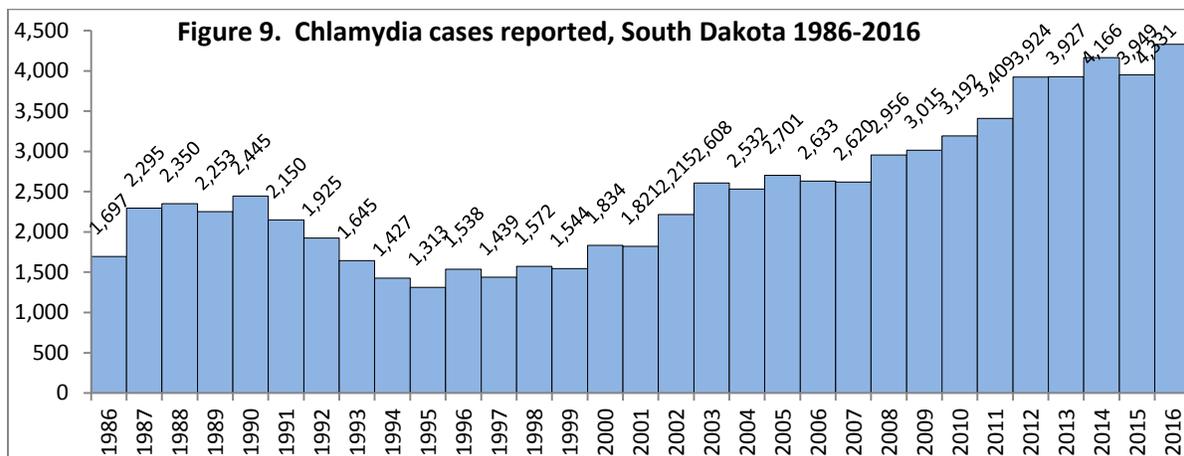


CHLAMYDIA. *Chlamydia trachomatis* (serovars D-K) is an intracellular bacterium that infects the genital tract. Chlamydia transmission occurs during contact with mucus membrane secretions of infected individuals – almost always during sexual activity. Neonatal transmission occurs when an infant is born to an infected mother, and may then cause pneumonia or conjunctivitis in the newborn. Most female infections are asymptomatic or mild, but can cause mucus-pus discharges, pelvic inflammatory disease, infertility and ectopic pregnancy. Men experience urethral discharge, epididymal pain and sexually reactive arthritis.

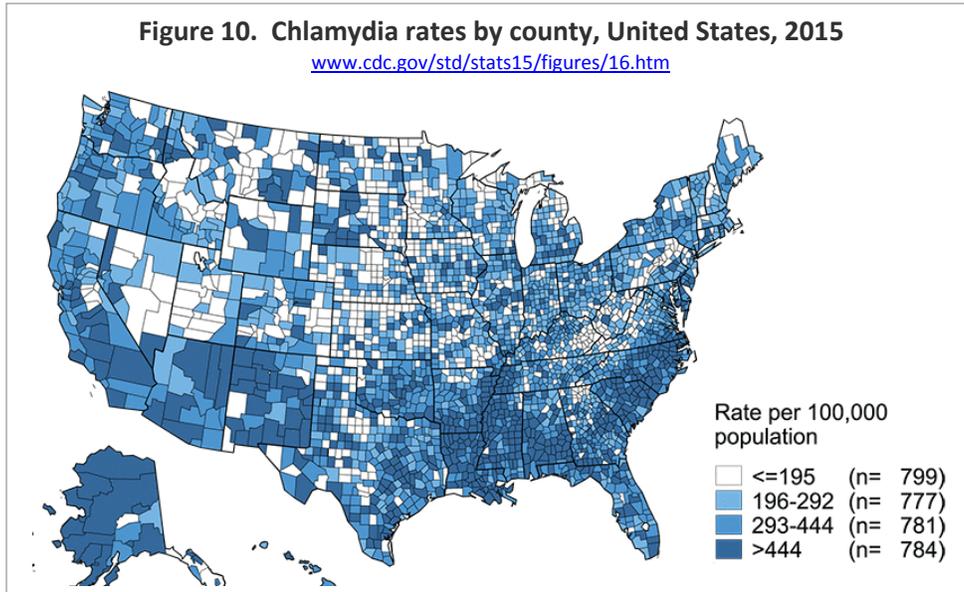
Formal public health monitoring of chlamydia started in the mid-1980s. Figure 8 graphs chlamydia’s increasing incidence in South Dakota and the United States over the past 23 years. Since the early 1990s national and state chlamydia incidence rates have more than doubled. South Dakota’s chlamydia incidence has been fairly similar to the national incidence, with South Dakota exceeding the national rate during nine of these years. Chlamydia is now the most frequently reported infectious disease in South Dakota and the United States.



Chlamydia’s historical trend has been upward in South Dakota, ranging from a 1,313 cases reported in 1995 increasing to 4,331 cases in 2016, a +230% increase over 22 years (Figure 9). During the past five years, 2012-2016, all of South Dakota’s 66 counties have reported chlamydia cases.

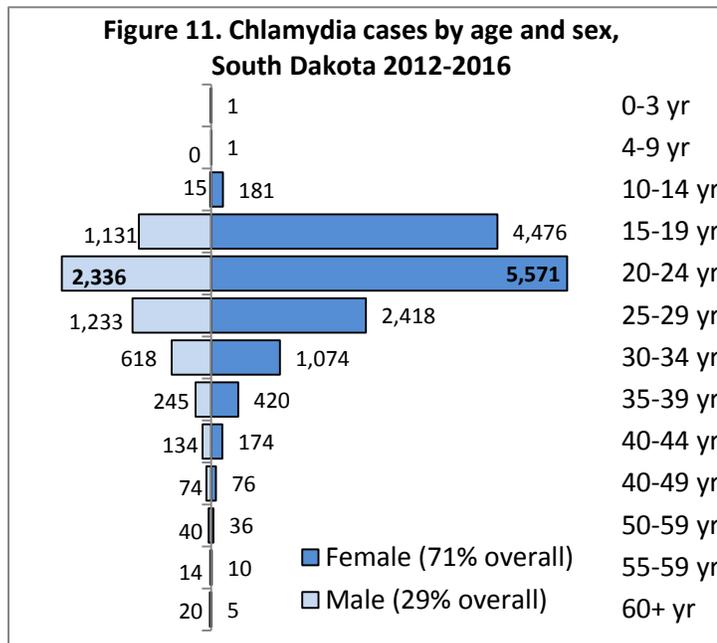


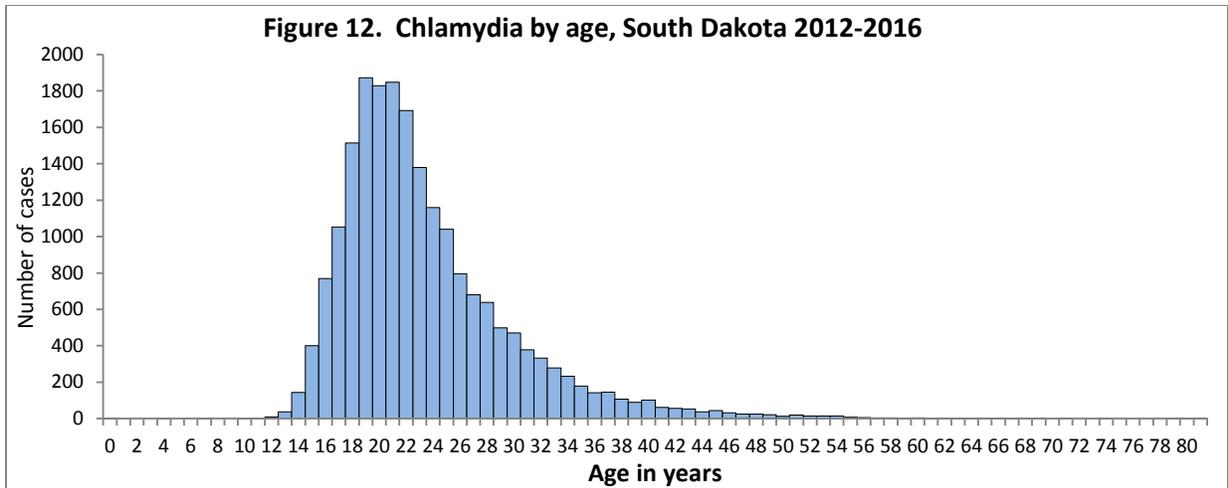
During 2015, the most recent year of nationally available data, 98.6% of 3,140 US counties reported cases of chlamydia. Nationally, five South Dakota counties ranked in the highest 25 county incidence rates in the United States⁽²⁾: Oglala Lakota County ranked 3rd (2,448 cases per 100,000 population), Dewey 4th (2,420 incidence), Todd 7th (1,856 incidence), Corson 23rd (1,244 incidence) and Buffalo 25th (1,204 incidence). Our two largest counties, Minnehaha and Pennington, ranked 452nd (563 incidence) and 543rd (524 incidence), respectively. Five South Dakota counties had no chlamydia cases reported in 2015.



Females accounted for 71% of the chlamydia cases reported in South Dakota during the five-year period, 2012-2016 (Figure 11). The peak age for chlamydia was 19 years of age (Figure 12). The median female age was 21 years (range 0-81 years), while the median male case age was 23 years (range 4-81 years).

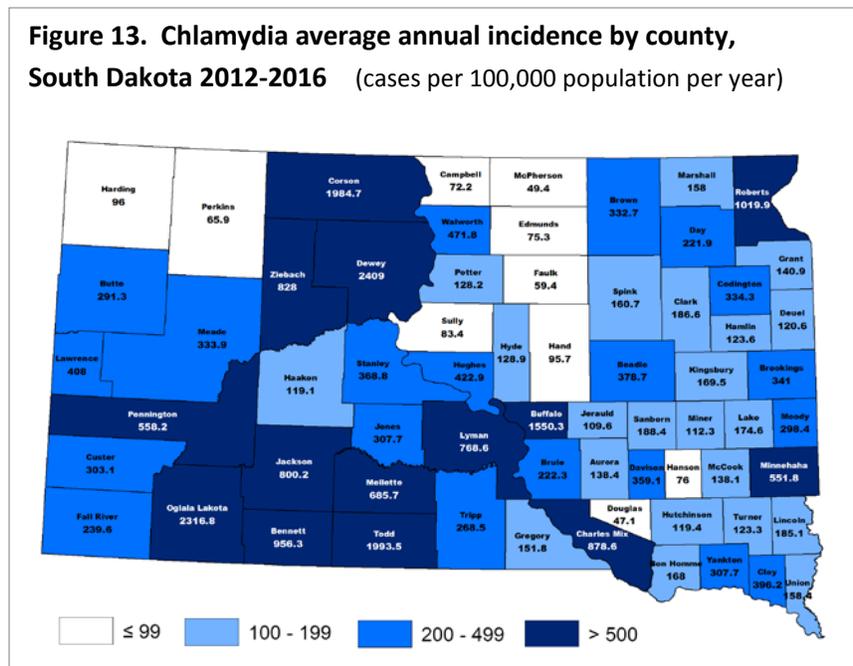
Four South Dakota cases were in children 10 years and younger. Overall, female chlamydia cases exceeded male cases in South Dakota, and all other states, by double or more. Nationally in 2015, the female incidence of chlamydia was 645.5 cases per 100,000 population and 305.2 for males, while in South Dakota the rates were 667.9 for females and 206.4 for males.⁽¹⁾ South Dakota had the 45th lowest male-to-female chlamydia incidence ratio in the United States, suggesting that South Dakota males may be under-reported, under-diagnosed, under-screened or may have less disease.





During the five year period, 2012-2015, American Indian cases accounted for 40.5% of South Dakota’s chlamydia cases, 39.7% of cases were White race, 4.8% were Black race, 2.3% other races and 12.7% were individuals of unknown race (Figure 1). Although race status is self-designated by the case patients themselves, race classifications are often ambiguous, ephemeral and sometimes inaccurate. In 2015, South Dakota’s American Indian chlamydia incidence, 2,130 cases per 100,000 population, was second highest in the United States when compared with all state’s American Indian rates. The overall national American Indian chlamydia incidence was 655 cases per 100,000 population. Alaska had the highest rate (2,358 incidence). The states with the next highest American Indian chlamydia rates were South Dakota (2,130 incidence) and our neighboring states Montana (1,473 incidence), North Dakota (1,447 incidence), Wyoming (1,273 incidence) and Nebraska (1,151 incidence).⁽²⁾

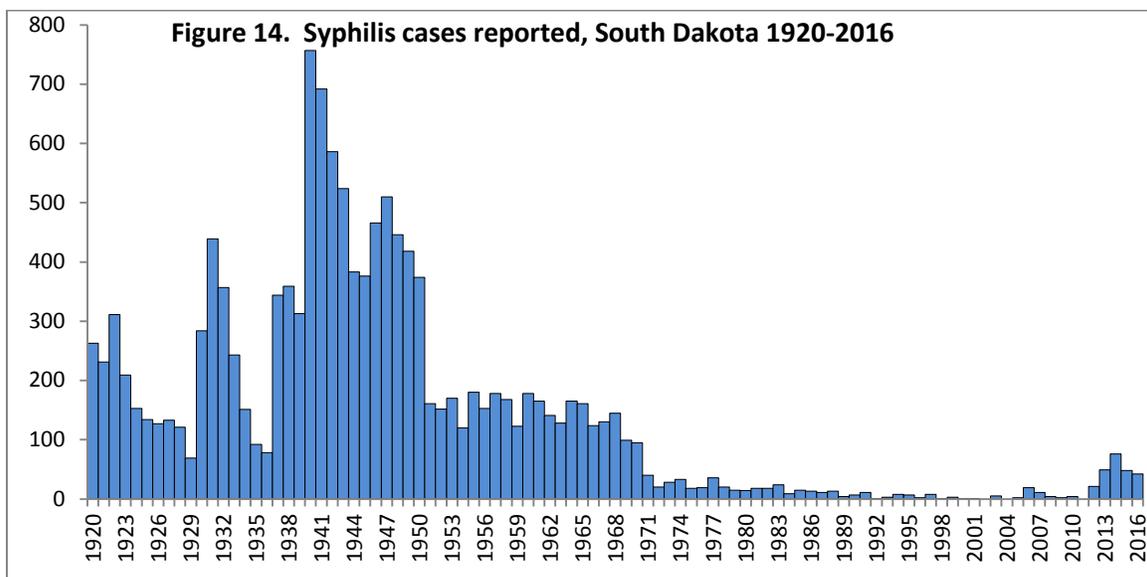
The map in Figure 13 shows the average annual incidence of chlamydia for South Dakota counties. Counties with the highest rates include Dewey, Oglala Lakota, Todd, Corson, Buffalo and Roberts.



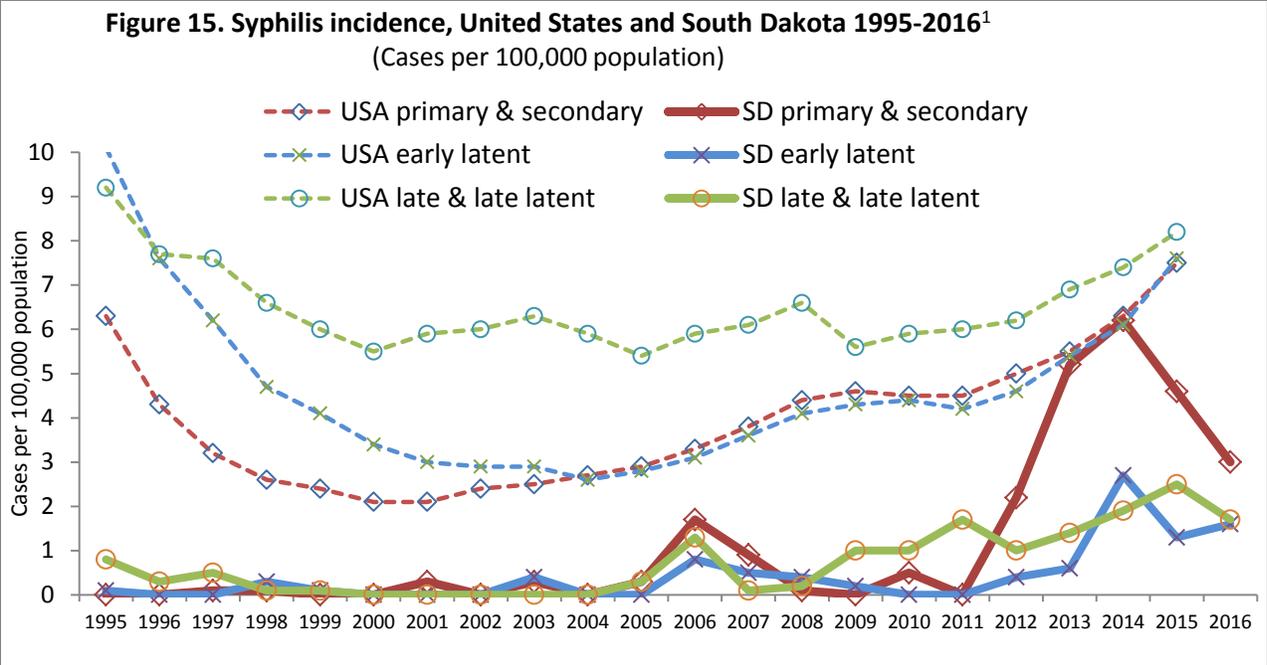
SYPHILIS. Syphilis is caused by the spirochete bacterium *Treponema pallidum*. Syphilis manifests as primary, secondary, latent and tertiary stages in adults or children. Congenital syphilis may cause still-birth or developmental anomalies in infected infants. Syphilis infection is clinically multi-staged as:

- **Primary syphilis:** chancre, a painless ulcer on skin or mucus membrane at the site of exposure. Chancres are highly infectious, appearing about three weeks (range 10-90 days) after exposure and heal spontaneously in about two weeks.
- **Secondary syphilis:** 3-8 weeks after the primary chancre disappears systemic symptoms start: fever, malaise, rash, lymphadenopathy with spontaneous resolution in 3-12 weeks.
- **Early latent, late latent syphilis:** asymptomatic.
- **Early syphilis:** defined as primary, secondary and early latent stages.
- **Tertiary syphilis:** 15-30 years after initial infection, exhibits varied clinical manifestations including neurosyphilis, mental deterioration, blindness, aortitis and gumma growths.
- **Congenital syphilis:** range from asymptomatic infection to severe cases with rash, snuffles, hepatosplenomegaly, condyloma lata warts, jaundice, pseudoparalysis, anemia or edema.

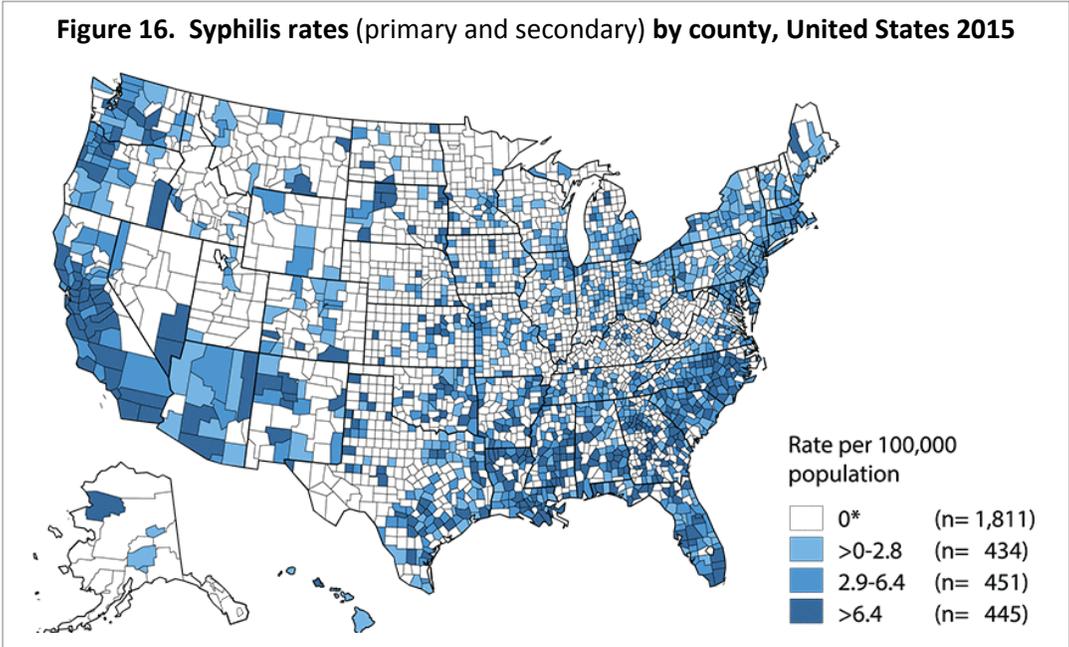
Syphilis is not a new disease in South Dakota (Figure 14). Over 500 syphilis cases were reported annually in the 1940s, thereafter case numbers dwindled so that zero cases were reported during some years in the early 2000s when the hope of syphilis elimination in South Dakota was near. Since 2006, however, the state has experienced a resurgence peaking in 2014 when 76 early syphilis cases and three congenital cases were reported. During the past five years, 2012-2016, South Dakota syphilis cases have included five congenital, 139 primary, 85 secondary, 51 early latent and 72 late latent cases.



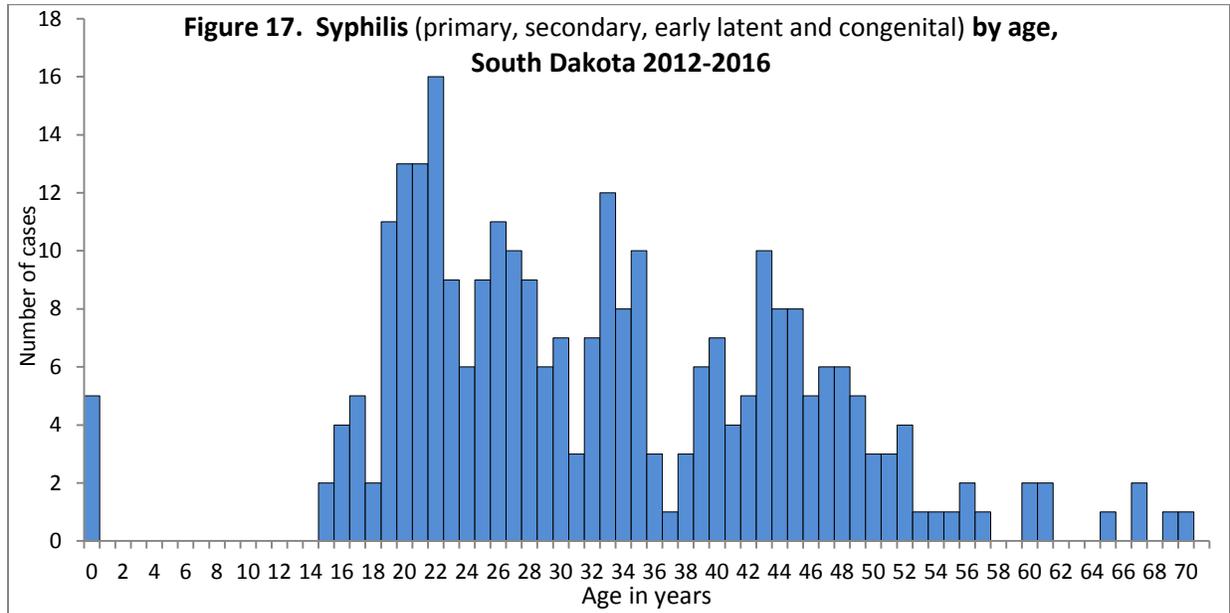
Since 1995, South Dakota’s annual incidence of syphilis has been well below the national rates for all stages; however, in 2013 and 2014 our rate of primary and secondary syphilis was near the national rate (Figure 15). In 2011, South Dakota had the lowest rate of primary and secondary syphilis in the United States, zero, but increased to 14th highest in 2014 with a rate of 6.3 cases per 100,000 population.



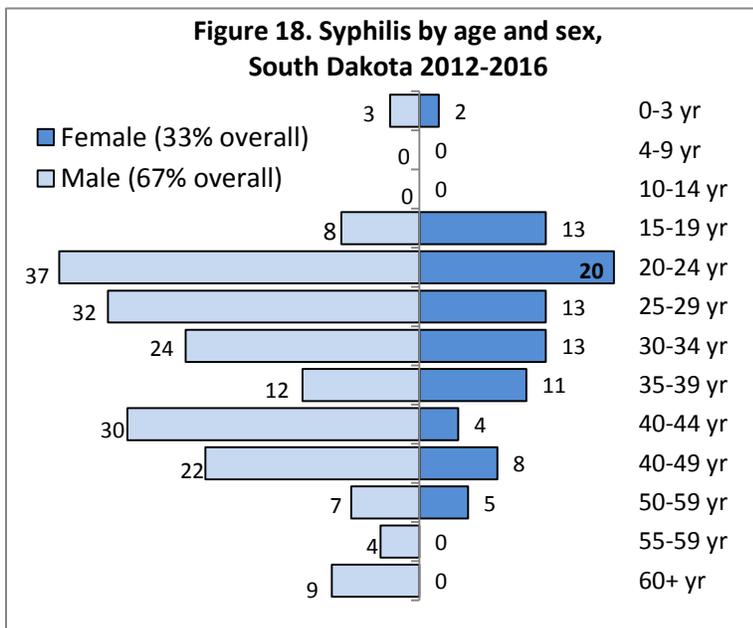
During 2015, which is the most recent year with nationally published data available, 42.3% of 3,140 US counties reported at least one case of primary or secondary syphilis (Figure 16). The overall national incidence in 2015 was 7.5 cases of primary or secondary syphilis per 100,000 population, while South Dakota’s incidence was 4.6 (Table 3). Corson County ranked first in the United States with 95.6 cases per 100,000 population. Our two largest counties, Minnehaha and Pennington ranked 302nd (8.7 incidence) and 1,129th (1.8 incidence), respectively.⁽²⁾



During the five year period, 2012-2016, 26 of South Dakota's 66 counties reported cases of primary, secondary or congenital syphilis. Three counties, Minnehaha, Corson and Dewey, accounted for 74% of the state's cases.



Unlike gonorrhea and chlamydia, males accounted for the majority, 67.1%, of primary and secondary syphilis cases reported in South Dakota during the five-year period, 2012-2016 (Figure 18). The peak age for syphilis was 22 years of age. The median male age was 33 years (range 17-70 years), while the female median age was 28 years (15-53 years). During 2015, the national male primary and secondary syphilis rate exceeded the female rate over five-fold.



Heterosexual transmission (male-to-female or female-to-male) accounted for 57.1% of South Dakota's early syphilis cases, whereas 41.8% were male-to-male sexual transmission mode, and 1.1% were unknown transmission mode during the past five years. Of just the men, 62.2% were male-to-male sexual transmission, 36.2% were heterosexual transmission and 1.6% were unknown transmission mode.

During the five year period, 2012-2016, 49.3% of early syphilis cases were American Indian, 41.4% were

White race, 5.7% were Black race and 3.9% were other races (Figure 1). Although race status is self-

designated by the case patients themselves, race classifications are often ambiguous, ephemeral and sometimes inaccurate.

Among the White race early syphilis cases (n=115), 74.7% were male-to-male sexual transmission, 22.6% were heterosexual and 2.6% were unknown transmission. Among the American Indian cases (n=133) 7.5% were male-to-male sexual transmission and 92.5% were heterosexual transmission. Among Black race cases (n=16), 68.8% were male-to-male sexual transmission and 31.2% were heterosexual transmission.

Congenital syphilis in South Dakota had been rare until 2014 when three cases were reported, prior to which our last case was reported in 1999. Two cases of congenital syphilis were also reported in 2016. Four of these five congenital syphilis cases were born healthy. There were four syphilis-associated stillbirths during 2013-2016.

Diagnosis of sexually transmitted diseases

- Recommendations for the Laboratory-Based Detection of *Chlamydia trachomatis* and *Neisseria gonorrhoeae* — 2014. CDC. 14 March 2016. MMWR 63/2. www.cdc.gov/std/laboratory/2014labrec/2014-lab-rec.pdf
- Suggested Reporting Language for Syphilis Serology Testing. 2015. Association of Public Health Laboratories (APHL). www.aphl.org/AboutAPHL/publications/Documents/ID_Suggested_Syphilis_Reporting_Lang_122015.pdf

Treatment of sexually transmitted diseases

- Sexually Transmitted Diseases Treatment Guidelines, 2015. CDC. 5 June 2015. MMWR 64/3. www.cdc.gov/std/tg2015/tg-2015-print.pdf

Prevention of sexually transmitted diseases

Effective strategies for reducing STD risk (www.cdc.gov/std/prevention):

- **Practice abstinence:** The surest way to avoid STDs is to not have sex. This means not having vaginal, oral or anal sex.
- **Mutual monogamy:** Agree to be sexually active with only one person, who has agreed to be sexually active only with you. Being in a long-term mutually monogamous relationship with an uninfected partner is one of the most reliable ways to avoid STDs. You must both be certain you are not infected with STDs. It is important to have an open and honest conversation with your partner.
- **Condoms:** Correct and consistent use of the male latex condom is highly effective in reducing STD transmission. Use a condom every time you have vaginal, anal or oral sex.
- **Talk with partner:** Talk with your sex partner(s) about STDs and staying safe before having sex. It might be an uncomfortable conversation to start, but protecting your health is your responsibility.

- **Get tested:** Many STDs don't have symptoms, but they can still cause health problems. The only way to know if you have an STD is to get tested.
- **If you test positive:** Many STDs are curable and all are treatable. If either you or your partner has an STD, both of you need to start treatment immediately to avoid getting re-infected.
- **The goal of the South Dakota Sexually Transmitted Disease (STD) Control Program** is to reduce and prevent the incidence of sexually transmitted diseases, including HIV. The STD Program provides statewide consultation and technical assistance, partner services, screening, surveillance, health care provider education, case management and partner notification for reportable STDs in the state. <https://doh.sd.gov/diseases/infectious/std/>

Screening recommendations and considerations

- **Screening for Chlamydia and Gonorrhea:**
U.S. Preventive Services Task Force Recommendation Statement
www.uspreventiveservicestaskforce.org/Page/Document/RecommendationStatementFinal/chlamydia-and-gonorrhea-screening
- **Syphilis screening during pregnancy:**
U.S. Preventive Services Task Force Recommendation Statement
www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/syphilis-infection-in-pregnancy-screening
- **Gonorrhea screening:**
www.cdc.gov/std/tg2015/screening-recommendations.htm
Women:
 - Sexually active women under 25 years of age.
 - Sexually active women age 25 years and older if at increased risk*.
 - Retest 3 months after treatment.
 Pregnant Women:
 - All pregnant women under 25 years of age and older women if at increased risk*.
 - Retest 3 months after treatment.
 Men who have sex with men (MSM):
 - At least annually for sexually active MSM at sites of contact (urethra, rectum, pharynx) regardless of condom use.
 - Every 3 to 6 months if at increased risk*.
- **Chlamydia screening:**
www.cdc.gov/std/tg2015/screening-recommendations.htm
Women:
 - Sexually active women under 25 years of age.
 - Sexually active women age 25 years and older if at increased risk*.
 - Retest approximately 3 months after treatment.

Pregnant Women:

- All pregnant women under 25 years of age.
- All pregnant women aged 25 years and older women if at increased risk*.
- Retest during the third trimester for women less than 25 years of age or at risk*.
- Pregnant women with chlamydial infection should have a test-of-cure 3-4 weeks after treatment and be retested within 3 months.

Men who have sex with men (MSM):

- At least annually for sexually active MSM at sites of contact (urethra, rectum) regardless of condom use.
- Every 3 to 6 months if at increased risk*.

- **Syphilis screening:**

www.cdc.gov/std/tg2015/screening-recommendations.htm

Pregnant Women:

- All pregnant women at first prenatal visit.
- Retest early in the third trimester and at delivery if at high risk*.

Men who have sex with men (MSM):

- At least annually for sexually active MSM.
- Every 3 to 6 months if at increased risk*.

*Increased risk includes “those who have a new sex partner, more than one sex partner, a sex partner with concurrent partners, or a sex partner who has an STI; inconsistent condom use among persons who are not in mutually monogamous relationships; previous or coexisting sexually transmitted infections; and exchanging sex for money or drugs.”

<http://annals.org/aim/article/1906843/screening-chlamydia-gonorrhea-u-s-preventive-services-task-force-recommendation>

Expedited partner therapy (EPT)

EPT is the clinical practice of treating the sex partners of patients diagnosed with chlamydia or gonorrhea by providing prescriptions or medications to the patient to take to their partner without the health care provider first examining the partner. Effective clinical management of STD patients requires treatment of the patients’ current sex partners to prevent reinfection and curtail further transmission.

www.cdc.gov/std/ept

Behaviors that contribute sexually transmitted diseases in high school students

Questions about self-reported sexual behaviors by high school students are part of the biannual Youth Risk Behavior Survey (YRBS).⁽⁴⁾ YRBS is conducted in South Dakota⁽⁵⁾ and most other states during the spring of odd numbered years. The YRBS asks students a variety of questions including tobacco use, injuries, alcohol and other drug use, sexual behaviors, dietary behaviors and physical activity. Survey questions relating to sexual behavior include the following:

- Have you ever had sexual intercourse?
- How old were you when you had sexual intercourse for the first time?
- During your life, with how many people have you had sexual intercourse?
- During the past 3 months, with how many people did you have sexual intercourse?
- Did you drink alcohol or use drugs before you had sexual intercourse the last time?
- The last time you had sexual intercourse, did you or your partner use a condom?
- The last time you had sexual intercourse, what one method did you or your partner use to prevent pregnancy?
- Have you ever been physically forced to have sexual intercourse when you did not want to?
- During the past 12 months, how many times did anyone force you to do sexual things that you did not want to do? (Count such things as kissing, touching, or being physically forced to have sexual intercourse.)
- During the past 12 months, how many times did someone you were dating or going out with force you to do sexual things that you did not want to do? (Count such things as kissing, touching, or being physically forced to have sexual intercourse.)

Over the past 25 years, the rate of South Dakota high school students responding that they ever had sexual intercourse decreased from 52.0% in 1993 to 37.2% in 2015 (Figure 19, Table 4). The percentage of South Dakota high school students reporting having had sexual intercourse with four or more partners decreased over time from 16.5% in 1993 to 12.2% in 2013. Paradoxically, while the reported high school sexual activity decreased, the STD rates increased in South Dakota.

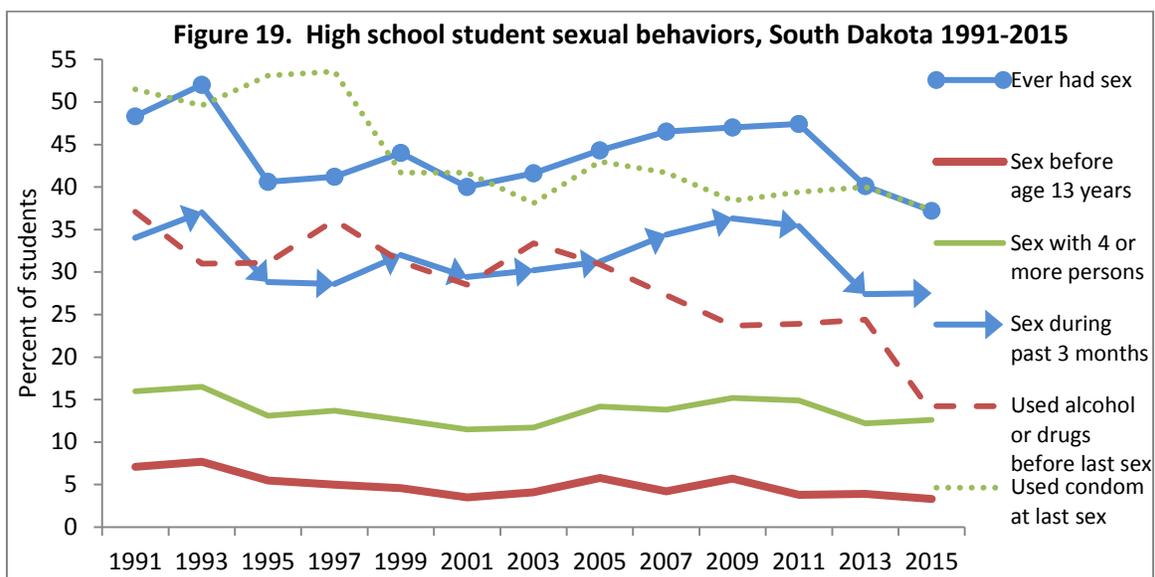
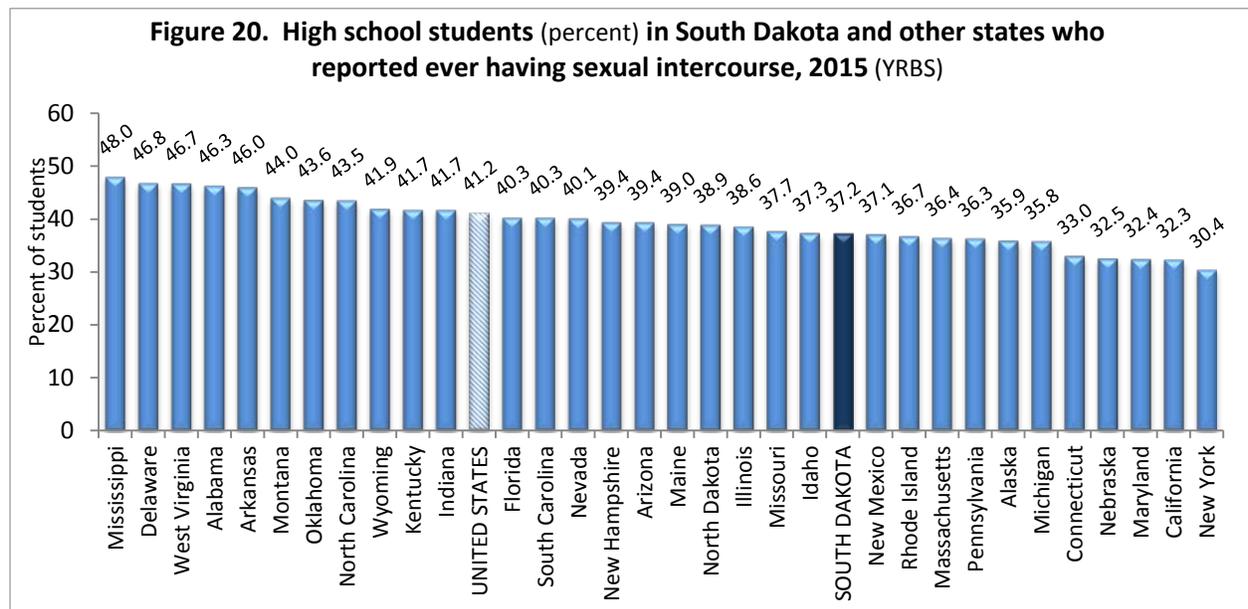


Table 4. High school student sexual behaviors, South Dakota 1991-2015

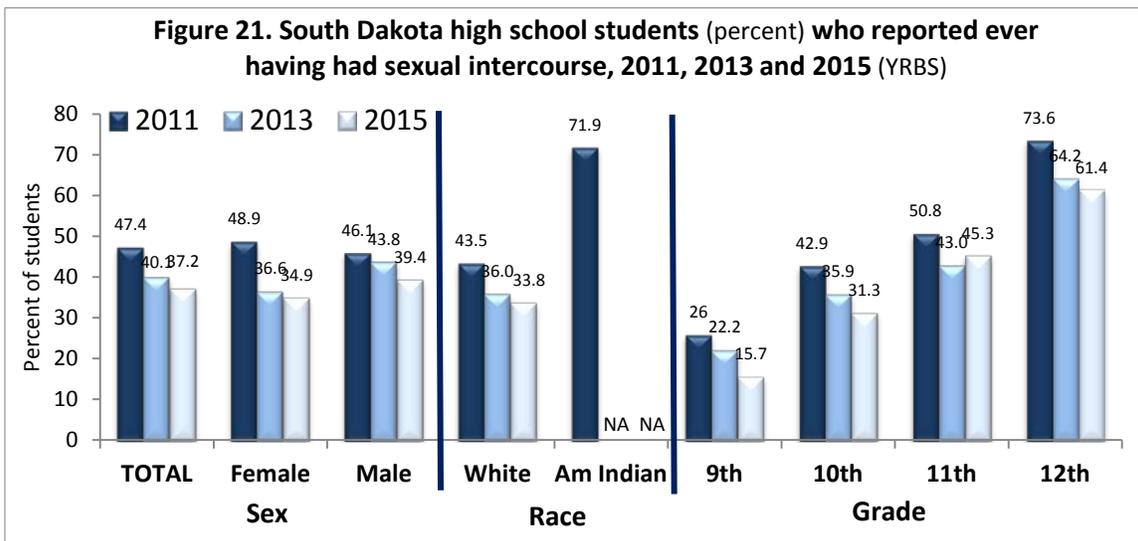
		1991	1993	1995	1997	1999	2001	2003	2005	2007	2009	2011	2013	2015
Percent of students who have ever had sexual intercourse.	Total	48.3	52.0	40.6	41.2	44.0	40.0	41.6	44.3	46.5	47.0	47.4	40.1	37.2
	Girls	47.3	47.9	39.8	43.1	44.0	38.3	43.4	47.1	47.1	46.9	48.9	36.6	34.9
	Boys	49.0	56.1	41.5	39.4	44.0	41.7	39.6	41.4	45.9	47.1	46.1	43.8	39.4
Percent of students who had sexual intercourse before age 13 years.	Total	7.1	7.7	5.5	5.0	4.6	3.5	4.1	5.8	4.2	5.7	3.8	3.9	3.3
	Girls	4.8	4.0	3.5	3.9	3.5	1.9	2.5	3.6	1.7	3.7	2.5	1.7	2.6
	Boys	9.2	11.3	7.4	6.1	5.7	5.1	5.6	8.0	6.7	7.6	5.1	6.1	3.8
Percent of students who have had sexual intercourse with four or more partners.	Total	16.0	16.5	13.1	13.7	12.6	11.5	11.7	14.2	13.8	15.2	14.9	12.2	12.6
	Girls	15.6	14.1	13.3	14.5	12.5	10.4	8.8	16.9	13.7	14.4	15.4	11.5	10.9
	Boys	16.3	18.6	13.0	12.9	12.7	12.7	14.4	11.5	13.9	16.0	14.5	12.9	14.2
Percent of students who had sexual intercourse during past 3 months.	Total	34.0	37.0	28.8	28.6	32.0	29.4	30.2	31.2	34.4	36.3	35.4	27.4	27.5
	Girls	33.9	36.4	29.7	30.3	33.5	29.7	32.0	33.7	37.8	38.9	37.6	26.4	26.6
	Boys	33.9	37.5	27.8	26.9	30.4	28.9	28.3	28.7	30.7	33.7	33.4	28.5	28.1
Percent of students ever having been physically forced to have sexual intercourse.	Total	NA	NA	NA	NA	NA	8.0	8.7	9.5	9.8	9.3	9.6	7.5	5.1
	Girls	NA	NA	NA	NA	NA	10.9	12.7	12.8	13.9	12.5	13.5	9.6	6.1
	Boys	NA	NA	NA	NA	NA	5.1	5.0	6.3	5.7	6.3	5.8	5.4	4.2
Among sexually active students, percent who used alcohol or drugs before last sexual intercourse.	Total	37.1	31.0	31.1	36.1	31.2	28.5	33.4	30.9	27.3	23.7	23.9	24.4	13.5
	Girls	34.5	25.6	24.8	31.4	29.0	26.8	31.7	26.4	25.7	23.4	21.3	22.8	8.4
	Boys	40.1	35.6	37.7	41.4	33.9	30.4	35.6	36.1	29.5	24.1	26.7	25.9	18.1
Percent who used a condom at last sexual intercourse.	Total	51.5	49.6	53.1	53.6	41.7	41.7	38.1	43.0	41.7	38.4	39.4	40.0	37.3
	Girls	53.1	53.7	58.4	58.7	45.1	46.2	45.3	46.3	46.4	44.6	48.2	39.2	38.2
	Boys	49.9	45.5	47.4	47.8	38.0	36.7	29.8	39.1	35.4	31.2	29.3	40.7	36.5

High school students having sexual intercourse

During 2015, 37.2% of South Dakota high school students reported having ever had sexual intercourse, which was below the national rate of 41.2%. South Dakota students ranked 23rd out of the 34 states asking that question (Figure 20). States with the highest rates include Mississippi, Delaware and West Virginia, whereas states with the lowest rates include Maryland, California and New York.

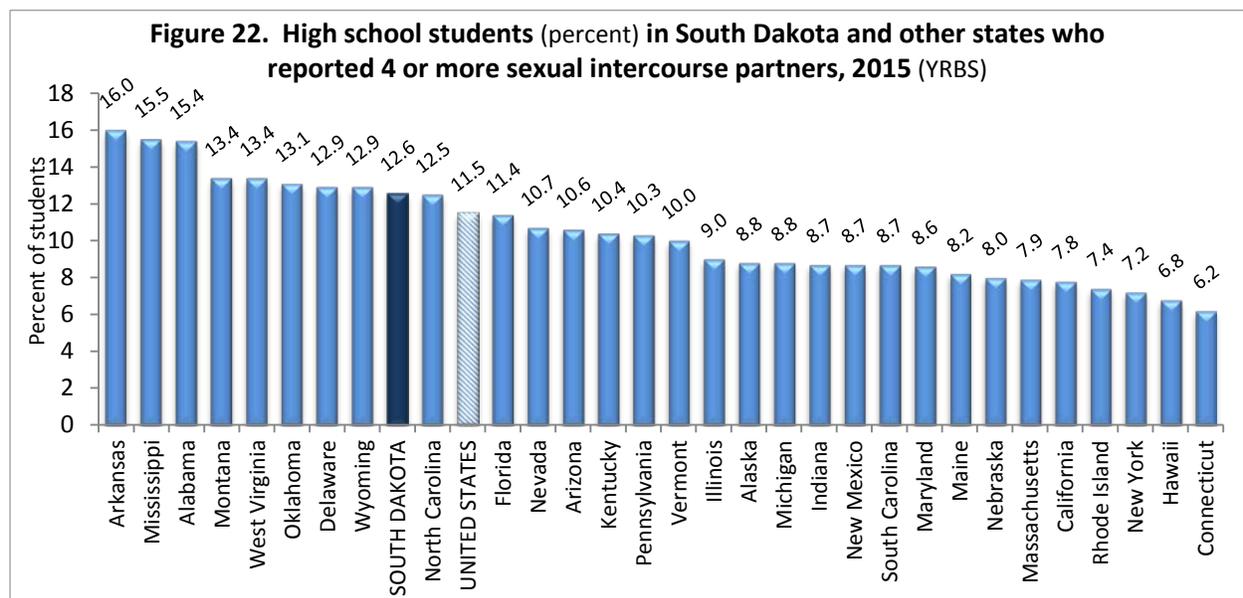


During the three most recent YRBS reports for South Dakota (2011, 2013 and 2015), the overall percent of high school students having sexual intercourse decreased by 10 percentage points, from 47.4% in 2011 to 37.2% in 2015 (Figure 21). In 2015, male students reported being more sexually active than female students (39.4% vs. 34.9%, respectively). The American Indian sample was large enough to be statistically reliable in 2011 only. During that year, 71.9% American Indian students reported sexual intercourse compared to 43.5% of White race students. The rate of sexual experience increased by grade level, from 15.7% among 9th graders to 61.4% among 12th graders in 2015.

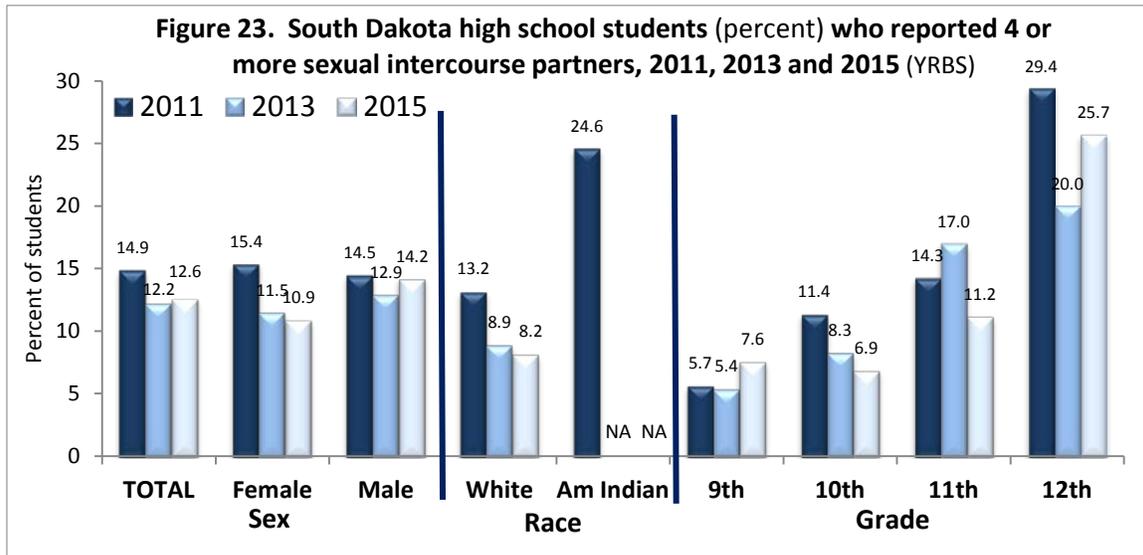


High school students having had four or more sexual partners

Non-monogamy, having multiple sexual partners is a risk factor for acquiring STDs. During 2015, 12.6% of South Dakota high school students reported having four or more lifetime sexual intercourse partners, which was more than the national rate of 11.5%. South Dakota ranked 9th out of the 32 states asking that question (Figure 22). States with the highest rates include Arkansas, Mississippi and Alabama, whereas states with the lowest rates include New York, Hawaii and Connecticut.

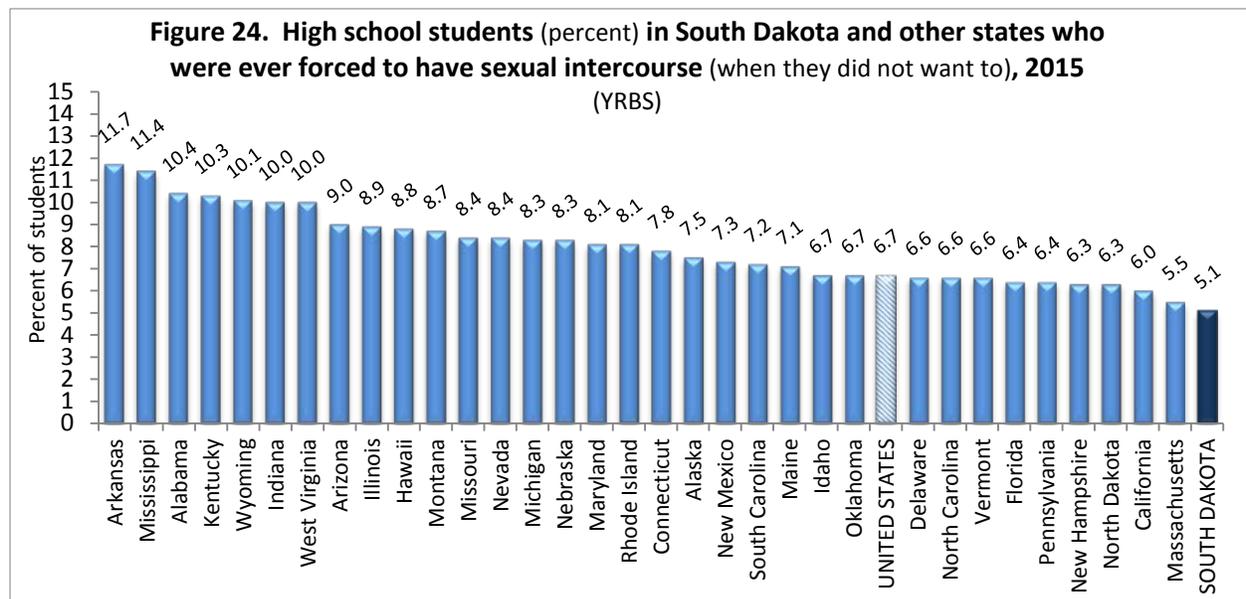


During the three most recent YRBS reports for South Dakota (2011, 2013 and 2015), the overall percent of high school students who reported four or more sexual partners decreased by two percentage points (Figure 23). In 2015, male students reported being more sexually experienced than female students (14.2% vs. 10.9%, respectively). The American Indian sample was large enough to be statistically reliable in 2011 only. During that year, 24.6% American Indian students reported having four or more sex partners compared to 13.2% of White race students. The rate of sexual experience increased by grade level.

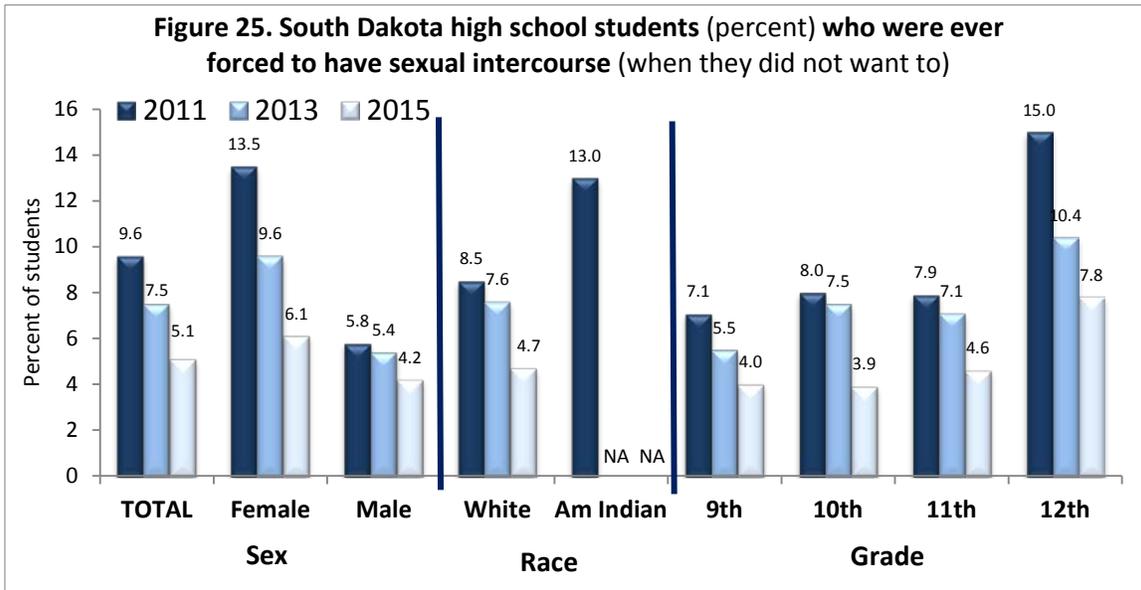


High school students having been physically forced to have sexual intercourse

Forced sexual intercourse is a risk factor for acquiring STDs. During 2015, 5.1% of South Dakota high school students reported having been forced to have had sexual intercourse when they did not want to, which was fewer than the national rate of 6.7%. South Dakota ranked 35th out of the 35 states asking that question (Figure 24). States with the highest rates include Arkansas, Mississippi and Alabama, whereas states with the lowest rates include California, Massachusetts and South Dakota.



During the three most recent YRBS reports for South Dakota (2011, 2013 and 2015), the overall percent of high school students forced to have sex decreased by 4.5 percentage points from 9.6% in 2011 to 5.1% in 2015 (Figure 25). In 2015 female students reported having been forced into sex at a higher rate than male students (6.1% vs. 4.2%, respectively). The American Indian sample was large enough to be statistically reliable in 2011 only. During that year 13.0% American Indian students reported having had forced sex compared to 8.5% of White race students. The rate of forced sex increased by grade level, but each grade decreased during the survey years.



Youth Risk Behavior Survey (YRBS). The YRBS is conducted biannually on odd years in randomly selected high schools in South Dakota by the Department of Health or the Department of Education in collaboration with and funded by the Centers for Disease Control and Prevention (CDC). Participating schools are from the public and private sectors, and Bureau of Indian Education schools. YRBS is a voluntary, confidential, self-reporting survey with questions on tobacco use, sexual behaviors, eating habits, physical activity, alcohol/drug use, suicide ideation, suicide attempts, bullying, violence and many other topics. During the 2015 survey, 1,313 South Dakota high schoolers participated, including 48.7% female and 51.3% male students.

YRBS Sexual Behavior Questions

Have you ever had sexual intercourse?

- A. Yes
- B. No

How old were you when you had sexual intercourse for the first time?

- A. I have never had sexual intercourse
- B. 11 years old or younger
- C. 12 years old
- D. 13 years old
- E. 14 years old
- F. 15 years old
- G. 16 years old
- H. 17 years old or older

During your life, with how many people have you had sexual intercourse?

- A. I have never had sexual intercourse
- B. 1 person
- C. 2 people
- D. 3 people
- E. 4 people
- F. 5 people
- G. 6 or more people

During the past 3 months, with how many people did you have sexual intercourse?

- A. I have never had sexual intercourse
- B. I have had sexual intercourse, but not during the past 3 months
- C. 1 person
- D. 2 people
- E. 3 people
- F. 4 people
- G. 5 people
- H. 6 or more people

Did you drink alcohol or use drugs before you had sexual intercourse the last time?

- A. I have never had sexual intercourse
- B. Yes
- C. No

The last time you had sexual intercourse; did you or your partner use a condom?

- A. I have never had sexual intercourse
- B. Yes
- C. No

The last time you had sexual intercourse, what one method did you or your partner use to prevent pregnancy?

- A. I have never had sexual intercourse
- B. No method was used to prevent pregnancy
- C. Birth control pills
- D. Condoms
- E. IUD or implant
- F. A shot, patch, or birth control ring
- G. Withdrawal or some other method
- H. Not sure

Have you ever been physically forced to have sexual intercourse when you did not want to?

- A. Yes
- B. No

During the past 12 months, how many times did anyone force you to do sexual things that you did not want to do? (Count such things as kissing, touching, or being physically forced to have sexual intercourse.)

- A. 0 times
- B. 1 time
- C. 2 or 3 times
- D. 4 or 5 times
- E. 6 or more times

During the past 12 months, how many times did someone you were dating or going out with force you to do sexual things that you did not want to do? (kissing, touching, or being physically forced to have sexual intercourse.)

- A. I did not date or go out with anyone during the past 12 months
- B. 0 times
- C. 1 time
- D. 2 or 3 times
- E. 4 or 5 times
- F. 6 or more times

Case definitions for gonorrhea, chlamydia and syphilis

Chlamydia Trachomatis infection case definition (2010)

<https://wwwn.cdc.gov/nndss/conditions/chlamydia-trachomatis-infection/case-definition/2010/>

Clinical Description

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

Laboratory Criteria for Diagnosis

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

Case Classification

Confirmed: A case that is laboratory confirmed

Gonorrhea (*Neisseria gonorrhoeae*) (2014)

<https://wwwn.cdc.gov/nndss/conditions/gonorrhea/case-definition/2014/>

Clinical Description

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

Laboratory Criteria for Diagnosis

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

Case Classification

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

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

Syphilis (*Treponema pallidum*) (2014)

<https://wwwn.cdc.gov/nndss/conditions/syphilis/case-definition/2014/>

Subtypes: Syphilis, primary; Syphilis, secondary; Syphilis, early latent; Syphilis, late latent; Syphilis, late with clinical manifestations (including late benign syphilis and cardiovascular syphilis); Syphilitic stillbirth; Syphilis, congenital.

Syphilis, primary:

Clinical Description

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

Laboratory Criteria for Diagnosis

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

Case Classification

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

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

Syphilis, secondary:

Clinical Description

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

Laboratory Criteria for Diagnosis

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

Case Classification

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

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

Syphilis, early latent:

Clinical Description

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

Case Classification

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

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

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

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

There is no confirmed case classification for early latent syphilis.

Syphilis, late latent:

Clinical Description

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

Case Classification

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

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

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

There is no confirmed case classification for early latent syphilis.

Syphilis, late with clinical manifestations (including late benign syphilis and cardiovascular syphilis):

Clinical Description

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

Laboratory Criteria for Diagnosis

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

Case Classification

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

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

Syphilitic stillbirth:

Clinical Description

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

Comments

For reporting purposes, syphilitic stillbirths should be reported as cases of congenital syphilis.

*Inadequate treatment consists of any non-penicillin therapy or penicillin given less than 30 days before delivery.

Syphilis, congenital:

Clinical Description

A condition caused by infection in utero with *Treponema pallidum*. A wide spectrum of severity exists, and only severe cases are clinically apparent at birth. An infant or child (aged less than 2 years) may have signs such as hepatosplenomegaly, rash, condyloma lata, snuffles, jaundice (nonviral hepatitis), pseudoparalysis, anemia or

edema (nephrotic syndrome and/or malnutrition). An older child may have stigmata (e.g., interstitial keratitis, nerve deafness, anterior bowing of shins, frontal bossing, mulberry molars, Hutchinson teeth, saddle nose, rhagades or Clutton joints).

Laboratory Criteria for Diagnosis

Demonstration of *T. pallidum* by darkfield microscopy, fluorescent antibody or other specific stains in 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 treponemal test for syphilis and any one of the following:

- Any evidence of congenital syphilis on physical examination.
- Any evidence of congenital syphilis on radiographs of long bones.
- A reactive cerebrospinal fluid (CSF) venereal disease research laboratory (VDRL).
- An elevated CSF cell count or protein (without other cause).
- A reactive fluorescent treponemal antibody absorbed--19S-IgM antibody test or IgM enzyme-linked immunosorbent assay.

Confirmed: A case that is laboratory confirmed.

Comments

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

*Inadequate treatment consists of any non-penicillin therapy or penicillin given less than 30 days before delivery.

Neurosyphilis Surveillance Case Definition:

Clinical description

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

Laboratory criteria for diagnosis

A reactive VDRL in cerebrospinal fluid (CSF) AND either:

1. a reactive treponemal serologic test for syphilis (e.g., FTA-ABS, TP-PA, EIA, CIA or equivalent serologic methods), OR
2. a reactive nontreponemal serologic test for syphilis (VDRL, RPR or equivalent serologic method).

Case classification

Probable: Syphilis of any stage with a negative VDRL test in CSF specimen and either:

1. a reactive treponemal serologic test for syphilis (e.g., FTA-ABS, TP-PA, EIA, CIA or equivalent serologic methods), OR
2. a reactive non-treponemal serologic test for syphilis (VDRL, RPR, or equivalent serologic method),

AND both the following:

- Elevated CSF protein[†] or leukocyte count[†] in the absence of other known causes of these abnormalities, AND
- Clinical symptoms or signs consistent with neurosyphilis without other known causes for these clinical abnormalities.

†CSF protein >50 mg/dL2, >5 white blood cells/cubic millimeter CSF3; in HIV-positive individuals, these parameters are less specific.

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

Comments

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

South Dakota Department of Health STD testing and counseling locations

For testing and counseling for HIV/AIDS and other sexually transmitted diseases, contact one of the following department Disease Intervention offices or call 1-800-592-1861.

Aberdeen

402 S. Main St.
Aberdeen, SD 57401-4127
Phone: 1-866-805-1007

Sioux Falls

1200 North West Ave.
Sioux Falls, SD 57104-1335
Phone: 1-866-315-9214

Pierre

740 E. Sioux, Suite 107
Pierre, SD 57501-3395
Phone: 1-866-229-4927

Watertown

2001 9th Ave. SW #500
Watertown, SD 57201-4038
Phone: 1-866-817-4090

Rapid City

909 E. St. Patrick, Suite 7
Rapid City, SD 57701
Phone: 1-866-474-8221

Tables and Figures

Table 1. Sexually transmitted disease cases reported in South Dakota, 2007-2016.....	3
Table 2. STD cases and average annual rates by county, South Dakota 2012-2016	3
Table 3. STDs reported cases and rates cases by state, ranked by rates, United States, 2015	4
Figure 1. Gonorrhea, Chlamydia and Syphilis by sex and race, South Dakota, 2012-2016	5
Figure 2. Gonorrhea incidence, South Dakota and United States, 1941-2016	6
Figure 3. Gonorrhea rates by county, United States, 2015	6
Figure 4. Gonorrhea average annual incidence by county, South Dakota 2012-2016	7
Figure 5. Gonorrhea rates by age, South Dakota, 2012-2016	7
Figure 6. Gonorrhea cases by age and sex, South Dakota 2012-2016	8
Figure 7. Gonorrhea cases reported by sex, South Dakota 1980 – 2016	8
Figure 8. Chlamydia incidence, United States and South Dakota 1994-2016	9
Figure 9. Chlamydia cases reported, South Dakota 1986-2016	9
Figure 10. Chlamydia rates by county, United States, 2015.....	10
Figure 11. Chlamydia cases by age and sex, South Dakota 2012-2016	10

Figure 12. Chlamydia by age, South Dakota 2012-2016	11
Figure 13. Chlamydia average annual incidence by county, South Dakota 2012-2016	11
Figure 14. Syphilis cases reported, South Dakota 1920-2016	12
Figure 15. Syphilis incidence, United States and South Dakota 1995-2016	13
Figure 16. Syphilis rates (primary and secondary) by county, United States 2015	13
Figure 17. Syphilis (primary, secondary, early latent and congenital) by age, South Dakota 2012-16	14
Figure 18. Syphilis by age and sex, South Dakota 2012-2016	14
Figure 19. High school student sexual behaviors, South Dakota 1991-2015	18
Table 4. High school student sexual behaviors, South Dakota 1991-2015	19
Figure 20. High school students in South Dakota and other states who reported ever having sexual intercourse, 2015 (YRBS)	19
Figure 21. South Dakota high school students who reported ever having had sexual intercourse, 2011, 2013 and 2015 (YRBS)	20
Figure 22. High school students in South Dakota and other states who reported 4 or more sexual intercourse partners, 2015 (YRBS)	20
Figure 23. South Dakota High school students who reported 4 or more sexual intercourse partners, 2011, 2013 and 2015 (YRBS)	21
Figure 24. High school students in South Dakota and other states who were ever forced to have sexual intercourse, 2015 (YRBS)	21
Figure 25. South Dakota High school students (percent) who were ever forced to have sexual intercourse	22

References

1. CDC, Sexually Transmitted Disease Surveillance annual reports. www.cdc.gov/std/stats/default.htm
2. CDC, Atlas (NCHHSTP: National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention). <https://gis.cdc.gov/grasp/nchhstpatlas/main.html>
3. CDC National Center for HIV, STD and TB Prevention (NCHSTP), Division of STD/HIV Prevention, Sexually Transmitted Disease Morbidity 1984-2011 Archive, CDC WONDER Online Database. Accessed at <http://wonder.cdc.gov/std-v2011.html> on May 17, 2017 4:46:54 PM
4. CDC. Youth Risk Behavior Survey (YRBS). www.cdc.gov/healthyyouth/data/yrbs/index.htm
5. South Dakota Youth Risk Behavior Survey (YRBS). <http://doh.sd.gov/statistics/YRBS.aspx>
6. Sexually Transmitted Diseases Treatment Guidelines, 2015. CDC. 5 June 2015. MMWR 64/3. www.cdc.gov/std/tg2015/tg-2015-print.pdf
7. Recommendations for the Laboratory-Based Detection of *Chlamydia trachomatis* and *Neisseria gonorrhoeae* — 2014. CDC. 14 March 2016. MMWR 63/2. www.cdc.gov/std/laboratory/2014labrec/2014-lab-rec.pdf
8. Reporting Language for Syphilis Serology Testing. 2015. Association of Public Health Laboratories (APHL). www.aphl.org/AboutAPHL/publications/Documents/ID_Suggested_Syphilis_Reporting_Lang_122015.pdf

This monograph prepared by Lon Kightlinger, with the invaluable assistance of Amanda Gill, Nato Tarkhashvili, Michelle Hoffman, Bonnie Jameson, Cassie Deffenbaugh and Katie Hill.