

## Infectious Diseases in South Dakota, 2020

The South Dakota Department of Health (SDDOH) strives to promote healthy living and to protect the health of all South Dakotans. A core public health function is the surveillance of infectious diseases in the state.

Infectious disease surveillance monitors patterns of disease occurrence and assesses the health status of South Dakota's population. Surveillance can detect sudden changes in disease occurrence, such as an outbreak, or identify long-term disease trends or new and emerging diseases. Surveillance activities are linked to public health actions, such as investigation, control and prevention, evaluation, or planning and allocating resources to address the diseases affecting the population.

SDDOH is authorized by South Dakota Codified Law 34-22-12 and Administrative Rules Article 44:20 to receive and process mandatory reports of communicable diseases by physicians, hospitals, laboratories, and institutions, and to establish public health measures to control and prevent disease transmission.

This report provides an overview of disease surveillance conducted by SDDOH in 2020. It highlights important statistics and shows key trends on selected reportable diseases in the state. The COVID-19 pandemic was the dominant public health issue of 2020. A variety of pandemic-related factors, such as widespread interventions to limit the spread of COVID-19, changes to daily life, hygiene, healthcare-seeking behaviors, healthcare delivery, and laboratory capacity, all likely contributed to decreases in incidence of many infectious diseases.

**Table 71 Reportable Diseases in South Dakota, 2011-2020** (Calendar years)

Reportable diseases	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Babesiosis	0	0	1	1	0	0	0	0	0	1	3
Botulism	0	0	0	0	0	0	0	0	0	0	0
Brucellosis	0	0	1	0	0	0	1	0	0	0	2
Campylobacteriosis	301	276	296	307	346	450	395	532	524	324	3751
Carbapenem-resistant Enterobacteriales (CRE)	NR	NR	12	3	37	58	64	53	40	29	296
Chicken Pox (Varicella)	67	32	43	23	27	32	24	31	26	18	323
Chlamydia	3412	3925	3947	4129	3967	4336	4439	4441	4545	4007	41148
Coccidioidomycosis	NR	NR	NR	NR	NR	5	6	3	8	7	29
Coronavirus Disease 2019 (COVID-19)	-	-	-	-	-	-	-	-	-	99984	99984
Cryptosporidiosis	143	113	175	151	248	158	163	177	167	76	1571
Cyclosporiasis	0	0	1	0	0	3	4	30	10	22	70
Dengue	0	2	3	0	2	2	0	1	1	2	13
Ehrlichiosis and Anaplasmosis	4	1	1	0	0	1	1	4	0	2	14
Giardiasis	110	144	111	131	129	116	104	114	92	66	1117
Gonorrhea	602	707	789	880	1055	1271	1291	1694	2170	2399	12858
Hantavirus pulmonary syndrome	1	1	0	0	0	0	1	0	2	1	6
Hepatitis A	2	0	4	3	2	1	1	1	8	1	23
Hepatitis B, chronic	51	51	80	58	52	60	52	46	37	53	540
Hepatitis B, acute	2	2	5	3	2	2	2	1	5	4	28
Hepatitis C, chronic	356	392	406	516	570	714	563	545	583	723	5368
Hepatitis C, acute	0	4	1	0	0	22	20	19	31	10	107
<i>Haemophilus influenzae</i> , invasive	NR	NR	NR	NR	NR	20	21	30	30	14	115
Hemolytic uremic syndrome	0	0	0	1	1	1	0	0	5	2	10
HIV and AIDS	16	36	45	38	29	43	41	33	39	40	360
Legionellosis	2	9	8	9	10	9	15	33	23	10	128

Reportable diseases	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Leprosy	0	0	0	0	0	0	0	0	0	0	0
Listeriosis	1	0	0	0	0	0	2	1	0	2	6
Lyme disease	4	4	4	2	5	11	12	7	10	8	67
Malaria	2	5	7	5	4	4	8	9	6	2	52
Measles	0	0	0	8	2	0	0	0	0	0	10
Meningococcal disease	3	0	4	2	1	1	0	0	0	0	11
Mumps	0	0	0	0	0	2	0	0	12	0	14
Pertussis	37	71	67	109	16	15	9	163	147	34	668
Q fever	1	2	4	5	5	4	5	12	11	8	57
Rabies, animal	40	60	28	21	29	27	22	15	16	10	268
Salmonellosis	162	170	183	164	230	305	226	227	166	179	2012
Shiga toxin-producing <i>E. coli</i>	41	48	42	41	62	84	91	204	136	97	846
Shigellosis	6	11	190	616	285	28	29	26	9	12	1212
Spotted fever rickettsiosis	1	1	7	3	2	6	13	14	10	7	64
Methicillin-resistant <i>Staph aureus</i> (MRSA), invasive	91	89	94	124	159	144	115	173	156	169	1314
<i>Strep. pneumoniae</i> , invasive	42	97	99	88	110	129	135	106	101	71	978
Syphilis (primary, secondary, and early non-primary non-secondary)	0	21	49	76	48	41	52	50	56	101	494
Syphilis, congenital	0	0	0	3	0	2	3	1	3	4	16
Toxic shock syndrome	0	0	0	0	3	1	0	1	0	0	5
Tularemia	8	5	7	5	25	14	13	9	17	10	113
Tuberculosis	15	19	9	8	17	12	14	12	16	16	138
Typhoid fever	0	0	3	0	1	2	0	0	0	0	6
West Nile fever	2	141	92	45	29	117	46	122	11	9	614
West Nile neuroinvasive	0	62	57	12	11	35	27	47	0	11	262
Vibriosis	NR	NR	NR	NR	NR	5	12	9	3	3	32

\*NR = not reportable

Source: South Dakota Department of Health. Minor variances from past reports reflect differences between MMWR year and calendar year, cross-year deduplication and recategorization.

**Table 72 Reportable Diseases by County of Residence, South Dakota, 2020** (Calendar years)

County of residence	Campylobacteriosis	Chlamydia	Cryptosporidiosis	Giardiasis	Gonorrhea	Hepatitis B, chronic	Hepatitis C, chronic	Legionellosis	MRSA, Invasive	Pertussis	Salmonella	Shigellosis	<i>Strep. pneumo</i> , Invasive	Shiga Toxin-Prod <i>E. coli</i>	Tularemia	Varicella (Chicken pox)	West Nile disease
<b>TOTAL</b>	<b>324</b>	<b>4007</b>	<b>76</b>	<b>66</b>	<b>2399</b>	<b>53</b>	<b>723</b>	<b>10</b>	<b>169</b>	<b>34</b>	<b>179</b>	<b>12</b>	<b>71</b>	<b>97</b>	<b>10</b>	<b>18</b>	<b>20</b>
Incidence*	36.3	448.9	8.5	7.4	268.7	5.9	81.0	1.1	18.9	3.8	20.1	1.3	8.0	10.9	1.1	2.0	2.2
Aurora	<5	<5	<5	0	<5	0	<5	0	<5	0	<5	0	0	<5	0	0	0
Beadle	8	62	<5	<5	9	>5	<5	0	<5	0	5	0	>5	0	0	0	0
Bennett	<5	25	0	0	9	0	<5	0	0	0	0	0	0	0	<5	0	0
Bon Homme	>5	18	0	>5	<5	0	<5	0	0	0	>5	0	>5	>5	0	0	0
Brookings	16	134	<5	<5	18	<5	6	0	<5	0	<5	0	<5	<5	0	<5	0
Brown	16	113	0	<5	42	<5	18	0	<5	0	<5	<5	<5	<5	0	0	5
Brule	7	21	<5	<5	17	<5	6	0	<5	0	0	0	<5	<5	0	0	0
Buffalo	0	17	0	0	17	0	13	0	<5	0	<5	0	0	0	0	0	0
Butte	>5	36	<5	<5	8	0	<5	0	0	0	<5	0	0	<5	0	0	0
Campbell	<5	>5	<5	0	0	0	<5	0	0	0	0	0	>5	0	0	0	0
Charles Mix	12	39	<5	0	24	0	21	<5	<5	0	<5	0	<5	0	0	>5	0
Clark	6	>5	<5	0	<5	0	<5	0	<5	<5	>5	0	0	0	0	0	0
Clay	6	58	<5	0	17	0	9	0	0	<5	<5	0	0	<5	0	0	0
Codington	12	78	<5	<5	31	0	<5	0	<5	0	<5	<5	<5	<5	0	0	<5
Corson	0	35	0	0	36	0	19	0	<5	0	<5	0	>5	0	0	0	0
Custer	<5	15	0	<5	5	0	<5	<5	<5	0	6	0	<5	<5	0	<5	0

County of residence	Campylobacteriosis	Chlamydia	Cryptosporidiosis	Giardiasis	Gonorrhea	Hepatitis B, chronic	Hepatitis C, chronic	Legionellosis	MRSA, invasive	Pertussis	Salmonella	Shigellosis	Strep. pneumo., invasive	Shiga Toxin-Prod E. coli	Tularemia	Varicella (Chicken pox)	West Nile disease
Davison	<5	72	<5	0	25	<5	11	0	<5	0	<5	<5	0	0	0	0	0
Day	<5	9	0	0	5	0	<5	0	<5	0	<5	0	0	0	0	0	0
Deuel	<5	5	<5	0	<5	0	<5	0	<5	0	<5	0	0	0	0	0	0
Dewey	<5	83	<5	<5	64	0	19	0	8	0	<5	0	0	<5	0	0	0
Douglas	<5	5	0	0	0	0	0	0	<5	0	<5	0	0	<5	0	0	<5
Edmunds	<5	<5	0	0	<5	0	<5	0	0	0	<5	0	<5	0	0	0	<5
Fall River	<5	13	0	<5	<5	0	10	0	0	0	0	0	<5	0	0	0	0
Faulk	0	<5	0	0	<5	0	0	0	<5	0	<5	0	0	0	0	0	<5
Grant	<5	6	0	0	<5	0	<5	0	<5	0	<5	0	0	<5	0	<5	0
Gregory	5	13	0	<5	<5	0	<5	0	<5	0	0	0	<5	<5	0	0	0
Haakon	<5	7	<5	0	0	0	0	0	<5	0	<5	0	0	<5	0	0	0
Hamlin	<5	7	<5	<5	<5	0	<5	0	0	19	<5	0	0	<5	0	0	0
Hand	<5	<5	0	0	<5	0	0	0	0	0	0	0	0	0	0	0	0
Hanson	<5	6	<5	0	0	0	0	0	0	0	0	<5	0	0	0	0	0
Harding	<5	<5	<5	0	0	0	0	0	0	0	<5	0	0	<5	0	0	0
Hughes	<5	61	<5	0	41	0	15	0	10	0	<5	0	<5	0	0	<5	0
Hutchinson	<5	14	<5	<5	<5	0	<5	0	<5	0	5	0	<5	5	0	0	0
Hyde	0	<5	0	0	0	0	<5	0	0	0	0	0	0	0	0	0	0
Jackson	<5	22	<5	0	21	0	<5	0	<5	0	<5	0	0	0	0	0	0
Jerauld	<5	<5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Jones	<5	<5	0	0	0	<5	<5	0	0	0	0	0	0	0	0	0	0
Kingsbury	<5	7	<5	0	<5	0	0	0	0	0	<5	<5	0	<5	0	0	0
Lake	<5	40	<5	<5	5	<5	5	0	<5	0	0	0	0	0	0	0	<5
Lawrence	7	84	<5	0	14	<5	13	0	<5	0	<5	<5	<5	<5	<5	0	0
Lincoln	13	167	<5	<5	54	0	11	0	6	<5	6	0	<5	5	0	0	<5
Lyman	5	24	0	<5	35	0	18	0	<5	0	<5	0	<5	0	<5	<5	0
Marshall	7	<5	<5	<5	<5	0	<5	0	0	0	0	0	0	<5	0	0	0
McCook	<5	10	0	0	6	<5	<5	0	0	0	<5	0	0	0	0	0	<5
McPherson	9	<5	0	0	<5	0	0	0	0	0	<5	0	<5	<5	0	0	0
Meade	13	100	0	0	24	0	17	0	6	0	<5	0	<5	<5	0	0	0
Mellette	0	14	0	0	<5	0	<5	0	<5	0	0	0	<5	<5	<5	0	<5
Miner	<5	8	<5	0	0	0	<5	0	0	0	0	0	0	0	0	0	0
Minnehaha	38	1106	12	22	805	32	223	6	33	<5	32	<5	18	18	0	<5	<5
Moody	<5	28	<5	<5	12	<5	9	0	<5	0	<5	0	<5	0	0	0	0
Oglala Lakota	6	288	0	<5	233	<5	30	0	8	0	<5	0	<5	<5	<5	<5	0
Pennington	26	689	7	10	539	<5	115	0	20	<5	31	<5	11	20	0	<5	0
Perkins	<5	<5	<5	0	<5	0	<5	0	0	0	0	0	0	<5	0	0	0
Potter	<5	<5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Roberts	<5	69	<5	<5	55	0	13	0	<5	<5	<5	0	0	<5	0	0	0
Sanborn	<5	5	<5	0	<5	0	<5	0	<5	0	<5	0	0	0	<5	0	0
Spink	5	<5	0	0	0	0	<5	0	<5	0	<5	0	<5	<5	0	0	<5
Stanley	0	7	0	0	<5	0	<5	0	0	0	<5	0	0	0	0	0	0
Sully	0	<5	0	0	0	0	<5	0	<5	0	<5	0	0	0	0	0	0
Todd	5	167	<5	<5	112	0	25	0	10	0	<5	0	<5	0	<5	0	0
Tripp	15	20	0	<5	16	0	0	<5	<5	0	<5	0	0	0	0	0	0
Turner	<5	20	0	0	<5	0	0	0	0	0	<5	0	<5	0	0	0	0
Union	<5	43	<5	0	8	0	<5	0	<5	0	<5	0	0	<5	0	0	0
Walworth	<5	16	0	<5	10	0	7	0	<5	6	<5	0	<5	0	0	0	<5
Yankton	8	71	<5	5	27	<5	15	0	<5	0	<5	0	0	<5	0	0	0
Ziebach	<5	17	0	0	12	0	5	<5	0	0	0	0	<5	0	0	0	0

\*Incidence: cases per 100,000 population  
Individual county events of 1, 2, 3 or 4 are published as <5

**Table 73 Reportable Diseases by Gender, Race and Age, South Dakota, 2020** (Calendar years)

	Campylobacteriosis	Chlamydia	CRE	Cryptosporidiosis	Giardiasis	Gonorrhea	Hepatitis B, chronic	Hepatitis C, chronic	HIV and AIDS	MRSA, invasive	Pertussis**	Salmonellosis	Shiga Toxin-Producing <i>E. coli</i>	Shigellosis	<i>Strep. pneumoniae</i> , invasive	Syphilis (P, S, E non-P non-S)	Tuberculosis	Tularemia	Varicella (Chicken pox)	West Nile disease
<b>Total</b>	<b>324</b>	<b>4007</b>	<b>29</b>	<b>76</b>	<b>66</b>	<b>2399</b>	<b>53</b>	<b>723</b>	<b>40</b>	<b>169</b>	<b>34</b>	<b>179</b>	<b>97</b>	<b>12</b>	<b>71</b>	<b>101</b>	<b>16</b>	<b>10</b>	<b>18</b>	<b>20</b>
<b>Incidence*</b>	36.3	448.9	3.2	8.5	7.4	268.7	5.9	81.0	4.5	18.9	3.8	20.1	10.9	1.3	8.0	11.3	1.8	1.1	2.0	2.2
<b>Gender</b>																				
Female	124	2763	18	26	32	1269	20	317	9	72	18	102	48	5	36	40	6	5	7	3
Male	200	1244	11	50	34	1130	33	406	31	97	16	77	49	7	35	61	10	5	11	17
<b>Race</b>																				
White	268	1835	24	68	53	656	20	280	18	104	29	139	87	9	40	35	2	1	8	18
Am.Indian	29	1525	5	5	11	1357	3	337	10	64	2	21	4	2	22	54	7	8	7	2
Black	3	281	0	0	0	255	16	12	9	0	0	1	3	0	4	9	3	0	0	0
Asian	1	36	0	0	0	12	6	1	1	0	0	3	0	0	3	0	4	0	0	0
Other	4	93	0	0	1	36	4	29	1	0	0	3	0	1	1	3	0	0	0	0
Unknown	19	237	0	3	1	83	4	64	1	1	3	12	3	0	1	0	0	1	3	0
<b>Age group</b>																				
<1 yr	5	2	0	0	2	1	0	0	0	2	7	6	2	0	4	0	0	0	3	0
1-4 yrs	41	0	0	8	4	1	0	0	0	3	6	14	24	0	2	0	0	1	7	0
5-14 yrs	34	34	0	15	7	15	0	0	1	9	18	7	2	1	0	0	0	2	7	1
15-24 yrs	49	2498	1	13	8	890	4	72	6	5	19	19	1	5	15	1	0	1	3	
25-39 yrs	70	1303	0	22	20	1228	25	305	21	19	2	29	20	5	4	65	9	0	0	2
40-64 yrs	83	167	8	13	17	259	20	278	13	70	1	49	14	3	30	21	4	4	0	7
≥65 yrs	42	0	20	5	8	3	4	68	0	68	0	44	11	1	25	0	2	3	0	7

Total cases reported on this table may differ slightly from column totals due to incomplete case information.

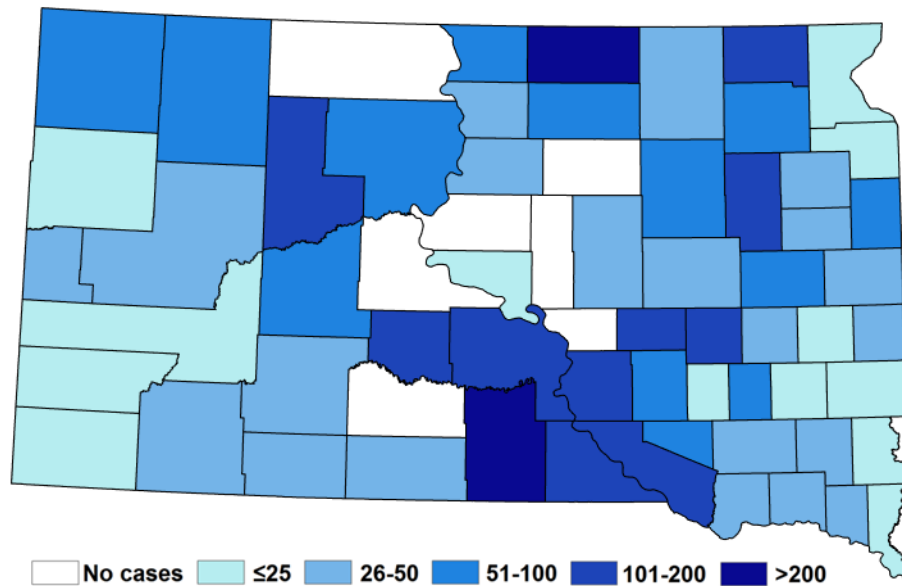
\*Incidence: cases per 100,000 population

### Campylobacteriosis

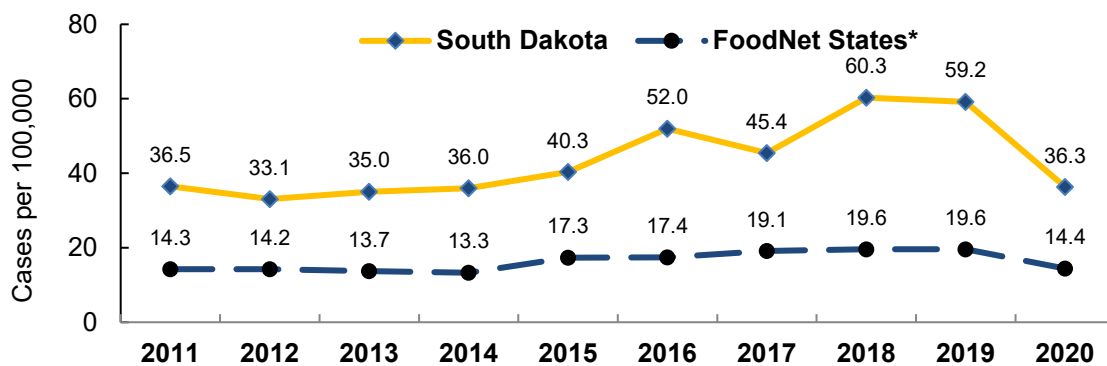
*Campylobacter* is a bacterium that can cause diarrhea, often bloody, abdominal pain, vomiting, fever, nausea, and malaise. Most cases of campylobacteriosis are relatively mild, lasting one to two days. Some cases, however, are more severe and relapses occur in about 20 percent of patients. Complications may include convulsions, neonatal septicemia, extra-intestinal infection, arthritis, and one in 1,000 campylobacteriosis cases leads to Guillain-Barré syndrome. *Campylobacter*-associated deaths are rare.

Campylobacteriosis has been the most commonly reported enteric bacterial pathogen in South Dakota since 2001. In 2020, there were 324 cases of *Campylobacter* infection reported, a 28 percent decrease from the five-year median (median: 450). Counties with the highest incidence (cases per 100,000 population) included McPherson (380.9), Tripp (279.0), Clark (157.8), and Marshall (143.3). Children less than 5 years of age had the highest rate of disease. South Dakota's rate of campylobacteriosis ranks high nationally, usually double the rate of states receiving enhanced funding for conducting active surveillance for foodborne disease (FoodNet).

**Figure 34**  
**Incidence of Campylobacteriosis by County of Residence: South Dakota, 2020**  
(cases per 100,000)



**Figure 35**  
**Campylobacteriosis Incidence, South Dakota & U.S. (FoodNet States\*) 2011-2020**



\*FoodNet states include CA, CO, CT, GA, MD, MN, NM, NY, OR, and TN.

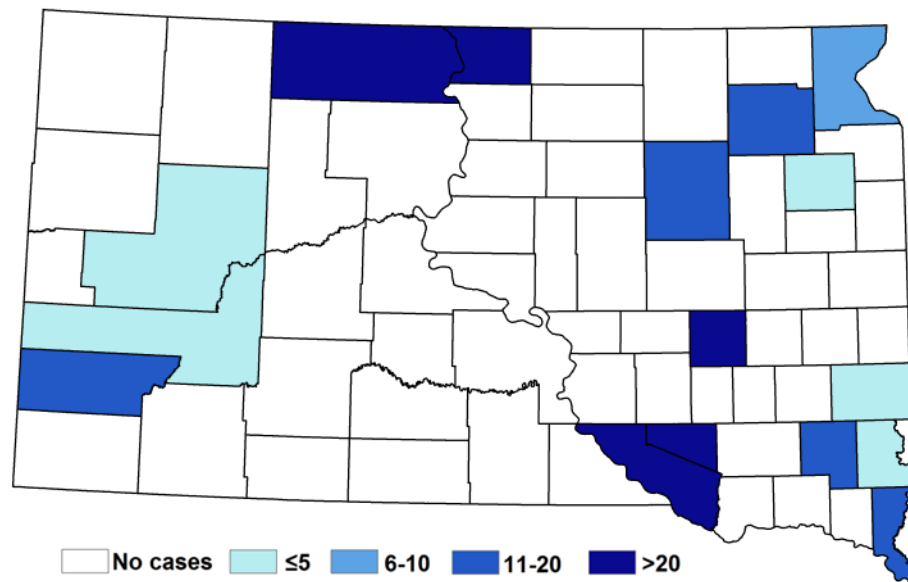
### Carbapenem-resistant Enterobacterales (CRE)

Carbapenem-resistant Enterobacterales (CRE) are a family of bacteria that are difficult to treat because they are highly resistant to antibiotics. CRE are an important emerging threat to public health. Common bacteria in the Enterobacterales order include *Klebsiella* species, *Enterobacter* species, and *Escherichia coli*. These bacteria are typically found in the human gastrointestinal tract. However, they can spread outside the gut and cause serious infections, such as urinary tract infections, bloodstream infections, wound infections, and pneumonia. Enterobacterales can cause infections in people in both healthcare and community settings.

Carbapenems are a group of antibiotics that are usually reserved to treat serious infections, particularly when these infections are caused by bacteria that are highly resistant to other antibiotics. Sometimes carbapenems are considered antibiotics of last resort for some infections. Some Enterobacterales can no longer be treated with carbapenems because they have developed resistance to these antibiotics (i.e., CRE), making antibiotics ineffective in killing the resistant organism.

In South Dakota, 29 cases of CRE were reported in 2020. The statewide incidence was 3.2 cases per 100,000 population.

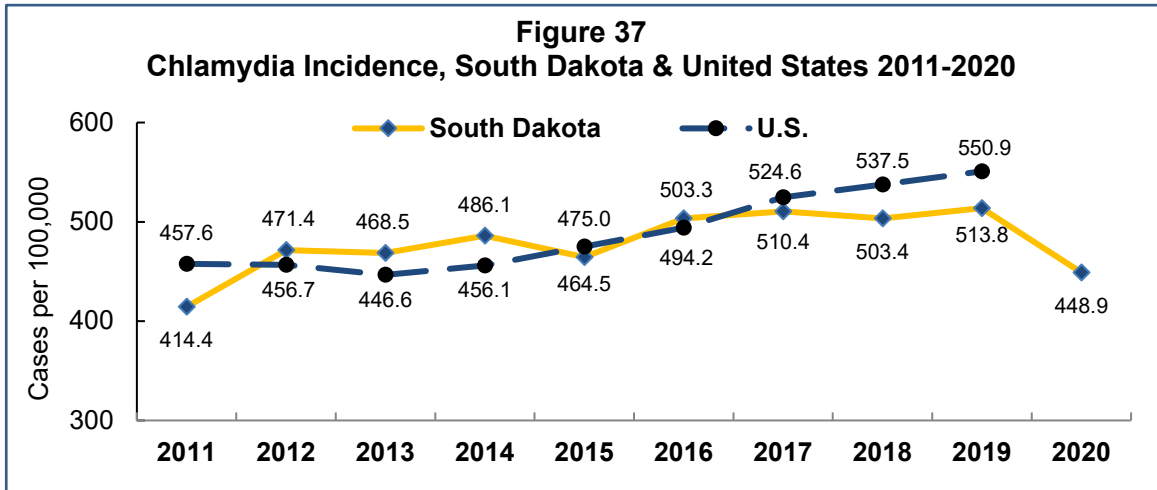
**Figure 36**  
**Incidence of CRE by County of Residence: South Dakota, 2020**  
 (cases per 100,000)



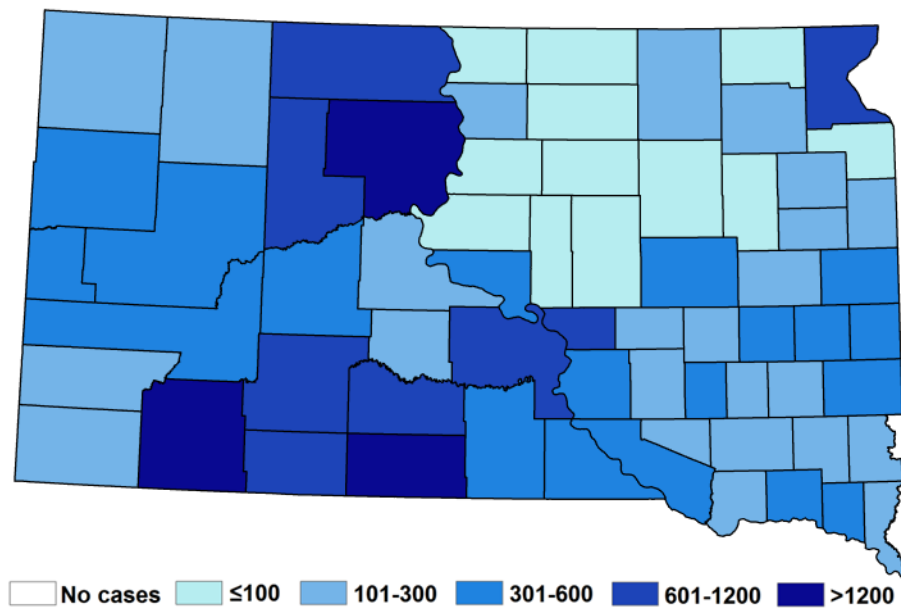
### Chlamydia

Chlamydia is a common sexually transmitted disease (STD) caused by the bacterium *Chlamydia trachomatis* that can infect both men and women. 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.

In 2020, there were 4,007 cases of chlamydia reported in South Dakota, a ten percent decrease from the five-year median (median: 4,439). Counties with the highest incidence (cases per 100,000 population) included Oglala Lakota (2,046.9), Todd (1,619.3), Dewey (1,433.8), and Buffalo (869.1). Youth in the 15–24 year age group had the highest rate of disease. The number of chlamydia cases has been increasing over the past decade in South Dakota.



**Figure 38**  
**Incidence of Chlamydia by County of Residence: South Dakota, 2020**  
(cases per 100,000)



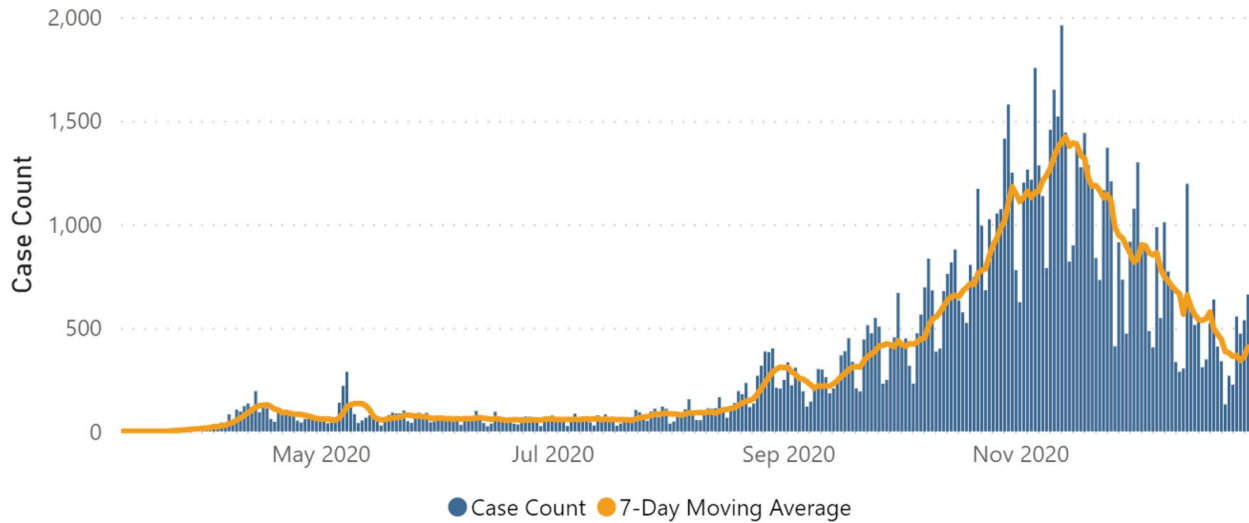
### Coronavirus Disease 2019 (COVID-19)

The SARS-CoV-2 novel coronavirus that causes COVID-19 was first identified in December 2019 in China among patients with severe respiratory illness and pneumonia. The virus spread worldwide through person-to-person transmission and on March 11, 2020, the World Health Organization declared the COVID-19 outbreak a global pandemic.

In South Dakota, the first COVID-19 case was identified on March 10, 2020. After an initial wave of cases in the spring, case counts remained relatively low through the summer until the end of August when a second, larger wave of cases occurred, reaching a peak in mid-November. By the end of 2020, there were 99,984 cases of COVID-19 reported in South Dakota, resulting in 5,348 hospitalizations and 1,830 deaths.

Vaccines for COVID-19 became available in December 2020, however, supply was limited at the time and vaccination efforts focused on immunizing individuals deemed to be at highest risk. In addition to vaccination, nonpharmaceutical interventions, such as physical distancing and masking, remain to be effective prevention tools against COVID-19, especially as new SARS-CoV-2 variants emerge.

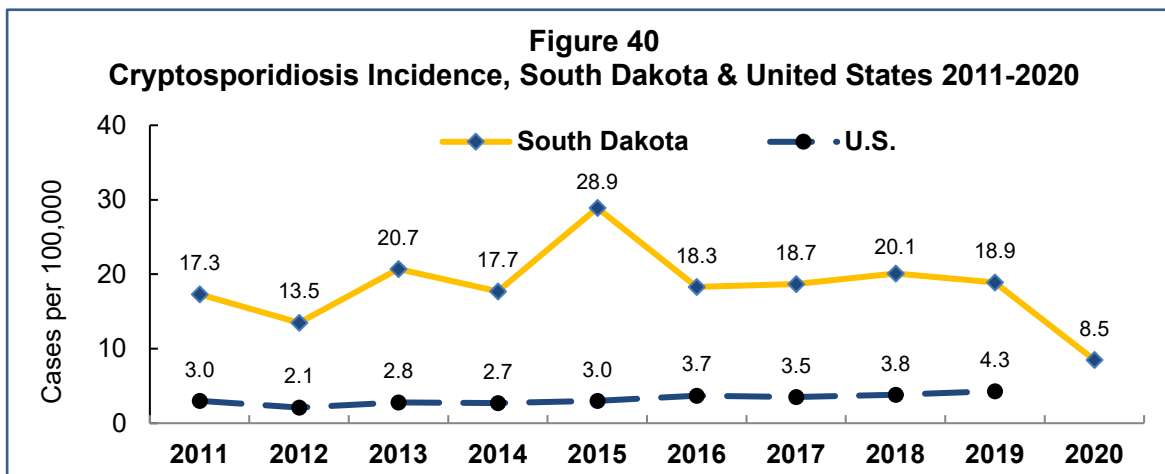
**Figure 39**  
**Cases of COVID-19 by Date Reported to SDDOH: South Dakota, 2020**



**Cryptosporidiosis**

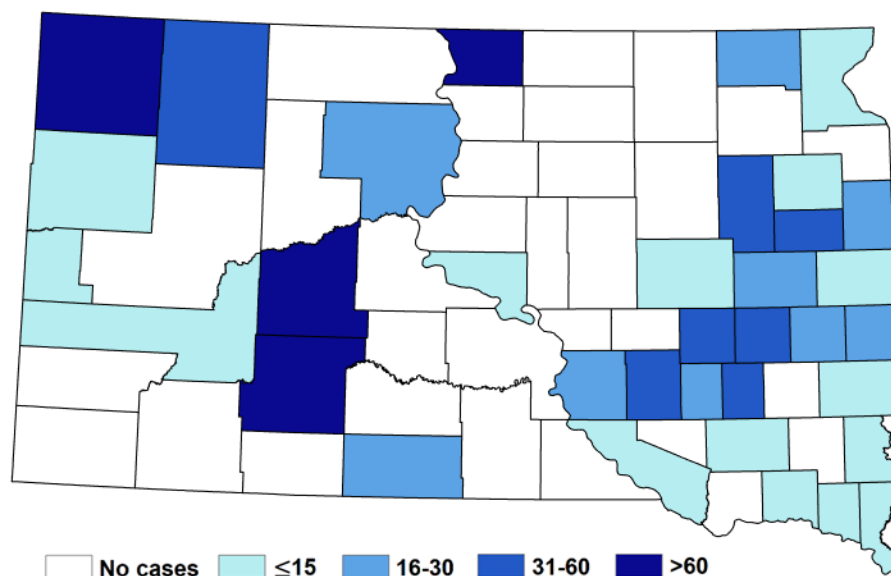
Cryptosporidiosis is a diarrheal disease caused by a chlorine-tolerant protozoan parasite that is transmitted by cattle or human feces through contaminated food or water or by direct person-to-person or animal-to-person contact. In 2020, there were 76 cases (8.5 cases per 100,000 population) reported in South Dakota, a 54 percent decrease from the five-year median (median: 167). Children less than 15 years of age accounted for 30 percent of cases. South Dakota’s cryptosporidiosis rate has been consistently higher than the national rate over the past decade.

**Figure 40**  
**Cryptosporidiosis Incidence, South Dakota & United States 2011-2020**





**Figure 41**  
**Incidence of Cryptosporidiosis by County of Residence: South Dakota, 2020**  
(cases per 100,000)



***Escherichia coli*, shiga toxin-producing (STEC)**

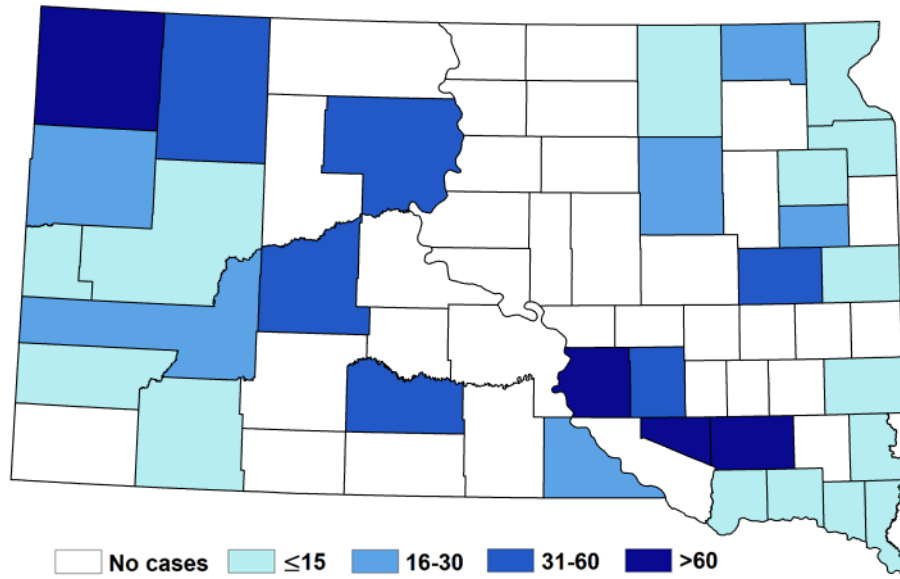
Shiga-toxin producing *E. coli* (STEC) often causes severe bloody diarrhea and abdominal pain. The illness usually resolves in five to ten days. In some individuals, however, complications may involve severe hemorrhagic colitis, hemolytic uremic syndrome, thrombotic thrombocytopenic purpura, and even death. STEC is transmitted by meat, water, fresh vegetables or other foods contaminated by feces of cattle, sheep, deer, and other animals. Person-to-person transmission can also occur. Human infection can be prevented by proper slaughtering and processing methods, adequate cooking of meats, proper kitchen hygiene, pasteurization of dairy products and fruit juices, and handwashing after contact with cattle or their feces. Individuals with STEC infections are restricted from commercial food handling, child day care, or patient health care until two successive negative fecal samples are produced.

Culture-independent diagnostic testing (CIDTs) is rapidly being adopted by clinical laboratories in the state for detecting STEC infections. The STEC surveillance case definition used by SDDOH to classify and report cases was updated in 2018. Individuals testing positive by CIDT (but not subsequently confirmed by culture) have been included in the reported case count totals since 2018.

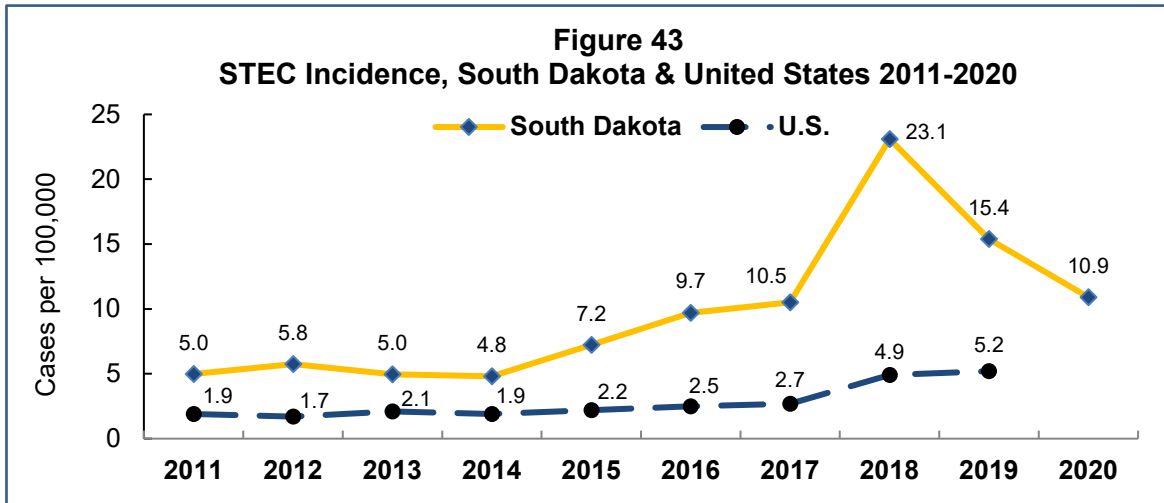
In 2020, 97 cases of STEC were reported in South Dakota. The incidence rate was 10.9 cases per 100,000 population. South Dakota’s STEC rate has been greater than two times the national rate over the past decade. There were 33 cases (34%) that occurred in children less than 15 years of age. Two cases of hemolytic uremic syndrome (HUS) associated with STEC infection were reported.

In addition to *E. coli* O157:H7, there are several other STEC serotypes. The following serotypes were identified in South Dakota cases in 2020: 11 cases O121, 7 cases O157:H7, 7 cases O111, 5 cases O145, 4 cases O26, and 3 cases O103.

**Figure 42**  
**Incidence of STEC by County of Residence: South Dakota, 2020**  
(cases per 100,000)



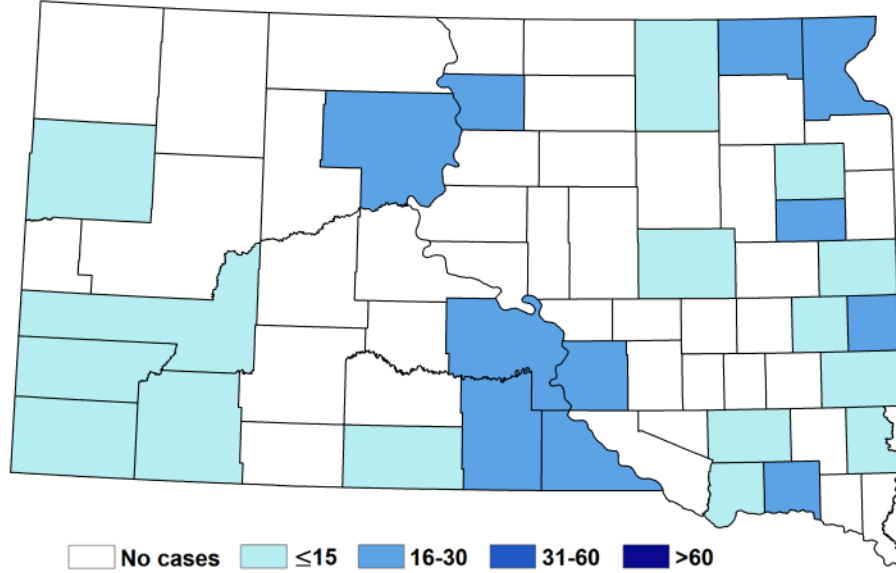
**Figure 43**  
**STEC Incidence, South Dakota & United States 2011-2020**



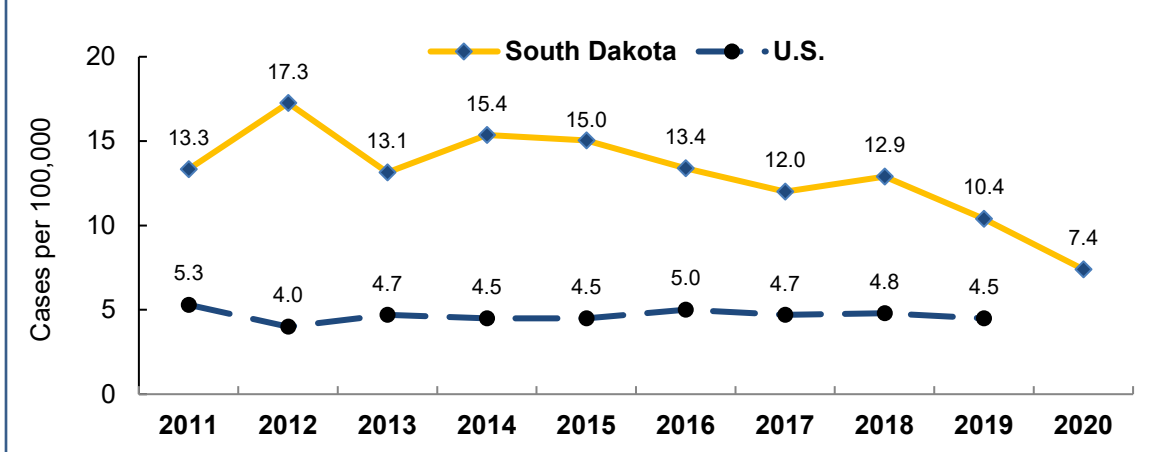
### Giardiasis

Giardiasis is a gastrointestinal disease involving diarrhea and abdominal cramps that is caused by a protozoan parasite called *Giardia lamblia* (*G. intestinalis*, *G. duodenalis*). Giardiasis is transmitted person-to-person or by contaminated water, or in some cases animal-to-human. In 2020, 66 cases of *Giardia* infection were reported in South Dakota residents (7.4 cases per 100,000 population), which was below the five-year median (median: 114). South Dakota's giardiasis rate has been more than double the national rate over the past decade.

**Figure 44**  
**Incidence of Giardiasis by County of Residence: South Dakota, 2020**  
(cases per 100,000)



**Figure 45**  
**Giardiasis Incidence, South Dakota & United States 2011-2020**

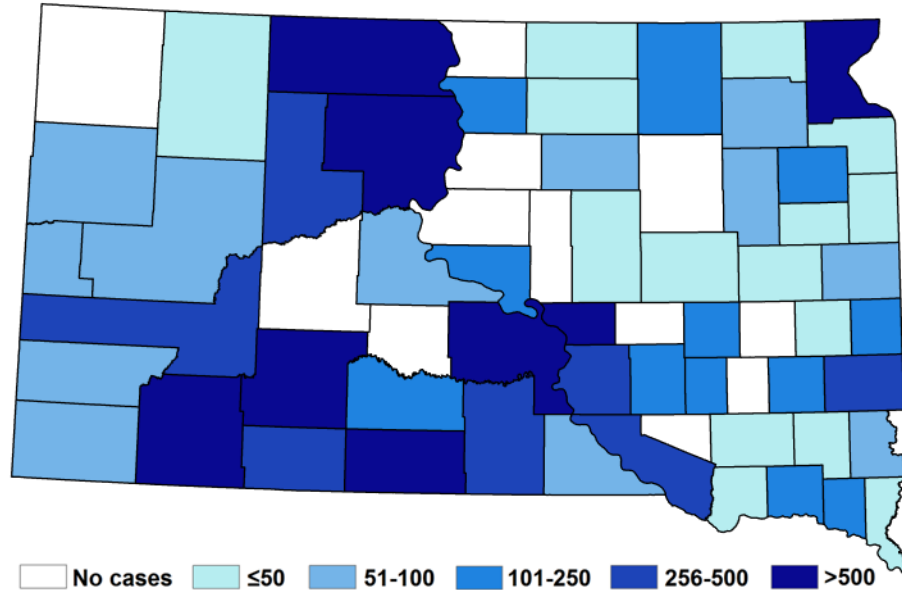


**Gonorrhea**

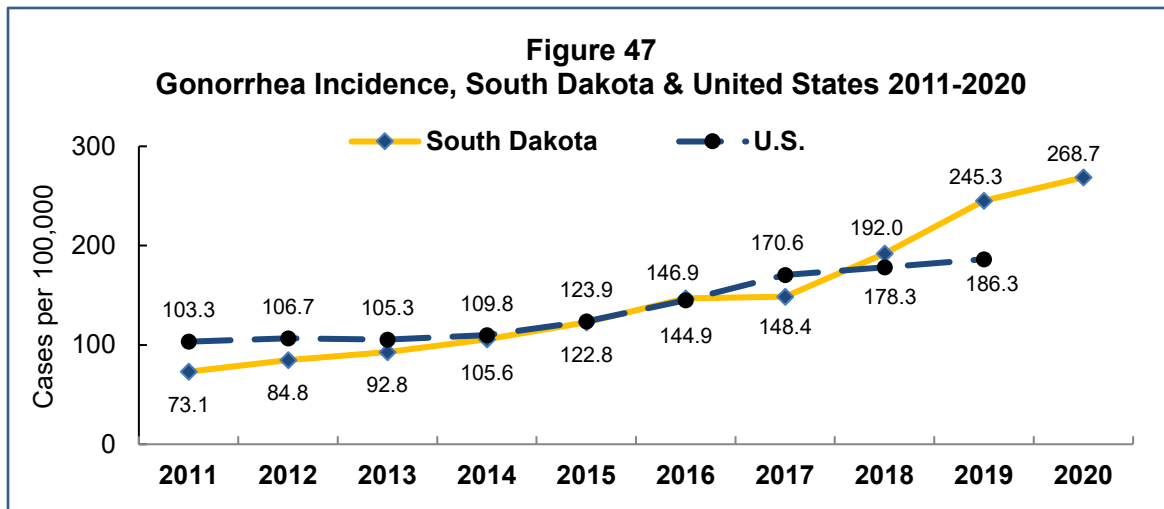
Gonorrhea is a sexually transmitted disease (STD) that can cause infections in the genitals, rectum, and throat, and less commonly as an invasive, disseminated disease. Gonorrhea is most common among young people ages 15-24 years. Although gonorrhea may be asymptomatic, untreated gonorrhea can cause serious and permanent health problems in both women and men. In women, untreated gonorrhea can cause pelvic inflammatory disease with complications such as scar tissue in fallopian tubes, ectopic pregnancy, infertility, and long-term pelvic/abdominal pain. In men gonorrhea may infect the tubes attached to the testicles which may cause sterility.

Gonorrhea has been increasing over the past decade in South Dakota. In 2020, there were 2,399 cases reported, which is a rate of 268.7 cases per 100,000 population. The median age of cases was 28 years old (range: 0 to 73). Females accounted for 53 percent of cases.

**Figure 46**  
**Incidence of Gonorrhea by County of Residence: South Dakota, 2020**  
 (cases per 100,000)

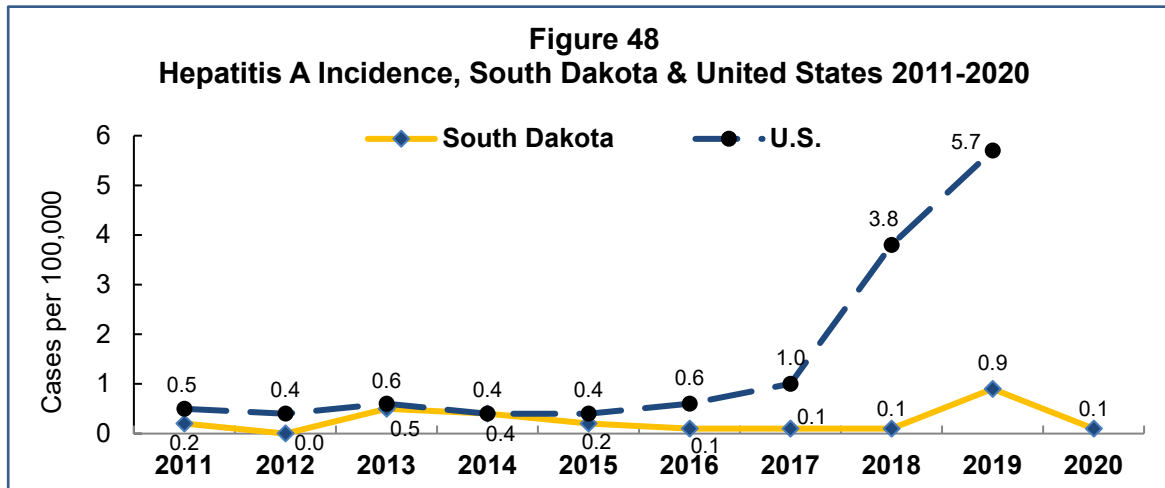


**Figure 47**  
**Gonorrhea Incidence, South Dakota & United States 2011-2020**



**Hepatitis A, acute**

Hepatitis A is a liver disease caused by the hepatitis A virus (HAV), which infects humans through fecal-oral transmission. Since the licensure of the hepatitis A vaccine in 1995-1996, rates of infection have declined significantly. In South Dakota, there was one case of hepatitis A reported in 2020.

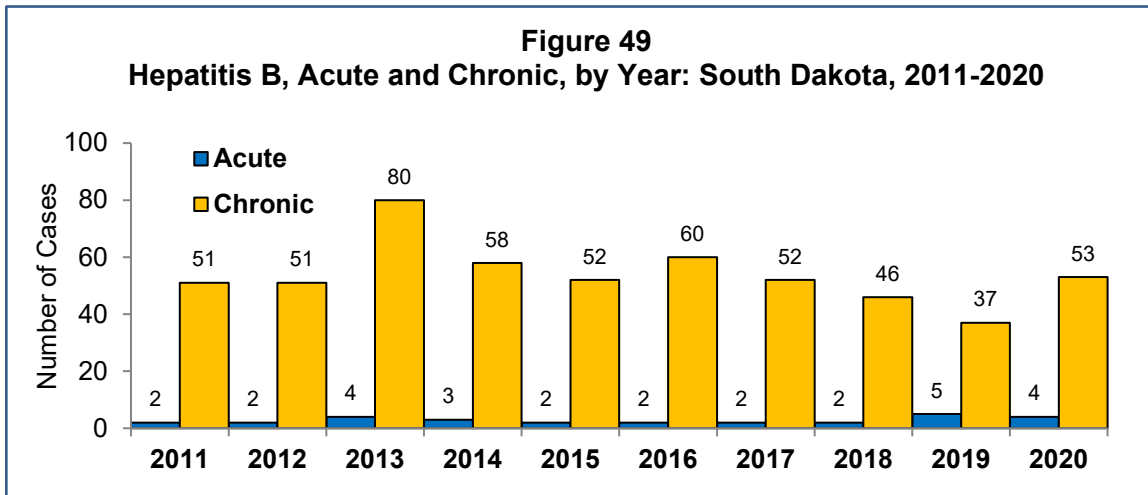


### Hepatitis B, acute and chronic

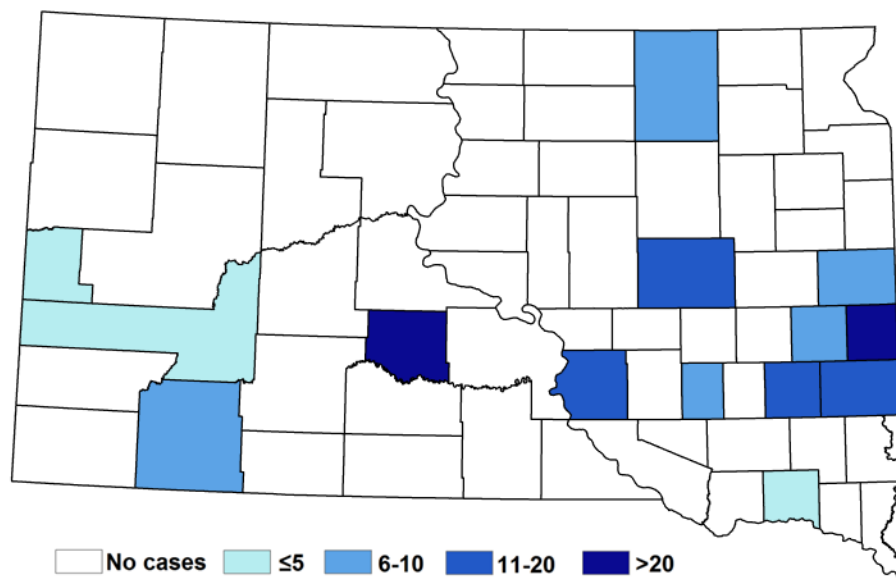
Hepatitis B is a liver disease caused by the hepatitis B virus (HBV). This virus is transmitted when blood and other body fluid from an infected person enters the body of someone who is not infected during sexual contact; sharing needles, syringes, or other drug-injection equipment; or from mother to baby at birth. For some individuals, hepatitis B is an acute, or short-term, illness but for others, it can become a long-term, chronic infection. Risk for HBV chronic infection is related to age at infection: approximately 90 percent of infected infants become chronically infected, compared with 2-6 percent of adults. Chronic hepatitis B can lead to serious health issues, like cirrhosis or liver cancer.

The best way to prevent hepatitis B is by getting vaccinated. HBV vaccine is now recommended at birth and for children and adolescents who did not complete vaccination as infants. HBV vaccination is not mandatory for school entry in South Dakota. Adults who should consider HBV vaccination include: people who have more than one sex partner in six months, men who have sex with other men, sex contacts of infected people, people who inject illegal drugs, health care and public safety workers who might be exposed to infected blood or body fluids, household contacts of persons with chronic HBV infection and hemodialysis patients.

In 2020, there were four cases of acute hepatitis B and 53 cases of chronic hepatitis B reported in South Dakota. The median age of cases was 37 years (range: 19 to 81) and 65 percent were male.



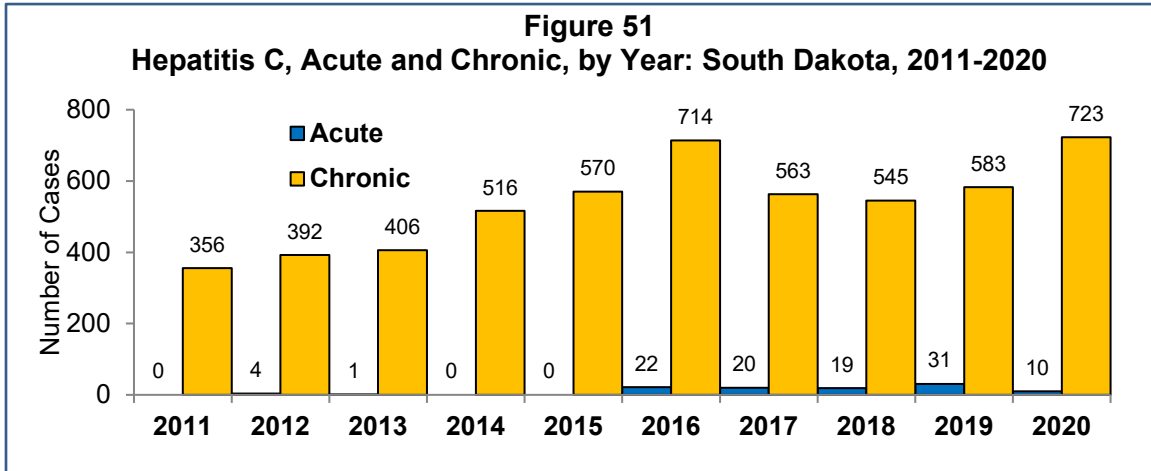
**Figure 50**  
**Incidence of Hepatitis B, Chronic, by County of Residence: South Dakota, 2020**  
(cases per 100,000)



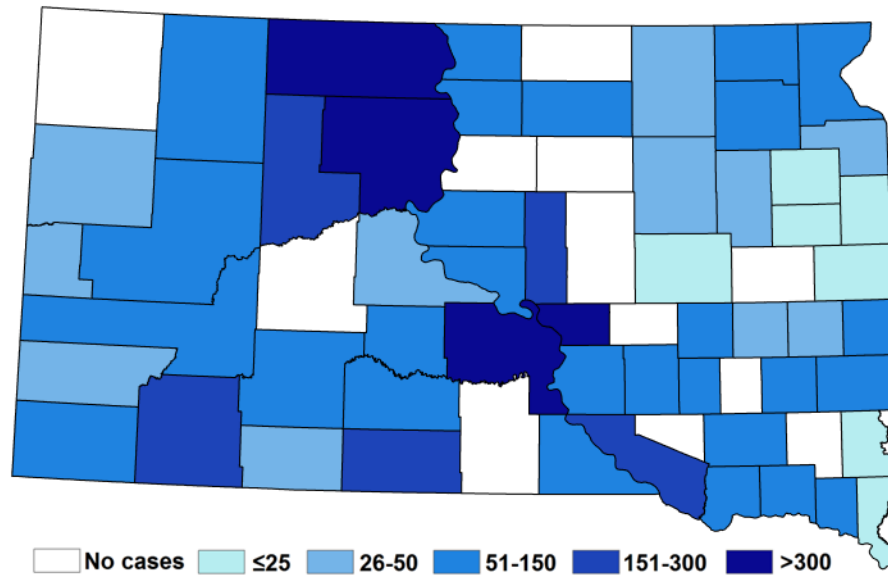
**Hepatitis C, acute and chronic**

Hepatitis C causes liver disease. For most people hepatitis C is a long-term, chronic infection and may cause long-term health problems resulting in death. The majority (70-80%) of persons might not be aware of their infection because they do not become clinically ill. There is no vaccine available for hepatitis C. Hepatitis C is a blood-borne virus and the greatest risk for infection is among persons who inject drugs.

In 2020, there were ten cases of acute hepatitis C and 723 cases of chronic hepatitis C reported in South Dakota. The counties with the highest incidence of chronic hepatitis C (cases per 100,000 population) were Buffalo (664.6), Lyman (474.1), Corson (471.3), and Dewey (328.2).



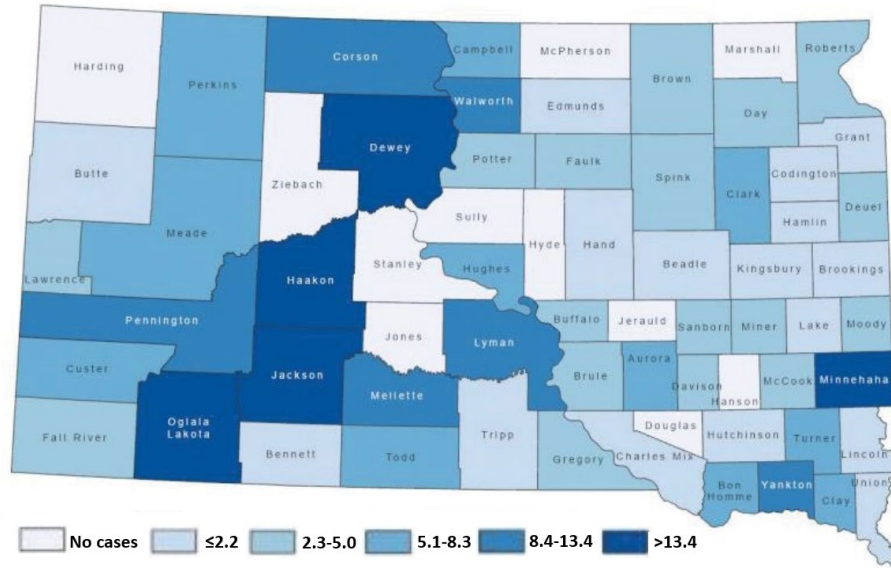
**Figure 52**  
**Incidence of Hepatitis C, Acute and Chronic, by County of Residence: South Dakota, 2020**  
 (cases per 100,000)



### HIV and AIDS

Human immunodeficiency virus (HIV) infection may lead to acquired immunodeficiency syndrome, or AIDS. HIV is spread mainly by having sex with or sharing drug injection needles and syringes with someone who is already infected with HIV. The only way to know for sure if you have HIV infection is to get tested. In 2020, 40 new HIV/AIDS cases were reported in South Dakota.

**Figure 53**  
**Incidence of HIV/AIDS, by County of Residence: South Dakota, 1985-2020**  
 (cases per 10,000)



**Influenza**

The 2020–2021 influenza season was a mild season likely affected by the COVID-19 pandemic. Unlike previous influenza seasons, there was limited access to care in the clinical setting, with most influenza testing only done following a negative COVID-19 test. Subtyping of influenza specimens was not performed during the season due to focus of laboratory resources on the COVID-19 pandemic response.

In South Dakota, there were 83 confirmed influenza cases reported to SDDOH, including 49 (59%) influenza A and 34 (41%) influenza B. Additionally, 9,033 rapid antigen influenza tests were performed with 294 positive results (3%); 87 (30%) positive for influenza A and 207 (70%) positive for influenza B.

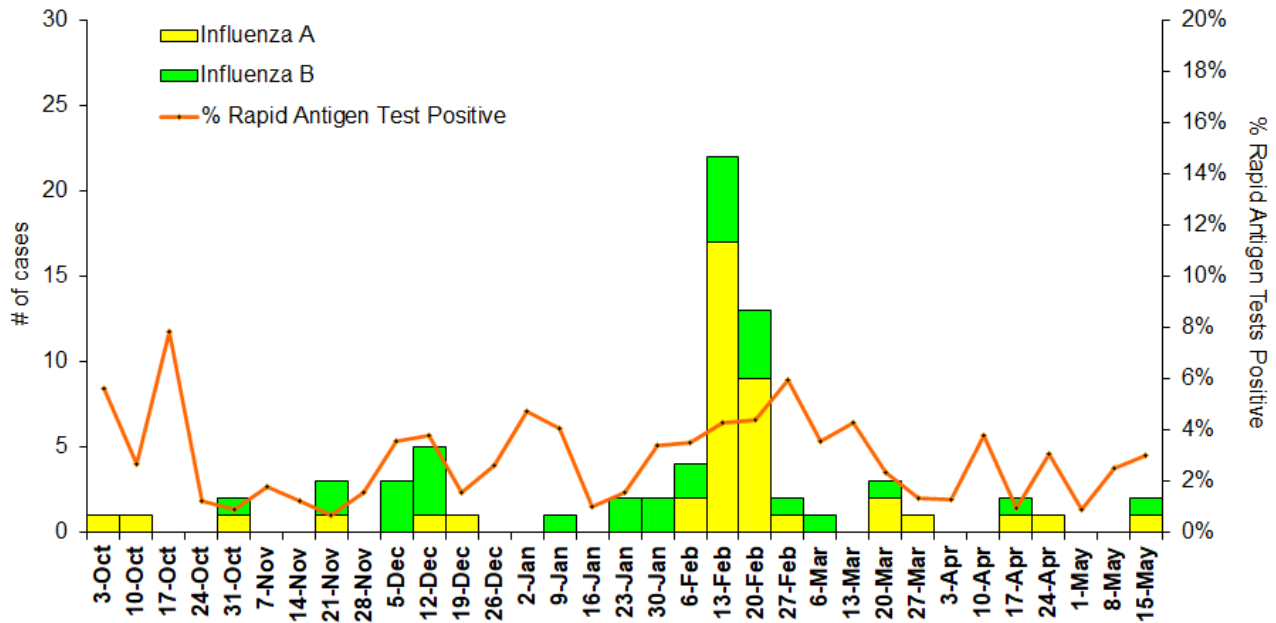
**Table 74**  
**Influenza Cases by Age Group, South Dakota, 2020-2021**

Lab Confirmed Influenza Cases (by DFA, PCR, or culture)		Influenza Associated Hospitalizations		Influenza Associated Deaths	
Age Group	# Cases (%)	# Hosp (%)	Deaths (%)		
0-4	10 (12%)	1 (14%)	0	(0%)	
5-18	8 (10%)	0 (0%)	0	(0%)	
19-49	44 (53%)	0 (0%)	0	(0%)	
50-64	11 (13%)	0 (0%)	0	(0%)	
> 64	10 (12%)	6 (86%)	2	(100%)	
<b>Total</b>	<b>83</b>	<b>7</b>	<b>2</b>		

A total of seven influenza-associated hospitalizations and two influenza-associated deaths were reported during the 2020–2021 influenza season.



**Figure 54**  
**2020-2021 Influenza Season Lab Confirmed Influenza Cases\* and**  
**% Rapid Antigen Positive – South Dakota**  
 \* Confirmed by Culture, PCR, or DFA



**Legionellosis**

Legionellosis includes two diseases, Legionnaires’ disease and Pontiac fever, caused by exposure to *Legionella* bacteria. Legionnaires’ disease causes pneumonia, while Pontiac fever causes a milder illness with fever and muscle aches. *Legionella* is naturally found in the environment, usually in water. People can get legionellosis after breathing in water droplets that contain the bacteria.

There were ten cases of legionellosis reported in South Dakota in 2020, a 33 percent decrease from the five-year median (median: 15).

**Lyme disease**

Lyme disease is caused by the spirochete *Borrelia burgdorferi* and is transmitted to humans by bites from *Ixodes scapularis*, commonly known as the blacklegged tick or deer tick. Currently, *I. scapularis* has only been found and documented in a few locations in eastern South Dakota, so the risk of exposure to Lyme disease in South Dakota is low.

In 2020, eight cases of Lyme disease were reported in South Dakota residents, a slight decrease from the five-year median (median: 10).

### **Methicillin-resistant *Staphylococcus aureus* (MRSA), invasive**

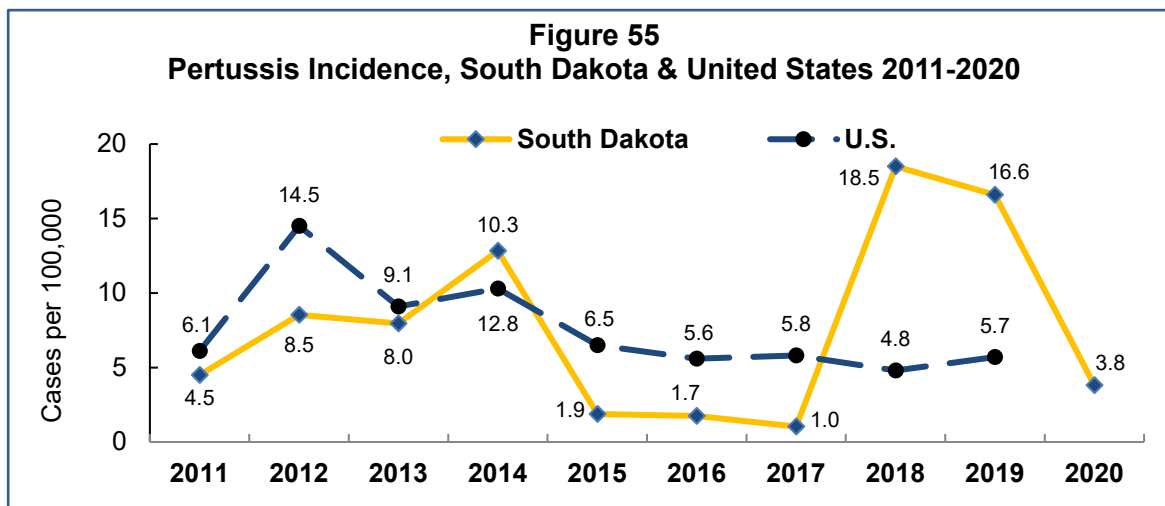
Methicillin-resistant *Staphylococcus aureus* (MRSA) is a bacterium resistant to most commonly used antibiotics. Most MRSA infections are skin infections, but may cause life-threatening bloodstream infections, pneumonia, and surgical site infections.

In 2020, there were 169 cases of invasive MRSA reported in South Dakota, an eight percent increase from the five-year median (median: 156). The highest rate of disease was among the elderly, ages 65 years and older.

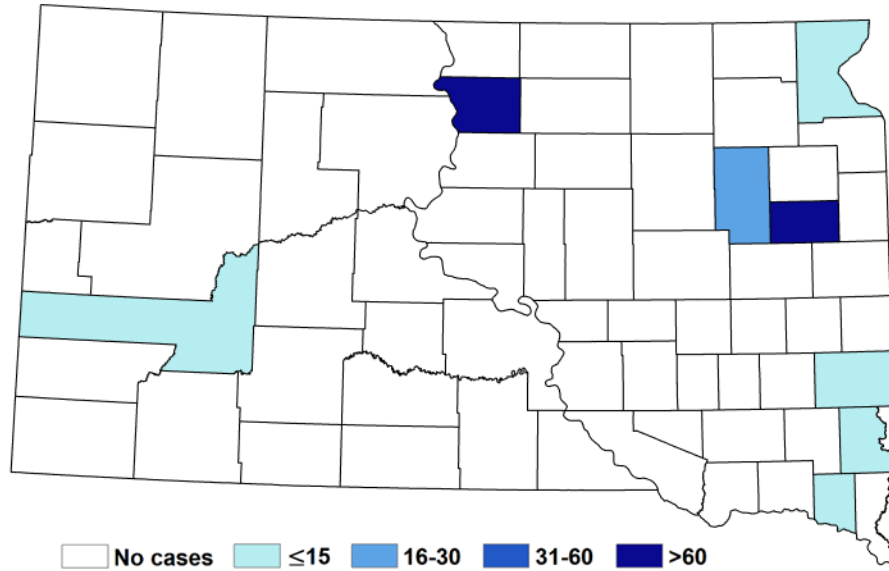
### **Pertussis (whooping cough)**

Pertussis, commonly called whooping cough, is an acute infectious bacterial disease caused by *Bordetella pertussis*. The bacteria produce toxins that inflame and paralyze respiratory cilia causing severe coughing. Pertussis is transmitted by aerosolized droplets of respiratory secretions from infected individuals. Infants and young children are at higher risk of pertussis-associated complications, hospitalization, and death. The most common complication is secondary bacterial pneumonia. Youth and adults infected with pertussis may expose unprotected infants who are at risk of severe disease and complications.

In 2020, 34 cases of pertussis were reported in South Dakota. This represented a 113 percent increase over the five-year median (median: 16), however it was a substantial decrease from the 147 cases reported in 2019. There were 22 cases (65%) in children less than 15 years of age.



**Figure 56**  
**Incidence of Pertussis by County of Residence: South Dakota, 2020**  
(cases per 100,000)



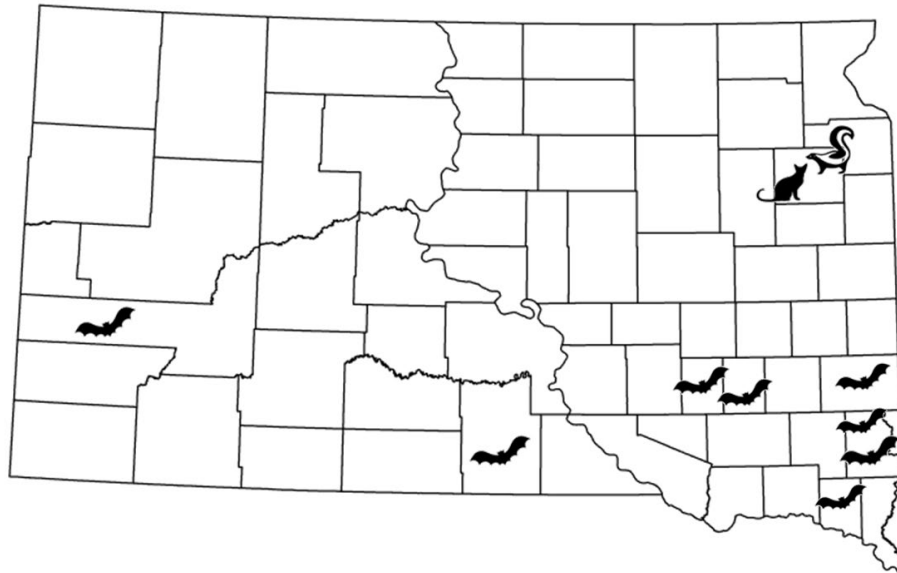
**Rabies, animal**

Rabies is a viral disease affecting the central nervous system. All mammals, including humans, are susceptible to the rabies virus. Bites from infected animals constitute the primary route of transmission. Rabies is a fatal disease and cannot be treated once symptoms appear. Fortunately, rabies is successfully prevented by using post-exposure prophylaxis in people exposed to the rabies virus. While the last human rabies case in South Dakota occurred in 1970, substantial resources are spent managing potential exposures to rabies because of its constant presence in the state. Skunks (*Memphitis mephitis*) are the primary rabies reservoir in South Dakota. Over the past decade 44 percent of skunks tested have been rabid. Bat rabies is also enzootic in South Dakota with four percent of bats tested being positive.

A total of ten animals tested positive for rabies in 2020, a 55 percent decrease from the five-year median (median: 22). The ten rabid animals included only one domestic animal (a cat), and nine wild animals (8 bats and 1 skunk). This was the lowest annual total of positive animals on record in South Dakota. No human rabies was reported.

Rabid animals in 2020 were reported from the following counties: Codington 2, Lincoln 2, Clay 1, Davison 1, Hanson 1, Minnehaha 1, Pennington 1, and Tripp 1.

**Figure 57**  
**Animal Rabies in South Dakota, 2020**

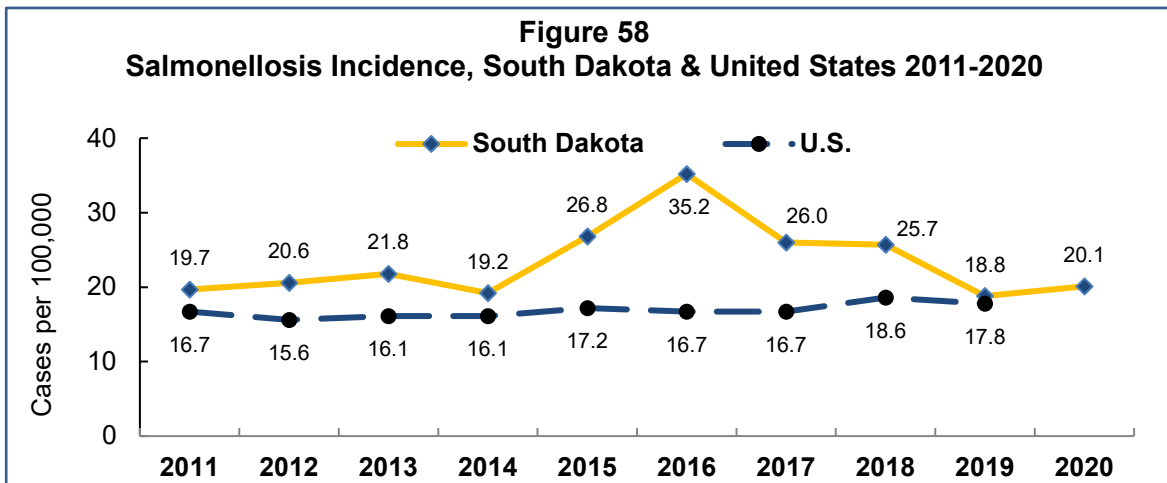


**Salmonellosis**

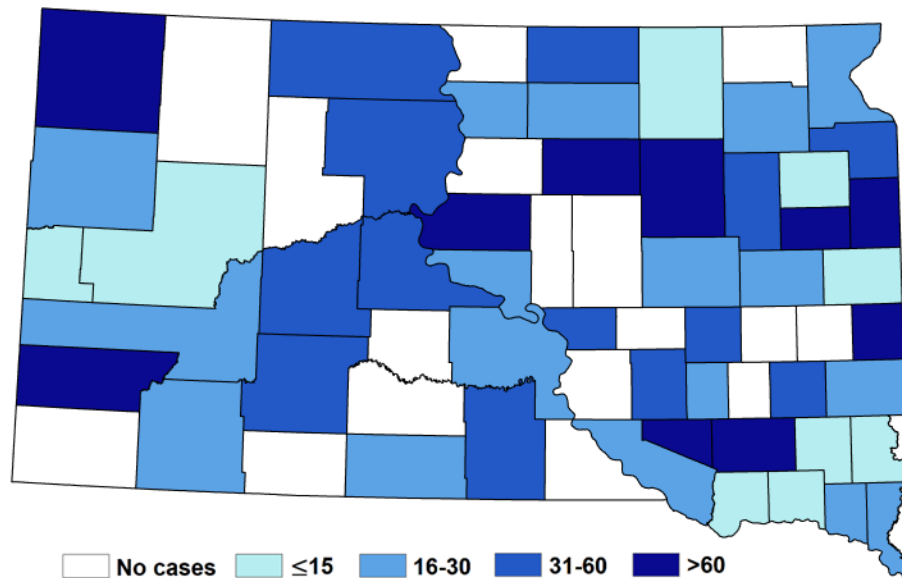
*Salmonella* is a bacterium that can cause diarrhea, fever, and abdominal cramps between 12 and 72 hours after infection. The illness usually lasts four to seven days, and most individuals recover without treatment, but in some with diarrhea infection may spread from the intestines to the blood stream, and then to other body sites. In severe cases, infection may cause death. The elderly, infants, and those with impaired immune systems are more likely to have a severe illness.

In 2020, 179 cases of salmonellosis were reported in South Dakota. The *Salmonella* serotypes most commonly identified were *S. Newport* (29 cases), *S. Enteritidis* (28 cases), *S. Typhimurium* (21 cases), and *S. I 4:b:-* (21 cases). These four serotypes accounted for 63 percent of cases with available serotype information. Older adults had the highest rate of infection in 2020; 45 percent of reported cases were over the age of 50.

**Figure 58**  
**Salmonellosis Incidence, South Dakota & United States 2011-2020**



**Figure 59**  
**Incidence of Salmonellosis by County of Residence: South Dakota, 2020**  
 (cases per 100,000)

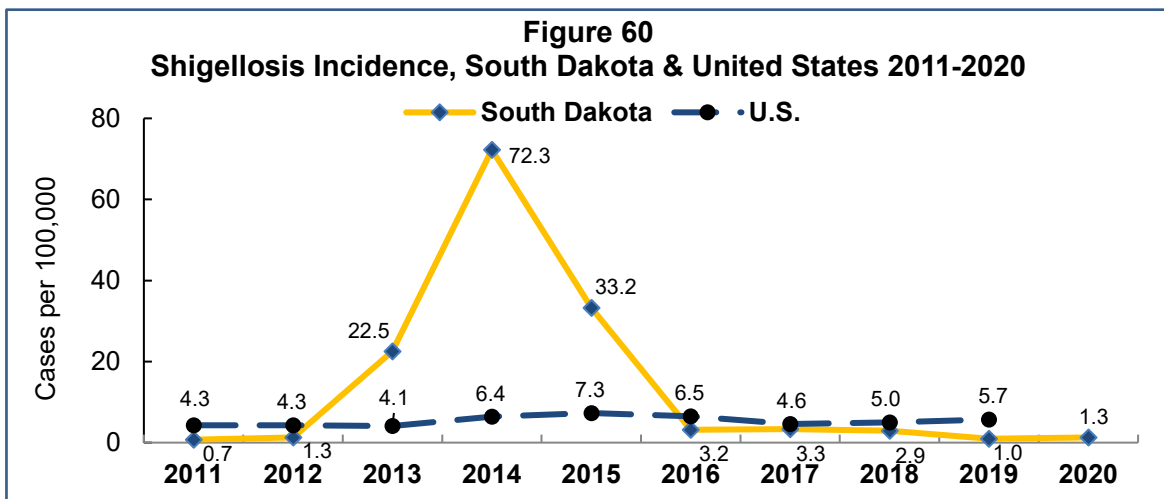


**Shigellosis**

Shigellosis is an intestinal infection causing diarrhea, fever, nausea, vomiting, and abdominal cramps. Complications, such as severe dehydration or seizures, may occur, especially among young children. *Shigella* bacteria are transmitted by the fecal-oral route (human feces). Following exposure, illness usually occurs within one to four days. Transmission is typically person-to-person within families, child day care centers, and adult residential living situations. Food may be contaminated by people not washing their hands properly.

In 2020, there were 12 cases of shigellosis reported in South Dakota, a 57 percent decrease from the five-year median (median: 28). South Dakota experienced a protracted multi-county outbreak from October 2013 to November 2015, largely in childcare settings.

**Figure 60**  
**Shigellosis Incidence, South Dakota & United States 2011-2020**



### ***Streptococcus pneumoniae*, invasive**

Pneumococcal disease is an infection caused by the bacteria *Streptococcus pneumoniae*, also referred to as pneumococcus. Invasive *Streptococcus pneumoniae* can cause many types of illnesses, including bacteremia, pneumonia, ear infections and meningitis. There are vaccines to prevent pneumococcal disease for both children and adults. In 2020, there were 71 cases of invasive pneumococcal disease reported in South Dakota. The majority (77%) of cases occurred in adults over 40 years of age.

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### **Syphilis (primary, secondary, early non-primary non-secondary, and congenital)**

Syphilis is a sexually transmitted disease that can cause long-term complications if not treated promptly and correctly. Symptoms in adults are divided into stages: primary, secondary, early latent, and late latent syphilis. The primary, secondary, and early latent stages are infectious to others. Syphilis is spread by direct contact with a syphilis sore during vaginal, anal, or oral sex. Sores can be found on the penis, vagina, rectum, or on the lips and in the mouth. Syphilis can also be spread from an infected mother to her unborn baby, i.e., congenital syphilis.

In South Dakota, there were 101 cases of early syphilis (primary, secondary, and early non-primary non-secondary) and four congenital syphilis cases reported in 2020. Three counties (Minnehaha, Pennington, and Todd) accounted for 69 percent of the state's cases.

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### **Tuberculosis**

Tuberculosis (TB) is caused by the *Mycobacterium tuberculosis* bacteria. *M. tuberculosis* usually infects the lungs but can attack any part of the body such as the kidney, spine, and brain. If not treated properly, TB disease can be fatal. Tuberculosis is spread through the air from one person to another when an infectious person coughs, sneezes, speaks, talks, or sings.

There were 16 cases of TB reported in South Dakota in 2020. The median age of cases was 39 years (range: 25 to 75). American Indians have historically reported the highest percentage of TB cases by race. This trend continued in 2020 as American Indians contributed 44 percent of the total TB cases. In addition, 50 percent of TB cases were foreign-born.

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### **Tularemia**

Tularemia is a bacterial disease caused by *Francisella tularensis* and is typically found in rodents but can infect insects as well. Infection can occur from a tick or deerfly bite, handling sick or dead animals, eating contaminated food, or inhaling airborne organisms. Depending on how a person is infected, symptoms can range from skin ulcers, inflamed eyes, sore throat and diarrhea to fever, chills, headache, and muscle aches. There are six main clinical forms of disease: ulceroglandular, glandular, pneumonic, oropharyngeal, oculoglandular, and typhoidal. If left untreated, tularemia may be fatal.

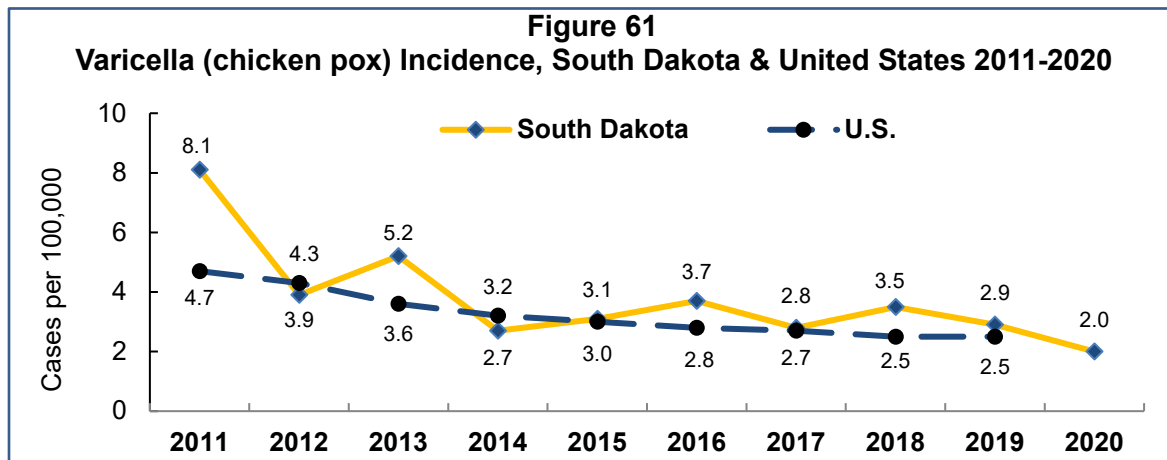
In 2020, there were ten cases of tularemia reported in South Dakota (5 ulceroglandular, 2 pneumonic, 1 oropharyngeal, 1 typhoidal, and 1 unknown form). The median age of cases was 55 years old (range: 2 to 85).

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### Varicella (chicken pox)

Varicella (chicken pox) is a highly contagious disease consisting of a blistering rash, itching and fever caused by varicella-zoster virus. Chicken pox can be a serious disease, especially in babies and people with weakened immune systems. Varicella is spread through the air by the cough or sneeze of an infected person. It can also be spread by touching or breathing in the virus particles that come from chicken pox blisters. The best way to prevent chicken pox is to get the varicella vaccine. Varicella vaccination is mandated for school entry in South Dakota.

In 2020, 18 cases of chicken pox were reported in South Dakota, with 60 percent of cases with known vaccination status being unvaccinated. One-third of those who were unvaccinated were too young to be vaccinated. The median age was 3 years old (range: 0 to 17).

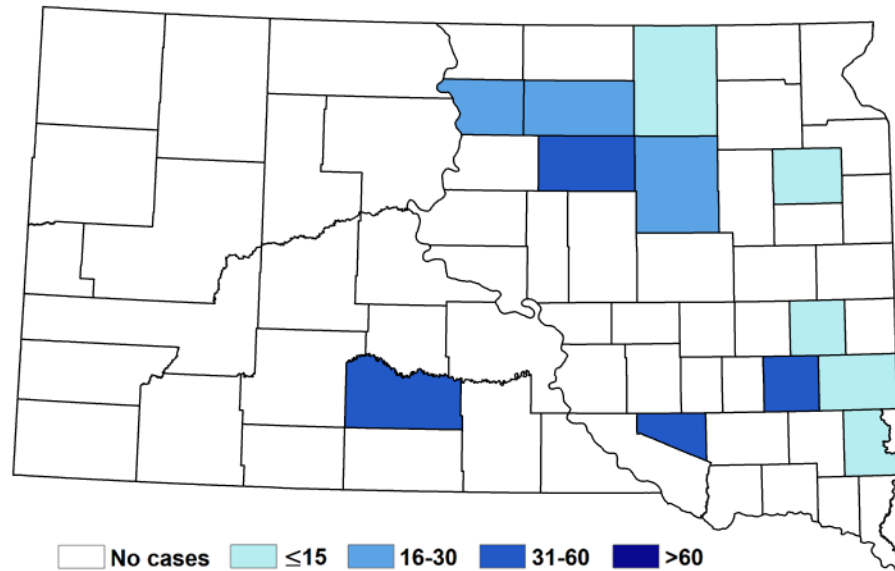


### West Nile virus (WNV)

West Nile disease is a viral mosquito-borne illness that emerged in South Dakota in 2002. About 20 percent of WNV infected individuals develop fever with other symptoms such as headache, body aches, joint pains, vomiting, diarrhea, or rash. Most people with this type of West Nile virus disease recover completely, but fatigue and weakness can last for weeks or months. Less than one percent of infected individuals develop a serious neurologic illness such as encephalitis (infection of the brain) or meningitis (infection of the spinal cord). The symptoms of neurologic illness can include headache, high fever, neck stiffness, disorientation, coma, tremors, seizures, or paralysis. Neuroinvasive WNV infection may take several weeks or months to recover. Some of the neurologic effects may be permanent. The death rate for WNV neurologic disease is about ten percent.

In South Dakota, there were 20 human cases of WNV disease (11 neuroinvasive and 9 non-neuroinvasive) reported in 2020. The overall incidence of WNV was 2.2 cases per 100,000 population. Ten (50%) WNV cases were hospitalized. There were no deaths. Additionally, 3 persons were identified to have WNV infection through blood donation screenings.

**Figure 62**  
**Incidence of Human WNV disease by County of Residence: South Dakota, 2020**  
(cases per 100,000)



**Other Infectious Diseases**

Other infectious diseases reported in South Dakota during 2020 include: 22 cases of cyclosporiasis, 14 cases of invasive *Haemophilus influenzae* non-type b, 8 cases of Q fever, 7 cases each of coccidioidomycosis and spotted fever rickettsiosis, 3 cases of vibriosis, 2 cases each of listeriosis and malaria, 2 cases each of anaplasmosis and dengue, and 1 case each of babesiosis and hantavirus pulmonary syndrome.