

## Infectious Diseases in South Dakota, 2019

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 2019. It highlights important statistics and shows key trends on selected reportable diseases in the state.

**Table 72 Reportable Diseases in South Dakota, 2010-2019** (Calendar years)

Reportable diseases	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Babesiosis	0	0	0	1	1	0	0	0	0	0	2
Botulism	0	0	0	0	0	0	0	0	0	0	0
Brucellosis	0	0	0	1	0	0	0	1	0	0	2
Campylobacteriosis	297	301	276	296	307	346	450	395	532	524	3724
Carbapenem-resistant <i>Enterobacteriaceae</i> (CRE)	NR	NR	NR	12	3	37	58	64	53	40	267
Chicken Pox (Varicella)	62	67	32	43	23	27	32	24	31	26	367
Chlamydia	3187	3412	3925	3947	4129	3967	4336	4439	4441	4545	40328
Coccidioidomycosis	NR	NR	NR	NR	NR	NR	5	6	3	8	22
Cryptosporidiosis	108	143	113	175	151	248	158	163	177	167	1603
Cyclosporiasis	0	0	0	1	0	0	3	4	30	10	48
Ehrlichiosis and Anaplasmosis	0	4	1	1	0	0	1	1	4	0	12
Giardiasis	102	110	144	111	131	129	116	104	114	92	1153
Gonorrhea	467	602	707	789	880	1055	1271	1291	1694	2170	10926
Hantavirus pulmonary syndrome	0	1	1	0	0	0	0	1	0	2	5
Hepatitis A	1	2	0	4	3	2	1	1	1	8	23
Hepatitis B, chronic	51	51	51	80	58	52	60	52	46	37	538
Hepatitis B, acute	2	2	2	5	3	2	2	2	1	5	26
Hepatitis C, chronic	350	356	392	406	516	570	714	563	545	583	4995
Hepatitis C, acute	0	0	4	1	0	0	22	20	19	31	97
<i>Haemophilus influenzae</i> type b	0	1	0	3	0	1	1	1	0	1	8
Hemolytic uremic syndrome	2	0	0	0	1	1	1	0	0	5	10
HIV and AIDS	35	21	29	36	31	25	47	41	31	38	334
Legionellosis	9	2	9	8	9	10	9	15	33	23	127
Leprosy	0	0	0	0	0	0	0	0	0	0	0
Listeriosis	3	1	0	0	0	0	0	2	1	0	7
Lyme disease	1	4	4	4	2	5	11	12	7	10	60
Malaria	3	2	5	7	5	4	4	8	9	6	53
Measles	0	0	0	0	8	2	0	0	0	0	10
Meningococcal disease	0	3	0	4	2	1	1	0	0	0	11

Reportable diseases	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	Total
Mumps	2	0	0	0	0	0	2	0	0	12	16
Pertussis	32	37	71	67	109	16	15	9	163	147	666
Q fever	4	1	2	4	5	5	4	5	12	11	53
Rabies, animal	32	40	60	28	21	29	27	22	15	16	290
Salmonellosis	186	162	170	183	164	230	305	226	227	166	2019
Shiga toxin-producing <i>E. coli</i>	35	41	48	42	41	62	84	91	204	136	784
Shigellosis	7	6	11	190	616	285	28	29	26	9	1207
Spotted fever rickettsiosis	0	1	1	7	3	2	6	13	14	10	57
Methicillin-resistant <i>Staph aureus</i> (MRSA), invasive	98	91	89	94	124	159	144	115	173	156	1243
<i>Strep. pneumoniae</i> , invasive	NR	42	97	99	88	110	129	135	106	101	907
Syphilis (primary, secondary, and early non-primary non-secondary)	4	0	21	49	76	48	41	52	50	56	397
Syphilis, congenital	0	0	0	0	3	0	2	3	1	3	12
Toxic shock syndrome	0	0	0	0	0	3	1	0	1	0	5
Tularemia	11	8	5	7	5	25	14	13	9	17	114
Tuberculosis	15	15	19	9	8	17	12	14	12	16	137
Typhoid fever	1	0	0	3	0	1	2	0	0	0	7
West Nile fever	16	2	141	92	45	29	117	46	122	11	621
West Nile neuroinvasive	4	0	62	57	12	11	35	27	47	0	255
Vibriosis	NR	NR	NR	NR	NR	NR	5	12	9	3	29

\*NR = not reportable

Source: South Dakota Department of Health, Office of Disease Prevention Services, Mavens report by calendar year. Minor variances from past reports reflect differences between MMWR year and calendar year, cross-year deduplication and recategorization.

**Table 73 Reportable Diseases by County of Residence, South Dakota, 2019** (Calendar years)

County of residence	Campylobacteriosis	Chlamydia	Cryptosporidiosis	Giardiasis	Gonorrhea	Hepatitis B, chronic	Hepatitis C, chronic	Legionellosis	MRSA, invasive	Pertussis	Salmonella	Shigellosis	<i>Strep. pneumoniae</i> , invasive	Shiga Toxin-Prod <i>E. coli</i>	Tularemia	Varicella (Chicken pox)	West Nile disease
<b>TOTAL</b>	<b>524</b>	<b>4545</b>	<b>167</b>	<b>92</b>	<b>2170</b>	<b>37</b>	<b>583</b>	<b>23</b>	<b>156</b>	<b>147</b>	<b>166</b>	<b>9</b>	<b>101</b>	<b>136</b>	<b>17</b>	<b>26</b>	<b>11</b>
Incidence*	59.2	513.8	18.9	10.4	245.3	4.1	65.9	2.6	17.6	16.6	18.8	1.0	11.4	15.4	1.9	2.9	1.2
Aurora	12	10	0	0	0	<5	0	0	0	0	<5	0	<5	<5	0	0	0
Beadle	14	54	6	6	5	<5	5	0	<5	0	<5	0	<5	<5	<5	0	0
Bennett	<5	24	0	0	25	0	0	0	<5	0	<5	0	0	0	0	0	0
Bon Homme	<5	8	<5	0	<5	<5	9	<5	0	0	0	0	<5	0	0	0	0
Brookings	18	144	9	8	19	<5	<5	<5	0	8	0	<5	<5	0	0	<5	0
Brown	22	153	6	5	44	<5	7	<5	5	0	<5	0	7	<5	<5	<5	0
Brule	5	26	0	0	13	0	5	0	<5	<5	0	0	<5	0	<5	0	0
Buffalo	<5	35	0	0	18	0	9	0	<5	0	0	0	<5	0	<5	0	0
Butte	12	40	<5	<5	<5	<5	<5	<5	0	0	0	0	<5	6	0	0	0
Campbell	<5	<5	0	0	0	0	0	0	0	0	<5	0	0	0	0	0	0
Charles Mix	11	65	<5	<5	33	0	20	0	0	<5	<5	0	<5	<5	<5	0	0
Clark	6	<5	0	<5	0	0	<5	0	6	0	0	0	0	<5	0	<5	0
Clay	11	78	8	<5	17	0	<5	0	<5	0	5	0	<5	<5	0	<5	0
Codington	13	86	10	<5	15	0	<5	<5	<5	10	<5	0	0	9	0	0	0
Corson	8	63	0	0	60	0	31	0	<5	6	0	0	0	<5	0	0	0
Custer	<5	15	0	<5	<5	0	9	0	<5	0	0	0	0	8	0	0	0
Davison	18	93	7	<5	24	0	11	0	5	0	<5	0	<5	0	0	0	0
Day	<5	15	<5	0	<5	0	0	0	0	0	0	0	0	0	0	0	<5
Deuel	<5	<5	<5	0	<5	0	0	0	0	0	<5	0	0	<5	0	0	0
Dewey	17	129	<5	<5	88	0	23	0	<5	0	<5	0	0	<5	0	0	0
Douglas	6	<5	<5	0	0	0	0	0	<5	<5	0	0	<5	<5	0	0	0
Edmunds	7	<5	0	0	<5	0	<5	0	0	0	<5	0	0	<5	0	0	0
Fall River	7	15	<5	<5	<5	0	<5	0	<5	0	<5	0	<5	5	0	0	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
Faulk	<5	<5	<5	<5	0	0	0	<5	0	0	0	0	0	0	0	0	0
Grant	<5	15	<5	<5	<5	0	<5	<5	<5	<5	<5	0	<5	<5	0	0	0
Gregory	9	10	<5	<5	<5	0	<5	<5	0	0	<5	0	0	<5	0	0	<5
Haakon	0	<5	0	0	0	0	0	<5	0	0	<5	0	0	<5	0	0	0
Hamlin	<5	10	6	<5	<5	<5	<5	0	<5	<5	<5	0	0	<5	0	0	<5
Hand	<5	0	0	0	<5	0	0	<5	0	0	0	0	<5	0	0	0	0
Hanson	<5	<5	0	0	0	0	<5	0	<5	<5	<5	0	0	<5	0	0	0
Harding	<5	0	0	0	0	0	0	0	0	0	0	0	0	<5	0	0	0
Hughes	8	77	0	<5	59	0	16	0	<5	0	0	0	5	<5	<5	0	<5
Hutchinson	7	<5	8	<5	<5	0	<5	0	<5	<5	<5	0	<5	<5	0	<5	0
Hyde	<5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	<5	0
Jackson	<5	24	0	0	15	0	<5	0	<5	0	0	0	0	0	0	<5	0
Jerauld	6	<5	<5	0	0	0	0	0	0	0	<5	0	0	0	0	0	0
Jones	0	<5	0	0	<5	0	0	0	0	0	0	0	0	0	0	0	0
Kingsbury	8	13	<5	0	6	0	<5	0	<5	0	<5	0	<5	0	0	<5	<5
Lake	5	27	<5	0	<5	0	<5	0	0	0	<5	0	0	0	0	0	0
Lawrence	9	98	<5	<5	19	0	14	<5	<5	0	<5	0	<5	<5	0	0	0
Lincoln	18	164	10	<5	32	<5	8	<5	10	20	12	<5	5	5	<5	<5	0
Lyman	5	42	<5	0	29	0	13	0	<5	<5	0	0	<5	0	0	0	0
Marshall	<5	<5	0	<5	<5	0	0	0	<5	0	0	0	0	0	0	0	0
McCook	<5	11	<5	<5	<5	0	0	0	<5	0	0	0	<5	<5	0	<5	0
McPherson	<5	<5	<5	<5	<5	0	0	0	0	<5	<5	0	0	0	0	0	<5
Meade	18	90	<5	<5	18	<5	14	<5	<5	<5	6	0	<5	12	0	<5	0
Mellette	0	8	0	0	14	0	0	0	<5	0	0	0	0	0	<5	0	<5
Miner	<5	<5	<5	0	0	0	0	0	<5	0	0	0	0	0	0	0	0
Minnehaha	48	1127	32	22	681	19	148	5	36	90	34	5	26	12	0	5	<5
Moody	5	31	<5	0	14	0	9	0	<5	0	<5	0	0	<5	0	0	0
Oglala Lakota	7	363	<5	<5	211	<5	20	0	<5	0	0	0	<5	<5	<5	0	0
Pennington	53	758	7	7	364	<5	111	<5	22	<5	25	0	12	8	<5	<5	0
Perkins	5	<5	0	0	0	0	0	0	0	0	0	0	<5	0	0	0	0
Potter	<5	5	0	0	<5	0	0	0	0	0	0	0	0	0	0	0	0
Roberts	9	81	<5	<5	30	0	13	<5	5	<5	7	<5	<5	16	<5	0	0
Sanborn	<5	5	<5	0	<5	0	0	0	0	0	<5	0	<5	<5	0	0	0
Spink	9	<5	0	0	0	0	0	<5	<5	0	0	0	0	<5	<5	0	0
Stanley	<5	9	<5	0	<5	0	0	0	<5	0	0	0	<5	0	0	0	0
Sully	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Todd	10	277	0	<5	199	0	29	<5	<5	0	<5	0	<5	<5	<5	0	0
Tripp	14	24	0	<5	6	0	0	0	<5	0	<5	0	0	0	<5	0	0
Turner	<5	11	<5	<5	<5	0	0	0	0	0	<5	0	0	<5	0	0	<5
Union	<5	36	<5	0	11	<5	<5	0	<5	0	<5	0	<5	3	0	<5	0
Walworth	<5	16	0	0	<5	0	<5	0	<5	0	<5	0	0	0	0	0	0
Yankton	10	94	7	<5	33	<5	19	0	<5	<5	9	0	7	7	0	<5	0
Ziebach	<5	20	0	0	14	0	<5	0	0	0	0	0	0	0	0	0	0

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

**Table 74 Reportable Diseases by Gender, Race and Age, South Dakota, 2019** (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. pneumo.</i> , invasive	Syphilis (P, S, E non-P non-S)	Tuberculosis	Tularemia	Varicella (Chicken pox)	West Nile disease	
<b>Total</b>	<b>524</b>	<b>4545</b>	<b>40</b>	<b>167</b>	<b>92</b>	<b>2170</b>	<b>37</b>	<b>583</b>	<b>38</b>	<b>156</b>	<b>147</b>	<b>166</b>	<b>136</b>	<b>9</b>	<b>101</b>	<b>56</b>	<b>16</b>	<b>17</b>	<b>26</b>	<b>11</b>	
<b>Incidence*</b>	59.2	513.8	4.5	18.9	10.4	245.3	4.1	65.9	4.3	17.6	16.6	18.8	15.4	1.0	11.4	6.3	1.8	1.92	2.9	1.24	
<b>Gender</b>																					
Female	213	3195	25	86	47	1227	16	270	11	76	78	92	70	5	44	16	6	5	12	4	
Male	311	1350	15	81	45	943	21	313	27	80	69	74	66	4	57	40	10	12	14	7	
<b>Race</b>																					
White	441	1825	33	146	66	526	9	234	14	97	123	142	112	7	73	27	3	11	16	10	
Am.Indian	64	1900	3	4	9	1355	2	289	15	51	16	10	19	0	14	17	1	4	3	1	
Black	6	290	2	5	9	213	11	12	7	1	2	4	2	0	3	7	8	1	0	0	
Asian	1	43	1	2	2	12	6	1	0	0	1	1	0	1	0	0	4	0	1	0	
Other	5	147	0	9	2	31	8	28	2	2	3	6	2	1	10	2	0	1	4	0	
Unknown	7	340	1	1	4	33	1	19	0	5	2	3	1	0	1	3	0	0	2	0	
<b>Age group</b>																					
<1 yr	12	1	0	4	1	0	0	0	0	2	17	6	5	0	4	0	0	0	4	0	
1-4 yrs	51	0	2	29	17	1	0	0	0	0	26	16	22	0	1	0	0	1	7	0	
5-14 yrs	51	40	1	20	11	11	0	0	0	1	66	13	25	0	3	0	0	5	6	1	
15-24 yrs	74	2743	1	27	7	819	5	82	6	1	13	22	15	0	0	11	0	0	6	1	
25-39 yrs	125	1590	2	35	16	1108	13	229	20	14	11	23	24	4	10	31	11	2	3	5	
40-64 yrs	134	164	8	34	25	223	14	237	12	68	12	59	22	3	30	14	3	5	0	3	
≥65 yrs	77	7	26	18	15	8	5	35	0	70	2	27	23	2	53	0	2	4	0	1	

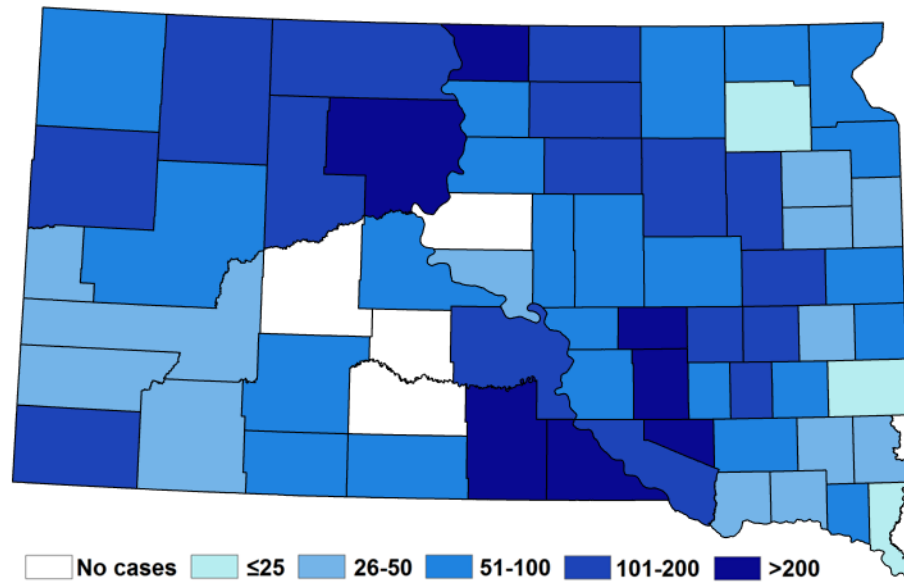
\*Incidence: cases per 100,000 population

### Campylobacteriosis

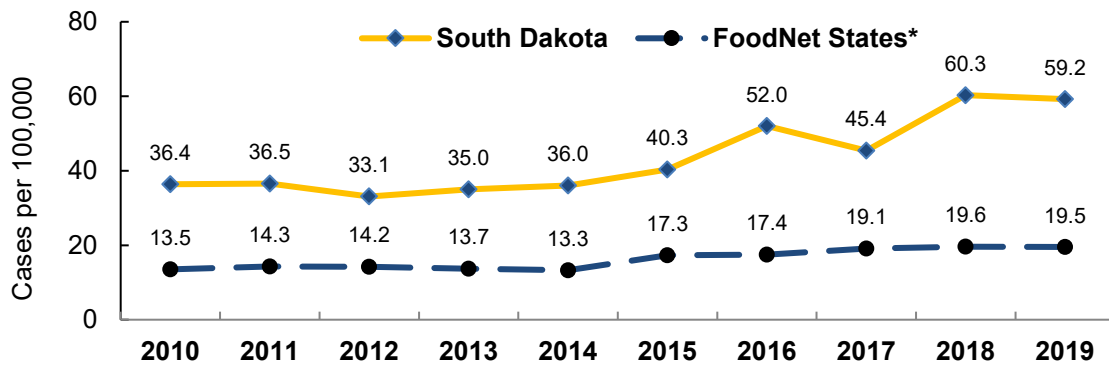
*Campylobacter* is a bacterium that can cause diarrhea, often bloody, abdominal pain, vomiting, fever, nausea, and malaise. Most cases of campylobacteriosis are relatively mild, lasting one to two days. Some cases, however, are more severe and relapses occur in about 20 percent of patients. Complications 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 2019, there were 524 cases of *Campylobacter* infection reported, just below the record high of 532 cases reported in 2018. Counties with the highest incidence (cases per 100,000 population) included Aurora (436.2), Jerauld (298.1), Dewey (288.5), and Tripp (257.3). Young adults 25–39 years old 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 36**  
**Incidence of Campylobacteriosis by County of Residence: South Dakota, 2019**  
(cases per 100,000)



**Figure 37**  
**Campylobacteriosis Incidence, South Dakota & U.S. (FoodNet States\*) 2010-2019**



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

**Carbapenem-resistant *Enterobacteriaceae* (CRE)**

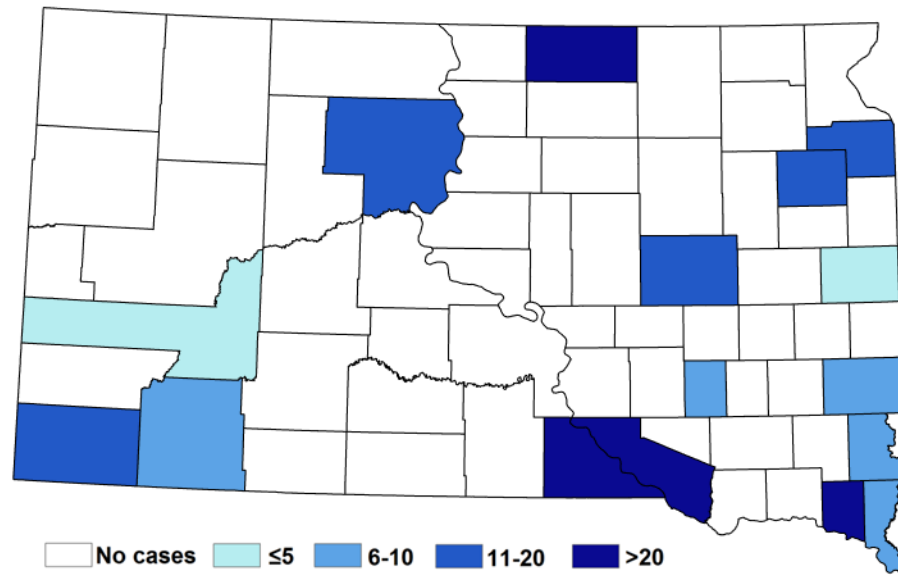
Carbapenem-resistant *Enterobacteriaceae* (CRE) are a family of bacteria that are difficult to treat because they are highly resistant to antibiotics. CRE are an important emerging threat to public health. Common *Enterobacteriaceae* include *Klebsiella* species, *Enterobacter* species, and *Escherichia 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. *Enterobacteriaceae* 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 *Enterobacteriaceae* 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.

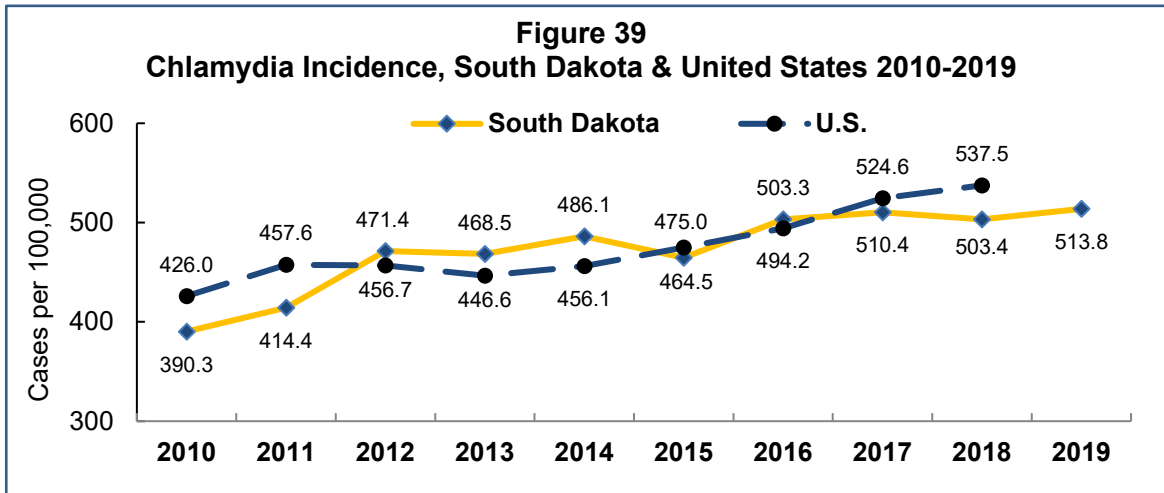
In South Dakota, 40 cases of CRE were reported in 2019. The statewide incidence was 4.5 cases per 100,000 population.

**Figure 38**  
**Incidence of CRE by County of Residence: South Dakota, 2019**  
(cases per 100,000)

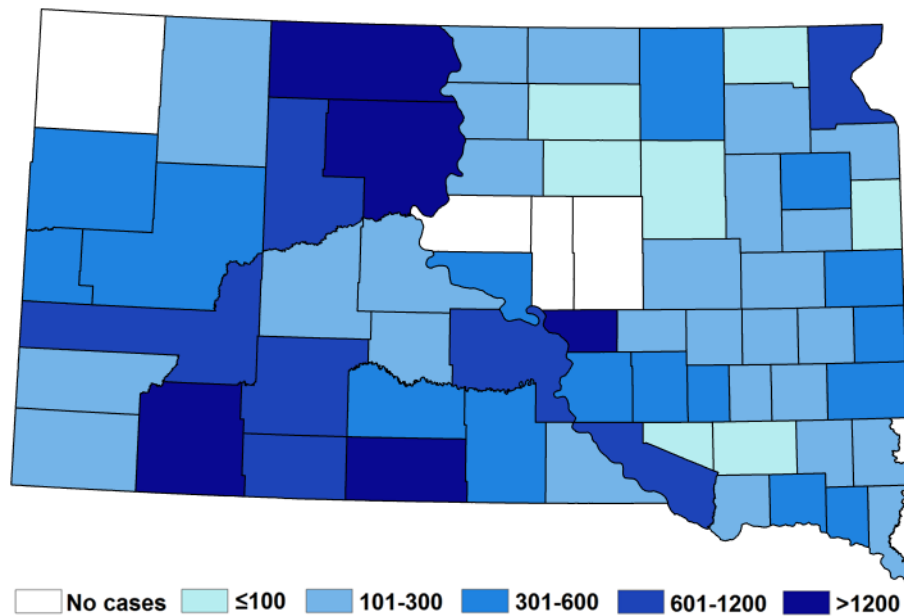


### Chlamydia

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. The number of chlamydia cases has been increasing over the past decade in South Dakota. In 2019, there were 4,545 cases reported. Youth in the 15–24 year age group had the highest rate.

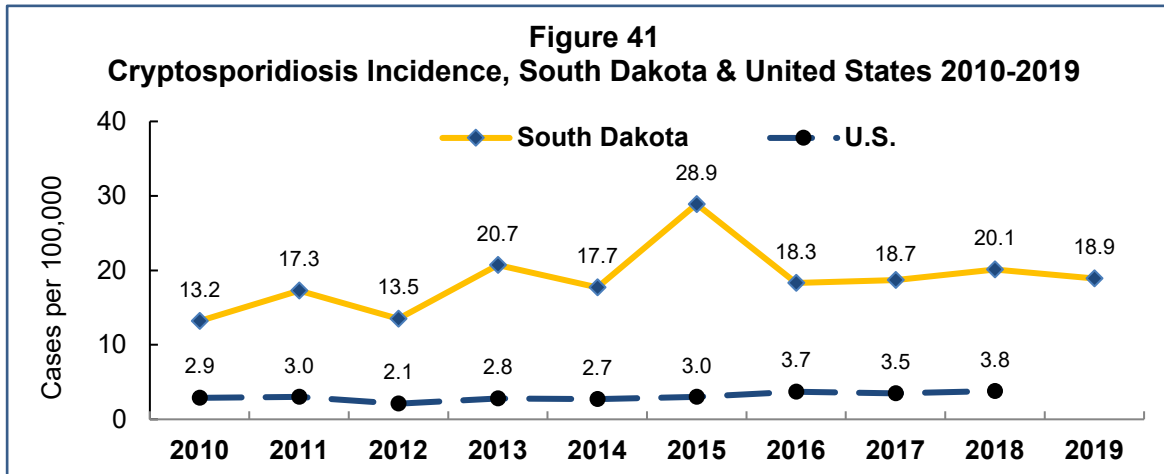


**Figure 40**  
**Incidence of Chlamydia by County of Residence: South Dakota, 2019**  
(cases per 100,000)

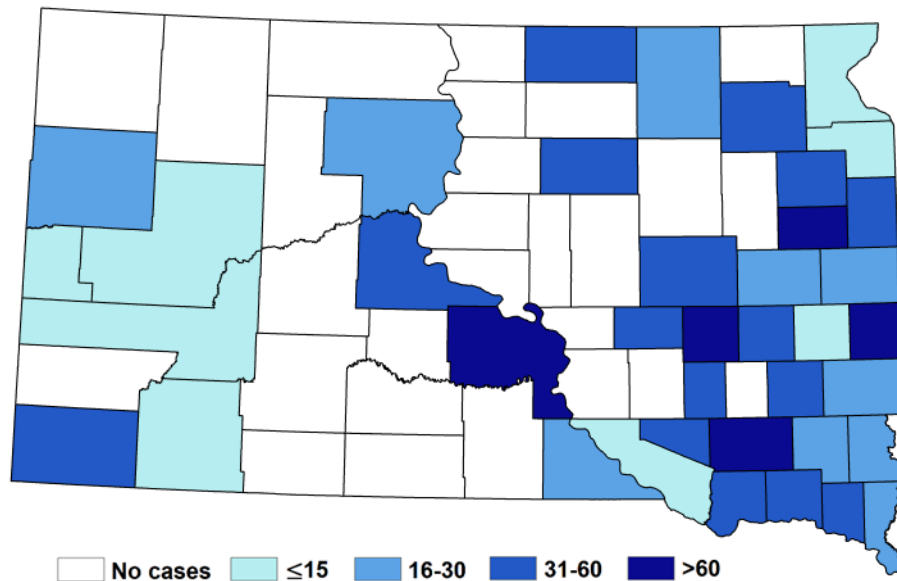


### Cryptosporidiosis

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 2019, there were 167 cases (18.9 cases per 100,000 population) reported in South Dakota. Children less than 15 years old had the highest rate of disease. South Dakota's cryptosporidiosis rate has been consistently higher than the national rate over the past decade.



**Figure 42**  
**Incidence of Cryptosporidiosis by County of Residence: South Dakota, 2019**  
(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 10 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.

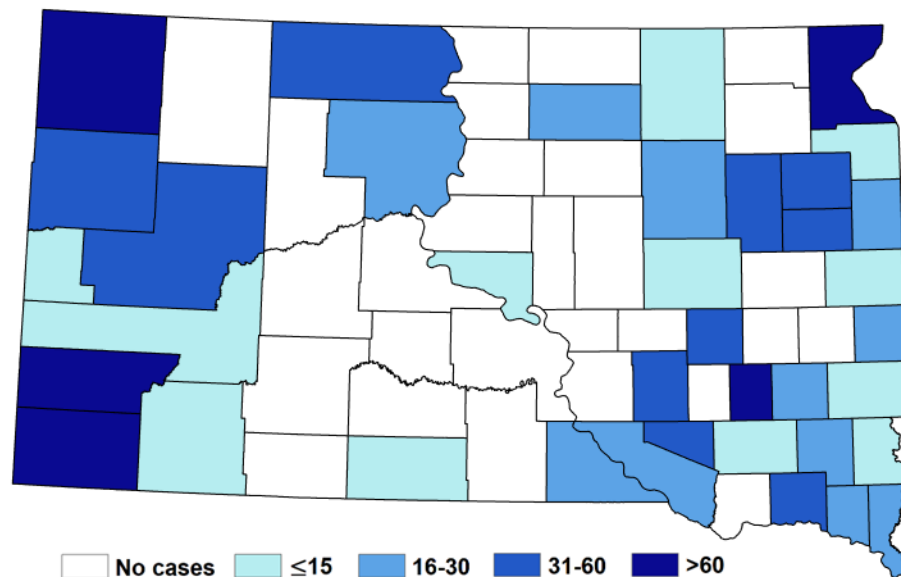


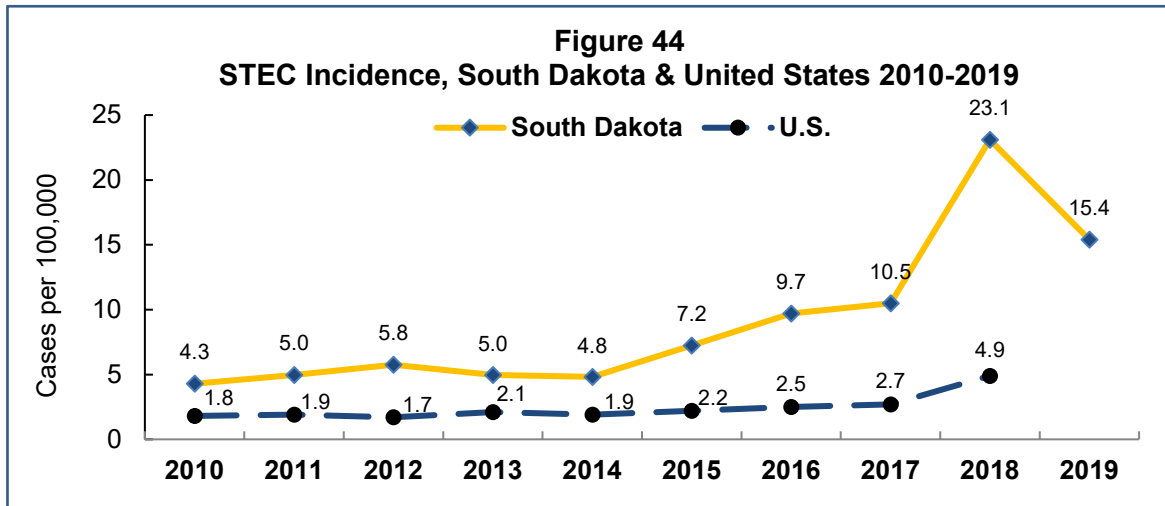
Culture-independent diagnostic testing (CIDTs) is rapidly being adopted by clinical laboratories in the state for detecting STEC infections. The STEC surveillance case definition used by SDDOH to classify and report cases was updated in 2018. Individuals testing positive by CIDT (but not subsequently confirmed by culture) are included in the 2018 and 2019 reported case count totals.

In 2019, 136 cases of STEC were reported in South Dakota. The incidence rate was 15.4 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 52 cases (38%) that occurred in children less than 15 years of age. Five 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 2019: 25 cases O157:H7, 8 cases O103, 8 cases O111, 3 cases O121, 3 cases O26, and 1 case each of O145 and O9.

**Figure 43**  
**Incidence of STEC by County of Residence: South Dakota, 2019**  
(cases per 100,000)

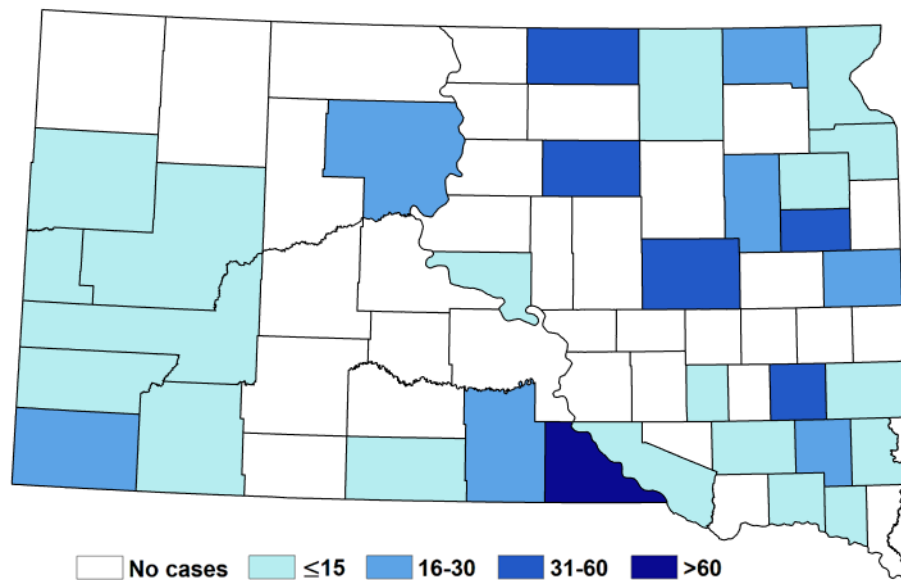


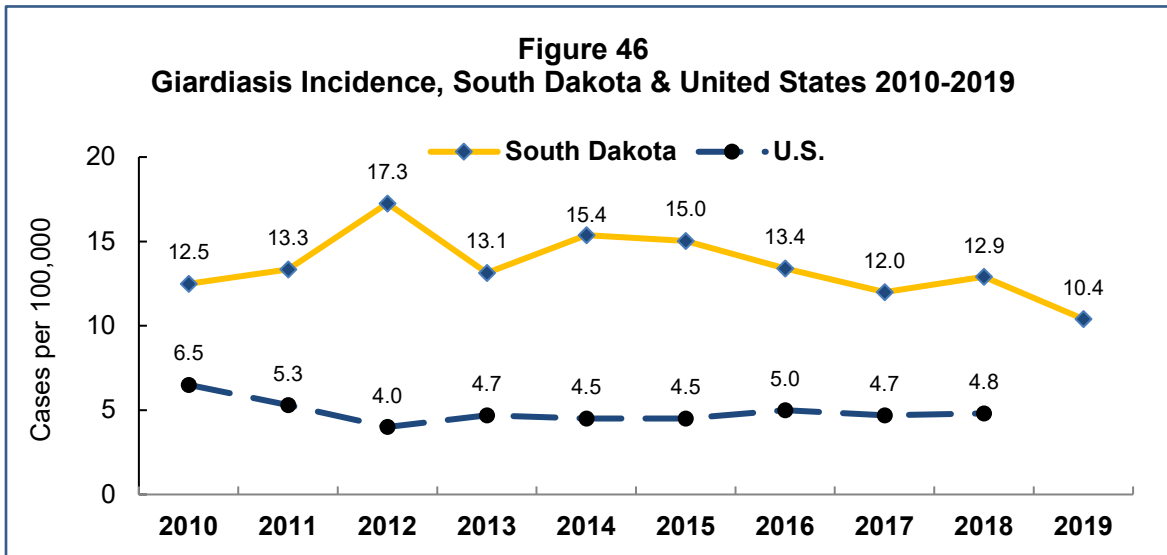


**Giardiasis**

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 2019, 92 cases of *Giardia* infection were reported in South Dakota residents (10.4 cases per 100,000 population), which was below the five-year median (median: 116). South Dakota's giardiasis rate has been more than double the national rate over the past decade.

**Figure 45**  
**Incidence of Giardiasis by County of Residence: South Dakota, 2019**  
 (cases per 100,000)



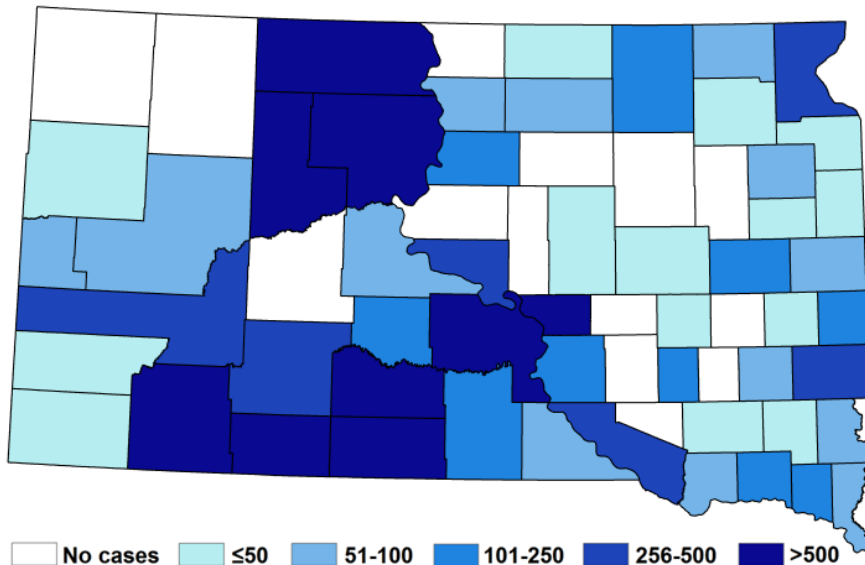


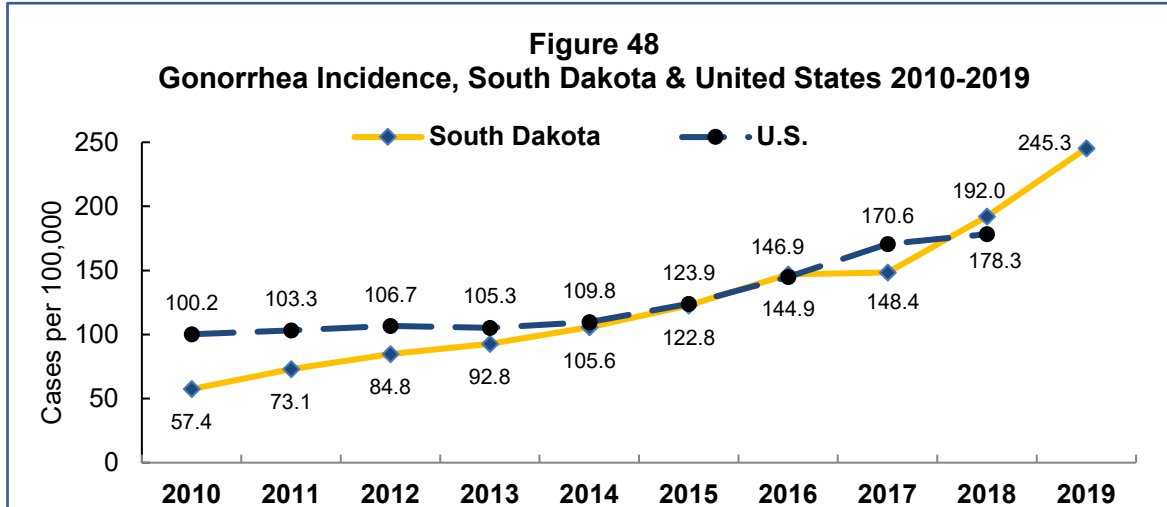
### Gonorrhea

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 2019, there were 2,170 cases reported, which is a rate of 245.3 cases per 100,000 population. The median age for gonorrhea cases was 27 years old (range: 4 to 70). Females accounted for 57 percent of cases.

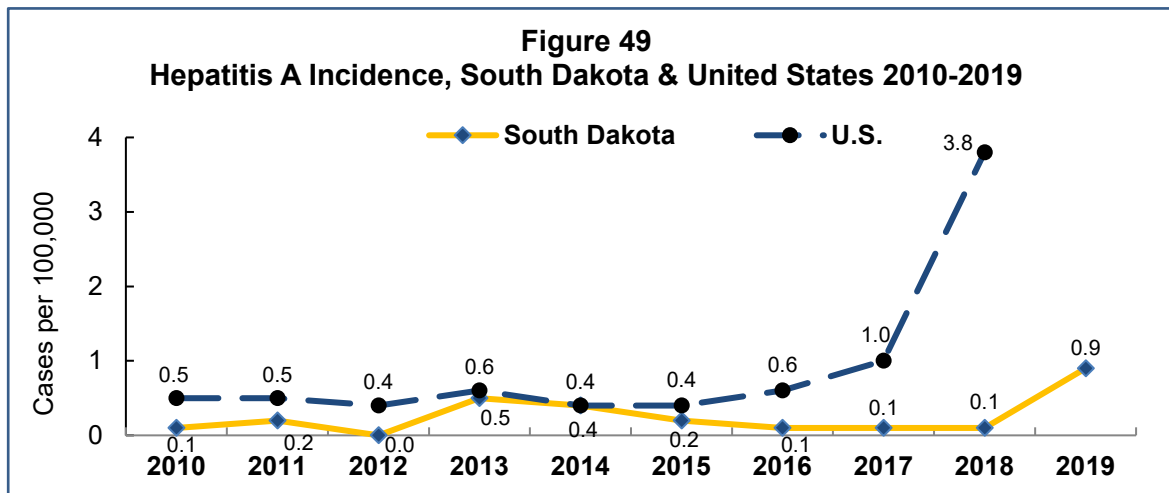
**Figure 47**  
**Incidence of Gonorrhea by County of Residence: South Dakota, 2019**  
(cases per 100,000)





**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 were eight cases of hepatitis A reported in 2019, an increase over the five-year median (median: 1).

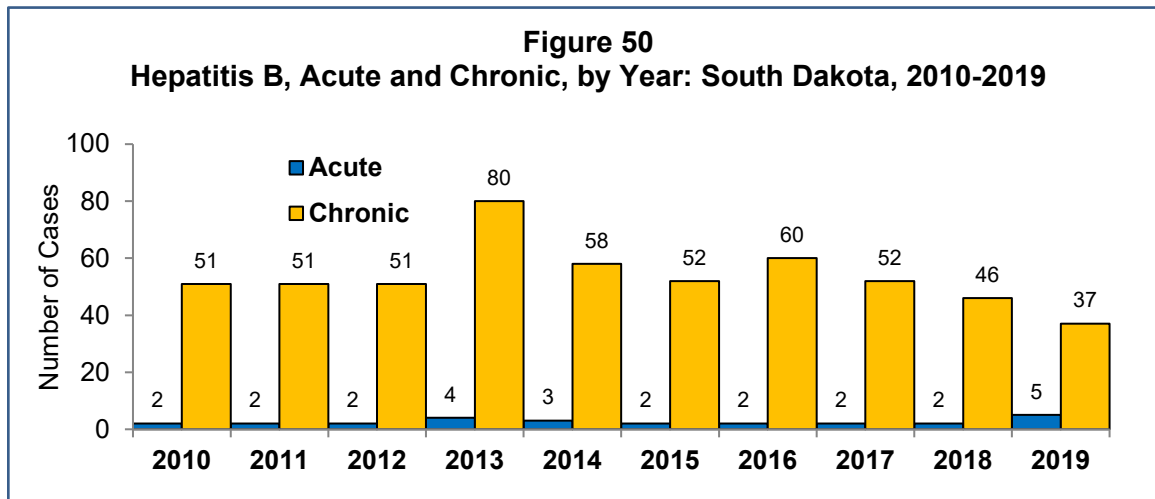


**Hepatitis B, acute and chronic**

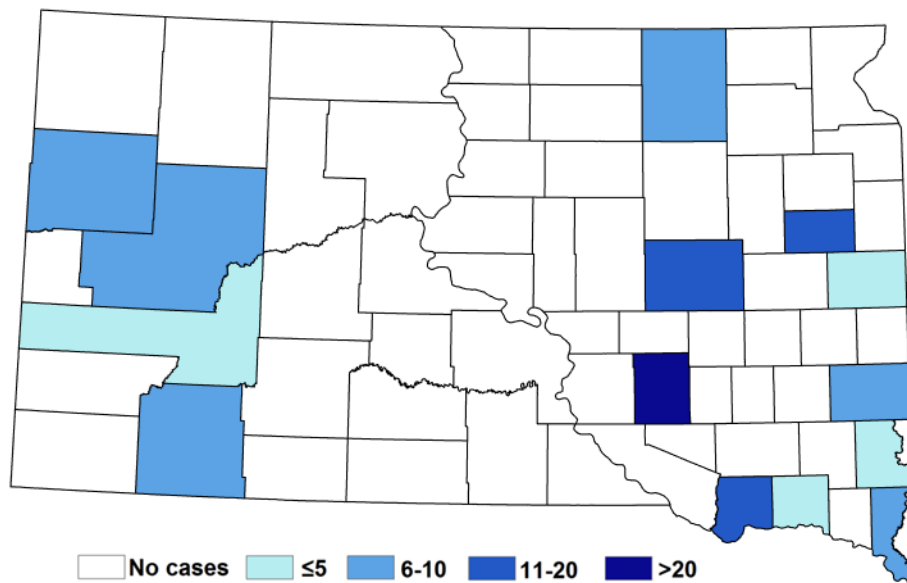
Hepatitis B is a liver disease caused by the hepatitis B virus (HBV). This virus is transmitted when blood and other body fluid from an infected person enters the body of someone who is not infected during sexual contact; sharing needles, syringes, or other drug-injection equipment; or from mother to 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 2019, there were 5 cases of acute hepatitis B and 37 cases of chronic hepatitis B reported in South Dakota. The median age of cases was 39 years old (range: 16 to 73) and 60 percent were male.



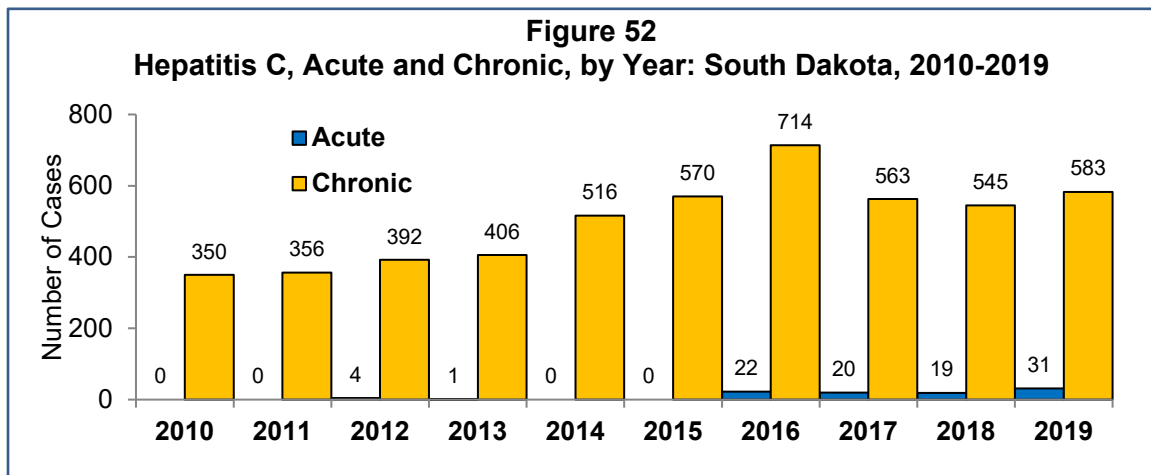
**Figure 51**  
**Incidence of Hepatitis B, Chronic, by County of Residence: South Dakota, 2019**  
(cases per 100,000)



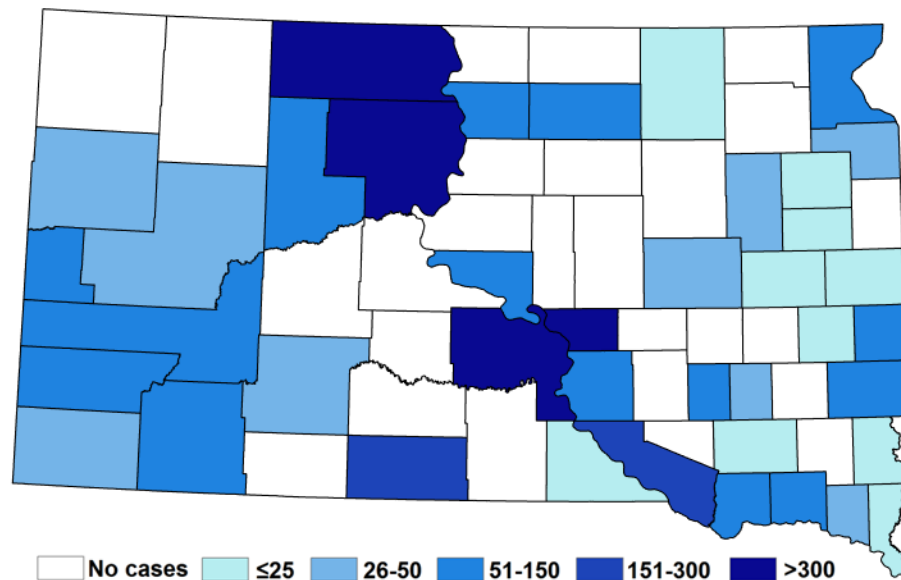
### Hepatitis C, acute and chronic

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 2019, there were 31 cases of acute hepatitis C and 583 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 Corson (758.7), Buffalo (458.7), Dewey (390.4), and Lyman (343.8).



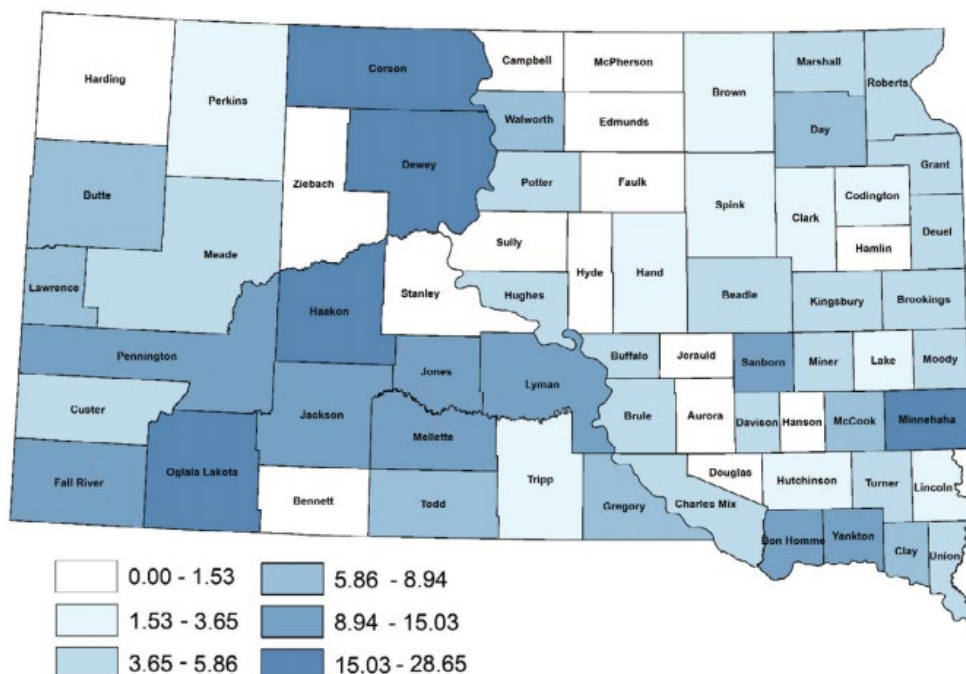
**Figure 53**  
**Incidence of Hepatitis C, Acute and Chronic, by County of Residence: South Dakota, 2019**  
(cases per 100,000)



## 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 2019, 38 new HIV/AIDS cases were reported in South Dakota.

**Figure 54**  
**Incidence of HIV/AIDS, by County of Residence: South Dakota, 1985-2019**  
 (cases per 10,000)



## Influenza

The 2019–2020 influenza season was a moderate severity season with two waves of influenza activity, beginning with influenza B followed by influenza A(H1N1)pdm09. Overall, influenza A(H1N1)pdm09 was the most commonly reported influenza viruses this season.

In South Dakota, there were 14,774 confirmed influenza cases reported to SDDOH, including 704 (5%) A(H1N1)pdm09, 22 (<1%) A(H3N2), 6,995 (47%) A-not subtyped, and 7,053 (48%) influenza B. The number of laboratories using rapid confirmatory tests has increased, which may account for some of the increase in confirmed cases reported in the 2019–2020 influenza season. Additionally, 27,012 rapid antigen influenza tests were performed with 7,171 positive results (27%); 3,385 (47%) positive for influenza A and 3,786 (53%) positive for influenza B.

**Table 75**  
**South Dakota Influenza Cases by Age Group, 2019-2020**

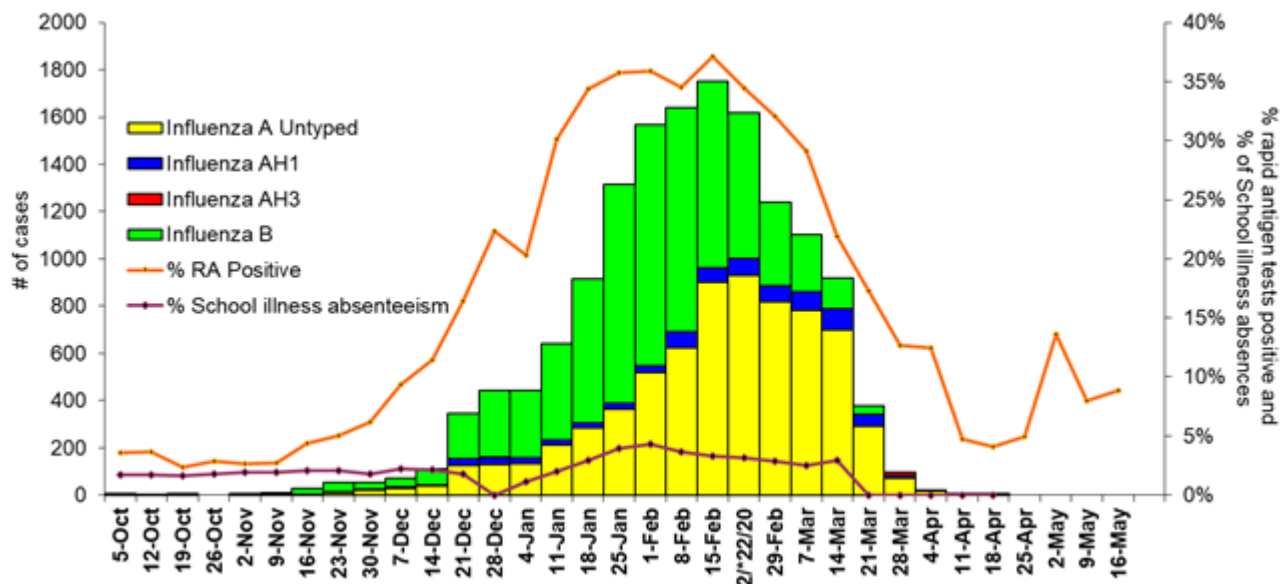
Lab Confirmed Influenza Cases (by DFA, PCR, or culture)		Influenza Associated Hospitalizations	Influenza Associated Deaths
Age Group	# Cases (%)	# Hosp (%)	Deaths (%)
0-4	2932 (20%)	55 (10%)	0 (0%)
5-18	5560 (38%)	50 (9%)	1 (3%)
19-49	4069 (28%)	120 (21%)	4 (12%)
50-64	1354 (9%)	116 (21%)	7 (21%)
> 64	859 (8%)	218 (39%)	21 (64%)
<b>Total</b>	<b>14,774</b>	<b>559</b>	<b>33</b>

The first confirmed case of influenza was reported the first week of October 2019 and the last case reported early April 2020. The peak of the season was the third week in February 2020 with influenza A and influenza B viruses all circulating at the same time.

There were 559 hospitalizations and 33 influenza-associated deaths reported during the 2019–2020 influenza season. The first case of COVID-19, caused by the SARS-CoV-2 virus, was first detected in South Dakota on March 10, 2020, which may have impacted the final weeks of influenza surveillance.

**Figure 55**  
**2019-2020 Influenza Season Lab Confirmed Influenza Cases\*,**  
**% Rapid Antigen Positive, & % School Absenteeism SD**

\* 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 23 cases of legionellosis reported in South Dakota in 2019, a 130 percent increase over the five-year median (median: 10).



### 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 which lowers the risk of exposure to Lyme disease among South Dakota residents.

In 2019, 10 cases of Lyme disease were reported in South Dakota residents. Six (60%) cases reported recent travel outside of South Dakota, mainly to states along the Great Lakes, where they were likely exposed to blacklegged ticks.

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### 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.

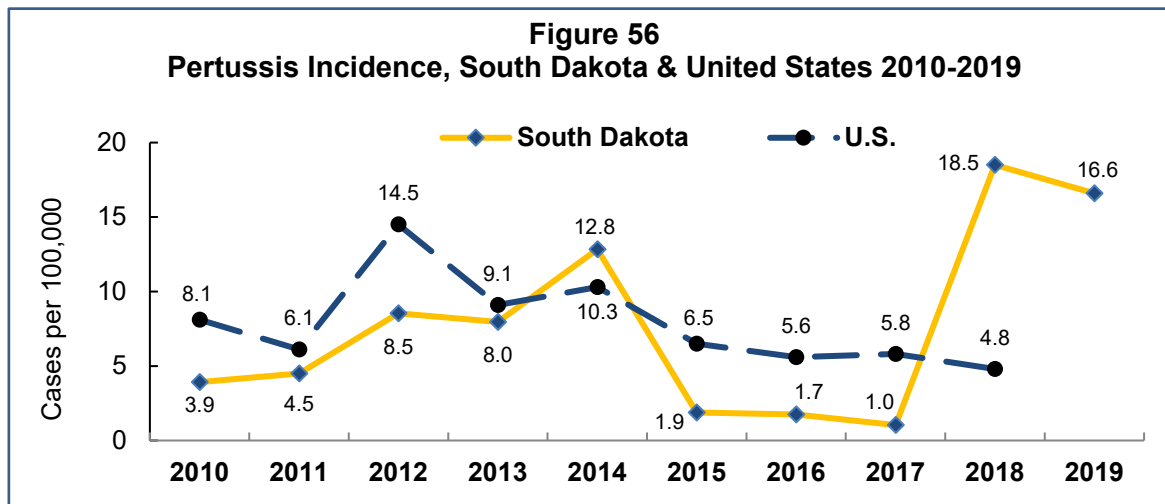
In 2019, there were 156 cases of invasive MRSA reported in South Dakota, an 8% increase from the five-year median (median: 144). The highest rate of disease was among the elderly, ages 65 years and older.

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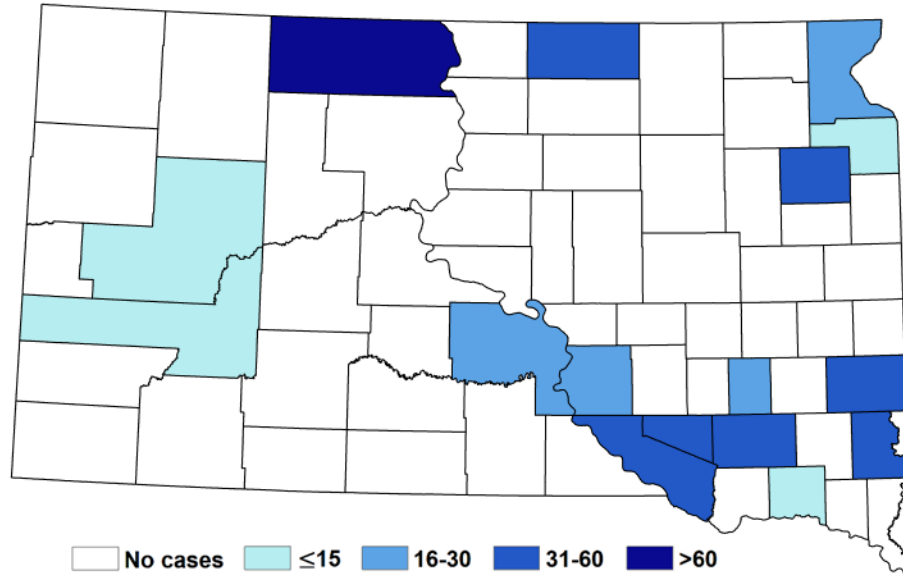
### Pertussis (whooping cough)

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.

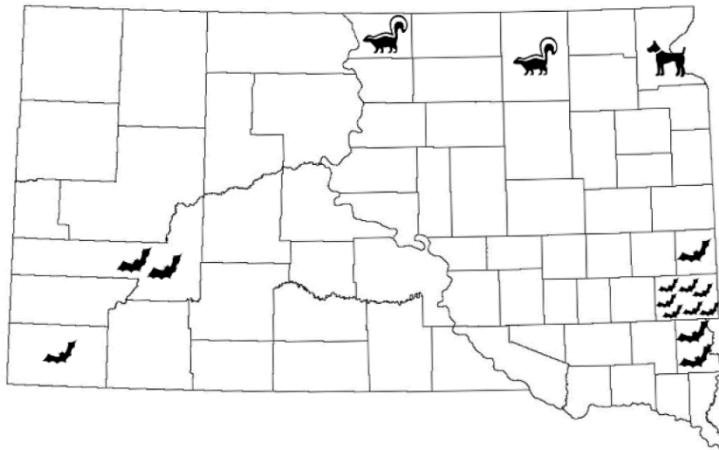
In 2019, 147 cases of pertussis were reported in South Dakota. This represented an 819 percent increase over the five-year median (median: 16). There were 109 cases (74%) in children less than 15 years old.



**Figure 57**  
**Incidence of Pertussis by County of Residence: South Dakota, 2019**  
(cases per 100,000)



**Figure 58**  
**Animal Rabies in South Dakota, 2019**



**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.

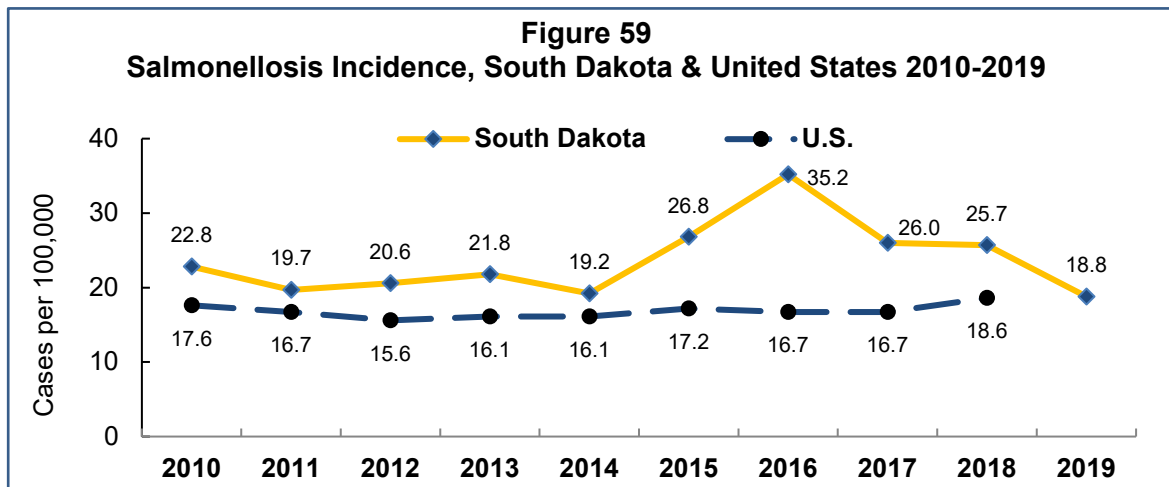
A total of 16 animals tested positive for rabies in 2019, a seven percent increase from 2018. The 16 rabid animals included only one domestic animal (a dog), and 15 wild animals (13 bats and 2 skunks). The total was the second-lowest annual total on record in South Dakota (15 in 2018). No human rabies was reported.

Rabid animals in 2019 were reported from the following counties: Minnehaha 7, Lincoln 2, Pennington 2, Brown 1, Campbell 1, Fall River 1, Moody 1, and Roberts 1.

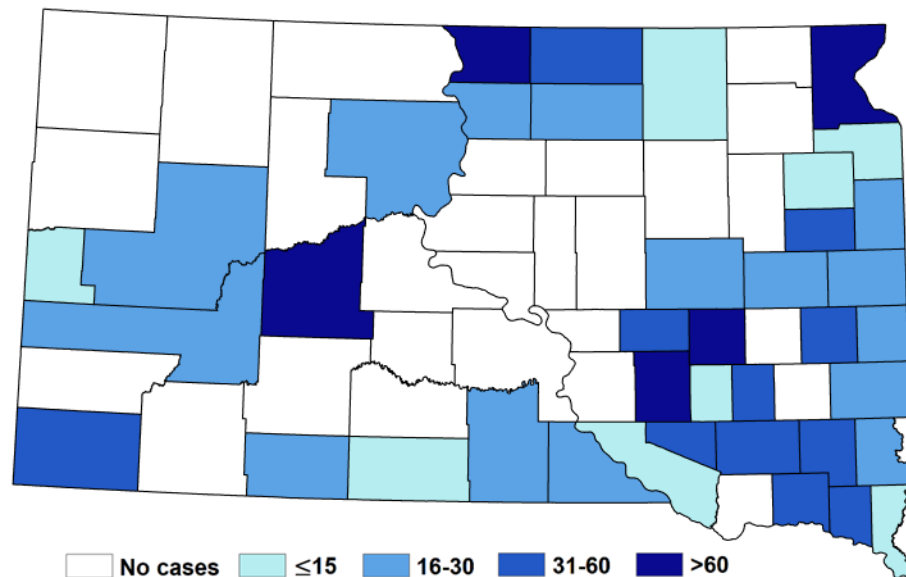
## Salmonellosis

*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 2019, 166 cases of salmonellosis were reported in South Dakota (incidence of 18.8 cases per 100,000 population), which was a 27 percent decrease from the five-year median (median: 227). The *Salmonella* serotypes most commonly identified were *S. Typhimurium* (33 cases) and *S. Enteritidis* (24 cases), accounting for 41 percent of cases with available serotype information.



**Figure 60**  
**Incidence of Salmonellosis by County of Residence: South Dakota, 2019**  
(cases per 100,000)

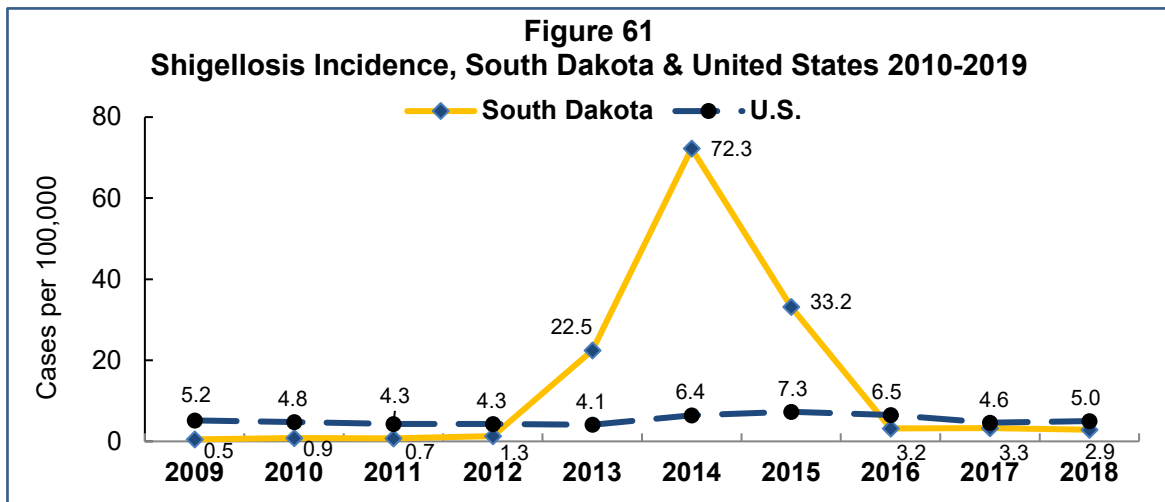


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## Shigellosis

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 2019, there were 9 cases of shigellosis reported in South Dakota, a 69 percent decrease from the five-year median (median: 29). South Dakota experienced a protracted multi-county outbreak from October 2013 to November 2015, largely in childcare settings.



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## *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 ear infections and meningitis. There are vaccines to prevent pneumococcal disease in children and adults. In 2019, there were 101 cases of invasive pneumococcal disease reported in South Dakota.

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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 56 cases of early syphilis (primary, secondary, and early non-primary non-secondary) and 3 congenital syphilis cases reported in 2019. Three counties (Minnehaha, Pennington, and Todd) accounted for 64 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 2019. The median age of cases was 35 years (range: 25 to 68). American Indians have historically reported the highest percentage of TB cases by race, however, in 2019 they only contributed 6 percent of the cases, with white (19%), black (50%), and Asian (25%) each contributing higher percentage of TB cases. In 2019, 75 percent of the 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.

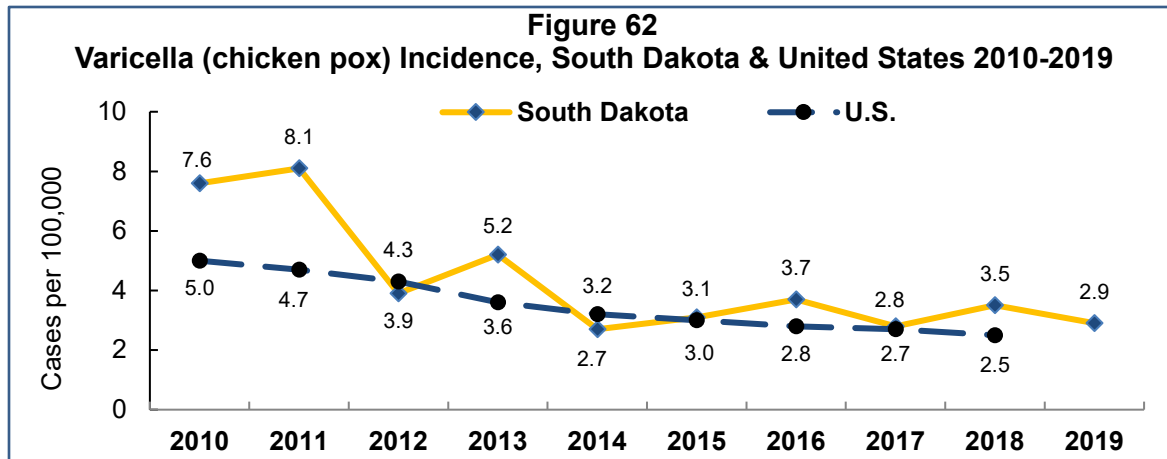
There were 17 cases of tularemia reported in South Dakota in 2019 (10 ulceroglandular, 3 pneumonic, 2 glandular, and 2 oropharyngeal). The median age of cases was 41 years old (range: 1 to 76) and 71 percent were male.

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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 2019, 26 cases of chicken pox were reported in South Dakota, with 62 percent of cases being unvaccinated. The median age was 6 years old (range: 0 to 32).

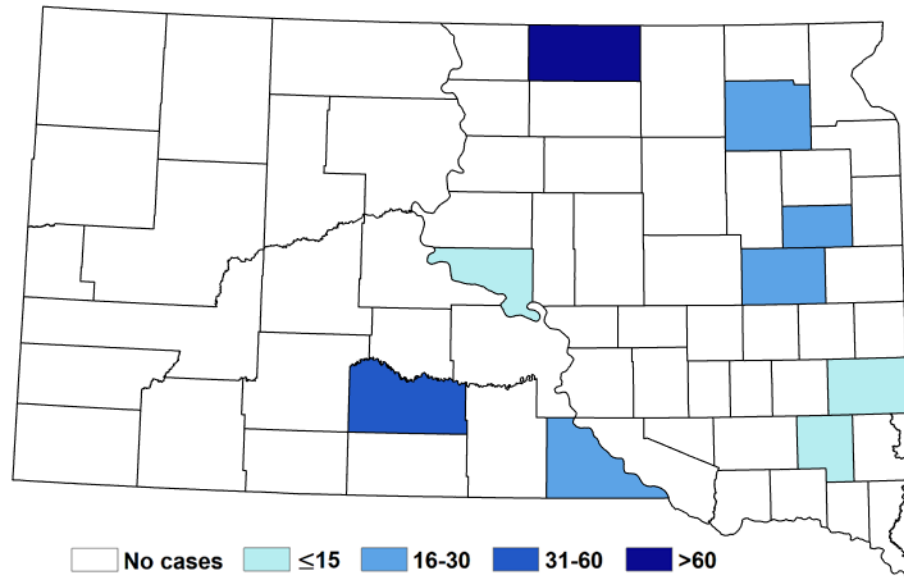


### West Nile virus (WNV)

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 individuals with this type of WNV disease recover completely, but fatigue and weakness can last for weeks or months. Less than 1% 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 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 10 percent.

In South Dakota, there were 11 human cases of WNV disease reported in 2019, all non-neuroinvasive. The overall incidence of WNV was 1.2 cases per 100,000 population. One (9%) WNV case was hospitalized. There were no deaths.

**Figure 63**  
**Incidence of Human WNV disease by County of Residence: South Dakota, 2019**  
(cases per 100,000)



**Other Infectious Diseases**

Other infectious diseases reported in South Dakota during 2019 include: 30 cases of invasive *Haemophilus influenzae* (1 type b, 29 non-type b), 12 cases of mumps, 11 cases of Q fever, 10 cases each of cyclosporiasis and spotted fever rickettsiosis, 8 cases of coccidioidomycosis, 6 cases of malaria, 3 cases each of hantavirus infection (2 pulmonary, 1 non-pulmonary) and vibriosis, and 1 case each of dengue and tetanus.





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