

## Infectious Diseases in South Dakota, 2021

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 2021. It highlights important statistics and shows key trends on selected reportable diseases in the state. The COVID-19 pandemic continued to be the dominant public health issue of 2021 with the emergence of new SARS-CoV-2 variants. 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 impacted the incidence of many infectious diseases.

**Table 71 Reportable Diseases in South Dakota, 2012-2021** (Calendar years)

Reportable diseases	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
Babesiosis	0	1	1	0	0	0	0	0	1	0	3
Botulism	0	0	0	0	0	0	0	0	0	0	0
Brucellosis	0	1	0	0	0	1	0	0	0	0	2
Campylobacteriosis	276	296	307	346	450	395	532	524	324	310	3760
Carbapenem-resistant Enterobacterales (CRE)	NR	12	3	37	58	64	53	40	29	39	335
Chicken Pox (Varicella)	32	43	23	27	32	24	31	26	18	9	265
Chlamydia	3925	3947	4129	3967	4336	4439	4441	4545	4007	4858	42594
Coccidioidomycosis	NR	NR	NR	NR	5	6	3	8	7	6	35
Coronavirus Disease 2019 (COVID-19)	-	-	-	-	-	-	-	-	99984	81626	181610
Cryptosporidiosis	113	175	151	248	158	163	177	167	76	127	1555
Cyclosporiasis	0	1	0	0	3	4	30	10	22	16	86
Dengue	2	3	0	2	2	0	1	1	2	0	13
Ehrlichiosis and Anaplasmosis	1	1	0	0	1	1	4	0	2	3	13
Giardiasis	144	111	131	129	116	104	114	92	66	71	1078
Gonorrhea	707	789	880	1055	1271	1291	1694	2170	2399	3261	15517
Hantavirus pulmonary syndrome	1	0	0	0	0	1	0	2	1	0	5
Hepatitis A	0	4	3	2	1	1	1	8	1	1	22
Hepatitis B, chronic	51	80	58	52	60	52	46	37	53	36	525
Hepatitis B, acute	2	5	3	2	2	2	1	5	4	4	30
Hepatitis C, chronic	392	406	516	570	714	563	545	583	723	847	5859
Hepatitis C, acute	4	1	0	0	22	20	19	31	10	5	112

Reportable diseases	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	Total
<i>Haemophilus influenzae</i> , invasive	NR	NR	NR	NR	20	21	30	30	14	17	132
Hemolytic uremic syndrome	0	0	1	1	1	0	0	5	2	6	16
HIV and AIDS	23	26	24	20	35	28	21	31	32	27	267
Legionellosis	9	8	9	10	9	15	33	23	10	21	147
Leprosy (Hansen's disease)	0	0	0	0	0	0	0	0	0	1	1
Listeriosis	0	0	0	0	0	2	1	0	2	1	6
Lyme disease	4	4	2	5	11	12	7	10	8	16	79
Malaria	5	7	5	4	4	8	9	6	2	8	58
Measles	0	0	8	2	0	0	0	0	0	0	10
Meningococcal disease	0	4	2	1	1	0	0	0	0	1	9
Multisystem inflammatory syndrome	NR	NR	NR	NR	NR	NR	NR	NR	6	9	15
Mumps	0	0	0	0	2	0	0	12	0	0	14
Pertussis	71	67	109	16	15	9	163	147	34	1	632
Q fever	2	4	5	5	4	5	12	11	8	5	61
Rabies, animal	60	28	21	29	27	22	15	16	10	15	243
Salmonellosis	170	183	164	230	305	226	227	166	179	220	2070
Shiga toxin-producing <i>E. coli</i>	48	42	41	62	84	91	204	136	97	96	901
Shigellosis	11	190	616	285	28	29	26	9	12	17	1223
Spotted fever rickettsiosis	1	7	3	2	6	13	14	10	7	7	70
Methicillin-resistant <i>Staph aureus</i> (MRSA), invasive	89	94	124	159	144	115	173	156	169	178	1401
<i>Strep. pneumoniae</i> , invasive	97	99	88	110	129	135	106	101	71	95	1031
Syphilis (primary, secondary, and early non-primary non-secondary)	21	49	76	48	41	52	50	56	101	787	1281
Syphilis, congenital	0	0	3	0	2	3	1	3	4	16	32
Toxic shock syndrome	0	0	0	3	1	0	1	0	0	0	5
Tularemia	5	7	5	25	14	13	9	17	10	14	119
Tuberculosis	19	9	8	17	12	14	12	16	16	12	135
Typhoid fever	0	3	0	1	2	0	0	0	0	1	7
West Nile fever	141	92	45	29	117	46	122	11	9	29	641
West Nile neuroinvasive	62	57	12	11	35	27	47	0	11	19	281
Vibriosis	NR	NR	NR	NR	5	12	9	3	3	9	41

\*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, 2021** (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>310</b>	<b>4858</b>	<b>127</b>	<b>71</b>	<b>3261</b>	<b>36</b>	<b>846</b>	<b>21</b>	<b>178</b>	<b>1</b>	<b>220</b>	<b>17</b>	<b>95</b>	<b>96</b>	<b>14</b>	<b>9</b>	<b>48</b>
Incidence*	34.6	542.6	14.2	7.9	364.2	4.0	94.5	2.3	19.9	0.1	24.6	1.9	10.6	10.7	1.6	1.0	5.4
Aurora	<5	6	0	0	<5	0	<5	0	0	0	0	0	0	<5	0	0	0
Beadle	11	53	<5	<5	13	0	7	0	<5	0	6	0	<5	<5	0	0	<5
Bennett	5	41	0	0	34	0	<5	0	<5	0	0	0	0	0	0	0	0
Bon Homme	<5	14	0	0	<5	<5	5	0	0	0	<5	0	0	<5	0	0	<5

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
Brookings	5	178	<5	<5	31	0	0	0	<5	0	5	<5	0	<5	0	0	0
Brown	12	139	<5	0	26	<5	25	0	0	0	6	0	5	0	0	0	0
Brule	7	24	<5	0	32	0	6	0	0	<5	<5	0	0	<5	0	0	0
Buffalo	0	34	0	0	34	0	16	<5	0	0	0	<5	0	0	0	0	0
Butte	7	33	<5	<5	10	0	<5	<5	0	0	<5	0	<5	<5	0	0	0
Campbell	<5	<5	0	<5	0	0	0	0	0	0	0	0	<5	0	0	0	0
Charles Mix	<5	79	<5	<5	53	0	30	<5	5	0	5	<5	0	<5	0	<5	0
Clark	6	<5	<5	<5	<5	0	0	0	0	0	<5	0	0	0	0	0	<5
Clay	<5	86	<5	<5	8	<5	7	0	0	0	5	0	0	<5	0	0	0
Codington	<5	91	<5	<5	25	0	10	0	<5	0	5	<5	0	<5	0	0	<5
Corson	<5	39	0	0	41	0	31	0	<5	0	<5	0	<5	0	0	0	0
Custer	<5	8	<5	0	9	0	11	0	0	0	<5	0	<5	<5	0	0	0
Davison	11	82	<5	0	30	<5	12	0	<5	0	<5	<5	<5	<5	<5	<5	<5
Day	<5	9	<5	0	<5	0	<5	0	<5	0	0	0	<5	<5	0	0	0
Deuel	<5	7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Dewey	<5	110	<5	<5	93	<5	29	0	<5	0	<5	0	0	0	0	0	<5
Douglas	5	<5	<5	0	0	0	<5	0	0	0	6	0	<5	<5	0	0	<5
Edmunds	0	5	0	0	0	0	<5	0	0	0	<5	0	0	0	0	0	0
Fall River	6	27	0	0	9	0	15	0	<5	0	0	<5	0	0	0	0	0
Faulk	<5	<5	0	<5	<5	0	0	0	<5	0	0	0	0	0	<5	<5	0
Grant	<5	8	0	0	<5	0	<5	0	0	0	<5	0	<5	<5	0	0	0
Gregory	9	5	0	0	<5	0	<5	0	<5	0	0	0	<5	0	0	0	0
Haakon	0	7	0	0	<5	0	<5	0	0	0	0	0	0	<5	0	0	0
Hamlin	<5	6	0	<5	0	0	<5	0	<5	0	<5	0	0	0	0	0	<5
Hand	0	6	0	0	<5	0	<5	0	0	0	0	0	<5	0	0	0	<5
Hanson	<5	9	<5	0	0	0	0	0	0	0	<5	0	0	0	0	<5	0
Harding	<5	<5	0	0	<5	0	0	0	0	0	<5	0	0	0	0	0	0
Hughes	<5	60	<5	0	52	0	17	0	<5	0	<5	0	<5	0	0	0	<5
Hutchinson	<5	8	0	0	<5	0	<5	0	<5	0	5	0	0	0	0	0	<5
Hyde	<5	<5	0	0	0	0	<5	0	<5	0	0	0	0	0	0	0	0
Jackson	<5	35	0	<5	32	0	9	<5	0	0	0	0	0	0	<5	<5	0
Jerauld	<5	<5	0	0	0	0	0	0	0	0	0	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	<5	10	0	<5	<5	0	<5	0	<5	0	<5	0	0	0	0	0	<5
Lake	<5	24	<5	<5	5	0	<5	0	<5	0	<5	0	<5	0	0	0	<5
Lawrence	7	95	0	0	31	0	31	0	<5	0	<5	0	<5	<5	0	0	<5
Lincoln	11	183	10	6	56	0	12	<5	8	0	19	<5	<5	7	0	<5	0
Lyman	<5	28	0	<5	36	0	14	0	<5	0	<5	0	0	<5	0	0	0
Marshall	<5	10	<5	<5	<5	0	<5	0	<5	0	0	0	0	0	0	0	<5
McCook	<5	15	0	<5	0	0	<5	0	0	0	0	0	<5	<5	0	0	0
McPherson	<5	<5	0	<5	0	0	<5	0	<5	0	0	0	0	0	0	0	0
Meade	8	107	<5	<5	30	0	17	<5	<5	0	5	0	0	7	0	0	0
Mellette	<5	25	0	0	20	<5	<5	0	<5	0	<5	<5	0	0	0	0	0
Miner	<5	<5	0	0	0	0	<5	0	0	0	<5	0	0	<5	0	0	0
Minnehaha	47	1253	45	17	878	21	221	9	38	<5	44	6	28	18	0	<5	5
Moody	<5	28	<5	<5	9	0	<5	0	<5	0	0	0	0	<5	0	0	<5
Oglala Lakota	7	305	0	<5	313	0	28	0	10	0	<5	0	<5	0	5	0	<5
Pennington	38	889	<5	11	841	5	123	<5	31	0	15	0	17	16	0	<5	0
Perkins	<5	<5	0	0	0	0	0	0	0	0	<5	0	0	<5	0	0	0
Potter	<5	5	<5	<5	0	0	0	0	<5	0	<5	0	0	0	0	0	<5
Roberts	<5	72	<5	<5	30	0	8	0	6	0	<5	0	<5	0	0	0	<5
Sanborn	<5	5	<5	0	<5	0	0	0	0	0	0	0	<5	0	0	0	<5
Spink	<5	<5	<5	0	0	0	<5	0	<5	0	<5	0	<5	0	0	0	<5
Stanley	<5	12	<5	0	<5	0	<5	0	0	0	0	0	0	0	0	0	<5
Sully	0	0	<5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Todd	<5	320	<5	<5	320	0	61	0	6	0	<5	0	<5	0	<5	0	0
Tripp	<5	34	0	0	25	0	6	<5	<5	0	5	0	<5	<5	0	0	<5

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
Turner	9	23	5	0	5	0	5	0	5	0	15	0	5	5	0	0	0
Union	9	34	5	5	16	0	8	5	0	0	10	0	5	5	0	0	5
Walworth	0	28	0	0	29	0	10	0	0	0	5	5	0	0	0	0	5
Yankton	8	94	6	5	33	5	12	0	9	0	5	0	5	0	0	0	5
Ziebach	0	24	0	0	21	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 73 Reportable Diseases by Gender, Race and Age, South Dakota, 2021** (Calendar years)

	Campylobacteriosis	Chlamydia	CRE	Cryptosporidiosis	Giardiasis	Gonorrhea	Hepatitis B, chronic	Hepatitis C, chronic	HIV and AIDS	MRSA, invasive	Salmonellosis	Shiga Toxin-Producing E. coli	Shigellosis	Strep. pneumo, invasive	Syphilis (P, S, E non-P non-S)	Tuberculosis	Tularemia	Varicella (Chicken pox)	West Nile disease	
<b>Total</b>	<b>310</b>	<b>4858</b>	<b>39</b>	<b>127</b>	<b>71</b>	<b>3261</b>	<b>36</b>	<b>846</b>	<b>27</b>	<b>178</b>	<b>220</b>	<b>96</b>	<b>17</b>	<b>95</b>	<b>787</b>	<b>12</b>	<b>14</b>	<b>9</b>	<b>48</b>	
<b>Incidence*</b>	34.6	542.6	4.4	14.2	7.9	364.2	4.0	94.5	3.0	19.9	24.6	10.7	1.9	10.6	87.9	1.3	1.6	1.0	5.4	
<b>Gender</b>																				
Female	119	3311	23	61	37	1842	13	395	6	64	103	45	9	47	397	7	8	3	10	
Male	191	1547	16	66	34	1419	23	451	21	114	117	51	8	48	390	5	6	6	38	
<b>Race</b>																				
White	259	2131	33	116	59	786	5	346	11	101	194	88	16	58	137	3	4	6	43	
Am.Indian	29	2054	6	7	8	2086	2	406	11	67	18	5	1	29	610	2	10	1	4	
Black	5	380	0	2	0	303	19	21	5	9	2	0	0	5	32	1	0	1	0	
Asian	1	43	0	0	1	19	7	4	0	0	1	1	0	1	2	4	0	0	0	
Other	7	222	0	1	1	47	0	43	0	1	3	1	0	2	6	2	0	0	1	
Unknown	9	28	0	1	2	20	3	26	0	0	2	1	0	0	0	0	0	1	0	
<b>Age group</b>																				
<1 yr	2	0	0	3	3	1	0	0	1	0	8	0	0	2	0	0	0	3	0	
1-4 yrs	28	0	0	21	10	2	0	0	0	1	10	15	1	3	0	0	1	2	0	
5-14 yrs	34	41	2	25	12	16	0	0	0	3	12	10	0	0	0	0	10	0	0	
15-24 yrs	35	2802	0	31	3	1081	2	106	3	5	27	14	1	1	155	2	2	2	1	
25-39 yrs	71	1769	0	22	10	1756	20	367	13	19	37	21	2	14	475	4	1	2	6	
40-64 yrs	94	240	12	18	18	399	12	298	10	83	62	20	4	42	155	5	0	0	22	
≥65 yrs	46	4	25	7	15	5	2	75	0	67	64	16	9	33	2	1	0	0	19	

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

\*Incidence: cases per 100,000 population

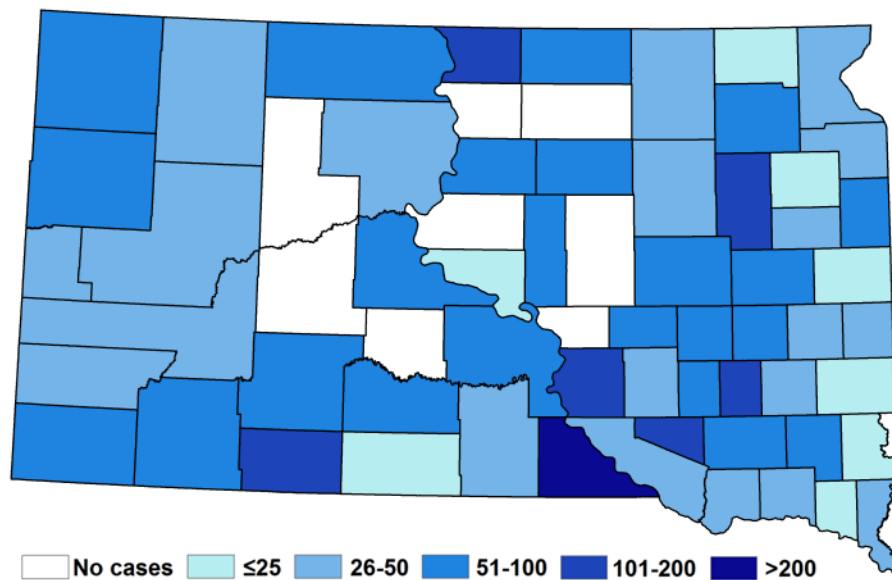
### Campylobacteriosis

*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.

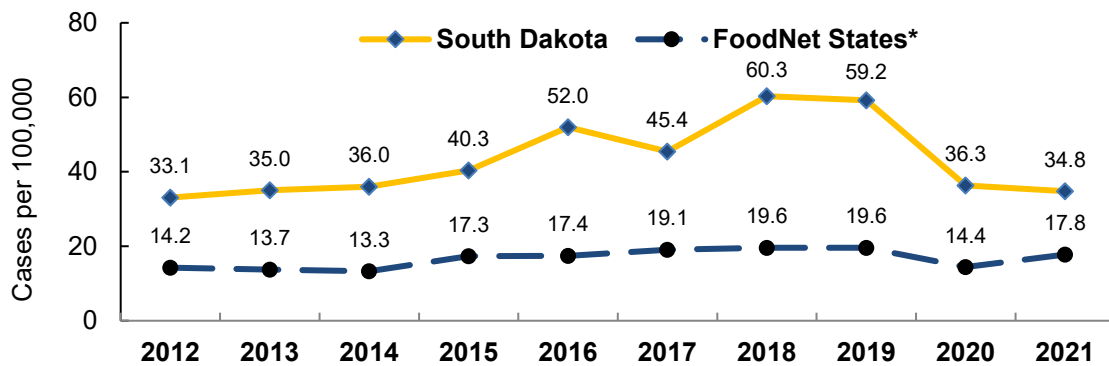
Complications may include convulsions, neonatal septicemia, extra-intestinal infection, arthritis, and one in 1,000 campylobacteriosis cases leads to Guillain-Barré syndrome. *Campylobacter*-associated deaths are rare.

Campylobacteriosis has been the most commonly reported enteric bacterial pathogen in South Dakota since 2001. In 2021, there were 310 cases of *Campylobacter* infection reported, a 31 percent decrease from the five-year median (median: 450). Counties with the highest incidence (cases per 100,000 population) included Gregory (226.3), Douglas (177.2), Clark (155.6), and Bennett (146.8). 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, 2021**  
(cases per 100,000)



**Figure 35**  
**Campylobacteriosis Incidence, South Dakota & U.S. (FoodNet States\*) 2012-2021**

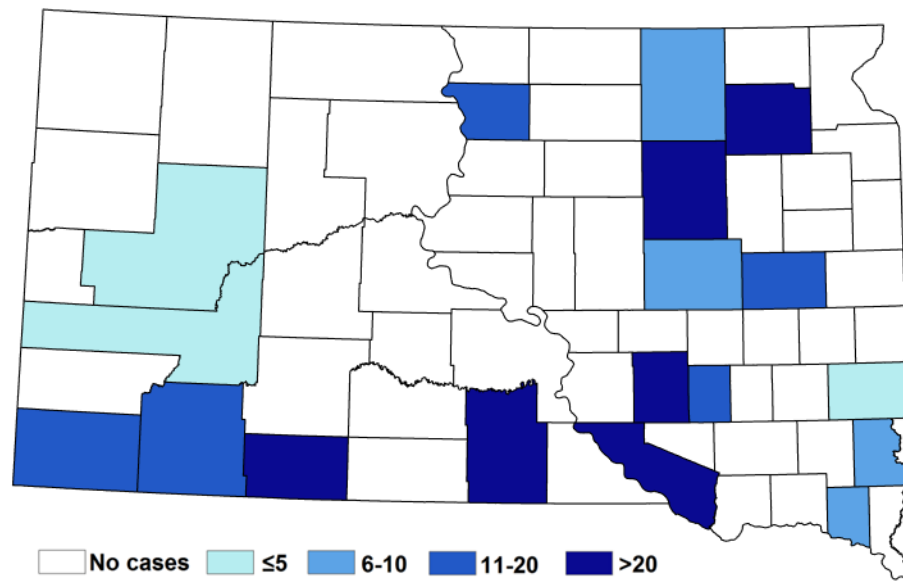


\*FoodNet states include CA, CO, CT, GA, MD, MN, NM, NY, OR, and TN.

### Carbapenem-resistant Enterobacteriales (CRE)

Carbapenem-resistant Enterobacteriales (CRE) are a family of bacteria that are difficult to treat because they are highly resistant to group of antibiotics called carbapenems. CRE are an important emerging threat to public health. Common bacteria in the Enterobacteriales 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. Enterobacteriales can cause infections in people in both healthcare and community settings. In South Dakota, 39 cases of CRE were reported in 2021. The statewide incidence was 4.4 cases per 100,000 population.

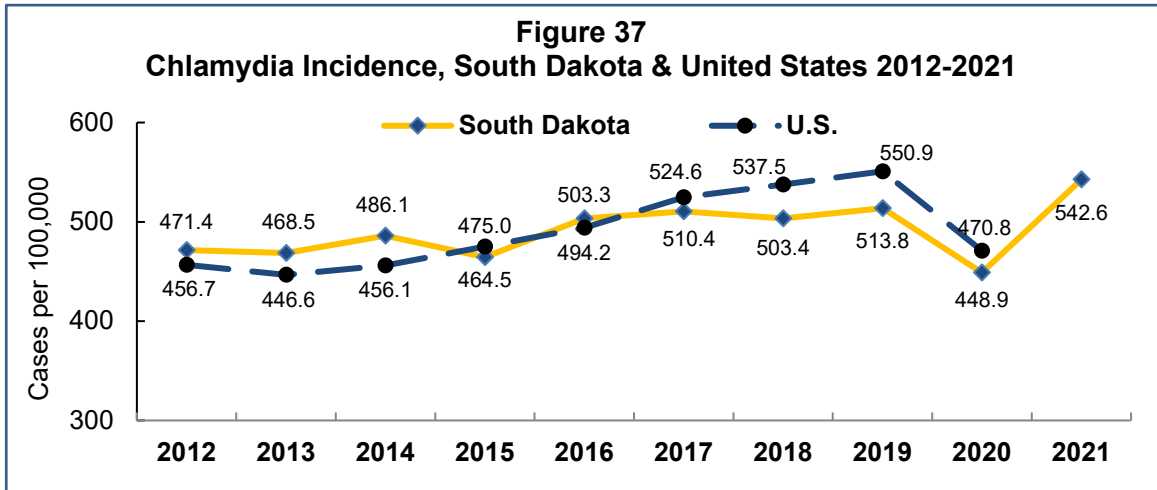
**Figure 36**  
**Incidence of CRE by County of Residence: South Dakota, 2021**  
(cases per 100,000)



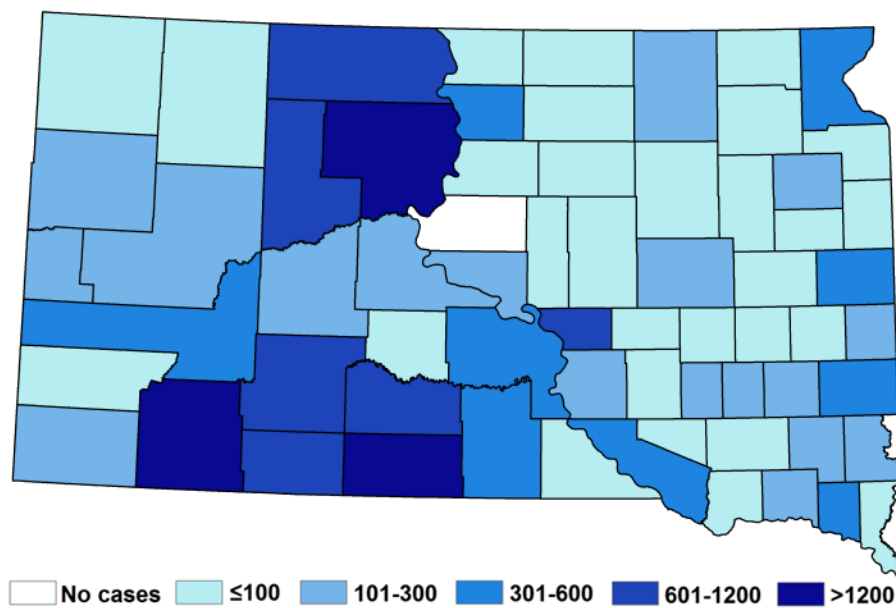
### Chlamydia

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 2021, there were 4,858 cases of chlamydia reported in South Dakota, a nine percent increase from the five-year median (median: 4,439). Counties with the highest incidence (cases per 100,000 population) included Todd (3,446.0), Oglala Lakota (2,245.0), Dewey (2,096.8), and Buffalo (1,768.1). 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, 2021**  
 (cases per 100,000)



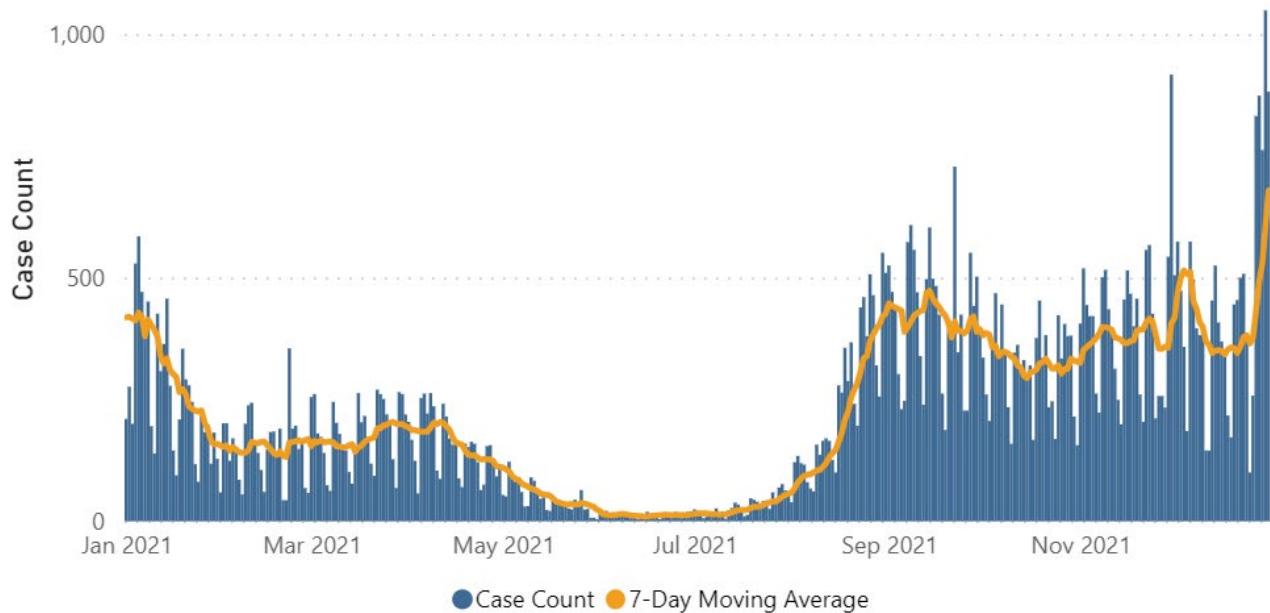
**Coronavirus Disease 2019 (COVID-19)**

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 Year 2 of the COVID-19 pandemic in South Dakota, new SARS-CoV-2 variants caused waves in case counts – Alpha variant in the spring, Delta variant at the end of summer into the fall, and Omicron variant in December. In total, there were 81,626 cases of COVID-19 reported in South Dakota in 2021, resulting in 3,867 hospitalizations and 831 deaths.

Vaccines for COVID-19 became widely available by the spring of 2021. In addition to vaccination, nonpharmaceutical interventions, such as physical distancing and masking, remained to be effective prevention tools against COVID-19, especially as new SARS-CoV-2 variants emerged.

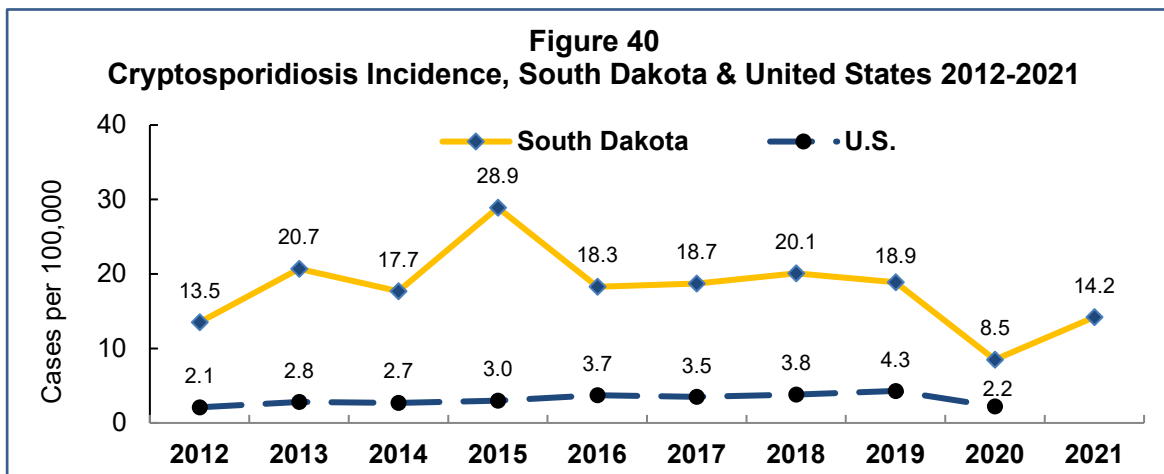
**Figure 39**  
**Cases of COVID-19 by Date Reported to SDDOH: South Dakota, 2021**



**Cryptosporidiosis**

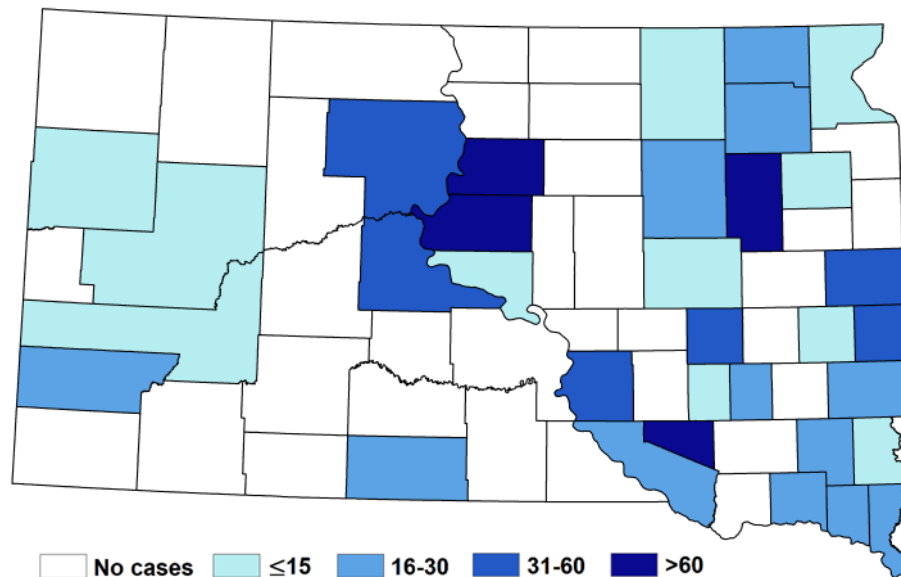
Cryptosporidiosis is a diarrheal disease caused by a chlorine-tolerant protozoan parasite that is transmitted by cattle or human feces through contaminated food or water or by direct person-to-person or animal-to-person contact. In 2021, there were 127 cases (14.2 cases per 100,000 population) reported in South Dakota, a 22 percent decrease from the five-year median (median: 163). Children less than 15 years of age accounted for 39 percent of cases. An outbreak associated with a swimming pool impacted this age group. 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 2012-2021**





**Figure 41**  
**Incidence of Cryptosporidiosis by County of Residence: South Dakota, 2021**  
(cases per 100,000)



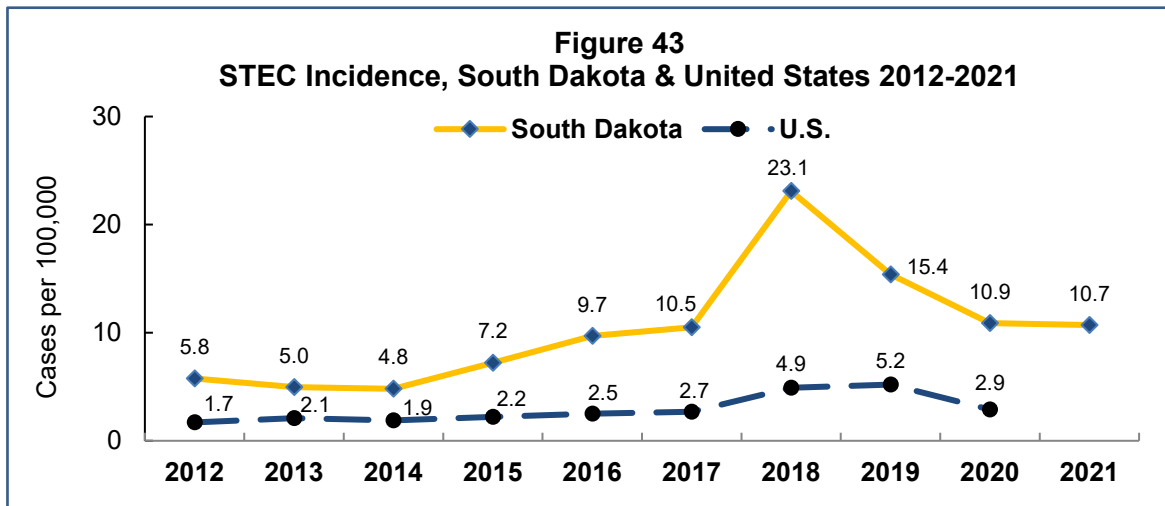
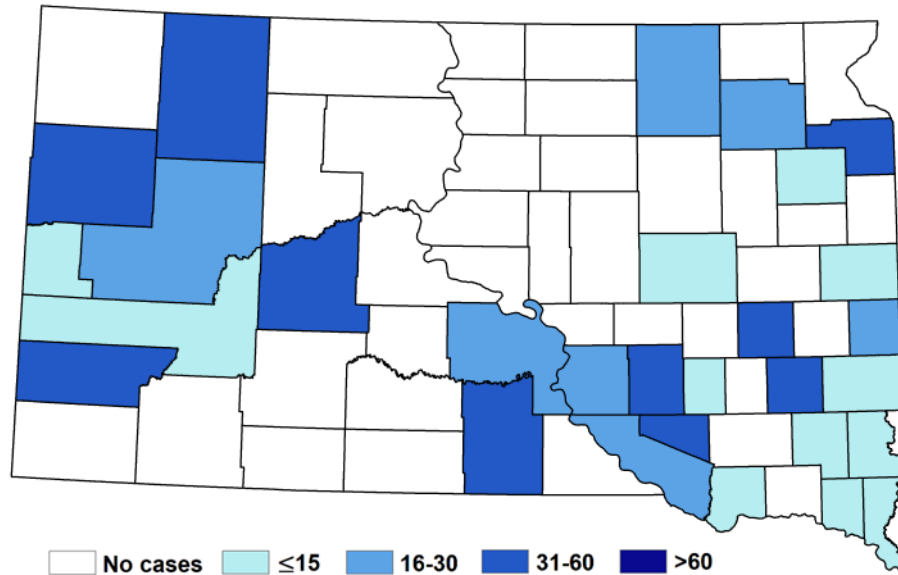
***Escherichia coli*, shiga toxin-producing (STEC)**

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) have been included in the reported case count totals since 2018.

In 2021, 96 cases of STEC were reported in South Dakota. The incidence rate was 10.7 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 25 cases (26%) that occurred in children less than 15 years of age. Six 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 2021: 14 cases O157:H7, four cases O26, three cases O111, and two cases O121.

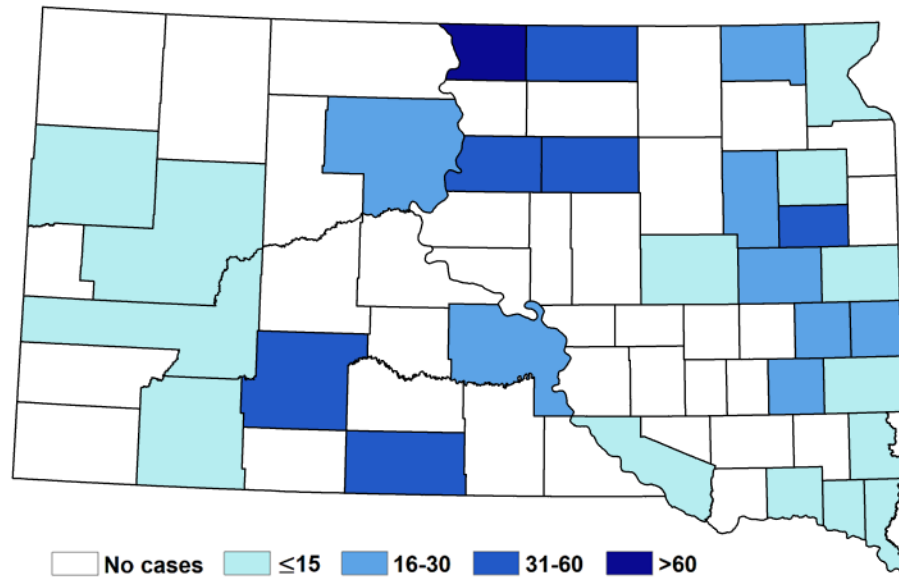
**Figure 42**  
**Incidence of STEC by County of Residence: South Dakota, 2021**  
(cases per 100,000)



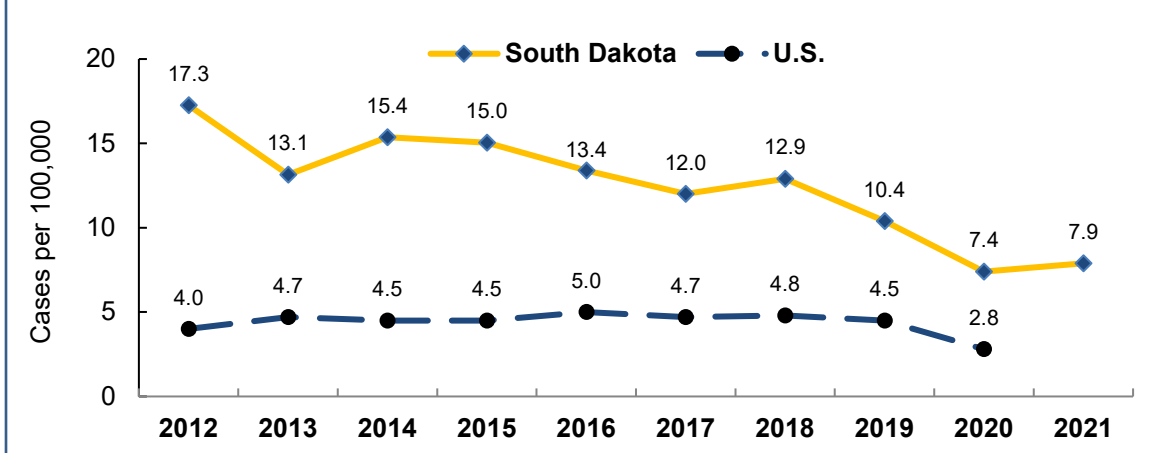
**Giardiasis**

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 2021, 71 cases of *Giardia* infection were reported in South Dakota residents (7.9 cases per 100,000 population), which was below the five-year median (median: 104). 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, 2021**  
(cases per 100,000)



**Figure 45**  
**Giardiasis Incidence, South Dakota & United States 2012-2021**

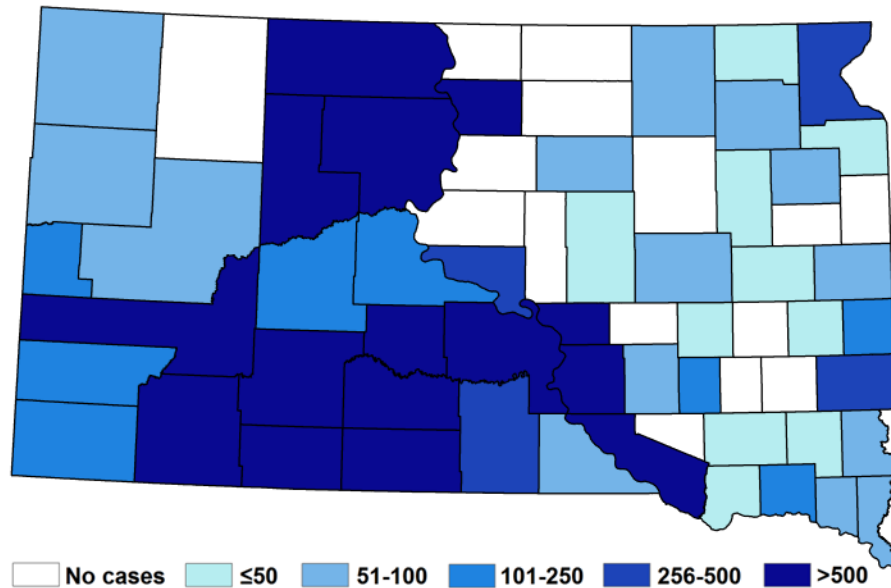


**Gonorrhea**

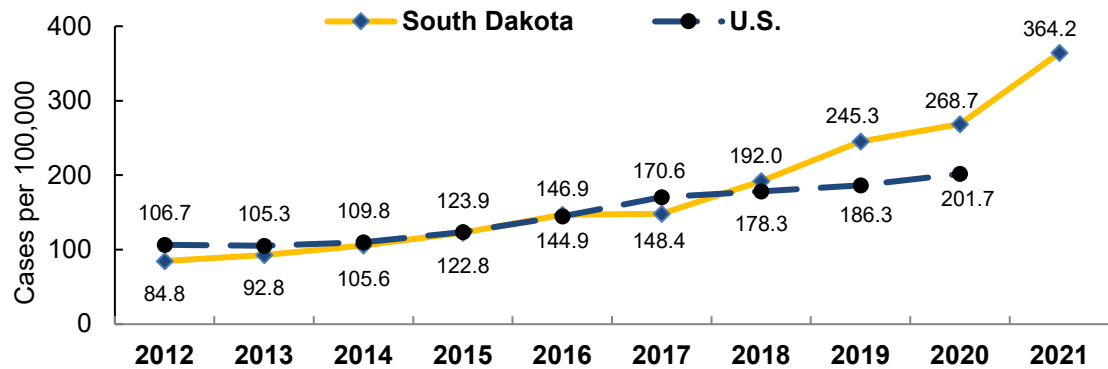
Gonorrhea is a sexually transmitted disease (STD) that can cause infections in the genitals, rectum, and throat, and less commonly as an invasive, disseminated disease. Gonorrhea is most common among young people ages 15-24 years. Although gonorrhea may be asymptomatic, untreated gonorrhea can cause 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 2021, there were 3,261 cases reported, which is a rate of 364.2 cases per 100,000 population. The median age of cases was 28 years old (range: 0 to 73). Females accounted for 56 percent of cases.

**Figure 46**  
**Incidence of Gonorrhea by County of Residence: South Dakota, 2021**  
 (cases per 100,000)

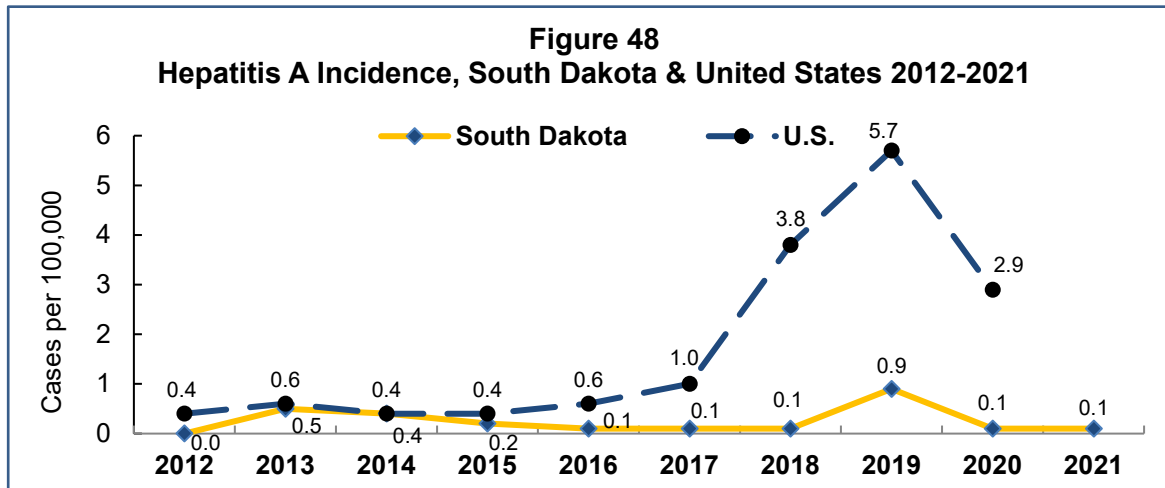


**Figure 47**  
**Gonorrhea Incidence, South Dakota & United States 2012-2021**



### Hepatitis A, acute

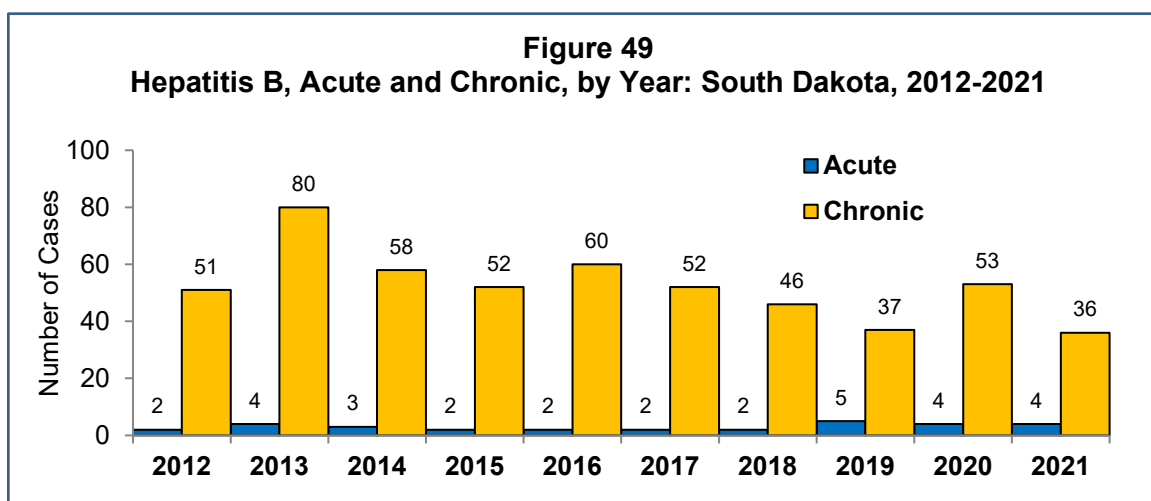
Hepatitis A is a liver disease caused by the hepatitis A virus (HAV), which infects humans through fecal-oral transmission. Since the licensure of the hepatitis A vaccine in 1995-1996, rates of infection have declined significantly. In South Dakota, there was one case of hepatitis A reported in 2021.



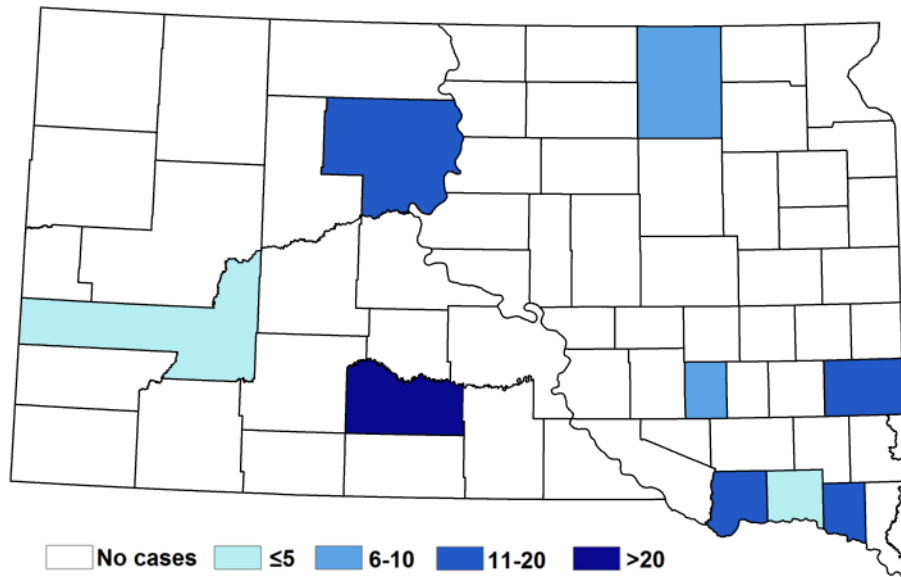
### Hepatitis B, acute and chronic

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.

In 2021, there were four cases of acute hepatitis B and 36 cases of chronic hepatitis B reported in South Dakota. The median age of cases was 38 years (range: 19 to 79) and 68 percent were male.



**Figure 50**  
**Incidence of Hepatitis B, Chronic, by County of Residence: South Dakota, 2021**  
(cases per 100,000)

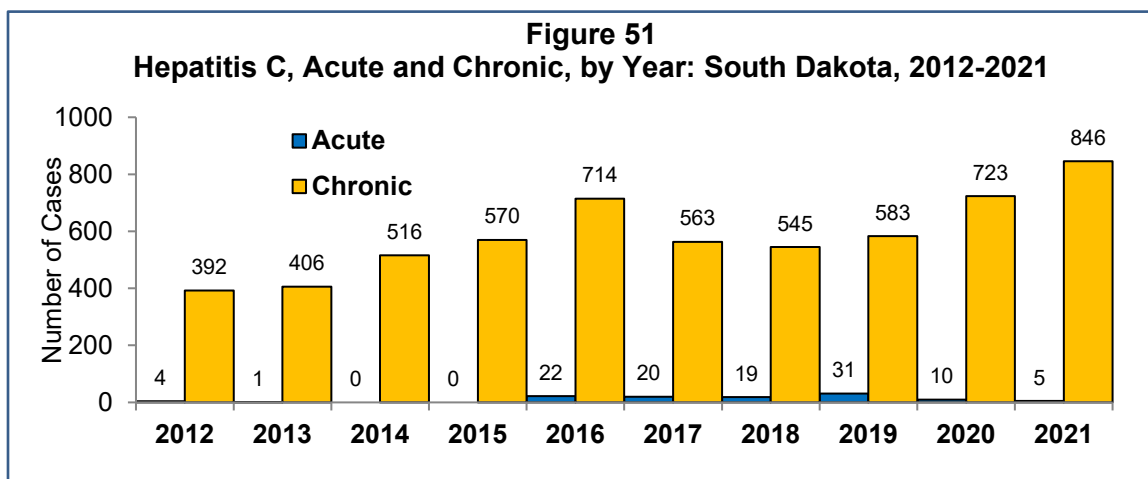


### Hepatitis C, acute and chronic

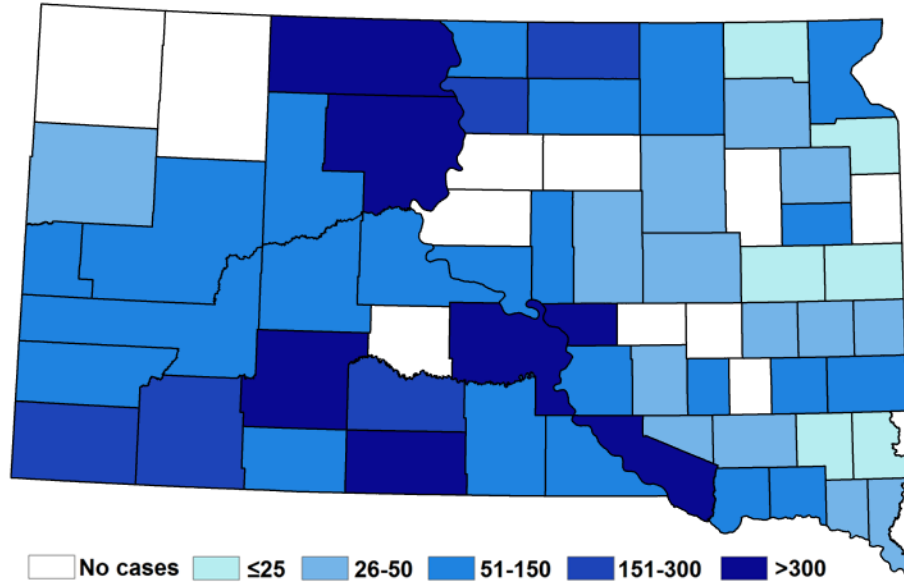
Hepatitis C causes liver disease. For most people hepatitis C is a long-term, chronic infection and may cause long-term health problems resulting in death. The majority (70-80%) of persons might not be aware of their infection because they do not become clinically ill. There is no vaccine available for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

In 2021, there were five cases of acute hepatitis C, 846 cases of chronic hepatitis C, and one case of perinatal hepatitis C reported in South Dakota. The counties with the highest incidence of chronic hepatitis C (cases per 100,00 population) were Buffalo (832.0), Corson (800.6), Todd (656.9) and Dewey (552.8).

**Figure 51**  
**Hepatitis C, Acute and Chronic, by Year: South Dakota, 2012-2021**



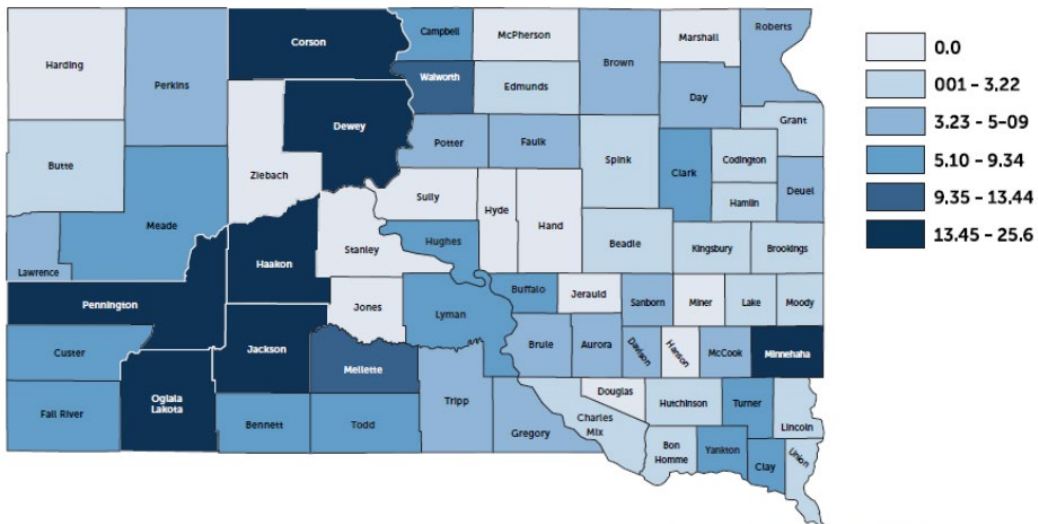
**Figure 52**  
**Incidence of Hepatitis C, Acute and Chronic, by County of Residence: South Dakota, 2021**  
(cases per 100,000)



**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 2021, there were 27 new HIV/AIDS cases reported in South Dakota.

**Figure 53**  
**Incidence of HIV/AIDS, by County of Residence: South Dakota, 1985-2021**  
(cases per 10,000)



## Influenza

The 2021–2022 influenza season was a moderate season in South Dakota. A total of 11,289 confirmed influenza cases were reported to SDDOH, including 11,223 (99%) influenza A and 66 (1%) influenza B. Additionally, 8,500 rapid antigen influenza tests were performed with 261 positive results (3%); 81 (31%) positive for influenza A and 180 (69%) positive for influenza B.

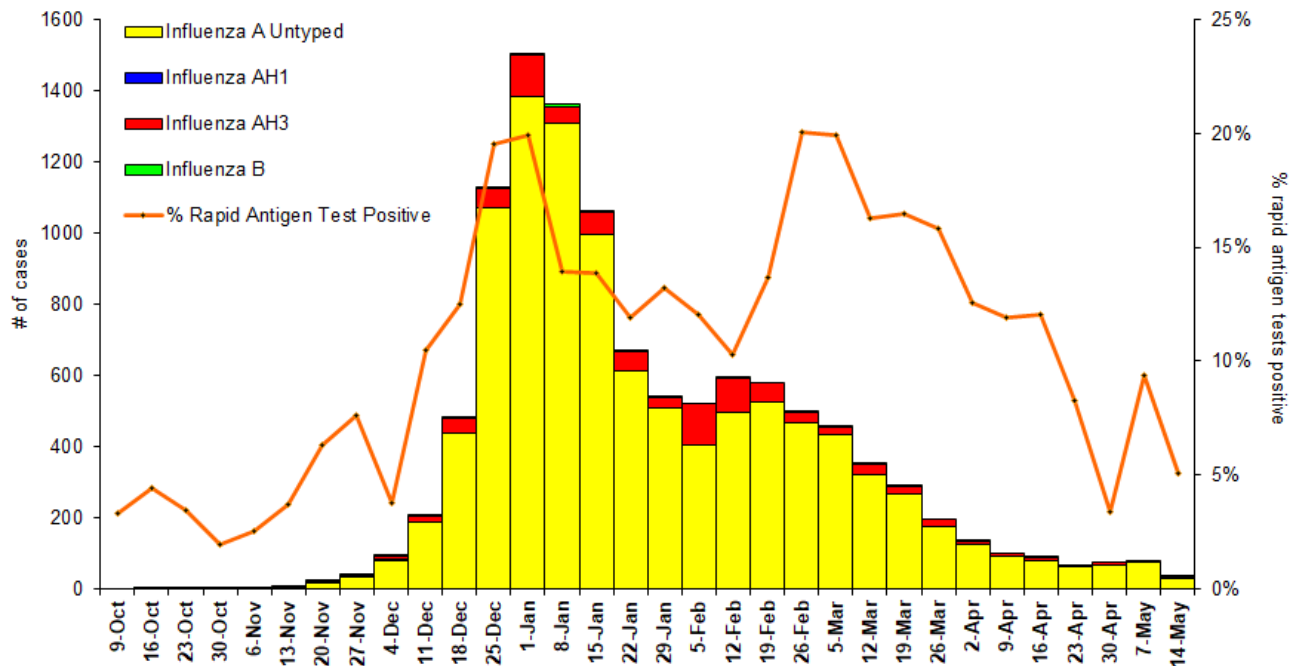
There were also 284 hospitalizations and 22 deaths reported during the 2021–2022 influenza season.

**Table 74**  
**Influenza Cases by Age Group, South Dakota, 2021-2022**

Lab Confirmed Influenza Cases (by DFA, PCR, or culture)		Influenza Associated Hospitalizations	Influenza Associated Deaths
Age Group	# Cases (%)	# Hosp (%)	Deaths (%)
0-4	1866 (17%)	22 (8%)	1 (5%)
5-18	4289 (38%)	21 (7%)	1 (5%)
19-49	3466 (31%)	52 (18%)	2 (9%)
50-64	811 (7%)	54 (19%)	4 (18%)
> 64	857 (8%)	135 (48%)	14 (64%)
<b>Total</b>	<b>11,289</b>	<b>284</b>	<b>22</b>

**Figure 54**  
**2021-2022 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 21 cases of legionellosis reported in South Dakota in 2021, a 40 percent increase 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 2021, there were 16 cases of Lyme disease reported in South Dakota residents, a 60 percent increase from the five-year median (median: 10).

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

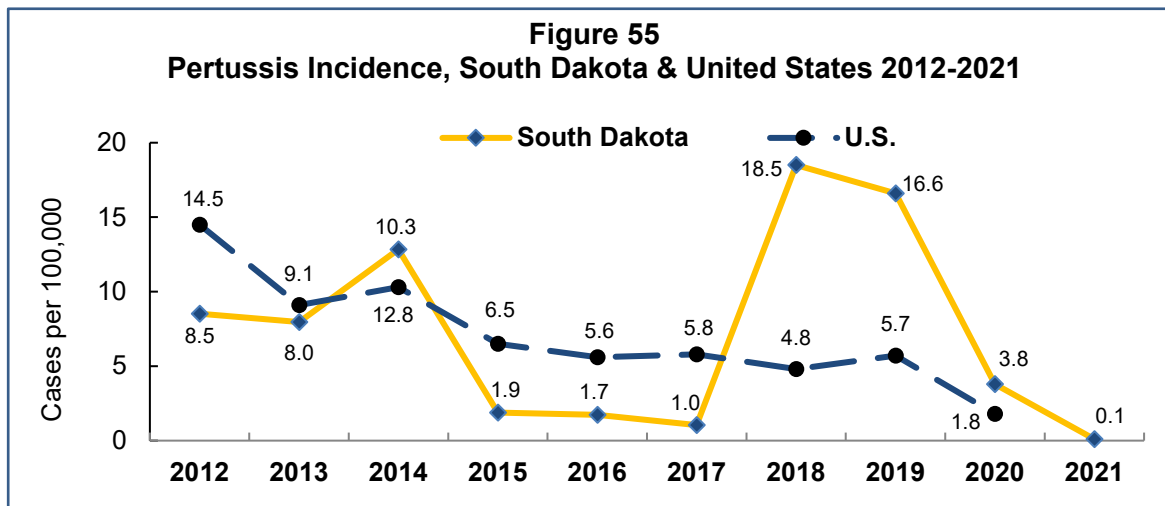
Methicillin-resistant *Staphylococcus aureus* (MRSA) is a bacterium resistant to most commonly used antibiotics. Most MRSA infections are skin infections, but may cause life-threatening bloodstream infections, pneumonia and surgical site infections. In 2021, there were 178 cases of invasive MRSA reported in South Dakota, a 14 percent increase from the five-year median (median: 156). The highest rate of disease was among the elderly, ages 65 years and older.

### Multisystem Inflammatory Syndrome (MIS)

Multisystem inflammatory syndrome (MIS) is a rare but serious inflammatory condition in children (MIS-C) and young adults (MIS-A) that affects multiple organ systems, almost always requiring hospitalization. It appears to be linked to infection with SARS-CoV-2, the virus which causes COVID-19. In 2021, there were 9 cases of MIS-C reported in South Dakota. All cases were male with a median age of 10 years (range: 1 to 16). There were no deaths.

### 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 2021, only 1 case of pertussis was reported in South Dakota. This represented a 97 percent decrease from the five-year median (median: 34).

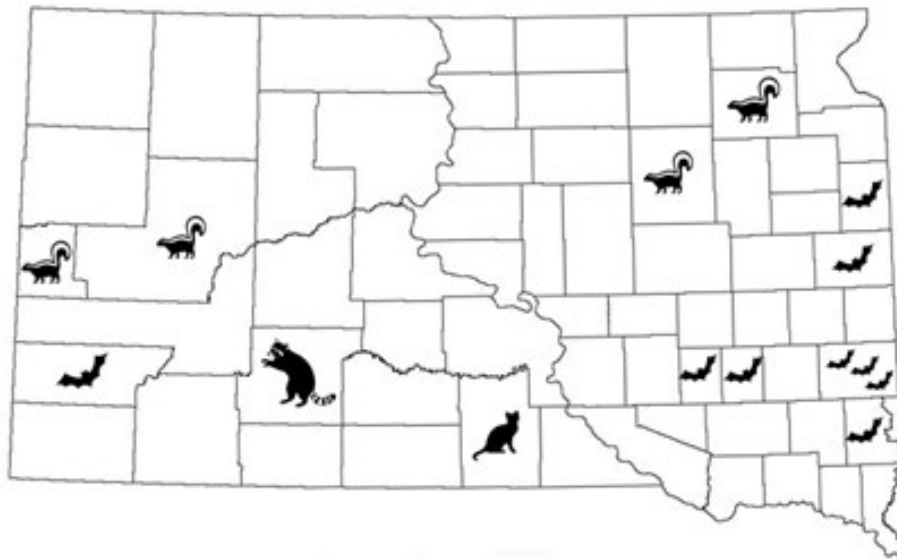


### Rabies, animal

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 15 animals tested positive for rabies in 2021, a slight decrease from the five-year median (median: 16). The 15 rabid animals included only one domestic animal (a cat), and 14 wild animals (9 bats, 4 skunks, and 1 raccoon). No human rabies was reported.

**Figure 56**  
**Animal Rabies by County: South Dakota, 2021**

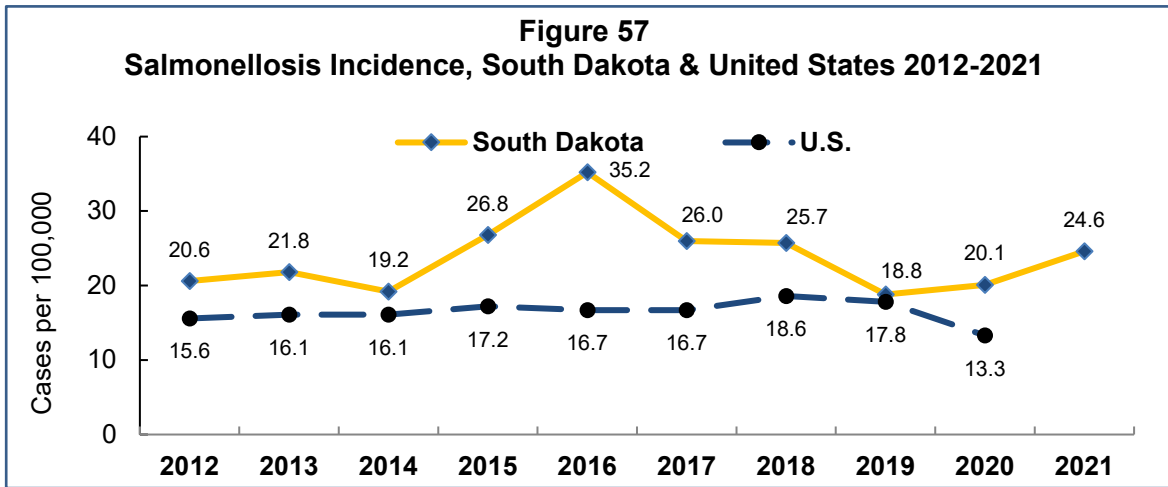


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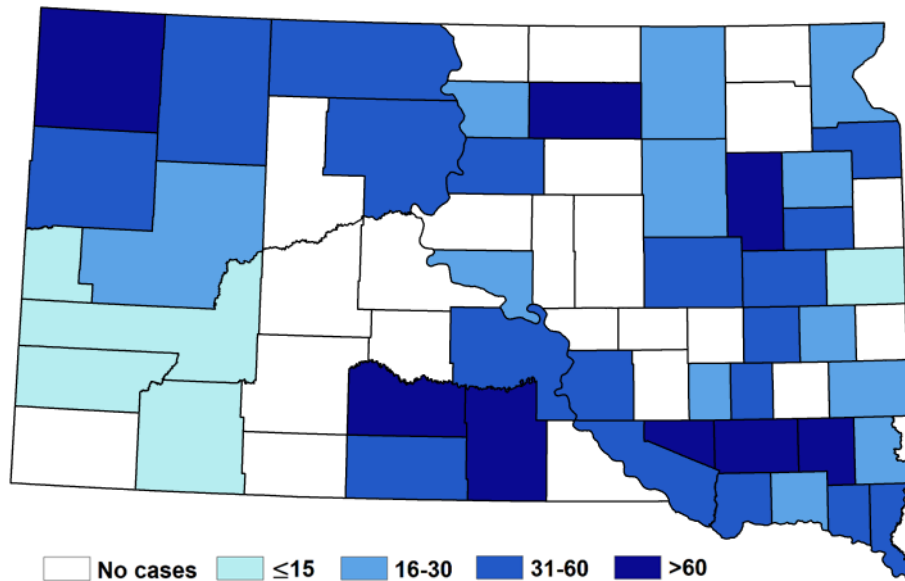
### Salmonellosis

*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 2021, 220 cases of salmonellosis were reported in South Dakota. The *Salmonella* serotypes most commonly identified were *S. Enteritidis* (30 cases), *S. Typhimurium* (26 cases), *S. I 4:b:-* (15 cases), and *S. Newport* (14 cases). Older adults had the highest rate of infection; 44 percent of reported cases were over the age of 50.



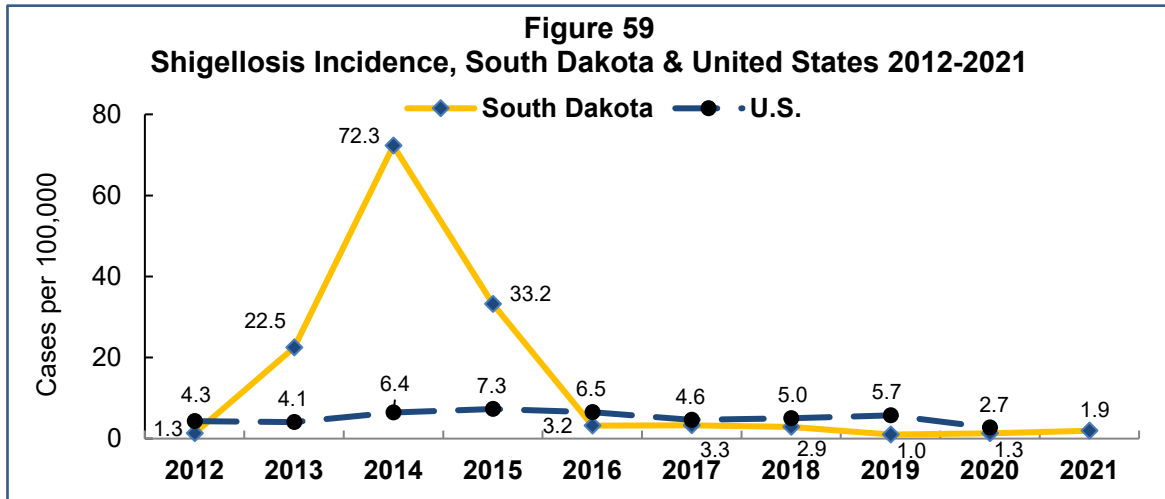
**Figure 58**  
**Incidence of Salmonellosis by County of Residence: South Dakota, 2021**  
(cases per 100,000)



### 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 2021, there were 17 cases of shigellosis reported in South Dakota, a 35 percent decrease from the five-year median (median: 26). South Dakota experienced a protracted multi-county outbreak from October 2013 to November 2015, largely in childcare settings.



### ***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 2021, there were 95 cases of invasive pneumococcal disease reported in South Dakota. The majority (79%) of cases occurred in adults over 40 years of age.

### **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. Syphilis can also be spread from an infected mother to her unborn baby, i.e., congenital syphilis.

In South Dakota, there were 787 cases of early syphilis (primary, secondary, and early non-primary non-secondary) reported in 2021, a 1,413 percent increase from the five-year median (median: 52). Sixteen congenital syphilis cases were also reported. Three counties (Minnehaha, Pennington, and Todd) accounted for 72 percent of the state's cases.

### **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 12 cases of TB reported in South Dakota in 2021. The median age of cases was 42 years (range: 22 to 76). American Indians have historically reported the highest percentage of TB cases by race, but this trend has decreased in recent years. In 2021, American Indians represented 17 percent of the total TB cases. The majority (67%) of TB cases reported were foreign-born.

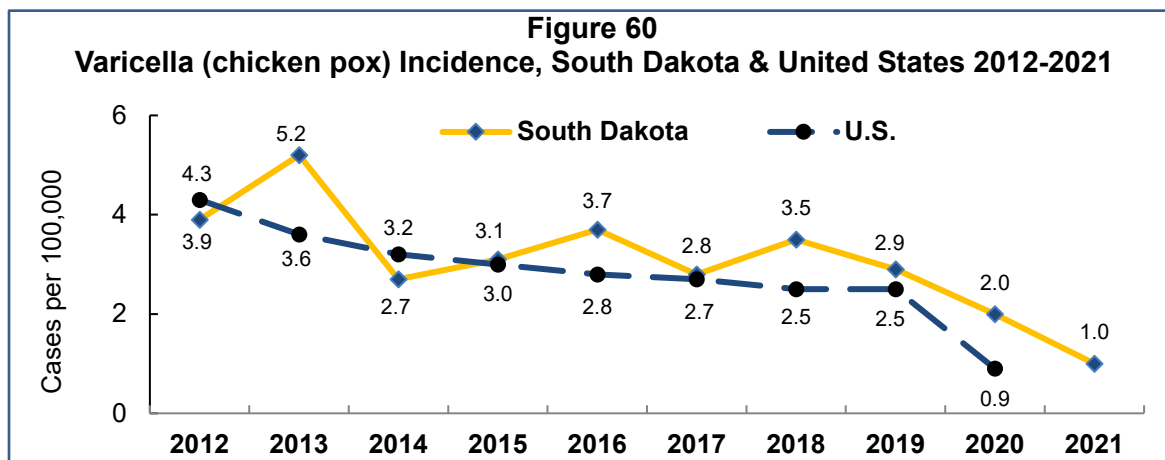
## Tularemia

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 2021, there were 14 cases of tularemia reported in South Dakota (12 ulceroglandular and 2 glandular). The median age of cases was 7 years old (range: 1 to 35).

## 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 2021, nine cases of chicken pox were reported in South Dakota, with 77 percent of cases with known vaccination status being unvaccinated. About one-quarter of those who were unvaccinated were too young to be vaccinated. The median age was 4 years old (range: 0 to 38).

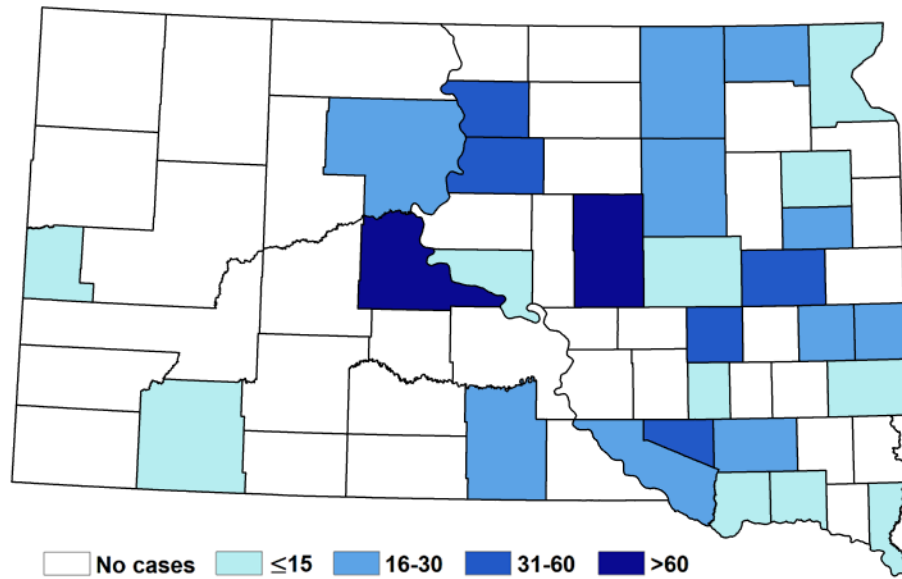


## West Nile virus (WNV)

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 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 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 10 percent.

In South Dakota, there were 48 human cases of WNV disease (19 neuroinvasive and 29 non-neuroinvasive) reported in 2021. The overall incidence of WNV was 5.4 cases per 100,000 population. Twenty-seven (56%) WNV cases were hospitalized, including one death. Additionally, six persons were identified to have WNV infection through blood donation screenings.

**Figure 61**  
**Incidence of Human WNV disease by County of Residence: South Dakota, 2021**  
 (cases per 100,000)



### Other Infectious Diseases

Other infectious diseases reported in South Dakota during 2021 include: 17 cases of invasive *Haemophilus influenzae*, 16 cases of cyclosporiasis, nine cases of vibriosis, eight cases of malaria, seven cases of spotted fever rickettsiosis, six cases of coccidioidomycosis, five cases of Q fever, two cases of ehrlichiosis, one case each of anaplasmosis, Hansen’s disease, meningococcal disease, listeriosis, and typhoid fever.

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