

## **Introduction**

The South Dakota Department of Health strives to promote healthy living and protect the overall health of the population. The many different divisions of the Department of Health use different methods in order to achieve these goals. Disease surveillance is the ongoing collection, analysis, interpretation and dissemination of health data and is a tool used to study disease trends, monitor new and emerging diseases.

Disease surveillance includes investigations, control and prevention, evaluation, planning, and allocating resources to address the diseases affecting the population. An important surveillance component is sharing infectious disease data with health care providers, public health agencies, the general population, academia, and public health and medical policy makers at local, state, tribal and national levels. Surveillance assessment reports should serve to inform and motivate.

This report provides an overview of disease surveillance that is conducted by the South Dakota Department of Health. It highlights important statistics and shows key trends for several diseases that impact the South Dakota population.

Sexually transmitted diseases continue to increase in South Dakota. Chlamydia is the most commonly reported disease in the state and 2011 had the highest number of gonorrhea cases reported in the past 10 years. These diseases are most commonly reported in females from 15-24 years of age.

**Table 68**  
**Reportable Diseases in South Dakota, 2002-2011**

Reportable Diseases	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Anaplasmosis	NR	3								
Anthrax	1	0	0	0	0	0	0	0	0	0
Botulism	0	1	0	1	0	0	0	0	0	0
Brucellosis	0	1	0	0	0	0	0	0	0	0
Campylobacteriosis	198	188	273	244	219	235	262	298	297	301
Chlamydia trachomatis infections	2215	2606	2534	2701	2633	2619	2942	3015	3192	3409
Cholera	1	0	0	0	0	0	0	0	0	0
Cryptosporidiosis	42	49	44	31	86	169	88	138	107	146
Dengue fever	1	0	0	1	0	3	0	0	1	0
Diphtheria	0	0	0	0	0	0	0	0	0	0
Ehrlichiosis	0	0	0	0	0	0	1	0	0	1
Giardiasis	83	89	87	118	97	104	136	112	103	110
Gonorrhea	263	226	304	351	367	261	370	344	468	602
Haemophilus influenzae type b	1	1	0	0	0	0	0	0	0	1
Hantavirus pulmonary syndrome	0	1	1	2	2	1	0	0	0	1
Hemolytic uremic syndrome	0	1	0	3	8	1	3	3	2	2
Hepatitis A	3	0	4	1	9	6	4	3	1	2
Hepatitis B, acute	3	4	1	8	5	7	0	4	2	2
Hepatitis B, chronic	NR	NR	26	33	16	39	47	40	51	51
Hepatitis C, chronic	NR	NR	NR	207	355	317	365	381	349	356
HIV and AIDS	21	25	19	33	34	25	34	21	35	21
Legionellosis	4	2	5	21	5	4	3	2	9	2
Leprosy	0	0	0	0	0	0	1	0	0	0
Listeriosis	1	0	1	0	2	2	1	1	3	1
Lyme disease	2	1	1	2	1	0	3	1	1	4
Malaria	2	3	1	0	1	1	0	1	3	2
Measles	0	0	0	0	0	0	0	0	0	0
Meningococcal disease	2	1	4	4	4	3	3	5	0	3
Methicillin-resistant <i>Staph aureus</i> , invasive	NR	NR	36	47	50	88	77	91	98	91
Mumps	0	0	0	0	296	6	1	2	2	0
Pertussis (whooping cough)	8	7	169	183	26	60	67	58	29	37
Plaque	0	0	0	0	0	0	0	0	0	0
Q fever	1	0	0	2	2	1	1	9	4	1
Rabies, animal	96	132	94	68	38	27	24	53	32	40
Rabies, human	0	0	0	0	0	0	0	0	0	0
Rocky Mountain Spotted Fever	1	5	4	5	0	5	3	0	0	1
Rubella and congenital rubella syndrome	0	0	0	0	0	0	0	0	0	0
St. Louis Encephalitis	0	2	0	0	0	0	0	0	0	0
Salmonellosis	121	131	156	160	135	174	152	198	186	162
Shiga toxin-producing E. coli, including O157:H7	43	33	35	33	50	47	53	71	35	41
Shigellosis	157	17	12	131	389	122	76	4	7	6
Streptococcal disease, Group A, invasive	14	25	22	26	10	12	23	29	44	22
Streptococcal disease, Group B, invasive	20	14	11	26	13	20	22	27	37	18
<i>Streptococcus pneumoniae</i> , invasive all ages	NR	43								
<i>Streptococcus pneumoniae</i> , invasive ≤5 year	0	1	4	1	8	11	13	9	9	14
Syphilis, Primary and Secondary, Early Latent	0	5	0	2	19	11	4	2	4	0
Tetanus	0	0	0	0	0	0	0	0	0	0
Toxic shock syndrome	1	1	1	2	0	0	1	0	0	0
Tuberculosis	13	20	11	16	14	13	16	18	15	15
Tularemia	3	5	4	8	5	7	10	5	11	8
Typhoid fever	0	0	0	0	1	0	2	2	1	0
Varicella (chicken pox)	NR	NR	99	136	118	84	55	53	62	67
West Nile neuroinvasive disease	14	170	6	35	38	48	11	6	4	0
West Nile fever	23	869	45	194	74	160	28	15	16	2

\*NR= not reportable

Source: South Dakota Department of Health, Office of Disease Prevention, Maven report by MMWR year

**Table 69**  
**South Dakota Selected Notifiable Diseases by County, 2011**

County	Campylobacteriosis	Chlamydia	Cryptosporidiosis	Shiga toxin-producing E. coli	Giardiasis	Gonorrhea	Hepatitis B, Chronic	Hepatitis C, Chronic	Methicillin-resistant Staphylococcus aureus, invasive	Pertussis	Salmonellosis	Tuberculosis	Tularemia	Varicella	West Nile Disease
Aurora	≤ 3	≤ 3	≤ 3	0	≤ 3	0	0	0	0	0	0	0	≤ 3	0	0
Beadle	10	76	10	0	≤ 3	≤ 3	11	5	≤ 3	0	5	0	0	9	0
Bennett	≤ 3	24	0	≤ 3	0	8	0	≤ 3	≤ 3	0	0	0	≤ 3	≤ 3	0
Bon Homme	4	5	≤ 3	≤ 3	0	0	≤ 3	7	≤ 3	0	≤ 3	0	0	0	0
Brookings	13	75	4	≤ 3	≤ 3	5	≤ 3	6	4	≤ 3	4	≤ 3	0	≤ 3	0
Brown	17	128	10	≤ 3	5	9	0	8	≤ 3	17	6	≤ 3	0	4	0
Brule	≤ 3	15	0	0	≤ 3	≤ 3	0	≤ 3	0	0	≤ 3	0	0	≤ 3	0
Buffalo	≤ 3	24	0	0	0	≤ 3	0	4	≤ 3	≤ 3	≤ 3	0	0	≤ 3	0
Butte	5	22	0	0	≤ 3	≤ 3	0	≤ 3	0	0	≤ 3	0	0	0	0
Campbell	0	≤ 3	0	0	0	0	0	0	0	0	≤ 3	0	0	0	0
Charles Mix	11	61	5	0	0	6	0	7	≤ 3	0	0	≤ 3	0	≤ 3	0
Clark	0	4	≤ 3	0	0	0	≤ 3	0	0	0	0	0	0	0	0
Clay	≤ 3	63	4	0	0	≤ 3	0	≤ 3	0	0	≤ 3	0	0	0	0
Codington	5	118	7	5	5	21	≤ 3	6	≤ 3	0	4	0	0	≤ 3	0
Corson	≤ 3	81	0	0	0	44	0	5	≤ 3	0	≤ 3	0	0	0	0
Custer	≤ 3	33	≤ 3	0	0	≤ 3	0	≤ 3	≤ 3	0	≤ 3	0	0	≤ 3	0
Davison	9	62	9	≤ 3	≤ 3	4	≤ 3	5	5	≤ 3	4	0	0	0	0
Day	≤ 3	9	≤ 3	0	≤ 3	≤ 3	0	≤ 3	0	0	≤ 3	0	0	0	0
Deuel	≤ 3	5	≤ 3	0	≤ 3	0	0	0	0	0	0	0	0	0	0
Dewey	7	116	0	0	0	26	0	≤ 3	≤ 3	0	0	0	0	0	0
Douglas	4	≤ 3	0	0	0	0	0	≤ 3	0	0	≤ 3	≤ 3	0	0	0
Edmunds	4	4	≤ 3	0	≤ 3	0	0	0	0	0	≤ 3	0	0	0	0
Fall River	≤ 3	12	0	0	≤ 3	≤ 3	0	10	≤ 3	0	0	0	0	0	0
Faulk	4	4	≤ 3	0	0	0	0	0	≤ 3	0	4	0	0	0	0
Grant	5	13	≤ 3	0	0	≤ 3	0	≤ 3	0	0	≤ 3	0	0	0	0
Gregory	5	7	≤ 3	0	0	0	0	≤ 3	0	0	≤ 3	0	0	0	0
Haakon	5	0	0	≤ 3	≤ 3	0	0	0	0	0	≤ 3	0	0	0	0
Hamlin	7	4	≤ 3	≤ 3	4	0	≤ 3	0	≤ 3	0	0	0	0	0	0
Hand	≤ 3	≤ 3	≤ 3	0	0	0	0	≤ 3	0	0	0	0	0	0	0
Hanson	≤ 3	≤ 3	≤ 3	≤ 3	0	0	0	0	0	0	≤ 3	0	0	0	0
Harding	≤ 3	≤ 3	0	0	≤ 3	0	0	0	0	0	0	0	0	0	0
Hughes	≤ 3	69	≤ 3	≤ 3	≤ 3	6	≤ 3	≤ 3	0	0	≤ 3	0	0	≤ 3	0
Hutchinson	7	5	4	0	≤ 3	≤ 3	0	0	0	0	≤ 3	0	0	0	0
Hyde	0	≤ 3	0	0	0	0	0	≤ 3	0	0	0	0	0	0	0
Jackson	≤ 3	23	0	0	0	≤ 3	0	0	≤ 3	0	0	0	0	0	0
Jerauld	≤ 3	≤ 3	≤ 3	0	0	0	0	≤ 3	0	≤ 3	≤ 3	0	0	0	0

Continued

**Table 69 (continued)**  
**South Dakota Selected Notifiable Diseases by County, 2011**

County	Campylobacteriosis	Chlamydia	Cryptosporidiosis	Shiga toxin-producing E. coli	Giardiasis	Gonorrhea	Hepatitis B, Chronic	Hepatitis C, Chronic	Methicillin-resistant Staphylococcus aureus, invasive	Pertussis	Salmonellosis	Tuberculosis	Tularemia	Varicella	West Nile Disease
Jones	0	0	0	0	0	0	0	≤ 3	0	0	0	0	0	0	0
Kingsbury	5	≤ 3	≤ 3	0	0	≤ 3	0	0	0	0	0	0	0	0	0
Lake	4	27	4	0	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	0	0	0	0	0	0
Lawrence	0	59	0	0	4	4	≤ 3	5	≤ 3	0	≤ 3	0	0	≤ 3	0
Lincoln	9	72	≤ 3	≤ 3	10	4	0	9	≤ 3	≤ 3	11	0	0	0	0
Lyman	≤ 3	26	0	0	0	9	0	4	0	0	≤ 3	0	0	0	0
Marshall	≤ 3	8	≤ 3	0	0	0	0	≤ 3	0	≤ 3	≤ 3	0	0	0	0
McCook	6	9	≤ 3	≤ 3	≤ 3	0	0	≤ 3	≤ 3	0	≤ 3	0	0	0	0
McPherson	≤ 3	4	0	≤ 3	0	0	0	0	0	0	0	0	0	0	0
Meade	7	58	0	5	≤ 3	5	0	4	4	≤ 3	≤ 3	0	0	22	0
Mellette	7	6	0	0	0	≤ 3	0	0	≤ 3	0	0	0	0	0	0
Miner	≤ 3	4	0	≤ 3	0	0	0	0	0	0	0	0	0	0	0
Minnehaha	32	781	17	5	29	86	26	113	19	5	29	4	0	14	≤ 3
Moody	6	18	0	0	0	≤ 3	0	4	0	0	6	0	0	0	0
Pennington	17	547	4	4	9	148	4	73	14	≤ 3	13	≤ 3	0	6	0
Perkins	≤ 3	0	≤ 3	0	0	0	0	≤ 3	≤ 3	0	0	0	0	0	0
Potter	0	0	≤ 3	0	0	0	0	≤ 3	0	0	0	0	0	0	0
Roberts	5	54	≤ 3	0	0	≤ 3	0	5	4	0	≤ 3	0	0	0	0
Sanborn	≤ 3	≤ 3	0	0	0	0	0	≤ 3	0	0	5	0	0	0	0
Shannon	≤ 3	277	0	0	≤ 3	137	≤ 3	11	7	0	≤ 3	≤ 3	≤ 3	0	0
Spink	5	15	0	0	≤ 3	≤ 3	0	≤ 3	≤ 3	0	0	0	0	0	0
Stanley	≤ 3	18	0	0	0	≤ 3	0	≤ 3	0	0	0	0	0	0	0
Sully	0	≤ 3	0	0	0	0	0	0	0	0	0	0	0	0	0
Todd	≤ 3	185	≤ 3	0	≤ 3	31	0	8	≤ 3	0	≤ 3	0	≤ 3	0	0
Tripp	4	18	0	≤ 3	≤ 3	≤ 3	0	0	≤ 3	0	≤ 3	0	0	0	0
Turner	5	4	≤ 3	0	≤ 3	0	0	≤ 3	≤ 3	≤ 3	0	0	0	0	0
Union	5	20	0	≤ 3	≤ 3	≤ 3	0	7	≤ 3	≤ 3	≤ 3	0	0	0	0
Walworth	9	29	≤ 3	0	≤ 3	10	0	≤ 3	≤ 3	0	7	0	0	0	0
Yankton	6	74	34	≤ 3	6	4	0	9	≤ 3	0	12	0	0	0	≤ 3
Ziebach	0	17	0	0	0	≤ 3	0	0	0	0	0	0	0	0	0
South Dakota	301	3409	146	41	110	602	51	356	91	37	162	15	8	67	2
Rate per 100,000	36.5	413.8	17.7	5.0	13.3	73.1	6.2	43.2	11.0	4.5	19.7	1.8	1.0	8.1	0.2
5-year median	262	2942	107	50	104	367	40	355	88	58	174	16	7	62	39
% change of median	15%	16%	36%	-18%	6%	64%	28%	0%	3%	-36%	-7%	-6%	14%	8%	-95%

In 2011 there were also: 43 cases of invasive *Streptococcus pneumoniae* in all ages; 22 cases of invasive Group A Streptococcal disease, 18 cases of invasive Group B Streptococcal disease; 6 cases of Shigellosis; 4 cases of Lyme disease; 3 cases each of Anaplasmosis and Meningococcal disease; 2 cases each of Hepatitis A, Acute Hepatitis B, Legionellosis, and Malaria; and one case each of Ehrlichiosis, Haemophilus influenzae type b, Hantavirus pulmonary syndrome, Listeriosis, Q fever, and Rocky Mountain Spotted Fever.

To safeguard privacy "≤ 3" designates strata with 1, 2 or 3 cases.  
 Source: South Dakota Department of Health, Office of Disease Prevention

**Table 70**  
**South Dakota Selected Notifiable Disease Summary by Gender, Race, and Age, 2011**

Disease	Total	Gender*		Race*			Median age	Age group (in years)						
		Male (%)	Female (%)	White (%)	American Indian (%)	Other or Unknown (%)		<1	1-4	5-14	15-24	25-39	40-64	≥65
Campylobacteriosis	301	206 (68%)	95 (32%)	261 (87%)	25 (8%)	15 (5%)	24	8	45	43	55	44	80	25
Chlamydia	3409	915 (27%)	2487 (73%)	1043 (31%)	1273 (37%)	1093 (32%)	21	1	0	37	2399	902	60	0
Cryptosporidiosis	146	73 (50%)	73 (50%)	136 (93%)	5 (3%)	5 (3%)	17	3	31	30	17	24	26	15
Shiga-toxin producing E. coli	41	19 (46%)	22 (54%)	38 (93%)	1 (2%)	2 (5%)	15	1	6	13	9	5	6	1
Giardiasis	110	57 (52%)	53 (48%)	91 (83%)	7 (6%)	12 (11%)	24	2	27	17	10	24	24	6
Gonorrhea	602	202 (33%)	399 (66%)	115 (19%)	409 (68%)	78 (13%)	24	0	0	6	321	233	39	2
Hepatitis B, Chronic	51	32 (63%)	19 (37%)	13 (25%)	2 (4%)	36 (71%)	32	0	0	3	9	20	16	3
Hepatitis C, Chronic	356	231 (65%)	125 (35%)	170 (48%)	88 (25%)	98 (28%)	49	0	0	1	14	81	242	18
HIV/AIDS	21	13 (62%)	8 (38%)	11 (52%)	5 (24%)	5 (24%)	37	0	0	0	1	10	10	0
Methicillin-resistant <i>Staph. aureas</i> , invasive	91	46 (51%)	45 (49%)	66 (73%)	23 (25%)	2 (2%)	66	0	0	5	2	9	29	46
Pertussis	37	22 (59%)	15 (41%)	32 (86%)	4 (11%)	1 (3%)	11	8	5	11	6	3	3	1
Salmonellosis	162	85 (52%)	77 (48%)	139 (86%)	16 (10%)	7 (4%)	29	10	14	29	15	39	34	20
Streptococcus A, invasive	22	10 (45%)	12 (55%)	13 (59%)	9 (41%)	0 (0%)	54	1	0	2	0	3	9	7
Streptococcus B, invasive	18	10 (56%)	8 (44%)	9 (50%)	5 (28%)	4 (22%)	61	3	0	0	0	2	5	8
Streptococcus pneumoniae, invasive all ages	43	23 (53%)	20 (47%)	25 (58%)	15 (35%)	3 (7%)	44	7	7	1	2	3	14	9
Syphilis	14	11 (79%)	3 (21%)	6 (43%)	1 (7%)	7 (50%)	40	0	0	0	0	7	7	7
Tuberculosis	15	9 (60%)	6 (40%)	5 (33%)	5 (33%)	5 (33%)	32	0	1	0	4	3	4	3
Tularemia	8	4 (50%)	4 (50%)	1 (12%)	7 (88%)	0 (0%)	6	0	3	5	0	0	0	0
Varicella	67	35 (52%)	32 (48%)	51 (76%)	6 (9%)	10 (15%)	10	2	6	45	9	4	0	0
West Nile virus disease	2	2 (100%)	0 (0%)	2 (100%)	0 (0%)	0 (0%)	33	0	0	0	0	2	0	0

Total cases reported on this table may differ slightly from row totals due to incomplete case information.  
The sum of individual percentages may not equal 100% due to rounding.  
\*South Dakota's overall population was 50% male and 50% female; 86% White, 9% American Indian and 5% other races.  
Source: South Dakota Department of Health, Office of Disease Prevention

**VACCINE-PREVENTABLE DISEASES:** Diphtheria, Pertussis, Tetanus, Measles, Mumps, Rubella, Polio, *Haemophilus influenzae* type b disease, Varicella, Hepatitis A and B.

The Centers for Disease Control and Prevention (CDC) regards vaccination as one of the 10 great public health achievements of the twentieth century. Vaccination is responsible for the global eradication of smallpox, the elimination of poliomyelitis from the Western Hemisphere, and the control of measles, rubella, tetanus, diphtheria, *Haemophilus influenzae* type b (Hib), and other infectious diseases in the United States and many other countries.

Immunization is a fundamental component of comprehensive child health care. South Dakota's statewide goal is to immunize 90 percent of 2-year old children for measles, mumps, rubella, diphtheria, pertussis, polio, Hib, varicella, tetanus and hepatitis B.

In South Dakota, factors contributing to increased vaccination rates and disease reduction include enacting a statewide school immunization law in 1971; implementing child-care facility immunization standards; providing vaccines (measles vaccine distribution began in 1967, rubella in 1969, mumps in 1976, *Haemophilus influenzae* b in 1989, hepatitis B in 1993, hepatitis A in 1995, and chicken pox in 2001).

In 1996, the South Dakota Immunization Information System (SDIIS) was implemented, and it currently networks the immunization records of over 550 health clinics, public schools, colleges, universities, tribal colleges and head start facilities across the state. The DOH strives to enroll all children in South Dakota in SDIIS. Adult vaccination records may also be kept in SDIIS.

During 2011, no cases of measles, mumps, rubella, diphtheria, tetanus, or polio were reported in South Dakota. Thirty-seven cases of pertussis (whooping cough) were reported in South Dakota in 2011 which is up 28 percent from 2010. Eight of this year's pertussis cases were in a child less than one year of age.

Mumps is an acute viral infection typified by inflammation and swelling of the parotid salivary glands. Complications may include deafness, meningoencephalitis, and orchitis. After nearly 20 years of decreasing cases in the United States a mumps outbreak hit several Midwestern states, including South Dakota, in 2006. In 2011 no cases of mumps were reported in South Dakota.

In 2011, one case of *Haemophilus influenzae* type b was reported. A decreasing trend of *Haemophilus influenzae* type b is evident from the 54 cases reported in 1990 down to zero in 2004 and has remained at zero until this year. Invasive Hib disease can cause meningitis, pneumonia, osteomyelitis, epiglottitis, cellulitis and pericarditis. This preventable disease has a case-fatality rate of two to five percent.

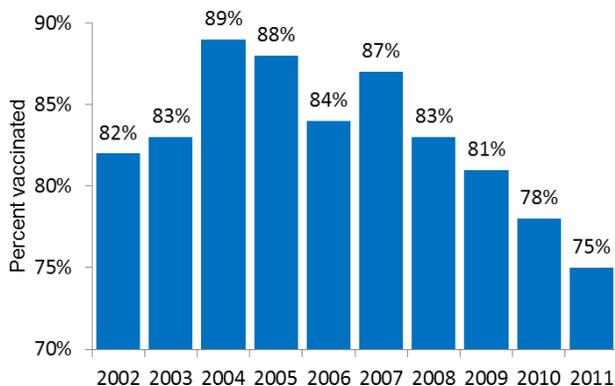
Immunization requirements for entrance into South Dakota schools since 2000 include:

- a) 4 doses of diphtheria, tetanus, pertussis vaccine (DTaP), and
- b) 4 doses of poliovirus vaccine, and
- c) 2 doses of measles, mumps, and rubella vaccine (MMR), and
- d) 2 doses of chicken pox vaccine.

Child vaccination coverage rates are estimated by the National Immunization Survey (NIS). The NIS provides vaccination coverage estimates for children aged 19-35 months for each of the 50 states, including South Dakota.

The NIS uses random telephone sampling to find households with children aged 19 to 35 months. Parents or guardians are asked to report the vaccines, with dates, that appear on the child's "shot card" kept in the home. At the end of the interview, permission is requested to contact the child's vaccination providers. The providers are then contacted by mail to verify each child's vaccinations.

**Figure 47**  
**South Dakota Immunization Rates,**  
**Children 19-35 Months, 2002 – 2011**  
 (National Immunization Survey 4:3:1)



Immunization rates of children 19-35 months old immunized with 4 doses of DTaP, 3 doses polio, and 1 dose of MMR. Source: South Dakota Department of Health, Office of Disease Prevention

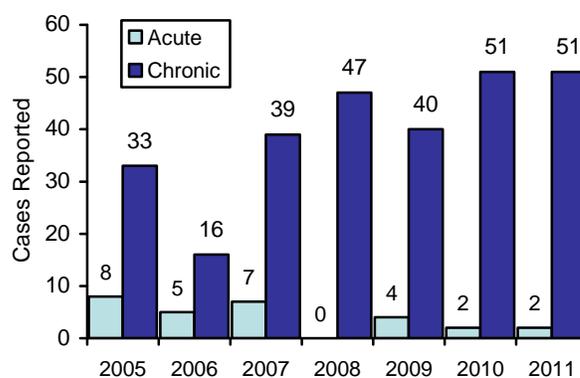
In 2011, 75 percent of children 19-35 months old in South Dakota were adequately immunized (Figure 47). SDDOH is still short of the 90 percent immunization coverage objective.

**Viral Hepatitis** Two cases of acute hepatitis B and 51 cases of chronic hepatitis B were reported in 2011 (Figure 48). Hepatitis B is caused by a virus transmitted by blood and other body fluids. It can cause lifelong infection, liver cirrhosis, liver cancer, liver failure, and death.

Hepatitis B vaccine is now recommended at birth and for children and adolescents who did not complete vaccination as infants. Hepatitis B vaccination is not mandatory for school entry in South Dakota. Adults at risk

for hepatitis B infection who should consider 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.

**Figure 48**  
**Acute and Chronic Hepatitis B**  
**in South Dakota 2005-2011**



Source: South Dakota Department of Health, Office of Disease Prevention

There were also two cases of Hepatitis A and 356 cases of chronic Hepatitis C reported in 2011 in South Dakota.

## PERTUSSIS

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. During the first half of the twentieth century, pertussis was a common childhood disease and major cause of death. In the 1930s South Dakota averaged 480 pertussis cases reported annually. The pertussis vaccine became available in the 1940s reducing the incidence of the disease. During 2011, 37 (4.5 cases per 100,000 population) cases of pertussis were reported in South Dakota, which is 36 percent below the five year median. Figure 49 shows incidence (per 100,000 population) by county in South Dakota in 2011. No deaths were reported due to pertussis complications in 2011; however, 2 infant deaths due to pertussis have been reported since 2000.

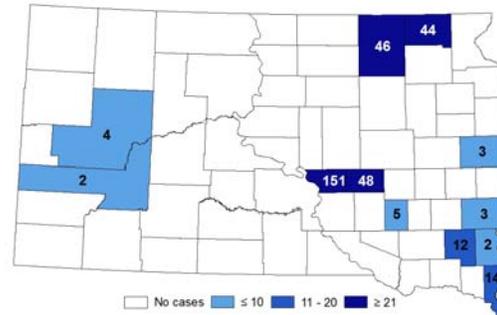
Infants and young children are at higher risk of pertussis-associated complications, hospitalization and death. The most common complication is secondary bacterial pneumonia. Thirty-five percent of the 2011 cases were less than five years old, and 65 percent were less than 15 years old. Pertussis infected youth and adults may expose unprotected infants who are at risk of severe disease and complications.

Immunization is the best protection for infants and young children. Since 2005 pertussis vaccine has been licensed in the United States for adolescents and adults. Figure 50 shows the number of cases per year in South Dakota since 1950.

Individuals who are directly exposed contacts should receive antibiotic prophylaxis, and if they are symptomatic or suspected of having pertussis, they are

recommended for diagnostic testing, isolated and not allowed to attend day care, school or work.

**Figure 49**  
**Pertussis Incidence Rates by County, South Dakota, 2011**

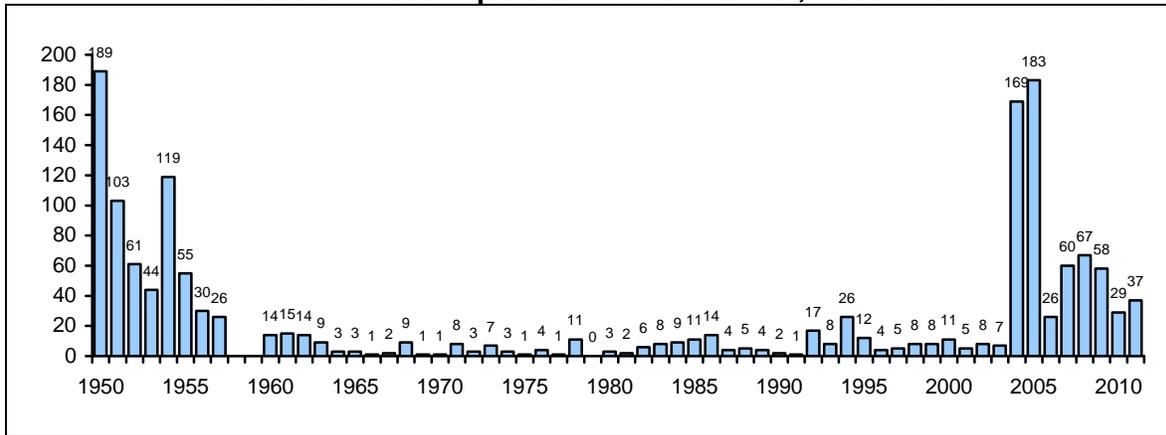


Source: South Dakota Department of Health,  
Office of Disease Prevention

The current pertussis vaccine has a reported efficacy of 80-85 percent. Immunity conferred by either vaccination or natural infection wanes over time. Although unvaccinated children are at highest risk for pertussis, children who are fully vaccinated may also develop disease. Pertussis in previously immunized children is usually milder than in unvaccinated children.

The diagnostic gold standard for pertussis is a positive culture result for *Bordetella pertussis*. The preferred specimen is a nasopharyngeal aspirate or a nasopharyngeal swab. Throat or anterior nasal specimens are unacceptable. Molecular polymerase chain reaction (PCR) testing of nasopharyngeal specimens is available at the SD Public Health Laboratory. The PCR method is more sensitive than the traditional culture method. The direct fluorescent antibody (DFA) stain of a nasopharyngeal swab is unreliable, so this test cannot be used to confirm pertussis. Serologic testing is not acceptable for clinical diagnosis.

**Figure 50**  
**Pertussis Cases Reported in South Dakota, 1950 – 2011**



No data available for 1958 and 1959.

Source: South Dakota Department of Health, Office of Disease Prevention

## INFLUENZA

### National Influenza Surveillance Data

Influenza-like-illness (ILI) in the United States typically begins to increase in late December or early January and peaks in February most commonly. During the 2011-2012 influenza season, ILI remained low through February and did not reach baseline until mid-March. ILI never exceeded baseline during the season.

Another key flu indicator was low this season as well. As of May 25, 2012, 26 pediatric deaths occurring during the 2011-2012 season had been reported to the CDC; this is the lowest number of pediatric deaths reported during a season since such record keeping began. These are deaths in children younger than 18 who test positive for influenza.

The reason for the mildness and lateness of the season isn't certain, but it's likely that there were a number of contributing factors, including a mild winter, the fact that most of the influenza viruses circulating this season were similar to those that have circulated for the past two seasons and the fact that most circulating viruses were similar to the viruses that the 2011-2012 vaccine was designed to protect against. The low levels of influenza virus "drift" for two consecutive

years and steadily increasing influenza vaccination coverage in the country likely contributed to broad levels of immunity in the population.

How well the flu vaccine works can range widely from season to season. During the 2011-2012 flu season, influenza A (H3N2), 2009 influenza A (H1N1), and influenza B viruses co-circulated in the United States. Over the course of the season, predominant viruses varied from region to region and between states, but nationally, influenza A (H3N2) influenza viruses predominated. Most of the viruses tested this season were well matched to the vaccine viruses the vaccine is designed to protect against.

Since July 2012, there have been outbreaks of H3N2 variant viruses with the matrix (M) gene from the 2009 N1N1 pandemic virus in multiple U.S. states. As of August 2012, there have been 296 confirmed cases, 16 hospitalizations, and one death reported. Investigations into H3N2v cases indicate that the main risk factor for infection is prolonged exposure to pigs, mostly in fair settings. Found in the U.S. pigs in 2010 and humans in July 2011, this virus appears to spread more easily from pigs to people than other variant viruses. Though limited person-to-person spread with this virus has

occurred, no sustained community spread of H3N2v has been detected at this time. Associated illness so far has been mostly mild with symptoms similar to seasonal flu and most cases have occurred in children who have little immunity against this virus. The Centers for Disease Control and Prevention (CDC) is working with states to respond to these outbreaks and continues to monitor the situation closely.

### South Dakota Influenza Epidemiology and Laboratory Surveillance

The South Dakota Department of Health (SD DOH) and SD Public Health Laboratory (SDPHL) conduct surveillance for influenza year-round, and intensifies activities October through May. The components of South Dakota's influenza surveillance program for the 2011-2012 season included 66 laboratory sentinel sites; 21 Influenza Like Illness Network (ILINet) providers); viral culture and PCR testing (SDPHL); DFA testing (Pine Ridge, Rapid City Regional, and Sanford Laboratories); reporting of aggregate rapid antigen results; confirmed influenza, influenza hospitalizations and deaths, and institutional outbreaks. During the influenza season, weekly summary reports are posted on the SD DOH website at: [www.doh.sd.gov/Flu/](http://www.doh.sd.gov/Flu/).

Table 71 shows a total of 505 confirmed influenza cases, A(H3N2) 352 (70%), A(H1N1) 11 (2%), A-not subtyped 130 (26%) and 12 (2%) influenza B, were reported to SD DOH. Additionally, 23,842 rapid antigen influenza tests were accomplished with 3,191 positive (13%), 3,085 (97%) positive for influenza A and 106 (3%) positive for influenza B.

Other viral respiratory pathogen reports included 67 adenovirus, 125 hMPV, 50 parainfluenza-1, 19 parainfluenza-2, 32 parainfluenza-3, 55 parainfluenza-4, and 538 respiratory syncytial virus.

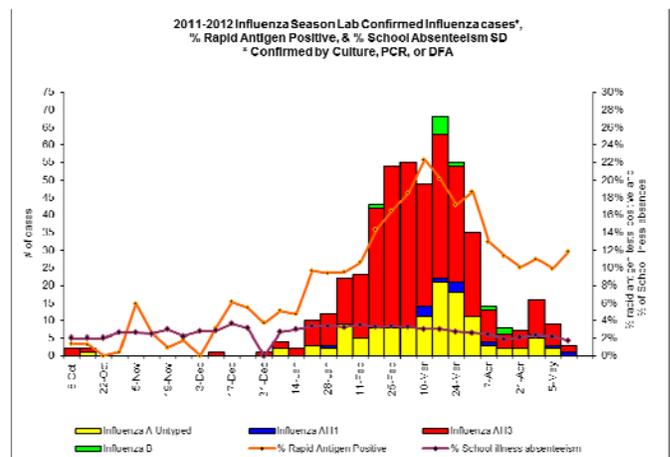
**Table 71**  
**Age Distribution of Reported Influenza Cases, South Dakota, 8 Oct 2011 - 28 Jul 2012 Influenza Season**

Lab Confirmed Influenza Cases (by DFA, PCR, or culture)		Influenza Associated Hospitalizations	Influenza Associated Deaths
Age Group	# Cases (%)	# Hosp (%)	# Deaths
0-4	116 (23%)	25 (15%)	0
5-24	132 (26%)	10 (6%)	0
25-49	90 (18%)	14 (9%)	0
50-64	47 (9%)	17 (10%)	1
> 64	120 (24%)	98 (60%)	16
<b>Total</b>	<b>505</b>	<b>164</b>	<b>17</b>

Source: South Dakota Department of Health, Office of Disease Prevention

The 2011-2012 influenza viruses had a substantial impact on all age groups. The median age of confirmed influenza cases was 26 years with an age range of 4 weeks to 102 years.

**Figure 51**



The first confirmed case of influenza was reported the last week of October 2011 and the last case reported mid-June 2012. The predominant virus in South Dakota was influenza A (H3N2). The peak of the season was mid-March 2012 with few AH1N1 and Influenza B viruses circulating.

There were 164 individuals reported hospitalized during the 2011-2012 influenza season. The first hospitalization was identified early October 2011 and the last was reported mid-June 2012. Hospitalizations peaked mid-March. For patients that were hospitalized with influenza, the age range was 2 months to 101 years with a median age of 73 years.

Seventeen individuals died due to influenza and its complications during the 2011-2012 season. Gender breakdown was 41 percent male and 59 percent female. The median age was 86 years, with an age range of 63-95 years. One hundred percent of the influenza associated deaths were white.

## SEXUALLY TRANSMITTED DISEASES

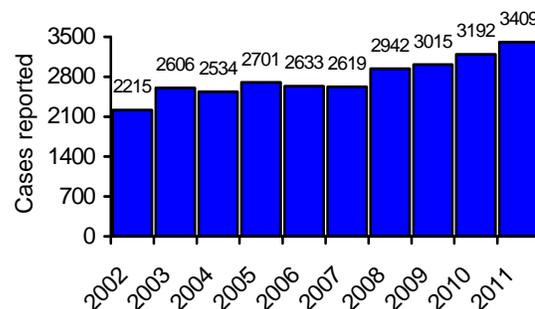
Sexually transmitted diseases (STDs) include several bacterial and viral infections that can be passed person-to-person by genital, oral or anal sexual contact. STDs include gonorrhea, chlamydia, genital herpes, syphilis, genital warts, HIV infection, chancroid, trichomoniasis, lymphogranuloma venereum, and others. All STDs have the potential to cause serious illness, but most are treatable. STDs are preventable by abstinence, uninfected partner monogamy, and proper use of condoms. Genital human papillomavirus (HPV) is the only vaccine preventable STD.

STDs in South Dakota primarily affect young people between the ages of 15 and 24 years, and minority populations.

**Chlamydia** Chlamydia is the most commonly reported STD in South Dakota. During 2011, the DOH received 3,409 case reports (Figure 52), which was an incidence rate of 413.8 cases per 100,000 population. This year, 2011, had the most chlamydia cases ever reported in one year in South Dakota.

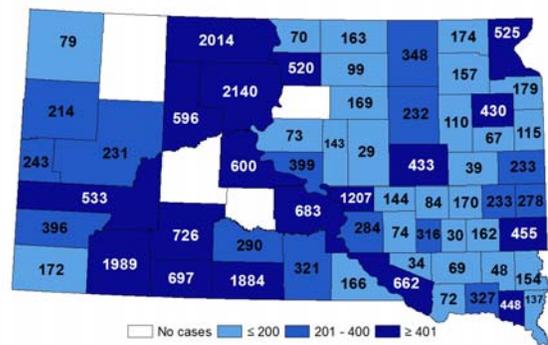
Counties with the highest incidence (cases per 100,000 population) included Dewey (2140), Corson (2014), Shannon (1989), Todd (1884), and Buffalo (1207), (Figure 53).

**Figure 52**  
Chlamydia in South Dakota, 2002-2011



Source: South Dakota Department of Health, Office of Disease Prevention

**Figure 53**  
Chlamydia Incidence Rates by County, South Dakota, 2011



Source: South Dakota Department of Health, Office of Disease Prevention

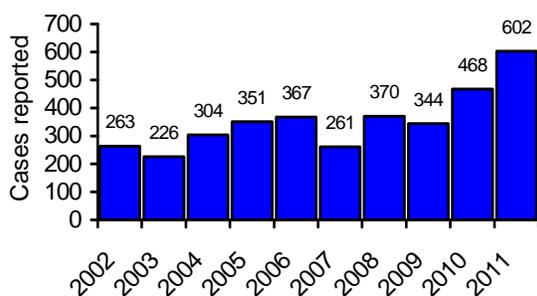
Nationally, the incidence of chlamydia in 2011 was 457.6 cases per 100,000 population, which was an increase of 8 percent from 2010. Comparing incidence rates by state, South Dakota ranked 26<sup>th</sup>.

Screening for chlamydia infection has become standard practice for many health care providers in the state. Family planning clinics, Indian Health Service and many private providers have incorporated chlamydia screening as part of the routine health examination for sexually active young women. Screening follow-up encompasses treatment and partner referral. Because screening efforts are focused on women, female infections are more likely to be identified than males. Our data show that 73 percent of chlamydia cases were female in 2011.

Young people between 15 and 24 years old accounted for 70 percent of chlamydia cases reported in 2011. Although American Indians comprise nine percent of the state's population, a disproportionate share, 37 percent, of chlamydia case reports were in this population group. This higher disease rate necessitates continued targeting of screening and disease intervention among American Indians.

**Gonorrhea** In 2011 the DOH received 602 reports of gonorrhea (Figure 54), this is the highest number reported in South Dakota since 1987. This was an incidence of 73.1 cases per 100,000 population, 64 percent above the 5-year median. Nineteen percent of the gonorrhea case reports occurred in the white population, and 66 percent were female.

**Figure 54**  
**Gonorrhea in South Dakota, 2002-2011**

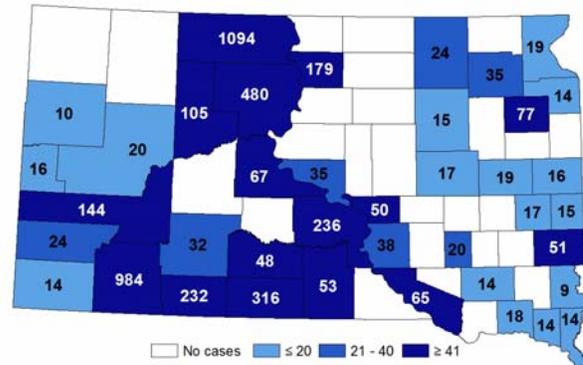


Source: South Dakota Department of Health, Office of Disease Prevention

Counties with the highest incidence (cases per 100,000 population) included Corson

(1094), Shannon (984), Dewey (480), Todd (316), and Lyman (236), (Figure 55).

**Figure 55**  
**Gonorrhea Incidence Rates by County, South Dakota, 2011**



Source: South Dakota Department of Health, Office of Disease Prevention

Sexually active adolescents and young adults are the population most at risk with 53 percent of the gonorrhea cases reported being 15 to 24 years old. The American Indian population was disproportionately affected with 68 percent of the reported cases.

Nationally the incidence of gonorrhea was 104.2 cases per 100,000 population in 2011, an increase of four percent from 2010. Comparing incidence rates by state, South Dakota ranked 30<sup>th</sup>.

**Syphilis** In 2011 there were no cases of early syphilis (primary, secondary, or early latent) reported (Table 72, Figure 56 on the next page). South Dakota participates in syphilis elimination through expedited case management, partner referral, and interstate coordination of outbreak investigations.

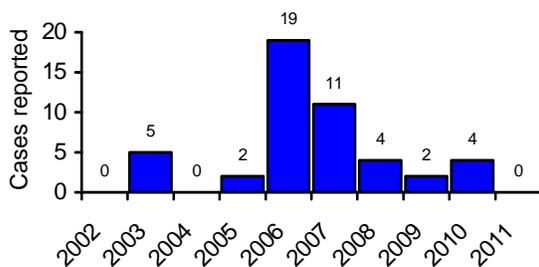
The national rate of primary and secondary syphilis in 2011 was 14.9 cases per 100,000 population with a five year median of 14.6. The incidence of syphilis in South Dakota is very low compared to the national rate.

**Table 72**  
**Syphilis in South Dakota, 2002-2011**

Year	Primary and Secondary	Early Latent	Late Latent	Congenital
2002	0	0	0	0
2003	2	3	0	0
2004	0	0	0	0
2005	2	0	0	0
2006	13	6	7	0
2007	7	4	1	0
2008	1	3	2	0
2009	1	2	4	0
2010	4	0	2	0
2011	0	0	1	0
<b>Total</b>	<b>30</b>	<b>18</b>	<b>17</b>	<b>0</b>

Source: South Dakota Department of Health, Office of Disease Prevention

**Figure 56**  
**Early Syphilis in South Dakota, 2002-2011**



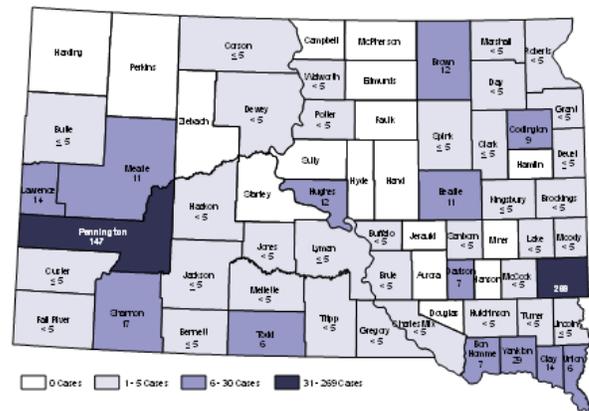
Source: South Dakota Department of Health, Office of Disease Prevention

## HIV/AIDS

Acquired immunodeficiency syndrome (AIDS) is caused by an infection of human immunodeficiency virus (HIV). AIDS became a reportable disease in South Dakota in 1985 and HIV infection became reportable in 1988. From 1985 through December 2011, 665 South Dakota residents were reported as infected with HIV to the Department of Health (501 male, 164 female) and 366 of those were also diagnosed with AIDS. Cases have been reported from 49 of the state's 66 counties (Figure 39).

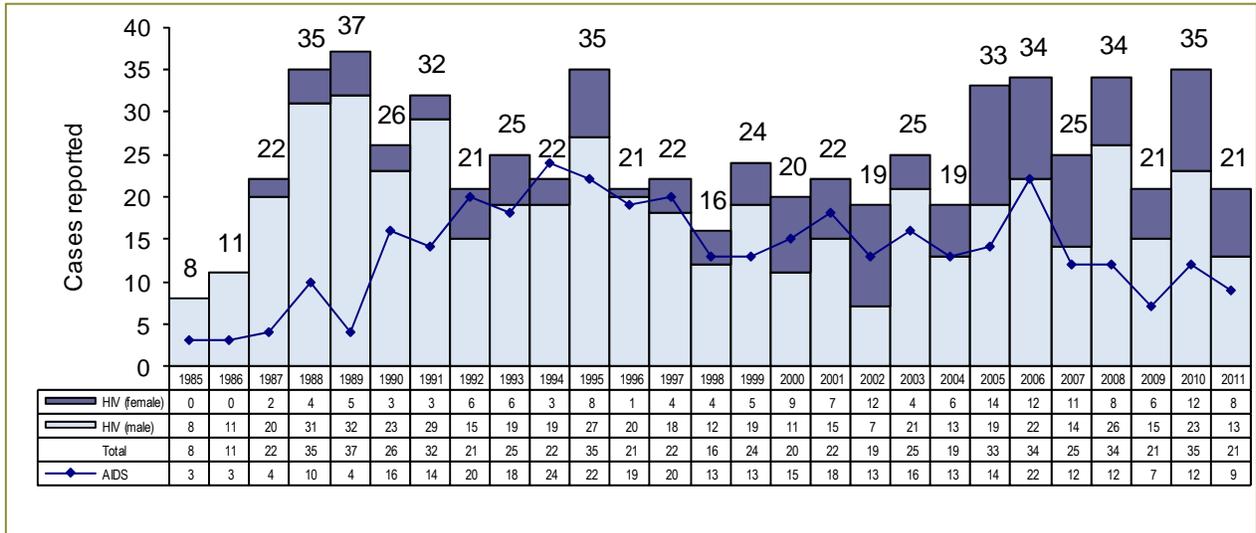
Twenty-one new HIV/AIDS cases were reported in 2011 (Figure 57). Thirteen of these cases were male and eight cases were female. There are an estimated 405 people living with HIV/AIDS in South Dakota, 70 percent male and 30 percent female. Blacks and American Indians are disproportionately affected by HIV/AIDS with Blacks comprising 23 percent of the living cases and American Indians 15 percent, when they comprise <1 percent and 9 percent of the population, respectively.

**Figure 57**  
**South Dakota Residents Reported Infected with HIV/AIDS**  
**Cumulative Cases by County, 1985-2011**



The DOH coordinates a statewide HIV/AIDS prevention and control program. Counseling and testing sites are located in Aberdeen, Dupree, Pierre, Rapid City, and Sioux Falls. These sites provide free, confidential counseling and testing for HIV. A toll-free statewide phone number (1-800-592-1861) is available to answer questions about AIDS and HIV during working hours. The national 24-hour AIDS hotline number is 1-800-232-4636.

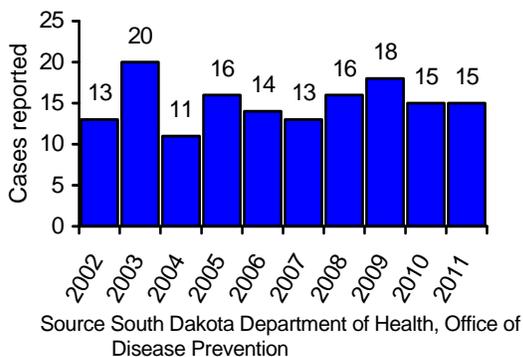
**Figure 58**  
**South Dakota Residents Diagnosed with HIV and AIDS by Gender, 1985-2011**



## TUBERCULOSIS

During calendar year 2011, 15 cases of active tuberculosis were reported (Figure 59) to the DOH.

**Figure 59**  
**Tuberculosis in South Dakota, 2002 – 2011**



The overall incidence rate was 1.8 per 100,000; with an incidence of 6.1 for American Indians, 0.7 for whites, 13.6 for blacks and 39.4 for Asians. Of the cases reported in 2011, six were female (40%), nine were male (60%). Forty percent of cases were foreign-born. The DOH's goal is

the elimination of tuberculosis transmission in South Dakota. The Healthy People 2020 target is 1.0 new case of tuberculosis per 100,000 per year.

In 2011, there was one case of tuberculosis reported in a child less than 10 years old. The occurrence of tuberculosis in young children is of special concern. Each child case represents a failure to stop transmission of infection and a failure to prevent the emergence of disease in an unexposed person.

There was one drug resistant tuberculosis case reported in 2011 which was resistant to isoniazid.

The DOH has an aggressive tuberculosis control strategy that includes contact investigations and oversight of patient treatment adherence. The elimination of tuberculosis in South Dakota focuses on preventing and monitoring disease activation among the elderly, the American Indian population, and foreign-born persons.

## FOODBORNE and DIARRHEAL DISEASES

### ***Escherichia coli*, shiga toxin-producing**

Shiga-toxin producing *E. coli* often causes severe bloody diarrhea and abdominal cramps. The illness usually resolves in 5 to 10 days. In some individuals, however, complications may involve severe hemorrhagic colitis, hemolytic uremic syndrome, thrombotic thrombocytopenic purpura, and even death.

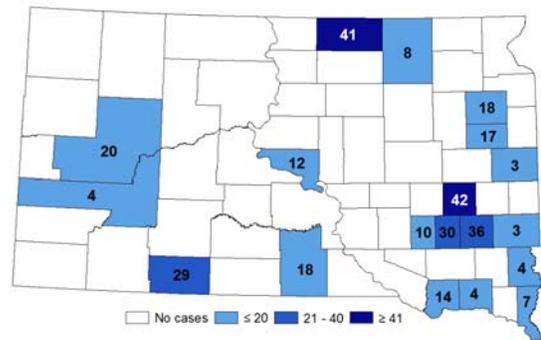
*Escherichia coli* O157:H7 infection has been legally reportable since 1996 and all shiga-toxin-producing *E. coli* have been reportable since 2005. During 2011 there were 41 cases of shiga toxin-producing *E. coli* (STEC) reported, representing a 17 percent increase from 2010 and an 18 percent decrease below the five year median. The incidence rate was 5.0 cases per 100,000 population. Figure 60 shows STEC incidence rates by county in South Dakota for 2011. Forty-nine percent of the cases were in children less than 15 years of age. There were two cases of hemolytic uremic syndrome (HUS) associated with *E. coli* infection.

*E. coli* O157:H7 is only one of several enterohemorrhagic, shiga toxin-producing serotypes of the bacteria. There were 27 cases of *E. coli* O157:H7, 5 cases of *E. coli* O145, 3 cases of *E. coli* O26, 2 cases of *E. coli* O111, 1 case each of *E. coli* O103, *E. coli* O121 and *E. coli* O5, and also 1 case of other shiga toxin-producing *E. coli* (unknown serotype) reported.

Shiga-toxin producing *E. coli* is transmitted by meat, water, fresh vegetables or other foods contaminated by the intestinal contents or manure of cattle, sheep, deer, and other animals. Person-to-person transmission can also occur. Human infection can be prevented by proper slaughtering methods, adequate cooking of meats, proper kitchen hygiene, pasteurization of fruit juices and dairy products, and hand-washing after contact with cattle or manure. Individuals with shiga

toxin-producing *E. coli* infections are restricted from commercial food handling, child day care, or patient health care until two successive negative fecal samples are produced.

**Figure 60**  
**STEC Incidence Rates by County,**  
**South Dakota, 2011**



Source: South Dakota Department of Health  
Office of Disease Prevention

**Campylobacteriosis** *Campylobacter* has been the most commonly reported enteric pathogen in South Dakota since 2001 (Table 79). In 2011, there were 301 cases of campylobacteriosis, which is an incidence of 36.5 cases per 100,000 population. This was a 15 percent increase over the five-year median baseline. Twenty-seven percent of the cases were in adults ages 40-64. Counties with the highest incidence (cases per 100,000 population) included Mellette (339), Haakon (262), Faulk (170), Walworth (161), and Douglas (135), (Figure 61).

*Campylobacter* is a Gram negative bacteria 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.



**Shigellosis** In 2011 there were 6 cases of shigellosis reported which represent a 92 percent decrease below the five-year median. This was an incidence rate of 0.7 cases per 100,000 population. Table 84 shows the most common shigellosis serotypes since 2000 in South Dakota.

*Shigella sonnei* has been the most common species isolated since 2002 while *S. flexneri* has been the second most common (Table 74). Shigellosis is an intestinal infection causing diarrhea, fever, nausea, vomiting, and abdominal cramps. Complications, such as severe dehydration or seizures, may occur, especially among infants.

*Shigella* is transmitted by the fecal-oral route (human feces), with a very small dose sufficient to cause illness. Following exposure, illness usually follows a one to four day incubation period. 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. Shigellosis may also be transmitted by contaminated drinking or recreational water, anal intercourse, houseflies, or by fecally contaminated objects.

**Table 74**  
**Most Common Shigella Serotypes,**  
**South Dakota, 2002-2011**

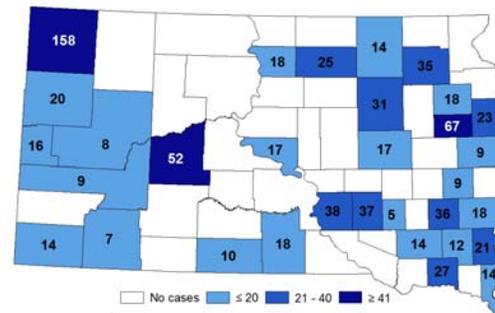
Year	S. flexn	S. sonnei	S. boydii	Species Unk	Total
2002	5	113	0	39	157
2003	3	9	0	5	17
2004	0	6	4	2	12
2005	1	70	5	55	131
2006	0	268	1	120	389
2007	0	75	0	47	122
2008	1	36	0	38	75
2009	1	2	0	1	4
2010	3	4	0	0	7
2011	3	2	0	1	6
<b>Total</b>	<b>17</b>	<b>585</b>	<b>10</b>	<b>308</b>	<b>920</b>
<b>Percent</b>	<b>2%</b>	<b>64%</b>	<b>1%</b>	<b>33%</b>	<b>100%</b>

Source: South Dakota Department of Health, Office of Disease Prevention

**Giardiasis** Giardiasis is a gastrointestinal disease caused by a flagellate protozoan parasite called *Giardia lamblia* (*G. intestinalis*) which is transmitted person-to-person or by contaminated water. During 2011, 110 cases of giardiasis were reported which is a 6 percent increase above the five-year median.

Forty-two percent of the cases were from children less than 15 years of age. Figure 63 shows giardiasis incidence rates (cases per 100,000 population) by county in South Dakota for 2011.

**Figure 63**  
**Giardiasis Incidence Rates by County,**  
**South Dakota, 2011**



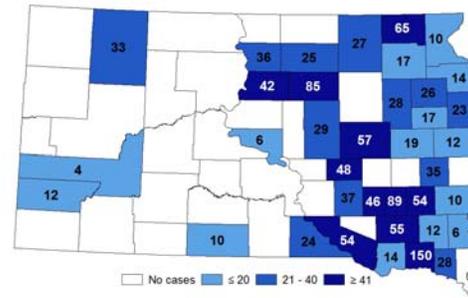
Source: South Dakota Department of Health, Office of Disease Prevention

**Cryptosporidiosis** Cryptosporidiosis is a coccidian protozoan diarrheal disease transmitted by cattle and human feces, often waterborne. In 2011 there were 146 cases reported representing a 36 percent increase over the five-year median. Forty-four percent of the cases were from children less than 15 years of age.

Nationally, an increase in reported cases is occurring with outbreaks often traced to outdoor recreational water sources and contaminated swimming pools.

Figure 64 shows cryptosporidiosis incidence rates (cases per 100,000 population) by county in South Dakota for 2011. Counties with the highest incidence rates (cases per 100,000 population) included Yankton (150), Hanson (89), Faulk (85), Marshall (65), and Beadle (57). East River counties accounted for 95 percent of the cases.

**Figure 64**  
**Cryptosporidiosis Incidence Rates by County, South Dakota, 2011**



Source: South Dakota Department of Health, Office of Disease Prevention

## RABIES

Rabies is an enzootic, nearly always fatal viral disease and a serious public health concern in South Dakota. In 2011, 711 animals were submitted for rabies testing with 40 animals testing positive. This is an increase of 25 percent from the previous year. The 40 rabid animals included 28 wild animals (20 skunks, 6 bats and 2 raccoons) and 12 domestic animals (4 cats, 4 cattle, 3 dogs and 1 horse). South Dakota's last human rabies case was in 1970.

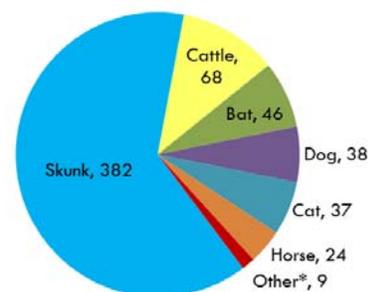
In 2011, 671 animals tested negative for rabies, including 191 cats, 167 dogs, 1115 bats, 70 cattle, 41 raccoons, 21 skunks, 14 horses, 13 muskrats, 11 deer, 4 mice, 3 coyotes, 3 minks, 3 opossums, 2 fox, 2 goats, 2 pigs, 2 rats, and 1 each of badger, gopher, guinea pig, moose, porcupine, squirrel, and woodchuck.

During 2011, rabid animals were detected in 24 South Dakota counties (Table 75 on the next page). Animals were submitted for testing from all but three counties. Over the

past 10 years, 2002-2011, rabid animals were reported in 58 of the state's counties, with 65 of 66 counties submitting animals for testing. Over the decade 7,991 animals were tested and 604 (8%) were rabid.

During the past decade 28 percent of rabies cases in South Dakota have been domestic animals (Figure 65 below). There were 37 rabid cats and 38 rabid dogs, many of which were unvaccinated strays or semi-tame barn cats. Rabid livestock included 68 cattle, 24 horses, and 4 goats.

**Figure 65**  
**Rabid Animals – South Dakota 2002-2011**



\*Others include 4 goats, 3 raccoons, 1 fox and 1 woodchuck

Source: South Dakota Department of Health, Office of Disease Prevention

**Table 75  
Animals Tested and Confirmed Rabies Cases in  
South Dakota, 2002-2011**

Animal	2011		2002 - 2011		% Pos
	Pos	Total tested	Pos	Total tested	
Skunk	20	41	382	619	62%
Cattle	4	74	68	878	8%
Bat	6	121	46	1,507	3%
Dog	3	170	38	1,590	2%
Cat	4	195	37	2,290	2%
Horse	1	15	24	241	10%
Goat	0	2	4	27	15%
Raccoon	2	43	3	350	1%
Fox	0	2	1	31	3%
Woodchuck	0	1	1	16	6%
Deer, elk, donkey	0	11	0	89	0%
Squirrel, chipmunk	0	1	0	74	0%
Rodents*	0	9	0	74	0%
Sheep	0	0	0	45	0%
Muskrat	0	13	0	43	0%
Opossum	0	3	0	28	0%
Coyote, wolf	0	3	0	26	0%
Weasel, ferret,	0	3	0	22	0%
Rabbit, hare	0	0	0	13	0%
Pig	0	2	0	6	0%
Badger	0	1	0	5	0%
Shrew, mole	0	0	0	4	0%
Bison	0	0	0	3	0%
Mountain Lion	0	0	0	3	0%
Moose	0	1	0	1	0%
Other animals	0	0	0	6	0%
<b>TOTAL</b>	<b>40</b>	<b>711</b>	<b>604</b>	<b>7,991</b>	<b>8%</b>

\*Rodents: rat, mouse, prairie dog, gopher, beaver, porcupine, vole  
Source: South Dakota Department of Health, Office of Disease Prevention

Skunks (*Mephitis mephitis*) are the enzootic rabies reservoir in South Dakota. Since 2002, 62 percent of skunks tested have been rabid. Bat rabies is also enzootic in South Dakota with 46 of 1,507 (3%) bats testing positive. Although rabies is not enzootic in other wild animals in South

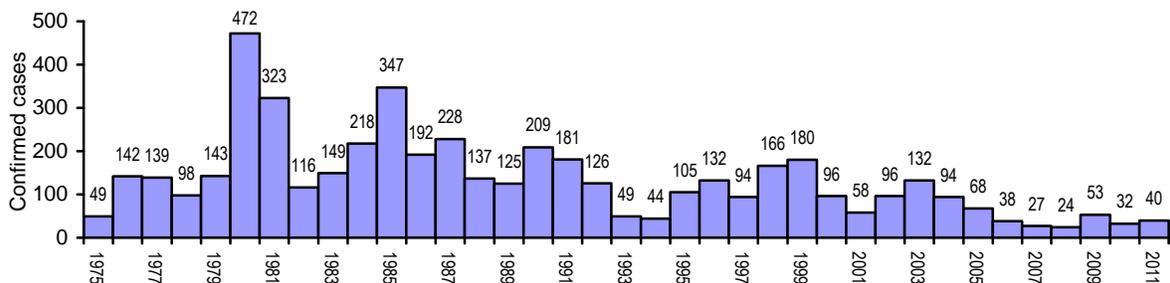
Dakota, during the past 10 years rabies has been detected in 3 raccoons, 1 fox, and 1 woodchuck. These other animals are likely spillover infections following exposure to rabid skunks.

Nationally in 2011, there was a two percent decrease from the previous year with 6,031 cases of animal rabies reported (92% wild animals, 8% domestic animals). Six human rabies cases were reported in 2011.

Nationally from 2002 through 2011, there have been 33 human rabies cases, including 30 deaths and 3 survivals, which is a 91 percent case fatality rate. Twenty-two of the human cases (67%) were associated with bat-rabies virus, 8 (24%) had dog rabies virus (all foreign imports) and 1 raccoon, 1 fox, and 1 unknown exposure. These 33 human rabies cases were from California (6), Texas (5), Indiana (2), Massachusetts (2), Virginia (2), Wisconsin (2) and one case each in Arkansas, Florida, Iowa, Louisiana, Michigan, Minnesota, Mississippi, Missouri, New Jersey, New York, Oklahoma, Puerto Rico, South Carolina and Tennessee.

Rabies consultations are available from the Office of Disease Prevention, South Dakota Department of Health, seven days a week. Consultations are based on current Centers for Disease Control and Prevention (CDC) recommendations. We strive to recommend appropriate rabies prevention measures and to minimize unnecessary and inappropriate post-exposure testing and prophylactic treatment.

**Figure 66  
Animal Rabies in South Dakota, 1975-2011**



Source: South Dakota Department of Health, Office of Disease Prevention

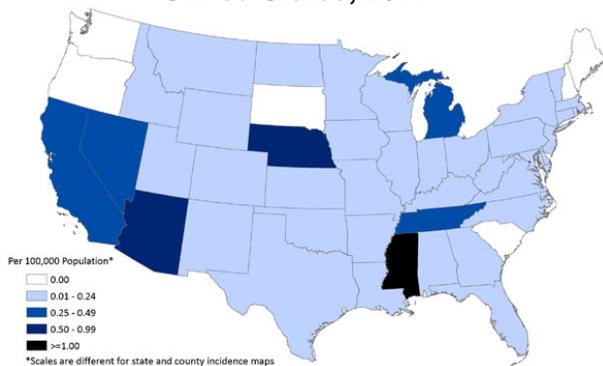
## West Nile Virus

West Nile virus (WNV) was first detected in the Western Hemisphere in 1999. The virus spread west across the continent, emerging in South Dakota in 2002. West Nile virus is now endemic in much of North America, including South Dakota.

2011 was the 13th year of WNV transmission in North America and the 10th transmission season in South Dakota. In 2003, North America experienced the largest ever recorded arboviral epidemic. The 2003 epidemic was centered in the Great Plains region with South Dakota having the third most WNV cases and the highest incidence of neuroinvasive disease (NID) in the country.

Nationally in 2011 there were 712 human WNV cases reported, of these 486 were neuroinvasive, (Figure 67), and 226 were non-neuroinvasive. Forty-three deaths were reported with 137 Presumptive Viremic Donors, although South Dakota did not have either of these instances.

**Figure 67**  
**West Nile Virus Neuroinvasive Disease Incidence, reported to ArboNET, by State, United States, 2011**



Source: Centers for Disease Control and Prevention

In South Dakota, there were two human cases of WNV disease and no deaths reported in 2011. Both cases were diagnosed with West Nile fever, a milder form of the disease. By contrast, in 2003 there were 1,039 human WNV cases, including 170 cases of neuro-invasive disease (NID 16%) and 869 cases of WN fever (84%) in South Dakota. Of these cases, 19 were reported with Acute Flaccid Paralysis and 14 died of WNV-associated illness.

The overall incidence of West Nile disease in 2011 was 0.2 cases per 100,000 population, which is down 95 percent from the five-year median.

The screening of donated blood has enhanced the safety of the blood supply and prevented many cases of WNV disease.

During the summer West Nile season, individuals with severe or unusual headaches should seek medical care as soon as possible. Physicians are encouraged to have a high index of suspicion for WNV disease. Free WNV testing is available at the South Dakota Public Health Laboratory for ill suspects. We do not encourage testing mildly ill patients or individuals who wish to know if they have an antibody titer.

## OTHER INFECTIOUS DISEASES

### Vector borne diseases

**Tularemia** In 2011 there were eight cases of Tularemia in South Dakota. This is an incidence rate of 1.0 for every 100,000 population. 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. If left untreated Tularemia may lead to death.

**Lyme Disease** In 2011 there were 4 cases of Lyme disease which is an incidence rate of 0.5 per 100,000 population. Lyme disease is caused by the bacteria *Borrelia burgdorferi* and is transmitted to humans through the bite of an infected tick. Each of South Dakota's four cases was exposed in other eastern states that are endemic for Lyme disease.

**Other Infectious Diseases** In 2011, there were 43 cases of invasive *Streptococcus pneumoniae* in all ages, 22 cases of invasive Group A *Streptococcus* and 18 cases of invasive Group B *Streptococcus*. There were 91 cases of invasive Methicillin Resistant *Staphylococcus aureus* (MRSA) and 67 cases of chicken pox. Additionally, three cases each of Anaplasmosis and Meningococcal disease were reported, two cases each of Hepatitis A, acute Hepatitis B, Legionellosis and Malaria, and one case each of Ehrlichiosis, Haemophilus influenza type B, Hantavirus pulmonary syndrome, Listeriosis, Q Fever and Rocky Mountain Spotted Fever in 2011.

