

## **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 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 2012 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 78**  
**Reportable Diseases in South Dakota, 2003-2012**

Reportable Diseases	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Anaplasmosis	NR	3	0							
Anthrax	0	0	0	0	0	0	0	0	0	0
Botulism	1	0	1	0	0	0	0	0	0	0
Brucellosis	1	0	0	0	0	0	0	0	0	0
Campylobacteriosis	188	273	244	219	235	262	298	297	301	276
Chlamydia trachomatis infections	2606	2534	2701	2633	2619	2942	3015	3192	3409	3924
Cholera	0	0	0	0	0	0	0	0	0	0
Cryptosporidiosis	49	44	31	86	169	88	138	107	146	113
Dengue fever	0	0	1	0	3	0	0	1	0	2
Diphtheria	0	0	0	0	0	0	0	0	0	0
Ehrlichiosis	0	0	0	0	0	1	0	0	1	1
Giardiasis	89	87	118	97	104	136	112	103	110	144
Gonorrhea	226	304	351	367	261	370	344	468	602	707
Haemophilus influenzae type b	1	0	0	0	0	0	0	0	1	0
Hantavirus pulmonary syndrome	1	1	2	2	1	0	0	0	1	1
Hemolytic uremic syndrome	1	0	3	8	1	3	3	2	2	0
Hepatitis A	0	4	1	9	6	4	3	1	2	0
Hepatitis B, acute	4	1	8	5	7	0	4	2	2	2
Hepatitis B, chronic	NR	26	33	16	39	47	40	51	51	51
Hepatitis C, chronic	NR	NR	207	355	317	365	381	349	356	390
HIV and AIDS	25	19	33	34	25	34	21	35	21	29
Legionellosis	2	5	21	5	4	3	2	9	2	9
Leprosy	0	0	0	0	0	1	0	0	0	0
Listeriosis	0	1	0	2	2	1	1	3	1	0
Lyme disease	1	1	2	1	0	3	1	1	4	4
Malaria	3	1	0	1	1	0	1	3	2	5
Measles	0	0	0	0	0	0	0	0	0	0
Meningococcal disease	1	4	4	4	3	3	5	0	3	0
Methicillin-resistant <i>Staph aureus</i> , invasive	NR	36	47	50	88	77	91	98	91	87
Mumps	0	0	0	296	6	1	2	2	0	0
Pertussis (whooping cough)	7	169	183	26	60	67	58	29	37	70
Plaque	0	0	0	0	0	0	0	0	0	0
Q fever	0	0	2	2	1	1	9	4	1	2
Rabies, animal	132	94	68	38	27	24	53	32	40	60
Rabies, human	0	0	0	0	0	0	0	0	0	0
Rocky Mountain Spotted Fever	5	4	5	0	5	3	0	0	1	1
Rubella and congenital rubella syndrome	0	0	0	0	0	0	0	0	0	0
St. Louis Encephalitis	2	0	0	0	0	0	0	0	0	0
Salmonellosis	131	156	160	135	174	152	198	186	162	170
Shiga toxin-producing <i>E. coli</i> , including	33	35	33	50	47	53	71	35	41	47
Shigellosis	17	12	131	389	122	76	4	7	6	11
Streptococcal disease, Group A, invasive	25	22	26	10	12	23	29	44	22	NR
Streptococcal disease, Group B, invasive	14	11	26	13	20	22	27	37	18	NR
<i>Streptococcus pneumoniae</i> , invasive all ages	NR	43	96							
<i>Streptococcus pneumoniae</i> , invasive ≤5 year	1	4	1	8	11	13	9	9	14	NR
Syphilis, Primary and Secondary, Early Latent	5	0	2	19	11	4	2	4	0	21
Tetanus	0	0	0	0	0	0	0	0	0	0
Toxic shock syndrome	1	1	2	0	0	1	0	0	0	0
Tuberculosis	20	11	16	14	13	16	18	15	15	19
Tularemia	5	4	8	5	7	10	5	11	8	5
Typhoid fever	0	0	0	1	0	2	2	1	0	0
Varicella (chicken pox)	NR	99	136	118	84	55	53	62	67	32
West Nile neuroinvasive disease	170	6	35	38	48	11	6	4	0	62
West Nile fever	869	45	194	74	160	28	15	16	2	140

\*NR= not reportable

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

**Table 79  
South Dakota Selected Notifiable Diseases by County, 2012**

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	0	0	0	≤ 3	0	0	0	0	≤ 3	0	0	≤ 3	≤ 3
Beadle	4	84	7	0	≤ 3	0	5	11	0	0	≤ 3	0	0	≤ 3	12
Bennett	≤ 3	26	0	0	≤ 3	11	0	0	≤ 3	0	0	0	0	0	0
Bon Homme	≤ 3	8	4	≤ 3	0	0	0	10	0	0	≤ 3	0	0	0	≤ 3
Brookings	11	102	≤ 3	≤ 3	≤ 3	6	≤ 3	≤ 3	≤ 3	10	7	0	0	0	10
Brown	13	111	10	≤ 3	4	≤ 3	≤ 3	14	≤ 3	0	9	0	0	≤ 3	36
Brule	8	17	≤ 3	0	0	≤ 3	≤ 3	≤ 3	≤ 3	0	≤ 3	0	≤ 3	≤ 3	0
Buffalo	0	32	0	0	≤ 3	5	0	≤ 3	0	0	≤ 3	0	≤ 3	≤ 3	0
Butte	0	17	0	0	4	0	≤ 3	4	≤ 3	0	0	0	0	0	0
Campbell	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Charles Mix	6	66	0	≤ 3	≤ 3	9	0	7	0	4	5	≤ 3	0	0	≤ 3
Clark	≤ 3	10	≤ 3	0	4	≤ 3	0	≤ 3	0	≤ 3	≤ 3	0	0	0	≤ 3
Clay	13	47	≤ 3	0	≤ 3	5	≤ 3	5	≤ 3	≤ 3	6	0	0	≤ 3	≤ 3
Codington	6	102	9	0	6	11	0	≤ 3	0	≤ 3	≤ 3	0	0	0	8
Corson	≤ 3	84	0	0	≤ 3	29	0	8	≤ 3	≤ 3	0	0	0	0	0
Custer	≤ 3	25	≤ 3	0	≤ 3	≤ 3	0	0	0	≤ 3	0	0	0	≤ 3	≤ 3
Davison	13	72	0	0	7	15	0	7	7	0	5	0	0	0	10
Day	≤ 3	8	5	0	0	≤ 3	0	≤ 3	≤ 3	≤ 3	0	0	0	0	4
Deuel	≤ 3	8	≤ 3	0	0	0	0	0	0	0	≤ 3	0	0	0	≤ 3
Dewey	≤ 3	124	≤ 3	0	0	45	0	≤ 3	≤ 3	0	≤ 3	≤ 3	0	0	≤ 3
Douglas	5	4	0	≤ 3	0	0	0	≤ 3	0	0	0	0	0	0	≤ 3
Edmunds	≤ 3	4	≤ 3	0	0	0	0	0	0	0	≤ 3	0	0	0	≤ 3
Fall River	≤ 3	10	≤ 3	0	≤ 3	0	0	5	≤ 3	0	4	0	0	0	0
Faulk	≤ 3	0	4	≤ 3	0	0	0	≤ 3	0	0	0	0	0	0	≤ 3
Grant	0	12	0	0	≤ 3	≤ 3	0	≤ 3	0	0	≤ 3	0	0	0	5
Gregory	≤ 3	9	0	0	≤ 3	≤ 3	0	0	0	0	≤ 3	0	0	0	0
Haakon	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Hamlin	≤ 3	4	≤ 3	0	≤ 3	≤ 3	0	0	0	≤ 3	0	0	0	0	4
Hand	0	≤ 3	0	0	0	0	0	0	0	0	0	≤ 3	0	0	0
Hanson	8	≤ 3	0	0	≤ 3	0	0	0	0	0	≤ 3	0	0	0	≤ 3
Harding	0	≤ 3	≤ 3	0	0	0	0	0	0	0	0	0	0	0	0
Hughes	≤ 3	72	0	0	≤ 3	9	0	12	0	4	0	0	0	≤ 3	6
Hutchinson	≤ 3	5	≤ 3	0	≤ 3	0	0	0	0	0	6	0	0	0	≤ 3
Hyde	0	≤ 3	0	0	0	0	0	0	0	0	0	0	0	0	≤ 3
Jackson	≤ 3	16	0	0	0	≤ 3	0	≤ 3	0	0	0	0	0	0	0
Jerauld	≤ 3	4	≤ 3	0	0	0	0	≤ 3	0	0	0	0	0	0	≤ 3

Continued

**Table 79**  
**South Dakota Selected Notifiable Diseases by County, 2012 (continued)**

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	≤ 3	0	0	≤ 3	0	0	0	0	0	0	0
Kingsbury	5	16	≤ 3	0	0	≤ 3	0	0	0	≤ 3	≤ 3	0	0	0	8
Lake	≤ 3	20	0	0	0	0	0	≤ 3	≤ 3	0	≤ 3	0	0	0	6
Lawrence	≤ 3	101	0	0	6	≤ 3	0	8	0	≤ 3	0	0	0	≤ 3	≤ 3
Lincoln	11	84	≤ 3	≤ 3	17	≤ 3	0	8	0	4	7	≤ 3	0	0	6
Lyman	≤ 3	32	0	0	≤ 3	13	0	0	≤ 3	0	≤ 3	0	0	0	0
Marshall	7	8	0	0	≤ 3	0	0	≤ 3	0	0	≤ 3	0	0	0	11
McCook	4	9	≤ 3	≤ 3	≤ 3	≤ 3	0	≤ 3	≤ 3	≤ 3	≤ 3	0	0	0	≤ 3
McPherson	≤ 3	≤ 3	≤ 3	≤ 3	0	0	0	0	0	0	≤ 3	0	0	0	≤ 3
Meade	4	76	0	0	≤ 3	7	0	4	≤ 3	≤ 3	≤ 3	0	0	≤ 3	0
Mellette	0	10	0	0	0	0	0	≤ 3	≤ 3	0	0	≤ 3	0	0	0
Miner	≤ 3	≤ 3	0	0	0	0	0	0	0	0	0	0	0	0	≤ 3
Minnehaha	53	948	14	13	31	140	30	129	20	7	35	9	0	≤ 3	16
Moody	4	21	5	0	0	≤ 3	0	6	≤ 3	0	0	0	0	0	≤ 3
Pennington	8	647	≤ 3	7	11	183	7	64	11	17	11	≤ 3	0	5	≤ 3
Perkins	4	≤ 3	0	0	0	0	0	0	0	≤ 3	0	0	0	0	0
Potter	≤ 3	0	0	0	0	0	0	0	0	0	0	0	0	0	≤ 3
Roberts	≤ 3	94	0	0	5	≤ 3	0	6	≤ 3	0	0	0	0	≤ 3	≤ 3
Sanborn	≤ 3	5	≤ 3	≤ 3	≤ 3	0	0	0	0	0	0	0	0	0	≤ 3
Shannon	0	400	0	0	≤ 3	124	0	17	7	0	10	0	≤ 3	0	0
Spink	7	4	≤ 3	≤ 3	0	≤ 3	0	≤ 3	≤ 3	0	≤ 3	0	0	≤ 3	5
Stanley	0	14	0	0	0	≤ 3	0	4	0	≤ 3	0	0	0	0	0
Sully	0	≤ 3	0	0	0	0	0	0	0	0	0	0	0	0	≤ 3
Todd	4	175	≤ 3	0	≤ 3	44	0	6	5	≤ 3	0	≤ 3	≤ 3	≤ 3	0
Tripp	5	22	0	≤ 3	0	≤ 3	0	≤ 3	≤ 3	0	4	0	0	0	≤ 3
Turner	6	15	0	0	4	≤ 3	0	≤ 3	≤ 3	0	9	0	0	0	≤ 3
Union	8	16	4	≤ 3	≤ 3	≤ 3	0	6	≤ 3	≤ 3	≤ 3	0	0	≤ 3	≤ 3
Walworth	≤ 3	24	≤ 3	≤ 3	0	4	0	5	0	0	≤ 3	0	0	0	≤ 3
Yankton	4	64	16	6	6	4	≤ 3	14	≤ 3	0	7	0	0	≤ 3	4
Ziebach	0	19	0	0	0	5	0	0	0	0	0	0	0	0	0
<b>South Dakota</b>	<b>276</b>	<b>3924</b>	<b>113</b>	<b>47</b>	<b>144</b>	<b>707</b>	<b>51</b>	<b>390</b>	<b>87</b>	<b>70</b>	<b>170</b>	<b>19</b>	<b>5</b>	<b>32</b>	<b>202</b>
Rate per 100,000	33.4	476.2	13.7	5.7	17.5	85.8	6.2	47.3	10.6	8.5	20.6	2.3	.6	3.9	24.5
5-year median	296	3016	138	47	110	382	46	346	91	58	172	15	8	62	21
% change of median	-7%	30%	-18%	0%	31%	85%	11%	13%	-4%	21%	-1%	27%	-38%	-48%	862%

In 2012 there were also: 96 cases of invasive *Streptococcus pneumoniae* in all ages; 11 cases of Shigellosis; 9 cases of Legionellosis; 5 cases of Malaria; 4 cases of Lyme disease; 2 cases each of Acute Hepatitis B, Dengue fever, and Q fever; and one case each of Ehrlichiosis, Hantavirus pulmonary syndrome, 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 80**  
**South Dakota Selected Notifiable Disease Summary by Gender, Race, and Age, 2012**

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	276	172 (62%)	104 (38%)	254 (92%)	17 (6%)	5 (2%)	47	9	40	22	49	64	64	28
Chlamydia	3924	1123 (29%)	2801 (71%)	1486 (38%)	1537 (39%)	901 (23%)	36	0	0	43	2786	1015	77	3
Cryptosporidiosis	113	46 (41%)	67 (59%)	102 (90%)	4 (4%)	7 (6%)	37	1	16	18	18	17	29	14
Shiga-toxin producing E. coli	47	25 (53%)	22 (47%)	44 (94%)	2 (4%)	1 (2%)	20	2	10	15	4	7	7	2
Giardiasis	144	70 (49%)	74 (51%)	117 (81%)	10 (7%)	17 (12%)	38	2	34	25	7	33	27	15
Gonorrhea	707	260 (37%)	447 (63%)	147 (21%)	476 (67%)	84 (12%)	31	0	0	9	403	266	29	0
Hepatitis B, Chronic	51	25 (49%)	26 (51%)	10 (20%)	1 (2%)	40 (78%)	38	0	0	2	7	18	21	3
Hepatitis C, Chronic	390	236 (61%)	154 (39%)	181 (46%)	62 (16%)	147 (38%)	43	0	1	0	30	109	235	15
HIV/AIDS	29	20 (69%)	9 (31%)	13 (45%)	10 (34%)	6 (21%)	45	0	0	1	0	6	22	0
Methicillin-resistant <i>Staph. aureas</i> , invasive	87	40 (46%)	47 (54%)	55 (63%)	22 (25%)	10 (12%)	58	1	0	2	1	5	39	39
Pertussis	70	31 (44%)	39 (56%)	56 (80%)	11 (16%)	3 (4%)	18	11	9	24	7	7	10	2
Salmonellosis	170	89 (52%)	81 (48%)	125 (74%)	28 (16%)	17 (10%)	43	12	22	25	20	18	53	20
Streptococcus pneumoniae, invasive all ages	96	49 (51%)	47 (49%)	61 (64%)	19 (20%)	16 (17%)	54	2	9	1	1	7	50	26
Syphilis	21	20 (95%)	1 (5%)	18 (86%)	0 (0%)	3 (14%)	40	0	0	0	0	8	12	1
Tuberculosis	19	6 (32%)	13 (68%)	6 (32%)	8 (42%)	5 (26%)	45	0	2	0	1	4	8	4
Tularemia	5	3 (60%)	2 (40%)	0 (0%)	5 (100%)	0 (0%)	4	0	3	2	0	0	0	0
Varicella	32	12 (38%)	20 (62%)	16 (50%)	7 (22%)	9 (28%)	9	7	15	5	3	2	0	0
West Nile virus disease	202	98 (49%)	104 (51%)	195 (97%)	2 (1%)	5 (2%)	49	0	0	8	10	40	99	45

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* type 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 2012, no cases of measles, mumps, rubella, diphtheria, tetanus, *Haemophilus influenzae* type b or polio were reported in South Dakota. Seventy cases of pertussis (whooping cough) were reported in South Dakota in 2012 which is up 89 percent from

2011. Eleven 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 2012 no cases of mumps were reported in South Dakota.

A decreasing trend of *Haemophilus influenzae* type b is evident from the 54 cases reported in 1990 down to zero in 2004 through 2012, with the exception of a single case in 2011. 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:

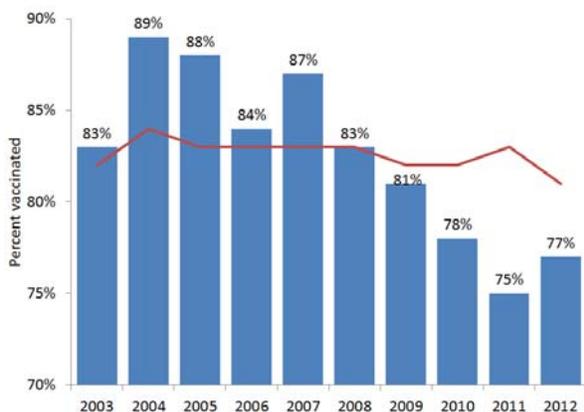
- a) 4 doses of diphtheria, tetanus, pertussis vaccine (DTaP), and
- b) 4 doses of poliovirus vaccine, and
- c) 2 doses of measles, mumps, and rubella vaccine (MMR), and
- d) 2 doses of chicken pox vaccine.

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, 2003 – 2012**  
 (National Immunization Survey 4:3:1)



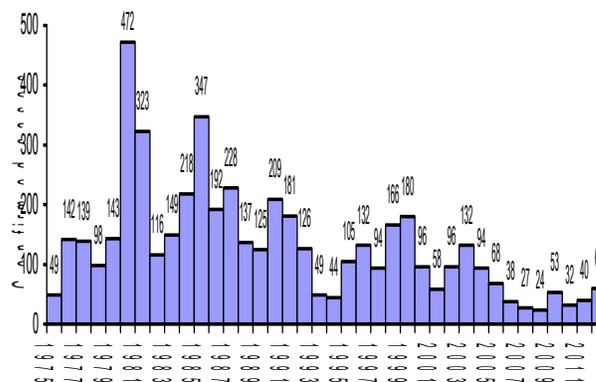
Immunization rates of children 19-35 months old immunized with 4 doses of DTaP, 3 doses polio, and 1 dose of MMR.  
 Source: South Dakota Department of Health, Office of Disease Prevention

In 2012, 77 percent of children 19-35 months old in South Dakota were adequately immunized for the 4:3:1 series (Figure 47). We are still short of our 90 percent immunization coverage objective. In 2012 South Dakota ranked 44<sup>th</sup> nationally for the 4:3:1 vaccination series.

**Viral Hepatitis** Two cases of acute hepatitis B and 51 cases of chronic hepatitis B were reported in 2012 (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, 2006-2012**



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

There were zero cases of Hepatitis A and 390 cases of chronic Hepatitis C reported in 2012 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 2012, 70 (8.5 cases per 100,000 population) cases of pertussis were reported in South Dakota, which is 21 percent above the five year

median. Figure 49 shows incidence (per 100,000 population) by county in South Dakota in 2012. No deaths were reported due to pertussis complications in 2012; however, two 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. Twenty-nine percent of the 2012 cases were less than five years old, and 64 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.

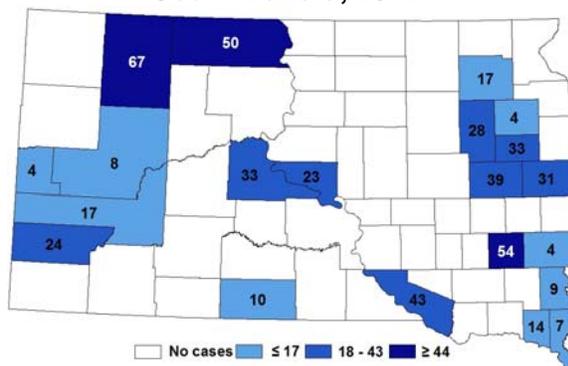
Immunization is the best protection for infants and young children. Since 2005 pertussis vaccine has been licensed in the United States for adolescents and adults. Figure 50 shows the number of cases per year in South Dakota since 1950.

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.

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.

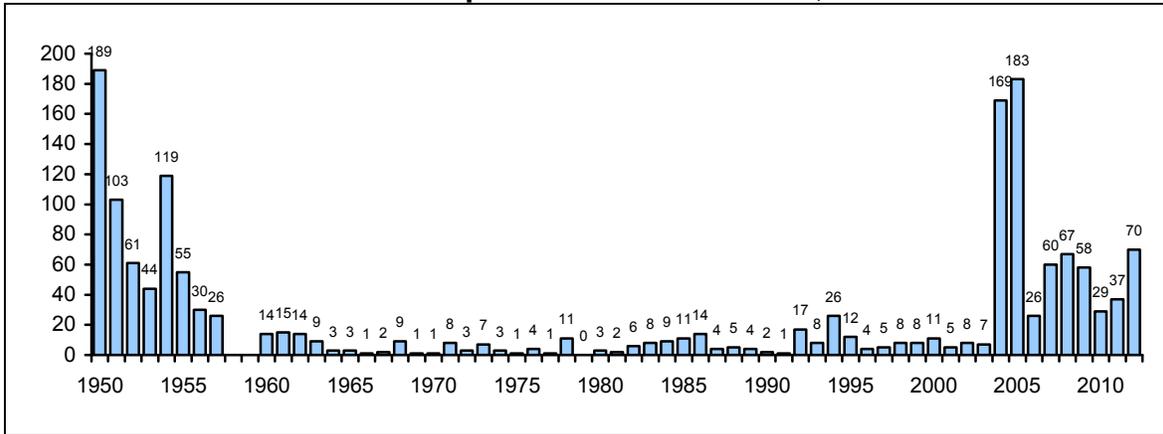
The diagnostic gold standard for pertussis is a positive culture result for *Bordetella pertussis*. The preferred specimen is a nasopharyngeal aspirate or a nasopharyngeal swab. Throat or anterior nasal specimens are unacceptable. Molecular polymerase chain reaction (PCR) testing of nasopharyngeal specimens 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 49**  
**Pertussis Incidence Rates by County, South Dakota, 2012**



Note: Cases per 100,000 population  
Source: South Dakota Department of Health, Office of Disease Prevention

**Figure 50**  
**Pertussis Cases Reported in South Dakota, 1950 – 2012**



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. The 2012-13 influenza season peaked early and was a moderately severe season, with influenza A (H3N2) viruses predominating. Nationally activity peaked in late December, and influenza A (H3N2) viruses were most commonly reported through the week ending February 16, 2013 (week 7). From the week ending February 23, 2013 (week 8), through the end of the season, influenza B viruses were more commonly reported. The majority of all influenza viruses in specimens sent to CDC for further antigenic characterization were similar to the components of the 2012-13 Northern Hemisphere vaccine.

The peak percentage of outpatient visits for ILI (6.1%) was one of the highest reported since the system began in its current format in 1997. The number and rate of influenza-associated hospitalizations among adults aged  $\geq 65$  years during the 2012-13 influenza season are the highest since systematic data collection on laboratory-confirmed, influenza-associated hospitalization in adults began in the 2005-06 season. Hospitalization rates for those

aged  $\geq 65$  were 191 per 100,000 population, two and a half times the highest rate previously reported for this age group. With the exception of the 2009 H1N1 pandemic, the number of influenza-associated pediatric deaths reported to CDC for the 2012-13 season was the highest reported since data collection began in 2004. Reported Pneumonia & Influenza mortality exceeded the epidemic threshold for 13 consecutive weeks. Based on the percentage of specimens testing positive for influenza, the peak of influenza activity for the 2012-13 season, occurring during the week ending December 29, 2012 (week 52), was similar to the 2003-04 season and was the earliest since the 2009 H1N1 pandemic, when activity peaked during the week ending October 24, 2009 (week 42).

On March 31, 2013, Chinese health authorities reported a novel avian influenza A (H7N9) virus causing human infection. As of Jun 7, 2013, 132 cases have been confirmed; many of the infected people are reported to have had close contact with poultry. The virus has only been seen in mainland China and Taiwan; no cases have been reported in the United States. Unlike the variant influenza A (H3N2)v virus associated with swine exposure at agriculture fairs in the United States which

generally caused mild illness, the avian influenza A (H7N9) virus has caused severe illness in the majority of cases in humans, and approximately 27 percent of identified cases have been fatal.

Testing for seasonal influenza viruses and monitoring for novel influenza A virus infections should continue year-round, as should specimen submission to CDC for further antigenic and genetic analysis and antiviral resistance monitoring. A total of 308 infections with variant influenza viruses (304 H3N2v viruses, three H1N2v viruses, and one H1N1v virus) were reported from 10 states during the summer and fall of 2012, before the start of the 2012-13 influenza season, and two cases of H3N2v were detected during the 2012-13 season. The H3N2v virus circulated in pigs in 2010 and was first detected in humans in 2012, when 12 cases were identified. Most of these infections occurred in children with prolonged exposure to pigs at agricultural fairs. Limited human-to-human spread of this virus was detected, but no sustained community spread of H2N2v was identified. However, this increase of H3N2v cases in 2012, and the recent emergence of the novel avian influenza A (H7N9) virus in China, further emphasizes the importance of continuing to monitor for novel influenza A viruses. Although summer influenza activity in the United States typically is low, cases of influenza and even sporadic outbreaks are detected in the United States throughout the summer. Health-care providers should remain vigilant and consider influenza as a potential cause of summer respiratory illnesses. They also should consider novel influenza viruses in persons with ILI and swine exposure, and those with severe acute respiratory infection after travel to China. Public health laboratories should immediately send to CDC virus specimens that they cannot type or subtype using standard methods and submit all specimens that are unusual, including all summer specimens, as soon as possible after identification.

Since 2010, CDC has recommended annual influenza vaccination for all persons aged

≥6 months, preferable in the fall before the U.S. influenza season begins. However, during other times of the year, persons who have not received the vaccination for the current season should be vaccinated before traveling to parts of the world where influenza activity is ongoing. This is particularly important for persons at high risk for influenza-related complications. This recommendation also applies to persons traveling within the temperate regions of the Southern Hemisphere or as part of large tourist groups (e.g., on cruise ships) that might include persons from other parts of the world where influenza activity is ongoing. Persons should also be aware that all Northern Hemisphere influenza vaccine manufactured for the 2012-13 season expires by June 30, 2013, after which influenza vaccines will not be available in the United States until the 2013-14 vaccine is available in the fall.

As a supplement to vaccination, influenza antiviral drugs are an important adjunct to reduce the impact of influenza. Based on recommendations of the Advisory Committee on Immunization Practices, antiviral treatment is recommended as soon as possible for patients with confirmed or suspected influenza who have severe, complicated, or progressive illness; who require hospitalization; or who are at higher risk for influenza-related complications. Antiviral treatment also may be considered for outpatients with confirmed or suspected influenza who do not have known risk factors for severe illness if treatment can be initiated within 48 hours of illness onset. In addition, if a clinician does suspect that a patient might have an infection caused by a novel influenza virus; prompt empiric antiviral therapy is recommended. Recommended antiviral medications include oseltamivir and zanamivir. Recent viral surveillance and resistance data indicate that the majority of currently circulating influenza viruses are sensitive to these medications. Amantadine and rimantadine should not be used because of sustained high levels of resistance to these drugs among circulating influenza A viruses.

## 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 2012-2013 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 associated hospitalizations and deaths, and institutional outbreaks. During the influenza season, weekly summary reports are posted on the SD DOH website at: [doh.sd.gov/Flu/](http://doh.sd.gov/Flu/).

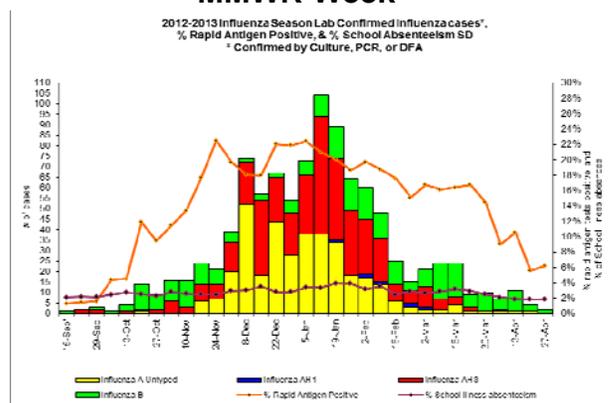
Table 81 shows a total of 993 confirmed influenza cases, A(H3N2) 384 (39%), A(H1N1) 7 (1%), A-not subtyped 354 (36%) and 249 (25%) influenza B, were reported to SD DOH. Additionally, 46,172 rapid antigen influenza tests were accomplished with 8,371 positive (18%), 5,786 (69%) positive for influenza A and 2,585 (31%) positive for influenza B.

**Table 81**  
**Age Distribution of Laboratory Confirmed Cases of Influenza and Influenza Associated Hospitalizations and Deaths**

Lab Confirmed Influenza Cases (by DFA, PCR, or culture)		Influenza Associated Hospitalizations	Influenza Associated Deaths
Age Group	# Cases (%)	# Hosp (%)	# Deaths
0-4	230 (23%)	64 (18%)	1 (3%)
5-24	211 (21%)	15 (4%)	2 (5%)
25-49	208 (21%)	41 (11%)	0
50-64	123 (12%)	56 (15%)	1 (3%)
> 64	221 (22%)	189 (52%)	34 (89)
<b>Total</b>	<b>993</b>	<b>365</b>	<b>38</b>

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

**Figure 51**  
**Seasonal Distribution of Influenza by MMWR Week**



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

The 2012-2013 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 9 months to 101 years.

As indicated in Figure 51, the first confirmed case of influenza was reported the second week of September 2012 and the last case reported late May 2013. The predominant virus in South Dakota was influenza A (H3N2); however, the season started and ended with influenza B being the predominant virus. The peak of the season was the second week in January 2013 with AH1N1, AH3N2, and Influenza B viruses circulating.

There were 365 individuals reported hospitalized during the 2012-2013 influenza season. The first hospitalization was identified mid-September 2012 and the last was reported early June 2013. Hospitalizations peaked mid-January. For patients that were hospitalized with influenza, the age range was 2 weeks to 102 years with a median age of 66 years.

Thirty-eight individuals died due to influenza and its complications during the 2012-2013 season. Gender breakdown was 50 percent male and 50 percent female. The median age was 88 years, with an age range of 3 weeks to 100 years. Eighty-nine percent of the influenza associated deaths were White and 11 percent were Native American.

Other viral respiratory pathogen reports included 86 adenovirus, 164 hMPV, 11 parainfluenza-1, 27 parainfluenza-2, 173

parainfluenza-3, 5 parainfluenza-4, and 471 respiratory syncytial virus.

## SEXUALLY TRANSMITTED DISEASES

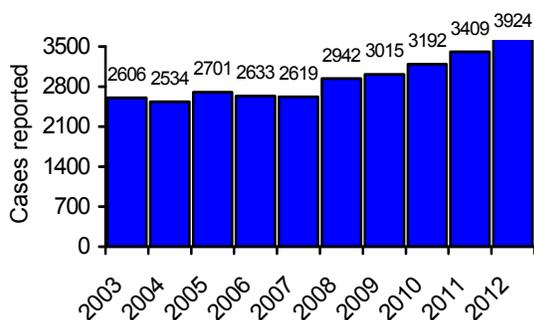
Sexually transmitted diseases (STDs) include several bacterial and viral infections that can be passed person-to-person by genital, oral or anal sexual contact. STDs include gonorrhea, chlamydia, genital herpes, syphilis, genital warts, HIV infection, chancroid, trichomoniasis, lymphogranuloma venereum, 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 2012, the DOH received 3,924 case reports (Figure 52), which was an incidence rate of 476.2 cases per 100,000 population. This year, 2012, had the most chlamydia cases ever reported in one year in South Dakota.

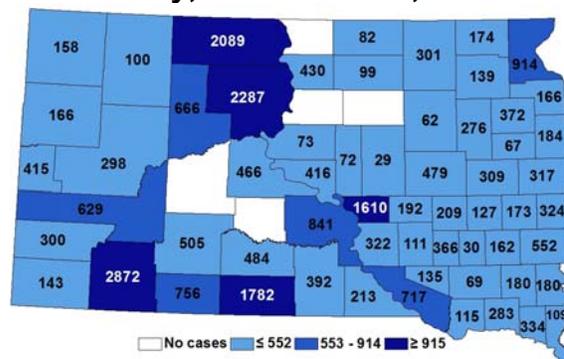
Counties with the highest incidence (cases per 100,000 population) included Shannon (2872), Dewey (2287), Corson (2089), Todd (1782), and Buffalo (1610), (Figure 53).

**Figure 52**  
**Chlamydia in South Dakota, 2003-2012**



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

**Figure 53**  
**Chlamydia Incidence Rates by County, South Dakota, 2012**



Note: Cases per 100,000 population  
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>.

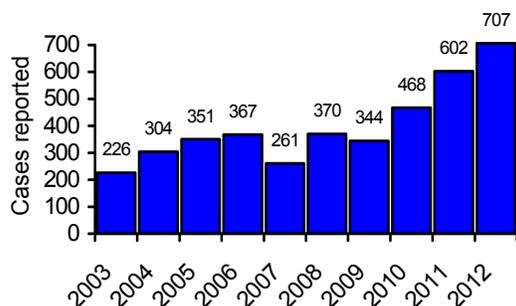
Screening for chlamydia infection has become standard practice for many health care providers in the state. Family planning clinics, prenatal clinics, Indian Health Service and many private providers have incorporated chlamydia screening as part of the routine health examination for sexually active young 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 71 percent of chlamydia cases were female in 2012.

Young people between 15 and 24 years old accounted for 71 percent of chlamydia cases reported in 2012. Although American Indians comprise 9 percent of the state's population, a disproportionate share, 39 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 2012 the DOH received 707 reports of gonorrhea (Figure 54), this is the highest number reported in South Dakota since 1986. This was an incidence of 85.8 cases per 100,000 population, 85 percent above the 5-year median. Twenty-one percent of the gonorrhea case reports occurred in the white population, and 63 percent were female.

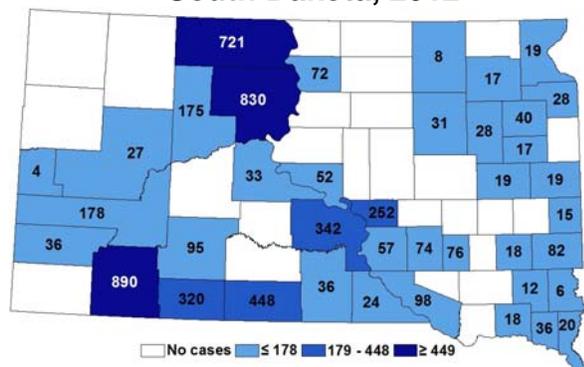
**Figure 54**  
**Gonorrhea in South Dakota, 2003-2012**



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

Counties with the highest incidence (cases per 100,000 population) included Shannon (890), Dewey (830), Corson (721), Todd (448) and Lyman (342), (Figure 55).

**Figure 55**  
**Gonorrhea Incidence Rates by County, South Dakota, 2012**



Note: Cases per 100,000 population  
Source: South Dakota Department of Health, Office of Disease Prevention

Sexually active adolescents and young adults are the population most at risk with 57 percent of the gonorrhea cases reported being 15 to 24 years old. The American Indian population was disproportionately affected with 67 percent of the reported cases.

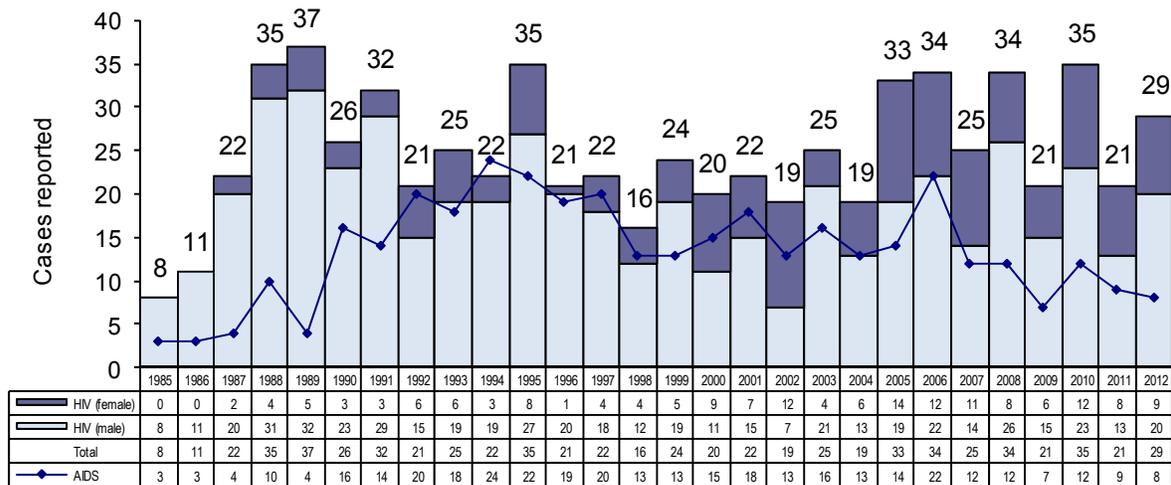
Nationally the incidence of gonorrhea was 104.2 cases per 100,000 population in 2011, an increase of 4 percent from 2010. Comparing incidence rates by state, South Dakota ranked 30<sup>th</sup>.

**Syphilis** In 2012 there were 21 cases of early syphilis (primary, secondary, or early latent) reported (Table 82, Figure 56), which was an incidence rate of 2.5 cases per 100,000 population, 425 percent above the 5-year median. 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 4.5 cases per 100,000 population.



**Figure 58**  
**South Dakota Residents Diagnosed by Gender with HIV and AIDS by Gender, 1985-2012**

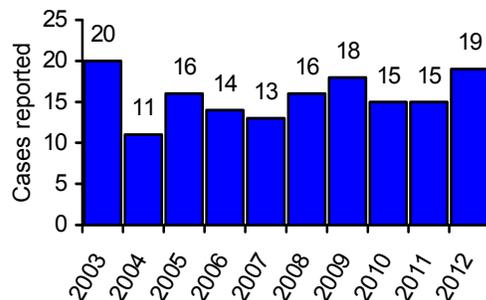


Source: South Dakota Department of Health, Office of Disease Prevention

## TUBERCULOSIS

During calendar year 2012, 19 cases of active tuberculosis were reported (Figure 59) to the DOH.

**Figure 59**  
**Tuberculosis in South Dakota, 2003 – 2012**



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

The overall incidence rate was 2.3 per 100,000; with an incidence of 10.8 for American Indians, 0.8 for whites, 18.2 for blacks and 24.3 for Asians. Of the cases reported in 2012, 13 were female (68%), 6 were male (32%). Thirty-seven 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.

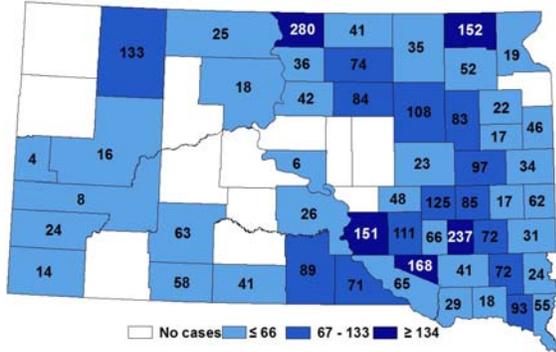
In 2012, there were two cases of tuberculosis reported in a child less than 10 years old. The occurrence of tuberculosis in young children is of special concern. Each child case represents a failure to stop transmission of infection and a failure to prevent the emergence of disease in an unexposed person.

There was one drug resistant tuberculosis case reported in 2012 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 tuberculosis in South Dakota focuses on preventing and monitoring disease activation among the elderly, the American Indian population, and foreign-born persons.



**Figure 61**  
**Campylobacteriosis Incidence Rates by County, South Dakota, 2012**



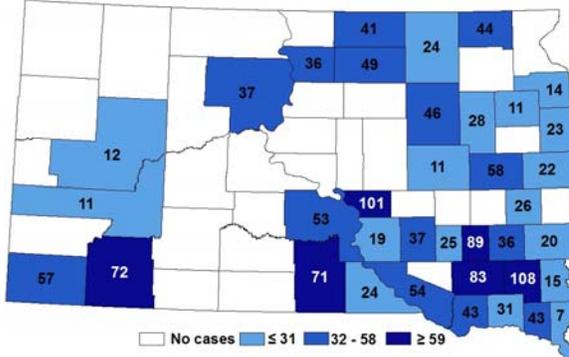
Note: Cases per 100,000 population  
Source: South Dakota Department of Health, Office of Disease Prevention

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

**Salmonellosis** There were 170 culture-confirmed cases of salmonellosis reported in South Dakota in 2012, which was an incidence of 20.6 cases per 100,000 population and showed a 1 percent decrease over the five-year median. Fifteen percent of the *Salmonella* cases were reported among children ages five to fourteen years of age.

Counties with the highest incidence (cases per 100,000 population) included Turner (108), Buffalo (101), Hanson (89), Hutchinson (83), Shannon (72) and Tripp (71), (Figure 62).

**Figure 62**  
**Salmonellosis Incidence Rates by County, South Dakota, 2012**



Note: Cases per 100,000 population  
Source: South Dakota Department of Health, Office of Disease Prevention

Table 83 shows the most commonly isolated serotypes of *Salmonella* since the year 2002 in South Dakota. *S. typhimurium*, *S. enteritidis*, *S. newport* and *S. infantis* were the most commonly isolated serotypes in 2012.

**Table 83**  
**Most Common Salmonella Serotypes, South Dakota, 2003-2012**

Salmonella serotype	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Total	Percent
Agona	0	0	0	1	2	3	2	5	1	2	16	1%
Braenderup	3	1	6	0	0	2	2	2	3	2	21	1%
Enteritidis	15	20	24	17	29	26	22	29	27	21	230	14%
Hadar	7	1	1	2	3	2	2	1	3	1	23	1%
Heidelberg	3	6	6	5	4	10	6	1	4	3	48	3%
Infantis	1	0	9	6	1	3	2	1	3	10	36	2%
Litchfield	1	0	3	0	2	1	2	2	2	2	15	1%
Montevideo	3	6	5	5	7	6	6	5	1	4	48	3%
Muenchen	2	5	2	3	8	3	3	2	2	1	31	2%
Newport	9	9	10	11	23	9	19	14	10	11	125	8%
Oranienburg	2	5	5	2	2	3	2	1	2	7	31	2%
Paratyphi B	5	3	3	3	2	1	1	0	1	3	22	1%
Saint Paul	5	1	0	3	1	3	38	13	7	1	72	5%
Thompson	0	1	2	2	1	1	3	1	4	3	18	1%
Typhimurium	50	61	49	45	41	35	44	44	63	58	490	30%
Other serotypes	25	37	35	30	47	44	44	65	29	41	397	24%
Total	131	156	160	135	173	152	198	186	162	170	1623	100%

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

**Shigellosis** In 2012 there were 11 cases of shigellosis reported which represent a 57 percent increase above the five-year median. This was an incidence rate of 0.8 cases per 100,000 population. Table 84 shows the most common shigellosis serotypes since 2003 in South Dakota.

*Shigella sonnei* has been the most common species isolated since 2003 while *S. flexneri* has been the second most common (Table 84). 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 84**  
**Most Common Shigella Serotypes,**  
**South Dakota, 2003-2012**

Year	S. flexn	S. sonnei	S. boydii	Species Unk	Total
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
2012	2	7	0	2	11
<b>Total</b>	<b>14</b>	<b>479</b>	<b>10</b>	<b>271</b>	<b>774</b>
<b>Percent</b>	<b>2%</b>	<b>62%</b>	<b>1%</b>	<b>35%</b>	<b>100%</b>

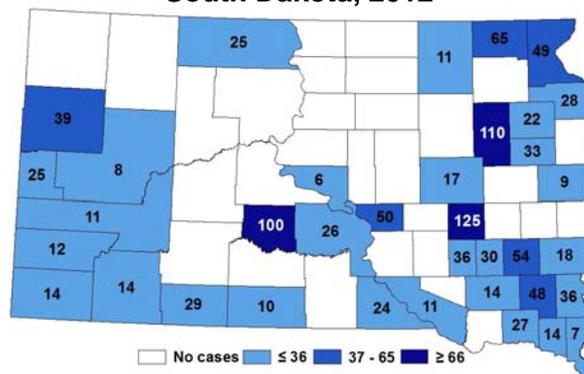
Source: South Dakota Department of Health, Office of Disease Prevention

**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 2012, 144 cases of giardiasis were reported which is a 31 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 2012.

**Figure 63**  
**Giardiasis Incidence Rates by County,**  
**South Dakota, 2012**



Note: Cases per 100,000 population  
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 2012 there were 113 cases reported representing an 18 percent decrease over the five-year median. Thirty-one percent of the cases were from children less than 15 years of age.

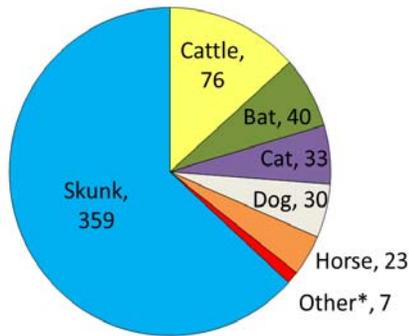
Nationally, an increase in reported cases is occurring with outbreaks often traced to outdoor recreational water sources and contaminated swimming pools.

Figure 64, on the next page, shows cryptosporidiosis incidence rates (cases per 100,000 population) by county in South Dakota for 2012. Counties with the highest incidence rates (cases per 100,000 population) included Faulk (169), Day (87), Harding (79), Moody (77), and Yankton (71). East River counties accounted for 94 percent of the cases.



**Figure 65**

**Rabid animals, South Dakota 2003-2012**  
 \*Others include 3 raccoons, 2 goats, 1 fox and 1 woodchuck



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

During the past decade 29 percent of rabies cases in South Dakota have been domestic animals. There were 33 rabid cats and 30 rabid dogs, many of which were unvaccinated strays or semi-tame barn cats. Rabid livestock included 76 cattle, 23 horses, and 2 goats (Figure 65).

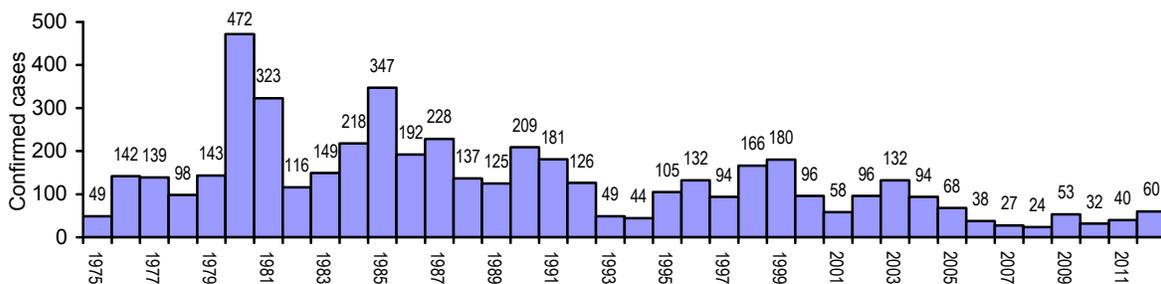
Skunks (*Mephitis mephitis*) are the enzootic rabies reservoir in South Dakota. Over the past decade 60 percent of skunks tested have been rabid. Bat rabies is also enzootic in South Dakota with 40 of 1,300 (3%) bats testing positive. Although rabies is not enzootic in other wild animals in South Dakota, 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 2012, 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 fox, 1 raccoon 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, 1975-2012**



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.

2012 was the 14th year of WNV transmission in North America and the 11th 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 2012 there were 5,674 human WNV cases reported, of these 2,873 were neuroinvasive, (Figure 67), and 2,801 were nonneuroinvasive. 286 deaths were reported with 703 Presumptive Viremic Donors.

In South Dakota, there were 203 human cases of WNV disease and three deaths reported in 2012. Sixty-two of those cases were neuro-invasive and 141 were nonneuro-invasive. Forty-two presumptive viremic donors were reported.

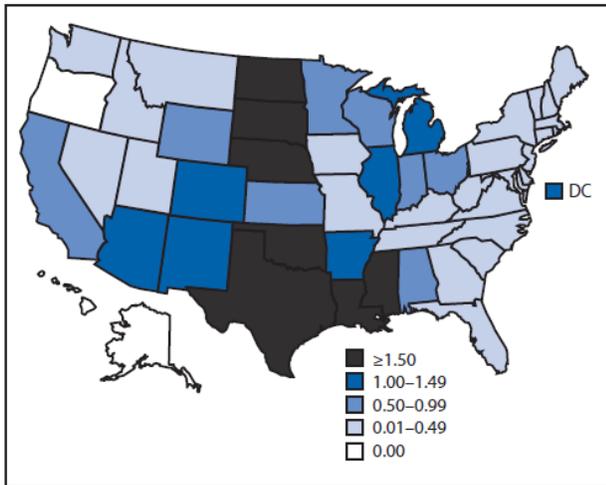
The overall incidence of West Nile disease in 2012 was 24.5 cases per 100,000 population, which is an 862 percent increase from the five-year median.

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

South Dakota also conducts active mosquito surveillance during the summer months.

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.

**Figure 67**  
West Nile Virus Neuroinvasive Disease Incidence, Reported to ArboNET, by State, United States, 2012



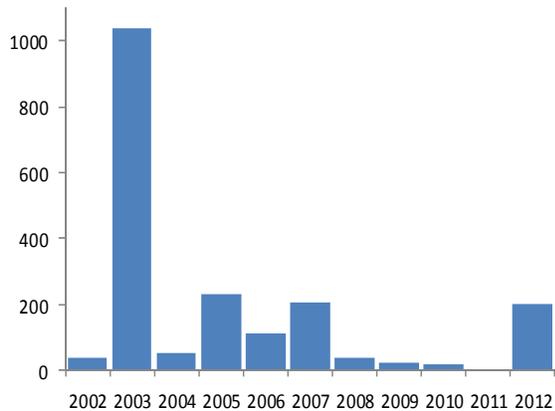
Source: Centers for Disease Control and Prevention

**Figure 68**  
West Nile Virus Cases, by County, South



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

**Figure 69**  
**South Dakota West Nile Virus**  
**Neuroinvasive**  
**and West Nile Fever Cases, 2002-2012**



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

*Staphylococcus aureus* (MRSA) and 32 cases of chicken pox. Additionally, 9 cases of Legionellosis were reported, 5 cases of Malaria, 2 cases each of acute Hepatitis B and Q Fever, and one case each of Ehrlichiosis, Hantavirus pulmonary syndrome, and Rocky Mountain Spotted Fever in 2012.

## OTHER INFECTIOUS DISEASES

### Vector borne diseases

**Tularemia** In 2012 there were 5 cases of Tularemia in South Dakota. This is an incidence rate of 0.6 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 be fatal.

**Lyme Disease** In 2012 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 4 cases was exposed in other eastern states that are endemic for Lyme disease.

**Other Infectious Diseases** In 2012, there were 96 cases of invasive *Streptococcus pneumoniae* in all ages. There were 87 cases of invasive Methicillin Resistant