

Infectious Diseases in South Dakota, 2013

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, and 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 infectious disease surveillance that is conducted by the South Dakota Department of Health. It highlights important statistics and shows key trends for infectious 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 2013 had the highest number of gonorrhea cases reported in the past ten years. These diseases are most commonly reported in females from 15-24 years of age.

Table 78
Reportable Diseases in South Dakota, 2004-2013

Reportable Diseases	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Anaplasmosis	NR	3	0	0						
Anthrax	0	0	0	0	0	0	0	0	0	0
Botulism	0	1	0	0	0	0	0	0	0	0
Brucellosis	0	0	0	0	0	0	0	0	0	1
Campylobacteriosis	273	244	219	235	262	298	297	301	276	295
Chlamydia trachomatis infections	2534	2701	2633	2619	2942	3015	3192	3409	3924	3927
Cholera	0	0	0	0	0	0	0	0	0	0
Cryptosporidiosis	44	31	86	169	88	138	107	146	113	174
Denque fever	0	1	0	3	0	0	1	0	2	3
Diphtheria	0	0	0	0	0	0	0	0	0	0
Ehrlichiosis	0	0	0	0	1	0	0	1	1	1
Giardiasis	87	118	97	104	136	112	103	110	144	111
Gonorrhea	304	351	367	261	370	344	468	602	707	784
Haemophilus influenzae type b	0	0	0	0	0	0	0	1	0	3
Hantavirus pulmonary syndrome	1	2	2	1	0	0	0	1	1	0
Hemolytic uremic syndrome	0	3	8	1	3	3	2	2	0	0
Hepatitis A	4	1	9	6	4	3	1	2	0	4
Hepatitis B, acute	1	8	5	7	0	4	2	2	2	5
Hepatitis B, chronic	26	33	16	39	47	40	51	51	51	79
Hepatitis C, chronic	NR	207	355	317	365	381	349	356	390	405
HIV and AIDS	19	33	34	25	34	21	35	21	29	36
Legionellosis	5	21	5	4	3	2	9	2	9	7
Leprosy	0	0	0	0	1	0	0	0	0	0
Listeriosis	1	0	2	2	1	1	3	1	0	0
Lyme disease	1	2	1	0	3	1	1	4	4	4
Malaria	1	0	1	1	0	1	3	2	5	7
Measles	0	0	0	0	0	0	0	0	0	0
Meningococcal disease	4	4	4	3	3	5	0	3	0	4
Methicillin-resistant <i>Staph aureus</i> , invasive	36	47	50	88	77	91	98	91	87	92
Mumps	0	0	296	6	1	2	2	0	0	0
Pertussis (whooping cough)	169	183	26	60	67	58	29	37	70	67
Plague	0	0	0	0	0	0	0	0	0	0
Q fever	0	2	2	1	1	9	4	1	2	4
Rabies, animal	94	68	38	27	24	53	32	40	60	28
Rabies, human	0	0	0	0	0	0	0	0	0	0
Rocky Mountain Spotted Fever	4	5	0	5	3	0	0	1	1	7
Rubella and congenital rubella syndrome	0	0	0	0	0	0	0	0	0	0
St. Louis Encephalitis	0	0	0	0	0	0	0	0	0	0
Salmonellosis	156	160	135	174	152	198	186	162	170	182
Shiga toxin-producing E. coli, including O157:H7	35	33	50	47	53	71	35	41	47	43
Shigellosis	12	131	389	122	76	4	7	6	11	186
Streptococcal disease, Group A, invasive	22	26	10	12	23	29	44	22	NR	NR
Streptococcal disease, Group B, invasive	11	26	13	20	22	27	37	18	NR	NR
<i>Streptococcus pneumoniae</i> , invasive all ages	NR	43	96	99						
<i>Streptococcus pneumoniae</i> , invasive ≤5 year	4	1	8	11	13	9	9	14	NR	NR
Syphilis, Primary and Secondary, Early Latent	0	2	19	11	4	2	4	0	21	49
Tetanus	0	0	0	0	0	0	0	0	0	0
Toxic shock syndrome	1	2	0	0	1	0	0	0	0	0
Tuberculosis	11	16	14	13	16	18	15	15	19	9
Tularemia	4	8	5	7	10	5	11	8	5	7
Typhoid fever	0	0	1	0	2	2	1	0	0	3
Varicella (chicken pox)	99	136	118	84	55	53	62	67	32	43
West Nile neuroinvasive disease	6	35	38	48	11	6	4	0	62	57
West Nile fever	45	194	74	160	28	15	16	2	140	92

*NR= not reportable

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

Table 79
South Dakota Selected Notifiable Diseases by County, 2013

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	0	0	0	0	0	0	0	0	≤ 3	0
Beadle	9	70	7	0	≤ 3	4	23	13	≤ 3	0	≤ 3	0	0	≤ 3	8
Bennett	4	35	≤ 3	≤ 3	≤ 3	7	0	≤ 3	0	≤ 3	0	0	≤ 3	0	0
Bon Homme	≤ 3	9	5	≤ 3	≤ 3	≤ 3	0	11	≤ 3	≤ 3	0	0	0	≤ 3	0
Brookings	11	96	≤ 3	≤ 3	4	≤ 3	≤ 3	6	≤ 3	≤ 3	6	0	0	0	7
Brown	7	106	5	≤ 3	≤ 3	11	≤ 3	6	≤ 3	≤ 3	8	0	0	0	23
Brule	7	10	≤ 3	0	≤ 3	≤ 3	0	4	≤ 3	≤ 3	≤ 3	0	≤ 3	0	≤ 3
Buffalo	0	40	0	0	≤ 3	7	≤ 3	4	≤ 3	0	5	0	0	0	≤ 3
Butte	≤ 3	22	≤ 3	0	≤ 3	0	0	5	≤ 3	4	≤ 3	≤ 3	0	0	≤ 3
Campbell	≤ 3	≤ 3	0	0	0	0	0	0	0	0	0	0	0	0	≤ 3
Charles Mix	12	80	≤ 3	≤ 3	0	13	0	12	0	0	4	≤ 3	0	0	≤ 3
Clark	≤ 3	5	0	≤ 3	0	≤ 3	0	≤ 3	0	≤ 3	0	0	0	0	4
Clay	9	58	11	≤ 3	0	6	≤ 3	≤ 3	0	≤ 3	5	0	0	0	≤ 3
Codington	9	90	17	≤ 3	5	4	0	5	≤ 3	0	≤ 3	0	0	0	4
Corson	0	85	≤ 3	0	0	53	0	12	≤ 3	8	≤ 3	0	0	≤ 3	≤ 3
Custer	≤ 3	35	0	≤ 3	0	≤ 3	0	≤ 3	0	≤ 3	0	0	0	0	0
Davison	10	70	8	≤ 3	5	11	0	6	≤ 3	≤ 3	11	≤ 3	≤ 3	0	≤ 3
Day	9	14	≤ 3	0	0	0	≤ 3	≤ 3	≤ 3	0	≤ 3	0	0	0	≤ 3
Deuel	≤ 3	≤ 3	≤ 3	0	0	0	0	≤ 3	≤ 3	0	≤ 3	0	0	0	≤ 3
Dewey	≤ 3	125	0	0	0	74	0	8	4	≤ 3	0	0	≤ 3	≤ 3	≤ 3
Douglas	≤ 3	0	0	0	0	0	0	0	≤ 3	≤ 3	4	0	0	0	≤ 3
Edmunds	5	≤ 3	0	0	0	0	0	≤ 3	≤ 3	0	≤ 3	0	0	0	≤ 3
Fall River	0	11	0	0	0	≤ 3	≤ 3	6	≤ 3	≤ 3	0	0	0	0	0
Faulk	0	≤ 3	≤ 3	0	0	≤ 3	0	≤ 3	0	0	≤ 3	0	0	0	≤ 3
Grant	≤ 3	8	0	0	0	5	0	≤ 3	≤ 3	0	≤ 3	0	0	0	0
Gregory	9	4	≤ 3	0	0	0	0	≤ 3	0	≤ 3	≤ 3	0	0	0	0
Haakon	≤ 3	≤ 3	0	0	0	0	0	0	≤ 3	≤ 3	≤ 3	0	0	0	0
Hamlin	5	6	≤ 3	0	≤ 3	0	≤ 3	0	0	0	0	0	0	0	≤ 3
Hand	≤ 3	4	0	0	0	0	0	0	0	0	0	0	0	0	0
Hanson	≤ 3	≤ 3	≤ 3	0	0	0	0	≤ 3	0	0	≤ 3	0	0	0	0
Harding	≤ 3	≤ 3	0	0	0	0	0	≤ 3	0	0	0	0	0	0	0
Hughes	≤ 3	79	≤ 3	0	9	9	≤ 3	9	0	0	≤ 3	0	≤ 3	≤ 3	6
Hutchinson	9	6	6	≤ 3	≤ 3	≤ 3	0	≤ 3	4	≤ 3	≤ 3	0	0	≤ 3	≤ 3
Hyde	0	≤ 3	≤ 3	0	0	0	0	0	0	0	0	0	0	0	0
Jackson	≤ 3	24	0	0	0	5	0	0	0	0	≤ 3	0	0	0	≤ 3
Jerauld	≤ 3	≤ 3	0	0	≤ 3	0	0	≤ 3	0	0	≤ 3	0	0	0	≤ 3

Continued

Table 79
South Dakota Selected Notifiable Diseases by County, 2013 (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	≤ 3	4	0	0	0	0	0	0	0	≤ 3	0	0	0	0	4
Kingsbury	5	5	≤ 3	≤ 3	0	≤ 3	0	≤ 3	≤ 3	0	5	0	0	0	0
Lake	≤ 3	29	≤ 3	≤ 3	0	≤ 3	0	0	0	0	≤ 3	0	0	0	≤ 3
Lawrence	≤ 3	81	7	0	5	≤ 3	0	13	0	0	≤ 3	0	0	4	≤ 3
Lincoln	8	101	8	≤ 3	11	9	≤ 3	4	≤ 3	≤ 3	7	0	0	≤ 3	4
Lyman	≤ 3	19	≤ 3	0	≤ 3	4	0	≤ 3	0	0	0	0	0	0	≤ 3
Marshall	4	6	0	0	≤ 3	≤ 3	≤ 3	0	0	0	≤ 3	0	0	0	≤ 3
McCook	6	5	≤ 3	0	0	≤ 3	0	≤ 3	0	0	≤ 3	0	0	0	≤ 3
McPherson	0	≤ 3	≤ 3	≤ 3	0	0	0	≤ 3	0	0	≤ 3	0	0	0	≤ 3
Meade	≤ 3	109	7	≤ 3	≤ 3	5	≤ 3	13	≤ 3	0	≤ 3	0	0	≤ 3	≤ 3
Mellette	≤ 3	8	0	≤ 3	0	≤ 3	0	≤ 3	0	0	0	0	0	0	≤ 3
Miner	5	≤ 3	0	0	0	≤ 3	0	0	0	0	0	0	0	0	≤ 3
Minnehaha	43	932	15	10	26	193	33	106	18	≤ 3	43	≤ 3	0	5	9
Moody	5	19	≤ 3	0	≤ 3	4	0	5	0	0	0	0	0	0	≤ 3
Pennington	12	601	9	6	13	122	5	70	16	15	9	≤ 3	0	12	11
Perkins	≤ 3	≤ 3	0	0	0	0	0	≤ 3	0	0	0	0	0	0	≤ 3
Potter	0	6	0	0	0	0	0	0	0	0	≤ 3	0	0	0	0
Roberts	5	128	0	≤ 3	≤ 3	12	0	8	≤ 3	0	4	0	0	0	≤ 3
Sanborn	4	8	≤ 3	0	0	0	0	≤ 3	0	0	≤ 3	0	0	0	≤ 3
Shannon	≤ 3	373	0	0	0	117	0	6	5	≤ 3	6	≤ 3	≤ 3	0	≤ 3
Spink	4	4	≤ 3	≤ 3	0	0	0	≤ 3	0	0	≤ 3	0	0	≤ 3	6
Stanley	≤ 3	16	0	0	≤ 3	≤ 3	0	≤ 3	0	0	≤ 3	0	0	≤ 3	0
Sully	0	4	0	0	0	0	0	0	0	0	0	0	0	≤ 3	≤ 3
Todd	4	194	≤ 3	0	0	39	0	10	8	0	≤ 3	0	0	≤ 3	0
Tripp	7	17	0	0	≤ 3	5	0	≤ 3	0	6	≤ 3	0	0	0	≤ 3
Turner	4	4	≤ 3	0	≤ 3	0	0	0	≤ 3	0	8	0	0	0	≤ 3
Union	10	24	≤ 3	0	≤ 3	7	0	7	≤ 3	0	4	0	0	0	≤ 3
Walworth	≤ 3	28	0	≤ 3	≤ 3	12	0	≤ 3	≤ 3	≤ 3	≤ 3	0	0	0	≤ 3
Yankton	9	61	30	5	5	9	≤ 3	20	4	≤ 3	≤ 3	0	0	0	≤ 3
Ziebach	≤ 3	23	0	0	0	10	0	0	0	0	0	≤ 3	0	≤ 3	0
South Dakota	295	3927	174	43	111	784	79	405	92	67	182	9	7	43	149
Rate per 100,000	35.4	471.2	20.9	5.2	13.3	94.1	9.5	48.6	11.0	8.0	21.8	1.1	0.8	52	68
5-year median	297	3192	113	47	112	468	51	371	90	58	170	15	8	55	21
% change of median	-1%	23%	54%	-9%	-1%	68%	55%	9%	2%	16%	7%	-67%	-14%	-28%	710%

In 2013 there were also: 186 cases of Shigellosis; 99 cases of invasive *Streptococcus pneumoniae* in all ages; 7 cases each of Legionellosis, Malaria and Rocky Mountain Spotted Fever; 5 cases of Acute Hepatitis B; 4 cases each of Lyme disease, Meningococcal disease and Q fever; 3 cases each of Dengue fever and Typhoid fever; and one case each of Brucellosis and Ehrlichiosis.

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, 2013

Disease	Total	Gender*		Race*				Median age	Age group (in years)						
		Male (%)	Female (%)	White (%)	American Indian (%)	Other (%)	Unknown (%)		<1	1-4	5-14	15-24	25-39	40-64	≥65
Campylobacteriosis	295	188 (64%)	107 (36%)	262 (89%)	19 (6%)	5 (2%)	9 (3%)	28	5	28	48	50	57	75	32
Chlamydia	3927	1134 (29%)	2793 (71%)	1583 (40%)	1641 (42%)	230 (6%)	473 (12%)	22	0	0	49	2673	1118	85	2
Cryptosporidiosis	174	86 (49%)	88 (51%)	153 (88%)	12 (7%)	2 (1%)	7 (4%)	17	4	40	35	23	38	24	10
Shiga-toxin producing E. coli	43	18 (42%)	25 (58%)	36 (84%)	4 (10%)	1 (2%)	2 (5%)	23	1	9	5	7	4	9	8
Giardiasis	111	59 (53%)	52 (47%)	92 (83%)	5 (5%)	7 (6%)	7 (6%)	29	2	29	16	3	25	21	15
Gonorrhea	784	320 (41%)	464 (59%)	173 (22%)	506 (65%)	85 (11%)	20 (3%)	24	0	0	6	410	319	46	3
Hepatitis B, Chronic	79	51 (65%)	28 (35%)	13 (16%)	1 (1%)	59 (75%)	6 (8%)	37	0	0	0	12	34	32	1
Hepatitis C, Chronic	405	230 (57%)	175 (43%)	156 (39%)	77 (19%)	19 (5%)	153 (38%)	47	0	0	0	26	119	244	16
HIV/AIDS	36	24 (67%)	12 (33%)	12 (33%)	12 (33%)	12 (33%)	0 (0%)	41	0	0	0	3	13	19	1
Methicillin-resistant <i>Staph. aureus</i> , invasive	92	53 (58%)	39 (42%)	57 (62%)	27 (29%)	2 (2%)	6 (7%)	64	3	0	4	0	11	31	43
Pertussis	67	28 (42%)	39 (58%)	43 (64%)	20 (30%)	0 (0%)	4 (6%)	11	12	8	20	13	5	5	4
Salmonellosis	182	101 (55%)	81 (45%)	155 (85%)	19 (10%)	4 (2%)	4 (2%)	31	11	21	24	27	29	53	17
Streptococcus pneumoniae, invasive all ages	99	55 (56%)	44 (44%)	65 (66%)	20 (20%)	6 (6%)	8 (8%)	58	5	5	0	1	6	47	35
Syphilis	49	34 (69%)	15 (31%)	22 (45%)	24 (49%)	3 (6%)	0 (0%)	35	0	0	0	12	15	21	1
Tuberculosis	9	3 (33%)	6 (67%)	1 (11%)	5 (56%)	3 (33%)	0 (0%)	49	0	0	0	1	1	6	1
Tularemia	7	2 (29%)	5 (71%)	2 (29%)	5 (71%)	0 (0%)	0 (0%)	6	0	3	3	0	1	0	0
Varicella	43	19 (44%)	24 (56%)	19 (44%)	8 (19%)	1 (2%)	15 (35%)	5	7	12	17	3	4	0	0
West Nile virus disease	149	92 (62%)	57 (38%)	133 (89%)	14 (9%)	0 (0%)	2 (1%)	54	0	0	5	11	21	68	44

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 2013, no cases of measles, mumps, rubella, diphtheria, tetanus or polio were reported in South Dakota. Sixty-seven cases of pertussis (whooping cough) were reported in South Dakota in 2013 which is down 4 percent from 2012. Twelve 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 2013 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 and 3 cases in 2013. 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.

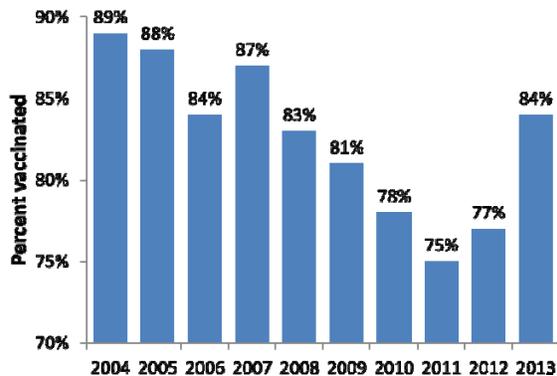
Immunization requirements for entrance into South Dakota schools since 2000 include:

- 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 46
South Dakota Immunization Rates,
Children 19-35 Months, 2004 – 2013
 (National Immunization Survey 4:3:1)



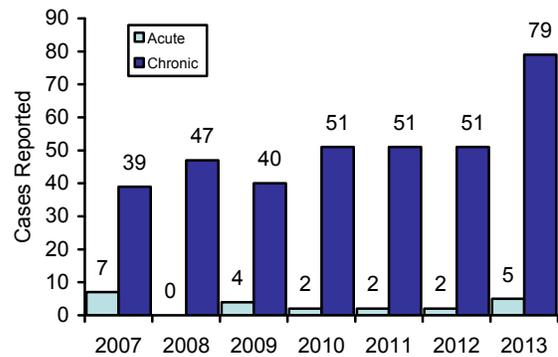
Immunization rates of children 19-35 months old immunized with 4 doses of DTaP, 3 doses polio, and 1 dose of MMR.
 Source: South Dakota Department of Health, Office of Disease Prevention

In 2013, 84 percent of children 19-35 months old in South Dakota were adequately immunized for the 4:3:1 series (Figure 46). We are still short of our 90 percent immunization coverage objective. In 2013 South Dakota ranked 36th nationally for the 4:3:1 vaccination series.

Viral Hepatitis Five cases of acute hepatitis B and 79 cases of chronic hepatitis B were reported in 2013 (Figure 47). 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.

Figure 47
Acute and Chronic Hepatitis B
in South Dakota 2007-2013



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

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.

There were four cases of Hepatitis A and 405 cases of chronic Hepatitis C reported in 2013 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 2013, 67 (8.0 cases per 100,000 population) cases of pertussis were reported in South Dakota, which is 16 percent above the five year median. Figure 48 shows incidence (per 100,000 population) by county in South Dakota in 2013. No deaths were reported due to pertussis complications in 2013; however, two infant deaths due to pertussis have been reported since 2000.

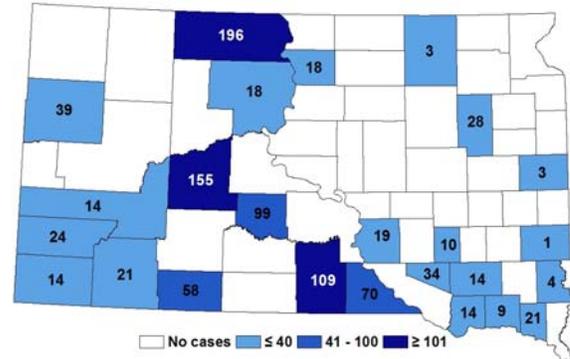
Infants and young children are at higher risk of pertussis-associated complications, hospitalization and death. The most common complication is secondary bacterial pneumonia. Thirty percent of the 2013 cases were less than five years old, and 60 percent were less than 15 years old. Pertussis infected 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 49, on the next page, 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 48
Pertussis Incidence* Rates by County, South Dakota, 2013

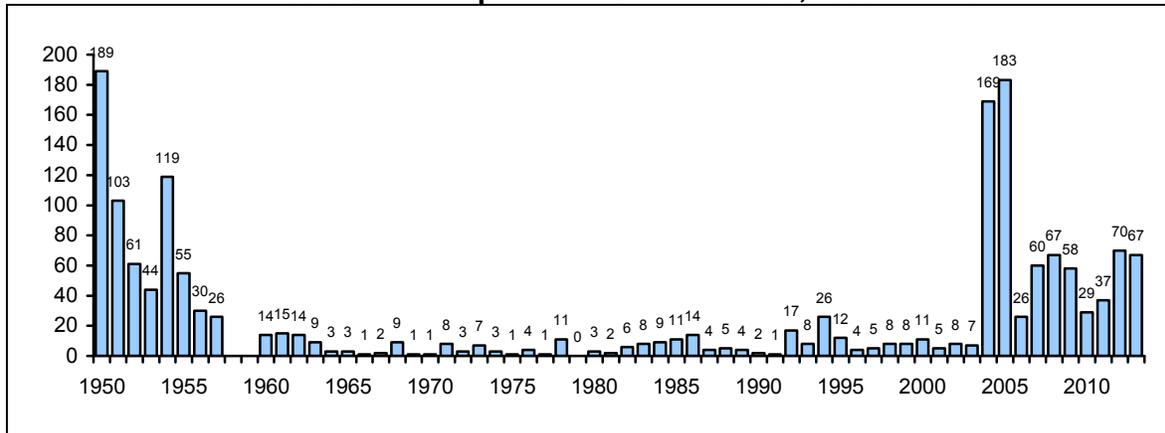


*Cases per 100,000 population
Source: South Dakota Department of Health,
Office of Disease Prevention

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 South Dakota 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 Cases Reported in South Dakota, 1950 – 2013



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 2013-14 influenza season was a moderately severe season with influenza A (H1N1) viruses predominating. Nationally activity peaked the first week of January and influenza A (H1N1), influenza A (H3N2), and influenza B viruses circulated throughout the season. CDC has antigenically characterized 2,815 influenza viruses [2,008 (2009 H1N1) viruses, 426 influenza A (H3N2), and 381 influenza B viruses) collected by U.S. laboratories since October 1, 2013 by hemagglutination inhibition. The majority of all influenza viruses in specimens sent to CDC for further antigenic characterization were similar to the components of the 2013-14 Northern Hemisphere vaccine. Ninety-eight percent of the H1N1 viruses were characterized as A/California/7/2009 like, 95.3 percent of the H3N2 viruses tested have been characterized as A/Texas/50/2012- like which were the influenza A components of the 2013-14 trivalent and quadrivalent influenza vaccines. Slightly over seventy percent, (70.6%) of the influenza B viruses tested belonged to B/Yamagata/16/99 lineage and 20.4 percent of the influenza viruses tested belong to B/Victoria/02/87 lineage. Nearly one hundred percent (99.6%) of the influenza B/Yamagata lineage viruses were

characterized as B/Massachusetts/2/2012-like which is included as an influenza B component of both the 2013-14 trivalent and quadrivalent influenza vaccines. One hundred percent of the influenza B/Victoria lineage viruses were characterized as B/Brisbane/60/2008-like, which is included as an influenza B component of the 2013-14 quadrivalent influenza vaccine.

The peak percentage of outpatient visits for ILI (4.6%) was noted the third week in December. Laboratory-confirmed influenza –associated hospitalizations reported via FluSurv-NET were at a rate of 35.6 per 100,000 population. The highest rate of hospitalization is among adults aged ≥ 65 years, although those aged 18-64 years account for approximately 60 percent of reported hospitalized cases. Among all hospitalizations 88.2 percent were associated with influenza A and, 10.9 percent with influenza B and 0.4 percent with influenza A & B co-infection, and 49 percent had no virus type information. Among those with influenza A subtype information 6 percent were H3N2 and 94 percent were 2009 H1N1. The number of influenza-associated pediatric deaths reported to CDC for the 2013-14 season was 95 compared to the previous season of 171.

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

≥6 months, preferably 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 2013-14 season expires by June 30, 2014, after which influenza vaccines will not be available in the United States until the 2014-15 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 South Dakota Public Health Laboratory (SDPHL) conduct surveillance for influenza year-round, and intensify activities October through May. The components of South Dakota's influenza surveillance program for the 2013-2014 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/.

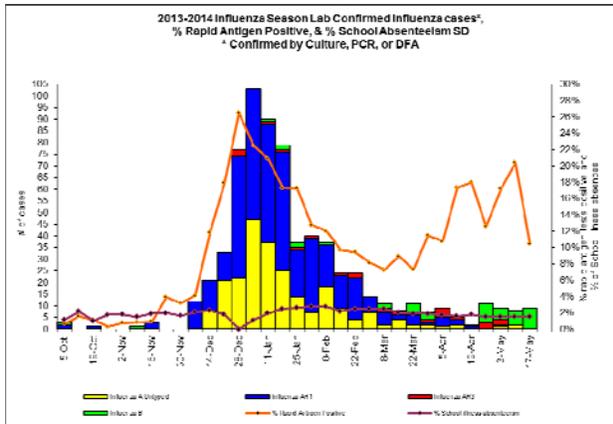
Table 81 shows a total of 707 confirmed influenza cases, A(H3N2) 26 (3.6%), A(H1N1) 382 (54%), A-not subtyped 235 (33.2%) and 64 (9%) influenza B, were reported to SD DOH. Additionally, 36,590 rapid antigen influenza tests were accomplished with 5,209 positive (14%), 4,723 (91%) positive for influenza A and 486 (9%) positive for influenza B.

Table 81
Age Distribution of Laboratory Confirmed Cases of Influenza and Influenza Associated Hospitalizations and Deaths, 2013

Lab Confirmed Influenza Cases (by DFA, PCR, or culture)		Influenza Associated Hospitalizations	Influenza Associated Deaths
Age Group	# Cases (%)	# Hosp (%)	# Deaths
0-4	187 (28%)	32 (13%)	0
5-24	124 (19%)	10 (4%)	0
25-49	200 (30%)	51 (21%)	2 (17%)
50-64	99 (15%)	66 (28%)	3 (25%)
> 64	97 (15%)	80 (33%)	7 (58%)
Total	707	239	12

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

Figure 50
Seasonal Distribution of Influenza by
MMWR Week



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

As indicated in Figure 50, the first confirmed case of influenza was reported the first week of October 2013 and the last case reported mid June 2014. The predominant virus in South Dakota was influenza A (H1N1) with influenza H3N2 and influenza B circulation late season as well. The peak of the season was the first week in January 2014 with A H1N1 being the only virus circulating in South Dakota at that time.

There were 239 individuals reported hospitalized during the 2013-2014 influenza season. The first hospitalization was identified early October 2013 and the last was reported early June 2014. Hospitalizations peaked the first week of January 2014. See Table 81 for age distribution.

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

Twelve individuals died due to influenza and its complications during the 2013-2014 season. Gender breakdown was 50 percent male and 50 percent female. The median age was 68 years, with an age range of 34 to 92 years of age. Eighty-three percent of the influenza associated deaths were white, and 8 percent were Asian or Native American.

Other aggregate viral respiratory pathogen reports included 73 adenovirus, 183 hMPV, 73 parainfluenza-1, 4 parainfluenza-2, 55 parainfluenza-3, 31 parainfluenza-4, and 338 respiratory syncytial virus.

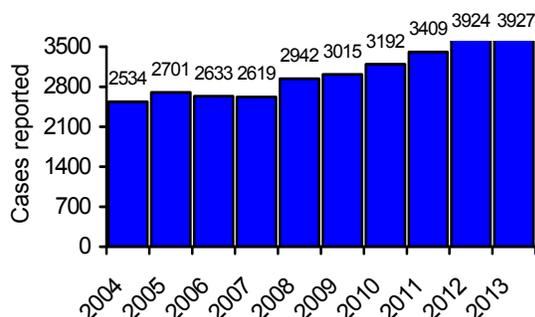
condoms. Genital human papillomavirus (HPV) is the only vaccine preventable STD.

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 2013, the DOH received 3,927 case reports (Figure 51), which was an incidence rate of 471.2 cases per 100,000 population.

This year, 2013, had the most chlamydia cases ever reported in one year in South Dakota.

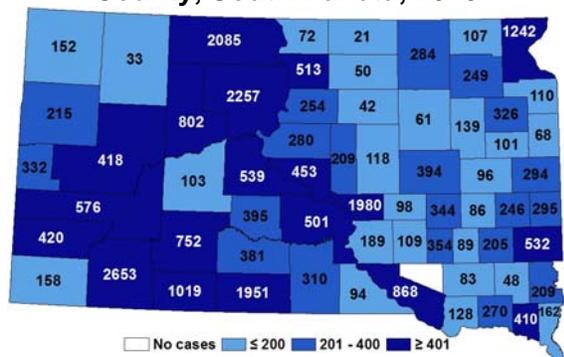
Figure 51
Chlamydia in South Dakota, 2004-2013



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

Counties with the highest incidence (cases per 100,000 population) included Shannon (2653), Dewey (2257), Corson (2085), Buffalo (1980), and Todd (1951), (Figure 52).

Figure 52
Chlamydia Incidence* Rates by County, South Dakota, 2013



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

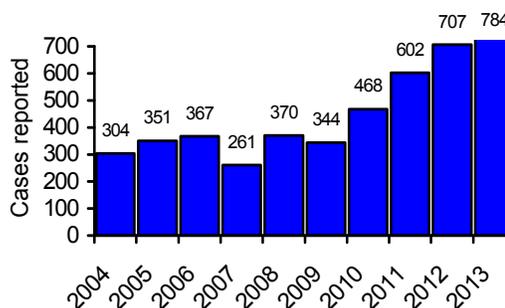
Nationally, the incidence of chlamydia in 2011 was 457.6 cases per 100,000 population, which was an increase of 8 percent from 2010. Comparing incidence rates by state, South Dakota ranked 26th.

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 2013.

Young people between 15 and 24 years old accounted for 68 percent of chlamydia cases reported in 2013. Although American Indians comprise 9 percent of the state's population, a disproportionate share, 42 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.

Figure 53
Gonorrhea in South Dakota, 2004-2013

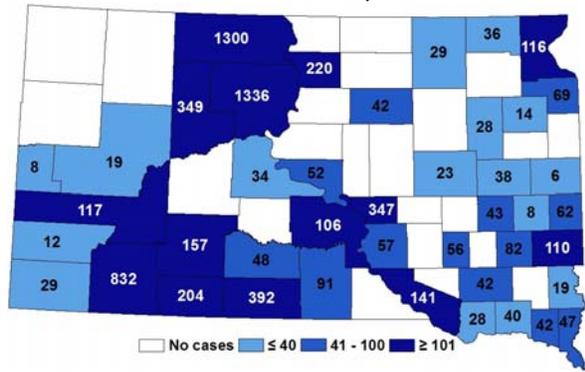


Source: South Dakota Department of Health, Office of Disease Prevention

Gonorrhea In 2013 the DOH received 784 reports of gonorrhea (Figure 53). This is the highest number reported in South Dakota since 1986. This was an incidence of 94.1 cases per 100,000 population, 68 percent above the 5-year median. Twenty-two percent of the gonorrhea case reports occurred in the white population, and 59 percent were female. Counties with the highest incidence (cases per 100,000 population) included Dewey (1336), Corson (1300), Shannon (832), Todd (392) and Ziebach (349), (Figure 54).

Sexually active adolescents and young adults are the population most at risk with 52 percent of the gonorrhea cases reported being 15 to 24 years old. The American Indian population was disproportionately affected with 65 percent of the reported cases.

Figure 54
Gonorrhea Incidence* Rates by County, South Dakota, 2013



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

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 30th.

Table 82
Syphilis in South Dakota, 2004-2013

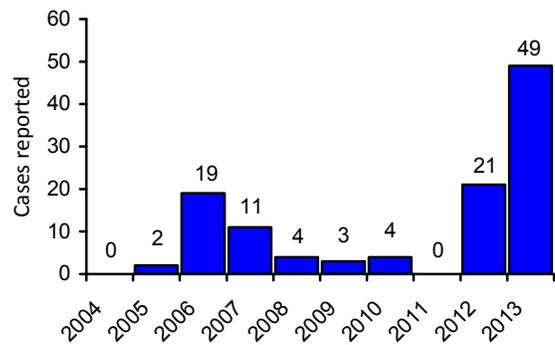
Year	Primary and Secondary	Early Latent	Late Latent	Congenital
2004	0	0	0	0
2005	2	0	0	0
2006	13	6	7	0
2007	7	4	1	0
2008	1	3	2	0
2009	1	2	4	0
2010	4	0	2	0
2011	0	0	1	0
2012	18	3	3	0
2013	44	5	4	0
Total	90	23	24	0

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

Syphilis In 2013 there were 49 cases of early syphilis (primary, secondary, or early latent) reported (Table 82, Figure 55), which was an incidence rate of 5.9 cases per 100,000 population, 1225 percent above the 5-year median. South Dakota participates in syphilis elimination through expedited case management, partner referral, and interstate coordination of outbreak investigations.

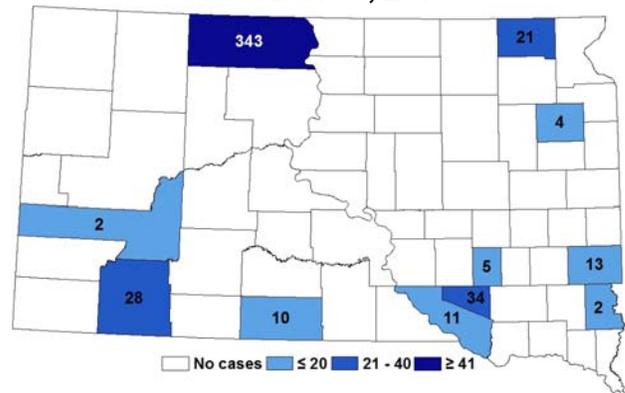
The national rate of primary and secondary syphilis in 2011 was 4.5 cases per 100,000 population.

Figure 55
Early Syphilis in South Dakota, 2004-2013



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

Figure 56
Syphilis Incidence* Rates by County, South Dakota, 2013



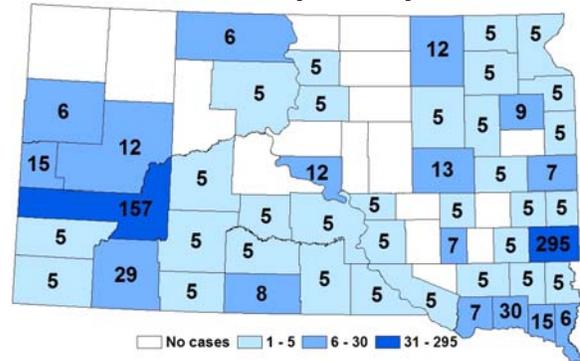
*Cases per 100,000 population
Source: South Dakota Department of Health, Office of Disease Prevention

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 2013, 730 South Dakota residents were reported as infected with HIV to the Department of Health (545 male, 185 female) and 391 of those were also diagnosed with AIDS. Cases have been reported from 49 of the state's 66 counties (Figure 57).

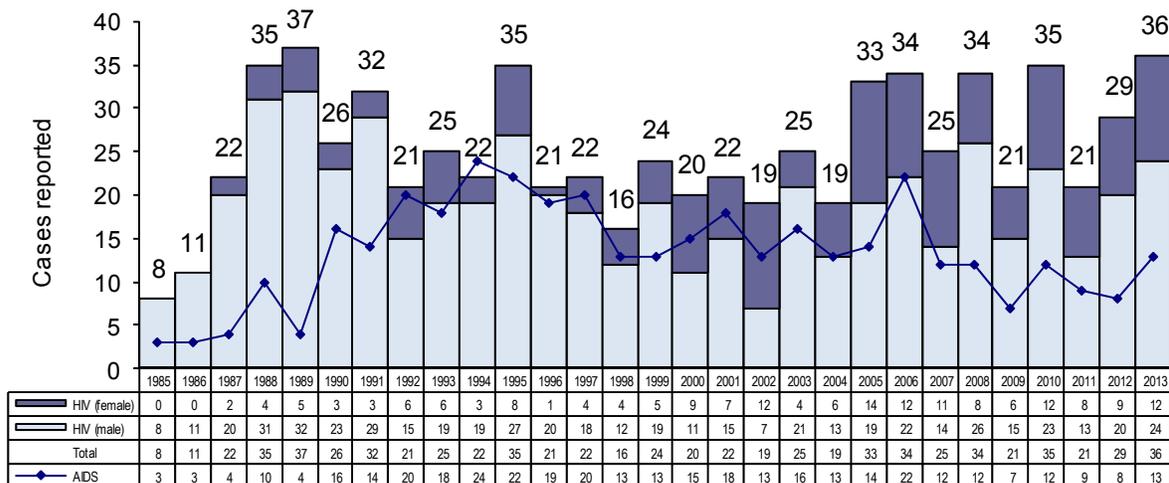
Thirty-six new HIV/AIDS cases were reported in 2013 (Figure 58). Twenty four of these cases were male and twelve cases were female. There are an estimated 515 people living with HIV/AIDS in South Dakota, 71 percent male and 29 percent female. Blacks and American Indians are disproportionately affected by HIV/AIDS with Blacks comprising 24 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, 1985-2013



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.

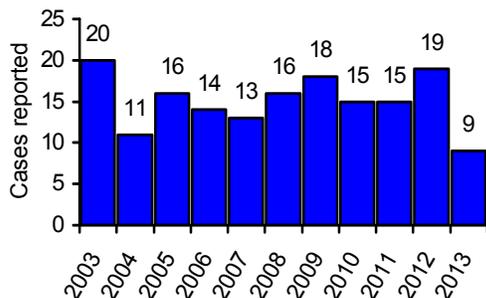
Figure 58
South Dakota Residents Diagnosed by Gender with HIV and AIDS, 1985-2013



TUBERCULOSIS

During calendar year 2013, nine cases of active tuberculosis were reported to the DOH as shown below in Figure 59.

Figure 59
Tuberculosis in South Dakota,
2004 – 2013



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

The overall incidence rate was 1.1 per 100,000; with an incidence of 6.7 for American Indians, 0.1 for whites, 14.1 for blacks and 10.9 for Asians. Of the cases reported in 2013, six were female (67%), three were male (33%). Forty-four 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 2013, there were zero 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 were zero drug resistant tuberculosis case reported in 2013 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.

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 five to 10 days. In some individuals, however, complications may involve severe hemorrhagic colitis, hemolytic uremic syndrome, thrombotic thrombocytopenic purpura, and even death.

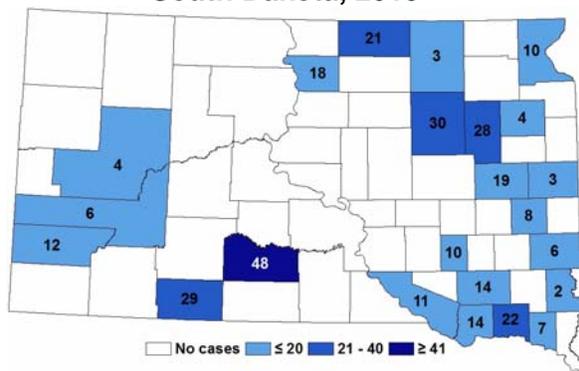
Escherichia coli O157:H7 infection has been legally reportable since 1996 and all shiga-toxin-producing *E. coli* have been reportable since 2005. During 2013 there were 43 cases of shiga toxin-producing *E. coli* (STEC) reported, representing a 9 percent decrease from 2012. The incidence rate was 5.2 cases per 100,000 population. Figure 60, on the following page, shows

STEC incidence rates by county in South Dakota for 2013. Thirty-five percent of the cases were in children less than 15 years of age. There were zero 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; 6 cases of *E. coli* O26; 3 cases of *E. coli* O121; 2 cases of *E. coli* O111; 1 case each of *E. coli* O103, *E. coli* O145, *E. coli* O165 and *E. coli* 08:H19; 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, 2013

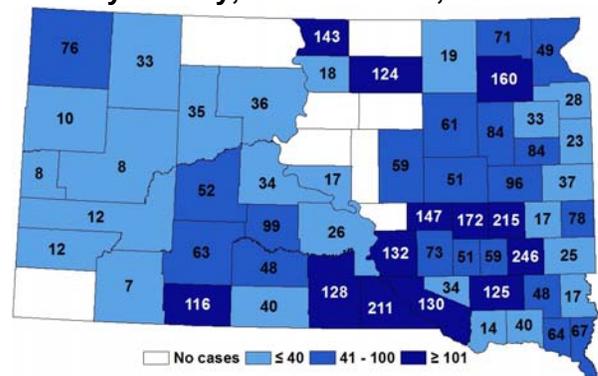


*Cases per 100,000 population
Source: South Dakota Department of Health
Office of Disease Prevention

Campylobacteriosis *Campylobacter* has been the most commonly reported enteric pathogen in South Dakota since 2001 (Table 79). In 2013, there were 295 cases of campylobacteriosis, which is an incidence of 35.4 cases per 100,000 population. This was a one percent decrease over the five-year median baseline. Twenty-five percent of the cases were in adults ages 40-64. Counties with the highest incidence (cases per 100,000 population) included McCook (246), Miner (215), Gregory (211), Sanborn (172), and Day (160), (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.

Figure 61
Campylobacteriosis Incidence* Rates by County, South Dakota, 2013



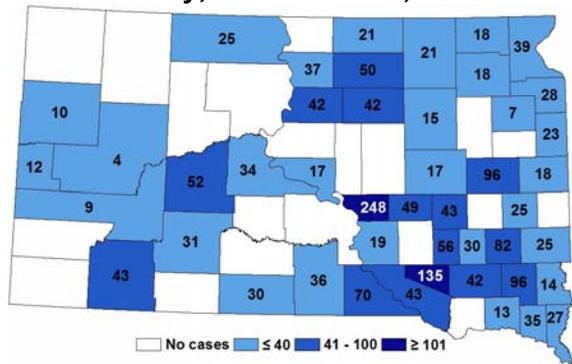
*Cases per 100,000 population
Source: South Dakota Department of Health,
Office of Disease Prevention

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

Salmonellosis There were 182 culture-confirmed cases of salmonellosis reported in South Dakota in 2013, which was an incidence of 21.8 cases per 100,000 population and showed a seven percent increase over the five-year median. Thirteen 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 Buffalo (248), Douglas (135), Kingsbury (96), Turner (96), McCook (82) and Gregory (70), (Figure 62, on the following page).

Figure 62
Salmonellosis Incidence* Rates by
County, South Dakota, 2013



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

Table 83, below, shows the most commonly isolated serotypes of *Salmonella* since the year 2004 in South Dakota. *S. typhimurium*, *S. enteritidis*, *S. newport* and *S. saint paul* were the most commonly isolated serotypes in 2013.

Table 83
Most Common Salmonella Serotypes, South Dakota, 2004-2013

Salmonella serotype	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total	Percent
Agona	0	0	1	2	3	2	5	1	2	2	18	1%
Braenderup	1	6	0	0	2	2	2	3	2	3	21	1%
Enteritidis	20	24	17	29	26	22	29	27	21	31	246	15%
Hadar	1	1	2	3	2	2	1	3	1	1	17	1%
Heidelberg	6	6	5	4	10	6	1	4	3	2	47	3%
Infantis	0	9	6	1	3	2	1	3	10	4	39	2%
Litchfield	0	3	0	2	1	2	2	2	2	2	16	1%
Montevideo	6	5	5	7	6	6	5	1	4	3	48	3%
Muenchen	5	2	3	8	3	3	2	2	1	2	31	2%
Newport	9	10	11	23	9	19	14	10	11	7	123	7%
Oranienburg	5	5	2	2	3	2	1	2	7	0	29	2%
Paratyphi B	3	3	3	2	1	1	0	1	3	0	17	1%
Saint Paul	1	0	3	1	3	38	13	7	1	6	73	4%
Thompson	1	2	2	1	1	3	1	4	3	4	22	1%
Typhimurium	61	49	45	41	35	44	44	63	58	73	513	31%
Other serotypes	37	35	30	47	44	44	65	29	41	42	414	25%
Total	156	160	135	173	152	198	186	162	170	182	1674	100%

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

Shigellosis In 2013 there were 186 cases of shigellosis reported which represent a 2,657 percent increase above the five-year median. This was an incidence rate of 22.3 cases per 100,000 population. Table 84, below, 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, 2004-2013

Year	S. flexn	S. sonnei	S. boydii	Species Unk	Total
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
2013	0	104	1	81	186
Total	11	574	11	347	943
Percent	1%	61%	1%	37%	100%

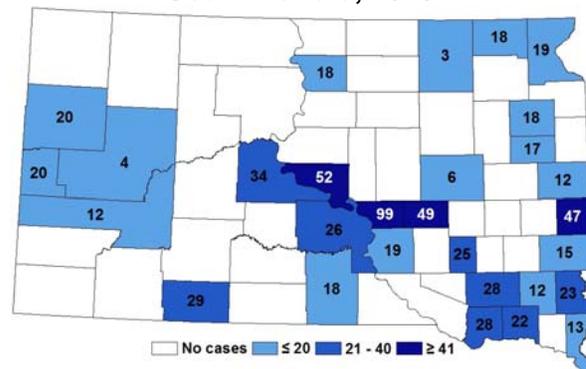
Source: South Dakota Department of Health, Office of Disease Prevention

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 2013, 111 cases of giardiasis were reported which is a one percent decrease over 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 2013.

Figure 63
Giardiasis Incidence* Rates by County,
South Dakota, 2013



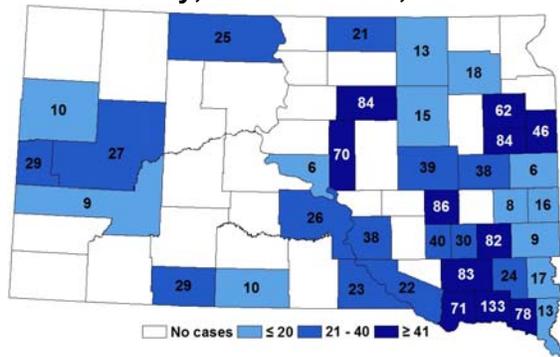
*Cases per 100,000 population
Source: South Dakota Department of Health,
Office of Disease Prevention

Cryptosporidiosis Cryptosporidiosis is a coccidian protozoan diarrheal disease transmitted by cattle and human feces, often waterborne. In 2013 there were 174 cases reported representing a 54 percent increase over the five-year median. Forty-five 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 2013. Counties with the highest incidence rates (cases per 100,000 population) included Yankton (133), Sanborn (86), Faulk (84), Hamlin (84), and Hutchinson (83). East River counties accounted for 83 percent of the cases.

Figure 64
Cryptosporidiosis Incidence* Rates by
County, South Dakota, 2013



*Cases per 100,000 population

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 2013, 635 animals were submitted for rabies testing with 28 animals testing positive. This is a decrease of 53 percent from the previous year. The 28 rabid animals included 7 domestic animals (cattle, 1 dog and 1 cat), and 21 wild animals (16 skunks and 5 bats). No human rabies was reported. South Dakota's last human rabies case was in 1970.

During 2013, 607 animals tested negative for rabies, including 206 cats, 143 bats, 111 dogs, 66 cattle, 28 raccoons, 12 skunks, 11 horses, six deer, five sheep, two each goats, fox, mice, opossums and woodchucks, and one each bison, coyote, elk, gopher, mink, mountain lion, muskrat, porcupine and prairie dog.

During 2013, rabid animals were detected in 20 South Dakota counties (Table 85). Animals were submitted for testing from 56 of South Dakota's 66 counties. Over the past 10 years, 2004-2013, rabid animals were reported in 60 of the state's counties, with 65 of 66 counties submitting animals for testing. Over the decade 7,077 animals were tested and 464 (6.6%) were rabid.

Table 85
Animals Tested and Confirmed Rabies Cases in
South Dakota, 2004-2013

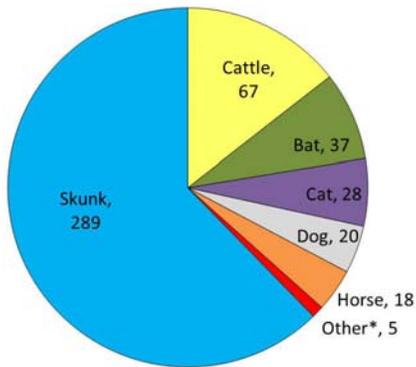
Animal	2013		2004 - 2013		
	Pos	Total tested	Pos	Total tested	% Pos
Skunk	16	28	289	522	55%
Cattle	5	71	67	837	8%
Bat	5	148	37	1,169	3%
Cat	1	207	28	2,182	1%
Dog	1	112	20	1,418	1%
Horse/donkey	0	11	18	156	12%
Raccoon	0	28	2	332	1%
Goat	0	2	2	26	8%
Woodchuck	0	2	1	17	6%
Deer, elk	0	7	0	81	0%
Rodents	0	5	0	68	0%
Squirrel, chipmunk	0	0	0	55	0%
Muskrat	0	1	0	43	0%
Sheep	0	5	0	42	0%
Opossum	0	2	0	28	0%
Fox	0	2	0	23	0%
Weasel, ferret, mink	0	1	0	22	0%
Coyote, wolf	0	1	0	20	0%
Rabbit, hare	0	0	0	10	0%
Badger	0	0	0	6	0%
Pig	0	0	0	4	0%
Shrew, mole	0	0	0	4	0%
Mountain lion	0	1	0	4	0%
Bison	0	1	0	3	0%
Other animals	0	0	0	5	0%
TOTAL	28	635	464	7,077	6.6%

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

Figure 65

Rabid animals, South Dakota 2004-2013

*Others include 2 raccoons, 2 goats, 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 28 rabid cats and 20 rabid dogs, many of which were unvaccinated strays or semi-tame barn cats. Rabid livestock included 67 cattle, 18 horses, and two goats.

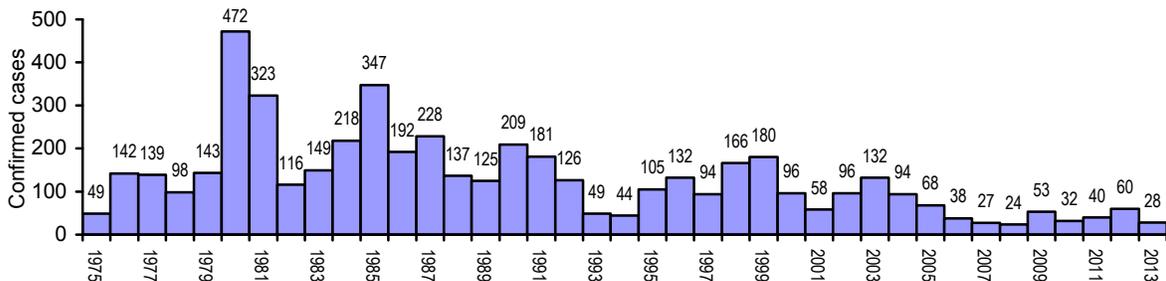
Skunks (*Mephitis mephitis*) are the enzootic rabies reservoir in South Dakota. Over the past decade 55 percent of skunks tested have been rabid. Bat rabies is also enzootic in South Dakota with three percent bats testing positive. Although rabies is not enzootic in other wild animals in South Dakota, during the past 10 years rabies has been detected in two raccoons and one woodchuck. These other animals are likely spillover infections following exposure to rabid skunks.

Nationally in 2012, there was a two percent increase from the previous year with 6,612 cases of animal rabies reported (92% wild animals, eight percent domestic animals). Six human rabies cases were reported in 2011.

Nationally from 2004 through 2013, there have been 31 human rabies cases, including 28 deaths and three survivals, which is a 90 percent case fatality rate. Nineteen of the human cases (61%) were associated with bat-rabies virus, eight (26%) had dog rabies virus (all foreign imports) and one fox, two raccoon and one unknown exposure. These 31 human rabies cases were from Texas (6), California (5), Indiana (2), Massachusetts (2), Wisconsin (2) and one case each in Arkansas, Florida, Louisiana, Maryland, Michigan, Minnesota, Mississippi, Missouri, New Jersey, New York, North Carolina, Oklahoma, South Carolina and Virginia.

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, 1975-2013



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.

The year 2013 was the 15th year of WNV transmission in North America and the 12th 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 2013 there were 2,469 human WNV cases reported, of these 1,267 were neuroinvasive, (Figure 67), and 1,202 were nonneuroinvasive. There were 119 deaths reported with 431 Presumptive Viremic Donors.

In South Dakota, there were 149 human cases of WNV disease and three deaths reported in 2013. Fifty-seven of those cases were neuro-invasive and 92 were nonneuro-invasive. Twenty-six presumptive viremic blood donors were reported.

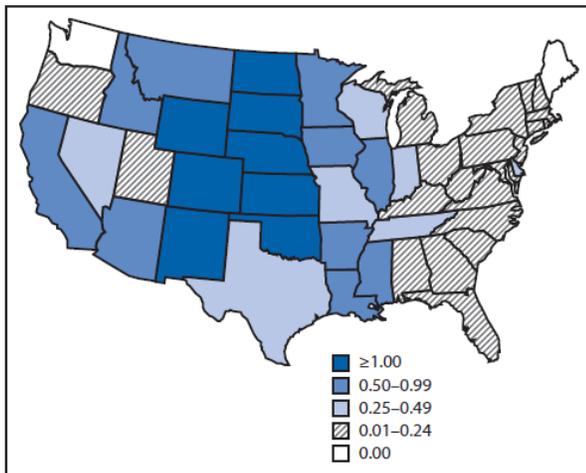
The overall incidence of West Nile disease in 2013 was 6.8 cases per 100,000 population, the second highest rate in the United States.

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.

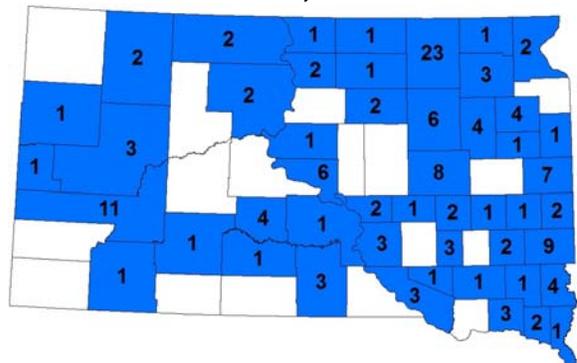
During the summer West Nile season, individuals with severe or unusual headaches should seek medical care as soon as possible. Physicians are encouraged to have a high index of suspicion for WNV disease. Free WNV testing is available at the South Dakota Public Health Laboratory for ill suspects. We do 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, 2013



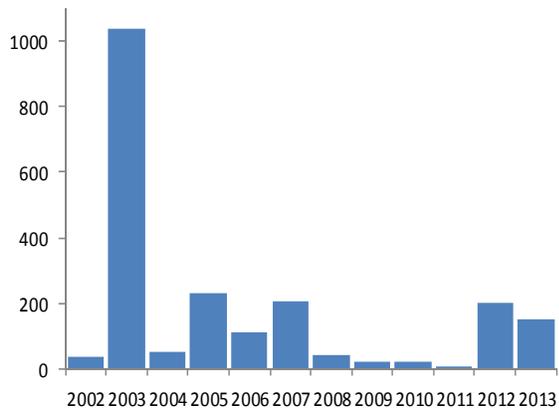
Source: Centers for Disease Control and Prevention

Figure 68
West Nile Virus Cases, by County, South Dakota, 2013



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

Figure 69
South Dakota West Nile Virus
Neuroinvasive and West Nile Fever
Cases, 2002-2013



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

OTHER INFECTIOUS DISEASES

Vector borne diseases

Tularemia In 2013 there were seven cases of Tularemia in South Dakota. This is an incidence rate of 0.8 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 2013 there were four 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 were exposed in other eastern states that are endemic for Lyme disease.

Other Infectious Diseases In 2013, there were 99 cases of invasive *Streptococcus pneumoniae* in all ages. There were 92 cases of invasive Methicillin Resistant *Staphylococcus aureus* (MRSA) and 43 cases of chicken pox. Additionally, seven cases each of Legionellosis, Malaria and Rocky Mountain Spotted Fever were reported; five cases of Acute Hepatitis B; four cases each of Meningococcal disease and Q fever; three cases of Typhoid fever; and one case each of Brucellosis and Ehrlichiosis in 2013.