

INFECTIOUS DISEASES IN SOUTH DAKOTA 2009

The South Dakota Department of Health (DOH) is authorized by South Dakota Codified Law 34-22-12 and Administrative Rules Article 44:20 to receive and process mandatory reports of communicable diseases by physicians, hospitals, laboratories and institutions, and to establish public health measures to control and prevent disease transmission.

Category I: Report immediately on suspicion of disease	Category II: Report within 3 days	
<p>Anthrax (<i>Bacillus anthracis</i>) Botulism (<i>Clostridium botulinum</i>) Cholera (<i>Vibrio cholerae</i>) Diphtheria (<i>Corynebacterium diphtheriae</i>) Enterohemorrhagic <i>E. coli</i> (EHEC) shiga toxin-producing (<i>Escherichia coli</i>), includes <i>E. coli</i> O157:H7 Measles (<i>paramyxovirus</i>) Meningococcal disease, invasive (<i>Neisseria meningitidis</i>) Plague (<i>Yersinia pestis</i>) Poliomyelitis (<i>picornavirus</i>) Rabies, human and animal (<i>rhabdovirus</i>) Ricin toxin Rubella and congenital rubella syndrome (<i>togavirus</i>) SARS (Severe Acute Respiratory Syndrome, <i>coronavirus</i>) Smallpox (<i>Variola</i>) Tularemia (<i>Francisella tularensis</i>) Typhoid (<i>Salmonella typhi</i>) Viral Hemorrhagic Fevers (filoviruses, arenaviruses)</p> <p>Outbreaks: - Acute upper respiratory illness - Diarrheal disease - Foodborne - Illnesses in child care settings - Nosocomial - Rash illness - Waterborne</p> <p>Syndromes suggestive of bioterrorism and other public health threats Unexplained illnesses or deaths in humans or animals</p>	<p>Acquired immunodeficiency syndrome (AIDS) Arboviral encephalitis, meningitis and infection (<i>West Nile, St. Louis, Eastern and Western equine, California serotype, Japanese, Powassan</i>) Brucellosis (<i>Brucella spp.</i>) Campylobacteriosis (<i>Campylobacter spp.</i>) Chancroid (<i>Haemophilus ducreyi</i>) Chicken pox/Varicella (<i>herpesvirus</i>) Chlamydia infections (<i>Chlamydia trachomatis</i>) Cryptosporidiosis (<i>Cryptosporidium parvum</i>) Cyclosporiasis (<i>Cyclospora cayetanensis</i>) Dengue fever (<i>flavivirus</i>) Drug resistant organisms: <ul style="list-style-type: none"> • Methicillin-resistant <i>Staphylococcus aureus</i> (MRSA), invasive • Vancomycin-resistant and -intermediate <i>Staphylococcus aureus</i> (VRSA and VISA) • Drug resistant <i>Streptococcus pneumoniae</i> (DRSP), invasive Ehrlichiosis (<i>Ehrlichia spp.</i>) Epsilon toxin of <i>Clostridium perfringens</i> Giardiasis (<i>Giardia lamblia / intestinalis</i>) Glanders (<i>Burkholderia mallei</i>) Gonorrhea (<i>Neisseria gonorrhoeae</i>) <i>Haemophilus influenzae</i> type b disease, invasive Hantavirus pulmonary syndrome (<i>hantavirus</i>) Hemolytic uremic syndrome Hepatitis, acute viral A, B, C, D, and E Hepatitis, chronic viral B and C Hepatitis B infection, perinatal Herpes simplex virus infection, neonatal or genital Human immunodeficiency virus infection (HIV)</p>	<p>Influenza: 1) hospitalizations and deaths; 2) lab confirmed cases (culture, DFA, PCR); 3) weekly aggregate report of total rapid antigen positive test (A & B) and total tested Legionellosis (<i>Legionella spp.</i>) Leprosy/Hansen's disease (<i>Mycobacterium leprae</i>) Listeriosis (<i>Listeria monocytogenes</i>) Lyme disease (<i>Borrelia burgdorferi</i>) Malaria (<i>Plasmodium spp.</i>) Melioidosis (<i>Burkholderia pseudomallei</i>) Mumps (<i>paramyxovirus</i>) Nipah virus (<i>paramyxovirus</i>) Pertussis/Whooping cough (<i>Bordetella pertussis</i>) Psittacosis (<i>Chlamydia psittaci</i>) Q fever (<i>Coxiella burnetii</i>) Rocky Mountain spotted fever (<i>Rickettsia rickettsii</i>) Salmonellosis (<i>Salmonella spp.</i>) Shigellosis (<i>Shigella spp.</i>) Staphylococcus enterotoxin B Streptococcal disease, Group A, invasive Streptococcal disease, Group B, invasive <i>Streptococcus pneumoniae</i>, invasive, (<5-years of age) Syphilis (<i>Treponema pallidum</i>) Tetanus (<i>Clostridium tetani</i>) Toxic shock syndrome Transmissible spongiform encephalopathies Trichinosis (<i>Trichinella spiralis</i>) Tuberculosis (<i>Mycobacterium tuberculosis</i> and <i>Mycobacterium bovis</i>) active disease and latent infection (positive skin test) Typhus fever (<i>Rickettsia prowazekii</i>) Vaccine Adverse Events Yellow fever (<i>flavivirus</i>)</p>

WHEN TO REPORT

Category I diseases are reportable immediately by telephone on recognition or strong suspicion of disease.

Category II diseases are reportable by secure website, telephone, fax or mail within 3 days.

WHAT TO REPORT: Disease reports must include as much of the following as is known:

- Disease or condition diagnosed or suspected
- Case's name, age, date of birth, sex, race, address, and occupation
- Date of disease onset
- Pertinent laboratory results and date of specimen collection
- Attending physician's name, address and phone number
- Name and phone number of the person making the report.

HOW TO REPORT

Secure website: www.state.sd.us/doh/diseasereport

Telephone: 1-800-592-1804 confidential answering-recording device, or 1-800-592-1861 or 605-773-3737 for a disease surveillance person during normal business hours; after hours to report Category I diseases or other emergencies, call 605-280-4810.

Fax: 605-773-5509

Mail or courier, address to: Infectious Disease Surveillance, Office of Disease Prevention, Department of Health, 615 East 4th Street, Pierre, SD 57501; marked "Confidential Disease Report"

COMMUNICABLE DISEASE SURVEILLANCE

Infectious disease surveillance is the ongoing collection, analysis, interpretation, and dissemination of health data. This monitoring and assessment of disease occurrence is a core public health function. Surveillance detects sudden changes in disease occurrence, such as outbreaks, identifies long-term disease trends and monitors new and emerging diseases. Surveillance activities are linked to public health actions, such as investigation, 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.

Table 76 summarizes the infectious disease reports from 1999 to 2009. Table 77 reports the 2009 disease numbers by county of residency, statewide total, and shows the statewide incidence rate (cases per 100,000 population). Each disease is compared to the median case count of the previous five years (2004-2008), and shows the percentage increase or decrease from the 5-year baseline. Table 78 presents selected diseases stratified by gender, race, and age group.

In 2009 the following diseases (cases) were reported and found to meet the case definition:

- Anthrax (0)
- Botulism (0)
- Brucellosis (0)
- Campylobacteriosis (298)
- Chancroid (0)
- Chlamydia trachomatis infections (3,015)
- Cryptosporidiosis (138)
- Cyclosporiasis (0)
- Dengue fever (0)
- Diphtheria (0)
- Ehrlichiosis/anaplasmosis (0)
- Giardiasis (112)
- Gonorrhea (344)
- Haemophilus influenzae type B (0)
- Hantavirus pulmonary syndrome (0)
- Hemolytic uremic syndrome (3)
- Hepatitis A (3)
- Hepatitis B, acute (4)
- Hepatitis B, chronic (40)
- Hepatitis C, chronic (381)
- Herpes simplex, genital and neonatal (319)
- HIV and AIDS (21)
- Legionellosis (2)
- Leprosy/Hansen's disease (0)
- Listeriosis (1)
- Lyme disease (1)
- Malaria (1)
- Measles (0)
- Meningococcal disease (5)
- Methicillin resistant *Staphylococcus aureus*, invasive (91)
- Mumps (2)
- Pertussis (58)
- Plague (0)
- Psittacosis (0)
- Q fever, acute (9)
- Rabies, animal (53)
- Rabies, human (0)
- Rocky Mountain spotted fever (0)
- Rubella and congenital rubella syndrome (0)
- Salmonellosis (198)
- Shiga-toxin producing *E. coli* (71)
- Shigellosis (4)
- Streptococcal disease, Group A, invasive (29)
- Streptococcal disease, Group B, invasive (27)
- *Streptococcus pneumoniae*, drug resistant (4)
- Syphilis, primary and secondary, early latent (2)
- Tetanus (0)
- Toxic shock syndrome (0)
- Transmissible spongiform encephalopathies (0)
- Trichinosis (0)
- Tuberculosis (18)
- Tularemia (5)
- Typhoid fever (2)
- Varicella/Chicken pox (53)
- West Nile neuroinvasive disease (6)
- West Nile fever (15)

Table 76
Reportable Diseases in South Dakota, 1999-2009

Reportable Diseases	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Anthrax	0	0	0	1	0	0	0	0	0	0	0
Botulism	1	1	0	0	1	0	1	0	0	0	0
Brucellosis	0	0	0	0	1	0	0	0	0	0	0
Campylobacteriosis	140	141	160	198	188	273	244	219	235	262	298
Chlamydia trachomatis infections	1554	1835	1821	2215	2606	2534	2701	2633	2619	2942	3015
Cholera	0	0	0	1	0	0	0	0	0	0	0
Cryptosporidiosis	7	15	8	42	49	44	31	86	169	88	138
Denque fever	0	0	0	1	0	0	1	0	3	0	0
Diphtheria	0	0	0	0	0	0	0	0	0	0	0
Giardiasis	143	108	106	83	89	87	118	97	104	136	112
Gonorrhea	192	277	289	263	226	304	351	367	261	370	344
Haemophilus influenzae type b	4	1	0	1	1	0	0	0	0	0	0
Hantavirus pulmonary syndrome	0	1	0	0	1	1	2	2	1	0	0
Hemolytic uremic syndrome	4	2	1	0	1	0	3	8	1	3	3
Hepatitis A	10	3	3	3	0	4	1	9	6	4	3
Hepatitis B, acute	1	2	1	3	4	1	8	5	7	0	4
Hepatitis B, chronic	NR	NR	NR	NR	NR	26	33	16	39	47	40
Hepatitis C, chronic	NR	NR	NR	NR	NR	NR	207	355	317	365	381
HIV and AIDS	27	22	22	21	25	19	33	34	25	34	21
Legionellosis	6	2	3	4	2	5	21	5	4	3	2
Leprosy	0	0	0	0	0	0	0	0	0	1	0
Listeriosis	1	0	0	1	0	1	0	2	2	1	1
Lyme disease	0	0	0	2	1	1	2	1	0	3	1
Malaria	0	1	0	2	3	1	0	1	1	0	1
Measles	0	0	0	0	0	0	0	0	0	0	0
Meningococcal disease	11	6	5	2	1	4	4	4	3	3	5
Methicillin-resistant <i>Staph aureus</i> , invasive	NR	NR	NR	NR	NR	36	47	50	88	77	91
Mumps	0	0	0	0	0	0	0	296	6	1	2
Pertussis (whooping cough)	8	11	5	8	7	169	183	26	60	67	58
Plague	0	0	0	0	0	0	0	0	0	0	0
Q fever	NR	NR	0	1	0	0	2	2	1	1	9
Rabies, animal	180	96	58	96	132	94	68	38	27	24	53
Rabies, human	0	0	0	0	0	0	0	0	0	0	0
Rocky Mountain Spotted Fever	4	2	2	1	5	4	5	0	5	3	0
Rubella and congenital rubella syndrome	0	0	0	0	0	0	0	0	0	0	0
St. Louis Encephalitis	0	0	0	0	2	0	0	0	0	0	0
Salmonellosis	100	100	151	121	131	156	160	135	174	152	198
Shiga-toxin producing E. coli, including O157:H7	47	69	50	43	33	35	33	50	47	53	71
Shigellosis	18	8	716	157	17	12	131	389	122	76	4
Streptococcal disease, Group A, invasive	11	16	17	14	25	22	26	10	12	23	29
Streptococcal disease, Group B, invasive	NR	NR	NR	20	14	11	26	13	20	22	27
<i>Streptococcus pneumoniae</i> , drug resistant	3	8	6	1	1	5	3	4	17	9	4
Syphilis, Primary and Secondary, Early Latent	1	0	1	0	5	0	2	19	11	4	2
Tetanus	0	0	0	0	0	0	0	0	0	0	0
Toxic shock syndrome	0	2	0	1	1	1	2	0	0	1	0
Tuberculosis	21	16	13	13	20	11	16	14	13	16	18
Tularemia	7	13	7	3	5	4	8	5	7	10	5
Typhoid fever	0	0	0	0	0	0	0	1	0	2	2
Varicella (chicken pox)	NR	NR	NR	NR	NR	99	136	118	84	55	53
West Nile neuroinvasive disease	0	0	0	14	170	6	35	38	48	11	6
West Nile fever	0	0	0	23	869	45	194	74	160	28	15

*NR= not reportable

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

Table 77
South Dakota Selected Notifiable Diseases by County, 2009

County	Campylobacteriosis	Chlamydia	Cryptosporidiosis	<i>Shiga toxin-producing E. coli</i>	Giardiasis	Gonorrhea	Hepatitis B, Chronic	Hepatitis C, Chronic	Methicillin-resistant <i>Staphylococcus aureus</i> , invasive (MRSA)	Pertussis	Q fever	Salmonellosis	Tuberculosis	Varicella	West Nile Disease
Aurora	≤ 3	≤ 3	0	≤ 3	≤ 3	0	0	0	0	≤ 3	≤ 3	≤ 3	0	0	≤ 3
Beadle	10	63	5	≤ 3	≤ 3	≤ 3	4	5	≤ 3	≤ 3	0	5	0	0	≤ 3
Bennett	≤ 3	18	0	0	0	≤ 3	0	≤ 3	0	0	0	0	0	0	≤ 3
Bon Homme	6	11	6	0	≤ 3	0	0	8	0	0	0	≤ 3	0	0	≤ 3
Brookings	16	74	5	≤ 3	0	5	0	≤ 3	0	≤ 3	0	7	0	≤ 3	0
Brown	10	90	11	≤ 3	≤ 3	0	≤ 3	7	≤ 3	0	0	15	0	0	≤ 3
Brule	≤ 3	14	≤ 3	18	0	0	0	≤ 3	≤ 3	0	0	0	0	6	0
Buffalo	≤ 3	32	0	0	≤ 3	0	0	≤ 3	0	0	0	0	0	0	0
Butte	5	23	0	0	0	≤ 3	0	5	≤ 3	0	0	≤ 3	≤ 3	0	≤ 3
Campbell	≤ 3	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Charles Mix	6	66	≤ 3	≤ 3	4	≤ 3	0	7	≤ 3	0	0	≤ 3	≤ 3	≤ 3	≤ 3
Clark	0	0	≤ 3	0	≤ 3	0	0	≤ 3	0	≤ 3	0	≤ 3	0	0	0
Clay	0	35	4	0	≤ 3	≤ 3	0	3	≤ 3	≤ 3	0	≤ 3	0	≤ 3	≤ 3
Codington	9	78	6	≤ 3	≤ 3	≤ 3	≤ 3	8	0	≤ 3	0	≤ 3	0	≤ 3	0
Corson	≤ 3	43	≤ 3	0	≤ 3	6	0	4	0	0	0	0	0	0	0
Custer	≤ 3	27	0	≤ 3	≤ 3	≤ 3	≤ 3	≤ 3	0	0	0	≤ 3	0	≤ 3	0
Davison	11	56	7	≤ 3	≤ 3	≤ 3	≤ 3	5	4	≤ 3	0	6	≤ 3	≤ 3	≤ 3
Day	4	7	≤ 3	0	0	≤ 3	0	≤ 3	≤ 3	0	0	0	0	0	0
Deuel	≤ 3	≤ 3	0	0	0	0	0	≤ 3	0	0	0	≤ 3	0	≤ 3	0
Dewey	≤ 3	142	0	0	0	51	0	6	≤ 3	0	0	0	0	0	0
Douglas	4	≤ 3	0	0	0	0	0	0	≤ 3	≤ 3	0	0	0	0	0
Edmunds	5	4	0	0	≤ 3	≤ 3	≤ 3	0	0	0	0	≤ 3	0	0	0
Fall River	≤ 3	9	0	0	≤ 3	≤ 3	0	7	≤ 3	0	0	≤ 3	0	0	≤ 3
Faulk	4	≤ 3	≤ 3	0	≤ 3	0	0	0	0	0	0	≤ 3	0	0	0
Grant	≤ 3	9	≤ 3	0	0	≤ 3	0	≤ 3	0	0	0	≤ 3	0	0	0
Gregory	5	5	≤ 3	≤ 3	0	0	0	≤ 3	≤ 3	0	0	≤ 3	0	0	0
Haakon	≤ 3	0	0	0	0	0	0	≤ 3	0	0	0	8	0	0	0
Hamlin	≤ 3	≤ 3	≤ 3	0	0	0	0	≤ 3	0	0	0	≤ 3	0	≤ 3	0
Hand	0	≤ 3	0	0	0	0	0	≤ 3	0	0	0	0	0	0	0
Hanson	≤ 3	≤ 3	0	0	0	0	0	0	≤ 3	0	0	0	0	0	0
Harding	≤ 3	0	0	0	≤ 3	0	0	0	0	≤ 3	0	0	0	0	0
Hughes	≤ 3	67	0	≤ 3	0	4	0	6	0	0	5	≤ 3	0	6	≤ 3
Hutchinson	≤ 3	4	0	0	0	0	0	0	≤ 3	0	0	≤ 3	0	0	0
Hyde	0	≤ 3	0	0	0	0	0	0	0	0	≤ 3	0	0	0	0
Jackson	6	14	0	0	≤ 3	0	0	0	≤ 3	0	0	0	0	0	0
Jerauld	≤ 3	5	0	≤ 3	0	0	0	0	0	≤ 3	0	0	≤ 3	0	0

Continued

Table 77 (continued)
South Dakota Selected Notifiable Diseases by County, 2009

County	Campylobacteriosis	Chlamydia	Cryptosporidiosis	<i>Shiga toxin-producing E. coli</i>	Giardiasis	Gonorrhea	Hepatitis B, Chronic	Hepatitis C, Chronic	Methicillin-resistant <i>Staphylococcus aureus</i> , invasive (MRSA)	Pertussis	Q fever	Salmonellosis	Tuberculosis	Varicella	West Nile Disease
Jones	0	≤3	0	0	0	0	0	≤3	0	0	0	0	0	0	0
Kingsbury	6	≤3	0	≤3	0	0	0	0	≤3	0	0	4	0	5	0
Lake	9	25	≤3	0	≤3	0	0	5	≤3	0	0	8	0	0	0
Lawrence	≤3	57	0	0	5	≤3	0	12	0	0	0	5	0	≤3	0
Lincoln	9	38	4	≤3	6	≤3	0	11	≤3	≤3	0	13	0	≤3	0
Lyman	4	34	0	≤3	0	≤3	0	0	0	0	0	0	0	0	0
Marshall	≤3	≤3	0	4	≤3	0	0	0	0	0	0	0	0	0	0
McCook	6	6	≤3	≤3	0	0	0	0	≤3	0	0	≤3	0	0	0
McPherson	≤3	0	0	0	≤3	0	0	0	0	0	0	0	0	4	0
Meade	5	43	0	0	≤3	5	≤3	4	≤3	≤3	0	≤3	0	≤3	0
Mellette	≤3	5	0	0	0	≤3	0	0	0	0	0	0	0	0	0
Miner	≤3	9	≤3	0	0	0	0	0	0	0	0	≤3	0	0	0
Minnehaha	41	802	40	9	43	130	25	138	20	22	0	55	7	7	≤3
Moody	4	13	0	0	≤3	≤3	0	7	≤3	0	0	≤3	0	0	0
Pennington	20	446	4	≤3	4	52	5	68	9	10	≤3	12	0	8	≤3
Perkins	8	≤3	0	≤3	0	0	0	0	0	0	0	≤3	0	0	0
Potter	0	≤3	0	0	0	≤3	0	0	≤3	0	0	0	0	0	0
Roberts	4	52	0	0	0	5	0	≤3	5	0	0	≤3	≤3	0	0
Sanborn	≤3	≤3	0	0	≤3	0	0	0	0	0	0	4	0	0	≤3
Shannon	0	239	0	0	≤3	24	0	9	6	0	0	≤3	≤3	0	0
Spink	4	10	6	4	0	0	0	≤3	4	0	0	≤3	≤3	0	0
Stanley	≤3	6	0	0	0	0	0	0	0	0	0	≤3	0	≤3	0
Sully	≤3	0	0	0	0	0	0	≤3	0	0	0	0	0	0	0
Todd	≤3	185	0	0	≤3	16	0	6	5	0	0	4	≤3	0	≤3
Tripp	10	20	≤3	≤3	≤3	0	0	0	0	0	0	0	0	0	0
Turner	4	5	0	≤3	≤3	0	0	≤3	≤3	0	≤3	≤3	0	0	0
Union	4	16	0	≤3	0	≤3	0	6	≤3	≤3	0	4	0	0	≤3
Walworth	≤3	29	0	0	0	4	0	≤3	≤3	0	0	≤3	0	0	0
Yankton	6	25	21	≤3	10	6	0	17	≤3	≤3	0	4	0	≤3	0
Ziebach	0	25	0	0	≤3	7	0	0	≤3	≤3	0	0	0	0	0
South Dakota	298	3015	138	71	112	344	40	386	93	58	9	198	18	53	21
Rate per 100,000	36.7	371.1	17.0	8.7	13.8	42.3	4.9	47.5	11.4	7.1	1.1	24.4	2.2	6.5	26
5-year median	244	2633	86	47	104	351	33	NA	50	67	1	156	14	99	112
% change of median	22%	15%	60%	51%	8%	-2%	21%	NA	86%	-13%	800%	27%	29%	-46%	-81%

In 2009 there were also: 29 cases of invasive Group A Streptococcal disease; 27 cases of invasive Group B Streptococcal disease; 9 cases of invasive *Streptococcus pneumoniae* in children less than 5 years of age, 4 cases of drug resistant, invasive *Streptococcus pneumoniae*; 9 cases of Q fever; 5 cases each of Tularemia and Meningococcal disease; 4 cases of acute Hepatitis B; 3 cases each of Hepatitis A and Hemolytic Uremic Syndrome; 2 cases each of Legionellosis, Typhoid Fever, and Mumps; and one case each of Lyme disease, Listeriosis, acute Hepatitis C, and Malaria; and finally 1 asymptomatic West Nile positive blood donor.

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

Table 78
South Dakota Selected Notifiable Disease Summary by Gender, Race, and Age, 2009

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	298	196 (66%)	102 (34%)	274 (92%)	16 (5%)	8 (3%)	24	9	44	46	50	56	67	25
Chlamydia	3015	788 (26%)	2214 (74%)	1279 (42%)	1302 (43%)	434 (14%)	21	0	0	39	2147	757	66	1
Cryptosporidiosis	138	66 (48%)	71 (52%)	125 (91%)	5 (3%)	8 (6%)	26	1	31	18	16	33	20	19
Shiga-toxin producing E. coli	71	29 (41%)	42 (59%)	65 (92%)	6 (8%)	0 (0%)	5	4	27	10	13	2	8	7
Giardiasis	112	62 (55%)	50 (45%)	92 (82%)	11 (10%)	9 (8%)	18	1	31	20	6	28	24	2
Gonorrhea	344	153 (45%)	190 (55%)	81 (24%)	203 (59%)	60 (17%)	23	0	0	2	199	125	17	0
Hepatitis B, Chronic	40	18 (45%)	22 (55%)	8 (20%)	0 (0%)	32 (80%)	31	0	1	1	10	19	8	1
Hepatitis C, Chronic	386	244 (63%)	142 (37%)	252 (65%)	83 (22%)	51 (13%)	48	0	1	0	15	84	268	17
HIV/AIDS	21	15 (71%)	6 (29%)	11 (52%)	5 (24%)	5 (24%)	45	0	0	0	0	5	14	2
Methicillin-resistant <i>Staph. aureas</i> , invasive	93	48 (52%)	45 (48%)	64 (69%)	22 (24%)	7 (7%)	65	1	4	1	2	7	31	47
Pertussis	58	25 (43%)	33 (57%)	53 (91%)	4 (7%)	1 (2%)	10	12	9	15	8	5	7	2
Q fever	9	8 (89%)	1 (11%)	9 (100%)	0 (0%)	0 (0%)	49	0	0	0	0	1	8	0
Salmonellosis	198	93 (47%)	105 (53%)	176 (89%)	15 (8%)	7 (3%)	27	12	26	34	23	38	48	16
Streptococcus A, invasive	29	18 (62%)	11 (38%)	20 (69%)	9 (31%)	0 (0%)	57	1	3	0	2	3	11	9
Streptococcus B, invasive	27	14 (52%)	13 (48%)	20 (74%)	6 (22%)	1 (4%)	56	3	0	0	0	0	14	10
Tuberculosis	18	11 (61%)	7 (39%)	6 (33%)	7 (39%)	5 (28%)	45	0	0	0	2	5	9	2
Varicella	53	23 (43%)	30 (57%)	42 (79%)	8 (15%)	3 (6%)	9	0	13	31	9	0	0	0
West Nile virus disease	21	10 (48%)	11 (52%)	17 (81%)	0 (0%)	4 (19%)	48	0	0	1	4	5	6	5

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

*South Dakota's overall population was 50% male and 50% female; 89% White, 9% American Indian and 2% other races.

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

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

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

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

In South Dakota, factors contributing to increased vaccination rates and disease reduction include enacting a statewide school immunization law in 1971; implementing child-care facility immunization standards; providing vaccines (measles vaccine distribution began in 1967, rubella in 1969, mumps in 1976, *Haemophilus influenzae* b in 1989, hepatitis B in 1993, hepatitis A in 1995, and chicken pox in 2001); and since 1978 providing free supplies of all required childhood vaccines for private and public clinic use.

In 1996, the South Dakota Immunization Information System (SDIIS) was implemented, and it currently networks the immunization records of 264 health clinics, 193 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 2009, no cases of measles, rubella, diphtheria, Hib, tetanus, or polio were reported in South Dakota. Fifty-eight cases of pertussis (whooping cough) were reported in South Dakota in 2009. Twelve of this year's 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 2009 two 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 2009. 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 or DTP), and
- b) 4 doses of poliovirus vaccine, and
- c) 2 doses of measles vaccine, and
- d) 2 doses of rubella vaccine, and
- e) 2 doses of mumps vaccine, and
- f) 2 doses of chicken pox vaccine.

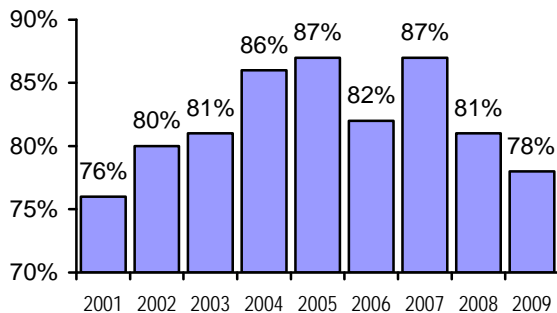
Child vaccination coverage rates are estimated by the National Immunization Survey (NIS). The NIS provides vaccination coverage estimates for children aged 19-35 months for each of the 50 states, including South Dakota.

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.

In 2009, 78 percent of children 19-35 months old in South Dakota were adequately immunized (Figure 30). We are still short of our 90 percent immunization coverage objective.

Figure 30
South Dakota Immunization Rates,
Children 19-35 months, 2001 – 2009
 (National Immunization Survey 4:3:1:3:3)



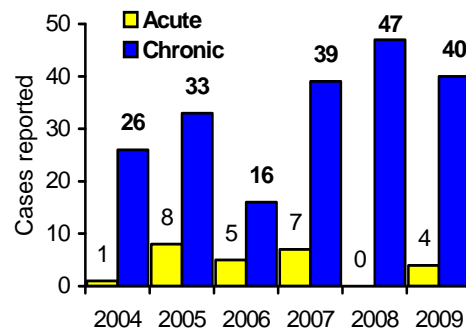
Immunization rates of children 19-35 months old immunized with 4 doses of DTaP, 3 doses of polio, 1 dose of MMR, 3 doses of *Haemophilus influenzae* b, and 3 doses of

Viral Hepatitis Four cases of acute hepatitis B and 40 cases of chronic hepatitis B were reported in 2009 (Figure 31). 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.

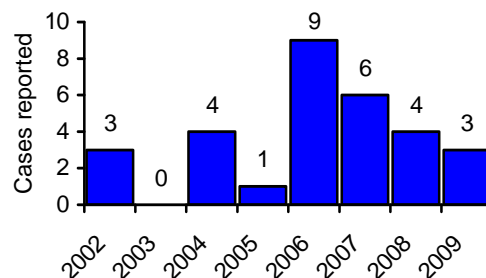
Figure 31
Acute and Chronic Hepatitis B
in South Dakota, 2004 – 2009



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

In 2009, there were three cases of hepatitis A reported in South Dakota (Figure 32) which is a rate of 0.5 new cases per 100,000 population. Several of these cases were acquired by South Dakota residents traveling to foreign countries. The Healthy People 2010 target is 4.5 new cases of hepatitis A per 100,000 population. For the past 9 years, South Dakota has met this target.

Figure 32
Hepatitis A in South Dakota,
2002 – 2009



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

Hepatitis A is a virus shed in the feces and transmitted person-to-person or by contaminated food or water. The illness causes mild to serious liver disease. The hepatitis A vaccine has been available since 1995.

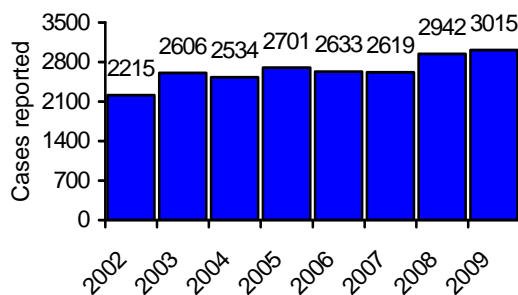
SEXUALLY TRANSMITTED DISEASES

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. In South Dakota syphilis and lymphogranuloma venereum have become rare, and chancroid is almost unheard of.

Chlamydia Chlamydia is the most commonly reported STD in South Dakota. During 2009, the DOH received 3,015 case reports (Figure 33), which was an incidence rate of 371.1 cases per 100,000 population. This is the most chlamydia cases ever reported in one year in South Dakota.

Figure 33
Chlamydia in South Dakota,
2002 – 2009



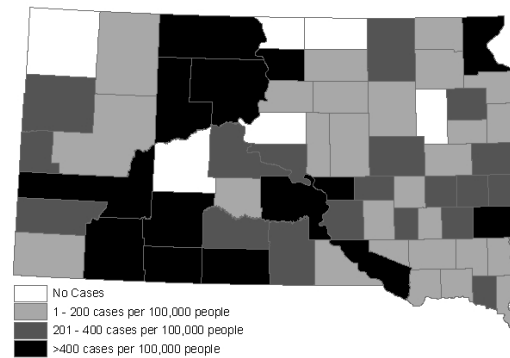
Source: South Dakota Department of Health, Office of Disease Prevention

Counties with the highest incidence (cases per 100,000 population) included Dewey (2379), Todd (1833), Shannon (1741),

Buffalo (1548) and Corson (1051), (Figure 34).

Nationally, the incidence of chlamydia in 2008 was 401.3 cases per 100,000 population. By state, South Dakota ranked 28th with an incidence of 371.3 that year.

Figure 34
Chlamydia Incidence Rates by County,
South Dakota, 2009



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

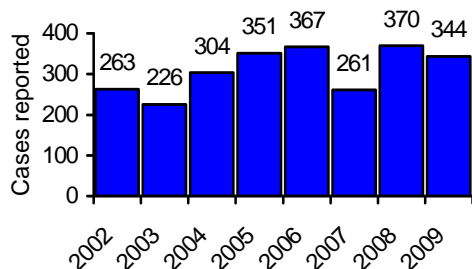
Screening for chlamydia infection has become standard practice for many health care providers in the state. Family planning clinics, Indian Health Service and many private providers have incorporated chlamydia screening as part of the routine health examination for sexually active young women. Screening follow-up encompasses treatment and partner referral. Because screening efforts are focused on women, female infections are more likely to be identified than males. Our data show that 74 percent of chlamydia cases were female in 2009.

Young people between 15 and 24 years old accounted for 73 percent of chlamydia cases reported in 2009. Although American Indians comprise 9 percent of the state's population, a disproportionate share, 43 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 2009 the DOH received 344 reports of Gonorrhea (Figure 35), which was an incidence of 42.3 cases per 100,000 population. This is a 2 percent decrease below the 5-year median.

Figure 35
Gonorrhea in South Dakota,
2002 – 2009



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

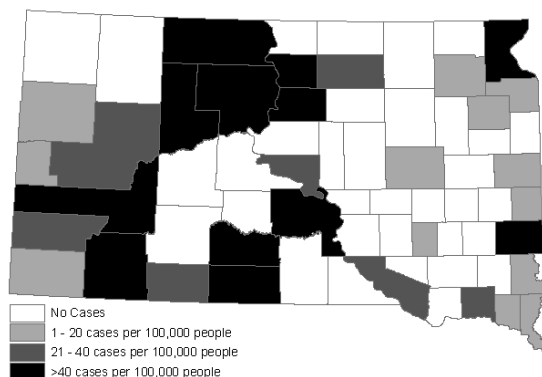
Twenty-four percent of the gonorrhea case reports occurred in the white population, and 55 percent were female. The Healthy People 2010 objective is 19 new cases of gonorrhea per 100,000 population.

Counties with the highest incidence (cases per 100,000 population) included Dewey (854), Ziebach (274), Shannon (175), Todd (158) and Corson (147), (Figure 36).

Sexually active adolescents and young adults are the population most at risk with 58 percent of the gonorrhea cases reported being 15 to 24 years old. The American Indian population was disproportionately affected with 59 percent of the reported cases.

Nationally the incidence of gonorrhea was 111.6 cases per 100,000 population in 2008. South Dakota ranked 38th that year with an incidence of 47.1. In 2009, the incidence decreased to 42.3.

Figure 36
Gonorrhea Incidence Rates by County,
South Dakota, 2009



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

Syphilis In 2009 there were 2 cases (Table 79) which was an incidence of 0.2 cases per 100,000 population. The Healthy People 2010 target for primary and secondary syphilis is 0.2 cases per 100,000 population. South Dakota participates in syphilis elimination through expedited case management, partner referral, and interstate coordination of outbreak investigations.

Table 79
Syphilis in South Dakota, 2000-2009

Year	Primary and Secondary	Early Latent	Late Latent	Congenital
2000	0	0	1	0
2001	1	0	0	0
2002	0	0	0	0
2003	2	3	0	0
2004	0	0	0	0
2005	2	0	0	0
2006	13	6	7	0
2007	7	4	1	0
2008	1	3	2	0
2009	0	2	4	0
Total	26	18	15	0

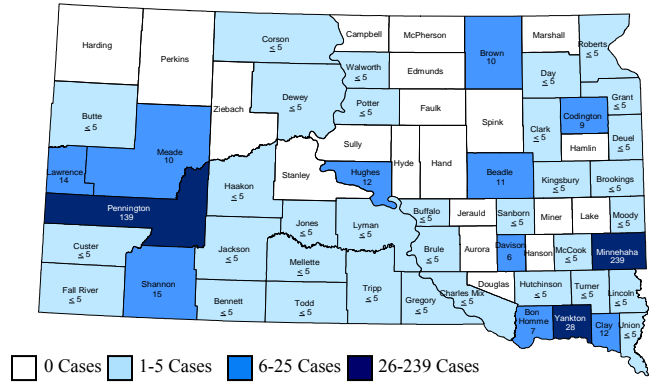
Source: South Dakota Department of Health, Office of Disease Prevention

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 2009, 609 South Dakota residents were reported as infected with HIV to the Department of Health (466 male, 143 female) and 345 of those were also diagnosed with AIDS. Cases have been reported from 46 of the state's 66 counties (Figure 37).

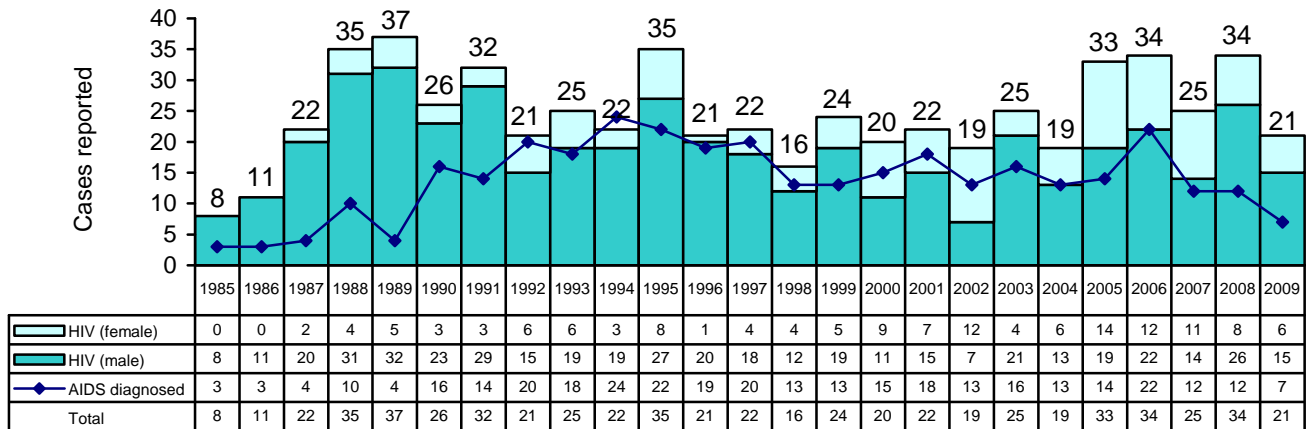
Twenty-one new HIV/AIDS cases were reported in 2009 (Figure 38). Fifteen of these cases were male and 6 cases were female. There are an estimated 372 people living with HIV/AIDS in South Dakota, 71 percent male and 29 percent female. Blacks and American Indians are disproportionately affected by HIV/AIDS with blacks comprising 22 percent of the living cases and American Indians 16 percent, when they comprise <1 percent and 9 percent of the population, respectively.

Figure 37
South Dakota Residents Reported Infected with HIV/AIDS
Cumulative Cases by County, 1985-2009



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.

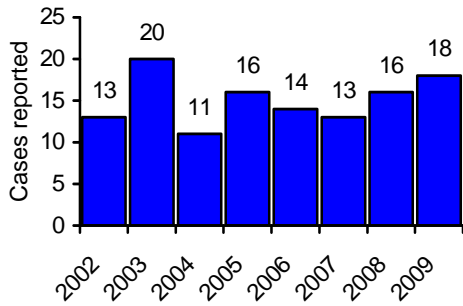
Figure 38
South Dakota Residents Diagnosed by Gender with HIV and AIDS, 1985-2009



TUBERCULOSIS

During calendar year 2009, 18 cases of active tuberculosis were reported (Figure 39) to the DOH.

Figure 39
Tuberculosis in South Dakota,
2002 – 2009



Source South Dakota Department of Health, Office of Disease Prevention

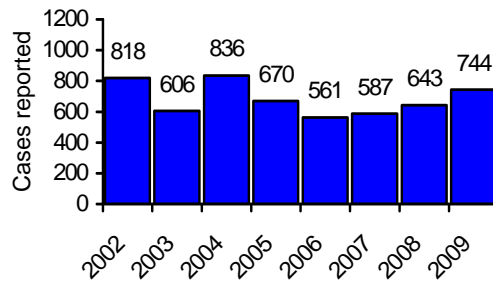
The overall incidence rate was 2.2 per 100,000; with an incidence of 10.3 for American Indians, 0.9 for whites, 64.5 for blacks and 17.4 for Asians. Of the cases reported in 2009, 7 were female (39%), 11 were male (61%). Twenty-eight percent of cases were foreign-born. The DOH's goal is the elimination of tuberculosis transmission in South Dakota. The Healthy People 2010 target is 1.0 new case of tuberculosis per 100,000 per year.

There were no cases of tuberculosis in children less than 15 years old reported in South Dakota in 2009. 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 three drug resistant tuberculosis cases reported in 2009, including one isoniazid resistant, one ethambutol resistant, and one streptomycin resistant.

In 2009, there were 744 reports of positive skin tests for tuberculosis infection (Figure 40). Since no data is collected on negative tests, it is not known how many people were skin tested overall. A positive skin test indicates that the person has been exposed to active tuberculosis, and an evaluation must follow.

Figure 40
Latent Tuberculosis Infection (Positive
Skin Tests) in South Dakota,
2002-2009



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

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

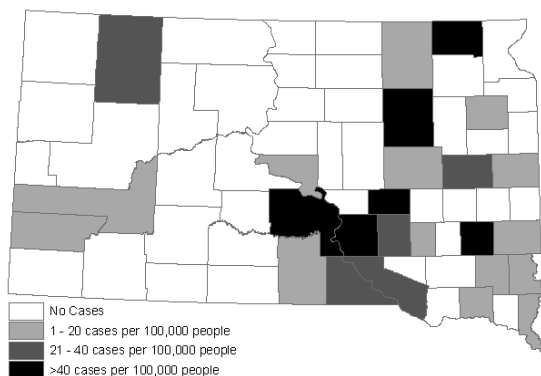
FOODBORNE and DIARRHEAL DISEASES

Escherichia coli, shiga toxin-producing

Shiga-toxin producing *E. coli* often causes severe bloody diarrhea and abdominal cramps. The illness usually resolves in 5 to 10 days. In some individuals, however, complications may involve severe hemorrhagic colitis, HUS, 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 2009 there were 71 cases of shiga toxin-producing *E. coli* (STEC) reported, representing a 51 percent increase over the five-year median. This was an incidence rate of 8.7 cases per 100,000 population. Figure 41 shows STEC incidence rates by county in South Dakota for 2009. Fifty-eight percent of the cases were in children less than 15 years of age. There were three cases of hemolytic uremic syndrome (HUS) associated with *E. coli* infection. Brule County had the highest incidence rate (341 cases per 100,000 population) due to an outbreak of *E. coli* O1111 in a child day care facility.

Figure 41
STEC Incidence Rates by County, South Dakota, 2009



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

E. coli O157:H7 is only one of several enterohemorrhagic, shiga toxin-producing serotypes of the bacteria. There were 41 cases of *E. coli* O157:H7, 15 cases of *E. coli* O111, 4 cases of *E. coli* O26, and also 11 cases of other shiga toxin-producing *E. coli* (unknown serotype) reported.

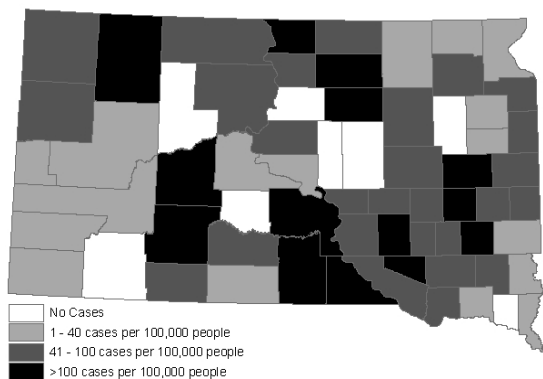
Shiga-toxin producing *E. coli* is transmitted by meat, water, fresh vegetables or other foods contaminated by the intestinal contents or manure of cattle, sheep, deer, and other animals. Person-to-person transmission can also occur. Human infection can be prevented by proper slaughtering methods, adequate 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 care until two successive negative fecal samples are produced.

Campylobacteriosis *Campylobacter* has been the most commonly reported enteric pathogen in South Dakota since 1999 (Table 79, page 102). In 2009, there were 298 cases of campylobacteriosis, which is an incidence of 36.7 cases per 100,000 population. This was a 22 percent increase over the five-year median baseline. Eighteen percent of the cases were in children less than five years old. Counties with the highest incidence (cases per 100,000 population) were all rural counties including Perkins (279), McCook (246), Jackson (226), Faulk (181), and Tripp (180), (Figure 42 on the following page).

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 42
Campylobacteriosis Incidence Rates by County, South Dakota, 2009

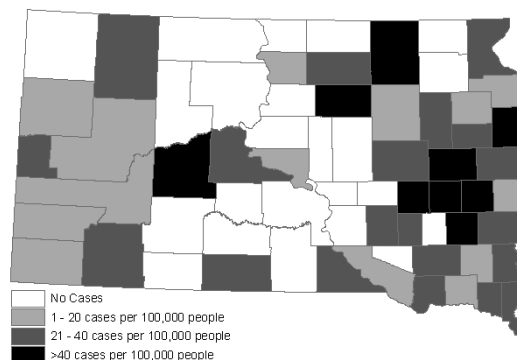


Source: South Dakota Department of Health, Office of Disease Prevention

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 198 culture-confirmed cases of salmonellosis reported in South Dakota in 2009, which was an incidence of 24.4 cases per 100,000 population, which was a 27 percent increase over the five-year median. This is the most cases of salmonellosis ever reported in a single year in South Dakota. The increased number is largely due to an outbreak of *Salmonella Saintpaul* with 38 reported cases associated with contaminated sprouts. Nineteen percent of the *Salmonella* cases were reported among children less than five years old. Counties with the highest incidence (cases per 100,000 population) included Haakon (450), Sanborn (164), Miner (124), Kingsbury (75), and Lake (67), (Figure 43).

Figure 43
Salmonellosis Incidence Rates by County, South Dakota, 2009



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

Table 80, on the next page, shows the most commonly isolated serotypes of *Salmonella* over the past decade by year in South Dakota. *S. typhimurium*, *S. saintpaul*, *S. enteritidis* and *S. newport* were the most commonly isolated serotypes in 2009.

Shigellosis In 2009 there were 4 cases of shigellosis reported which represent a 97 percent decrease below the five-year median. This was an incidence rate of 0.5 cases per 100,000 population. Figure 43 shows shigellosis incidence rates (cases per 100,000 population) by county in South Dakota for 2009.

Shigella sonnei has been the most common species isolated since 2000 while *S. flexneri* has been the second most common (Table 81). 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.

Table 80
Most Common Salmonella Serotypes, South Dakota, 2000-2009

Salmonella serotype	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Total	Percent
Agona	2	0	0	0	0	0	1	2	3	2	10	1%
Braenderup	3	2	0	3	1	6	0	0	2	2	19	1%
Enteritidis	9	12	14	15	20	24	17	29	26	22	188	13%
Hadar	7	5	0	7	1	1	2	3	2	2	30	2%
Heidelberg	11	22	10	3	6	6	5	4	10	6	83	6%
Infantis	1	2	1	1	0	9	6	1	3	2	26	2%
Litchfield	1	0	2	1	0	3	0	2	1	2	12	1%
Montevideo	1	1	4	3	6	5	5	7	6	6	44	3%
Muenchen	2	1	3	2	5	2	3	8	3	3	32	2%
Muenster	2	1	2	0	0	0	0	1	0	0	6	0%
Newport	5	6	11	9	9	10	11	23	9	19	112	8%
Oranienburg	0	1	1	2	5	5	2	2	3	2	23	2%
Paratyphi A	1	0	0	0	0	0	0	0	0	0	1	0%
Paratyphi B	1	4	0	5	3	3	3	2	1	1	23	2%
Poona	0	0	0	0	1	1	0	0	2	1	5	0%
Saintpaul	1	1	1	5	1	0	3	1	3	38	54	4%
Thompson	1	2	2	0	1	2	2	1	1	3	15	1%
Typhimurium	33	48	36	50	61	49	45	41	35	44	442	30%
Other serotypes	19	42	34	25	36	34	30	47	42	43	352	24%
Total	100	151	121	131	156	160	135	174	152	198	1478	100%

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

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.

Giardiasis Giardiasis is a gastrointestinal disease caused by a protozoan parasite called *Giardia lamblia* (*G. intestinalis*) which is transmitted person-to-person or by contaminated water. During 2009, 112 cases of giardiasis were reported which is an 8 percent increase over the five-year baseline.

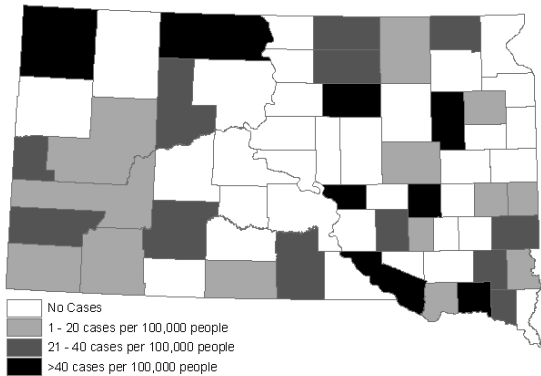
Table 81
Most Common Shigella Serotypes, South Dakota, 2000-2009

Year	S. flexn	S. sonnei	S. boydii	Species Unk	Total
2000	2	2	0	4	8
2001	6	508	1	201	716
2002	5	113	0	39	157
2003	3	9	0	5	17
2004	0	6	4	2	12
2005	1	70	5	55	131
2006	0	268	1	120	389
2007	0	75	0	47	122
2008	1	36	0	38	76
2009	1	2	0	1	4
Total	19	1089	11	512	1632
Percent	1%	67%	1%	31%	100%

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

Forty-six percent of the cases were from children less than 15 years of age. Figure 44 shows giardiasis incidence rates (cases per 100,000 population) by county in South Dakota for 2009.

Figure 44
Giardiasis Incidence Rates by County,
South Dakota, 2009

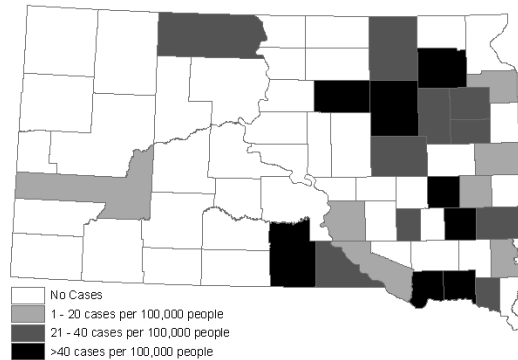


Source: South Dakota Department of Health, Office of Disease Prevention

Cryptosporidiosis Cryptosporidiosis is a protozoan diarrheal disease transmitted by cattle and human feces, often waterborne. In 2009 there were 138 cases reported representing a 60 percent increase over the five-year median. Thirty-six percent of the cases were from children less than 15 years of age. Generally, an increase in reported cases is occurring nationally with outbreaks often traced to outdoor recreational water sources and contaminated swimming pools. Figure 45 shows cryptosporidiosis incidence rates (cases per 100,000 population) by county in South Dakota for 2009. Counties

with the highest incidence (cases per 100,000 population) included Yankton (96), Spink (92), Bon Homme (86) and McCook (82). East River counties accounted for 93 percent of the cases.

Figure 45
Cryptosporidiosis Incidence Rates by
County, South Dakota, 2009

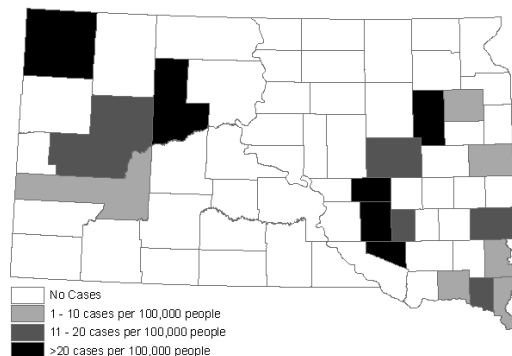


Source: South Dakota Department of Health, Office of Disease Prevention

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 2009, 58

Figure 46
Pertussis Incidence Rates by County,
South Dakota, 2009



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

(7.1 cases per 100,000 population) cases of pertussis were reported in South Dakota. No deaths were reported due to pertussis complications.

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.

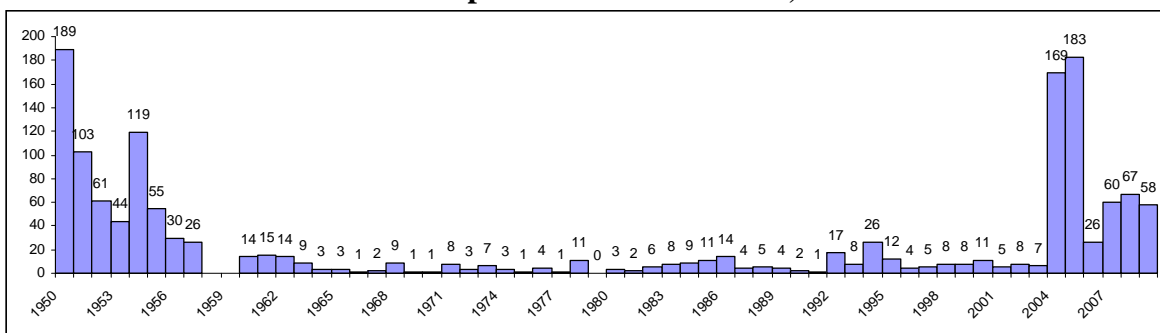
Infants and young children are at higher risk of pertussis-associated complications, hospitalization and death. The most common complication is secondary bacterial pneumonia. Twenty-five percent of the 2009 cases were less than five years old, and 54 percent were less than 15 years old. Pertussis infected 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.

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 47
Pertussis Cases Reported in South Dakota, 1950 – 2009



No data available for 1958 and 1959.

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

INFLUENZA

The 2009 influenza season was the most unusual in the past 40 years; unusual in length, intensity and age groups afflicted. The 2009 influenza activity continuously spanned a full year with confirmed cases of influenza reported every week between 14 December 2008 and 12 December 2009 in South Dakota. Between December 2008 and April 2009 we experienced a “normal” seasonal influenza outbreak, but a new influenza virus emerged in April 2009 causing a global pandemic (A/California/2009-H1N1). The 2009 influenza seasons peaked during March 2009 and again during the 3rd week of October 2009 when the pandemic H1N1 virus peaked. Although the pandemic emerged in April 2009 this reports covers the period of 30 August 2009 through 2 October 2010. During this period 2,302 laboratory confirmed influenza cases, 430 influenza-associated hospitalizations and 24 influenza deaths were reported to the South Dakota Department of Health (SD DOH).

Table 82,
Age Distribution of Reported Influenza Cases, South Dakota, 30 Aug 2009-2 Oct 2010 Influenza Season

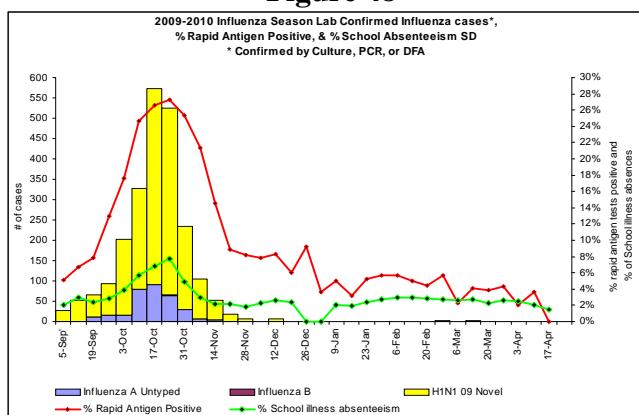
Lab Confirmed Influenza Cases (by DFA, PCR, or culture)			Influenza Associated Hospitalizations		Influenza Associated Deaths
Age Group	# Cases	%	# Hosp	%	# Deaths
0-9	1,031	45%	175	41%	1
10-18	548	24%	37	9%	1
19-29	313	14%	44	10%	2
30-39	135	6%	25	6%	2
40-49	110	5%	38	9%	5
50-59	97	4%	49	11%	3
60-69	42	2%	34	8%	6
70+	26	1%	28	7%	4
Total	2,302		430		24

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

Influenza Epidemiology and Laboratory Surveillance

The SD DOH and South Dakota 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 2009-2010 season included 36 sentinel sites; seven Influenza Like Illness Network Providers; SDPHL culture and PCR testing; Pine Ridge, Rapid City Regional, and Sanford Laboratories DFA testing; reporting of aggregate rapid antigen results; confirmed influenza, influenza hospitalizations and deaths, and institutional outbreaks. During the influenza season, weekly summary reports are posted on the SD DOH website at: doh.sd.gov/Flu/.

Figure 48



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

A total of 2,302 confirmed influenza cases, A-H1N1 1,981 (86%), A-not subtyped 318 (14%) and 3 (<1%) influenza B, were reported to SD DOH. Additionally, 46,004 rapid antigen influenza tests were accomplished with 8,395 positive, (18%) positive for influenza A and 100 (<1%) positive for influenza B. Other viral respiratory pathogen reports included 103 adenovirus, 50 enterovirus, 183, hMPV, 161, parainfluenza - 1, 31 parainfluenza - 2, 100 parainfluenza - 3, 66 parainfluenza - 4, and 596, respiratory syncytial virus (RSV).

The pandemic A-H1N1 virus hit children and younger adults harder than the elderly. The median age of confirmed influenza cases (Table 82, previous page) was 11 years with an age range of 2 months to 98 years.

There were 430 individuals reported hospitalized during the 2009-10 influenza season. The first hospitalization was identified during the week ending 5 September 2009. Hospitalizations peaked during week ending October 24 when 114 patients were hospitalized for influenza. For patients who were hospitalized with influenza, the age range was 1 month to 96 years with a median age of 19 years.

Twenty-four individuals died due to influenza and its complications during the 2009-10 influenza season. Gender breakdown was 71 percent male and 29 percent female. The median age was 56 years, with an age range of 8 - 85 years. Seventy-five percent of the influenza-associated deaths were white people and 25 percent were American Indian.

H1N1 in South Dakota 2009-2010

In April 2009 CDC reported Swine Influenza A(H1N1) infection in two children in Southern California. There was also widespread respiratory disease in Mexico at the same time. South Dakota saw its first case of H1N1 in mid-March 2009. In May 2009, South Dakota Public Health Laboratory became certified on a new testing platform (ABI7500); allowing confirmatory testing to be done at SDPHL rather than sending all unsubtypeable specimens to CDC for confirmatory testing. In June 2009 World Health Organization (WHO) declared a global pandemic. In July

2009 Department of Health and Human Services decided to offer mass vaccination for this new novel A(H1N1) virus. Sporadic H1N1 activity occurred in South Dakota from June through August 2009. Confirmed cases and hospitalizations began to increase once children and college students returned to school. In October 2009 the first pandemic influenza death was reported. In October 2009 a vaccine became available for the novel H1N1 virus and vaccination began with the highest risk groups. The pandemic peaked during the third week of October. In November 2009 vaccinations were offered to moderate-high risk groups and confirmed cases continue to decline. In December 2009 vaccinations were offered to the full population. In August 2010, WHO declared the end of H1N1 global pandemic and CDC stated that this virus was no longer to be reported a novel influenza virus.

National Influenza Surveillance Data

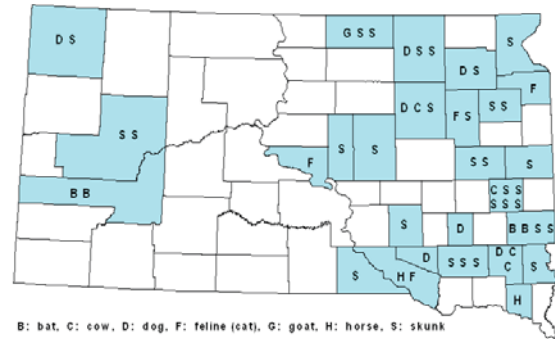
The United States experienced its first wave of 2009 H1N1 activity in the spring of 2009, followed by a second, larger wave of 2009 H1N1 activity in the fall and winter, during typical “flu season” time for the U.S. For information about 2009 H1N1 flu, visit the CDC’s 2009 H1N1 website: <http://www.cdc.gov/h1n1flu/>.

The 2009-2010 flu season began very early, with 2009 H1N1 viruses predominating and causing high levels of flu activity much earlier in the year than during most regular flu seasons. Activity peaked in October and then declined quickly to below baseline levels by January. While activity was low and continuing to decline, 2009 H1N1 viruses were still reported in small numbers through the spring and summer of 2010.

RABIES

Rabies is a fatal viral disease and a serious enzootic public health concern in South Dakota. While rabid animal events occur throughout the year in South Dakota, most rabies events occur during the spring and summer months. In 2009, 718 animals were submitted for rabies testing with 53 animals testing positive. This is an increase of 121 percent from the previous year. The 53 rabid animals included 35 wild animals (31 skunks and 4 bats) and 18 domestic animals (7 dogs, 4 cats, 4 cattle, 2 horses, and 1 goat). The last human rabies case in South Dakota was in 1970.

Figure 49
Animal Rabies in South Dakota, 2009



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

Table 83
Animals tested and confirmed rabies cases, SD, 2000-2009

Animal	2009		2000 - 2009		
	Pos	Total tested	Pos	Total tested	% Pos
Skunk	31	57	436	682	64%
Cattle	4	79	74	973	8%
Bat	4	108	60	2027	3%
Dog	7	159	40	1642	2%
Cat	4	231	40	2491	2%
Horse	2	14	29	264	11%
Goat	1	4	4	23	17%
Woodchuck	0	2	1	23	4%
Fox	0	1	1	35	3%
Raccoon	0	27	1	388	<1%
Deer, elk, donkey, llama	0	13	0	78	0%
Rodents*	0	7	0	71	0%
Squirrel, chipmunk	0	5	0	82	0%
Muskrat	0	4	0	32	0%
Sheep	0	3	0	58	0%
Opossum	0	2	0	36	0%
Weasel, ferret, mink	0	2	0	30	0%
Pig	0	0	0	6	0%
Badger	0	0	0	4	0%
Bison	0	0	0	5	0%
Shrew, mole	0	0	0	3	0%
Coyote, wolf	0	0	0	28	0%
Rabbit, hare	0	0	0	13	0%
Bobcat, bear	0	0	0	1	0%
Mountain lion	0	0	0	3	0%
Other animals	0	0	0	7	0%
TOTAL	53	718	686	9005	8%

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

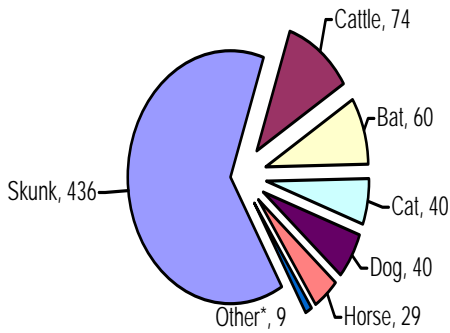
In 2009, 665 animals tested negative for rabies, including 227 cats, 152 dogs, 104 bats, 75 cattle, 27 raccoons, 26 skunks, 13 deer, 12 horses, 5 rats, 5 squirrels, 4 muskrats, 3 sheep, 3 goats, 2 ferrets, 2 opossums, 2 woodchucks, and 1 each fox, gopher, and mouse.

During 2009, rabid animals were detected in 27 South Dakota counties (Figure 49 above). Animals were submitted for testing from all counties except Campbell, Mellette, Sully and Ziebach.

During the 10-year period (2000-2009) 686 of 9,005 (8%) animals tested were positive for rabies (Table 83). During these years animals were tested from all counties, and rabid animals were detected in all counties except Bennett, Shannon, Todd, and Ziebach. The most animals were submitted for testing from Minnehaha County and Ziebach submitted the fewest.

Since 2000, 27 percent of rabies cases in South Dakota have been domestic animals. There were 40 rabid dogs and 40 rabid cats, most of which were unvaccinated strays. In 2009 the 7 rabid dogs were the most since 2003. Rabid livestock since 2000 included 74 cattle, 29 horses and 4 goats.

Figure 50
Rabid Animals – South Dakota
2000-2009



*Others include goat 4, fox 1, raccoon 1, woodchuck 1.

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

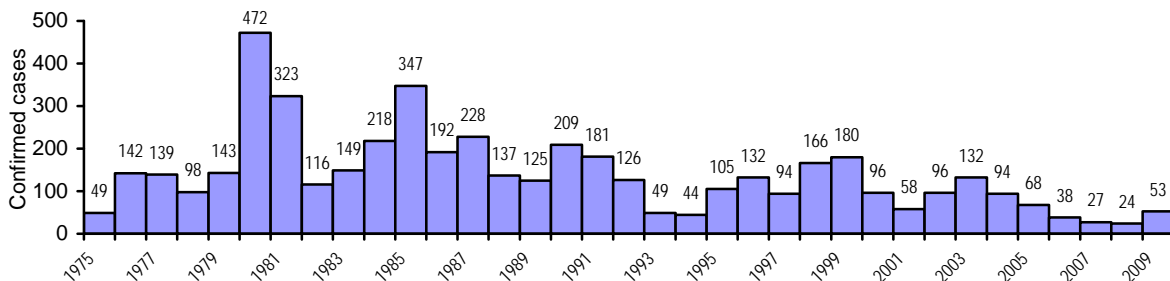
The common skunk (*Mephitis mephitis*) is the enzootic rabies reservoir in South Dakota. Since 2000, 64 percent of skunks tested have been rabid. Bat rabies is also enzootic in South Dakota with 60 of 2,027 (3%) bats testing positive over the past ten years. Although rabies is not enzootic in other wild animals in South Dakota, since year 2000 rabies has been detected in 1 fox, 1 raccoon and 1 woodchuck. These other wild animals are likely spillover rabies following exposure to rabid skunks. During 2009 there were 13 deer tested for rabies, the most tested since at least 1990.

The latest national animal rabies surveillance data reported are for 2008. Nationally, there was a 3 percent decrease from the previous year with 6,841 cases of animal rabies reported (93% wild animals, 7% domestic animals).

Two laboratories offer rabies tests in South Dakota: (1) the Animal Disease Research Diagnostic Laboratory (ADRDL) in Brookings, and (2) the State Public Health Laboratory (SDPHL) in Pierre. Both laboratories use the direct fluorescent antibody (DFA) technique. The case definition of a confirmed animal rabies case is a positive DFA test, performed preferably on central nervous system tissue, or isolation of the rabies virus in cell culture or in a laboratory animal. Human serum rabies antibody titers on previously vaccinated people may be ordered through SDPHL.

Rabies consultations are available from the Office of Disease Prevention, South Dakota Department of Health, 7 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 51
Animal Rabies in South Dakota, 1975-2009



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

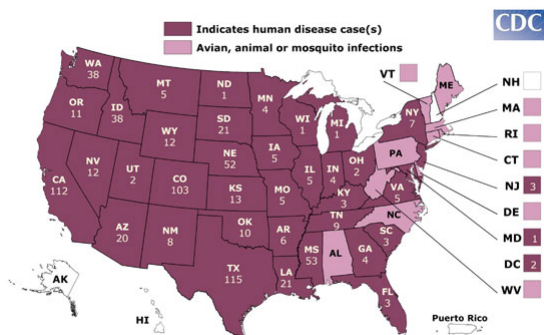
West Nile Virus

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

2009 was the 11th year of WNV transmission in North America and the 8th 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 2009 there were 720 human WNV cases reported, with 32 deaths (Figure 52). The WNV cases included 373 NID cases (encephalitis or meningitis).

Figure 52
West Nile Human Deaths/Cases, United States, 2009



OTHER INFECTIOUS DISEASES

***Neisseria meningitidis* invasive disease**

There were five cases of invasive *Neisseria meningitidis* disease reported in 2009. This is an incidence of 0.6 cases per 100,000 population. The Healthy People 2010 target was 1.0 new cases of meningococcal disease per 100,000 population.

Vector borne diseases in South Dakota in 2009 included five cases of tularemia and one case of Lyme Disease. Although detections of plague in prairie dogs and other mammals were reported in southwest South Dakota, there were no human cases detected in 2009.

Other Infectious Diseases There were 29 cases of invasive Group A *Streptococcus*, 27 cases of invasive Group B *Streptococcus*, 9 cases of *Streptococcus pneumoniae* in children less than 5 years of age, and 5 cases of invasive drug resistant *Streptococcus pneumoniae* in 2009. There were 91 cases of invasive Methicillin Resistant *Staphylococcus aureus* (MRSA) and 53 cases of chicken pox. Additionally, 9 cases of Q Fever, 4 cases of acute Hepatitis B, 3 cases of Hepatitis A, 3 cases of Hemolytic Uremic Syndrome, 2 cases of Legionellosis, 2 cases of Typhoid fever, 2 cases of Mumps and one case each of Listeriosis, acute Hepatitis C and Malaria were reported in 2009.

