2006

South Carolina Annual Report

On

Reportable Conditions

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South Carolina Department of Health and Environmental Control

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Introduction

The South Carolina Department of Health and Environmental Control (DHEC), Bureau of Disease Control, is pleased to present this 2006 Annual Report of Notifiable Diseases. A brief narrative and accompanying graphs displaying summary data for the 86 diseases or conditions are included in this report, which were reportable by law in South Carolina in 2006. Useful web links and bibliographic references have been provided for readers interested in additional information.

Legal Basis for Disease Reporting and Surveillance:

In South Carolina, as in all other states and indeed in most countries around the world, reporting of diseases of public health importance has a legal basis (State Law # 44-29-10, Regulation # 61-20, State Laws #44-1-110 and 44-1-140). Federal HIPAA legislation allows disclosure of otherwise protected health information to public health authorities that collect and receive such information for the purpose of preventing or controlling disease. (HIPAA 45 CFR §164.512). State law also directs DHEC to update the list of reportable diseases on an annual basis, though few changes are made from one year to the next. A PDF version of the South Carolina's reportable disease list may be found on the DHEC web site (www.scdhec.gov/health/disease/docs/reportable_conditions.pdf).

Uses of Surveillance Data:

Reporting is the foundation of what is termed "disease surveillance", an activity which permits society to know what diseases are afflicting it, in what numbers, and when, where, and in whom cases are occurring. Surveillance for cases of infectious disease is useful for several purposes:

(a) Prevention of disease in contacts: For example, household or daycare contacts of persons with meningococcal meningitis are at increased risk of developing meningitis themselves, and prompt administration of an appropriate antibiotic greatly reduces this risk. Similar preventive measures are needed following exposure of contacts to cases of pertussis, hepatitis A, sexually transmitted diseases, tuberculosis, and certain other conditions.

(b) Detection of outbreaks: Some infectious diseases occur at a more or less constant background rate - sporadic cases, therefore, regularly occur in the community. Many of these may not be preventable given currently available tools. Periodically, a number of cases occur clustered in time and/or in space, and the community rate then greatly exceeds what is normally expected. Such an event is called an "outbreak" and often requires a focused public health response to identify the cause of the outbreak, to control it, and to prevent it from recurring.

(c) Program evaluation: Some infectious diseases are targeted by government-funded programs. For example, Immunization Programs are funded with state and federal funds. Surveillance of vaccine preventable diseases is thus essential to monitor program efforts so that the program can be constantly evaluated, populations at risk (e.g., under-vaccinated subgroups in society) identified, and corrective actions taken.

(d) Contribution to knowledge about new diseases: The last 30 years have seen the emergence both of "new diseases" such as Hantavirus, H5N1 Avian Influenza, Hepatitis C, SARS, Ebola virus, E. coli O157:H7 and many others (www.cdc.gov/eid), and of "old diseases up to "new tricks", such as West Nile Virus' spread in North America, emergence of Methicillin-resistant staph aureus (MRSA), or emergence of multi-drug resistant tuberculosis (MDRTB). In many cases, these diseases have been detected by surveillance systems and their natural history, mode of transmission, and risk factors have been clarified through careful review of surveillance data - sometimes even before the causative agent was identified (e.g., HIV in the early 1980s). Similarly, cases identified by surveillance systems are often needed to serve as the basis for case-control studies, a formal study design commonly used in infectious disease epidemiology (http://en.wikipedia.org/wiki/Case-control_study) to identify risk factors or even causes for infectious diseases.

Sources of Reports:

Disease reports are submitted to DHEC from a variety of sources. Many reports are submitted by practicing physicians who may diagnose, or just suspect, a case of measles or tetanus. Similarly, clinical laboratories, either freestanding or hospital-based, are required to submit reports of positive diagnostic tests for reportable diseases. Examples might be positive IgM antibody tests for hepatitis A virus, EIA or Western Blot tests for HIV, and cerebrospinal fluid cultures for Neisseria *meningitidis* that confirms the diagnosis of meningococcal meningitis. Additional reports come from the designated Infection Control Practitioners who work in all accredited hospitals in South Carolina. Also, DHEC's local health departments report cases identified in their own clinics (e.g. tuberculosis and STDs). The DHEC Bureau of Laboratories also makes the diagnosis for numerous cases of reportable diseases based on tests performed on clinical specimens submitted by DHEC's own clinics or disease investigation teams, by hospital laboratories, or by providers who participate in special "sentinel surveillance" networks. An example of the later is the collaborative network of providers who submit specimens for detection and characterization of circulating influenza viruses that are seen in the state every winter flu season. Reports may also come from other disease control partners, such as from the Infection Control Practitioners (ICPs) or Infection Control Nurses (ICNs) who work in major hospitals throughout the state.

Mechanism for Reporting:

For years, disease reports in SC were made using DHEC's 1129 Disease Reporting Cards. However, since 2003, the DHEC Division of Acute Disease Epidemiology has also been using an adaptation of the NEDSS Base System (NBS) provided by the US Centers for Disease Control and Prevention (CDC) (www.cdc.gov/nedss, www.cdc.gov/phin). The NBS is a web-

based tool allowing for decentralized intranet or Internet data entry, secure storage, and improved access to data for analysis. In South Carolina, DHEC's implementation of the NBS is called Carolina's Health Electronic Surveillance System, or CHESS. CHESS was initially deployed to DHEC sites throughout the state, but in the last year a number of regional hospitals have also come on-line and are becoming partners in the system. It is therefore anticipated that over the next few years, use of CHESS will gradually replace the use of the 1129 paper reporting cards.

Disease Occurrence vs. Disease Counts:

Conceptually it is important to distinguish *disease reporting* from *disease occurrence.* Thus, for many conditions, *reported cases* represent only the *tip-of-the-iceberg* of a much larger number of cases that have actually *occurred* in the community. This is illustrated in Figure 1 and explained more fully in Table 1.

Figure 1

Disease Occurrence* vs. *Disease Counts
Schematic Sequence of Six Events

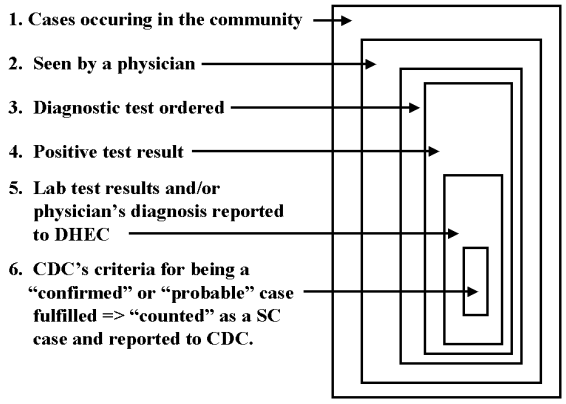


Table 1

Why even "true cases" might not follow the Sequence of Events from Step 1 to Step 6

1 ⇒ 2 Not all patients will consult a physician. May depend on severity of symptoms; availability of health insurance; or ability to pay.

2 ⇒ 3 Specific diagnostic tests not always ordered: e.g. specific diagnosis may not be considered; or test may be considered moot as condition will resolve in any case.

3 ⇒ 4 No laboratory test is 100% sensitive, hence false negative can and do occur for a multitude of reasons (http://en.wikipedia.org/wiki/Sensitivity_(tests)

4 ⇒ 5 Compliance with SC Statutory Reporting Laws is not 100%. Hence some diagnosed cases are never reported.

5 ⇒ 6 Only those cases which meet strict CDC criteria as being "confirmed", or at least "probable" are officially counted as SC cases, are reported to CDC, and thus become part of the national totals (www.cdc.gov/EPO/dphsi/casedef/) .

Note: The proportion of reported cases which can be confirmed depends on many factors such as: (a) patterns of testing done by SC physicians, and (b) levels of federal or state funding available to DHEC disease-specific activities. For example, specific funding is available for tuberculosis, HIV-AIDS, and syphilis, and for conditions such as anthrax or smallpox which might be intentionally disseminated in a bioterror attack.

These points illustrate why a statement such as: "There were 1250 cases of salmonella last year in SC" is, strictly speaking, not correct for most diseases. A better formulation might state: "Last year DHEC received 1250 disease reports which were confirmed as cases of Salmonella".

Availability and Consistency of Data from Different Sources:

Case counts for reportable diseases are available from several sources. During the year, the Division of Acute Disease Epidemiology publishes counts of "cases reported to date" in its Epi Notes which is published several times a year and which can be found on the web at: www.scdhec.gov/health/disease. Likewise, CDC, based on reports submitted by the 50 states, publishes its own weekly figures in the Morbidity and Mortality Weekly Report (MMWR, see: www.cdc.gov/mmwr). The CDC also later publishes a final annual disease summary for the nation in a special MMWR supplement (www.cdc.gov/mmwr/summary.html) though this may not appear for 15 to 18 months after the end of a "reporting year". For a number of reasons, data from these different sources are not always consistent. For example, yearly totals may differ depending on whether they have been compiled by "year of disease onset" or "year of report". Also, laboratory data confirming that a "suspect case" should be reclassified as a "confirmed" case may arrive late and thus lead to retroactive "change in the numbers" which cannot be updated in tables which have already been published. Finally, available laboratory data are not always sufficient to make fine distinctions necessary to unambiguously categorize a case. For example, even if a patient with clinical manifestations of hepatitis has a positive test for HBsAg, it may not be possible to ascertain whether the patient has acute or chronic hepatitis B unless results from the more specialized test for presence of IgM-anti-HBcAb has been ordered.

Interpreting disease trends over time: One of the reasons for maintaining surveillance over infectious diseases of public health importance is to monitor trends over time so as to be able to answer questions about whether disease incidence is rising, remaining relatively constant, or falling. However, caution conditioned by detailed knowledge of the subject is often needed to interpret an apparent increase or decrease in reported cases. Questions to consider include:

(a) Has the definition of what constitutes a "confirmed" or "probable" case changed over time? (Example: The US AIDS case definition change of 1993.)

(b) Have new (perhaps more sensitive) diagnostic tests just recently become available?

(c) Has there been a sudden influx of funds? (Example: Increased federal grant monies to states enabling them to do more screening for the disease or, conversely, decrease in funds and hence decreased screening efforts and then and a consequent decline in number of cases identified.)

(d) Is the disease just newly recognized or has it just recently been introduced into the United States? (Example: Emergence and dramatic East Coast to West Coast spread of West Nile Virus in the United States since 1999.)

(e) Are there data derived from other sources (e.g. hospital discharge summaries, death certificates, community surveys, serological studies, etc.) that can shed complementary light on the evolution of a disease in the population?

(f) Might a sudden recent increase be attributable to a one-time anomaly (e.g., a large outbreak in one school or among patrons of a single restaurant) but not otherwise really signal an overall increase in the "general population"?

Thus, disease surveillance trends, though important, should be understood as being only part of a more complex reality, and consultation is often advisable before conclusions are drawn solely on the basis of trends in disease reports.

Conclusion:

Despite hopes some decades ago that communicable diseases were a problem of the past, infectious diseases continue to pose public health problems whose solutions call for biological understanding, technical tools, political will, and societal resources. The DHEC Bureau of Disease Control hopes this report will contribute to knowledge and understanding of the challenges posed by infectious diseases of public health importance in South Carolina.

S.C. List of Reportable Conditions

S.C. 2006 List of Reportable Conditions

Attention: Health Care Facilities, Physicians, and Laboratories

South Carolina Law requires reporting of diseases and conditions on this list to your local public health department.
(State Law # 44-29-10, Regulation # 61-20, State Laws #44-1-110 and 44-1-140.)

HIPAA: Federal HIPAA legislation allows disclosure of protected health information, without consent of the individual, to public health authorities to collect and receive such information for the purpose of preventing or controlling disease. (HIPAA 45 CFR §164.512)

REPORT IMMEDIATELY
by Phone
(Confirmed and Suspected Cases)

Any outbreak, unusual disease, or cluster of cases to include a potential biological, chemical, or terrorist event. (1)
- **Animal (mammal) bites**
- ☣ **Anthrax (7)**
- ☣ **Botulism**
- ☣ **Food borne outbreak – unusual cluster**
- ***Haemophilus influenzae* type b, invasive disease (4) (7)**
- **Measles (rubeola)**
- **Meningococcal disease (7)**
- ☣ **Plague (7)**
- **Poliomyelitis**
- **SARS – Severe Acute Respiratory Syndrome (7) (by current CDC case definition)**
- ☣ **Smallpox**
- ☣ **Viral Hemorrhagic Fever**

Urgently Reportable
within 24 Hours by Phone

- **Arboviral Neuroinvasive Disease (acute infection, including acute flaccid paralysis, atypical Guillain-Barre Syndrome): Eastern Equine (EEE), LaCrosse (LAC), St. Louis (SLE), West Nile Virus (WNV) (7)**
- ☣ **Brucellosis (7)**
- **Cholera (*Vibrio cholerae* type O1 and non-O1) (7)**
- **Diphtheria (7)**
- **Enterohemorrhagic E. Coli (includes O157:H7) (7)**
- ☣ **Glanders (7)**
- **Hantavirus**
- **Hemolytic uremic syndrome (HUS)**
- **Hepatitis A, acute (IgM Ab + only)**
- **Hepatitis B, acute (IgM core Ab + only)**
- ☣ **Melioidosis *(Burkholderia pseudomallei)* (7)**
- **Pertussis**
- ☣ **Q fever**
- **Rabies (human)**
- **Rubella (includes congenital)**
- ***Staphylococcus aureus*, vancomycin-resistant (VRSA/VISA)**
- **Syphilis, primary or secondary (lesion or rash)**
- **Syphilis, congenital**
- ☣ **Toxins (i.e., Ricin, *C. perfringens*, Staph enterotoxin)**
- **Trichinosis**
- **Tuberculosis (7)**
- ☣ **Tularemia**
- **Typhoid fever *(Salmonella typhi)* (7)**
- ☣ **Typhus (scrub) fever**

☣ **Potential agent of bioterrorism** ☣

Report within 7 Days

- **AIDS (2)**
- **Campylobacter enteritis**
- **CD4 T-lymphocyte count – all results (L) (2)**
- **Chancroid**
- **Chlamydia trachomatis, genital site (L)**
- **Creutzfeldt - Jakob Disease (Age < 55 years)**
- **Cryptosporidiosis**
- **Cyclosporiasis**
- **Dengue**
- **Ehrlichiosis**
- **Giardiasis**
- **Gonorrhea**
- ***Haemophilius influenzae*, non-type b invasive disease (4) (7)**
- **Hepatitis B, chronic**
- **Hepatitis B Surface Antigen + (HBsAg +) with each pregnancy**
- **Hepatitis C, D, E**
- **HIV-1 or HIV-2 infection (2)**
- **HIV quantification / viral load - all results (L) (2)**
- **Influenza, positive rapid flu test (#)**
- **Influenza, positive virus culture isolates (L)**
- **Influenza, pediatric deaths - age < 17 years**
- **Kawasaki disease**
- **Lead poisoning (5)**
- **Lead tests, all (6) (L, includes office tests)**
- **Legionellosis**
- **Leprosy**
- **Leptospirosis**
- **Listeriosis (7)**
- **Lyme disease**
- **Lymphogranuloma venereum**
- **Malaria**
- **Meningitis, aseptic (8)**
- **Mumps**
- **Pesticide poisoning**
- ☣ **Psittacosis**
- **Rocky Mountain Spotted Fever**
- **Salmonellosis (7)**
- **Shigellosis (7)**
- **Streptococcus group A, invasive disease (4)**
- **Streptococcus group B, age < 90 days**
- ***Streptococcus pneumoniae*, invasive, (4) (include antibiotic resistance patterns) (3)**
- **Syphilis, latent or tertiary**
- **Syphilis, positive serologic test**
- **Tetanus**
- **Toxic Shock (Staphylococcal or Streptococcal)**
- **Varicella**
- **Varicella death**
- **Vibrio infections (non-cholera)**
- **Yellow Fever**
- **Yersiniosis (L)**

(L) Only Labs required to report.
(#) Report only total number of positive results; individual case reporting is not necessary

1. Outbreak: An excess number of cases or syndromes over the expected occurrence of disease within a geographic area or population group.
2. Report HIV or AIDS when serum, urine, or oral fluid specimen is positive by: (a) screening test (e.g., EIA antibody) ***or*** (b) confirmatory test (e.g., Western blot) ***or*** (c) an HIV detection test (e.g., PCR nucleic acid test, including viral load), ***or*** (d) clinical diagnosis of a case of HIV or AIDS. All reactive rapid HIV test results must be reported to DHEC. However, if a confirmation test is performed within 14 days and is negative, reactive EIAs alone should not be reported. All HIV viral load and CD4 test results must be reported by laboratories regardless of results. For reporting procedure, see "How to Report."
3. Antibiotic resistant organisms: resistant pneumococcus: MIC ≥ 2μg/ml of penicillin G (or Oxacillin disc zone ≤ 19mm) or resistance to any single drug accepted as effective treatment. The definition of resistance may differ between laboratories by test methods used to determine susceptibility. Reports should specify the site from which the isolate was obtained and the drug susceptibility profile.
4. Invasive disease = isolated from normally sterile site: blood; bone; CSF; joint; pericardial, peritoneal or pleural fluid; necrotizing fasciitis; and cellulitis only if isolate is from a tissue biopsy. Always specify site of isolate.
5. Physicians should report serum lead level ≥10 μg/dL for children under 6 years of age and ≥ 25 μg/dL for persons 6 years or older.
6. Labs must report results of all lead tests performed. This includes lab tests performed in physician offices.
7. Labs should submit these isolates and positive serologies to the DHEC Bureau of Laboratories for confirmatory testing, serotyping, serogrouping, or genotyping.
8. Acute meningeal symptoms, fever, CSF pleocytosis, sterile culture. Consult SC DHEC in outbreaks to submit specimens to lab for virus identification.

Diseases by Year

Disease Specific Data	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
HIV/AIDS	1,095	1,062	1,076	999	938	930	882	851	875	772	779
Animal (Mammal) Bites	11,372	11,316	11,796	11,867	11,752	11,383	11,132	11,535	10,926	11,544	11,767
Animal Bites Resulting in Post Exposure Prophylaxis (PEP)	361	418	422	426	467	382	421	413	380	452	434
Anthrax	0	0	0	0	0	0	0	0	0	0	0
Botulism	0	0	0	0	0	0	0	0	1	0	0
Brucellosis	NR	NR	NR	NR	NR	1	0	0	0	1	3
Campylobacteriosis	210	226	182	206	168	196	212	238	202	220	224
Chancroid	2	0	0	0	0	0	0	0	0	0	0
Chlamydia trachomatis	9,545	12,680	18,678	14,715	10,907	12,755	12,435	14,879	19,043	18,831	19,086
Cholera	0	0	0	0	0	0	0	0	0	0	1
Creutzfeldt-Jakob Disease	0	0	0	0	0	0	0	0	0	0	0
Cryptosporidiosis	13	11	25	10	23	7	8	18	25	28	132
Cyclosporiasis	0	0	2	0	1	0	3	0	0	3	5
Dengue	0	0	0	1	1	0	0	0	2	0	1
Diphtheria	0	0	0	0	0	0	0	0	0	0	0
Eastern Equine Encephalitis	1	2	0	0	1	0	1	2	1	1	0
Ehrlichiosis	1	0	1	0	1	1	4	1	7	11	5
Giardiasis	NR	NR	NR	NR	NR	NR	150	163	144	107	111
Glanders	0	0	0	0	0	0	0	0	0	0	0
Gonorrhea	11,661	11,487	11,574	10,727	10,167	9,598	8,839	8,646	9,588	8,781	9,070
Haemophilus influenza	4	5	3	6	7	1	15	16	17	38	39
Hantavirus	0	0	0	0	0	0	0	0	0	0	0
Hemolytic uremic syndrome	0	2	1	0	0	3	0	0	3	0	2
Hepatitis A, Acute	52	110	55	48	97	86	64	54	50	50	27
Hepatitis B, Acute	95	97	66	63	23	72	139	197	170	191	104

Disease Specific Data	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Hepatitis B, Chronic	0	1	1	0	3	1	7	235	866	664	662
Hepatitis B, Perinatal	0	0	0	0	0	0	0	0	1	0	0
Hepatitis C, Acute	38	40	21	21	3	13	5	28	17	4	1
Hepatitis C, Chronic	0	3	0	0	2	3	6	461	3,277	4,685	4,740
Hepatitis D	2	1	0	0	0	0	0	0	0	1	0
Hepatitis E	0	0	0	0	1	0	0	0	1	1	0
Influenza, Positive Culture	105	40	48	114	103	78	31	810	510	54	175
Kawasaki disease	1	3	6	2	3	6	4	1	4	4	3
Legionellosis	9	8	12	12	7	15	10	12	16	17	9
Leprosy	0	0	0	0	0	0	0	0	0	0	0
Leptospirosis	0	0	0	0	0	0	0	0	0	0	0
Listeriosis	6	4	13	11	9	5	8	8	11	17	9
Lyme Disease	6	3	8	6	25	6	26	18	25	11	18
Lymphogranuloma venereum	1	0	0	0	0	0	0	0	0	0	0
Malaria	13	19	6	19	2	9	9	6	10	12	9
Measles	0	1	0	0	0	0	0	0	0	0	0
Melioidosis	0	0	0	0	0	0	0	0	0	0	0
Meningitis, aseptic	NR	NR	NR	NR	NR	NR	NR	NR	NR	93	114
Meningococcal Disease	69	63	56	48	26	33	34	31	17	15	26
Mumps	8	11	6	6	11	7	3	4	1	3	10
Pertussis	69	31	29	26	62	34	49	209	234	423	204

NR: Disease was not reportable as individual during the specified year.

Note: Some variation in case counts from year to year may be due to changes in the case definition and/or reporting requirements.

Disease Specific Data	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Plague	0	0	0	0	0	0	0	0	0	0	0
Poliomyelitis	0	0	0	0	0	0	0	0	0	0	0
Psittacosis	0	1	0	0	0	0	2	3	1	0	0
Q Fever	0	0	0	0	0	0	0	0	2	1	0
Rabies, animal	97	189	154	145	181	143	162	276	181	220	180
Rabies, human	0	0	0	0	0	0	0	0	0	0	0
Rocky Mountain Spotted Fever	29	35	34	52	51	31	75	48	70	50	47
Rubella	1	15	1	0	30	0	0	0	0	0	0
Salmonellosis	884	597	665	699	780	918	896	868	1,083	1,468	1,063
SARS (Severe Acute Respiratory Syndrome)	0	0	0	0	0	0	0	0	0	0	0
Shiga toxin producing E. coli (STEC)	13	13	15	22	21	24	7	7	14	16	5
Shigellosis	200	87	196	121	145	249	149	561	620	113	72
Smallpox	0	0	0	0	0	0	0	0	0	0	0
Staphylococcus aureus, vancomycin-resistant	0	0	0	0	0	0	0	1	0	0	NR
Streptococcus group A, invasive	0	4	7	5	13	14	42	44	63	49	71
Streptococcus group B, <90 days	NR	NR	10	19	39	22	30	28	21	36	36
Streptococcus pneumoniae, invasive	NR	NR	NR	NR	NR	NR	64	137	142	198	243
St. Louis Encephalitis	0	0	0	0	0	0	0	0	0	0	0
Syphilis - Total	1,290	1,141	876	846	846	884	647	510	517	513	401
Syphilis - Primary and Secondary	404	378	270	249	225	222	139	92	111	78	68
Tetanus	2	1	0	0	0	0	1	0	0	0	1
Toxic Shock Syndrome	3	3	4	2	0	3	2	0	0	0	1
Trichinosis	0	0	0	0	0	0	0	0	0	0	0

Disease Specific Data	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**
Tuberculosis	348	328	286	315	286	263	256	254	233	261	222
Tularemia	0	0	0	0	0	0	0	0	1	1	0
Typhoid fever (addressed in Salmonellosis)	0	3	0	3	0	0	0	0	0	0	1
Typhus fever	0	0	0	0	0	0	0	0	0	0	0
Varicella	NR	NR	NR	NR	NR	NR	NR	NR	559	740	1,228
Vibrio infections, non cholera	0	2	12	6	2	4	0	5	6	10	13
Viral Hemorrhagic Fever	0	0	0	0	0	0	0	0	0	0	0
West Nile Encephalitis	0	0	0	0	0	0	1	6	0	4	1
Yellow Fever	0	0	0	0	0	0	0	0	0	0	0
Yersiniosis	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	10

NR: Disease was not reportable as individual during the specified year.

Note: Some variation in case counts from year to year may be due to changes in the case definition and/or reporting requirements.

Incidence Rate by Year

Disease Specific Data	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
HIV/AIDS	30.4	28.8	27.5	27.5	25.1	23.3	22.9	21.5	20.5	20.8	18.03
Animal (Mammal) Bites	301.0	299.6	293.2	301.0	298.6	292.1	280.4	271.3	278.2	260.3	271.3
Animal Bites Resulting in Post Exposure Prophylaxis (PEP)	11.4	9.5	10.8	10.8	10.7	11.6	9.4	10.3	10.0	9.1	10.6
Anthrax	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Botulism	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brucellosis	0.0	NR	NR	NR	NR	NR	0.0	0.0	0.0	0.0	0.0
Campylobacteriosis	7.7	5.5	5.9	4.6	5.2	4.2	4.8	5.2	5.7	4.8	5.2
Chancroid	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Chlamydia trachomatis	235.3	251.4	328.5	476.6	370.2	271.1	314.2	303.1	358.8	453.6	441.7
Cholera	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Creutzfeldt-Jakob Disease	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Cryptosporidiosis	0.4	0.3	0.3	0.6	0.3	0.6	0.2	0.2	0.4	0.6	3.05
Cyclosporiasis	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1
Dengue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Diphtheria	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eastern Equine Encephalitis	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ehrlichiosis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.10	0.02	0.17	0.12
Giardiasis	NR	NR	NR	NR	NR	NR	NR	3.7	3.9	3.4	2.5
Glanders	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Gonorrhea	322.9	307.2	297.6	295.3	269.9	252.7	236.4	215.5	208.5	228.4	209.9
Haemophilus influenza	0.1	0.1	0.1	0.1	0.2	0.2	0.0	0.4	0.4	0.4	0.9
Hantavirus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hemolytic uremic syndrome	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.05
Hepatitis A, Acute	1.4	1.4	2.8	1.4	1.2	2.4	2.1	1.6	1.3	1.2	1.2

Disease Specific Data	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Hepatitis B, Acute	1.8	2.5	2.5	1.7	1.6	0.6	1.8	3.4	4.8	4.0	4.5
Hepatitis B, Chronic	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.2	5.7	20.6	15.6
Hepatitis B, Perinatal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hepatitis C, Acute	0.5	1.0	1.0	0.5	0.5	0.1	0.3	0.1	0.7	0.4	0.02
Hepatitis C, Chronic	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1	11.1	78.1	109.7
Hepatitis D	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hepatitis E	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Influenza, Positive Culture	1.5	2.8	1.0	1.2	2.9	2.6	1.9	0.8	19.5	12.1	4.04
Kawasaki disease	0.1	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.1	0.07
Legionellosis	0.6	0.2	0.2	0.3	0.3	0.2	0.4	0.2	0.3	0.4	0.2
Leprosy	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Leptospirosis	0.2	0.2	0.1	0.3	0.3	0.2	0.1	0.2	0.2	0.3	0.4
Listeriosis	0.2	0.2	0.1	0.3	0.3	0.2	0.1	0.2	0.2	0.3	0.2
Lyme Disease	0.3	0.2	0.1	0.2	0.2	0.6	0.1	0.6	0.4	0.6	0.42
Lymphogranuloma venereum	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Malaria	0.1	0.3	0.5	0.2	0.5	0.0	0.2	0.2	0.1	0.2	0.21
Measles	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Melioidosis	1.1	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.00
Meningitis, aseptic	1.5	1.8	1.6	1.4	1.2	0.6	0.8	0.8	0.7	0.4	0.4
Meningococcal Disease	0.3	0.2	0.3	0.2	0.2	0.3	0.2	0.1	0.1	0.0	0.6
Mumps	0.7	1.8	0.8	0.7	0.7	1.5	0.8	1.2	0.2	0.7	0.23
Pertussis	0.7	1.8	0.8	0.7	0.7	0.84	1.19	4.8	5.5	9.6	4.7

NR: Disease was not reportable as individual during the specified year.

Note: Some variation in case counts from year to year may be due to changes in the case definition and/or reporting requirements.

Disease Specific Data	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Plague	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Poliomyelitis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Psittacosis	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
Q Fever	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rabies, animal	2.6	4.9	3.9	3.6	4.5	3.5	3.9	6.7	4.3	5.2	7.7
Rabies, human	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rocky Mountain Spotted Fever	0.8	0.9	0.9	1.3	1.3	0.8	1.8	1.3	1.7	1.2	1.1
Rubella	0.0	0.4	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0
Salmonellosis	23.3	15.5	17.0	17.6	19.4	22.6	21.8	20.9	25.8	34.5	24.6
SARS (Severe Acute Respiratory Syndrome)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Shiga toxin producing E. coli (STEC)	0.3	0.3	0.4	0.6	0.5	0.6	0.2	0.2	0.3	0.4	0.1
Shigellosis	5.3	2.3	5.0	3.0	3.6	6.1	3.6	13.5	14.8	2.7	1.7
Smallpox	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Staphylococcus aureus, vancomycin-resistant	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Streptococcus group A, invasive	0.0	0.1	0.2	0.1	0.3	0.3	1.0	1.1	1.5	1.2	1.6
Streptococcus group B, <90 days	0.0	0.0	0.3	0.5	1.0	0.5	0.7	0.7	0.5	0.8	0.83
Streptococcus pneumoniae, invasive	NR	NR	NR	NR	NR	NR	1.6	3.3	3.4	4.7	5.6
St. Louis Encephalitis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Syphilis - Total	34.0	29.6	22.4	21.3	21.0	21.8	15.8	12.3	12.3	12.1	9.3
Syphilis - Primary and Secondary	10.6	9.8	6.9	6.3	5.6	5.5	3.4	2.2	2.6	1.8	1.6
Tetanus	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Toxic Shock Syndrome	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Trichinosis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Disease Specific Data	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Tuberculosis	9.2	8.5	7.3	7.9	7.1	6.5	6.2	6.1	5.6	6.1	5.2
Tularemia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Typhoid fever (addressed in Salmonellosis)	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Typhus fever	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Varicella	NR	NR	NR	NR	NR	NR	NR	NR	13.3	17.4	28.4
Vibrio infections, non cholera	0.0	0.1	0.3	0.2	0.0	0.1	0.0	0.1	0.1	0.2	0.3
Viral Hemorrhagic Fever	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
West Nile Encephalitis	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.0
Yellow Fever	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yersiniosos	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	0.23

NR: Disease was not reportable as individual during the specified year.

Note: Some variation in case counts from year to year may be due to changes in the case definition and/or reporting requirements.

2006 Diseases by County (* indicates 3 or fewer cases)

County	HIV/AIDS	Animal Bite - Bat	Animal Bite - Cat	Animal Bite - Dog	Animal Bite - Farm	Animal Bite - Fox	Animal Bite - Other	Animal Bite - Raccoon	Animal Bite - Skunk	Animal Bite - Wild	Aseptic meningitis	Brucellosis	Campylobacteriosis	Cholera	Ciguatera fish poisoning	Cryptosporidiosis	Cyclosporiasis
Abbeville	*	4	*	0	0	0	*	*	*	0	0	0	*	0	0	0	0
Aiken	18	*	0	9	0	0	0	0	0	0	5	*	7	0	0	4	0
Allendale	*	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Anderson	13	13	12	26	0	*	*	5	*	0	10	0	19	0	0	*	0
Bamberg	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Barnwell	11	*	*	*	0	0	0	0	0	0	*	0	*	0	0	0	0
Beaufort	22	0	8	*	0	0	0	*	0	*	4	0	14	0	0	6	*
Berkeley	15	*	5	13	0	0	0	0	0	*	16	*	13	0	0	21	*
Calhoun	*	0	0	*	0	0	0	0	0	0	0	*	0	0	0	0	0
Charleston	65	13	26	27	0	7	*	9	0	*	10	0	29	0	0	52	*
Cherokee	*	0	0	0	0	0	0	0	0	0	0	0	*	0	0	0	0
Chester	*	0	*	0	0	0	0	0	0	0	0	0	0	*	0	*	0
Chesterfield	6	0	*	*	0	0	0	0	0	0	0	0	*	0	0	*	0
Clarendon	7	*	*	4	0	*	0	0	0	*	0	0	*	0	0	0	0
Colleton	*	*	*	4	0	0	0	0	0	0	*	0	0	0	0	*	0
Darlington	7	*	0	4	0	0	0	0	0	0	0	0	*	0	0	0	0
Dillon	11	0	*	*	0	0	0	0	0	0	0	0	*	0	0	0	0
Dorchester	14	*	7	12	0	0	*	*	0	0	23	0	8	0	*	15	0
Edgefield	*	0	0	4	0	0	0	0	0	0	*	0	0	0	0	0	0
Fairfield	*	0	*	0	0	0	0	0	0	*	0	0	*	0	0	0	0
Florence	37	6	*	*	0	0	0	0	0	0	0	0	8	0	0	0	0
Georgetown	12	0	0	*	0	0	0	*	0	*	*	0	*	0	0	*	0
Greenville	51	4	7	6	4	*	0	*	*	0	0	0	14	0	0	*	*
Greenwood	12	*	6	4	0	0	0	0	0	0	0	0	4	0	0	0	0
Hampton	6	*	0	*	0	0	0	0	0	0	*	0	0	0	0	0	0
Horry	41	*	*	*	0	*	0	*	0	0	7	0	10	0	0	4	0
Jasper	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	*	0
Kershaw	13	*	*	8	0	*	0	0	0	0	*	0	*	0	0	0	0
Lancaster	9	0	0	*	0	0	*	0	0	0	*	0	5	0	0	0	0
Laurens	7	*	*	*	*	0	0	0	0	*	0	0	4	0	0	0	0
Lee	6	0	0	*	0	0	0	0	0	0	0	0	0	0	0	0	0
Lexington	30	*	4	4	0	*	0	0	0	*	19	0	15	0	0	*	0
Marion	6	0	*	*	0	*	0	0	0	0	0	0	0	0	0	*	0
Marlboro	6	0	0	*	0	0	0	0	0	0	0	0	0	0	0	0	0
McCormick	*	0	0	*	0	0	0	0	0	0	0	0	0	0	0	0	0
Newberry	11	*	0	*	0	0	0	0	0	0	*	0	0	0	0	0	0
Oconee	*	0	*	*	0	*	0	0	0	0	8	0	16	0	0	5	0
Orangeburg	43	8	*	*	0	0	0	*	0	0	*	0	*	0	0	0	0
Pickens	8	*	*	0	0	0	0	*	0	0	0	0	5	0	0	4	0
Richland	142	8	*	*	0	*	0	*	0	*	*	0	21	0	0	*	0
Saluda	*	0	*	0	0	*	0	0	0	0	0	0	0	0	0	0	0
Spartanburg	36	0	0	0	0	0	0	0	0	0	0	0	*	0	0	*	0
Sumter	29	0	*	*	0	0	0	0	0	0	0	0	8	0	0	*	0
Union	*	0	0	0	0	*	0	0	0	0	0	0	0	0	0	0	0
Williamsburg	14	0	*	*	0	0	0	0	0	0	0	0	0	0	0	*	0
York	22	0	*	0	0	0	0	0	0	0	0	0	4	0	0	*	0
Unknown	*	*	*	35	1	17	9	*	5	10	12	3	20	0	0	21	5
Total	**779**	**81**	**114**	**160**	**5**	**24**	**9**	**29**	**5**	**10**	**114**	**3**	**224**	*****	*****	**132**	**5**

2006 Diseases by County (* indicates 3 or fewer cases)

County	Dengue Fever	Ehrlichiosis, Human monocytic	Ehrlichiosis, Human, Other&unspec	Encephalitis, West Nile	Enterohem E coli O157:H7	Enterohem_E_coli shigatox+,?serogrp	Enterohem E coli, shigatox+,non-O157	Giardiasis	Group A Streptococcus, invasive	Group B Streptococcus, invasive	Haemophilus influenzae, invasive	Hemolytic uremic synd,postdiarrheal
Abbeville	0	0	0	0	0	0	0	0	0	0	*	0
Aiken	0	0	0	0	*	0	0	*	*	*	0	0
Allendale	0	0	0	0	0	0	0	0	0	*	0	0
Anderson	0	0	0	0	0	0	*	5	5	0	*	0
Bamberg	0	0	0	0	0	0	0	0	0	0	0	0
Barnwell	0	0	0	0	0	0	0	0	0	0	0	0
Beaufort	0	0	0	0	0	0	0	6	6	0	0	0
Berkeley	0	0	0	0	0	0	0	6	*	0	5	0
Calhoun	0	0	0	0	0	0	0	0	0	0	0	0
Charleston	*	*	*	0	*	0	0	16	12	8	*	0
Cherokee	0	0	0	0	0	0	0	0	0	0	0	0
Chester	0	0	0	0	0	0	0	0	0	0	0	0
Chesterfield	0	0	0	0	0	0	0	0	0	0	0	0
Clarendon	0	0	0	0	0	0	0	0	0	0	0	0
Colleton	0	0	0	0	0	0	0	*	*	*	0	0
Darlington	0	0	0	0	0	*	0	0	*	*	*	0
Dillon	0	0	0	0	0	0	0	0	0	0	0	0
Dorchester	0	0	0	0	0	0	0	*	*	*	*	0
Edgefield	0	0	0	0	0	0	0	0	0	0	0	0
Fairfield	0	*	0	0	0	0	0	0	0	0	0	0
Florence	0	0	0	0	0	0	0	*	4	0	*	0
Georgetown	0	0	0	0	0	0	0	4	*	*	*	0
Greenville	0	*	0	0	0	0	0	15	10	*	4	0
Greenwood	0	0	0	0	0	0	0	*	0	*	0	0
Hampton	0	0	0	0	0	0	0	0	0	0	0	0
Horry	0	0	0	0	*	0	0	4	4	*	*	0
Jasper	0	0	0	0	0	0	0	*	0	0	0	0
Kershaw	0	0	0	0	0	0	0	*	0	*	*	0
Lancaster	0	0	0	0	0	0	0	*	*	0	0	0
Laurens	0	0	0	0	0	0	0	*	*	*	*	0
Lee	0	0	0	0	0	0	0	0	*	0	*	0
Lexington	0	0	0	0	0	0	*	*	*	6	0	*
Marion	0	0	0	0	0	0	0	0	0	0	0	0
Marlboro	0	0	0	0	0	0	0	0	0	0	*	0
McCormick	0	0	0	0	0	0	0	0	*	*	0	0
Newberry	0	0	0	0	0	0	0	*	0	0	0	0
Oconee	0	0	0	0	0	0	0	*	0	*	0	*
Orangeburg	0	0	0	*	0	0	0	0	*	*	0	0
Pickens	0	*	0	0	0	0	0	4	*	0	0	0
Richland	0	0	0	0	*	0	0	16	*	*	4	0
Saluda	0	0	0	0	0	0	0	0	0	0	0	0
Spartanburg	0	0	0	0	*	0	0	8	*	0	*	0
Sumter	0	0	0	0	0	0	0	*	*	*	0	0
Union	0	0	0	0	0	0	0	0	0	0	0	0
Williamsburg	0	0	0	0	0	0	0	0	0	0	*	0
York	0	0	0	0	*	0	0	6	0	0	0	0
Unknown	0	4	0	0	9	0	0	21	30	22	26	0
Total	*****	**4**	*****	*****	**9**	*****	*****	**111**	**71**	**36**	**39**	*****

2006 Diseases by County (* indicates 3 or fewer cases)

County	Hepatitis A, acute	Hepatitis B virus infection, Chronic	Hepatitis B, acute	Hepatitis C Virus Infection, chronic or resolved	Hepatitis C Virus Infection, past or present	Hepatitis C, acute	Influenza, human isolates	Influenza, Rapid Test	Kawasaki disease	Legionellosis	Listeriosis	Lyme disease	Malaria	Mumps
Abbeville	0	*	0	0	17	0	0	9	0	0	0	0	0	0
Aiken	0	14	*	0	90	*	*	15	0	0	0	*	0	0
Allendale	0	*	0	0	8	0	*	5	0	0	0	0	0	0
Anderson	*	18	*	0	290	0	*	29	0	*	0	0	0	*
Bamberg	0	*	0	0	14	0	0	12	0	0	0	0	0	0
Barnwell	0	5	0	0	18	0	*	15	0	*	0	0	0	0
Beaufort	*	32	*	0	108	0	0	30	0	0	*	*	0	0
Berkeley	*	15	6	0	129	0	*	23	0	*	0	0	*	0
Calhoun	0	*	0	0	10	0	0	0	0	0	0	0	0	0
Charleston	*	53	13	0	577	0	5	29	*	0	*	*	*	0
Cherokee	0	*	0	0	47	0	0	14	0	0	0	0	0	0
Chester	0	4	0	0	33	0	0	4	0	0	0	0	0	0
Chesterfield	0	7	*	0	33	0	0	19	0	0	0	0	0	0
Clarendon	0	4	*	0	31	0	*	0	0	0	0	0	0	0
Colleton	*	13	*	0	45	0	0	12	0	0	0	0	0	0
Darlington	0	7	*	*	75	0	0	23	0	0	0	0	0	*
Dillon	0	*	0	0	18	0	0	4	0	0	*	0	0	0
Dorchester	*	14	*	0	144	0	*	19	0	0	0	0	0	0
Edgefield	0	*	0	0	14	0	0	*	0	0	0	*	0	0
Fairfield	0	*	0	0	27	0	0	14	0	0	0	0	0	0
Florence	*	34	8	0	172	0	*	20	0	0	0	*	0	0
Georgetown	0	8	*	0	57	0	0	25	0	0	0	*	*	*
Greenville	*	66	10	0	505	0	5	25	0	0	*	*	0	5
Greenwood	*	7	*	0	59	0	*	16	0	0	0	0	0	0
Hampton	0	8	*	0	19	0	0	0	0	0	0	0	0	0
Horry	4	25	13	0	267	0	*	26	*	*	*	*	0	0
Jasper	0	*	*	0	22	0	0	4	0	0	0	*	0	0
Kershaw	*	8	0	0	66	0	4	21	0	0	0	0	0	0
Lancaster	0	7	0	0	50	0	0	5	0	0	0	0	0	0
Laurens	0	7	*	*	71	0	0	10	0	0	0	0	0	0
Lee	0	5	*	0	12	0	0	14	0	0	0	0	0	0
Lexington	*	33	*	0	211	0	*	26	0	*	*	*	*	*
Marion	0	5	*	0	29	0	0	13	0	0	0	0	0	0
Marlboro	0	*	0	0	36	0	0	4	0	0	0	0	0	0
McCormick	0	*	0	0	4	0	0	0	0	0	0	0	0	0
Newberry	0	*	0	0	26	0	0	18	0	0	0	0	0	0
Oconee	0	7	0	0	67	0	0	10	0	0	0	0	0	0
Orangeburg	*	15	*	0	70	0	0	10	0	0	*	0	0	0
Pickens	*	11	*	0	77	0	0	23	0	0	0	0	*	0
Richland	*	133	9	0	540	0	*	30	0	*	*	*	*	*
Saluda	0	*	0	0	7	0	0	*	0	0	0	0	0	0
Spartanburg	*	14	*	*	348	0	0	26	0	0	0	0	0	0
Sumter	0	26	*	0	84	0	4	19	0	0	0	*	0	0
Union	0	*	0	0	32	0	0	8	0	0	0	0	0	0
Williamsburg	0	9	*	0	33	0	*	4	0	0	0	0	0	0
York	*	23	4	0	145	0	0	5	0	*	0	0	0	0
Unknown	23	*	41	0	8	0	17	2	0	9	9	18	9	5
Total	**27**	**662**	**104**	*****	**4745**	*****	**35**	**640**	*****	**9**	**9**	**18**	**9**	**10**

2006 Diseases by County (* indicates 3 or fewer cases)

County	Neisseria meningitidis, invasive (Mening_ disease)	Pertussis	Rocky Mountain spotted fever	Salmonellosis	Shiga toxin-producing Escherichia coli (STEC)	Shigellosis	Strep pneumoniae, invasive	Streptococcal disease, invasive, other	Tetanus	Toxic-shock syndrome,staphylococcal
Abbeville	0	5	0	9	0	0	*	0	0	0
Aiken	0	*	*	28	0	0	6	0	0	*
Allendale	0	0	0	0	0	0	0	0	0	0
Anderson	*	27	*	37	*	4	31	0	0	0
Bamberg	0	0	0	0	0	0	*	0	0	0
Barnwell	0	0	0	4	0	*	0	0	0	0
Beaufort	*	*	0	65	0	*	4	*	0	0
Berkeley	0	11	*	58	0	0	16	0	0	0
Calhoun	0	0	*	*	0	0	*	0	0	0
Charleston	0	42	*	104	*	5	51	0	0	0
Cherokee	0	0	*	*	0	*	0	0	0	0
Chester	0	0	*	9	0	*	0	0	0	0
Chesterfield	0	0	*	8	0	0	0	0	0	0
Clarendon	0	0	0	7	0	0	*	0	0	0
Colleton	0	*	0	9	0	0	*	0	0	0
Darlington	0	*	0	20	0	0	15	*	0	0
Dillon	0	0	0	9	0	0	*	0	0	0
Dorchester	0	26	0	42	*	*	5	0	0	0
Edgefield	0	0	0	5	0	0	*	0	0	0
Fairfield	0	*	0	*	0	*	0	0	0	0
Florence	*	*	4	33	0	0	8	0	0	0
Georgetown	*	*	0	34	0	*	7	0	0	0
Greenville	8	9	*	38	0	*	6	0	0	0
Greenwood	*	*	*	15	0	0	5	0	0	0
Hampton	0	0	0	*	0	0	0	0	0	0
Horry	*	17	*	107	0	4	23	0	0	0
Jasper	0	0	0	9	0	0	*	0	0	0
Kershaw	0	0	0	25	0	0	0	0	0	0
Lancaster	0	*	*	18	0	0	0	0	0	0
Laurens	0	*	0	*	0	0	*	0	0	0
Lee	0	0	0	4	0	0	*	0	0	0
Lexington	*	*	0	46	0	*	*	0	0	0
Marion	*	*	*	8	0	0	*	0	0	0
Marlboro	0	0	0	5	0	0	*	0	0	0
McCormick	0	0	*	*	0	0	0	0	0	0
Newberry	0	*	0	5	0	0	*	0	0	0
Oconee	0	5	*	5	0	0	5	0	0	0
Orangeburg	0	0	0	15	0	0	8	*	0	0
Pickens	*	4	*	35	0	0	*	0	0	0
Richland	*	21	*	100	0	4	16	0	0	0
Saluda	0	6	0	5	0	*	0	0	0	0
Spartanburg	*	7	0	35	0	35	*	0	0	0
Sumter	0	*	0	28	0	0	8	0	0	0
Union	0	0	0	7	0	*	*	0	0	0
Williamsburg	0	0	*	6	0	0	*	0	*	0
York	0	0	10	52	0	*	*	0	0	0
Unknown	18	24	33	*	5	20	29	4	0	0
Total	**26**	**204**	**47**	**1063**	**5**	**72**	**243**	**4**	*****	*****

2006 Diseases by County (* indicates 3 or fewer cases)

County	Typhoid fever (Salmonella typhi)	Vancomycin-Resistant Enterococcus	Varicella (Chickenpox)	Vibrio parahaemolyticus	Vibrio spp_, non-toxigenic, other or unspecified	Vibrio vulnificus infection	Yersiniosis
Abbeville	0	0	4	0	0	0	0
Aiken	0	0	126	0	0	0	0
Allendale	0	0	0	0	0	0	0
Anderson	0	*	44	0	0	0	*
Bamberg	0	0	0	0	0	0	0
Barnwell	0	*	6	0	0	0	0
Beaufort	0	*	15	*	0	0	0
Berkeley	0	8	21	0	*	0	0
Calhoun	0	0	*	0	0	0	0
Charleston	0	49	66	*	0	*	*
Cherokee	0	0	0	0	0	0	0
Chester	0	0	9	*	0	0	0
Chesterfield	0	0	*	0	0	0	0
Clarendon	0	0	*	0	*	0	0
Colleton	0	4	4	*	0	0	0
Darlington	0	0	57	0	0	0	0
Dillon	0	*	24	0	0	0	*
Dorchester	0	10	98	0	0	0	0
Edgefield	0	0	0	0	0	0	0
Fairfield	0	0	*	0	0	0	0
Florence	0	0	111	0	0	0	*
Georgetown	0	0	9	0	0	0	0
Greenville	0	0	181	0	0	0	*
Greenwood	0	0	15	0	0	0	0
Hampton	0	*	0	0	0	0	0
Horry	0	0	50	*	0	0	0
Jasper	0	0	0	0	0	0	*
Kershaw	0	0	8	0	0	0	0
Lancaster	0	0	8	0	0	0	0
Laurens	0	*	8	0	0	0	0
Lee	0	0	*	0	0	0	0
Lexington	0	*	77	0	*	0	*
Marion	0	*	8	0	0	0	0
Marlboro	0	0	*	0	0	0	0
McCormick	0	0	*	0	0	0	0
Newberry	0	0	0	0	0	0	0
Oconee	0	*	18	0	*	0	0
Orangeburg	0	*	6	0	*	0	0
Pickens	0	0	45	0	0	0	0
Richland	0	*	39	0	0	0	0
Saluda	0	0	4	0	0	0	0
Spartanburg	*	*	28	0	0	0	0
Sumter	0	*	4	0	0	0	0
Union	0	*	0	0	0	0	0
Williamsburg	0	0	7	0	0	0	0
York	0	0	115	0	0	0	0
Unknown	0	20	13	6	5	0	10
Total	*****	**91**	**1228**	**6**	**5**	*****	**10**

Disease Reports

AIDS / HIV

(Acquired Immunodeficiency Syndrome and Human Immunodeficiency Virus)

2006 New Cases in SC: 779 2006 Cases per 100,000: 18.3

Characteristics:

HIV is a retrovirus that is transmitted by sexual, parenteral or perinatal contact with infectious body fluids. HIV causes progressive damage to the body's ability to fight infections and certain cancers. AIDS represents the late stages of HIV disease resulting from progressive damage to the immune and other organ systems. The HIV/AIDS surveillance case definition includes a result of any test that is FDA approved and licensed for diagnosing HIV infection or clinical criteria indicating AIDS, one of more than a dozen opportunistic infections or several malignancies associated with HIV, or one of the HIV-induced conditions such as wasting or dementia.

Epidemiology:

As of December 2006, 14,120 persons have been diagnosed and reported living with HIV/AIDS in South Carolina. In 2006, there were 779 new cases of HIV/AIDS reported in South Carolina for a case rate of 18.3 per 100,000 population. Of the new cases reported in 2006, 69% were male and 31% were female. African-Americans were disproportionately affected with 72% of the cases reported in blacks (Figure 1). Cumulatively there have been 21,700 HIV cases (includes total number of AIDS cases) reported in South Carolina since 1986.

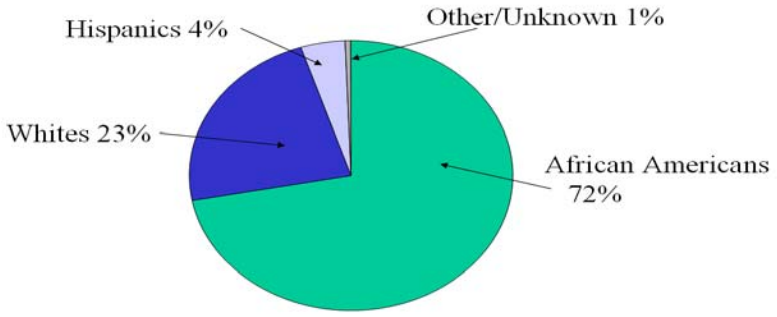
By risk, men who have sex with men and men and women infected through heterosexual sex represent the largest proportion of new infections, followed by injecting drug users (Figure 2).

In 2006, 5 counties reported 44% of new HIV/AIDS cases: Richland, 143 (18%), Charleston, 65 (8%), Greenville, 51, (7%), Orangeburg, 43 (6%), and Horry, 41 (5%). By age groups, the rate of new infections have been consistently highest among persons 25-44 years of age, followed by those 20-24 years of age.

Reporting:

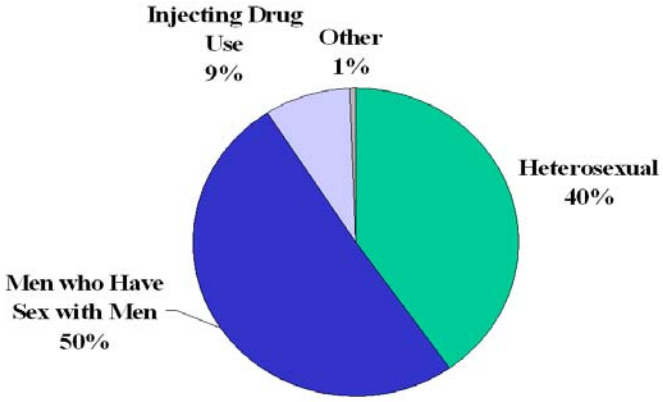
HIV/AIDS is reportable within 7 days to DHEC.

Figure 1



Estimates of Annual New Infections by race, based on 2006 diagnosed cases, N = 779

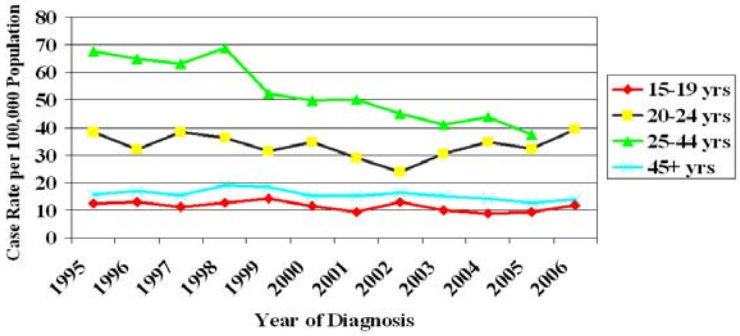
Figure 2



Estimates of Annual New Infections by risk, based on Proportion of Persons Reporting Risk 2006, N = 525

Figure 3

S.C. HIV/AIDS Case Rate per 100,000 by Age by Year of Diagnosis, 1995-2006



Animal Bites to Humans

2006 Cases in SC: 11,767 2006 Cases per 100,000: 271.3

Characteristics:

Animal bites to humans are included on the Immediately Reportable list in SC, requiring immediate telephone notification to the SC DHEC. Animal bites are of immediate concern due to the need for immediate treatment of the wound as well as the concern for identifying the animal involved and confining or capturing it. If the animal is a dog, cat, or ferret, it must be quarantined for 10 days for observation for signs and symptoms of rabies. If the animal is a wild animal, and can be captured, the animal can be euthanized and the head submitted for rabies testing. If the biting animal is not available for quarantine or rabies testing, the patient must undergo rabies post-exposure prophylaxis (PEP). The SC DHEC administers the evaluation program of patients referred for rabies PEP and provides the Rabies Immune Globulin (RIG) and Rabies Vaccine. There have been no vaccine failures in the United States (i.e. someone developed rabies) when PEP was given promptly and appropriately after an exposure.

Epidemiology:

SC: County Environmental Health Departments track the number of Pet and Non-Pet Bite Investigations completed and provide the data annually for compilation. In 2006, 10,777 Pet Bite Investigations and 990 Non-Pet Bite Investigations were completed. In 2006, 434 cases of animal bites that were recommended for PEP were entered in to the Carolina Health Electronic Surveillance System.

US: According to CDC, approximately 800,000 Americans seek medical attention for dog bites each year; half of these are children. Of those injured, 386,000 require treatment in an emergency department and about a dozen die. The rate of dog bite related injuries is highest for children ages 5 to 9 years, and the rate decreases as children age. Almost two thirds of injuries among children ages four years and younger are to the head or neck region. Injury rates in children are significantly higher for boys than for girls. Each year, 4.7 million Americans are bitten by dogs. These bites result in approximately 12 fatalities. Cat bites are the second most common animal bite reported in the U.S.

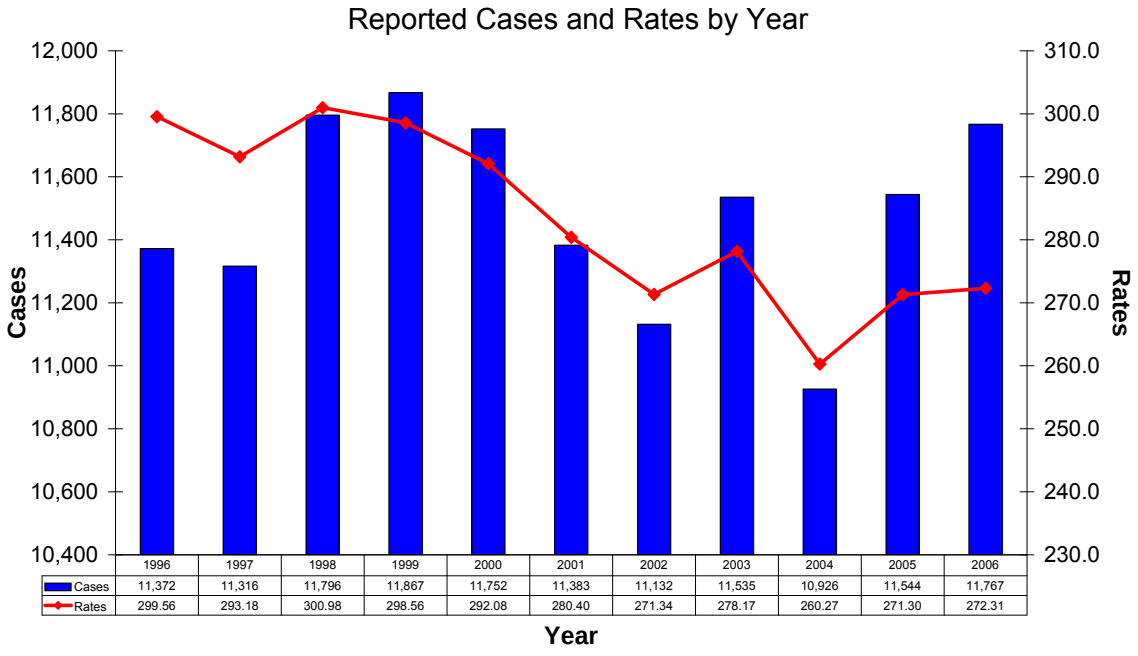
Prevention:

Animal bites can be prevented through public education programs and animal restraint laws. The CDC website, “Spotlight on Dog Bite Prevention Week” at http://www.cdc.gov/ncipc/duip/biteprevention.htm, has recommendations for the public, particularly children, in preventing dog bites. Rabies in animals can be prevented via pre-exposure vaccination. The US Department of Agriculture is the approval agency for rabies vaccines in the U.S. Vaccines are currently available for dogs, cats, ferrets, cattle, horses, and sheep. A listing of the approved vaccines and administration guidelines are available in the National Association of State Public Health Veterinarians publication, “Compendium of Animal Rabies Prevention and Control, 2007,”http://www.cdc.gov/MMWR/PDF/rr/rr5603.pdf.

Reporting:

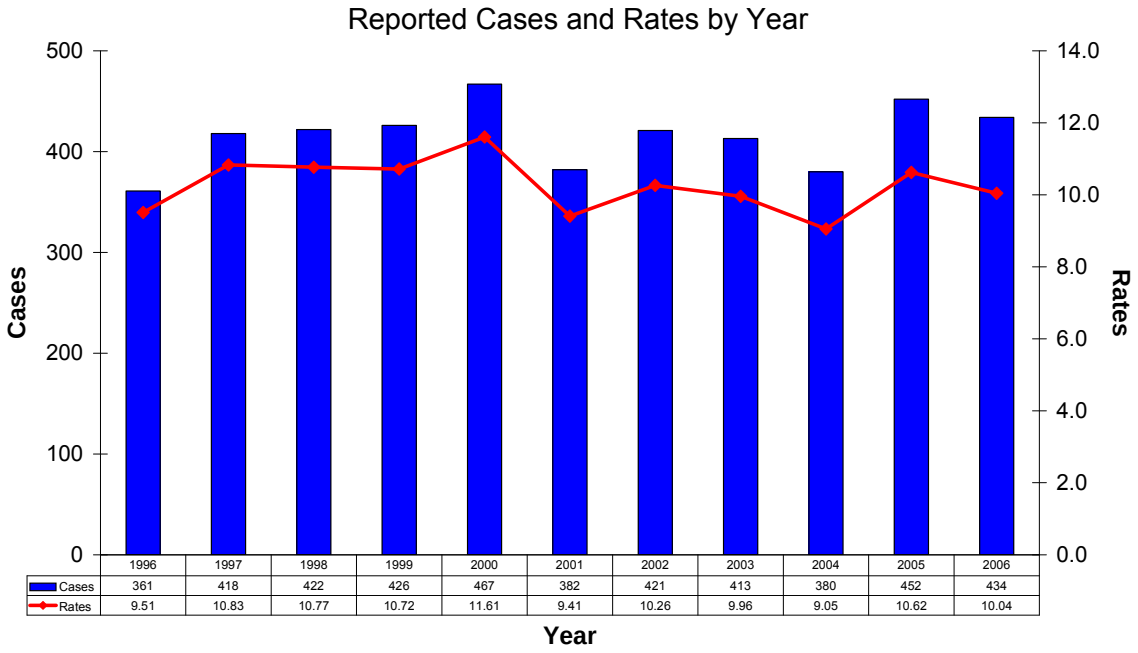
Animal Bites are immediately reportable by phone to DHEC.

Animal (Mammal) Bites



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Cases	11,372	11,316	11,796	11,867	11,752	11,383	11,132	11,535	10,926	11,544	11,767
Rates	299.56	293.18	300.98	298.56	292.08	280.40	271.34	278.17	260.27	271.30	272.31

Animal Bites Resulting in Post Exposure Prophylaxis (PEP)



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Cases	361	418	422	426	467	382	421	413	380	452	434
Rates	9.51	10.83	10.77	10.72	11.61	9.41	10.26	9.96	9.05	10.62	10.04

Anthrax

2006 Cases in SC: 0 2006 Cases per 100,000: 0

Characteristics:

Anthrax is a disease caused by the spore forming bacterium *Bacillus anthracis*. Naturally occurring anthrax is primarily a zoonotic disease of herbivores, the usual domesticated hosts being cattle, sheep, goats, and horses but wildlife can be infected (e.g. deer).

Humans can become infected with anthrax via three different mechanisms: by inhaling the bacteria's spores, by eating contaminated meat from an infected animal, and by contracting spores or bacteria through the skin. Humans can contract the disease when handling contaminated hair, wool, hides, flesh, blood, and excreta of infected animals. The most common form of human anthrax is cutaneous anthrax. Inhalational and gastro-intestinal anthrax are the more serious forms. Anthrax is not known to spread from person to person.

Epidemiology:

There were no reported cases of anthrax in South Carolina or the United States in 2006. There have been no reported cases of anthrax in humans or animals in South Carolina in recent history.

Anthrax can be used as a weapon of bioterrorism. This occurred in the U.S. in the fall of 2001 when several letters containing weaponized anthrax powder were intentionally sent through the mail, resulting in 22 cases of confirmed or suspected cases of anthrax. None of these letters were delivered to South Carolina.

Anthrax is classified as a Category A agent. Category A agents are those that: (1) pose the greatest possible threat for a bad effect on public health, (2) may spread across a large area or need public awareness, and (3) need a great deal of planning to protect the public's health.

Reporting:

A case or suspected case of anthrax is immediately reportable by phone to DHEC.

Botulism (*Clostridium botulinum*)

2006 Cases in SC: 0 2006 Cases per 100,000: 0.0

Characteristics:

Botulism is a muscle-paralyzing disease caused by a toxin produced by *Clostridium botulinum*. In 2006 there were no reports to DHEC of cases of botulism. Common symptoms are diplopia, blurred vision, and bulbar weakness. Symmetric paralysis may progress rapidly.

The diagnosis of botulism is not difficult when it is strongly suspeced, as in a large outbreak. Since cases of botulism most often occur singularly, the diagnosis may pose more of a problem. Lab criteria for diagnosis includes detection of *botulinum* toxin in serum, stool, or patient's food, or isolation of *Clostridium botulinum* from stool. Findings from many outbreaks have sugggested that early cases are commonly misdiagnosed.

Surveillance for botulism cases in South Carolina is focused on three areas:

Foodborne botulism occurs when a person ingests pre-formed toxin that leads to illness within a few hours to days. Every case of foodborne botulism is treated as a public health emergency, due to the potential that the responsible food, whether homemade or commercial, may be still available for consumption.

Infant botulism occurs in a small number of susceptible infants each year who harbor *C. botulinum* in their intestinal tract.

Wound botulism occurs when wounds are infected with *C. botulinum* that secrete toxin.

Regarding foodborne botulism, symptoms begin within 6 hours to 2 weeks (most commonly between 12 and 36 hours) after eating toxin-containing food. Foodborne botulism can occur in all age groups, with the following clincial and laboratory presentations:

Potential Agent of Bioterrorism:

Classified as a “Category A” biological threat by CDC, aerosolized *botulinum* toxin is a possible mechanism for a bioterroism attack. Inhalation botulism does not occur naturally and cannot be clinically differentiated from the three naturally occurring forms described above. Indications of a possible intentional release of botulinum toxin as may include:

An unusual geographic clustering of illness (i.e., persons who attended the same public event or gathering.)

A large number of cases of acute flaccid paralysis with prominent bulbar palsies, especially if occurring in otherwise healthy persons.

Prevention:

Botulinum antitoxin, supplied by Centers for Disease Control (CDC) can prevent progression of illness and shorten symptoms in severe botulism cases if administered early. DHEC and the CDC will consult with the physician treating the patient for requests for antitoxin. If indicated, antitoxin can be delivered from the CDC to the physician.

Reporting:

Confirmed or suspected cases of botulism are immediately reportable to DHEC.

Brucellosis

2006 Cases in SC: 3 2006 Cases per 100,000: 0.07

Characteristics:

Brucellosis is an infectious disease caused by Brucella species (*melitensus, abortus, suis,* and *canis*) and is transmitted to humans from domestic and wild animals (e.g., sheep, goats, cattle, deer, elk, pigs and dogs.) Veterinarians, slaughterhouse workers, ranchers and other livestock workers, and hunters have been infected in occupational and recreational settings. Transmission to humans can occur by ingesting raw milk and other dairy products from infected animals. Transmission by inhalation is also possible. Symptoms are usually non-specific and include fever, malaise, sweats, myalgias, arthralgias, fatigue, chills, and backache. Fever can have an undulant pattern in patients who are not treated for long periods ("undulant fever.")

Epidemiology:

Worldwide: Brucellosis is found worldwide, but high-risk areas include the Mediterranean basin, South and Central America, Eastern Europe, Asia, Africa, the Caribbean, and the Middle East.

United States: In the United States approximately 100 cases per year were reported over the last 10 years. The majority occur among returned travelers or immigrants from countries with endemic brucellosis, in particular South and Central America, and are associated with consumption of unpasteurized milk or soft cheeses.

South Carolina: In South Carolina in 2006 there were three unrelated human cases reported to DHEC. This is the first year since 1987 where more than one case of *Brucella* was reported during the year.

Potential Agent of Bioterrorism: Pathogenic *Brucella* species are considered category B biologic threat agents because of a high potential for aerosol transmission.

Reporting:

Confirmed or suspected cases of Brucellosis are reportable to DHEC within 24 hours.

Campylobacteriosis

2006 Cases in SC: 224 2006 Cases per 100,000: 5.2

Characteristics:

Campylobacter is one of the most common bacterial causes of diarrheal illness in the United States. Virtually all cases occur as isolated, sporadic events, not as a part of large outbreaks. Many cases go undiagnosed or unreported, and campylobacteriosis is estimated to affect 2.4 million persons every year. Campylobacteriosis occurs much more frequently in the summer months than in the winter months. The organism is isolated from infants and young adults more frequently than from other age groups and from males more frequently than females. Most cases of campylobacteriosis are associated with handling raw poultry or eating raw or undercooked poultry meat. Ingestion of raw or lightly cooked foods cross-contaminated with poultry juices is also a common source of infection. The organism is not usually spread from person to person, but this can happen if the infected person is a small child or is producing a large volume of diarrhea. Larger outbreaks due to *Campylobacter* are not usually associated with raw poultry but are usually related to drinking unpasteurized milk or contaminated water. Animals can also be infected, and some people have acquired their infection from contact with the infected stool of an ill dog or cat.

Epidemiology:

In South Carolina, two hundred and twenty-four cases of campylobacteriosis were reported to the DHEC in 2006. The overall incidence rate in South Carolina was 5.2 cases per 100,000 population. There were no known outbreaks of campylobacteriosis in 2006. Cases occurred among residents of 30 counties. The reported number of cases by month did not illustrate a typical seasonal trend of increased Campylobacter infections during the summer and fall months. January was the peak month for cases with 12.1% of case reports.

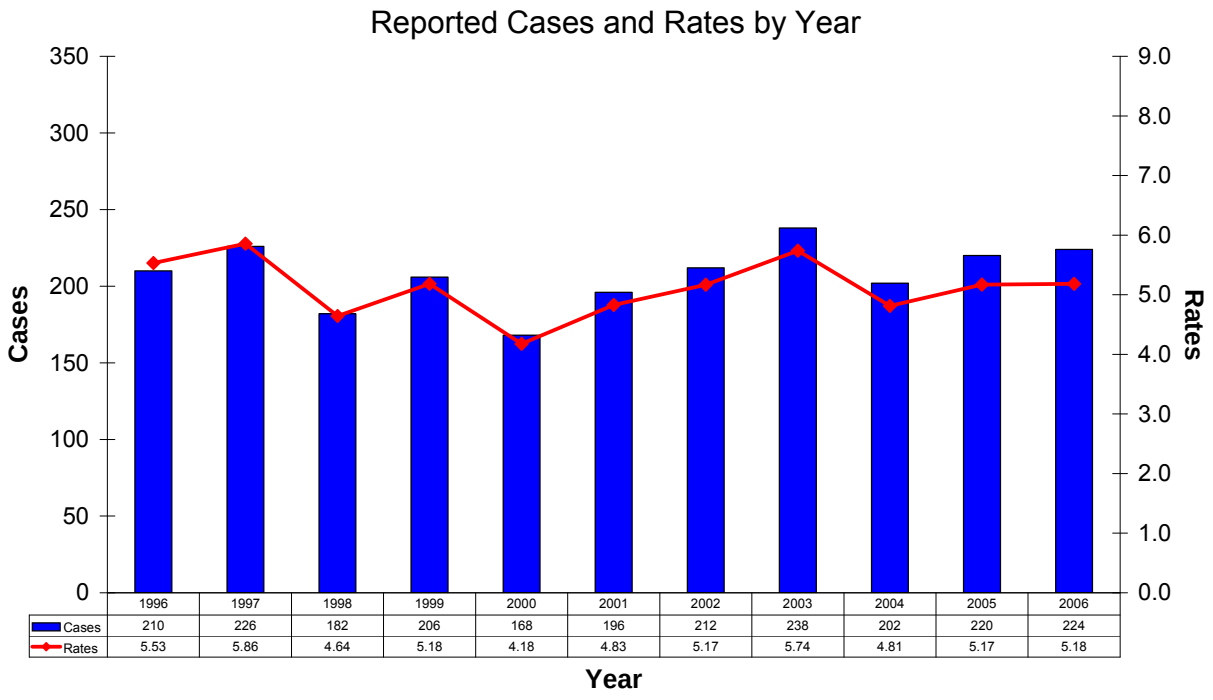
In 2006, cases ranged in age from 1 month to 85 years with a median age of 38. The incidence of infection was highest among infants and children under 10 years of age and adults in their fifties. Males account for 52% of the reports received.

Over the last ten years there have been an average of 5.1 cases of campylobacteriosis per 100,000 population reported in South Carolina per year. Although campylobacteriosis is not a nationally notifiable disease, the CDC estimate national annual incidence is about 20 cases per 100,000 population.

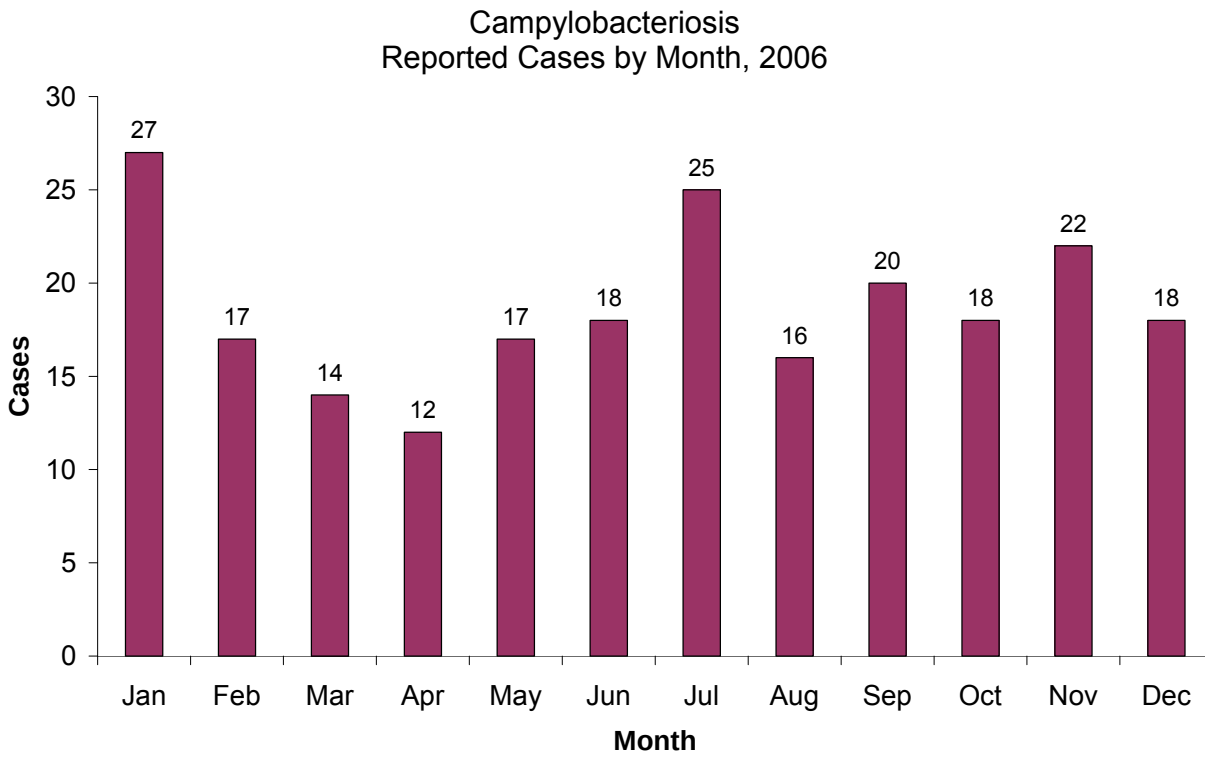
Reporting:

Campylobacteriosis is reportable within 7 days in South Carolina.

Campylobacteriosis



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Cases	210	226	182	206	168	196	212	238	202	220	224
Rates	5.53	5.86	4.64	5.18	4.18	4.83	5.17	5.74	4.81	5.17	5.18



Chancroid

Cases in SC in 2006: 0* 2006 Cases per 100,000: 0.0

Characteristics:

Chancroid is an acute bacterial infection localized in the genital area characterized by necrotizing ulcers at the site of the infection.

Epidemiology:

Recent years have seen an overall decline in reported chancroid cases. This decrease most likely reflects a decline in the incidence of the disease, however these data should be interpreted with caution in view of the fact that *Haemophilus ducreyi*, the causative organism of chancroid, is difficult to culture and, as a result, this condition may be substantially under diagnosed.

*CDC's *STD Surveillance 2006 Report* indicates that 33 cases were reported nationally and attributes 14 of those cases to South Carolina. This data is incorrect and will be addressed by the STD/HIV Division of DHEC. South Carolina reported no cases of chancroid in 2006.

S.C. trend data is not appropriate for this disease since the numbers have been small for the last three years and unreliable reporting suspected for prior years.

Reporting:

Chancroid is reportable within 7 days to DHEC.

Chlamydia

2006 Cases in SC: 19,086 2006 Cases per 100,000: 441.7

Characteristics:

Chlamydia trachomatis infections are among the most prevalent of all STDs. In women, chlamydial infections are often asymptomatic and may result in pelvic inflammatory disease (PID), which is a major cause of infertility. Pregnant women infected with *Chlamydia* can pass the infection to their infants during delivery, potentially resulting in neonatal ophthalmia and pneumonia.

Epidemiology:

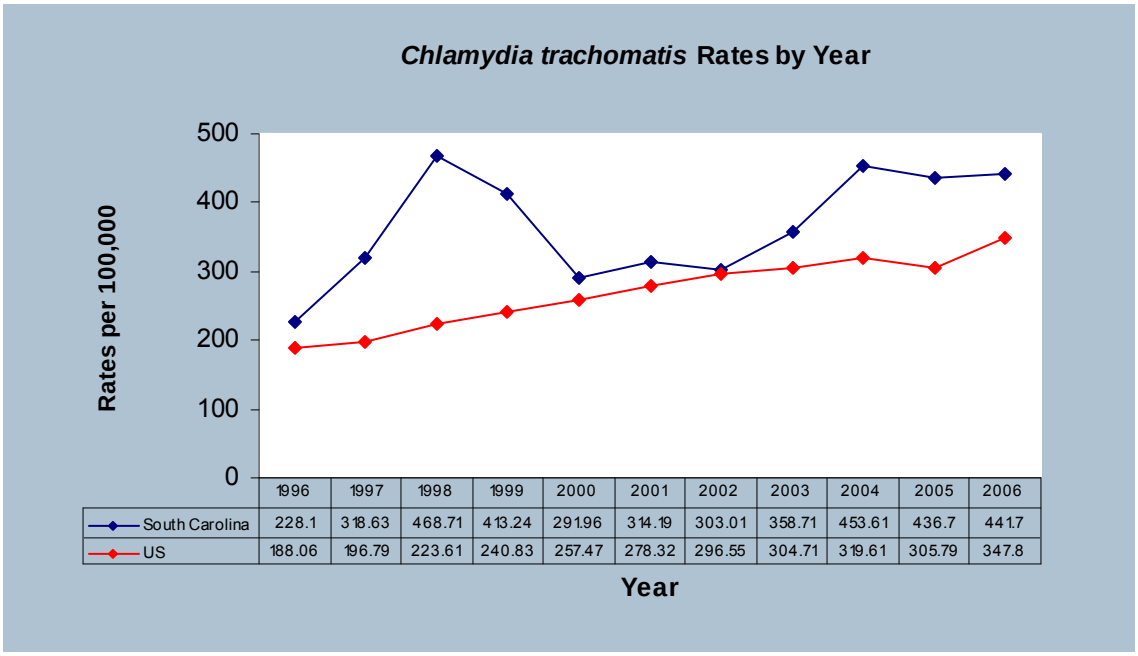
In 2006, there were 19,086 cases of *chlamydia* diagnosed in South Carolina. Figure 1 shows the increase of *chlamydia* as a result of initiating routine screening for all young women attending family planning and STD clinics in health departments statewide. Among those cases with reported race/gender, close to two-thirds were African American women (65%); 20% were white women in 2006.

In 2006 young adults ages 20-29 account for half of the cases (50%) diagnosed in South Carolina, followed by those 10-19 years of age (40%). Counties with highest chlamydia rates per 100,000 population in 2006 were Bamberg (1,180.0), Allendale (837.4), and Dillon (829.5).

Reporting:

Chlamydia infection is reportable within 7 days to DHEC.

Figure 1



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
South Carolina	228.1	318.63	468.71	413.24	291.96	314.19	303.01	358.71	453.61	436.7	441.7
US	188.06	196.79	223.61	240.83	257.47	278.32	296.55	304.71	319.61	305.79	347.8

Cholera

2006 Cases: 1 2006 Cases per 100,000: 0.02

Characteristics:

Cholera is an acute, diarrheal illness caused by infection of the intestine with the bacterium *Vibrio cholerae*. The infection is often mild or without symptoms, but sometimes it can be severe. Approximately one in 20 infected persons has severe disease characterized by profuse watery diarrhea, vomiting, and leg cramps. In these persons, rapid loss of body fluids leads to dehydration and shock. Without treatment, death can occur within hours. A person may get cholera by drinking water or eating food contaminated with the cholera bacterium. In an epidemic, the source of the contamination is usually the feces of an infected person. The disease can spread rapidly in areas with inadequate treatment of sewage and drinking water.

Epidemiology:

The cholera bacterium may also live in the environment in brackish rivers and coastal waters. Shellfish eaten raw have been a source of cholera, and a few persons in the United States have contracted cholera after eating raw or undercooked shellfish from the Gulf of Mexico. The disease is not likely to spread directly from one person to another; therefore, casual contact with an infected person is not a risk for becoming ill. In the United States, cholera was prevalent in the 1800s but has been virtually eliminated by modern sewage and water treatment systems. However, as a result of improved transportation, more persons from the United States travel to parts of Africa, Asia, or Latin America where epidemic cholera is occurring. U.S. travelers to areas with epidemic cholera may be exposed to the cholera bacterium. In addition, travelers may bring contaminated seafood back to the United States; foodborne outbreaks have been caused by contaminated seafood brought into this country by travelers.

In South Carolina, one case of cholera (serogroup O75) was reported to the DHEC in 2006. This individual reported recent out-of-state travel and consumption of raw shellfish. This is the first case reported in the past ten years. Nationally, CDC reports that approximately five cases are reported each year

Reporting:

Cholera is reportable by phone within 24 hours to DHEC.

Creutzfeldt-Jakob Disease (CJD)

2006 Cases in SC: 0 2006 Cases per 100,000: 0.00

Characteristics:
CJD belongs to a large family of human and animal diseases called the transmissible spongiform encephalopathies (TSEs). They are named after the characteristic spongiform degeneration of infected brains, which become filled with holes until they resemble sponges under a microscope. CJD and other TSEs are thought to be caused by accumulation of an abnormal form of a cellular brain protein called prion protein. Accumulation of the abnormal prions in the brain results in severe neurodegenerative disease and death. Abnormal prions can form in the brain de novo due to mutations in the gene that encodes prion protein. Transmission of abnormal proteins to humans may occur via the ingestion of meat from cattle with bovine spongiform encephalopathy (BSE or mad cow disease) and may result in a form of CJD called variant CJD (vCJD).

There are four major forms of human TSEs and each has certain distinct clinical and diagnostic features. These are classic, variant, iatrogenic, and hereditary CJD. The incubation period is unknown but is probably years to decades depending on the form of CJD. It is important to remember that CJD may have symptoms similar to other progressive neurological disorders such as Alzheimer's or Huntington's disease but can only be distinguished from them by identification of the unique histologic changes in brain tissue caused by abnormal prions.

Epidemiology:
SC: In 2006, there were no cases of CJD reported in SC. CJD was not listed on the required reportable disease list in SC until 2006. Because of a concern that BSE or vCJD may occur in the US if there are violations of FDA regulations, surveillance for CJD in individuals 55 years or younger was initiated in South Carolina.

US: To date, 3 BSE-infected cattle have been confirmed in the U.S. The infected cattle were identified in Washington State (imported from Canada) in 2003, Texas in 2004 (confirmatory testing in 2005), and in Alabama in 2006. These 3 confirmed cases are the only cases in cattle identified through an intense surveillance program implemented by the USDA in 1990. In humans, one case of vCJD in a British citizen residing in Florida believed to be transmitted from BSE-infected beef has been identified in the US.

Since 1997 strict regulations by the FDA and USDA have been in place to help to prevent BSE-infected cattle from entering the U.S. food chain. No protein of mammalian origin is allowed as an ingredient in feed for food animals.

Reporting:
Known or suspected cases of CJD in individuals 55 years or younger are reportable within 7 days to DHEC.

Cryptosporidiosis

2006 Cases in SC: 132 2006 Cases per 100,000: 3.05

Characteristics:

During the past two decades, cryptosporidiosis has become recognized as one of the most common causes of waterborne disease within humans in the United States. The parasite may be found in drinking water and recreational water in every region of the United States and throughout the world.

Epidemiology:

Most cases of cryptosporidiosis are associated with swallowing drinking or recreational water contaminated with sewage or feces from humans or animals or eating uncooked foods contaminated with *Cryptosporidium*.

In South Carolina, 132 cases of cryptosporidiosis were reported to the DHEC in 2006. The overall incidence rate in South Carolina was 3.05 cases per 100,000 population. A community-wide outbreak during the late summer in the lowcountry of South Carolina accounts for approximately 50 these cases. Investigation of the outbreak indicated that the use of outdoor recreational water facilities was associated with illness. Children less than 17 years of age represented 69% of cases. 59% of cases were male. Investigation into the outbreak also revealed an important change in laboratory practices-a test was introduced to test simultaneously for giardia and cryptosporidiosis. Ease of diagnosis confirmation often contributes to a significant increase in numbers.

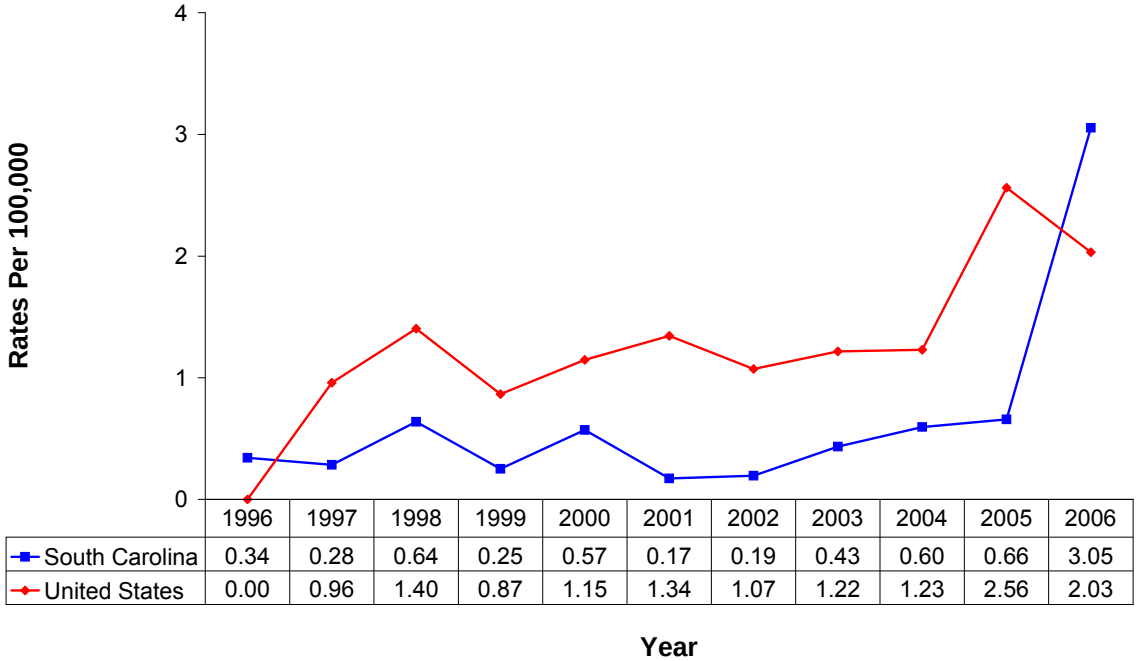
Over the last ten years there have been an average of 0.4 cases of cryptosporidiosis per 100,000 population reported in South Carolina per year. The CDC reports a national rate of 1.1 cases of cryptosporidiosis per 100,000 population. However, it is important to note that although cryptosporidiosis has been a state reportable disease for the last ten years, it was not until 1997 that it became a CDC Nationally Notifiable Disease.

Reporting:

Cryptosporidiosis is reportable within 7 days to DHEC.

Cryptosporidiosis

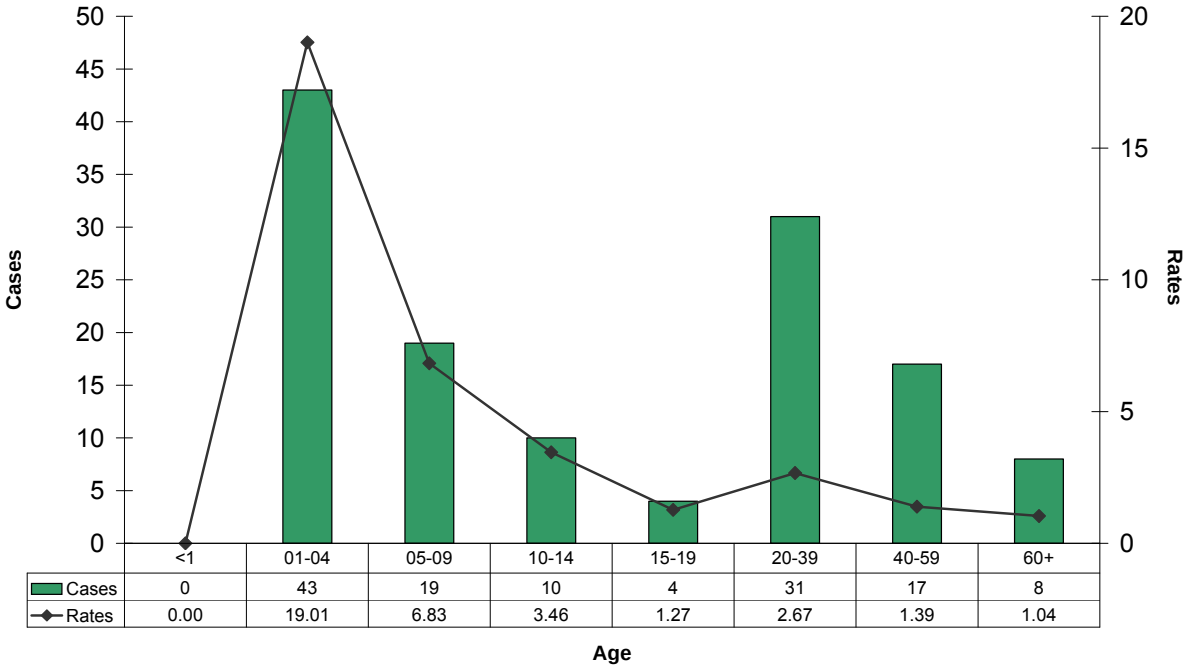
Rates by Year



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
South Carolina	0.34	0.28	0.64	0.25	0.57	0.17	0.19	0.43	0.60	0.66	3.05
United States	0.00	0.96	1.40	0.87	1.15	1.34	1.07	1.22	1.23	2.56	2.03

Cryptosporidiosis

2006 Reported Cases by Age Group



	<1	01-04	05-09	10-14	15-19	20-39	40-59	60+
Cases	0	43	19	10	4	31	17	8
Rates	0.00	19.01	6.83	3.46	1.27	2.67	1.39	1.04

Cyclosporiasis

2006 Cases in SC: 5 Cases per 100,000: 0.12

Characteristics:

The first known human cases of illness caused by *Cyclospora* infection were reported in the medical literature in 1979. Cases have been reported with increased frequency from various countries since the mid 1980s, in part because of the availability of better techniques for detecting the parasite in stool specimens.

Infected persons excrete the oocyst stage of *Cyclospora* in their feces. When excreted, oocysts are not infectious and may require days to weeks to become infectious (i.e., to sporulate). Therefore, transmission of *Cyclospora* directly from an infected person to someone else is unlikely. However, indirect transmission can occur if an infected person contaminates the environment and oocysts have sufficient time, under appropriate conditions, to become infectious. For example, *Cyclospora* may be transmitted by ingestion of water or food contaminated with oocysts. Outbreaks linked to contaminated water or various types of fresh produce have been reported in recent years. Modes of transmission and sources of infection are, not fully understood; nor is it known whether animals can be infected and serve as sources of infection for humans.

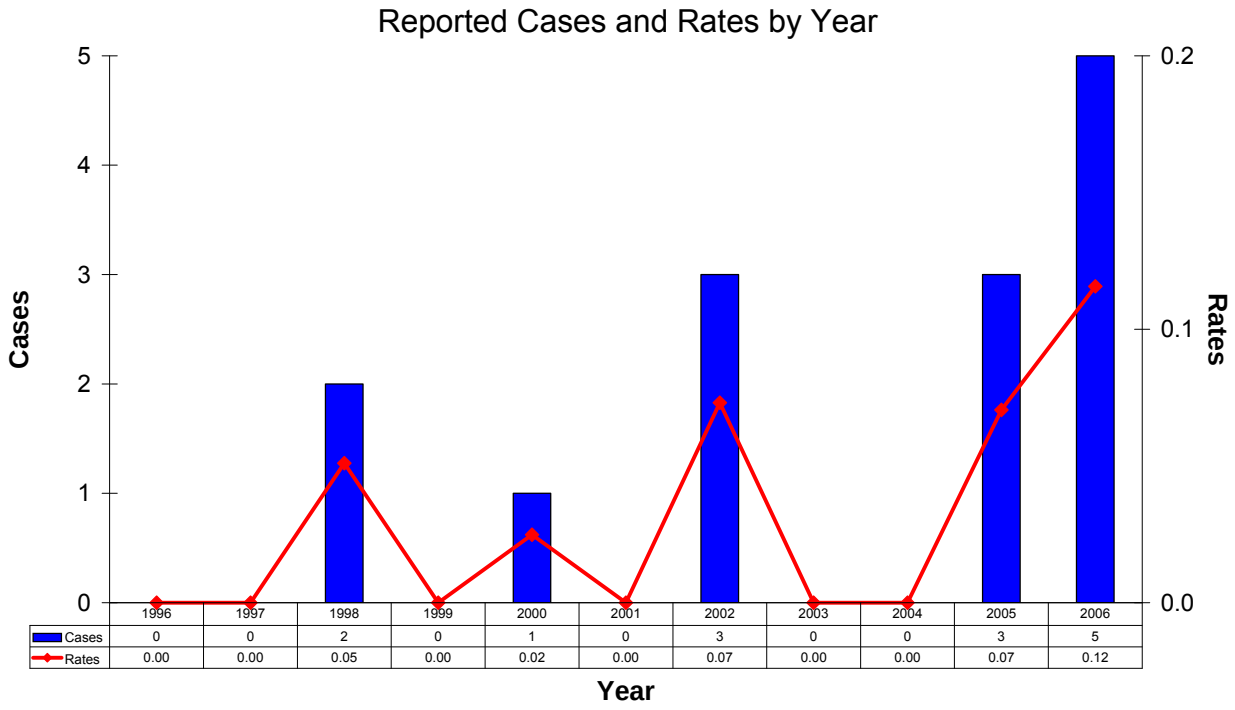
Epidemiology:

Cyclosporiasis was added as a reportable disease in South Carolina in 1998. Over the last nine years, an average of 1 case of cyclosporiasis was reported in South Carolina per year. The number of reports received by the DHEC in 2006 was within the expected range of case reports based on the last eight years of data. Cyclosporiasis has been a nationally notifiable disease since 1999. The CDC has an average of <0.1 cases of cyclosporiasis per 100,000 population reported annually.

Reporting:

Cyclosporiasis is reportable within 7 days to DHEC.

Cyclosporiasis



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Cases	0	0	2	0	1	0	3	0	0	3	5
Rates	0.00	0.00	0.05	0.00	0.02	0.00	0.07	0.00	0.00	0.07	0.12

Dengue

2006 Cases in SC: 0 Cases per 100,000 population: 0

Characteristics.

Dengue is a viral disease carried by mosquitoes. The viruses are transmitted to humans by the bite of an infected mosquito. In the Western Hemisphere, the *Aedes aegypti* mosquito is the most important transmitter or vector of dengue viruses.

Dengue or Dengue fever (DF) symptoms include high fever, severe headache, backache, joint pains, nausea and vomiting, eye pain, and rash. Younger children often have a milder illness than older children and adults.

Dengue hemorrhagic fever (DHF) is characterized by a fever that lasts from 2 to 7 days, with systemic flu-like symptoms including nausea, vomiting, abdominal pain, and headache. This stage is followed by hemorrhagic manifestations, such as a tendency to bruise easily or develop other types of skin hemorrhages, bleeding nose or gums, and possibly internal bleeding. The smallest blood vessels (capillaries) become excessively permeable ("leaky"), allowing the fluid component to escape from the blood vessels. This may lead to failure of the circulatory system and shock, followed by death, if circulatory failure is not corrected. However, with good medical management, mortality due to DHF can be less than 1%.

Epidemiology:

Worldwide. Dengue is often found in tropical climates. Globally, there are an estimated 50 to 100 million cases of DF and several hundred thousand cases of dengue hemorrhagic fever (DHF) per year. There have been epidemics of DF in Africa, Asia and Central and South America in the 1980s. In countries of Asia where DHF is endemic, the epidemics have become progressively larger in the last 15 years. Increased numbers of cases have been seen in the Americas due to re-infestation by the Dengue carrying mosquito, *Aedes aegypti,* after eradication efforts were discontinued in 1970.

SC & US. Between 100 to 200 suspected cases of DF are introduced into U.S. each year by travelers from foreign countries. In 1995, 250,000 cases of DF and 7,000 cases of DHF were reported in the Americas.

Prevention:

There is no vaccine against dengue. The best preventive measure for residents living in areas infested with *Aedes aegypti* is to eliminate the places where the mosquito lays her eggs, primarily artificial containers that hold water.

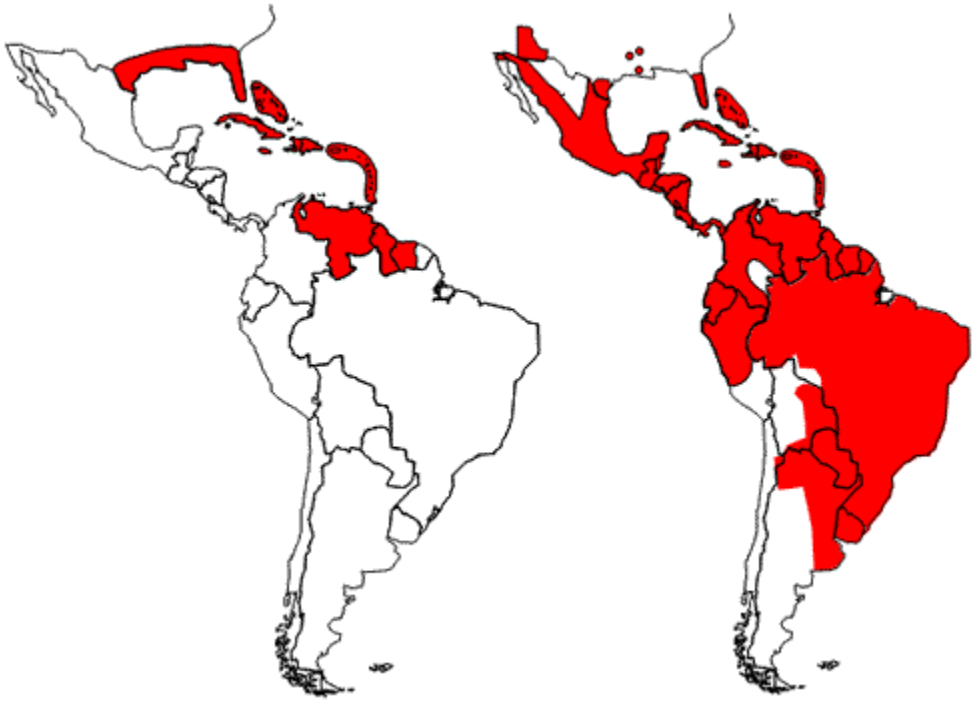
Reporting:

Confirmed or suspected cases of Dengue or Dengue Hemorrhagic Fever are reportable within 7 days to DHEC.

Map: Distribution of *Aedes aegypti* in the Americas in 1970, at the end of the mosquito eradication program, and in 2002

Reinfestation by *Aedes aegypti* in the Americas

1970 **2002**



SOURCE: PAHO/WHO, 2002

Obtained from CDC Division of Vector-borne Diseases.
http://www.cdc.gov/ncidod/dvbid/dengue/map-ae-aegypti-distribution.htm

Diphtheria

2006 Cases in SC: 0 Cases per 100,000 population: 0.0

Characteristics:

Diphtheria is an acute, toxin-mediated disease caused by the bacterium, *Corynebacterium diphtheriae*. In the prevaccine era, diphtheria was a leading childhood killer worldwide. Diphtheria has a case fatality rate of 5-10 percent with rates as high as 20 percent in children younger than 5 years of age and adults older than 40 years of age.

Epidemiology:

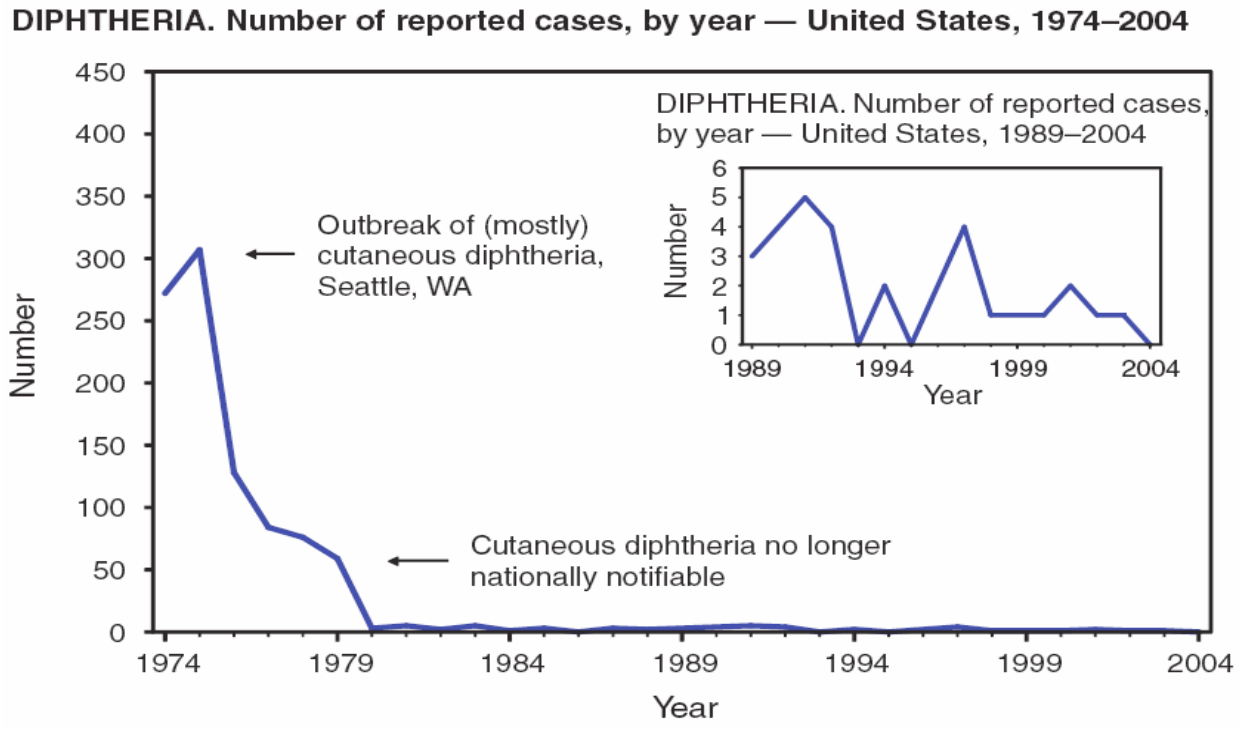
Diphtheria remains endemic in many parts of the world. Outbreaks, though very rare, still occur worldwide. After the breakup of the former Soviet Union Soviet in the late 1980s, vaccination rates decreased, resulting in outbreaks of diphtheria. In 1991 there were 2,000 cases of diphtheria in the Soviet Union. By 1998, it is estimated that there were as many as 200,000 cases in the Commonwealth of Independent States with 5,000 deaths.

In the U.S. prior to vaccination with diphtheria toxoid, 100,000 to 200,000 cases and 13,000 to 15,000 deaths occurred annually. The number of cases declined significantly after the widespread use of this vaccine such that during the 1970s, approximately 200 cases were reported annually. Since 1980, approximately 1-3 cases have been reported each year. There have been no reported cases in the U.S. since 2004.

During the 10-year period in SC from 1996-2006, no cases of diphtheria have been reported.

Reporting:

Diphtheria is reportable within 24 hours by phone to DHEC. .



Eastern Equine Encephalitis

2006 Cases in SC: 0 human case 2006 cases per 100,000: n/a

Characteristics:

Eastern equine encephalitis (EEE) is a mosquito-borne viral (arboviral) disease. It generally takes from 3 to 10 days to develop symptoms of EEE after being bitten by an infected mosquito. The symptoms of EEE range from a mild fever illness to a severe nervous system infection. Medical treatment consists of treating the symptoms and preventing complications. EEE is one of the most serious mosquito-borne diseases in the United States; the human fatality rate can be up to 35%. About half of people who survive EEE will have lingering neurologic damage.

Epidemiology and Zoology:

EEE virus occurs in the eastern half of the United States where it can cause disease in humans, horses, and some bird species. EEE transmission is usually a cycle carried on between birds and mosquitoes. Infectious mosquitoes can fatally infect horses. The presence of a horse infected with EEE does not put nearby humans at risk. Horses are considered a “dead-end host.” Mosquitoes feeding on an infected horse are unlikely to pick up the virus; the concentration of EEE virus in the horse is too low.

In 2005, there was one confirmed case of Eastern Equine Encephalitis, in Marlboro County.

Prevention:

There is no vaccine for humans against this virus but there is a vaccine for horses. EEE prevention is best accomplished by limiting amount of time spent outdoors during peak mosquito hours (dawn and dusk) or wearing insect repellant containing DEET, eucalyptus, or picaridin. Mosquito reduction may be accomplished by eliminating sources of standing water.

Reporting:

All suspected and confirmed cases of acute arboviral neuroinvasive disease are urgently reportable by phone within 24 hours to DHEC.

Ehrlichiosis

2006 Cases in SC: 5 2006 cases per 100,000: 0.12

Characteristics:

Ehrlichiosis is a tick-borne disease, caused by several species of the bacterial genus *Ehrlichia*. This illness affects human and animals. Most people with ehrlichiosis are infected in the spring and summer when they are more commonly exposed to infected ticks. Symptoms generally occur 5-10 days after the tick bite and include fever, headache, malaise, and muscle aches. Other signs and symptoms may include nausea, vomiting, diarrhea, cough, joint pains, and confusion. A rash is very uncommon.

Epidemiology:

In the United States, ehrlichiae are transmitted by the bite of an infected tick. The lone star tick (*Amblyomma americanum*) transmits disease caused by *Ehrlichia chaffeensis*; this condition is referred to as human ehrlichiosis, or HME. Disease from the lone star tick occurs primarily in the southeastern and south central US.

The blacklegged tick (*Ixodes scapularis*), and the western blacklegged tick (*Ixodes pacificus*) are known vectors of human granulocytic ehrlichiosis (HGE) caused by species similar to the veterinary pathogens *Ehrlichia equi* and *Ehrlichia phagocytophila.*

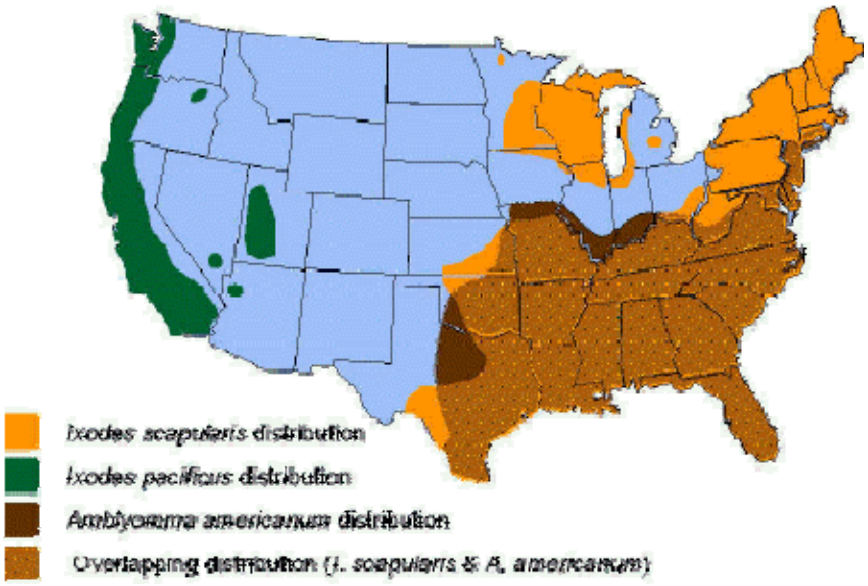
Ehrlichia ewingii is a recently recognized bacterium causing human disease, currently limited to a few patients in Missouri, Oklahoma, and Tennessee, most of whom have had underlying immunosuppression. The extent of the geographic range of this species, its vectors, and its role in human disease is currently under investigation.

Prevention:

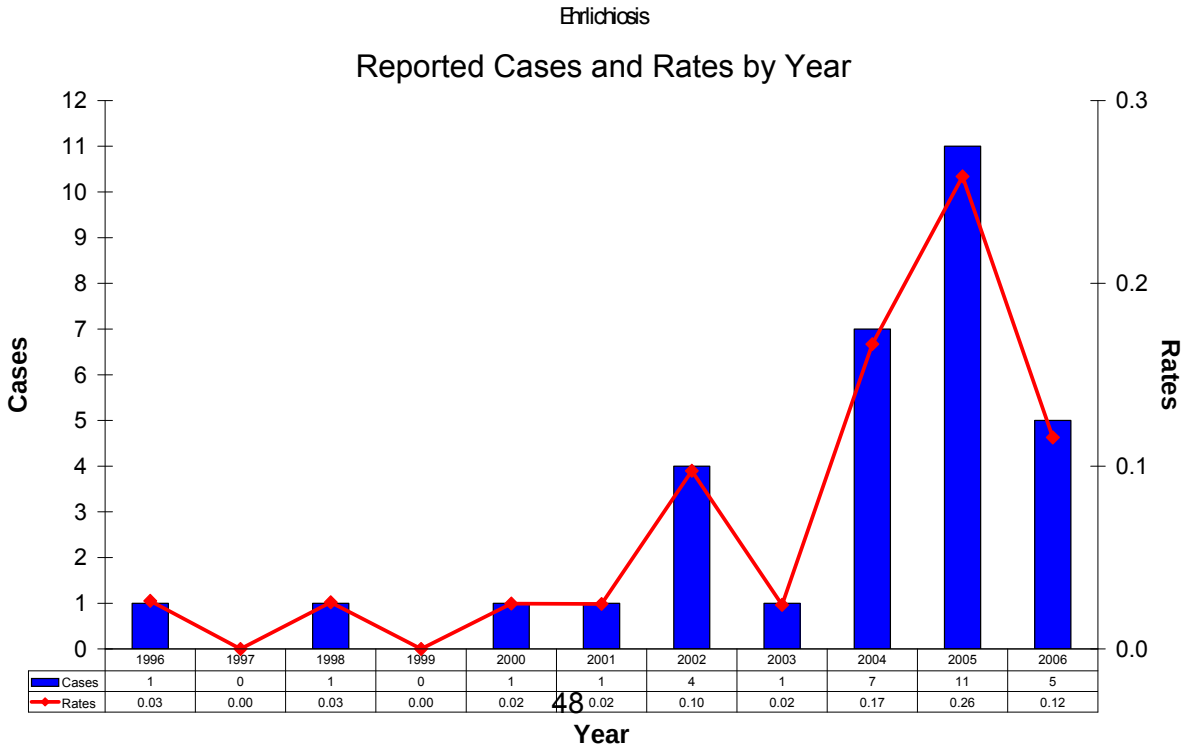
Prevention of tick bites is the only certain way to avoid Erhlichial infection. Measures include appropriate clothing when in tick-infested areas, control of tick habitats, and applications of acaricides (chemicals that will kill ticks and mites) to infested areas.

Reporting:

Ehrlichiosis, presenting as HME, HGE, or novel infection with *Ehrlichia ewingii* is reportable within 7 days to DHEC.



Areas where human ehrlichiosis may occur based on approximate distribution of vector tick species.



Giardiasis

2006 Cases in SC: 111 2006 Cases per 100,000: 2.57

Characteristics:

During the past 2 decades, *Giardia* infection has become recognized as one of the most common causes of waterborne disease (found in both drinking and recreational water) in humans in the United States. *Giardia* is found worldwide and within every region of the United States.

Giardia is found in soil, food, water, or surfaces that have been contaminated with the feces from infected humans or animals. Most cases of Giardiasis are associated with swallowing recreational water contaminated with *Giardia,* eating uncooked food contaminated with *Giardia* or coming in contact with surfaces contaminated with *Giardia*. Animals can also be infected, and some people have acquired their infection from contact with the infected stool of an ill dog or cat.

Epidemiology:

In 2006, cases ranged in age from 1 month to 89 years with a median age of 29. The incidence of infection was highest among infants and children under 5 years of age. Reported cases were evenly distributed among gender.

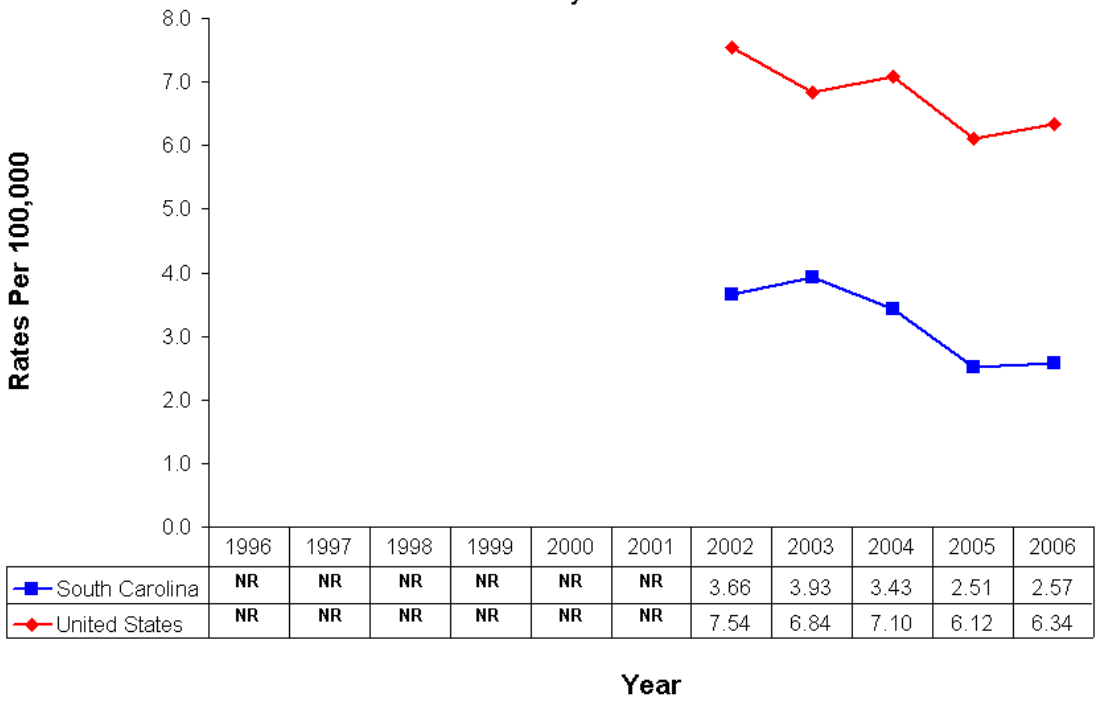
Giardiasis was added as a reportable disease nationally and in South Carolina in 2002. Over the last five years there have been an average of 3.2 cases of giardiasis per 100,000 population reported in South Carolina per year. The CDC reports a national average of 7.5 cases of giardiasis per 100,000 population. The number of reports received by the DHEC in 2006 was within the expected range of case reports based on the last five years of data.

Reporting:

Giardiasis is reportable within 7 days to DHEC.

Giardiasis

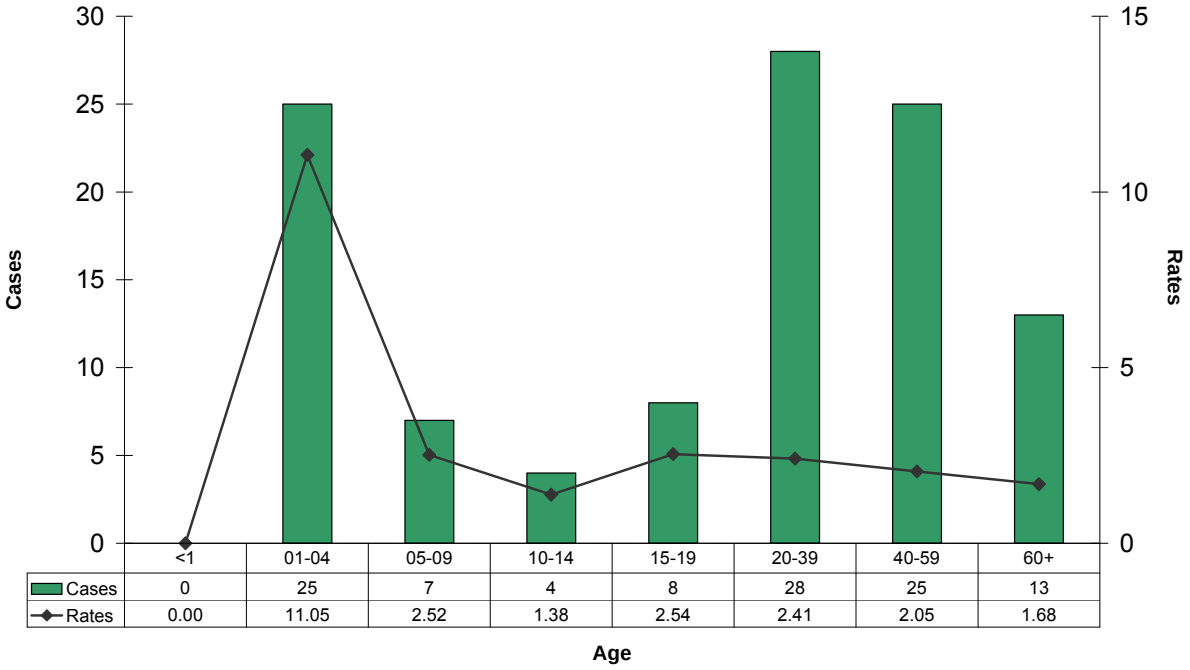
Rates By Year



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
South Carolina	NR	NR	NR	NR	NR	NR	3.66	3.93	3.43	2.51	2.57
United States	NR	NR	NR	NR	NR	NR	7.54	6.84	7.10	6.12	6.34

Giardiasis

2006 Reported Cases by Age Group



	<1	01-04	05-09	10-14	15-19	20-39	40-59	60+
Cases	0	25	7	4	8	28	25	13
Rates	0.00	11.05	2.52	1.38	2.54	2.41	2.05	1.68

Glanders (*Burkholderia mallei*)

2006 Cases in SC: 0 2006 Cases per 100,000: 0.0

Characteristics:

Glanders is an infectious disease that is caused by the bacterium *Burkholderia mallei.* Glanders is primarily a zoonotic disease affecting horses, but it also affects donkeys and mules and can be naturally contracted by goats, dogs, and cats. Glanders is transmitted to humans by direct contact with infected animals. In addition to animal exposure, rare cases of human-to-human transmission have been reported. These cases included two suggested cases of sexual transmission and several cases in family members who cared for the patients. The bacteria enter the body through the skin and through mucosal surfaces of the eyes and nose. The disease is diagnosed in the laboratory by isolating *Burkholderia mallei* from blood, sputum, urine, or skin lesions. Serologic assays are currently not available. Symptoms of glanders depend upon the route of infection with the organism. Generalized symptoms include fever, muscle aches, chest pain, muscle tightness, and headache. Additional symptoms have included excessive tearing of the eyes, light sensitivity, and diarrhea.

Localized infections*:* Localized infection with ulceration will develop within 1 to 5 days at the site where the bacteria entered the body through a scrape or cut. Swollen lymph nodes may also be apparent. Infections involving the mucous membranes in the eyes, nose, and respiratory tract will cause increased mucus production from the affected sites.

Pulmonary infections*:* Pneumonia, pulmonary abscesses, and pleural effusion can occur. Chest X-rays will show localized infection in the lobes of the lungs.

Bloodstream infections*:* Septicemia from glanders is usually fatal within 7 to 10 days.

Chronic suppurative infections*:* The chronic form of glanders involves multiple abscesses within the muscles of the arms and legs or in the spleen or liver.

Epidemiology:

US: Human infection, although not seen in the United States since 1945, has occurred rarely and sporadically among laboratory workers, veterinarians, horse and donkey caretakers, abattoir workers and those in direct and prolonged contact with infected domestic animals.

Worldwide: Glanders is still commonly seen among domestic animals in Africa, Asia, Middle East, and Central and South America; recent travel history, direct contact with infected animals, and symptoms consistent with Glanders should be considered in the differential diagnosis.

Potential as an Agent of Bioterrorism:

Glanders has a history of use as a biological weapon, and is listed by the CDC as a “Category B” agent.

Reporting:

Due to the lack of reported human cases in recent years, the historical use of glanders as a biological weapon, and the CDC listing of glanders as a “Category B” biological threat agent, any suspected or confirmed case is reportable within 24 hours by phone to DHEC.

Gonorrhea

2006 Cases in SC: 9,070 2006 Cases per 100,000: 209.9

Characteristics:

Gonorrhea is a sexually transmitted bacterial disease of the urogenital tract that may also cause infection in the pharyngeal and rectal areas, and occasionally disseminated infection. Conjunctivitis may result from direct exposure to the organism, especially in infants.

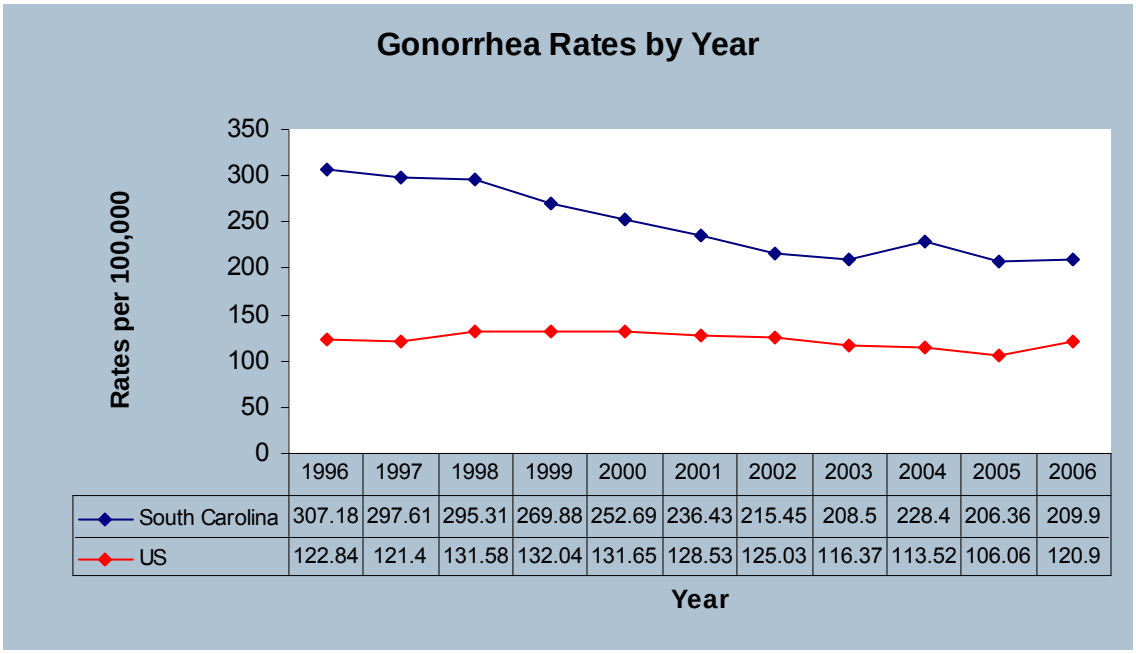
Epidemiology:

In 2006, 9,070 gonorrhea cases were diagnosed. African American men and women account for 84% of reported cases with known race/gender in 2006. Over the past 10 years, the number of gonorrhea cases has been greatest among African-American men and women.

Most of the cases were among females (52%). Although gonorrhea cases were reported in virtually all age groups, 78% of the cases in 2006 were reported in young adolescents/adults 10-29 years of age. Counties with highest rates per 100,000 of gonorrhea in 2006 were Allendale (493.1), Bamberg (440.1), and Orangeburg (401.8).

Reporting:

Gonorrhea is reportable with 7 days to DHEC.



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
South Carolina	307.18	297.61	295.31	269.88	252.69	236.43	215.45	208.5	228.4	206.36	209.9
US	122.84	121.4	131.58	132.04	131.65	128.53	125.03	116.37	113.52	106.06	120.9

Haemophilus Influenza

Type b and non-type b invasive disease

2006 Cases in SC: 39 2006 Cases per 100,000: 0.9

Characteristics:

Haemophilus influenzae bacteria are a group of bacteria that are divided into two major categories: those types that have capsules around them and those that do not have capsules. The *H. influenzae* bacteria that contain capsules are divided into 6 different major serotypes (a, b, c, d, e and f). In the prevaccine ere, *H. influenzae* serotype b (Hib) was responsible for most of the serious invasive and sometimes fatal diseases in children and adults, including bacteremia, meningitis, cellulitis, epiglottitis, septic arthritis, pneumonia, and empyema. The case fatality rate of invasive infection with Hib is 5% with 35% of survivors suffering neurologic sequelae. Infections with *H. influenzae* non-type b bacteria (types a, c, d, e and f) and *H. influenzae* bacteria that do not have capsules usually cause less serious disease. The most common diseases that occur from infection with these less pathogenic bacteria occur in the respiratory tract and include infections such as otitis media, conjunctivitis, sinusitis, or pneumonia. Less commonly, infections with *H. influenzae* non-type b bacteria may result in invasive disease.

Epidemiology:

In the US, before *H. influenzae* type b conjugate vaccine became available in 1991 for immunization of infants, Hib was the leading cause of bacterial meningitis and other invasive bacterial disease among children younger than 5 years of age. The rate of invasive Hib disease was estimated at 40-50 cases per 100,000 children younger than 5 years of age with approximately 20,000 cases each year, including 12,000 cases of meningitis and 1000 deaths per year. With the advent of the Hib conjugate vaccine, the number of cases in children younger than 5 years has decreased by more than 99% compared to the pre-vaccine era. Since 2001, less than 30 cases of invasive Hib disease in children younger than 5 years has been reported to the CDC each year with only 8 cases being reported in 2006.

Despite the decrease in Hib disease, the number of cases of invasive disease in persons of all ages due to all types of *H. influenzae* reported to the CDC has been 1400 to 2300 cases annually between the years of 2000 and 2006. Most of these cases are due to *H. influenzae* non-serotype b and occur more commonly occur in older persons (e.g. over 60 years of age). These types of infections generally represent a personal health rather than a public health problem, and, unlike serotype-b cases, are not currently vaccine-preventable.

In SC, records from the 1980s show that in the prevaccine era dozens of children had invasive Hib disease every year. Since 2002 DHEC has been collecting reports of invasive H. influenza disease caused by both serotype b strains and non-serotype b strains. Surveillance for non-serotype b strains is useful because it serves as an indirect indicator of the ability of DHEC surveillance to detect the occurrence of vaccine preventable cases due to the more important Hib strains in addition to detecting any “ecological replacement” of Hib by non-serotype b disease producing strains should this occur. Currently, it appears that a majority of invasive *H influenzae* infections are caused by these non-type b strains in the older population. In 2006, 39 cases of confirmed and probable invasive *H influenzae* infections (both Hib and non-serotype b

strains) were reported to DHEC. More than 75 percent of the cases of invasive *H. influenzae* were due to *H. influenzae* non-serotype b and most of these cases occurred in persons 60 years of age and older.

Reporting:

Confirmed or suspected *Haemophilus influenzae*, serotype b, invasive disease is immediately reportable by phone to DHEC. *Haemophilus influenzae*, non-serotype b invasive disease is reportable within 7 days to DHEC.

	<1	01-04	05-09	10-14	15-19	20-39	40-59	60+
Cases	2	1	3	1	1	3	8	19
Rates	3.49	0.44	1.08	0.35	0.32	0.26	0.65	2.46

Note: The increase observed since 2002 reflects the fact that non-type b cases have also been reported since that year (see text).

Note: Cases in older persons were rarely reported prior to 2002 when non-type b *H. influenza* first became reportable in South Carolina. This fact, along with other data, suggests that cases occurring in these age groups are not due to the vaccine preventable type-b strains.

Hantavirus

Hantavirus Pulmonary Syndrome

2006 Cases in SC: 0 2006 Cases per 100,000: 0

Characteristics:

Hantavirus causes two types of diseases in humans, hantavirus pulmonary syndrome (HPS), a rare but deadly infection, or fever with kidney infection.

Early symptoms of HPS include fatigue, fever and muscle aches, especially in the large muscle groups-thighs, hips, back, and sometimes shoulders. Some patients experience headaches, dizziness, chills, and abdominal symptoms, including nausea, vomiting, diarrhea, and abdominal pain. Four to 10 days after the initial phase of illness, the late symptoms of HPS appear. These include coughing and shortness of breath, with the sensation of, as one survivor put it, a "...tight band around my chest and a pillow over my face" as the lungs fill with fluid.

Rodents are natural carriers of hantavirus, which does not cause them to become ill. Human can contract hantavirus when they come into contact with infected rodent saliva, feces or urine, especially when these materials are aerosolized. Deer mice are often implicated in cases of HPS, as they live near people in rural and semi-rural areas—in barns and outbuildings, woodpiles, and inside people's homes. No cases of human-to-human transmission have been described in the US.

Epidemiology:

US. HPS was first recognized in 1993 (although it is thought to have caused earlier outbreaks attributed to the Sin Nombre virus) in the "Four Corners" area of New Mexico, Arizona, Utah and Colorado, following the deaths of several previously healthy young adults who suddenly developed acute respiratory symptoms. Cases have been reported in 30 states, including most of the western half of the country and some eastern states as well. Over half of the confirmed cases have been reported from areas outside the Four Corners area.

(Statistics available from CDC include 2006 cases.) Through September 19, 2006, a total of 453 cases of hantavirus pulmonary syndrome have been reported in the United States. The case count started when the disease was first recognized in May 1993. Thirty-five percent of all reported cases have resulted in death.

SC. In SC there were no reported cases of Hantavirus in 2006.

Prevention:

The primary strategy for hantavirus prevention is control of rodent populations in and around the home, farm, workplace, campsite, etc.

Reporting:

Confirmed or suspected Hantavirus / Hantavirus Pulmonary Syndrome is urgently reportable by phone within 24 hours to DHEC.

Hemolytic Uremic Syndrome (HUS)

2006 Cases in SC: 2 2006 Cases per 100,000: 0.05

Characteristics:

Hemolytic uremic syndrome (HUS) is a combination of microangiopathic hemolytic anemia, thrombocytopenia and acute renal failure. The syndrome is primarily observed in infants and young children. HUS is seen most frequently following an infection with a Shiga toxin-producing organism, most often *Escherichia coli* O157:H7 although other strains of Shiga toxin-producing *E. coli* (STEC) and Shigella dystenteriae can be followed by the syndrome.

Epidemiology:

In South Carolina, there were 2 cases of HUS reported to the DHEC in 2006. Over the last ten years, an average of 1 case of HUS has been reported in South Carolina per year. Nationally, CDC reports approximately 200 cases of HUS annually. The number of cases reported to DHEC is likely a gross underestimate of the actual number of cases occurring in South Carolina. Reasons for this underreporting may include difficulty in diagnosing this syndrome and provider unfamiliarity with reporting requirements.

E. coli O157:H7 can be found on a small number of cattle farms and can live in the intestines of healthy cattle. Meat can become contaminated during slaughter, and organisms can be thoroughly mixed into beef when it is ground. Bacteria present on the cow's udders or on equipment may get into raw milk. Additionally, the consumption of cross-contaminated non-meat items such as sprouts, lettuce, unpasteurized milk and juice, as well as swimming in or drinking sewage-contaminated water are sources of infection. Bacteria in diarrheal stools of infected persons can be passed from one person to another if hygiene or handwashing habits are inadequate. Many cases go undiagnosed or unreported, and *E. coli* O157:H7 is estimated to cause 73,000 cases and 2,100 hospitalizations annually in the United States. Approximately 8% of children with *E. coli* O157:H7 diarrhea will develop Hemolytic uremic syndrome. HUS has a case fatality rate of around 5%.

Reporting:

All suspected and confirmed cases of hemolytic uremic syndrome (HUS) are urgently reportable by phone within 24 hours to DHEC.

Hepatitis A, Acute

2006 Cases: 34 2006 Cases per 100,000: 0.79

Characteristics:

Hepatitis A is a viral infection characterized by an abrupt onset of fever, malaise, anorexia, nausea, and abdominal discomfort, followed within a few days by jaundice. Symptomatic hepatitis A virus (HAV) infection occurs in approximately 30% of infected children younger than 6 years of age; few of these children will have jaundice. Among older children and adults, infection usually is symptomatic and typically lasts several weeks, with jaundice occurring in 70% or more. Prolonged or relapsing disease lasting as long as 6 months can occur. Fulminant hepatitis is rare but is more common in people with underlying liver disease. Chronic infection does not occur. Infection with HAV provides immunity from future infections.

Epidemiology:

HAV infection is transmitted by the fecal-oral route and may be spread by person-to-person transmission, by ingestion of food contaminated by an infected food handler, by contaminated produce, and by contaminated water. Groups at increased risk for hepatitis A include international travelers, men who have sex with men, users of illegal drugs, and persons who work with primates. Persons with chronic lever disease are not at increased risk of infection but are at increased risk of acquiring fulminant hepatitis A. Children plan an important role in HAV transmission. Children generally have asymptomatic or unrecognized illnesses and they may excrete virus longer than adults, so they may serve as a source of infection, particularly for household or other close contact. Depending on conditions, HAV can be stable in the environment for months.

In the United States, hepatitis A became a reportable condition in 1966. Although HAV infection continues to occur at relatively high rates, rates have been declining since 1995, and since 1998 have been at historically low levels, probably as a result of wider use of vaccine. Prior to 2000, the incidence of reported hepatitis A was substantially higher in the western United States than in other parts of the country. Many of these high-incidence states in the western United States began routine hepatitis A vaccination programs for children n the late 1990s. Since 2002, rates have been similar in all parts of the country.

Prevention:

Hepatitis A vaccination is highly immunogenic – more than 95% of adults will develop protective antibody within 4 weeks of a single dose of vaccine, and nearly 100% will seroconvert after receiving two doses. Among children and adolescents, more than 97% will be seropositive with a month of the first dose.

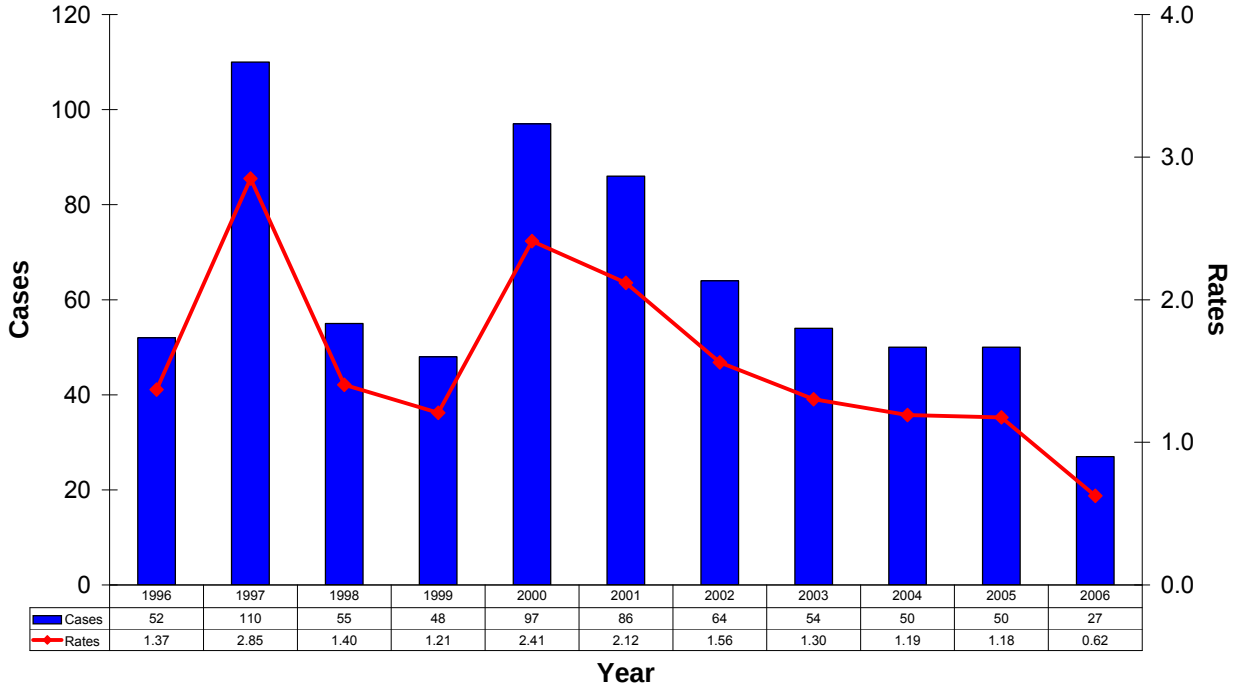
Hepatitis A immunization is recommended routinely for infants at one year of age, for people who are at increased risk of infection, and for any person who wants to obtain immunity. Unimmunized persons who have had close contact (household or sexual) with a person with hepatitis A and persons in certain common-source exposure situations (e.g., patrons of a food establishment in which a food handler is HAV-infected) should be given immune globulin (IG).

Reporting:

Hepatitis A is urgently reportable by phone with 24 hours to DHEC.

Hepatitis A, Acute

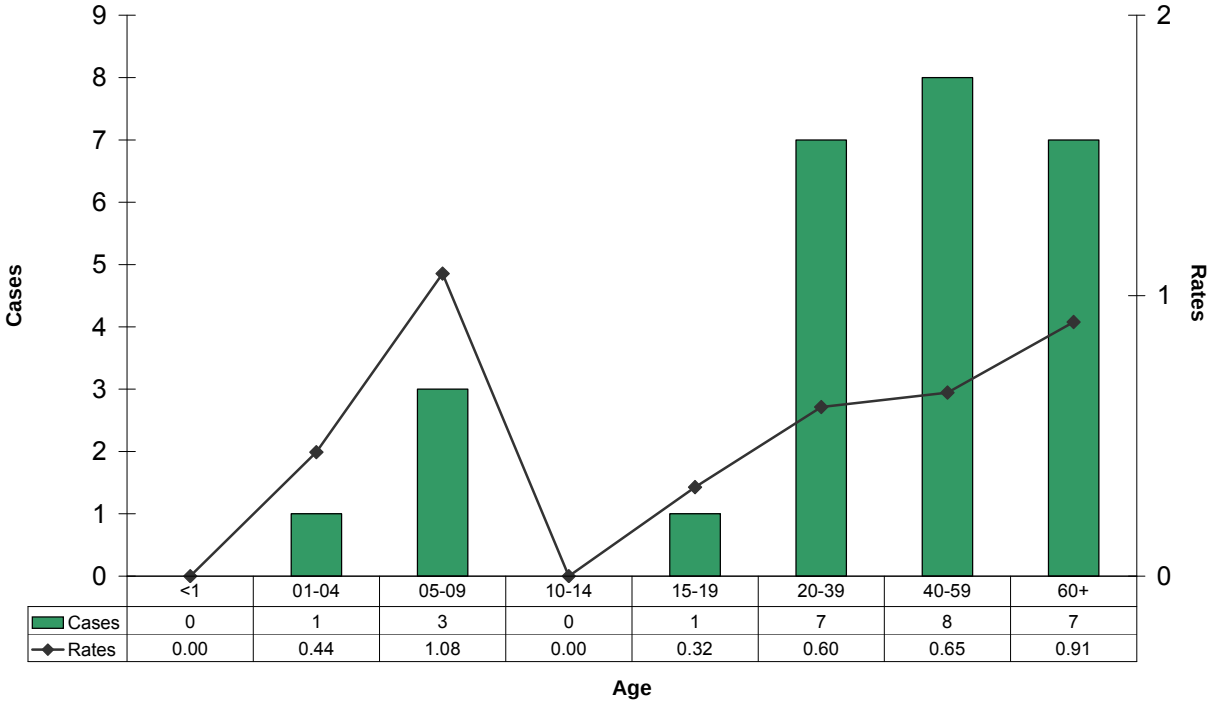
Reported Cases and Rates by Year



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Cases	52	110	55	48	97	86	64	54	50	50	27
Rates	1.37	2.85	1.40	1.21	2.41	2.12	1.56	1.30	1.19	1.18	0.62

Hepatitis A, Acute

2006 Reported Cases by Age Group



	<1	01-04	05-09	10-14	15-19	20-39	40-59	60+
Cases	0	1	3	0	1	7	8	7
Rates	0.00	0.44	1.08	0.00	0.32	0.60	0.65	0.91

Hepatitis B, Acute and Chronic Infection

2006 Acute Hepatitis B Cases in SC: 104 Cases per 100,000 population: 2.41

2006 Chronic Hepatitis B Cases in SC: 662 Cases per 100,000 population: 15.32

Characteristics:

Hepatitis B virus (HBV) is the most common known cause of chronic viremia, with more that 200 million chronically infected persons estimated worldwide. HBV infection is an established cause of up to 80% of hepatocellular carcinomas, and is second only to tobacco among known human carcinogens. More than 250,000 persons die worldwide each year of hepatitis B-associated acute and chronic liver disease. In countries where HBV is highly endemic, most infections occur during infancy and early childhood. Where endemicity is low, most infections occur in young adults, especially those belonging to know risk groups. Even in countries with low HBV endemicity, a high proportion of chronic infections may be acquired during childhood because the development of chronic infection is age-dependent. Many of these infections would be prevented by administering the birth dose of hepatitis B vaccine to all newborns.

The clinical course of acute hepatitis B is indistinguishable from that of other types of acute viral hepatitis. Clinical signs and symptoms occur more often in adults than in infants or children, who usually have an asymptomatic acute course. However, approximately 50% of adults who have acute infections are asymptomatic. Approximately 10% of all acute HBV infections progress to chronic infection, with the risk of chronic HBV infection decreasing with age. As many as 90% of infants who acquire HBV infection from their mothers at birth become chronically infected. Of children who become infected with HBV between 1 year and 5 years of age, 30% to 50% become chronically infected. By adulthood, the risk of acquiring chronic HBV infection is approximately 5%.

Persons with chronic infection are often asymptomatic and may not be aware that they are infected; however, they can infect others and are referred to as carriers. Persons with either acute or chronic HBV infection should be considered infectious any time that HBsAg is present in the blood. Chronic infection is responsible for most HBV-related morbidity and mortality, including chronic hepatitis, cirrhosis, liver failure, and hepatocellular carcinoma. Approximately 25% of persons with chronic HBV infection die prematurely from cirrhosis or liver cancer.

Epidemiology:

In the United States, hepatitis B became a reportable condition in the 1970s. The incidence of reported hepatitis B peaked in the mid-80s and has since steadily declined. The greatest decline has occurred among children and adolescents, coincident with an increase in hepatitis B vaccine coverage. However, reported cases of HBV infection represent only a fraction of cases that actually occur. Even with an increase in vaccine coverage, in the U.S. there are approximately 78,000 new infections per year, more than 1 million current carriers, more than 5,000 new carriers per year, and approximately 5,000 deaths per year.

Approximately 10% of all acute HBV infections progress to chronic infection, with the risk of chronic HBV infection decreasing with age.

Body substances capable of transmitting HBV include: blood and blood products: saliva (although transmission of HBV infection due to saliva alone has not been documented): cerebrospinal fluid: peritoneal, pleural, pericardial, and synovial fluid, amniotic fluid; wound exudates; semen and vaginal secretions; any other body fluid containing blood; and unfixed

tissues and organs. Because HBV is stable on environmental surfaces for at least 7 days, indirect inoculation of HBV can occur via inanimate objects.

Major modes of HBV transmission include sexual and close household contacts with an infected person, perinatal mother-to-infant transmission, injecting drug use, and nosocomial exposure. Sexual transmission from infected men to women is about 3 times more efficient than that from infected women to men.

Prevention:

Hepatitis B immunization is recommended routinely for infants, for persons who are at increased risk of infection, and for any person who wants to obtain immunity. Strategies to eliminate HBV transmission include: vaccination of all newborns prior to hospital discharge, appropriate postexposure prophylaxis of all infants born to HBsAg-positive women, timely completion of the hepatitis B vaccine series, and vaccination of adults in high-risk groups.

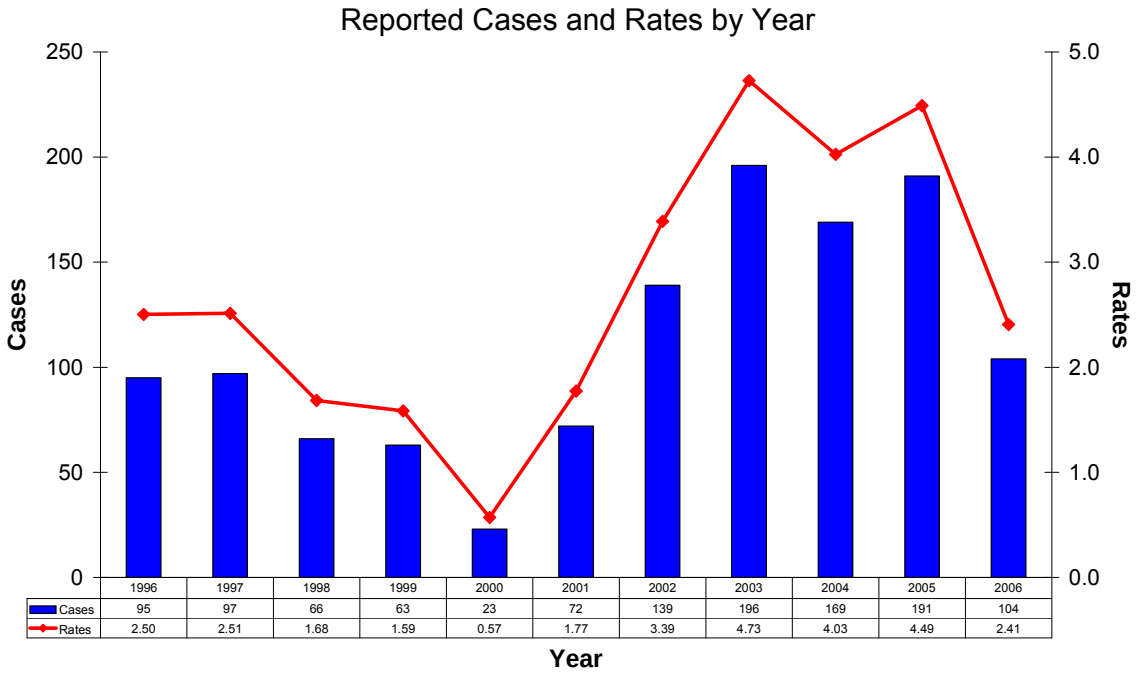
Reporting:

Acute hepatitis B is urgently reportable by phone within 24 hours to DHEC.

Chronic hepatitis B is reportable within 7 days to DHEC.

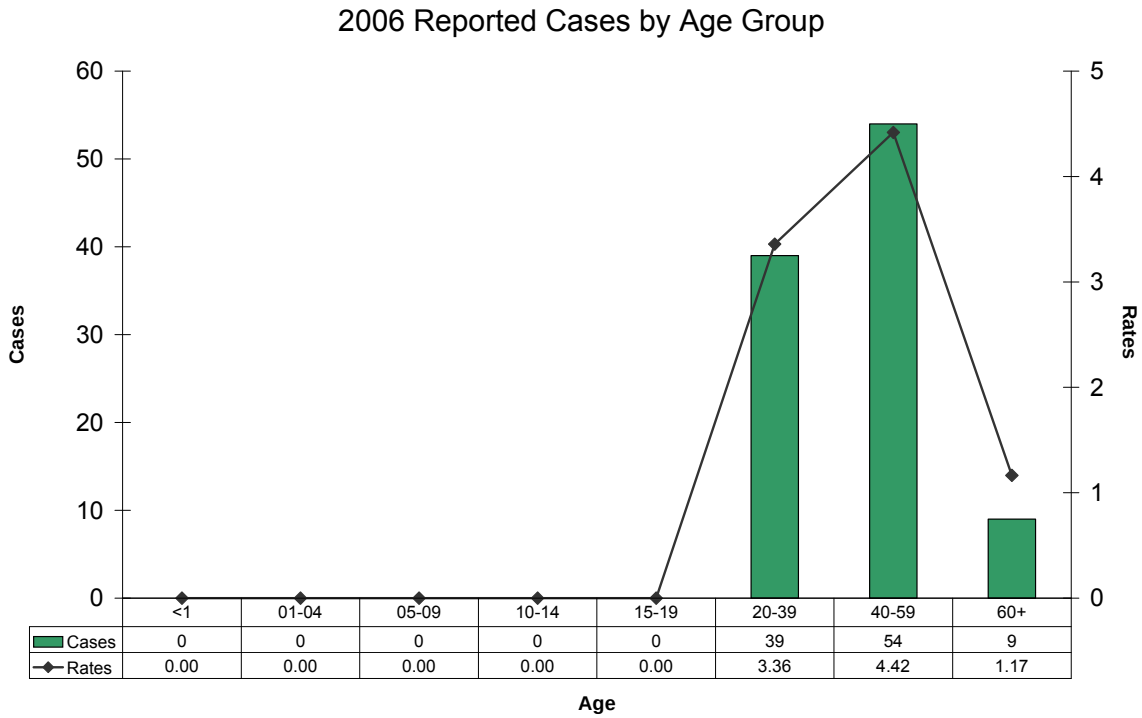
Note: Published Data regarding Hepatitis B and Hepatitis C are not always easy to interpret due to the fact that, for both conditions, some reports may refer only to "acute" infection, others only to "chronic" infection, and yet others to a combination of both. At the national level, routine reporting from states to the CDC has traditionally been only for "acute" cases. Similarly, in South Carolina, prior to 2003 only "acute" cases were computerized in the NETSS database that had been in use since the early 1990s. Since 2003, and with the advent of the new NEDSS system, DHEC has been gathering reports, usually from laboratory tests, of chronic hepatitis B or C. Even prior to 2003, however, in the late 1990s DHEC had created an informal "chronic hepatitis reporting system" which remained in use until it was replaced by NEDSS. South Carolina data presented here regarding chronic hepatitis should therefore be interpreted with caution as they reflect information collected at different times using slightly different systems and different methods. Despite their limitations, data concerning chronic hepatitis are important as they document the fact that many thousands of South Carolina residents are afflicted with these long-term, and often life-long, infections. In the past, efforts to document the prevalence of such infections were felt by some to be debatable, as curative treatment for chronic hepatitis B and C did not exist. In recent years, however, new and gradually improving anti-viral treatments for these conditions are becoming available and they offer hope of preventing cirrhosis and cancer of the liver which otherwise develop in an important proportion of patients. Thus, data regarding the prevalence of chronic hepatitis B and chronic hepatitis C are now likely to assume greater importance as they will provide a rational basis for developing nationwide and local programs in order to identify infected persons (many of whom are not aware of their infection), apply prevention measures to reduce transmission, and refer them for appropriate and now potentially curative treatment which can prevent the devastating and expensive long-term consequences of infection.

Hepatitis B, Acute



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Cases	95	97	66	63	23	72	139	196	169	191	104
Rates	2.50	2.51	1.68	1.59	0.57	1.77	3.39	4.73	4.03	4.49	2.41

Hepatitis B, Acute



	<1	01-04	05-09	10-14	15-19	20-39	40-59	60+
Cases	0	0	0	0	0	39	54	9
Rates	0.00	0.00	0.00	0.00	0.00	3.36	4.42	1.17

Hepatitis B, Perinatal

Perinatal Hepatitis B Cases in 2006: 0

Number of Infants Born to Hepatitis B-Positive Women in 2006: 78

Epidemiology:

Perinatal transmission of hepatitis B virus (HBV) infection is highly efficient and usually occurs from blood exposures during labor and delivery. In utero transmission of HBV is rare, accounting for <2% of perinatal infections in most studies. The risk of an infant acquiring HBV from an infected mother as a result of perinatal exposure is 70% to 90% for infants born to mothers who are HBsAg and HBeAg positive; the risk is 5% to 20% for infants born to HBeAg-negative mothers.

More than 90% of infants infected perinatally will develop chronic HBV infection. Up to 25% of infants and children who acquire chronic HBV infection eventually develop HBV-related hepatocellular carcinoma or cirrhosis.

According to CDC estimates, approximately 200 women with chronic hepatitis B virus infection give birth in South Carolina each year. The ACIP recommends that these infants receive appropriate immunoprophylaxis ≤12 hours of birth and case management to assure completion of the vaccine series and post-vaccination serologic testing.

Hospitals should have policies and procedures in place in order to assure that infants born to hepatitis B-positive mothers receive appropriate vaccination at birth. These policies and procedures should include the following:

1. Review HBsAg test results for all pregnant women at the time of admission for labor and delivery

2. Conduct HBsAg testing as soon as possible after admission for pregnant women who do not have a documented HbsAg result and for pregnant women identified as being at risk for HBV infection during pregnancy (e.g., >1 sex partner in the previous 6 months, evaluation or treatment for a sexually transmitted disease, recent or current injection-drug use, HBsAg-positive sex partner).

3. Administer hepatitis B vaccine and hepatitis B immune globulin within 12 hours of birth to all infants born to HBsAg-positive mothers.

4. Administer hepatitis B vaccine within 12 hours of birth to all infants born to women of unknown HBsAg status.

5. Document on the infant's medical record the maternal HBsAg test results and the infant's hepatitis B immunization.

Reporting:

A positive HBsAg result with each pregnancy is reportable within 7 days to DHEC. An infant with a positive postvaccination serology (e.g. positive HBsAg result) is reportable within 7 days to DHEC.

Perinatal Hepatitis B: Case Management Data - 2006

The most recent data regarding Perinatal Hepatitis B was submitted to CDC in March 2007 for CY 2005 births.

During 2005 the following numbers were reported to DHEC:

- Number of infants born to HbsAg-positive women – 88
- Number of infants born to HbsAg-positive women who were entered into DHEC perinatal case management tracking system - 88

Of the 88 infants entered into DHEC perinatal hepatitis B case management tracking system:

- Number who received HBIG and dose #1 of Hepatitis B vaccine within 1 calendar day of birth – 81
- Number who did not receive HBIG and dose #1 of Hepatitis B vaccine within 1 calendar day of birth or Unknown – 1
- Number who completed Hepatitis B vaccine series by 12 months of age – 65
- Number who received post vaccination serologic testing indicating evidence of immunity- 43
- Number who received post vaccination serologic testing indicating infection with Hepatitis B virus – 0

Perinatal Hepatitis B Prevention Program

Annual Assessments by Birth Year	**'97**	**'98**	**'99**	**'00**	**'01**	**'02**	**'03**	**'04**	**'05**	**'06**
# Infants born to HbsAg+ women	**58**	**33**	**28**	**46**	**40**	**43**	**41**	**41**	**88***	**78**
# Infants who received HBIG and Hep B-1 at birth (within 24 hrs)	**48**	**31**	**24**	**42**	**35**	**39**	**37**	**37**	**81**	**76**
# Infants who received HBIG and 3 doses Hep B by 12 months of age	**43**	**30**	**16**	**39**	**31**	**31**	**33**	**31**	**65**	**64**
# Infants who received post-vaccination serologic testing	**38**	**28**	**9**	**24**	**22**	**17**	**32**	**23**	**43**	**33**
# Infants chronically infected at birth	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

* The increase in infants born to HBsAg positive women beginning in 2005 is due to improved surveillance and reporting via NEDSS.

Hepatitis C, Acute and Chronic

2006 Acute Hepatitis C Cases in SC: 1 Cases per 100,000 population: 0.02

2006 Chronic Hepatitis C Cases in SC: 4740 Cases per 100,000 population: 109.7

Characteristics:

Acute hepatitis C tends to be mild and insidious in onset, and most infections are asymptomatic. Jaundice occurs in <20% of patients, and abnormalities in liver function tests generally are less pronounced than abnormalities in patients with hepatitis B virus infection. Persistent, chronic HCV infection occurs in 50% to 60% of infected children. Most children with chronic infection are asymptomatic. Chronic hepatitis develops in approximately 60% to 70% of infected adults. The course of chronic HCV varies widely and depends on a number of factors, including age, race, sex, and alcohol consumption. Chronic HCV infection can result in fibrosis, cirrhosis, hepatocellular carcinoma, and hepatic decompensation.

The incubation period for HCV disease average 6 to 7 weeks, with a range of 2 weeks to 6 months. The time from exposure to development of viremia generally is 1 to 2 weeks.

The two major types of tests available for the laboratory diagnosis of HCV infections are: 1) tests that detect antibodies against the virus, such the enzyme immunoassay (EIA) and the recombinant immunoblot assay, which are at least 97% sensitive and more than 99% specific, and 2) qualitative and quantitative tests that detect/measure virus, such the HCV RNA assay. Quantitative determination of HCV levels provides information on the likelihood of response to treatment in patients undergoing antiviral therapy. Liver biopsy can provide direct histological assessment of liver injury due to HCV but cannot be used to diagnose HCV infection.

Therapy is aimed at inhibiting HCV replication, eradicating infection, and improving the natural history of disease. Treatment for HCV—a 6-to-12 month course of pegylated interferon and ribavirin—has many drawbacks, including potentially severe side effects. On average, treatment eradicates HCV in about half of patients, but various factors can dramatically increase or decrease the likelihood of a sustained virological response. Initial reports suggest that HCV treatment may be particularly effective during acute infection. Treatment may also improve the condition of the liver, even in people who do not have a sustained virological response. In addition, vaccinations for hepatitis A and B are recommended by CDC for persons with HCV infection in order to further reduce damage to the liver.

Since viral inactivation procedures and effective donor screening have almost completely eliminated the risk of hepatitis C infection from blood transfusions and blood products, the majority of new HCV infections occur via injection drug use with shared, unsterilized equipment.

Epidemiology:

Hepatitis C virus (HCV) is the most common bloodborne pathogen and is, therefore, a serious global health problem worldwide; an estimated 170 million people have been infected with the hepatitis C virus (HCV). In the United States, the Centers for Disease Control (CDC) estimate that at least 4 million people have been infected with HCV; 2.7 million of them have developed chronic hepatitis C. The U.S. estimate may be low, as many high-prevalence populations were excluded from HCV surveillance. Up to one quarter of HIV-positive individuals in the U.S. are coinfected with HCV. In South Carolina, DHEC estimates that between 50,000 and 70,000 people are infected. Most people are not aware that they are infected. Hepatitis C is the

leading cause of chronic liver disease in the U.S. and is the leading indication for liver transplants.

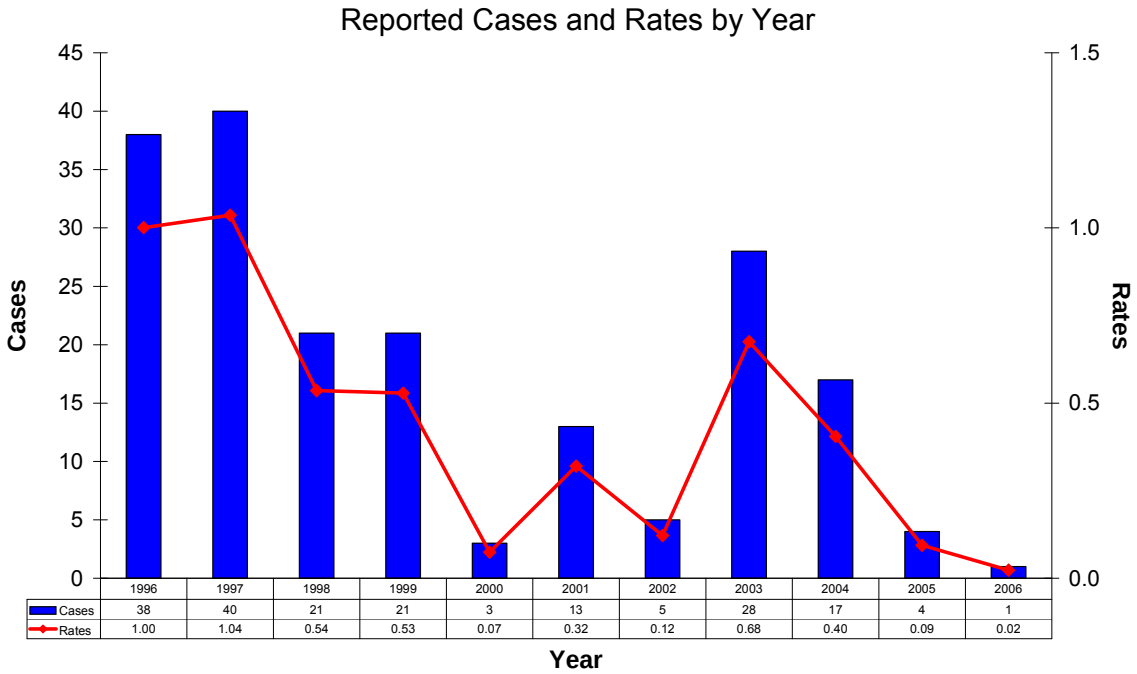
The highest seroprevalence of HCV infection (60% - 90%) are in people with large or repeated direct percutaneous exposure to blood or blood products, such as injection drug users and people with hemophilia who were treated with clotting factor concentrates before 1987. HCV is prevalent among current and former injection drug users; up to 90% have been infected. While it has been speculated that HCV may be transmitted from shared tubes used for intranasal drug use and from crack pipes, the risk of HCV transmission from non-injection drug use has not been quantified. Prevalences are moderately high among people with frequent but smaller direct percutaneous exposures, such as patients receiving hemodialysis (10% - 20%). HCV can also be transmitted through sex and perinatally from mother to infant. Men who have sex with men, sex workers, people with multiple sex partners, and partners of HIV/HCV-coinfected persons have higher-than-average HCV prevalence rates (1% - 10%), yet the routes and risks of sexual transmission are unclear. Sexual transmission among monogamous couples is uncommon, with infection found only in 1.5% of spouses without other risk factors. The risk of HCV transmission from mother to infant is about 5%; the risk increases if the mother is HIV/HCV coinfected. Transmission among family contacts also is uncommon but could occur from direct or inapparant percutaneous or mucosal exposure to blood.

Reporting:

Hepatitis C is reportable within 7 days to DHEC.

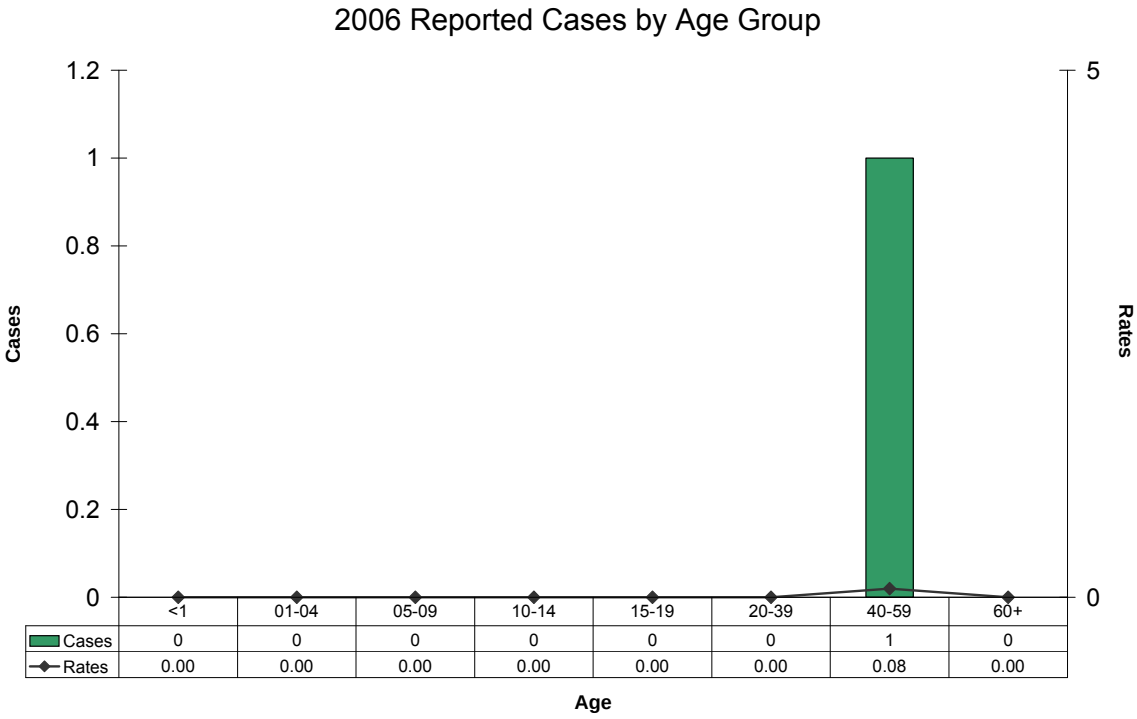
Note: Published Data regarding Hepatitis B and Hepatitis C are not always easy to interpret due to the fact that, for both conditions, some reports may refer only to "acute" infection, others only to "chronic" infection, and yet others to a combination of both. At the national level, routine reporting from states to the CDC has traditionally been only for "acute" cases. Similarly, in South Carolina, prior to 2003 only "acute" cases were computerized in the NETSS database that had been in use since the early 1990s. Since 2003, and with the advent of the new NEDSS system, DHEC has been gathering reports, usually from laboratory tests, of chronic hepatitis B or C. Even prior to 2003, however, in the late 1990s DHEC had created an informal "chronic hepatitis reporting system" which remained in use until it was replaced by NEDSS. South Carolina data presented here regarding chronic hepatitis should therefore be interpreted with caution as they reflect information collected at different times using slightly different systems and different methods. Despite their limitations, data concerning chronic hepatitis are important as they document the fact that many thousands of South Carolina residents are afflicted with these long-term, and often life-long, infections. In the past, efforts to document the prevalence of such infections were felt by some to be debatable, as curative treatment for chronic hepatitis B and C did not exist. In recent years, however, new and gradually improving anti-viral treatments for these conditions are becoming available and they offer hope of preventing cirrhosis and cancer of the liver which otherwise develop in an important proportion of patients. Thus, data regarding the prevalence of chronic hepatitis B and chronic hepatitis C are now likely to assume greater importance as they will provide a rational basis for developing nationwide and local programs in order to identify infected persons (many of whom are not aware of their infection), apply prevention measures to reduce transmission, and refer them for appropriate and now potentially curative treatment which can prevent the devastating and expensive long-term consequences of infection.

Hepatitis C, Acute



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Cases	38	40	21	21	3	13	5	28	17	4	1
Rates	1.00	1.04	0.54	0.53	0.07	0.32	0.12	0.68	0.40	0.09	0.02

Hepatitis C, Acute



	<1	01-04	05-09	10-14	15-19	20-39	40-59	60+
Cases	0	0	0	0	0	0	1	0
Rates	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00

Hepatitis D

2006 Cases: 0 2006 Cases per 100,000: 0.0

Characteristics:

Hepatitis D virus (HDV) causes hepatitis only in persons with acute or chronic hepatitis B virus (HBV) infection. HDV requires HBV as a helper virus and cannot produce infection in the absence of HBV. HDV can cause an infection at the same time as the initial HBV infection (coinfection), or it can infect a person already chronically infection with HBV (superinfection). The incubation period for HDV superinfection is approximately 2 to 8 weeks. When HBV and HDV viruses infect simultaneously, the incubation period is similar to that of HBV, which is 45 to 160 days; average, 90 days.

HDV infection can convert an asymptomatic or mild chronic HBV infection into fulminant or more severe or rapidly progressive disease. Acute coinfection with HBV and HDV usually causes an acute illness indistinguishable from acute HBV infection alone, except that the likelihood of fulminant hepatitis can be as high as 5%.

Transmission of HDV occurs by parenteral, percutaneous, or mucous membrane inoculation. HDV can be acquired from blood or blood products, through injection drug use, or by sexual contact, but only if HBV is also present. Transmission from mother to newborn is uncommon.

Transmission may occur among family members with chronic HBV infection.

Laboratory tests for HDV include radioimmunoassay and enzyme immunoassay for antibody to HDV. Persons should also be tested for HBV infection.

Epidemiology:

High-prevalence areas of HDV infection include southern Italy and parts of Eastern Europe, South America, Africa, and the Middle East. Although HBV is common in Asia, HDV is not. In the United States, HDV infection is found most commonly in injection drug users, people with hemophilia, and people who have immigrated from areas with endemic infection.

Prevention:

Prevention of HDV infection is immunization for HBV infection.

Reporting:

Hepatitis D is reportable with 7 days to DHEC.

Hepatitis E

2006 Cases: 0 2006 Cases per 100,000: 0.0

Characteristics:

Hepatitis E virus (HEV) infection is an acute illness with symptoms including jaundice, malaise, anorexia, fever, abdominal pain, and arthralgia. HEV is transmitted by the fecal-oral route. Unlike other hepatitis infections, HEV is commonly found in wild and domestic animals, which may provide an important source of infection in humans. Persons also often acquire HEV infection from contaminated water. Person-to-person transmission of HEV appears to be much less efficient than with hepatitis A virus (HAV). Chronic HEV infection has not been reported.

Laboratory testing for IgM and IgG anti-HEV is available. However, results should be interpreted with caution, particularly in cases with no recent history of travel to an endemic country.

Epidemiology:

In the United States, HEV infection is uncommon and generally occurs in travelers returning from countries with endemic infection, such as India, Mexico, and other developing countries.

Prevention:

The most effective prevention measure is the provision of safe water. A preventive vaccine has been developed but currently is not available.

Reporting:

Hepatitis E is reportable within 7 days to DHEC.

Influenza

2006 confirmed cases in SC: 175 2006 cases per 100,000: 4.04

(35(CHESS)+DHEC Bureau Labs 140 cultures=175)

Characteristics:

Influenza, or flu, is a seasonal virus caused by Influenza type A or type B. Flu symptoms may include: fever, headache, extreme tiredness, dry cough, sore throat, runny or stuffy nose, and muscle aches. Gastrointestinal symptoms, such as nausea, vomiting, and diarrhea, may also occur, but are more common in children than adults. Complications may include bacterial pneumonia, ear infections, sinus infections, dehydration, and worsening of chronic medical conditions, such as congestive heart failure, asthma, or diabetes.

Epidemiology:

Though influenza can occur year round, the United States sees an "epidemic" or increase in cases between October and May; this period is otherwise known as the "Flu Season." An epidemic/routine flu season should not be confused with a pandemic, which is defined as a rapid worldwide infection with a new influenza type never seen before in humans that can spread rapidly from person to person.

For a number of reasons, it is never possible to know exactly how many influenza cases South Carolina has in a given flu season:

- Not everyone who is ill with influenza presents to a healthcare provider, urgent care center or emergency department for testing, diagnosis or treatment. Many flu patients simply stay home until they feel better.
- Not everyone who presents with influenza-like illness is reported to DHEC, unless there is a report of a positive flu culture or a positive rapid flu test.

DHEC uses three different systems, listed on the DHEC Influenza Surveillance page: http://www.scdhec.gov/health/disease/acute/flu.htm, to estimate the burden of influenza in South Carolina:

- DHEC monitors the number of positive influenza viral cultures that are performed by and/or reported to the SC Bureau of Laboratories.
- DHEC also requires reporting of positive rapid influenza tests. These are often performed in medical offices, or urgent care centers. These tests, while not as reliable as an influenza culture, can give a picture of the disease burden.
- DHEC recruits sentinel healthcare providers to report to the CDC the percentages of patients seen in any week, by age, with influenza-like illness (ILI.) ILI is defined as is: fever (>100 F), cough and/or sore throat, without another cause for those symptoms.

Surveillance data are posted on the DHEC website weekly. These data also determine the level of flu activity reported each week: No activity, sporadic, local, regional or widespread activity.

Prevention:

Immunizations for influenza are given each fall to cover the upcoming flu season. Although patients often do not seek influenza immunization after the New Year, the influenza season in South Carolina generally peaks in late February or in early March; thus "it is never too late to vaccinate."

Reporting: Positive rapid flu tests are reportable within 7 days, by number, to DHEC. Positive influenza cultures are reportable by name within 7 days to DHEC.

Kawasaki Disease / Kawasaki Syndrome

2006 Cases in SC: 3 (all in children under age 10) 2006 SC Cases per 100,000: 0.07

Characteristics:

Kawasaki Disease is an acute, self-limited disease of childhood characterized by fever, rash, swelling of the hands and feet, irritation and redness of the whites of the eyes, swollen lymph glands in the neck, and irritation and inflammation of the mouth, lips, and throat. Serious complications of Kawasaki Disease include coronary artery dilatations and aneurysms; it is a leading cause of acquired heart disease in developed nations, including the United States. The standard treatment with intravenous immunoglobulin and aspirin substantially decreases the development of these coronary artery abnormalities. In Japan, many cases of fatal and nonfatal MI in young adults have been attributed to "missed" Kawasaki disease in childhood.

Since its identification in Japan in 1967, a contagious cause has been theorized, but not demonstrated until 2005, when research demonstrated a possible viral cause.

Epidemiology:

SC: SC's population 9 years of age and younger in 2005 was estimated at 550,540. There were 0.093 cases per 100,000 in this age population in SC in 2006. 37 of 38 Kawasaki cases (97.4%) in SC from 1996 through 2006 occurred in children under 10 years of age.

US and Worldwide: Kawasaki Disease occurs worldwide, with the highest incidence in Japan, and it most often affects boys and younger children. It may have a winter-spring seasonality, and community-wide outbreaks have been reported occasionally. In the continental United States, population-based and hospitalization studies have estimated an incidence of Kawasaki Disease ranging from 9 to 19 per 100,000 children younger than 5 years of age.

Prevention:

There is currently no preventive therapy for Kawasaki Disease; treatments are primarily aimed at prevention of cardiac complications. There are no Public Health actions taken for cases.

Reporting:

In 2006, Kawasaki Disease was reportable within 7 days in South Carolina. In January 2007, Kawasaki Disease was removed from the List of Reportable Conditions.

Legionellosis (Legionnaires' Disease)

2006 Cases: 9 2006 Cases per 100,000: 0.21

During 2005-2006, nationwide legionellosis (Legionnaires' Disease) case counts increased for the second year in a row. In 2005, in collaboration with the CDC, the Council of State and Territorial Epidemiologists adopted a position statement to improve reporting of travel-associated legionellosis; this might have resulted in an increase in case reporting. Nearly all regions of the United States, with the exception of the West North Central area, reported more cases in 2006 than in 2005. Other possible explanations for the increase include an actual increase in disease incidence or increase use of *Legionella* diagnostic tests.

Characteristics. Legionnaires' disease (LD) is the more severe form of Legionellosis and is characterized by pneumonia, commencing 2-10 days after exposure. Pontiac fever is an acute-onset, flu-like, non-pneumonic illness, occurring within a few hours to two days of exposure.

At least 46 species and 70 serogroups of *Legionella pneumophila* and other *Legionella* species have been identified. *L. pneumophila*, an ubiquitous aquatic organism that thrives in warm environments (32°- 45°C), causes over 90% of LD in the United States.

Epidemiology:

Legionellosis case rates reported in South Carolina since 1996 appear fairly flat when compared to the increasing US rate during that same time period.

An estimated 8,000-18,000 cases occur each year in the United States, but only a fraction of these are reported. Most cases are sporadic; 23% are nosocomial and 10%-20% can be linked to outbreaks. More illness is usually found in the summer and early fall, but cases occur year round.

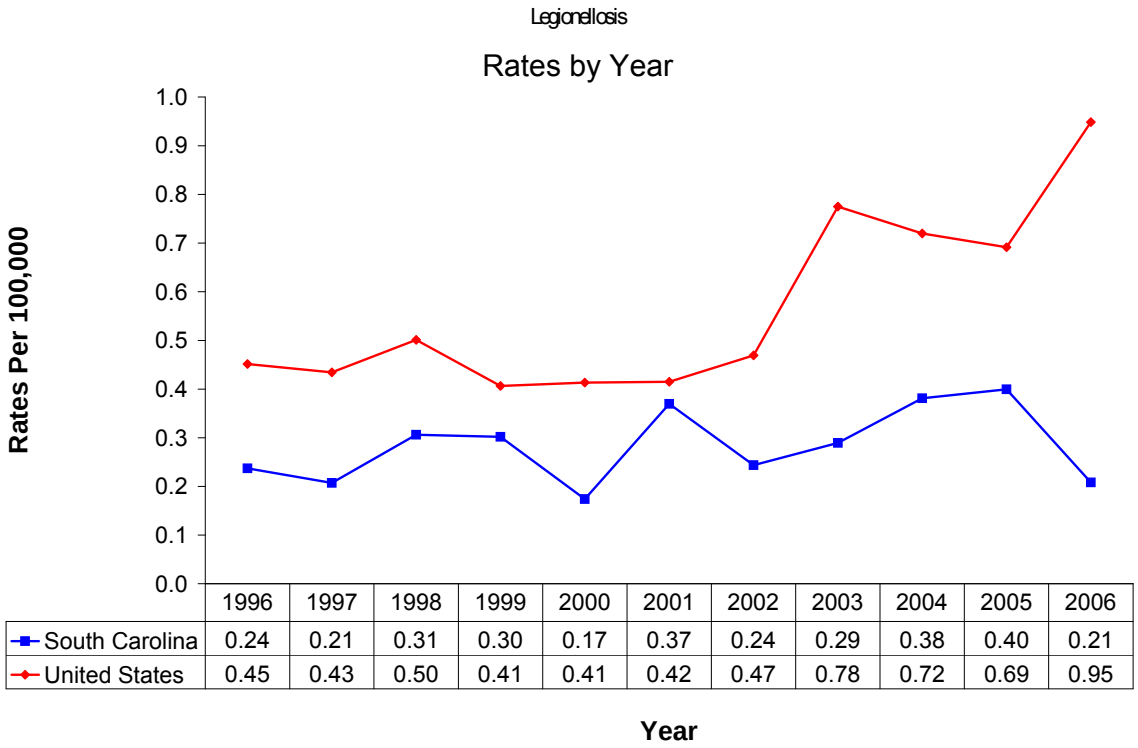
Outbreaks of *Legionella* are considered when two or more individuals become ill in the same place at about the same time, such as patients in hospitals, hotels, water parks, etc. Outbreaks have been linked to aerosol sources in the community, or with cruise ships and hotels, with the most likely sources being whirlpool spas, cooling towers (air-conditioning units from large buildings), and water used for drinking and bathing.

While this disease is most frequently found in older people, usually 65 years of age or older, people who are smokers, or those with chronic lung disease (i.e. emphysema) as also at increased risk. In addition, people who have weak immune systems from diseases like cancer, diabetes, or kidney failure are also more likely to become ill from *Legionella* bacteria. People on immunosuppressive therapies (i.e., post-transplant, chemotherapy) are also at increased risk.

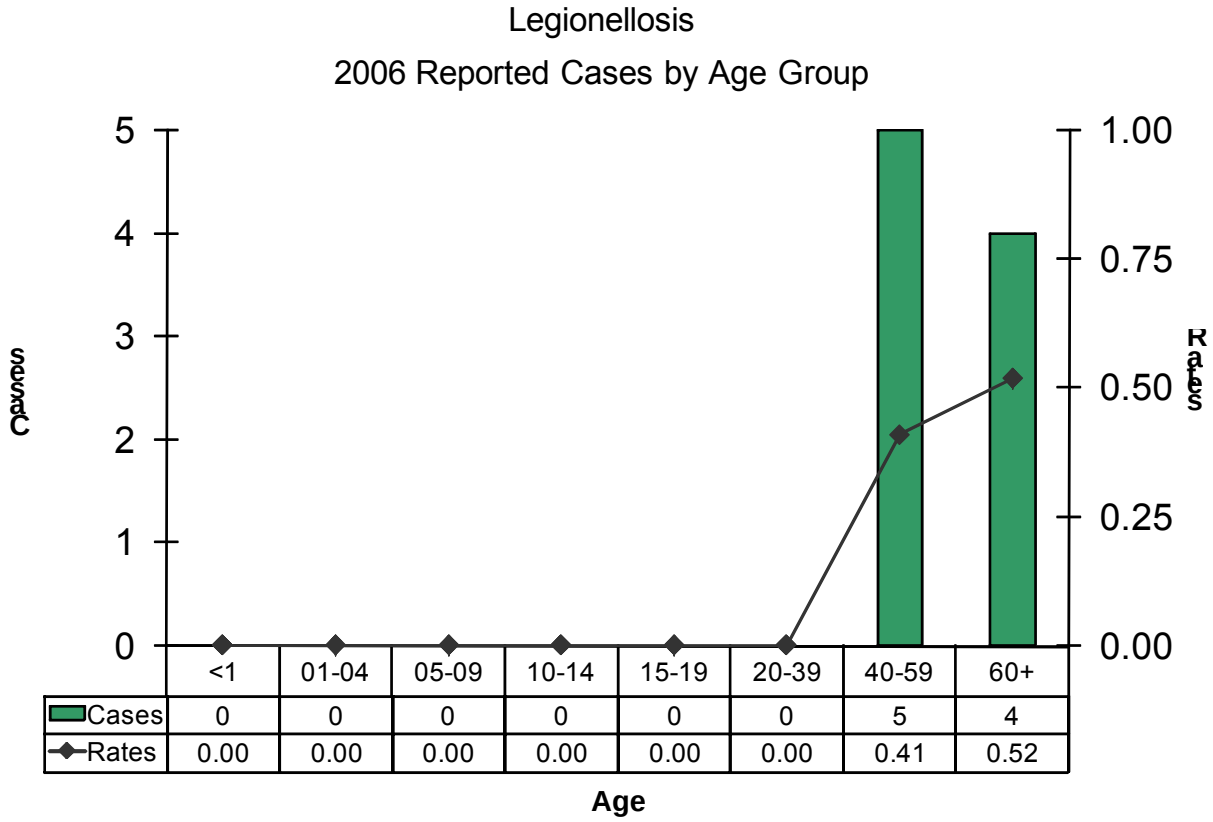
Sporadic cases of Legionnaires' disease were reported to the DHEC during 2006 with nine (9) cases reported. All cases were identified in individuals greater than 40 years of age and no outbreaks of LD were investigated during 2006.

Reporting:

Legionellosis is reportable within seven days.



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
South Carolina	0.24	0.21	0.31	0.30	0.17	0.37	0.24	0.29	0.38	0.40	0.21
United States	0.45	0.43	0.50	0.41	0.41	0.42	0.47	0.78	0.72	0.69	0.95



	<1	01-04	05-09	10-14	15-19	20-39	40-59	60+
Cases	0	0	0	0	0	0	5	4
Rates	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.52

Leprosy / Hansen's Disease

2006 Cases in SC: 0 2006 Cases per 100,000: 0.00

Characteristics:

Hansen's Disease, more commonly known as Leprosy, is caused by *Mycobacterium leprae.* It is an infectious disease that affects the skin, peripheral nerves and mucous membranes, and other tissues, most notably the eye, the mucosa of the upper respiratory tract, muscles, bone and testes. Untreated, disseminated Hansen's Disease can be debilitating, with sensory loss resulting from nerve damage leading to loss of muscle control and crippling of hands and feet. Eye involvement may lead to blindness.

Leprosy is an ancient disease, described in ancient writings from the Sumerians. Its origin may have been in India, China, or Egypt. The disease described in Hebrew Scriptures as *"sara'at*" and translated *"lepra"* (hence *leprosy* in the Vulgate--see especially Leviticus 13 & 14) differs somewhat from the form of leprosy described since the Middle Ages.

Worldwide, 1-2 million persons are permanently disabled as a result of Hansen's disease. However, persons receiving antibiotic treatment (which may take one to three years to complete) or having completed treatment are considered free of active infection. Timely diagnosis and early treatment may help patients avoid deformities that historically have stigmatized leprosy patients.

Epidemiology:

SC: Two cases were diagnosed in SC in the past decade, one in 1995 and one in 1997.

US-CDC Numbers: 87 cases were reported to the CDC in 2005 (most recent data available.) 16 of these were in California, 22 in Hawaii, and 23 in Texas. Of note, of those patients for whom a race is indicated in MMWR reporting, ⅓ to nearly ½ of cases occurred in persons identified as Asian/Pacific Islander. Where gender was reported, males outnumbered females 38 to 26. The MMWR reports that the number of reported cases of Hansen disease in the United States peaked at 361 in 1985 and has declined since 1988. The MMWR first noted in 2001 that discrepancies may exist between numbers reported to the CDC via the NEDSS reporting system and those cases reported via the National Hansen's Disease Reporting System.

US-NHDP: The National Hansen's Disease Program (NHDP) in Baton Rouge, LA reports that there are approximately 6,500 cases on the US Hansen's Disease Registry, of which 3300 require active medical management. This number includes all cases reported since the registry began and who are still living. The NHDP reports that 166 new cases of Hansen's disease were reported in the U.S. in 2005, from 30 different states. 60% (100) of new cases were reported by five states: California (24), Louisiana (21), Massachusetts (19), New York (12) and Texas (24). More than half (88) of new cases were in people who identified themselves as white; 72% (120) of new cases were in males, and the ages of individuals with new cases ranged from 6 to 93 years

Worldwide: In 2002 (most recent data), the number of new cases detected worldwide was 763,917. Hansen's is most common in tropical climates. The largest numbers of Hansen's disease patients continue to be in Southeast Asia and Central Africa with smaller numbers in South and Central America. The largest numbers of patients in the Western Hemisphere are in Brazil. In 2002, WHO listed Brazil, Madagascar, Mozambique, Tanzania, and Nepal as having 90% of worldwide cases.

Prevention:

Although the mode of transmission of Hansen's disease remains uncertain, most investigators think that *M. leprae* is usually spread from person to person in respiratory droplets. Prevention efforts focus on treatment of infected individuals, since most transmission appears to be related to prolonged exposure. Incubation periods for Hansen's Disease range from months to decades.

Reporting:

Hansen's Disease is reportable in 7 days in SC. As of 2006, it is no longer mandatorily reportable in all 50 states.

Hansen's Illustrations:

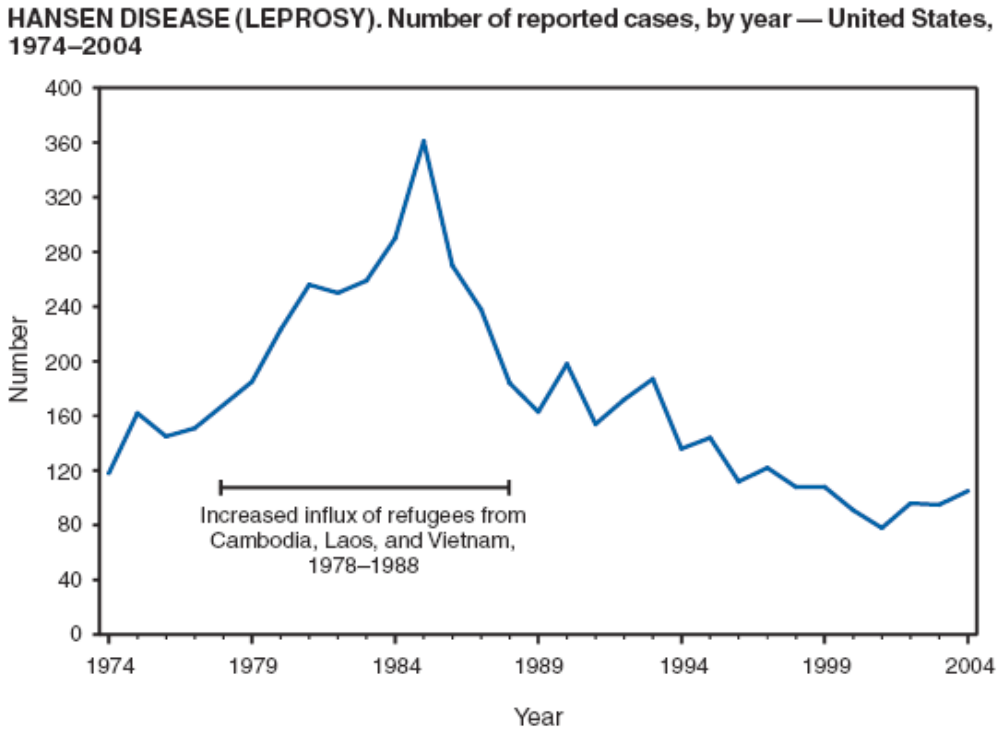


Image Source: MMWR 2004 Surveillance Summary (pub 6/16/2006)

Leptospirosis

2006 Cases in SC: 0 2006 Cases per 100,000: 0

Characteristics:

Leptospirosis is described by the CDC as the most widespread zoonotic disease in the world. Also known as "swamp fever," Leptospirosis is a bacterial disease transmitted directly or indirectly from a mammalian host. Most cases are thought to be caused by contact with *Leptospira* contaminated water or soil. The bacteria, thin, mobile spirochetes, may be free-living in freshwater, soil, or mud, and are mainly found in tropical areas. Humans may also be infected through direct contact with urine or fluids of parturition of infected animals.

Symptoms of Leptospirosis include fever, headache, chills, muscle aches, vomiting, jaundice, anemia, and sometimes a rash. The incubation period usually is 7 days, with a range of 2-29 days. Meningitis, hemorrhage, hepatomegaly, pulmonary hemorrhage, ARDS and jaundice are among the severe features of advanced or untreated disease. The case fatality rate is 1 to 5%.

Epidemiology:

US: Leptospirosis is not nationally reportable, but estimates are that 100-200 cases of Leptospirosis are identified annually, with 50% occurring in Hawaii. A number of cases of Leptospirosis in the US have been associated with athletic activities occurring in swampy water, either swimming or canoeing in or drinking contaminated water. The largest recorded outbreak in the continental United States (110 cases in a group of 775 exposed persons who participated in triathlons, which included swimming in a lake) occurred in June and July 1998.

SC: The last two reported cases in South Carolina occurred in 1995 in residents of the Upstate.

Zoonotic: Because of their outdoor activities and frequent contact with water or soil contaminated with the organism, dog infections are not uncommon. Dog vaccination is not completely effective due to a limited coverage in the vaccine for the numerous types of the organism. Infected dogs theoretically pose a risk of transmission to their owners through contact with their urine, although such direct transmission has been infrequently documented.

Prevention:

There are 13 named and 4 unnamed species of pathogenic leptospires, with over 200 serologic variants. Previous infection does not confer immunity to other strains. Preventive measures include use of boots and gloves in high-risk places, including recently flooded soil and swampy or flooded areas. Rodent control decreases run-off and can help reduce spread. Medications taken for malaria chemoprophylaxis was confer some protection against Leptospirosis and may be considered for travelers at increased risk of exposure.

Reporting: Leptospirosis is reportable within 7 days to DHEC.

Listeriosis

2006 Cases in SC: 9 2006 Cases per 100,000: 0.2

Characteristics:

Listeriosis, a serious infection caused by eating food contaminated with the bacterium *Listeria monocytogenes*, has recently been recognized as an important public health problem in the United States. The disease affects primarily pregnant women, newborns, and adults with weakened immune systems. A person with listeriosis has fever, muscle aches, and sometimes gastrointestinal symptoms such as nausea or diarrhea. If infection spreads to the nervous system, symptoms such as headache, stiff neck, confusion, loss of balance, or convulsions can occur. Infected pregnant women may experience only a mild, flu-like illness; however, infections during pregnancy can lead to miscarriage or stillbirth, premature delivery, or infection of the newborn.

Epidemiology:

In the United States, an estimated 2,500 persons become seriously ill with listeriosis each year. Of these, 500 die. *Listeria monocytogenes* is found in soil and water. Vegetables can become contaminated from the soil or from manure used as fertilizer. Animals can carry the bacterium without appearing ill and can contaminate foods of animal origin such as meats and dairy products. The bacterium has been found in a variety of raw foods, such as uncooked meats and vegetables, as well as in processed foods that become contaminated after processing, such as soft cheeses and cold cuts at the deli counter. Unpasteurized (raw) milk or foods made from unpasteurized milk may contain the bacterium.

Listeria is killed by pasteurization and cooking; however, in certain ready-to-eat foods such as hot dogs and deli meats, contamination may occur after cooking but before packaging.

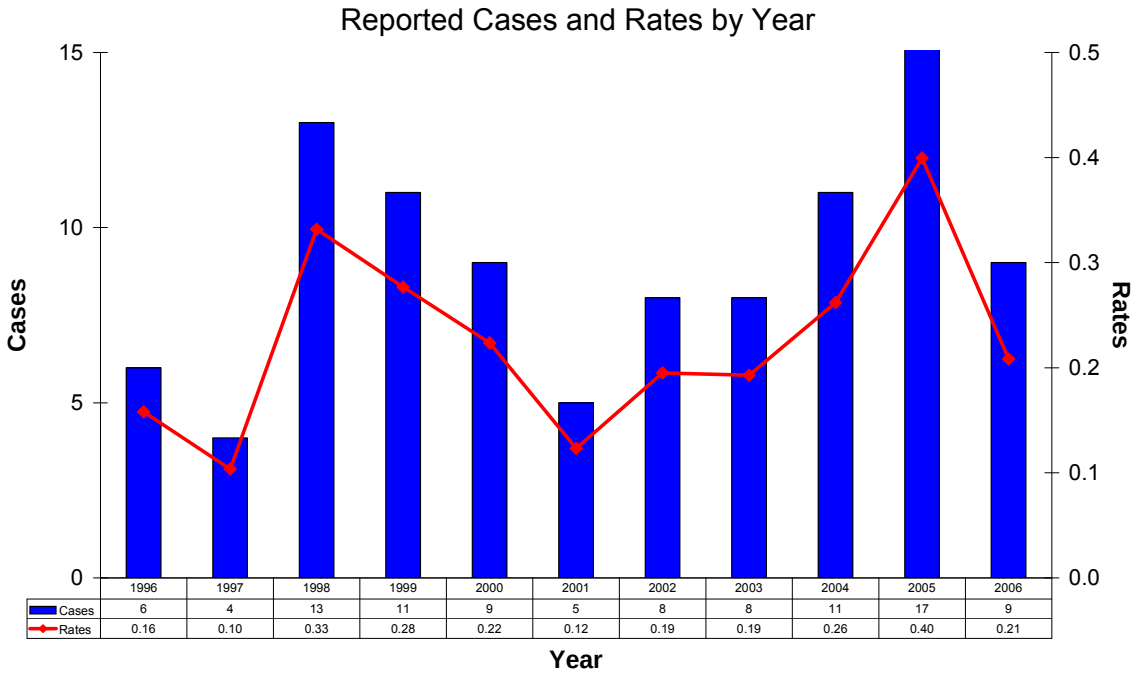
In South Carolina, nine cases of listeriosis were reported to the DHEC in 2006. The overall incidence rate in South Carolina was 0.2 cases per 100,000 population. There were no known outbreaks of listeriosis in 2006. Cases occurred among residents of 8 counties. In 2006, cases ranged in age from under 1 to 76 years with a median age of 45. The majority of cases were male, with 66% of case reports.

Listeriosis has been reportable in South Carolina for the last ten years. Nationally, listeriosis has been reportable since 2000. Over the last ten years, an average of 0.2 cases of listeriosis per 100,000 population were reported in South Carolina per year. The number of reports received by the DHEC in 2006 was within the expected range of case reports based on the last five years of data. It is important to note that in 2004 listeriosis was added as a disease for which the DHEC requests an isolate be sent to the state health laboratory. The CDC report a national average of 0.2 cases of listeriosis per 100,000 population.

Reporting:

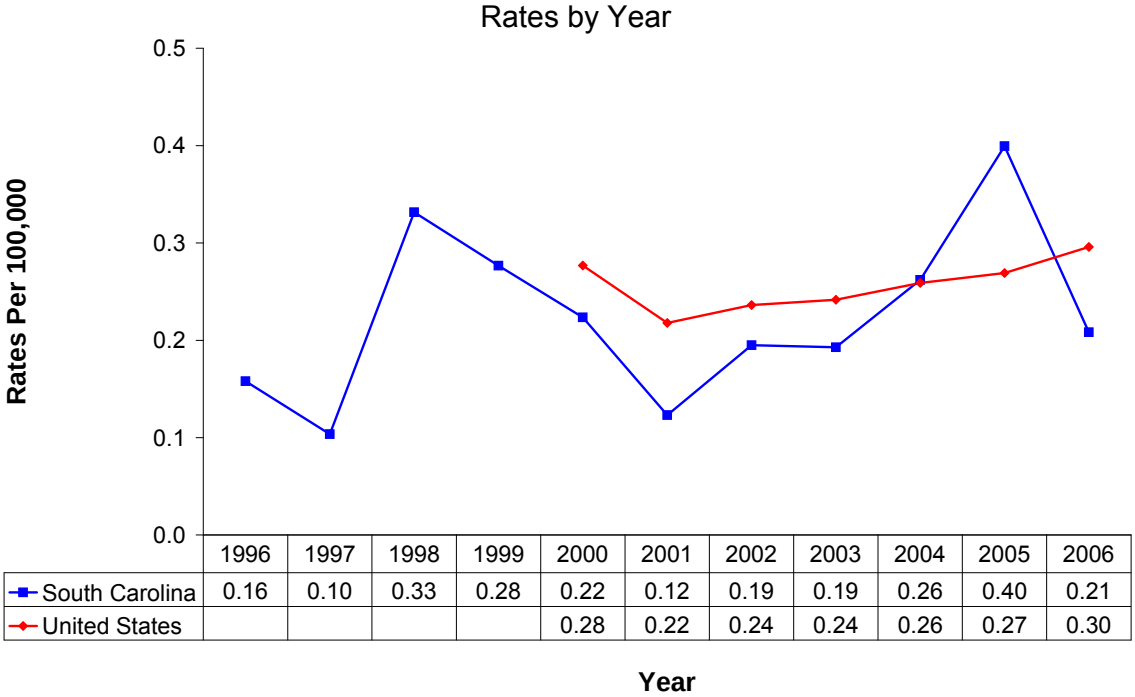
Listeriosis is reportable within 7 days in South Carolina.

Listeriosis



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Cases	6	4	13	11	9	5	8	8	11	17	9
Rates	0.16	0.10	0.33	0.28	0.22	0.12	0.19	0.19	0.26	0.40	0.21

Listeriosis



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
South Carolina	0.16	0.10	0.33	0.28	0.22	0.12	0.19	0.19	0.26	0.40	0.21
United States					0.28	0.22	0.24	0.24	0.26	0.27	0.30

Lyme Disease

2006 Cases in SC: 18 2006 Cases per 100,000: 0.42

Characteristics:

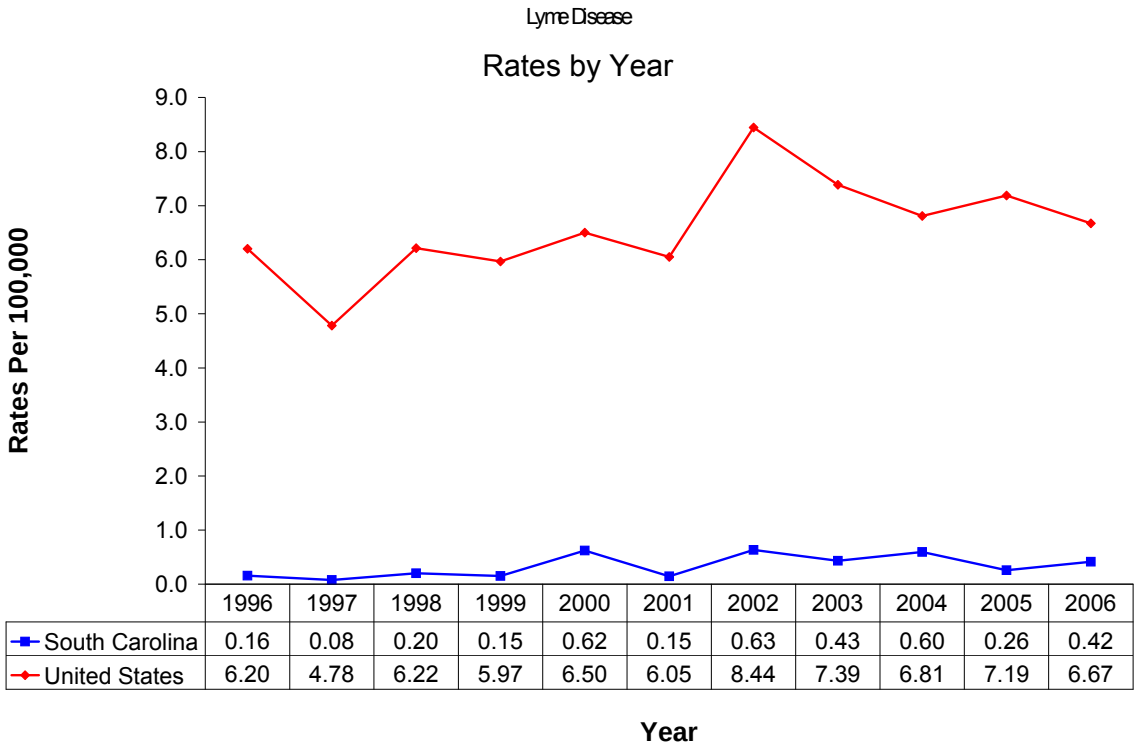
Lyme disease has three stages of clinical symptoms. Initially after a tick bite there is a localized rash, sometimes referred to as a 'bull's eye' lesion. The second stage takes place several weeks after the bite and consists of a body rash with lesions smaller in size then the 'bull's eye'. The third stage of Lyme disease manifests itself as arthritis, affecting large joints such as knees and hips.

Epidemiology:

Lyme disease is a tick borne disease most prevalent in the northeastern part of the United States. Over the past 10 years the southeastern U.S. (Geogia, North Carolina and South Carolina) has had lower levels of confirmed cases in comparison to the rest of the country. The 2006 incidence rates per 100,000 of confirmed Lyme disease in South Carolina, North Carolina and Georgia was 0.5, 0.4 and 0.1, respectively. 2006 incidence rates per 100,000 in New York, New Jersey and Connecticut was 23.1, 27.9 and 51.0, respectively.

Reporting:

Lyme disease is reportable within 7 days to DHEC.



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
South Carolina	0.16	0.08	0.20	0.15	0.62	0.15	0.63	0.43	0.60	0.26	0.42
United States	6.20	4.78	6.22	5.97	6.50	6.05	8.44	7.39	6.81	7.19	6.67

Lymphogranuloma venereum

2006 Cases in SC: 0 2006 Cases per 100,000: 0.0

Characteristics:

Lymphogranuloma venereum (LGV) is a systemic, sexually transmitted disease caused by a type of Chlamydia trachomatis.

Epidemiology:

Prevalent in developing countries, LGV has been relatively rare in industrialized countries. However, beginning in late 2003 and continuing to the present time, outbreaks of LGV proctitis among men who have sex with men (MSM), the majority of whom were HIV infected, have been reported in Europe. There is no national surveillance for LGV in the United States. In 1995, LGV was removed from the list of nationally notifiable disease. However, reporting is mandated in 24 states, and some of these states continue to report cases of LGV to the CDC.

The CDC did not publish national data for 2006 due to low numbers of cases reported. South Carolina does require reporting of LGV and reported 0 cases to CDC for 2006. S.C. trend data is not appropriate for this disease since the numbers have been small each year.

Reporting:

Lymphogranuloma venereum is reportable within 7 days to DHEC.

Malaria

2006 Cases in SC: 9 2006 Cases per 100,000: 0.21

All the malaria cases in South Carolina in 2006 were imported from other countries.

Characteristics:

Malaria is a vector borne disease caused by the bite of a female Anopheles mosquito infected with one of several species of an intraerythrocytic protozoa: *Plasmodium vivax* , *Plasmodium ovale, Plasmodium falciparum* and Plasmodium malariae. Two species of Anopheles mosquito (of the 10 found in the US), Anopheles *quadrimaculatus* in the east and *Anopheles freeborni* in the west, were responsible for most of the malaria in this country prior to eradication. Less common modes of transmission include blood transfusions, congenital transmission, and contaminated needles or syringes.

Symptoms of malaria depend on the infecting species of plasmodium. Symptoms are often nonspecific, but fever usually is present. Other symptoms include headache, chills, increased sweating, back pain, myalgia, diarrhea, nausea, vomiting, and cough. Blood disorders such as anemia also occur. Malaria also poses a threat to pregnant women who may experience miscarriage or stillbirths. Untreated P. falciparum infections can rapidly progress to coma, renal failure, pulmonary edema, and death.

Epidemiology:

Worldwide, there are 300-500 million cases with 1.5-2.7 million deaths each year. Malaria is most prevalent in the tropical areas of the world. It is possible to contract malaria in temperate climates where the anopheles is present, such as a mosquito trapped in an airplane returning from a tropical country.

US. Malaria is considered eradicated in the US since the 1950's. Nonetheless, in 2004, 1,324 cases of malaria were reported in the US or one of its territories. Of these, 775 (58%) were identified US resident civilians with imported cases; 282 (21%) were identified as non-US resident civilians (nationality of the remainder was not known.) Of the cases for which location of infection is known, 3% were acquired in Oceania, 14.5% in Asia, 14:5% in the Americas and 68% in Africa. Four US deaths were attributed to malaria, including two caused by P. falciparum, one by P. vivax, and one by a mixed infection with P. falciparum and P. malariae.

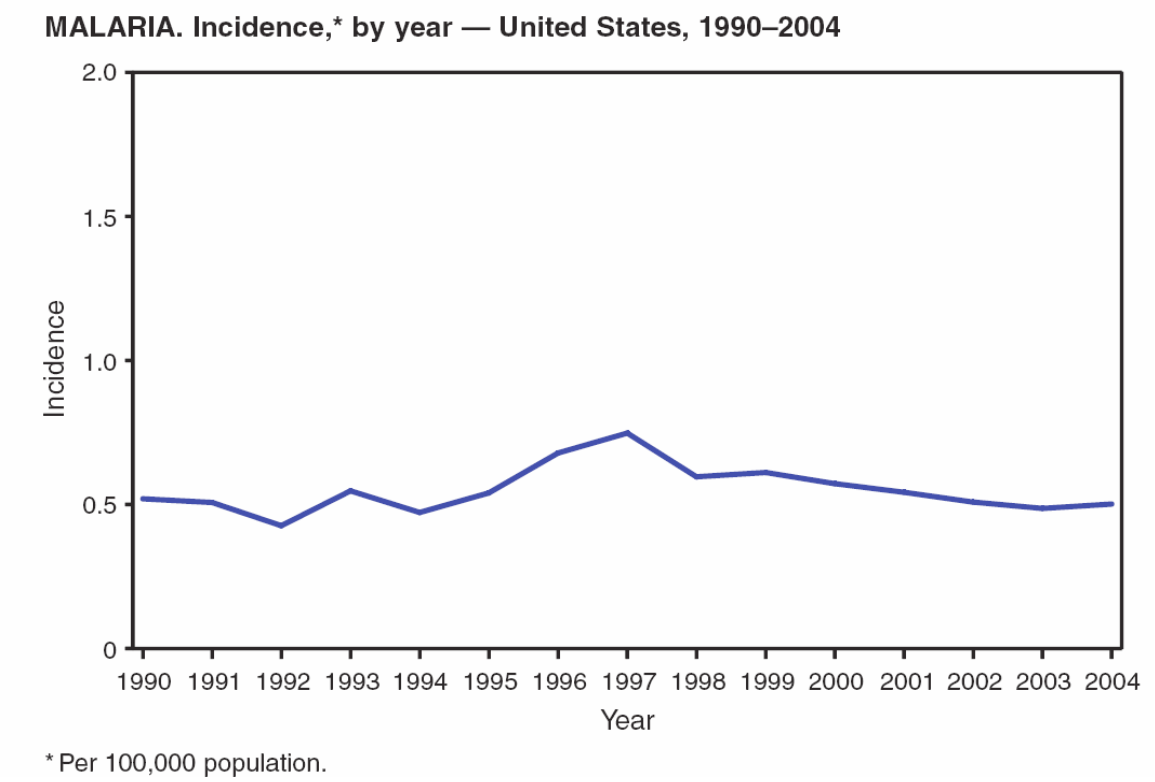
Four patients became infected in the US in 2004 (non-imported cases): one case was attributed to laboratory-related mosquitoborne transmission, and three cases were infants with infections attributed to congenital transmission.

Prevention:

Persons traveling to a malarious area should take one of the recommended chemoprophylaxis regimens appropriate for the region of travel and use personal protection measures to prevent mosquito bites. Any person who has been to a malarious area and who subsequently has a fever or influenza-like symptoms should seek medical care immediately and report their travel history to the clinician; investigation should include a blood-film test for malaria. Malaria infections can be fatal if not diagnosed and treated promptly.

Reporting:

Malaria is reportable within 7 days to DHEC.



Measles

2006 Cases in SC: 0 2006 Cases per 100,000: 0.0

Characteristics:

Measles is a respiratory illness characterized by rash and high fever, preceded by the triad of cough, coryza and conjunctivitis. The rash Illness lasts 5-6 days after onset. Complications of measles may include diarrhea, ear infections, pneumonia, blindness, encephalitis, seizures, and death. Approximately 20% of reported measles cases experience one or more complications. These complications are more common among children under 5 years of age and adults over 20 years old. In developing countries, where malnutrition and vitamin A deficiency are prevalent, measles has been known to kill as many as one out of four people. It is the leading cause of blindness among African children

Epidemiology:

Measles has been called the greatest killer of children in history. The World Health Organization has estimated that in 2004 alone there were 30 million cases of measles with 454,000 deaths. The highest incidence of measles and its associated morbidity and mortality is observed in developing countries. However, it still occurs infrequently in the United States and other industrialized nations.

In the U.S, since 1993, fewer than 500 cases have been reported annually to the CDC, and fewer than 200 cases per year have been reported since 1997. Since, 2002 the number of cases of measles reported has ranged from 37 to 66. Available epidemiologic and virologic data indicate that measles transmission in the US has been interrupted because of the high immunization rates in the U.S. The majority of cases are now imported from other countries or linked to imported cases.

SC: During the 10-year period from 1996 to 2006 in SC, there have been no cases of indigenous measles and only one case of imported measles in 1997.

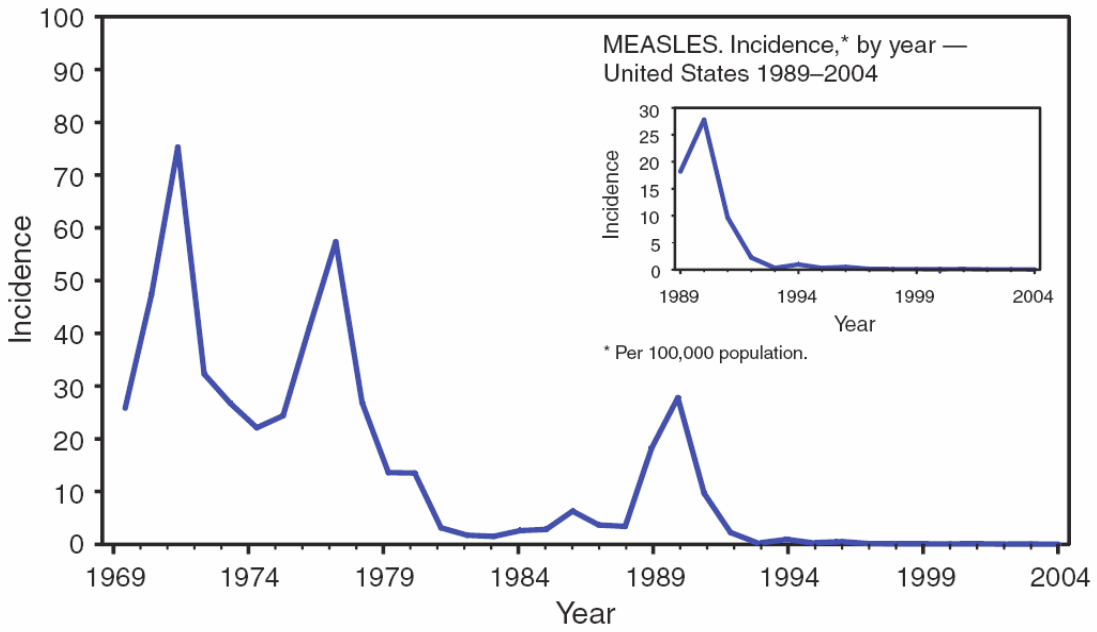
Prevention:

Measles vaccine is given as part of routine childhood immunizations, with documentation required for entry into school and college in SC. Proof of immunity is also required for healthcare workers and students in healthcare professions programs (nursing, dental and medical schools, etc.)

Reporting:

Measles, confirmed or suspected, is immediately reportable by phone to DHEC.

MEASLES. Incidence, by year — United States, 1969–2004



* Per 100,000 population.

Measles incidence remains at less than one case per million population.

Melioidosis

2006 Cases in SC: 0 2006 Cases per 100,000: 0

Characteristics:

Melioidosis, also called Whitmore's Disease, is a bacterial infection caused by *Burkholderia pseudomallei*. It is predominately a disease of tropical climates, especially in Southeast Asia where it is endemic. *B. pseudomallei* are normally found deep in the soil, but may be found in water or mud after heavy rainfall, especially in tropical rainy seasons. These bacteria are spread to humans and animals through direct contact with contaminated water and soil, with small cuts and sores on exposed skin often serving as the route of infection. Person-to-person transmission is unusual, but has been reported (once) from caretaker to diabetic patient and (twice) via sexual contact. The incubation period may range from 2 days to many years. The fatality rate of melioidosis is greater in people with specific comorbidities, such as diabetes mellitus, renal dysfunction, or chronic pulmonary disease, and in people who are immunosuppressed for one reason or another. Illness from melioidosis can be categorized as acute or localized infection, acute pulmonary infection, acute bloodstream infection (septicemia), and chronic suppurative infection. Inapparent infections are also possible.

Potential as an Agent of Bioterrorism. *Burkholderia pseudomallei* is an organism that has been described as a potential agent for biological warfare and biological terrorism.

Epidemiology:

Worldwide: Melioidosis is endemic in Southeast Asia, with the greatest concentration of cases reported in Vietnam, Cambodia, Laos, Thailand, Malaysia, Myanmar (Burma), and northern Australia. Additionally, it is seen in the South Pacific, Africa, India, and the Middle East. In many of these countries, *Burkholderia pseudomallei* is so prevalent that it is a common contaminate found on laboratory cultures. It is also common to military personnel who have served in endemic areas. A few isolated cases of melioidosis have occurred in the Western Hemisphere in Mexico, Panama, Ecuador, Haiti, Brazil, Peru, and Guyana. Melioidosis is most widespread in Thailand, where it was responsible for 19% of community-acquired sepsis and 40% of deaths from community-acquired septicemia. Inhalation of *Burkholderia pseudomallei* may occur during near-drowning incidents; this exposure route was implicated in over 1000 cases of Melioidosis that were diagnosed immediately after the December 2004 tsunami struck Thailand and South Asia.

US: Confirmed cases range from none to five each year and occur among travelers and immigrants.

SC: No cases of Melioidosis have been reported to DHEC in the past 11 years.

Prevention:

There is no vaccine for Melioidosis. Prevention of the infection in endemic-disease areas can be difficult since contact with contaminated soil is so common. Persons with diabetes and skin lesions should avoid contact with soil and standing water in these areas. Wearing boots during

agricultural work can prevent infection through the feet and lower legs. In health care settings, using common blood and body fluid precautions can prevent transmission.

Reporting:

Melioidosis or suspected *Burkholderia pseudomallei* infection is reportable within 24 hours in South Carolina.

Meningitis, aseptic (viral)

2006 Cases in SC: 114 2006 Cases per 100,000: 2.64

Characteristics:

Viral or "aseptic" meningitis is the most common type of meningitis. About 90% of viral meningitis cases in the US are caused by enteroviruses, such as coxsackieviruses and echoviruses. Infection with these viruses is more common during summer and fall months. Infection may be associated with exposure to unchlorinated or contaminated water sources, including recreational water sources (pools, lakes, etc.) Herpesviruses and the mumps virus, or fungal, mycobacterial or parasitic agents may also cause viral/aseptic meningitis.

Aseptic meningitis is a diagnosis of exclusion; diagnostic criteria include a sterile cerebrospinal fluid culture.

While symptoms of meningitis may vary from person to person, common meningeal signs include fever, severe headache, stiff neck, photophobia, lethargy or coma, confusion, and nausea and vomiting. Symptoms of meningitis are often more difficult to identify in infants, who may demonstrate fever, fretfulness or irritability, difficulty in awakening, or refusing to eat. Incubation periods for enteroviruses may be 3 to 7 days; infected persons may be able to spread these viruses from three days before until 10 days after symptoms appear. Symptoms of acute aseptic meningitis may last 7-10 days, with treatment being primarily supportive.

Epidemiology:

US. In the United States, there are between 25,000 and 50,000 hospitalizations due to viral meningitis each year.

SC. Aseptic meningitis became reportable in South Carolina in 2005 in order to assist in identifying outbreaks. The 93 cases of aseptic meningitis reported in 2005 represented a new baseline, with a 22% increase in number of reported cases for 2006. Older data showed an average of 30 cases reported per year from 1990 through 1995.

For those cases with ages reported, 20 of 98 (20.4%) occurred in persons under one year of age, 32 of 98 (32.7%) occurred in persons 20-39 years of age, and 16 of 98 (16.3%) occurred in persons 40-59 years of age. Highest rates per 100,000 were seen in infants under 1 (13.78) and in persons 20-39 years of age (22.05.)

Double-digit numbers of cases were reported in 2006 from the farthest northwest corner of SC, the Midlands and the Charleston area. No cases of aseptic meningitis appear in the CHESS system for 2006 from the Greenville-Spartanburg area of SC. A slight increase in numbers of reported cases is seen in the April to September period.

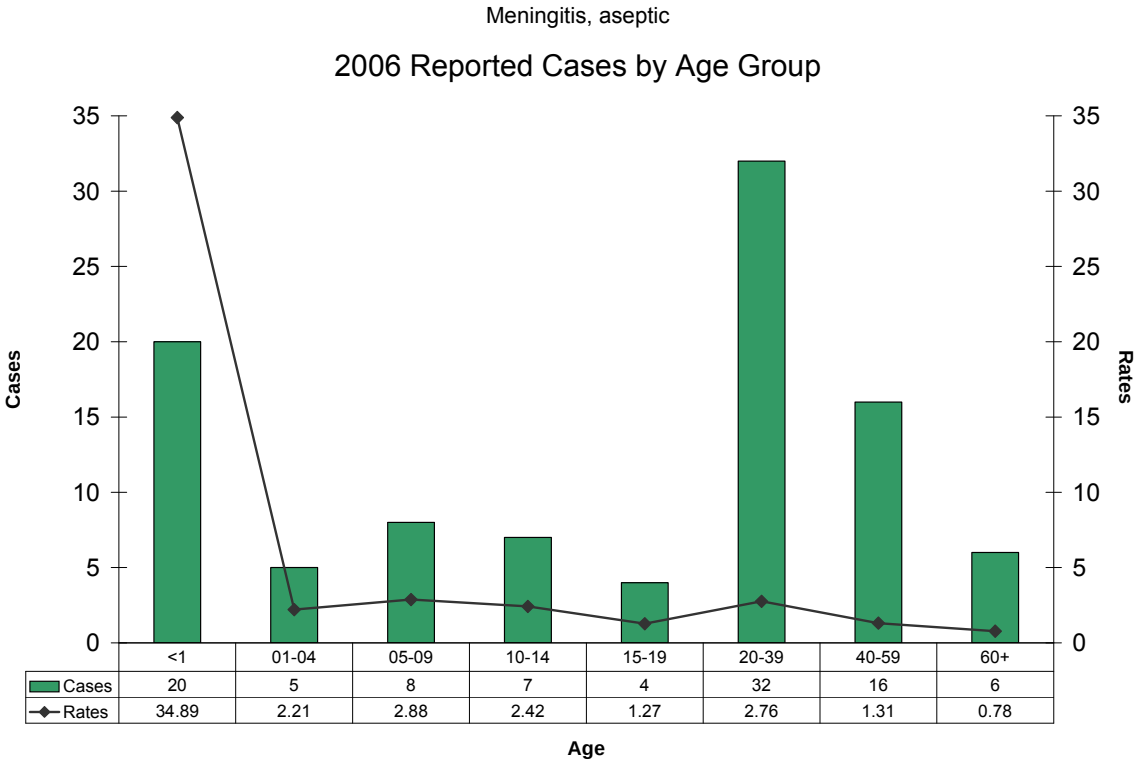
Prevention:

Because most persons who are infected with enteroviruses are asymptomatic, it can be difficult to prevent the spread of these viruses, especially those exposures linked to recreational water sources. Chances of becoming infected are reduced through avoiding drinking recreational water, and through good personal hygiene, especially if in contact with someone known to have

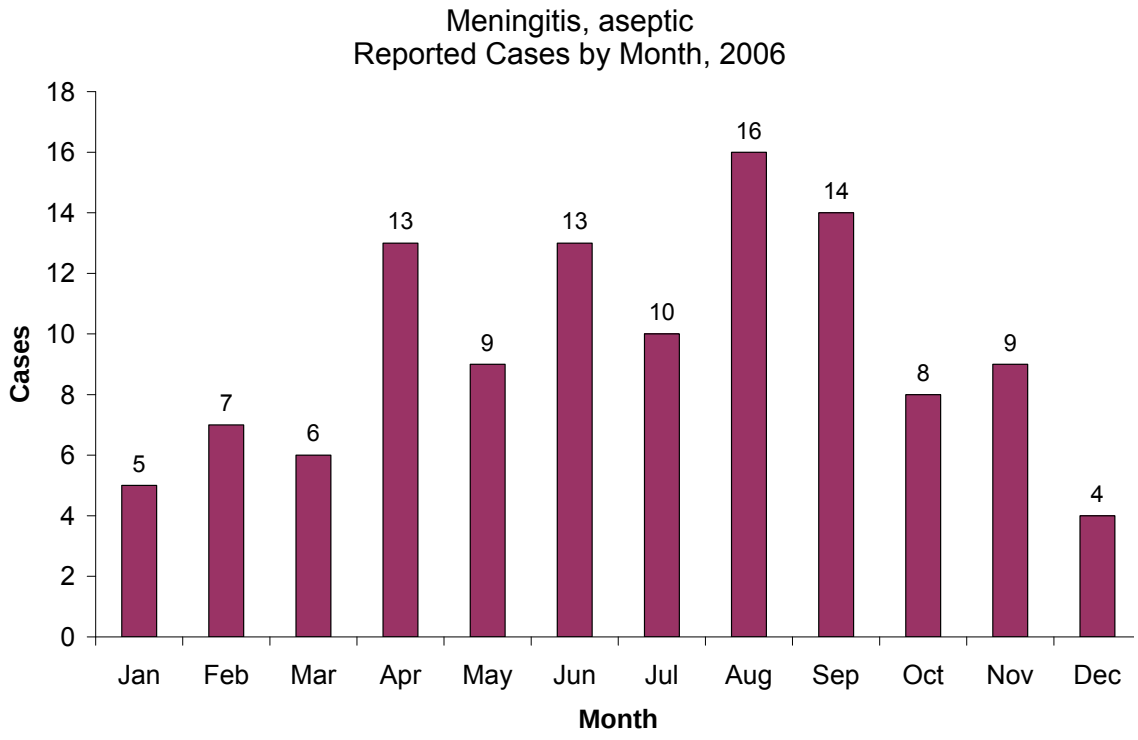
an enterovirus infection. Aseptic meningitis from mumps infection may be prevented with immunization.

Reporting:

Aseptic meningitis, defined as acute meningeal symptoms, fever, CSF pleocytosis, and sterile culture, is reportable within 7 days to DHEC. The DHEC Bureau of Laboratories should be contacted in outbreaks for assistance in viral isolation. Aseptic meningitis is not nationally reportable.



	<1	01-04	05-09	10-14	15-19	20-39	40-59	60+
Cases	20	5	8	7	4	32	16	6
Rates	34.89	2.21	2.88	2.42	1.27	2.76	1.31	0.78


Meningitis, aseptic
Reported Cases by Month, 2006
Cases
18
16
14
12
10
8
6
4
2
0
5
7
6
13
9
13
10
16
14
8
9
4
Jan
Feb
Mar
Apr
May
Jun
Jul
Aug
Sep
Oct
Nov
Dec
Month

Meningococcal Disease

2006 Cases in SC: 26 2006 Cases per 100,000: 0.60

Characteristics:

Meningococcal disease is an acute, potentially severe or fatal illness caused by the bacteria *Neisseria meningitides*. Infection with *N. meningitides* is the leading cause of bacterial meningitis and severe sepsis in U.S. and, despite advances in medical care, is still associated with a high mortality rate and persistent neurological defects.

Epidemiology:

The number of cases and rates of meningococcal disease in SC have been decreasing since 1995. These declining rates parallel those seen in the U.S. during this time period. In 2006, 18 cases of invasive meningococcal disease were reported in SC, giving a rate **of 0.XXXX** cases of invasive meningococcal disease per 100,000 population.

By Age: In SC, the three age groups with the highest incidence of meningococcal disease were the 1 to 4 year age group, the 15 to 19 year age group and the 20 to 39 year age group.

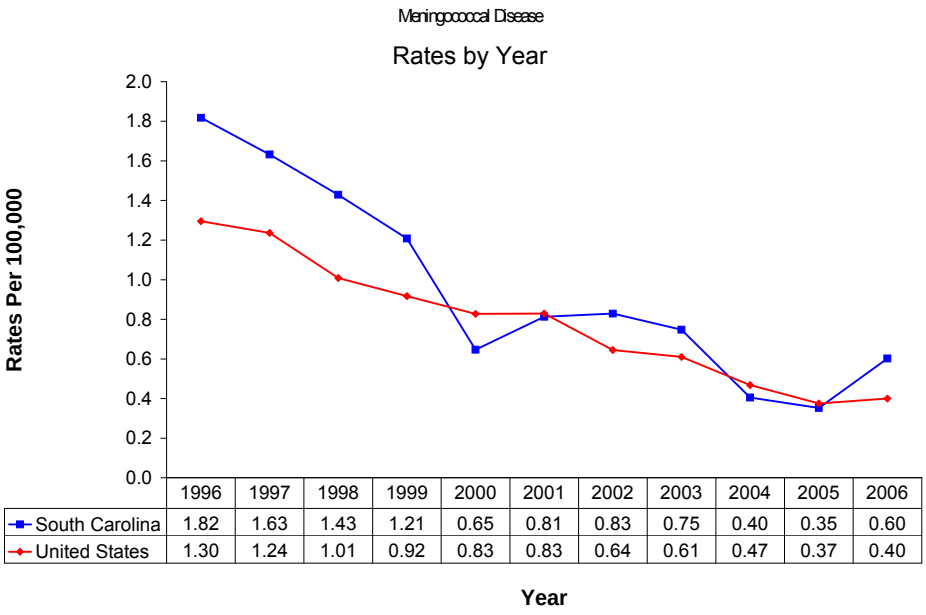
By sero-group: Five different serogroups of meningococcus cause disease: A, B, C, Y and W135. The proportion of disease caused by different serotypes changes over time. However, certain serogroups predominate in different age groups. Nationally most cases in children <1 year of age are due to serogroup B, while serogroups B, C and Y caused disease in older children and adults. In SC in 2006, all cases of invasive meningococcal disease in children <1 year of age were due to serogroup B while serogroups B, C and Y caused disease in persons greater than 1 year of age.

Prevention:

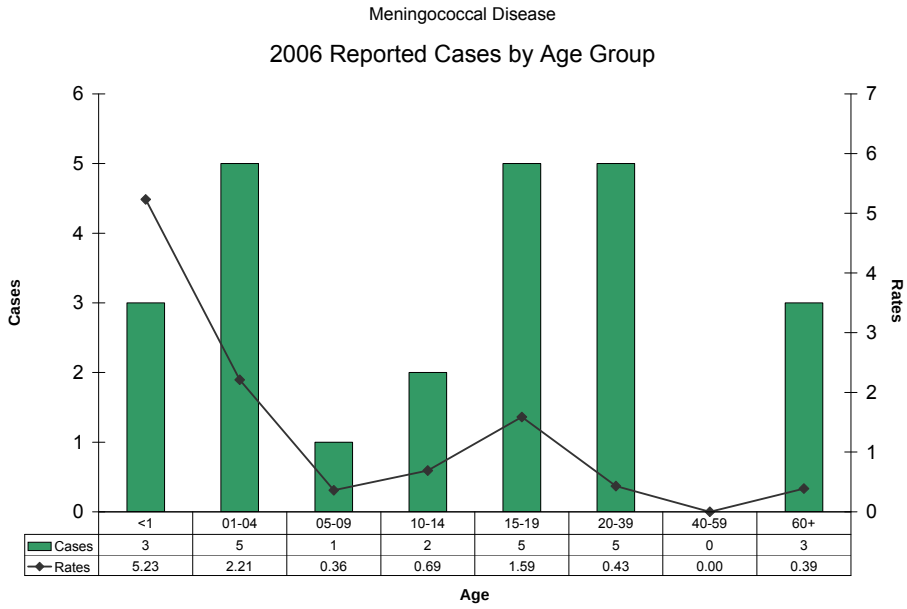
Two types of meningococcal vaccines that provide immunity against A, C, Y and W135 are available. There is currently no vaccine effective against serogroup B. The meningococcal polysaccharide vaccine was licensed in 1974 for children and adults but is not effective in children < 24 mo. The second vaccine, meningococcal conjugate vaccine (MCV4), was licensed in 2005 and is expected to offer a longer duration of protection. In 2006, the Advisory Committee for Immunization Practices (ACIP) has recommended that 11-12 year old children and unvaccinated adolescents at high school entry routinely receive MCV4. In addition, the ACIP also recommended that all college freshmen living in dormitories also receive this vaccine.

Reporting:

Confirmed or suspected meningococcal disease is immediately reportable by phone to DHEC.



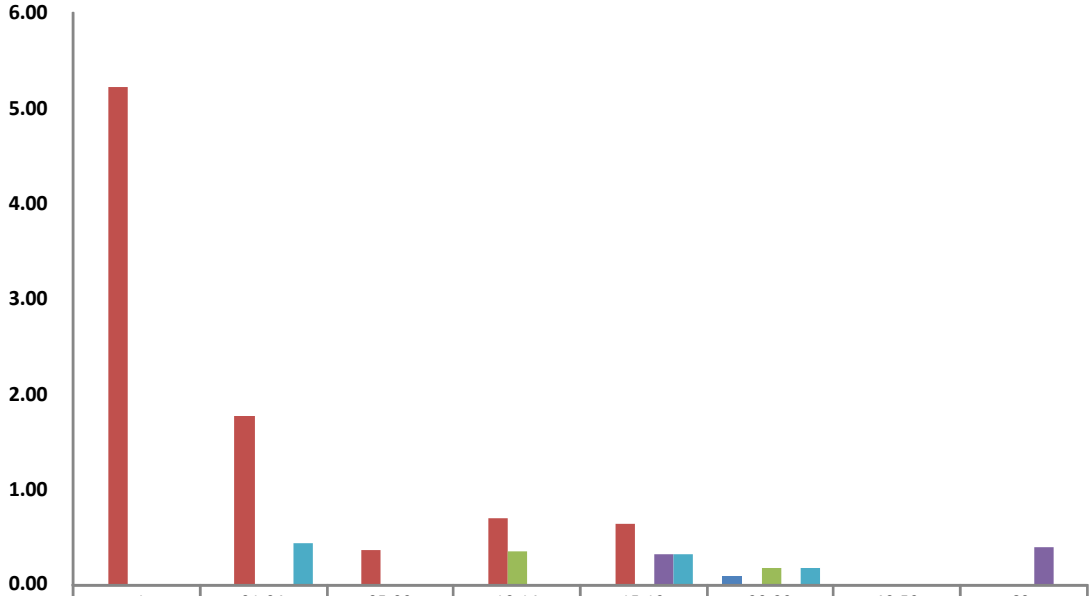
	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
South Carolina	1.82	1.63	1.43	1.21	0.65	0.81	0.83	0.75	0.40	0.35	0.60
United States	1.30	1.24	1.01	0.92	0.83	0.83	0.64	0.61	0.47	0.37	0.40



	<1	01-04	05-09	10-14	15-19	20-39	40-59	60+
Cases	3	5	1	2	5	5	0	3
Rates	5.23	2.21	0.36	0.69	1.59	0.43	0.00	0.39

Age was not available for 2 cases.

Invasive Meningococcal Disease SC 2006



	<1	01-04	05-09	10-14	15-19	20-39	40-59	60+
Serogroup A	0.00	0.00	0.00	0.00	0.00	0.09	0.00	0.00
Serogroup B	5.23	1.77	0.36	0.69	0.63	0.00	0.00	0.00
Serogroup C	0.00	0.00	0.00	0.35	0.00	0.17	0.00	0.00
Serogroup Y	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.39
Unknown Serogroup	0.00	0.44	0.00	0.00	0.32	0.17	0.00	0.00

Age was not available for 2 cases.

Mumps

2006 Cases in SC: 10 2006 Cases per 100,000: 0.23

Characteristics:

Mumps is an acute contagious disease caused by the mumps virus. The most common clinical symptom is parotitis as well as enlargement of other salivary glands. Other manifestations that may occur with or without parotitis include meningoencephalitis, orchitis and pancreatitis. Approximately 30-40% of persons infected with mumps virus may be asymptomatic. While infection can occur in persons of any age, most cases in the past were in children less than 15 years of age.

Epidemiology:

US: For the period from 2000 through 2005, 219 to 338 cases were reported to the CDC each year. However, during 2006, over 6000 cases of mumps were reported to the CDC. The increase in cases was due to multiple outbreaks of mumps in at least 45 states. Most of the mumps cases occurred in young persons of college age and many of these persons with mumps had previously been immunized with at least one dose of mumps-containing vaccine. In response to this nationwide mumps outbreak, CDC recommendations for the prevention and control of mumps immunization were updated in 2006.

SC: SC had ten cases of mumps in 2006. Most cases were individuals aged 10 to 14 years and 40-49 years. Only two of the ten cases were in the young persons of college age. This shows that unlike the cases occurring in the rest of the US, very few cases affected college-aged persons.

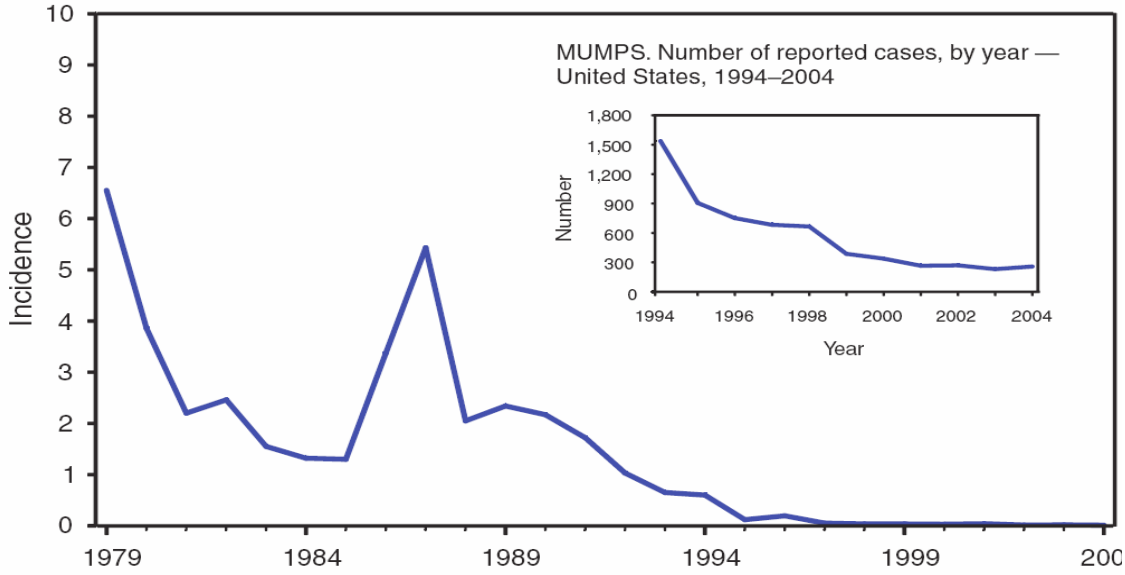
Prevention:

The mumps vaccine was licensed in 1967 and resulted in a significant decrease in the number of cases. However, the large numbers of cases in the US in 2006 has demonstrated that a second dose of a mumps-containing vaccine is important for mumps prevention.

Reporting:

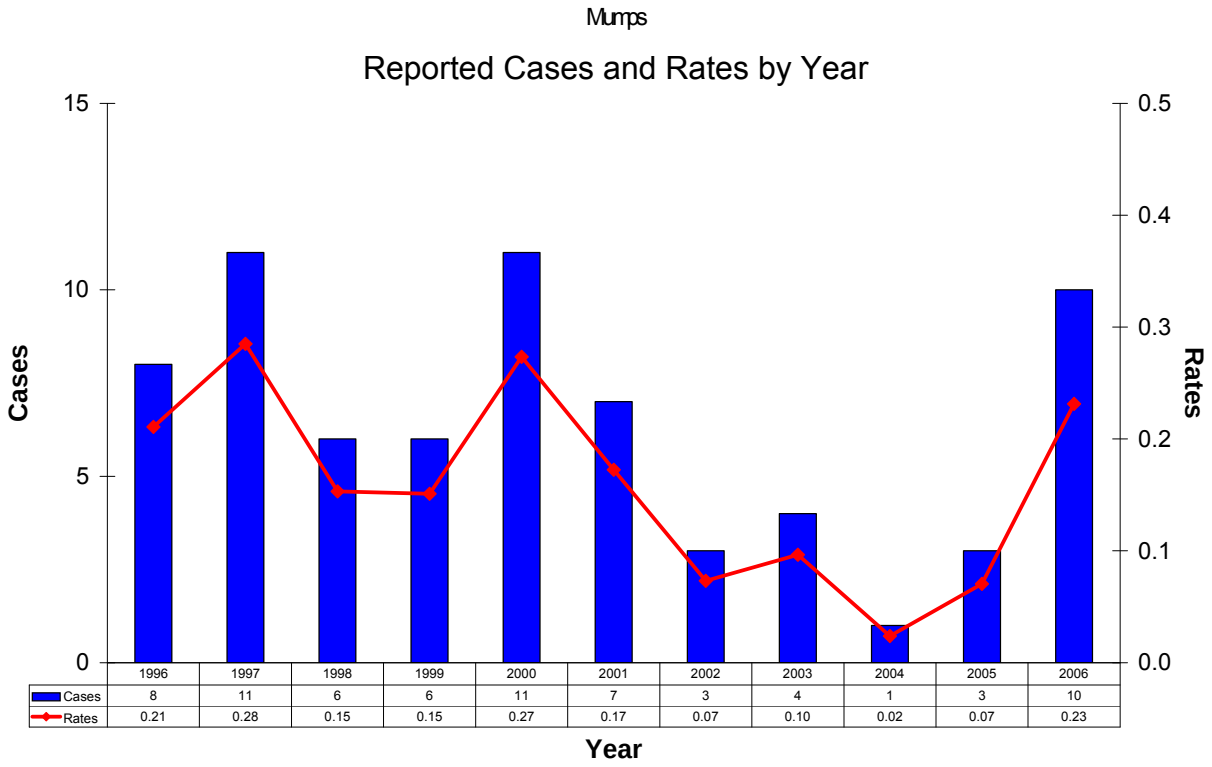
Mumps is reportable within 7 days to DHEC.

MUMPS. Incidence,* by year — United States, 1979–2004



* Per 100,000 population.

In 2004, of 258 reported cases, 89 (31%) were laboratory confirmed.



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Cases	8	11	6	6	11	7	3	4	1	3	10
Rates	0.21	0.28	0.15	0.15	0.27	0.17	0.07	0.10	0.02	0.07	0.23

Pertussis

2006 Cases in SC: 204 2006 Cases per 100,000: 4.72

Characteristics:

Pertussis (whooping cough) is a respiratory tract infection caused by *Bordetella pertussis*. It is a toxin-mediated disease and manifests as a prolonged illness with paroxysmal cough in infected persons beyond the neonatal and early infant period. Before the advent of pertussis immunization, pertussis was a major cause of morbidity and mortality among infants and children. Reported cases of pertussis decreased by more than 99% after the introduction of pertussis vaccine in the 1940s.

Prior to introduction of pertussis vaccine, most cases of pertussis were in the toddler age group. However, the highest rates are now in young infants with modest increases in the rates in adolescents and young adults. The change in age distribution is thought to be due to waning immunity in the adolescent and adult population (neither the vaccine nor pertussis disease provides long-term immunity.) Pertussis in these age groups, especially among persons in contact with children, result in transmission to infants who now receive little protective maternal antibodies against pertussis.

Epidemiology:

In the US, from 2000 through 2002, the number of cases of pertussis reported to the CDC was approximately 8000. However, the number of reported cases increased significantly and reached a peak of over 25,000 cases in 2005. Fortunately, in 2006 the number of cases had decreased to approximately 13,000. The increase in cases can be attributed to several factors that include waning immunity in previously immunized children, an increased recognition of pertussis and the ability to more easily diagnose pertussis with a polymerase chain reaction test (PCR.)

Numbers of cases of pertussis in SC from 1996 to 2006 parallel the pertussis data for the US. From 1996 through 2002, the number of pertussis cases was stable in SC. However, since 2003, the rates and number of cases have significantly increased. In 2005, there were 423 cases, representing an almost 10-fold increase over the numbers seen in 2002 (48 cases). 2006 saw the number of cases of pertussis decrease to 204.

Pertussis is particularly concerning in infants since infants are at greatest risk of severe complications and death due to pertussis. Often, the institution of treatment and provision of supportive care are delayed because pertussis is unrecognized in infants due to the atypical presentation in this age group.

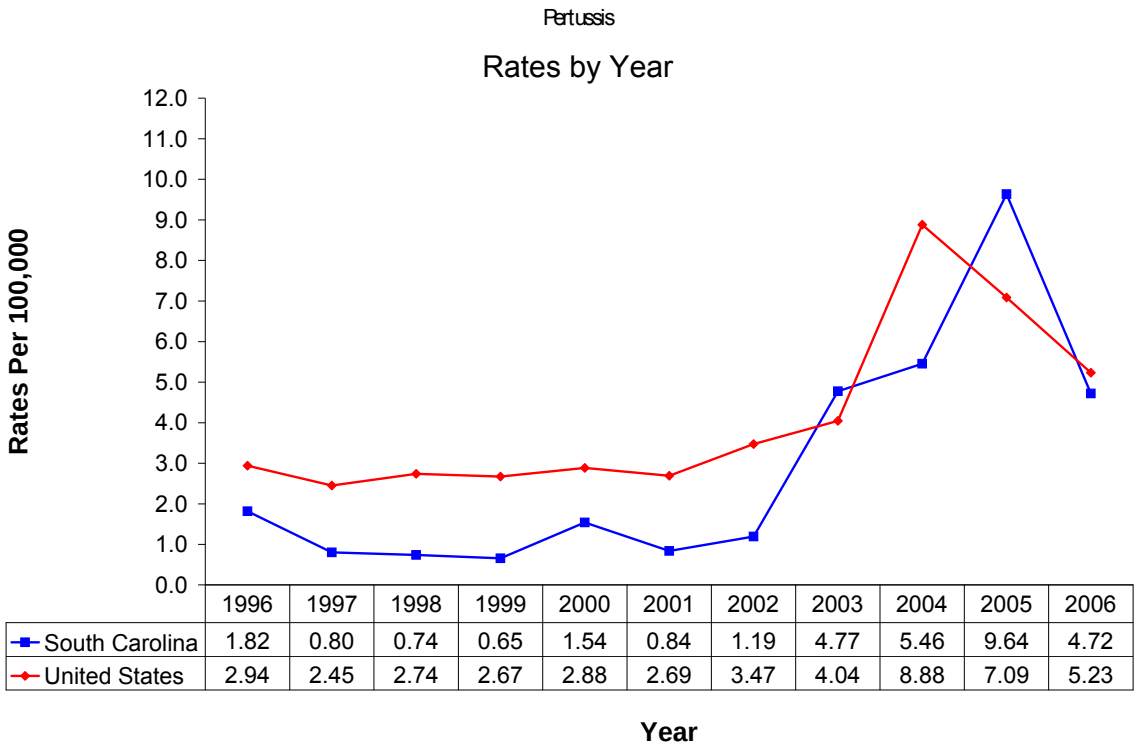
Prevention:

Two recently licensed pertussis-containing vaccines (Tdap vaccines) are now available for adolescents only or both adolescents and adults. In 2005, the Advisory Committee for Immunization Practices recommended that 11-12 year old children routinely receive Tdap vaccine and that specific groups of adults such as health care workers, women of childbearing age as well as persons who will be in contact with young infants also receive Tdap vaccine. It is

anticipated that immunizing adolescents and specific groups of adults will decrease the incidence of pertussis in these persons and thereby decrease transmission to infants.

Reporting:

Pertussis is urgently reportable by phone within 24 hours to DHEC.



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
South Carolina	1.82	0.80	0.74	0.65	1.54	0.84	1.19	4.77	5.46	9.64	4.72
United States	2.94	2.45	2.74	2.67	2.88	2.69	3.47	4.04	8.88	7.09	5.23

Pesticide Poisoning

2006 Cases in SC: 0 2006 Cases per 100,000: 0.00

Characteristics:

According to the Environmental Protection Agency (EPA), pesticide poisoning is a commonly under-diagnosed illness in America today. Despite recommendations by the Institute of Medicine and others urging the integration of environmental medicine into medical education, health care providers generally receive a very limited amount of training in occupational and environmental health, and in pesticide-related illnesses, in particular. Poison Control Centers are best at capturing pesticide exposures that occur in residential environments. However, occupational exposures are not as well covered. When used properly, pesticides offer a variety of benefits to society. They increase crop production, preserve produce, combat insect infestations, and control exotic species. However, pesticides also have the potential for causing harm. Approximately one billion pounds of pesticide active ingredient are used annually in the U.S. and over 16,000 different pesticide products are being marketed in the U.S.

Patients with pesticide poisoning are not contagious but direct contact with the skin or clothing of persons contaminated with pesticides could lead to additional exposures. Though all pesticide poisonings are reportable in South Carolina, not all types of pesticide poisonings are documented as single cases for reporting purposes or investigation, but may be reported as clusters or outbreaks of illness (e.g., contamination of food or water).

Epidemiology:

US: The EPA estimates that 10,000-20,000 physician-diagnosed pesticide poisonings occur each year among the approximately 3,380,000 U.S. agricultural workers. Agricultural workers, groundskeepers, pet groomers, fumigators, and a variety of other occupations are at risk for exposure to pesticides including fungicides, herbicides, insecticides, rodenticides, and sanitizers. Surveillance for occupational pesticide-related illness and injury is designed to protect workers by determining the magnitude and underlying causes of over-exposure to pesticides in the workplace. Surveillance also serves as an early warning system of any harmful effects not detected by manufacturer testing of pesticides. CDC conducts national surveillance through **Sentinel Event Notification System for Occupational Risk (SENSOR).** The goal of this program is to build and maintain occupational illness and injury surveillance capacity within state health departments. Under SENSOR, NIOSH provides funding and technical support to 8 state health departments to conduct surveillance on one or more occupational illnesses including pesticide poisoning. Four other states participate without funding support. SC does not participate in SENSOR.

Industry is another source of occupational disease surveillance. Currently, the primary data source for occupational injuries and illnesses is the Bureau of Labor Statistics' Annual Survey. This survey uses the information that employers record on the OSHA 200 logs and is useful for estimating the trends and overall burden of injuries. There has, however, been much concern about the completeness and accuracy of these records. Occupational diseases are particularly susceptible to underreporting.

SC: The SC Palmetto Poison Control Center is the only 24-hour poison control hotline in SC and approximately 8.5% of their calls are related to insecticides, herbicides, and rodenticides. Palmetto Poison Control Center calls regarding potential pesticide poisonings are reported to the SC DHEC.

According to the Medical University of SC (MUSC) Agromedicine Program web site: http://www.musc.edu/oem/apunews.html, acute pesticide poisoning is a rare event in South Carolina. There has been a steady decline in the number of cases since the early 1980s. The Agromedicine Program has reported on hospitalized and non-hospitalized cases of acute pesticide poisoning in the state over the past 25 years. The most recent study (published in the February 2004 issue of the Journal of the South Carolina Medical Association) covered the years 1997-2001. Key findings are:

- There were 148 hospitalizations in five years or about 30 cases per year.
- 50% of the cases were accidental exposures among children and adults at home.
- 0% of the hospitalizations were suicide attempts.
- Only 27% of the cases were occupationally related.
- Only one death was reported.
- For each case hospitalized, there are an estimated 5.8 emergency department cases.

There are many types of pesticides and all pesticide poisonings are reportable in South Carolina. It is important to notify public health departments about even one person with pesticide poisoning. Public health departments can then investigate to determine how the poisoning occurred. This helps prevent subsequent exposures. In any food poisoning occurrence, citizens are asked to note foods eaten and freeze any uneaten portions in case they need to be tested.

Reporting:

Pesticide poisonings are reportable within 7 days in South Carolina. Pesticide poisonings are not included on the list of nationally reportable diseases so national reporting numbers and rates are not available.

Plague *(Yersina pestis)*

2006 Cases in SC: 0 2006 Cases per 100,000: 0.0

Characteristics:

Plague is an infectious disease that affects animals and humans. It is caused by the bacterium Yersinia pestis. This bacterium is found in rodents and their fleas and occurs in many areas of the world, including the United States. *Y. pestis* is easily destroyed by sunlight and drying. Even so, when released into air, the bacterium will survive for up to one hour, although this could vary depending on conditions.

Epidemiology:

The World Health Organization reports 1,000 to 3,000 cases of plague worldwide every year. An average of 5 to 15 cases occur each year in the western United States. These cases are usually scattered and occur in rural to semi-rural areas. Most cases are of the bubonic form of the disease. Naturally occurring pneumonic plague is uncommon, although small outbreaks do occur. Both types of plague are readily controlled by standard public health response measures.

Types of plague infections include:

Pneumonic plague occurs when *Y. pestis* infects the lungs. This type of plague can spread from person to person through the air. Transmission can take place if someone breathes in aerosolized bacteria. Pneumonic plague is also spread by breathing in *Y. pestis* suspended in respiratory droplets from a person (or animal) with pneumonic plague. Becoming infected in this way usually requires direct and close contact with the ill person or animal. Pneumonic plague may also occur if a person with bubonic or septicemic plague is untreated and the bacteria spread to the lungs.

Bubonic plague is the most common form of plague. This occurs when an infected flea bites a person or when materials contaminated with Y. pestis enter through a break in a person's skin. Patients develop swollen, tender lymph glands (called buboes) and fever, headache, chills, and weakness. Bubonic plague does not spread from person to person.

Septicemic plague occurs when plague bacteria multiply in the blood. It can be a complication of pneumonic or bubonic plague or it can occur by itself. When it occurs alone, it is caused in the same ways as bubonic plague; however, buboes do not develop. Patients have fever, chills, prostration, abdominal pain, shock, and bleeding into skin and other organs. Septicemic plague does not spread from person to person.

With pneumonic plague, the first signs of illness are fever, headache, weakness, and rapidly developing pneumonia with shortness of breath, chest pain, cough, and sometimes bloody or watery sputum. The pneumonia progresses for 2 to 4 days and may cause respiratory failure and shock. **Early treatment of pneumonic plague is essential.** Without early treatment, death is likely. To reduce the chance of death, antibiotics must be given within 24 hours of first symptoms.

Reporting:

Suspected or confirmed case of Plague in South Carolina is immediately reportable by phone to DHEC.

Poliomyelitis, paralytic

2006 Cases in SC: 0 2006 Cases per 100,000: 0.00

Characteristics:

Poliomyelitis, or polio, is characterized by acute onset of a flaccid paralysis of one or more limbs with decreased or absent reflexes in the affected limbs, without other apparent cause, and without sensory or cognitive loss (as reported by a physician.) Poliovirus is spread, usually person-to-person, via the fecal-oral route. Polio, once the leading cause of permanent disability in the United States, remains a substantial cause of disability in polio-endemic countries.

Epidemiology and Eradication:

As of January 24, 2007, there were 1,939 confirmed cases of paralytic polio worldwide in 2006. Four countries are endemic for polio (Afghanistan, India, Nigeria, and Pakistan), and 12 additional countries have reported cases in 2006 as a result of importations (Angola, Bangladesh, Cameroon, the Democratic Republic of Congo, Ethiopia, Indonesia, Kenya, Namibia, Nepal, Niger, Somalia, Yemen). Until polio is eradicated in every country, it remains a threat to children in polio-free countries. (CDC)

Since the advent of the polio vaccine in the 1950's, public health has adopted the goal of worldwide polio eradication. The Global Polio Eradication Initiative has successfully reduced the burden of paralytic polio globally and the threat of imported polio in the United States.

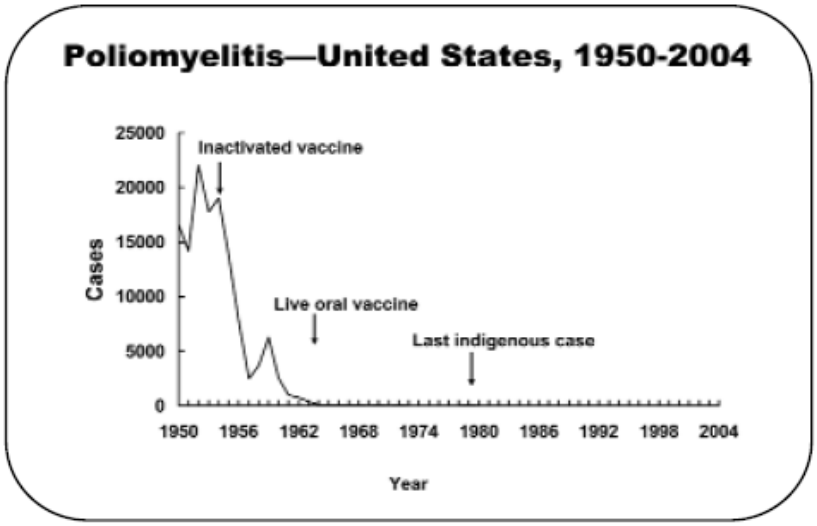
Epidemiology in US: Since 1979, transmission of wild poliovirus has been interrupted in the US. All US wild-type polio cases since that time have been imported from areas of the world with endemic polio. Transmission of vaccine-associated paralytic polio (VAPP), associated with use of oral polio vaccine (OPV), greatly decreased following the adopted of an all injectable-polio vaccine (IPV) schedule in 1999.

Prevention:

Polio is primarily prevented through use of IPV as part of the childhood immunization schedule. Travelers to countries where polio is endemic or where outbreaks are occurring should be made aware of the risk for acquiring paralytic polio in those countries and be immunized in accordance with current recommendations. Health-care providers assessing vaccine needs for unimmunized adults traveling to countries that use OPV should be aware of the risk that OPV might pose to such travelers and should consider offering them polio vaccine. At least 4--6 weeks before departure, international travelers should contact travel medicine providers to obtain immunizations and prophylactic medications.

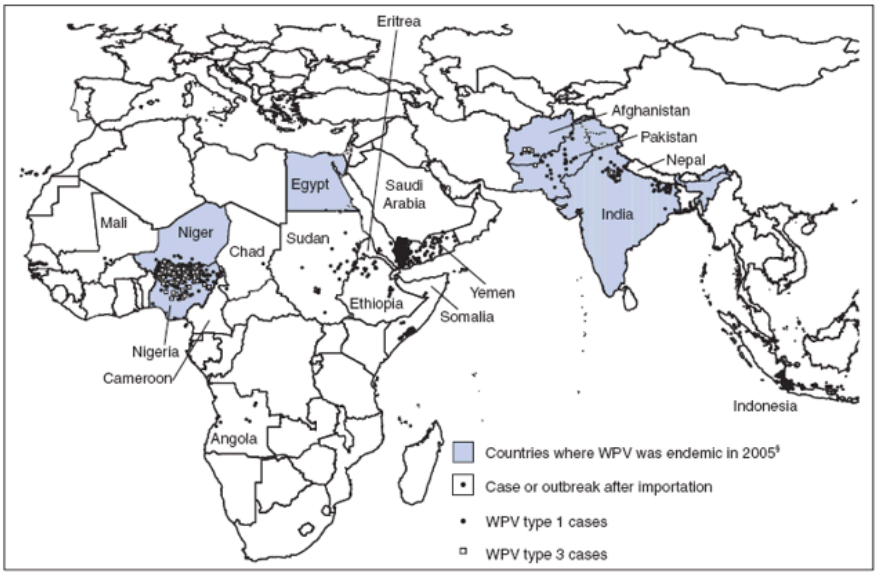
Reporting:

Paralytic polio is immediately reportable by phone to DHEC. Immediate testing, coordinated with the DHEC Bureau of Laboratories and the CDC, is required to determine virus strain, especially to stop/prevent outbreaks of either imported wild-type poliovirus or VAPP.



Source: http://www.cdc.gov/nip/publications/pink/polio.pdf

FIGURE. Number of wild poliovirus (WPV) cases* — worldwide, 2005†



*Data reported to the World Health Organization as of March 31, 2006.
†Excludes polioviruses detected by environmental surveillance and vaccine-derived polioviruses.
§Egypt and Niger were removed from the list of polio-endemic countries in 2006. However, recent genetic data suggest residual low-level indigenous transmission in Niger.

Source: http://www.cdc.gov/programs/global04.htm

Psittacosis

2006 Cases in SC: 0 2006 Cases per 100,000: 0.00

Characteristics:

Psittacosis, also known as ornithosis or parrot fever, is caused by the *Chlamydia psittaci* bacterium. *Chlamydia psittaci* infection is endemic in many types of birds (especially pet birds and poultry) and is transmitted to humans by inhaling dried secretions (feces, nasal discharge, dust from feathers). Clinical presentation includes influenza-like symptoms (fever, chills, headache, muscle aches, and a dry cough); pneumonia is often evident on chest x-ray. See also: "Psittacosis" http://www.cdc.gov/ncidod/dbmd/diseaseinfo/psittacosis_t.htm.

Classification as a potential bioterrorism agent/disease: Psittacosis is classified as a Category B agent. According to the CDC, Category B agents are, "moderately easy to disseminate, result in moderate morbidity rates and low mortality rates, and require specific enhancements of CDC's diagnostic capacity and enhanced disease surveillance." http://www.bt.cdc.gov/agent/agentlist-category.asp

Epidemiology:

Since 1996, less than 50 cases per year of confirmed psittacosis were reported in the United States; from 1988 through 2003, the CDC received reports of 935 cases of psittacosis. Many cases are probably not diagnosed or reported, indicating that psittacosis is largely underreported. Risk groups for psittacosis infection include, but are not limited to, bird owners, pet shop workers, and veterinarians. Infections in humans are generally sporadic, but outbreaks have also been reported in poultry processing plants. According to the "Compendium of measures to control *Chlamydophila psittaci* (formerly *Chlamydia psittaci*) infection among humans (psittacosis) and pet birds, 2005" by the American Veterinary Medical Association: "Most human cases were associated with exposure to pet birds. Other persons at risk include pigeon fanciers and persons in specific occupations (e.g., employees in poultry slaughtering and processing plants, veterinarians, veterinary technicians, laboratory workers, workers in avian quarantine stations, farmers, wildlife rehabilitators, and zoo workers). Because human infection can result from brief, passing exposure to infected birds or their contaminated excretions or secretions, persons with no identified leisure time or occupational risk can become infected." http://www.avma.org/pubhlth/psittacosis.asp

Reporting:

Psittacosis is reportable within 7 days to DHEC.

Q Fever (*Coxiella burnetii*)

2006 Cases in SC: 0 2006 Cases per 100,000: 0.0

Characteristics:

Q fever is a zoonotic disease caused by the obligate intracellular rickettsial agent *Coxiella burnetii* (*C. burnetii*), a species of bacteria that is distributed worldwide. Cattle, sheep, and goats are common reservoirs of *C. burnetii*, and the bacteria shed from these animals are responsible for most human infections.

Only about one-half of all people infected with *C. burnetii* show signs of clinical illness. Most acute cases of Q fever begin with sudden onset of one or more of the following: high fevers (up to 104-105°F), severe headache, general malaise, myalgia, chills and/or sweats, non-productive cough, nausea, vomiting, diarrhea, abdominal pain, chest pain. Fever usually lasts for 1 to 2 weeks with thirty to fifty percent of patients with a symptomatic infection developing pneumonia.

Infection of humans usually occurs by inhalation of these organisms in small droplets or from inhalation of barnyard dust contaminated with *C. burnetii.* Infection via ingestion of contaminated dairy products is a less common mode of transmission. Other modes of transmission to humans, including tick bites and human-to-human transmission, are rare.

Epidemiology:

In the United States, Q fever outbreaks have resulted mainly from occupational exposure involving veterinarians, workers at meat processing plants, sheep and dairy workers, livestock farmers, and researchers at facilities housing sheep. In 1999, Q fever became a notifiable disease in the United States, but reporting is not required in many other countries. On average, approximately 50-60 cases of Q fever are reported in the United States each year, and the average annual reported incidence is 0.28 cases per million persons. Q fever is believed to be under-diagnosed and under-reported in the United States, so the number of reported cases likely does not reflect the true incidence of disease. In 2006, there were not reports to DHEC of cases of Q Fever in humans.

Reporting:

Suspected or confirmed cases of Q fever are South Carolina is reportable within 24 hours by phone to DHEC.

Rabies, Animal

2006 Cases in SC: 180 SC % Positive, Total (all species): 7.7%

Characteristics:

Rabies is a viral infection transmitted in the saliva of infected mammals. The virus enters the central nervous system of the host, causing an encephalomyelitis that is almost always fatal. Human cases of rabies have greatly decreased in this country due to the successful program of vaccination of domestic animals, in particular dogs. Rabies remains a common disease in dogs of foreign nations, due to extremely low rates of vaccination; therefore, international travelers to areas where canine rabies is still endemic have an increased risk of exposure to rabies.

Rabies among wildlife has become more prevalent since the 1950s, accounting for greater than 85% of all reported cases of animal rabies every year since 1976. Rabies among wildlife occurs throughout the continental United States; only Hawaii remains consistently rabies-free. The most common wild animal species to carry the rabies virus in the Southeastern United States are raccoons, skunks, and bats. Wildlife is the most important potential source of infection for both humans and domestic animals in the United States. Since 1980, approximately 58% of the human cases of rabies diagnosed in the United States have been associated with bat variants. In most other countries, especially Asia, Africa, and Latin America, dogs remain the major species with rabies, and are the most common source of rabies among humans.

Epidemiology:

SC: During calendar year 2006, the DHEC Bureau of Laboratories examined 2,349 animal heads for rabies, of which 180, or 7.7% tested positive. The animal species that tested positive for rabies, and their corresponding portion of the total number of rabies positive animals, were: dog (2.2%), cat (11.1%), other domestic animals (0.6%), skunk (8.3%), fox (14.5%), bat (3.9%), raccoon (58.3%), rodent (0%), and other wild animals (1.1%). Actual numbers of rabies positive, total number tested, and percentage of total for each animal species, were as follows: dog 4/738 (0.5%), cat 20/892 (2.2%), other domestic species 1/62 (1.6%), skunk 15/21 (71.4%), fox 26/70 (37.1%), bat 7/157 (4.5%), raccoon 105/255 (41.2%), rodent 0/84 (0%), and other wild species 2/70 (29%). The rabies positive other domestic species in 2006 was horse; and the rabies positive other wild species was bobcat.

US: The Centers for Disease Control and Prevention (CDC) compiles animal rabies data for the United States each year. According to CDC published data, during 2004, 49 states and Puerto Rico reported 6,940 cases of rabies in nonhuman animals and 3 cases in humans to the CDC; this represents a 8.2% increase from the 6,417cases in nonhuman animals and 1 case in human reported in 2005. Approximately 92% of the cases were in wildlife, and 8% were in domestic animals, as was the case in 2005. Relative contributions by the major animal groups were as follows: 2,615 raccoons (37.7%), 1,494 skunks (21.5%), 1,692 bats (24.4%), 427 foxes (6.2%), 318 cats (4.6%), 82 cattle (1.2 %), and 79 dogs (1.1 %).

Compared with numbers of reported cases in 2005, cases in 2006 increased among all species except cattle. Cases of rabies in cats, dogs, horses and mules, and sheep and goats increased 18.2%, 3.9%, 12.8%, and 22.2%, respectively; whereas cases reported in cattle decreased 11.8%. No cases of rabies associated with the dog/coyote rabies virus variant were reported. The last identified case of this canine rabies virus variant was identified in March 2004, along the US/Mexico border. With 2006 marking the second year of no apparent transmission of the

dog/coyote variant, this surveillance data supports the contention that the canine rabies virus variant is no longer in circulation in the United States.

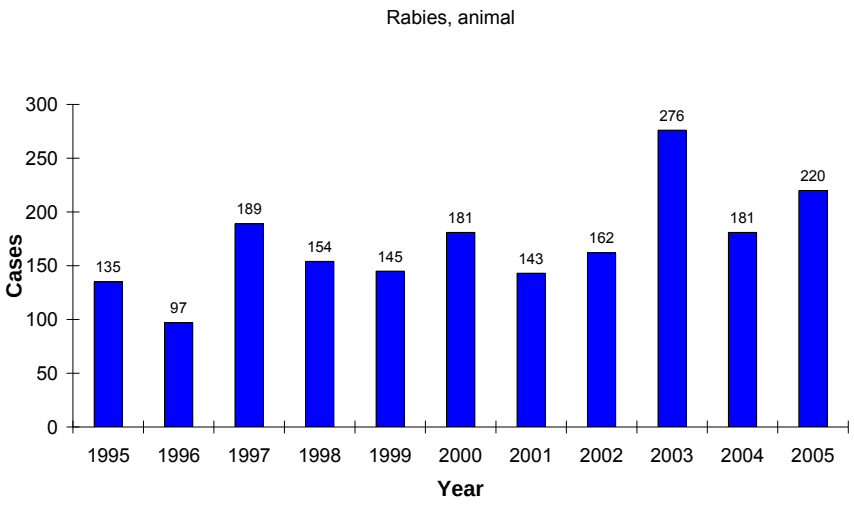
Increases in numbers of rabid raccoons during 2006 were reported by 11 of the 20 eastern states where raccoon rabies was enzootic; and, reported cases increased by 3.2% overall, compared with 2005. The number of rabies cases in skunks during 2006 increased by 6.1% from the number reported in 2005. Once again, Texas reported the greatest number (n = 351) of rabid skunks and the greatest overall state total of animal rabies cases (899). Total number of cases of rabies reported nationally in foxes increased 13.6%, compared with 2005. The 1,692 cases of rabies reported in bats represented a 14.5% increase, compared with numbers reported in 2005, making bats the second most reported rabid animal behind raccoons. (The above obtained from *Public Veterinary Medicine: Public Health, Rabies surveillance in the United States during 2006*; the CDC.)

Prevention:

Rabies in animals can be prevented via pre-exposure vaccination. The US Department of Agriculture is the approval agency for rabies vaccines in the US. Vaccines are currently available for dogs, cats, ferrets, cattle, horses, and sheep. A listing of the approved vaccines and administration guidelines are available in the National Association of State Public Health Veterinarians publication, "Compendium of Animal Rabies Prevention and Control, 2006," available from: http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5603a1.htm .

Reporting:

Animal Rabies data is compiled by the DHEC Bureau of Environmental Health and is based on Direct Fluorescent Antibody testing conducted by the DHEC Bureau of Laboratories. Testing is conducted on suspect animals submitted to the Laboratory generally because they were involved in a bite incident to a person or another animal. This is therefore not a random sample, and does not reflect actual rabies prevalence in the animal population across the state.



Rabies, Human

2006 Cases in SC: 0 2006 SC Cases per 100,000: 0.00

Characteristics:

Rabies is a preventable viral disease of mammals most often transmitted through the bite of a rabid animal. The vast majority of rabies cases reported each year occur in wild animals like raccoons, skunks, bats, and foxes. Domestic animals account for less than 10% of the reported rabies cases, with cats, cattle, and dogs most often reported rabid.

Rabies virus infects the central nervous system, causing encephalopathy and ultimately death. Early symptoms of rabies in humans are nonspecific, consisting of fever, headache, and general malaise. As the disease progresses, neurological symptoms appear and may include insomnia, anxiety, confusion, slight or partial paralysis, excitation, hallucinations, agitation, hypersalivation, difficulty swallowing, and hydrophobia (fear of water.) Death usually occurs within days of the onset of symptoms.

Epidemiology

SC: No cases of human rabies were reported in SC in 2006. Numerous persons received post-exposure prophylaxis following bites, especially from bats, dogs and raccoons, or after "overnighting" with bats.

US: In 2004, there were 7 case of human rabies in the US. Significantly, among these were 1 person from Oklahoma and 3 persons from Texas who died following receipt of infected organs and tissues from an infected Arkansas donor. This was the first demonstrated transmission of rabies via organ transplantation. Also in 2004, a Wisconsin teenager contracted rabies from a bat bite and became the first known person to survive rabies despite not having received rabies vaccine prior to symptom onset.

In September 2005, a previously healthy boy aged 10 years in Mississippi died from encephalitis later attributed to rabies. This patient's clinical course and the subsequent epidemiologic investigation implicated exposure to bats at the boy's home as the likely source of rabies, underscoring the importance of recognizing the risk for rabies from direct contact with bats and seeking prompt medical attention when exposure occurs. Co-incidentally, the child had attended a summer camp in Alabama for several weeks in July. The camp program included an overnight stay in a nearby cavern used for tours and special events. Interviews with the camp director and parents of children who attended the overnight camp-out with the patient revealed no indication of direct contact with bats at the camp or in the cavern,

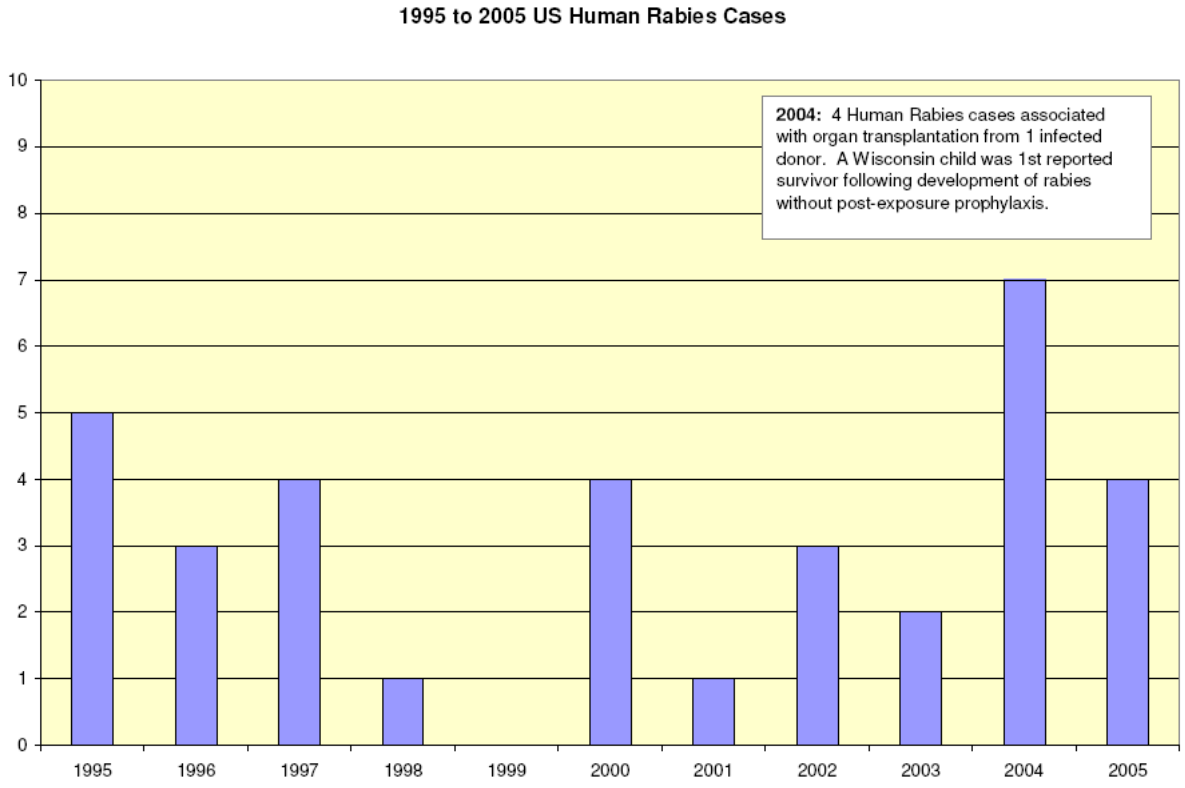
Prevention:

Rabies is prevented via pre-exposure vaccination or post-exposure prophylaxis (PEP.) Pre-exposure vaccine is recommended for persons in high-risk groups, such as veterinarians, animal handlers, and certain laboratory workers, and travelers to certain areas where canine rabies is enzootic, if the traveler is likely to come into contact with animals and if immediate access to appropriate medical care, including biologics, might be limited. Human rabies is preventable with proper wound care and timely and appropriate administration of PEP after

exposure. PEP consists of Rabies immunoglobulin, injected in/near the exposure site (bite) and a series of five injections of rabies vaccine.

Reporting: Known or suspected human rabies is immediately reported by phone to DHEC.

Rabies Illustration:



Rocky Mountain Spotted Fever

2006 cases in SC: 47 Cases per 100,000: 1.1

Characteristics:

Rocky Mountain Spotted Fever (RMSF) is a bacterial disease (caused by *Rickettsia rickettsii*), transmitted by the bite of an infected *Ixodes* species tick. It usually takes several hours of attachment and feeding before the rickettsiae are transmitted to the host. There are two major vectors of *R. rickettsii* in the United States, the American dog tick (*Dermacentor variabilis*) and the Rocky Mountain wood tick (*Dermacentor andersoni*). Ticks transmit the organism to vertebrates primarily by their bite. Less commonly, infections may occur following exposure to crushed tick tissues, fluids, or tick feces.

Initial signs and symptoms of RMSF disease include sudden onset of fever, headache, and muscle pain, followed by development of rash. The rash may present on the wrists and ankles, and quickly spread to the trunk. Additional signs include low blood counts within 1-3 weeks of infected tick exposure. Possible long-term complications of untreated RMSF include nerve damage in the brain or limbs. The disease can be difficult to diagnose in the early stages, and without prompt and appropriate treatment it can be fatal. Approximately 3% to 5% of individuals who become ill with Rocky Mountain spotted fever die from the infection

Persons at highest risk for contracting RMSF are those with increased exposure to ticks such as pet owners, animal handlers and people who spend a lot of time outdoors. Most people who become infected with RMSF are younger than 15 years of age. Deaths from RMSF are increased in those over age 50 and those who delayed recognition of tick exposure (bite or attachment) and/or delayed subsequent treatment with antibiotics.

Epidemiology:

US: Rocky Mountain spotted fever has been a reportable disease in the United States since the 1920s. In the last 50 years, approximately 250-1200 cases of Rocky Mountain spotted fever have been reported annually, although it is likely that many more cases go unreported. Cases rates tend to peak in warmer months, as more time is spent out of doors.

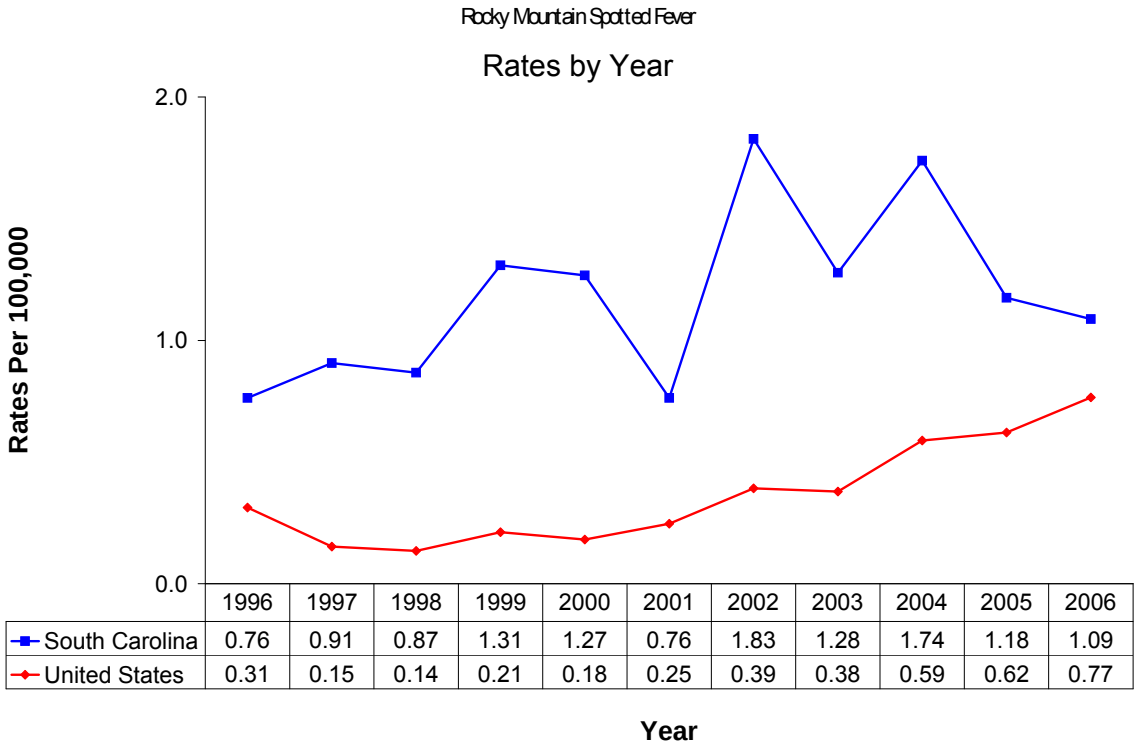
SC: South Carolina is one of five states (along with NC, AR, OK, MO) that has annual rates of 15 or greater per 1 million population in the US of RMSF in 2002, the most recent year for which CDC mapped comparisons are available.

Prevention:

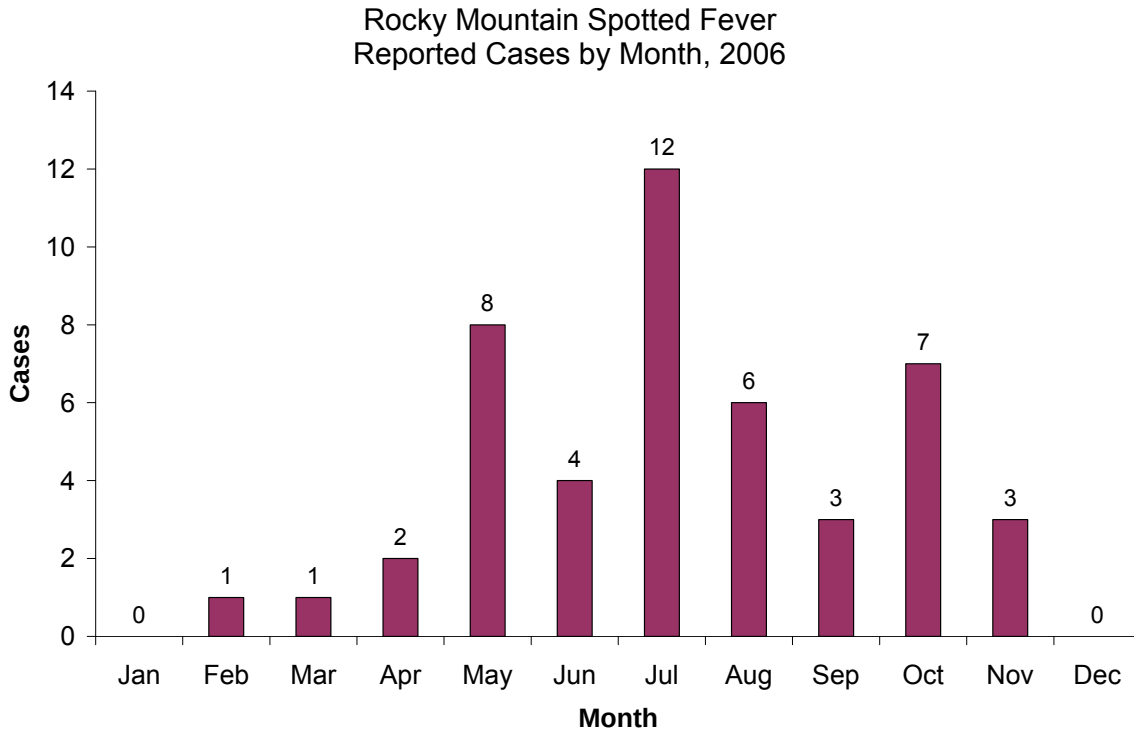
Limiting exposure to ticks is the most effective way to reduce the likelihood of Rocky Mountain spotted fever infection. In persons exposed to tick-infested habitats, prompt careful inspection and removal of crawling or attached ticks is an important method of preventing disease. It may take extended attachment time before organisms are transmitted from the tick to the host. Currently, no licensed vaccine is available for prevention of Rocky Mountain spotted fever.

Reporting:

Confirmed cases of RMSF are reportable within 7 days to DHEC



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
South Carolina	0.76	0.91	0.87	1.31	1.27	0.76	1.83	1.28	1.74	1.18	1.09
United States	0.31	0.15	0.14	0.21	0.18	0.25	0.39	0.38	0.59	0.62	0.77



Rubella

2006 Cases in SC: 0 2006 SC Cases per 100,000: 0.0

Characteristics:

Rubella (German measles) is usually a mild acute exanthematous viral illness of children and adults. The major complications of rubella are the teratogenic effects when pregnant women contract the disease, especially in the early stages of gestation. Rubella virus crosses the placenta, infects the fetus and is capable of causing severe congenital defects, abortions, and stillbirths.

Epidemiology:

Worldwide, rubella continues to cause disease and birth defects. In developing countries alone, more than 100,000 cases of congenital rubella syndrome (CRS) are estimated to occur each year. In 2003, a total of 304,320 cases were reported in Europe, with 41% from the Russian Federation, and 40% from Romania.

Prior to the introduction of the live attenuated rubella vaccine in 1969, it is estimated that 12.5 million rubella cases occurred in the US during the 3-year period from 1962-1965, resulting in 20,000 cases of congenital rubella syndrome. Since the introduction of rubella vaccine, there has been a continual decrease over time in the number of cases of rubella and CRS. In 2000 and 2001, 176 and 23 cases of rubella, respectively, were reported to the CDC. Since 2002, the number of cases of rubella has remained low, ranging from 7 to 11 per year. The number of cases congenital rubella syndrome cases ranged from 0-3 cases per year since 2000. Cases of rubella have involved susceptible individuals who had not been immunized with rubella vaccine and who did not have a history of previous rubella infection.

During the 10-year period in SC from 1996-2006, no cases of rubella have been reported.

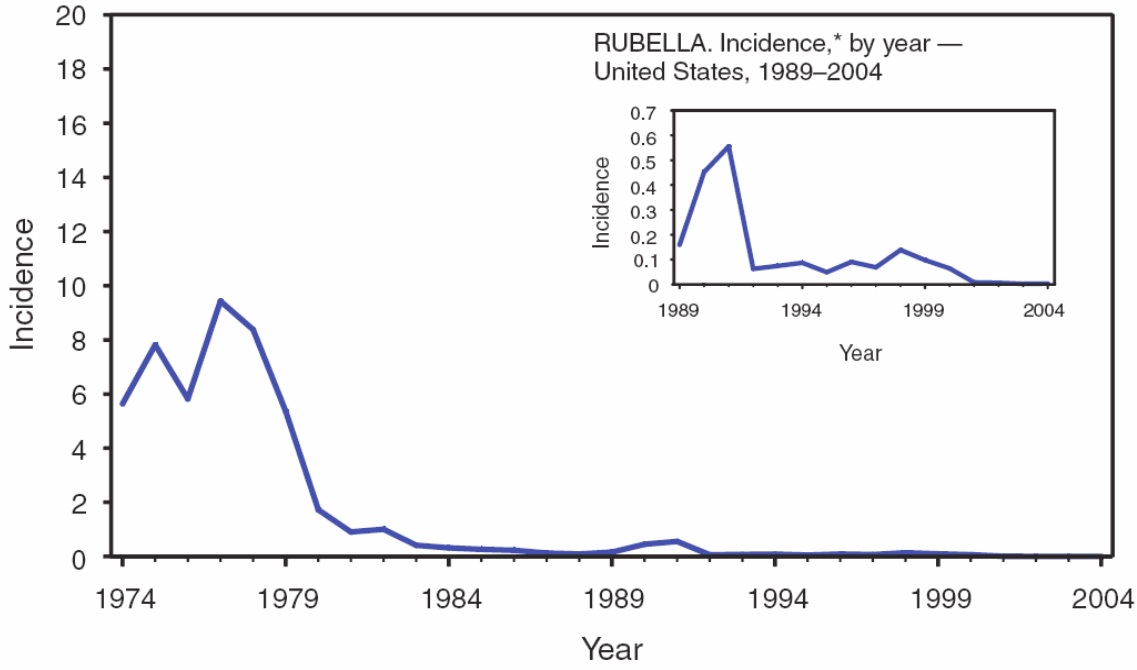
Prevention:

The success of the rubella vaccine is evident by the conclusion of the CDC independent expert panel convened in 2004 on the prevalence of rubella in the US: that rubella was no longer endemic in the United States.

Reporting:

Rubella and congenital rubella syndrome are urgently reportable by phone within 24 hours to DHEC.

RUBELLA. Incidence,* by year — United States, 1974–2004



* Per 100,000 population.

Evidence suggests that rubella is no longer endemic in the United States (CDC. Elimination of rubella and congenital rubella syndrome—United States, 1969–2004. MMWR 2005; 54:279–82).

Salmonellosis

2006 Cases: 1063 2006 Cases per 100,000: 24.6

Characteristics:

Every year, approximately 40,000 cases of salmonellosis are reported in the United States. Because many milder cases are not diagnosed or reported, the actual number of infections may be thirty or more times greater. Salmonella live in the intestinal tracts of humans and other animals, including birds and reptiles. Salmonella are usually transmitted to humans by eating foods contaminated with animal feces. Contaminated foods are often of animal origin, such as poultry, beef, milk, or eggs. However, other foods may also become contaminated. The unwashed hands of an infected food handler may also contaminate food.

Epidemiology:

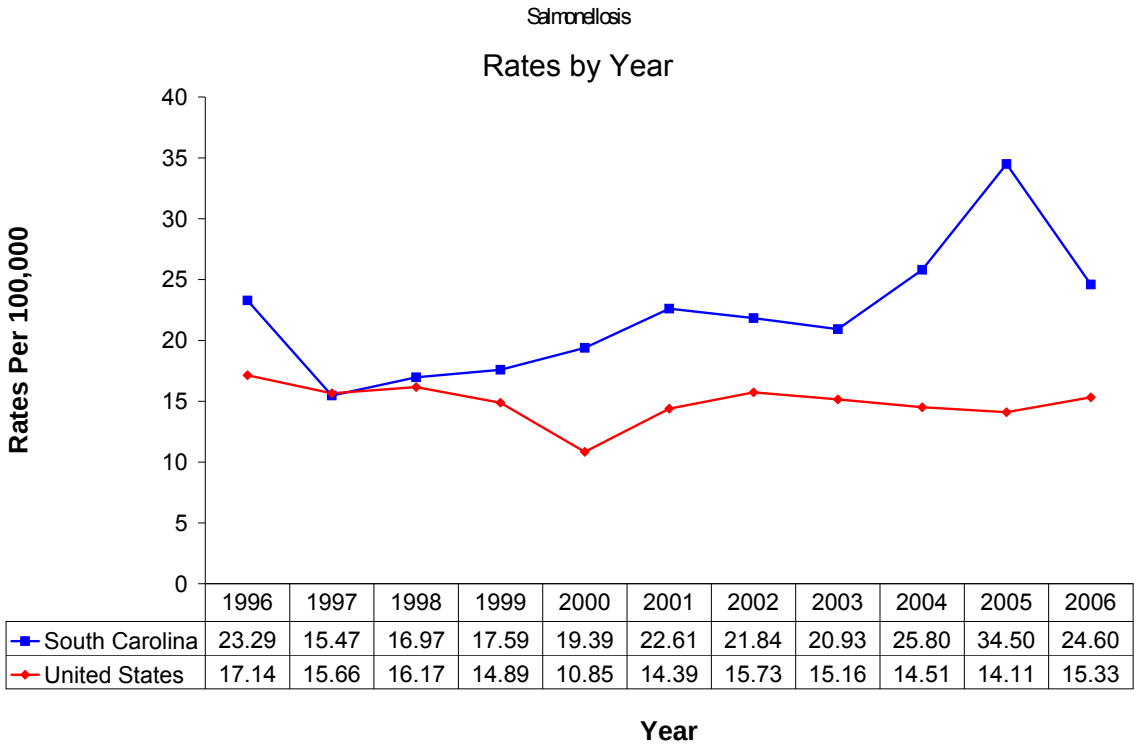
In South Carolina, one thousand sixty-three cases of salmonellosis were reported to the Department of Health and Environmental Control in 2006. The overall incidence rate was 24.6 cases per 100,000 population. There were three known outbreaks of salmonellosis. The reported number of cases by month illustrated a typical seasonal trend of increased Salmonella infections during the summer and fall months. Seventy-four percent of cases were reported in the months of May through October. August was the peak month for cases with 15.2% cases reports.

In 2006, cases ranged in age from 1 month to 93 years with a median age of 11. The incidence of infection was highest among infants and children under 5 years of age. Additionally rates were fairly evenly distributed by gender. There are over 2500 serotypes of salmonellosis. In 2006 the three most common serotypes seen in South Carolina were *S. Newport, S. Typhimurium* and *S. Javiana*. In 2006, there was 1 reported case of S. Typhi, the cause of Typhoid fever.

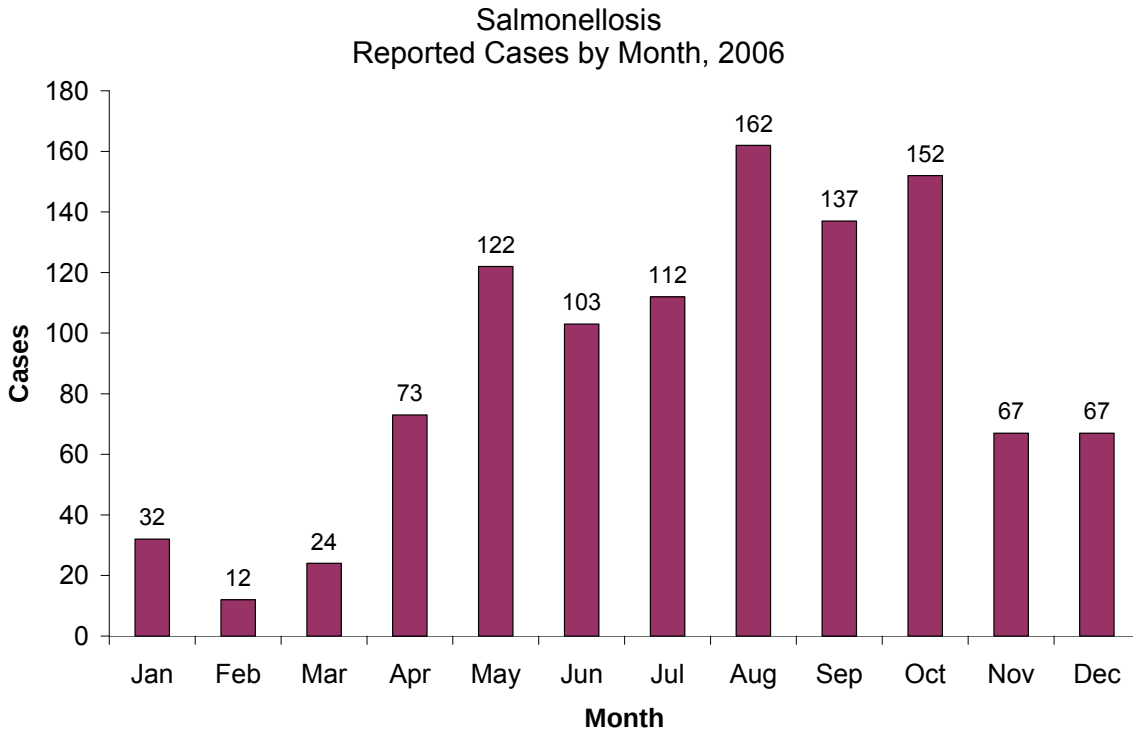
Over the last ten years there have been an average of 22 cases of salmonellosis per 100,000 population reported in South Carolina per year. The CDC reports a national average of 15 cases of salmonellosis per 100,000 population per year. The number of reports received by the DHEC in 2006 was slightly higher than expected based on the last ten years of data. While this is due in part to the increased number of Salmonella outbreaks investigated in 2006, South Carolina has a higher than expected incidence of Salmonella when compared to the nation as a whole.

Reporting:

Salmonellosis is reportable within 7 days in South Carolina.



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
South Carolina	23.29	15.47	16.97	17.59	19.39	22.61	21.84	20.93	25.80	34.50	24.60
United States	17.14	15.66	16.17	14.89	10.85	14.39	15.73	15.16	14.51	14.11	15.33



SARS

2006 Cases in SC: 0 2006 SC Cases per 100,000: 0.00

Characteristics:

Severe acute respiratory syndrome (SARS) came to global attention in February 2003, when officials in China informed the World Health Organization (WHO) about 305 cases of atypical pneumonia that had occurred in Guangdong Province. The evolving case definition of SARS focused on patients who required hospitalization for radiographically confirmed pneumonia or acute respiratory distress syndrome without identifiable etiology AND who had one of the following risk factors in the 10 days before the onset of illness:

- Travel to mainland China, Hong Kong, or Taiwan, or close contact with an ill person with a history of recent travel to one of these areas, OR

- employment in an occupation associated with a risk for SARS-CoV exposure (e.g., healthcare worker with direct patient contact; worker in a laboratory that contains live SARS-CoV), OR

- Part of a cluster of cases of atypical pneumonia without an alternative diagnosis.

Epidemiology

SC: No cases of SARS have been reported in SC.

US: Of the 161 total cases reported from the US in 2003, 134 were classified as suspected; 19 were classified as probable; and eight were laboratory confirmed as SARS-CoV infection. As of July 1, 2003, SARS-CoV disease was added to the list of nationally notifiable diseases.

World: During November 2002-July 2003, a total of 8,098 probable SARS cases were reported to the World Health Organization (WHO) from 29 countries. By July 2003, when SARS-CoV transmission was brought to an end, >8,000 cases and 780 deaths had been reported to WHO. Since SARS-CoV transmission was declared contained, active global surveillance for SARS-CoV disease has detected no person-to-person transmission of SARS-CoV.

Prevention:

Prevention efforts in 2003 focused on containment and personal protective equipment (PPE.) Symptomatic persons and communities with SARS transmission in a number of countries were subject to isolation and quarantine. PEP was used by healthcare workers, contacts, and many of the general public in countries with SARS transmission. No SARS-CoV vaccine exists.

Surveillance:

Continued vigilance is critical to ensure the rapid recognition and appropriate management of SARS patients if person-to-person SARS-CoV transmission recurs. US surveillance efforts focus on specific clinical syndromes (i.e., cases of pneumonia requiring hospitalization) in groups likely to be first affected by the re-emergence of SARS-CoV (e.g., travelers to areas previously affected with SARS-CoV; healthcare workers).

Reporting:

SARS is immediately reportable by phone to DHEC.

Shiga toxin-producing Escherichia coli (STEC)

2006 Cases in SC: 5 2006 Cases per 100,000: 0.42

Characterictics:

Shiga toxin-producing *E. coli* (STEC), formerly known as enterohemorrhagic *E. coli* or verotoxin-producing E. coli, strains are associated with diarrhea, hemorrhagic colitis, hemolytic-uremic syndrome (HUS) and postdiarrheal thrombotic thrombocytopenic purpura (TTP). Shiga toxin-producing *E. coli* O157:H7 is the most virulent member of this group.

E. coli O157:H7 is one of hundreds of strains of the bacterium Escherichia coli. Although most strains are harmless and live in the intestines of healthy humans and animals, this strain produces a powerful toxin and can cause severe illness. The organism can be found on a small number of cattle farms and can live in the intestines of healthy cattle. Meat can become contaminated during slaughter, and organisms can be thoroughly mixed into beef when it is ground. Bacteria present on the cow's udders or on equipment may get into raw milk.

Additionally, the consumption of cross-contaminated non-meat items such as sprouts, lettuce, unpasteurized milk and juice, as well as swimming in or drinking sewage-contaminated water are sources of infection. Bacteria in diarrheal stools of infected persons can be passed from one person to another if hygiene or handwashing habits are inadequate. Many cases go undiagnosed or unreported, and *E. coli* O157:H7 is estimated to cause 73,000 cases and 2,100 hospitalizations annually in the United States.

Epidemiology:

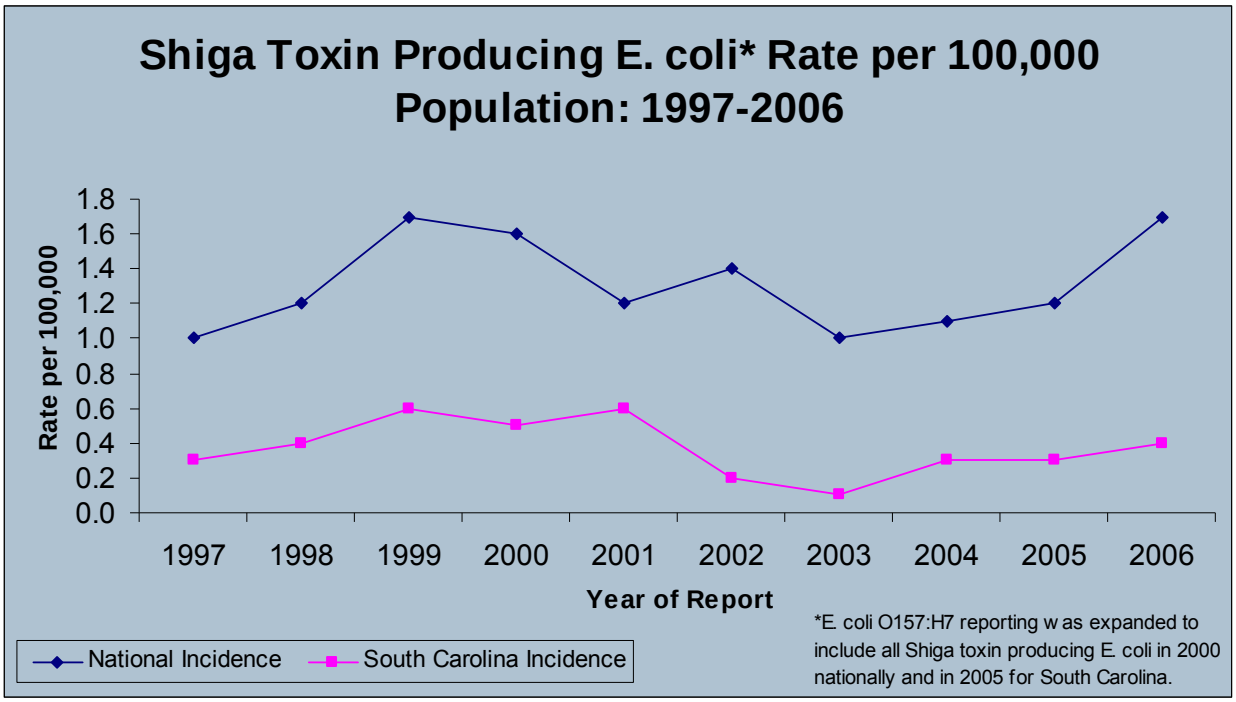
In South Carolina, seventeen cases Shiga toxin-producing *E. coli* (STEC) were reported to the DHEC in 2006. The overall incidence rate in South Carolina was 0.42 cases per 100,000 population. There were no known outbreaks of Shiga toxin-producing *E. coli* (STEC) in South Carolina in 2006. Cases occurred among residents of 9 counties. In 2006, cases ranged in age from under 1 to 79 years with a median age of 11. Cases were evenly distributed by gender, with males consisting of 47% of reports received. The month with the most cases reported was July, with 29.4% of case reports, followed by November with 17.6% of case reports. Nine of the seventeen Shiga toxin-producing *E. coli* (STEC) cases reported in 2006 were *E. coli* O157:H7. An additional six of the seventeen reports were reported as Shiga toxin-producing *E. coli* without serotype specified.

Over the last ten years there has been an average of 0.4 cases of STEC per 100,000 population reported in South Carolina per year. The CDC have had an average of 1.5 cases of STEC per 100,000 population reported nationally per year. It is important to note that the reporting procedures of *E. coli* O157:H7 were expanded to include all Shiga toxin-producing *E. coli* nationally in 2000 and for South Carolina in 2005.

Reporting:

Shiga toxin-producing *E. coli* (STEC) is classified as a disease that is reportable by phone within 24 hours in South Carolina.

Graph 1: Ten-year trend for Shiga toxin-producing *E. coli*



*The data presented here concerning Enterohemorrhagic (EHEC) E. coli include cases identified in the laboratory as being due either to (1) E. coli O157:H7, (2) Shiga toxin positive E. coli serogroup non-O157, or (3) Shiga toxin positive E. coli, not serogrouped. In various publications, the US Centers for Disease Control (CDC) likewise regroups these variants (see for example: http://wonder.cdc.gov/mmwr/mmwr_reps.asp?mmwr_year=2005&mmwr_week=48&mmwr_table=2B)

Shigellosis

2006 Cases in SC: 72 2006 Cases per 100,000: 1.7

Characteristics:

Every year, about 18,000 cases of shigellosis are reported in the United States. Because many milder cases are not diagnosed or reported, the actual number of infections may be twenty times greater. Shigellosis is particularly common and causes recurrent problems in settings where hygiene is poor and can sometimes sweep through entire communities. Shigellosis is more common in summer than winter. Children, especially toddlers, are the most likely to get shigellosis. Many cases are related to the spread of illness in child-care settings, and many more are the result of the spread of the illness in families with small children. *Shigella* infections may be acquired by person-to-person transmission or by consumption of contaminated food or drink. Infected food handlers may contaminate food with unwashed hands. *Shigella* infections can also be acquired by swimming in contaminated water.

Epidemiology:

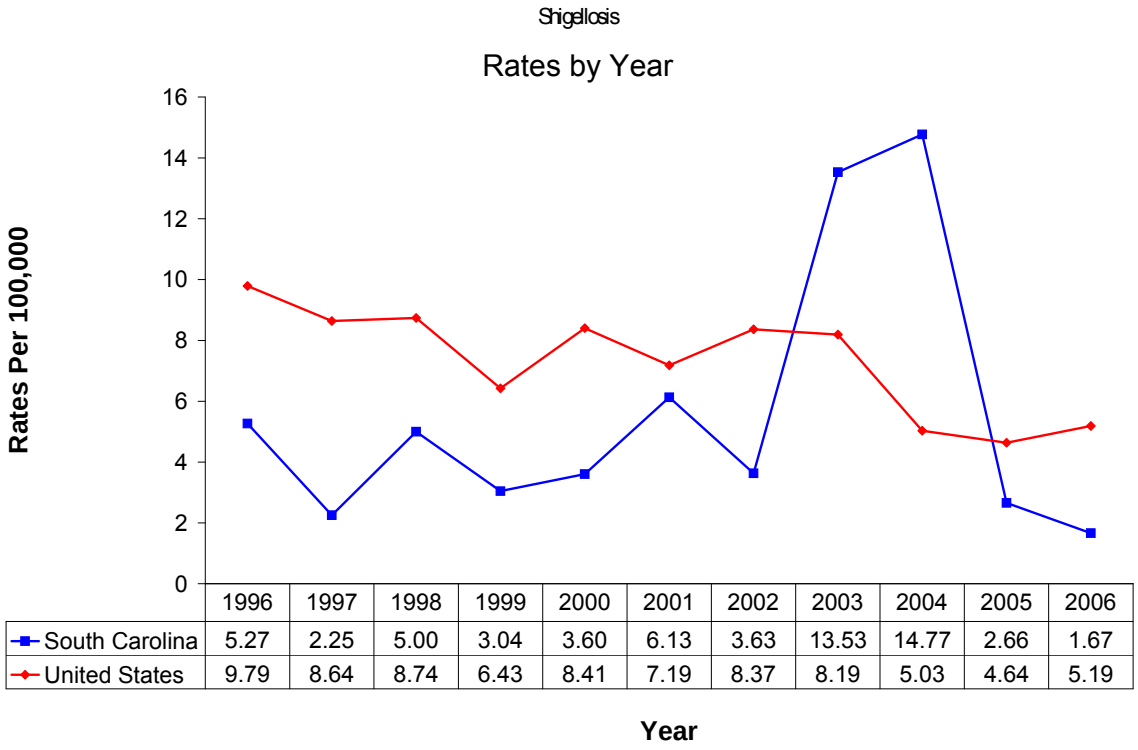
In South Carolina, seventy-two cases of shigellosis were reported to the DHEC in 2006. The overall incidence rate in South Carolina was 1.7 cases per 100,000 population. Cases occurred among residents of 17 counties. The reported number of cases by month did not illustrate a typical seasonal trend of increased *Shigella* infections during the summer months. The majority of cases occurred January - May (80.5%) with May as the peak month for cases with 23.6% of case reports. There were no known outbreaks of shigellosis in 2006.

In 2006, cases ranged in age from 3 to 90 years with a median age of 7. The incidence of infection was highest among toddlers and children under 8 years of age. This age distribution follows the expected distribution of cases and may be related to the spread of illness is child-care settings. Additionally rates were higher among females, comprising 62% of the reports received.

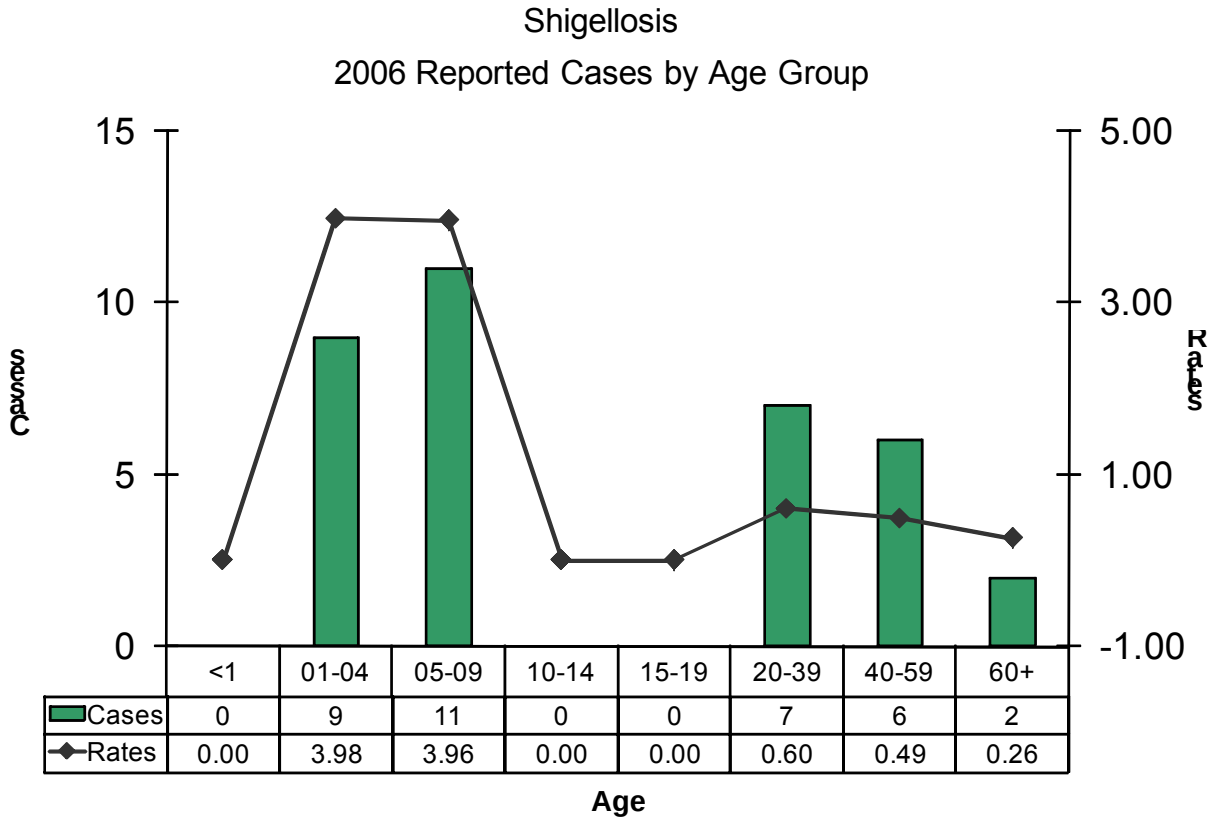
Over the last ten years there have been an average of 6 cases of shigellosis per 100,000 population reported in South Carolina per year. The CDC have had an average of 7.8 cases of shigellosis per 100,000 population reported nationally per year. While the number of reports received by the DHEC in 2006 was within the expected range based on the last ten years of data, it is important to note that 2006 represented a decrease in reported cases when compared to the previous few years. Both 2003 and 2004 were very active years for outbreaks of Shigella infection.

Reporting:

Shigellosis is reportable within 7 days in South Carolina.



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
South Carolina	5.27	2.25	5.00	3.04	3.60	6.13	3.63	13.53	14.77	2.66	1.67
United States	9.79	8.64	8.74	6.43	8.41	7.19	8.37	8.19	5.03	4.64	5.19



	<1	01-04	05-09	10-14	15-19	20-39	40-59	60+
Cases	0	9	11	0	0	7	6	2
Rates	0.00	3.98	3.96	0.00	0.00	0.60	0.49	0.26

Age was not available for 37 cases.

Smallpox / Variola

2006 Cases in SC: 0 2006 Cases per 100,000: 0.00

Characteristics:

Smallpox is an acute contagious disease caused by Variola virus. Smallpox has two main forms: variola major and variola minor, both forms with similar lesions which progress from macules to papules to vesicles to pustules. All lesions in a given area progress at the same rate through these stages. From 8 to 14 days after the onset of symptoms, the pustules form scabs which leave depressed depigmented scars upon healing. The disease follows a milder course in variola minor, which has a case-fatality rate of less than 1 per cent. The fatality rate of variola major is around 30%. There are also two rare forms of smallpox: hemorrhagic and malignant, both almost invariably fatal.

Epidemiology & Eradication:

Smallpox has been known to medicine for thousands of years. Pharaoh Ramses V is thought by many to have been the earliest identified victim of this disease. Others evidence points to its origin being in India. For centuries, repeated epidemics swept across continents, decimating populations and changing the course of history. Smallpox toppled the Aztec Empire. In some ancient cultures, smallpox was such a major killer of infants that custom forbade the naming of a newborn until the infant had caught the disease and proved it would survive. The disease, for which no effective treatment was ever developed, killed as many as 30% of those infected. Between 65–80% of survivors were marked with deep-pitted scars (pockmarks), most prominent on the face. In 18th century Europe, a third of all reported cases of blindness were due to smallpox. In a survey conducted in Viet Nam in 1898, 95% of adolescent children were pockmarked and nine-tenths of all blindness was ascribed to smallpox.

Smallpox was one of the world's most feared diseases until it was eradicated by a collaborative global vaccination program led by the World Health Organization. The last US case occurred in 1949. The last known natural case was in Somalia in 1977. Since then, the only known cases were caused by a laboratory accident in 1978 in Birmingham, England, which killed one person and caused a limited outbreak. Smallpox was officially declared eradicated in 1979.

Prevention: Smallpox has been eradicated, but preventive measures are still used due to the possibility of its use as a weapon of bioterrorism (BT.) Limited vaccination of persons who would respond to a BT event, who would care for patients and who would be handling laboratory samples was resumed in the US in 2002. In the event of an outbreak, vaccine, vaccinia-immune globulin (if available), and social distancing measures would be first employed to contain the spread of disease.

Reporting: A confirmed or suspected case of smallpox is immediately reportable by phone to DHEC.

St. Louis Encephalitis

2006 Cases in SC: 0 2006 Cases per 100,000: 0

Characteristics:

St. Louis encephalitis (SLE) is a mosquito borne viral disease that can cause encephalitis, meningitis, or myelitis-all diseases of the central nervous system. SLE is transmitted by the bite of a mosquito, primarily the *Culex* species, that has become infected with St. Louis encephalitis virus. Mosquitoes become infected by feeding on birds infected with the St. Louis encephalitis virus. SLE is not transmitted from person to person.

It can take between 4 days to 2 weeks to show symptoms after having been bitten by an infected mosquito. Mild infections occur without apparent symptoms other than fever with headache. More severe infections may be marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, occasional convulsions (especially in infants), and spastic (but rarely flaccid) paralysis. Case-fatality rates range from 3% to 30% (especially in the aged).

Diagnosis of SLE encephalitis can be difficult, as other arboviral encephalitides can mask as SLE on blood tests. The DHEC Bureau of Laboratories, utilizing specific testing techniques, can distinguish between SLE and other arboviral illnesses.

Epidemiology:

US. SLE typically occurs in the northeastern, central, southern, and western parts of the United States. The CDC reports that between 1964 and 2005, 4,651 reported human cases of St. Louis encephalitis occurred.

SC. CDC data from 1964 through 2005 show no cases in South Carolina.

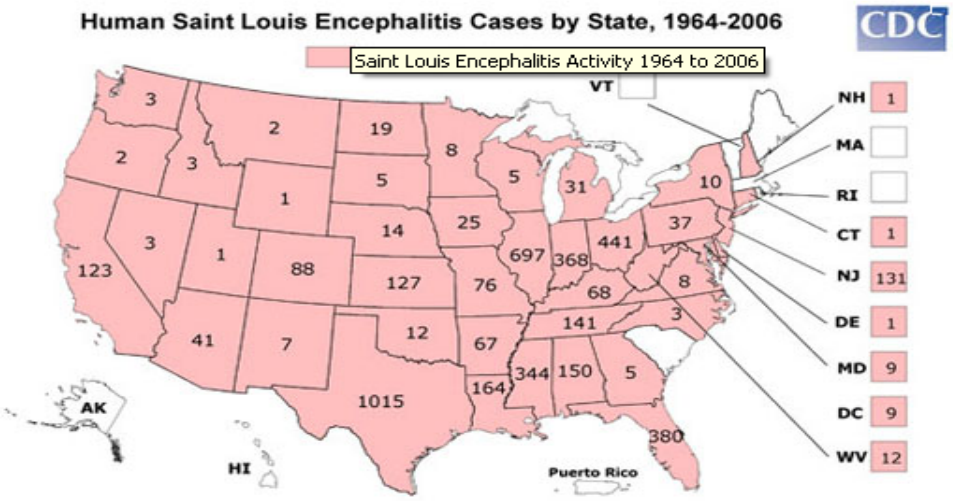
Prevention:

There is no vaccine available against SLE. Prevention is best accomplished by limiting amount of time spent outdoors during peak mosquito hours (dawn and dusk) or wearing insect repellant containing DEET, eucalyptus, or picaridin. Mosquito reduction may be accomplished by eliminating sources of standing water.

Reporting:

Confirmed or suspected Neuroinvasive St. Louis Encephalitis is urgently reportable by phone within 24 hours to DHEC.

St. Louis Encephalitis Surveillance & Control Activity Map



Map shows the distribution of Human cases occurring from 1964 though 2006 with number of human cases if any, by state. If Saint Louis Encephalitis is reported to CDC from any area of a state, that entire state is shaded.

Source: http://www.cdc.gov/ncidod/dvbid/sle/MapsActivity/Sle_SurvControl.html

Streptococcus Group A, Invasive Disease

2006 Cases in SC: 71 2006 Cases per 100,000: 1.64

Characteristics:

Group A *Streptococcus* (GAS), also known as *Streptococcus pyogenes*, causes a spectrum of diseases that includes a variety of respiratory and cutaneous and deep soft tissue infections (e.g., myositis or necrotizing fasciitis) as well as invasive infections such as meningitis, peritonitis, osteomyelitis, septic arthritis, postpartum sepsis (i.e., puerperal fever), neonatal sepsis and nonfocal bacteremia. GAS can also lead to poststreptococcal nonsuppurative sequelae that include acute rheumatic fever and glomerulonephritis.

Epidemiology:

This report addresses Group A *Streptococcus* invasive infections in South Carolina in which *Streptococcus pyogenes* was isolated by culture from a normally sterile site (e.g., blood or cerebrospinal fluid, or, less commonly, joint, pleural, or pericardial fluid) from an individual with a clinically compatible disease.

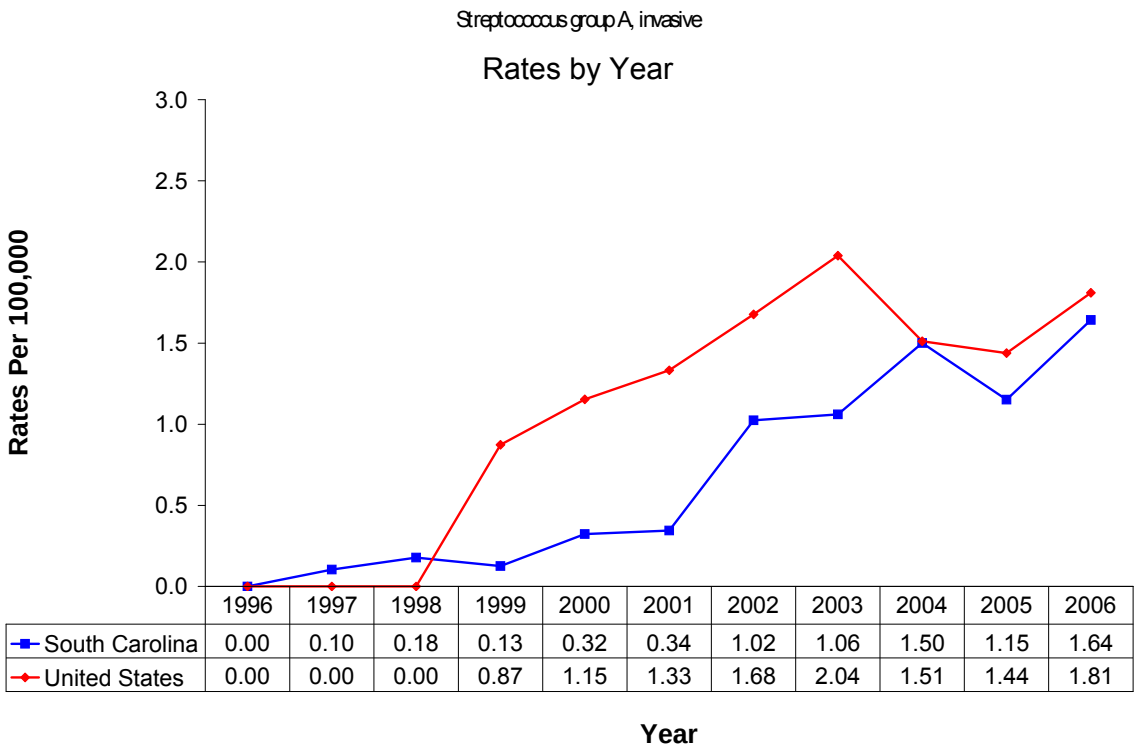
US: The annual incidence rates of invasive group A streptococcal disease in the US have ranged from 0.23 cases to 1.59 cases per 100,000 population for the years 1995 through 2005.

SC: Invasive group A streptococcal disease became reportable in South Carolina in 1999. In 2006, SC had 71 cases, corresponding to an incidence rate of 1.64 cases/100,000 population. It is not known whether the low incidence rates from 1999 through 2001 are due to lack of case reports to DHEC or if these rates reflect a low incidence of disease in the SC population. The incidence rate in SC has been similar to that of the US population for each year since 1999.

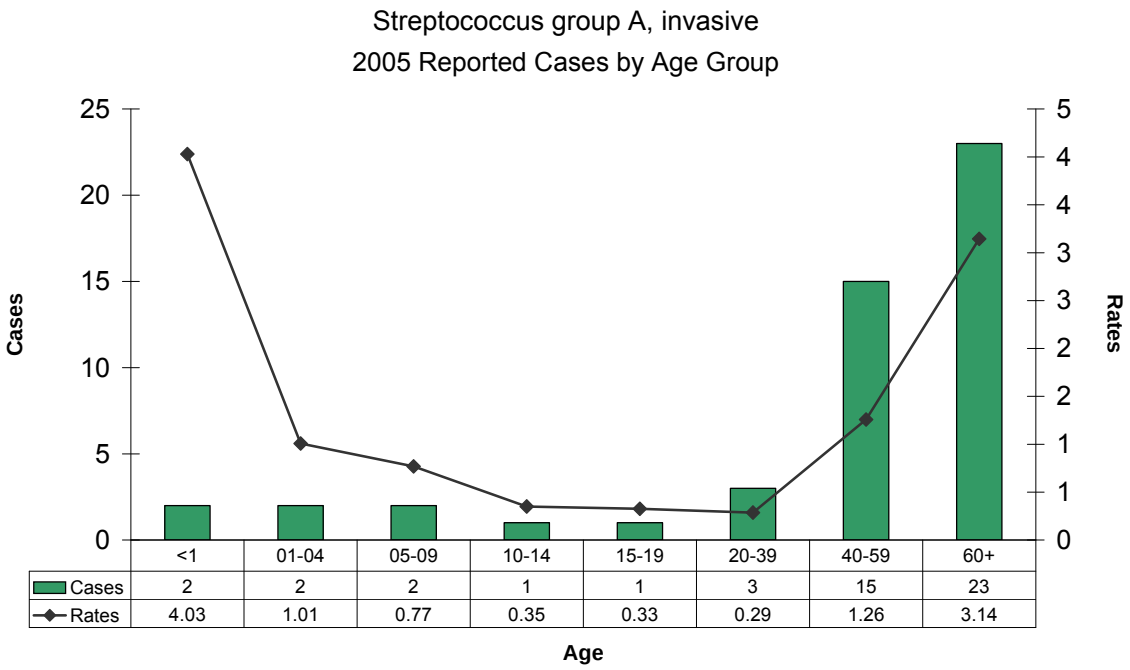
By age: The incidence of Invasive group A streptococcal disease was greatest in persons 65 years of age and older and persons 40-59 (16.54 and 13.09 cases/100,000 population, respectively). However, 34% of the cases (18 of 46 cases) occurred in persons 65 years of age and older while only 3 cases occurred in infants. This indicates that persons 65 years of age and older are particularly vulnerable to invasive group A streptococcal disease. This is mostly to due to risk factors in older adults such as diabetes mellitus, cardiac disease, cancer, and corticosteroid use which are associated with invasive GAS infection.

Reporting:

Invasive Group A Streptococcal disease is routinely reportable, within 7 days, to DHEC.



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
South Carolina	0.00	0.10	0.18	0.13	0.32	0.34	1.02	1.06	1.50	1.15	1.64
United States	0.00	0.00	0.00	0.87	1.15	1.33	1.68	2.04	1.51	1.44	1.81



	<1	01-04	05-09	10-14	15-19	20-39	40-59	60+
Cases	2	2	2	1	1	3	15	23
Rates	4.03	1.01	0.77	0.35	0.33	0.29	1.26	3.14

Streptococcal Infection, Group B, age under 90 days

2006 Cases in SC: 26 2006 Cases per 100,000: 0.83

Characteristics:

Group B *Streptococcus* (GBS), also known as *Streptococcus agalactiae,* is the leading cause of neonatal sepsis, pneumonia and meningitis. GBS disease in infants has two distinct clinical presentations. Early onset disease (from 0-6 days of age) is acquired in utero or during delivery and is characterized by respiratory distress, apnea, shock, pneumonia and meningitis. Late onset disease usually occurs in the 3 to 4 week of life and is most often acquired through person-to-person contact. It often presents as meningitis, occult bacteremia, osteomyelitis, septic arthritis and cellulitis.

Epidemiology and Prevention:

Before the widespread use of intrapartum antibiotics to prevent the transmission of GBS to the neonate, the incidence of invasive neonatal GBS disease in the US ranged from 2 to 3 cases per 1,000 live births. Early-onset disease accounted for the majority of cases.

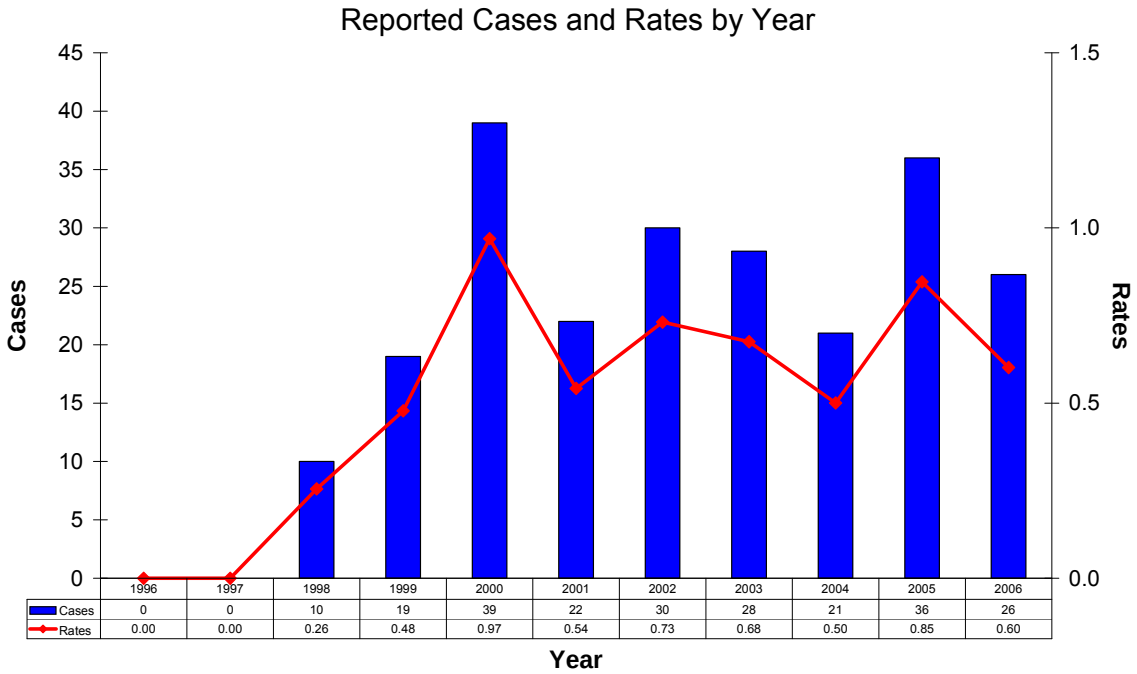
Following the widespread use of intrapartum antibiotics to prevent neonatal GBS disease, the incidence of early-onset disease declined by 70% to 0.5 cases per 1,000 live births in 1999. The rate of late-onset disease remained fairly constant (approximately to 0.5 cases per 1,000 live births) suggesting that this intervention is not effective against late-onset disease. Despite dramatic declines in GBS incidence in the United States in the 1990s, GBS remains a leading cause of newborn morbidity and mortality, resulting in an estimated 1,600 early-onset cases and 80 deaths annually.

In 2006, there were 36 reported cases of GBS, >90 days, with an incidence rate of 0.83 per 100,000.

Reporting:

Group B streptococcal infections in infants less than 90 days of age are reportable within 7 days to DHEC.

Streptococcus group B, < 90 days



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Cases	0	0	10	19	39	22	30	28	21	36	26
Rates	0.00	0.00	0.26	0.48	0.97	0.54	0.73	0.68	0.50	0.85	0.60

Streptococcus Pneumoniae, Invasive Disease

2006 Cases in SC: 243 2006 Cases per 100,000: 5.64

Characteristics:

Streptococcus pneumoniae is a leading cause of illness in young children and causes illness and death among the elderly and persons who have certain underlying medical conditions. Although ninety serotypes have been identified, a minority of serotypes produces the majority of pneumococcal infections. In the US, the seven most common serotypes isolated from blood or cerebrospinal fluid of children younger than 6 years of age account for 80% of infections. However, these seven serotypes account for only about 50% of isolates from older children and adults.

S. pneumoniae causes several types of illnesses. One group of infections are the invasive infections in which the illness caused by *S. pneumoniae* is accompanied by the isolation of this bacteria from a sterile body site such as blood (bacteremia) or cerebral spinal fluid (meningitis). Noninvasive infections. These include pneumonia and other lower respiratory tract infections, and upper respiratory tract infections, including otitis media and sinusitis. *S. pneumoniae is* now the most common cause of bacterial meningitis in the U.S. Case-fatality rates vary by age and underlying illnesses of patients; however, case-fatality rates for some high-risk patients have been reported to be greater than 40% for bacteremia and 55% for meningitis, despite appropriate antimicrobial therapy.

Epidemiology:

Prior to the use of the 7-valent pneumococcal conjugate vaccine (PCV-7) in children 2 to 59 months of age beginning in 2000*, S. pneumoniae* accounted for an estimated 3,000 cases of meningitis, 50,000 cases of bacteremia, 500,000 cases of pneumonia, and 7 million cases of otitis media in the U.S. annually. Routine use of PCV7 in young children has significantly reduced the incidence of invasive disease by vaccine serotypes by at least 80%. In addition, by decreasing colonization and disease in children, and therefore, transmission, PCV7 has had a significant effect in decreasing invasive pneumococcal disease in older age groups.

In SC in 2006, the greatest number of cases and the highest incidence rates of invasive pneumococcal disease (IPD) occurred in persons over 40 years of age. For persons 40-59 years of age there were 68 cases with a corresponding rate of 48.9 cases /100,000 population. For persons 60 year and older, the number of cases was 105 cases with a corresponding rate of 72.4 cases/100,000 population. For children 9 years of age and younger, the greatest number of cases and rates of IPD occurred in children between the ages of 1 year and 4 years (25 cases and 17.2 cases/100,000 population, respectively). The decreased number of cases and rates of invasive pneumococcal disease in children relative to that in the older adult population reflects the high rates of pneumococcal vaccination in children and the underutilization of the pneumococcal vaccine in the elderly.

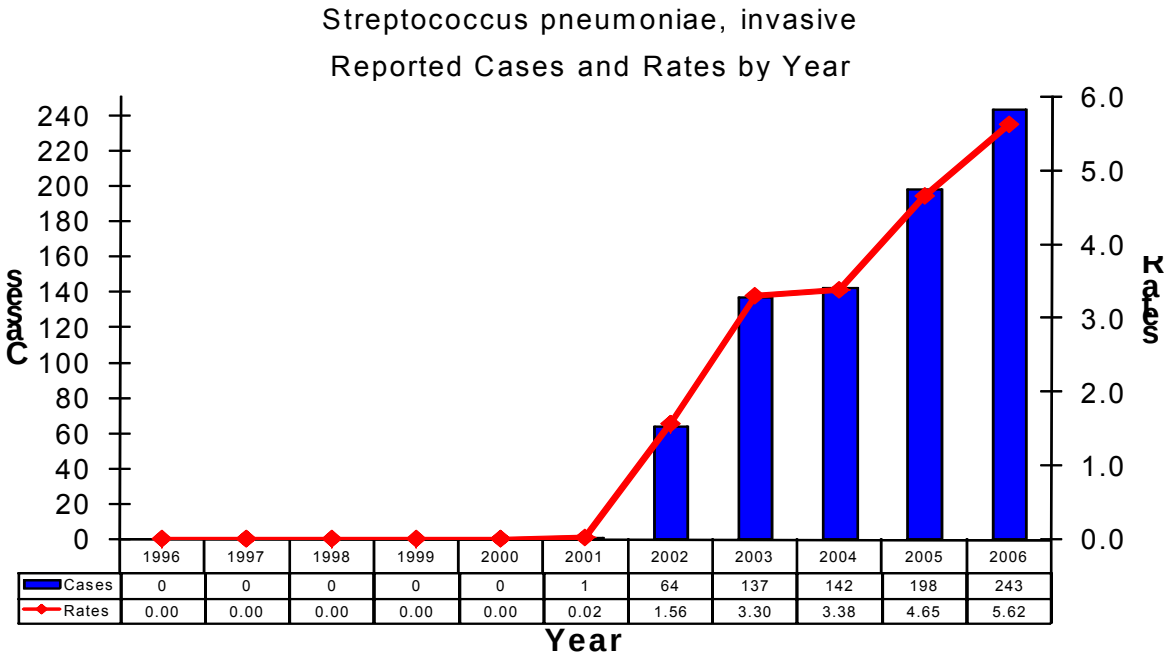
Prevention:

The 7-valent pneumococcal conjugate vaccine (PCV-7) is recommended for all children younger than 2 years of age and for children 2 to 59 months of age. Another vaccine (PPV-23) provides protection against 23 of the most common serotypes of *S. pneumoniae*. PPV-23 is

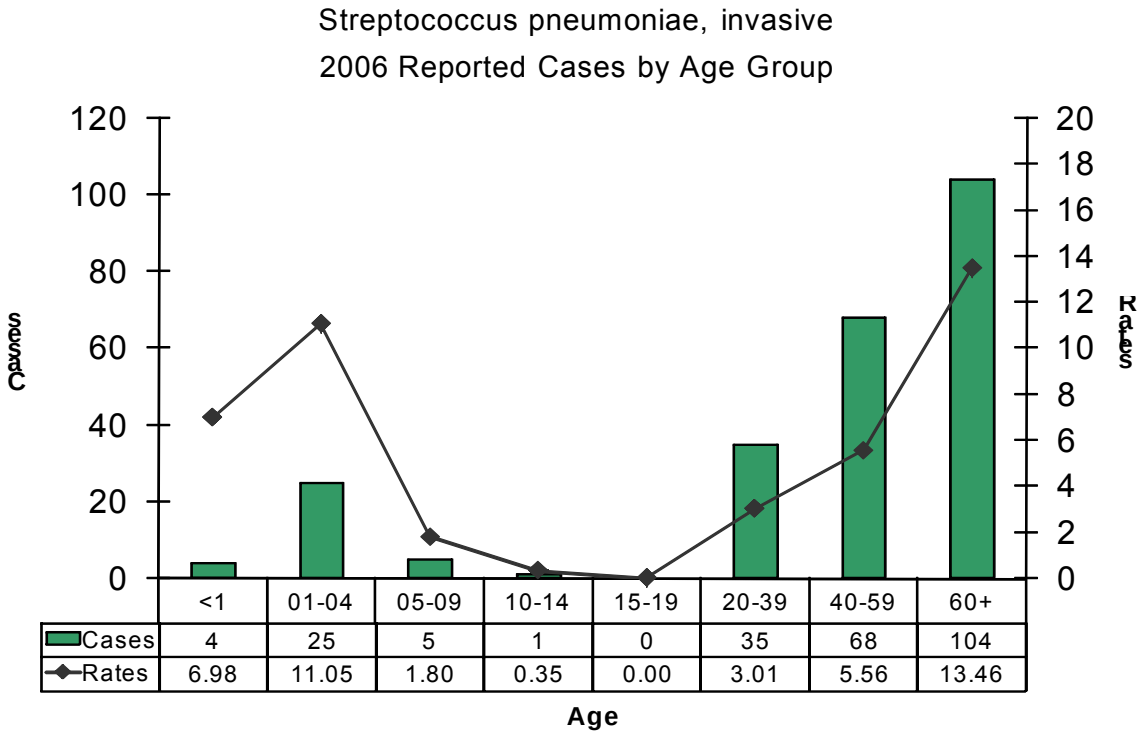
recommended for persons greater than 2 years of age with medical conditions that place them at high risk of complications from pneumococcal infection as well as for all persons 65 years of age and older. However, despite its availability, the vaccine is greatly underutilized.

Reporting:

Invasive Streptococcus pneumoniae disease, with antibiotic resistance patterns, if available, is reportable within 7 days to DHEC.



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Cases	0	0	0	0	0	1	64	137	142	198	243
Rates	0.00	0.00	0.00	0.00	0.00	0.02	1.56	3.30	3.38	4.65	5.62



	<1	01-04	05-09	10-14	15-19	20-39	40-59	60+
Cases	4	25	5	1	0	35	68	104
Rates	6.98	11.05	1.80	0.35	0.00	3.01	5.56	13.46

Syphilis

2006 Cases in SC: 68 (infectious) Cases per 100,000 population: 1.6

2006 Cases in SC: 401 (total) Cases per 100,000 population: 9.3

Characteristics:

Syphilis is a complex, sexually transmitted, genital ulcerative disease that has a highly variable clinical course. It is highly infectious, but easily curable in its early (primary and secondary) stages. If untreated, it can lead to serious long-term complications, including nerve, cardiovascular and organ damage, and even death. Congenital syphilis can cause stillbirth, death soon after birth, and physical deformity and neurological complications in children who survive. The case surveillance definition for syphilis includes several stages that are based on laboratory and clinical presentation. Infectious cases represent the infectious primary and secondary stages of syphilis. Total syphilis cases represent reports for all stages including primary and secondary (infectious), latent, neurosyphilis, and congenital syphilis.

Epidemiology:

Infectious Syphilis. In 2006, 68 cases of infectious syphilis were diagnosed, compared to 402 cases in 1996. Significant decreases have occurred during the past ten years for all infectious syphilis cases. The number of primary and secondary (P&S) syphilis - the most infectious stages of the disease - decreased throughout the 1990s, reaching an all time low of 68 cases in 2005 compared to over 900 in 1993.

As with other STDs, African Americans are most impacted, accounting for 72% of total cases of infectious syphilis. Unlike other STDs, infectious syphilis most affects adults, 30 years of age and older (63% of total.) Males account for 82% of new infectious cases of syphilis. Counties with highest infectious syphilis rates per 100,000 population in 2006 were Williamsburg (16.6), Dillon (6.5), and Richland (6.0).

All Syphilis Cases. In 2006, 401 total cases of syphilis were diagnosed in South Carolina, compared to 846 cases in 1999. Significant decreases in numbers of cases have been documented during the past five years for all syphilis cases, especially among African Americans. Beginning in 2003, however, there has been an increase in confirmed cases among white males. African Americans are the population most affected by syphilis, accounting for 77% of total cases in 2006. Males account for 63% of newly diagnosed cases of syphilis (including infectious, latent and neurosyphilis.) Counties with highest total syphilis rates per 100,000 population in 2006 were Lee (34.0), McCormick (29.3), and Greenwood (27.9).

Reporting:

Congenital, primary, and secondary syphilis are reportable by phone to DHEC within 24 hours of diagnosis. Latent/tertiary syphilis or a positive serologic test for syphilis is reportable within 7 days to DHEC.

Figure 1

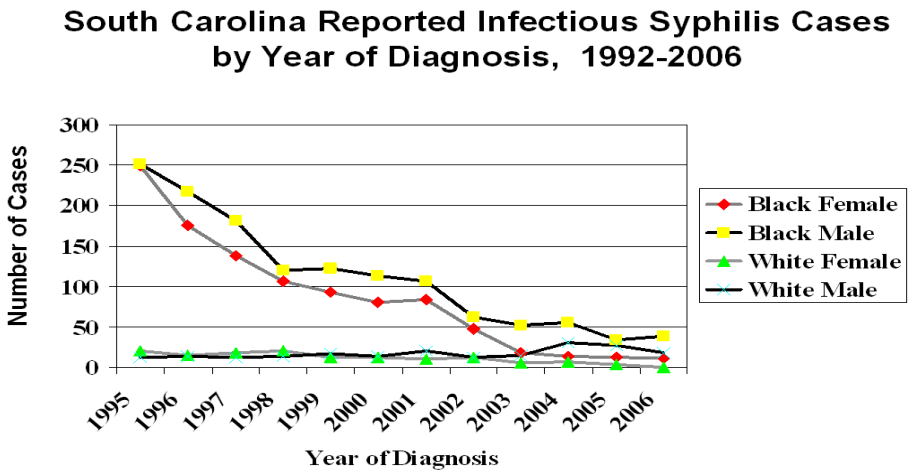


Figure 2

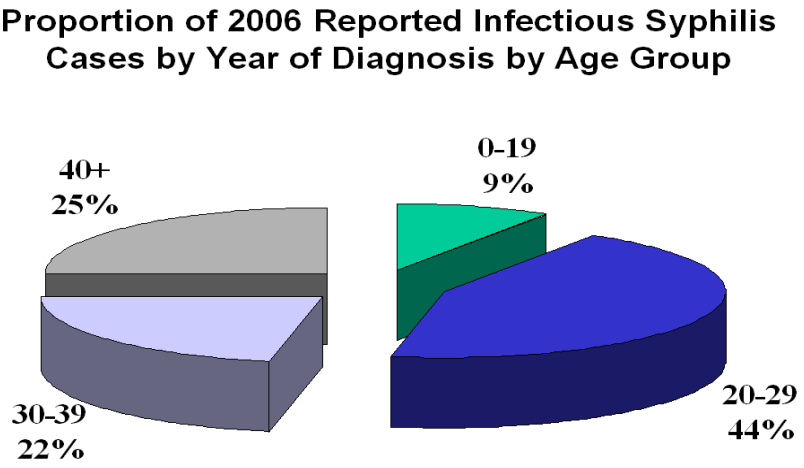


Figure 1

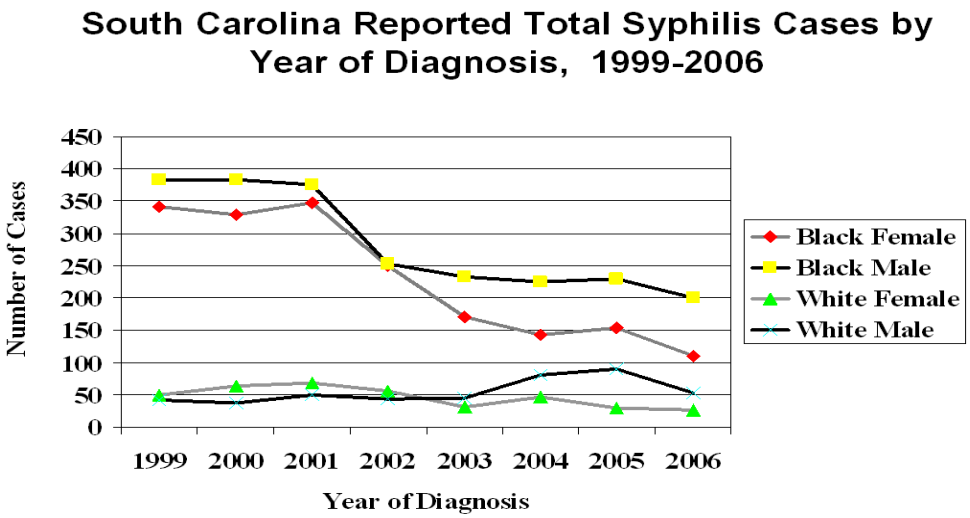
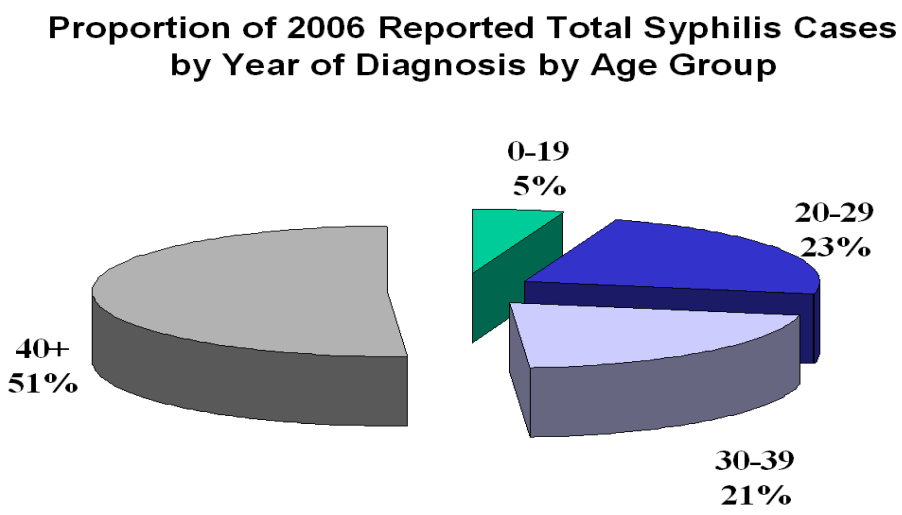


Figure 2



Tetanus

2006 Cases in SC: 0 2006 Cases per 100,000: 0.0

Characteristics:

Tetanus, often called Lockjaw, is an acute disease caused by an exotoxin produced by the bacterium, *Clostridium tetani*. It is characterized by generalized rigidity and convulsive spasms of skeletal muscles. The muscle stiffness usually involves the jaw and neck and then becomes generalized. Tetanus has a case fatality rate of approximately 30 percent.

Epidemiology:

Worldwide, tetanus is among the 10 most frequent causes of death in developing countries with an estimated 1 million cases annually. Tetanus affects all age groups; the highest prevalence is found in newborns and young people. In 1992 alone, an estimated 578,000 infant deaths occurred due to neonatal tetanus. Since the beginning of the 1990s, it is estimated that 360,000 cases and 140,000 deaths occurred each year from tetanus beyond the neonatal period.

In the US since the 1940s, the incidence rates of reported cases of tetanus and tetanus-related deaths have decreased steadily. The decrease has been attributed primarily to universal vaccination with tetanus toxoid-containing vaccines. However, improved wound management and childbirth practices have also contributed to the decrease in reported cases and deaths from tetanus.

During the 10-year period from 1996 to 2006, between 20 to 40 cases occurred each year in the US. These cases occurred primarily in older adults who are unvaccinated or inadequately vaccinated. During this same time period, SC remained free of tetanus cases other than 2 cases reported in 1996.

Prevention:

According to the CDC's 2007 publication *Epidemiology and Prevention of Vaccine-Preventable Diseases*: "Rarely have cases of tetanus occurred in persons with a documented primary series of tetanus toxoid. Persons with wounds that are neither clean nor minor, and who have had 0–2 prior doses of tetanus toxoid or have an uncertain history of prior doses should receive Tetanus Immune Globulin [TIG] as well as Td toxoid. This is because early doses of toxoid may not induce immunity, but only prime the immune system. The TIG provides temporary immunity by directly providing antitoxin. This ensures that protective levels of antitoxin are achieved even if an immune response has not yet occurred."

Reporting:

Tetanus is reportable within 7 days to DHEC.

Toxic Shock Syndrome

Staphylococcal toxic shock syndrome and Streptococcal Toxic shock syndrome

2006 Cases in SC: 1 Case per 100,000 population: 0.02

Characteristics:

Toxic shock syndrome (TSS) is a toxin-mediated disease characterized by fever, rash, hypotension, constitutional symptoms, and multiorgan involvement. Endotoxin toxic shock syndrome toxin-1 (TSST-1) is the major toxin produced by strains of *S aureus* that are responsible for causing TSS. *Streptococcus pyogenes* exotoxin A (SPEA) and *S pyogenes* exotoxin B (SPEB) are the major toxins that mediate streptococcal toxic shock syndrome. Almost every organ system can be involved, including the cardiovascular, renal, skin, mucosa, GI, musculoskeletal, hepatic, hematologic, and central nervous systems. Staphylococcal TSS may be caused by either colonization or infection with a toxin-producting strain of S. aureus while streptococcal TSS occurs following infection with a toxin-producting strain of S. pyogenes (Group A streptococcus).

TSS predominantly occurs in young, healthy adolescents and adults but may affect any age group. The mortality rate is less than 3% for Staphylococcal TSS while that for Streptococcal TSS ranges between 30-70%.

Epidemiology:

US: In the US, the annual incidence of Staphylococcal TSS has ranged from 0.0 to 0.1 per 100,000 persons from 1993 through 2004. The annual incidence of Streptococcal TSS has ranged from 0.01 to 0.1 per 100,000 from 1997 through 2004. In 2005, 129 cases of streptococcal TSS and 90 cases of staphylococcal TSS were reported to the CDC.

SC: One case of Staphylococcal TSS was reported in 2006. Previous to this year, no cases of Streptococcal TSS have reported since 1995. These results are similar to the rates seen in the US.

Reporting:

Staphylococcal and Streptococcal Toxic Shock Syndrome are routinely reportable within 7 days in South Carolina.

Toxins

2006 Cases in SC: 1 case marine toxin 2006 Cases per 100,000: <0.01

General Characteristics:

There are many types of toxins that are reportable in South Carolina. Here, they are categorized into three main groups: **marine toxins, foodborne toxins, and ricin**. Patients with these illnesses are not contagious. Toxins are not transmitted from one person to another; though, they do have the potential to cause outbreaks of illness of public health significance, or could potentially be used as agents of bioterrorism. Though all toxins are reportable in South Carolina, not all types of toxins are documented as single cases; instead, only clusters or outbreaks of illness of marine toxins and ricin are reportable.

Marine Toxins

Characteristics:

Marine toxins are naturally occurring chemicals that can contaminate certain seafood. The seafood contaminated with these chemicals frequently looks, smells, and tastes normal. When humans eat such seafood, disease can result. The most common diseases caused by marine toxins in United States, in order of incidence are: scombrotoxic fish poisoning, ciguatera poisoning, paralytic shellfish poisoning, neurotoxic shellfish poisoning, and amnesic shellfish poisoning. Diagnosis of marine toxin poisoning is generally based on symptoms and a history of recently eating a particular kind of seafood. Laboratory testing for the specific toxin in patient samples is generally not necessary, as this requires certain techniques and equipment available in only specialized laboratories. If suspect leftover fish or shellfish are available, they can be tested for the presence of the toxin more easily. Identification of the specific toxin is not usually necessary for treating patients; because, patients generally receive supportive care.

Epidemiology:

United States. Every year, approximately 30 cases of poisoning by marine toxins are reported in the United States. Because healthcare providers are not required to report these illnesses and because many milder cases are not diagnosed or reported, the actual number of poisonings may be much greater. Toxic seafood poisonings are more common in the summer than winter because dinoflagelates grow well in warmer seasons. It is estimated from cases with available data that one person dies every 4 years from toxic seafood poisonings. In 2006, 45 cases of ciguatera toxicity and 102 cases of scrombroid fish toxicity were reported to the CDC. (Data obtained from the CDC website.)

South Carolina. One case of ciguatera fish poisoning was reported in South Carolina in 2006; no cases of scrombroid fish toxicity were reported.

Prevention: It is important to notify public health departments about even one person with marine toxin poisoning. Public health departments can then investigate to determine if a restaurant, oyster bed, or fishing area has a problem, in order to prevent other illnesses. In any food poisoning occurrence, consumers should note foods eaten and freeze any uneaten portions, in case they need to be tested.

Foodborne Toxins

Characteristics: *Staphylococcus aureus, Clostridium perfringens,* and *Bacillus cereus* are three bacteria that can produce enterotoxins that cause human gastrointestinal illness. Illness is caused by eating foods contaminated with toxins produced by these bacteria. These toxins are resistant to heat and cannot be destroyed by cooking. The most common ways for food to be contaminated with *Staphylococcus* is through contact with food workers who carry the bacteria, or through contaminated milk and cheeses. Common vehicles for *Clostridium perfringens* are beef, poultry, gravies, and dried or precooked foods; and, *Bacillus cereus* is often found in rice, meat, and vegetables. Staphylococcal toxins and emetic *Bacillus cereus* are fast acting, sometimes causing illness in as little as 30 minutes, with symptoms usually developing within 1-6 hours after eating contaminated food; while, *Clostridium perfringens* and diarrheal *Bacillus cereus* have a longer incubation period of 6-24 hours. Symptoms include nausea and vomiting (staphylococcal and emetic *Bacillus cereus* only), stomach cramps, and diarrhea; the illness is usually mild and most patients recover after one to three days. In a small minority of patients the illness may be more severe. Toxin-producing organisms can be identified in stool or vomit, and toxin can be detected in food items. Diagnosis of toxin-related food poisoning in an individual is generally based only on the signs and symptoms of the patient. Testing for the toxin-producing bacteria or the toxin is not usually done in individual patients; testing is usually reserved for outbreaks involving several persons.

Epidemiology:

United States. Because healthcare providers are not required to report these illnesses, and because many milder cases are not diagnosed or reported, the actual number of poisonings is not known.

South Carolina. One outbreak was associated with *Clostridium perfringens i*n 2006; this outbreak is estimated to have affected 4 people.

Prevention:

It is important to notify public health departments about even one person with foodborne toxin poisoning. Public health departments can then investigate to determine if a restaurant or a common public food source is implicated, in order to prevent other illnesses. In any food poisoning occurrence, consumers should note foods eaten and freeze any uneaten portions, in case they need to be tested.

Ricin

Characteristics:

Ricin is a poison that can be made from the waste left over from processing castor beans. It can be in the form of a powder, a mist, a pellet, or it can be dissolved in water or weak acid. It would take a deliberate act to make ricin and use it to poison people; accidental exposure to ricin is highly unlikely. People can breathe in ricin mist or powder and be poisoned. Ricin can also get into water or food and then be swallowed. Pellets of ricin, or ricin dissolved in a liquid, can be injected into people's bodies. The major symptoms of ricin poisoning depend on the route of exposure and the dose received, though many organs may be affected in severe cases. Initial symptoms of ricin poisoning by inhalation may occur within 8 hours of exposure. Following

ingestion of ricin, initial symptoms typically occur in less than 6 hours. If it is suspected that people have inhaled ricin, a potential clue would be that a large number of people who had been close to each other suddenly developed fever, cough, and excess fluid in their lungs. These symptoms could be followed by severe breathing problems and possibly death. No widely available, reliable test exists to confirm that a person has been exposed to ricin.

Epidemiology:

South Carolina: No cases/outbreaks of ricin poisoning were reported in 2006.

Classification as a potential bioterrorism agent/disease:

Epsilon toxin of *Clostridium perfringens*, ricin toxin, and staphylococcal enterotoxin B are classified as Category B agents. According to the CDC, Category B agents are, "moderately easy to disseminate, result in moderate morbidity rates and low mortality rates, and require specific enhancements of CDC's diagnostic capacity and enhanced disease surveillance." http://www.bt.cdc.gov/agent/agentlist-category.asp

Reporting:

Toxins are not nationally reportable; therefore, national reporting numbers and rates are not available. However, due to the potential for toxins to cause outbreaks of disease or possibly be used as an agent of bioterrorism, toxins are urgently reportable by phone within 24 hours to DHEC.

Trichinosis

2006 Cases in SC: 0 2006 Cases per 100,000: 0.0

Characteristics:

Trichinosis is acquired by ingesting meat containing cysts (encysted larvae) of *Trichinella.* Light infections may be asymptomatic. Intestinal invasion can be accompanied by gastrointestinal symptoms (diarrhea, abdominal pain, vomiting). Headaches, fevers, chills, cough, eye swelling, aching joints and muscle pains, itchy skin, diarrhea, or constipation follow the first symptoms. If the infection is heavy, patients may experience difficulty coordinating movements and have heart and breathing problems. In severe cases, death can occur.

Epidemiology:

US: Nationally, averages of less than 10 cases of Trichinosis were reported per year over the last ten years. The number of cases has decreased because of legislation prohibiting the feeding of raw-meat garbage to hogs, and the public awareness of the danger of eating raw or undercooked pork products. Cases are less commonly associated with pork products and more often associated with eating raw or undercooked wild game meats.

SC: In South Carolina, there were no cases of Trichinosis reported to the DHEC in 2006. DHEC has not received any reported cases of Trichinosis in the past ten years.

Reporting:

Trichinosis is reportable by phone within 24 hours to DHEC.

Tuberculosis

2006 Cases in SC: 222 2006 Cases per 100,000: 5.2

Characteristics:

Tuberculosis (TB) is a bacterial disease primarily found in the lungs, although extrapulmonary disease can occur. Transmission is usually by inhalation of aerosolized droplets from a person with active pulmonary disease.

Epidemiology:

In 2006, South Carolina reported a total of 222 cases, which ranks SC 10th nationally in TB incidence with a case rate of 5.2 per 100,000 individuals in the population. Approximately 51% of the cases were reported from the following 7 counties:

County	Cases	Percent
Horry	24	10.8%
Charleston	23	10.3
York	19	8.5%
Darlington	12	5.4%
Spartanburg	12	5.4%
Richland	12	5.4%
Florence	11	4.9%

Based on the 2006 data, nineteen of the forty-six counties in South Carolina meet or exceed the national average of 4.6 cases per 100,000 and seven of the twenty-six counties are greater than 10.3. The 222 cases reported in 2006 represents a decrease of 15% in number of cases reported in 2005 (261cases), but graphically, the change is not significant.

In 2006, males represented 66% (up from 60% in 2005) and 63 percent of the cases were in African Americans. The highest percentage of cases was reported in the 45-64 age group with 37% (2005 was 35%) and the 25-44 age group with 28% (while in 2005 was 27%). The <15 age group showed a decrease from 11% in 2005 to 7% in 2006.

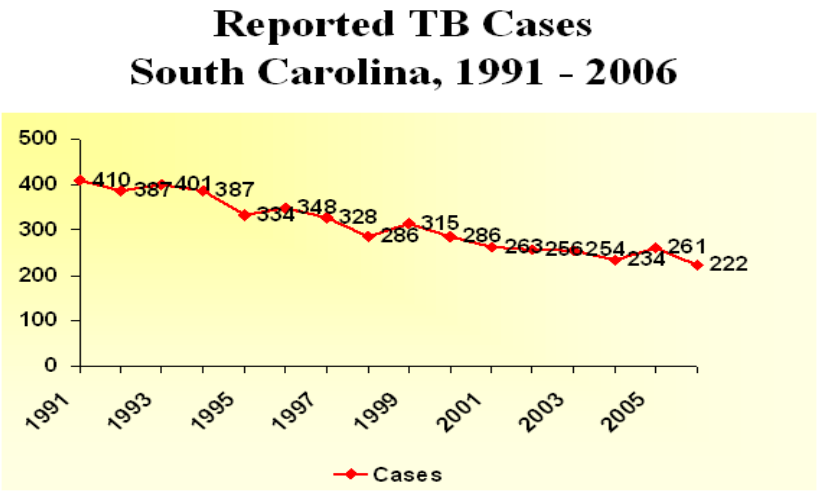
Drug resistant tuberculosis cases have become a problem nationally and continue to present problems in SC for the year 2006. The state had 13 cases involving drug resistance in 2006, nine with resistance to one drug and 4 involving resistance to 2 drugs. No case met the definition of multi-drug resistant.

Nationally, TB cases among foreign born persons have been steadily increasing to about 50% of cases. In South Carolina, though, the foreign-born cases increased to 41 (18%) in 2006, up from 18 in 2005.

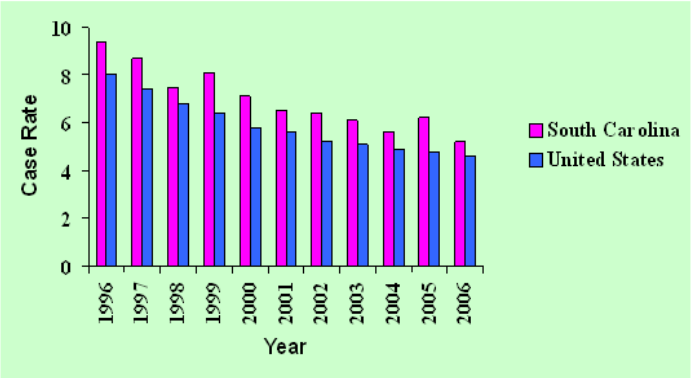
All cases in South Carolina are counseled and offered testing for HIV. Co-infection was found in 9% of the TB cases in 2006 and 8% in 2005.

Tuberculosis Control Services including diagnostic, treatment, prevention, and examinations are available in each county health department and are provided by licensed health care professionals. Consultation is available daily through the State TB Control Division from Central Office Professional Staff.

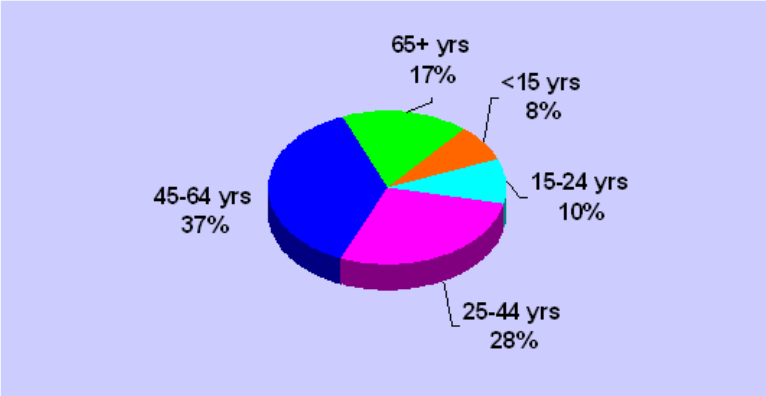
Reporting:
Tuberculosis is urgently reportable by phone within 24 hours to DHEC.



TB Case Rates, 1996-2006
United States vs. South Carolina



TB Cases by Age Group
South Carolina, 2006



Tularemia (*Francisella tularensis*)

2006 Cases in SC: 0 2006 Cases per 100,000: 0.0

Characteristics:

Tularemia, also known as rabbit-fever or deer-fly fever, is a potentially serious illness that occurs naturally in the United States. The causitive agent, *Francisella tularensis,* is a small, nonmotile, aerobic, gram-negative non spore-forming coccobacillus that survives for weeks at low temperatures in water, moist soil, hay, straw, and decaying animal carcasses. *F. tularensis* is found in widely diverse animal hosts and habitats and can be recovered from contaminated water, soil, and vegetation. A variety of small mammals, including voles, mice, water rats, squirrels, rabbits, and hares, are natural reservoirs of infection. They acquire infection through bites by ticks, flies, and mosquitoes, and by contact with contaminated environments. The incubation period for tularemia is typically 2 to 10 days. There are multiple presentations of tularemia, most commonly as ulceroglandular disease (45 to 80% of cases). The bacteria replicate in the skin at the localized site of penetration, where an ulcer usually forms. From the penetration site(s), bacteria are transported by the lymphatic system to regional nodes and then may be disseminated to blood and other sites. Onset is sudden: typically, the patient has a temperature of 38 to 40$_{o}$c accompanied by chills, headache, generalized body aches (often prominent in the lower back), coryza, pharyngitis, cough and chest pain or tightness. Without treatment, nonspecific symptoms usually persist for several weeks, and sweats, chills, progressive weakness, and weight loss characterize the illness. Other forms of tularemia may be complicated by bacteremic spread, leading to tularemic pneumonią, sepsis, and meningitis (rare). Clinical diagnosis is supported by evidence or history of a tick or deerfly bite, exposure to tissues of a mammalian host of *Francisella tularensis*, or exposure to potentially contaminated water.

Potential as an Agent of Bioterrorism:

The CDC lists tularemia as a “Category A” biological threat agent.

Epidemiology:

US: Although the incidence of human tularemia is rare in the United States, the distribution of the pathogen appears ubiquitous. From 1981 to 1987, approximately 60% of the cases reported in the United States occurred in Arkansas, Louisiana, Missouri, Oklahoma, or Texas. With the exception of localized outbreaks at Martha's Vineyard, Massachusetts, the central states of Arkansas, Missouri, Oklahoma, and South Dakota reported the highest incidence of the disease from 1990 to 2000. Human tularemia incidence in the United States peaked in 1939 with 2,291 reported cases and has since decreased to 100–200 cases annually.

SC: In 2006, no cases of tularemia were reported.

Reporting:

Any suspected or confirmed case in South Carolina is reportable by phone within 24 hours to DHEC.

Typhoid Fever

2006 Cases in SC: 1 2006 Cases per 100,000: <0.1

Characteristics:

Typhoid fever is a life-threatening illness caused by the bacterium *Salmonella Typhi*. In the United States about 400 cases occur each year, and 75% of these are acquired while traveling internationally. Typhoid fever is still common in the developing world, where it affects about 21.5 million persons each year. *Salmonella Typhi* lives only in humans. Persons with typhoid fever carry the bacteria in their bloodstream and intestinal tract. In addition, a small number of persons, called carriers, recover from typhoid fever but continue to carry the bacteria. Both ill persons and carriers shed *S. Typhi* in their feces. Typhoid fever is most commonly spread by consuming food or drink contaminated with fecal matter of an ill person or carrier of *S. Typhi*.

Epidemiology:

In South Carolina, one case of *Salmonella Typhi* was reported to the DHEC in 2006.

Over the last ten years there have been an average of <0.1 cases of Typhoid fever per 100,000 population reported in South Carolina per year. The CDC have had an average of 0.1 cases of Typhoid fever per 100,000 population reported nationally per year. The number of reports received by the DHEC in 2006 was equal to expected based on the last ten years of data.

Reporting:

Typhoid fever reportable by phone within 24 hours to DHEC.

Typhus Fever

2006 Cases in SC: 0 Cases per 100,000 population: 0.00

Characteristics:

There are three types of typhus fever:

- Epidemic louse-borne (classic) caused by *Rickettsia prowazekii*: Epidemic typhus is transmitted from one person to another by the human body louse. Contemporary outbreaks are rare in most developed countries and generally occur only in communities and populations in which body louse infestations are frequent (typically seen in refugee and prisoner populations, particularly during wars or famine). This disease also occurs sporadically in cooler mountainous regions of Africa, South America, Asia, and Mexico, especially during the colder months when louse-infested clothing is not laundered and person-to-person spread of lice is more frequent. Travelers who are not at risk of exposure to lice or to persons with lice are unlikely to acquire this illness. However, health-care workers who care for these patients may be at risk of acquiring louse-borne illnesses through inhalation or inoculation into the skin of infectious louse feces. In the eastern United States, campers and wildlife workers can acquire typhus if they come in contact with flying squirrels, their ectoparasites, or their nests, which can be made in houses and tree-holes. Though rare in the United States, most reported cases occur in southern California, southern Texas, Hawaii, and the southeastern Gulf Coast (see Red Book, 27th edition by the American Academy of Pediatrics).

- Endemic flea-borne (murine) caused by *Rickettsia typhi, mooseri, felis*: Murine typhus occurs worldwide and is transmitted to humans by rat fleas. Flea-infested rats can be found throughout the year in humid tropical environments, but in temperate regions, they are most common during the warm summer months. Travelers who visit rat-infested buildings and homes, especially in harbor or riverine environments, can be at risk for exposure to the agent of murine typhus.

- Mite-borne (scrub, Tsutsugamushi disease) caused by *Orientia tsutsugamushi*: Mites ("chiggers") transmit the agent of scrub typhus to humans. These mites occur year-round in a large area from the Indian subcontinent to Australia and in much of Asia, including Japan, China, Korea, Maritime Provinces and Sakhalin Island of Russia, and Tajikistan. Their prevalence, however, fluctuates with temperature and rainfall. Infection may occur on coral atolls in both the Indian and Pacific Oceans, in rice paddies, on oil palm plantations, and in tropical to desert habitats and elevated river valleys. Humans typically encounter the arthropod vector of scrub typhus in recently disturbed terrain (e.g., forest clearings) or other persisting rat-mite foci with rats and other rodents.

Clinical Presentation and Diagnosis:

Clinical presentations of rickettsial illnesses differ, but early symptoms, including fever, headache, and malaise, are generally nonspecific. Rashes are often associated with rickettsioses, and an eschar (thick blackened scab) is seen in scrub typhus. Illnesses resulting from infection with rickettsial agents often go unrecognized or are attributed to other causes. Atypical presentations are common and may be expected with poorly characterized nonindigenous agents, so appropriate samples should be obtained for examination by specialized reference laboratories. A diagnosis of rickettsial disease is based on two or more of the following: 1) compatible clinical symptoms and epidemiologic history, 2) the development of

specific convalescent-phase antibodies reactive with a given pathogen or antigenic group, 3) a positive polymerase chain reaction test result, 4) immunohistologic detection of a microorganism, or 5) isolation of a rickettsial agent. Ascertaining the place and the nature of potential exposures is particularly important for accurate diagnosis, as many rickettsial diseases have strong geographic links or are associated with exposure to specific animal reservoir species or arthropod vectors.

Classification as a potential bioterrorism agent/disease:

Epidemic louse-borne (classic) typhus fever caused by *Rickettsia prowazekii* is classified as a Category B agent. According to the CDC, Category B agents are, "moderately easy to disseminate, result in moderate morbidity rates and low mortality rates, and require specific enhancements of CDC's diagnostic capacity and enhanced disease surveillance." http://www.bt.cdc.gov/agent/agentlist-category.asp

Prevention:

With the exception of the louse-borne diseases described above, for which contact with infectious arthropod feces is the primary mode of transmission (through autoinoculation into a wound or inhalation), travelers and health-care providers are generally not at risk of becoming infected via exposure to an ill person. Infections result primarily from exposure to an infected vector or animal reservoir. Limiting these exposures remains the best means for reducing the risk for disease. Travelers should be advised that prevention is based on avoidance of vector-infested habitats, use of repellents and protective clothing, prompt detection and removal of arthropods from clothing and skin, and attention to hygiene. Disease management should focus on early detection and proper treatment to prevent severe complications of these illnesses.

Treatment:

Treatments for most rickettsial illnesses are similar and include administration of appropriate antibiotics (most often tetracycline class or chloramphenicol) and supportive care. Treatment should be initiated on the basis of clinical and epidemiologic clues, without waiting for laboratory confirmation. It is advisable to seek specialized infectious disease advice in travel and tropical medicine. No commercially licensed vaccines are available in the United States, and vaccinations to prevent rickettsial infections are not required by any country as a condition for entry.

Epidemiology:

Endemic (fleaborne or murine) typhus occurs worldwide, with most cases occurring in the summer and fall in adult males. Though rare in the United States, most reported cases occur in southern California, southern Texas, Hawaii, and the southeastern Gulf Coast.

Reporting:

Typhus fever is urgently reportable by phone within 24 hours by phone to DHEC.

Varicella

2006 Cases in SC: 1228 2006 Cases per 100,000: 28.42

Characteristics:

Varicella (chickenpox) is a common disease of childhood. It is caused by the *Varicella zoster* virus. In the prevaccine era, virtually all persons acquired varicella infection by adulthood. Varicella is usually benign but can result in serious complications including extensive severe rash, severe constitutional symptoms, pneumonia and secondary bacterial infections.

Epidemiology:

In the US, varicella vaccine was licensed in 1995 and had been recommended as a single dose for children 12-18 months of age. From 1995 through 2004, the incidence of varicella and its complications, including hospitalizations and deaths, has decreased steadily, primarily in children 1 to 4 years of age. However, since 2005 there has been an increase in the number of varicella cases in the US. The actual number of cases of varicella in the US cannot be accurately determined because not all states report varicella cases to the CDC. However, for the states that are reporting varicella cases (including SC), there has been a steady increase in the number of cases. In 2003 and 2004, approximately 18,000 cases of varicella each year were reported to the CDC. In 2005 and 2006, however, the number of reported cases increased to approximately 32,000 and 42,000, respectively. Most of these varicella infections were mild cases of varicella that occurred in approximately 10-20% of school-age children who were previously immunized with one dose of varicella vaccine. These cases of varicella are called “breakthrough” varicella infections and occur possibly due to partial vaccine failure or waning immunity.

In SC, most of the 1228 cases of varicella that occurred in 2006 were due to breakthrough infections and were in the 5-14 year age group. .

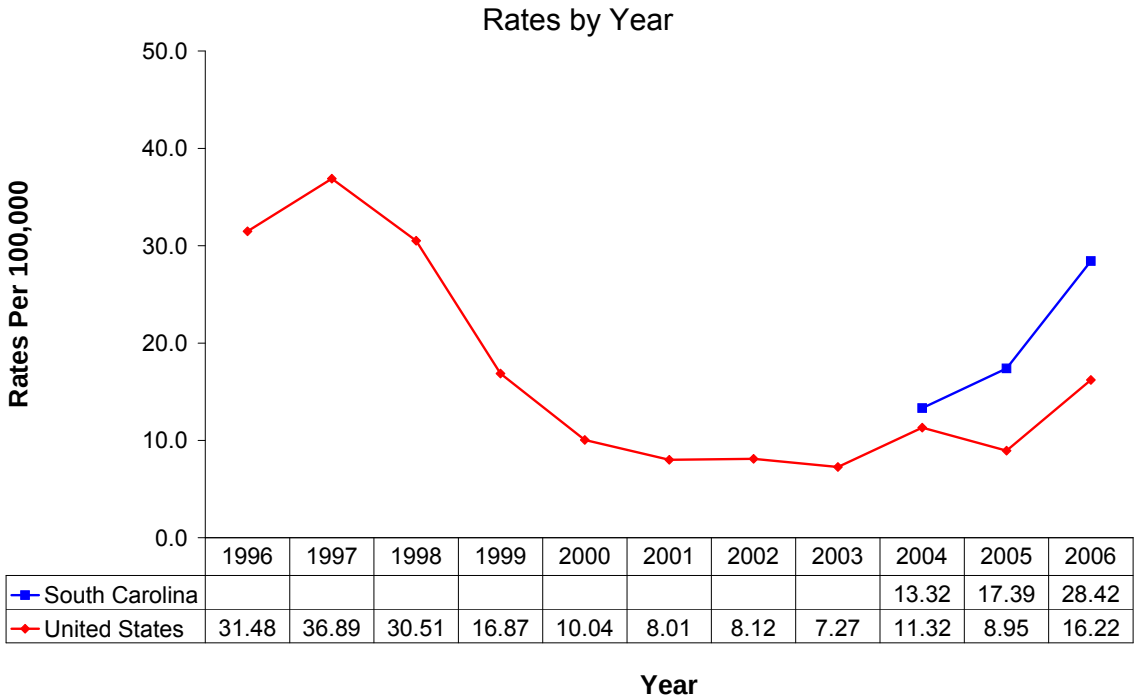
Prevention:

In June 2006, the Advisory Committee on Immunization Practices recommended the institution of a second dose of varicella vaccine for all children to boost immunity and prevent breakthrough varicella infections.

Reporting:

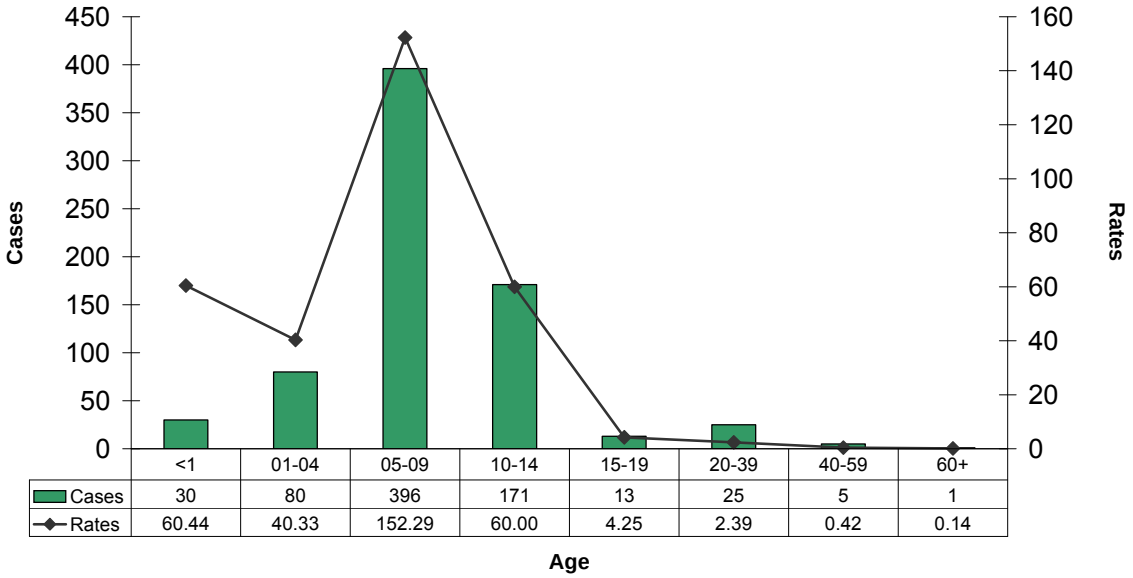
Varicella is reportable within 7 days to DHEC. Deaths from Varicella infection are also reportable within 7 days to DHEC.

Varicella



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
South Carolina									13.32	17.39	28.42
United States	31.48	36.89	30.51	16.87	10.04	8.01	8.12	7.27	11.32	8.95	16.22

Varicella
2005 Reported Cases by Age Group



	<1	01-04	05-09	10-14	15-19	20-39	40-59	60+
Cases	30	80	396	171	13	25	5	1
Rates	60.44	40.33	152.29	60.00	4.25	2.39	0.42	0.14

Vibrio Infection (non-Cholera)

2006 Cases in SC: 13 2006 Cases per 100,000: 0.3

Characteristics:

There are multiple species of Vibrio infection (non-Cholera), however two species that cause the most serious illness are *V. parahaemolyticus* and *V. vulnificus*. Most people become infected by eating raw or undercooked shellfish, particularly oysters. Less commonly, this organism can cause a skin infection when an open wound is exposed to seawater. Among healthy people, ingestion of Vibrio can cause vomiting, diarrhea, and abdominal pain. In immunocompromised persons, particularly those with chronic liver disease, Vibrio can infect the bloodstream, causing a severe and life-threatening illness characterized by fever and chills, decreased blood pressure (septic shock), and blistering skin lesions. *V. vulnificus* bloodstream infections are fatal about 50% of the time.

Epidemiology:

In the United States, Vibrio is not commonly recognized, partly because clinical laboratories rarely use the selective medium that is necessary to identify this organism. The Gulf Coast states report the most cases of Vibrio infection to the CDC. From those states, about 30-40 cases of *V. parahaemolyticus* infections are reported each year. *V. vulnificus* is a rare cause of disease, but it is also underreported. Between 1988 and 1995, CDC received reports of over 300 *V. vulnificus* infections from the Gulf Coast states.

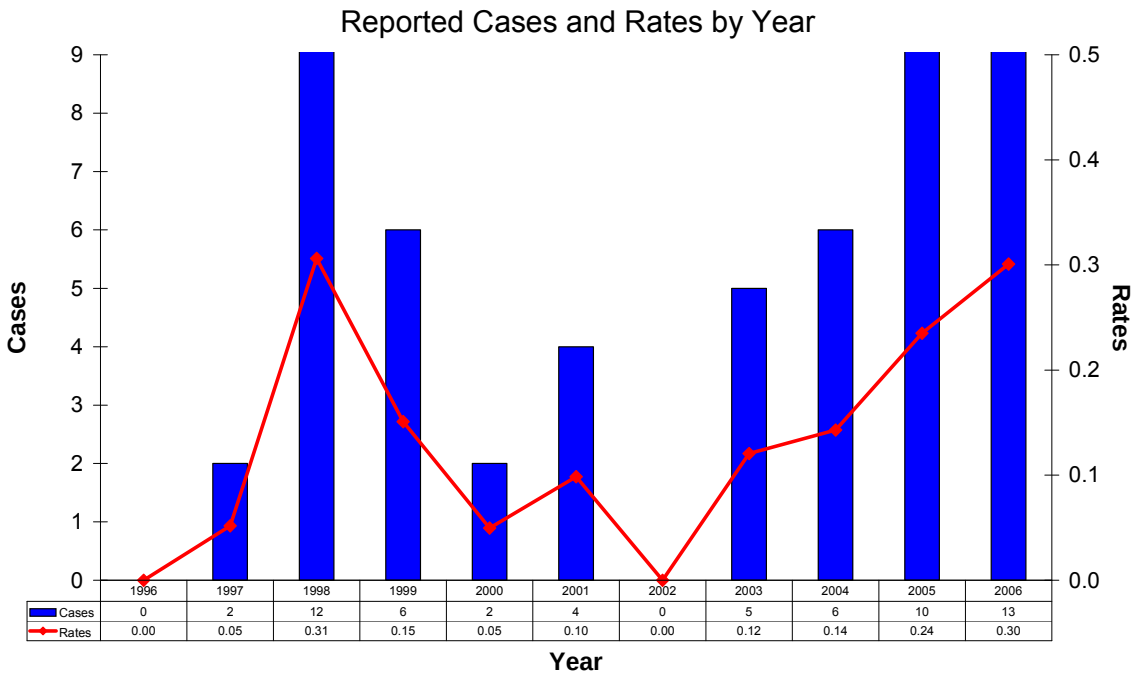
In South Carolina, thirteen cases of Vibrio infection (non-cholera) were reported to the DHEC in 2006. The overall incidence rate in South Carolina was 0.3 cases per 100,000 population. There were no known outbreaks of Vibrio infection in 2006. Cases reported reflected five different species of Vibrio: *V. vulnificus, V. alginolyticus, V. hollisae, V. cholerae non-O1/non-O139 and V. parahaemolyticus*. Cases occurred in all seasons throughout the year. In 2006, cases ranged in age from 14 to 88 years with a median age of 49. Additionally rates were higher among males, comprising 62% of the reports received.

Over the last ten years, SC has reported an average of 0.1 cases of Vibrio infection (non-cholera) per 100,000 population per year. The number of reports received in 2006 is higher than average, although this is likely due increased testing and reporting. Efforts were made in 2004 to educate healthcare providers about the importance of Vibrio surveillance.

Reporting:

Vibrio infection (non-cholera) is reportable within 7 days to DHEC.

Vibrio infections, non cholera



	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Cases	0	2	12	6	2	4	0	5	6	10	13
Rates	0.00	0.05	0.31	0.15	0.05	0.10	0.00	0.12	0.14	0.24	0.30

*Vibrio Infection (non-Cholera) is not a nationally notifiable condition.

Viral Hemorrhagic Fever

2006 Cases in SC: 0 2006 Cases per 100,000: 0

Characteristics:

Viral hemorrhagic fever (VHF) refers to a group of diseases that are caused by several distinct families of viruses. In general, the term "viral hemorrhagic fever" is used to describe a severe multisystem syndrome. Characteristically, the overall vascular system is damaged, and the body's ability to regulate itself is impaired. These symptoms are often accompanied by hemorrhage; however, the bleeding is itself rarely life-threatening. While some types of hemorrhagic fever viruses can cause relatively mild illnesses, many of these viruses cause severe, life-threatening disease. Specific symptoms vary by the type of VHF, but initial symptoms often include marked fever, fatigue, dizziness, muscle aches, loss of strength, and exhaustion. Patients with severe cases of VHF often show signs of bleeding under the skin, in internal organs, or from body orifices like the mouth, eyes, or ears. Critically ill patients may also show shock, nervous system malfunction, coma, delirium, seizures, and death.

Bioterrorism:

VHFs classified as filoviruses (e.g., Ebola, Marburg) and arenaviruses (e.g., Lassa, Machupo) are Category A bioterroism diseases because they can be easily disseminated or transmitted from person to person, result in high mortality rates, have the potential for major public health impact, and require special action for public health preparedness.

Epidemiology:

SC: There were 0 cases of viral hemorrhagic fever in SC in 2006.

US & Worldwide: Viruses associated with most VHFs are zoonotic. This means that these viruses naturally reside in an animal reservoir host or arthropod vector. They are totally dependent on their hosts for replication and overall survival. For the most part, rodents and arthropods are the main reservoirs for viruses causing VHFs. Taken together, the viruses that cause VHFs are distributed over much of the globe. However, because each virus is associated with one or more particular host species, the virus and the disease it causes are usually seen only where the host species live(s).

Prevention:

No vaccines exist that can protect against any VHF. Therefore, prevention efforts must concentrate on avoiding contact with host species. If prevention methods fail and a case of VHF does occur, efforts should focus on preventing further transmission from person to person, if the virus can be transmitted in this way. Because many of the hosts that carry hemorrhagic fever viruses are rodents, disease prevention efforts include controlling rodent populations, discouraging rodents from entering or living in homes or workplaces, and encouraging safe cleanup of rodent nests and droppings. For hemorrhagic fever viruses spread by arthropod vectors, prevention efforts often focus on community-wide insect and arthropod control. In addition, people are encouraged to use insect repellant, proper clothing, window screens, and other insect barriers to avoid being bitten. For those hemorrhagic fever viruses that can be

transmitted from one person to another, avoiding close physical contact with infected people and their body fluids is the most important way of controlling the spread of disease.

Reporting:

Viral Hemorrhagic Fever is reportable immediately by phone to DHEC.

West Nile Virus (Acute Neuroinvasive Arboviral Disease)

2006 Cases in SC: 1 2006 Cases per 100,000: 0.02

Characteristics:

West Nile Virus (WNV) is a mosquito borne infection. Mosquitoes become infected when they feed on infected birds. The virus is transmitted to humans and animals during blood meals. Most persons who become infected with West Nile virus (WNV) develop no clinical illness or symptoms, however approximately 20% of persons infected with WNV may exhibit one of these two clinical syndromes:

West Nile Fever is characterized by a febrile rash of sudden onset, often accompanied by headache, myalgia, malaise, anorexia, nausea, vomiting, lymphadenopathy and eye pain. The illness lasts several weeks and recovery may take several weeks or months.

West Nile Neuroinvasive Disease: Presents as meningitis, encephalitis, or poliomyelitis. These severe illnesses may develop in 1 in 150 persons with WNV.

West Nile Neuroinvasive Disease

About 60% to 75% of people with neuroinvasive WNV infection are reported to have encephalitis or meningoencephalitis, which is characterized by altered mental status or focal neurologic findings. West Nile meningitis usually involves fever, headache, and stiff neck. Changes in consciousness are not usually seen and are mild when present. West Nile encephalitis, the most severe form of neuroinvasive West Nile viral disease, involves fever and headache, but there are more global symptoms. There is usually an alteration of consciousness, which may be mild and result in lethargy but may progress to confusion or coma. Focal neurologic deficits, including limb paralysis and cranial nerve palsies, may be observed. Tremors and movement disorders also have been noted.

West Nile poliomyelitis, a flaccid paralysis syndrome associated with WNV infection, is less common than meningitis or encephalitis. This syndrome is generally characterized by the acute onset of asymmetric limb weakness or paralysis in the absence of sensory loss. Pain sometimes precedes the paralysis, which can also occur in the absence of fever, headache, or other common symptoms associated with WNV infection. Involvement of respiratory muscles, leading to acute respiratory failure, may occur.

Epidemiology:

US. West Nile Cases were first diagnosed in the US in 1999.

SC. The first known human case of West Nile Virus infection in SC occurred in 2002. In 2006, there was one confirmed case of human West Nile neuroinvasive disease.

Prevention:

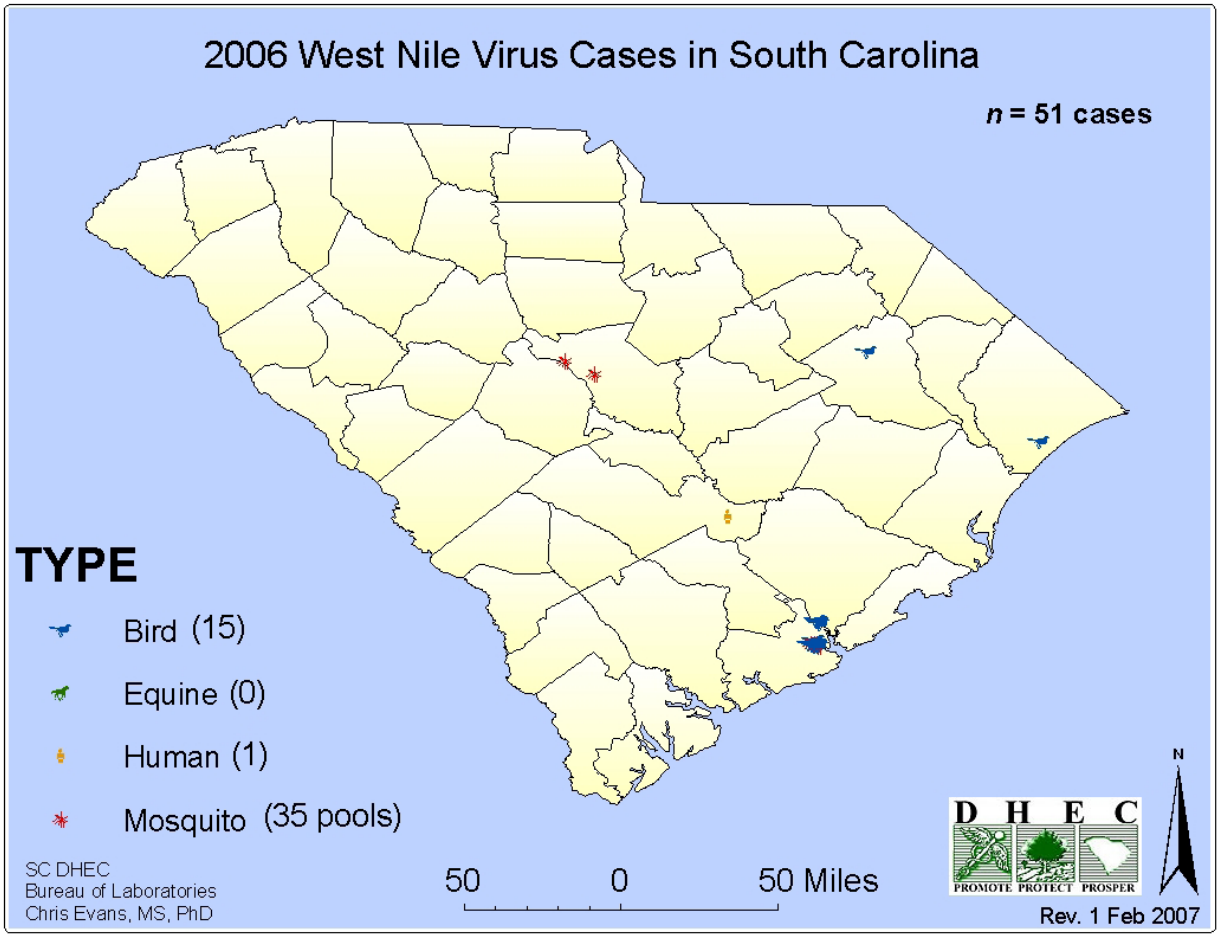
Mosquitoes. WNV prevention is best accomplished by limiting amount of time spent outdoors during peak mosquito hours (dawn and dusk) or wearing insect repellant containing DEET, eucalyptus, or picaridin. Mosquito reduction may be accomplished by eliminating sources of standing water.

Birds. There is no evidence of human infection from handling live or dead infected birds. However, persons should avoid bare-handed contact when handling *any* dead animals and use gloves or double plastic bags to place the carcass in a garbage can.

Reporting:

Confirmed or suspected Neuroinvasive West Nile Virus infection is urgently reportable by phone within 24 hours to DHEC.

Clinical, diagnostic, testing and reporting information is available from DHEC: http://www.scdhec.gov/health/envhlth/general_sanitation/docs/WNV_Physicians.pdf.



Yellow Fever

2006 Cases in SC: 0 2006 Cases per 100,000: 0

Characteristics:

Yellow fever is a viral disease transmitted to humans through the bite of an infected mosquito. Illness ranges in severity from an influenza-like syndrome to severe hepatitis, hemorrhagic fever, and death. The yellow fever virus is maintained in nature by mosquito-borne transmission between nonhuman primates. Transmission by mosquitoes from one human to another occurs during epidemics of "urban yellow fever".

Epidemiology:

SC: There were 0 cases of Yellow Fever in SC in 2006.

US & Worldwide: There were 0 cases of Yellow Fever in the US in 2005. The last US case of Yellow Fever was fatal, and was reported in 2002 in a Texas resident who had traveled to Brazil. Yellow fever is endemic to only Africa and South America. In Africa the virus is transmitted in three geographic regions: in the humid savanna zones of West and Central Africa during the rainy season, in urban locations and villages, and finally, to a lesser extent, in jungle regions. In South America sporadic infections occur almost exclusively in forestry and agricultural workers from occupational exposure in or near forests.

Prevention:

Yellow fever is preventable by a relatively safe, effective vaccine. Yellow fever is a very rare cause of illness in travelers, but most countries have regulations and requirements for yellow fever vaccination that must be met prior to entering the country. General precautions to avoid mosquito bites should be followed. These include the use of insect repellent, protective clothing, and mosquito netting. Yellow fever vaccine is a live virus vaccine that has been used for several decades. A single dose confers immunity lasting 10 years or more. If a person is at continued risk of yellow fever infection, a booster dose is needed every 10 years. Adults and children over 9 months can take this vaccine. Administration of immune globulin does not interfere with the antibody response to yellow fever vaccine.

Reporting:

Yellow Fever is reportable within 7 days to DHEC.

Yersiniosis (Yersinia enterocolitica)

2006 Cases in SC: 10 2006 Cases per 100,000: 0.23

In response to surveillance data showing twelve cases being identified in South Carolina since 2000 and also due to the potential public health impact of outbreaks, yersiniosis was added to the List of Reportable Conditions in 2006.

Characteristics:

Yersiniosis is an infectious disease caused by a bacterium of the genus *Yersinia*. In the United States, most human illness is caused by one species, *Y. enterocolitica*. Infection with *Y. enterocolitica* can cause a variety of symptoms depending on the age of the person infected. Infection with *Y. enterocolitica* occurs most often in young children. Common symptoms in children are fever, abdominal pain, and diarrhea, which is often bloody. Symptoms typically develop 4 to 7 days after exposure and may last 1 to 3 weeks or longer.

Epidemiology:

Infection is most often acquired by eating contaminated food, especially raw or undercooked pork products. The preparation of raw pork intestines (chitterlings) may be particularly risky. Infants can be infected if their caretakers handle raw chitterlings and then do not adequately clean their hands before handling the infant or the infant's toys, bottles, or pacifiers. Drinking contaminated unpasteurized milk or untreated water can also transmit the infection. Occasionally, *Y. enterocolitica* infection occurs after contact with infected animals. On rare occasions, it can be transmitted as a result of the bacterium passing from the stools or soiled fingers of one person to the mouth of another person. This may happen when basic hygiene and handwashing habits are inadequate.

Ten (10) confirmed cases of *Yersinia enterocolitica* were reported to DHEC from seven counties in South Carolina during 2006.

Prevention of Yersiniosis infections:

Information about ways of preventing are available at the Centers for Disease Control website (http://www.cdc.gov/ncidod/dbmd/diseaseinfo/yersinia_g.htm) and include the following tips:

- Avoid eating raw or undercooked pork.
- Consume only pasteurized milk or milk products.
- Wash hands with soap and water before eating and preparing food, after contact with animals, and after handling raw meat.
- After handling raw chitterlings, clean hands and fingernails scrupulously with soap and water before touching infants or their toys, bottles, or pacifiers. Someone other than the foodhandler should care for children while chitterlings are being prepared.

- Prevent cross-contamination in the kitchen by using separate cutting boards for meat and other foods and carefully clean all cutting boards, counter-tops, and utensils with soap and hot water after preparing raw meat.
- Dispose of animal feces in a sanitary manner.

Reporting:

Confirmed or suspected cases of Yersiniosis are reportable to DHEC within seven days.

Outbreak Investigations and Special Surveillance Projects

Outbreak Investigations 2006

Overview

As defined by the Centers for Disease Control and Prevention's 10 Essential Services of Public Health, (www.cdc.gov/od/ocphp/nphpsp/essentialphservices.htm) investigations of outbreaks are included under "Essential Service #2: Diagnose and Investigate Health Problems and Health Hazards in the Community". Having the capacity at both the local and state level for epidemiological investigations of disease outbreaks and patterns of infectious and other health threats is a core component of the public health mission in South Carolina. Comprehensive epidemiological and environmental investigations help in identifying the source of an outbreak and in preventing additional cases. In addition, the experience and data collected from such investigations increase knowledge of a disease and can help prevent future outbreaks.

Defining an outbreak as an increased incidence of a disease over normal incidence can be a helpful indicator; however, knowing the normal incidence of a given disease is not merely a question of pure statistics. For example, with the United States' excellent vaccine coverage, pertussis has long been considered a disease of the past. Today, however, a pertussis diagnosis is not an unusual event; indeed, pertussis now appears to be endemic, much like varicella. Thus, one or two cases of pertussis now would not necessarily be deemed an outbreak. On the other hand, even one case of smallpox would not only be considered an outbreak, it would trigger an enormous investigation and response effort.

Outbreak recognition may occur in several ways. Outbreaks may be recognized and reported by a perceptive clinician, lab tech, or infection control nurse. Astute public health staff may identify an unusual upsurge of case reports. Computerized databases of reportable conditions may be used to identify outbreaks. Rarely, the media will be the first to notify the community and/or public health agency of an outbreak. Finally, patients themselves may make the initial report.

In South Carolina, all of these methods are used to receive outbreak reports. Since 2003, the Carolinas Health Electronic Surveillance System (CHESS) has been used to capture reportable condition information and convey the data to the Centers of Disease Control and Prevention in Atlanta.

Outbreak Data and Reports

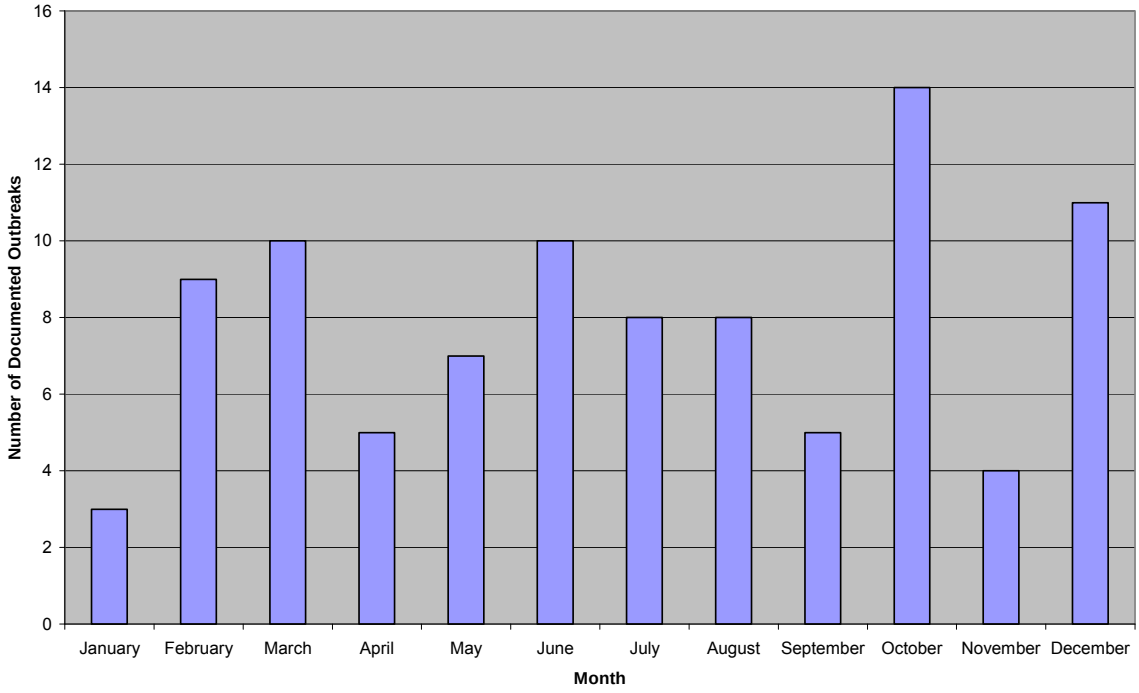
Using CHESS for centralized data collection, the Division of Acute Disease Epidemiology (DADE) maintains a list of outbreaks, the South Carolina Acute Disease Outbreak Log, that necessitated investigation and response. This list includes outbreaks of all the conditions that are listed by name on the current year's List of Reportable Conditions.

Many of these outbreaks, however, involve illnesses that are not listed by name on the official list of reportable conditions. DHEC requires immediate reporting by phone of *any outbreak, unusual disease, or cluster of cases to include a potential biological, chemical, or terrorist event.* For example, single cases of methicillin-resistant *Staphylococcus aureus* (MRSA) infections are not reportable by name; however, DHEC does require reporting of outbreaks of MRSA due to its outbreak potential.

Ninety-three outbreaks were documented in the South Carolina Acute Disease Outbreak Log in 2006 and include such varying conditions as norovirus, varicella, salmonella, pertussis, cryptosporidiosis, influenza, community-acquired MRSA, mycoplasma pneumonia, Respiratory syncytial virus and *Staphlococcus aureus*. Outbreaks were documented in all public health regions and in all months of the year (see Figure 1). Also, thirteen outbreaks were due to unknown agents for which identification was not made due to a multitude of factors such as lack of cooperation from involved parties or an unavailability of specimens or foods for laboratory testing.

It is important to keep in mind that the documented outbreaks represented in this log probably represent only a fraction of the true number of infectious disease outbreaks in South Carolina in 2006. This is why it is so important that health care providers, health care facilities (such as hospitals and nursing homes), and institutions (such as schools) report any suspected cluster or outbreak of disease so that local public health officials can properly investigate.

Figure 1: Documented Outbreaks in South Carolina by Month - 2006



Twenty-eight of these documented outbreaks in 2006 were caused by norovirus. Outbreaks of norovirus were reported in 6 of 8 public health regions and outbreaks are estimated to have affected almost 1400 persons. This is not surprising given that the Centers for Disease Control and Prevention estimates that there are 23 million norovirus infections annually in the United States (see: www.cdc.gov/ncidod/dvrd/revb/gastro/norovirus-factsheet.htm). The causes of transmission and common settings for norovirus infection in 2006 in South Carolina are compatible with national statistics.

Twenty-two of these documented outbreaks were caused by varicella, affecting more than 340 people in South Carolina in 2006. The actual number of cases of varicella in the US cannot be accurately determined because not all states report varicella cases to the CDC. However, for the states that are reporting varicella cases (including SC), there has been a steady increase in the number of cases since 2005. A response to outbreaks of varicella is critical, due to the fact that varicella is highly communicable and can case serious complications in immunocompromised patients.

Thirteen of these documented outbreaks were caused by pertussis totaling an estimated 110 outbreak-associated cases. These numbers are both less than reported in 2005, which experienced the largest increase in outbreaks and outbreak-associated cases during the 1996-2005 timeframe.

Described below are sample summaries from some outbreaks in South Carolina in 2006:

Staphylococcus aureus skin/soft tissue infection

During June of 2006, eight cases of *staphylococcus aureus* soft tissue infection were identified as a result of activities associated with a tattoo parlor. The investigation of this outbreak reaffirmed the need for tattoo artists to be compliant with South Carolina State Law Section 44-34-10 which states the need for each artist to complete courses in bloodborne pathogen training and infection control provided by the American Red Cross and the American Heart Association. In addition, individuals who obtain a tattoo should be aware that this procedure carries a definable risk.

Cryptosporidiosis

During 2006, 123 cases of laboratory-confirmed cryptosporidiosis were reported to the South Carolina Department of Health and Environmental Control, compared with a median of 19 cases (range: seven to 29) reported annually during 2001--2005. In the Charleston region (i.e., Berkeley, Charleston, and Dorchester counties), 88 laboratory-confirmed cases were reported, compared with a median of seven cases (range: one to seven) reported annually during 2001--2005; no other outbreaks were reported or detected during this period. Eighty-one (95%) of 85 patients reported in the Charleston region during June--November 2006 were interviewed by telephone. Although no controls were interviewed, multiple water parks, swimming pools, and day care centers were identified as common sources of exposure. As a result, health department staff members visited eight of the identified recreational water venues and 13 of the identified day care centers to examine policies and implement control measures (e.g., hyperchlorinate recreational water). This investigation should reinforce the message that swimming pool patrons share responsibility for controlling the spread of Cryptosporidium in recreational water venues. Refraining from swimming while ill with diarrhea, not swallowing pool water, practicing good hygiene, and reporting fecal contamination to pool operators so that

appropriate disinfection can be administered are major steps that can be taken to limit illnesses associated with recreational water use.

Salmonellosis

In June of 2006, DHEC investigated a large foodborne outbreak associated with a popular festival in South Carolina. A case was defined as an individual who attended the festival and experienced diarrhea with or without vomiting, abdominal craps, or nausea within 72 hours of visiting the festival. Ten culture-confirmed cases were identified. Over 90 additional patients reported similar symptoms/exposure but did not obtain laboratory confirmation. One sample of boiled peanuts yielded *Salmonella* serotype Thompson which matched the same pattern as present in cultures submitted by case patients. This outbreak was noteworthy due to being the first in the United States associated with boiled peanuts. Although the peanuts are boiled and salted, contamination is possible after processing. This outbreak was a reminder to clinicians and food vendors that any food can be a source of illness if improper food handling occurs.

Hospital-based Syndromic Surveillance Progress Report

The South Carolina Aberration Alerting Network (SCAAN) system is the unified syndromic surveillance system for South Carolina. SCAAN includes datastreams from: hospital emergency department (ED) chief-complaint, and RODS NRDM over-the-counter (OTC) sales. Data from the SC Poison Control Center will soon be integrated into the system.

The Syndromic Team at the Division of Acute Disease Epidemiology (DADE) is actively recruiting hospitals to join the SCAAN system. The DHEC regional mass casualty meetings are being used to introduce the SCAAN system to hospitals. There is a three-stage approach to implementing hospitals into the SCAAN system:

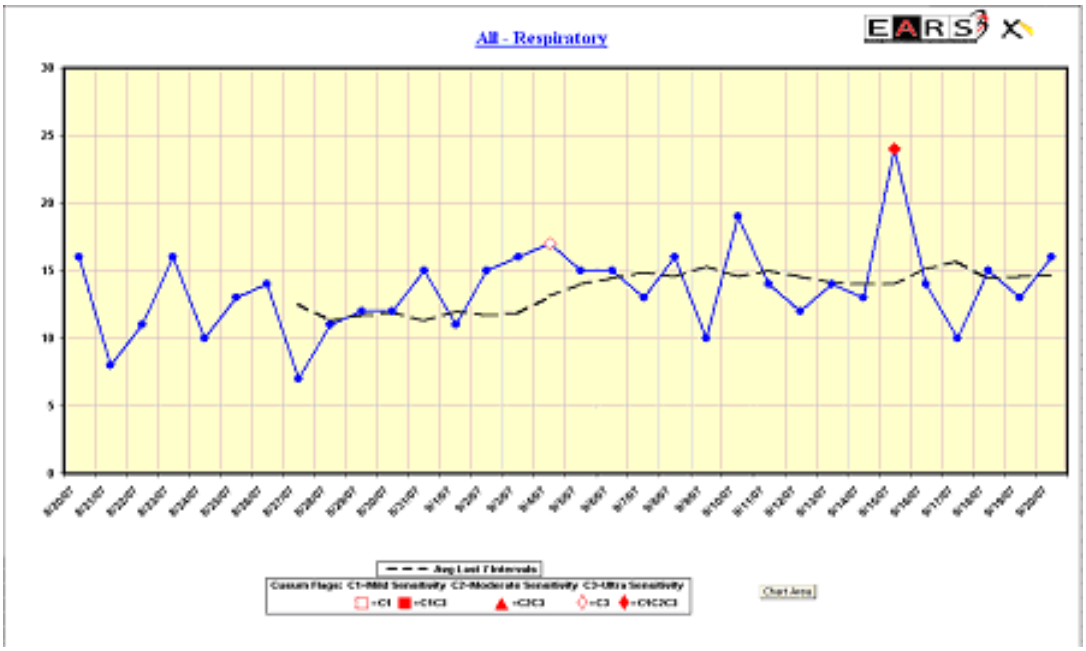
- Hospitals at the first stage have been presented the SCAAN system at the regional mass casualty meetings and have expressed an interest in a one-on-one discussion with the Syndromic Team.
- In stage two, hospitals that have agreed to join are working with the Syndromic Team to generate an automated syndromic data feed.
- During the third and final stage, a successful test file has been sent by the hospital to DADE and the process becomes automated.

Currently, five hospitals from two healthcare systems sending daily chief-complaint data to SC DHEC. The first chief-complaint live data feed occurred in the fall of 2007 from the Medical University of South Carolina (MUSC). The Greenville Hospital System was soon to follow with a daily feed from four hospitals within their healthcare system. The daily data feeds occur automatically and are sent through the Public Health Information Network Messaging System (PHINMS), which was developed by the Centers for Disease Control & Prevention (CDC) to rapidly and securely send sensitive health information over the Internet to local, state, and federal public health agencies. The ED chief-complaint data from hospitals is securely stored on the SC DHEC syndromic server, where daily cumulative sums analysis using EARS-SAS occurs and reports and graphs are generated for review (see Figure 1). The syndromic surveillance team in DADE is embarking on a novel approach to sending hospital syndromic data (including generated reports and graphs) back to hospitals through the PHINMS route. Since the entire data feed process is automated, few resources are needed to maintain the transmission at the hospital level.

Collaborations are underway with Self-Regional Healthcare and Palmetto Health Alliance (see Figure 2) to move them from stage 2 to stage 3 of the implementation process. Hospital IT personnel observe that the relative simplicity of the data file format (flat file structure) makes implementation straightforward. The Syndromic Team provides IT support in the following manner: a pre-written autosend program (specific to each hospital), manuals, and trouble-shooting technical support. Funds are also available for hospitals to purchase a dedicated server for syndromic surveillance.

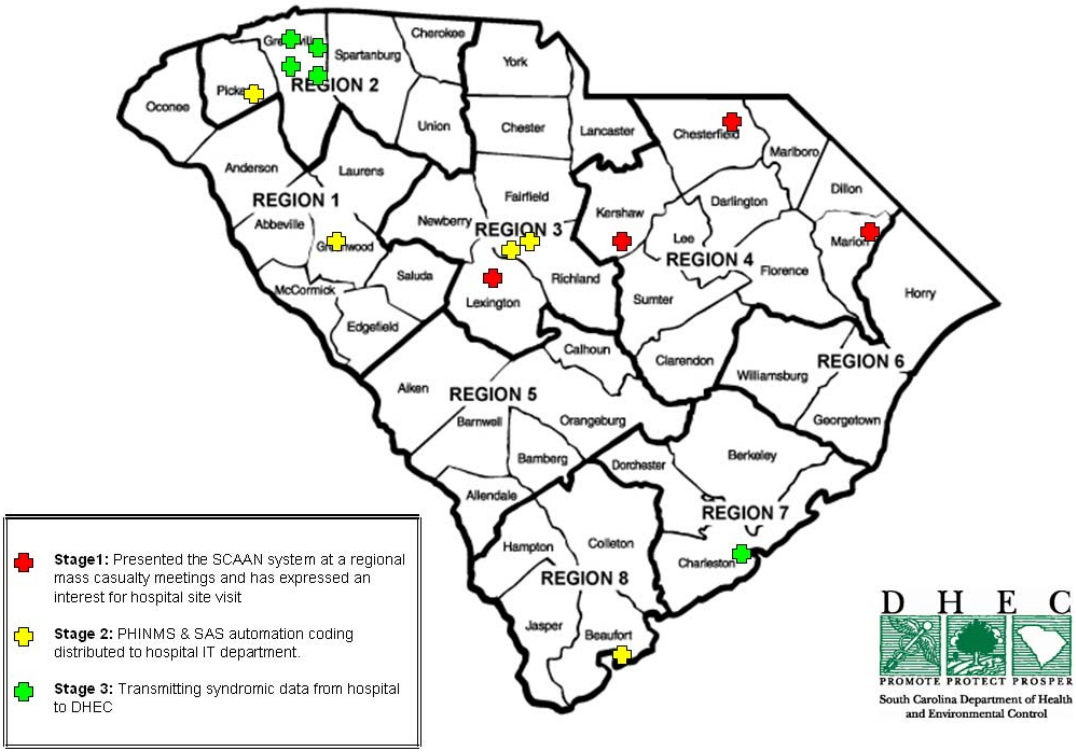
Syndromic surveillance can be an excellent way for hospitals to gain daily situational awareness of the activity within their emergency department. DHEC's goal is to establish hospital participation from every region in South Carolina. Facilities who are interested in participating can contact the Division of Acute Disease Epidemiology at 803-898-0289.

Figure 1. A graphical output from the EARS software of the “Respiratory” syndrome category using data from one of our current healthcare providers*.



*During this one-month period, aberrations from the running CUSUM indicated days requiring further investigation. Some examples of patient chief complaints that were included in developing the “Respiratory” syndrome category are: “difficulty breathing”, “chest cold”, “pneumonia”, “respiratory difficulty”, “gasping”, “pulmonary”, etc.

Figure 2. SCAAN Hospital ED Coverage.



Appendix

Further Information and Resources

This section presents selected internet and printed sources of further information regarding infectious diseases of public health importance.

I. (Free) Periodicals

- **Morbidity and Mortality Weekly Report (MMWR).** Published by the Centers for Disease Control (CDC). Weekly issues often include breaking news about important domestic or international infectious disease outbreaks. In addition MMWR Recommendation and Reports supplements, typically published about 10 to 20 times per year, contain detailed recommendations which provide much of the technical guidance used by public health and disease control programs. In addition, special MMWR Surveillance Summaries, provide periodic analytic updates regarding trends in various reportable diseases. All issues of the MMWR are available in PDF format from www.cdc.gov/mmwr.

- **Emerging Infectious Diseases (EID):** A monthly journal published by the Centers for Disease Control (CDC). The journal was conceived in 1995 in response to increasing awareness of the emergence in the last 30 years of a host of new, or newly recognized, infectious agents. Since then, over 2000 articles submitted from all over the world have appeared in the journal which provides an excellent free way to stay current of developing trends in infectious disease emergence. The publication is available in PDF format, and either entire issues, or any individual article may be downloaded from www.cdc.gov/eid.

- **Weekly Epidemiologic Record (WER)** published weekly by the World Health Organization (WHO) for whom the WER is roughly analogous to CDC's MMWR, though the WER presents more international perspectives. All issues available in PDF format from www.who.int/wer**.**

- **Bulletin of the World Health Organization (BWHO).** A major monthly journal of international health covering infectious and other diseases and public health problems. All issues available in PDF format from www.who.int/bulletin. An excellent resource providing the "larger global picture".

II. Reference Books

Book	Comment
Control of Communicable Diseases Manual. 18th Edition (2004). Official report of the American Public Health Association. Paperback, 699 pages. Available via www.apha.org	A standard public health reference used throughout the United States and in other countries as well. Editorial team and contributors includes World Health Organization as well as American Experts.
The "Red Book": Report of the Committee on Infectious Diseases of the American Academy of Pediatrics. 27th edition (2006). Paperback, 992 pages. Available via www.aap.org/bookstorepubs.html	Another widely used authoritative reference which provides guidance for clinical and public health aspects of infectious diseases.
Principles and Practice of Public Health Surveillance. Ed S Teutsch. Oxford University Press, hardcover, 406 pages. 2nd edition (2000).	A somewhat technical but very understandable review of public health disease surveillance from over a dozen perspectives: e.g. technical, epidemiological, ethical, legal etc
Modern Infectious Disease Epidemiology. J. Giesecke. Arnold Press, 268 pages, 2nd edition (2002	Short clear introductory text providing good foundation for understanding the epidemiology of infectious diseases.
Infectious Disease Epidemiology: Theory and Practice. Ed K Nelson. Jones & Bartlett Publishers 1207 pages 2nd edition (2007).	A much more detailed graduate level text presenting not only specific diseases (e.g. measles, tuberculosis, diarrheal diseases etc), but also methodological issues (e.g. surveillance, outbreak epidemiology, mathematical modeling, etc.)
Guide to Foodborne Pathogens. Ronald G. Labbe and Santos Garcia (editors), 2nd edition (2001).	A detailed text covering the management of foodborne pathogens.
Control of Communicable Diseases Manual. David, L. Heymann (editor), American Public Health Association, 18th edition, (2004).	A manual that covers over 140 communicable diseases and groups of diseases authored by experts from around the world.

III. Disease Control Information on the DHEC web site.

The links presented below provide access to a variety of information related to communicable disease control in South Carolina. As this list is not exhaustive, links to other topics of interest may be found by browsing through the DHEC web site.

Web Link	Topic
www.dhec.sc.gov/	DHEC's Home page
www.dhec.sc.gov/administration/atoz.htm	A to Z subject listing
www.dhec.sc.gov/health/	Health Services
www.dhec.sc.gov/health/disease/index.htm	Bureau of Disease Control home page . (Also provides links to current and past issues (in PDF format) of DHEC's EpiNotes, a newsletter which contains updates regarding SC communicable disease issues.)
www.dhec.sc.gov/health/disease/acute/flu.htm	Influenza surveillance
www.dhec.sc.gov/health/disease/docs/reportable_conditions.pdf	List of reportable conditions
www.dhec.sc.gov/health/disease/exclusion.htm	Child Care and School Exclusion lists of Contagious or communicable diseases.
www.dhec.sc.gov/health/disease/han/notifications.htm	Public Health Notifications
www.dhec.sc.gov/health/disease/immunization/index.htm	Immunization Division
www.dhec.sc.gov/health/disease/stdhiv/index.htm	STD/HIV program
www.dhec.sc.gov/health/disease/tb/index.htm	Tuberculosis Control
www.dhec.sc.gov/health/disease/acute/index.htm	Acute Disease Epidemiology
www.dhec.sc.gov/health/envhlth/	Environmental Health

IV. Other Selected Web Resources

Presented below are selections of useful web sites maintained by government agencies, private foundations, and educational institutions which present quality information relating to infectious diseases of public health importance.

Web site	Organization	Info and Tips
www.cdc.gov	US Centers for Disease Control and Prevention	At the top of the CDC home page, click on "A-Z Index" (or go directly to www.cdc.gov/az.do). This provides access to extensive information on many specific infectious conditions.
http://medlineplus.gov/	National Library of Medicine of the National Institutes of Health	Access to information about 700 medical conditions…. and much more.
www.pubmed.gov	National Library of Medicine of the National Institutes of Health	Access to abstracts to most of the world's peer-reviewed medical literature since 1966.
www.who.int	World Health Organization	Clicking on "Health Topics" provides access to alphabetical listing of conditions similar to CDC's A-Z index, but with additional global perspectives.
www.cidrap.umn.edu/	University of Minnesota's Center for Infectious Disease Research and Policy	Good mix of academically sound information and updates on infectious disease news
www.idsociety.org/	Infectious Disease Society of America	An important non-governmental professional organization devoted to infectious disease research, training, and other issues.
www.nfid.org/	National Foundation for Infectious Diseases	A non-profit, organization founded dedicated to educating the public and healthcare professionals about the causes, treatment and prevention of infectious diseases.
www.ashastd.org/	American Social Health Association	Extensive information and links regarding sexually transmitted diseases (STDs)
http://aidsinfo.nih.gov/	Project sponsored by the U.S. Department of Health and Human Services	Extensive up-to-date information about HIV/AIDS Treatment, Prevention, and Research
www.nastad.org/	National Alliance of State and Territorial AIDS directors	An organization which seeks to bridge science policy and public health aspects of AIDS
www.gavialliance.org/	Global Alliance for Vaccines and Immunization	Partnership that combines public and private sector resources to bring the benefits of immunization to children in greatest need.
www.vaccineinformation.org/	Immunization Action Coalition	Information about vaccine preventable diseases for the public and for health professionals
www.nationaltbcenter.edu/	Curry National TB Center in San Francisco	Extensive resources and links regarding Tuberculosis.
www.pandemicflu.gov/	US Dept of Health and Human Services	Avian and pandemic flu information

Contact Information

South Carolina Department of Health and Environmental Control

http://www.scdhec.gov/

Bureau of Disease Control

http://www.scdhec.gov/health/disease/index.htm

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