

Surveillance for Botulism in South Carolina

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Background

Botulism is a neuroparalytic illness resulting from the action of a potent toxin produced by the organism *Clostridium botulinum*. This microbe was first described in 1897 by E. van Ermengem after his investigation of a foodborne outbreak in Ellezelles, Belgium¹. Foodborne botulism is rare, but it may kill rapidly, and contaminated products may expose many persons. The July 2007 botulism outbreaks in Indiana and Texas that were associated with canned chili sauce have increased the need for botulism awareness. They've also increased the understanding that foodborne botulism represents a medical and a public health emergency that places a premium on rapid, effective communication between clinicians and public health officials.

Surveillance

The diagnosis of botulism is not difficult when it is strongly suspected, as in a large outbreak. But since cases of botulism most often occur singularly, the diagnosis may pose more of a problem. Findings from many outbreaks have suggested that early cases are commonly misdiagnosed.²

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 a few days.
- 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 toxins.

Symptom Presentation/Epidemiology

Incubation periods for foodborne botulism are reported to be as short as six hours or as long as 10 days, but generally

Neisseria gonorrhoea Antimicrobial Resistance: Important Considerations for the Treatment of Sexually Transmitted Infections

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Sexually transmitted infections (STI) due to *Neisseria gonorrhoea* are a very important public health problem. Approximately 800,000 people are infected with *N. gonorrhoea* each year at an estimated cost of \$1 billion. The number of reported cases underestimates the true prevalence of *N. gonorrhoea* STIs, as many cases can be asymptomatic and occur in populations who either do not seek care or have limited access to care. This underscores the need for large surveillance surveys representative of the national population.

Rates remain high in the southeastern United States, especially among men who have sex with men, minorities, and adolescents of all racial and ethnic groups. This high prevalence suggests continued unprotected sexual intercourse, and it underscores the importance of stronger prevention messages and education. In particular, those in the younger age groups may be unaware of AIDS-related mortality prior to the advent of highly active antiretroviral therapy (HAART). Thus, they may not be as cautious in their sexual practices.

The spectrum of infection with *N. gonorrhoea* includes cervicitis, urethritis, pharyngitis, and pelvic inflammatory disease. The risk for HIV transmission

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the time between toxin ingestion and onset of symptoms ranges from 18 to 36 hours³. The clinical syndrome of botulism, whether foodborne, infant, or wound, is dominated by the neurologic symptoms and signs resulting from a toxin-induced blockade of the voluntary motor and autonomic cholinergic junctions and is quite similar for each cause and toxin type. Symptoms of botulism include double vision, blurred vision, drooping eyelids, slurred speech, difficulty swallowing, and dry mouth. Botulism also causes muscle weakness that always descends through the body: first shoulders are affected, then upper arms, lower arms, thighs, calves, etc. Botulism should be suspected in any adult with a history of acute onset of gastrointestinal, autonomic (e.g., dry mouth, difficulty focusing) and cranial nerve dysfunction (diplopia, dysarthria, dysphagia) or in any infant with poor feeding, diminished sucking and crying ability, neck and peripheral muscle weakness, and/or ventilatory distress. The demonstration of bilateral cranial nerve findings and the documentation of neurologic progression (descending peripheral muscle weakness, ventilatory compromise) increase the level of suspicion⁴. The diagnosis is even more likely if an adult patient has recently eaten home-canned foods or if family members are similarly ill, or both. Foodborne botulism can occur in all age groups.

Treatment

The points in the treatment of foodborne and wound botulism are as follows:

- Administration of botulinum antitoxin in an attempt to prevent neurologic progression of a moderate, slowly progressive illness, or to shorten the duration of ventilatory failure in those with a severe, rapidly progressive illness;
- Careful monitoring of respiratory vital capacity and aggressive respiratory care for those with ventilatory insufficiency (monitoring of respiratory vital capacity should be performed as soon as diagnosis of botulism is made); and
- Meticulous and intensive care for the duration of the often prolonged paralytic illness⁵.

Antitoxin therapy is more effective if undertaken early in the course of illness. Botulinum antitoxin, supplied by the U.S. Centers for Disease Control and Prevention (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 directly to the physician.

Public Health Response

Because cases of foodborne botulism result from ingestion of contaminated food that still may be available to cause illness in others, a single case of foodborne botulism represents a public health emergency that might indicate potential for a larger outbreak. Therefore, it is critical for clinicians who suspect botulism to discuss the case immediately with their DHEC regional public health office. If, after this clinical consultation, antitoxin is indicated, state public health officials will contact the CDC and

request antitoxin. If a commercial food product is a suspected vehicle for botulism, the U.S. Department of Agriculture or the U.S. Food and Drug Administration will also be notified. Investigation of a suspected case of botulism includes an immediate search for other possible cases and identification of suspected food exposures. Diagnostic testing of both case specimens and foods may be performed as needed. If a number of people are affected, a rapid and detailed epidemiologic investigation will be initiated to assure the source is identified and controlled.

Reporting:

The lack of reported human cases of botulism in recent years, the historical use of botulism as a biological weapon, and the need to request botulinum antitoxin directly from the CDC, makes any suspected or confirmed case of botulism a condition immediately reportable by phone as per the current South Carolina List of Reportable Conditions, available at:

http://www.scdhec.gov/health/disease/docs/reportable_conditions.pdf.

References:

- ¹ Shapiro RL, Hatheway C, Swerdlow DL. Botulism in the United States: A clinical and epidemiologic review. *Ann Intern Med*. 1998; 129: 221-228.
- ² St. Louis ME, Peck SH, Bowering D, et al. Botulism from chopped garlic: Delayed recognition of a major outbreak. *Ann Intern Med* 1988;108:363-368.
- ³ Woodruff BA, Griffin PM, McCroskey LM, et al. Clinical and laboratory comparison of botulism from toxin types A, B, and E in the United States, 1975-1988. *J Infect Dis* 1992;166:1281-1286.
- ⁴ U.S. Centers for Disease Control and Prevention: Botulism in the United States, 1899-1996. Handbook for Epidemiologists, Clinicians, and Laboratory Workers, Atlanta, GA. U.S. Centers for Disease Control and Prevention, 1998: 12.
- ⁵ Centers for Disease Control and Prevention: Botulism in the United States, 1899-1996. Handbook for Epidemiologists, Clinicians, and Laboratory Workers, Atlanta, GA. Centers for Disease Control and Prevention, 1998: 13-14.

(NEISSERIA GONORRHEA cont'd from Page 1)

is also significantly increased in the presence of *N. gonorrhoea* STI. The potential for serious complications and risk for HIV transmission should convince providers in both public and private clinical practices of the need to implement the CDC screening recommendations. More intensive measures should be undertaken to: re-screen after a positive test result three months after diagnosis; anonymously notify partners of infected individuals; and implement expedited partner therapy (delivery of antibiotic therapy by patients directly to their partners) as appropriate and permissible. A recent study concluded from modeling estimates that screening of high-risk men could be a viable

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tool in STI control (2007 ISSTD Conference, Abstract O-008).

Clinically significant antimicrobial resistance by *N. gonorrhoea* has been the trend over the past 60 years. The Gonococcal Isolate Surveillance Project (GISP) was established in 1986 to monitor this trend. STI clinics in 25 - 30 U.S. cities participate each year. The first 25 gonococcal (GC) urethral isolates each month from men attending the clinics are forwarded to regional laboratories for antimicrobial susceptibility testing. In this sample, resistance to ciprofloxacin did not occur until 1995, but it appeared in 4.1 percent of isolates in 2003. In 2003, 14.4 percent and 6.5 percent of isolates were resistant to tetracycline and penicillin, respectively, and these two drugs have been abandoned as GC therapy in the United States (Annals of Intern Med 2007; 147:81-88).

GISP data continues to document the rapidly rising GC resistance to fluoroquinolones, including ciprofloxacin. This resistance was first observed in Hawaii in the 1990s and in California in the early 2000s. By 2003, it had become prevalent nationally in men who have sex with men. As a result, the current CDC guidelines do not recommend the use of fluoroquinolones to treat gonococcal STIs in men who have sex with men (2006 MMWR; Vol 55).

Another important observation has been the rising GC fluoroquinolones resistance in heterosexuals. An updated CDC treatment guideline does not recommend the use of fluoroquinolones to treat gonococcal STIs in heterosexuals (2007 MMWR; Vol 56). This trend threatens the use of cheap, oral fluoroquinolones and necessitates the use of expensive, often injectable cephalosporins. The oral cephalosporin, Cefixime, at the time of this writing, is no longer available. Single agent treatment for chlamydia and GC co-infection with a tetracycline or a macrolide is ineffective for fluoroquinolone-resistant GC because of the frequent tetracycline resistance and high MICs of azithromycin among GC isolates.

Geographic location dramatically influences the prevalence of GC resistance. For example, in an independent study at DHEC's Richland County STD Clinic in 2006-2007, there were 44 GC isolates from the 350 patients tested, all of which were susceptible to ciprofloxacin. From principal investigator communications, a similar susceptibility result was reported from the Jackson, Mississippi site. However, the Miami, Florida site reported different results in this independent study. The Florida site had increased GC resistance.

Unfortunately, many providers are not requesting gonococcal STI susceptibilities because of the widespread use of combination chlamydia and gonorrhea nucleic acid amplification diagnostic tests. GC resistance testing requires culturing the organism and this may not be readily available. In addition, the demographic characteristics and risk factors in the GISP population are very different from those normally encountered in the southeast or publicly

funded STI clinics. This makes it difficult to generalize the results from the GISP study.

In certain settings in South Carolina, ciprofloxacin may still be a useful drug to treat gonococcal STI in heterosexuals. However, targeted intramuscular ceftriaxone should be used for men who have sex with men and in individuals with a travel history west of the Mississippi or to any large urban setting. Note that GC treatment failure is defined as growth on culture seven days after treatment because dead organisms will give a reactive nucleic acid amplification test. This assumes no reinfection and completion of treatment course as prescribed. Return of symptoms is unreliable because of an untreated partner, other causes of STIs (eg trichomonas, chlamydia, *Mycoplasma genitalium*), and initial empiric treatment. Patients with a history consistent with treatment failure should have a GC culture sent for susceptibility and have themselves and their partner treated with intramuscular ceftriaxone. DHEC is presently reviewing ways to monitor changing *Neisseria gonorrhoea* resistance prevalence in our state.

ReachSC and South Carolina Health Alert Network

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DHEC, Division of Acute Disease Epidemiology

Reach South Carolina (ReachSC) is an interactive Web-based notification system used for urgent public health threats and events that require a statewide emergency response. It is managed jointly by the South Carolina Department of Health and Environmental Control (DHEC) and the S.C. Emergency Management Division (EMD).

The Health Alert Network (HAN) is a component of ReachSC that will be used by DHEC for routine communication and to distribute health alerts/advisories from the U.S. Centers for Disease Control and Prevention (CDC) and DHEC. These health notifications can be sent to public health partners by fax, phone, and email. Health notifications are sent to organization-defined points of contact who then forward the message to appropriate recipients according to their organization's internal communication plan.

There are many benefits of the ReachSC Health Alert Network:

- It strengthens local public health departments by connecting them to other health care providers.
- It offers high-speed, around the clock connection between network members.
- It provides an early warning system.
- It allows local, state and federal health authorities to communicate and coordinate quickly and securely with each other and with

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- emergency management and law enforcement.
- It notifies the public of public health threats and provides important information in an emergency.

Is your contact information in the ReachSC system current? Outdated contact information within the ReachSC system may delay rapid alerts and notification. Please make sure that your contact information remains current. If you are already registered in the ReachSC system, you may update your contact information by logging in to ReachSC (www.reachsc.com) using the user ID and password created during the registration process.

If you would like to sign up and begin receiving health notifications from HAN, contact the HAN coordinator at DHEC by calling (803) 898-0431 or by e-mailing the coordinator at dorseysl@dhec.sc.gov. If the HAN coordinator approves your request to receive health notifications, you will receive an e-mailed invitation to register for ReachSC.

Help DHEC Identify the Circulating Strains of Influenza Virus in South Carolina

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 DHEC, Division of Acute Disease Epidemiology

Participate in DHEC's FREE influenza viral isolate network and help DHEC alert health care providers and the U.S. Centers for Disease Control and Prevention (CDC) to the emergence of novel strains of influenza A or B. All DHEC-processed influenza isolates are reported to the CDC. Upon CDC request, virus isolates are sent for further characterization.

Enrollment is simple. Just contact Nena Turner at (803) 896-0819 to provide demographics, including license number.

The DHEC Bureau of Laboratories suggest you confirm your first rapid test results via a sampling (three to four patients) of cultures at the beginning, middle, and end of the influenza season. After sending several patient specimens for culture, please wait three to four weeks before submitting additional cultures.

FREE: Collection kits, ice packs, lab forms, instructions, and postage-paid shipping materials are provided. Kits contain five specimen collection tubes. It is not necessary to submit all five at once. Following shipment to the DHEC Bureau of Laboratories, the shipping box will be returned to you for additional use.

Please think of verifying respiratory illness clusters by submitting FREE viral isolates to DHEC Laboratories.

Help DHEC Measure Influenza Burden in South Carolina

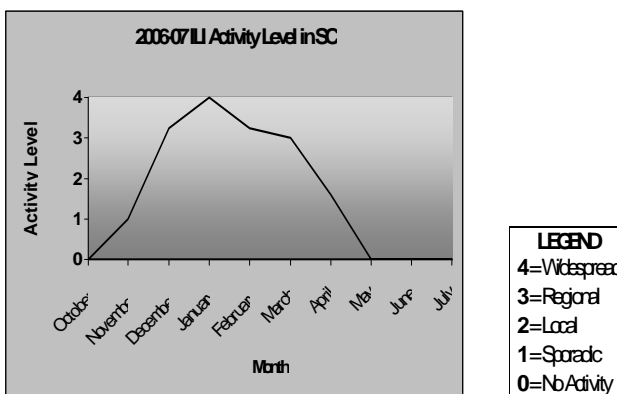
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The U.S. Centers for Disease Control and Prevention (CDC) Influenza-Like Illness (ILI) network bypasses laboratory testing and focuses on respiratory signs and symptoms. ILI is defined as: fever (≥ 100 Fahrenheit), cough, and/or a sore throat in ABSENCE of other known cause. This is the fifth year that South Carolina is participating in the ILI network. We encourage enrolled providers to take the brief time needed each week to submit data via fax or internet to the CDC. Even during summer months, providers should continue to submit data. Zeros should be submitted if applicable.

To enroll or reactivate your account, please contact Dr. Lena Bretous at (803) 898-0862. Once enrolled, the CDC will mail a provider number and ID password.

Enrolled providers can register for free personalized S.C. Weekly Flu Status emails.

- There were 34 providers who participated in the ILI Surveillance Program with the CDC and DHEC this past season. Two more providers have already been enrolled for the 2007-2008 season, which brings the total actively enrolled to 36 providers.
- Twenty-four counties had a provider who submitted data at least once during the season; 22 counties had no active providers. Thus, out of the 46 counties in SC, 52 percent had providers who submitted data at least once.
- Widespread activity status was attained from MMWR week 52 through MMWR week 06. Thus, there were seven straight weeks of "widespread" ILI activity in the state this



(PUBLIC HEALTH CLINICAL LIAISONS cont'd from Page 5)

experience who have stepped right into these roles with great enthusiasm and gusto. Their main modes of training resemble pharmaceutical "detailing." Training involves visits to medical practices and face-to-face presentations to small groups of nurses and other staff. The PHCLs offer a highly focused set of activities that the practices can adopt to increase their ability to cope with a pandemic. Medical practice groups can tailor the disease control activities to their specific organization, patient characteristics, and personnel skills. The trainers offer a "practice readiness assessment" up front, followed by a pandemic influenza overview.

The practice skills are offered in four modules, each of which can be presented to a medical practice to educate staff on key preparedness components. A practice can choose targeted training using one module based upon their perceived need or limited training time. Or, a practice can establish a training schedule for each of the four modules to provide a broader perspective on how the practice can prepare for the potential impact of pandemic influenza.

The four modules are:

- Module 1:** Preparation of practice to become a sentinel Influenza-like-illness (ILI) reporting source and/or sentinel influenza culture surveillance participant,
- Module 2:** Infection control in the practice in the face of pandemic influenza,
- Module 3:** Community disease control activities and patient education,
- Module 4:** Continuity of operations: Planning for the practice.

Along with a pandemic influenza notebook containing each of the four modules, supporting information, checklists, and resources, providers are also offered colorful posters to help patients and staff improve cough etiquette, hand hygiene, and other infection control activities.

Medical practice enrollment as ILI sentinel providers and influenza culture surveillance participants has increased since the PHCLs began working with practices. Follow-up visits have revealed increasing implementation of infection control policies and practices. Evaluations are being administered to practices to analyze the effectiveness of PHCL activities.

For further information or PHCL contact information, call Dr. Lena Bretous at (803) 898-0862 or Roscia Hardee, RN, at (803) 898-1490.

Ask Epi Infectious Disease Information

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The DHEC Bureau of Disease Control regularly receives questions from physicians, hospitals, and local public health departments regarding disease control, epidemiology, and public health issues. We occasionally publish questions and replies that may be of general interest. Questions may be submitted to: askEpi@sc.dhec.gov

Question: In our community, DHEC disease control consultants have recently helped resolve several thorny communicable disease questions for which answers were not readily available in the usual internal medicine, pediatric, or other standard texts. Which references do your in-house DHEC consultants typically use?

Answer: This is an excellent question. Certainly we, like everyone else these days, struggle to have just the right mix of paper and electronic resources at our fingertips so we can keep up with the barrage of questions and issues we face every day. One good source of general information about communicable disease reports in South Carolina is DHEC's Annual Disease Summary, which is posted on the Web (1). More generally, the CDC's Web home page (www.cdc.gov) provides an excellent entry point for information. An especially friendly feature of the page is the mini-on-screen *A-Z typewriter*, which lets users quickly find a disease topic of interest. For example, clicking on "**W**" will take you to *Water-related diseases*, *West Nile Virus*, *Whooping Cough* and more. (Access to the CDC *alphabet soup* listings is even more direct through www.cdc.gov/az). A similar Web information portal is run by the National Institutes of Health. (<http://medlineplus.gov> and www.nlm.nih.gov/medlineplus/healthtopics.html) Both the CDC and NIH sites are great sources for patients seeking reliable information.

For a general reference about both clinical and community aspects of infectious diseases, it's hard to beat the American Academy of Pediatrics Red Book (2). Most of

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(ASK EPI cont'd from Page 6)

DHEC's central office and regional medical consultants are not pediatricians, but our consulting nurses, physicians, and epidemiologists never venture far from their Red Book, especially when taking calls. In addition to standard textbook-style summaries about clinical manifestations of disease, diagnosis, and treatment, the Red Book includes community-oriented sections on disease reservoir, mode of transmission, period of communicability, isolation precautions, and control measures. It's a real treasure. Slightly more esoteric, but much more portable, is the Control of Communicable Disease Manual (3). Like the Red Book it is organized alphabetically by disease and, if anything, places even greater emphasis on practical community health issues.

Somewhat more specialized are the CDC's Recommendations and Reports (RR) series. These are related to the CDC's more famous Morbidity and Mortality Weekly Report (MMWR), but the RR series should not be confused with the "plain-vanilla" weekly MMWRs (however interesting the short articles in the weekly edition may be). Rather, each issue of the RR series provides an in-depth mini-reference or authoritative recommendations about a particular topic. A recent example was the March 23, 2007, RR issue introducing the new Human Papilloma Virus (HPV) vaccine (4). Recent RRs have also addressed influenza vaccine issues (updated yearly in the RR series), numerous other recommendations regarding immunization, HIV testing, treatment of STDs, diagnosis and management of tick-borne diseases, and much more. RR issues are published about a dozen times per year, and issues going back to 1990 can be downloaded in PDF format from www.cdc.gov/mmwr.

Aside from these paper and electronic resources, DHEC consultants constantly seek advice and information from one another, not only in Columbia, but throughout the state. Although all of our consultants try to be generalists, in the natural course of things some of us have become more knowledgeable about particular subjects. So, for complex questions, or when the health of a group is at stake, we adhere to the adage *several heads are better than one*. We collaborate with our colleagues either right down the hall or by phone. Finally, we communicate frequently with our counterparts in other state public health departments (e.g. with those in North Carolina or Georgia for cross-border issues). We communicate almost daily with colleagues at the U.S. Centers for Disease Control (CDC), frequently seeking advice or opinions from its many highly specialized consultants.

In summary, we commonly use a number of useful reference manuals and make extensive use of Web resources. Beyond that, we benefit from the counsel of experienced colleagues both in-house and around the country. All these resources are available directly or indirectly to physicians from around the state. We're always pleased to consult with physicians and other health care professionals.(5).

References (*)

1. 2005 South Carolina Annual Report on Reportable Conditions. Available from DHEC's Web site at: www.dhec.sc.gov/health/disease/docs/Annual_Report_on_Reportable_Conditions.pdf.
2. Red Book. 2006 Report of the Committee on Infectious Diseases, 27th edition. (2006) American Academy of Pediatrics.
3. Control of Communicable Disease Manual. American Public Health Association 18th Edition (2004) David Heymann Editor.
4. Quadrivalent Human Papillomavirus Vaccine Recommendations of the Advisory Committee on Immunization Practices (ACIP). MMWR March 23, 2007 / Vol. 56 / No. RR—2.
5. At the state level, consultations are available through the Division of Acute Disease Epidemiology at (803) 898 – 0861. DHEC's regional disease consultants may be reached through your local public health department.

Year-to-Date Summary of Selected Reportable Conditions - January 1, 2007 - September 30, 2007

Condition	Confirmed	Probable	Total
Animal Bite—PEP Recommended	273	*	273
Aseptic meningitis	71	0	72
Brucellosis	2	0	2
Campylobacteriosis	188	1	189
Ciguatera fish poisoning	1	0	1
Cryptosporidiosis	54	*	54
Cyclosporiasis	1	*	1
Dengue Fever	1	1	2
Ehrlichiosis- human granulocytic	1	0	1
Ehrlichiosis- human monocytic	1	2	3
Ehrlichiosis- human- other&unspec	1	1	2
Encephalitis- West Nile	1	0	1
Enterohem. E.coli O157:H7	4	0	4
Enterohem.E.coli shigatox+- ?serogrp	0	0	0
Enterohem.E.coli- shigatox+- non-O157	1	0	1
Giardiasis	75	0	75
Group A Streptococcus- invasive	78	0	78
Group B Streptococcus- invasive	25	0	25
Haemophilus influenzae- invasive	37	0	37
Hemolytic uremic synd- postdiarrheal	1	0	1
Hepatitis A- acute	12	0	12
Hepatitis B- acute	13	0	13
Hepatitis B virus infection—Chronic	166	266	432
Hepatitis B virus infection—Perinatal	0	0	0
Hepatitis C- acute	0	0	0
Hepatitis C Virus Infection- past or present	2884	425	3309
Hepatitis Delta co- or super-infection- acute	0	0	0
Hepatitis E- acute	1	0	1
Influenza- human isolates	65	0	65
Legionellosis	12	1	13
Listeriosis	8	0	8
Lyme disease	22	0	22
Malaria	5	0	5
Mumps	1	0	1
Neisseria meningitidis- invasive (Mening. disease)	13	0	13
Pertussis	44	10	54
Rocky Mountain spotted fever	14	41	55
S. aureus, vancomycin intermediate susc (VISA)	2	0	2
Salmonellosis	770	4	774
Shiga toxin-producing Escherichia coli (STEC)	8	0	8
Shigellosis	108	0	108
Strep pneumoniae- invasive	237	0	237
Streptococcal disease- invasive- other	6	0	6
Tetanus	0	0	0
Toxic-shock syndrome- staphylococcal	0	0	0
Varicella (Chickenpox)	460	320	780
Vibrio parahaemolyticus	1	0	1
Vibrio spp.- non-toxigenic- other or unspecified	5	0	5
Vibrio vulnificus infection	0	0	0
West Nile Fever	1	1	2
Yersiniosis	5	1	6

*Probable status is not allowed for this condition.

Epi-Notes

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**Epi-Notes is published by the South Carolina
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Division of Acute Disease Epidemiology
FOR DISEASE REPORTING**

For immediately reportable conditions, call your local county health department or, for after-hours, call 1-888-847-0902. Routine reports may be phoned in to your local health department or mailed on a completed DHEC DISEASE REPORTING CARD (DHEC 1129). Local

county health department numbers are listed on the Official List of Reportable Conditions. For a copy of the current Official List of Reportable Conditions, call 803-898-0861 or visit www.scdhec.gov/health/disease/index.htm

THE EPI NOTES NEWSLETTER IS NOW AVAILABLE ON LINE AT
www.scdhec.gov/health/disease/index.htm

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