Listeria

Listeria is a Class C Disease and must be reported to the state within five business days.

Listeriosis is an infection usually caused by eating food contaminated with the bacterium *Listeria monocytogenes.* A gram-positive non-spore forming rod-shaped bacterium, *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 meat and dairy products.

This bacterium can grow in relatively high salt and cold environments, and has been found in a variety of raw foods, such as uncooked meats and vegetables as well as processed foods that become contaminated after processing, such as soft cheeses and ready-to-eat deli meats. Unpasteurized (raw) milk or foods made from unpasteurized milk may contain the bacterium.

Epidemiology

Listeriosis is an important public health problem in the United States. However, the national incidence rate has declined due to improved sanitation, education and control of contamination at food processing establishments. Reporting reflects the fact that the diagnosis of listeriosis is rarely made.

The Centers for Disease Control and Prevention (CDC) estimates that the disease is responsible for approximately 1,600 serious illnesses with more than 1,400 hospitalizations and 260 deaths per year in the United States. The CDC reported the incidence rate in ten states participating in FoodNet, an active surveillance system, to be 0.3 per 100,000 with a case fatality rate of 13% (2010 data). The incidence rate decreased 38% from 1996 to 2010. On average from 1998 to 2008, 2.4 outbreaks per year were reported to the CDC. Before 2011, the largest outbreak occurred in 2002, when 54 illnesses, eight deaths and three fetal deaths in nine states were found to be associated with consumption of contaminated turkey deli meat.

The incubation period is variable, ranging from three to 70 days; the median incubation period for foodborne transmission is thought to be three weeks. Listeriosis infections are usually characterized by fever and muscle aches, sometimes preceded by diarrhea or other gastrointestinal symptoms. Listeriosis primarily affects older adults, pregnant women, newborns, and adults with weakened immune systems. Healthy adults and children occasionally get infected with Listeria, but they rarely become seriously ill. Immunocompetent persons may experience acute febrile gastroenteritis or no symptoms. Almost all diagnosed cases have "invasive" infection, in which the bacteria spread beyond the gastrointestinal tract. These symptoms are host-dependent.

Pregnant woman are approximately 20 times more likely than other healthy adults to get listeriosis; about one in six cases of listeriosis occur during pregnancy. Pregnant women typically experience a mild, flu-like illness followed by miscarriage, stillbirth, premature delivery, or life-threatening infection of the newborn.

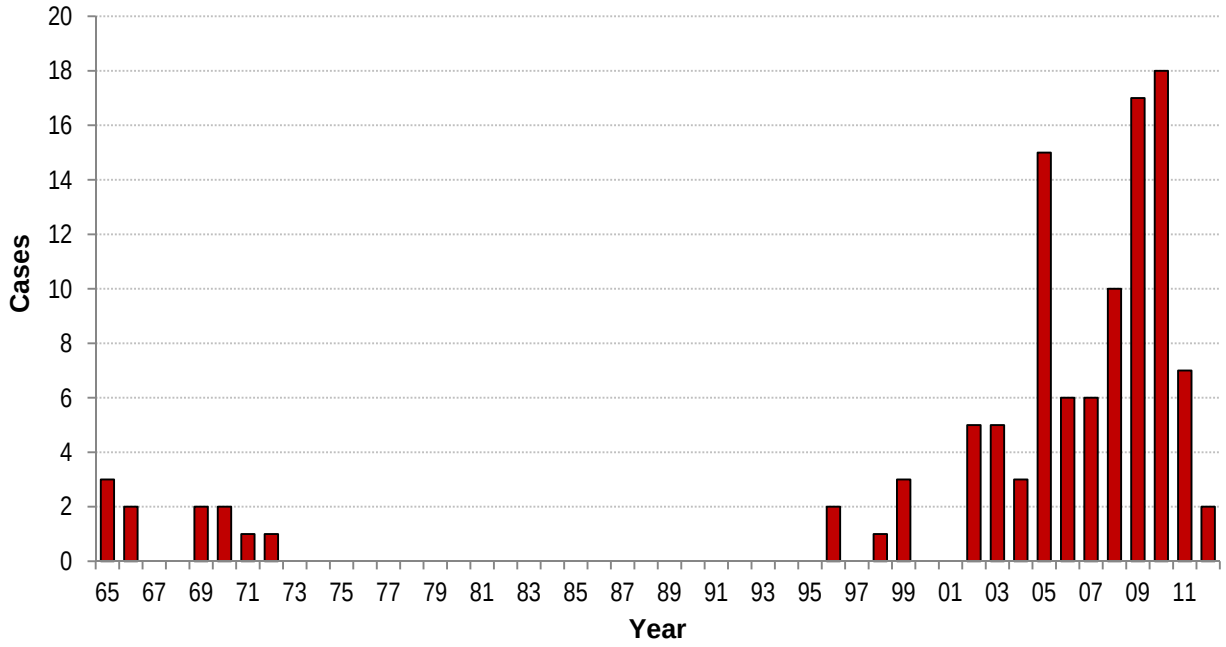
Fetal or neonatal cases rather than the pregnant women themselves, suffer the serious effects of infection in pregnancy. Infected mothers can spread the bacterium to their fetus, causing stillbirth or abortion. Infection may not be apparent until after birth and may lead to meningitis, brain injury and death of the neonate. In 2005, the U.S. incidence rate in neonates younger than 28 days old was 52.8 per 100,000. The case fatality rate in neonates is 20% to 30%.

In older adults and persons with immunocompromising conditions, septicemia and meningitis are the most common clinical presentations. The incidence rate among people 65 years of age or older was reported as 0.78 per 100,000 in 2011.

Incidence

From 1965 to 2001, reports of listeriosis in Louisiana were sporadic. Reports of listeriosis have been increasing since 2002 with the highest number of cases (18 cases) being reported in 2010 (Figure 1).

Figure 1: Reported Listeriosis cases – Louisiana, 1965-2012

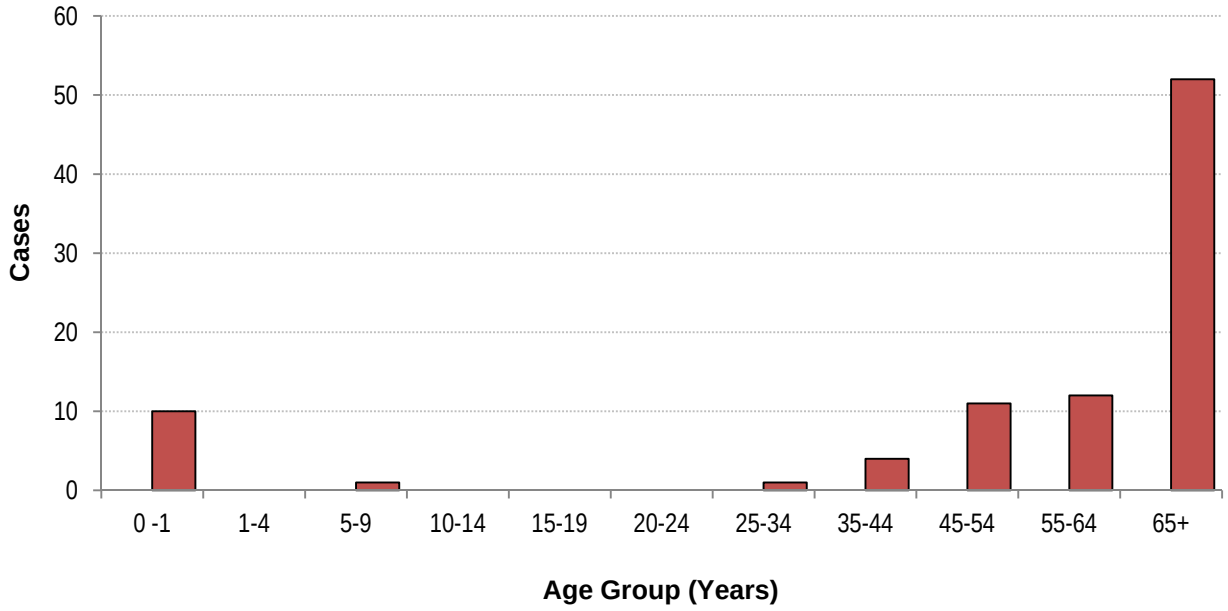


The number of hospitalized cases of listeriosis based on The Louisiana Inpatient Hospital Discharge Data (LaHIDD) is similar to the number of cases reported, suggesting that most diagnosed listeriosis cases are hospitalized.

Age Group Distribution

The majority of the listeriosis cases in Louisiana are 65 years of age or older. There is also a relatively high number of cases in the newborn to the one-year old and 45 to 64-year old age groups (Figure 2).

Figure 2: Listeriosis cases by age group - Louisiana, 2002-2012

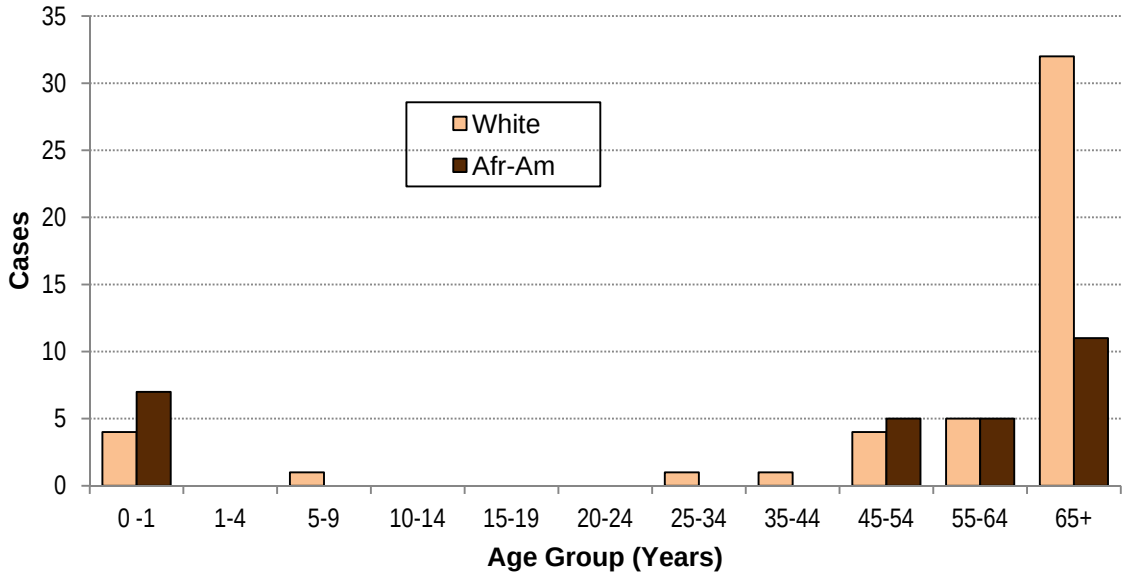


The age distribution of listeriosis cases for females is very similar to that of males.

Race

The number of cases among African-Americans as compared to Whites is similar across age groups except in the 65-year and older age group, where the majority of cases reported occur among Whites. It is difficult to draw any conclusions based on this data however, considering the small number of cases and the substantial difference in population of African-Americans versus Whites. In 2011, the estimated population in Louisiana included 1,529,801 African-Americans as compared with 2,956,593 Whites (Figure 3).

Figure 3: Listeriosis cases by race and age group - Louisiana, 2002-2012



Geographic Distribution

The geographic distribution of Listeria cases in Louisiana includes both urban rural parishes (Table).

Table: Reported Listeriosis cases - Louisiana, 2002-2012

Region	Parish	Cases 2002-2011
1	Orleans	12
	Jefferson	9
	Plaquemines	0
	St. Bernard	0
2	E. Baton Rouge	12
	W. Baton Rouge	2
	E. Feliciana	1
	W. Feliciana	0
	Ascension	5
	Iberville	0
	Pointe Coupee	0
3	Lafourche	2
	Terrebonne	3
	St. Mary	1
	St. John	1

Region	Parish	Cases 2002-2011
6	Vernon	0
	Grant	0
	Winn	0
	La Salle	0
	Catahoula	0
	Concordia	0
7	Caddo	6
	De Soto	1
	Sabine	0
	Bossier	1
	Webster	0
	Claiborne	0
	Bienville	0
	Red River	0
	Natchitoches	0

	St. Charles	1
	St. James	1
	Assumption	0
4	Lafayette	5
	St. Martin	1
	Iberia	1
	Acadia	2
	Vermilion	1
	Evangeline	0
	St. Landry	0
5	Calcasieu	1
	Cameron	0
	Beauregard	0
	Jeff. Davis	0
	Allen	0
6	Rapides	2
	Avoyelles	0

8	Ouachita	5
	Union	0
	Lincoln	0
	Jackson	0
	Morehouse	0
	Caldwell	0
	Richland	0
	E. Carroll	0
	W. Carroll	0
	Madison	0
	Franklin	0
	Tensas	0
9	St. Tammany	8
	Tangipahoa	2
	Washington	4
	St. Helena	1
	Livingston	3

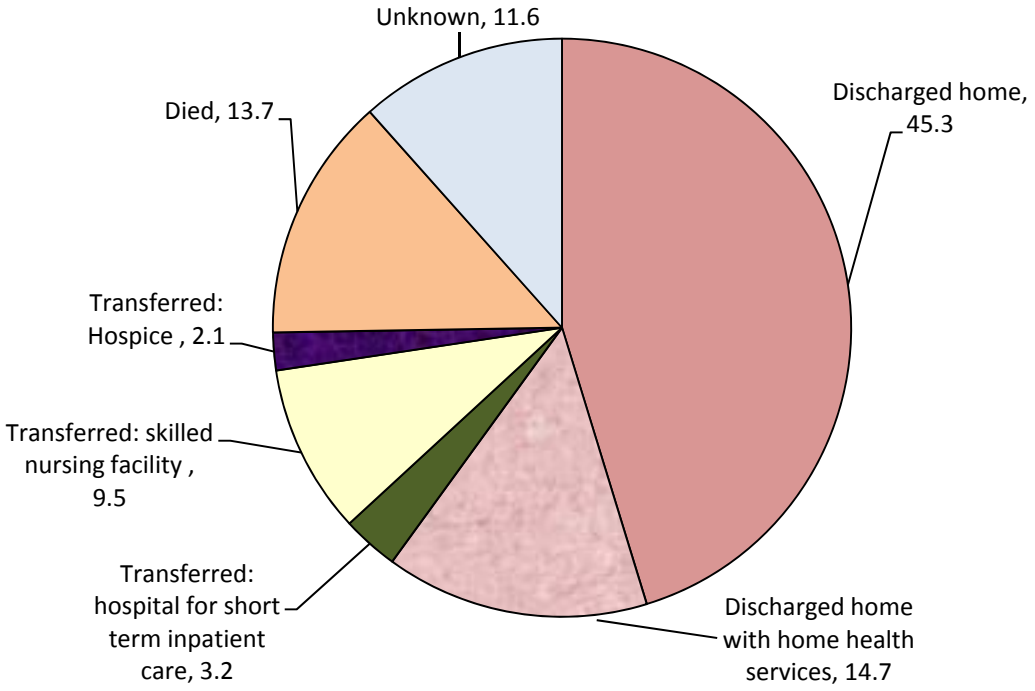
Seasonality

There is no seasonal variation in the number of listeriosis cases reported or hospitalized in Louisiana.

Mortality

Based on LaHIDD data, 14% of hospitalized cases died from 1999 to 2011. The majority of the hospitalized Listeria cases were discharged home to care for themselves. The remaining cases were discharged home with home health services, or discharged to another facility to receive care. Outcome was unknown in the majority of reported cases (Figure 4).

Figure 4: Percent outcomes for hospitalized *Listeria* cases - Louisiana, 1999-2011



The Hog Head Cheese Outbreak – October, 2010

Follow up is routinely conducted on all *Listeria* cases reported in Louisiana. Outbreaks or clusters of Listeriosis require more intense and focused investigations. By August of 2010, 14 cases of Listeriosis were reported in Louisiana; twelve of these cases were confirmed by the State Public Health Lab. After being confirmed by the State Lab, isolated bacteria are submitted to the State's Pulse Field Gel Electrophoresis (PFGE) lab. There, enzymes are used to cut the bacteria's DNA to determine the DNA "fingerprint" or pattern. These patterns are uploaded onto a database (PulseNet) supported by CDC and used by State and County Public Health Labs. PFGE patterns from the following bacteria are commonly uploaded onto PulseNet: *Salmonella*, *Shigella*, *Campylobacter*, *E. coli*, *Listeria*, and *Vibrio*. Clusters and outbreaks are detected through this database as bacterial DNA patterns are compared from across the country. Isolates from food and environmental samples can also be uploaded onto PulseNet which can aid in focusing the outbreak investigation. A cluster of eight *Listeria* cases in Louisiana were detected through PulseNet. Eight of the 12 isolates submitted to the State's PFGE lab had the same DNA pattern. This finding triggered a more thorough investigation into the cases. It was discovered that three of the cases reported eating hog head cheese. Samples of the product were collected and tested for *Listeria* at the CDC. One of the samples grew *Listeria monocytogenes* with a

PFGE pattern that matched the PFGE pattern of the human isolates. The positive *Listeria* culture resulted in the recall of 500,000 pounds hog head cheese as well as sausage that was produced at the same facility.