

Shigella

Shigellosis is a Class B Disease and must be reported to the state within one business day.

Shigellosis or bacterial dysentery is an acute infectious enteritis of humans due to members of the *Shigella* bacterial genus.

Epidemiology

Shigella have a human reservoir and are transmitted via the fecal-oral route. Person-to-person transmission is the most frequent mode of transmission. Although rare, common source outbreaks may also occur. *Shigella* find their way into water or food and are spread through this vehicle. Foodborne outbreaks are usually traced to infected food handlers, and are associated with food eaten raw, or handled after preparation.

Ninety-nine percent of *Shigella* isolates received by the State Lab come from stools. Stool concentration in infected individuals may be very high, with anywhere from 100,000 to 100 million *Shigella* per gram. *Shigella* has a low infectious dose; ten to 100 organisms can cause illness. The communicable period includes the time when a person is symptomatic up to a short time (up to four weeks) after a person has recovered from the infection. The incubation period of Shigellosis is usually one to three days, with a range of 12 hours to four days. Long-term carriage of *Shigella* is rare in industrialized countries.

Shigellosis can spread easily among closed populations such as army barracks and ships. *Shigella* infection is a major concern for some institutions such as those for the mentally disabled and day care centers. Endemic shigellosis appears during infancy but becomes more common among toddlers and young children. Shigellosis has become a significant problem in child care centers and can spread to household contacts. Secondary attack rates in household contacts range from 10% to 40%. Attack rates are higher in younger children than in adults. Breast-fed neonates seem to be protected, but bottle-fed are not.

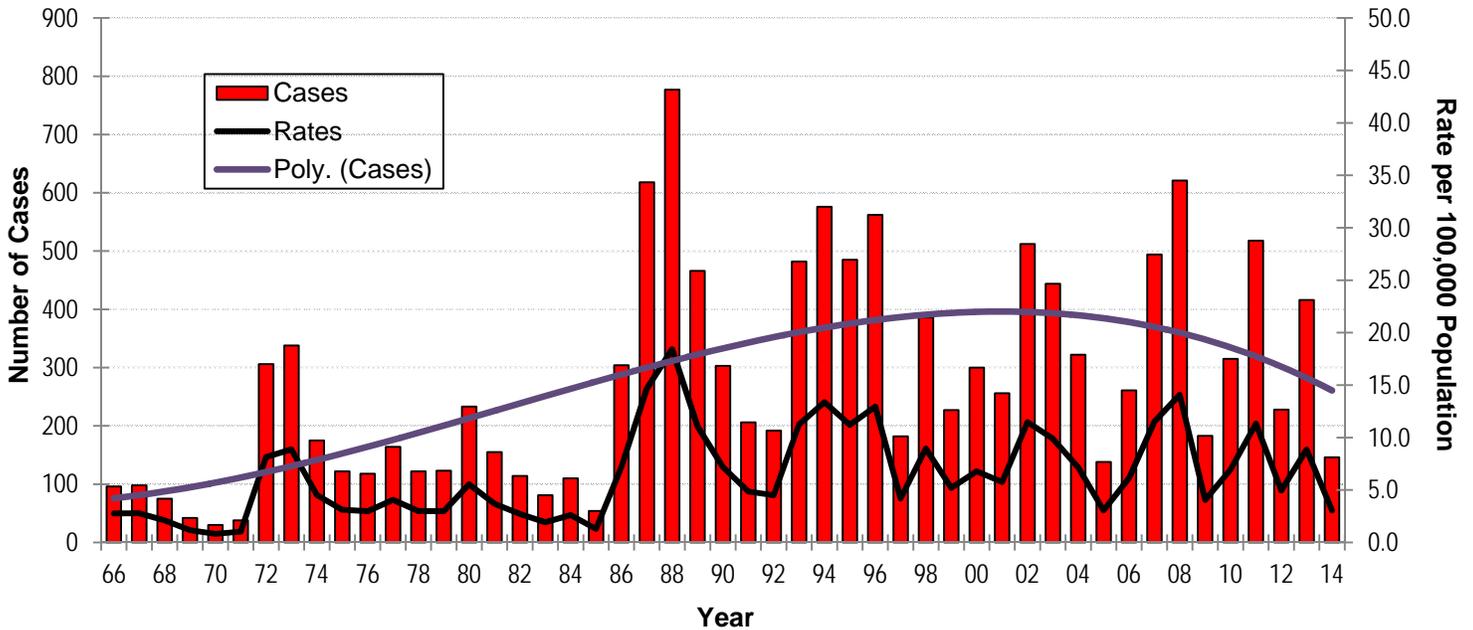
Incidence

There was a general increase in cases in the late 1950s similar to that observed for *Salmonella*. Two diseases with completely different epidemiological patterns (*Salmonella* coming from food sources and *Shigella* mostly from person-to-person contact) show the same pattern of increase in the late 1980s. It is reasonable to conclude that this increase results from a reporting artifact. In the late 1980s, a computerized disease report system replaced the old manual card system.

There are about 150 to 600 cases reported each year (3.5 to 14 cases per 100,000 population) with periods of two to four years of high numbers of reports followed by several years of low reporting. The graph shows a low reported number of cases for 2005; this is due to a disruption in reporting caused by Hurricane Katrina (Figure 1).

According to the Centers for Disease Control and Prevention (CDC) estimates adapted to Louisiana, there are about 8,200 cases of shigellosis occurring annually while only 500 to 800 are reported. Of these 8,200 cases, 30% are foodborne (about 2,500 per year), causing about 20 to 30 hospitalizations and zero, or very few deaths.

Figure 1: Shigellosis cases and incidence rates - Louisiana, 1966-2014

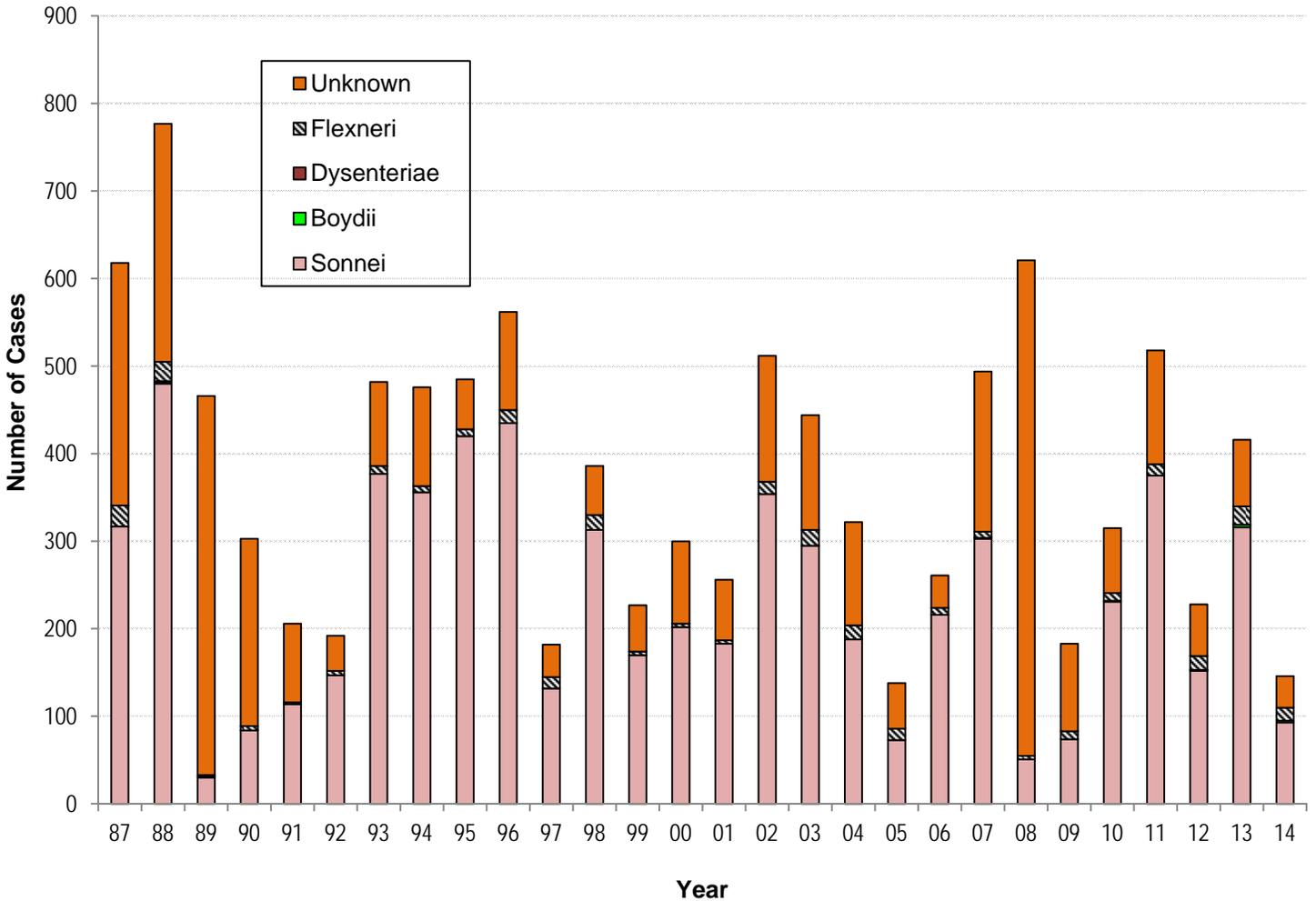


Shigella are divided into four major O antigenic groups:

- S. dysenteriae*
- S. flexneri*
- S. boydii*
- S. sonnei*

Very large epidemics of *S. dysenteriae* with high morbidity and mortality were common before World War I. In 1920, *S. flexneri* progressively became the most common *Shigella*. After World War II, *S. sonnei* replaced *S. flexneri* in industrialized nations while *S. flexneri* remained predominant in the developing world. In the United States, *S. sonnei* accounts for over 90% of cases (Figure 2).

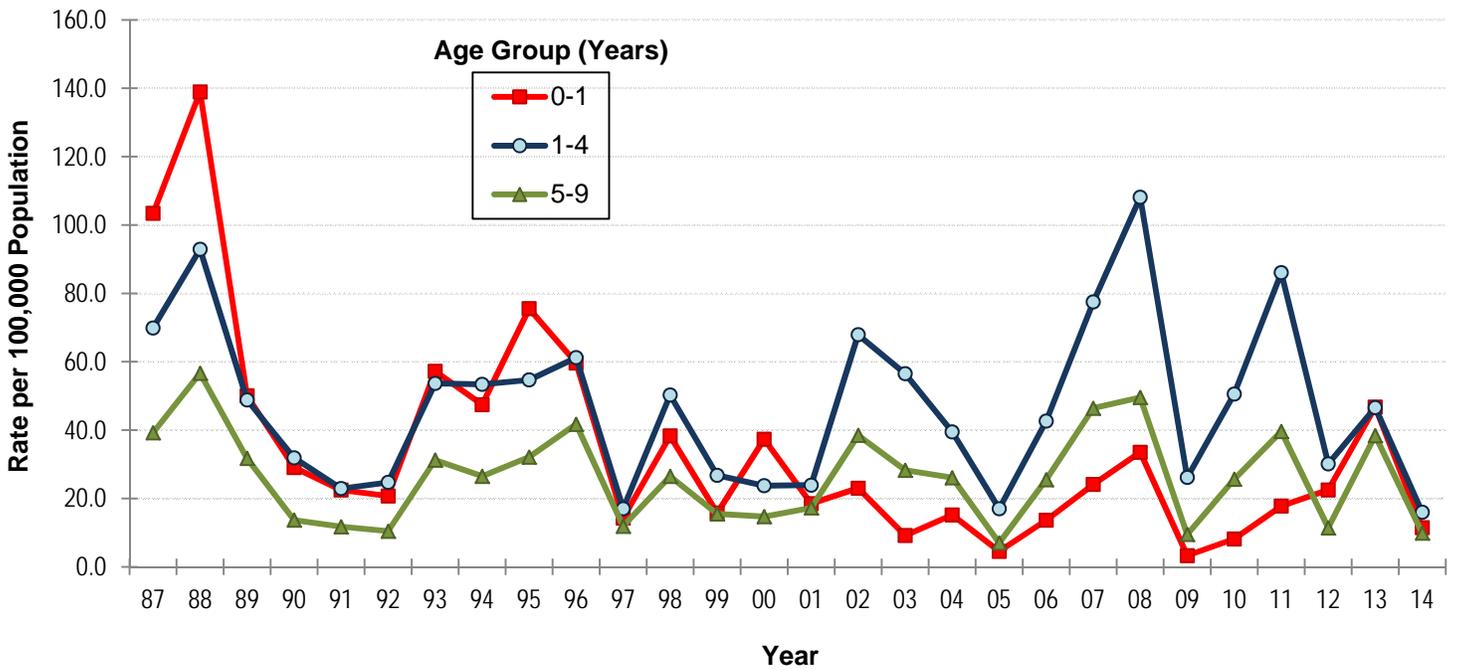
Figure 2: Shigella case distribution by type - Louisiana, 1987-2014



Age Group Distribution

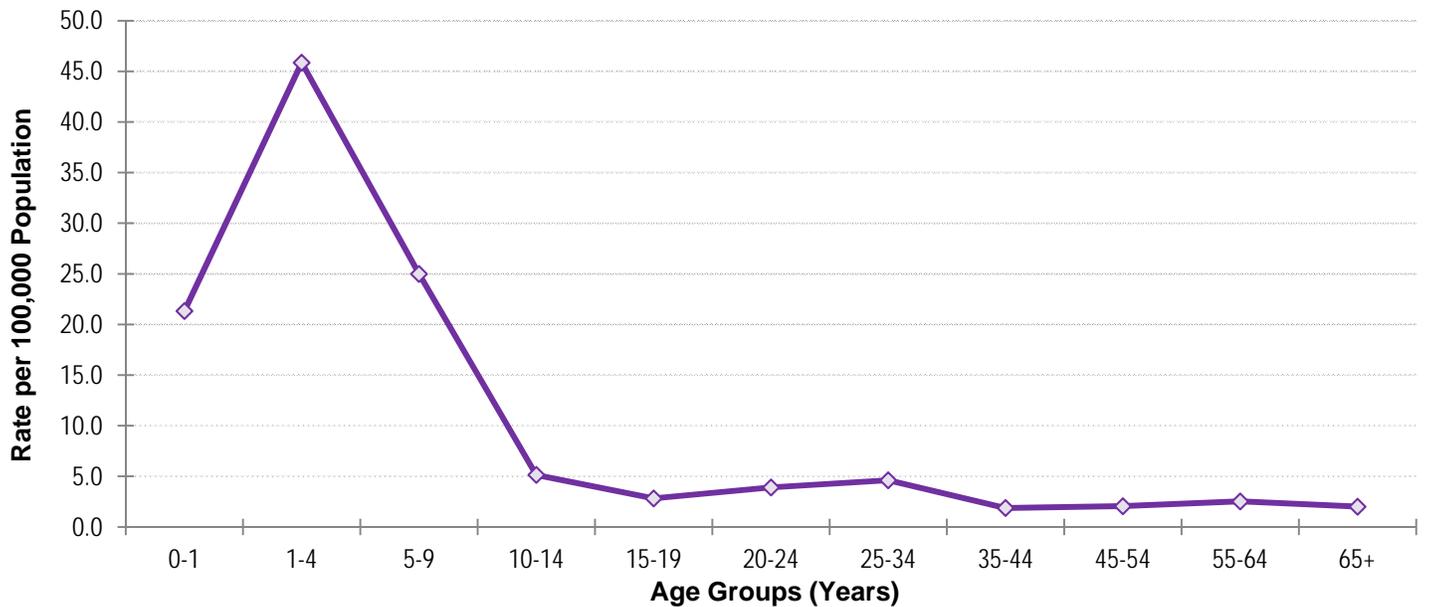
Endemic shigellosis appears during infancy and becomes more common among toddlers and young children. These infections are usually associated with poor hygienic conditions. Breast-fed neonates seem to be protected but those who are bottle-fed are not (Figure 3).

Figure 3: Shigellosis incidence rates in children - Louisiana, 1987-2014



In Louisiana, as in the rest of the U.S., children aged less than 10 years have the highest rate of shigellosis incidence (Figure 4).

Figure 4: Shigellosis by age distribution - Louisiana, 2010-2014

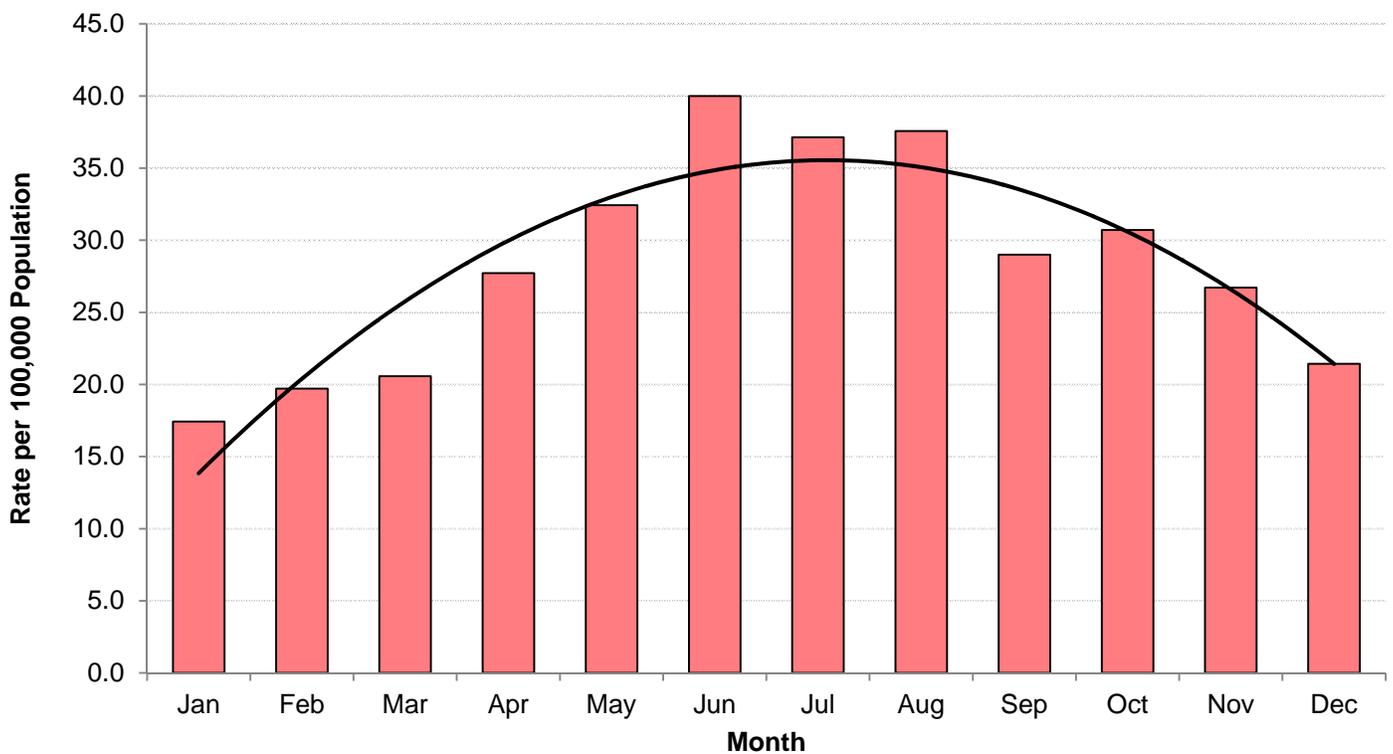


The peaks and troughs observed in trends of *Shigella* infections are mainly driven by the number of cases in children. There is a slight rise in incidence in young adults, then a decline until rates stabilize in middle age. There is no difference in incidence rates of Shigellosis for males and females. Likewise, there is no difference in incidence rates for Whites and African-Americans.

Seasonal Distribution

Shigella cases are reported throughout the year. There is an increase in the number of cases in the summer months (Figure 5).

Figure 5: Shigellosis average monthly case distribution - Louisiana, 2008-2014



Geographical Distribution

The geographic distribution may represent a combination of true differences in disease incidence and also in reporting habits (Table 1).

Table 1: Incidence Rates of Shigellosis by Parish
Louisiana, 1990-1999, 2000-2010 and 2011-2014

Region	Parish	Rate 1990-1999	Rate 2000-2010	Rate 2011-2014
1	Orleans	15.10	9.19	8.54
	Jefferson	8.69	4.29	5.67
	Plaquemines	10.91	0.00	4.21
	St. Bernard	5.11	3.28	13.75
2	E. Baton Rouge	8.33	1.60	7.28
	W. Baton Rouge	5.97	1.75	47.94
	E. Feliciana	2.96	9.06	9.58
	W. Feliciana	3.83	7.13	6.21
	Ascension	5.24	1.01	8.15
	Iberville	1.61	3.89	18.90
	Pointe Coupee	1.30	2.84	2.13
3	Lafourche	1.26	2.49	2.52
	Terrebonne	11.72	13.94	4.99
	St. Mary	2.44	9.79	2.22
	St. John	3.61	6.76	3.70
	St. Charles	3.50	4.60	3.22
	St. James	1.91	7.19	4.39
	Assumption	2.64	3.97	1.04
4	Lafayette	10.29	4.20	14.89
	St. Martin	2.63	14.96	7.91
	Iberia	7.92	4.44	6.96
	Acadia	4.21	8.39	3.93
	Vermillion	12.38	5.30	9.62
	Evangeline	5.61	2.78	2.86
	St. Landry	2.19	6.95	4.37
5	Calcasieu	8.70	6.08	5.92
	Cameron	1.11	7.11	0.00
	Beauregard	0	9.87	4.08
	Jefferson Davis	3.83	5.15	1.54
	Allen	3.02	16.16	1.88
6	Rapides	13.15	12.08	19.73
	Avoyelles	1.00	1.87	11.53
	Vernon	4.76	6.01	1.39
	Grant	3.31	0.38	6.53
	Winn	0	9.94	0.00
	La Salle	0	6.86	4.89
	Catahoula	0	0.87	0.00
	Concordia	1.44	2.93	1.17

7	Caddo	10.92	4.65	3.52
	De Soto	0.40	2.81	0.91
	Sabine	1.72	7.17	0.00
	Bossier	12.06	1.30	2.49
	Webster	2.85	11.87	1.77
	Claiborne	3.50	5.03	1.91
	Bienville	4.37	2.77	3.38
	Red River	2.09	9.64	0.00
	Natchitoches	2.15	3.21	3.07
8	Ouachita	6.04	11.52	3.16
	Union	1.40	3.71	1.07
	Lincoln	4.26	8.15	0.00
	Jackson	0	4.03	1.49
	Morehouse	21.34	4.61	1.73
	Caldwell	1.98	2.96	2.39
	Richland	0.97	3.24	4.68
	W. Carroll	0.83	2.10	10.46
	E. Carroll	0	9.19	81.31
	Madison	0	4.29	2.01
	Franklin	1.35	0.00	1.17
	Tensas	0	3.28	0.00
9	St. Tammany	3.44	1.60	6.02
	Tangipahoa	5.69	1.75	8.02
	Washington	7.21	9.06	4.12
	St. Helena	1.01	7.13	0.00
	Livingston	5.70	1.01	9.10

Hospitalization

From 2005 to 2011, 9% of persons infected with *Shigella* were hospitalized. The age groups with the highest hospitalization rate for this time period were 65-years and older with 44.5% hospitalized (Figure 6).

Figure 6: Shigellosis average annual proportion of hospitalized cases by age group
Louisiana, 2005-2012

