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Shigellosis, Orange County 2005 – 2014

Shigellosis is an infection caused by strains (species) of *Shigella* bacteria. The four species of *Shigella* are *boydii*, *dysenteriae*, *flexneri*, and *sonnei*. The signs and symptoms usually consist of diarrhea, fever, and abdominal cramps and begin 1 to 2 days after ingestion of the bacteria. The illness usually lasts 5 to 7 days and may require hospitalization if symptoms are severe. The bacterium is transmitted from person to person via the fecal-oral route. Only a small number of *Shigella* bacteria are needed to cause infection, and infected persons can shed the bacteria in their stool for up to a month if not treated with antibiotics. Occasionally, *Shigella* bacteria can also be spread through contaminated food or drinking water, contaminated recreational water, or sexual activity. For more information, go to http://www.cdc.gov/shigella.

Each case of shigellosis is investigated to assess potential sources and prevent transmission. In addition, all isolates of *Shigella* bacteria are to be sent to the Orange County Public Health Laboratory to be strain typed.

Table 1a. Orange County Shigellosis* Case Counts with Gender, Race/Ethnicity and Age Group Detail, 2005 – 2014

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total Cases	140	84	74	94	82	81	64	66	70	83
Gender										
Male	78	47	27	48	42	39	35	44	40	43
Female	62	37	47	46	40	42	29	22	30	40
Race/Ethnicity										
White	26	18	23	14	24	19	17	19	16	44
Black	0	1	1	1	0	1	0	1	1	0
Hispanic	102	61	41	70	51	46	37	38	45	25
Asian	3	1	6	3	5	3	1	1	0	8
Pacific Islander	0	0	0	0	0	0	0	0	1	0
AI/AN	0	0	0	0	0	0	1	0	0	0
Multiracial	0	0	0	0	0	0	0	0	1	0
Other/Unknown	9	3	3	6	2	12	8	7	6	6
Age Group										
Under 1 year	8	1	1	3	0	1	0	1	0	0
1-4	30	18	12	27	22	21	14	9	10	4
5-9	21	14	14	20	15	16	10	6	10	4
10-14	17	7	6	3	5	2	5	6	5	5
15-19	5	4	3	10	4	6	0	1	2	6
20-24	6	7	3	2	4	4	3	6	5	6
25-34	14	9	8	5	8	6	5	11	13	15
35-44	21	9	9	10	7	8	7	9	6	17
45-54	6	7	4	6	5	10	10	7	9	10
55-64	8	2	3	5	8	3	6	7	7	7
65 & over	4	6	11	2	4	4	4	3	3	9

**Shigellosis includes cases of all four species and those with unknown species.*

Table 1b. Orange County Shigellosis* Incidence Rates with Gender, Race/Ethnicity and Age Group Detail, 2005 – 2014**

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Total Rate	4.7	2.8	2.5	3.2	2.7	2.7	2.1	2.1	2.3	2.7
Gender										
Male	5.3	3.2	1.8	3.2	2.8	2.6	2.3	2.9	2.6	2.8
Female	4.2	2.5	3.1	3.1	2.6	2.8	1.9	1.4	1.9	2.5
Race/Ethnicity										
White	1.8	1.3	1.7	1.0	1.8	1.4	1.3	1.4	1.2	3.3
Black	--	--	--	--	--	--	--	--	--	--
Hispanic	10.7	6.3	4.2	7.1	5.1	4.5	3.6	3.6	4.2	2.3
Asian	--	--	1.2	--	1.0	--	--	--	--	1.4
Pacific Islander	--	--	--	--	--	--	--	--	--	--
AI/AN	--	--	--	--	--	--	--	--	--	--
Multiracial	--	--	--	--	--	--	--	--	--	--
Age Group										
Under 1 year	19.1	--	--	--	--	--	--	--	--	--
1-4	17.7	10.9	7.4	16.8	14.0	13.6	9.2	6.0	6.7	--
5-9	9.8	6.6	6.7	9.7	7.5	8.1	5.1	3.0	5.1	--
10-14	7.4	3.1	2.7	--	2.4	--	2.4	2.9	2.5	2.5
15-19	2.4	--	--	4.6	--	2.6	--	--	--	2.8
20-24	2.9	3.4	--	--	--	--	--	2.7	2.2	2.6
25-34	3.3	2.2	2.0	1.2	1.9	1.4	1.2	2.6	3.1	3.5
35-44	4.4	1.9	1.9	2.2	1.6	1.8	1.6	2.1	1.4	4.0
45-54	1.5	1.7	--	1.4	1.1	2.2	2.2	1.6	2.0	2.2
55-64	2.9	--	--	1.7	2.5	--	1.8	2.0	1.9	1.9
65 & over	--	1.9	3.4	--	--	--	--	--	--	2.2

*Shigellosis includes cases of all four species and those with unknown species.
**Incidence rates are per 100,000 population but not calculated when cases are less than five.

From 2005 to 2011, the incidence rate of shigellosis declined in Orange County, California, and United States. The incidence rates began to increase, however, after 2012 in Orange County, California, and United States.

Table 2. Shigellosis Incidence Rates in United States, California, and Orange County

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
United States[1]	5.5	5.2	6.6	7.5	5.2	4.8	4.3	4.9	4.0	6.5
California[2]	6.2	5.1	3.6	4.5	2.8	2.9	2.5	2.9	2.8	4.2
Orange County	4.7	2.8	2.5	3.2	2.7	2.7	2.1	2.1	2.3	2.7

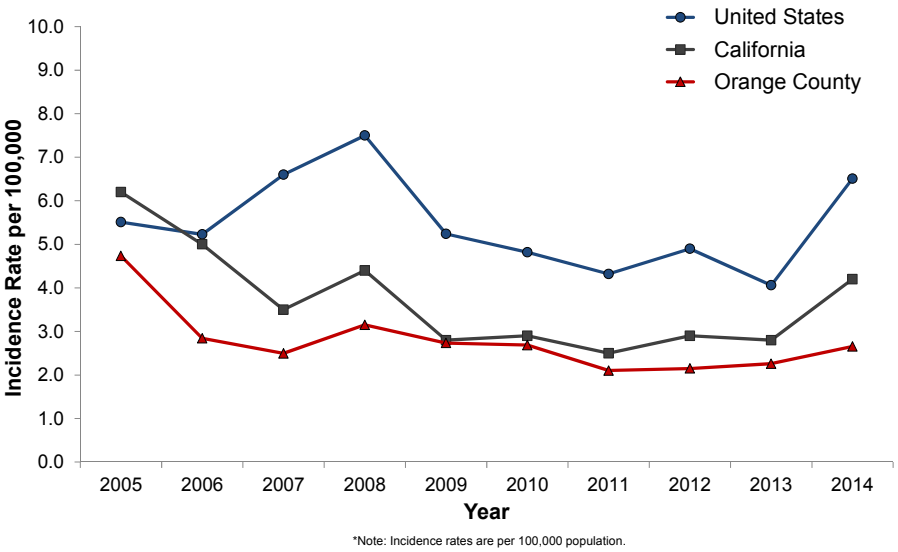
[1] Summary of Notifiable Diseases - United States, 2013. MMWR 2013;62(No. 53)

[2] Infectious Diseases Branch, California Department of Public Health, 5/2015.

Restaurant Outbreaks

In 2014, three restaurant outbreaks of shigellosis in Orange County were investigated. All three of the outbreaks were caused by *S. sonnei*, and the number of reported illnesses ranged from 6 to 9. Each of the restaurant outbreaks was thought to have been foodborne-related although not confirmed. Two of the outbreaks had matching PFGE patterns, or DNA fingerprint, when tested by the Orange County Public Health Laboratory.

Figure 1. Comparison of Shigellosis Incidence Rates* in United States, California, and Orange County, 2005-2014



*Note: Incidence rates are per 100,000 population.

The four species of *Shigella* (*boydii*, *dysenteriae*, *flexneri,* and *sonnei*) vary in their incidence and severity. *S. dysenteriae* causes the most severe disease and occurs in less developed areas of the world. *S. sonnei* generally causes more mild disease and is most common in developed countries.

The distribution of the four *Shigella* species over time in Orange County is shown in Figure 2. *S. sonnei* was the most common isolate each year, accounting for 64% of isolates from 2005 to 2014. However, in 2013, the total number of cases for *S. flexneri* and *S. sonnei* were nearly equal. Between 2007 and 2009, Orange County saw an increase of *S. boydii* cases. In totality, the occurrence of *S. dysenteriae* is very uncommon in Orange County cases.

Figure 2. Total Cases Per Year of Shigellosis by Species Type, Orange County, 2005-2014

Table 3. *Shigella* cases by species in Orange County

	2014		2005 - 2013	
Species	**Number**	**Percent***	**Number**	**Percent***
S. dysenteriae	0	0%	4	0%
S. flexneri	21	25%	267	32%
S. boydii	1	1%	20	2%
S. sonnei	61	73%	539	64%
Unknown species	0	0%	8	1%
Total	83	100%	838	100%

**Percentage may not total 100% due to rounding.*