

National Enteric Disease Surveillance: *Shigella* Annual Report, 2015

The Laboratory-based Enteric Disease Surveillance (LEDS) system contributes to the understanding of human shigellosis in the United States by collecting reports of infections from state and regional public health laboratories. Reporting to LEDS is voluntary; the number of laboratories submitting reports varies somewhat from year to year, although almost all laboratories report every year. Occasionally, more than one isolate is reported from a single episode of infection in a person; this report includes only one isolate of a given *Shigella* species per person within a 30-day period.

An overview of surveillance methods and systems for *Shigella* infections is available online at <http://www.cdc.gov/ncezid/dfwed/PDFs/Shigella-Overview-508.pdf> (1).

Data in this report are current as of February 10, 2017.

Summary

- In 2015, 52 state and regional public health laboratories reported 13,784 cases of culture-confirmed *Shigella* infections to LEDS, 26% more than in 2014. The substantial increase in 2015 may be associated with a two-fold increase in outbreak-related cases reported to NORS.²
- Of the 13,784 isolates, 12,952 (94%) were identified to the species level.
- Distribution by species was similar to previous years, with *Shigella sonnei* accounting for the largest percentage of infections (84.9%), followed by *Shigella flexneri* (8.7%), *Shigella boydii* (0.3%), and *Shigella dysenteriae* (0.1%).
- Overall national incidence of culture-confirmed *Shigella* in 2015 (4.3 cases per 100,000 population) was greater than in 2014 (3.4 cases per 100,000 population) but less than that in 2008 (4.8 cases per 100,000 population).³
- Since the mid-1980s, reporting of *Shigella* without species information has fluctuated (range: 0.03–1.17 cases per 100,000 population). This may be partly due to outbreaks for which public health laboratories did not characterize all isolates to the species level. Incidence of these isolates generally parallels incidence of *Shigella sonnei*.
- As in previous years, children aged 1–4 years had the highest incidence of all age groups.
- The incidence of *Shigella* infection is driven by outbreaks; it does not exhibit a distinct seasonal pattern.

¹ For reporting year 2015, the LEDS *Shigella* Annual Report only includes *Shigella* infections confirmed by culture.

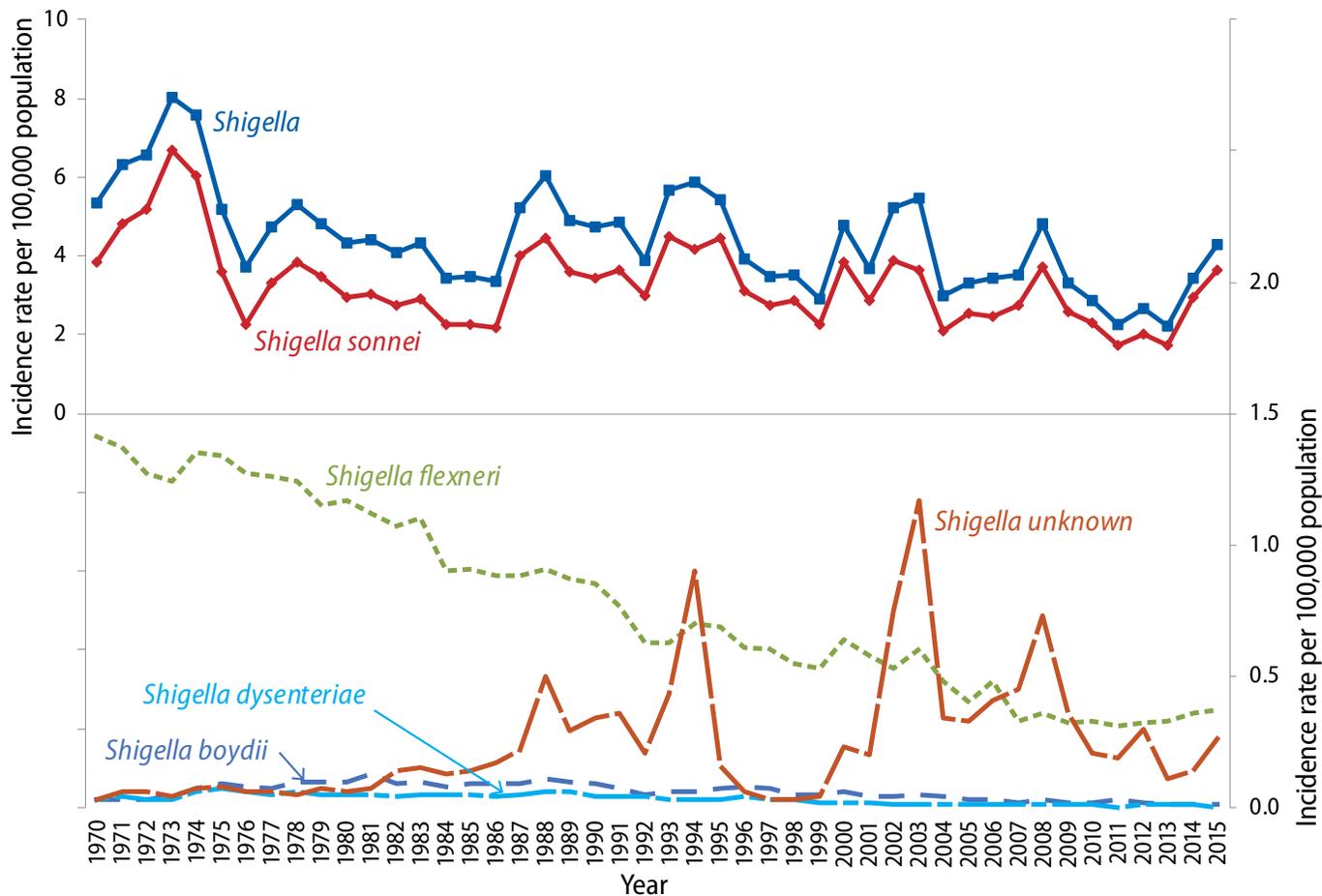
² CDC. Unpublished data, National Outbreak Reporting System. Atlanta, GA: US Department of Health and Human Services, CDC. Data received on March 28, 2017.

³ The practice of testing clinical specimens for presence of *Shigella* species without concomitant bacterial culture and subtyping has increased in recent years (2); this may lead to underestimation of national *Shigella* incidence by the LEDS system. In 2015, 9% of *Shigella* infections reported to FoodNet sites were not confirmed by culture.

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Figure 1. Incidence rate of culture-confirmed human *Shigella* infection (all species), reported to LEDES, United States, 1970–2015



Note: Full data table for graph https://www.cdc.gov/nationalsurveillance/data/2015/figure1_data.csv

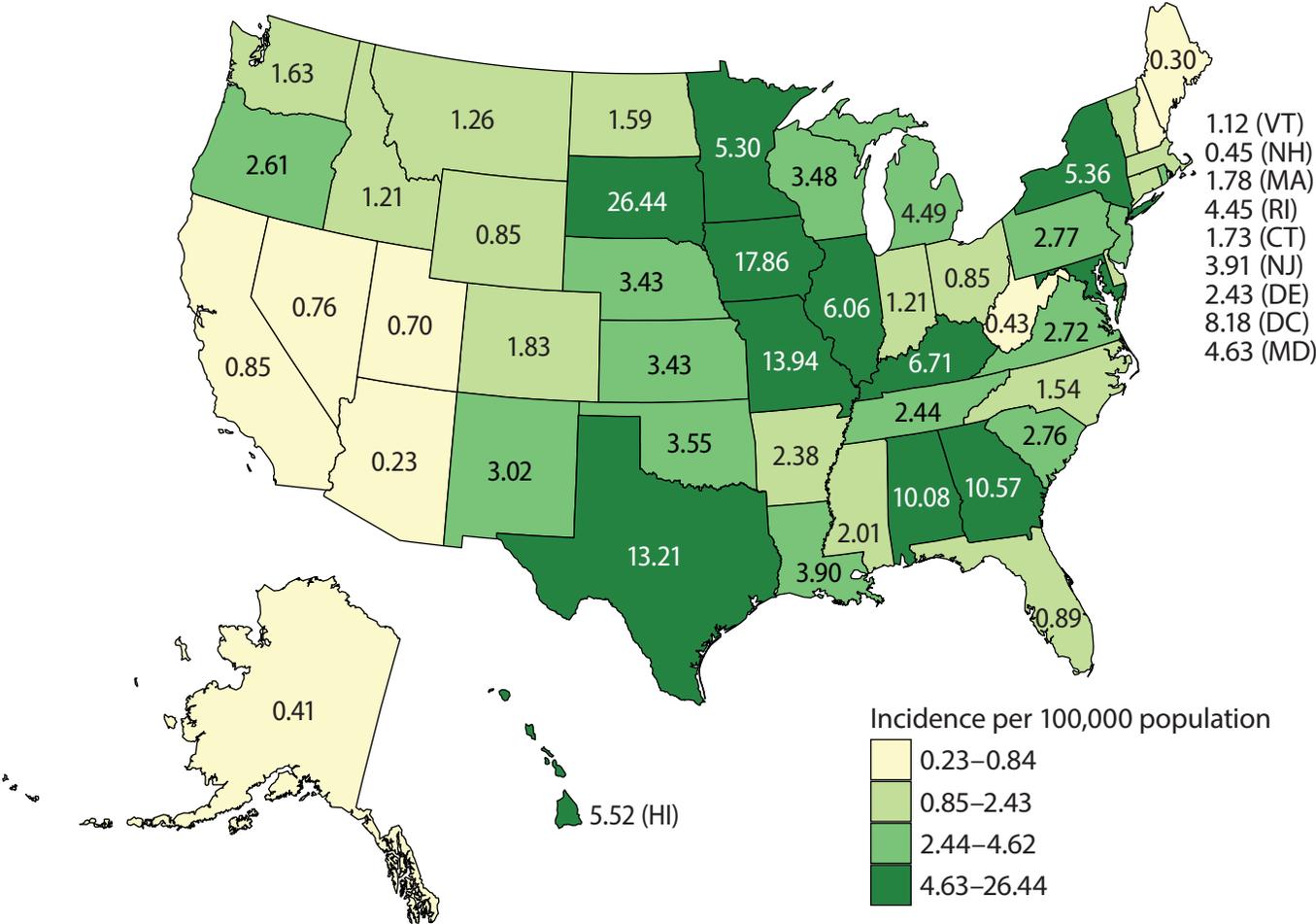
Table 1a. Culture-confirmed *Shigella* infections reported to LEDS, by species, United States, 2015

Rank	Serotype	Number reported	Percent	Incidence per 100,000
1	<i>S. sonnei</i>	11,700	84.9	3.64
2	<i>S. flexneri</i>	1,200	8.7	0.37
3	<i>S. boydii</i>	38	0.3	<0.01
4	<i>S. dysenteriae</i>	14	0.1	<0.01
	Subtotal	12,952	94.0	
	Unknown	832	6.0	
	Total	13,874	100	4.29

Table 1b. Incidence rate of culture-confirmed *Shigella* infection reported to LEDS, by age group and sex, United States, 2015 (n = 12,315 with age and sex information reported)

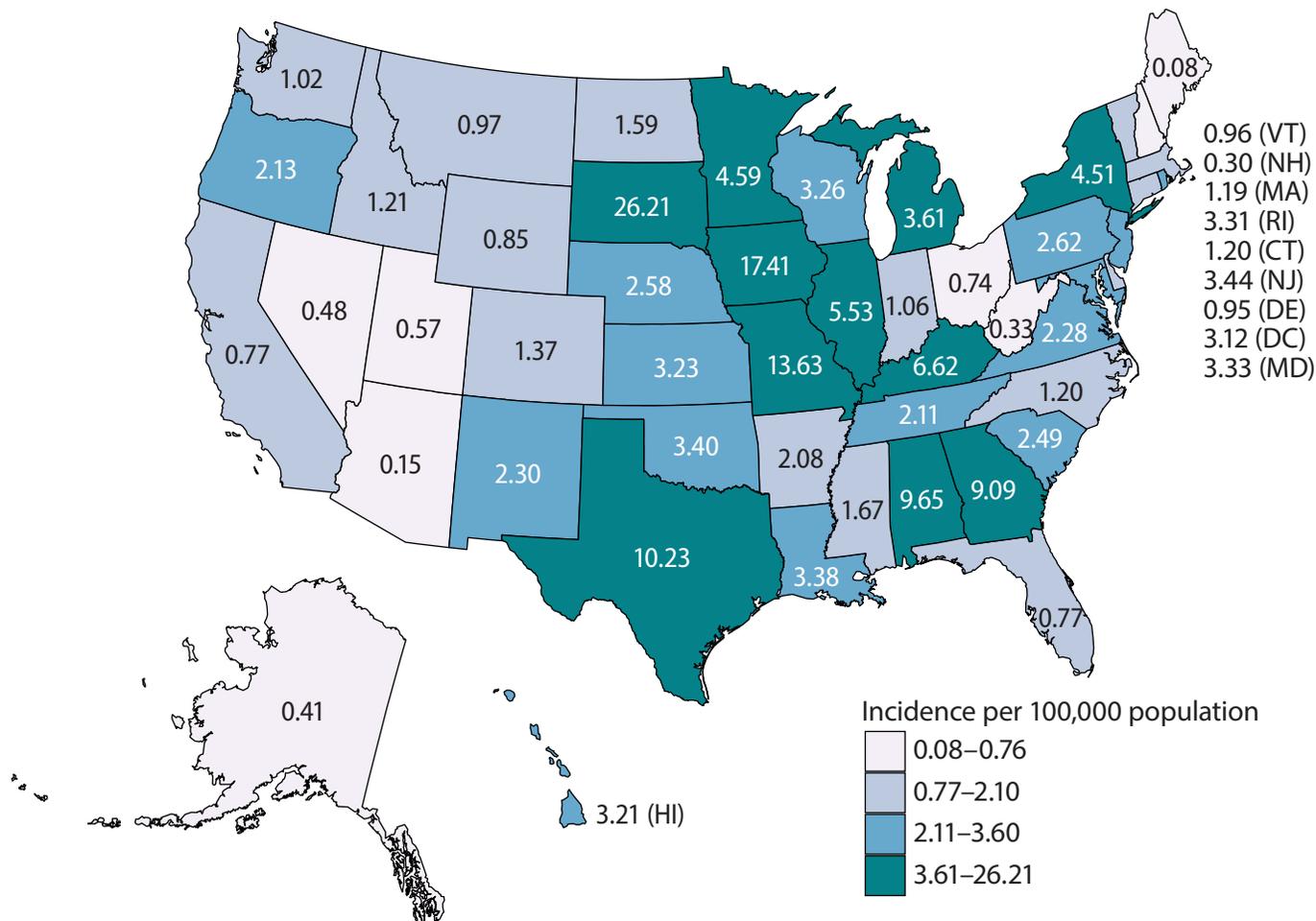
Age group, years	Incidence	
	Female	Male
<1	3.81	5.11
1–4	21.43	22.4
5–9	17.48	15.76
10–19	2.99	2.49
20–29	3.77	2.79
30–39	2.86	3.09
40–49	1.66	2.3
50–59	1.44	1.73
60–69	1.2	1.2
70–79	1	0.82
≥80	0.64	0.55
Overall	4.03	4.13

Figure 2a. Incidence rate of culture-confirmed human *Shigella* infection reported to LEDS (all species), by reporting jurisdiction, United States, 2015 (n = 13,784)



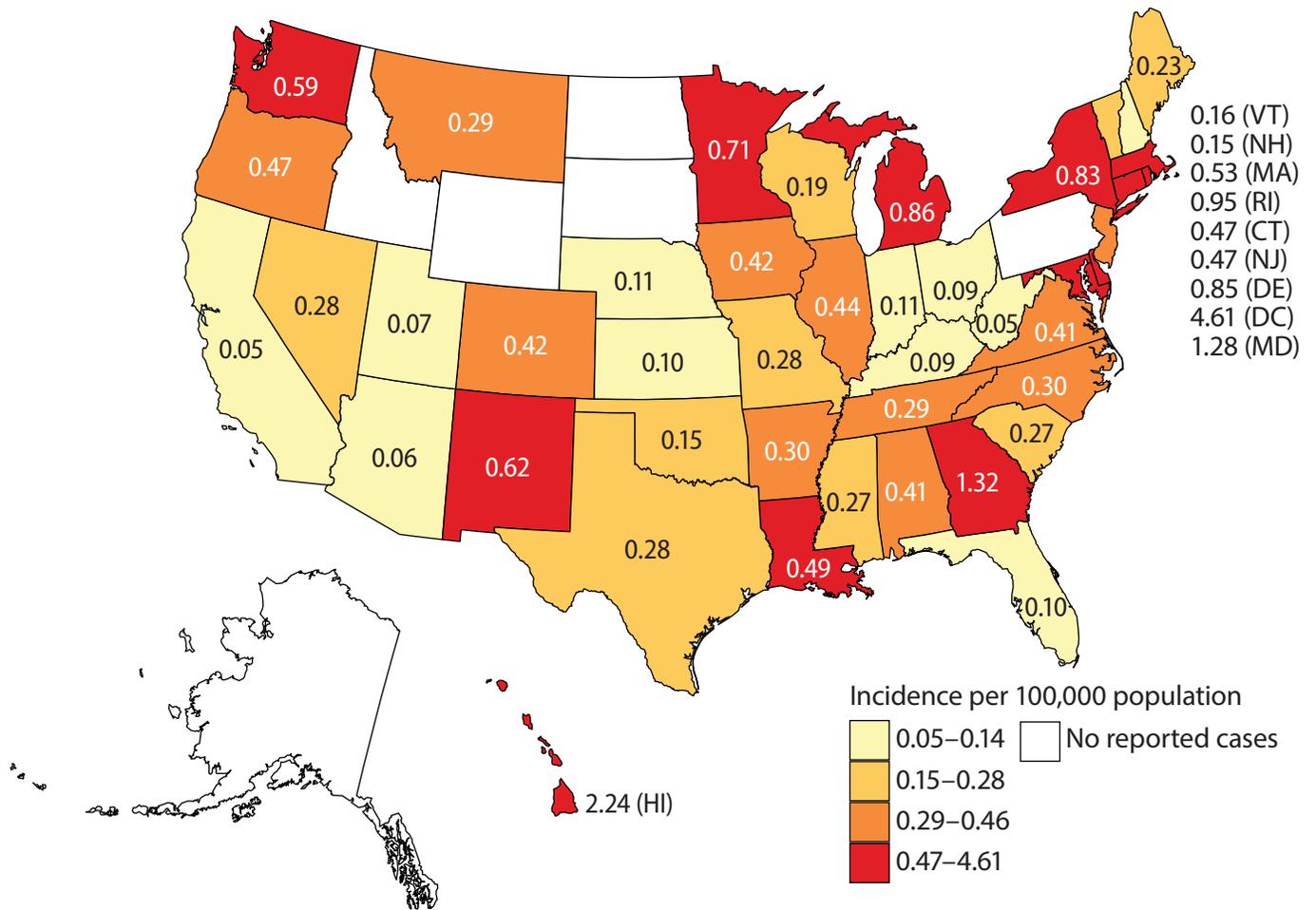
Note: Full data table for all states at <https://www.cdc.gov/nationalsurveillance/data/2015/fig2a.csv>

Figure 2b. Incidence rate of culture-confirmed human *Shigella sonnei* infection reported to LEADS, by reporting jurisdiction, United States, 2015 (n = 11,700)



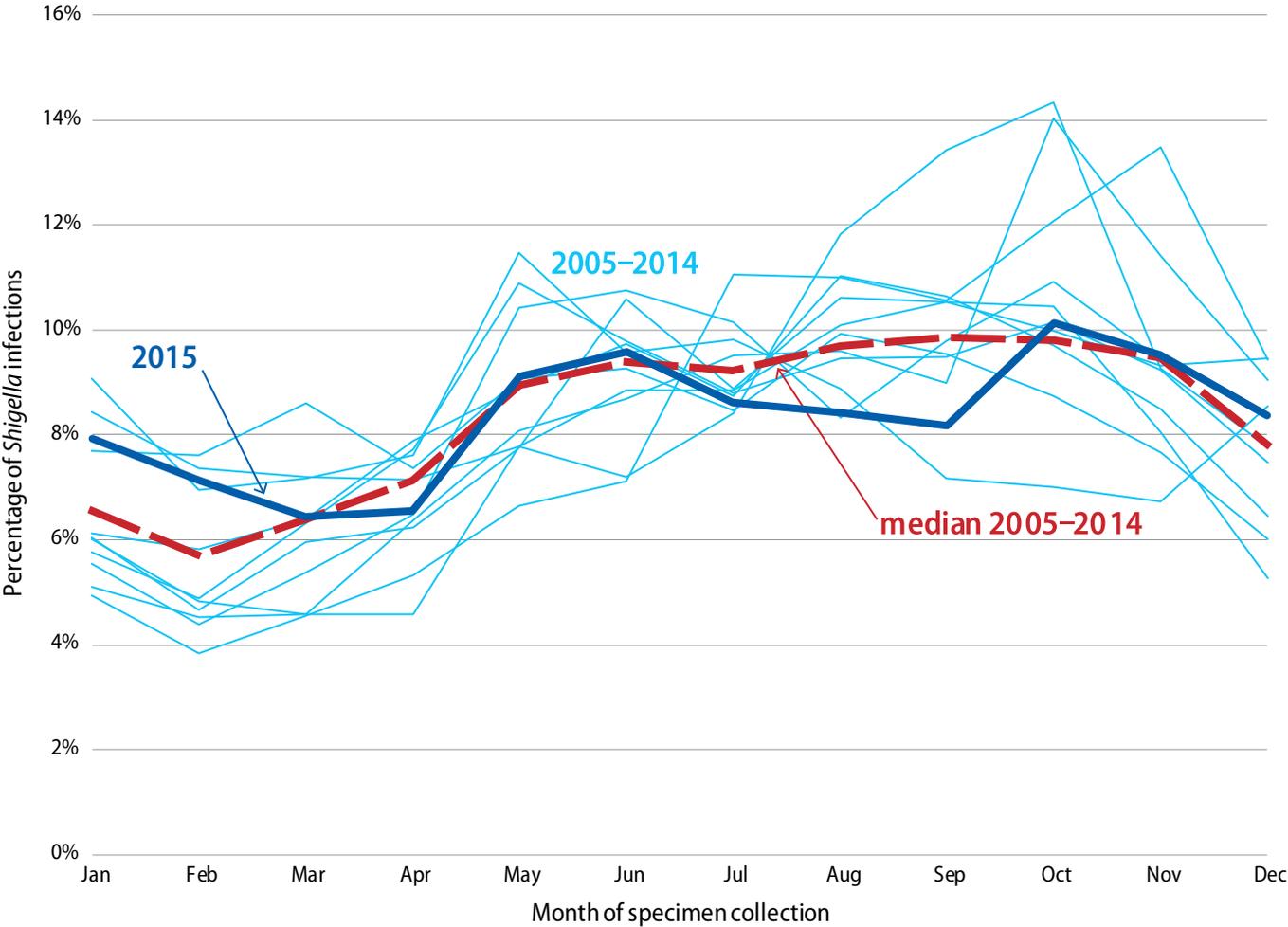
Note: Full data table for all states at <https://www.cdc.gov/nationalsurveillance/data/2015/fig2b.csv>

Figure 2c. Incidence rate of culture-confirmed human *Shigella flexneri* infection reported to LEDES, by reporting jurisdiction, United States, 2015 (n = 1,200)



Note: Full data table for all states at <https://www.cdc.gov/nationalsurveillance/data/2015/fig2c.csv>

Figure 3. Percentage of culture-confirmed *Shigella* infections reported to LEDS, by month of specimen collection, United States, 2005–2015



References

1. Centers for Disease Control and Prevention (CDC). National *Shigella* Surveillance Overview. Atlanta, Georgia: US Department of Health and Human Services, CDC, 2012.
2. Iwamoto, Martha, et al. "Bacterial enteric infections detected by culture-independent diagnostic tests—FoodNet, United States, 2012–2014." *MMWR Morb Mortal Wkly Rep* 64 (2015): 252-7.

Recommended Citation:

Centers for Disease Control and Prevention (CDC). National *Shigella* Surveillance Annual Report, 2015. Atlanta, Georgia: US Department of Health and Human Services, CDC, 2017.

Other Sources of National *Shigella* Surveillance Data

National Notifiable Diseases Surveillance System (NNDSS)

The National Notifiable Disease Surveillance System (NNDSS) collects and compiles case counts of nationally notifiable infectious diseases, including shigellosis. Shigellosis cases are not currently reported by species to NNDSS.

Annual reports: http://www.cdc.gov/mmwr/mmwr_nd/index.html

Data: <https://data.cdc.gov/browse?category=NNDSS>

National Antimicrobial Resistance Monitoring System (NARMS)

The National Antimicrobial Resistance Monitoring System (NARMS) Annual Human Isolates Report includes antimicrobial resistance data on enteric bacteria (including *Shigella*) isolated from humans.

Annual reports: <https://www.cdc.gov/narms/reports/index.html>

Data: <https://wwwn.cdc.gov/narmsnow/>

National Outbreak Reporting System (NORS)

The National Outbreak Reporting System (NORS) is a web-based platform used by local, state, and territorial health departments in the United States to report waterborne and foodborne disease outbreaks and enteric disease outbreaks transmitted by contact with environmental sources, infected persons or animals, or unknown modes of transmission to CDC.

Annual reports—

Foodborne: <https://www.cdc.gov/foodsafety/fdoss/data/annual-summaries/index.html>

Drinking water-associated outbreaks: <https://www.cdc.gov/healthywater/surveillance/drinking-surveillance-reports.html>

Recreational water-associated outbreaks: <https://www.cdc.gov/healthywater/surveillance/rec-water-surveillance-reports.html>

Outbreaks associated with environmental and undetermined water exposures: <https://www.cdc.gov/healthywater/surveillance/environmental/environ-water-surveillance-reports.html>

Data—Foodborne: <https://wwwn.cdc.gov/foodborneoutbreaks//>

NCEZID Atlanta:

For more information please contact Centers for Disease Control and Prevention

1600 Clifton Road NE, Atlanta, GA 30329-4027 MS C-09

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Email: cdcinfo@cdc.gov

National Enteric Disease Surveillance: *Shigella* Annual Report Appendices, 2015

Recommended Citation

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Appendices

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Appendix 1. Culture-confirmed *Shigella* infections reported to LEDS by species, age group, and sex, 20155

Species	Age Group (years)	Sex			Total
		Female	Male	Unknown	
All <i>Shigella</i>	<1	74	104	9	187
	1–4	1669	1824	150	3643
	5–9	1753	1648	133	3534
	10–19	610	531	46	1187
	20–29	834	643	62	1539
	30–39	600	650	72	1322
	40–49	343	469	27	839
	50–59	325	372	42	739
	60–69	221	201	26	448
	70–79	107	73	7	187
	≥80	48	25	3	76
	Unknown	26	34	23	83
Total		6610	6574	600	13784

Species	Age Group (years)	Sex			Total
		Female	Male	Unknown	
<i>S. boydii</i>	<1	0	0	1	1
	1–4	3	1	0	4
	5–9	1	1	0	2
	10–19	0	2	0	2
	20–29	4	1	0	5
	30–39	1	1	0	2
	40–49	5	1	0	6
	50–59	5	1	0	6
	60–69	2	5	0	7
	70–79	0	0	0	0
	≥80	0	0	0	0
	Unknown	0	0	3	3
Total		21	13	4	38

Species	Age Group (years)	Sex			Total
		Female	Male	Unknown	
<i>S. dysenteriae</i>	<1	0	0	0	0
	1-4	1	1	1	3
	5-9	0	1	0	1
	10-19	0	0	0	0
	20-29	1	0	0	1
	30-39	0	1	0	1
	40-49	0	0	0	0
	50-59	1	0	0	1
	60-69	1	1	0	2
	70-79	2	0	0	2
	≥80	1	0	0	1
	Unknown	0	0	2	2
Total		7	4	3	14

Species	Age Group (years)	Sex			Total
		Female	Male	Unknown	
<i>S. flexneri</i>	<1	1	1	1	3
	1-4	42	44	14	100
	5-9	45	22	6	73
	10-19	22	34	3	59
	20-29	32	268	13	313
	30-39	13	206	9	228
	40-49	18	162	6	186
	50-59	13	126	6	145
	60-69	11	49	5	65
	70-79	7	7	2	16
	≥80	2	5	0	7
	Unknown	1	1	3	5
Total		207	925	68	1200

Species	Age Group (years)	Sex			Total
		Female	Male	Unknown	
<i>S. sonnei</i>	<1	69	101	7	177
	1-4	1530	1651	134	3315
	5-9	1581	1482	126	3189
	10-19	548	476	43	1067
	20-29	748	348	48	1144
	30-39	546	421	63	1030
	40-49	302	292	21	615
	50-59	279	229	35	543
	60-69	194	141	21	356
	70-79	87	58	5	150
	≥80	38	19	3	60
	Unknown	16	23	15	54
Total		5938	5241	521	11700

Species	Age Group (years)	Sex			Total
		Female	Male	Unknown	
Unknown	<1	4	2	0	6
	1-4	93	127	1	221
	5-9	126	142	1	269
	10-19	40	19	0	59
	20-29	49	26	1	76
	30-39	40	21	0	61
	40-49	18	14	0	32
	50-59	27	16	1	44
	60-69	13	5	0	18
	70-79	11	8	0	19
	≥80	7	1	0	8
	Unknown	9	10	0	19
Total		437	391	4	832

Appendix 2a. Culture-confirmed *Shigella* infections reported to LEDS by serotype and reporting jurisdiction, 2015 (Alaska to Kansas¹)

Serotype	AK	AL	AR	AZ	CA	CO	CT	DC	DE	FL	GA	HI	IA	ID	IL	IN	KS
<i>boydii</i> 1					2												
<i>boydii</i> 2																	
<i>boydii</i> 4																	
<i>boydii</i> 8																	
<i>boydii</i> 10					1												
<i>boydii</i> 14																	
<i>boydii</i> 20					1												
<i>boydii</i> unspecified				2		1				1			1			1	2
<i>dysenteriae</i> 2					4												
<i>dysenteriae</i> unspecified					1					1						2	1
<i>flexneri</i> 1a					1						1				1		
<i>flexneri</i> 1b					3						12				23		
<i>flexneri</i> 1 unspecified		4			9	7	3					7					
<i>flexneri</i> 2a											74				19		
<i>flexneri</i> 2b											1				2		
<i>flexneri</i> 2 unspecified		9				5	4					16					
<i>flexneri</i> 3a											13				2		
<i>flexneri</i> 3b											3				1		
<i>flexneri</i> 3 unspecified						7	3					4					
<i>flexneri</i> 4a											16				2		
<i>flexneri</i> 4b																	
<i>flexneri</i> 4c																	
<i>flexneri</i> 4 unspecified		4				2	1					1					
<i>flexneri</i> 5 unspecified																	
<i>flexneri</i> 6												1					
<i>flexneri</i> 88-893											1				1		
<i>flexneri</i> unspecified		3	9	4	7	2	6	28	8	20	2		14			7	
<i>flexneri</i> variant x															1		
<i>flexneri</i> variant y											11	3			3		
<i>sonnei</i>	3	470	65	10	295	73	41	16	8	156	926	47	547	20	677	70	50
Unknown		1			3	1	2	3	6	1	16	1			13		
Total	3	491	74	16	327	98	60	47	22	179	1076	80	562	20	745	80	53

¹ The key to state name abbreviations can be found at http://www.census.gov/geo/reference/ansi_statetables.html.

Appendix 2b. Culture-confirmed *Shigella* infections reported to LEDS by serotype and reporting jurisdiction, 2015 (Kentucky to Nevada¹)

Serotype	KY	LA	MA	MD	ME	MI	MN	MO	MS	MT	NC	ND	NE	NH	NJ	NM	NV
<i>boydii</i> 1																	
<i>boydii</i> 2			2														
<i>boydii</i> 4																	
<i>boydii</i> 8																	
<i>boydii</i> 10																	
<i>boydii</i> 14											2						
<i>boydii</i> 20			1														
<i>boydii</i> unspecified								2			2					1	
<i>dysenteriae</i> 2																	
<i>dysenteriae</i> unspecified			1														
<i>flexneri</i> 1a			2			1											
<i>flexneri</i> 1b			9	6		6					5						1
<i>flexneri</i> 1 unspecified								2							11		
<i>flexneri</i> 2a			19			45					7						2
<i>flexneri</i> 2b			1														
<i>flexneri</i> 2 unspecified								13							16		
<i>flexneri</i> 3a			4	1		3					9						2
<i>flexneri</i> 3b				9		2					1						
<i>flexneri</i> 3 unspecified				32				6							7		
<i>flexneri</i> 4a			2			2					3						1
<i>flexneri</i> 4b											1						
<i>flexneri</i> 4c																	
<i>flexneri</i> 4 unspecified				13		19		1			1				8		1
<i>flexneri</i> 5 unspecified				1													
<i>flexneri</i> 6			1	10		3											
<i>flexneri</i> 88-893																	
<i>flexneri</i> unspecified	5	23		2	3		39		11	3			1	2		13	
<i>flexneri</i> variant x																	
<i>flexneri</i> variant y			1	2		4					4				1		1
<i>sonnei</i>	295	157	85	203	1	354	252	907	52	10	120	12	46	4	306	48	14
Unknown		1		1		3			2				14			1	
Total	300	181	128	280	4	442	291	931	65	13	155	12	61	6	349	63	22

¹The key to state name abbreviations can be found at http://www.census.gov/geo/reference/ansi_statetables.html.

Appendix 2c. Culture-confirmed *Shigella* infections reported to LEDS by serotype and reporting jurisdiction, 2015 (New York to Wyoming¹)

Serogroup	NY	OH	OK	OR	PA	RI	SC	SD	TN	TX	UT	VA	VT	WA	WI	WV	WY
<i>boydii</i> 1																	
<i>boydii</i> 2														1			
<i>boydii</i> 4												1					
<i>boydii</i> 8														1			
<i>boydii</i> 10																	
<i>boydii</i> 14																	
<i>boydii</i> 20																	
<i>boydii</i> unspecified	2	1						1	1	4	2	1			1		
<i>dysenteriae</i> 2												1					
<i>dysenteriae</i> unspecified								1		2							
<i>flexneri</i> 1a				2										1			
<i>flexneri</i> 1b				1										4			
<i>flexneri</i> 1 unspecified	2														3		
<i>flexneri</i> 2a				9										16			
<i>flexneri</i> 2b														2			
<i>flexneri</i> 2 unspecified			1							4					2		
<i>flexneri</i> 3a				1								1					
<i>flexneri</i> 3b				2										7			
<i>flexneri</i> 3 unspecified																	
<i>flexneri</i> 4a				2										1			
<i>flexneri</i> 4b																	
<i>flexneri</i> 4c														1			
<i>flexneri</i> 4 unspecified			1											4			
<i>flexneri</i> 5 unspecified																	
<i>flexneri</i> 6				2										2	1		
<i>flexneri</i> 88-893																	
<i>flexneri</i> unspecified	159	10	1			10	13		15	73	2	39	1	1	6		
<i>flexneri</i> variant x																	
<i>flexneri</i> variant y														3			
<i>sonnei</i>	890	84	129	86	339	35	125	225	138	2808	20	194	5	74	192	11	5
Unknown	3	2				2			2	733		19			1	1	
Total	1056	97	132	105	339	47	138	227	156	3624	24	256	6	118	206	12	5

¹ The key to state name abbreviations can be found at http://www.census.gov/geo/reference/ansi_statetables.html.

Appendix 3. Culture-confirmed *Shigella* infections reported to LEDS by species, serotype, and year, 2005–2015

Species	Serotype	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
<i>S. boydii</i>	<i>boydii 1</i>	8	9	3	11	5	3	5	2			2	48
	<i>boydii 2</i>	11	15	14	14	15	18	16	5	2		3	113
	<i>boydii 3</i>								1				1
	<i>boydii 4</i>	4	3	1	16	7	7	4	4	4		1	51
	<i>boydii 5</i>			2		1		1			4		8
	<i>boydii 7</i>									1			1
	<i>boydii 8</i>	1	1	3	1	1	1	4	1	1		1	15
	<i>boydii 9</i>					3							3
	<i>boydii 10</i>	2	1		1	2	1	2	1		4	1	15
	<i>boydii 11</i>					1							1
	<i>boydii 12</i>		2	2	3	1	2	2		1			13
	<i>boydii 13</i>			1						1	1		3
	<i>boydii 14</i>	3	6	7		5	3	3	1	2	1	2	33
	<i>boydii 15</i>	2											2
	<i>boydii 16</i>						2						2
	<i>boydii 18</i>	1	2		1	1					1		6
	<i>boydii 19</i>					2	1			1			4
	<i>boydii 20</i>	2		1	3	3	2	1	11	3	2	2	30
	<i>boydii unspecified</i>	56	63	28	29	19	34	45	41	29	22	26	392
Subtotal		90	102	62	79	66	74	83	68	44	35	38	741

Species	Serotype	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
<i>S. dysenteriae</i>	<i>dysenteriae 1</i>	3	2	3	1	1		1			1		12
	<i>dysenteriae 2</i>	5	4	4	7	8	5	2	2	5		5	47
	<i>dysenteriae 3</i>	4	2	3	1	1	2	1	1				15
	<i>dysenteriae 4</i>	4	3	1	4	6	1		2		1		22
	<i>dysenteriae 6</i>	1				1							2
	<i>dysenteriae 7</i>		1				1						2
	<i>dysenteriae 8</i>					1		1					2
	<i>dysenteriae 9</i>					1							1
	<i>dysenteriae 11</i>										1		1
	<i>dysenteriae 12</i>	1	2		1		3		2		1		10
	<i>dysenteriae 13</i>		1			1							2
	<i>dysenteriae 3162-96</i>							1	3				4
	<i>dysenteriae unspecified</i>	22	24	10	14	17	22	7	21	12	13	9	171
	Subtotal		40	39	21	28	37	35	15	28	17	17	14

Species	Serotype	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
S. flexneri	<i>flexneri 1a</i>	3	12	13	18	12	13	5	5	7	6	9	103
	<i>flexneri 1b</i>	33	38	52	43	54	61	74	70	49	58	70	602
	<i>flexneri 1 unspecified</i>	94	102	93	99	60	46	39	66	29	27	48	703
	<i>flexneri 2a</i>	88	107	123	120	157	125	151	97	137	162	191	1458
	<i>flexneri 2b</i>	17	21	23	13	9	10	2	3	3	2	6	109
	<i>flexneri 2 unspecified</i>	121	152	99	174	134	99	93	81	89	67	70	1179
	<i>flexneri 3a</i>	31	37	31	16	45	39	40	30	20	26	36	351
	<i>flexneri 3b</i>	17	7	16	12	18	22	17	33	31	36	25	234
	<i>flexneri 3 unspecified</i>	62	67	43	61	53	49	25	26	61	79	59	585
	<i>flexneri 4a</i>	47	37	49	45	52	50	44	25	33	32	29	443
	<i>flexneri 4b</i>	1	5	1		2	1		1	1	4	1	17
	<i>flexneri 4c</i>			1	2	1	1					1	6
	<i>flexneri 4 unspecified</i>	50	44	43	65	56	51	30	41	39	32	56	507
	<i>flexneri 5a</i>	1			2	1	2	2		1			9
	<i>flexneri 5b</i>		1										1
	<i>flexneri 5 unspecified</i>	2	2	2	3	10	2	2		1		1	25
	<i>flexneri 6</i>	28	57	30	45	23	34	32	20	16	19	20	324
	<i>flexneri 88-893</i>		1	3	2	2	7	5	7	3	4	2	36
	<i>flexneri unspecified</i>	565	718	330	357	273	387	386	479	508	548	542	5093
	<i>flexneri variant x</i>	1	3	6		6	5	5	4	1	6	1	38
<i>flexneri variant y</i>	26	22	30	16	24	23	27	27	26	27	33	281	
	Subtotal	1187	1433	988	1093	992	1027	979	1015	1055	1135	1200	12104

Species	Serotype	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
S. sonnei	<i>sonnei</i>	7535	7426	8239	11270	7947	7116	5345	6344	5467	9332	11700	87721

Species	Serotype	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	Total
Unknown	<i>Unknown</i>	966	1225	1343	2205	1095	643	597	934	358	432	832	10630
	Total	8852	9000	9310	12470	9042	8252	6422	7455	6583	10519	12952	100857

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