

National Enteric Disease Surveillance: *Shigella* Annual Report, 2013

The Laboratory-based Enteric Disease Surveillance (LEDS) system contributes to the understanding of human shigellosis in the United States by collecting reports of isolates from culture-confirmed infections submitted by state public health laboratories. Reporting to LEDS is voluntary; the number of states submitting reports varies somewhat from year to year, although almost all states 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.

Data in this report are current as of February 2, 2016.

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⁾

Summary

- In 2013, 51 jurisdictions (50 states plus the District of Columbia) reported 7,638 cases of culture-confirmed *Shigella* infections to LEDS, 10% fewer than in 2012. A larger percentage were identified to the species level in 2013 (93%) than in 2012 (89%).
- Distribution by species was similar to previous years, with *Shigella sonnei* accounting for the largest percentage of infections (77.5%), followed by *Shigella flexneri* (14.2%), *Shigella boydii* (0.6%), and *Shigella dysenteriae* (0.2%).
- Overall national incidence of culture-confirmed *Shigella* in 2013 (2.4 cases per 100,000 population) was less than in 2012 (2.7 cases per 100,000 population) and was half that in 2008 (4.9 cases per 100,000 population)¹.
- Since the mid-1980s, the incidence rate of *Shigella* for which species was not reported has fluctuated. 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 is generally parallel to incidence of *S. sonnei*.
- *Shigella boydii* and *Shigella dysenteriae* infections remained rare.
- Children aged 1–4 years had the highest incidence of infection of all age groups.
- Whereas the median of the previous 10 years (2003–2012) showed a nearly even distribution of *Shigella* infections in the first and second half of the year, a larger portion in 2013 were reported in the second half of the year (67%), with the most reported in November (13%). The incidence of *Shigella* infection is driven by outbreaks; it does not exhibit a distinct seasonal pattern.

¹ 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 2013, 7% of *Shigella* infections [reported to FoodNet sites](#) were not confirmed by culture.

Tables, Figures, and Appendices

Figure 1. Incidence rate of culture-confirmed human <i>Shigella</i> infection (all species), reported to CDC, United States, 1970–2013	3
Table 1a. Culture-confirmed <i>Shigella</i> infections reported to CDC, by species, United States, 2013	4
Table 1b. Incidence rate of culture-confirmed <i>Shigella</i> infection reported to CDC, by age group and sex, United States, 2013 (n = 7,035 with age and sex information reported)	4
Figure 2a. Incidence rate of culture-confirmed human <i>Shigella</i> infection reported to CDC (all species), by reporting jurisdiction, United States 2013 (n = 7,638)	5
Figure 2b. Incidence rate of culture-confirmed human <i>Shigella sonnei</i> infection reported to CDC, by reporting jurisdiction, United States, 2013 (n = 5,920)	6
Figure 2c. Incidence rate of culture-confirmed human <i>Shigella flexneri</i> infection reported to CDC, by reporting jurisdiction, United States, 2013 (n = 1,087)	7
Figure 3. Percentage of culture-confirmed <i>Shigella</i> infections reported to CDC, by month of specimen collection, United States, 2003–2013	8
Appendix 1. Culture-confirmed <i>Shigella</i> infections reported to CDC by species, age group, and sex, 2013	11
Appendix 2a. Culture-confirmed <i>Shigella</i> infections reported to CDC by serotype and reporting jurisdiction, 2013 (Alaska to Kansas)	14
Appendix 2b. Culture-confirmed <i>Shigella</i> infections reported to CDC by serotype and reporting jurisdiction, 2013 (Kentucky to Nevada)	15
Appendix 2c. Culture-confirmed <i>Shigella</i> infections reported to CDC by serotype and reporting jurisdiction, 2013 (New York to Wyoming)	16
Appendix 3. Culture-confirmed <i>Shigella</i> infections reported to CDC by species, serotype, and year, 2003–2013 ...	17

Figure 1. Incidence rate of culture-confirmed human *Shigella* infection (all species), reported to CDC, United States, 1970–2013

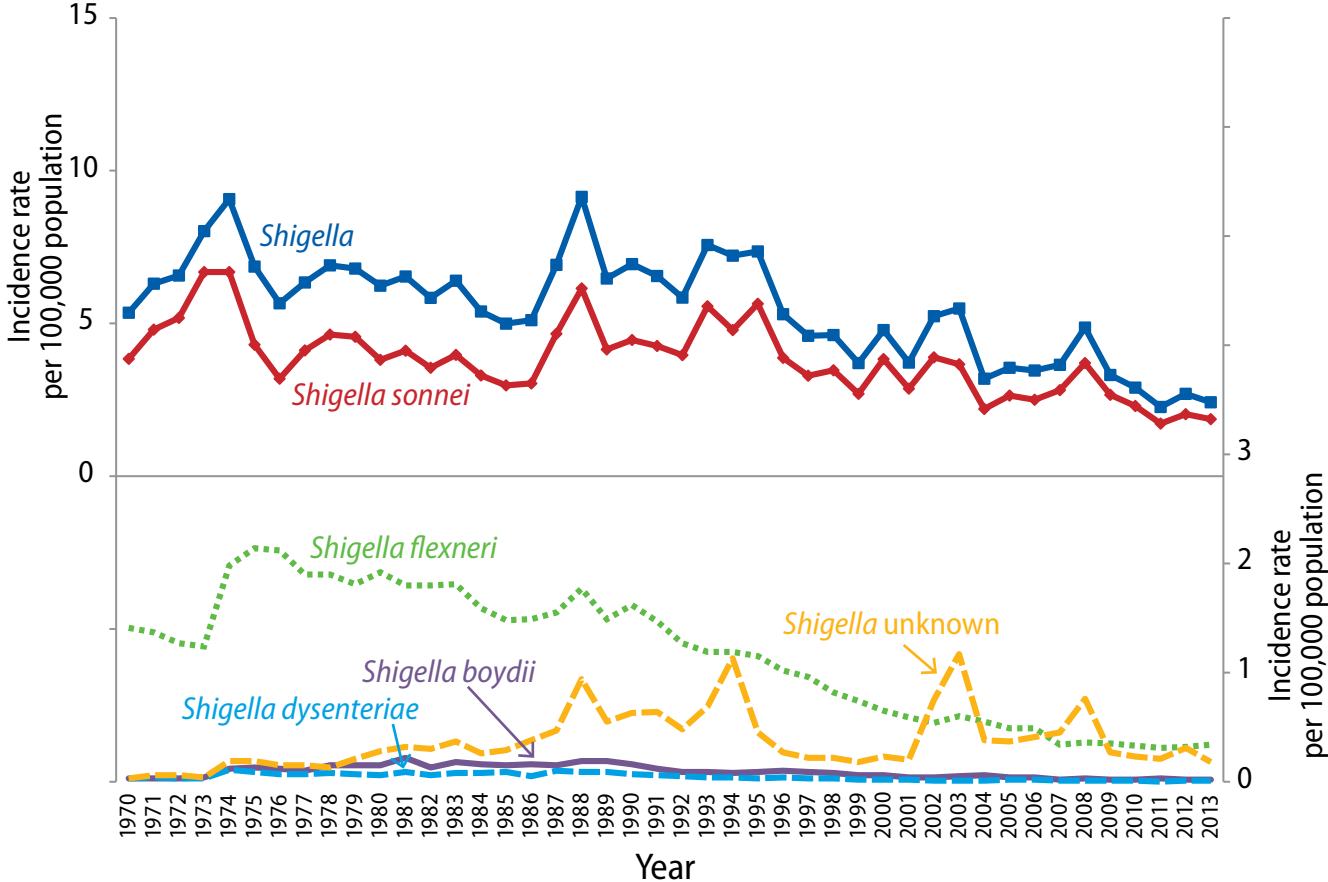


Table 1a. Culture-confirmed *Shigella* infections reported to CDC, by species, United States, 2013

Rank	Serotype	Number reported	Percent	Incidence per 100,000
1	<i>S. sonnei</i>	5,920	77.5	1.87
2	<i>S. flexneri</i>	1,087	14.2	0.34
3	<i>S. boydii</i>	48	0.6	<0.01
4	<i>S. dysenteriae</i>	17	0.2	<0.01
	Subtotal	7,072	92.6	2.25
	Unknown	566	7.4	0.18
	Total	7,638	100.0	2.43

Table 1b. Incidence rate of culture-confirmed *Shigella* infection reported to CDC, by age group and sex, United States, 2013 (n = 7,035 with age and sex information reported)

Age group, years	Incidence	
	Female	Male
<1	2.23	2.68
1–4	12.26	11.86
5–9	9.22	8.76
10–19	1.81	1.41
20–29	1.89	1.77
30–39	1.71	1.67
40–49	0.85	1.64
50–59	0.67	1.03
60–69	0.73	0.67
70–79	0.53	0.39
≥80	0.55	0.41
Overall	2.25	2.38

Figure 2b. Incidence rate of culture-confirmed human *Shigella sonnei* infection reported to CDC, by reporting jurisdiction, United States, 2013 (n = 5,920)

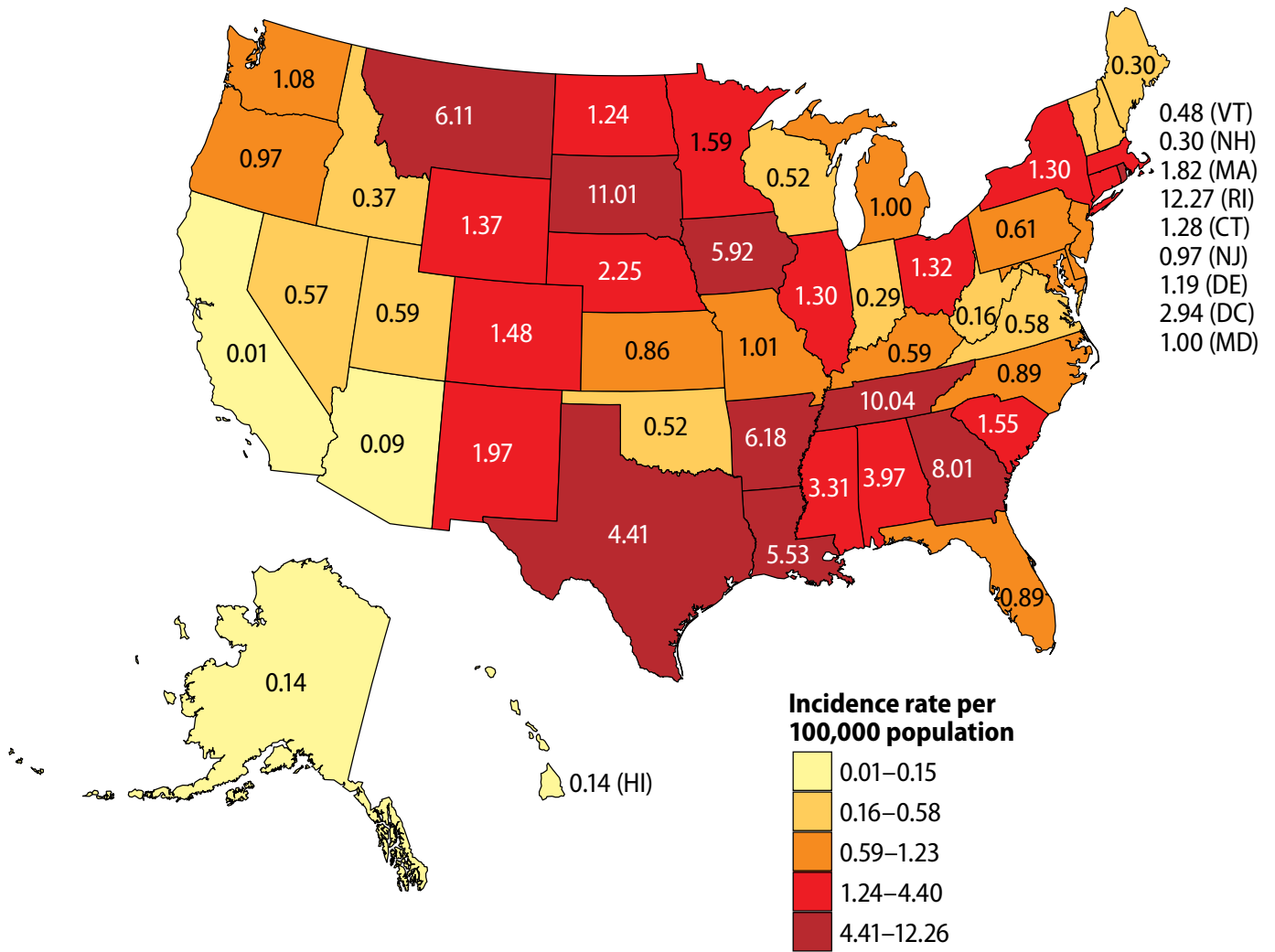


Figure 2c. Incidence rate of culture-confirmed human *Shigella flexneri* infection reported to CDC, by reporting jurisdiction, United States, 2013 (n = 1,087)

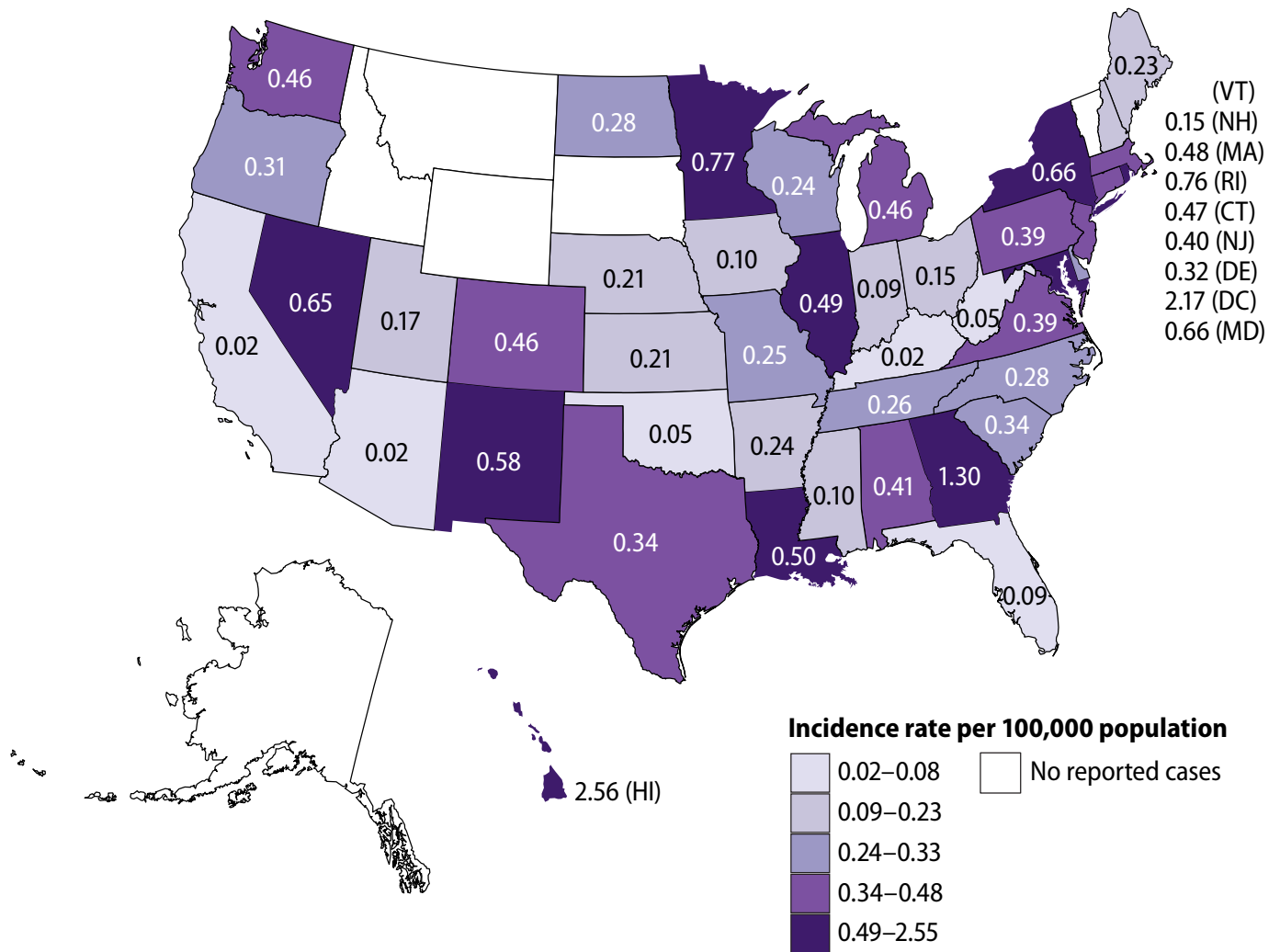
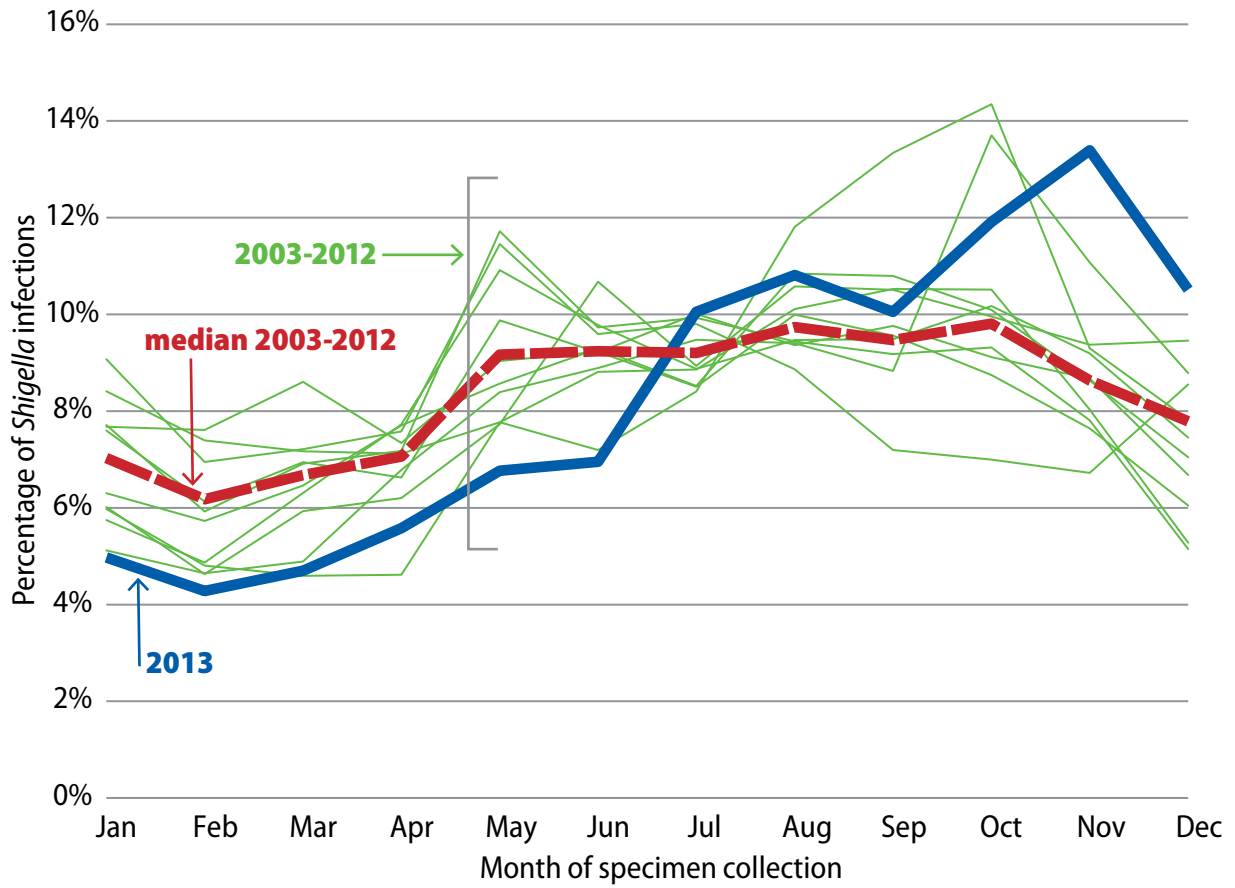


Figure 3. Percentage of culture-confirmed *Shigella* infections reported to CDC, by month of specimen collection, United States, 2003–2013



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.

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Appendices

Appendix 1. Culture-confirmed <i>Shigella</i> infections reported to CDC by species, age group, and sex, 2013.....	11
Appendix 2a. Culture-confirmed <i>Shigella</i> infections reported to CDC by serotype and reporting jurisdiction, 2013 (Alaska to Kansas)	14
Appendix 2b. Culture-confirmed <i>Shigella</i> infections reported to CDC by serotype and reporting jurisdiction, 2013 (Kentucky to Nevada)	15
Appendix 2c. Culture-confirmed <i>Shigella</i> infections reported to CDC by serotype and reporting jurisdiction, 2013 (New York to Wyoming).....	16
Appendix 3. Culture-confirmed <i>Shigella</i> infections reported to CDC by species, serotype, and year, 2003–2013...	17

Appendix 1. Culture-confirmed *Shigella* infections reported to CDC by species, age group, and sex, 2013

Serogroup	Age Group (years)	Sex			Total
		Female	Male	Unknown	
All <i>Shigella</i>	< 1	43	55	1	99
	1–4	955	965	78	1998
	5–9	928	921	88	1937
	10–19	369	302	25	696
	20–29	411	401	29	841
	30–39	349	341	25	715
	40–49	180	342	19	541
	50–59	150	219	15	384
	60–69	125	105	10	240
	70–79	53	32	3	88
	≥ 80	41	18	3	62
	Unknown	7	13	17	37
Total		3611	3714	313	7638

Serogroup	Age Group (years)	Sex			Total
		Female	Male	Unknown	
<i>S. boydii</i>	< 1	0	0	0	0
	1–4	4	4	0	8
	5–9	2	2	0	4
	10–19	7	0	0	7
	20–29	2	4	0	6
	30–39	3	2	0	5
	40–49	1	1	1	3
	50–59	3	1	0	4
	60–69	3	1	0	4
	70–79	1	0	0	1
	≥ 80	4	2	0	6
	Unknown	0	0	0	0
Total		30	17	1	48

Serogroup	Age Group (years)	Sex			Total
		Female	Male	Unknown	
<i>S. dysenteriae</i>	< 1	0	0	0	0
	1-4	2	1	0	3
	5-9	1	0	0	1
	10-19	2	1	0	3
	20-29	0	0	0	0
	30-39	1	0	0	1
	40-49	1	2	1	4
	50-59	1	0	0	1
	60-69	1	1	0	2
	70-79	0	0	0	0
	≥ 80	1	1	0	2
	Unknown	0	0	0	0
Total		10	6	1	17

Serogroup	Age Group (years)	Sex			Total
		Female	Male	Unknown	
<i>S. flexneri</i>	< 1	5	4	0	9
	1-4	67	69	5	141
	5-9	44	47	2	93
	10-19	26	30	0	56
	20-29	37	191	10	238
	30-39	28	151	3	182
	40-49	19	154	3	176
	50-59	16	94	4	114
	60-69	14	33	1	48
	70-79	3	6	0	9
	≥ 80	5	2	0	7
	Unknown	4	5	5	14
Total		268	786	33	1087

Serogroup	Age Group (years)	Sex			Total
		Female	Male	Unknown	
<i>S. sonnei</i>	< 1	34	38	1	73
	1-4	814	826	73	1713
	5-9	813	813	86	1712
	10-19	310	242	25	577
	20-29	345	168	16	529
	30-39	295	167	22	484
	40-49	144	157	13	314
	50-59	118	107	11	236
	60-69	98	56	9	163
	70-79	33	21	3	57
	≥ 80	25	12	3	40
	Unknown	3	8	11	22
Total		3032	2615	273	5920

Serogroup	Age Group (years)	Sex			Total
		Female	Male	Unknown	
Unknown	< 1	4	13	0	17
	1-4	68	65	0	133
	5-9	68	59	0	127
	10-19	24	29	0	53
	20-29	27	38	3	68
	30-39	22	21	0	43
	40-49	15	28	1	44
	50-59	12	17	0	29
	60-69	9	14	0	23
	70-79	16	5	0	21
	≥ 80	6	1	0	7
	Unknown	0	0	1	1
Total		271	290	5	566

Appendix 2a. Culture-confirmed *Shigella* infections reported to CDC by serotype and reporting jurisdiction, 2013 (Alaska to Kansas¹)

Serotype	AK	AL	AR	AZ	CA	CO	CT	DC	DE	FL	GA	HI	IA	ID	IL	IN	KS
<i>boydii</i> 12																	
<i>boydii</i> 14																	
<i>boydii</i> 2																	
<i>boydii</i> 20					2												
<i>boydii</i> 4																	
<i>boydii</i> 7																	
<i>boydii</i> 8					1												
<i>boydii</i> unspecified		2				2	2				2						1
<i>dysenteriae</i> 13															1		
<i>dysenteriae</i> 2					1												
<i>dysenteriae</i> unspecified						1		2					2				
<i>flexneri</i> 1 unspecified		3				3					1	4					
<i>flexneri</i> 1a											4				1		
<i>flexneri</i> 1b											11				13		
<i>flexneri</i> 2 unspecified		12				10	6				3	9					
<i>flexneri</i> 2a											60				24		
<i>flexneri</i> 2b					1												
<i>flexneri</i> 3 unspecified		4				2	1				2	19					
<i>flexneri</i> 3a											5	1			4		
<i>flexneri</i> 3b											2				5		
<i>flexneri</i> 4 unspecified		3				5									2		
<i>flexneri</i> 4a											19	2			5		
<i>flexneri</i> 4b																	
<i>flexneri</i> 5 unspecified		1															
<i>flexneri</i> 5a																	
<i>flexneri</i> 6						1	2				1				2		
<i>flexneri</i> 88-893					1						2	1					
<i>flexneri</i> unspecified		1	8	1	7	2	8	12	3	18	6		3			5	6
<i>flexneri</i> variant x																	
<i>flexneri</i> variant y											11				6		
<i>sonnei</i>	1	236	186	6	3	77	45	18	11	173	769	4	182	6	156	19	20
Unknown			1		3	7	3	3	1	25	89			1	12		
Total	1	262	195	7	19	110	67	35	15	216	987	40	187	7	231	24	27

¹The 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 CDC by serotype and reporting jurisdiction, 2013 (Kentucky to Nevada¹)

Serotype	KY	LA	MA	MD	ME	MI	MN	MO	MS	MT	NC	ND	NE	NH	NJ	NM	NV
<i>boydii</i> 12															1		
<i>boydii</i> 14																	
<i>boydii</i> 2			2	1		1											
<i>boydii</i> 20			1								1						
<i>boydii</i> 4																	
<i>boydii</i> 7							3										
<i>boydii</i> 8																	
<i>boydii</i> unspecified														1		1	
<i>dysenteriae</i> 13																	
<i>dysenteriae</i> 2			2			2		1									
<i>dysenteriae</i> unspecified											1						
<i>flexneri</i> 1 unspecified						6					1				9		
<i>flexneri</i> 1a				5				5									
<i>flexneri</i> 1b			8			15					11						3
<i>flexneri</i> 2 unspecified						1									11		
<i>flexneri</i> 2a			16	2				6									11
<i>flexneri</i> 2b						6					2						
<i>flexneri</i> 3 unspecified						1					4				8		
<i>flexneri</i> 3a			1	5		11		3									
<i>flexneri</i> 3b						1					2						1
<i>flexneri</i> 4 unspecified											1				4		2
<i>flexneri</i> 4a			5														
<i>flexneri</i> 4b											1						
<i>flexneri</i> 5 unspecified				1				1			1						
<i>flexneri</i> 5a																	
<i>flexneri</i> 6			1	24	2	1	42		3		1				4		1
<i>flexneri</i> 88-893											1						
<i>flexneri</i> unspecified	1	23				2					2	2	4	2		12	
<i>flexneri</i> variant x				59	4	99	86	70	95	62	89						
<i>flexneri</i> variant y			2	5			2		4		2						
<i>sonnei</i>	38	252	122				1					9	43	2	85	41	16
Unknown	11	1											24			7	
Total	50	276	160	102	6	146	133	86	102	62	121	11	71	5	122	61	34

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 CDC by serotype and reporting jurisdiction, 2013 (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> 12																	
<i>boydii</i> 14					1							1					
<i>boydii</i> 2	2																
<i>boydii</i> 20																	
<i>boydii</i> 4					1									1			
<i>boydii</i> 7																	
<i>boydii</i> 8																	
<i>boydii</i> unspecified	3	1		2		1		1		6	1			1	1		
<i>dysenteriae</i> 13																	
<i>dysenteriae</i> 2					1												
<i>dysenteriae</i> unspecified	2						1			2		1				1	
<i>flexneri</i> 1 unspecified			1		3		1								4		
<i>flexneri</i> 1a														2			
<i>flexneri</i> 1b														9			
<i>flexneri</i> 2 unspecified			1		22					1					4		
<i>flexneri</i> 2a				4										1			
<i>flexneri</i> 2b														1			
<i>flexneri</i> 3 unspecified					16										1		
<i>flexneri</i> 3a				1													
<i>flexneri</i> 3b				6										13			
<i>flexneri</i> 4 unspecified					4				1					1	2		
<i>flexneri</i> 4a																	
<i>flexneri</i> 4b																	
<i>flexneri</i> 5 unspecified																	
<i>flexneri</i> 5a																	
<i>flexneri</i> 6				1											2		
<i>flexneri</i> 88-893																	
<i>flexneri</i> unspecified	132	17			3	8	14		15	85	6	35		3	3	1	
<i>flexneri</i> variant x																	
<i>flexneri</i> variant y					2									1			
<i>sonnei</i>	255	155	20	38	78	134	74	93	628	1166	17	51	3	76	37	3	8
Unknown	46					2	1			311		1			3		1
Total	440	173	22	52	131	145	91	94	644	1571	24	89	3	110	57	5	9

¹The 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 CDC by species, serotype, and year, 2003–2013

Species	Serotype	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total	
<i>S. boydii</i>	<i>boydii</i> 1	10	10	8	9	3	11	5	3	5	2		66	
	<i>boydii</i> 10	2	3	2	1		1	2	1	2	1		15	
	<i>boydii</i> 11							1					1	
	<i>boydii</i> 12	1	1		2	2	3	1	2	2		1	15	
	<i>boydii</i> 14	1	3	3	6	7		5	3	3	1	2	34	
	<i>boydii</i> 15	1		2									3	
	<i>boydii</i> 16								2					2
	<i>boydii</i> 18				2		1	1						4
	<i>boydii</i> 19							2	1			1		4
	<i>boydii</i> 2	29	20	11	15	14	14	15	18	17	14	4	4	171
	<i>boydii</i> 20	1	1	2		1	3	3	1	1	11	3	3	27
	<i>boydii</i> 3										1			1
	<i>boydii</i> 4	9	15	4	3	1	16	7	7	4	4	4	4	74
	<i>boydii</i> 5	1	3			2		1		1				8
	<i>boydii</i> 7												1	1
	<i>boydii</i> 8	2	2	1	1	3	1	1	1	4	1	1	1	18
	<i>boydii</i> 9								3					3
	<i>boydii</i> unspecified	91	111	91	75	28	32	20	34	44	32	31	31	589
Subtotal		148	169	124	114	62	82	67	73	83	68	48	1038	

Species	Serotype	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total	
<i>S. dysenteriae</i>	<i>dysenteriae</i> 1	5	4	3	2	3	1			1			19	
	<i>dysenteriae</i> 12		2	1	2		1	1	3		2		12	
	<i>dysenteriae</i> 13				1			1				1	3	
	<i>dysenteriae</i> 14	1											1	
	<i>dysenteriae</i> 2	10	4	5	4	4	7	8	5	2	2	4	55	
	<i>dysenteriae</i> 3	2	4	4	2	3	1	1	2	1	1			21
	<i>dysenteriae</i> 3162-96			1			2		1					4
	<i>dysenteriae</i> 4	2	1	4	3	1	4	6				2		23
	<i>dysenteriae</i> 6			1				1						2
	<i>dysenteriae</i> 7				1				1					2
	<i>dysenteriae</i> 8								1		1			2
	<i>dysenteriae</i> 9	1							2					3
	<i>dysenteriae</i> unspecified	22	22	34	31	12	16	18	22	22	7	23	12	219
	Subtotal		43	37	53	46	23	32	39	34	12	30	17	366

Species	Serotype	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
<i>S. flexneri</i>	<i>flexneri</i> 1 unspecified	100	98	88	102	95	100	62	47	39	66	32	829
	<i>flexneri</i> 1a	6	1	3	12	13	18	13	13	4	5	8	96
	<i>flexneri</i> 1b	33	27	34	38	55	43	75	61	75	70	51	562
	<i>flexneri</i> 2 unspecified	186	185	109	152	100	174	134	100	93	82	89	1404
	<i>flexneri</i> 2a	95	89	88	107	125	120	176	125	151	97	142	1315
	<i>flexneri</i> 2b	17	10	17	22	24	14	14	10	2	3	3	136
	<i>flexneri</i> 3 unspecified	113	112	53	67	48	63	54	49	36	30	61	686
	<i>flexneri</i> 3a	79	53	31	38	33	17	53	40	29	26	20	419
	<i>flexneri</i> 3b	12	13	17	7	14	13	21	23	17	33	32	202
	<i>flexneri</i> 4 unspecified	61	69	50	54	45	65	60	50	30	41	43	568
	<i>flexneri</i> 4a	49	53	47	37	51	46	55	50	44	25	34	491
	<i>flexneri</i> 4b	6		1	5	1		2	1		1	1	18
	<i>flexneri</i> 5 unspecified	10	3	2	2	2	3	11	2	2		1	38
	<i>flexneri</i> 5a	1	2	1			2	1	2	2		1	12
	<i>flexneri</i> 5b				1								1
	<i>flexneri</i> 6	58	42	28	61	30	45	25	32	31	20	18	390
	<i>flexneri</i> 88-893	5	1	1	1	4	4	3	7	5	7	4	42
	<i>flexneri</i> unspecified	892	814	838	746	344	358	275	388	382	482	519	6038
	<i>flexneri</i> variant x	6	5	1	3	6		7	5	5	4	1	43
<i>flexneri</i> variant y	15	26	26	22	32	16	35	20	27	27	26	272	
Subtotal		1745	1603	1435	1477	1023	1103	1077	1026	974	1019	1087	13569

Species	Serotype	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
<i>S. sonnei</i>	<i>sonnei</i>	10621	6433	7809	7471	8519	11273	8175	7122	5348	6377	5920	85068
	Unknown	3394	1101	1082	1228	1370	2315	815	707	645	972	566	14195
TOTAL		15951	9343	10503	10335	10996	14805	10173	8962	7062	7746	7638	113514

NCEZID Atlanta:

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