

National Enteric Disease Surveillance: *Shigella* Annual Report, 2012

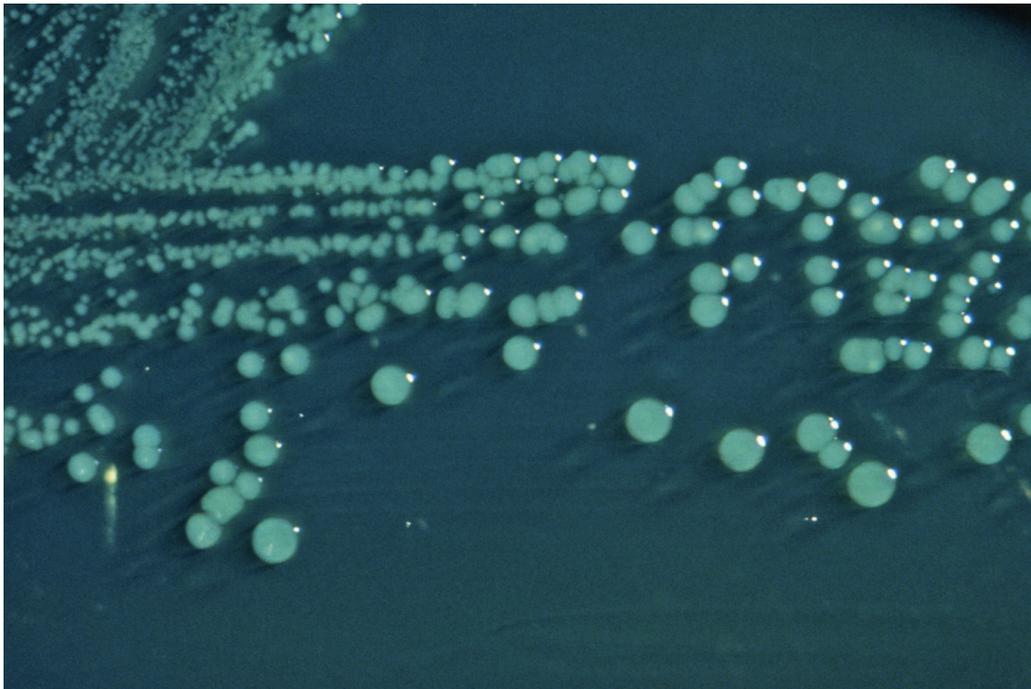
An overview of surveillance methods and systems for *Shigella* infections is available online at <http://www.cdc.gov/ncezid/dfwed/PDFs/Shigella-Overview-508.pdf> (1).

Human Surveillance Data: Laboratory-based Enteric Disease Surveillance (LEDS)

The Laboratory-based Enteric Disease Surveillance (LEDS) system collects reports of isolates of laboratory-confirmed human *Shigella* infections from state public health laboratories. Reporting to LEDS is voluntary, and 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.

In this report, we summarize the number of infections reported, and also report incidence rates (cases per 100,000 population), which are calculated as the number of *Shigella* infections in humans reported for a given year divided by the state population for that year. Data were received from 50 of 51 reporting jurisdictions (49 states plus the District of Columbia) in 2012.

Data in this report current as of 1/21/2014.



Photograph depicting the colonial morphology displayed by *Shigella boydii* bacteria cultivated on a Hektoen enteric (HE) agar surface.

Table 1. Laboratory-confirmed *Shigella* infections reported to CDC, by species, United States, 2012

Rank	Serotype	Number Reported	Percent
1	<i>S. sonnei</i>	5824	75.2
2	<i>S. flexneri</i>	957	12.4
3	<i>S. boydii</i>	60	0.8
4	<i>S. dysenteriae</i>	26	0.3
	Sub Total	6867	88.7
	Unknown	879	11.3
	Total	7746	100

State public health laboratories reported 7,746 laboratory-confirmed *Shigella* infections to CDC through LEDS

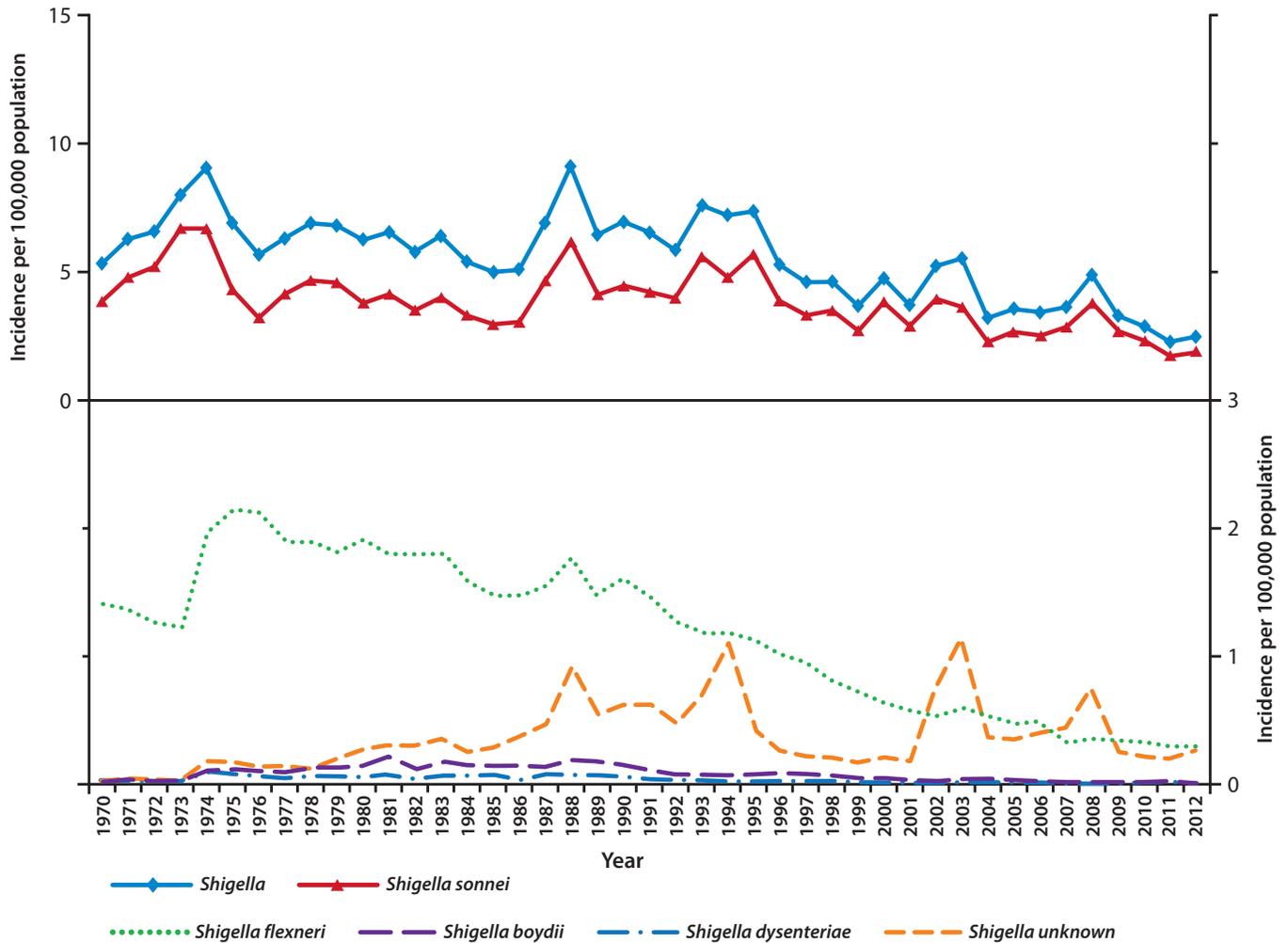
- Of the 7,746 isolates, 6,867 (89%) were identified to species level.
- Distribution by species was similar to previous years, with *Shigella sonnei* accounting for the largest percentage of infections (75%), followed by *Shigella flexneri* (12%), *Shigella boydii* (0.8%), and *Shigella dysenteriae* (0.3%).

Table 2. Median age (years) of persons with laboratory-confirmed *Shigella* infections reported to CDC, by species and year, United States, 2002-2012

Species	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
<i>S. sonnei</i>	7	7	7	7	7	6	6	6	6	6	7
<i>S. flexneri</i>	21	23	20	20	18	15	17	22	25	26	28
<i>S. boydii</i>	21	17	21	25	10	26	16	17	22	24	28
<i>S. dysenteriae</i>	29	22	9	25	20	8	15	31	28	26	27
Unknown	6	6	7	8	8	9	7	22	8	9	10

In 2012, the median age of persons with *S. sonnei* was 7 years, slightly higher than in each of the previous 5 years. The median age of persons with *S. flexneri* and of persons with *S. boydii* in 2012 (28 years for both) was higher than in any of the previous 10 years.

Figure 1. Incidence rate of laboratory-confirmed *Shigella* infection reported to CDC (all species), United States, 1970-2012



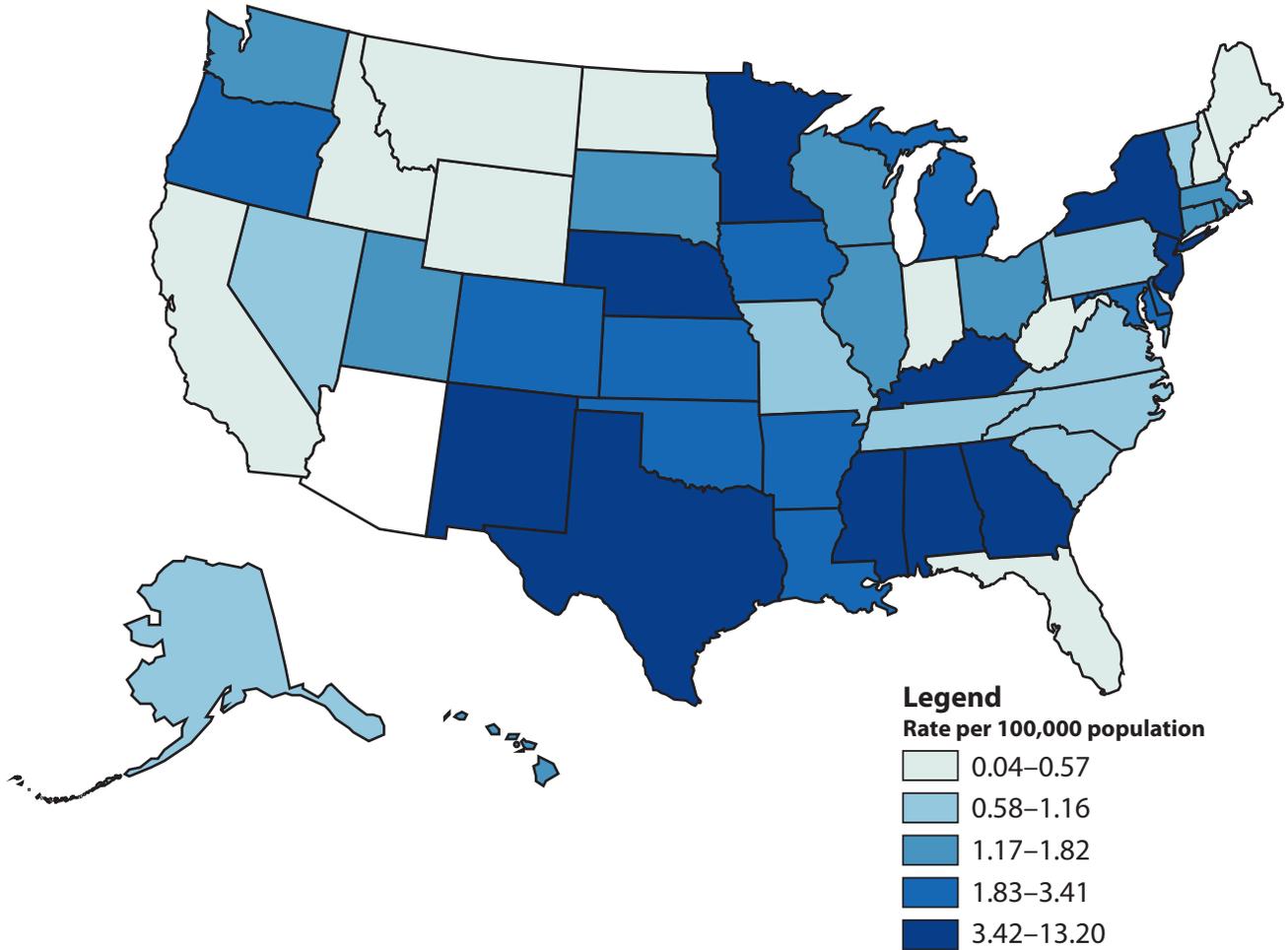
The top panel of this graph shows the incidence rates of infection with *Shigella* (all species) and *Shigella sonnei* from 1970 to 2012.

- Since 1970, the incidence rate of infection with *Shigella* (all species) has been driven by the incidence rate of infection with *Shigella sonnei*.
- The incidence rate of infection with *Shigella sonnei* decreased from 2008 through 2011, but increased in 2012.

The bottom panel of this graph shows the incidence rate of infection with *Shigella* species other than *Shigella sonnei* and includes infections with an unknown species.

- The incidence rate of infection with *Shigella flexneri* has decreased since the 1970s, but has remained relatively stable since 2007.
- Since the mid-1980s, the incidence rate of infection with an unknown species of *Shigella* has fluctuated, likely representing at least to some extent outbreak situations where public health laboratories did not characterize outbreak-associated *Shigella* isolates to the species level. Peaks in incidence of these isolates are generally parallel to peak in incidence of *S. sonnei*.
- *Shigella boydii* and *Shigella dysenteriae* infections are rare in the United States.

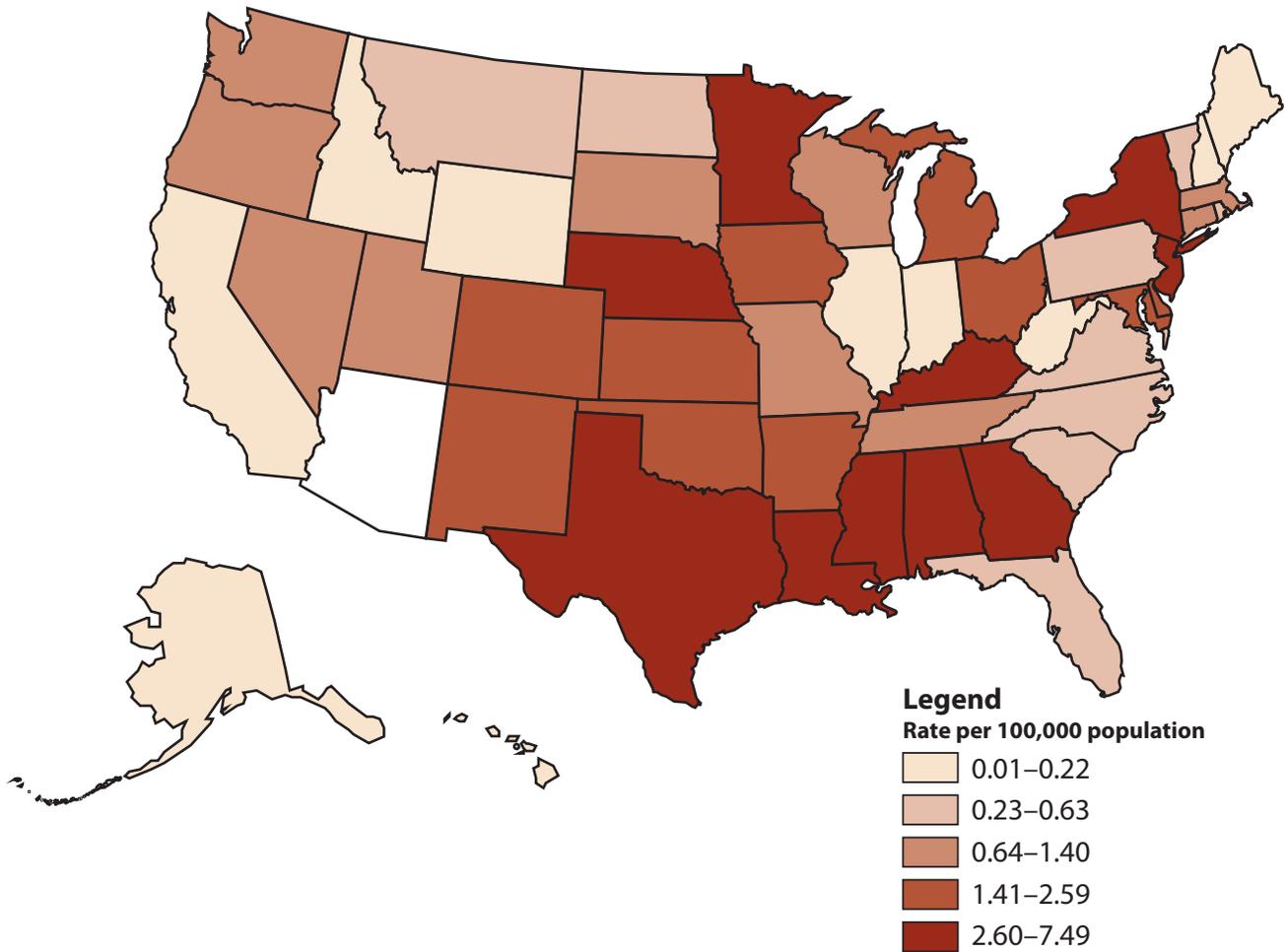
Figure 2a. Incidence rate of laboratory-confirmed *Shigella* infection reported to CDC (all species) by reporting jurisdiction, United States, 2012*



* Unshaded reporting jurisdictions are those for which the reporting jurisdiction reported no *Shigella* isolates (i.e., no infections were diagnosed or the reporting jurisdiction did not report to CDC).

Fifty reporting jurisdictions reported a total of 7,746 *Shigella* infections corresponding to an overall incidence rate (cases per 100,000 population) of 2.5. The reporting jurisdictions with the highest incidence rates were Nebraska (13.2), New Jersey (7.6), and Minnesota (7.1).

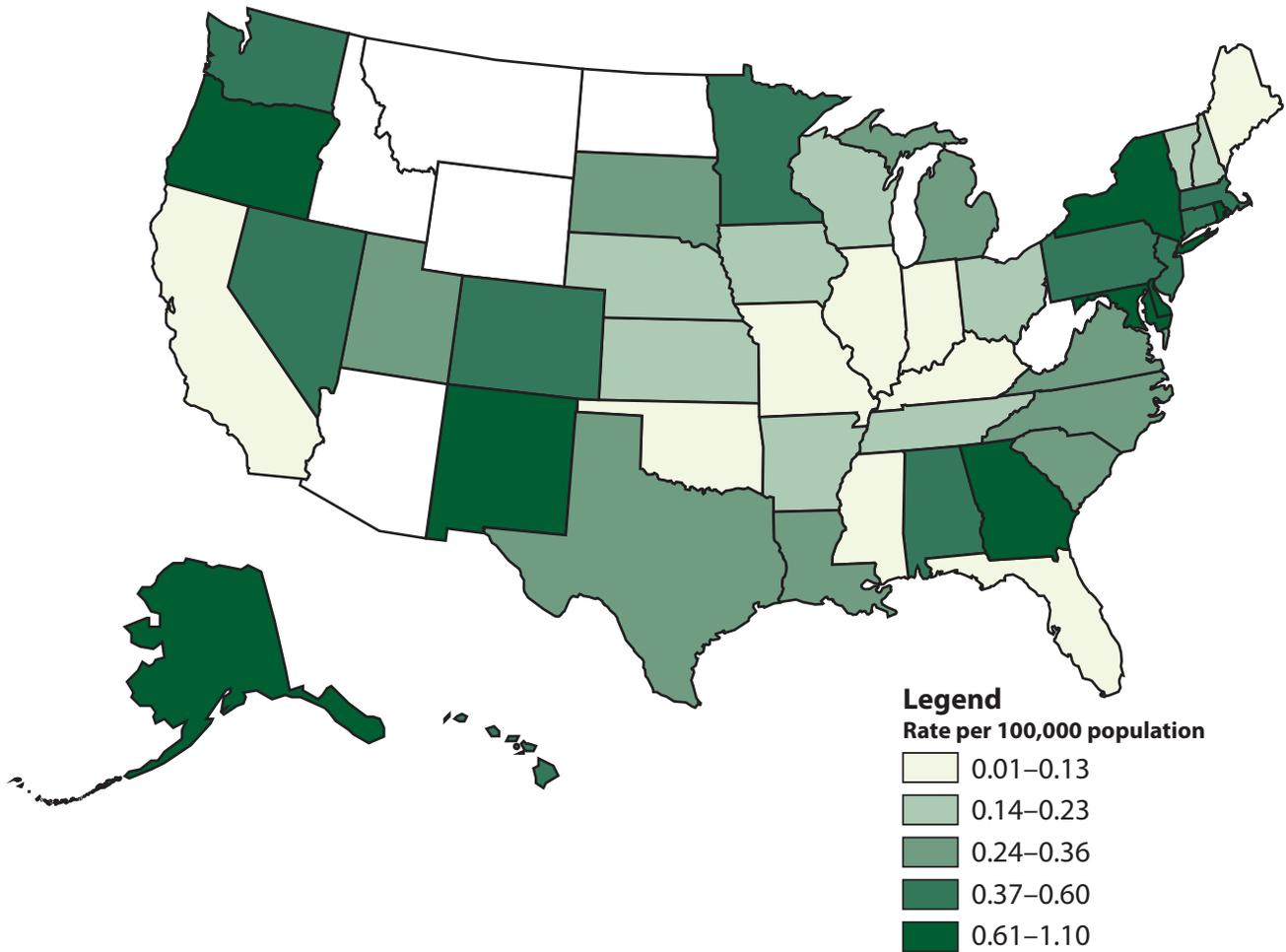
Figure 2b. Incidence rate of laboratory-confirmed human *Shigella sonnei* infection reported to CDC, by reporting jurisdiction, United States, 2012*



* Unshaded reporting jurisdictions are those for which the reporting jurisdiction reported no *Shigella* isolates (i.e., no infections were diagnosed or the reporting jurisdiction did not report to CDC).

Fifty reporting jurisdictions reported a total of 5,824 *Shigella sonnei* infections, corresponding to an overall incidence rate (cases per 100,000 population) of 1.9. The reporting jurisdictions with the highest incidence rates were Nebraska (7.5), New Jersey (7.1), and Mississippi (6.9).

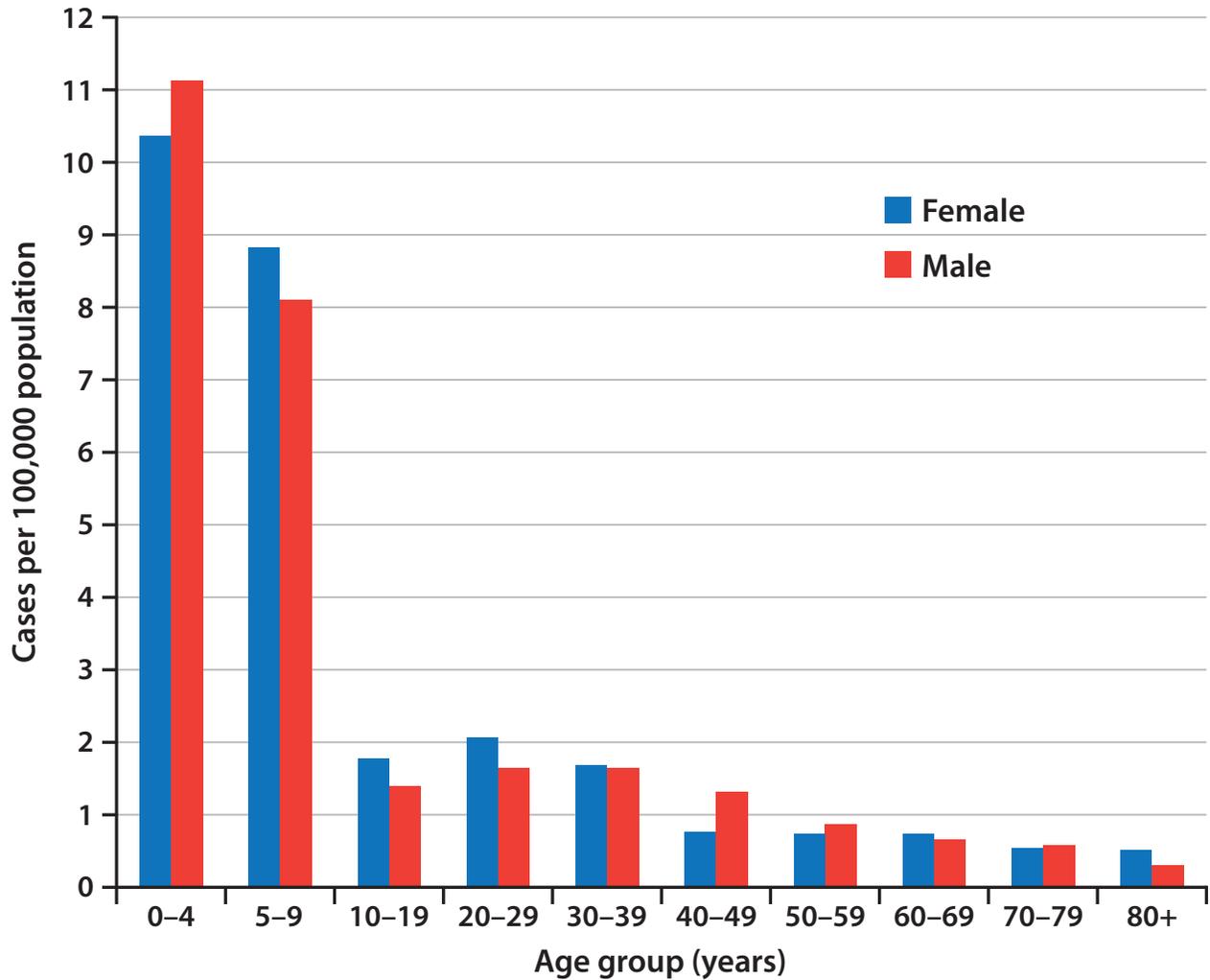
Figure 2c. Incidence rate of laboratory-confirmed *Shigella flexneri* infection reported to CDC, by reporting jurisdiction, United States, 2012*



* Unshaded reporting jurisdictions are those for which the reporting jurisdiction reported no *Shigella* isolates (i.e., no infections were diagnosed or the reporting jurisdiction did not report to CDC).

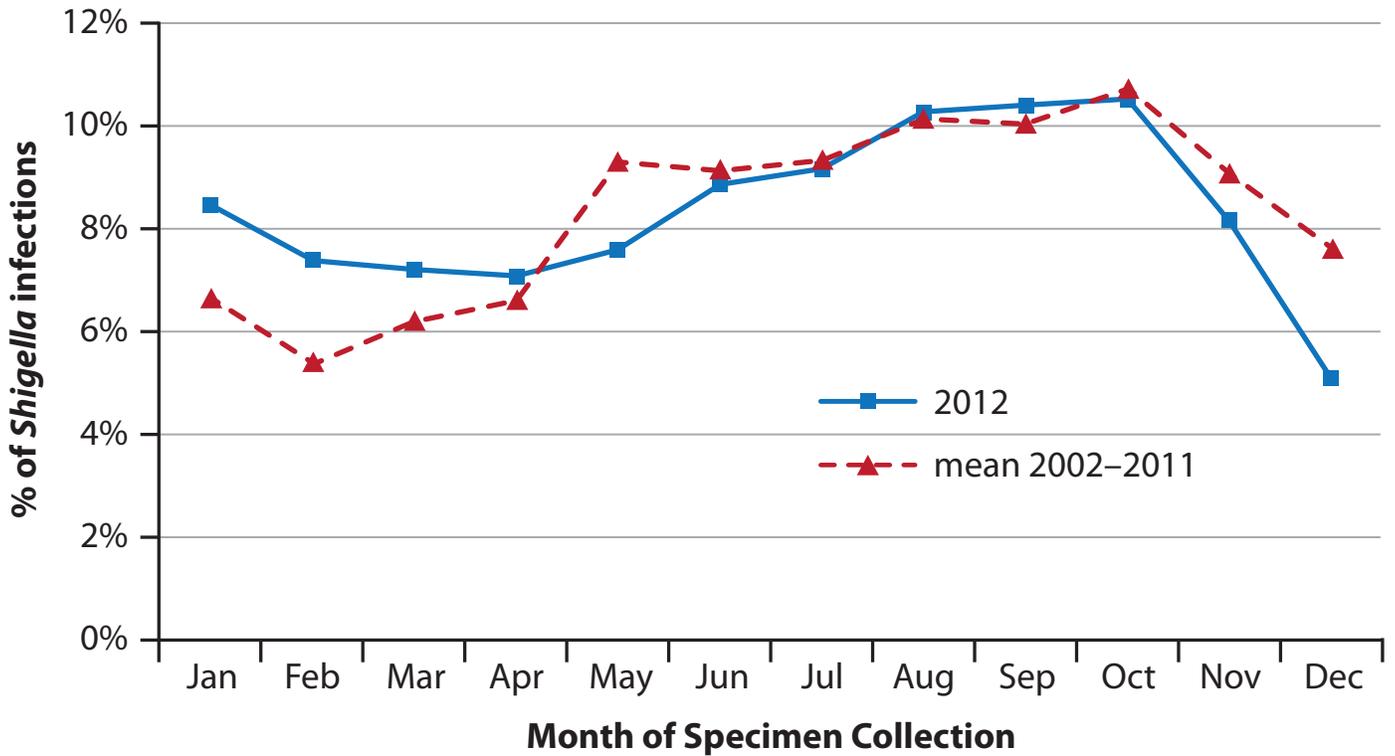
Forty-five reporting jurisdictions reported a total of 957 *Shigella flexneri* infections, corresponding to an overall incidence rate (cases per 100,000 population) of 0.3. The reporting jurisdictions with the highest incidence rates were New Mexico (1.1), Hawaii (1.1), and Georgia (1.0).

Figure 3. Incidence rate of laboratory-confirmed *Shigella* infection reported to CDC, by age group and sex, United States, 2012 (n=7,294 with age and sex information reported)



During 2012, the highest incidence rate of *Shigella* infection was in children under 5 years old. Among ages 0 to 4 and 40 to 49 years, males had a higher incidence rate of *Shigella* infection than females. Among ages 5 to 29 and ≥ 80 years, females had a higher incidence rate of *Shigella* infection than males. In the remaining age groups (30-39 and 50-79), incidence rates were relatively similar (i.e., $\leq 10\%$ difference) among both males and females.

Figure 4. Percentage of laboratory-confirmed *Shigella* infections reported to CDC, by month of specimen collection, United States, 2012 and mean percentage during 2002 to 2011



Compared with the previous 10 years (2002–2011), a larger portion of *Shigella* infections in 2012 were reported from January through March.

Human Surveillance Data: National Notifiable Diseases Surveillance System (NNDSS)

The National Notifiable Disease Surveillance System (NNDSS) collects and compiles reports of nationally notifiable infectious diseases, including *Shigella*. This system includes reports of laboratory-confirmed cases and probable cases (clinically compatible cases with an epidemiological link to a confirmed case).

The report for 2012 was not yet available when this report was written. Reports are available at http://www.cdc.gov/mmwr/mmwr_nd/index.html.

Human Antimicrobial Resistance Data: National Antimicrobial Resistance Monitoring System (NARMS)

The National Antimicrobial Resistance Monitoring System (NARMS) monitors antimicrobial resistance among enteric bacteria (including *Shigella*) isolated from humans.

The report for 2012 was not yet available when this report was written. Reports are available at <http://www.cdc.gov/narms/reports.html>.

Human Outbreak Data: Foodborne Disease Outbreak Surveillance System (FDOSS) and Waterborne Disease Outbreak Surveillance System (WBD OSS)

The Foodborne Disease Outbreak Surveillance System (FDOSS) collects reports of foodborne disease outbreaks from local, state, tribal, and territorial public health agencies.

The report for 2012 was not yet available when this report was written. Reports are available at <http://www.cdc.gov/foodsafety/fdoss/data/annual-summaries/index.html>.

The Waterborne Disease and Outbreak Surveillance System (WBD OSS) collects reports of waterborne disease outbreaks associated with drinking water and recreational water from local, state, and territorial public health agencies.

The report for 2012 was not yet available when this report was written. Reports are available at <http://www.cdc.gov/healthywater/surveillance/surveillance-reports.html>.

References

1. Centers for Disease Control and Prevention (CDC). National *Shigella* Surveillance Overview. Atlanta, Georgia: US Department of Health and Human Services, CDC, 2011.

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