

National Enteric Disease Surveillance: *Shigella* Annual Summary, 2009

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

National *Shigella* Surveillance Data

Laboratory-based Enteric Diseases Surveillance (LEDS) data

LEDS *Shigella* Data Tables for 2009 are available online at <http://www.cdc.gov/ncezid/dfwed/edeb/reports.html#Shigella>.

- The frequency and percentage of laboratory-confirmed *Shigella* species isolated from human sources reported to CDC in 2009 are shown by species in Table 1 and by serotype in Table 2.
 - During 2009, 10,173 isolates were reported to CDC through LEDS.
 - Of the 10,173 isolates, 9,358 (92%) were identified to species.
 - Distribution by species was similar to previous years, with *Shigella sonnei* accounting for the largest number of isolates (80.4%), followed by *Shigella flexneri* (10.6%), *Shigella boydii* (0.7%), and *Shigella dysenteriae* (0.4%).
- The distribution of isolates by species, age group, and sex during 2009 is shown in Table 3.
 - In 2009, *Shigella* was isolated most frequently from children from 1 to 9 years of age (57% of all isolates).
 - Overall, the distribution of isolates by gender varied, with a greater number of isolates from male than female infants and young children (ages <1 to 4 years), and a greater number of isolates from females in all age groups over 4 years old except males ages 40 to 49 years.
 - By species, for all age groups over 4 years old, most *Shigella sonnei* isolates came from females; by contrast, for all age groups over 19 years old (except 80+), most *Shigella flexneri* isolates came from males.
- The number of isolates by species from 1999 to 2009 is shown in Table 4.
 - *Shigella sonnei* isolates constituted the majority of reported isolates, ranging from a low of 66.6% of all isolates in 2003 to a high of 80.4% in 2009.
 - The number of isolates reported with an unknown species varied over time, ranging from a low of 4.7% in 2000 to a high of 21.3% in 2003. From 2004 to 2008, the average percentage of isolates each year with unknown species was 12.4%; in 2009 the percentage of isolates with unknown species dropped to 8%.
- The median age, in years, of persons with laboratory-confirmed *Shigella* isolates from 1999 to 2009 is shown in Table 5.
 - From 1999 to 2009, the median age of persons with *Shigella sonnei* infections has ranged from 6 to 8 years of age; the median age of persons with *Shigella flexneri* infections has ranged from 10 to 23 years of age.

- The number of isolates by species, serotype, and year from 1999 to 2009 is shown in Table 6.
 - The most frequently reported serotypes of *Shigella flexneri* from 1998 to 2008 (excluding *flexneri* of unspecified serotype, n=12503) were 2a (1284/4023, 31%), 6 (566/4023, 16%), and 4a (515/4023, 13%).
- The number of isolates by species, serotype, and month in 2009 and from 1999 to 2009, is shown in Tables 7 and 8.
 - In 2009, isolations of *Shigella sonnei* peaked in May.
 - From 1999 to 2009, isolation of *Shigella sonnei* increased in late summer and fall, reaching a peak in October, then declined to a trough in February.
 - From 1999 to 2009, isolations of *Shigella flexneri* peaked in August.
- The number of isolates by species and geographic region from 1999 to 2009 is shown in Table 9 and the number of *Shigella sonnei* isolates by geographic region from 1999 to 2009 is shown in Figure 1.
 - There were no marked differences in geographic distribution of all *Shigella* species or of *Shigella sonnei* from 1999 to 2009
- The number of isolates by species and state from 1999 to 2009 is shown in Table 10.

NNDSS Data

The National Notifiable Disease Surveillance System (NNDSS) collects and compiles reports of nationally notifiable infectious diseases, including shigellosis. This system includes reports of laboratory-confirmed cases and probable cases (clinically compatible cases with an epidemiological link to a confirmed case). The 2009 NNDSS report is available at <http://www.cdc.gov/mmwr/PDF/wk/mm5853.pdf>.

- A total of 15,931 cases of shigellosis were reported to NNDSS during 2009 (2).

Antimicrobial Resistance Data

The National Antimicrobial Resistance Monitoring System (NARMS) monitors antimicrobial resistance among enteric bacteria (including *Shigella*) from humans. The most recently published NARMS annual report is from 2010, available at <http://www.cdc.gov/narms/pdf/2010-annual-report-narms.pdf>. The 2009 data, as reported in the 2010 report, showed the following:

In *Enterobacteriaceae*, resistance to nalidixic acid, an elementary quinolone, correlates with decreased susceptibility to ciprofloxacin (MIC ≥ 0.12 $\mu\text{g/mL}$) and possible fluoroquinolone treatment failure. Ceftiofur is a third-generation cephalosporin used in food animals in the United States; resistance to ceftiofur among *Enterobacteriaceae* correlates with decreased susceptibility to ceftriaxone (MIC ≥ 2 $\mu\text{g/mL}$).

- 2.1% of *Shigella* isolates were resistant to nalidixic acid and 0.6% were resistant to ciprofloxacin.

Multidrug resistance is described in NARMS as resistance to three or more classes of antimicrobial agents, as defined by the Clinical and Laboratory Standards Institute (CLSI).

- 36.4% of *Shigella* isolates were resistant to at least three of the eight antimicrobial classes tested.
- 17.5% of *Shigella* isolates were resistant to ampicillin and trimethoprim-sulfamethoxazole

Outbreak Data

The Foodborne Disease Outbreak Surveillance System (FDOSS) collects reports of foodborne disease outbreaks from local, state, tribal, and territorial public health agencies. Reports can be found at http://www.cdc.gov/outbreaknet/surveillance_data.html.

The Waterborne Disease and Outbreak Surveillance System (WBDOSS) collects reports of waterborne disease outbreaks associated with drinking water and recreational water from local, state, tribal, and territorial public health agencies. Reports can be found at <http://www.cdc.gov/healthywater/statistics/wbdoss/surveillance.html>.

References

1. Centers for Disease Control and Prevention (CDC). National *Shigella* Surveillance Overview. Atlanta, Georgia: US Department of Health and Human Service, CDC, 2011. Available online at: <http://www.cdc.gov/ncezid/dfwed/edeb/reports.html>
2. Centers for Disease Control and Prevention (CDC). Summary of notifiable diseases—United States, 2009. MMWR 2009; 56(53): 1-94.

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