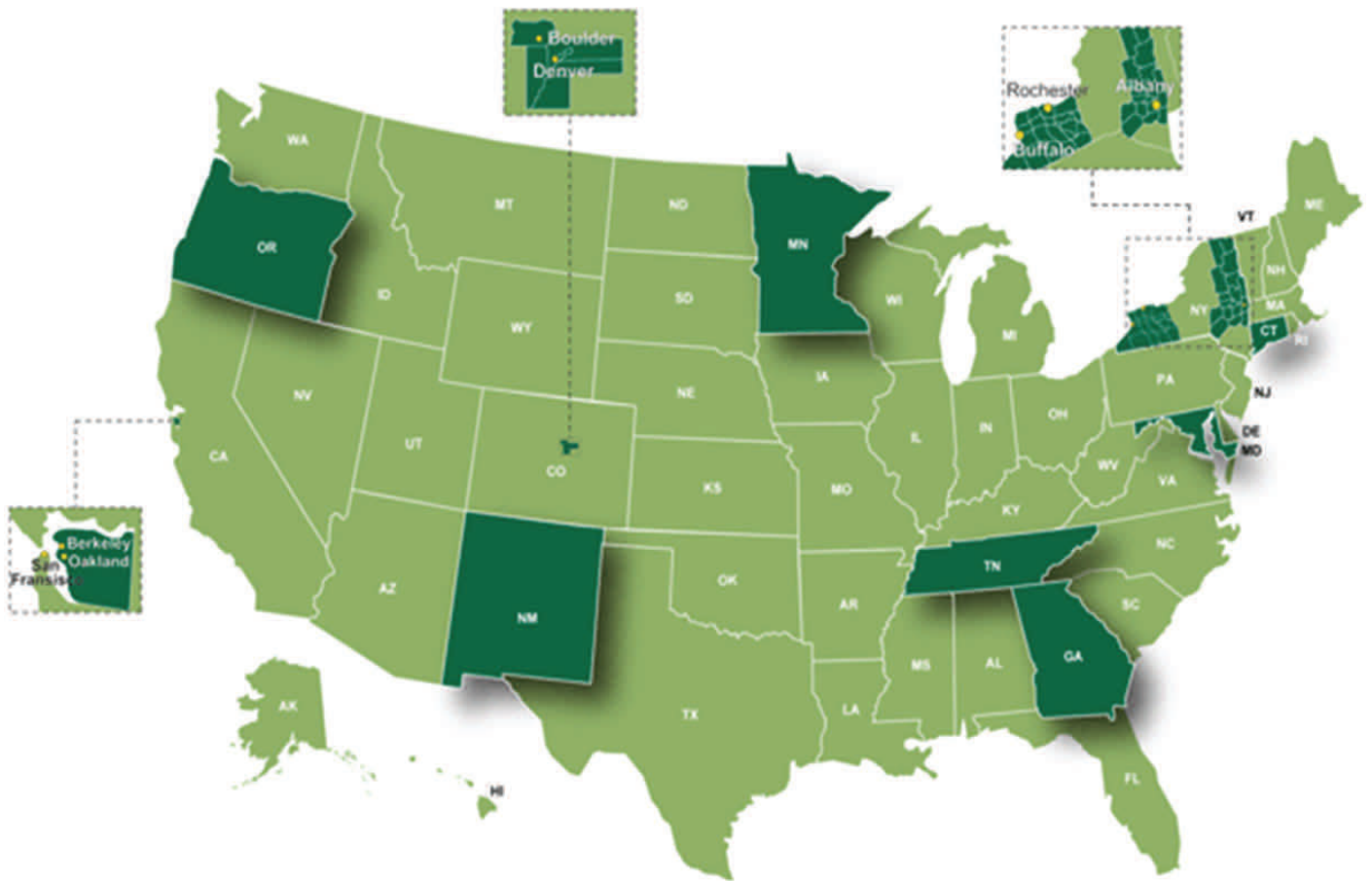


# Foodborne Diseases Active Surveillance Network

## FoodNet

### 2011 Surveillance Report



US Department of Health & Human Services  
Centers for Disease Control and Prevention



We would like to thank all of our site partners for their collection of surveillance data. The following persons from the Enteric Diseases Epidemiology Branch, CDC contributed substantially to compiling this report:

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## ***Background***

The Foodborne Diseases Active Surveillance Network (FoodNet) tracks important illnesses transmitted commonly by food, generating information used to guide and monitor food safety policy and prevention efforts. FoodNet provides information that contributes to food safety efforts by estimating numbers of foodborne illnesses, monitoring trends in incidence of specific illnesses over time, attributing illnesses to specific sources and settings, and disseminating information. A collaborative program of the US Centers for Disease Control and Prevention (CDC), 10 state health departments, the US Department of Agriculture's Food Safety and Inspection Service (USDA-FSIS), and the US Food and Drug Administration (FDA), FoodNet conducts population-based active surveillance for laboratory-confirmed infections caused by 7 bacterial pathogens (*Campylobacter*, *Listeria monocytogenes*, *Salmonella*, Shiga toxin-producing *Escherichia coli* [STEC], *Shigella*, *Vibrio*, and *Yersinia*), 2 parasitic pathogens (*Cyclospora* and *Cryptosporidium*), and 1 syndrome (postdiarrheal hemolytic uremic syndrome [D<sup>+</sup>HUS]). This report describes final FoodNet surveillance data for *Campylobacter*, *Cryptosporidium*, *Cyclospora*, *Listeria*, *Salmonella*, *Shigella*, Shiga toxin-producing *Escherichia coli* (STEC) O157, STEC non-O157, *Vibrio*, *Yersinia* infections for 2011, D<sup>+</sup>HUS for 2010, and trends in incidence since 1996.

Since it was established in 1996, FoodNet has included the states of Minnesota and Oregon and selected counties in California, Connecticut, and Georgia. From 1997 to 2004, the FoodNet surveillance area expanded several times to ultimately include the entire states of Connecticut, Georgia, Maryland, Minnesota, New Mexico, Oregon, and Tennessee, and selected counties in California, Colorado and New York (Figure 1). The FoodNet surveillance area in 2011 included 47.5 million persons or 15.2% of the United States population (Table 2). The demographic composition of the 2011 FoodNet surveillance population is similar to that of the United States population except that the Hispanic population is under-represented (Table 3).

## ***Methods***

### *Active Surveillance for laboratory-confirmed illness*

FoodNet has conducted active, population-based surveillance for laboratory-confirmed cases of infection caused by *Campylobacter*, *Listeria*, *Salmonella*, STEC O157, *Shigella*, *Vibrio*, and *Yersinia* since 1996; *Cryptosporidium* and *Cyclospora* since 1997; and STEC non-O157 since 2000. A case is defined as isolation (for bacteria) or identification (for parasites) of an organism from a clinical specimen. To identify cases, FoodNet personnel regularly communicate with clinical laboratories serving the surveillance area. Once a case is identified, FoodNet personnel at each site obtain information about a set of core variables (see Appendix I) and enter it into an electronic database. Hospitalizations occurring within 7 days of the specimen collection date are recorded, as is the patient's outcome (dead or alive) at hospital discharge (or at 7 days after the specimen collection date if the patient was not hospitalized).

## *Surveillance for Hemolytic Uremic Syndrome (HUS)*

Active surveillance for postdiarrheal HUS (D<sup>+</sup>HUS), a complication of STEC infection characterized by renal failure, thrombocytopenia, and microangiopathic hemolytic anemia, in children <18 years old is conducted through a network of pediatric nephrologists and infection control practitioners as well as by hospital discharge data review. For surveillance purposes, a case of D<sup>+</sup>HUS is defined as any illness diagnosed as HUS by a physician or any hospitalized illness with ICD-9-CM or ICD-10CM codes specifying HUS, acute renal failure with the hemolytic anemia and thrombocytopenia, or thrombotic thrombocytopenic purpura and with diarrhea caused by *E. coli* (or another unknown pathogen). Pediatric hospital discharge data review has been conducted in FoodNet sites except New Mexico since 2000. Laboratory data is collected for each case so that a laboratory-defined definition of D<sup>+</sup>HUS can be applied for other analyses. FoodNet conducts passive surveillance of D<sup>+</sup>HUS in adults

## ***Analysis***

Incidence was calculated by dividing the number of laboratory-confirmed infections in 2011 by U.S. Census Bureau population estimates for the same year. Case fatality rates (CFRs) were calculated by dividing the number of deaths by the number of laboratory-confirmed infections and multiplying by 100. Age groups were defined as <1 years, 1-4 years, 5-9 years, 10-19 years, 20-29 years, 30-39 years, 40-49 years, 50-59 years, 60-69 years, 70-79 years and ≥80 years of age.

A main effect, log-linear Poisson regression model (negative binomial model) with 95% confidence intervals (CIs) was used to estimate changes in incidence from 1996-1998 to 2011 and from 2006-2008 to 2011. The model accounts for site-to-site variation and changes in the size of the population under surveillance in FoodNet over time. As a measure of overall change in incidence of infection with pathogens transmitted commonly through food, data were combined for *Campylobacter*, *Listeria*, *Salmonella*, STEC O157, *Yersinia*, and *Vibrio*, six key bacterial pathogens for which >50% of illnesses are estimated to be foodborne, weighting by incidence of infection for each pathogen. For HUS, changes in incidence from 2006-2008 to 2010 were estimated. Trends were not assessed for *Cyclospora* because data were sparse or for STEC non-O157 because of changes in diagnostic practices.

## ***Results***

In 2011, FoodNet identified a total of 18,964 laboratory-confirmed cases of infection, 4,398 hospitalizations, and 82 deaths (Table 12, 15). For individual pathogens tracked, the number of infections and incidence were as follows: *Salmonella* (7813; 16.45 per 100,000), *Campylobacter* (6785; 14.28 per 100,000), *Shigella* (1541; 3.24 per 100,000), *Cryptosporidium* (1355; 2.85 per 100,000), STEC non-O157 (521; 1.10 per 100,000); STEC O157 (463; 0.97 per 100,000), *Yersinia* (163; 0.34 per 100,000), *Vibrio* (156; 0.33 per 100,000), *Listeria* (145; 0.31 per 100,000), and *Cyclospora* (22; 0.05 per 100,000) (Table 4, 5). Incidence was highest in children

aged <5 years for all pathogens except *Listeria*, *Vibrio*, and *Cyclospora*, for which incidence was highest in persons aged ≥60 years (Table 6, 6a). Both the percentage hospitalized and the case fatality rates (CFRs) were highest among persons aged ≥60 years (Tables 13, 13a, 16, 16a).

Among 7813 (92%) *Salmonella* isolates serotyped, the most common serotypes were Enteritidis (1424 [18%]), Typhimurium (981 [13%]), and Newport (959 [12%]). Among the 984 (92%) STEC infections with serogroup identified, the most common serogroups were O157 (463 [47%]), O26 (135 [14%]), and O103 (111 [11%]). Among the 154 (92%) *Vibrio* isolates with species information, the most common were *V. parahaemolyticus* (75 [49%]), *V. alginolyticus* (26 [17%]), and *V. vulnificus* (13[8%]).

In 2011, the overall incidence of infection with six key pathogens transmitted commonly through food was 24% lower compared with 1996-1998. For individual pathogens, the incidence of infection was significantly lower during the same period for *Shigella* (64% decrease; CI = 50%–75%), *Yersinia* (51% decrease; CI = 37%–61%), STEC O157 (42% decrease; CI = 29%–53%), *Listeria* (35% decrease; CI = 15%–50%), and *Campylobacter* (22% decrease; CI = 15%–28%) but was higher for *Vibrio* (76% increase; CI = 31%–138%) (Figures 8 and 9). Incidence did not change significantly for *Salmonella* or *Cryptosporidium*. Among the top three *Salmonella* serotypes, incidence of infection was significantly lower for Typhimurium (55% decrease; CI = 49%–61%) and higher for Newport (93% increase; CI = 48%–153%) and Enteritidis (58% increase; CI = 30%–91%).

Comparing 2011 with 2006-2008, the overall incidence of infection with the six key pathogens did not change significantly. For individual pathogens, the incidence of infection was significantly lower for *Shigella* (42% decrease; CI = 24%–55%) and STEC O157 (26% decrease; CI = 12%–38%) and higher for *Campylobacter* (14% increase; CI 7%–21%); incidence did not change significantly for *Cryptosporidium*, *Listeria*, *Salmonella*, *Vibrio*, and *Yersinia* (Figure 10).

In 2010, FoodNet ascertained 96 HUS cases, including 93 (97%) post-diarrheal (D<sup>+</sup>HUS) cases. Among D<sup>+</sup>HUS cases, 1(1%) person died. Eighty-two (88%) pediatric D<sup>+</sup>HUS cases were reported; among these, 55 (67%) cases were in children aged <5 years. Of all D<sup>+</sup>HUS cases, 69 (74%) had evidence of STEC infection, defined as isolation of STEC by stool culture, stool positive for Shiga toxin, or detection of antibodies to *E. coli* O157 or O111 lipopolysaccharide in serum; 66% of all D<sup>+</sup>HUS cases were diagnosed during June through September (Tables 20-22 and Figure 12).

## ***Publications and Abstracts, 2011***

All publications and abstracts listed used data from FoodNet surveillance.

### ***Publications***

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5. Guo C, Hoekstra RM, Schroeder CM, Pires SM, Ong KL, Hartnett E, et al. Application of Bayesian techniques to model the burden of human salmonellosis attributable to U.S. food commodities at the point of processing: adaptation of a Danish model. *Foodborne Pathog Dis.* 2011; 8:509-16.
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11. Rounds JM, Boxrud DJ, Jawahir SL, Smith KE. Dynamics of *Escherichia coli* O157:H7 outbreak detection and investigation, Minnesota 2000-2008. *Epidemiol Infect.* 2012; 140:1430-8. Epub 2011.
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### **Conference Abstracts**

1. Khanlian SA and Lathrop SL. Foodborne disease trends in a minority majority state; New Mexico's FoodNet Surveillance 2004-2009. In: Proceedings of the 139<sup>th</sup> Annual Meeting of the American Public Health Association; 2011 Oct 29-Nov 2; Washington, DC. Abstract 244462.
2. Mody R, Crim S, Wymore K, Clogher P, Palmer A, Dunn J, et al. Adverse Impact of Changing Clinical Diagnostics on Tracking Progress in Reducing Shiga Toxin-Producing *Escherichia coli* (STEC) Infections—FoodNet, 2008-2010. In: Proceedings of the 49<sup>th</sup> Annual Meeting of the Infectious Diseases Society of America (IDSA); 2011 Oct 20-23; Boston, MA. Abstract LB-16.
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**Further information concerning FoodNet, including previous surveillance reports, MMWR articles, and other FoodNet publications, can be obtained by visiting [www.cdc.gov/foodnet](http://www.cdc.gov/foodnet), emailing FoodNet at [foodnet@cdc.gov](mailto:foodnet@cdc.gov) or contacting the Enteric Diseases Epidemiology Branch at (404) 639-2206.**

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**TABLE 1. Foodborne Diseases Active Surveillance Network (FoodNet) Surveillance Area, by State and County — 1996-2011**

| State       | County   | Year |      |      |      |      |      |      |      |                | 2011 Total Catchment Population |
|-------------|--|------|------|------|------|------|------|------|------|----------------|---------------------------------|
|             |  | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 - Present |                                 |
| California  | Original counties (Alameda and San Francisco)  | •    | •    | •    | •    | •    | •    | •    | •    | •              | 3,408,797                       |
|             | Added county (Contra Costa)  |      |      |      |      | •    | •    | •    | •    | •              |                                 |
| Colorado    | Original counties (Adams, Arapahoe, Denver, Douglas, and Jefferson)  |      |      |      |      |      | •    | •    | •    | •              | 2,845,140                       |
|             | Added counties (Boulder and Broomfield)  |      |      |      |      |      |      | •    | •    | •              |                                 |
| Connecticut | Original counties (Hartford and New Haven)   | •    | •    | •    | •    | •    | •    | •    | •    | •              | 3,580,709                       |
|             | Rest of state  |      |      | •    | •    | •    | •    | •    | •    | •              |                                 |
| Georgia     | Original counties (Clayton, Cobb, DeKalb, Douglas, Fulton, Gwinnett, Newton, and Rockdale)                                     | •    | •    | •    | •    | •    | •    | •    | •    | •              | 9,815,210                       |
|             | Added counties (Barrow, Bartow, Carroll, Cherokee, Coweta, Fayette, Forsyth, Henry, Paulding, Pickens, Spalding, and Walton)   |      | •    | •    | •    | •    | •    | •    | •    | •              |                                 |
|             | Rest of state  |      |      |      | •    | •    | •    | •    | •    | •              |                                 |
| Maryland    | Original counties (Anne Arundel, Baltimore, Baltimore City, Carroll, Harford, and Howard)                                      |      |      | •    | •    | •    | •    | •    | •    | •              | 5,828,289                       |
|             | Added counties (Montgomery and Prince George's)  |      |      |      |      |      | •    | •    | •    | •              |                                 |
|             | Rest of state  |      |      |      |      |      |      | •    | •    | •              |                                 |
| Minnesota   | All counties   | •    | •    | •    | •    | •    | •    | •    | •    | •              | 5,344,861                       |
| New Mexico  | All counties   |      |      |      |      |      |      |      |      | •              | 2,082,224                       |
| New York    | Original sites (Genesee, Livingston, Monroe, Ontario, Orleans, Wayne, and Yates)   |      |      | •    | •    | •    | •    | •    | •    | •              | 4,325,138                       |
|             | Added counties (Albany, Columbia, Greene, Montgomery, Rensselaer, Saratoga, Schenectady, and Schoharie)                        |      |      |      | •    | •    | •    | •    | •    | •              |                                 |
|             | Added counties (Erie, Niagara, and Wyoming)  |      |      |      |      |      |      | •    | •    | •              |                                 |
|             | Added counties (Allegany, Cattaraugus, Chautauqua, Chemung, Schuyler, Seneca, Steuben, Warren, and Washington)                 |      |      |      |      |      |      |      | •    | •              |                                 |
|             | Added counties (Clinton, Delaware, Essex, Franklin, Fulton, Hamilton, and Otsego)  |      |      |      |      |      |      |      |      | •              |                                 |
| Oregon      | All counties   | •    | •    | •    | •    | •    | •    | •    | •    | •              | 3,871,859                       |
| Tennessee   | Original counties (Cheatham, Davidson, Dickson, Hamilton, Knox, Robertson, Rutherford, Shelby, Sumner, Williamson, and Wilson) |      |      |      |      | •    | •    | •    | •    | •              | 6,403,353                       |
|             | Rest of state  |      |      |      |      |      |      |      | •    | •              |                                 |

|                           |                   |
|---------------------------|-------------------|
| <b>Total Surveillance</b> | <b>47,505,580</b> |
|---------------------------|-------------------|

**TABLE 2. Population under Surveillance, by Site — FoodNet, 1996-2011**

| FoodNet Site                                  | 1996             | 1997             | 1998             | 1999             | 2000             | 2001             | 2002             | 2003             | 2004             | 2005             | 2006             | 2007             | 2008             | 2009             | 2010             | 2011             |
|---|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| California                                    | 2,087,032        | 2,113,195        | 2,142,806        | 2,162,359        | 3,180,535        | 3,221,301        | 3,214,691        | 3,207,854        | 3,199,470        | 3,203,574        | 3,213,968        | 3,243,540        | 3,291,704        | 3,338,351        | 3,370,988        | 3,408,797        |
| Colorado                                      | -                | -                | -                | -                | -                | 2,149,813        | 2,494,509        | 2,511,607        | 2,532,539        | 2,560,644        | 2,605,859        | 2,653,222        | 2,701,638        | 2,749,198        | 2,795,763        | 2,845,140        |
| Connecticut                                   | 1,622,809        | 2,453,483        | <b>3,272,563</b> | <b>3,282,031</b> | <b>3,411,777</b> | <b>3,432,835</b> | <b>3,458,749</b> | <b>3,484,336</b> | <b>3,496,094</b> | <b>3,506,956</b> | <b>3,517,460</b> | <b>3,527,270</b> | <b>3,545,579</b> | <b>3,561,807</b> | <b>3,575,498</b> | <b>3,580,709</b> |
| Georgia                                       | 2,720,443        | 3,632,206        | 3,744,022        | <b>7,788,240</b> | <b>8,227,303</b> | <b>8,377,038</b> | <b>8,508,256</b> | <b>8,622,793</b> | <b>8,769,252</b> | <b>8,925,922</b> | <b>9,155,813</b> | <b>9,349,988</b> | <b>9,504,843</b> | <b>9,620,846</b> | <b>9,712,157</b> | <b>9,815,210</b> |
| Maryland                                      | -                | -                | 2,441,279        | 2,450,566        | 2,517,195        | 4,243,342        | <b>5,440,389</b> | <b>5,496,269</b> | <b>5,546,935</b> | <b>5,592,379</b> | <b>5,627,367</b> | <b>5,653,408</b> | <b>5,684,965</b> | <b>5,730,388</b> | <b>5,785,681</b> | <b>5,828,289</b> |
| Minnesota                                     | <b>4,647,723</b> | <b>4,687,726</b> | <b>4,726,411</b> | <b>4,775,508</b> | <b>4,933,692</b> | <b>4,982,796</b> | <b>5,018,935</b> | <b>5,053,572</b> | <b>5,087,713</b> | <b>5,119,598</b> | <b>5,163,555</b> | <b>5,207,203</b> | <b>5,247,018</b> | <b>5,281,203</b> | <b>5,310,658</b> | <b>5,344,861</b> |
| New Mexico                                    | -                | -                | -                | -                | -                | -                | -                | 1,903,808        | 1,932,274        | 1,962,137        | 1,990,070        | 2,010,662        | 2,036,802        | 2,065,913        | 2,082,224        |                  |
| New York                                      | -                | -                | 1,105,062        | 2,084,453        | 2,115,057        | 2,119,971        | 3,332,739        | 3,981,730        | 4,328,097        | 4,320,853        | 4,318,715        | 4,319,290        | 4,323,449        | 4,326,495        | 4,328,822        | 4,325,138        |
| Oregon  | <b>3,195,087</b> | <b>3,243,254</b> | <b>3,282,055</b> | <b>3,316,154</b> | <b>3,429,708</b> | <b>3,467,937</b> | <b>3,513,424</b> | <b>3,547,376</b> | <b>3,569,463</b> | <b>3,613,202</b> | <b>3,670,883</b> | <b>3,722,417</b> | <b>3,768,748</b> | <b>3,808,600</b> | <b>3,838,332</b> | <b>3,871,859</b> |
| Tennessee                                     | -                | -                | -                | -                | 2,826,381        | 2,852,904        | 2,878,873        | <b>5,847,812</b> | <b>5,910,809</b> | <b>5,991,057</b> | <b>6,088,766</b> | <b>6,175,727</b> | <b>6,247,411</b> | <b>6,306,019</b> | <b>6,357,436</b> | <b>6,403,353</b> |
| <b>Total</b>                                  | 14,273,094       | 16,129,864       | 20,714,198       | 25,859,311       | 30,641,648       | 34,847,937       | 37,860,565       | 41,753,349       | 44,344,180       | 44,766,459       | 45,324,523       | 45,842,135       | 46,326,017       | 46,759,709       | 47,141,248       | 47,505,580       |
| FoodNet population as<br>% of U.S. population | 5.4              | 6.0              | 7.7              | 9.5              | 10.9             | 12.2             | 13.2             | 14.4             | 15.2             | 15.2             | 15.2             | 15.2             | 15.2             | 15.2             | 15.2             | 15.2             |

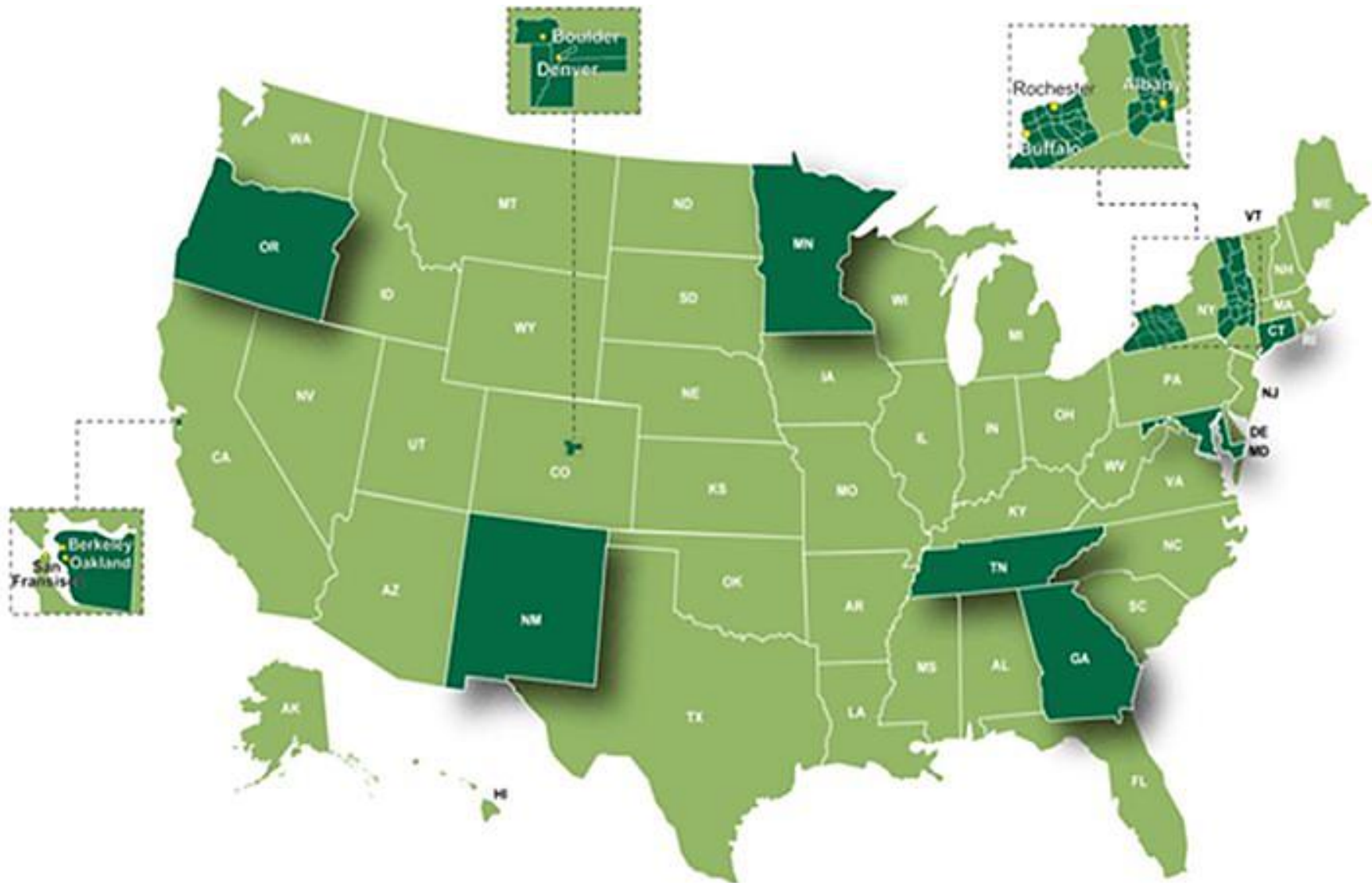
**Bold** indicates active surveillance was conducted statewide, including all counties within a state; otherwise, surveillance was conducted in “-” Indicates state was not a FoodNet site during indicated year.

**TABLE 3. Comparison of FoodNet Surveillance Population to U.S. Population, Overall and by Site —2011**

|                        | <b>FoodNet<br/>Surveillance<br/>Population</b> | <b>U.S. Population</b> | <b>CA*</b> | <b>CO*</b> | <b>CT</b> | <b>GA</b> | <b>MD</b> | <b>MN</b> | <b>NM</b> | <b>NY*</b> | <b>OR</b> | <b>TN</b> |
|------------------------|--|------------------------|------------|------------|-----------|-----------|-----------|-----------|-----------|------------|-----------|-----------|
|                        | <b>#</b>                                       | <b>#</b>               | <b>#</b>   | <b>#</b>   | <b>#</b>  | <b>#</b>  | <b>#</b>  | <b>#</b>  | <b>#</b>  | <b>#</b>   | <b>#</b>  | <b>#</b>  |
| <b>Total</b>           | 47,505,580                                     | 311,591,917            | 3,408,797  | 2,845,140  | 3,580,709 | 9,815,210 | 5,828,289 | 5,344,861 | 2,082,224 | 4,325,138  | 3,871,859 | 6,403,353 |
| <b>Age (years)</b>     |  |                        |            |            |           |           |           |           |           |            |           |           |
| <1                     | 590,063  | 3,996,537              | 40,272     | 37,986     | 37,318    | 133,611   | 73,059    | 68,312    | 28,752    | 44,735     | 46,460    | 79,558    |
| 1–4                    | 2,424,715                                      | 16,165,521             | 160,826    | 156,627    | 159,778   | 549,840   | 293,094   | 283,948   | 116,996   | 187,979    | 190,168   | 325,459   |
| 5–9                    | 3,073,654                                      | 20,334,196             | 197,077    | 200,058    | 219,451   | 695,246   | 366,123   | 355,801   | 145,236   | 246,356    | 237,068   | 411,238   |
| 10–19                  | 6,357,264                                      | 42,348,895             | 394,569    | 370,265    | 490,613   | 1,398,831 | 776,406   | 720,273   | 287,793   | 577,878    | 492,336   | 848,300   |
| 20–29                  | 6,536,231                                      | 43,433,626             | 500,066    | 413,209    | 445,140   | 1,387,471 | 800,985   | 726,563   | 290,054   | 585,127    | 526,887   | 860,729   |
| 30–39                  | 6,205,077                                      | 40,105,013             | 518,600    | 422,842    | 421,648   | 1,352,577 | 746,128   | 675,064   | 252,676   | 478,986    | 512,696   | 823,860   |
| 40–49                  | 6,777,333                                      | 43,191,650             | 511,764    | 411,074    | 541,844   | 1,423,712 | 868,133   | 742,747   | 264,146   | 611,380    | 508,465   | 894,068   |
| 50–59                  | 6,656,415                                      | 42,815,746             | 468,030    | 386,078    | 537,320   | 1,272,175 | 838,152   | 769,947   | 287,410   | 654,911    | 552,577   | 889,815   |
| 60–69                  | 4,722,805                                      | 30,680,380             | 324,510    | 251,836    | 367,109   | 897,374   | 572,004   | 509,715   | 218,320   | 472,134    | 430,139   | 679,664   |
| 70–79                  | 2,485,550                                      | 16,996,637             | 169,088    | 117,778    | 196,536   | 453,058   | 292,934   | 281,330   | 119,866   | 261,849    | 220,230   | 372,881   |
| 80+                    | 1,676,473                                      | 11,523,716             | 123,995    | 77,387     | 163,952   | 251,315   | 201,271   | 211,161   | 70,975    | 203,803    | 154,833   | 217,781   |
| <b>Sex</b>             |  |                        |            |            |           |           |           |           |           |            |           |           |
| Male                   | 23,314,913                                     | 153,290,819            | 1,684,260  | 1,416,777  | 1,744,816 | 4,802,807 | 2,820,574 | 2,654,903 | 1,030,110 | 2,123,115  | 1,916,620 | 3,120,931 |
| Female                 | 24,190,667                                     | 158,301,098            | 1,724,537  | 1,428,363  | 1,835,893 | 5,012,403 | 3,007,715 | 2,689,958 | 1,052,114 | 2,202,023  | 1,955,239 | 3,282,422 |
| <b>Ethnicity</b>       |  |                        |            |            |           |           |           |           |           |            |           |           |
| Hispanic               | 5,441,688                                      | 52,045,277             | 738,597    | 628,118    | 494,290   | 892,010   | 490,716   | 259,297   | 973,050   | 196,422    | 466,069   | 303,119   |
| Non-Hispanic           | 42,063,892                                     | 259,546,640            | 2,670,200  | 2,217,022  | 3,086,419 | 8,923,200 | 5,337,573 | 5,085,564 | 1,109,174 | 4,128,716  | 3,405,790 | 6,100,234 |
| <b>Race</b>            |  |                        |            |            |           |           |           |           |           |            |           |           |
| White                  | 35,779,842                                     | 243,470,497            | 1,984,625  | 2,452,567  | 2,946,740 | 6,198,354 | 3,561,383 | 4,645,546 | 1,735,602 | 3,735,986  | 3,428,804 | 5,090,235 |
| Black                  | 7,582,743                                      | 40,750,746             | 353,301    | 156,376    | 396,060   | 3,044,658 | 1,749,143 | 286,301   | 51,844    | 385,785    | 76,371    | 1,082,904 |
| Asian/Pacific Islander | 2,459,104                                      | 16,270,474             | 874,275    | 117,216    | 147,995   | 346,020   | 343,246   | 228,506   | 35,701    | 97,673     | 165,368   | 103,104   |
| Indian/Native Alaskan  | 574,836  | 3,814,772              | 36,016     | 40,144     | 17,093    | 50,113    | 31,454    | 68,412    | 210,499   | 25,831     | 68,455    | 26,819    |
| Multiple               | 1,109,055                                      | 7,285,428              | 160,580    | 78,837     | 72,821    | 176,065   | 143,063   | 116,096   | 48,578    | 79,863     | 132,861   | 100,291   |

\*This FoodNet site includes only selected counties; California includes Alameda, San Francisco, and Contra Costa; Colorado includes Adams, Arapahoe, Denver, Douglas, Jefferson, Boulder, and Broomfield; New York includes Albany, Allegany, Cattaraugus, Chautauqua, Chemung, Clinton, Columbia, Delaware, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Livingston, Monroe, Montgomery, Niagara, Ontario, Orleans, Otsego, Rensselaer, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, Steuben, Warren, Washington, Wayne, Wyoming, and Yates.

FIGURE 1. Foodborne Diseases Active Surveillance Network (FoodNet) Sites, 2011



**TABLE 4. Number of Laboratory-Confirmed Bacterial and Parasitic Infections, by Site and Pathogen — FoodNet, 2011**

|                        | CA*   | CO* | CT    | GA    | MD    | MN    | NM  | NY*   | OR    | TN    | Total  |
|------------------------|-------|-----|-------|-------|-------|-------|-----|-------|-------|-------|--------|
| <b>Bacterial</b>       |       |     |       |       |       |       |     |       |       |       |        |
| <i>Campylobacter</i>   | 1,142 | 405 | 657   | 642   | 595   | 995   | 308 | 677   | 957   | 407   | 6,785  |
| <i>Listeria</i>        | 18    | 29  | 18    | 9     | 19    | 6     | 15  | 16    | 9     | 6     | 145    |
| <i>Salmonella</i>      | 509   | 271 | 470   | 2,632 | 994   | 701   | 343 | 534   | 346   | 1,013 | 7,813  |
| <i>Shigella</i>        | 187   | 50  | 41    | 665   | 95    | 87    | 125 | 43    | 46    | 202   | 1,541  |
| STEC† O157             | 35    | 25  | 17    | 29    | 30    | 146   | 12  | 43    | 67    | 59    | 463    |
| STEC NON O157          | 28    | 71  | 25    | 90    | 37    | 102   | 33  | 30    | 60    | 45    | 521    |
| <i>Vibrio</i>          | 21    | 3   | 27    | 35    | 37    | 9     | 2   | 6     | 5     | 11    | 156    |
| <i>Yersinia</i>        | 8     | 11  | 7     | 32    | 13    | 28    |     | 23    | 17    | 24    | 163    |
| <b>Parasitic</b>       |       |     |       |       |       |       |     |       |       |       |        |
| <i>Cryptosporidium</i> | 41    | 46  | 70    | 306   | 68    | 307   | 144 | 88    | 194   | 91    | 1,355  |
| <i>Cyclospora</i>      |       |     | 10    | 6     | 1     |       | 1   | 2     |       | 2     | 22     |
| <b>Total</b>           | 1,989 | 911 | 1,342 | 4,446 | 1,889 | 2,381 | 983 | 1,462 | 1,701 | 1,860 | 18,964 |

\*This FoodNet site includes only selected counties; California includes Alameda, San Francisco, and Contra Costa; Colorado includes Adams, Arapahoe, Denver, Douglas, Jefferson, Boulder, and Broomfield; New York includes Albany, Allegany, Cattaraugus, Chautauqua, Chemung, Clinton, Columbia, Delaware, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Livingston, Monroe, Montgomery, Niagara, Ontario, Orleans, Otsego, Rensselaer, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, Steuben, Warren, Washington, Wayne, Wyoming, and Yates.

†Shiga toxin-producing *Escherichia coli*.

**TABLE 5. Incidence\* of Cases of Bacterial and Parasitic Infections Compared with National Health Objectives†, by Site and Pathogen — FoodNet, 2011**

|   | CA <sup>†</sup> | CO <sup>†</sup> | CT          | GA          | MD          | MN          | NM          | NY <sup>†</sup> | OR          | TN          | Overall<br>2011 | National 2010<br>health<br>objective <sup>§</sup> |
|---|-----------------|-----------------|-------------|-------------|-------------|-------------|-------------|-----------------|-------------|-------------|-----------------|---|
| <b>Bacteria</b>                                   |                 |                 |             |             |             |             |             |                 |             |             |                 |   |
| <i>Campylobacter</i>                              | 33.50           | 14.23           | 18.35       | 6.54        | 10.21       | 18.62       | 14.79       | 15.65           | 24.72       | 6.36        | 14.28           | 12.30   |
| <i>Listeria</i>                                   | 0.53            | 1.02            | 0.50        | 0.09        | 0.33        | 0.11        | 0.72        | 0.37            | 0.23        | 0.09        | 0.31            | 0.24  |
| <i>Salmonella</i>                                 | 14.93           | 9.53            | 13.13       | 26.82       | 17.05       | 13.12       | 16.47       | 12.35           | 8.94        | 15.82       | 16.45           | 6.28  |
| <i>Shigella</i>                                   | 5.49            | 1.76            | 1.15        | 6.78        | 1.63        | 1.63        | 6.00        | 0.99            | 1.19        | 3.15        | 3.24            | N/A <sup>¶</sup>                                  |
| <b>STEC** O157</b>                                | 1.03            | 0.88            | 0.47        | 0.30        | 0.51        | 2.73        | 0.58        | 0.99            | 1.73        | 0.92        | 0.97            | 1.00  |
| <b>STEC non-O157</b>                              | 0.82            | 2.50            | 0.70        | 0.92        | 0.63        | 1.91        | 1.58        | 0.69            | 1.55        | 0.70        | 1.10            | N/A   |
| <i>Vibrio</i>                                     | 0.62            | 0.11            | 0.75        | 0.36        | 0.63        | 0.17        | 0.10        | 0.14            | 0.13        | 0.17        | 0.33            | N/A   |
| <i>Yersinia</i>                                   | 0.23            | 0.39            | 0.20        | 0.33        | 0.22        | 0.52        | 0.00        | 0.53            | 0.44        | 0.37        | 0.34            | N/A   |
| <b>Parasites</b>                                  |                 |                 |             |             |             |             |             |                 |             |             |                 |   |
| <i>Cryptosporidium</i>                            | 1.20            | 1.62            | 1.95        | 3.12        | 1.17        | 5.74        | 6.92        | 2.03            | 5.01        | 1.42        | 2.85            | N/A   |
| <i>Cyclospora</i>                                 | 0.00            | 0.00            | 0.28        | 0.06        | 0.02        | 0.00        | 0.05        | 0.05            | 0.00        | 0.03        | 0.05            | N/A   |
| <b>Surveillance<br/>population<br/>(millions)</b> | <b>3.41</b>     | <b>2.85</b>     | <b>3.58</b> | <b>9.82</b> | <b>5.83</b> | <b>5.34</b> | <b>2.08</b> | <b>4.33</b>     | <b>3.87</b> | <b>6.40</b> | <b>47.51</b>    |   |

\*Rate per 100,000 population

†This FoodNet site includes only selected counties; California includes Alameda, San Francisco, and Contra Costa; Colorado includes Adams, Arapahoe, Denver, Douglas, Jefferson, Boulder, and Broomfield; New York includes Albany, Allegany, Cattaraugus, Chautauqua, Chemung, Clinton, Columbia, Delaware, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Livingston, Monroe, Montgomery, Niagara, Ontario, Orleans, Otsego, Rensselaer, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, Steuben, Warren, Washington, Wayne, Wyoming, and Yates.

§Healthy People 2010 objectives for incidence of *Campylobacter*, *Salmonella*, and Shiga toxin-producing *Escherichia coli* O157 infections for year 2010 and for incidence of *Listeria* infections for year 2010.

¶Not applicable, because no national health objective exists regarding infection with this pathogen.

\*\*Shiga toxin-producing *Escherichia coli*.



**TABLE 6. Number and Incidence\* of Pathogens, by Age, Sex, Race and Ethnicity—2011**

|                        | <i>Campylobacter</i> |              | <i>Listeria</i> |             | <i>Salmonella</i> |              | <i>Shigella</i> |             | STEC <sup>†</sup> O157 |             | STEC <sup>†</sup> non O157 |             |
|------------------------|----------------------|--------------|-----------------|-------------|-------------------|--------------|-----------------|-------------|------------------------|-------------|----------------------------|-------------|
|                        | #                    | Rate         | #               | Rate        | #                 | Rate         | #               | Rate        | #                      | Rate        | #                          | Rate        |
| <b>Age (years)</b>     |                      |              |                 |             |                   |              |                 |             |                        |             |                            |             |
| <1                     | 148                  | 25.08        | 3               | 0.51        | 787               | 133.38       | 25              | 4.24        | 10                     | 1.69        | 24                         | 4.07        |
| 1-4                    | 589                  | 24.29        | 2               | 0.08        | 1,273             | 52.50        | 376             | 15.51       | 101                    | 4.17        | 121                        | 4.99        |
| 5-9                    | 323                  | 10.51        | 0               | 0.00        | 637               | 20.72        | 301             | 9.79        | 61                     | 1.98        | 51                         | 1.66        |
| 10-19                  | 601                  | 9.45         | 2               | 0.03        | 770               | 12.11        | 120             | 1.89        | 79                     | 1.24        | 114                        | 1.79        |
| 20-29                  | 997                  | 15.25        | 5               | 0.08        | 834               | 12.76        | 196             | 3.00        | 58                     | 0.89        | 72                         | 1.10        |
| 30-39                  | 891                  | 14.36        | 7               | 0.11        | 691               | 11.14        | 164             | 2.64        | 22                     | 0.35        | 29                         | 0.47        |
| 40-49                  | 937                  | 13.83        | 10              | 0.15        | 690               | 10.18        | 162             | 2.39        | 22                     | 0.32        | 32                         | 0.47        |
| 50-59                  | 982                  | 14.75        | 15              | 0.23        | 816               | 12.26        | 101             | 1.52        | 36                     | 0.54        | 16                         | 0.24        |
| 60-69                  | 716                  | 15.16        | 33              | 0.70        | 637               | 13.49        | 60              | 1.27        | 33                     | 0.70        | 34                         | 0.72        |
| 70-79                  | 371                  | 14.93        | 31              | 1.25        | 418               | 16.82        | 23              | 0.93        | 26                     | 1.05        | 16                         | 0.64        |
| 80+                    | 225                  | 13.42        | 37              | 2.21        | 257               | 15.33        | 13              | 0.78        | 15                     | 0.89        | 12                         | 0.72        |
| Unknown                | 5                    | -            | 0               | -           | 3                 | -            | 0               | -           | 0                      | -           | 0                          | -           |
| <b>Sex</b>             |                      |              |                 |             |                   |              |                 |             |                        |             |                            |             |
| Female                 | 3,035                | 12.55        | 77              | 0.32        | 4,078             | 16.86        | 677             | 2.80        | 263                    | 1.09        | 305                        | 1.26        |
| Male                   | 3,744                | 16.06        | 68              | 0.29        | 3,723             | 15.97        | 861             | 3.69        | 200                    | 0.86        | 216                        | 0.93        |
| Unknown                | 6                    | -            | 0               | -           | 12                | -            | 3               | -           | 0                      | -           | 0                          | -           |
| <b>Ethnicity</b>       |                      |              |                 |             |                   |              |                 |             |                        |             |                            |             |
| Hispanic               | 591                  | 10.86        | 21              | 0.39        | 729               | 13.40        | 236             | 4.34        | 38                     | 0.70        | 85                         | 1.56        |
| Non-Hispanic           | 4,010                | 9.53         | 111             | 0.26        | 5,385             | 12.80        | 923             | 2.19        | 383                    | 0.91        | 373                        | 0.89        |
| Unknown                | 2,184                | -            | 13              | -           | 1,699             | -            | 382             | -           | 42                     | -           | 63                         | -           |
| <b>Race</b>            |                      |              |                 |             |                   |              |                 |             |                        |             |                            |             |
| Asian/Pacific Islander | 241                  | 9.80         | 9               | 0.37        | 389               | 15.82        | 28              | 1.14        | 10                     | 0.41        | 9                          | 0.37        |
| Black                  | 276                  | 3.64         | 19              | 0.25        | 1,063             | 14.02        | 472             | 6.22        | 29                     | 0.38        | 29                         | 0.38        |
| Indian/Native Alaskan  | 57                   | 9.92         | 2               | 0.35        | 68                | 11.83        | 42              | 7.31        | 1                      | 0.17        | 5                          | 0.87        |
| Multiple               | 44                   | 3.97         | 1               | 0.09        | 88                | 7.93         | 12              | 1.08        | 7                      | 0.63        | 6                          | 0.54        |
| Other                  | 168                  | -            | 2               | -           | 174               | -            | 70              | -           | 11                     | -           | 15                         | -           |
| Unknown                | 1,640                | -            | 9               | -           | 1,077             | -            | 214             | -           | 29                     | -           | 61                         | -           |
| White                  | 4,359                | 12.18        | 103             | 0.29        | 4,954             | 13.85        | 703             | 1.96        | 376                    | 1.05        | 396                        | 1.11        |
| <b>Total</b>           | <b>6,785</b>         | <b>14.28</b> | <b>145</b>      | <b>0.31</b> | <b>7,813</b>      | <b>16.45</b> | <b>1,541</b>    | <b>3.24</b> | <b>463</b>             | <b>0.97</b> | <b>521</b>                 | <b>1.10</b> |

\*Rate per 100,000 population.

†Shiga toxin-producing *Escherichia coli*.

**TABLE 6. Number and Incidence\* of Pathogens, by Age, Sex, Race, and Ethnicity—2011 (continued)**

|                        | <i>Vibrio</i> |             | <i>Yersinia</i> |             | <i>Cryptosporidium</i> |             | <i>Cyclospora</i> |             |
|------------------------|---------------|-------------|-----------------|-------------|------------------------|-------------|-------------------|-------------|
|                        | #             | Rate        | #               | Rate        | #                      | Rate        | #                 | Rate        |
| <b>Age (years)</b>     |               |             |                 |             |                        |             |                   |             |
| <1                     | 0             | 0.00        | 20              | 3.39        | 11                     | 1.86        | 0                 | 0.00        |
| 1–4                    | 5             | 0.21        | 17              | 0.70        | 119                    | 4.91        | 0                 | 0.00        |
| 5–9                    | 4             | 0.13        | 6               | 0.20        | 71                     | 2.31        | 0                 | 0.00        |
| 10–19                  | 17            | 0.27        | 19              | 0.30        | 152                    | 2.39        | 1                 | 0.02        |
| 20–29                  | 24            | 0.37        | 7               | 0.11        | 218                    | 3.34        | 2                 | 0.03        |
| 30–39                  | 16            | 0.26        | 8               | 0.13        | 210                    | 3.38        | 2                 | 0.03        |
| 40–49                  | 20            | 0.30        | 11              | 0.16        | 134                    | 1.98        | 7                 | 0.10        |
| 50–59                  | 31            | 0.47        | 18              | 0.27        | 118                    | 1.77        | 3                 | 0.05        |
| 60–69                  | 21            | 0.44        | 26              | 0.55        | 143                    | 3.03        | 7                 | 0.15        |
| 70–79                  | 10            | 0.40        | 14              | 0.56        | 109                    | 4.39        | 0                 | 0.00        |
| 80+                    | 8             | 0.48        | 17              | 1.01        | 70                     | 4.18        | 0                 | 0.00        |
| Unknown                | 0             | -           | 0               | -           | 0                      | -           | 0                 | -           |
| <b>Sex</b>             |               |             |                 |             |                        |             |                   |             |
| Female                 | 47            | 0.19        | 83              | 0.34        | 733                    | 3.03        | 13                | 0.05        |
| Male                   | 109           | 0.47        | 80              | 0.34        | 621                    | 2.66        | 9                 | 0.04        |
| Unknown                | 0             | -           | 0               | -           | 1                      | -           | 0                 | -           |
| <b>Ethnicity</b>       |               |             |                 |             |                        |             |                   |             |
| Hispanic               | 8             | 0.15        | 11              | 0.20        | 108                    | 1.98        | 3                 | 0.06        |
| Non-Hispanic           | 118           | 0.28        | 131             | 0.31        | 1006                   | 2.39        | 17                | 0.04        |
| Unknown                | 30            | -           | 21              | -           | 241                    | -           | 2                 | -           |
| <b>Race</b>            |               |             |                 |             |                        |             |                   |             |
| Asian/Pacific Islander | 7             | 0.28        | 13              | 0.53        | 27                     | 1.10        | 0                 | 0.00        |
| Black                  | 19            | 0.25        | 27              | 0.36        | 124                    | 1.64        | 1                 | 0.01        |
| Indian/Native Alaskan  | 2             | 0.35        | 0               | 0.00        | 16                     | 2.78        | 0                 | 0.00        |
| Multiple               | 0             | 0.00        | 2               | 0.18        | 12                     | 1.08        | 0                 | 0.00        |
| Other                  | 1             | -           | 2               | -           | 13                     | -           | 0                 | -           |
| Unknown                | 21            | -           | 13              | -           | 132                    | -           | 3                 | -           |
| White                  | 106           | 0.30        | 106             | 0.30        | 1031                   | 2.88        | 18                | 0.05        |
| <b>Total</b>           | <b>156</b>    | <b>0.33</b> | <b>163</b>      | <b>0.34</b> | <b>1,355</b>           | <b>2.85</b> | <b>22</b>         | <b>0.05</b> |

\*Rate per 100,000 population.

**TABLE 7. Number and Incidence\* of Laboratory-Confirmed *Salmonella* Infections Caused by the Top 20 *Salmonella* Serotypes, by Rank - FoodNet, 2011**

| Rank                |      | <i>Salmonella</i> serotype | Number of cases | % of total <i>Salmonella</i> cases | Incidence per 100,000 persons |
|---------------------|------|----------------------------|-----------------|------------------------------------|-------------------------------|
| 2006 - 2010         | 2011 |                            |                 |                                    |                               |
| 1                   | 1    | Enteritidis                | 1,424           | 18.2                               | <b>3.0</b>                    |
| 2                   | 2    | Typhimurium**              | 981             | 12.6                               | <b>2.1</b>                    |
| 3                   | 3    | Newport                    | 959             | 12.3                               | <b>2.0</b>                    |
| 4                   | 4    | Javiana                    | 753             | 9.6                                | <b>1.6</b>                    |
| 5                   | 5    | S. I 4,[5],12:i:-***       | 314             | 4.0                                | <b>0.7</b>                    |
| 9                   | 6    | Muenchen                   | 201             | 2.6                                | <b>0.4</b>                    |
| 6                   | 7    | Heidelberg                 | 169             | 2.2                                | <b>0.4</b>                    |
| 7                   | 8    | Montevideo                 | 150             | 1.9                                | <b>0.3</b>                    |
| 11                  | 9    | Infantis                   | 130             | 1.7                                | <b>0.3</b>                    |
| 14                  | 10   | S. I 13,23:b:-             | 119             | 1.5                                | <b>0.3</b>                    |
| 12                  | 11   | Oranienburg                | 114             | 1.5                                | <b>0.2</b>                    |
| 8                   | 12   | Saintpaul                  | 113             | 1.4                                | <b>0.2</b>                    |
| 10                  | 13   | Braenderup                 | 110             | 1.4                                | <b>0.2</b>                    |
| 16                  | 14   | Bareilly                   | 108             | 1.4                                | <b>0.2</b>                    |
| 13                  | 15   | Agona                      | 73              | 0.9                                | <b>0.2</b>                    |
| 15                  | 16   | Mississippi                | 69              | 0.9                                | <b>0.1</b>                    |
| 17                  | 17   | Thompson                   | 67              | 0.9                                | <b>0.1</b>                    |
| 18                  | 18   | Typhi                      | 63              | 0.8                                | <b>0.1</b>                    |
| 25                  | 19   | Berta                      | 52              | 0.7                                | <b>0.1</b>                    |
| 22                  | 20   | Anatum                     | 50              | 0.6                                | <b>0.1</b>                    |
| <b>Sub total</b>    |      |                            | <b>6,019</b>    | 77.0                               | <b>12.7</b>                   |
| All other serotyped |      |                            | 1,182           | 15.1                               | 2.5                           |
| Not serotyped       |      |                            | 332             | 4.2                                | 0.7                           |
| Partially serotyped |      |                            | 208             | 2.7                                | 0.4                           |
| Rough or nonmotile  |      |                            | 72              | 0.9                                | 0.2                           |
| <b>Total</b>        |      |                            | <b>7,813</b>    | <b>100</b>                         | <b>16.4</b>                   |

\*Rate per 100,000 persons

\*\*Includes I 4,[5],12:i:- and I 4,5,12:i:-

\*\*\* Typhimurium includes var.5- (Formerly var. Copenhagen)

**TABLE 8. Number and Incidence\* of Laboratory-Confirmed *Shigella* Infections, by Species — FoodNet, 2011**

| <i>Shigella</i> species | Number of cases | % of total <i>Shigella</i> cases | Incidence per 100,000 persons |
|-------------------------|-----------------|----------------------------------|-------------------------------|
| <i>S. sonnei</i>        | 1,097           | 71.2                             | 2.31                          |
| <i>S. flexneri</i>      | 315             | 20.4                             | 0.66                          |
| <i>S. boydii</i>        | 17              | 1.1                              | 0.04                          |
| <i>S. dysenteriae</i>   | 4               | 0.3                              | 0.01                          |
| <b>Unknown</b>          | 108             | 7.0                              | 0.23                          |
| <b>Total</b>            | <b>1,541</b>    | <b>100</b>                       | <b>3.24</b>                   |

\*Rate per 100,000 persons

**TABLE 9. Number and Incidence\* of Laboratory-Confirmed *Vibrio* Infections, by Species — FoodNet, 2011**

| <i>Vibrio</i> species               | Number of cases | % of total <i>Vibrio</i> cases | Incidence per 100,000 persons |
|-------------------------------------|-----------------|--------------------------------|-------------------------------|
| <i>V. parahaemolyticus</i>          | 75              | 48.7                           | 0.16                          |
| <i>V. alginolyticus</i>             | 26              | 16.9                           | 0.05                          |
| <i>V. vulnificus</i>                | 13              | 8.4                            | 0.03                          |
| <i>V. cholerae non-01. non-0139</i> | 9               | 5.8                            | 0.02                          |
| <i>V. fluvialis</i>                 | 8               | 5.2                            | 0.02                          |
| <i>V. cholerae unspecified</i>      | 4               | 2.6                            | 0.01                          |
| <i>V. mimicus</i>                   | 4               | 2.6                            | 0.01                          |
| <i>V. hollisae</i>                  | 2               | 1.3                            | 0.00                          |
| Unknown                             | 13              | 8.4                            | 0.03                          |
| <b>Total</b>                        | <b>154</b>      | <b>100</b>                     | <b>0.32</b>                   |

\*Rate per 100,000 persons

**TABLE 10. Number and Incidence\* of Laboratory-Confirmed STEC<sup>†</sup> non O157 Infections Caused by the Top Ten O Antigens, — FoodNet, 2011**

| <b>Rank</b>  | <b>STEC O Antigen</b> | <b>Number of cases</b> | <b>% total STEC non O157 cases</b> | <b>Incidence per 100,000 persons</b> |
|--------------|-----------------------|------------------------|------------------------------------|--------------------------------------|
| 1            | O26                   | 135                    | 25.9                               | 0.28                                 |
| 2            | O103                  | 111                    | 21.3                               | 0.23                                 |
| 3            | O111                  | 65                     | 12.5                               | 0.14                                 |
| 4            | O121                  | 26                     | 5.0                                | 0.05                                 |
| 5            | O45                   | 17                     | 3.3                                | 0.04                                 |
| 6            | O145                  | 16                     | 3.1                                | 0.03                                 |
| 7            | O118                  | 15                     | 2.9                                | 0.03                                 |
| 8            | O69                   | 8                      | 1.5                                | 0.02                                 |
| 9            | O71                   | 4                      | 0.8                                | 0.01                                 |
| 10           | O123                  | 3                      | 0.6                                | 0.01                                 |
| 10           | O156                  | 3                      | 0.6                                | 0.01                                 |
| 10           | O76                   | 3                      | 0.6                                | 0.01                                 |
| 10           | O80                   | 3                      |                                    |                                      |
|              | Undetermined          | 38                     | 7.3                                |                                      |
|              | Unknown               | 35                     | 6.7                                |                                      |
|              | All other             | 39                     | 7.5                                |                                      |
| <b>Total</b> |                       | <b>521</b>             |                                    |                                      |

\*Rate per 100,000 persons

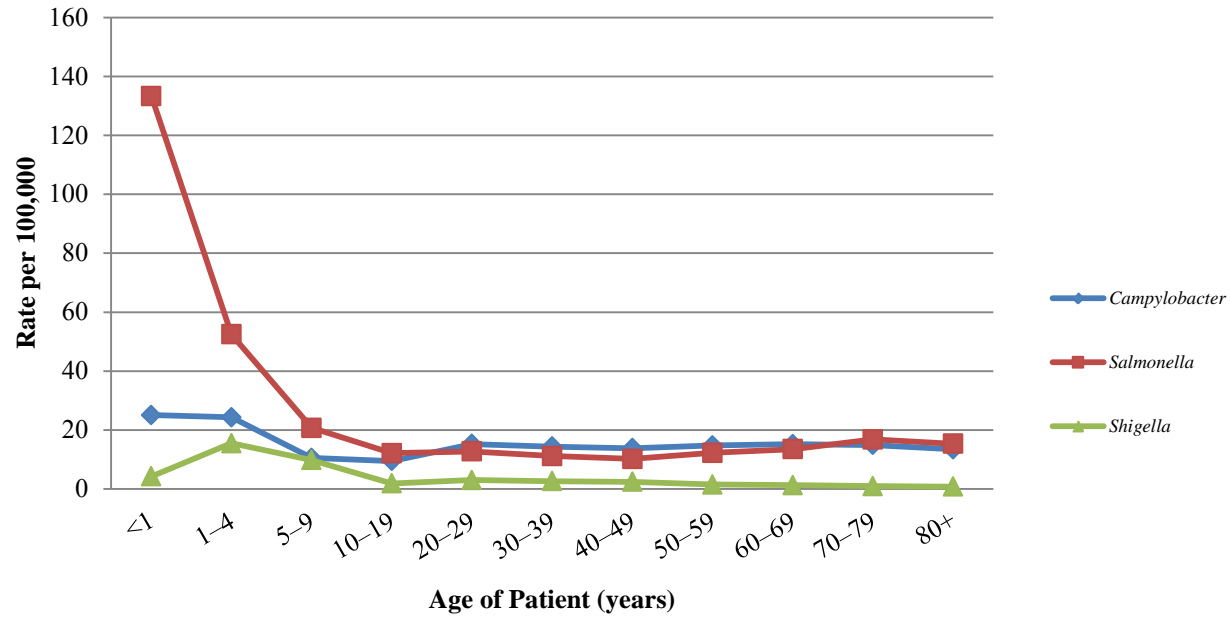
<sup>†</sup>Shiga toxin-producing *Escherichia coli* .

**Table 11. Number of Laboratory-confirmed *Campylobacter* infection speciated for NARMS at CDC\*, FoodNet 2011**

| <i>Campylobacter</i> species | Number of cases* | % of <i>Campylobacter</i> cases |
|------------------------------|------------------|---------------------------------|
| <i>C. jejuni</i>             | 1098             | 88.62                           |
| <i>C. coli</i>               | 115              | 9.28                            |
| <i>C. upsaliensis</i>        | 21               | 1.69                            |
| <i>C. fetus</i>              | 4                | 0.32                            |
| <i>C. lari</i>               | 1                | 0.08                            |
| <b>Total</b>                 | 1239             | 100.00                          |

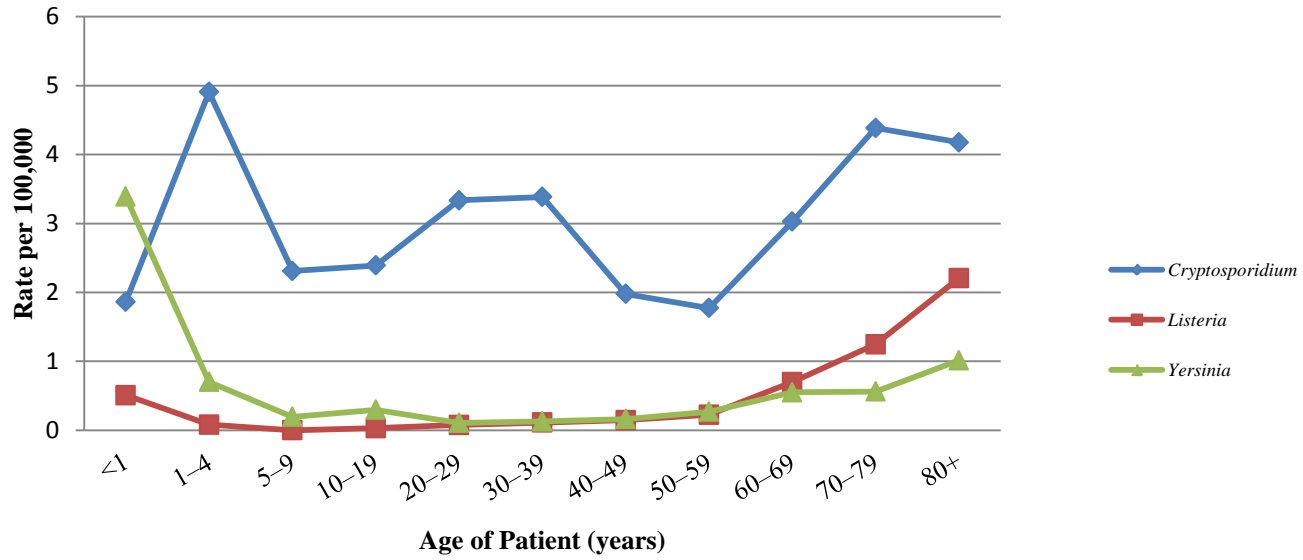
\*Includes linked reports between NARMS and FoodNet only

**FIGURE 2. Incidence of *Campylobacter*, *Salmonella*, and *Shigella* Infections, by Age Group — FoodNet, 2011**

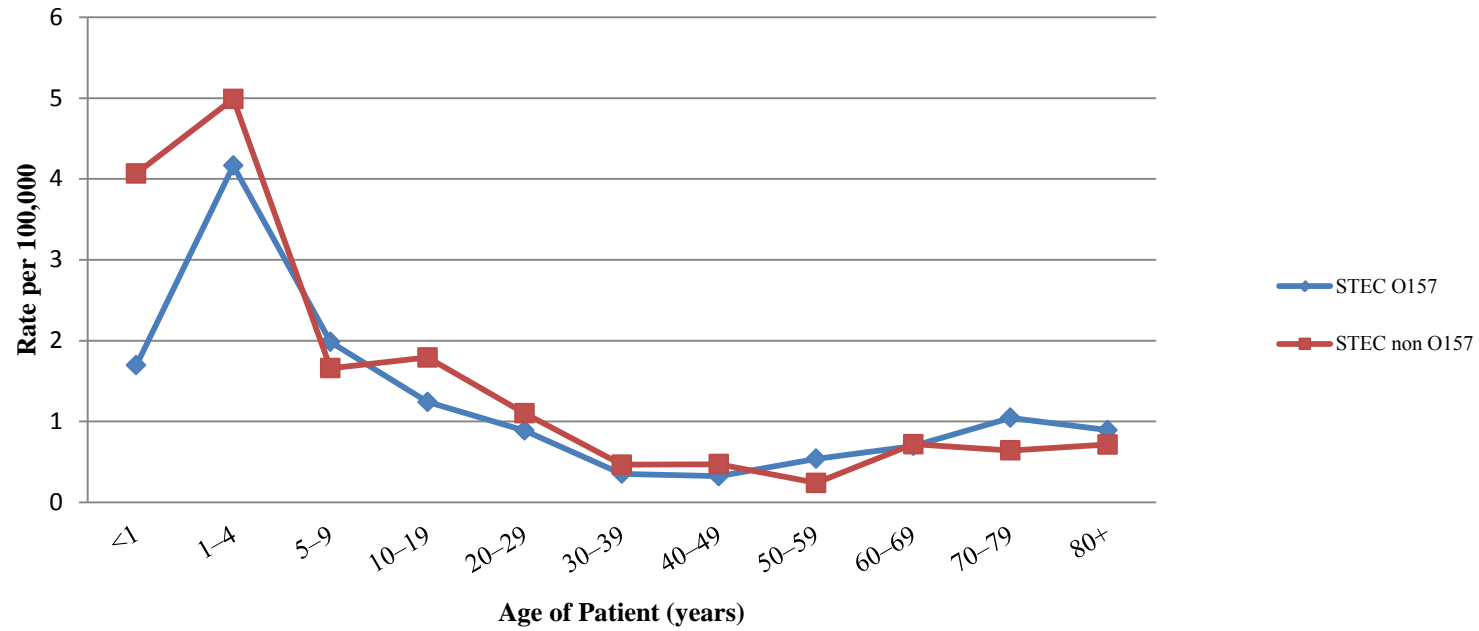




**FIGURE 3. Incidence of *Cryptosporidium*, *Listeria*, and *Yersinia* Infections, by Age Group — FoodNet, 2011**



**FIGURE 4. Incidence of STEC\* O157 and STEC non-O157 Infections, by Age Group — FoodNet, 2011**



**TABLE 12. Number and Percentage\* of Hospitalizations, by Pathogen — FoodNet, 2011**

|                        | #<br>Hospitalized | #<br>Outpatient | #<br>Unknown | Total # of<br>Cases | %<br>Hospitalized |
|------------------------|-------------------|-----------------|--------------|---------------------|-------------------|
| <b>Bacteria</b>        |                   |                 |              |                     |                   |
| <i>Campylobacter</i>   | 1,042             | 5,156           | 587          | 6,785               | 15.4              |
| <i>Listeria</i>        | 135               | 9               | 1            | 145                 | 93.1              |
| <i>Salmonella</i>      | 2,200             | 5,432           | 181          | 7,813               | 28.2              |
| <i>Shigella</i>        | 338               | 1,157           | 46           | 1,541               | 21.9              |
| STEC <sup>†</sup> O157 | 201               | 260             | 2            | 463                 | 43.4              |
| STEC non-O157          | 94                | 418             | 9            | 521                 | 18.0              |
| <i>Vibrio</i>          | 50                | 102             | 4            | 156                 | 32.1              |
| <i>Yersinia</i>        | 58                | 104             | 1            | 163                 | 35.6              |
| <b>Parasites</b>       |                   |                 |              |                     |                   |
| <i>Cryptosporidium</i> | 277               | 1,063           | 15           | 1,355               | 20.4              |
| <i>Cyclospora</i>      | 3                 | 19              | 0            | 22                  | 13.6              |
| <b>Total</b>           | 4,398             | 13,720          | 846          | 18,964              | 23.2              |

<sup>†</sup>Shiga toxin-producing *Escherichia coli* .

TABLE 13. Number and Percentage of Hospitalizations, by Age Group and Pathogen — FoodNet, 2011

|                        | <1 year        |           |                  |                | 1–4 years      |           |                  |                | 5–9 years      |           |                  |                |
|------------------------|----------------|-----------|------------------|----------------|----------------|-----------|------------------|----------------|----------------|-----------|------------------|----------------|
|                        | # Hospitalized | # Unknown | Total # of Cases | % Hospitalized | # Hospitalized | # Unknown | Total # of Cases | % Hospitalized | # Hospitalized | # Unknown | Total # of Cases | % Hospitalized |
| <b>Bacteria</b>        |                |           |                  |                |                |           |                  |                |                |           |                  |                |
| <i>Campylobacter</i>   | 30             | 5         | 148              | 20.3           | 48             | 48        | 589              | 8.1            | 44             | 33        | 323              | 13.6           |
| <i>Listeria</i>        | 3              | 0         | 3                | 100.0          | 2              | 0         | 2                | 100.0          | 0              | 0         | 0                | 0.0            |
| <i>Salmonella</i>      | 209            | 13        | 787              | 26.6           | 212            | 30        | 1,273            | 16.7           | 118            | 15        | 637              | 18.5           |
| <i>Shigella</i>        | 3              | 0         | 25               | 12.0           | 54             | 9         | 376              | 14.4           | 51             | 8         | 301              | 16.9           |
| STEC <sup>†</sup> O157 | 2              | 0         | 10               | 20.0           | 40             | 1         | 101              | 39.6           | 33             | 1         | 61               | 54.1           |
| STEC non-O157          | 2              | 0         | 24               | 8.3            | 7              | 4         | 121              | 5.8            | 5              | 0         | 51               | 9.8            |
| <i>Vibrio</i>          | 0              | 0         | 0                | 0.0            | 1              | 0         | 5                | 20.0           | 1              | 0         | 4                | 25.0           |
| <i>Yersinia</i>        | 8              | 1         | 20               | 40.0           | 3              | 0         | 17               | 17.6           | 1              | 0         | 6                | 16.7           |
| <b>Parasites</b>       |                |           |                  |                |                |           |                  |                |                |           |                  |                |
| <i>Cryptosporidium</i> | 2              | 0         | 11               | 18.2           | 21             | 1         | 119              | 17.6           | 9              | 3         | 71               | 12.7           |
| <i>Cyclospora</i>      | 0              | 0         | 0                | 0.0            | 0              | 0         | 0                | 0.0            | 0              | 0         | 0                | 0.0            |
| <b>Total</b>           | 259            | 19        | 1,028            | 25.7           | 388            | 93        | 2,603            | 15.5           | 262            | 60        | 1,454            | 18.0           |

|                        | 10–19 years    |           |                  |                | 20–29 years    |           |                  |                | 30–39 years    |           |                  |                |
|------------------------|----------------|-----------|------------------|----------------|----------------|-----------|------------------|----------------|----------------|-----------|------------------|----------------|
|                        | # Hospitalized | # Unknown | Total # of Cases | % Hospitalized | # Hospitalized | # Unknown | Total # of Cases | % Hospitalized | # Hospitalized | # Unknown | Total # of Cases | % Hospitalized |
| <b>Bacteria</b>        |                |           |                  |                |                |           |                  |                |                |           |                  |                |
| <i>Campylobacter</i>   | 67             | 51        | 601              | 11.1           | 100            | 87        | 997              | 10.0           | 107            | 99        | 891              | 12.0           |
| <i>Listeria</i>        | 2              | 0         | 2                | 100.0          | 5              | 0         | 5                | 100.0          | 7              | 0         | 7                | 100.0          |
| <i>Salmonella</i>      | 159            | 22        | 770              | 20.6           | 181            | 28        | 834              | 21.7           | 181            | 18        | 691              | 26.2           |
| <i>Shigella</i>        | 24             | 5         | 120              | 20.0           | 44             | 2         | 196              | 22.4           | 40             | 7         | 164              | 24.4           |
| STEC <sup>†</sup> O157 | 27             | 0         | 79               | 34.2           | 20             | 0         | 58               | 34.5           | 8              | 0         | 22               | 36.4           |
| STEC non-O157          | 26             | 0         | 114              | 22.8           | 11             | 3         | 72               | 15.3           | 3              | 1         | 29               | 10.3           |
| <i>Vibrio</i>          | 3              | 1         | 17               | 17.6           | 8              | 1         | 24               | 33.3           | 1              | 2         | 16               | 6.3            |
| <i>Yersinia</i>        | 7              | 0         | 19               | 36.8           | 3              | 0         | 7                | 42.9           | 1              | 0         | 8                | 12.5           |
| <b>Parasites</b>       |                |           |                  |                |                |           |                  |                |                |           |                  |                |
| <i>Cryptosporidium</i> | 20             | 1         | 152              | 13.2           | 32             | 2         | 218              | 14.7           | 35             | 5         | 210              | 16.7           |
| <i>Cyclospora</i>      | 0              | 0         | 1                | 0.0            | 0              | 0         | 2                | 0.0            | 0              | 0         | 2                | 0.0            |
| <b>Total</b>           | 335            | 80        | 1,875            | 17.9           | 404            | 123       | 2,413            | 17.6           | 383            | 132       | 2,040            | 18.8           |

<sup>†</sup>Shiga toxin-producing *Escherichia coli*.

TABLE 13. Number and Percentage of Hospitalizations, by Age Group and Pathogen — FoodNet, 2011 (continued)

|                        | 40–49 years    |           |                  |                | 50–59 years    |           |                  |                | 60–69 years    |           |                  |                |
|------------------------|----------------|-----------|------------------|----------------|----------------|-----------|------------------|----------------|----------------|-----------|------------------|----------------|
|                        | # Hospitalized | # Unknown | Total # of Cases | % Hospitalized | # Hospitalized | # Unknown | Total # of Cases | % Hospitalized | # Hospitalized | # Unknown | Total # of Cases | % Hospitalized |
| <b>Bacteria</b>        |                |           |                  |                |                |           |                  |                |                |           |                  |                |
| <i>Campylobacter</i>   | 122            | 84        | 937              | 13.0           | 177            | 62        | 982              | 18.0           | 137            | 62        | 716              | 19.1           |
| <i>Listeria</i>        | 8              | 0         | 10               | 80.0           | 11             | 0         | 15               | 73.3           | 30             | 1         | 33               | 90.9           |
| <i>Salmonella</i>      | 216            | 7         | 690              | 31.3           | 278            | 25        | 816              | 34.1           | 279            | 7         | 637              | 43.8           |
| <i>Shigella</i>        | 55             | 8         | 162              | 34.0           | 30             | 4         | 101              | 29.7           | 18             | 2         | 60               | 30.0           |
| STEC <sup>†</sup> O157 | 11             | 0         | 22               | 50.0           | 12             | 0         | 36               | 33.3           | 21             | 0         | 33               | 63.6           |
| STEC non-O157          | 10             | 1         | 32               | 31.3           | 3              | 0         | 16               | 18.8           | 12             | 0         | 34               | 35.3           |
| <i>Vibrio</i>          | 5              | 0         | 20               | 25.0           | 13             | 0         | 31               | 41.9           | 9              | 0         | 21               | 42.9           |
| <i>Yersinia</i>        | 5              | 0         | 11               | 45.5           | 5              | 0         | 18               | 27.8           | 10             | 0         | 26               | 38.5           |
| <b>Parasites</b>       |                |           |                  |                |                |           |                  |                |                |           |                  |                |
| <i>Cryptosporidium</i> | 32             | 1         | 134              | 23.9           | 28             | 1         | 118              | 23.7           | 37             | 1         | 143              | 25.9           |
| <i>Cyclospora</i>      | 0              | 0         | 7                | 0.0            | 0              | 0         | 3                | 0.0            | 3              | 0         | 7                | 42.9           |
| <b>Total</b>           | 464            | 101       | 2,025            | 22.9           | 557            | 92        | 2,136            | 26.1           | 556            | 73        | 1,710            | 32.5           |

|                        | 70–79 years    |           |                  |                | 80+ years      |           |                  |                |
|------------------------|----------------|-----------|------------------|----------------|----------------|-----------|------------------|----------------|
|                        | # Hospitalized | # Unknown | Total # of Cases | % Hospitalized | # Hospitalized | # Unknown | Total # of Cases | % Hospitalized |
| <b>Bacteria</b>        |                |           |                  |                |                |           |                  |                |
| <i>Campylobacter</i>   | 106            | 34        | 371              | 28.6           | 104            | 19        | 225              | 46.2           |
| <i>Listeria</i>        | 30             | 0         | 31               | 96.8           | 37             | 0         | 37               | 100.0          |
| <i>Salmonella</i>      | 214            | 7         | 418              | 51.2           | 153            | 8         | 257              | 59.5           |
| <i>Shigella</i>        | 12             | 0         | 23               | 52.2           | 7              | 1         | 13               | 53.8           |
| STEC <sup>†</sup> O157 | 15             | 0         | 26               | 57.7           | 12             | 0         | 15               | 80.0           |
| STEC non-O157          | 10             | 0         | 16               | 62.5           | 5              | 0         | 12               | 41.7           |
| <i>Vibrio</i>          | 4              | 0         | 10               | 40.0           | 5              | 0         | 8                | 62.5           |
| <i>Yersinia</i>        | 8              | 0         | 14               | 57.1           | 7              | 0         | 17               | 41.2           |
| <b>Parasites</b>       |                |           |                  |                |                |           |                  |                |
| <i>Cryptosporidium</i> | 32             | 0         | 109              | 29.4           | 29             | 0         | 70               | 41.4           |
| <i>Cyclospora</i>      | 0              | 0         | 0                | 0.0            | 0              | 0         | 0                | 0.0            |
| <b>Total</b>           | 431            | 41        | 1,018            | 44.1           | 359            | 28        | 654              | 54.9           |

<sup>†</sup>Shiga toxin-producing *Escherichia coli*.

TABLE 14. Number and Percentage of Hospitalizations, by Site and Pathogen — FoodNet, 2011

|                        | California*    |              |           |                  |                | Colorado*      |              |           |                  |                | Connecticut    |              |           |                  |                |
|------------------------|----------------|--------------|-----------|------------------|----------------|----------------|--------------|-----------|------------------|----------------|----------------|--------------|-----------|------------------|----------------|
|                        | # Hospitalized | # Outpatient | # Unknown | Total # of Cases | % Hospitalized | # Hospitalized | # Outpatient | # Unknown | Total # of Cases | % Hospitalized | # Hospitalized | # Outpatient | # Unknown | Total # of Cases | % Hospitalized |
| <b>Bacteria</b>        |                |              |           |                  |                |                |              |           |                  |                |                |              |           |                  |                |
| <i>Campylobacter</i>   | 95             | 674          | 373       | 1142             | 8.3            | 66             | 334          | 5         | 405              | 16.3           | 107            | 536          | 14        | 657              | 16.3           |
| <i>Listeria</i>        | 18             | 0            | 0         | 18               | 100.0          | 28             | 1            | 0         | 29               | 96.6           | 18             | 0            | 0         | 18               | 100.0          |
| <i>Salmonella</i>      | 104            | 382          | 23        | 509              | 20.4           | 67             | 204          | 0         | 271              | 24.7           | 125            | 338          | 7         | 470              | 26.6           |
| <i>Shigella</i>        | 39             | 131          | 17        | 187              | 20.9           | 12             | 37           | 1         | 50               | 24.0           | 8              | 33           | 0         | 41               | 19.5           |
| STEC <sup>†</sup> O157 | 14             | 19           | 2         | 35               | 40.0           | 12             | 13           | 0         | 25               | 48.0           | 11             | 6            | 0         | 17               | 64.7           |
| STEC non-O157          | 3              | 19           | 6         | 28               | 10.7           | 11             | 60           | 0         | 71               | 15.5           | 4              | 21           | 0         | 25               | 16.0           |
| <i>Vibrio</i>          | 0              | 20           | 1         | 21               | 0.0            | 0              | 3            | 0         | 3                | 0.0            | 8              | 18           | 1         | 27               | 29.6           |
| <i>Yersinia</i>        | 4              | 4            | 0         | 8                | 50.0           | 3              | 8            | 0         | 11               | 27.3           | 3              | 4            | 0         | 7                | 42.9           |
| <b>Parasites</b>       |                |              |           |                  |                |                |              |           |                  |                |                |              |           |                  |                |
| <i>Cryptosporidium</i> | 6              | 29           | 6         | 41               | 14.6           | 14             | 32           | 0         | 46               | 30.4           | 9              | 60           | 1         | 70               | 12.9           |
| <i>Cyclospora</i>      | 0              | 0            | 0         | 0                | 0.0            | 0              | 0            | 0         | 0                | 0.0            | 0              | 10           | 0         | 10               | 0.0            |
| <b>Total</b>           | 283            | 1,278        | 428       | 1,989            | 14.2           | 213            | 692          | 6         | 911              | 23.4           | 293            | 1,026        | 23        | 1,342            | 21.8           |

|                        | Georgia        |              |           |                  |                | Maryland       |              |           |                  |                |
|------------------------|----------------|--------------|-----------|------------------|----------------|----------------|--------------|-----------|------------------|----------------|
|                        | # Hospitalized | # Outpatient | # Unknown | Total # of Cases | % Hospitalized | # Hospitalized | # Outpatient | # Unknown | Total # of Cases | % Hospitalized |
| <b>Bacteria</b>        |                |              |           |                  |                |                |              |           |                  |                |
| <i>Campylobacter</i>   | 144            | 493          | 5         | 642              | 22.4           | 111            | 446          | 38        | 595              | 18.7           |
| <i>Listeria</i>        | 9              | 0            | 0         | 9                | 100.0          | 16             | 2            | 1         | 19               | 84.2           |
| <i>Salmonella</i>      | 733            | 1877         | 22        | 2632             | 27.8           | 335            | 628          | 31        | 994              | 33.7           |
| <i>Shigella</i>        | 138            | 526          | 1         | 665              | 20.8           | 22             | 68           | 5         | 95               | 23.2           |
| STEC <sup>†</sup> O157 | 10             | 19           | 0         | 29               | 34.5           | 13             | 17           | 0         | 30               | 43.3           |
| STEC non-O157          | 13             | 77           | 0         | 90               | 14.4           | 6              | 31           | 0         | 37               | 16.2           |
| <i>Vibrio</i>          | 12             | 23           | 0         | 35               | 34.3           | 18             | 18           | 1         | 37               | 48.6           |
| <i>Yersinia</i>        | 7              | 25           | 0         | 32               | 21.9           | 7              | 6            | 0         | 13               | 53.8           |
| <b>Parasites</b>       |                |              |           |                  |                |                |              |           |                  |                |
| <i>Cryptosporidium</i> | 96             | 209          | 1         | 306              | 31.4           | 20             | 47           | 1         | 68               | 29.4           |
| <i>Cyclospora</i>      | 1              | 5            | 0         | 6                | 16.7           | 0              | 1            | 0         | 1                | 0.0            |
| <b>Total</b>           | 1,163          | 3,254        | 29        | 4,446            | 26.2           | 548            | 1,264        | 77        | 1,889            | 29.0           |

\*This FoodNet site includes only selected counties; California includes Alameda, San Francisco, and Contra Costa; Colorado includes Adams, Arapahoe, Denver, Douglas, Jefferson, Boulder, and Broomfield.

<sup>†</sup>Shiga toxin-producing *Escherichia coli*.

TABLE 14. Number and Percentage of Hospitalizations, by Site and Pathogen — FoodNet, 2011 (continued)

|                        | Minnesota      |              |           |                  |                | New Mexico     |            |           |                  |                | New York*      |            |           |                  |                |
|------------------------|----------------|--------------|-----------|------------------|----------------|----------------|------------|-----------|------------------|----------------|----------------|------------|-----------|------------------|----------------|
|                        | # Hospitalized | # Outpatient | # Unknown | Total # of Cases | % Hospitalized | # Hospitalized | Outpatient | # Unknown | Total # of Cases | % Hospitalized | # Hospitalized | Outpatient | # Unknown | Total # of Cases | % Hospitalized |
| <b>Bacteria</b>        |                |              |           |                  |                |                |            |           |                  |                |                |            |           |                  |                |
| <i>Campylobacter</i>   | 167            | 828          | 0         | 995              | 16.8           | 55             | 241        | 12        | 308              | 17.9           | 117            | 551        | 9         | 677              | 17.3           |
| <i>Listeria</i>        | 5              | 1            | 0         | 6                | 83.3           | 15             | 0          | 0         | 15               | 100.0          | 14             | 2          | 0         | 16               | 87.5           |
| <i>Salmonella</i>      | 165            | 536          | 0         | 701              | 23.5           | 94             | 243        | 6         | 343              | 27.4           | 159            | 368        | 7         | 534              | 29.8           |
| <i>Shigella</i>        | 19             | 68           | 0         | 87               | 21.8           | 27             | 97         | 1         | 125              | 21.6           | 10             | 33         | 0         | 43               | 23.3           |
| STEC <sup>†</sup> O157 | 60             | 86           | 0         | 146              | 41.1           | 3              | 9          | 0         | 12               | 25.0           | 17             | 26         | 0         | 43               | 39.5           |
| STEC non-O157          | 18             | 84           | 0         | 102              | 17.6           | 11             | 22         | 0         | 33               | 33.3           | 7              | 23         | 0         | 30               | 23.3           |
| <i>Vibrio</i>          | 3              | 6            | 0         | 9                | 33.3           | 1              | 1          | 0         | 2                | 50.0           | 4              | 2          | 0         | 6                | 66.7           |
| <i>Yersinia</i>        | 12             | 16           | 0         | 28               | 42.9           | 0              | 0          | 0         | 0                | 0.0            | 9              | 14         | 0         | 23               | 39.1           |
| <b>Parasites</b>       |                |              |           |                  |                |                |            |           |                  |                |                |            |           |                  |                |
| <i>Cryptosporidium</i> | 52             | 254          | 1         | 307              | 16.9           | 21             | 122        | 1         | 144              | 14.6           | 6              | 82         | 0         | 88               | 6.8            |
| <i>Cyclospora</i>      | 0              | 0            | 0         | 0                | 0.0            | 0              | 1          | 0         | 1                | 0.0            | 1              | 1          | 0         | 2                | 50.0           |
| <b>Total</b>           | 501            | 1,879        | 1         | 2,381            | 21.0           | 227            | 736        | 20        | 983              | 23.1           | 344            | 1,102      | 16        | 1,462            | 23.5           |

|                        | Oregon         |              |           |                  |                | Tennessee      |            |           |                  |                |
|------------------------|----------------|--------------|-----------|------------------|----------------|----------------|------------|-----------|------------------|----------------|
|                        | # Hospitalized | # Outpatient | # Unknown | Total # of Cases | % Hospitalized | # Hospitalized | Outpatient | # Unknown | Total # of Cases | % Hospitalized |
| <b>Bacteria</b>        |                |              |           |                  |                |                |            |           |                  |                |
| <i>Campylobacter</i>   | 79             | 770          | 108       | 957              | 8.3            | 101            | 283        | 23        | 407              | 24.8           |
| <i>Listeria</i>        | 9              | 0            | 0         | 9                | 100.0          | 3              | 3          | 0         | 6                | 50.0           |
| <i>Salmonella</i>      | 74             | 269          | 3         | 346              | 21.4           | 344            | 587        | 82        | 1013             | 34.0           |
| <i>Shigella</i>        | 12             | 34           | 0         | 46               | 26.1           | 51             | 130        | 21        | 202              | 25.2           |
| STEC <sup>†</sup> O157 | 29             | 38           | 0         | 67               | 43.3           | 32             | 27         | 0         | 59               | 54.2           |
| STEC non-O157          | 12             | 48           | 0         | 60               | 20.0           | 9              | 33         | 3         | 45               | 20.0           |
| <i>Vibrio</i>          | 0              | 5            | 0         | 5                | 0.0            | 4              | 6          | 1         | 11               | 36.4           |
| <i>Yersinia</i>        | 5              | 12           | 0         | 17               | 29.4           | 8              | 15         | 1         | 24               | 33.3           |
| <b>Parasites</b>       |                |              |           |                  |                |                |            |           |                  |                |
| <i>Cryptosporidium</i> | 16             | 175          | 3         | 194              | 8.2            | 37             | 53         | 1         | 91               | 40.7           |
| <i>Cyclospora</i>      | 0              | 0            | 0         | 0                | 0.0            | 1              | 1          | 0         | 2                | 50.0           |
| <b>Total</b>           | 236            | 1,351        | 114       | 1,701            | 13.9           | 590            | 1,138      | 132       | 1,860            | 31.7           |

\*This FoodNet site includes only the Greene, Hamilton, Livingston, Monroe, Montgomery, Niagara, Ontario, Orleans, Otsego, Rensselaer, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, Steuben, Warren, Washington, Wayne, Wyoming, and Yates.

<sup>†</sup>Shiga toxin-producing *Escherichia coli*.

**TABLE 15. Number of Deaths and Case Fatality Rate (CFR), by Pathogen — FoodNet, 2011**

|                        | # Deaths | # Unknown | Total # of Cases | CFR   |
|------------------------|----------|-----------|------------------|-------|
| <b>Bacteria</b>        |          |           |                  |       |
| <i>Campylobacter</i>   | 4        | 764       | 6,785            | 0.06  |
| <i>Listeria</i>        | 28       | 1         | 145              | 19.31 |
| <i>Salmonella</i>      | 29       | 264       | 7,813            | 0.37  |
| <i>Shigella</i>        | 2        | 79        | 1,541            | 0.13  |
| STEC <sup>†</sup> O157 | 2        | 3         | 463              | 0.43  |
| STEC non-O157          | 1        | 11        | 521              | 0.19  |
| <i>Vibrio</i>          | 5        | 6         | 156              | 3.21  |
| <i>Yersinia</i>        | 4        | 6         | 163              | 2.45  |
| <b>Parasites</b>       |          |           |                  |       |
| <i>Cryptosporidium</i> | 7        | 41        | 1,355            | 0.52  |
| <i>Cyclospora</i>      | 0        | 0         | 22               | 0.00  |
| <b>Total</b>           | 82       | 1,175     | 18,964           | 0.43  |

<sup>†</sup>Shiga toxin-producing *Escherichia coli*.



**TABLE 16. Number of Deaths and Case Fatality Rate (CFR), by Age Group and Pathogen — FoodNet, 2011**

|                        | <1 years |           |                  |      | 1–4 years |           |                  |       | 5–9 years |           |                  |      |
|------------------------|----------|-----------|------------------|------|-----------|-----------|------------------|-------|-----------|-----------|------------------|------|
|                        | # Deaths | # Unknown | Total # of Cases | CFR  | # Deaths  | # Unknown | Total # of Cases | CFR   | # Deaths  | # Unknown | Total # of Cases | CFR  |
| <b>Bacteria</b>        |          |           |                  |      |           |           |                  |       |           |           |                  |      |
| <i>Campylobacter</i>   | 0        | 10        | 148              | 0.00 | 0         | 60        | 589              | 0.00  | 1         | 49        | 323              | 0.31 |
| <i>Listeria</i>        | 0        | 0         | 3                | 0.00 | 1         | 0         | 2                | 50.00 | 0         | 0         | 0                | 0.00 |
| <i>Salmonella</i>      | 0        | 32        | 787              | 0.00 | 1         | 59        | 1273             | 0.08  | 0         | 24        | 637              | 0.00 |
| <i>Shigella</i>        | 0        | 1         | 25               | 0.00 | 0         | 13        | 376              | 0.00  | 0         | 13        | 301              | 0.00 |
| STEC <sup>†</sup> O157 | 0        | 0         | 10               | 0.00 | 0         | 0         | 101              | 0.00  | 0         | 1         | 61               | 0.00 |
| STEC non-O157          | 0        | 0         | 24               | 0.00 | 0         | 3         | 121              | 0.00  | 0         | 2         | 51               | 0.00 |
| <i>Vibrio</i>          | 0        | 0         | 0                | 0.00 | 0         | 0         | 5                | 0.00  | 0         | 0         | 4                | 0.00 |
| <i>Yersinia</i>        | 0        | 0         | 20               | 0.00 | 0         | 3         | 17               | 0.00  | 0         | 0         | 6                | 0.00 |
| <b>Parasites</b>       |          |           |                  |      |           |           |                  |       |           |           |                  |      |
| <i>Cryptosporidium</i> | 0        | 0         | 11               | 0.00 | 0         | 1         | 119              | 0.00  | 0         | 3         | 71               | 0.00 |
| <i>Cyclospora</i>      | 0        | 0         | 0                | 0.00 | 0         | 0         | 0                | 0.00  | 0         | 0         | 0                | 0.00 |
| <b>Total</b>           | 0        | 43        | 1,028            | 0.00 | 2         | 139       | 2,603            | 0.08  | 1         | 92        | 1,454            | 0.07 |

|                        | 10–19 years |           |                  |      | 20–29 years |           |                  |      | 30–39 years |           |                  |       |
|------------------------|-------------|-----------|------------------|------|-------------|-----------|------------------|------|-------------|-----------|------------------|-------|
|                        | # Deaths    | # Unknown | Total # of Cases | CFR  | # Deaths    | # Unknown | Total # of Cases | CFR  | # Deaths    | # Unknown | Total # of Cases | CFR   |
| <b>Bacteria</b>        |             |           |                  |      |             |           |                  |      |             |           |                  |       |
| <i>Campylobacter</i>   | 0           | 52        | 601              | 0.00 | 0           | 137       | 997              | 0.00 | 0           | 138       | 891              | 0.00  |
| <i>Listeria</i>        | 0           | 0         | 2                | 0.00 | 0           | 0         | 5                | 0.00 | 1           | 0         | 7                | 14.29 |
| <i>Salmonella</i>      | 0           | 36        | 770              | 0.00 | 0           | 36        | 834              | 0.00 | 0           | 24        | 691              | 0.00  |
| <i>Shigella</i>        | 0           | 6         | 120              | 0.00 | 0           | 15        | 196              | 0.00 | 1           | 12        | 164              | 0.61  |
| STEC <sup>†</sup> O157 | 0           | 1         | 79               | 0.00 | 0           | 0         | 58               | 0.00 | 0           | 1         | 22               | 0.00  |
| STEC non-O157          | 0           | 0         | 114              | 0.00 | 0           | 4         | 72               | 0.00 | 0           | 0         | 29               | 0.00  |
| <i>Vibrio</i>          | 0           | 1         | 17               | 0.00 | 1           | 0         | 24               | 4.17 | 1           | 3         | 16               | 6.25  |
| <i>Yersinia</i>        | 0           | 1         | 19               | 0.00 | 0           | 0         | 7                | 0.00 | 0           | 0         | 8                | 0.00  |
| <b>Parasites</b>       |             |           |                  |      |             |           |                  |      |             |           |                  |       |
| <i>Cryptosporidium</i> | 0           | 3         | 152              | 0.00 | 0           | 10        | 218              | 0.00 | 0           | 12        | 210              | 0.00  |
| <i>Cyclospora</i>      | 0           | 0         | 1                | 0.00 | 0           | 0         | 2                | 0.00 | 0           | 0         | 2                | 0.00  |
| <b>Total</b>           | 0           | 100       | 1,875            | 0.00 | 1           | 202       | 2,413            | 0.04 | 3           | 190       | 2,040            | 0.15  |

<sup>†</sup>Shiga toxin-producing *Escherichia coli*.

TABLE 16. Number of Deaths and Case Fatality Rate, by Age Group and Pathogen — FoodNet, 2011 (continued)

|                        | 40–49 years |           |                  |       | 50–59 years |           |                  |      | 60–69 years |           |                  |       |
|------------------------|-------------|-----------|------------------|-------|-------------|-----------|------------------|------|-------------|-----------|------------------|-------|
|                        | # Deaths    | # Unknown | Total # of Cases | CFR   | # Deaths    | # Unknown | Total # of Cases | CFR  | # Deaths    | # Unknown | Total # of Cases | CFR   |
| <b>Bacteria</b>        |             |           |                  |       |             |           |                  |      |             |           |                  |       |
| <i>Campylobacter</i>   | 0           | 121       | 937              | 0.00  | 0           | 79        | 982              | 0.00 | 1           | 63        | 716              | 0.14  |
| <i>Listeria</i>        | 1           | 0         | 10               | 10.00 | 0           | 0         | 15               | 0.00 | 5           | 1         | 33               | 15.15 |
| <i>Salmonella</i>      | 3           | 16        | 690              | 0.43  | 6           | 14        | 816              | 0.74 | 7           | 9         | 637              | 1.10  |
| <i>Shigella</i>        | 1           | 13        | 162              | 0.62  | 0           | 4         | 101              | 0.00 | 0           | 2         | 60               | 0.00  |
| STEC <sup>†</sup> O157 | 0           | 0         | 22               | 0.00  | 0           | 0         | 36               | 0.00 | 0           | 0         | 33               | 0.00  |
| STEC non-O157          | 0           | 1         | 32               | 0.00  | 0           | 0         | 16               | 0.00 | 0           | 0         | 34               | 0.00  |
| <i>Vibrio</i>          | 0           | 0         | 20               | 0.00  | 3           | 0         | 31               | 9.68 | 0           | 1         | 21               | 0.00  |
| <i>Yersinia</i>        | 0           | 0         | 11               | 0.00  | 1           | 0         | 18               | 5.56 | 0           | 2         | 26               | 0.00  |
| <b>Parasites</b>       |             |           |                  |       |             |           |                  |      |             |           |                  |       |
| <i>Cryptosporidium</i> | 3           | 4         | 134              | 2.24  | 0           | 2         | 118              | 0.00 | 1           | 5         | 143              | 0.70  |
| <i>Cyclospora</i>      | 0           | 0         | 7                | 0.00  | 0           | 0         | 3                | 0.00 | 0           | 0         | 7                | 0.00  |
| <b>Total</b>           | 8           | 155       | 2,025            | 0.40  | 10          | 99        | 2,136            | 0.47 | 14          | 83        | 1,710            | 0.82  |

|                        | 70–79 years |           |                  |       | 80+ years |           |                  |       |
|------------------------|-------------|-----------|------------------|-------|-----------|-----------|------------------|-------|
|                        | # Deaths    | # Unknown | Total # of Cases | CFR   | # Deaths  | # Unknown | Total # of Cases | CFR   |
| <b>Bacteria</b>        |             |           |                  |       |           |           |                  |       |
| <i>Campylobacter</i>   | 0           | 34        | 371              | 0.00  | 2         | 18        | 225              | 0.89  |
| <i>Listeria</i>        | 10          | 0         | 31               | 32.26 | 10        | 0         | 37               | 27.03 |
| <i>Salmonella</i>      | 7           | 6         | 418              | 1.67  | 5         | 7         | 257              | 1.95  |
| <i>Shigella</i>        | 0           | 0         | 23               | 0.00  | 0         | 0         | 13               | 0.00  |
| STEC <sup>†</sup> O157 | 0           | 0         | 26               | 0.00  | 2         | 0         | 15               | 13.33 |
| STEC non-O157          | 0           | 1         | 16               | 0.00  | 1         | 0         | 12               | 8.33  |
| <i>Vibrio</i>          | 0           | 0         | 10               | 0.00  | 0         | 1         | 8                | 0.00  |
| <i>Yersinia</i>        | 1           | 0         | 14               | 7.14  | 2         | 0         | 17               | 11.76 |
| <b>Parasites</b>       |             |           |                  |       |           |           |                  |       |
| <i>Cryptosporidium</i> | 2           | 1         | 109              | 1.83  | 1         | 0         | 70               | 1.43  |
| <i>Cyclospora</i>      | 0           | 0         | 0                | 0.00  | 0         | 0         | 0                | 0.00  |
| <b>Total</b>           | 20          | 42        | 1,018            | 1.96  | 23        | 26        | 654              | 3.52  |

<sup>†</sup>Shiga toxin-producing *Escherichia coli*.

TABLE 17. Number of Deaths and Case Fatality Rate (CFR), by Site and Pathogen — FoodNet, 2011

|                        | California* |           |                  |       | Colorado* |           |                  |       | Connecticut |           |                  |       | Georgia  |           |                  |      | Maryland |           |                  |       |  |
|------------------------|-------------|-----------|------------------|-------|-----------|-----------|------------------|-------|-------------|-----------|------------------|-------|----------|-----------|------------------|------|----------|-----------|------------------|-------|--|
|                        | # Deaths    | # Unknown | Total # of Cases | CFR   | # Deaths  | # Unknown | Total # of Cases | CFR   | # Deaths    | # Unknown | Total # of Cases | CFR   | # Deaths | # Unknown | Total # of Cases | CFR  | # Deaths | # Unknown | Total # of Cases | CFR   |  |
| <b>Bacteria</b>        |             |           |                  |       |           |           |                  |       |             |           |                  |       |          |           |                  |      |          |           |                  |       |  |
| <i>Campylobacter</i>   | 1           | 657       | 1142             | 0.09  | 0         | 0         | 405              | 0.00  | 0           | 0         | 657              | 0.00  | 0        | 68        | 642              | 0.00 | 1        | 22        | 595              | 0.17  |  |
| <i>Listeria</i>        | 2           | 0         | 18               | 11.11 | 8         | 0         | 29               | 27.59 | 2           | 0         | 18               | 11.11 | 0        | 0         | 9                | 0.00 | 2        | 1         | 19               | 10.53 |  |
| <i>Salmonella</i>      | 3           | 32        | 509              | 0.59  | 0         | 0         | 271              | 0.00  | 0           | 0         | 470              | 0.00  | 5        | 173       | 2,632            | 0.19 | 9        | 20        | 994              | 0.91  |  |
| <i>Shigella</i>        | 0           | 21        | 187              | 0.00  | 0         | 0         | 50               | 0.00  | 0           | 0         | 41               | 0.00  | 2        | 53        | 665              | 0.30 | 0        | 3         | 95               | 0.00  |  |
| STEC†O157              | 0           | 1         | 35               | 0.00  | 0         | 0         | 25               | 0.00  | 0           | 0         | 17               | 0.00  | 0        | 2         | 29               | 0.00 | 0        | 0         | 30               | 0.00  |  |
| STEC non-O157          | 0           | 3         | 28               | 0.00  | 0         | 0         | 71               | 0.00  | 0           | 0         | 25               | 0.00  | 0        | 6         | 90               | 0.00 | 0        | 0         | 37               | 0.00  |  |
| <i>Vibrio</i>          | 0           | 1         | 21               | 0.00  | 0         | 0         | 3                | 0.00  | 1           | 0         | 27               | 3.70  | 2        | 2         | 35               | 5.71 | 1        | 2         | 37               | 2.70  |  |
| <i>Yersinia</i>        | 0           | 1         | 8                | 0.00  | 0         | 0         | 11               | 0.00  | 0           | 0         | 7                | 0.00  | 0        | 4         | 32               | 0.00 | 0        | 1         | 13               | 0.00  |  |
| <b>Parasites</b>       |             |           |                  |       |           |           |                  |       |             |           |                  |       |          |           |                  |      |          |           |                  |       |  |
| <i>Cryptosporidium</i> | 0           | 8         | 41               | 0.00  | 2         | 0         | 46               | 4.35  | 0           | 0         | 70               | 0.00  | 3        | 30        | 306              | 0.98 | 0        | 2         | 68               | 0.00  |  |
| <i>Cyclospora</i>      | 0           | 0         | 0                | 0.00  | 0         | 0         | 0                | 0.00  | 0           | 0         | 10               | 0.00  | 0        | 0         | 6                | 0.00 | 0        | 0         | 1                | 0.00  |  |
| <b>Total</b>           | 6           | 724       | 1,989            | 0.30  | 10        | 0         | 911              | 1.10  | 3           | 0         | 1,342            | 0.22  | 12       | 338       | 4,446            | 0.27 | 13       | 51        | 1,889            | 0.69  |  |

|                        | Minnesota |           |                  |       | New Mexico |           |                  |       | New York* |           |                  |       | Oregon   |           |                  |       | Tennessee |           |                  |      |  |
|------------------------|-----------|-----------|------------------|-------|------------|-----------|------------------|-------|-----------|-----------|------------------|-------|----------|-----------|------------------|-------|-----------|-----------|------------------|------|--|
|                        | # Deaths  | # Unknown | Total # of Cases | CFR   | # Deaths   | # Unknown | Total # of Cases | CFR   | # Deaths  | # Unknown | Total # of Cases | CFR   | # Deaths | # Unknown | Total # of Cases | CFR   | # Deaths  | # Unknown | Total # of Cases | CFR  |  |
| <b>Bacteria</b>        |           |           |                  |       |            |           |                  |       |           |           |                  |       |          |           |                  |       |           |           |                  |      |  |
| <i>Campylobacter</i>   | 1         | 0         | 995              | 0.10  | 0          | 11        | 308              | 0.00  | 0         | 0         | 677              | 0.00  | 1        | 0         | 957              | 0.10  | 0         | 6         | 407              | 0.00 |  |
| <i>Listeria</i>        | 4         | 0         | 6                | 66.67 | 5          | 0         | 15               | 33.33 | 3         | 0         | 16               | 18.75 | 2        | 0         | 9                | 22.22 | 0         | 0         | 6                | 0.00 |  |
| <i>Salmonella</i>      | 1         | 0         | 701              | 0.14  | 1          | 6         | 343              | 0.29  | 1         | 0         | 534              | 0.19  | 5        | 0         | 346              | 1.45  | 4         | 33        | 1013             | 0.39 |  |
| <i>Shigella</i>        | 0         | 0         | 87               | 0.00  | 0          | 1         | 125              | 0.00  | 0         | 1         | 43               | 0.00  | 0        | 0         | 46               | 0.00  | 0         | 0         | 202              | 0.00 |  |
| STEC†O157              | 1         | 0         | 146              | 0.68  | 0          | 0         | 12               | 0.00  | 0         | 0         | 43               | 0.00  | 1        | 0         | 67               | 1.49  | 0         | 0         | 59               | 0.00 |  |
| STEC non-O157          | 0         | 0         | 102              | 0.00  | 0          | 0         | 33               | 0.00  | 0         | 0         | 30               | 0.00  | 1        | 0         | 60               | 1.67  | 0         | 2         | 45               | 0.00 |  |
| <i>Vibrio</i>          | 0         | 0         | 9                | 0.00  | 1          | 0         | 2                | 50.00 | 0         | 0         | 6                | 0.00  | 0        | 0         | 5                | 0.00  | 0         | 1         | 11               | 0.00 |  |
| <i>Yersinia</i>        | 1         | 0         | 28               | 3.57  | 0          | 0         | 0                | 0.00  | 3         | 0         | 23               | 13.04 | 0        | 0         | 17               | 0.00  | 0         | 0         | 24               | 0.00 |  |
| <b>Parasites</b>       |           |           |                  |       |            |           |                  |       |           |           |                  |       |          |           |                  |       |           |           |                  |      |  |
| <i>Cryptosporidium</i> | 2         | 0         | 307              | 0.65  | 0          | 0         | 144              | 0.00  | 0         | 0         | 88               | 0.00  | 0        | 0         | 194              | 0.00  | 0         | 1         | 91               | 0.00 |  |
| <i>Cyclospora</i>      | 0         | 0         | 0                | 0.00  | 0          | 0         | 1                | 0.00  | 0         | 0         | 2                | 0.00  | 0        | 0         | 0                | 0.00  | 0         | 0         | 2                | 0.00 |  |
| <b>Total</b>           | 10        | 0         | 2,381            | 0.42  | 7          | 18        | 983              | 0.71  | 7         | 1         | 1,462            | 0.48  | 10       | 0         | 1,701            | 0.59  | 4         | 43        | 1,860            | 0.22 |  |

\*This FoodNet site includes only selected counties; California includes Alameda, San Francisco, and Contra Costa; Colorado includes Adams, Arapahoe, Denver, Douglas, Jefferson, Boulder, and Broomfield; New York includes Albany, Allegany, Cattaraugus, Chautauqua, Chemung, Clinton, Columbia, Delaware, Erie, Essex, Franklin, Fulton, Genesee, Greene, Hamilton, Livingston, Monroe, Montgomery, Niagara, Ontario, Orleans, Otsego, Rensselaer, Saratoga, Schenectady, Schoharie, Schuyler, Seneca, Steuben, Warren, Washington, Wayne, Wyoming, and Yates.

†Shiga toxin-producing *Escherichia coli*

TABLE 18. Outbreak-related Cases, by Pathogen — FoodNet, 2011

|                        | Total number of cases reported | Outbreak-related cases |      | Foodborne |       | Waterborne |      | Animal contact |      | Person-to-person |      | Non Foodborne |     | Environmental contamination other than food/water |     | Indeterminate/Other/Unknown |      |
|------------------------|--------------------------------|------------------------|------|-----------|-------|------------|------|----------------|------|------------------|------|---------------|-----|---|-----|-----------------------------|------|
|                        |                                | #                      | %    | #         | %     | #          | %    | #              | %    | #                | %    | #             | %   | #   | %   | #                           | %    |
| <b>Bacteria</b>        |                                |                        |      |           |       |            |      |                |      |                  |      |               |     |   |     |                             |      |
| <i>Campylobacter</i>   | 6,785                          | 37                     | 0.5  | 32        | 86.5  | 2          | 5.4  | 2              | 5.4  | 1                | 2.7  | 0             | 0.0 | 0   | 0.0 | 0                           | 0.0  |
| <i>Listeria</i>        | 145                            | 44                     | 30.3 | 44        | 100.0 | 0          | 0.0  | 0              | 0.0  | 0                | 0.0  | 0             | 0.0 | 0   | 0.0 | 0                           | 0.0  |
| <i>Salmonella</i>      | 7,813                          | 351                    | 4.5  | 301       | 85.8  | 0          | 0.0  | 16             | 4.6  | 2                | 0.6  | 0             | 0.0 | 0   | 0.0 | 32                          | 9.1  |
| <i>Shigella</i>        | 1,541                          | 81                     | 5.3  | 0         | 0.0   | 5          | 6.2  | 0              | 0.0  | 73               | 90.1 | 0             | 0.0 | 0   | 0.0 | 3                           | 3.7  |
| STEC <sup>†</sup> O157 | 463                            | 54                     | 11.7 | 28        | 51.9  | 3          | 5.6  | 0              | 0.0  | 9                | 16.7 | 0             | 0.0 | 0   | 0.0 | 14                          | 25.9 |
| STEC non-O157          | 521                            | 9                      | 1.7  | 5         | 55.6  | 0          | 0.0  | 0              | 0.0  | 0                | 0.0  | 0             | 0.0 | 0   | 0.0 | 4                           | 44.4 |
| <i>Vibrio</i>          | 156                            | 3                      | 1.9  | 3         | 100.0 | 0          | 0.0  | 0              | 0.0  | 0                | 0.0  | 0             | 0.0 | 0   | 0.0 | 0                           | 0.0  |
| <i>Yersinia</i>        | 163                            | 0                      | 0.0  | 0         | 0.0   | 0          | 0.0  | 0              | 0.0  | 0                | 0.0  | 0             | 0.0 | 0   | 0.0 | 0                           | 0.0  |
| <b>Parasites</b>       |                                |                        |      |           |       |            |      |                |      |                  |      |               |     |   |     |                             |      |
| <i>Cryptosporidium</i> | 1,355                          | 27                     | 2.0  | 4         | 14.8  | 5          | 18.5 | 15             | 55.6 | 2                | 7.4  | 0             | 0.0 | 0   | 0.0 | 1                           | 3.7  |
| <i>Cyclospora</i>      | 22                             | 2                      | 9.1  | 2         | 100.0 | 0          | 0.0  | 0              | 0.0  | 0                | 0.0  | 0             | 0.0 | 0   | 0.0 | 0                           | 0.0  |
| <b>Total</b>           | 18,964                         | 608                    | 3.2  | 419       | 68.9  | 15         | 2.5  | 33             | 5.4  | 87               | 14.3 | 0             | 0.0 | 0   | 0.0 | 54                          | 8.9  |

<sup>†</sup>Shiga toxin-producing *Escherichia coli*.

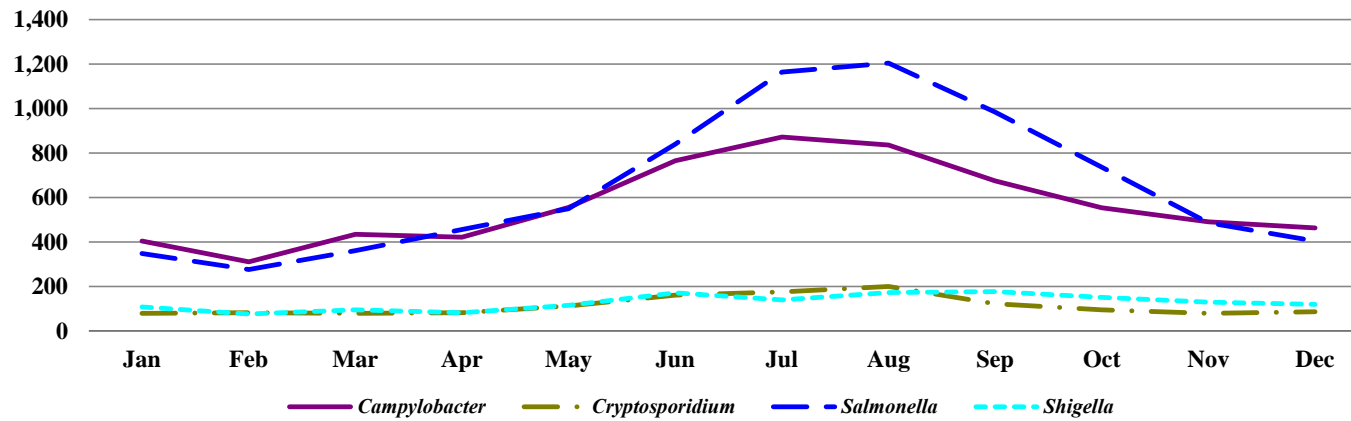
**TABLE 19. Frequency of International Travel, by Pathogen — FoodNet, 2011**

|                        | Total cases reported<br># | Cases with travel information |             | Traveled     |             | Did not travel |             |
|------------------------|---------------------------|-------------------------------|-------------|--------------|-------------|----------------|-------------|
|                        |                           | #                             | %           | #            | %*          | #              | %*          |
| <b>Bacteria</b>        |                           |                               |             |              |             |                |             |
| <i>Campylobacter</i>   | 6,785                     | 4,425                         | 65.2        | 706          | 16.0        | 3,719          | 84.0        |
| <i>Listeria</i>        | 145                       | 129                           | 89.0        | 2            | 1.6         | 127            | 98.4        |
| <i>Salmonella</i>      | 7,813                     | 6,005                         | 76.9        | 523          | 8.7         | 5,482          | 91.3        |
| <i>Shigella</i>        | 1,541                     | 1,085                         | 70.4        | 136          | 12.5        | 949            | 87.5        |
| STEC <sup>†</sup> O157 | 463                       | 446                           | 96.3        | 14           | 3.1         | 432            | 96.9        |
| STEC non-O157          | 521                       | 489                           | 93.9        | 67           | 13.7        | 422            | 86.3        |
| <i>Vibrio</i>          | 156                       | 105                           | 67.3        | 8            | 7.6         | 97             | 92.4        |
| <i>Yersinia</i>        | 163                       | 134                           | 82.2        | 3            | 2.2         | 131            | 97.8        |
| <b>Parasites</b>       |                           |                               |             |              |             |                |             |
| <i>Cryptosporidium</i> | 1,355                     | 1,059                         | 78.2        | 95           | 9.0         | 964            | 91.0        |
| <i>Cyclospora</i>      | 22                        | 21                            | 95.5        | 11           | 52.4        | 10             | 47.6        |
| <b>Total</b>           | <b>18,964</b>             | <b>13,898</b>                 | <b>73.3</b> | <b>1,565</b> | <b>11.3</b> | <b>12,333</b>  | <b>88.7</b> |

\*Among cases with known travel status.

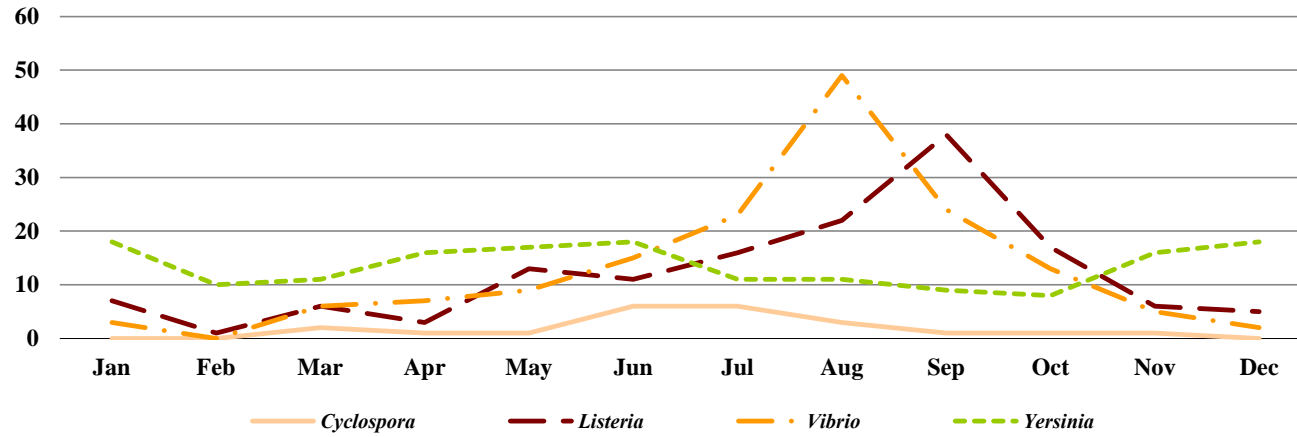
<sup>†</sup>Shiga toxin-producing *Escherichia coli*.

**FIGURE 5. Seasonality of *Campylobacter*, *Cryptosporidium*, *Salmonella*, and *Shigella* Infections — FoodNet, 2011**



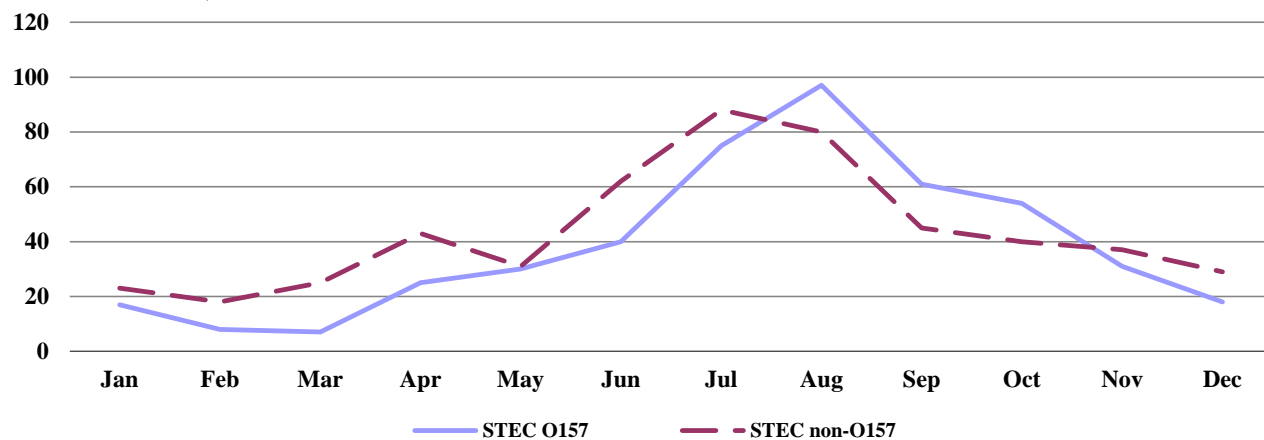
| <b>Pathogen</b>        | <b>Jan</b> | <b>Feb</b> | <b>Mar</b> | <b>Apr</b> | <b>May</b> | <b>Jun</b> | <b>Jul</b> | <b>Aug</b> | <b>Sep</b> | <b>Oct</b> | <b>Nov</b> | <b>Dec</b> |
|------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| <i>Campylobacter</i>   | 405        | 311        | 435        | 422        | 555        | 765        | 872        | 836        | 675        | 554        | 491        | 464        |
| <i>Cryptosporidium</i> | 79         | 82         | 79         | 82         | 112        | 161        | 176        | 200        | 122        | 95         | 80         | 87         |
| <i>Salmonella</i>      | 348        | 276        | 361        | 456        | 550        | 841        | 1,164      | 1,204      | 984        | 737        | 487        | 405        |
| <i>Shigella</i>        | 108        | 76         | 96         | 83         | 115        | 171        | 140        | 173        | 178        | 151        | 130        | 120        |

**FIGURE 6. Seasonality of *Cyclospora*, *Listeria*, *Vibrio*, and *Yersinia* Infections — FoodNet, 2011**



| Pathogen          | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <i>Cyclospora</i> | 0   | 0   | 2   | 1   | 1   | 6   | 6   | 3   | 1   | 1   | 1   | 0   |
| <i>Listeria</i>   | 7   | 1   | 6   | 3   | 13  | 11  | 16  | 22  | 38  | 17  | 6   | 5   |
| <i>Vibrio</i>     | 3   | 0   | 6   | 7   | 9   | 15  | 23  | 49  | 24  | 13  | 5   | 2   |
| <i>Yersinia</i>   | 18  | 10  | 11  | 16  | 17  | 18  | 11  | 11  | 9   | 8   | 16  | 18  |

**FIGURE 7. Seasonality of STEC\* O157 and STEC non-O157 Infections — FoodNet, 2011**

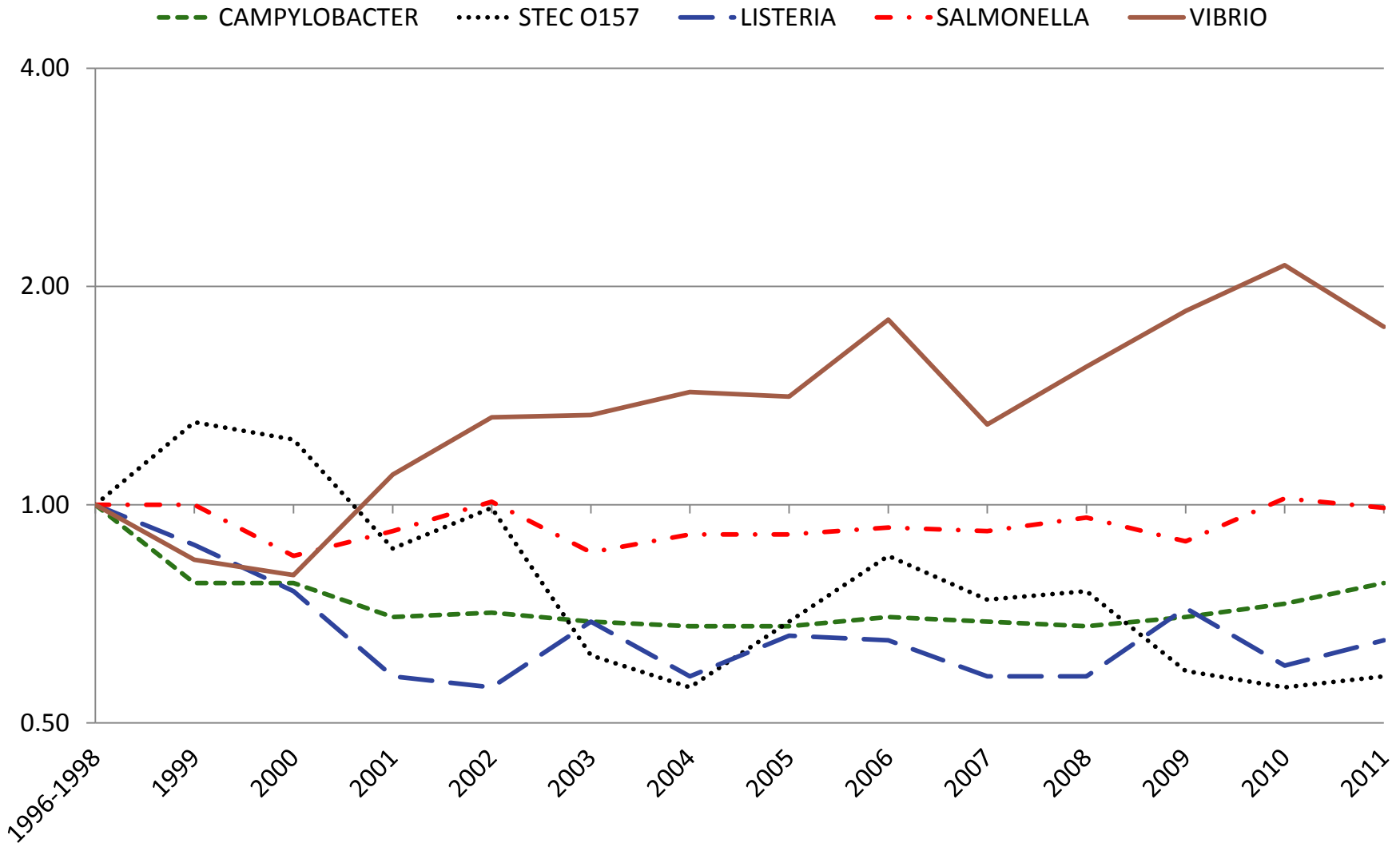


\*Shiga toxin-producing *Escherichia coli*.

| Pathogen             | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|----------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| <b>STEC O157</b>     | 17  | 8   | 7   | 25  | 30  | 40  | 75  | 97  | 61  | 54  | 31  | 18  |
| <b>STEC non-O157</b> | 23  | 18  | 25  | 43  | 31  | 62  | 88  | 80  | 45  | 40  | 37  | 29  |



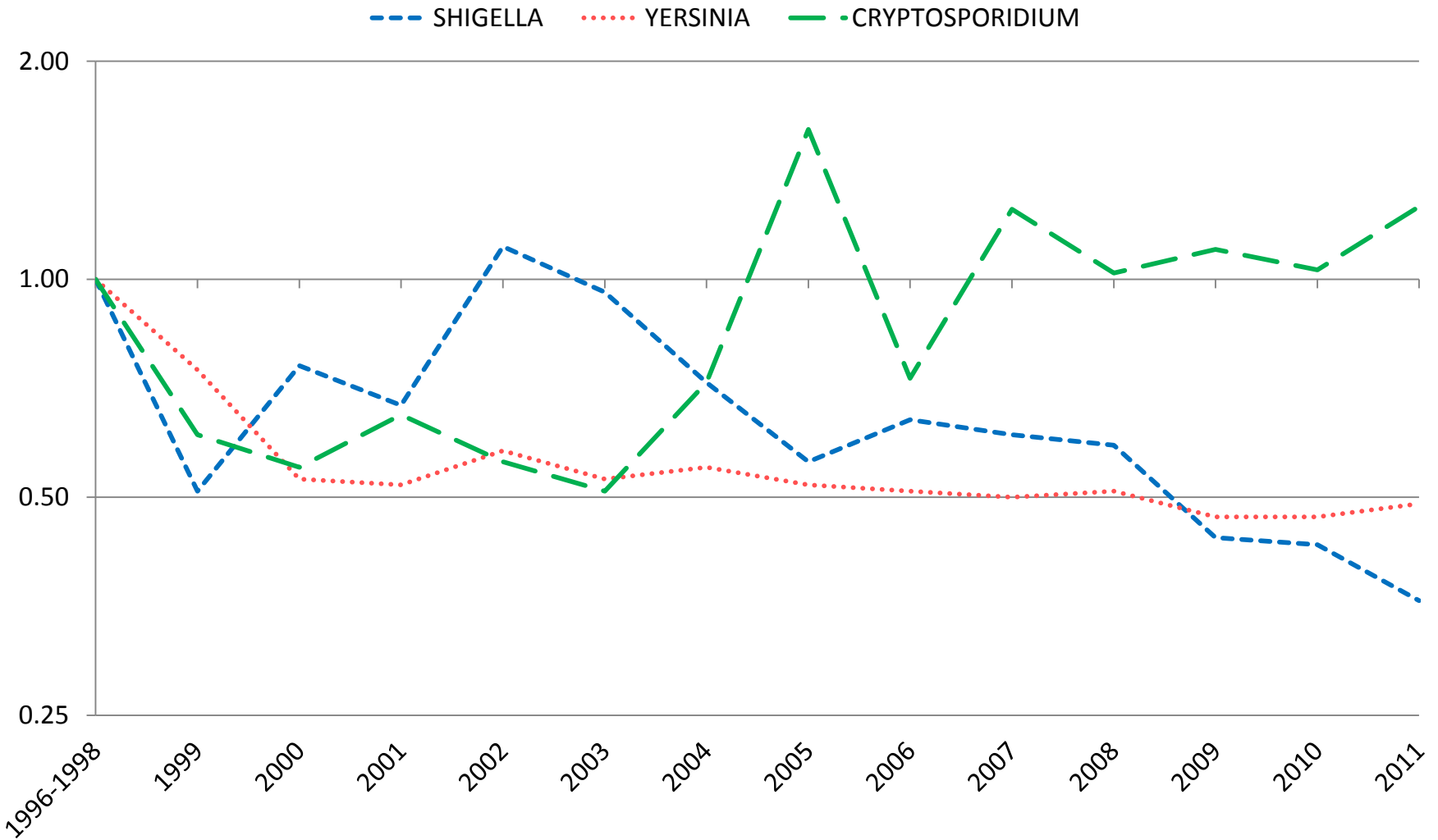
**Figure 8. Relative Rates of Laboratory-confirmed Infections with *Campylobacter*, STEC\* O157, *Listeria*, *Salmonella*, and *Vibrio* Compared with 1996-1998 Rates, by Year, FoodNet 1996-2011<sup>†</sup>**



\* Shiga toxin-producing *Escherichia coli*.

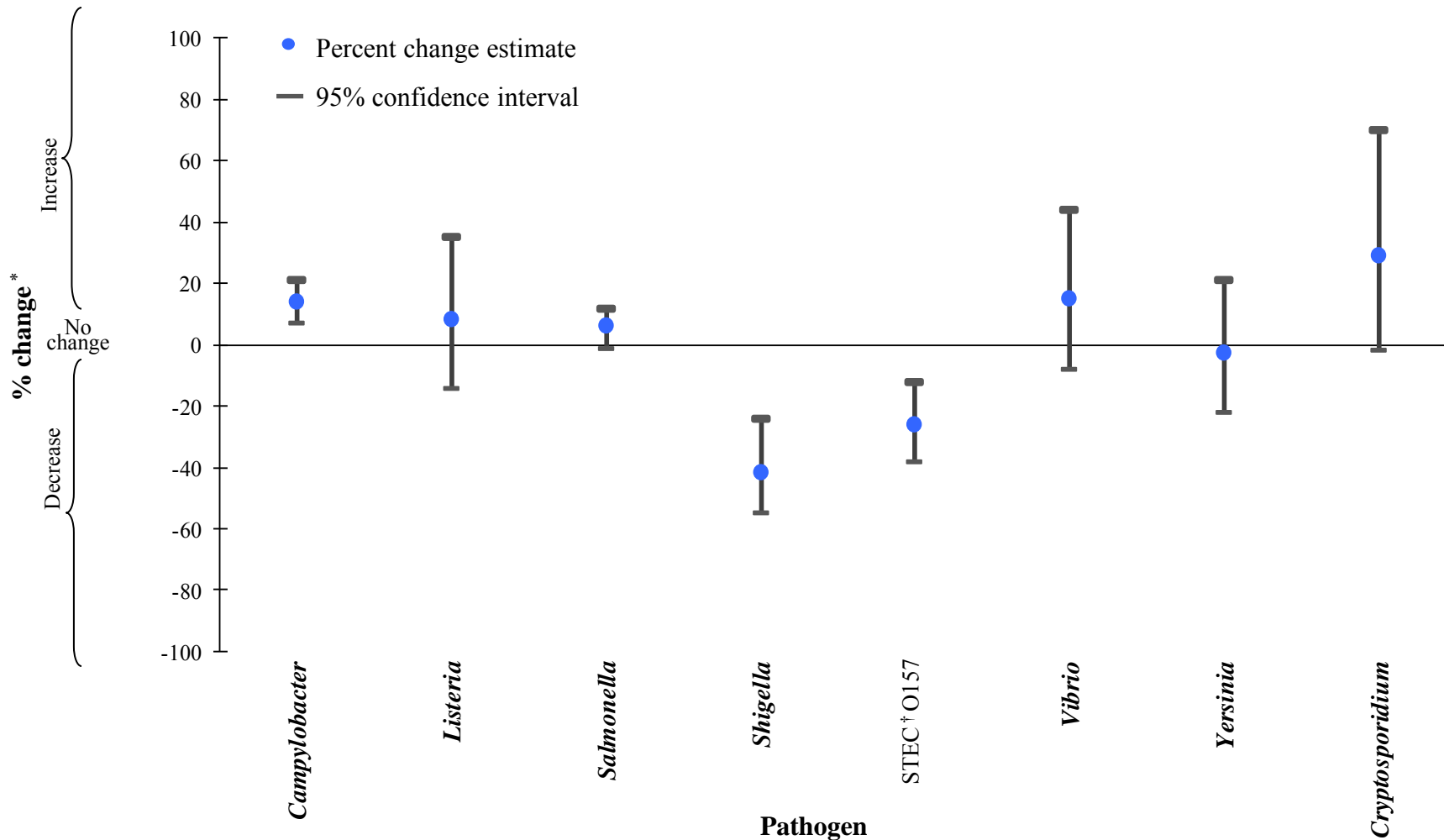
<sup>†</sup> The position of each line indicates the relative change in the incidence of that pathogen compared with 1996-1998. The actual incidences of these infections cannot be determined from this graph.

**Figure 9. Relative Rates of Laboratory-Confirmed Infections with *Shigella*, *Yersinia*, and *Cryptosporidium* Compared with 1996-1998 Rates, by Year, FoodNet 1996-2011\***



\*The position of each line indicates the relative change in the incidence of that pathogen compared with 1996-1998. The actual incidences of these infections cannot be determined from this graph.

**Figure 10. Percent Change in Incidence of Laboratory-Confirmed Bacterial and Parasitic Infections in 2011 Compared with Average Annual Incidence during 2006-2008, by Pathogen, FoodNet**



\*No significant change = 95% confidence interval is both above and below the no change line; significant increase = estimate and entire 95% confidence interval are above the no change line; significant decrease = estimate and entire 95% confidence interval are below the no change line.

† Shiga toxin-producing *Escherichia coli*.

**Table 20. Summary of Post-diarrheal Hemolytic Uremic Syndrome (D<sup>+</sup>HUS) Cases, All Ages – FoodNet, 1997-2010**

|                  | <b>Post-diarrheal<br/>HUS Cases*<br/>number</b> | <b>Age in years<br/>median (range)</b> | <b>Female<br/>number (%)</b> | <b>Days of<br/>Hospitalization<br/>median (range)</b> | <b>Deaths<br/>number (%)</b> | <b>Onset June-<br/>September<br/>number (%)</b> |
|------------------|---|--|------------------------------|---|------------------------------|---|
| <b>1997-2009</b> | 981   | 4.5 (0-89)                             | 567 (58%)                    | 12.0 (0-152)  | 52 (5%)                      | 569 (58%)                                       |
| <b>2010</b>      | 93  | 3.7 (0-88)                             | 54 (58%)                     | 14 (3-60)   | 1 (1%)                       | 61 (66%)  |

\*Based on surveillance case definition; does not include laboratory verification of hemolytic anemia, thrombocytopenia and kidney damage.

**Table 21. Results of Microbiologic Testing for Shiga Toxin-producing *Escherichia coli* (STEC) Infection among Post-diarrheal HUS Case<sup>±</sup>-patients, 1997–2010**

|   | 1997-2009        |            | 2010                 |           |
|---|------------------|------------|----------------------|-----------|
|   | No. (%)          | Total      | No. (%)              | Total     |
| Diarrhea in 3 weeks before HUS diagnosis / Total patients   | 981 (88%)        | 1115       | 93 (97%)             | 96        |
| Stool specimen obtained/ Total patients with diarrhea   | 936 (95%)        | 981        | 90 (97%)             | 93        |
| Stool tested for Shiga toxin/ Patients with stool specimen obtained   | 456 (49%)        | 936        | 76 (84%)             | 90        |
| Stool cultured for <i>E. coli</i> O157/ Patients with stool specimens obtained  | 886 (95%)        | 936        | 86 (96%)             | 90        |
| <i>E. coli</i> O157 isolated from stool/ Patients with stool cultured for <i>E. coli</i> O157   | 506 (57%)        | 886        | 54 (68%)             | 86        |
| Isolation of non-O157 STEC/ Patients with stool specimen obtained and no evidence of <i>E. coli</i> O157  | 18 (4%)          | 430        | 6 (17%)              | 36        |
| Serum positive for antibodies against <i>E. coli</i> / Patients with serum tested for antibodies against <i>E. coli</i> and no evidence of STEC in stool <sup>†</sup> | 84 (21%)*        | 399        | 9 (29%) <sup>‡</sup> | 31        |
| Stool positive for Shiga toxin/ Patients with stool tested for Shiga toxin and no other evidence of STEC  | 13 (12%)         | 106        | 2 (18%)              | 11        |
| <b>Total with any evidence of STEC/Diarrhea in 3 weeks before HUS diagnosis</b>   | <b>621 (63%)</b> | <b>981</b> | <b>71 (76%)</b>      | <b>93</b> |

<sup>±</sup>Based on surveillance case definition; does not include laboratory verification of hemolytic anemia, thrombocytopenia and kidney damage

<sup>†</sup>Information on serum specimens was not collected before 2000

\*Of the 84 positive serum samples, 81 had antibodies against *E. coli* O157 lipopolysacchride (LPS); three had antibodies against *E. coli* O111 LPS

<sup>‡</sup>All 11 positive serum samples had antibodies against *E. coli* O157 LPS

**Table 22. Number and Incidence Rate\* of Post-diarrheal Pediatric HUS cases<sup>†±</sup>, by Site and Age Group, 1997–2010**

| State        | Age <5 years |      | Age 5–14 years |      | Age 15–17 years |      | Age <18 years |      |
|--------------|--------------|------|----------------|------|-----------------|------|---------------|------|
|              | #            | Rate | #              | Rate | #               | Rate | #             | Rate |
| CA           | 41           | 1.54 | 17             | 0.32 | 0               | 0.00 | 58            | 0.61 |
| CO           | 33           | 1.77 | 21             | 0.53 | 2               | 0.19 | 56            | 0.88 |
| CT           | 35           | 1.18 | 35             | 0.53 | 2               | 0.10 | 72            | 0.62 |
| GA           | 76           | 0.94 | 27             | 0.17 | 4               | 0.07 | 107           | 0.37 |
| MD           | 33           | 0.82 | 22             | 0.25 | 4               | 0.12 | 59            | 0.38 |
| MN           | 114          | 2.41 | 56             | 0.56 | 3               | 0.10 | 173           | 0.97 |
| NM           | 13           | 1.30 | 4              | 0.21 | 0               | 0.00 | 17            | 0.47 |
| NY           | 39           | 1.56 | 19             | 0.34 | 5               | 0.25 | 63            | 0.63 |
| OR           | 92           | 2.89 | 31             | 0.47 | 5               | 0.23 | 128           | 1.07 |
| TN           | 108          | 2.63 | 44             | 0.55 | 3               | 0.11 | 155           | 1.03 |
| <b>Total</b> | 584          | 1.70 | 276            | 0.39 | 28              | 0.12 | 888           | 0.70 |

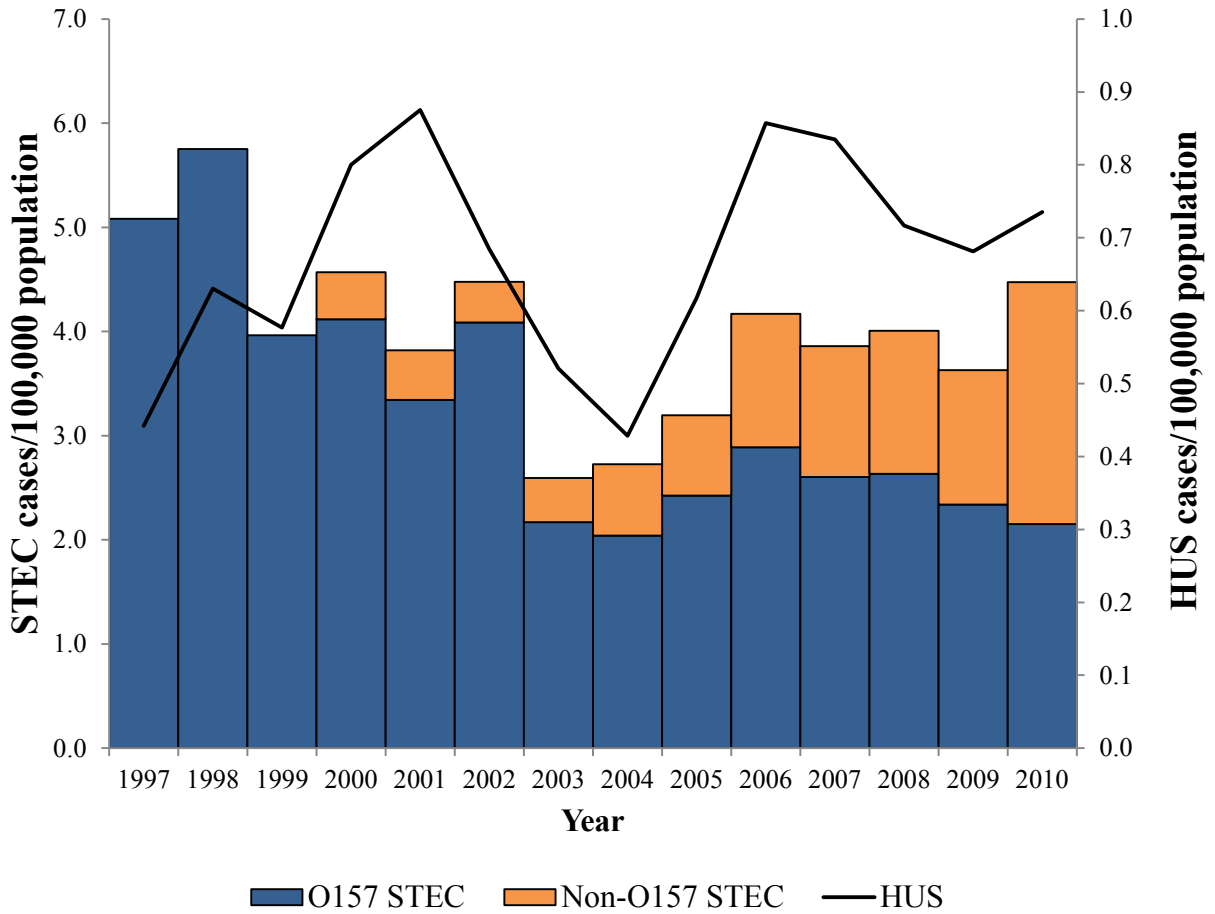
\*Cases per 100,000 population.

<sup>†</sup>Includes cases among persons residing within catchment area only.

<sup>±</sup>Based on surveillance case definition; does not include laboratory verification of hemolytic anemia, thrombocytopenia and kidney damage

<sup>§</sup>HUS surveillance started in CO in 2001; MD in 1999; NM in 204; NY in 1998, and TN in 2000.

**Figure 11. Comparison of Post-diarrheal Incidence Rates of Shiga Toxin-producing *E. coli* (STEC) and Pediatric post-diarrheal Hemolytic Uremic Syndrome (D<sup>+</sup>HUS) — 1997-2010\***



\*Non-O157 STEC became a nationally notifiable disease in 2000.

## FoodNet Variable Definitions

Below is a list and description of variables included in FoodNet active surveillance data. Variable names used in the dataset are indicated by parentheses.

|                              |        |                                     |   |
|------------------------------|--------|-------------------------------------|---|
| Pathogen.....                | Page 1 | Dates of International Travel ..... | 2 |
| Site .....                   | 1      | Immigrate .....                     | 3 |
| Age.....                     | 1      | Specimen source .....               | 3 |
| Sex .....                    | 1      | Specimen Collection Date.....       | 3 |
| Race .....                   | 1      | Specimen Collection Month .....     | 3 |
| Ethnicity.....               | 1      | State Lab Received .....            | 3 |
| County.....                  | 1      | State Lab ID.....                   | 3 |
| Hospitalization .....        | 1      | Sent to CDC.....                    | 3 |
| Hospitalization Dates .....  | 1      | Culture-Independent Variables ..... | 3 |
| Length of Hospital Stay..... | 2      | Serogroup .....                     | 5 |
| Hospital Transfer.....       | 2      | Pregnant.....                       | 5 |
| Death.....                   | 2      | Fetal Outcome.....                  | 5 |
| Bloody Diarrhea.....         | 2      | Underlying Conditions.....          | 5 |
| Diarrhea.....                | 2      | Mom-Baby Pair .....                 | 5 |
| Fever .....                  | 2      | Sterile Site .....                  | 6 |
| HUS .....                    | 2      | Where Pathogen Cultured .....       | 6 |
| Date of Illness Onset .....  | 2      | Where Pathogen Speciated .....      | 6 |
| Outbreak-related.....        | 2      | CSTE Case Definition .....          | 6 |
| CDC Outbreak ID .....        | 2      | Interview.....                      | 6 |
| Outbreak Type.....           | 2      | Serotype/Species.....               | 6 |
| International Travel.....    | 2      | Year .....                          | 6 |
| Travel Destination.....      | 2      |                                     |   |

**Pathogen** [Pathogen]: Format (Character); Length (25). Name of bacterial or parasitic pathogen identified from the case-patient’s specimen (prior to 2011 called ‘Isolate’). Responses include: ‘*Campylobacter*’, ‘*Cryptosporidium*’, ‘*Cyclospora*’, ‘*E. coli*’, ‘*Listeria*’, ‘*Salmonella*’, ‘*Shigella*’, ‘*Vibrio*’, and ‘*Yersinia*’.

**Site** [State]: Format (Character); Length (2). Case-patient’s state of residence (two character state abbreviations).

**Age** [Age]: Format (Numeric); Length (7). Age of case-patient in years (includes two decimal places). *If you would like age defined in months (for persons less than 1 year), please specify this in the comments field of the data request form.*

**Sex** [Sex]: Format (Character); Length (1). Case-patient’s gender. Responses are ‘M’ (Male), ‘F’ (Female), or ‘U’ (Unknown).

**Race** [Race]: Format (Character); Length (1). Case-patient’s race. Responses are ‘A’ (Asian), ‘B’ (Black), ‘I’ (American Indian or Alaskan Native), ‘M’ (Multiracial), ‘O’ (Other), ‘P’ (Pacific Islander or Native Hawaiian), ‘W’ (White), ‘U’ (Unknown).

**Ethnicity** [Ethnicity]: Format (Character); Length (1). Case-patient’s ethnicity. Responses are ‘H’ (Hispanic), ‘N’ (Non-Hispanic), and ‘U’ (Unknown).

**County** [County]: Format (Character); Length (20). Case-patient’s county of residence.

**Hospitalization** [Hospital]: Format (Character); Length (7). Was the case-patient hospitalized within (+/-) 7 days of specimen collection? Responses are ‘Yes’, ‘No’, ‘Unknown’. *Visits to the emergency room are not included unless the patient was subsequently admitted.*

### Hospitalization Dates

- **[DtAdmit]**: Format (Date); Length (mmddyyyy10). Date of hospital admission.
- **[DtDisch]**: Format (Date); Length (mmddyyyy10). Date of hospital discharge.
- **[DtAdmit2]**: Format (Date); Length (mmddyyyy10). Date of admission for second hospitalization, defined as  $\geq 24$  hours after first hospital discharge date.
- **[DtDisch2]**: Format (Date); Length (mmddyyyy10). Date of hospital discharge for second hospitalization, defined as  $\geq 24$  hours after first hospital discharge date.



## FoodNet Variable Definitions

- *If a patient is transferred from one hospital to another, [DtAdmit] will reflect date of admission to first hospital and [DtDisch] will be date discharged from last hospital. [DtAdmit2] and [DtDisch2] are only used if the patient is discharged for at least 24hrs and then re-admitted.*

**Length of Hospital Stay** [HospStay]: Format (Numeric); Length (7). Total length (in days) of hospitalization.

**Hospital Transfer** [HospTrans]: Format (Character); Length (7). If case patient was hospitalized, was s/he transferred to another hospital? Responses are 'Yes', 'No', 'Unknown'.

**Death** [Outcome]: Format (Character); Length (7). Case-patient's outcome. Assessed for non-hospitalized cases within 7 days of specimen collection date and hospitalized cases at hospital discharge. Responses are 'Alive', 'Dead', 'Unknown'. *Does not indicate whether the death resulted from the FoodNet infection, only that the patient died within the specified time period.*

**Bloody Diarrhea** [BloodyDiarr]: Format (Character); Length (10). Did the case-patient have bloody diarrhea (self-reported) during this illness? Responses are 'Yes', 'No', 'Unknown'. *Only available for selected cases from 2012 to current.*

**Diarrhea** [Diarrhea]: Format (Character); Length (10). Did the case-patient have diarrhea (self-reported) during this illness? Responses are 'Yes', 'No', 'Unknown'. *Only available for selected cases from 2012 to current.*

**Fever** [Fever]: Format (Character); Length (10). Did the case-patient have fever (self-reported) during this illness? Responses are 'Yes', 'No', 'Unknown'. *Only available for selected cases from 2012 to current.*

**HUS** [HUS]: Format (Character); Length (7). Did case-patient have a diagnosis of hemolytic uremic syndrome (HUS)? Responses are 'Yes', 'No', 'Unknown'. *Only available for E.coli cases from 2010 to current.*

**Date of Illness Onset** [DtOnset]: Format (Date); Length (mmddyyyy10). Date that the case-patient's symptoms first began. *Only available from 2009 to current.*

**Outbreak-related** [Outbreak]: Format (Character); Length (7). Was the case-patient part of a recognized outbreak? Responses are 'Yes', 'No'. *Only available from 2004 to current.*

**CDC Outbreak ID** [EforsNum]: Format (Character); Length (6). CDC FDOSS outbreak identification number. *Only available from 2004 to current.*

**Outbreak Type** [OutbrkType]: Format (Character); Length (50). Type of transmission mode for the outbreak in which that the case-patient was involved. Responses are 'Foodborne', 'Waterborne', 'Animal contact', 'Person-to-Person', 'Environmental contamination other than food/water', 'Indeterminate', 'Other', 'Unknown'. *Only available from 2004 to current.*

**International Travel** [TravelInt]: Format (Character); Length (7). Did the case-patient travel internationally? Responses are 'Yes', 'No', 'Unknown'. Travel is assessed within 30 days of illness onset for *Salmonella* Typhi, *Salmonella* Paratyphi, and *Listeria*, within 15 days of illness onset for *Cryptosporidium* and *Cyclospora*, and within seven days of illness onset for other FoodNet pathogens. *Only available from 2004 to current.*

**Travel Destination** [TravelDest]: Format (Text); Length (70). To which country did the case-patient travel? Does not include domestic travel destinations. *Only available from 2004 to current.*

### Dates of International Travel

- **[DtUSDepart]**: Format (Date); Length (mmddyyyy10). Date of departure from the U.S.
- **[DtUSReturn]**: Format (Date); Length (mmddyyyy10). Date of return to the U.S.

## FoodNet Variable Definitions

**Immigrate** [Immigrate]: Format (Character); Length (7). Did the case-patient immigrate to the U.S. (*within specific time period*)? Responses are ‘Yes’, ‘No’, ‘Unknown’. Immigration is assessed within 30 days of illness onset for *Salmonella* Typhi, *Salmonella* Paratyphi, and *Listeria*, within 15 days of illness onset for *Cryptosporidium* and *Cyclospora*, and within seven days of illness onset for other FoodNet pathogens. *Only available from 2004 to current.*

**Specimen source** [SpecSrc]: Format (Character); Length (30). Categories include: ‘Abscess’, ‘Blood’, ‘CSF’, ‘Ortho’, ‘Placenta/fetal tissue’, ‘Stool’, ‘Urine’, ‘Other sterile site’, ‘Other’, ‘Unknown’.

**Specimen Collection Date** [DtSpec]: Format (Date); Length (mmddyyyy10). Date of case-patient’s specimen collection.

**Specimen Collection Month** [Month]: Format (Numeric); Length (2). Month of case-patient’s specimen collection. Legal values are 1-12.

**State Lab Received** [StLabRcvd]: Format (Character); Length (7). Was the isolate sent to a state public health laboratory? Responses are ‘Yes’, ‘No’, ‘Unknown’. *This question indicates receipt at any state public health laboratory, including those outside of the FoodNet catchment area.*

**State Lab ID** [SLabsID]: Format (Character); Length (30). State laboratory isolate identification number.

**Sent to CDC** [SentCDC]: Format (Character); Length (7). Was specimen or isolate forwarded to CDC for testing or confirmation? Responses are ‘Yes’, ‘No’, ‘Unknown’.

### Culture-Independent Variables

- **[BioID]:** Format (Character); Length (10). Was the pathogen identified by culture? Responses are ‘Yes’, ‘No’, ‘Unknown’, ‘Not Tested’.
- **[AgClinic]:** Format (Character); Length (30). For possible *E. coli* cases: What was the result of specimen testing for Shiga toxin using an antigen-based test (e.g. EIA or lateral flow) at a clinical laboratory?
  - For *E. coli*, Responses are ‘Stx1+’, ‘Stx2+’, ‘Stx1+ and Stx2+’, ‘Positive undifferentiated’, ‘Negative’, ‘Not tested’.
  - For other pathogens: What was the result of specimen testing using an antigen-based test (e.g. EIA or lateral flow) at a clinical laboratory? Responses are ‘Positive’, ‘Negative’, ‘Indeterminate’, ‘Not tested’. For possible *Cryptosporidium* cases, results from rapid card testing or EIA would be entered.
- **[AgClinicTestType]:** Format (Character); Length (100). Name of antigen-based test used at clinical laboratory. This encompasses both EIA and lateral flow tests. Responses include the following test types, but others can be added as new tests are identified.
  - *E. coli* test types: ‘Immunocard STAT! EHEC (Meridian)’, ‘Duopath Verotoxins (Merck)’, ‘Premier EHEC (Meridian)’, ‘ProSpecT STEC (Remel)’, ‘VTEC Screen (Denka Seiken)’.
  - *Cryptosporidium* test types: ‘ImmunoCard STAT! Crypto/Giardia (Meridian)’, ‘Xpect Crypto (Remel)’, ‘Xpect Crypto/Giardia (Remel)’, ‘ColorPAC Crypto/Giardia (Becton Dickinson)’, ‘ProSpecT Crypto (Remel)’, ‘ProSpecT Crypto/Giardia (Remel)’, ‘Wampole EIA Cryptosporidium’, ‘TechLab EIA Cryptosporidium’, ‘Crypto CELISA (Cellabs)’, ‘Para-TECHT Crypto Antigen 96 (Medical Chemical Corporation)’, ‘Triage parasite panel (BioSite)’.
  - *Campylobacter* test types: ‘ProSpecT Campylobacter assay (Remel)’, ‘PREMIER™ CAMPY assay (Meridian)’, ‘ImmunoCard STAT! CAMPY (Meridian)’, ‘Xpect Campylobacter assay (Remel)’.
  - All pathogens: ‘Other’, ‘Unknown’.
- **[AgSphl]:** Format (Character); Length (30).
  - For possible *E. coli* cases: What was the result of specimen testing for Shiga toxin using an antigen-based test (e.g. EIA or lateral flow) at a state public health laboratory? Responses are ‘Stx1+’, ‘Stx2+’, ‘Stx1+ and Stx2+’, ‘Positive undifferentiated’, ‘Negative’, ‘Not tested’.
  - For other pathogens: What was the result of specimen testing using an antigen-based test (e.g. EIA or lateral flow) at a state public health laboratory? Responses are ‘Positive’, ‘Negative’,

## FoodNet Variable Definitions

- 'Indeterminate', 'Not tested. For possible *Cryptosporidium* cases, results from rapid card testing or EIA would be entered here.
- **[AgSphlTestType]:** Format (Character); Length (100). Name of antigen-based test used at a state public health laboratory. This encompasses both EIA and lateral flow tests. Responses include the following test types, but others can be added as new tests are identified.
    - *E.coli* test types: 'Immunocard STAT! EHEC (Meridian)', 'Duopath Verotoxins (Merck)', 'Premier EHEC (Meridian)', 'ProSpecT STEC (Remel)', 'VTEC Screen (Denka Seiken)'.
    - *Cryptosporidium* test types: 'ImmunoCard STAT! Crypto/Giardia (Meridian)', 'Xpect Crypto (Remel)', 'Xpect Crypto/Giardia (Remel)', 'ColorPAC Crypto/Giardia (Becton Dickinson)', 'ProSpecT Crypto (Remel)', 'ProSpecT Crypto/Giardia (Remel)', 'Wampole EIA Cryptosporidium', 'TechLab EIA Cryptosporidium', 'Crypto CELISA (Cellabs)', 'Para-TECHT Crypto Antigen 96 (Medical Chemical Corporation)', 'Triage parasite panel (BioSite)'.
    - *Campylobacter* test types: 'ProSpecT Campylobacter assay (Remel)', 'PREMIER™ CAMPY assay (Meridian)', 'ImmunoCard STAT! CAMPY (Meridian)', 'Xpect Campylobacter assay (Remel)'.
    - All pathogens: 'Other', 'Unknown'.
  - **[PcrClinic]:** Format (Character); Length (30)
    - For possible *E.coli* cases: what was the result of specimen testing for Shiga toxin using PCR at a clinical laboratory? Responses are 'Stx1+', 'Stx2+', 'Stx1+ and Stx2+', 'Positive undifferentiated', 'Negative', 'Not tested'.
    - For other pathogens: What was the result of specimen testing using PCR at a clinical laboratory? Responses are 'Positive', 'Negative', 'Not tested'. The goal of this PCR testing should be primary detection. If PCR is being performed for subtyping or speciation, then the response should be 'Not tested'.
  - **[PCRClinicTestType]:** Format (Character); Length (100). Name of PCR assay used at a clinical laboratory. Responses include (but are not limited to): 'Diatherix', 'Metamatrix', 'Seegene', 'Statens Serum Institut PCR assay', 'Home brew assay', 'Unknown'.
  - **[PcrSphl]:** Format (Character); Length (30).
    - For possible *E.coli* cases: what was the result of specimen testing for Shiga toxin using PCR at a state public health laboratory? Responses are 'Stx1+', 'Stx2+', 'Stx1+ and Stx2+', 'Positive undifferentiated', 'Negative', 'Not tested'.
    - For other pathogens: What was the result of specimen testing for diagnosis using PCR at a state public health laboratory? Do not enter PCR results if PCR was performed for speciation or subtyping. Responses are 'Positive', 'Negative', 'Not Tested'.
  - **[PcrCdc]:** Format (Character); Length (30)
    - For possible *E.coli* cases: what was the result of specimen testing for Shiga toxin using PCR at CDC? Responses are 'Stx1+', 'Stx2+', 'Stx1+ and Stx2+', 'Positive undifferentiated', 'Negative', 'Not tested'.
    - For other pathogens: What was the result of specimen testing for diagnosis using PCR at CDC? Do not enter PCR results if PCR was performed for speciation or subtyping. Responses include 'Positive', 'Negative', 'Not tested'.
  - **[OtherClinicTest]:** Format (Character); Length (30)
    - For possible *E.coli* cases: What was the result of specimen testing for Shiga toxin using another test at a clinical laboratory? Responses are 'Stx1+', 'Stx2+', 'Stx1+ and Stx2+', 'Positive undifferentiated', 'Negative', 'Not tested'.
    - For other pathogens: What was the result of specimen testing using another test at a clinical laboratory? Responses are 'Positive', 'Negative', 'Indeterminate', 'Not tested'.
  - **[OtherClinicTestType]:** Format (Character); Length (100). Name of other test used at a clinical laboratory. Responses include (but are not limited to) 'DFA-PARA-TECHTTM *Cryptosporidium/Giardia* DFA 75', 'DFA-Merifluor (Meridian)', 'Cellabs Crypto Cel', 'Wet mount', 'Trichrome stain', 'Modified acid-fast', 'Other', 'Unknown test type'. If 'other', please list actual name or description of test.
  - **[OtherSphlTest]:** Format (Character); Length (30)
    - For possible *E.coli* cases: What was the result of specimen testing for Shiga toxin using another test at the state public health laboratory? Responses are 'Stx1+', 'Stx2+', 'Stx1+ and Stx2+',

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‘Positive undifferentiated’, ‘Negative’, ‘Not tested’.

– For other pathogens: What was the result of specimen testing using another test at a state public health laboratory? Responses are ‘Positive’, ‘Negative’, ‘Indeterminate’, ‘Not tested’.

- **[OtherSphlTestType]:** Format (Character); Length (100). Name of other test used at the state public health laboratory. Responses include (but are not limited to) 'DFA-PARA-TECHTTM Cryptosporidium/Giardia DFA 75', 'DFA-Merifluor (Meridian)', 'Cellabs Crypto Cel', 'Wet mount', 'Trichrome stain', 'Modified acid-fast', 'Other', 'Unknown test type'. If 'other', please list actual name or description of test.
- **[OtherCdcTest]:** Format (Character); Length (30)
  - For possible *E.coli* cases: What was the result of specimen testing for Shiga toxin using another test at CDC? Responses are 'Stx1+', 'Stx2+', 'Stx1+ and Stx2+', 'Positive undifferentiated', 'Negative', 'Not tested'.
  - For other pathogens: What was the result of specimen testing using another test at the CDC? Responses are 'Positive', 'Negative', 'Indeterminate', 'Not tested'.
- **[OtherCdcTestType]:** Format (Character); Length (100). Name of other test used at CDC. Responses include (but are not limited to): 'DFA-PARA-TECHTTM Cryptosporidium/Giardia DFA 75', 'DFA-Merifluor (Meridian)', 'Cellabs Crypto Cel', 'Wet mount', 'Trichrome stain', 'Modified acid-fast', 'Other', 'Unknown test type'.

**Serogroup** [SalGroup]: Format (Character); Length (2). *Salmonella* serogroup. *Only available for Salmonella cases.*

**Pregnant** [Pregnant]: Format (Character); Length (7). Is this case pregnancy-associated? Responses are ‘Yes’, ‘No’, ‘Unknown’. *Only available for Listeria cases.*

– Responses will be ‘Yes’ if case occurred in a pregnant woman, or an infant born to a mother with a *Listeria* infection (*Listeria* isolated at birth or within 30 days of delivery; may also include infants who developed symptoms within 30 days of delivery but are cultured >30 days after delivery). If *Listeria* is isolated from both mother and an infant, both will be included in surveillance.

– *This variable refers to a pregnancy-associated infection; it does not ask if the case is pregnant. Therefore, this field can be answered ‘Yes’ for a male infant.*

**Fetal Outcome** [OutFetal]: Format (Character); Length (35). If the case is pregnancy-associated, what was the outcome of the fetus? Responses are ‘Survived, no apparent illness’, ‘Survived, clinical infection’, ‘Live birth/neonatal death’, ‘Abortion/still birth’, ‘Induced abortion’, ‘Unknown’, ‘Abortion, otherwise undetermined’, ‘Live birth, otherwise undetermined’, ‘Survived, otherwise undetermined’. *Only available for Listeria cases.*

**Underlying Conditions** [Comorb1], [Comorb2], [Comorb3], [Comorb4], [Comorb5]: Format (Text); Length (70). What are the underlying causes or associated illness? Responses may include but are not limited to the following: ‘AIDS’, ‘Alcohol Abuse’, ‘Artherosclerotic Cardiovascular Disease (ASCVD/CAD)’, ‘Asthma’, ‘Blunt Trauma’, ‘Burns’, ‘Cirrhosis’, ‘CSF Leak (2 trauma/surgery)’, ‘Diabetes Mellitus’, ‘Emphysema/COPD’, ‘Heart Failure/CHF’, ‘HIV Infection’, ‘Hodgkin's Disease’, ‘Immunoglobulin Deficiency’, ‘Immunosuppressive Therapy (steroids, chemotherapy, radiation)’, ‘IVDU’, ‘Leukemia’, ‘Multiple Myeloma’, ‘Nephrotic Syndrome’, ‘Organ Transplant’, ‘Other Illness’, ‘Other Malignancy’, ‘Penetrating Trauma’, ‘Renal Failure/Dialysis’, ‘Sickle Cell Anemia’, ‘Splenectomy/asplenia’, ‘Surgical Wound (post-operative)’, ‘Systemic Lupus Erythematosus (SLE)’, ‘Unknown’, ‘Varicella’. *Only available for Listeria cases.*

### Mom-Baby Pair

- **[MomBaby]:** Format (Character); Length (7). Is the case part of a mom-baby pair? Responses are ‘Yes’, ‘No’. *Only available for Listeria cases.*
- **[MomBabyID]:** Format (Character); Length (20). If [MomBaby] = ‘Yes’, designates which other case is part of the pair. Response will be the ‘PatID’ field of associated case. *Only available for Listeria cases.*

## FoodNet Variable Definitions

**Sterile Site** [Sterile]: Format (Character); Length (30). Was the specimen source from a sterile body site? Responses are 'Yes', 'No'. *Only available for Listeria cases.*

### Where Pathogen Cultured

- **[CultClinic]:** Format (Character); Length (20). What was the culture result at the clinical lab? Responses are 'Positive', 'Negative', 'Unknown', 'No bacterial growth', 'Not Tested'. *Only available for Campylobacter cases from 2009 to current.*
- **[CultSphl]:** Format (Character); Length (20). What was the culture result at a state public health lab? (*Refers to primary detection; it does not include isolate confirmation*). Responses are 'Positive', 'Negative', 'Unknown', 'No bacterial growth', 'Not Tested'. *Only available for Campylobacter cases from 2009 to current.*
- **[CultCdc]:** Format (Character); Length (20). What was the culture result at CDC? Responses are 'Positive', 'Negative', 'Unknown', 'No bacterial growth', 'Not Tested'. *Only available for Campylobacter cases from 2009 to current.*

**Where Pathogen Speciated** [SpeciesCdc]: Format (Character); Length (60). What was the species result at CDC? *Only available for Campylobacter for 2009 to current.* Responses are: 'jejuni', 'jejuni subsp jejuni', 'jejuni subsp doylei', 'coli', 'lari', 'lari subsp. concheus', 'lari subsp. lari', 'upsaliensis', 'helveticus', 'fetus', 'fetus subsp fetus', 'fetus subsp venerealis', 'hyointestinalis', 'hyointestinalis subsp. hyointestinalis', 'hyointestinalis subsp lawsonii', 'sputorum', 'sputorum bv sputorum', 'sputorum by paraureolyticus', 'laniena', 'mucosalis', 'insulaenigrae', 'concisus', 'curvus', 'rectus', 'showae', 'gracilis', 'canadensis', 'peloridis', 'avium', 'cuniculorum', 'hominis', 'Unknown', 'Not tested'.

**CSTE Case Definition** [CSTE]: Format (Character); Length (20). Classifies *Listeria* and *Cryptosporidium* cases according to CSTE case definition (where it differs from FoodNet definition); for analysis. Responses are 'Yes, confirmed', 'Yes, probable', 'No'. *Only available for Listeria and Cryptosporidium cases.*

**Interview** [Interview]: Format (Character); Length (7). Was the case interviewed by public health (i.e. state or local health department or FoodNet staff)? Responses are 'Yes', 'No', 'Unknown'. *Only available from 2009 to current.*

**Serotype/Species** [SerotypeSummary]: Format (Character); Length (60). Serotype/species of pathogen.

**Year** [Year]: Format (Numeric); Length (4). Year of case-patient's specimen collection.