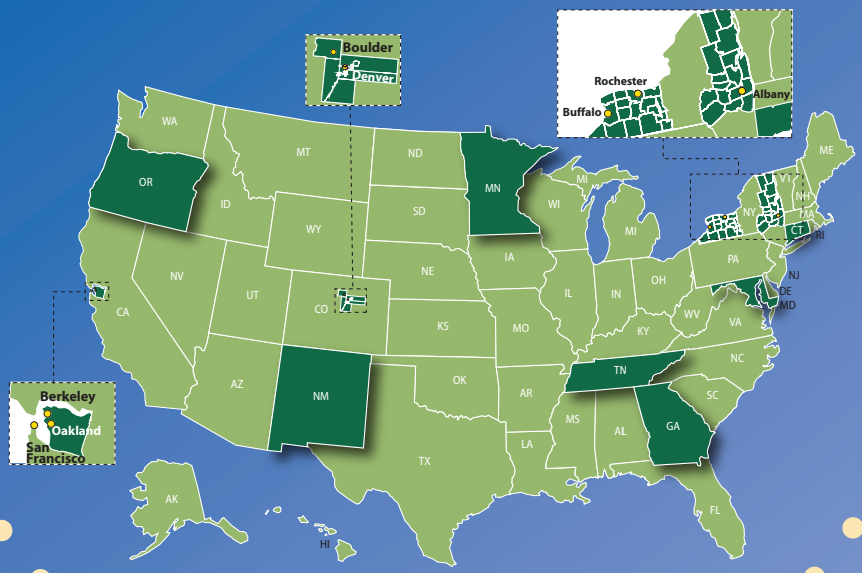

Foodborne Diseases Active Surveillance Network

FoodNet 2012 Surveillance Report

National Center for Emerging and Zoonotic Infectious Diseases
Division of Foodborne Waterborne, and Environmental Diseases

We would like to thank all of our site and federal partners for their participation in the FoodNet program.

- California Emerging Infections Program
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- Maryland Department of Health and Mental Hygiene
- Minnesota Department of Health
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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 changes 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 hemolytic uremic syndrome (HUS). This report describes final FoodNet surveillance data for *Campylobacter*, *Cryptosporidium, Cyclospora, Listeria*, *Salmonella*, Shiga toxin-producing *Escherichia coli* (STEC) O157, STEC non-O157, *Shigella*, *Vibrio*, and *Yersinia* for 2012, HUS for 2011, and changes in incidence since 1996-1998 and since 2006-2008.

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 to 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 2012 included 47.8 million persons or 15.2% of the United States population (Table 2). The demographic composition of the 2012 FoodNet surveillance population was similar to that of the United States population except that the Hispanic population was under-represented (Table 2).

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 from a culture (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) 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)

Surveillance for postdiarrheal HUS (D^+HUS), a complication of STEC infection characterized by renal failure, thrombocytopenia, and microangiopathic hemolytic anemia, is conducted for pediatrics cases through a network of nephrologists and infection control practitioners and by hospital discharge data review. Surveillance is active for children (persons <18 years old), and passive for persons ≥18 years old. For surveillance purposes a case of HUS is defined as any illness diagnosed as D^+HUS by a physician or any hospitalized illness with ICD-9-CM or ICD-10CM codes specifying HUS, acute renal failure with hemolytic anemia and thrombocytopenia, or thrombotic thrombocytopenic purpura with diarrhea caused by STEC (or an unknown pathogen). Pediatric hospital discharge data review has been conducted in FoodNet sites since 2000, with the exception of New Mexico which began in 2012. Laboratory data are collected for each reported case so that a laboratory-defined definition of D^+HUS can be applied for other analyses. FoodNet conducts passive surveillance of D^+HUS in adults.

Analysis

Incidence was calculated by dividing the number of laboratory-confirmed infections in 2012 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 <5 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-effects, log-linear Poisson regression model (negative binomial model) was used to estimate changes in incidence from 1996–1998 to 2012 and from 2006–2008 to 2012 with 95% confidence intervals (CIs). 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, *Vibrio*, and *Yersinia*, six key bacterial pathogens for which >50% of illnesses are estimated to be foodborne, weighting by incidence of infection for each pathogen. For D$^+$HUS, changes in incidence from 2006–2008 to 2011 were estimated. Changes in incidence were not assessed for *Cyclospora* because data were sparse or for STEC non-O157 because of changes in diagnostic practices.

Results

In 2012, FoodNet identified a total of 19,637 laboratory-confirmed cases of infection, 4,600 hospitalizations, and 69 deaths (Tables 11, 14). For individual pathogens tracked, the number of infections and incidence were as follows: *Salmonella* (7,842; 16.37 per 100,000), *Campylobacter* (6,812; 14.22 per 100,000), *Shigella* (2,141; 4.47 per 100,000), *Cryptosporidium* (1,258; 2.63 per 100,000), STEC non-O157 (557; 1.16 per 100,000); STEC O157 (533; 1.11 per 100,000), *Vibrio* (197; 0.41 per 100,000),*Yersinia* (159; 0.33 per 100,000), *Listeria* (123; 0.26 per 100,000), and *Cyclospora* (15; 0.03 per 100,000) (Tables 3, 4). 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 (Tables 5,5a). Both the percentage of persons hospitalized and the case fatality rates (CFRs) were highest among persons aged ≥60 years (Tables 12, 12a, 15, 15a).

Among 6,812 (40%) *Campylobacter* isolates speciated at the state public health laboratory, the most common species were *C. jejuni* (2444 [89%]), *C. coli* (223 [8%]), and *C. upsaliensis* 53 [2%]). Among 7,842 (90%) *Salmonella* isolates serotyped, the most common serotypes were Enteritidis (1,239 [18%]), Typhimurium (922 [13%]), and Newport 907 [13%]). Among the 1,090 (97%) STEC infections with O serogroup identified, the most common serogroups were O157 (533 [49%]), O26 (139 [13%]), and O103 (120 [11%]). Among the 2,141 (93%) *Shigella* isolates with species information, the most common were *S. sonnei* (1611 [80%]), *S. flexneri* (368 [18%]), and *S. boydii* (14[0.7%]). Among the 195 (96%) *Vibrio* isolates with species information, the most common were *V. parahaemolyticus* (113 [59%]), *V. alginolyticus* (26 [14%]), and *V. vulnificus* (21[11%]).

In 2012, the overall estimated incidence of infection with six key pathogens transmitted commonly through food did not change significantly compared with 2006–2008. For individual pathogens, the incidence of infection was significantly higher for *Vibrio* (44% increase; CI = 17%–77%) and *Campylobacter* (13% increase; CI = 6%–21%); incidence did not change significantly for *Cryptosporidium*, *Listeria*, *Salmonella*, STEC O157, *Shigella* or *Yersinia* (Figures 8). Among the top three *Salmonella* serotypes, incidence of infection was significantly lower for Typhimurium (19% decrease; CI = 10%–28%), higher for Newport (23% increase; CI = 0.5%–50%), and unchanged for Enteritidis. For D$^+$HUS, in 2011 compared with 2006–2008, the incidence was significantly lower in children aged <5 years (38% decrease; CI = 12%–57%) and was unchanged for all children.

In 2012, the overall estimated incidence of infection with six key pathogens transmitted commonly through food was 22% lower compared with 1996–1998. For individual pathogens, the incidence of infection was significantly lower during the same period for *Yersinia* (52% decrease; CI = 38%–62%), *Shigella* (47% decrease; CI = 25%–62%), *Listeria* (42% decrease; CI = 24%–55%), STEC O157 (31% decrease; CI = 15%–43%), and *Campylobacter* (22% decrease; CI = 16%–28%), and was higher for *Vibrio* (117% increase; CI = 63%–188%) (Figures 9 and 10). Incidence did not change significantly for *Salmonella* or *Cryptosporidium*. Incidence of infection was significantly lower for *Salmonella* serotype Typhimurium (58% decrease; CI = 52%–63%), and higher for serotypes Newport (80% increase; CI = 37%–135%) and Enteritidis (29% increase; CI = 6%–56%).

In 2011, FoodNet ascertained 83 HUS cases, including 77 (93%) post-diarrheal cases. Among post-diarrheal HUS cases, 3 (4%) persons died. Sixty-eight (88%) pediatric post-diarrheal HUS cases were reported; among these, 37 (54%) cases were in children aged <5 years. Of all post-diarrheal HUS cases, 58 (75%) 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; 51% of all D^+HUS cases were diagnosed during June through September.

Detailed information about active surveillance and HUS data can be found in Tables 19–21 and Figure 11.

Limitations

The findings in this report are subject to at least five limitations. First, health-care–seeking behaviors and other characteristics of the population in the surveillance area might affect the generalizability of the findings. Second, many infections transmitted commonly through food (e.g., norovirus infection) are not monitored by FoodNet because these pathogens are not identified routinely in clinical laboratories. Third, the proportion of illnesses transmitted by nonfood routes differs by pathogen, and the route cannot be determined for individual, nonoutbreak-associated illnesses and, therefore, the data provided in this report do not exclusively relate to infections from foodborne sources. Fourth, in some cases counted as fatal, the infection with the enteric pathogen might not have been the primary cause of death. Finally, year-to-year changes in incidence might reflect either annual variation or sustained trends; further data are needed to discern trends clearly.

Publications and Abstracts in 2012 That Used Data From FoodNet Surveillance

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2. Chai SJ, Crim S, Nisler A, Reynolds J, Swanson KC, Gould LH, et al. The increasing problem of *Salmonella enterica* serotype Newport in infants and in the South, United States. In: Proceedings of the International Conference on Emerging Infectious Diseases; 2012 Mar 11-14; Atlanta, GA. Abstract 150.

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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, emailing FoodNet at foodnet@cdc.gov or contacting the Enteric Diseases Epidemiology Branch at (404) 639-2206

TABLE 1. Foodborne Diseases Active Surveillance Network (FoodNet) Surveillance Area, by State and County — 1996-2012*

State	County	Year									2012 Total Catchment Population
		1996	1997	1998	1999	2000	2001	2002	2003	2004 - Present	
California	Original counties (Alameda and San Francisco)	•	•	•	•	•	•	•	•	•	3,460,180
	Added county (Contra Costa)					•	•	•	•	•	
Colorado	Original counties (Adams, Arapahoe, Denver, Douglas, and Jefferson)						•	•	•	•	2,896,598
	Added counties (Boulder and Broomfield)							•	•	•	
Connecticut	Original counties (Hartford and New Haven)	•	•	•	•	•	•	•	•	•	3,590,347
	Rest of state			•	•	•	•	•	•	•	
Georgia	Original counties (Clayton, Cobb, Dekalb, Douglas, Fulton, Gwinnett, Newton, and Rockdale)	•	•	•	•	•	•	•	•	•	9,919,945
	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)			•	•	•	•	•	•	•	5,884,563
	Added counties (Montgomery and Prince George's)						•	•	•	•	
	Rest of state							•	•	•	
Minnesota	All counties	•	•	•	•	•	•	•	•	•	5,379,139
New Mexico	All counties									•	2,085,538
New York	Original sites (Genesee, Livingston, Monroe, Ontario, Orleans, Wayne, and Yates)			•	•	•	•	•	•	•	4,326,839
	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	•	•	•	•	•	•	•	•	•	3,899,353
Tennessee	Original counties (Cheatham, Davidson, Dickson, Hamilton, Knox, Robertson, Rutherford, Shelby, Sumner, Williamson, and Wilson)					•	•	•	•	•	6,456,243
	Rest of state								•	•	
										Total Surveillance	**47,898,745**

*Based on 2012 intercensal estimates, U.S. Census Bureau

TABLE 2. Comparison of FoodNet Surveillance Population to U.S. Population, Overall and by Site —2012*

	U.S. Population	Total FoodNet Surveillance Population	CA**	CO**	CT	GA	MD	MN	NM	NY**	OR	TN
	#	#	#	#	#	#	#	#	#	#	#	#
Total population	313,914,040	47,898,745	3,460,180	2,896,598	3,590,347	9,919,945	5,884,563	5,379,139	2,085,538	4,326,839	3,899,353	6,456,243
Age												
<5	19,999,344	2,986,919	201,693	192,719	193,456	675,032	365,224	348,338	143,536	230,429	232,516	403,976
5–9	20,475,536	3,094,074	200,268	202,561	218,015	700,885	369,293	360,773	144,236	244,164	239,041	414,838
10–19	42,029,920	6,336,326	394,186	374,829	490,209	1,402,316	773,432	715,660	284,233	569,480	487,734	844,247
20–29	43,981,529	6,613,309	506,032	418,897	449,235	1,409,908	811,949	726,950	292,703	591,919	528,435	877,281
30–39	40,399,194	6,255,115	530,183	431,485	422,138	1,347,890	756,067	687,025	254,809	480,466	519,749	825,303
40–49	42,717,700	6,702,447	512,961	412,778	529,226	1,421,855	856,920	725,083	256,926	593,631	505,535	887,532
50–59	43,351,776	6,740,622	476,379	393,302	545,467	1,298,376	853,272	779,065	287,862	657,768	551,189	897,942
60–69	31,791,038	4,903,942	339,325	266,638	378,270	932,476	591,263	533,803	225,326	487,895	449,811	699,135
70–79	17,497,622	2,567,731	173,489	123,441	200,917	472,927	302,792	289,277	123,072	267,421	229,767	384,628
80+	11,670,381	1,698,260	125,664	79,948	163,414	258,280	204,351	213,165	72,835	203,666	155,576	221,361
Sex												
Male	154,492,067	23,513,733	1,709,669	1,442,638	1,749,916	4,851,024	2,850,403	2,672,169	1,032,707	2,125,732	1,930,712	3,148,763
Female	159,421,973	24,385,012	1,750,511	1,453,960	1,840,431	5,068,921	3,034,160	2,706,970	1,052,831	2,201,107	1,968,641	3,307,480
Ethnicity												
Hispanic	53,027,708	5,551,748	747,002	640,548	510,645	909,902	512,010	264,359	979,722	200,671	474,157	312,732
Non-Hispanic	260,886,332	42,346,997	2,713,178	2,256,050	3,079,702	9,010,043	5,372,553	5,114,780	1,105,816	4,126,168	3,425,196	6,143,511
Race												
White	244,495,567	35,928,231	1,998,747	2,492,559	2,942,335	6,231,978	3,579,276	4,654,134	1,735,255	3,731,724	3,444,767	5,117,456
Black	41,204,793	7,683,980	353,192	160,113	401,496	3,091,904	1,766,990	297,962	51,087	385,694	77,564	1,097,978
Asian/Pacific Islander	16,853,049	2,559,618	906,395	121,550	154,170	362,795	358,021	238,326	36,992	100,794	171,925	108,650
Indian/Native Alaskan	3,857,495	581,422	35,949	40,466	17,688	50,539	32,275	68,961	213,081	26,261	68,955	27,247
Multiple	7,503,136	1,145,494	165,897	81,910	74,658	182,729	148,001	119,756	49,123	82,366	136,142	104,912

* Based on 2012 intercensal estimates, U.S. Census Bureau

** 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, 2012

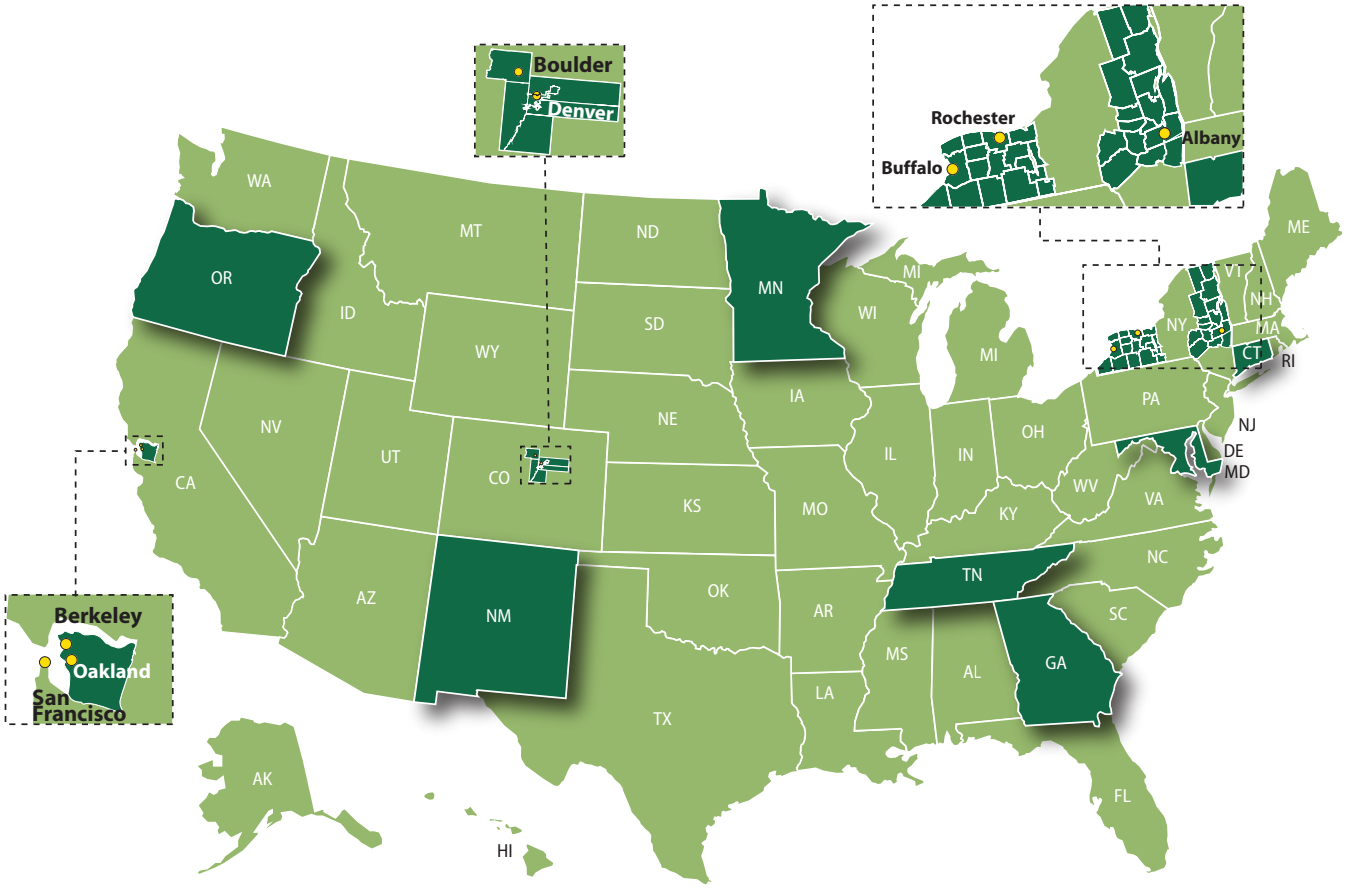


TABLE 3. Number of Laboratory-Confirmed Bacterial and Parasitic Infections, by Site and Pathogen — FoodNet, 2012

	CA*	CO*	CT	GA	MD	MN	NM	NY*	OR	TN	Total
Bacterial											
Campylobacter	1,188	399	599	795	605	951	319	612	895	449	6,812
Listeria**	18	4	22	16	16	6	5	14	15	7	123
Salmonella	483	264	455	2,681	906	781	327	501	387	1,057	7,842
Shigella	215	56	44	666	181	391	96	211	78	203	2,141
STEC† 0157	39	37	19	34	33	123	15	69	95	69	533
STEC non-0157	24	42	32	94	38	114	41	47	73	52	557
Vibrio	27	8	24	29	47	15	1	11	18	17	197
Yersinia	7	4	23	29	10	23	2	24	22	15	159
Parasitic											
Cryptosporidium	48	26	41	275	83	340	94	50	230	71	1,258
Cyclospora		1	6	2	3				1	2	15
Total	2,049	841	1,265	4,621	1,922	2,744	900	1,539	1,814	1,942	19,637

* This FoodNet site includes only selected counties; California includes Alameda, San Francisco, and Contra Costa; Colorado includs 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.*

** Only includes isolates from sterile sites

TABLE 4. Incidence* of Cases of Bacterial and Parasitic Infections Compared with National Health Objectives†, by Site and Pathogen — FoodNet, 2012

	CA†	CO†	CT	GA	MD	MN	NM	NY†	OR	TN	Overall 2012	National 2020 Health Objective§
Bacteria												
Campylobacter	34.33	13.77	16.68	8.01	10.28	17.68	15.30	14.14	22.95	6.95	14.22	8.50
Listeria	0.52	0.14	0.61	0.16	0.27	0.11	0.24	0.32	0.38	0.11	0.26	0.20
Salmonella	13.96	9.11	12.67	27.03	15.40	14.52	15.68	11.58	9.92	16.37	16.37	11.40
Shigella	6.21	1.93	1.23	6.71	3.08	7.27	4.60	4.88	2.00	3.14	4.47	N/A¶
STEC0157**	1.13	1.28	0.53	0.34	0.56	2.29	0.72	1.59	2.44	1.07	1.11	0.60
STEC non-0157	0.69	1.45	0.89	0.95	0.65	2.12	1.97	1.09	1.87	0.81	1.16	N/A¶
Vibrio	0.78	0.28	0.67	0.29	0.80	0.28	0.05	0.25	0.46	0.26	0.41	0.20
Yersinia	0.20	0.14	0.64	0.29	0.17	0.43	0.10	0.55	0.56	0.23	0.33	0.30
Parasites												
Cryptosporidium	1.39	0.90	1.14	2.77	1.41	6.32	4.51	1.16	5.90	1.10	2.63	N/A¶
Cyclospora	0.00	0.03	0.17	0.02	0.05	0.00	0.00	0.00	0.03	0.03	0.03	N/A¶
Surveillance population (millions)	3.46	2.90	3.59	9.92	5.88	5.38	2.09	4.33	3.90	6.46	47.90	

* 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 2020 objectives for incidence of Campylobacter, Listeria, Salmonella, Shiga toxin-producing *Escherichia coli*0157, Vibrio, Yersinia infections for year 2020.

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

** Shiga toxin-producing *Escherichia coli.*

TABLE 5. Number and Incidence* of FoodNet Pathogens, by Age, Sex, Race and Ethnicity—2012

	Campylobacter		*Listeria*		*Salmonella*		*Shigella*		STEC† 0157		STEC† non 0157	
	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate
Age (years)												
<5	728	24.37	6	0.20	1,938	64.88	513	17.17	144	4.82	146	4.89
5–9	325	10.50	0	0.00	597	19.29	454	14.67	71	2.29	41	1.33
10–19	602	9.50	2	0.03	718	11.33	189	2.98	106	1.67	106	1.67
20–29	967	14.62	9	0.14	786	11.89	252	3.81	67	1.01	92	1.39
30–39	905	14.47	4	0.06	719	11.49	272	4.35	33	0.53	44	0.70
40–49	923	13.77	9	0.13	776	11.58	199	2.97	25	0.37	23	0.34
50–59	980	14.54	23	0.34	857	12.71	137	2.03	29	0.43	37	0.55
60–69	777	15.84	21	0.43	701	14.29	73	1.49	27	0.55	37	0.75
70–79	377	14.68	18	0.70	472	18.38	28	1.09	20	0.78	16	0.62
80+	225	13.25	31	1.83	273	16.08	24	1.41	11	0.65	15	0.88
Unknown	3	-	0	-	5	-	0	-	0	-	0	-
Sex												
Female	3,130	12.84	78	0.32	4,086	16.76	1,035	4.24	277	1.14	311	1.28
Male	3,674	15.62	45	0.19	3,745	15.93	1,104	4.70	256	1.09	246	1.05
Unknown	8	-	0	-	11	-	2	-	0	-	0	-
Ethnicity												
Hispanic	636	11.46	15	0.27	684	12.32	404	7.28	36	0.65	85	1.53
Non-Hispanic	4,399	10.39	94	0.22	5,637	13.31	1,424	3.36	443	1.05	419	0.99
Unknown	1,777	-	14	-	1,521	-	313	-	54	-	53	-
Race												
Asian/Pacific Islander	318	12.42	14	0.55	370	14.46	58	2.27	17	0.66	10	0.39
Black	298	3.88	18	0.23	1,070	13.93	538	7.00	32	0.42	21	0.27
Indian/Native Alaskan	79	13.59	1	0.17	68	11.70	40	6.88	4	0.69	5	0.86
Multiple	55	4.80	0	0.00	89	7.77	38	3.32	10	0.87	2	0.17
Other	188	-	1	-	169	-	97	-	11	-	24	-
Unknown	1,437	-	7	-	978	-	255	-	36	-	57	-
White	4,437	12.35	82	0.23	5,098	14.19	1,115	3.10	423	1.18	438	1.22
Total	6,812	14.22	123	0.26	7,842	16.37	2,141	4.47	533	1.11	557	1.16

* Rate per 100,000 population.
† Shiga toxin-producing *Escherichia coli.*

TABLE 5a. Number and Incidence* of FoodNet Pathogens, by Age, Sex, Race, and Ethnicity—2012

	Vibrio		*Yersinia*		*Cryptosporidium*		*Cyclospora*	
	#	Rate	#	Rate	#	Rate	#	Rate
Age (years)								
<5	2	0.07	41	1.37	115	3.85	0	0.00
5–9	8	0.26	9	0.29	95	3.07	0	0.00
10–19	9	0.14	10	0.16	110	1.74	0	0.00
20–29	20	0.30	11	0.17	213	3.22	1	0.02
30–39	20	0.32	11	0.18	171	2.73	4	0.06
40–49	36	0.54	17	0.25	188	2.80	4	0.06
50–59	33	0.49	23	0.34	125	1.85	3	0.04
60–69	35	0.71	10	0.20	102	2.08	3	0.06
70–79	18	0.70	14	0.55	86	3.35	0	0.00
80+	15	0.88	13	0.77	53	3.12	0	0.00
Unknown	1	-	0	-	0	-	0	-
Sex								
Female	61	0.25	77	0.32	689	2.83	8	0.03
Male	136	0.58	82	0.35	569	2.42	7	0.03
Unknown	0	-	0	-	0	-	0	-
Ethnicity								
Hispanic	10	0.18	15	0.27	87	1.57	0	0.00
Non-Hispanic	141	0.33	121	0.29	955	2.26	13	0.03
Unknown	46	-	23	-	216	-	2	-
Race								
Asian/Pacific Islander	9	0.35	10	0.39	20	0.78	0	0.00
Black	22	0.29	13	0.17	131	1.70	1	0.01
Indian/Native Alaskan	0	0.00	0	0.00	9	1.55	0	0.00
Multiple	0	0.00	1	0.09	10	0.87	0	0.00
Other	0	-	4	-	21	-	0	-
Unknown	25	-	22	-	138	-	2	-
White	141	0.39	109	0.30	929	2.59	12	0.03
Total	197	0.41	159	0.33	1,258	2.63	15	0.03

* Rate per 100,000 population.

Table 6. Number of Laboratory-Confirmed *Campylobacter* Infection by Species*, FoodNet 2012

Campylobacter Species	Number of Cases*	% of *Campylobacter* Cases
C. jejuni	2444	35.88
C. coli	223	3.27
C. upsaliensis	53	0.78
C. fetus	10	0.15
C. lari	10	0.15
C. hyointestinalis	1	0.01
C. sputorum	1	0.01
Not speciated	4070	59.75
Total	6,812	100.00

*Species information represent *Campylobacter* isolates that were speciated at State Public Health Laboratory.

TABLE 7. Number and Incidence* of Laboratory-Confirmed *Salmonella* Infections Caused by the Top 20 *Salmonella* Serotypes, by Rank - FoodNet, 2012

Rank		*Salmonella* Serotype	Number of Cases	% of Total *Salmonella* Cases	Incidence Per 100,000 Persons
2007 - 2011	2012				
1	1	Enteritidis	1,239	15.8	2.6
2	2	Typhimurium**	922	11.8	1.9
3	3	Newport	907	11.6	1.9
4	4	Javiana	757	9.7	1.6
5	5	S. I 4,[5],12:i:-***	340	4.3	0.7
8	6	Muenchen	191	2.4	0.4
15	7	Bareilly	183	2.3	0.4
9	7	Montevideo	183	2.3	0.4
6	9	Heidelberg	177	2.3	0.4
7	10	Saintpaul	163	2.1	0.3
11	11	Infantis	152	1.9	0.3
13	12	S. I 13,23:b:-	125	1.6	0.3
17	13	Thompson	105	1.3	0.2
10	14	Braenderup	100	1.3	0.2
13	15	Oranienburg	99	1.3	0.2
18	16	Mississippi	90	1.1	0.2
16	17	Typhi	57	0.7	0.1
25	18	Berta	55	0.7	0.1
21	19	Hadar	51	0.7	0.1
23	20	Hartford	47	0.6	0.1
		Sub total	5,943	75.8	12.4
		All other serotyped isolates	1,126	14.4	2.4
		Not serotyped isolates	431	5.5	0.9
		Partially serotyped isolates	272	3.5	0.6
		Rough or nonmotile isolates	70	0.9	0.1
		Total	7,842	100	16.4

* Rate per 100,00 persons

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

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

TABLE 8. Number and Incidence* of Laboratory-Confirmed STEC† non O157 Infections Caused by the Top Ten O Antigens, — FoodNet, 2012

Rank	STEC O Antigen	Number of Cases	% total STEC non O157 Cases	Incidence per 100,000 Persons
1	026	139	25.0	0.29
2	0103	120	21.5	0.25
3	0111	74	13.3	0.15
4	0121	41	7.4	0.09
5	0145	21	3.8	0.04
6	0118	20	3.6	0.04
7	045	13	2.3	0.03
8	0186	9	1.6	0.02
8	05	9	1.6	0.02
10	071	8	1.4	0.02
	Undetermined	24	4.3	
	Unknown	10	1.8	
	All other	69	12.4	
	Total	557		

* Rate per 100,000 persons

† Shiga toxin-producing *Escherichia coli.*

TABLE 9. Number and Incidence* of Laboratory-Confirmed *Shigella* Infections, by Species — FoodNet, 2012

Shigella Species	Number of Cases	% of Total *Shigella* Cases	Incidence per 100,000 Persons
S. sonnei	1,611	75.2	3.36
S. flexneri	368	17.2	0.77
S. boydii	14	0.7	0.03
S. dysenteriae	4	0.2	0.01
Unknown	144	6.7	0.30
Total	2,141	100	4.47

* Rate per 100,000 persons

TABLE 10. Number and Incidence* of Laboratory-Confirmed *Vibrio* Infections, by Species — FoodNet, 2012

Vibrio species	Number of Cases	% of Total *Vibrio* Cases	Incidence per 100,000 Persons
V. parahaemolyticus	113	57.4	0.24
V. vulnificus	26	13.2	0.05
V. alginolyticus	21	10.7	0.04
V. fluvialis	12	6.1	0.03
V. cholerae non-01. non-0139	7	3.6	0.01
Grimontia hollisae	4	2.0	0.01
V. mimicus	3	1.5	0.01
V. metschnikovii	2	1.0	0.00
V. cholerae 01	1	0.5	0.00
V. cholerae unspecified	1	0.5	0.00
Unknown	7	3.6	0.01
Total	197	100	0.41

*Rate per 100,000 persons

FIGURE 2. Incidence of *Campylobacter*, *Salmonella*, and *Shigella* Infections, by Age Group — FoodNet, 2012

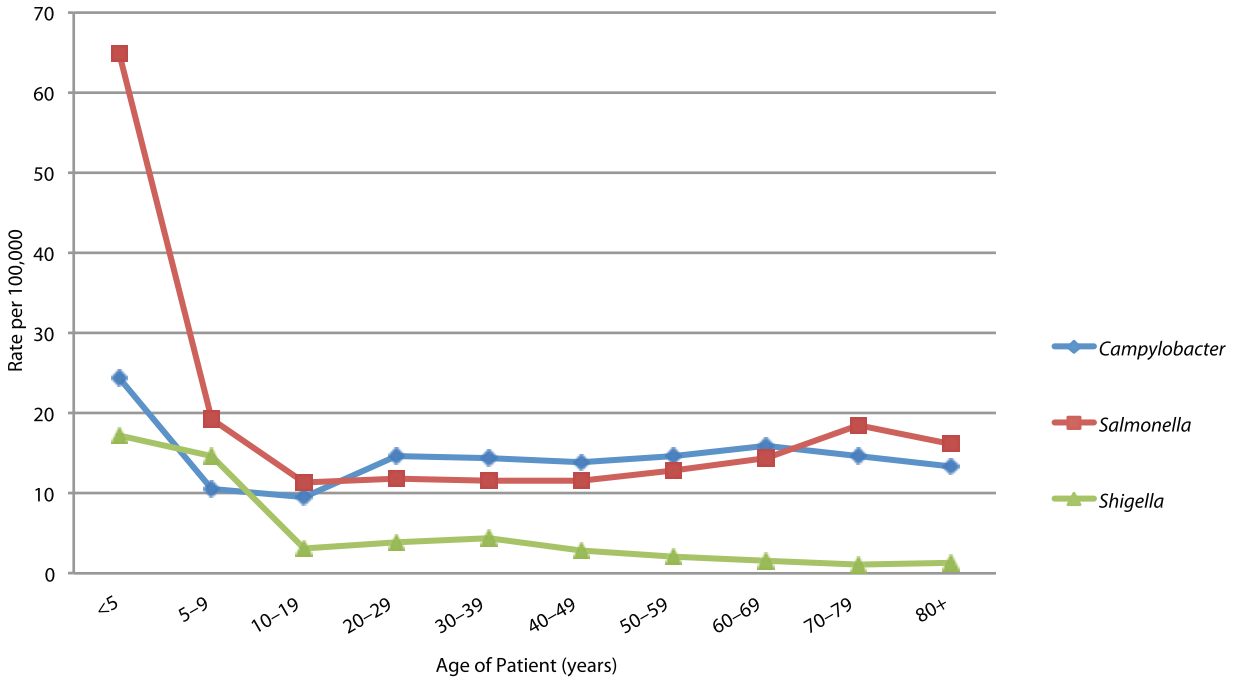


FIGURE 3. Incidence of *Cryptosporidium, Listeria*, and *Yersinia* Infections, by Age Group — FoodNet, 2012

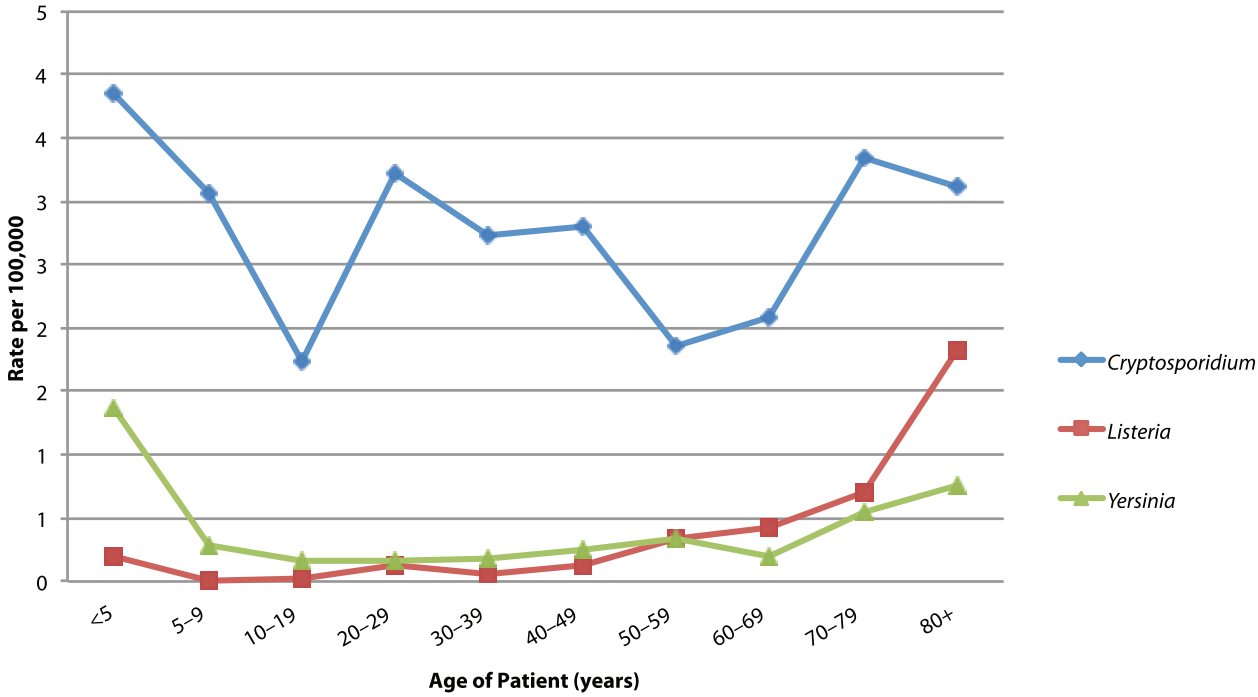
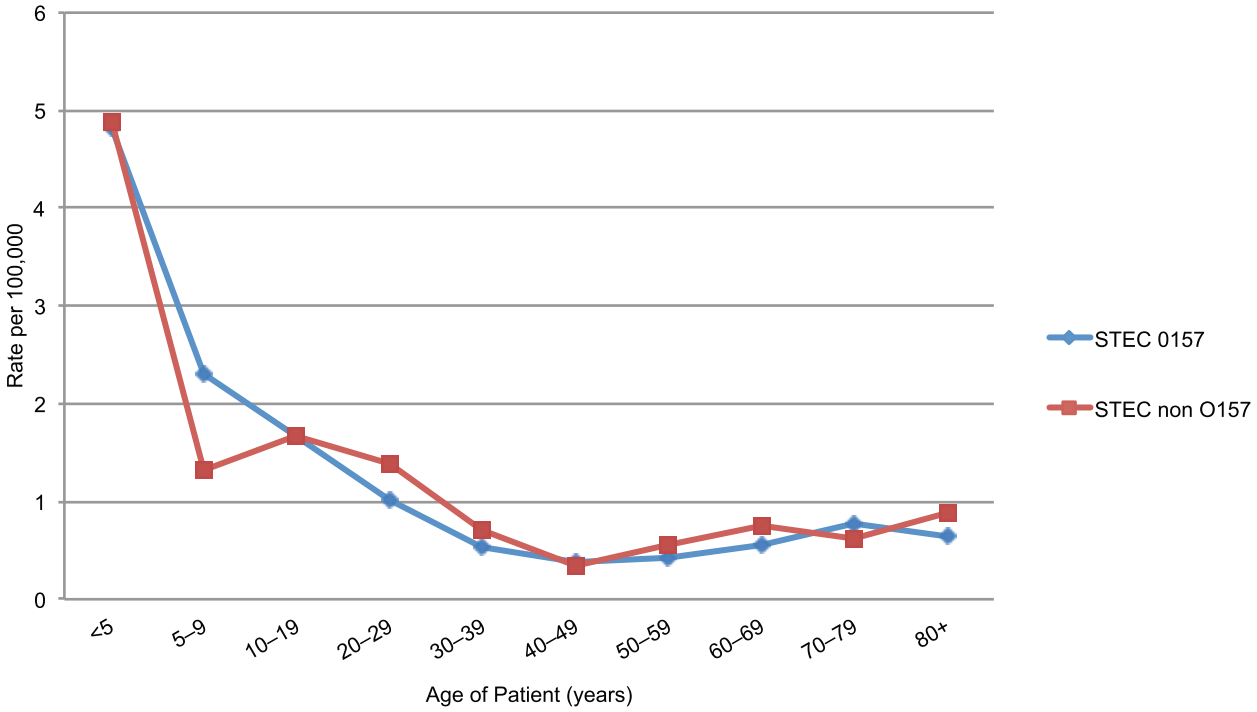


FIGURE 4. Incidence of STEC* O157 and STEC non-O157 Infections, by Age Group — FoodNet, 2012



*Shiga toxin-producing *Escherichia coli*

TABLE 11. Number and Percentage of Cases Hospitalized, by Pathogen — FoodNet, 2012

	# Hospitalized	# Outpatient	# Unknown	Total # of Cases	% Hospitalized
Bacteria					
Campylobacter	1,054	5,119	639	6,812	15.5
Listeria	118	5	0	123	95.9
Salmonella	2,297	5,292	253	7,842	29.3
Shigella	492	1,605	44	2,141	23.0
STEC* 0157	192	337	4	533	36.0
STEC non-0157	88	463	6	557	15.8
Vibrio	56	138	3	197	28.4
Yersinia	59	98	2	159	37.1
Parasites					
Cryptosporidium	241	998	19	1,258	19.2
Cyclospora	3	12	0	15	20.0
Total	4,600	14,067	970	19,637	23.4

*Shiga toxin-producing *Escherichia coli*.

TABLE 12. Number and Percentage of Cases Hospitalized, by Age Group and Pathogen — FoodNet, 2012

	<5 years				5–9 years			
	# Hospitalized	# Unknown	Total # of Cases	% Hospitalized	# Hospitalized	# Unknown	Total # of Cases	% Hospitalized
Bacteria								
Campylobacter	65	65	728	8.9	26	28	325	8.0
Listeria	6	0	6	100.0	0	0	0	0.0
Salmonella	428	63	1,938	22.1	120	14	597	20.1
Shigella	82	10	513	16.0	84	10	454	18.5
STEC* 0157	48	0	144	33.3	29	1	71	40.8
STEC non-0157	12	1	146	8.2	6	0	41	14.6
Vibrio	0	0	2	0.0	0	0	8	0.0
Yersinia	11	2	41	26.8	7	0	9	77.8
Parasites								
Cryptosporidium	14	0	115	12.2	16	1	95	16.8
Cyclospora	0	0	0	0.0	0	0	0	0.0
Total	666	141	3,633	19.1	288	54	1,600	18.0

	10–19 years				20–29 years			
	# Hospitalized	# Unknown	Total # of Cases	% Hospitalized	# Hospitalized	# Unknown	Total # of Cases	% Hospitalized
Bacteria								
Campylobacter	90	65	602	15.0	120	94	967	12.4
Listeria	2	0	2	100.0	9	0	9	100.0
Salmonella	145	21	718	20.2	162	30	786	20.6
Shigella	38	1	189	20.1	80	8	252	31.7
STEC* 0157	32	1	106	30.2	13	2	67	19.4
STEC non-0157	11	2	106	10.4	18	2	92	19.6
Vibrio	2	0	9	22.2	2	1	20	10.0
Yersinia	3	0	10	30.0	4	0	11	36.4
Parasites								
Cryptosporidium	10	1	110	9.1	33	4	213	15.5
Cyclospora	0	0	0	0.0	0	0	1	0.0
Total	333	91	1,852	18.0	441	141	2,418	19.4

	30–39 years			
	# Hospitalized	# Unknown	Total # of Cases	% Hospitalized
Bacteria				
Campylobacter	113	92	905	12.5
Listeria	4	0	4	100.0
Salmonella	176	26	719	24.5
Shigella	69	6	272	25.4
STEC* 0157	12	0	33	36.4
STEC non-0157	8	1	44	18.2
Vibrio	4	0	20	20.0
Yersinia	1	0	11	9.1
Parasites				
Cryptosporidium	23	5	171	13.5
Cyclospora	2	0	4	50.0
Total	412	130	2,183	18.9

*Shiga toxin-producing *Escherichia coli*.

TABLE 12a. Number and Percentage of Cases Hospitalized, by Age Group and Pathogen — FoodNet, 2012

	40–49 years				50–59 years			
	# Hospitalized	# Unknown	Total # of Cases	% Hospitalized	# Hospitalized	# Unknown	Total # of Cases	% Hospitalized
Bacteria								
Campylobacter	118	91	923	12.8	158	85	980	16.1
Listeria	7	0	9	77.8	23	0	23	100.0
Salmonella	225	30	776	29.0	303	28	857	35.4
Shigella	49	8	199	24.6	48	1	137	35.0
STEC* 0157	8	0	25	32.0	14	0	29	48.3
STEC non-0157	6	0	23	26.1	5	0	37	13.5
Vibrio	6	0	36	16.7	9	2	33	27.3
Yersinia	4	0	17	23.5	8	0	23	34.8
Parasites								
Cryptosporidium	45	2	188	23.9	31	3	125	24.8
Cyclospora	0	0	4	0.0	0	0	3	0.0
Total	468	131	2,200	21.3	599	119	2,247	26.7

	60–69 years				70–79 years			
	# Hospitalized	# Unknown	Total # of Cases	% Hospitalized	# Hospitalized	# Unknown	Total # of Cases	% Hospitalized
Bacteria								
Campylobacter	148	70	777	19.0	100	36	377	26.5
Listeria	19	0	21	90.5	17	0	18	94.4
Salmonella	309	22	701	44.1	261	9	472	55.3
Shigella	21	0	73	28.8	12	0	28	42.9
STEC* 0157	15	0	27	55.6	13	0	20	65.0
STEC non-0157	9	0	37	24.3	8	0	16	50.0
Vibrio	12	0	35	34.3	11	0	18	61.1
Yersinia	7	0	10	70.0	6	0	14	42.9
Parasites								
Cryptosporidium	24	2	102	23.5	17	1	86	19.8
Cyclospora	1	0	3	33.3	0	0	0	0.0
Total	565	94	1,786	31.6	445	46	1,049	44.4

	80+ years			
	# Hospitalized	# Unknown	Total # of Cases	% Hospitalized
Bacteria				
Campylobacter	115	11	225	51.1
Listeria	31	0	31	100.0
Salmonella	168	7	273	61.5
Shigella	9	0	24	37.5
STEC* 0157	8	0	11	72.7
STEC non-0157	5	0	15	33.3
Vibrio	10	0	15	66.7
Yersinia	8	0	13	61.5
Parasites				
Cryptosporidium	28	0	53	52.8
Cyclospora	0	0	0	0.0
Total	382	18	660	57.9

*Shiga toxin-producing *Escherichia coli*.

TABLE 13. Number and Percentage of Cases Hospitalized, by Site and Pathogen — FoodNet, 2012

	California*					Colorado*				
	# Hospitalized	# Outpatient	# Unknown	Total # of Cases	% Hospitalized	# Hospitalized	# Outpatient	# Unknown	Total # of Cases	% Hospitalized
Bacteria										
Campylobacter	114	651	423	1188	9.6	56	338	5	399	14.0
Listeria	18	0	0	18	100.0	4	0	0	4	100.0
Salmonella	103	354	26	483	21.3	72	192	0	264	27.3
Shigella	42	158	15	215	19.5	11	45	0	56	19.6
STEC† 0157	11	28	0	39	28.2	15	21	1	37	40.5
STEC non-0157	3	18	3	24	12.5	5	36	1	42	11.9
Vibrio	0	25	2	27	0.0	0	8	0	8	0.0
Yersinia	4	2	1	7	57.1	2	2	0	4	50.0
Parasites										
Cryptosporidium	7	32	9	48	14.6	5	20	1	26	19.2
Cyclospora	0	0	0	0	0.0	1	0	0	1	100.0
Total	302	1,268	479	2,049	14.7	171	662	8	841	20.3

	Connecticut					Georgia				
	# Hospitalized	# Outpatient	# Unknown	Total # of Cases	% Hospitalized	# Hospitalized	# Outpatient	# Unknown	Total # of Cases	% Hospitalized
Bacteria										
Campylobacter	103	487	9	599	17.2	151	633	11	795	19.0
Listeria	22	0	0	22	100.0	15	1	0	16	93.8
Salmonella	115	338	2	455	25.3	793	1863	25	2681	29.6
Shigella	12	32	0	44	27.3	172	488	6	666	25.8
STEC† 0157	6	13	0	19	31.6	16	18	0	34	47.1
STEC non-0157	8	24	0	32	25.0	8	86	0	94	8.5
Vibrio	7	17	0	24	29.2	11	18	0	29	37.9
Yersinia	9	14	0	23	39.1	11	18	0	29	37.9
Parasites										
Cryptosporidium	5	36	0	41	12.2	87	186	2	275	31.6
Cyclospora	1	5	0	6	16.7	0	2	0	2	0.0
Total	288	966	11	1,265	22.8	1,264	3,313	44	4,621	27.4

	Maryland				
	# Hospitalized	# Outpatient	# Unknown	Total # of Cases	% Hospitalized
Bacteria					
Campylobacter	96	469	40	605	15.9
Listeria	15	1	0	16	93.8
Salmonella	300	566	40	906	33.1
Shigella	48	133	0	181	26.5
STEC† 0157	14	19	0	33	42.4
STEC non-0157	8	30	0	38	21.1
Vibrio	17	30	0	47	36.2
Yersinia	4	6	0	10	40.0
Parasites					
Cryptosporidium	38	43	2	83	45.8
Cyclospora	1	2	0	3	33.3
Total	541	1,299	82	1,922	28.1

* 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.

† Shiga toxin-producing *Escherichia coli*.

TABLE 13a. Number and Percentage of Cases Hospitalized, by Site and Pathogen — FoodNet, 2012

	Minnesota					New Mexico				
	# Hospitalized	# Outpatient	# Unknown	Total # of Cases	% Hospitalized	# Hospitalized	# Outpatient	# Unknown	Total # of Cases	% Hospitalized
Bacteria										
Campylobacter	168	783	0	951	17.7	74	238	7	319	23.2
Listeria	6	0	0	6	100.0	5	0	0	5	100.0
Salmonella	202	579	0	781	25.9	101	221	5	327	30.9
Shigella	56	335	0	391	14.3	29	66	1	96	30.2
STEC† 0157	39	84	0	123	31.7	6	9	0	15	40.0
STEC non-0157	18	96	0	114	15.8	13	28	0	41	31.7
Vibrio	6	9	0	15	40.0	0	1	0	1	0.0
Yersinia	2	21	0	23	8.7	0	2	0	2	0.0
Parasites										
Cryptosporidium	37	303	0	340	10.9	27	66	1	94	28.7
Cyclospora	0	0	0	0	0.0	0	0	0	0	0.0
Total	534	2,210	0	2,744	19.5	255	631	14	900	28.3

	New York*					Oregon				
	# Hospitalized	# Outpatient	# Unknown	Total # of Cases	% Hospitalized	# Hospitalized	# Outpatient	# Unknown	Total # of Cases	% Hospitalized
Bacteria										
Campylobacter	109	499	4	612	17.8	72	726	97	895	8.0
Listeria	14	0	0	14	100.0	15	0	0	15	100.0
Salmonella	167	331	3	501	33.3	97	290	0	387	25.1
Shigella	54	157	0	211	25.6	12	66	0	78	15.4
STEC† 0157	25	43	1	69	36.2	30	65	0	95	31.6
STEC non-0157	10	37	0	47	21.3	10	63	0	73	13.7
Vibrio	4	7	0	11	36.4	5	13	0	18	27.8
Yersinia	15	9	0	24	62.5	6	16	0	22	27.3
Parasites										
Cryptosporidium	5	45	0	50	10.0	10	219	1	230	4.3
Cyclospora	0	0	0	0	0.0	0	1	0	1	0.0
Total	403	1,128	8	1,539	26.2	257	1,459	98	1,814	14.2

	Tennessee				
	# Hospitalized	# Outpatient	# Unknown	Total # of Cases	% Hospitalized
Bacteria					
Campylobacter	111	295	43	449	24.7
Listeria	4	3	0	7	57.1
Salmonella	347	558	152	1057	32.8
Shigella	56	125	22	203	27.6
STEC† 0157	30	37	2	69	43.5
STEC non-0157	5	45	2	52	9.6
Vibrio	6	10	1	17	35.3
Yersinia	6	8	1	15	40.0
Parasites					
Cryptosporidium	20	48	3	71	28.2
Cyclospora	0	2	0	2	0.0
Total	585	1,131	226	1,942	30.1

* 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.

† Shiga toxin-producing *Escherichia coli*.

TABLE 14. Number of Deaths and Case Fatality Rate (CFR), by Pathogen — FoodNet, 2012

	# Deaths	# Unknown	Total # of Cases	CFR
Bacteria				
Campylobacter	6	694	6,812	0.09
Listeria	14	0	123	11.38
Salmonella	32	245	7,842	0.41
Shigella	3	86	2,141	0.14
STEC*0157	1	5	533	0.19
STEC non-0157	1	5	557	0.18
Vibrio	6	4	197	3.05
Yersinia	0	3	159	0.00
Parasites				
Cryptosporidium	6	30	1,258	0.48
Cyclospora	0	0	15	0.00
Total	69	1,072	19,637	0.35

*Shiga toxin-producing *Escherichia coli*

TABLE 15. Number of Deaths and Case Fatality Rate (CFR), by Age Group and Pathogen — FoodNet, 2012

	<5 years				5–9 years			
	# Deaths	# Unknown	Total # of Cases	CFR	# Deaths	# Unknown	Total # of Cases	CFR
Bacteria								
Campylobacter	0	67	728	0.00	0	37	325	0.00
Listeria	0	0	6	0.00	0	0	0	0.00
Salmonella	0	67	1938	0.00	1	23	597	0.17
Shigella	0	18	513	0.00	1	15	454	0.22
STEC* 0157	0	1	144	0.00	0	1	71	0.00
STEC non-0157	0	2	146	0.00	0	0	41	0.00
Vibrio	0	0	2	0.00	0	0	8	0.00
Yersinia	0	1	41	0.00	0	0	9	0.00
Parasites								
Cryptosporidium	0	2	115	0.00	0	1	95	0.00
Cyclospora	0	0	0	0.00	0	0	0	0.00
Total	0	158	3,633	0.00	2	77	1,600	0.13

	10–19 years				20–29 years			
	# Deaths	# Unknown	Total # of Cases	CFR	# Deaths	# Unknown	Total # of Cases	CFR
Bacteria								
Campylobacter	0	66	602	0.00	0	114	967	0.00
Listeria	0	0	2	0.00	0	0	9	0.00
Salmonella	1	22	718	0.14	1	31	786	0.13
Shigella	1	6	189	0.53	0	10	252	0.00
STEC* 0157	0	2	106	0.00	0	1	67	0.00
STEC non-0157	0	1	106	0.00	1	2	92	1.09
Vibrio	0	0	9	0.00	0	1	20	0.00
Yersinia	0	0	10	0.00	0	0	11	0.00
Parasites								
Cryptosporidium	0	2	110	0.00	1	8	213	0.47
Cyclospora	0	0	0	0.00	0	0	1	0.00
Total	2	99	1,852	0.11	3	167	2,418	0.12

	30–39 years			
	# Deaths	# Unknown	Total # of Cases	CFR
Bacteria				
Campylobacter	1	116	905	0.11
Listeria	0	0	4	0.00
Salmonella	1	27	719	0.14
Shigella	0	15	272	0.00
STEC* 0157	0	0	33	0.00
STEC non-0157	0	0	44	0.00
Vibrio	1	0	20	5.00
Yersinia	0	0	11	0.00
Parasites				
Cryptosporidium	1	5	171	0.58
Cyclospora	0	0	4	0.00
Total	4	163	2,183	0.18

*Shiga toxin-producing *Escherichia coli*.

TABLE 15a. Number of Deaths and Case Fatality Rate, by Age Group and Pathogen — FoodNet, 2012

	40–49 years				50–59 years			
	# Deaths	# Unknown	Total # of Cases	CFR	# Deaths	# Unknown	Total # of Cases	CFR
Bacteria								
Campylobacter	1	95	923	0.11	2	89	980	0.20
Listeria	3	0	9	33.33	3	0	23	13.04
Salmonella	3	22	776	0.39	4	26	857	0.47
Shigella	0	14	199	0.00	0	4	137	0.00
STEC* 0157	0	0	25	0.00	0	0	29	0.00
STEC non-0157	0	0	23	0.00	0	0	37	0.00
Vibrio	0	0	36	0.00	2	2	33	6.06
Yersinia	0	1	17	0.00	0	1	23	0.00
Parasites								
Cryptosporidium	0	5	188	0.00	2	2	125	1.60
Cyclospora	0	0	4	0.00	0	0	3	0.00
Total	7	137	2,200	0.32	13	124	2,247	0.58

	60–69 years				70–79 years			
	# Deaths	# Unknown	Total # of Cases	CFR	# Deaths	# Unknown	Total # of Cases	CFR
Bacteria								
Campylobacter	0	65	777	0.00	0	34	377	0.00
Listeria	1	0	21	4.76	1	0	18	5.56
Salmonella	8	14	701	1.14	5	6	472	1.06
Shigella	0	4	73	0.00	0	0	28	0.00
STEC* 0157	0	0	27	0.00	1	0	20	5.00
STEC non-0157	0	0	37	0.00	0	0	16	0.00
Vibrio	2	1	35	5.71	1	0	18	5.56
Yersinia	0	0	10	0.00	0	0	14	0.00
Parasites								
Cryptosporidium	1	2	102	0.98	0	1	86	0.00
Cyclospora	0	0	3	0.00	0	0	0	0.00
Total	12	86	1,786	0.67	8	41	1,049	0.76

	80+ years			
	# Deaths	# Unknown	Total # of Cases	CFR
Bacteria				
Campylobacter	2	9	225	0.89
Listeria	6	0	31	19.35
Salmonella	8	5	273	2.93
Shigella	1	0	24	4.17
STEC* 0157	0	0	11	0.00
STEC non-0157	0	0	15	0.00
Vibrio	0	0	15	0.00
Yersinia	0	0	13	0.00
Parasites				
Cryptosporidium	1	2	53	1.89
Cyclospora	0	0	0	0.00
Total	18	16	660	2.73

*Shiga toxin-producing *Escherichia coli*.

TABLE 16. Number of Deaths and Case Fatality Rate (CFR), by Site and Pathogen — FoodNet, 2012

	California*				Colorado*			
	# Deaths	# Unknown	Total # of Cases	CFR	# Hospitalized	# Unknown	Total # of Cases	CFR
Bacteria								
Campylobacter	0	569	1188	0.00	1	0	399	0.25
Listeria	2	0	18	11.11	0	0	4	0.00
Salmonella	1	32	483	0.21	1	0	264	0.38
Shigella	0	20	215	0.00	0	0	56	0.00
STEC† 0157	0	0	39	0.00	0	0	37	0.00
STEC non-0157	1	2	24	4.17	0	0	42	0.00
Vibrio	0	2	27	0.00	0	0	8	0.00
Yersinia	0	3	7	0.00	0	0	4	0.00
Parasites								
Cryptosporidium	0	9	48	0.00	0	0	26	0.00
Cyclospora	0	0	0	0.00	0	0	1	0.00
Total	4	637	2,049	0.20	2	0	841	0.24

	Connecticut				Georgia			
	# Deaths	# Unknown	Total # of Cases	CFR	# Hospitalized	# Unknown	Total # of Cases	CFR
Bacteria								
Campylobacter	0	0	599	0.00	2	63	795	0.25
Listeria	2	0	22	9.09	4	0	16	25.00
Salmonella	3	0	455	0.66	9	133	2,681	0.34
Shigella	0	0	44	0.00	1	60	666	0.15
STEC† 0157	0	0	19	0.00	1	3	34	2.94
STEC non-0157	0	0	32	0.00	0	3	94	0.00
Vibrio	1	0	24	4.17	1	0	29	3.45
Yersinia	0	0	23	0.00	0	0	29	0.00
Parasites								
Cryptosporidium	0	0	41	0.00	0	18	275	0.00
Cyclospora	0	0	6	0.00	0	0	2	0.00
Total	6	0	1,265	0.47	18	280	4,621	0.39

	Maryland			
	# Deaths	# Unknown	Total # of Cases	CFR
Bacteria				
Campylobacter	1	24	605	0.17
Listeria	1	0	16	6.25
Salmonella	3	21	906	0.33
Shigella	1	0	181	0.55
STEC† 0157	0	0	33	0.00
STEC non-0157	0	0	38	0.00
Vibrio	0	0	47	0.00
Yersinia	0	0	10	0.00
Parasites				
Cryptosporidium	3	1	83	3.61
Cyclospora	0	0	3	0.00
Total	9	46	1,922	0.47

* 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.

† Shiga toxin-producing *Escherichia coli*.

TABLE 16a. Number of Deaths and Case Fatality Rate (CFR), by Site and Pathogen — FoodNet, 2012

	Minnesota				New Mexico			
	# Deaths	# Unknown	Total # of Cases	CFR	# Deaths	# Unknown	Total # of Cases	CFR
Bacteria								
Campylobacter	0	0	951	0.00	1	7	319	0.31
Listeria	2	0	6	33.33	0	0	5	0.00
Salmonella	3	0	781	0.38	1	5	327	0.31
Shigella	1	0	391	0.26	0	1	96	0.00
STEC† 0157	0	0	123	0.00	0	0	15	0.00
STEC non-0157	0	0	114	0.00	0	0	41	0.00
Vibrio	2	0	15	13.33	0	0	1	0.00
Yersinia	0	0	23	0.00	0	0	2	0.00
Parasites								
Cryptosporidium	1	0	340	0.29	1	1	94	1.06
Cyclospora	0	0	0	0.00	0	0	0	0.00
Total	9	0	2,744	0.33	3	14	900	0.33

	New York*				Oregon			
	# Deaths	# Unknown	Total # of Cases	CFR	# Deaths	# Unknown	Total # of Cases	CFR
Bacteria								
Campylobacter	1	0	612	0.16	0	0	895	0.00
Listeria	2	0	14	14.29	2	0	15	13.33
Salmonella	4	0	501	0.80	4	0	387	1.03
Shigella	0	0	211	0.00	0	0	78	0.00
STEC† 0157	0	0	69	0.00	0	0	95	0.00
STEC non-0157	0	0	47	0.00	0	0	73	0.00
Vibrio	1	0	11	9.09	0	0	18	0.00
Yersinia	0	0	24	0.00	0	0	22	0.00
Parasites								
Cryptosporidium	0	0	50	0.00	1	0	230	0.43
Cyclospora	0	0	0	0.00	0	0	1	0.00
Total	8	0	1,539	0.52	7	0	1,814	0.39

	Tennessee			
	# Deaths	# Unknown	Total # of Cases	CFR
Bacteria				
Campylobacter	0	31	449	0.00
Listeria	0	0	7	0.00
Salmonella	3	54	1057	0.28
Shigella	0	5	203	0.00
STEC† 0157	0	2	69	0.00
STEC non-0157	0	0	52	0.00
Vibrio	1	2	17	5.88
Yersinia	0	0	15	0.00
Parasites				
Cryptosporidium	0	1	71	0.00
Cyclospora	0	0	2	0.00
Total	4	95	1,942	0.21

* 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.

† Shiga toxin-producing *Escherichia coli*.

TABLE 17. Outbreak-Related Cases, by Pathogen — FoodNet, 2012

	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	
		#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Bacteria																	
Campylobacter	6,812	41	0.6	33	80.5	0	0.0	4	9.8	0	0.0	0	0.0	0	0.0	4	9.8
Listeria	123	3	2.4	3	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Salmonella	7,842	457	5.8	337	73.7	0	0.0	46	10.1	16	3.5	0	0.0	5	1.1	53	11.6
Shigella	2,141	182	8.5	0	0.0	0	0.0	0	0.0	171	94.0	0	0.0	0	0.0	11	6.0
STEC* 0157	533	117	22.0	55	47.0	0	0.0	1	0.9	40	34.2	0	0.0	0	0.0	21	17.9
STEC non-0157	557	11	2.0	2	18.2	0	0.0	3	27.3	3	27.3	0	0.0	0	0.0	3	27.3
Vibrio	197	12	6.1	12	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Yersinia	159	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Parasites																	
Cryptosporidium	1,258	54	4.3	0	0.0	35	64.8	10	18.5	6	11.1	0	0.0	0	0.0	3	5.6
Cyclospora	15	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total	**19,637**	**877**	**4.5**	**442**	**50.4**	**35**	**4.0**	**64**	**7.3**	**236**	**26.9**	**0**	**0.0**	**5**	**0.6**	**95**	**10.8**

* Shiga toxin-producing *Escherichia coli*.

TABLE 18. Frequency of International Travel, by Pathogen — FoodNet, 2012

	Total Cases Reported	Total Cases With Travel Information		Traveled		Did not travel		Unknown travel	
	#	#	%	#	%*	#	%*	#	%
Bacteria									
Campylobacter	6,812	4,652	68.3	739	15.9	3,913	84.1	2,160	31.7
Listeria	123	113	91.9	1	0.9	112	99.1	10	8.1
Salmonella	7,842	6,012	76.7	535	8.9	5,477	91.1	1,830	23.3
Shigella	2,141	1,688	78.8	174	10.3	1,514	89.7	453	21.2
STEC* 0157	533	514	96.4	13	2.5	501	97.5	19	3.6
STEC non-0157	557	528	94.8	66	12.5	462	87.5	29	5.2
Vibrio	197	174	88.3	6	3.4	168	96.6	23	11.7
Yersinia	159	130	81.8	8	6.2	122	93.8	29	18.2
Parasites									
Cryptosporidium	1,258	992	78.9	115	11.6	877	88.4	266	21.1
Cyclospora	15	15	100.0	4	26.7	11	73.3	0	0.0
Total	19,637	14,818	75.5	1,661	11.2	13,157	88.8	4,819	24.5

* Among cases with known travel status

† Shiga toxin-producing *Escherichia coli.*

FIGURE 5. Seasonality of *Campylobacter*, *Cryptosporidium*, *Salmonella*, and *Shigella* Infections — FoodNet, 2012

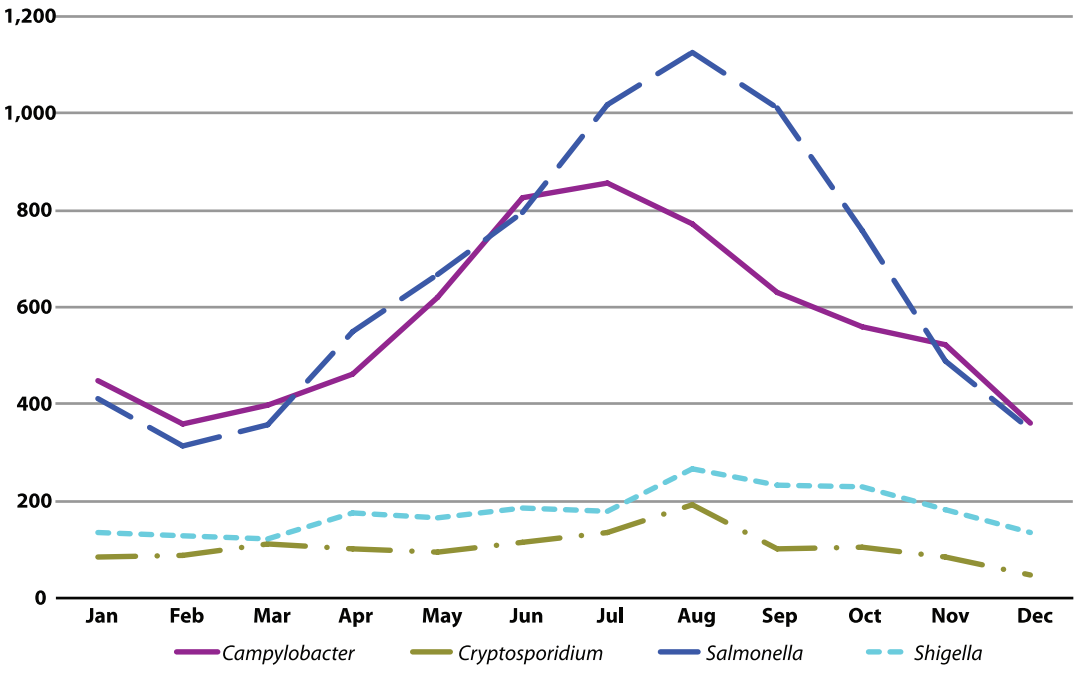


FIGURE 6. Seasonality of *Cyclospora*, *Listeria*, *Vibrio*, and *Yersinia* Infections — FoodNet, 2012

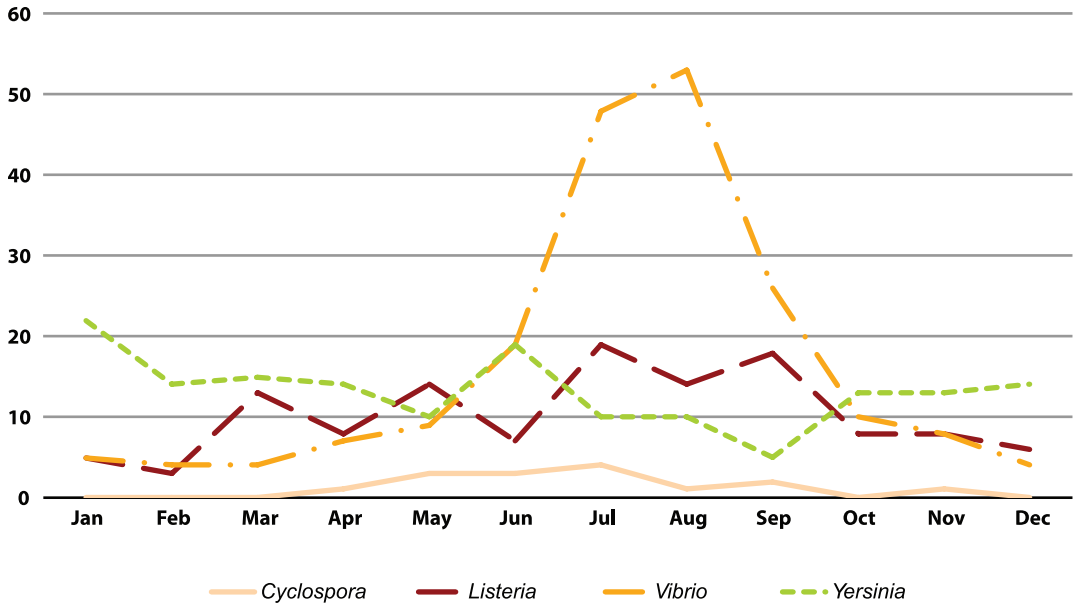
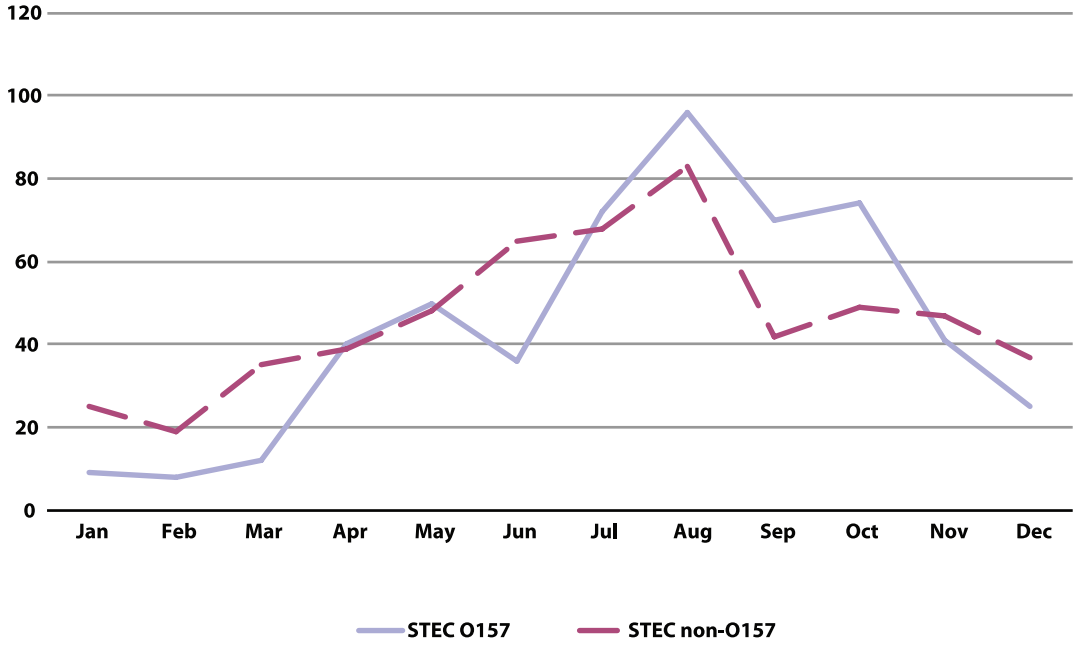
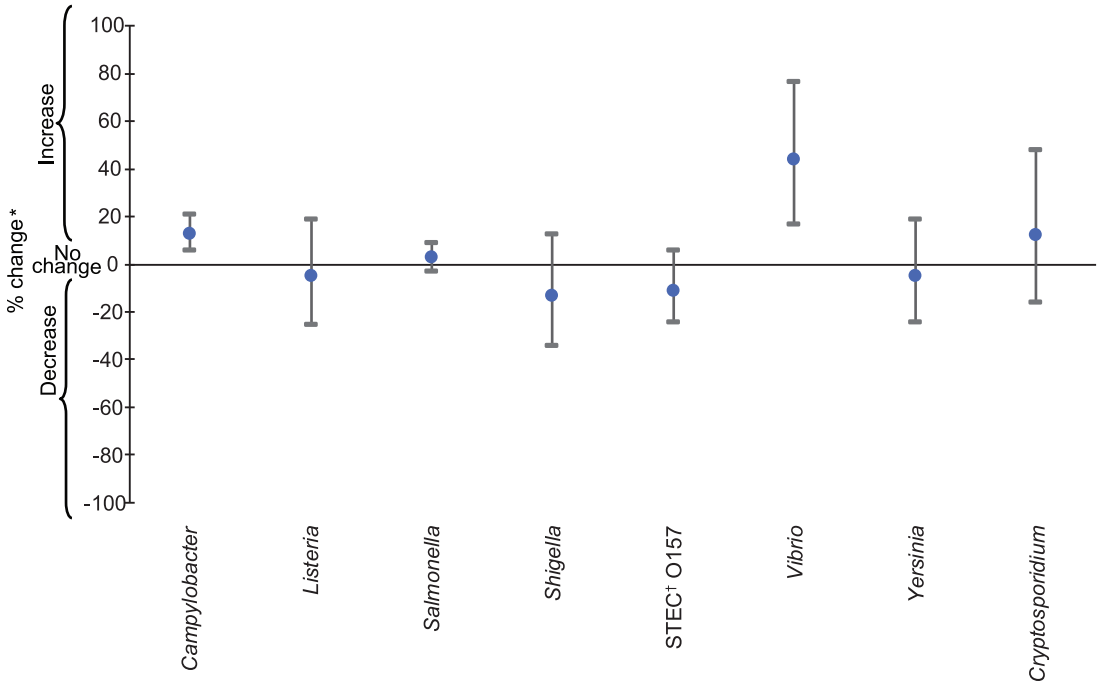


FIGURE 7. Seasonality of STEC* O157 and STEC non-O157 Infections — FoodNet, 2012



* Shiga toxin-producing *Escherichia coli*

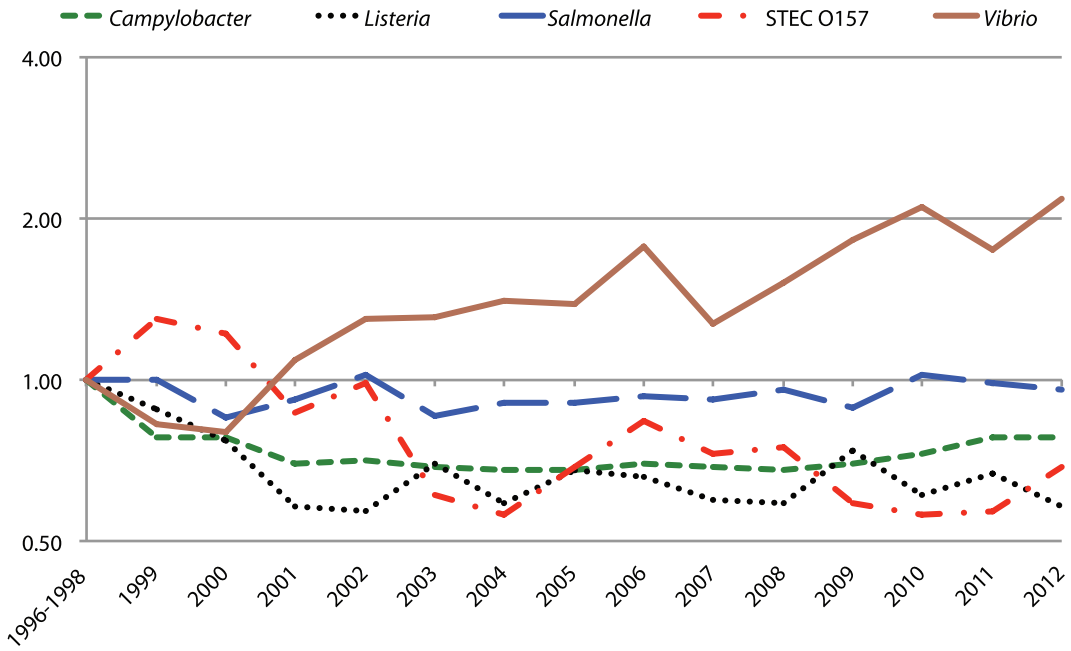
Figure 8. Percentage Change in Incidence of Laboratory-Confirmed Bacterial and Parasitic Infections in 2012 Compared with Average Annual Incidence during 2006–2008, by Pathogen, FoodNet



* 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*.

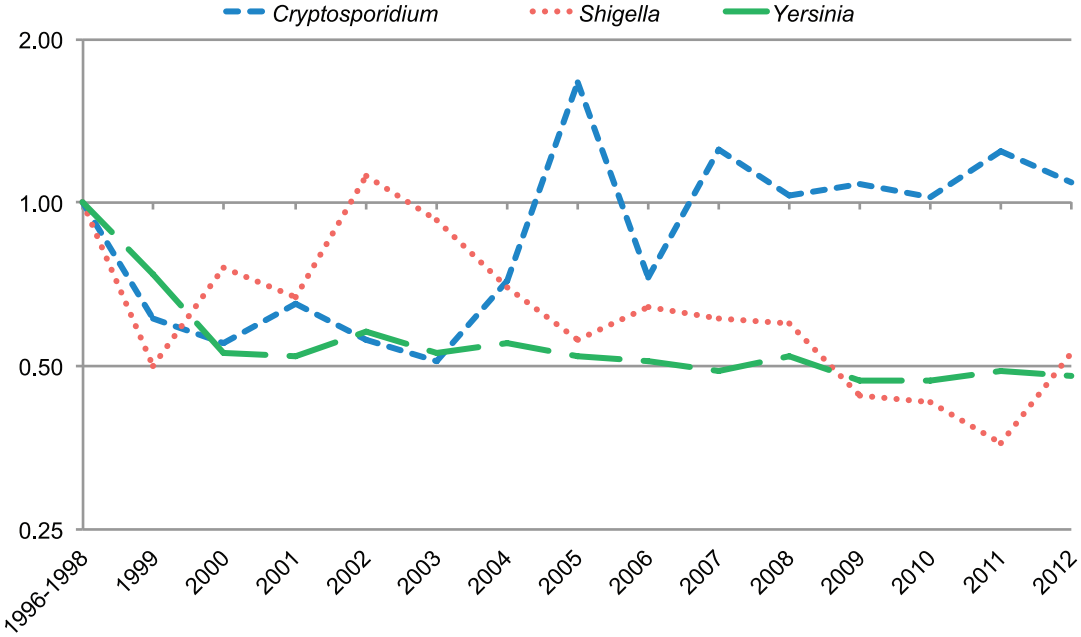
Figure 9. Relative Rates of Laboratory-Confirmed Infections with *Campylobacter, Listeria, Salmonella*, STEC* O157, and *Vibrio* Compared with 1996–1998 Rates, by Year, FoodNet 1996–2012†



* Shiga toxin-producing *Escherichia coli*.

† 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. Relative Rates of Laboratory-Confirmed Infections with *Cryptosporidium, Shigella* and *Yersinia* Compared with 1996–1998 Rates, by Year, FoodNet 1996–2012*



* 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.

Table 19. Summary of Post-Diarrheal Hemolytic Uremic Syndrome (HUS) Cases, All Ages — FoodNet, 1997-2011

	Number of Post-diarrheal HUS Cases	Median Age (range)	Number (%) Female
1997-2010	1078	4.4 (0–89)	623 (58%)
2011	77	5.3 (0–86)	45 (58%)

	Median Days (range) of Hospitalization	Number (%) of Deaths	Number (%) of Cases occurring June-September
1997-2010	12.0 (0–152)	54 (5%)	634 (59%)
2011	14 (2–61)	3 (4%)	39 (51%)

Table 20. Results of Microbiologic Testing for Shiga Toxin-producing *Escherichia coli* (STEC) Infection among Post-Diarrheal HUS Case-Patients, 1997–2011

	1997-2010		2011	
	No. (%)	Total	No. (%)	Total
Diarrhea in 3 weeks before HUS diagnosis / Total patients	1078 (88%)	1220	77 (93%)	83
Stool specimen obtained/ Total patients with diarrhea	1027 (95%)	1078	77 (100%)	77
Stool tested for Shiga toxin/ Patients with stool specimen obtained	533 (52%)	1027	65 (84%)	77
Stool cultured for *E. coli* 0157/ Patients with stool specimens obtained	973 (95%)	1027	73 (95%)	77
***E. coli* 0157 isolated from stool/ Patients with stool cultured for E. coli 0157**	561*** (58%)	973	50** (68%)	73
Isolation of non-0157 STEC/ Patients with stool specimen obtained and no evidence of E. coli 0157	25 (5%)	466	2 (7%)	27
Serum positive for antibodies against E. coli / Patients with serum tested for antibodies against E. coli and no evidence of STEC in stool†	93 (21%)*	433	6 (24%)‡	25
Stool positive for Shiga toxin/ Patients with stool tested for Shiga toxin and no other evidence of STEC	14 (12%)	117	0 (0%)	14
Total with evidence of STEC/Diarrhea in 3 weeks before HUS diagnosis	**693 (64%)**	**1078**	**58 (75%)**	**77**

† Information on serum specimens was not collected before 2000

* Of the 93 positive serum samples, 90 had antibodies against *E. coli* 0157 lipopolysacchride (LPS); three had antibodies against *E. coli* 0111 LPS

‡ All 6 positive serum samples had antibodies against *E. coli* 0157 LPS

** One patient additionally had 0103 isolated from stool

*** One patient additionally had 026 isolated from stool

Table 21. Number and Incidence Rate* of Post-diarrheal Pediatric HUS cases†, by Site and Age Group, 1997–2011

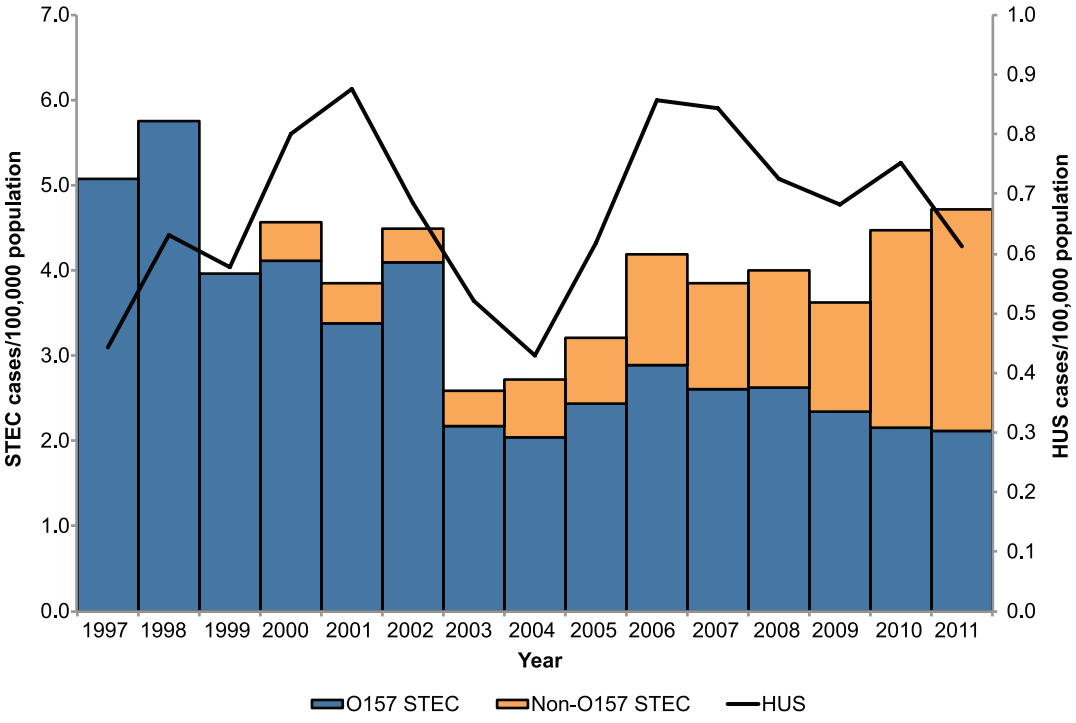
State	Age <5 years		Age 5–14 years		Age 15–17 years		Age <18 years	
	#	Rate	#	Rate	#	Rate	#	Rate
CA	43	1.50	20	0.35	0	0.00	63	0.62
CO	35	1.71	24	0.62	2	0.17	61	0.86
CT	36	1.13	36	0.50	2	0.09	74	0.59
GA	83	0.95	28	0.16	4	0.07	115	0.37
MD	34	0.79	24	0.25	4	0.12	62	0.37
MN	122	2.27	58	0.54	3	0.09	183	0.95
NM	15	1.31	6	0.27	0	0.00	21	0.51
NY	41	1.51	24	0.38	5	0.23	70	0.64
OR	98	2.87	35	0.49	5	0.22	138	1.08
TN	118	2.61	51	0.57	4	0.13	173	1.05
Total	625	1.68	306	0.41	29	0.11	960	0.70

* Cases per 100,000 population.

† Includes cases among persons residing within catchment area only.

§ HUS surveillance started in CO in 2001; MD in 1999; NM in 2004; NY in 1998, and TN in 2000.

Figure 11. Comparison of Incidence Rates of Shiga Toxin-producing *E. coli* (STEC) and Post-diarrheal Pediatric Hemolytic Uremic Syndrome (HUS) — 1997-2011*



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