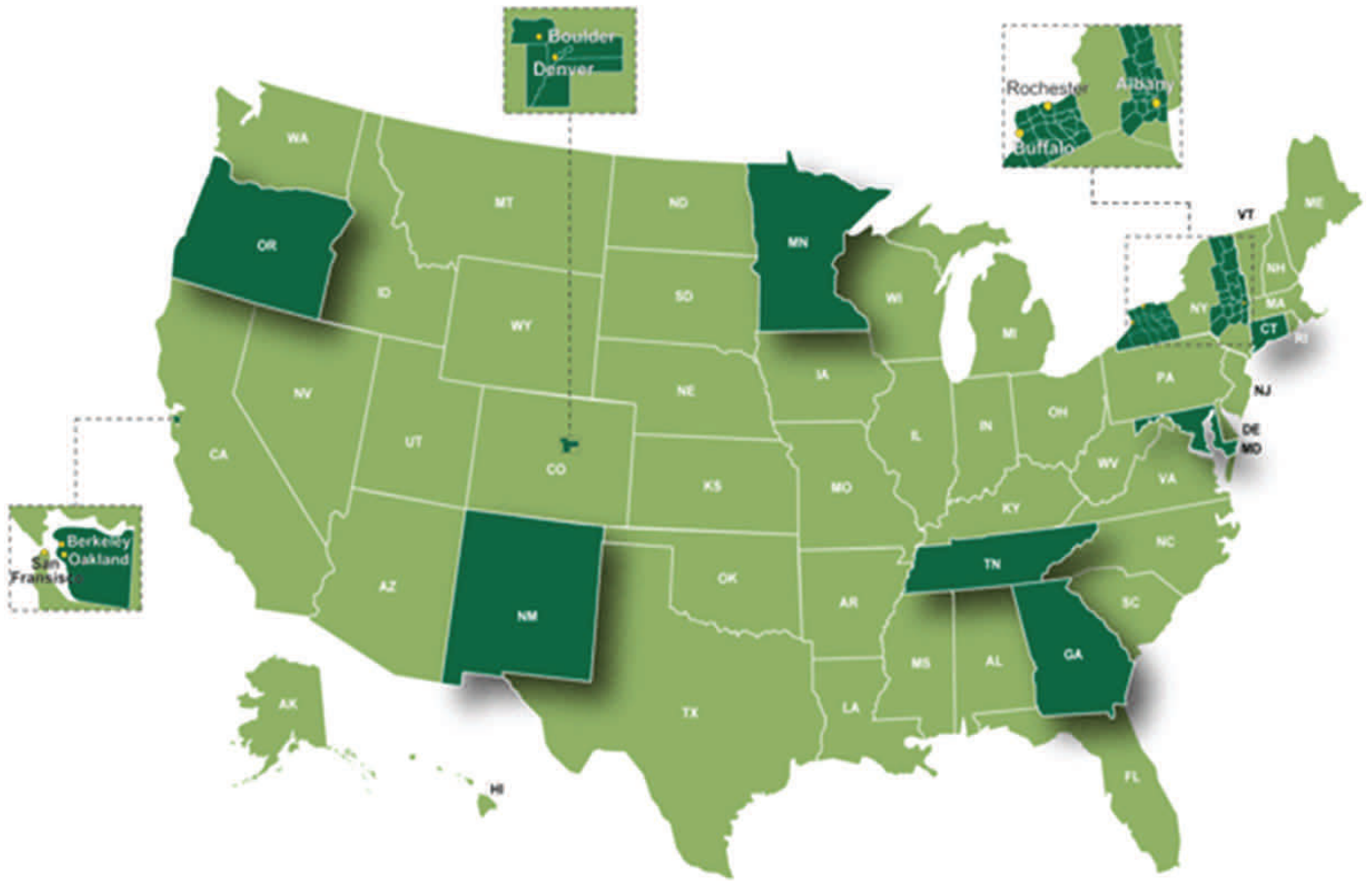


Foodborne Diseases Active Surveillance Network

FoodNet

2011 Surveillance Report



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



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Stacy Crim
Olga Henao
Jennifer Huang
Ruthie Luna-Gierke
Barbara Mahon
Rajal Mody
Mary Patrick

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<i>Table of Contents</i>	<i>Page</i>
Acknowledgements.....	1
Citation.....	1
Table of contents.....	2-3
Background	4
Methods.....	4
Analysis.....	5
Results.....	5-6
Publications and Abstracts in 2011.....	7-8
FoodNet Working Group, 2011	9
Tables and Figures	10-46
Demographics and Census.....	10-13
Tab.1. FoodNet Surveillance Area, by State and County — 1996-2011.....	10
Tab.2. Population under Surveillance, by Site — FoodNet, 1996-2011	11
Tab.3. Comparison of FoodNet Surveillance Population to U.S. Population, Overall and by Site — 2011.....	12
Fig.1. FoodNet Sites — 2011	13
Counts and Incidence.....	14-25
Tab.4. Number of Laboratory-Confirmed Bacterial and Parasitic Infections, by Site and Pathogen — FoodNet, 2011.....	14
Tab.5. Incidence of Cases of Bacterial and Parasitic Infection Compared to National Health Objectives, by Site and Pathogen — FoodNet, 2011.....	15
Tab.6. Number and Incidence of FoodNet Pathogens, by Age, Race, Sex, Ethnicity —2011	16-17
Tab.7. Number and Incidence of Laboratory-confirmed <i>Salmonella</i> Infections Caused by the Top 20 <i>Salmonella</i> Serotypes, FoodNet 2011.....	18
Tab.8. Number and Incidence of Laboratory-confirmed <i>Shigella</i> Infections, by Species — FoodNet, 2011.....	19
Tab.9. Number and Incidence of Laboratory-confirmed <i>Vibrio</i> infections, by Species — FoodNet, 2011.....	20
Tab.10. Number and Incidence of Laboratory-confirmed STEC non-O157 Infections Caused by the Top Ten Most Common Serogroups of STEC —FoodNet, 2011.....	21
Tab.11. Number of Laboratory-confirmed <i>Campylobacter</i> infections, by Species —FoodNet, 2011.....	22
Fig.2. Incidence of <i>Campylobacter</i> , <i>Salmonella</i> , and <i>Shigella</i> Infections, by Age Group — FoodNet, 2011.....	23
Fig.3. Incidence of <i>Cryptosporidium</i> , <i>Listeria</i> , and <i>Yersinia</i> Infections, by Age Group — FoodNet, 2011.....	24
Fig.4. Incidence of STEC O157 and STEC Non-O157 Infections, by Age Group — FoodNet, 2011.....	25
Hospitalization.....	26-30
Tab.12. Number and Percentage of Hospitalizations, by Pathogen — FoodNet, 2011	26

Tab.13. Number and Percentage of Hospitalizations, by Age Group and Pathogen — FoodNet, 2011.....	27-28
Tab.14. Number and Percentage of Hospitalizations, by Site and Pathogen — FoodNet, 2011.....	29-30
Death.....	31-34
Tab.15. Number of Deaths and Case Fatality Rate (CFR), by Pathogen — FoodNet, 2011.....	31
Tab.16. Number of Deaths and Case Fatality Rate, by Age Group and Pathogen — FoodNet, 2011.....	32-33
Tab.17. Number of Deaths and Case Fatality Rate, by Site and Pathogen — FoodNet, 2011.....	34
Outbreak-related cases.....	35
Tab.18. Outbreak-related Cases, by Pathogen — FoodNet, 2011.....	35
International Travel.....	36
Tab.19. Frequency of International Travel, by Pathogen — FoodNet, 2011.....	36
Seasonality.....	37-39
Fig.5. Seasonality of <i>Campylobacter</i> , <i>Cryptosporidium</i> , <i>Salmonella</i> , and <i>Shigella</i> Infections — FoodNet, 2011.....	37
Fig.6. Seasonality of <i>Cyclospora</i> , <i>Listeria</i> , <i>Vibrio</i> , and <i>Yersinia</i> Infections — FoodNet, 2011.....	38
Fig.7. Seasonality of STEC O157 and STEC non-O157 Infections — FoodNet, 2011.....	39
Trends.....	40-42
Fig.8. Relative rates of Laboratory-confirmed Infections with <i>Campylobacter</i> , STEC O157, <i>Listeria</i> , <i>Salmonella</i> , and <i>Vibrio</i> Compared with 1996-1998 Rates, by Year — FoodNet, 1996-2011.....	40
Fig.9. Relative Rates of Laboratory-Confirmed Infections with <i>Shigella</i> , <i>Yersinia</i> , <i>Cryptosporidium</i> and <i>Cyclospora</i> Compared with 1996-1998 Rates, by Year — FoodNet, 1996-2011.....	41
Fig.10. Percent Change in Incidence of Laboratory-confirmed Bacterial and Parasitic Infections in 2011 Compared with Average Annual Incidence during 2006-2009, by Pathogen — FoodNet.....	42
Hemolytic Uremic Syndrome (HUS).....	43-46
Tab.20. Summary of Post-Diarrheal HUS Cases, All Ages — FoodNet, 1997-2010.....	43
Tab.21. Results of Microbiologic testing for STEC Infection among Post-Diarrheal HUS Cases — FoodNet, 1997-2010.....	44
Tab.22. Number and Incidence Rate of Post-Diarrheal Pediatric HUS Cases, by Site and Age Group — FoodNet, 1997-2010.....	45
Fig.11. Comparison of Post-Diarrheal Incidence Rates of STEC and Pediatric HUS — FoodNet, 1997-2010.....	46
Appendix I.....	47-52

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⁺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⁺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⁺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⁺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⁺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 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⁺HUS) cases. Among D⁺HUS cases, 1(1%) person died. Eighty-two (88%) pediatric D⁺HUS cases were reported; among these, 55 (67%) cases were in children aged <5 years. Of all D⁺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⁺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.

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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.

FoodNet Working Group, 2011

CDC

Richard Bishop
Christopher Braden
Shua Chai
Susan Conner
Stacy Crim
Patricia Fields
Collette Fitzgerald
Katie Fullerton
Hannah Gould
Patricia Griffin
Rebecca Hall
Olga Henao
Michele Hlavsa
Mike Hoekstra
Jennifer Huang
Kevin Joyce
Magdalena Kendall
Ruthie Luna-Gierke
Barbara Mahon
Karunya Manikonda
Raj Mody
Liane Ong
Mary Patrick
Robert Pinner
Regan Rickert
Krista Swanson
Robert Tauxe
Jean Whichard
Jonathan Yoder

California

Mirasol Apostol
Susan Brooks
Lisa Chang
Claudia Crandall
Pam Daily
Gillian Edwards
Roberta Frick
Erin Garcia
Debra Gilliss
Mariah Hamilton
Melody Hung-Fan
Lauren Lee
Joelle Nadle
Dawn Norton
Jan Lidgard
Lauren Pasutti
Will Probert
Hallie Randel
Maria Rosales
Gretchen Rothrock
Linda Sae-Jang
Sherry Smith
Duc Vugia
Katie Wymore

Colorado

Deb Aragon
Nicole Comstock
Shaun Cosgrove
Alicia Cronquist
Ken Gershman

Skip Gossack
Joyce Knutsen
Hugh Maguire
Jen Sadlowski
Elaine Scallan
Benjamin White

Connecticut

Diane Barden
Matthew Cartter
Paula Clogher
John Fontana
James Hadler
Robert Heimer
Sharon Hurd
Aristea Kinney
Mona Mandour
Laurin Mank
Danyel Olson
Quyen Phan
Terry Rabatsky-Ehr

Georgia

Olivia Almendares
Wendy Baughman
Leigh Ann Clark
Hope Dishman
Cherie Drenzek
Monica Farley
Betty Franko
Ryan Gierke
Amy Holst
Janine Ladson Scott
Tori Mayes
Rebecca Meyer
Kyle Openo
Mahin Park
Lewis Perry
Lynett Poventud
Andrew Revis
Nicole Romero
Calista Schenck
Sasha Schlicher
Suzanne Segler
Betsy Stein
Norisse Tellman
Stepy Thomas
Zirka Thompson
Melissa Tobin-D'Angelo
Madhavi Vajani

Maryland

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Alvina Chu
Yaaqobah Evans
Nivia Facundo
Kim Holmes
Jonathan Johnston
Carrienne Jung
Celere Leonard
Robert Myers
Amanda Palmer
Jafar Razeq

Dale Rohn
Patricia Ryan
Amy Sapkota

Minnesota

Erin Hedican
Dawn Kaehler
Carlota Medus
Stephanie Meyer
Trisha Robinson
Josh Rounds
Joni Scheftel
Amy Saupe
Kirk Smith
Theresa Weber

New Mexico

Meg Adams-Cameron
Kathy Angeles
Joan Baumbach
Lisa Butler
Nicole Espinoza
Sarah Khanlian
Sarah Lathrop
Robert Mansmann
Cynthia Nicholson
Lisa Onischuk
Erica Pierce
Paul Torres

New York

Debra Blog
Kari Burlaff
Hwa-Gan Chang
Nellie Dumas
Ghinwa Dumyati
Greg Giambrone
Dina Hoefler
Jillian Karr
Daniel Kuhles
Kevin Malloy
Kim Musser
David Nicholas
Candace Noonan-Toly
Tim Root
Dianna Schoonmaker-Bopp
Glenda Smith
Suzanne Solghan
Nancy Spina
Shelley Zansky

Oregon

Hillary Booth
Cathy Ciaffoni
Paul Cieslak
Emilio DeBess
Julie Hatch
Bill Keene
Beletshachew Shiferaw
Janie Tierheimer
Rob Vega

Tennessee

Robyn Atkinson
Effie Boothe
John Dunn
Katie Garman
Samir Hanna
Amanda Ingram
Timothy Jones
Marcy McMillian
Nupur Sashti
Amy Woron

USDA-FSIS

Latasha Allen
Nathan Bauer
Wu San Chen
L. Victor Cook
Terry Disney
Moshe Dreyfuss
Denise Eblen
Myra Gardner
Alice Green
David Goldman
Neal Golden
Chuanfa Guo
Kristin Holt
Rachel Johnson
Janell Kause
Bonnie Kissler
Jeffrey Levine
Joseph Minicozzi
Frank Niagro
James Rogers
Bernard Salamone
Wayne Schlosser
Kristal Southern
Regina Tan
Patricia White
Joanna Zablotzky
Kufel

FDA-CORE

Richard Kanwal
Susan Lance
William Lanier

FDA-CVM

Emily Crarey
Patrick McDermott
Heather Tate
David White

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								•	•	
Total Surveillance											47,505,580

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	3,272,563	3,282,031	3,411,777	3,432,835	3,458,749	3,484,336	3,496,094	3,506,956	3,517,460	3,527,270	3,545,579	3,561,807	3,575,498	3,580,709
Georgia	2,720,443	3,632,206	3,744,022	7,788,240	8,227,303	8,377,038	8,508,256	8,622,793	8,769,252	8,925,922	9,155,813	9,349,988	9,504,843	9,620,846	9,712,157	9,815,210
Maryland	-	-	2,441,279	2,450,566	2,517,195	4,243,342	5,440,389	5,496,269	5,546,935	5,592,379	5,627,367	5,653,408	5,684,965	5,730,388	5,785,681	5,828,289
Minnesota	4,647,723	4,687,726	4,726,411	4,775,508	4,933,692	4,982,796	5,018,935	5,053,572	5,087,713	5,119,598	5,163,555	5,207,203	5,247,018	5,281,203	5,310,658	5,344,861
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	3,195,087	3,243,254	3,282,055	3,316,154	3,429,708	3,467,937	3,513,424	3,547,376	3,569,463	3,613,202	3,670,883	3,722,417	3,768,748	3,808,600	3,838,332	3,871,859
Tennessee	-	-	-	-	2,826,381	2,852,904	2,878,873	5,847,812	5,910,809	5,991,057	6,088,766	6,175,727	6,247,411	6,306,019	6,357,436	6,403,353
Total	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 % 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

	FoodNet Surveillance Population	U.S. Population	CA*	CO*	CT	GA	MD	MN	NM	NY*	OR	TN
	#	#	#	#	#	#	#	#	#	#	#	#
Total	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
Age (years)												
<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
Sex												
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
Ethnicity												
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
Race												
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

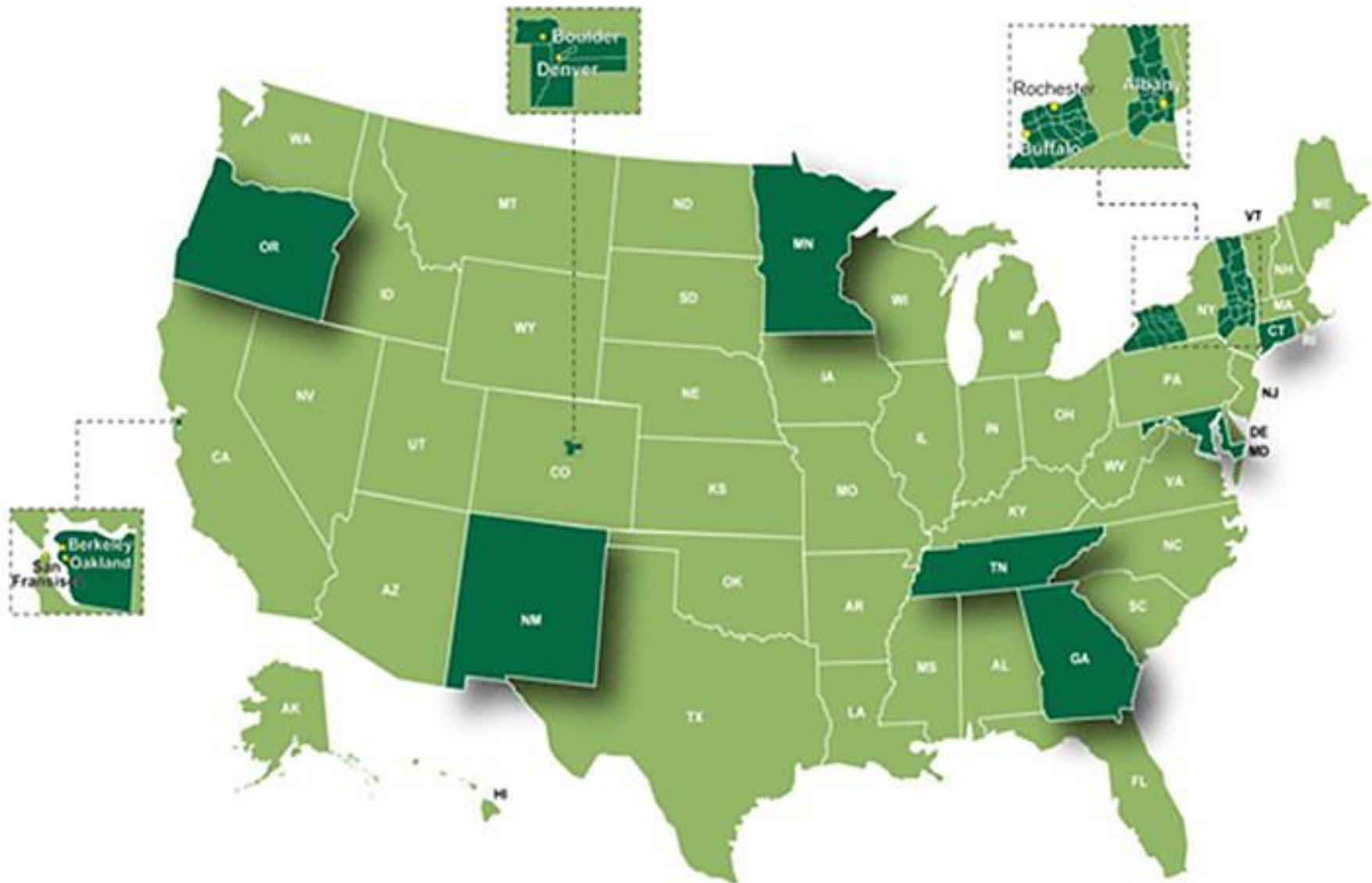


TABLE 4. Number of Laboratory-Confirmed Bacterial and Parasitic Infections, by Site and Pathogen — FoodNet, 2011

	CA*	CO*	CT	GA	MD	MN	NM	NY*	OR	TN	Total
Bacterial											
<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
Parasitic											
<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
Total	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 [†]	CO [†]	CT	GA	MD	MN	NM	NY [†]	OR	TN	Overall 2011	National 2010 health objective [§]
Bacteria												
<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 [¶]
STEC** O157	1.03	0.88	0.47	0.30	0.51	2.73	0.58	0.99	1.73	0.92	0.97	1.00
STEC non-O157	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
Parasites												
<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
Surveillance population (millions)	3.41	2.85	3.58	9.82	5.83	5.34	2.08	4.33	3.87	6.40	47.51	

*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 [†] O157		STEC [†] non O157	
	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate
Age (years)												
<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	-
Sex												
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	-
Ethnicity												
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	-
Race												
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
Total	6,785	14.28	145	0.31	7,813	16.45	1,541	3.24	463	0.97	521	1.10

*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
Age (years)								
<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	-
Sex								
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	-
Ethnicity								
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	-
Race								
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
Total	156	0.33	163	0.34	1,355	2.85	22	0.05

*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	3.0
2	2	Typhimurium**	981	12.6	2.1
3	3	Newport	959	12.3	2.0
4	4	Javiana	753	9.6	1.6
5	5	S. I 4,[5],12:i:-***	314	4.0	0.7
9	6	Muenchen	201	2.6	0.4
6	7	Heidelberg	169	2.2	0.4
7	8	Montevideo	150	1.9	0.3
11	9	Infantis	130	1.7	0.3
14	10	S. I 13,23:b:-	119	1.5	0.3
12	11	Oranienburg	114	1.5	0.2
8	12	Saintpaul	113	1.4	0.2
10	13	Braenderup	110	1.4	0.2
16	14	Bareilly	108	1.4	0.2
13	15	Agona	73	0.9	0.2
15	16	Mississippi	69	0.9	0.1
17	17	Thompson	67	0.9	0.1
18	18	Typhi	63	0.8	0.1
25	19	Berta	52	0.7	0.1
22	20	Anatum	50	0.6	0.1
Sub total			6,019	77.0	12.7
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
Total			7,813	100	16.4

*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
Unknown	108	7.0	0.23
Total	1,541	100	3.24

*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
Total	154	100	0.32

*Rate per 100,000 persons

TABLE 10. Number and Incidence* of Laboratory-Confirmed STEC[†] non O157 Infections Caused by the Top Ten O Antigens, — FoodNet, 2011

Rank	STEC O Antigen	Number of cases	% total STEC non O157 cases	Incidence per 100,000 persons
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	
Total		521		

*Rate per 100,000 persons

[†]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
Total	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

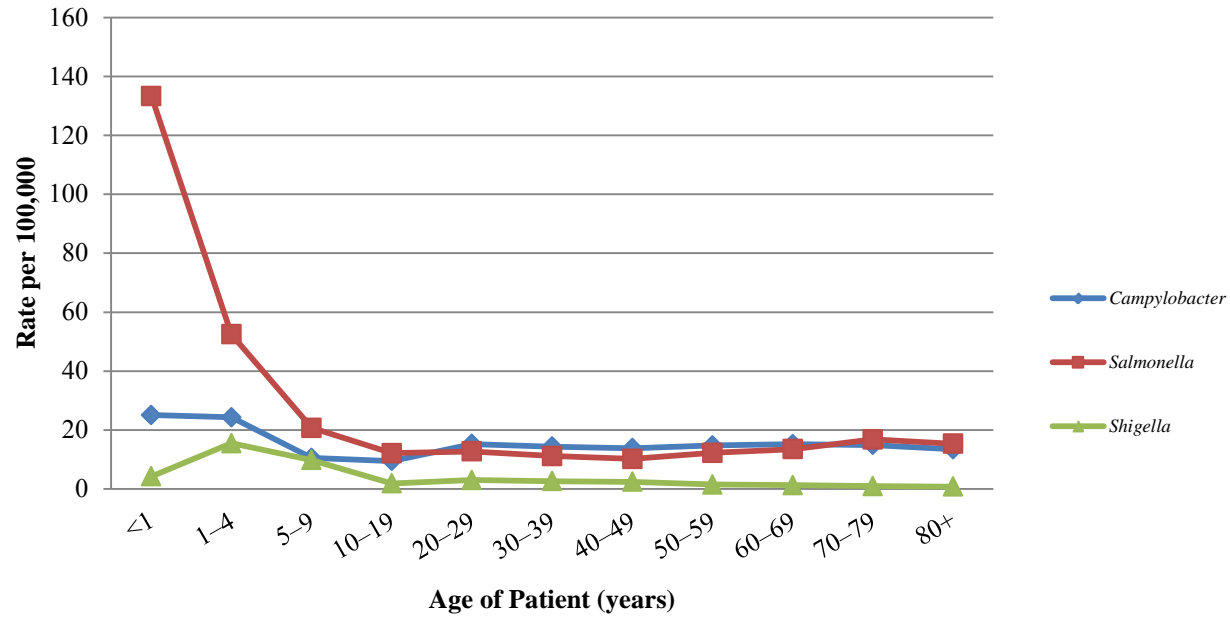


FIGURE 3. Incidence of *Cryptosporidium*, *Listeria*, and *Yersinia* Infections, by Age Group — FoodNet, 2011

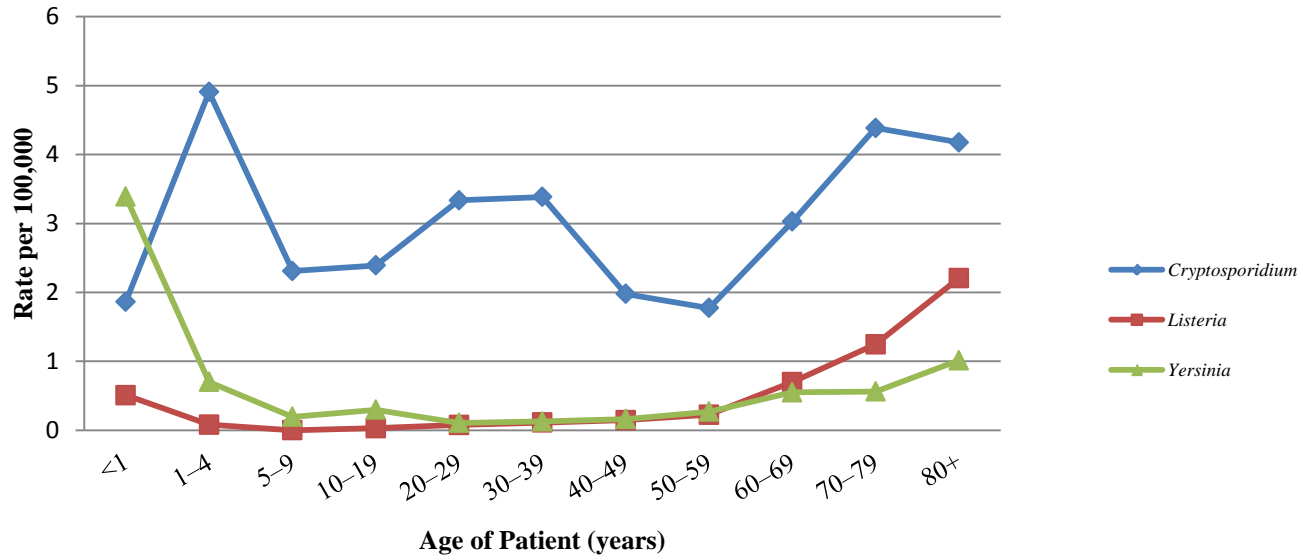


FIGURE 4. Incidence of STEC* O157 and STEC non-O157 Infections, by Age Group — FoodNet, 2011

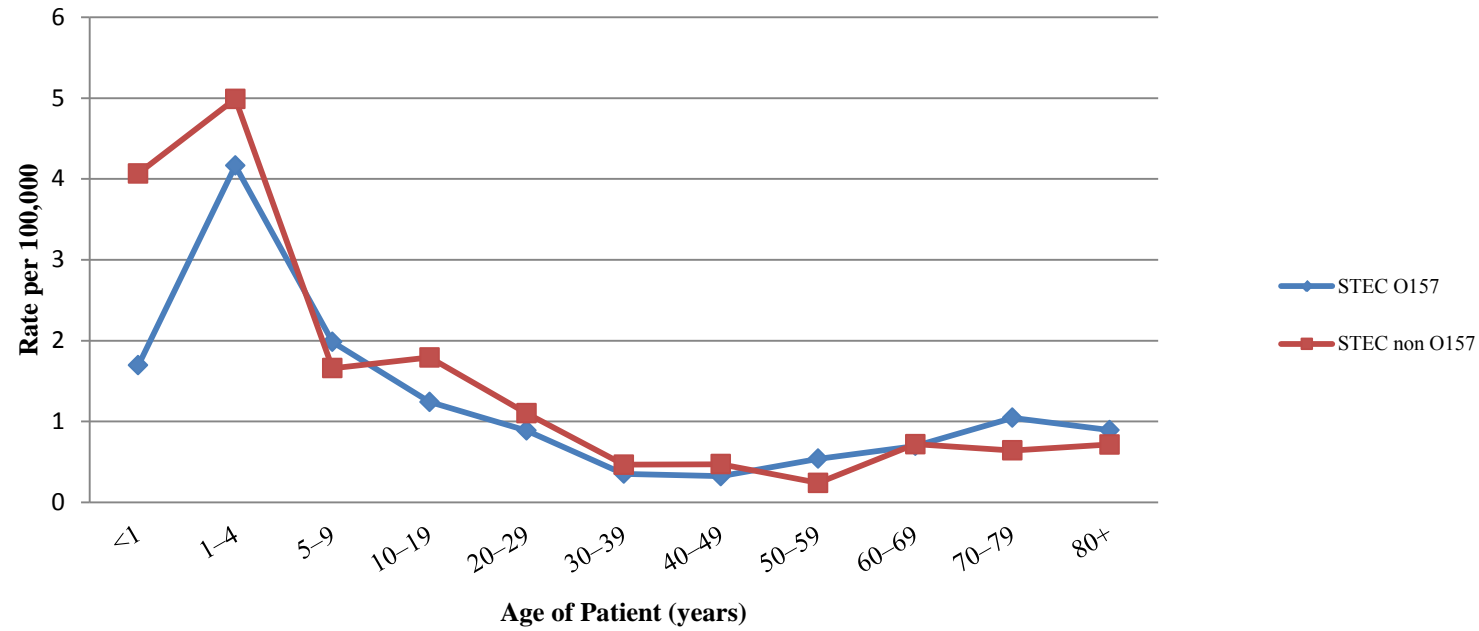


TABLE 12. Number and Percentage* of Hospitalizations, by Pathogen — FoodNet, 2011

	# Hospitalized	# Outpatient	# Unknown	Total # of Cases	% Hospitalized
Bacteria					
<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 [†] 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
Parasites					
<i>Cryptosporidium</i>	277	1,063	15	1,355	20.4
<i>Cyclospora</i>	3	19	0	22	13.6
Total	4,398	13,720	846	18,964	23.2

[†]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
Bacteria												
<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 [†] 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
Parasites												
<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
Total	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
Bacteria												
<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 [†] 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
Parasites												
<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
Total	335	80	1,875	17.9	404	123	2,413	17.6	383	132	2,040	18.8

[†]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
Bacteria												
<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 [†] 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
Parasites												
<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
Total	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
Bacteria								
<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 [†] 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
Parasites								
<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
Total	431	41	1,018	44.1	359	28	654	54.9

[†]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
Bacteria															
<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 [†] 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
Parasites															
<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
Total	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
Bacteria										
<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 [†] 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
Parasites										
<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
Total	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.

[†]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
Bacteria															
<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 [†] 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
Parasites															
<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
Total	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
Bacteria										
<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 [†] 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
Parasites										
<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
Total	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.

[†]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
Bacteria				
<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 [†] 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
Parasites				
<i>Cryptosporidium</i>	7	41	1,355	0.52
<i>Cyclospora</i>	0	0	22	0.00
Total	82	1,175	18,964	0.43

[†]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
Bacteria												
<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 [†] 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
Parasites												
<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
Total	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
Bacteria												
<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 [†] 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
Parasites												
<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
Total	0	100	1,875	0.00	1	202	2,413	0.04	3	190	2,040	0.15

[†]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
Bacteria												
<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 [†] 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
Parasites												
<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
Total	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
Bacteria								
<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 [†] 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
Parasites								
<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
Total	20	42	1,018	1.96	23	26	654	3.52

[†]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	
Bacteria																					
<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	
Parasites																					
<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	
Total	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	
Bacteria																					
<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	
Parasites																					
<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	
Total	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	
		#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Bacteria																	
<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 [†] 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
Parasites																	
<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
Total	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

[†]Shiga toxin-producing *Escherichia coli*.

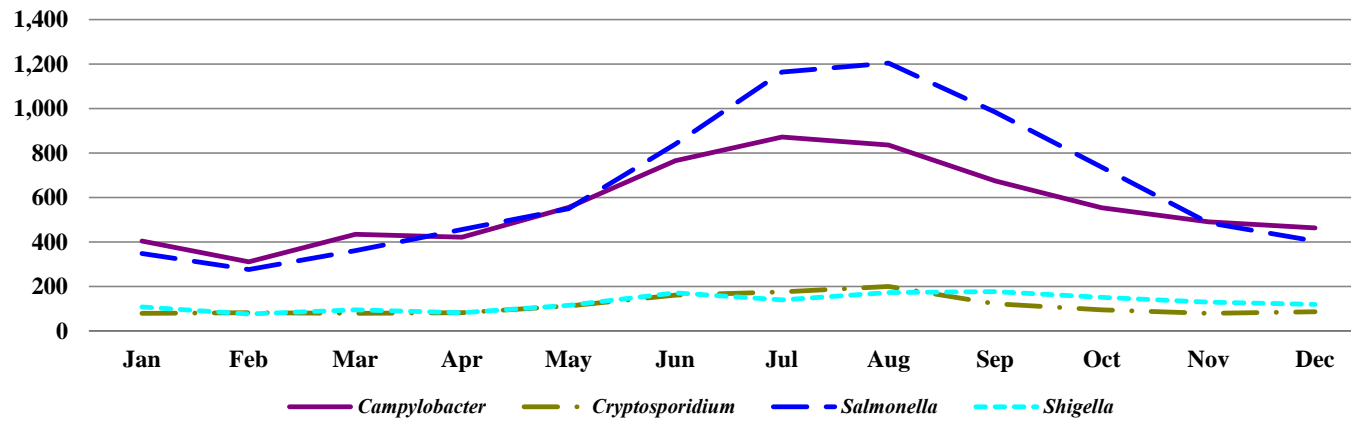
TABLE 19. Frequency of International Travel, by Pathogen — FoodNet, 2011

	Total cases reported #	Cases with travel information		Traveled		Did not travel	
		#	%	#	%*	#	%*
Bacteria							
<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 [†] 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
Parasites							
<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
Total	18,964	13,898	73.3	1,565	11.3	12,333	88.7

*Among cases with known travel status.

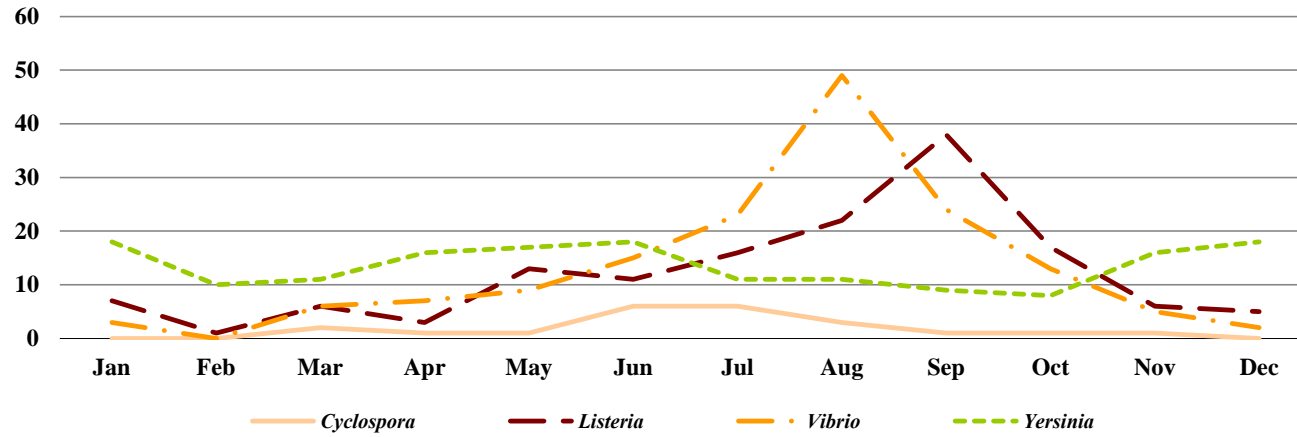
[†]Shiga toxin-producing *Escherichia coli*.

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



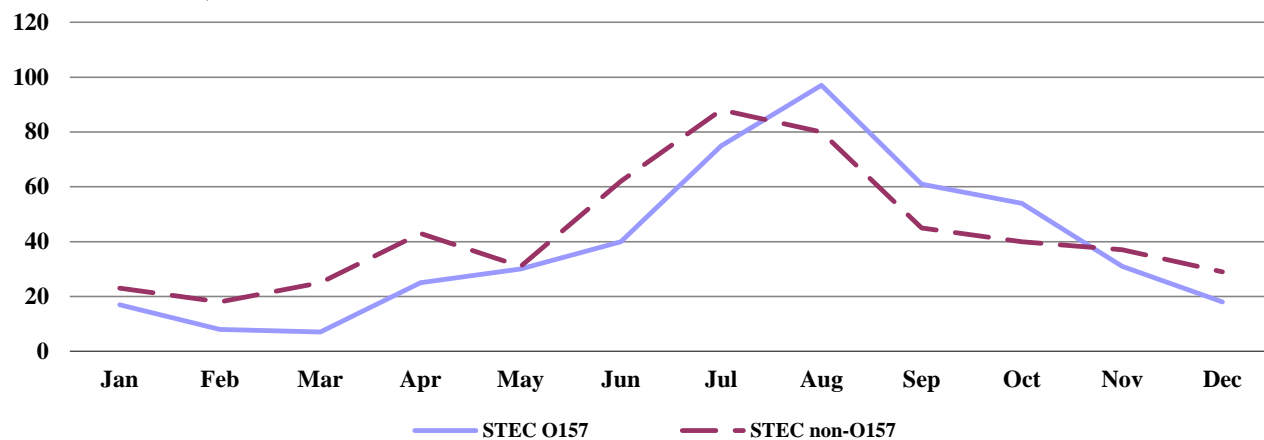
Pathogen	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
<i>Campylobacter</i>	405	311	435	422	555	765	872	836	675	554	491	464
<i>Cryptosporidium</i>	79	82	79	82	112	161	176	200	122	95	80	87
<i>Salmonella</i>	348	276	361	456	550	841	1,164	1,204	984	737	487	405
<i>Shigella</i>	108	76	96	83	115	171	140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

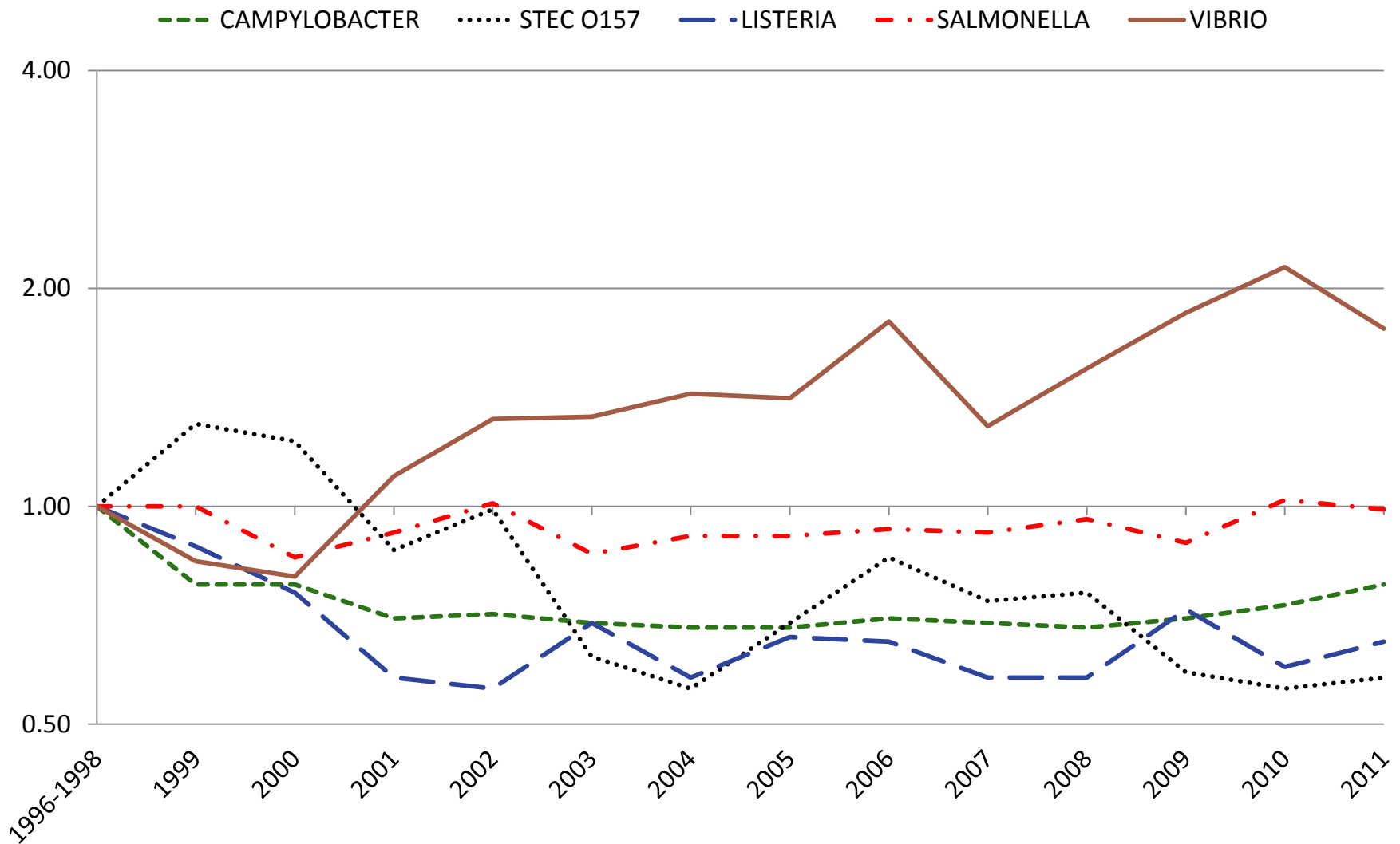
FIGURE 7. Seasonality of STEC* O157 and STEC non-O157 Infections — FoodNet, 2011



*Shiga toxin-producing *Escherichia coli*.

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

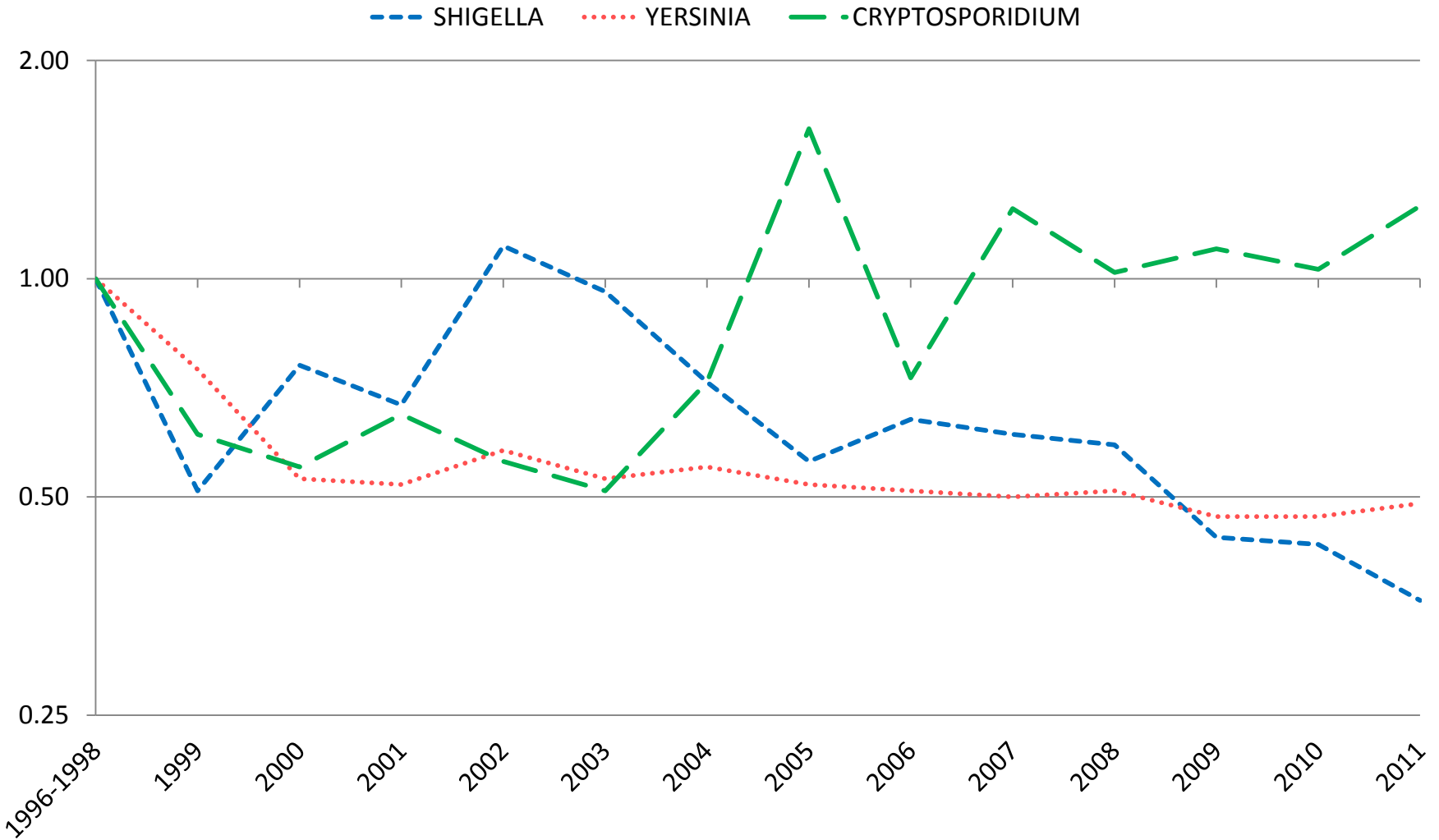
Figure 8. Relative Rates of Laboratory-confirmed Infections with *Campylobacter*, STEC* O157, *Listeria*, *Salmonella*, and *Vibrio* Compared with 1996-1998 Rates, by Year, FoodNet 1996-2011[†]



* Shiga toxin-producing *Escherichia coli*.

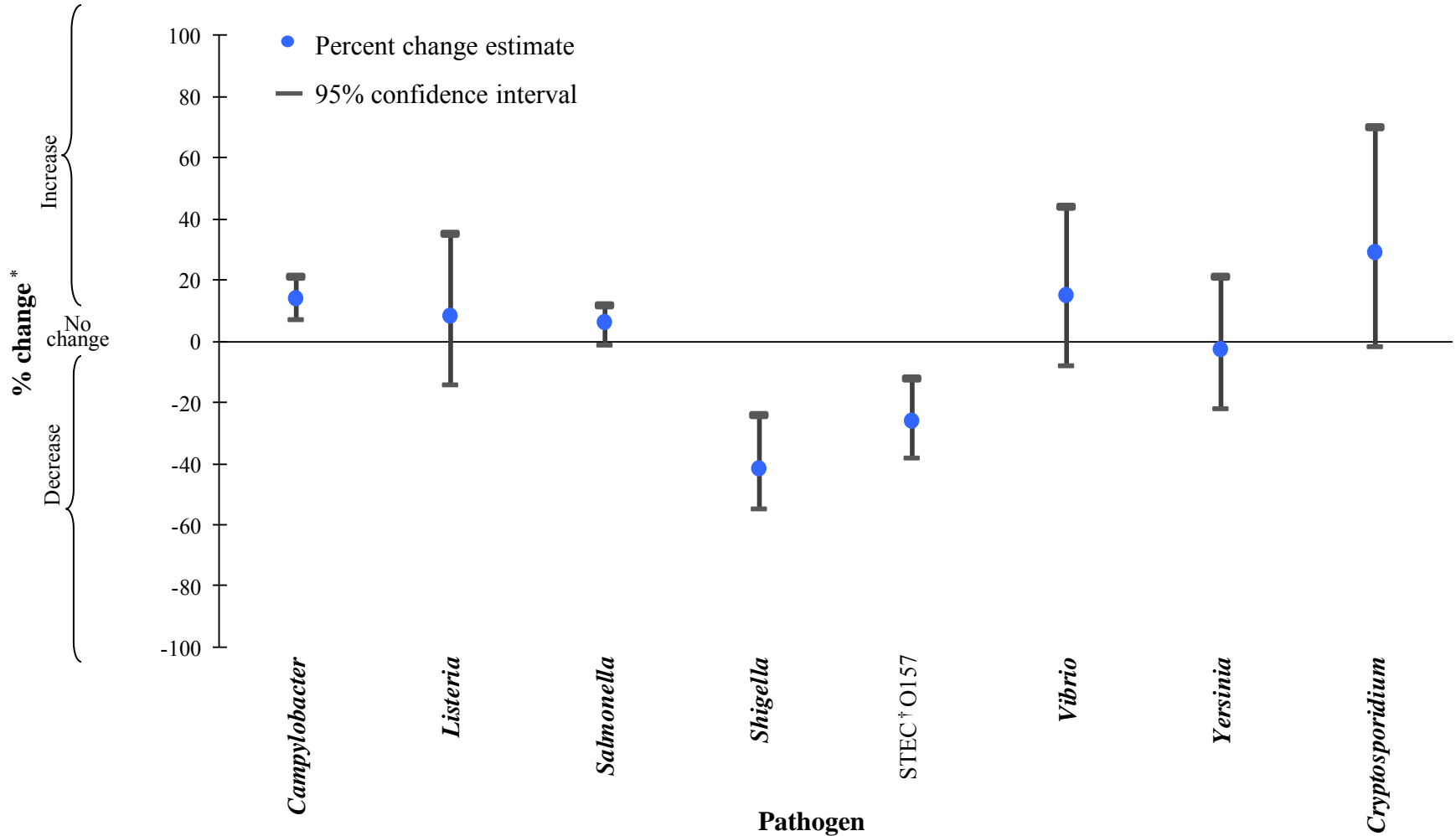
[†] The position of each line indicates the relative change in the incidence of that pathogen compared with 1996-1998. The actual incidences of these infections cannot be determined from this graph.

Figure 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⁺HUS) Cases, All Ages – FoodNet, 1997-2010

	Post-diarrheal HUS Cases* number	Age in years median (range)	Female number (%)	Days of Hospitalization median (range)	Deaths number (%)	Onset June- September number (%)
1997-2009	981	4.5 (0-89)	567 (58%)	12.0 (0-152)	52 (5%)	569 (58%)
2010	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[±]-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 [†]	84 (21%)*	399	9 (29%) [‡]	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
Total with any evidence of STEC/Diarrhea in 3 weeks before HUS diagnosis	621 (63%)	981	71 (76%)	93

[±]Based on surveillance case definition; does not include laboratory verification of hemolytic anemia, thrombocytopenia and kidney damage

[†]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

[‡]All 11 positive serum samples had antibodies against *E. coli* O157 LPS

Table 22. Number and Incidence Rate* of Post-diarrheal Pediatric HUS cases^{†±}, 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
Total	584	1.70	276	0.39	28	0.12	888	0.70

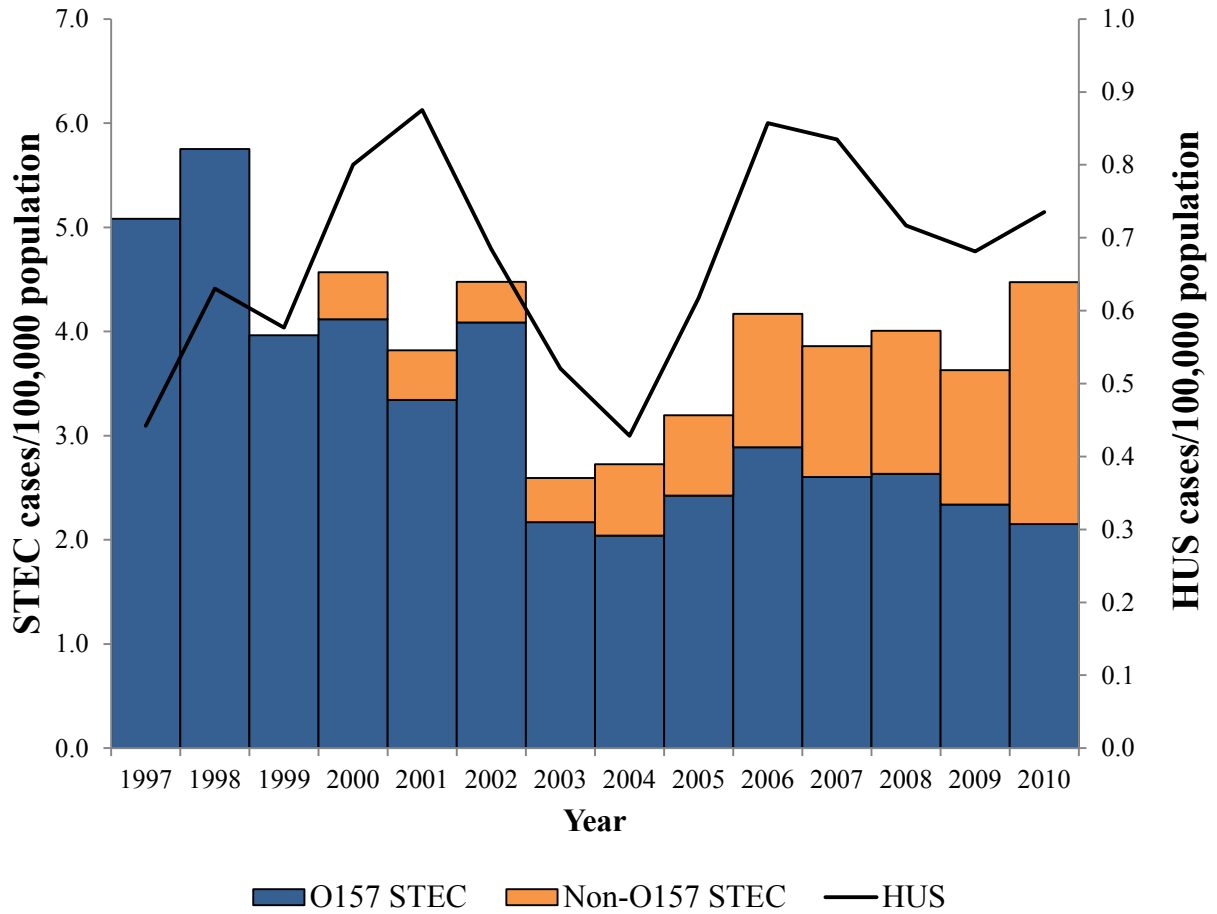
*Cases per 100,000 population.

[†]Includes cases among persons residing within catchment area only.

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

[§]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⁺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 ≥ 24 hours after first hospital discharge date.
- **[DtDisch2]**: Format (Date); Length (mmddyyyy10). Date of hospital discharge for second hospitalization, defined as ≥ 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+’,

FoodNet Variable Definitions

‘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.