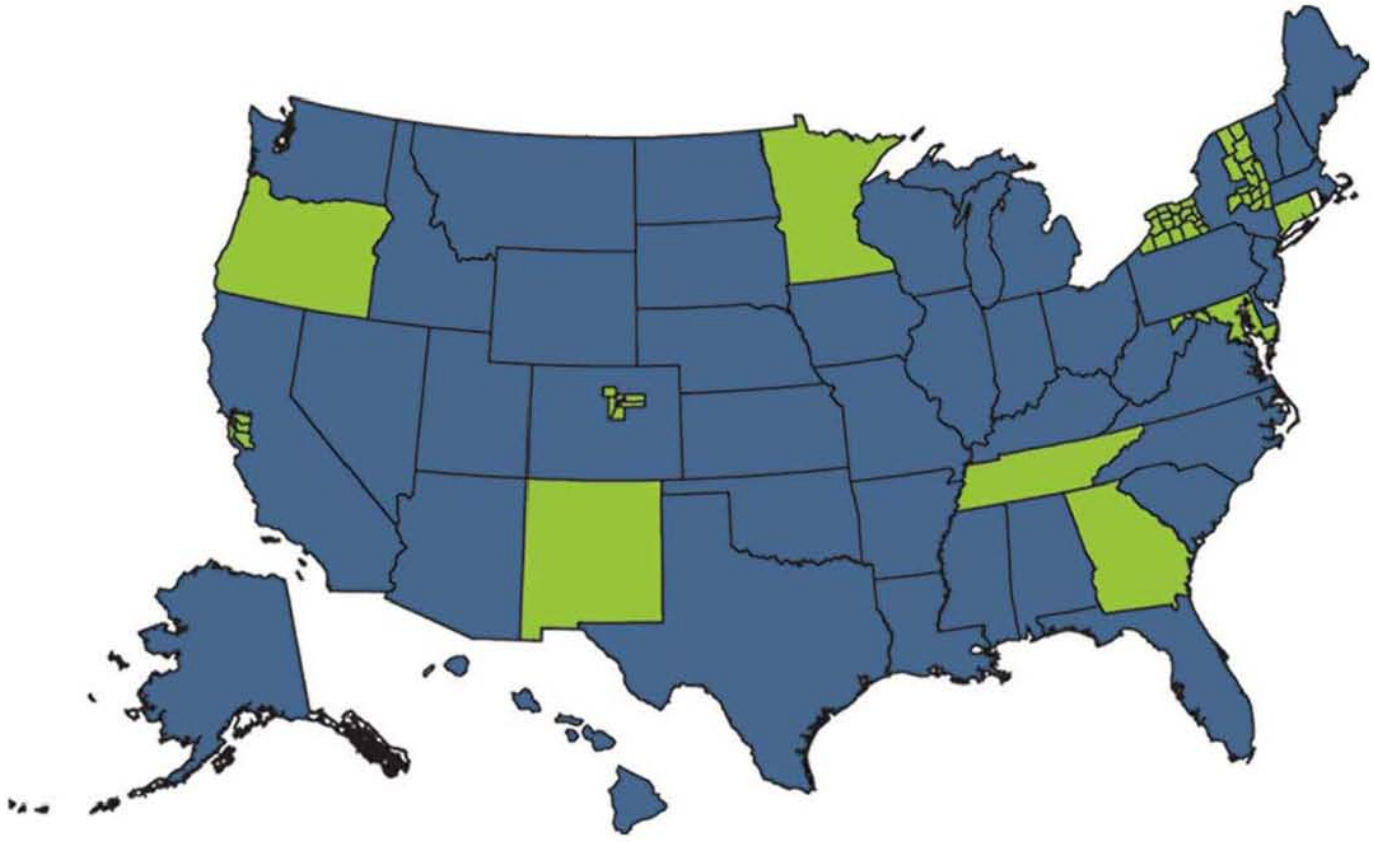
Foodborne Active Disease Surveillance Network (FoodNet)

2008 Surveillance Report



U.S. Department of Health & Human Services
Centers for Disease Control and Prevention

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

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Background

The Foodborne Diseases Active Surveillance Network (FoodNet) is the principal foodborne-disease component of the Centers for Disease Control and Prevention's (CDC's) Emerging Infections Program (EIP). FoodNet is a collaborative project involving CDC, 10 state health departments, the Food Safety and Inspection Service (FSIS) of the United States Department of Agriculture (USDA), and the Center for Food Safety and Applied Nutrition (CFSAN) and the Center for Veterinary Medicine (CVM) of the United States Food and Drug Administration (FDA). This report describes final surveillance data for *Campylobacter*, *Cryptosporidium*, *Cyclospora*, *Listeria*, *Salmonella*, *Shigella*, Shiga toxin-producing *Escherichia coli* (STEC) O157, STEC non-O157, *Vibrio*, *Yersinia* for 2008, HUS for 2007, and trends in incidence since 1996.

FoodNet was established in 1996 to conduct population-based active surveillance in five sites; Minnesota, Oregon, and selected counties in California, Connecticut, and Georgia. By 2004, the FoodNet surveillance area had expanded to include 10 sites: 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 2008 included 46.4 million persons, representing 15.2% of the United States population (Table 2). The sex, race, and ethnic distribution of the 2008 FoodNet surveillance population was similar to that of the United States population as whole, with the exception of the Hispanic population, which was under-represented (Table 3).

The objectives of FoodNet are to determine the burden of foodborne illness in the United States, monitor trends in the burden of specific foodborne illness over time, attribute the burden of foodborne illness to specific foods and settings, and disseminate information that can lead to improvements in public health practice and the development of interventions to reduce the burden of foodborne illness. By meeting these objectives, FoodNet can provide the information needed to assess the effectiveness of new food safety initiatives in decreasing the burden of foodborne illness in the United States. Data obtained through the network also can be used to target educational messages and other interventions for prevention and treatment to populations disproportionately affected by foodborne illness.

Methods

Active Surveillance

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

>650 clinical laboratories serving the surveillance area. Once a case is identified, FoodNet personnel at each site complete a set of core variables and enter this information 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 is not hospitalized). International travel within 7 days of illness onset is captured routinely for all *Salmonella* and STEC O157 cases.

Surveillance for Hemolytic Uremic Syndrome (HUS)

FoodNet also conducts surveillance for cases of hemolytic uremic syndrome (HUS). Active surveillance is conducted for cases of pediatric HUS (i.e., HUS in persons <18 years of age at time of diagnosis) through a network of pediatric nephrologists and infection-control practitioners who report all illnesses suspected to be HUS on the basis of clinical findings. Reported cases of HUS are not required to meet case definitions used by the National Notifiable Disease Surveillance System (NNDSS). FoodNet also conducts passive surveillance for cases of adult HUS (i.e., HUS in persons aged ≥18 years of age). Data from HUS surveillance are reported 1 year later than data from FoodNet Active Surveillance because of the additional time required for review of medical records and hospital discharge data for HUS cases.

In 2000, FoodNet sites began reviewing hospital discharge data for pediatric HUS cases to validate existing HUS surveillance activities and identify additional HUS cases among persons <18 years of age; with the exception of New Mexico, all FoodNet sites continue to conduct this review on a yearly basis. HUS cases are identified using ICD-9 codes specifying HUS, acute renal failure with the hemolytic anemia and thrombocytopenia, or thrombotic thrombocytopenic purpura with diarrhea caused by STEC (or another unknown pathogen).

Analysis

Incidence rates were calculated by dividing the number of laboratory-confirmed infections by U.S. Census Bureau population estimates for 2008. 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, and ≥70 years of age.

A main effects, log-linear Poisson regression model was used to estimate changes in incidence of infections in 2008 compared with previous years. This model accounts for site-to-site variation and changes in the size of the population under surveillance in FoodNet over time (*1*). The 2008 illness incidence was compared with annual average incidence data from two distinct 3-year periods: the first 3 years of FoodNet surveillance (i.e., 1996–1998) and the 3 years preceding 2008 (2005–2007); the estimated change in incidence between 2008 and the comparison periods was calculated with 95% confidence intervals (95% CIs). For HUS surveillance, the average annual incidence for 2004–2006 was used as the comparison period. Due to the small number of cases, changes over time were not evaluated for STEC non-O157 and *Cyclospora*.

Summary of Results

In 2008, a total of 18,624 laboratory-confirmed cases of infection were identified (Table 4). Compared with the first 3 years of surveillance (1996–1998), sustained declines in the incidence of infections caused by *Campylobacter, Listeria, Salmonella,* Shiga toxin-producing *Escherichia coli* (STEC) O157, *Shigella,* and *Yersinia* were observed (Figures 29-30). Compared with the 3 years preceding 2008 (2005–2007), no significant decreases were observed in incidence of *Campylobacter, Cryptosporidium, Cyclospora, Listeria, Salmonella, Shigella,* STEC O157, *Vibrio*, or *Yersinia* (Figure 31). For most infections, reported incidence was highest among children aged <5 years, whereas the percentage of persons hospitalized and the case fatality rates (CFRs) were highest among persons aged ≥50 years (Tables 6, 6a, 12, 12a, 15, 15a). .

In 2007, FoodNet ascertained 125 HUS cases, including 105 (84%) post-diarrheal cases. Among post-diarrheal HUS cases, 1 (1%) person died. Ninety-one (87%) pediatric post-diarrheal HUS cases were reported; among these, 62 (68%) cases were in children aged <5 years. Of all post-diarrheal HUS cases, 50% were diagnosed during June through September.

Detailed information about active surveillance and HUS data can be found in Tables 19-21 and Figure 32.

Publications and Abstracts, 2008

FoodNet publications and abstracts are available for download at: http://www.cdc.gov/nczved/divisions/dfbmd/edeb/publications.html

Publications

1. Ailes E, Demma L, Hurd S, Hatch J, Jones TF, Vugia D, Cronquist A, Tobin-D'Angelo M, Larson K, Laine E, Edge K, Zansky S, Scallan E. Continued decline in the incidence of *Campylobacter* infections, FoodNet 1996-2006. *Foodborne Pathog Dis.* 2008 Jun;5(3):329-37.

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6. Townes JM, Deodhar AA, Laine ES, Smith K, Krug HE, Barkhuizen A, Thompson ME, Cieslak PR, Sobel J. Reactive arthritis following culture-confirmed infections with bacterial enteric pathogens in Minnesota and Oregon: a population-based study. *Ann Rheum Dis*. 2008 Dec;67(12):1689-96.

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Abstracts

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2. Cole D, Tobin-D'Angelo M, Murray EL. Variation in Seasonality Among *Salmonella* Serotypes Isolated in Georgia. Presented at the International Conference on Emerging Infectious Diseases, Atlanta, GA, March 2008.

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4. Gould LH. Epidemiology of non-O157 Shiga-toxin producing *E. coli* in FoodNet sites. Presented at the International Conference on Emerging Infectious Diseases, Atlanta, GA, March 2008.

5. Henao OL, Long C, Scallan E. Differences in incidence of select foodborne pathogens by age group, implications for intervention and prevention efforts, Foodborne Active Surveillance Network, 1996-2007. Presented at the 48th Annual ICAAC/IDSA 46th Annual Meeting, Washington, DC, October 2008.

6. Henao OL, Long C. Examination and comparison of trends in incidence of sporadic, travel and outbreak associated cases of infection with pathogens trasmitted commonly through food, FoodNet 2007. Presented at the 48th Annual ICAAC/IDSA 46th Annual Meeting, Washington, DC, October 2008.

7. Henao OL. Patterns in incidence of diarrheal illness and associated symptoms, FoodNet Population Survey 1996-2006. Presented at the International Conference on Emerging Infectious Diseases, Atlanta, GA, March 2008.

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9. Hurd S, Marcus R, Zansky SM, Soeters M. Analysis of *Listeria* Case Report Forms Among Non-Pregnant Cases: FoodNet Sites, 2004-2006. Presented at the International Conference on Emerging Infectious Diseases, Atlanta, GA, March 2008.

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18. Ou J. The Prevalence of Reactive Arthritis Symptoms in the General Population, FoodNet Population Survey, 2006-2007. Presented at the International Conference on Emerging Infectious Diseases, Atlanta, GA, March 2008.

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27. Tobin-D'Angelo M. O157 STEC versus non-O157 STEC, comparison of exposures and clinical variables. Presented at the International Conference on Emerging Infectious Diseases, Atlanta, GA, March 2008.

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Further information concerning FoodNet, including previous surveillance reports, *MMWR* articles, and other FoodNet publications, can be obtained by contacting the Enteric Diseases Epidemiology Branch at (404) 639-2206.

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TABLE 1. Foodborne Diseases Active Surveillance Network (FoodNet) Surveillance Area, by State and County — 1996-2008

State	County	Year													2008 Total Catchment
		1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	
California	Original counties (Alameda and San Francisco)	•	•	•	•	•	•	•	•	•	•	•	•	•	3,313,047
	Added county (Contra Costa)					•	•	•	•	•	•	•	•	•	
Colorado	Original counties (Adams, Arapahoe, Denver, Douglas, and Jefferson)						•	•	•	•	•	•	•	•	2,745,804
	Added counties (Boulder and Broomfield)							•	•	•	•	•	•	•	
Connecticut	Original counties (Hartford and New Haven)	•	•	•	•	•	•	•	•	•	•	•	•	•	3,501,252
	Rest of state			•	•	•	•	•	•	•	•	•	•	•	
Georgia	Original counties (Clayton, Cobb, Dekalb, Douglas, Fulton, Gwinnett, Newton, and Rockdale)	•	•	•	•	•	•	•	•	•	•	•	•	•	9,685,744
	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)			•	•	•	•	•	•	•	•	•	•	•	5,633,597
	Added counties (Montgomery and Prince George's)						•	•	•	•	•	•	•	•	
	Rest of state							•	•	•	•	•	•	•	
Minnesota	All counties	•	•	•	•	•	•	•	•	•	•	•	•	•	5,220,393
New Mexico	All counties									•	•	•	•	•	1,984,356
New York	Original sites (Genesee, Livingston, Monroe, Ontario, Orleans, Wayne, and Yates)			•	•	•	•	•	•	•	•	•	•	•	4,263,767
	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	•	•	•	•	•	•	•	•	•	•	•	•	•	3,790,060
Tennessee	Original counties (Cheatham, Davidson, Dickson, Hamilton, Knox, Robertson, Rutherford, Shelby, Sumner, Williamson, and Wilson)					•	•	•	•	•	•	•	•	•	6,214,888
	Rest of state								•	•	•	•	•	•	

TABLE 2. Population under Surveillance, by Site — FoodNet, 1996-2008

FoodNet Site	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
California	2,087,032	2,113,195	2,142,806	2,162,359	3,181,232	3,226,057	3,222,073	3,216,453	3,211,623	3,218,408	3,235,558	3,267,518	3,313,047
Colorado	-	-	-	-	-	2,154,780	2,504,847	2,526,219	2,553,408	2,587,481	2,634,928	2,688,571	2,745,804
Connecticut	1,622,809	2,453,483	**3,272,563**	**3,282,031**	**3,411,714**	**3,428,208**	**3,448,261**	**3,467,932**	**3,475,351**	**3,478,714**	**3,487,896**	**3,489,868**	**3,501,252**
Georgia	2,720,443	3,632,206	3,744,022	**7,788,240**	**8,230,053**	**8,418,592**	**8,583,674**	**8,732,924**	**8,910,741**	**9,093,958**	**9,318,715**	**9,523,297**	**9,685,744**
Maryland	-	-	2,441,279	2,450,566	2,516,471	4,245,688	**5,439,327**	**5,495,009**	**5,538,989**	**5,575,552**	**5,602,258**	**5,618,899**	**5,633,597**
Minnesota	**4,647,723**	**4,687,726**	**4,726,411**	**4,775,508**	**4,933,787**	**4,982,339**	**5,016,643**	**5,046,708**	**5,078,014**	**5,104,890**	**5,143,134**	**5,182,360**	**5,220,393**
New Mexico	-	-	-	-	-	-	-	-	**1,889,266**	**1,912,884**	**1,937,916**	**1,964,402**	**1,984,356**
New York	-	-	1,105,062	2,084,453	2,114,892	2,115,477	3,320,485	3,959,403	4,295,581	4,280,192	4,270,498	4,263,973	4,263,767
Oregon	**3,195,087**	**3,243,254**	**3,282,055**	**3,316,154**	**3,430,828**	**3,470,716**	**3,517,982**	**3,551,877**	**3,576,262**	**3,621,939**	**3,680,968**	**3,735,549**	**3,790,060**
Tennessee	-	-	-	-	2,825,990	2,858,858	2,888,246	**5,849,563**	**5,906,936**	**5,983,211**	**6,068,306**	**6,149,116**	**6,214,888**
Total	14,273,094	16,129,864	20,714,198	25,859,311	30,644,967	34,900,715	37,941,538	41,846,088	44,436,171	44,857,229	45,380,177	45,883,553	46,352,908
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

Bold indicates active surveillance was conducted statewide, including all counties within a state; otherwise, surveillance was conducted in select counties.
"-" 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 — 2008

	Total FoodNet Surveillance Population		U.S. Population	CA*	CO*	CT	GA	MD	MN	NM	NY*	OR	TN
	#	%	#	#	#	#	#	#	#	#	#	#	#
Total population	46,352,908		304,059,724	3,313,047	2,745,804	3,501,252	9,685,744	5,633,597	5,220,393	1,984,356	4,263,767	3,790,060	6,214,888
Age													
<1	640,069	14.8%	4,313,132	42,483	42,712	42,446	149,167	75,362	73,528	30,431	48,265	50,484	85,191
1–4	2,499,161	15.0%	16,692,720	168,740	165,279	169,191	591,354	296,425	284,943	117,892	181,195	192,999	331,143
5–9	3,026,544	15.1%	20,065,249	195,268	192,817	218,859	711,353	361,155	335,904	136,849	235,081	234,635	404,623
10–19	6,239,929	15.0%	41,568,985	393,153	352,605	483,133	1,363,787	773,937	708,031	276,146	588,424	484,952	815,761
20–29	6,357,564	15.0%	42,392,724	426,794	384,485	428,772	1,368,800	756,680	727,453	288,531	620,931	520,558	834,560
30–39	6,296,371	15.5%	40,591,603	517,863	416,877	439,191	1,405,849	744,775	675,137	246,427	499,085	514,940	836,227
40–49	6,983,996	15.7%	44,387,223	535,703	421,883	563,286	1,450,342	888,074	795,789	268,354	625,929	528,393	906,243
50–59	6,288,927	15.7%	40,075,636	459,613	374,459	492,768	1,211,776	773,070	717,324	259,584	607,931	547,252	845,150
60–69	4,066,320	15.4%	26,451,418	286,919	218,170	320,269	774,501	494,223	440,033	176,616	401,598	362,439	591,552
70–79	2,323,489	14.5%	16,049,422	162,782	107,386	190,489	407,663	281,289	259,805	110,564	255,547	202,635	345,329
80+	1,630,538	14.2%	11,471,612	123,729	69,131	152,848	251,152	188,607	202,446	72,962	199,781	150,773	219,109
Sex													
Male	22,810,172	15.2%	149,924,604	1,647,933	1,381,109	1,707,410	4,764,975	2,727,323	2,599,899	978,326	2,091,351	1,882,731	3,029,115
Female	23,542,736	15.3%	154,135,120	1,665,114	1,364,695	1,793,842	4,920,769	2,906,274	2,620,494	1,006,030	2,172,416	1,907,329	3,185,773
Ethnicity													
Hispanic	4,755,122	10.1%	46,943,613	670,755	598,393	419,391	777,244	375,830	216,574	891,013	158,606	416,044	231,272
Non-Hispanic	41,597,786	16.2%	257,116,111	2,642,292	2,147,411	3,081,861	8,908,500	5,257,767	5,003,819	1,093,343	4,105,161	3,374,016	5,983,616
Race													
White	35,779,788	14.7%	242,639,242	2,039,358	2,414,833	2,950,808	6,333,287	3,571,589	4,648,528	1,666,790	3,743,190	3,416,377	4,995,028
Black	7,206,614	18.5%	39,058,834	353,356	147,560	361,879	2,907,944	1,658,422	238,531	59,009	360,993	76,109	1,042,811
Asian/Pacific Islander	2,114,718	15.0%	14,111,185	781,306	101,200	124,109	284,930	290,567	188,340	30,738	78,584	148,927	86,017
Indian/Native Alaskan	477,344	15.5%	3,083,434	23,543	28,310	13,387	35,528	20,321	64,503	192,235	24,403	54,405	20,709
Multiple	774,444	15.0%	5,167,029	115,484	53,901	51,069	124,055	92,698	80,491	35,584	56,597	94,242	70,323

*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 Disease Active Surveillance (FoodNet) Sites — 2008

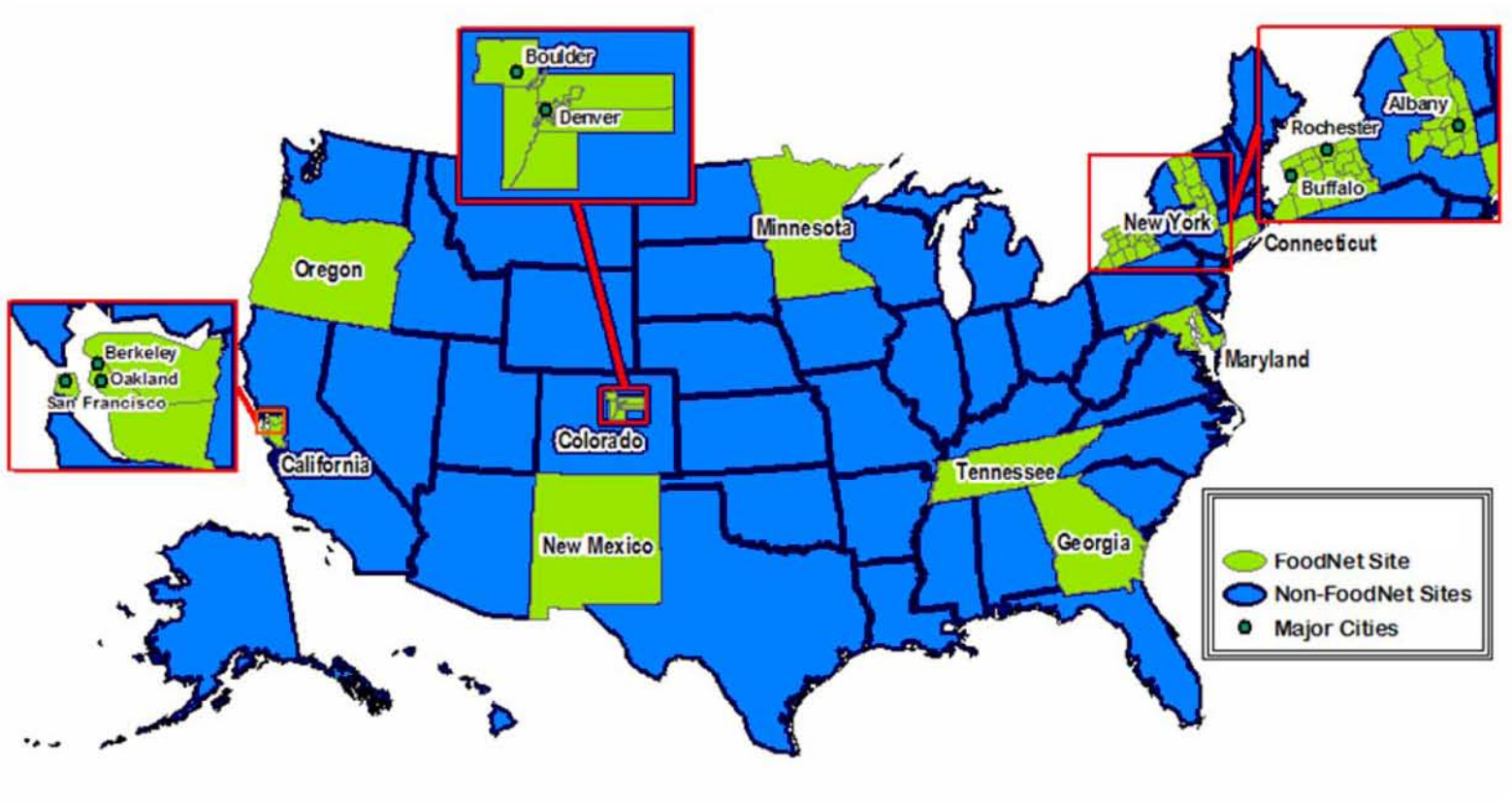


TABLE 4. Number of Laboratory-Confirmed Bacterial and Parasitic Infections, by Site and Pathogen — FoodNet, 2008

	CA*	CO*	CT	GA	MD	MN	NM	NY*	OR	TN	Total
Bacterial											
Campylobacter	985	388	530	683	378	884	357	479	690	480	5,854
Listeria	21	4	16	26	17	7	5	19	6	14	135
Salmonella	477	337	494	2,285	853	755	518	433	397	909	7,458
Shigella	159	85	40	1,103	117	311	154	33	74	967	3,043
STEC† O157	37	82	26	44	33	120	15	51	56	54	518
STEC non-O157	1	25	18	27	53	59	29	17	5	11	245
Vibrio	23	5	14	19	35	8	2	8	12	10	136
Yersinia	11	7	15	45	14	17	2	19	15	21	166
Parasitic											
Cryptosporidium	43	27	41	258	55	235	174	114	58	47	1,052
Cyclospora	0	0	4	2	3	3	2	0	0	3	17
Total	1,757	960	1,198	4,492	1,558	2,399	1,258	1,173	1,313	2,516	18,624

*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* .

TABLE 5. Incidence[*] of Cases of Bacterial and Parasitic Infections Compared with National Health Objectives†, by Site and Pathogen — FoodNet, 2008

	CA[†]	CO[†]	CT	GA	MD	MN	NM	NY[†]	OR	TN	Overall 2008	National 2010 health objective[§]
Bacteria												
Campylobacter	29.73	14.13	15.14	7.05	6.71	16.93	17.99	11.23	18.21	7.72	12.63	12.30
Listeria	0.63	0.15	0.46	0.27	0.30	0.13	0.25	0.45	0.16	0.23	0.29	0.24
Salmonella	14.40	12.27	14.11	23.59	15.14	14.46	26.10	10.16	10.47	14.63	16.09	6.28
Shigella	4.80	3.10	1.14	11.39	2.08	5.96	7.76	0.77	1.95	15.56	6.56	N/A[¶]
STEC[**]O157	1.12	2.99	0.74	0.45	0.59	2.30	0.76	1.20	1.48	0.87	1.12	1.00
STEC non-O157	0.03	0.91	0.51	0.28	0.94	1.13	1.46	0.40	0.13	0.18	0.53	N/A
Vibrio	0.69	0.18	0.40	0.20	0.62	0.15	0.10	0.19	0.32	0.16	0.29	N/A
Yersinia	0.33	0.25	0.43	0.46	0.25	0.33	0.10	0.45	0.40	0.34	0.36	N/A
Parasites												
Cryptosporidium	1.30	0.98	1.17	2.66	0.98	4.50	8.77	2.67	1.53	0.76	2.27	N/A
Cyclospora	0.00	0.00	0.11	0.02	0.05	0.06	0.10	0.00	0.00	0.05	0.04	N/A
Surveillance population (millions)	**3.31**	**2.75**	**3.50**	**9.69**	**5.63**	**5.22**	**1.98**	**4.26**	**3.79**	**6.21**	**46.35**	

[*]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 FoodNet Pathogens, by Age, Sex, Race and Ethnicity — 2008

	Campylobacter		*Listeria*		*Salmonella*		*Shigella*		STEC† O157		STEC† non O157	
	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate	#	Rate
Age (years)												
<1	204	31.87	18	2.81	882	137.80	77	12.03	11	1.72	14	2.19
1-4	609	24.37	1	0.04	1,182	47.30	838	33.53	119	4.76	70	2.80
5–9	292	9.65	0	0.00	573	18.93	908	30.00	73	2.41	26	0.86
10–19	574	9.20	0	0.00	729	11.68	266	4.26	109	1.75	48	0.77
20–29	826	12.99	12	0.19	855	13.45	275	4.33	57	0.90	27	0.42
30–39	786	12.48	8	0.13	678	10.77	271	4.30	23	0.37	12	0.19
40–49	847	12.13	9	0.13	733	10.50	166	2.38	35	0.50	19	0.27
50–59	766	12.18	11	0.17	682	10.84	115	1.83	27	0.43	10	0.16
60–69	521	12.81	25	0.61	507	12.47	78	1.92	22	0.54	8	0.20
70–79	268	11.53	26	1.12	371	15.97	31	1.33	31	1.33	7	0.30
80+	158	9.69	25	1.53	257	15.76	16	0.98	11	0.67	4	0.25
Unknown	3	-	0	-	9	-	2	-	0	-	0	-
Sex												
Male	3,214	14.09	56	0.25	3,637	15.94	1,442	6.32	255	1.12	114	0.50
Female	2,636	11.20	78	0.33	3,808	16.17	1,587	6.74	260	1.10	131	0.56
Unknown	4	-	1	-	13	-	14	-	3	-	0	-
Ethnicity												
Hispanic	510	10.73	25	0.53	737	15.50	411	8.64	32	0.67	38	0.80
Non-Hispanic	3,359	8.07	100	0.24	4,795	11.53	1,885	4.53	420	1.01	176	0.42
Unknown	1,985	-	10	-	1,926	-	747	-	66	-	31	-
Race												
White	3,189	8.91	68	0.19	3,941	11.01	1,333	3.73	375	1.05	141	0.39
Black	144	2.00	14	0.19	533	7.40	481	6.67	19	0.26	2	0.03
Asian/Pacific Islander	189	8.94	7	0.33	234	11.07	37	1.75	15	0.71	1	0.05
Indian/Native Alaskan	79	16.55	0	0.00	125	26.19	36	7.54	3	0.63	3	0.63
Multiple	304	39.25	19	2.45	736	95.04	87	11.23	38	4.91	37	4.78
Other	134	-	1	-	132	-	66	-	7	-	4	-
Unknown	1,815	-	26	-	1,757	-	1,003	-	61	-	57	-
Total	**5,854**	**12.63**	**135**	**0.29**	**7,458**	**16.09**	**3,043**	**6.56**	**518**	**1.12**	**245**	**0.53**

*Rate per 100,000 population.

†Shiga toxin-producing *Escherichia coli*.

TABLE 6a. Number and Incidence* of FoodNet Pathogens, by Age, Sex, Race, and Ethnicity — 2008

	Vibrio		*Yersinia*		*Cryptosporidium*		*Cyclospora*	
	#	Rate	#	Rate	#	Rate	#	Rate
Age (years)								
<1	0	0.00	33	5.16	25	3.91	0	0.00
1–4	2	0.08	28	1.12	153	6.12	0	0.00
5–9	2	0.07	7	0.23	87	2.87	0	0.00
10–19	5	0.08	16	0.26	126	2.02	2	0.03
20–29	11	0.17	11	0.17	174	2.74	1	0.02
30–39	17	0.27	11	0.17	148	2.35	2	0.03
40–49	28	0.40	11	0.16	146	2.09	3	0.04
50–59	30	0.48	11	0.17	68	1.08	6	0.10
60–69	18	0.44	19	0.47	56	1.38	3	0.07
70–79	12	0.52	12	0.52	45	1.94	0	0.00
80+	11	0.67	7	0.43	24	1.47	0	0.00
Unknown	0	-	0	-	0	-	0	-
Sex								
Male	100	0.44	80	0.35	528	2.31	4	0.02
Female	36	0.15	85	0.36	523	2.22	13	0.06
Unknown	0	-	1	-	1	-	0	-
Ethnicity								
Hispanic	8	0.17	17	0.36	106	2.23	1	0.02
Non-Hispanic	96	0.23	118	0.28	689	1.66	11	0.03
Unknown	32	-	31	-	257	-	5	-
Race								
White	67	0.19	80	0.22	612	1.71	10	0.03
Black	2	0.03	18	0.25	65	0.90	0	0.00
Asian/Pacific Islander	9	0.43	10	0.47	8	0.38	0	0.00
Indian/Native Alaskan	0	0.00	1	0.21	10	2.09	0	0.00
Multiple	27	3.49	12	1.55	58	7.49	2	0.26
Other	2	-	1	-	7	-	0	-
Unknown	29	-	44	-	292	-	5	-
Total	**136**	**0.29**	**166**	**0.36**	**1,052**	**2.27**	**17**	**0.04**

*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, 2008

Rank		*Salmonella* serotype	Number of cases	% of total *Salmonella* cases	Incidence per 100,000 persons
2008	2003-2007				
1	2	Enteridits	1,376	18.4	3.0
2	1	Typhimuirum*	1,092	14.6	2.4
3	3	Newport	690	9.3	1.5
4	4	Javiana	432	5.8	0.9
5	9	Saintpaul	409	5.5	0.9
6	6	I 4,[5],12:i:-*	280	3.8	0.6
7	8	Muenchen	216	2.9	0.5
8	5	Heidelberg	204	2.7	0.4
9	7	Montevideo	196	2.6	0.4
10	11	Braenderup	110	1.5	0.2
11	15	Agona	109	1.5	0.2
12	13	Infantis	88	1.2	0.2
13	39	I 13,23:b:-	86	1.2	0.2
14	12	Oranienburg	84	1.1	0.2
15	17	Typhi	65	0.9	0.1
16	16	Thompson	62	0.8	0.1
17	27	Poona	60	0.8	0.1
18	20	Bareilly	58	0.8	0.1
18	22	Hadar	58	0.8	0.1
20	10	Mississippi	52	0.7	0.1
		Sub total	**5,727**	76.8	**12.4**
		All other serotyped	1,226	16.4	2.6
		Not serotyped	387	5.2	0.8
		Partially serotyped	83	1.1	0.2
		Rough or nonmotile	35	0.5	0.1
		Total	**7,458**		**16.1**

*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 *Shigella* Infections, by Species — FoodNet, 2008

Shigella species	Number of cases	% of total *Shigella* cases	Incidence per 100,000 persons
S. sonnei	2,584	84.9	5.57
S. flexneri	299	9.8	0.65
S. boydii	18	0.6	0.04
S. dysenteriae	4	0.1	0.01
Unknown	138	4.5	0.30
Total	3,043	100	6.56

TABLE 9. Number and Incidence of Laboratory-Confirmed *Vibrio* Infections, by Species — FoodNet, 2008

Vibrio species	Number of cases	% of total *Vibrio* cases	Incidence per 100,000 persons
V. parahaemolyticus	77	56.6	0.17
V. vulnificus	19	14.0	0.04
V. alginolyticus	9	6.6	0.02
V. fluvialis	6	4.4	0.01
V. cholerae non-01	5	3.7	0.01
V. cholerae non-01. non-0139	5	3.7	0.01
V. mimicus	5	3.7	0.01
V. cholerae 01	1	0.7	0.00
Unknown	9	6.6	0.02
Total	**136**		**0.29**

TABLE 10. Number and Incidence of Laboratory-Confirmed STEC* non-O157 Infections Caused by the Ten Most Common Serogroups of STEC, — FoodNet, 2008

Rank	Serogroups	Number of cases	% total STEC non O157 cases	Incidence per 100,000 persons
1	O103	59	24.1	0.13
2	O26	56	22.9	0.12
3	O111	40	16.3	0.09
4	O45	12	4.9	0.03
5	O121	6	2.4	0.01
6	O145	4	1.6	0.01
6	O91	4	1.6	0.01
8	O146	3	1.2	0.01
8	O165	3	1.2	0.01
8	O76	3	1.2	0.01
	Undetermined	16	6.5	0.03
	Unknown	6	2.4	
	All other	33	13.5	
	Total	**245**		

*Shiga toxin-producing *Escherichia coli* .

FIGURE 2. Incidence of *Campylobacter*, *Salmonella*, and *Shigella* Infections, by Age Group — FoodNet, 2008

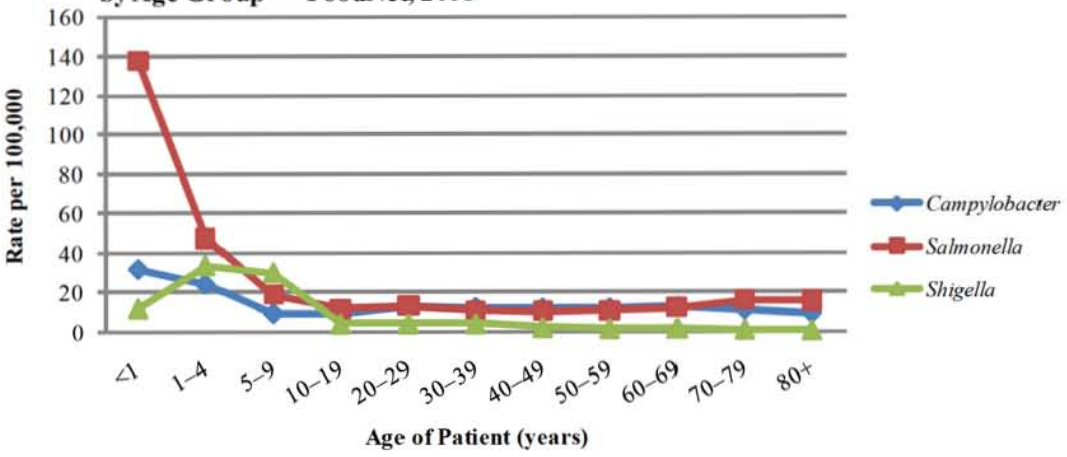


FIGURE 3. Incidence of *Cryptosporidium*, *Listeria*, and *Yersinia* Infections, by Age Group — FoodNet, 2008

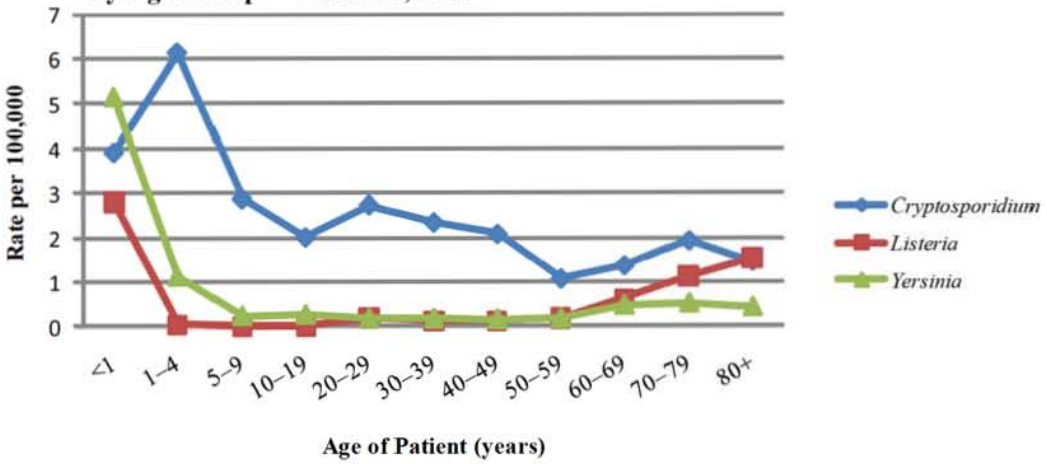
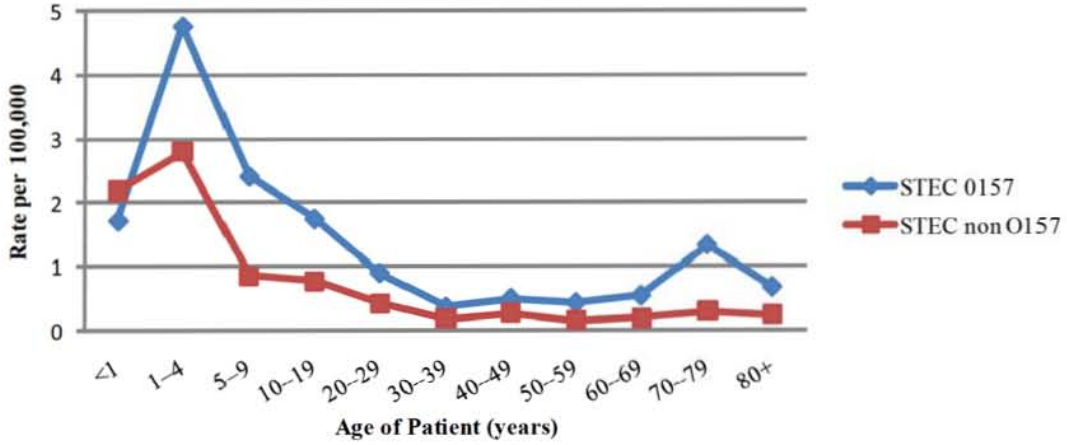


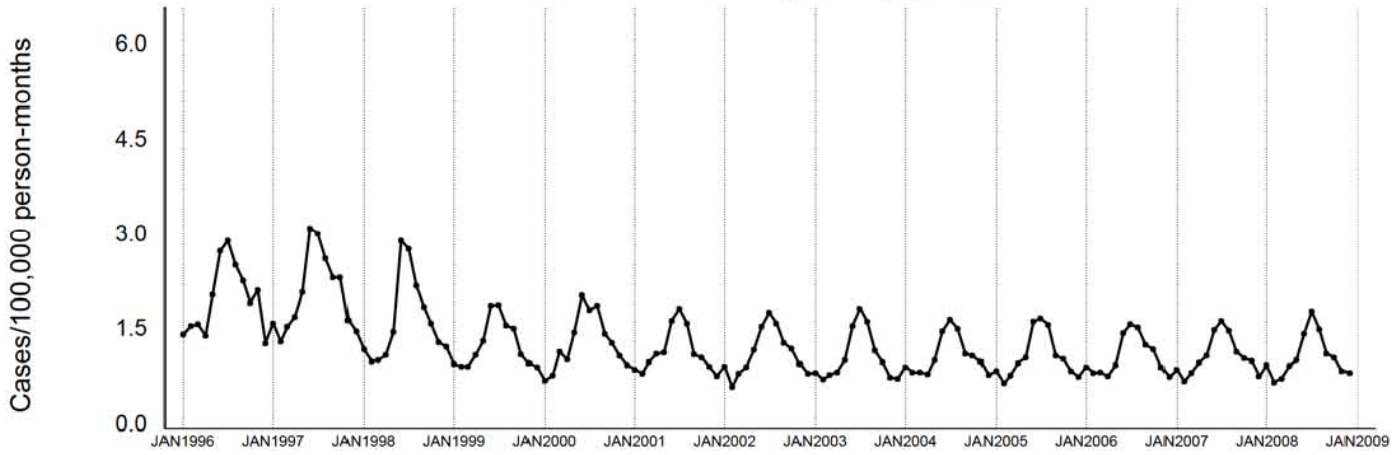
FIGURE 4. Incidence of STEC* O157 and STEC non-O157 Infections, by Age Group — FoodNet, 2008



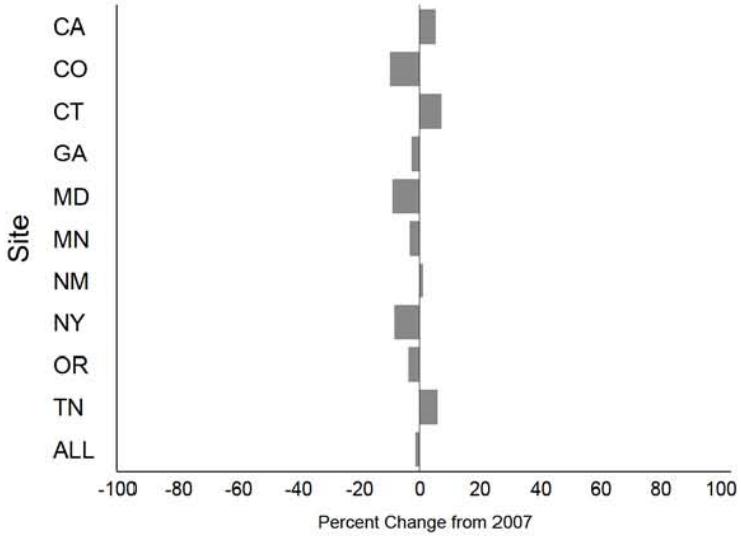
*Shiga toxin-producing *Escherichia coli* .

Figure 5 - *Campylobacter* Annual Summary (All Sites)

Incidence for 1996 through 2008, by month



Change in incidence between 2007 and 2008, by site



	2008		2007		5 year mean*	
Site	**Cases**	**Rate†**	**Cases**	**Rate†**	**Cases**	**Rate†**
CA	985	29.73	923	28.25	900	27.86
CO	388	14.13	421	15.66	453	17.46
CT	530	15.14	493	14.13	540	15.51
GA	683	7.05	689	7.23	610	6.70
MD	378	6.71	414	7.37	392	7.04
MN	884	16.93	907	17.50	896	17.54
NM	357	17.99	350	17.82	357	18.53
NY	479	11.23	522	12.24	503	11.94
OR	690	18.21	705	18.87	641	17.62
TN	480	7.72	448	7.29	438	7.31
ALL	**5,854**	**12.63**	**5,872**	**12.80**	**5,730**	**12.72**

* Year 2003–2007 except for NM (2004–2007)

† Incidence as cases/100,000 persons

Incidence for 2007 and 2008, by age group and sex

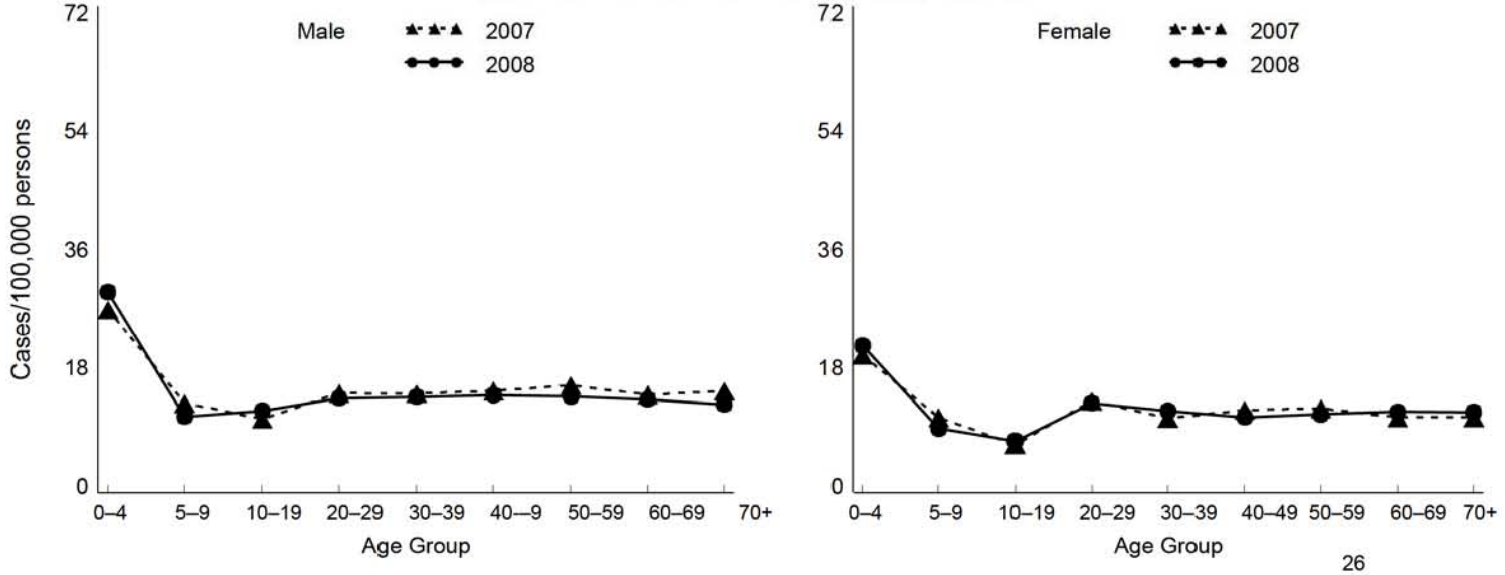
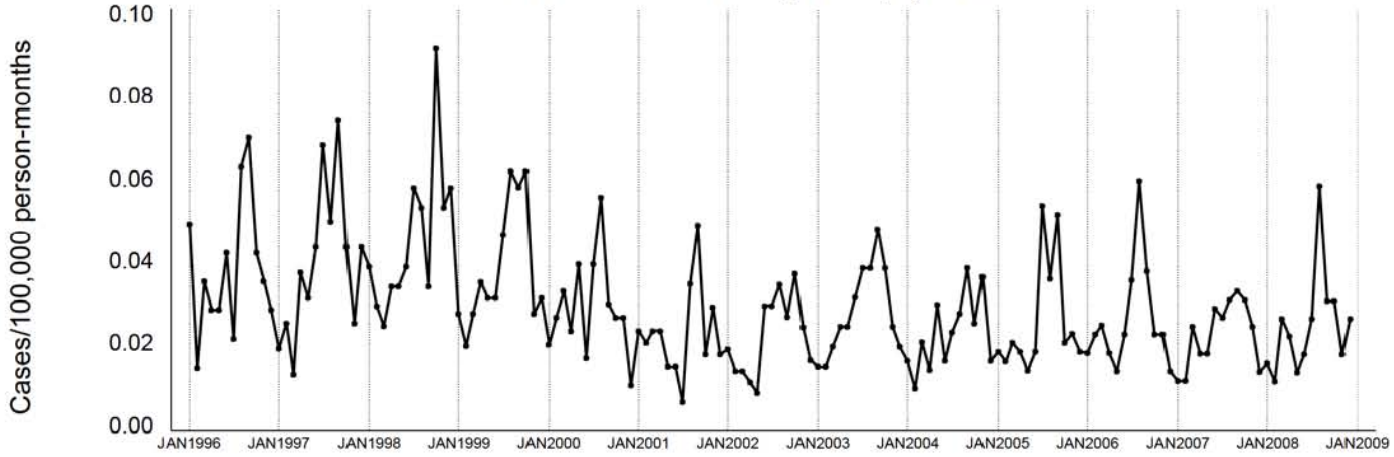
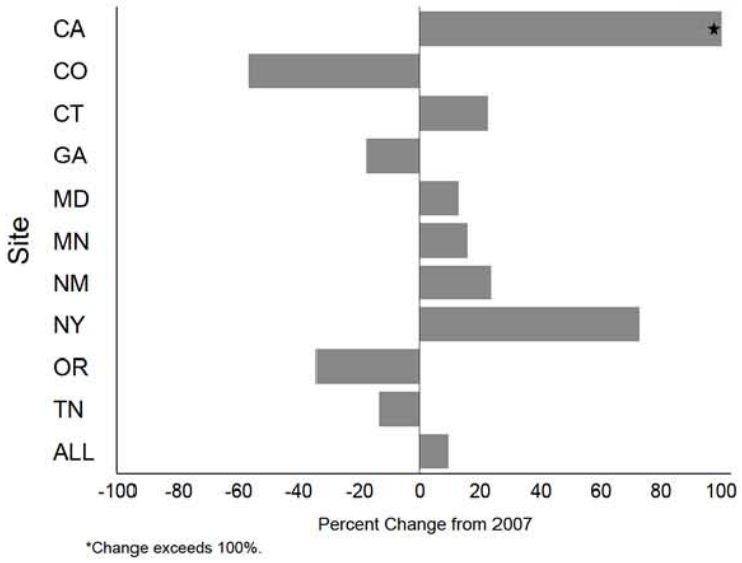


Figure 6 - *Listeria* Annual Summary (All Sites)

Incidence for 1996 through 2008, by month



Change in incidence between 2007 and 2008, by site



*Change exceeds 100%.

	2008		2007		5 year mean*	
Site	**Cases**	**Rate†**	**Cases**	**Rate†**	**Cases**	**Rate†**
CA	21	0.63	8	0.24	12	0.36
CO	4	0.15	9	0.33	6	0.24
CT	16	0.46	13	0.37	18	0.53
GA	26	0.27	31	0.33	25	0.27
MD	17	0.30	15	0.27	22	0.39
MN	7	0.13	6	0.12	8	0.15
NM	5	0.25	4	0.20	4	0.19
NY	19	0.45	11	0.26	16	0.37
OR	6	0.16	9	0.24	8	0.22
TN	14	0.23	16	0.26	14	0.23
ALL	**135**	**0.29**	**122**	**0.27**	**132**	**0.30**

* Year 2003–2007 except for NM (2004–2007)

† Incidence as cases/100,000 persons

Incidence for 2007 and 2008, by age group and sex

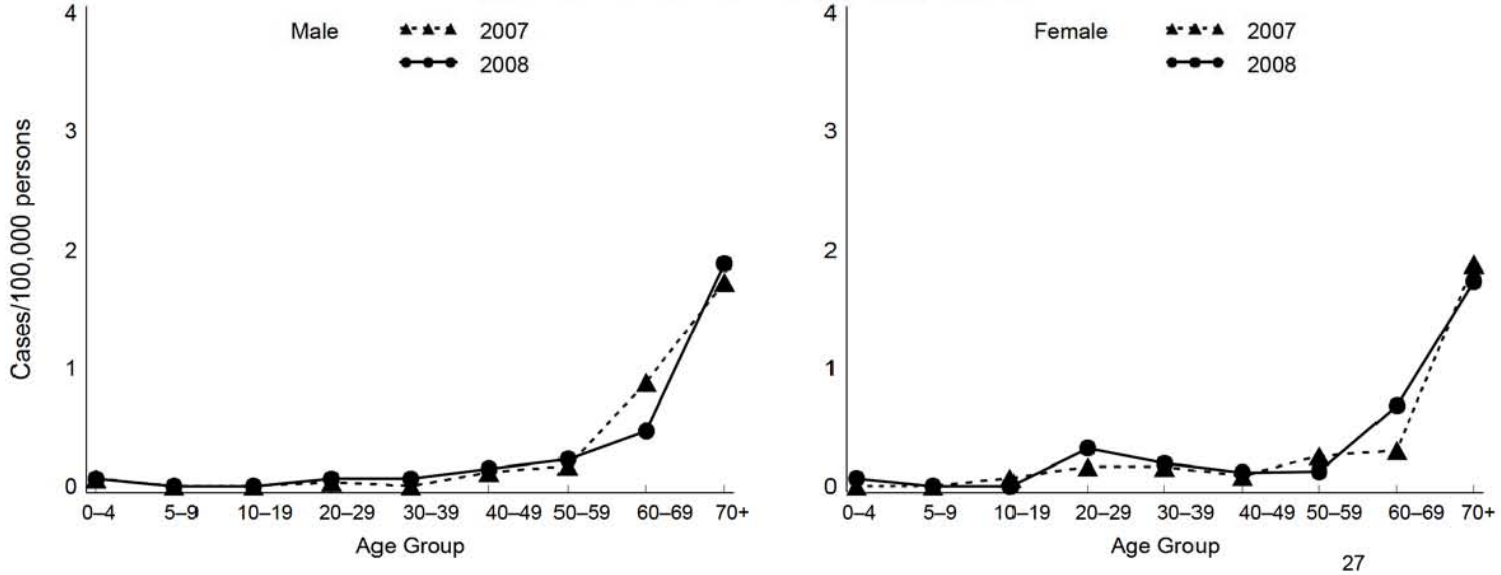
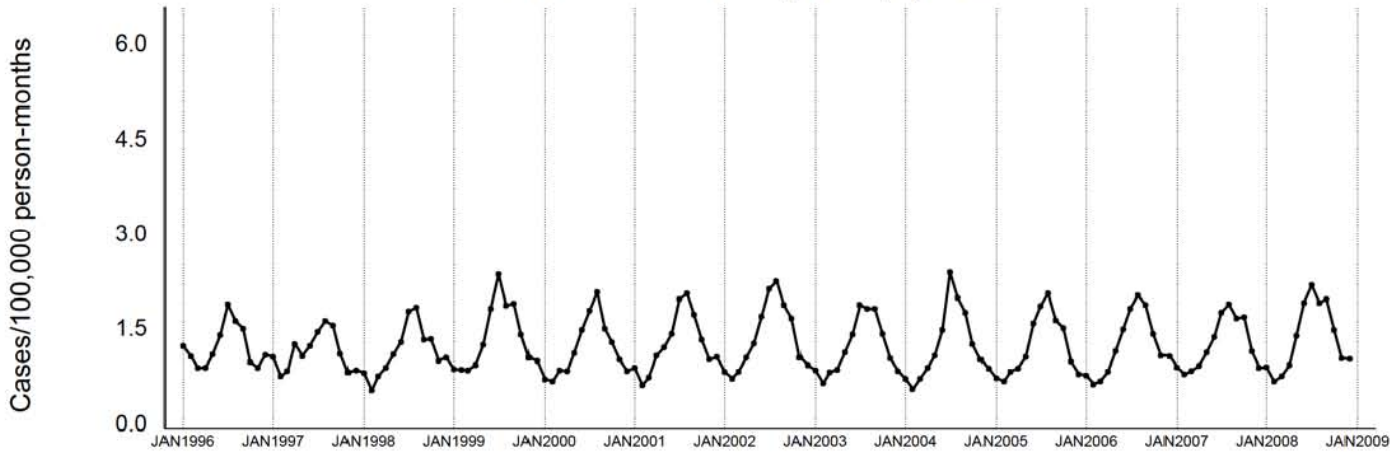
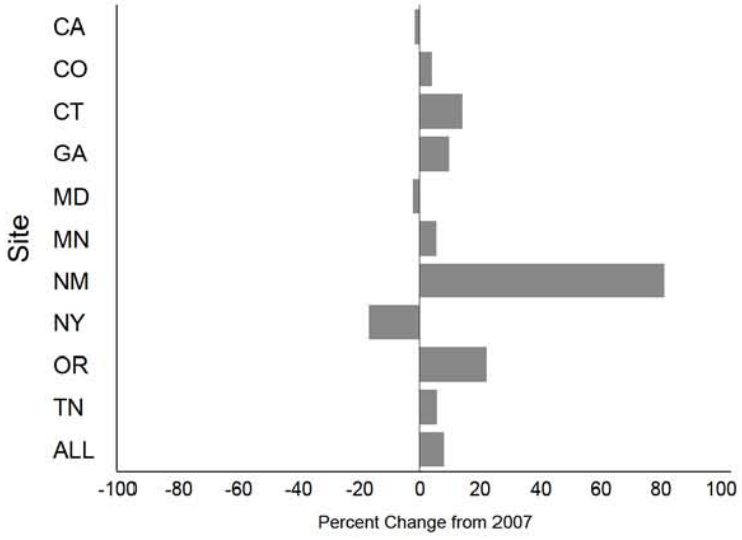


Figure 7 - *Salmonella,* All Serotypes, Annual Summary (All Sites)

Incidence for 1996 through 2008, by month



Change in incidence between 2007 and 2008, by site



	2008		2007		5 year mean*	
Site	**Cases**	**Rate†**	**Cases**	**Rate†**	**Cases**	**Rate†**
CA	477	14.40	478	14.63	477	14.77
CO	337	12.27	317	11.79	318	12.23
CT	494	14.11	431	12.35	454	13.03
GA	2,285	23.59	2,047	21.49	1,950	21.41
MD	853	15.14	870	15.48	805	14.46
MN	755	14.46	711	13.72	647	12.66
NM	518	26.10	283	14.41	269	13.95
NY	433	10.16	521	12.22	470	11.13
OR	397	10.47	320	8.57	369	10.16
TN	909	14.63	851	13.84	807	13.47
ALL	**7,458**	**16.09**	**6,829**	**14.88**	**6,566**	**14.64**

* Year 2003–2007 except for NM (2004–2007)

† Incidence as cases/100,000 persons

Incidence for 2007 and 2008, by age group and sex

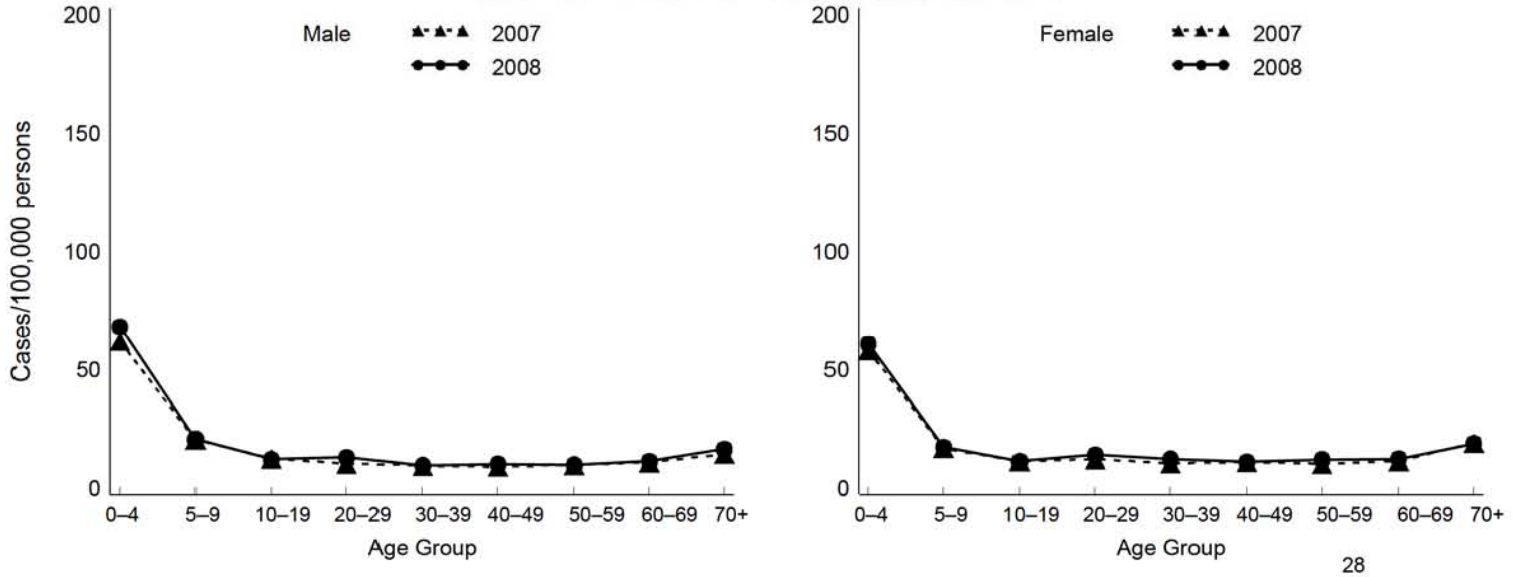
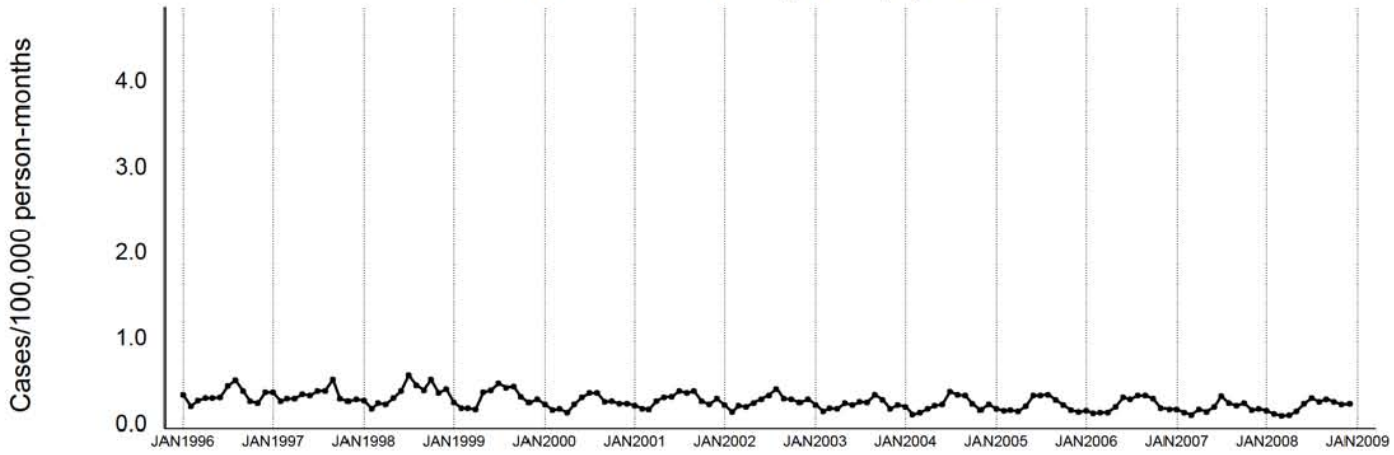
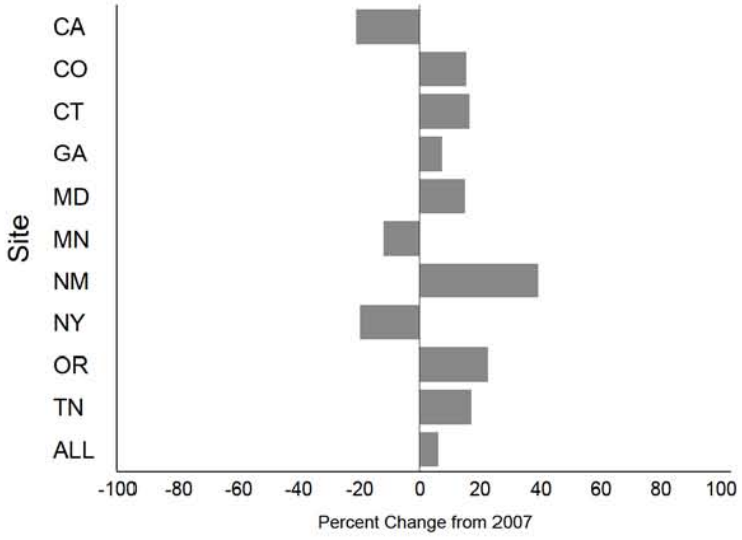


Figure 8 - *Salmonella* Typhimurium Annual Summary (All Sites)

Incidence for 1996 through 2008, by month



Change in incidence between 2007 and 2008, by site



	2008		2007		5 year mean*	
Site	**Cases**	**Rate†**	**Cases**	**Rate†**	**Cases**	**Rate†**
CA	48	1.45	60	1.84	75	2.34
CO	66	2.40	56	2.08	70	2.71
CT	90	2.57	77	2.21	87	2.51
GA	286	2.95	262	2.75	268	2.95
MD	128	2.27	111	1.98	128	2.30
MN	135	2.59	152	2.93	146	2.86
NM	52	2.62	37	1.88	46	2.38
NY	61	1.43	76	1.78	95	2.26
OR	66	1.74	53	1.42	75	2.08
TN	160	2.57	135	2.20	151	2.52
ALL	**1,092**	**2.36**	**1,019**	**2.22**	**1,143**	**2.55**

* Year 2003–2007 except for NM (2004–2007)

† Incidence as cases/100,000 persons

Incidence for 2007 and 2008, by age group and sex

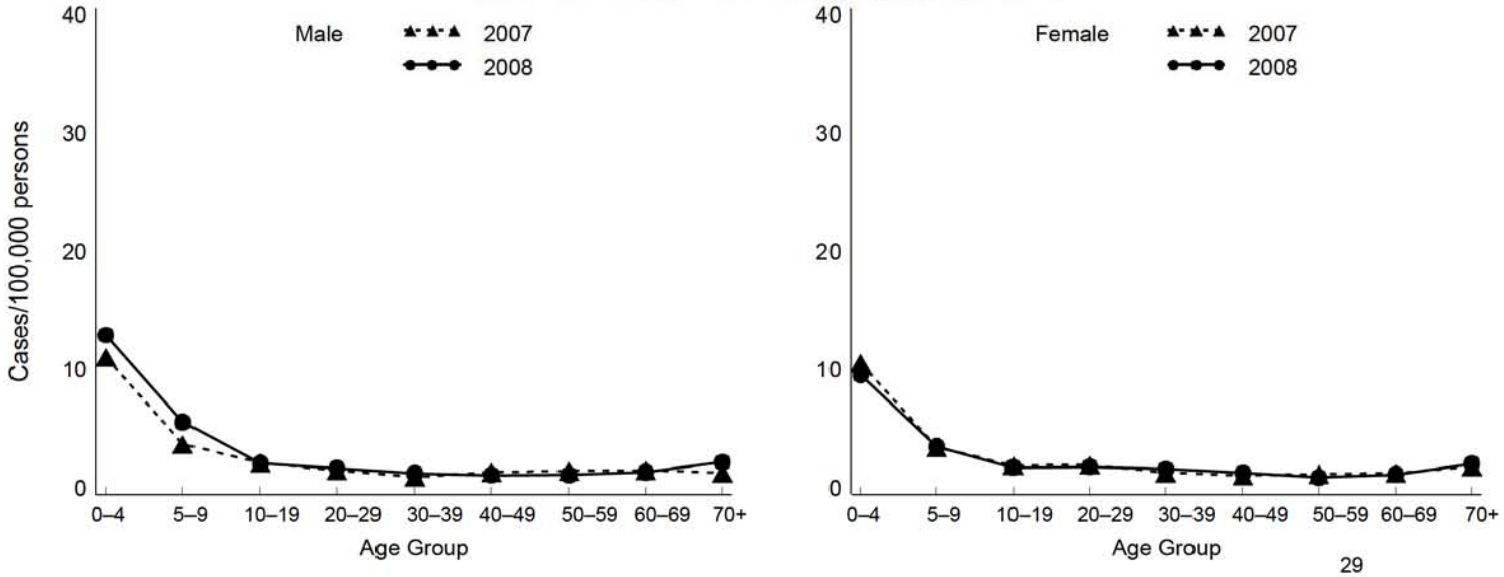
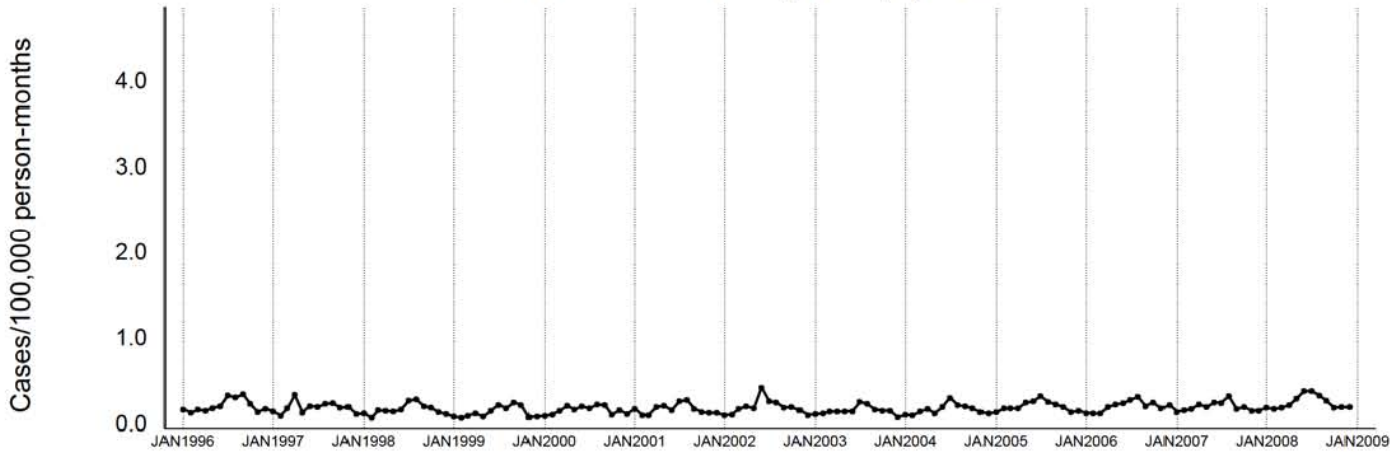
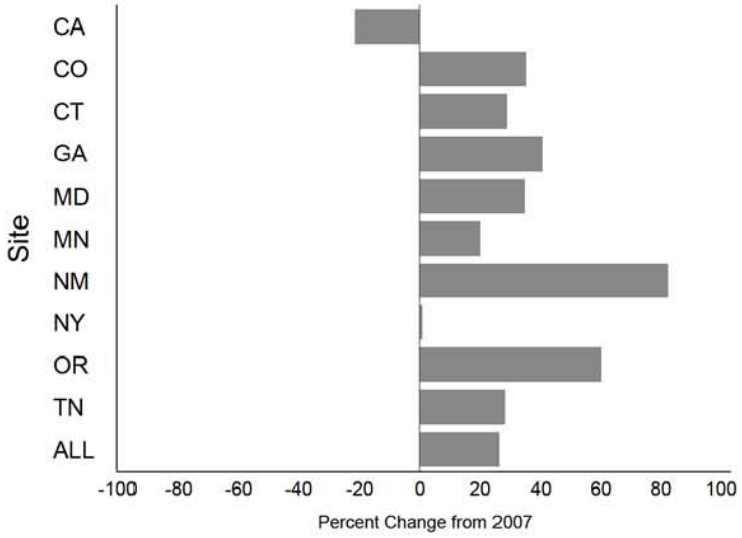


Figure 9 - *Salmonella* Enteritidis Annual Summary (All Sites)

Incidence for 1996 through 2008, by month



Change in incidence between 2007 and 2008, by site



Incidence for 2007 and 2008, by age group and sex

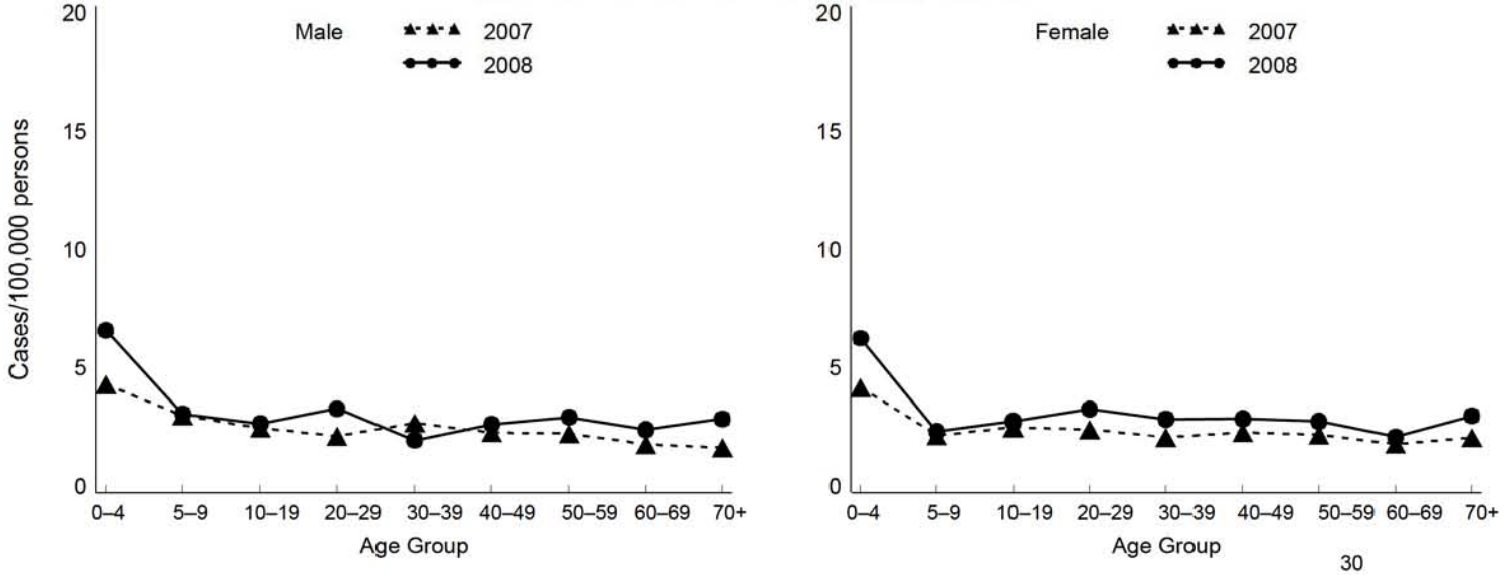
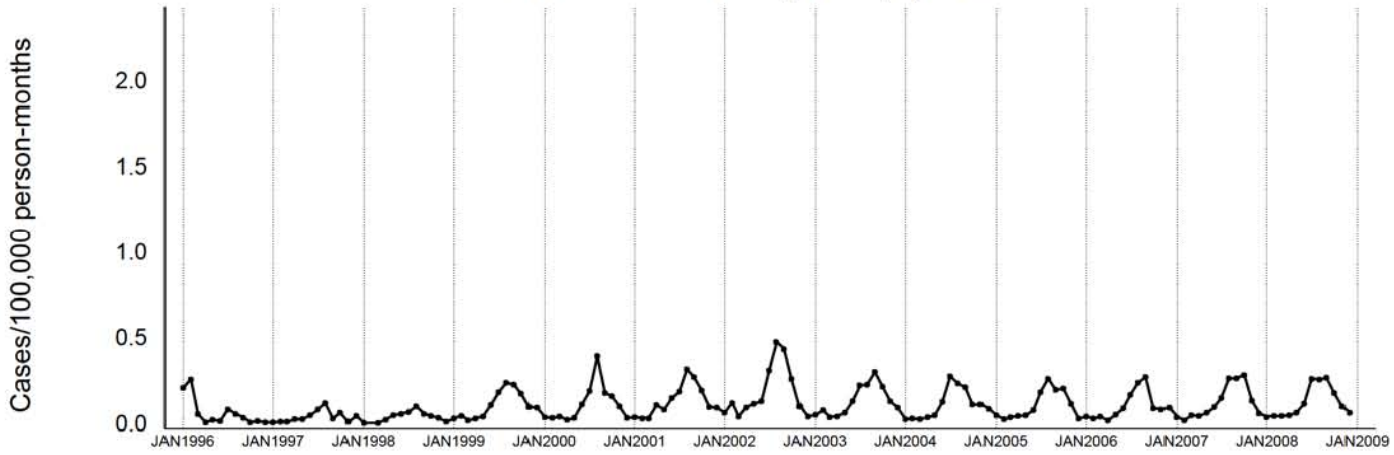
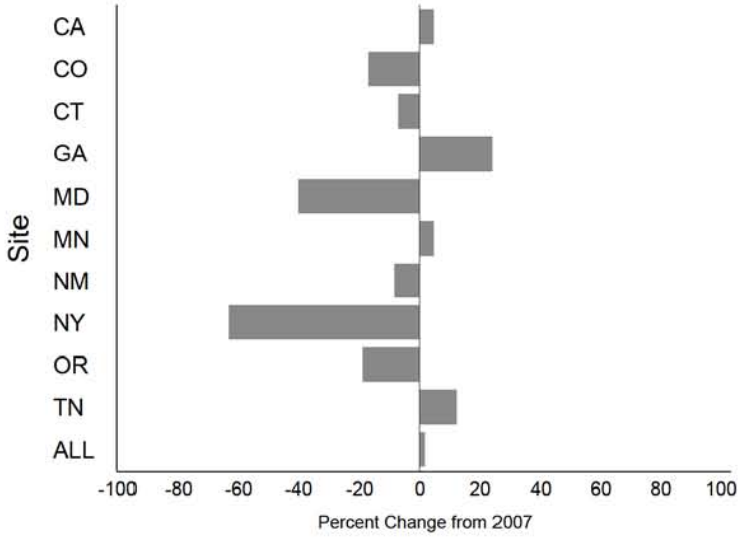


Figure 10 - *Salmonella* Newport Annual Summary (All Sites)

Incidence for 1996 through 2008, by month



Change in incidence between 2007 and 2008, by site



Incidence for 2007 and 2008, by age group and sex

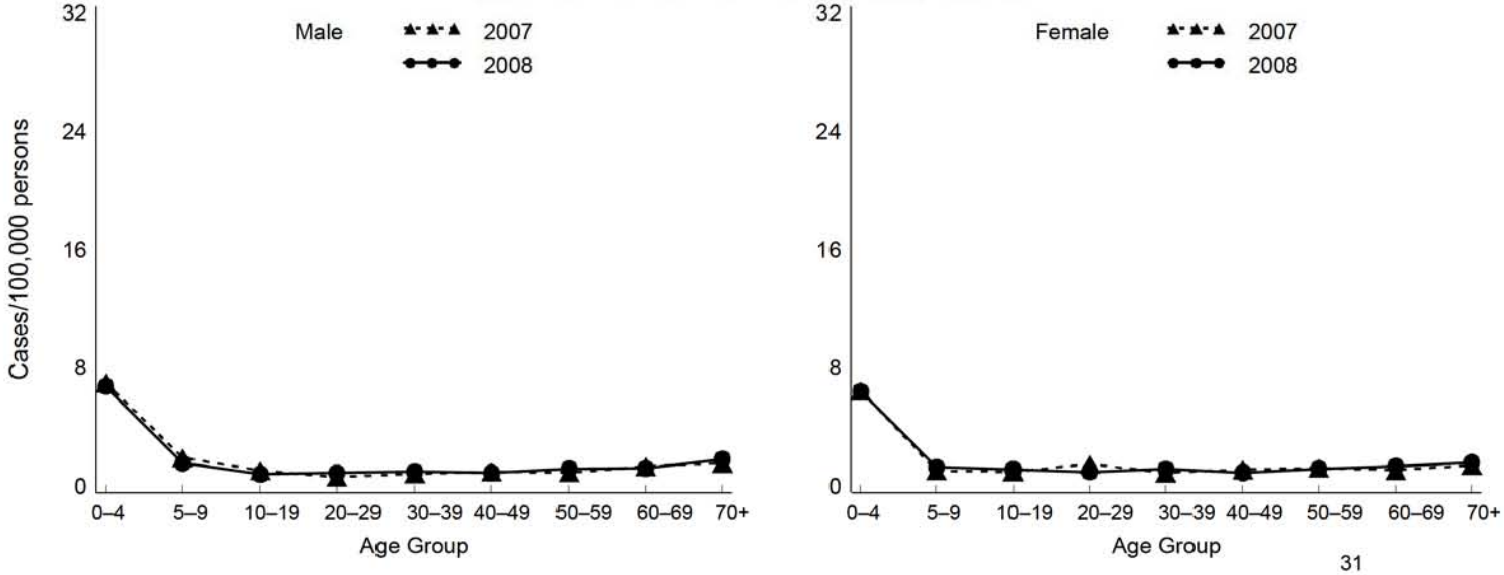
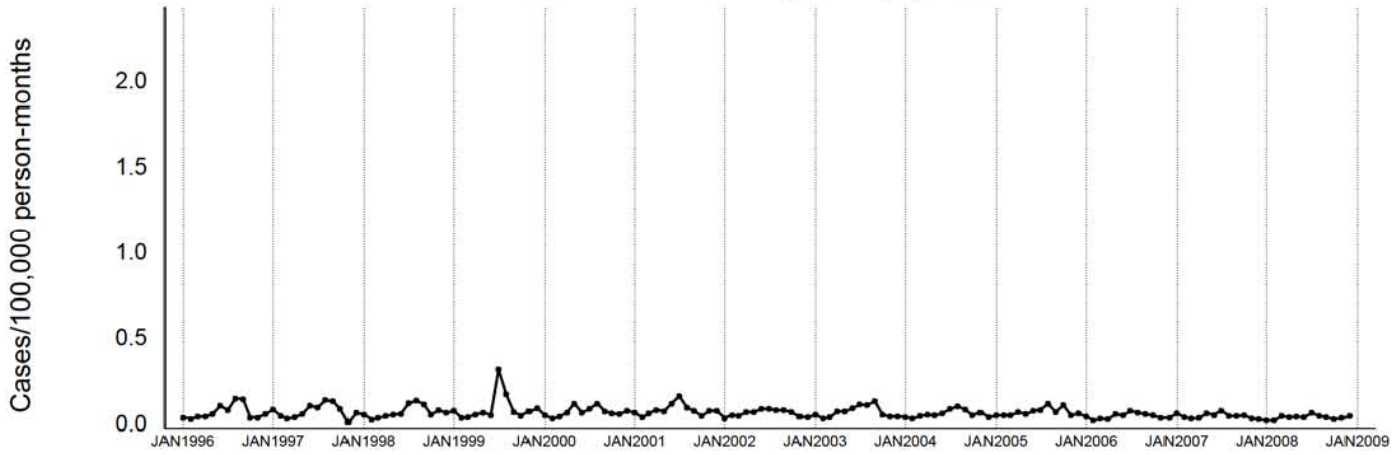
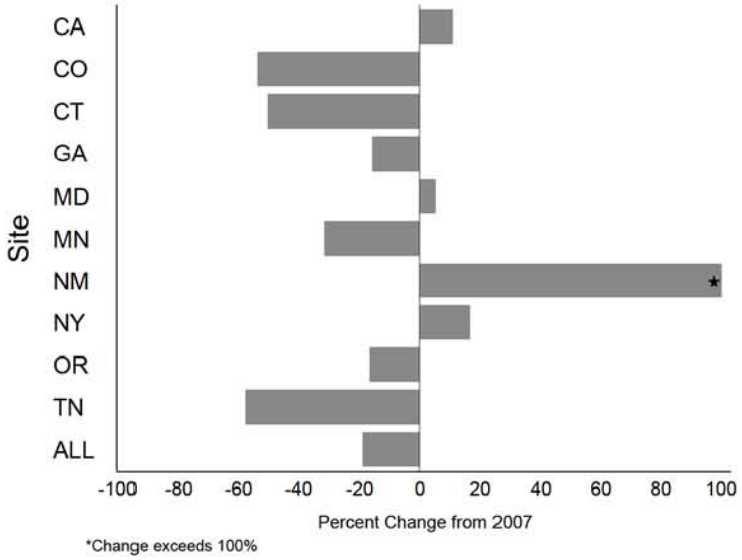


Figure 11 - *Salmonella* Heidelberg Annual Summary (All Sites)

Incidence for 1996 through 2008, by month



Change in incidence between 2007 and 2008, by site



	2008		2007		5 year mean*	
Site	**Cases**	**Rate†**	**Cases**	**Rate†**	**Cases**	**Rate†**
CA	36	1.09	32	0.98	39	1.21
CO	9	0.33	19	0.71	16	0.60
CT	9	0.26	18	0.52	21	0.60
GA	36	0.37	42	0.44	66	0.72
MD	19	0.34	18	0.32	24	0.43
MN	11	0.21	16	0.31	31	0.62
NM	13	0.66	5	0.25	5	0.27
NY	28	0.66	24	0.56	34	0.81
OR	22	0.58	26	0.70	28	0.78
TN	21	0.34	49	0.80	40	0.67
ALL	**204**	**0.44**	**249**	**0.54**	**304**	**0.68**

* Year 2003–2007 except for NM (2004–2007)

† Incidence as cases/100,000 persons

Incidence for 2007 and 2008, by age group and sex

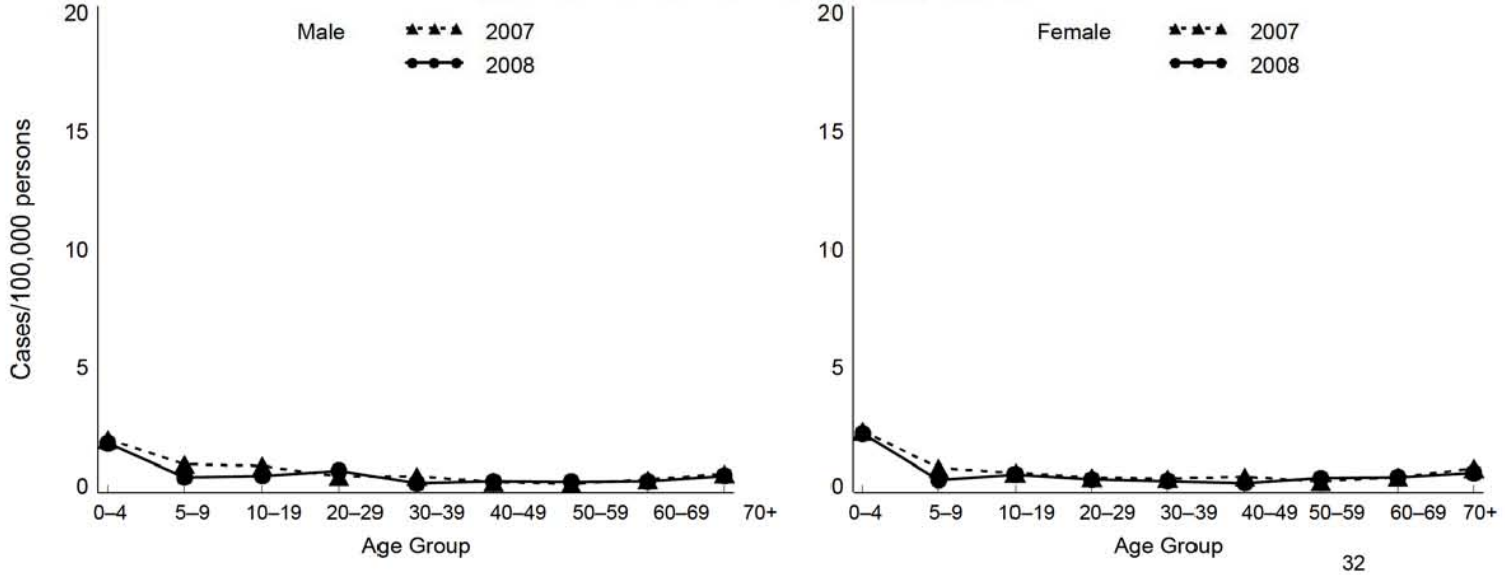
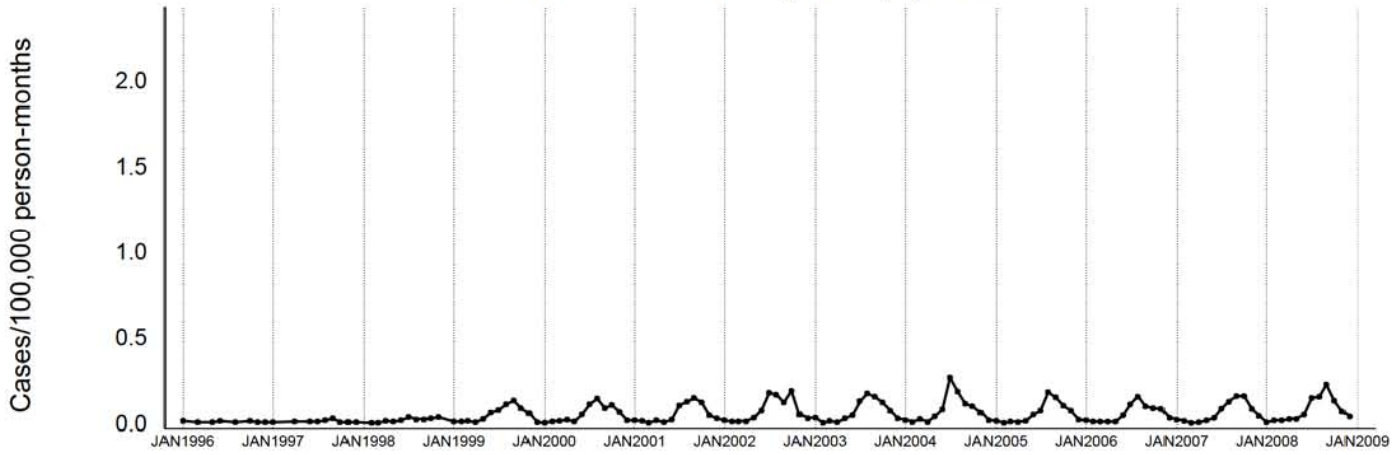
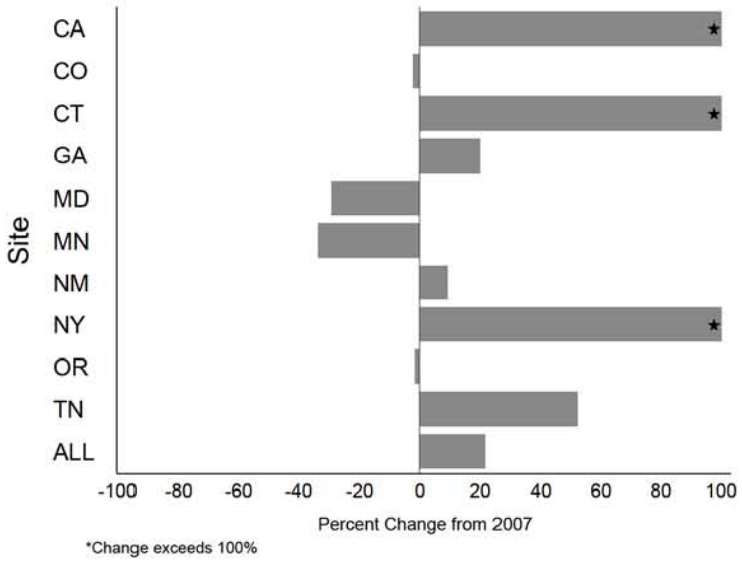


Figure 12 - *Salmonella* Javiana Annual Summary (All Sites)

Incidence for 1996 through 2008, by month



Change in incidence between 2007 and 2008, by site



	2008		2007		5 year mean*	
Site	**Cases**	**Rate†**	**Cases**	**Rate†**	**Cases**	**Rate†**
CA	9	0.27	4	0.12	5	0.16
CO	6	0.22	6	0.22	5	0.20
CT	12	0.34	2	0.06	6	0.16
GA	296	3.06	242	2.54	231	2.54
MD	22	0.39	31	0.55	38	0.69
MN	6	0.11	9	0.17	7	0.14
NM	32	1.61	29	1.48	23	1.17
NY	8	0.19	1	0.02	6	0.15
OR	1	0.03	1	0.03	3	0.08
TN	40	0.64	26	0.42	31	0.51
ALL	**432**	**0.93**	**351**	**0.76**	**354**	**0.79**

* Year 2003–2007 except for NM (2004–2007)

† Incidence as cases/100,000 persons

Incidence for 2007 and 2008, by age group and sex

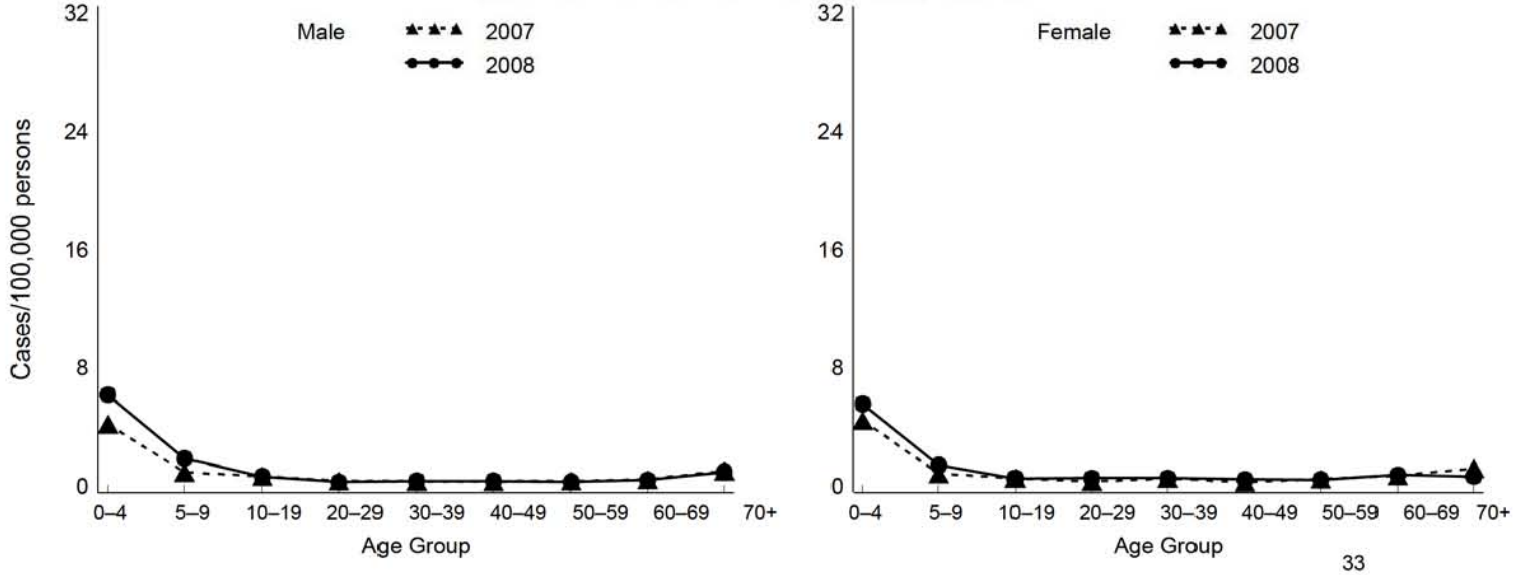
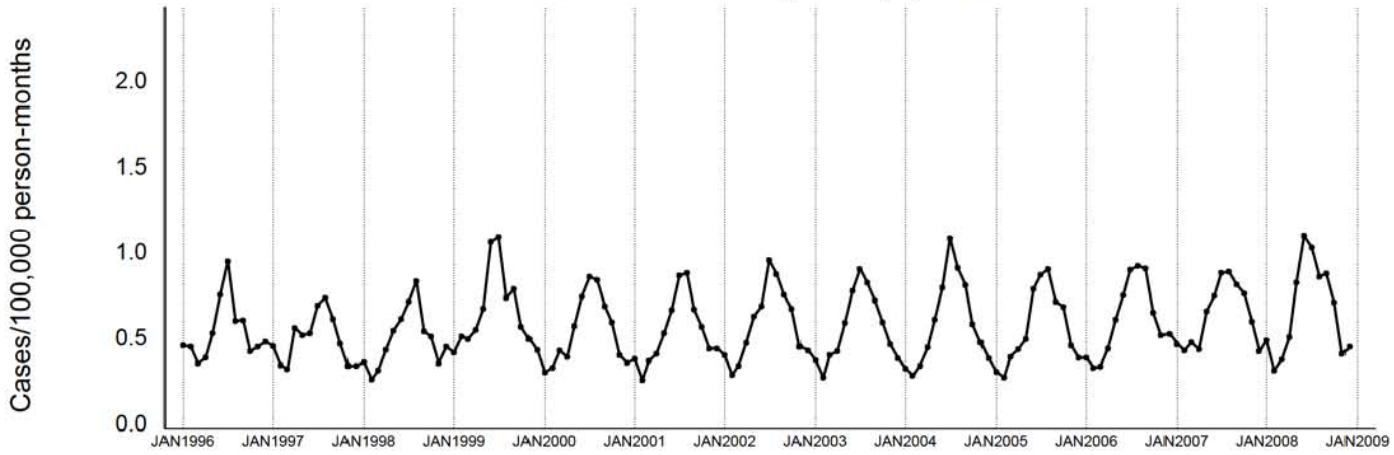
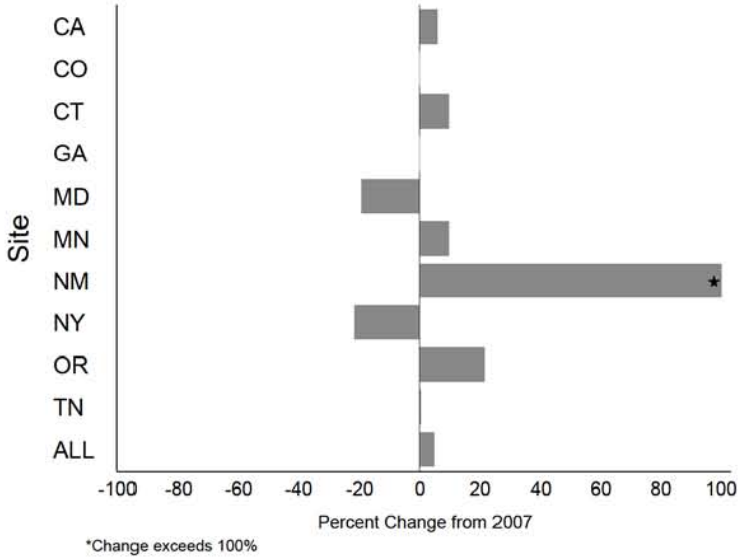


Figure 13 - *Salmonella,* All Others, Annual Summary (All Sites)

Incidence for 1996 through 2008, by month



Change in incidence between 2007 and 2008, by site



*Change exceeds 100%

Incidence for 2007 and 2008, by age group and sex

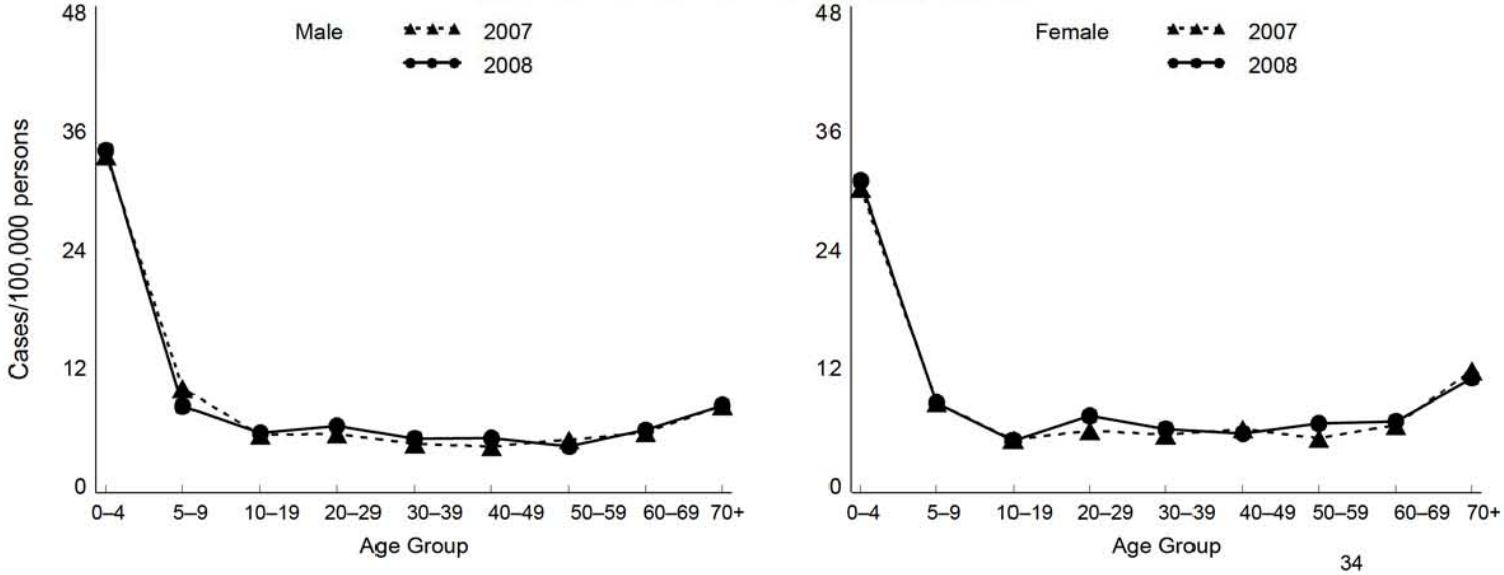
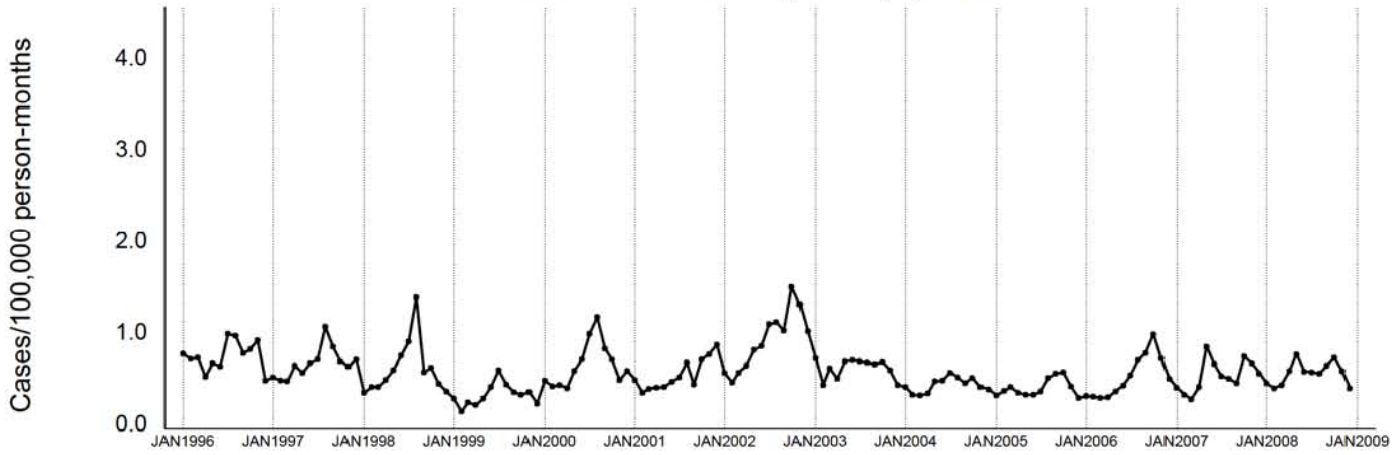
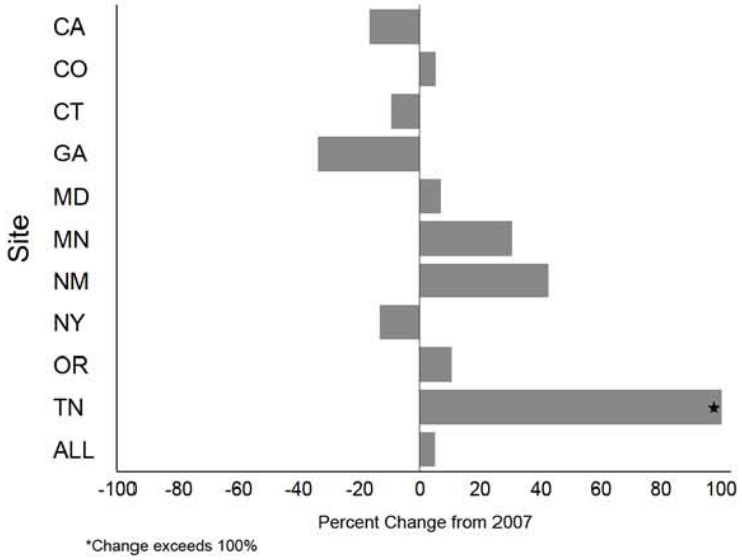


Figure 14 - *Shigella,* All Species, Annual Summary (All Sites)

Incidence for 1996 through 2008, by month



Change in incidence between 2007 and 2008, by site



	2008		2007		5 year mean*	
Site	**Cases**	**Rate†**	**Cases**	**Rate†**	**Cases**	**Rate†**
CA	159	4.80	188	5.75	244	7.56
CO	85	3.10	79	2.94	138	5.35
CT	40	1.14	44	1.26	61	1.76
GA	1,103	11.39	1,638	17.20	1,094	11.93
MD	117	2.08	109	1.94	189	3.41
MN	311	5.96	237	4.57	152	2.97
NM	154	7.76	107	5.45	138	7.17
NY	33	0.77	38	0.89	121	2.91
OR	74	1.95	66	1.77	85	2.36
TN	967	15.56	363	5.90	408	6.83
ALL	**3,043**	**6.56**	**2,869**	**6.25**	**2,631**	**5.87**

* Year 2003–2007 except for NM (2004–2007)

† Incidence as cases/100,000 persons

Incidence for 2007 and 2008, by age group and sex

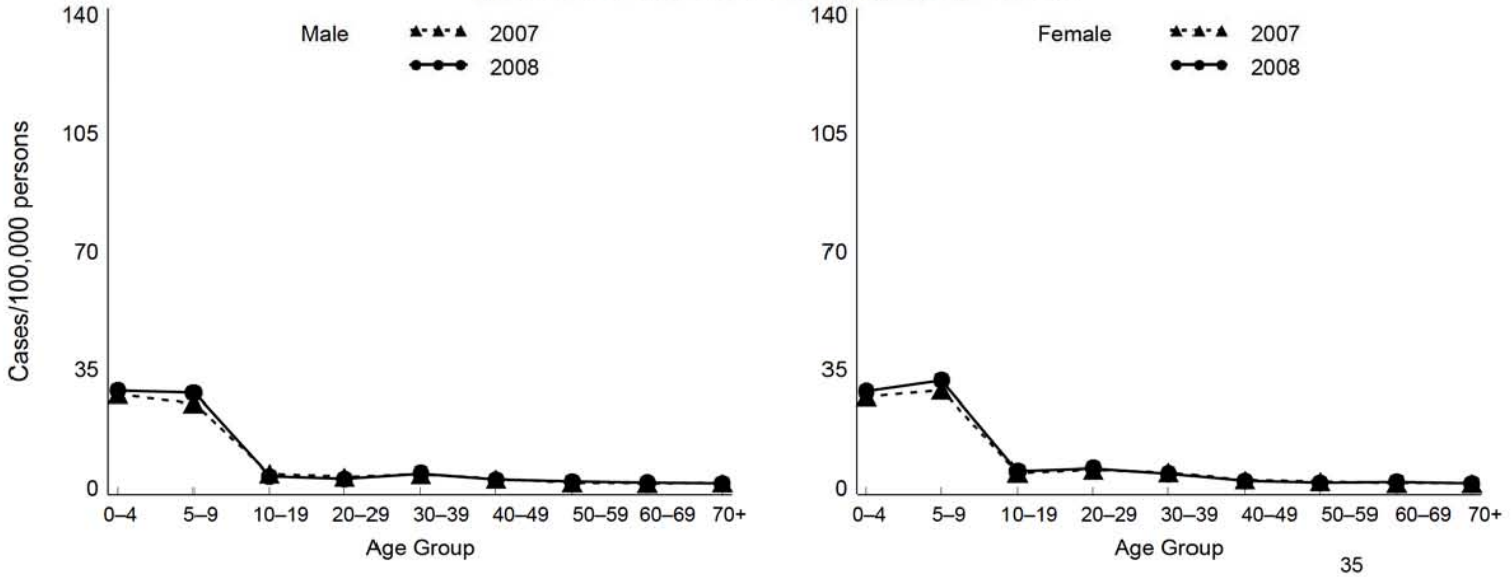
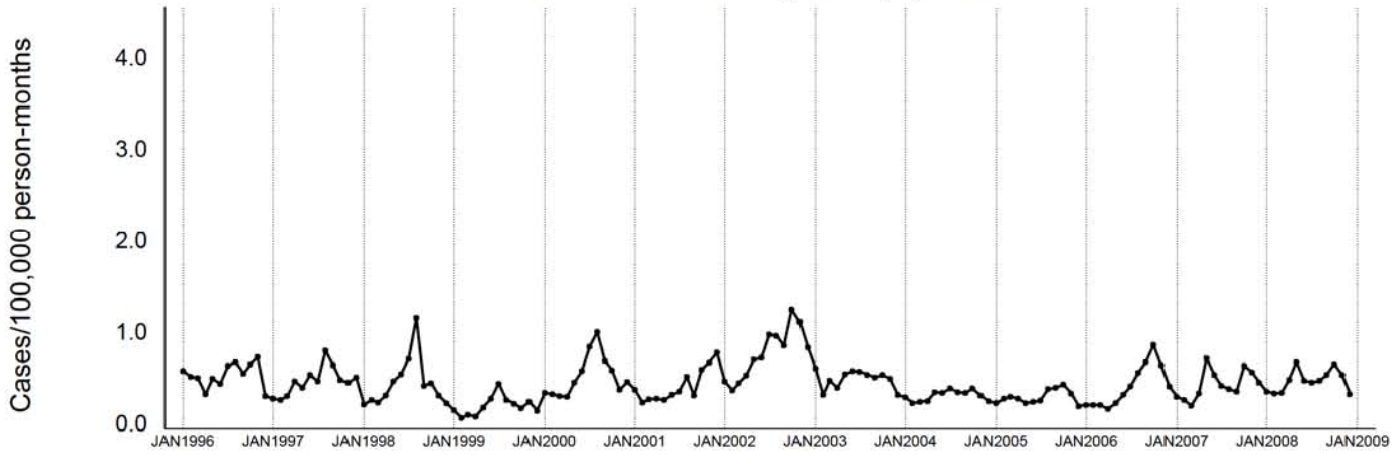
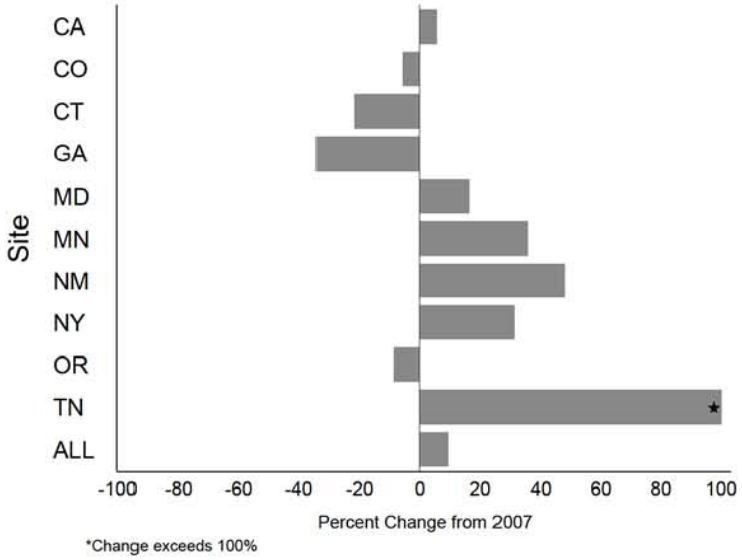


Figure 15 - *Shigella sonnei* Annual Summary (All Sites)

Incidence for 1996 through 2008, by month



Change in incidence between 2007 and 2008, by site



	2008		2007		5 year mean*	
Site	Cases	Rate†	Cases	Rate†	Cases	Rate†
CA	89	2.69	83	2.54	126	3.92
CO	55	2.00	57	2.12	98	3.81
CT	22	0.63	28	0.80	38	1.08
GA	949	9.80	1,418	14.89	917	9.99
MD	90	1.60	77	1.37	139	2.51
MN	283	5.42	207	3.99	123	2.39
NM	118	5.95	79	4.02	94	4.88
NY	21	0.49	16	0.38	105	2.53
OR	39	1.03	42	1.12	56	1.55
TN	918	14.77	330	5.37	357	5.97
ALL	**2,584**	**5.57**	**2,337**	**5.09**	**2,053**	**4.59**

* Year 2003–2007 except for NM (2004–2007)

† Incidence as cases/100,000 persons

Incidence for 2007 and 2008, by age group and sex

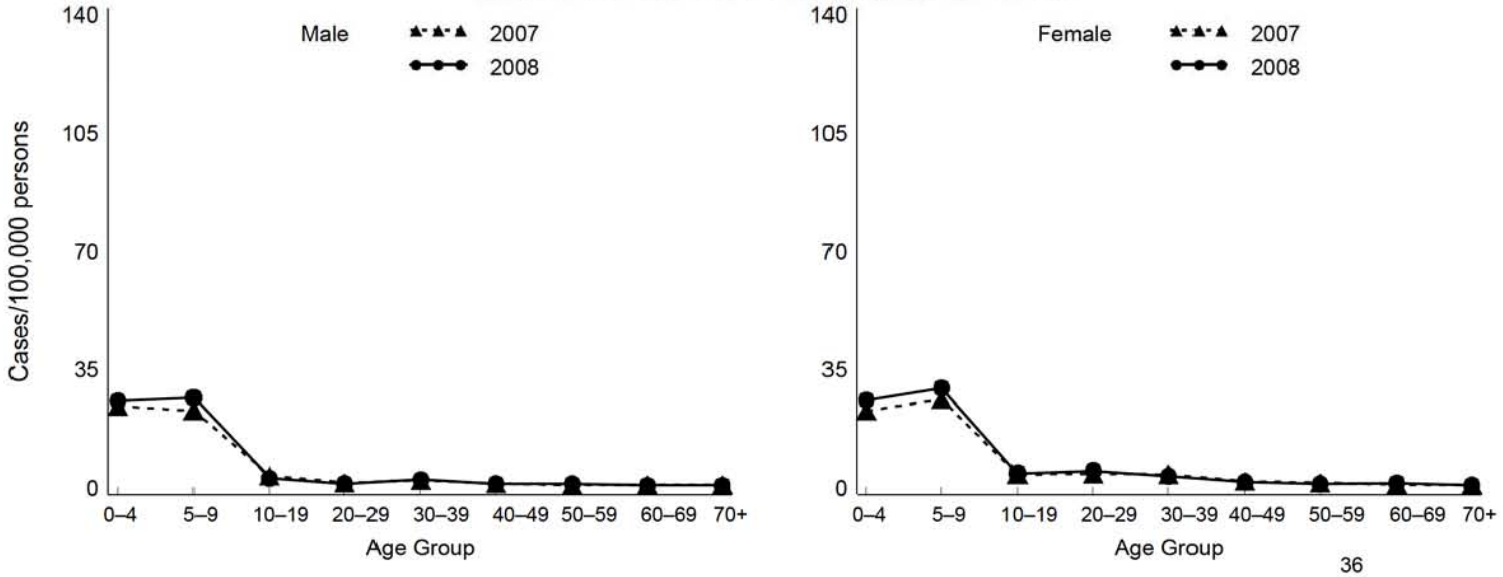
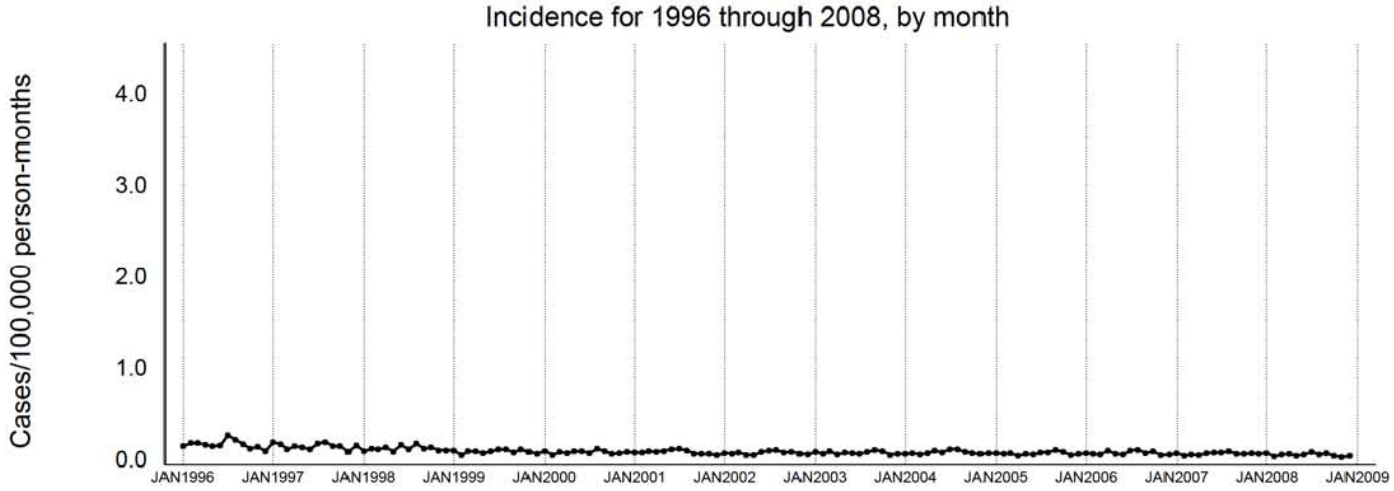
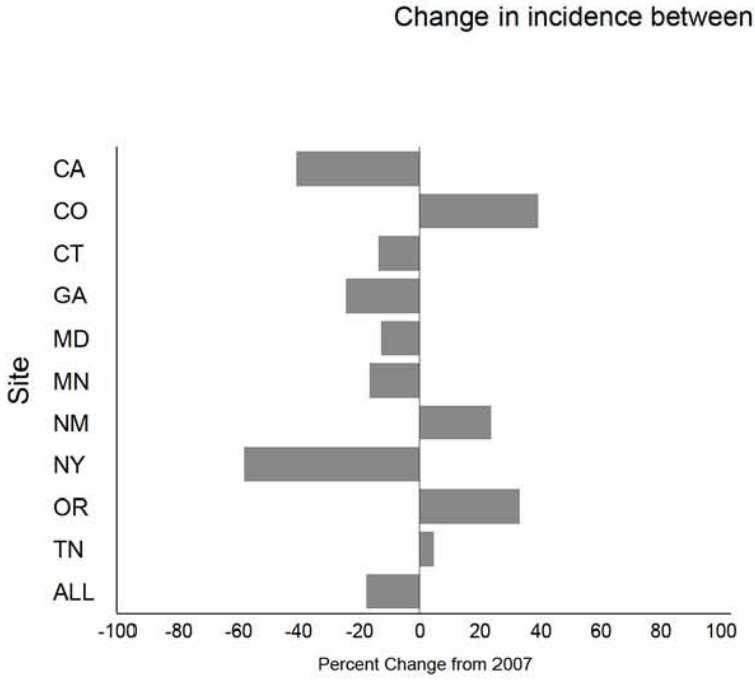


Figure 16 - *Shigella flexneri* Annual Summary (All Sites)





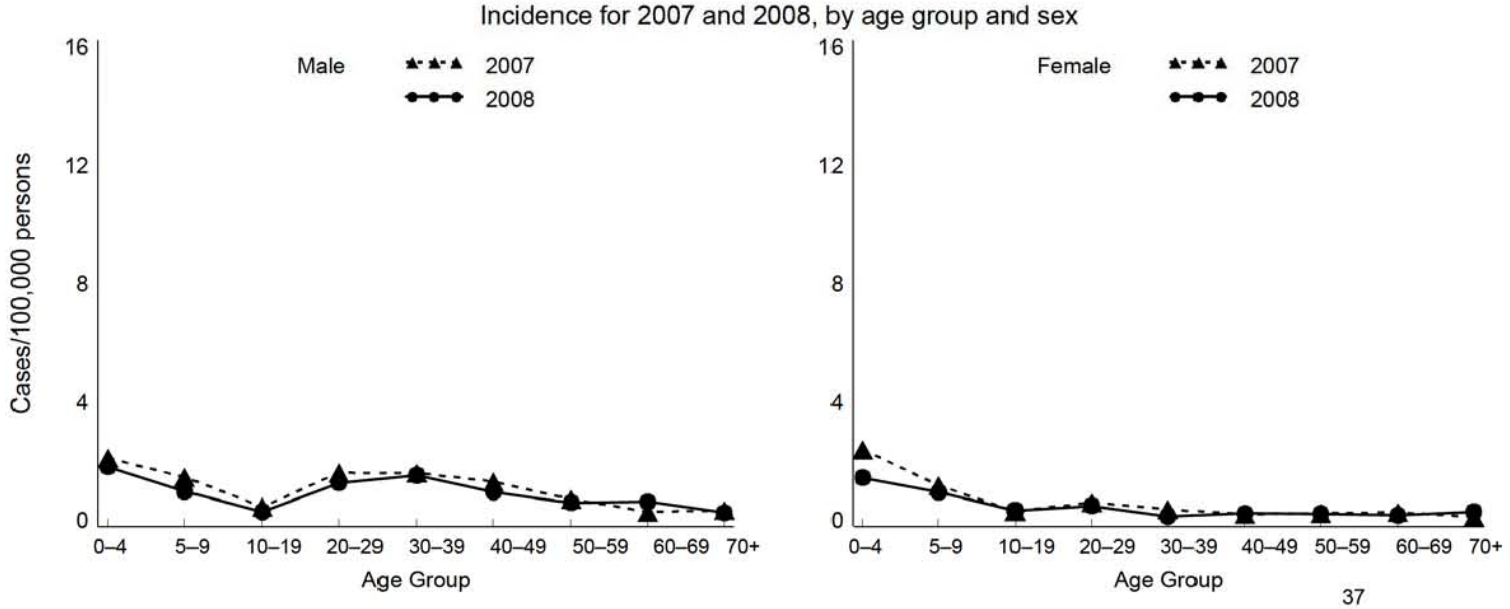
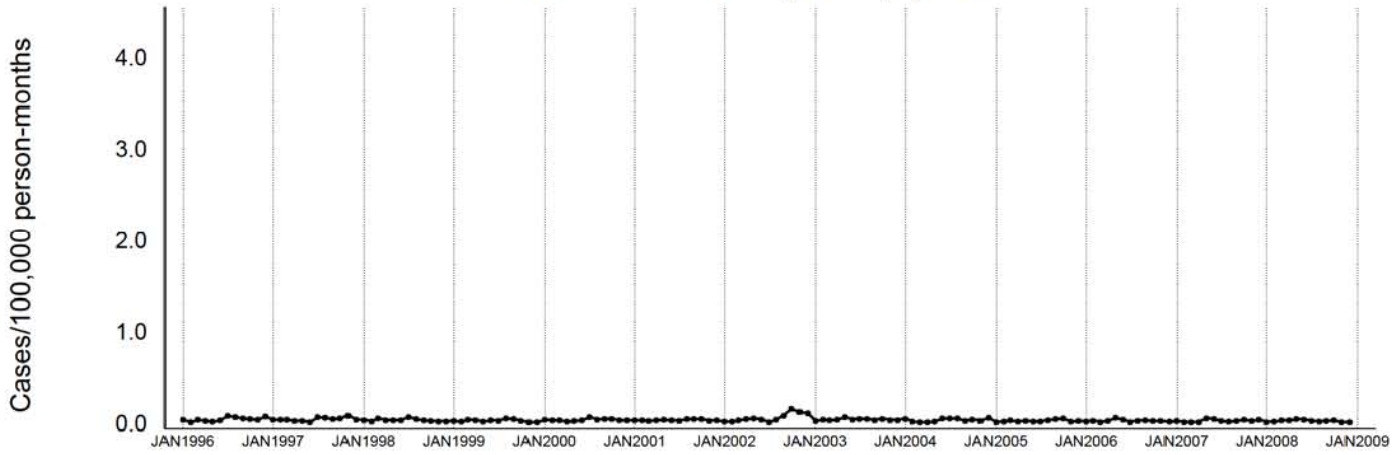
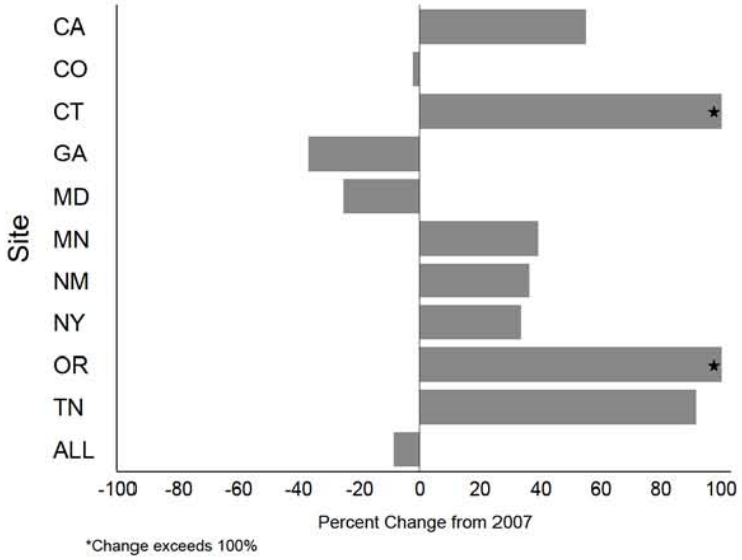


Figure 17 - *Shigella,* All Others, Annual Summary (All Sites)

Incidence for 1996 through 2008, by month



Change in incidence between 2007 and 2008, by site



Incidence for 2007 and 2008, by age group and sex

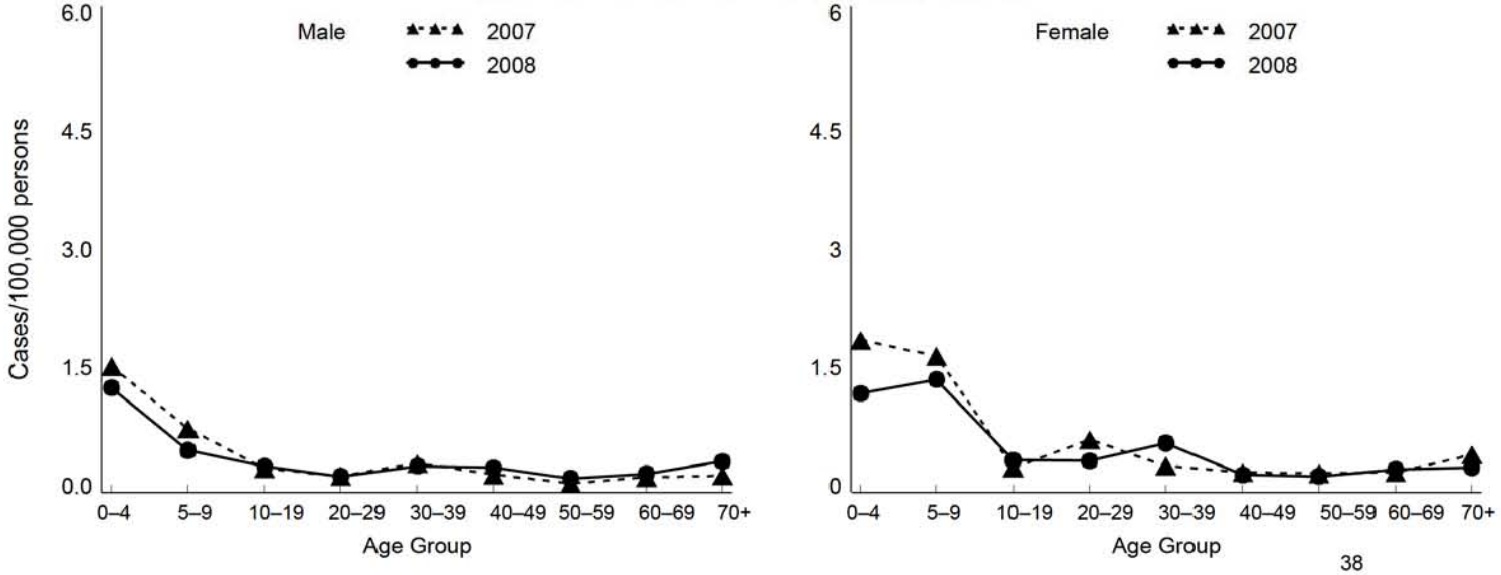
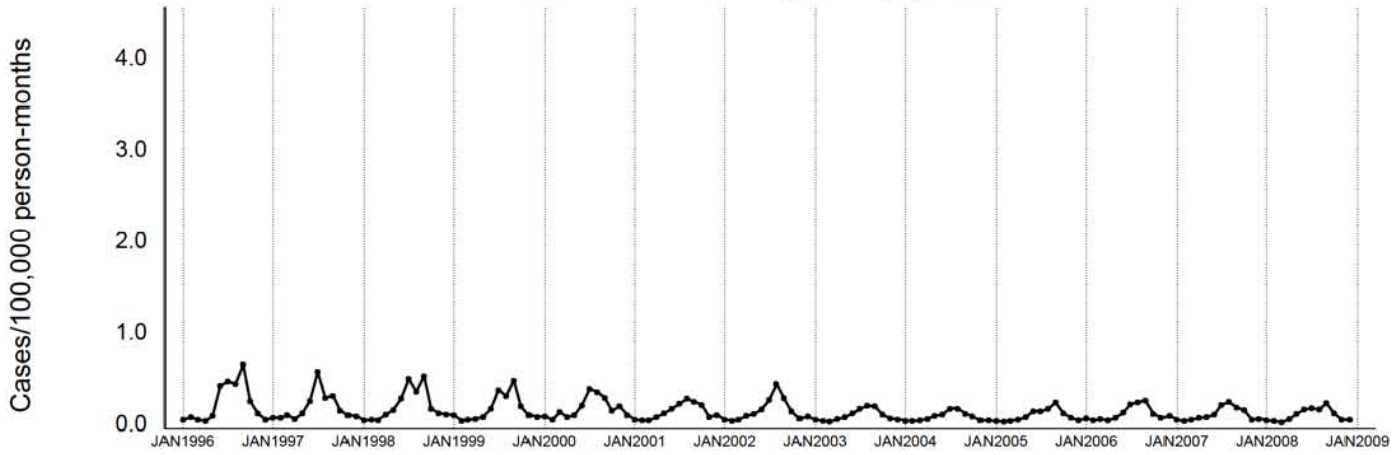
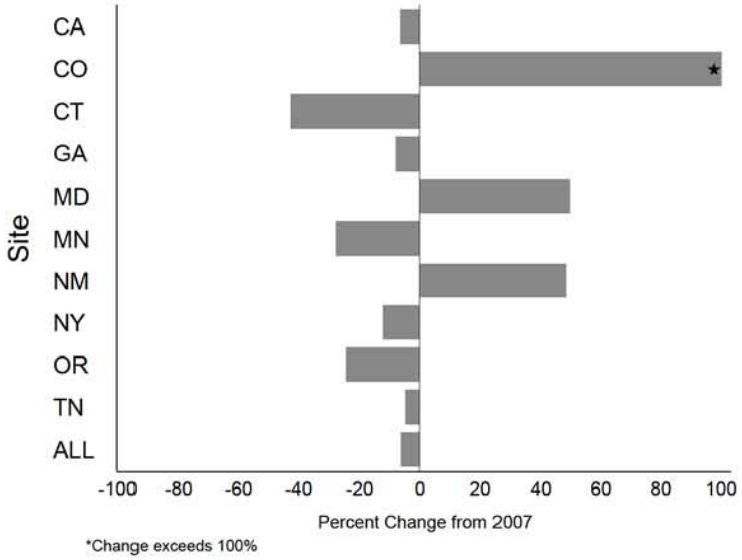


Figure 18 - STEC O157 Annual Summary (All Sites)

Incidence for 1996 through 2008, by month



Change in incidence between 2007 and 2008, by site



*Change exceeds 100%

Incidence for 2007 and 2008, by age group and sex

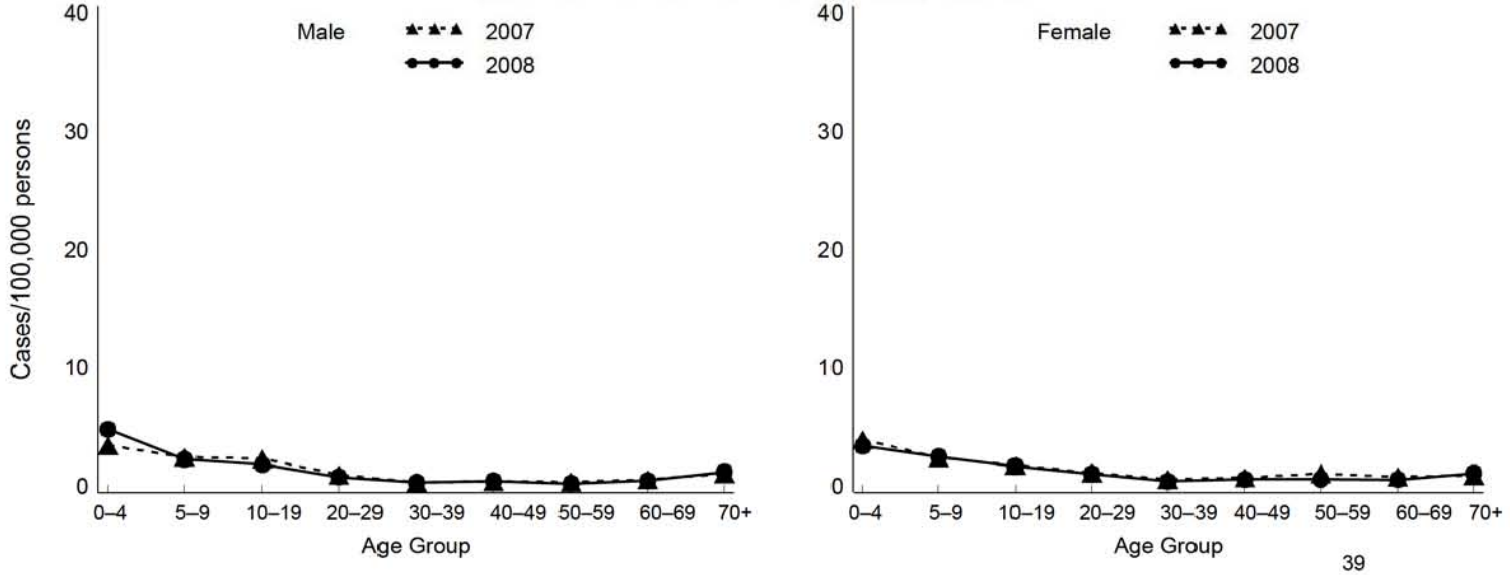
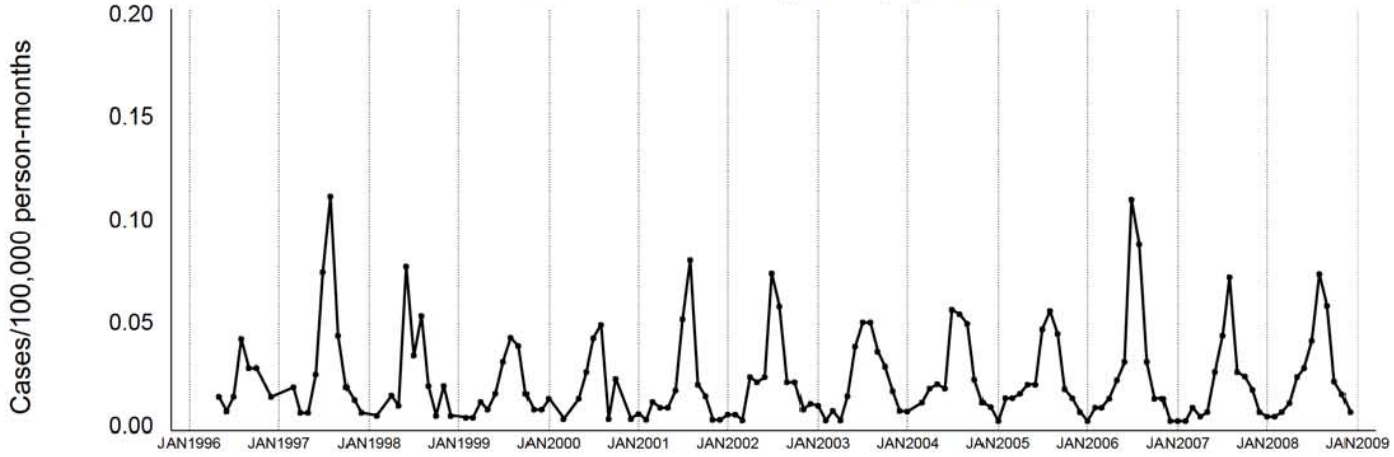
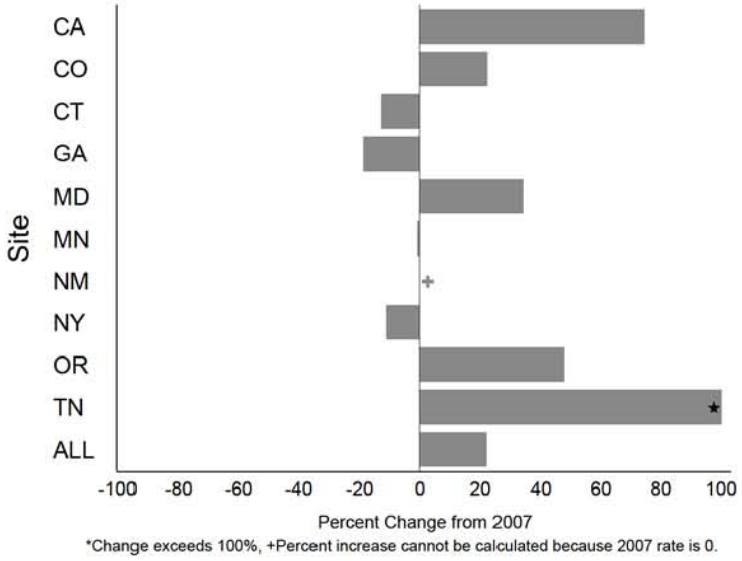


Figure 19 - *Vibrio,* All Species, Annual Summary (All Sites)

Incidence for 1996 through 2008, by month



Change in incidence between 2007 and 2008, by site



*Change exceeds 100%, +Percent increase cannot be calculated because 2007 rate is 0.

Incidence for 2007 and 2008, by age group and sex

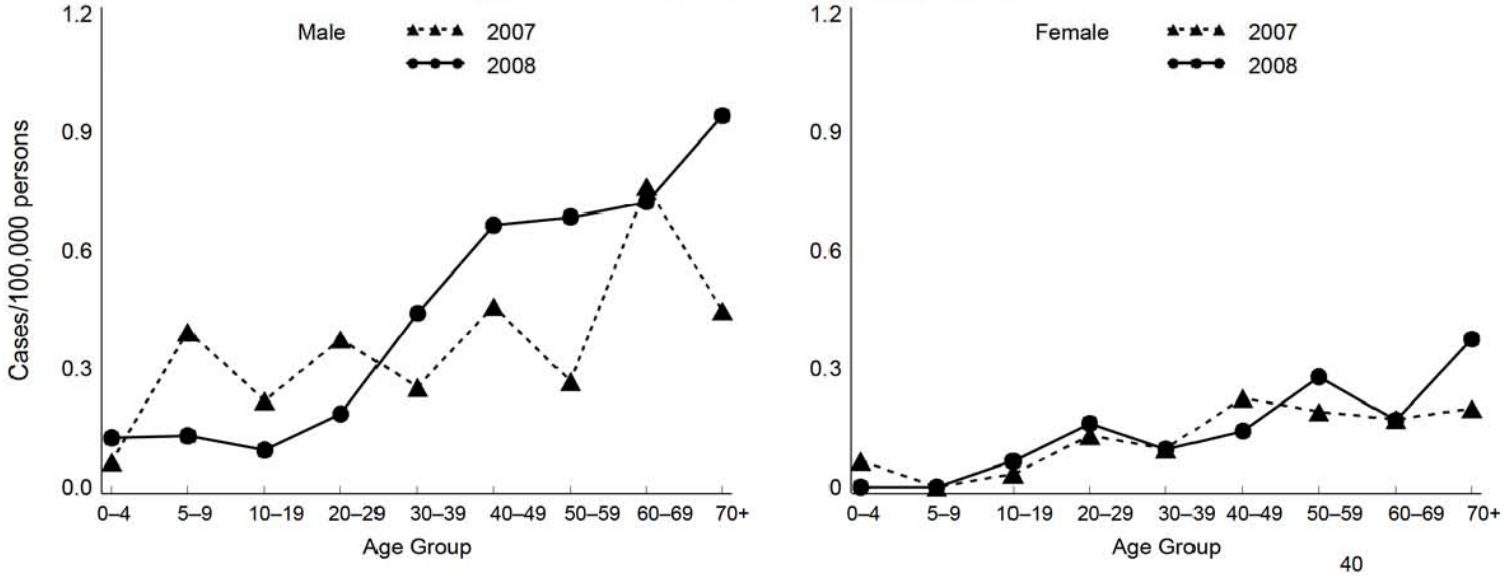
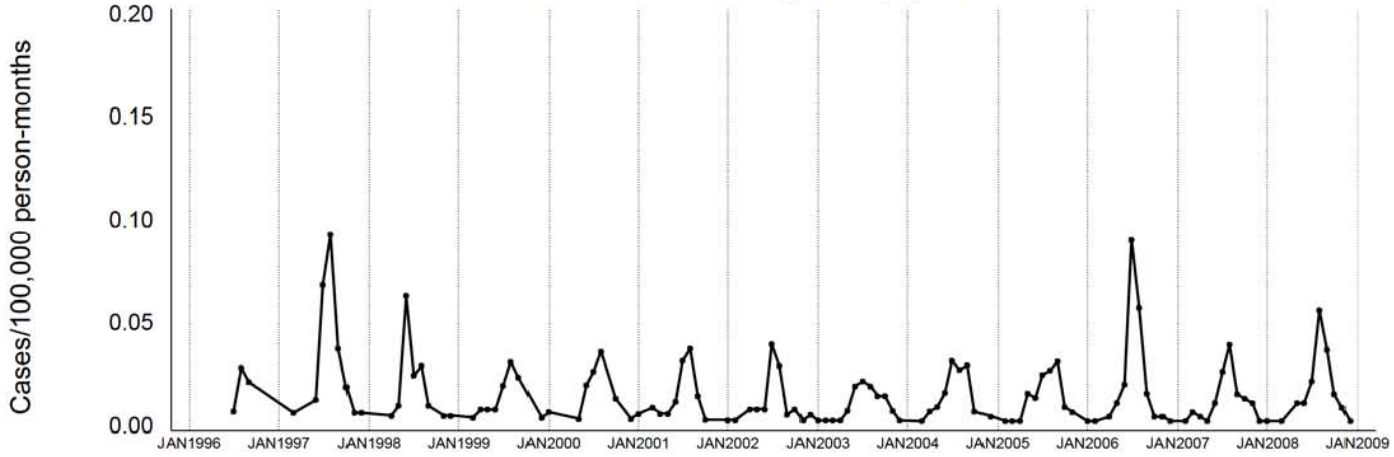
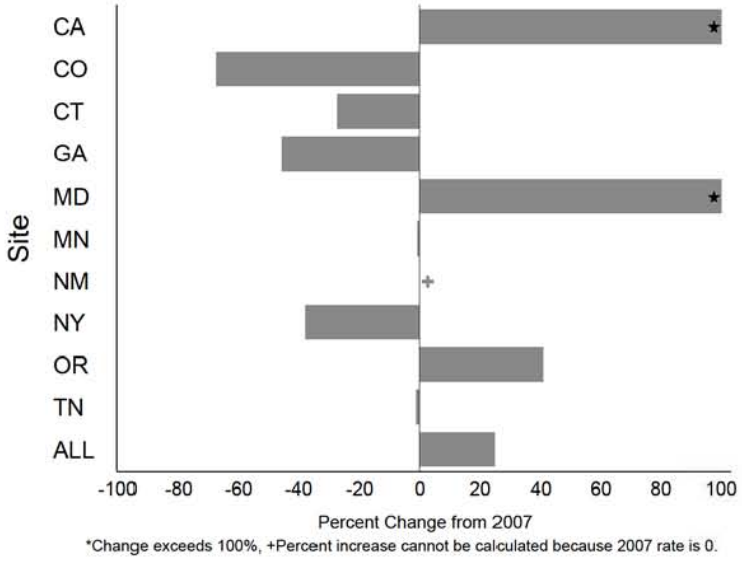


Figure 20 - *Vibrio parahaemolyticus* Annual Summary (All Sites)

Incidence for 1996 through 2008, by month



Change in incidence between 2007 and 2008, by site



*Change exceeds 100%, +Percent increase cannot be calculated because 2007 rate is 0.

Incidence for 2007 and 2008, by age group and sex

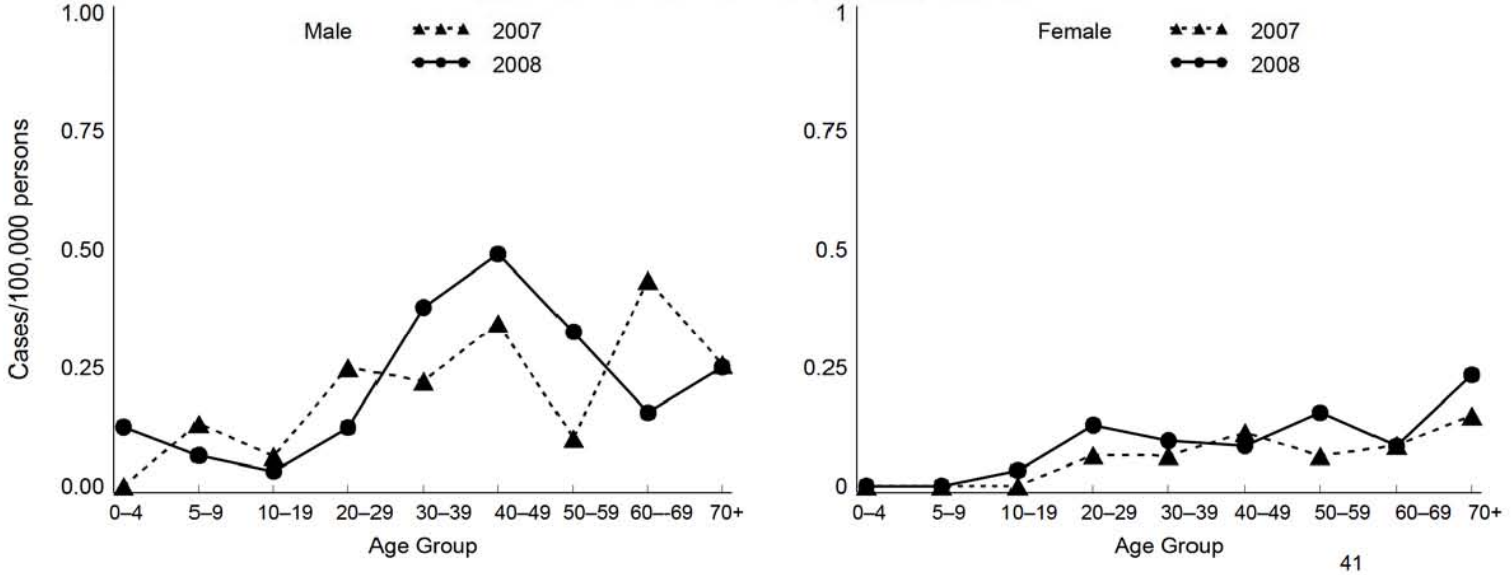
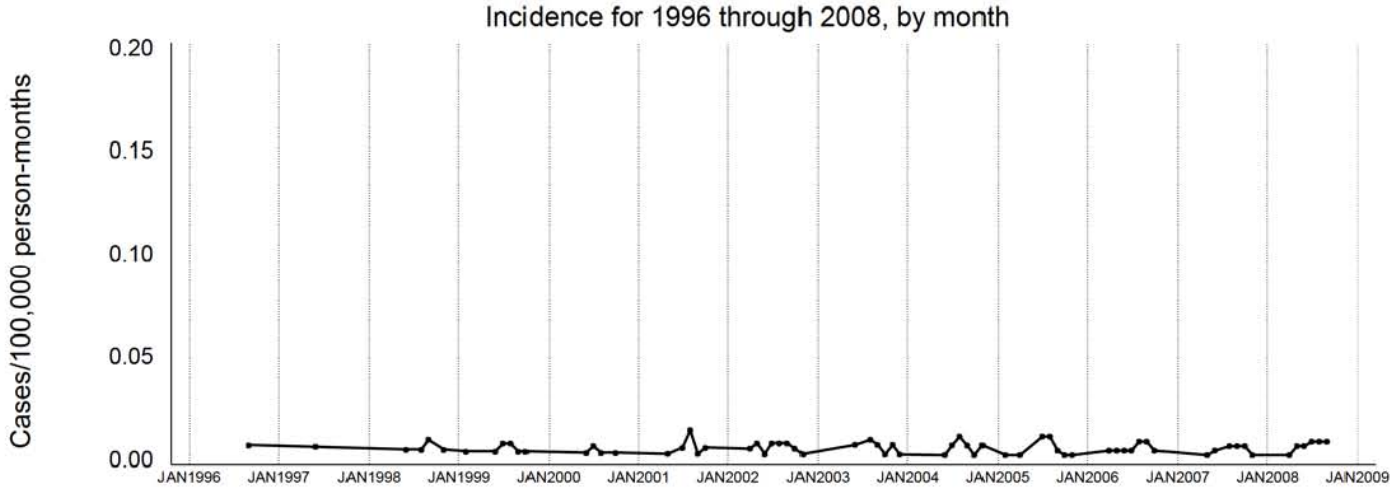
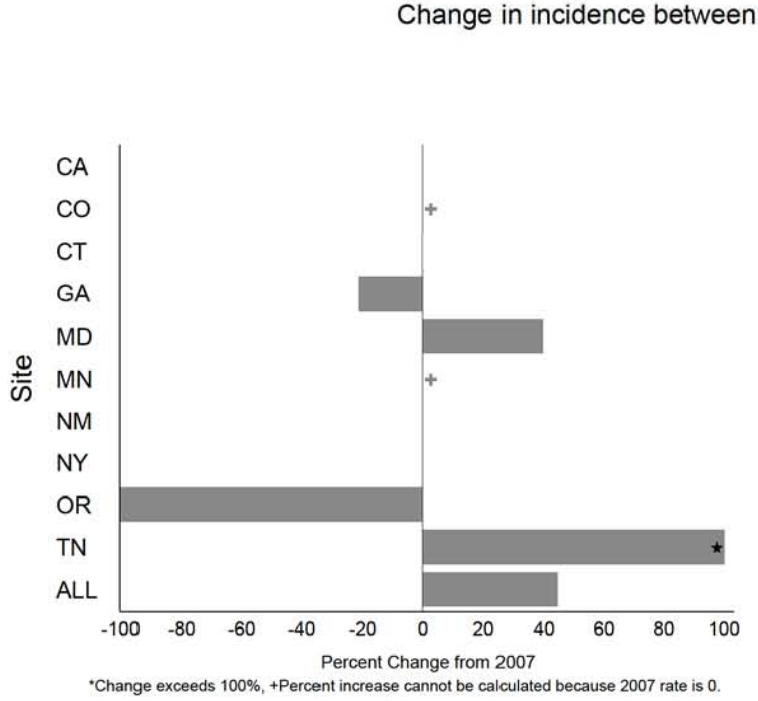


Figure 21 - *Vibrio vulnificus* Annual Summary (All Sites)





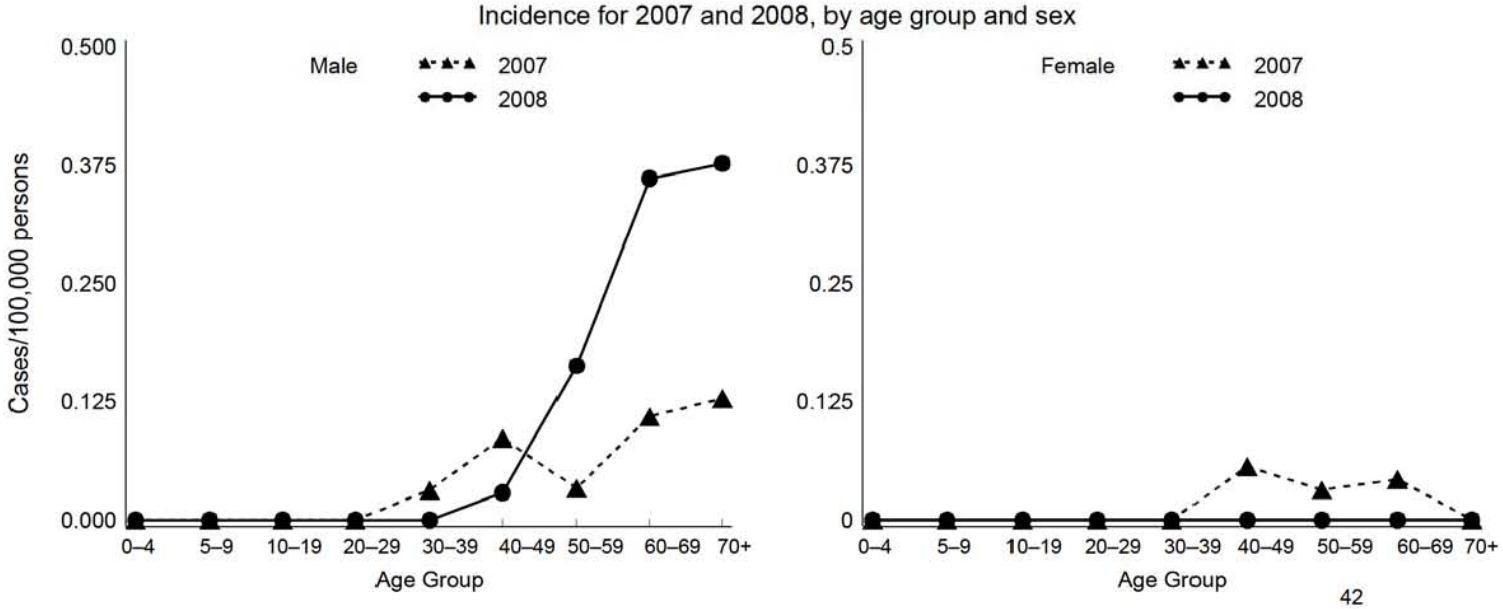
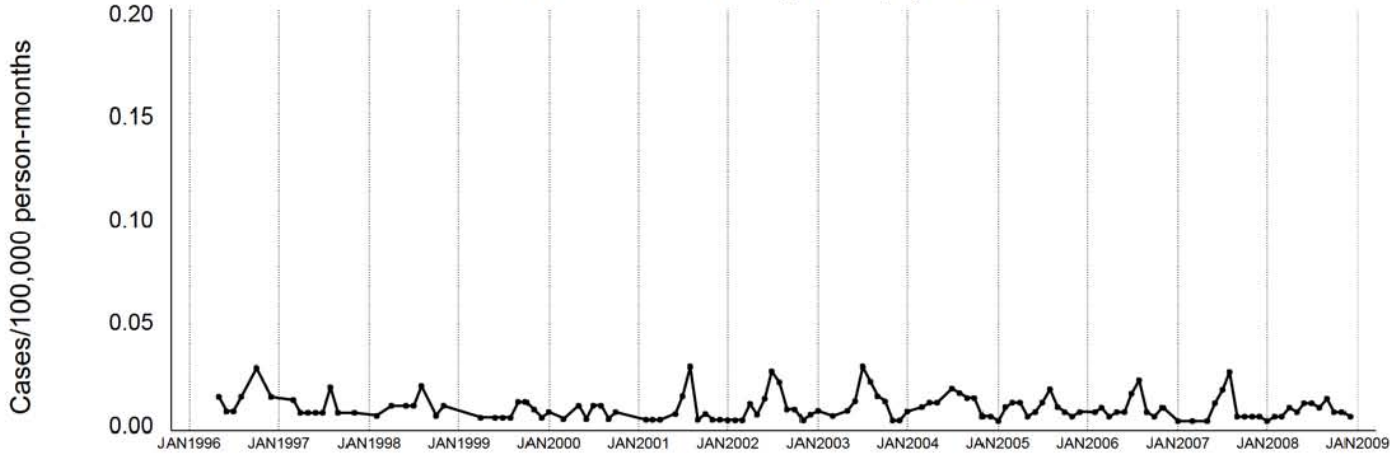
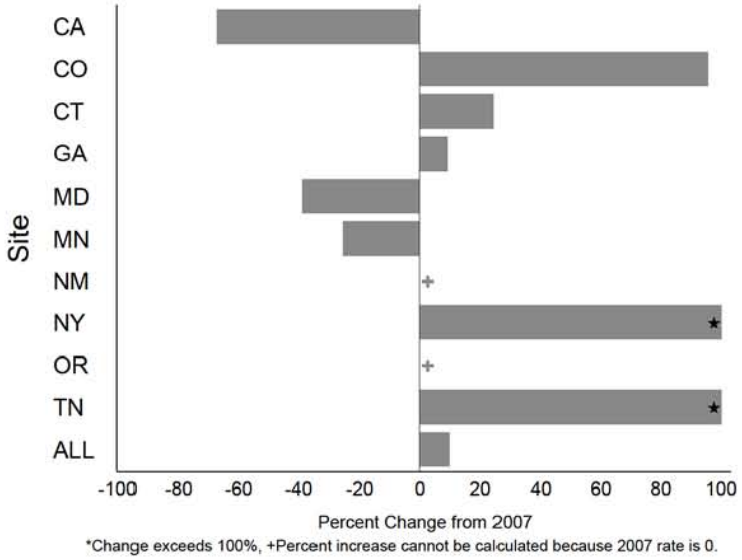


Figure 22 - *Vibrio,* All Others, Annual Summary (All Sites)

Incidence for 1996 through 2008, by month



Change in incidence between 2007 and 2008, by site



*Change exceeds 100%, +Percent increase cannot be calculated because 2007 rate is 0.

Incidence for 2007 and 2008, by age group and sex

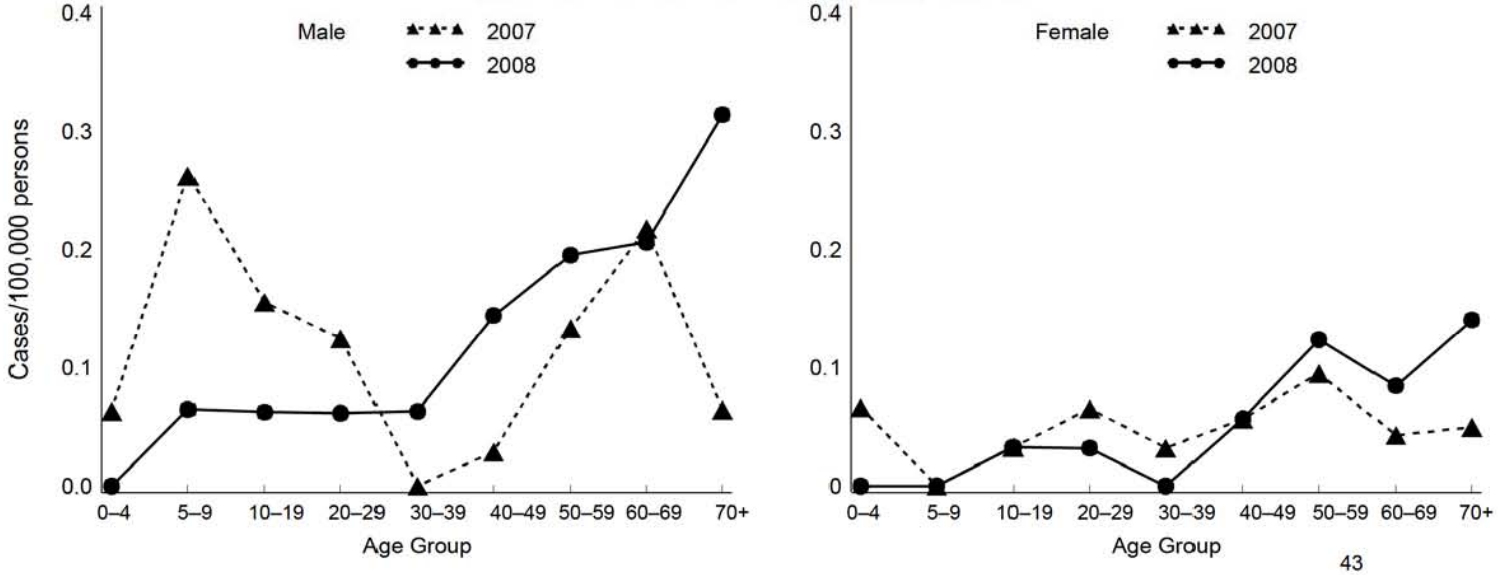
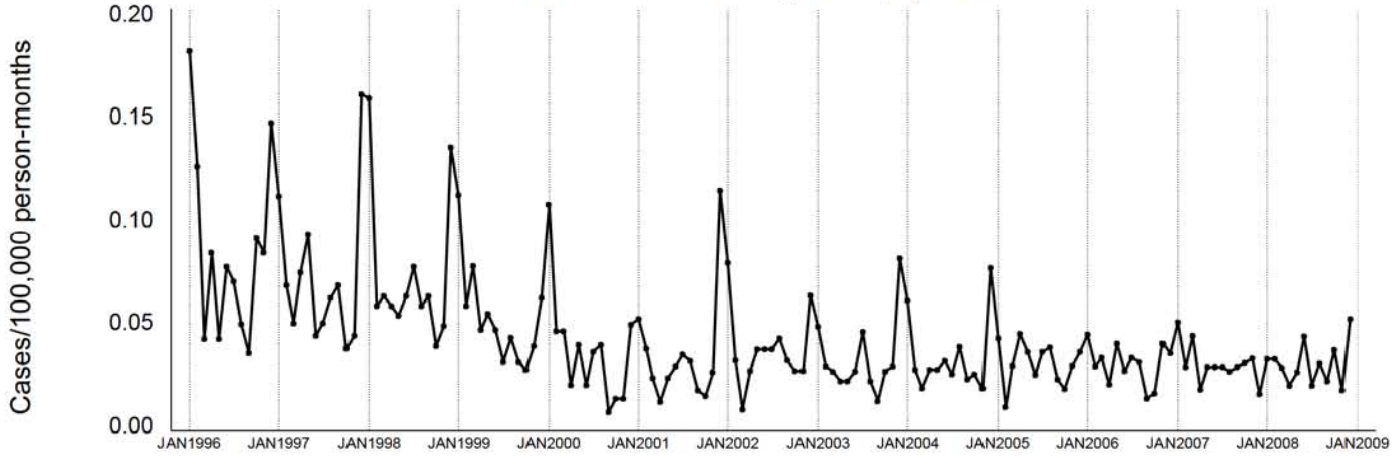
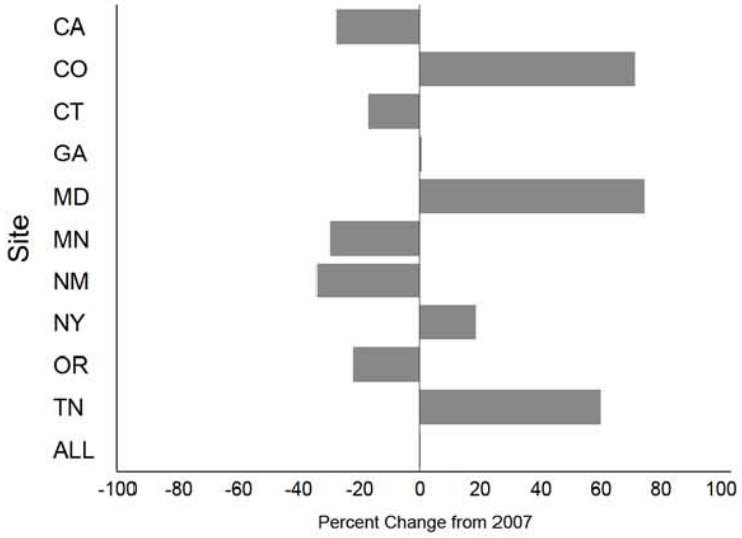


Figure 23 - *Yersinia* Annual Summary (All Sites)

Incidence for 1996 through 2008, by month



Change in incidence between 2007 and 2008, by site



Incidence for 2007 and 2008, by age group and sex

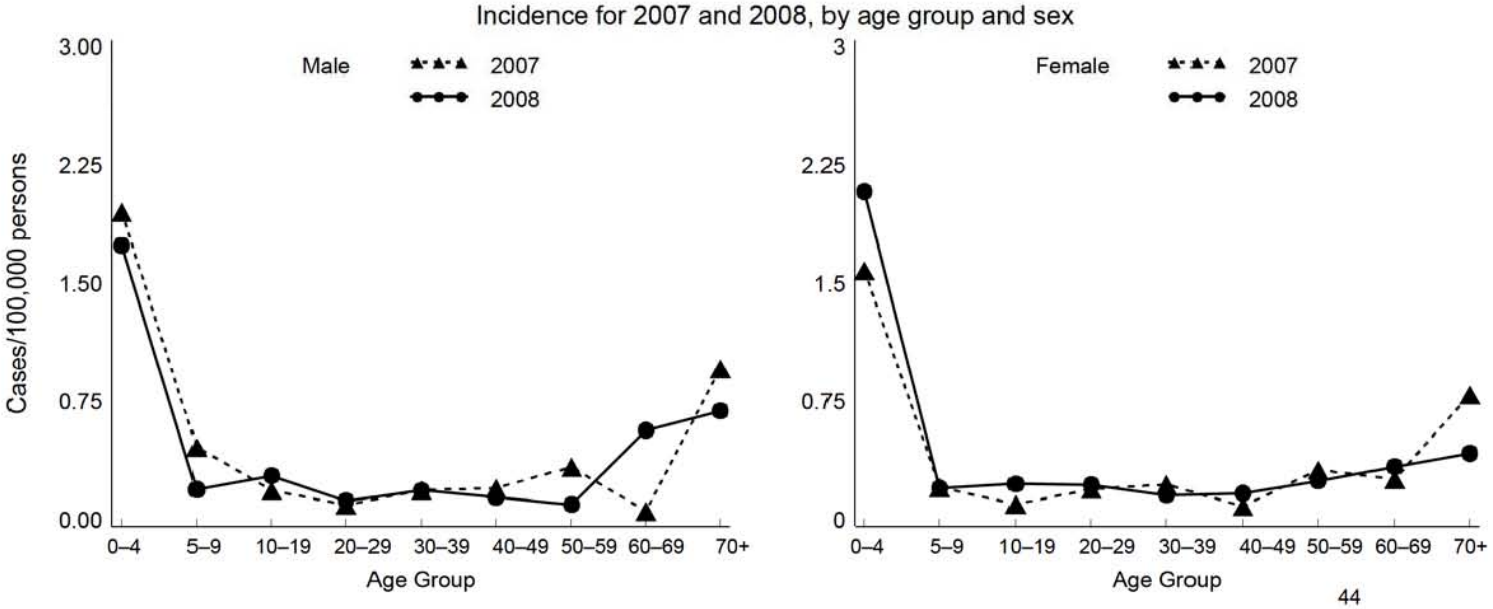
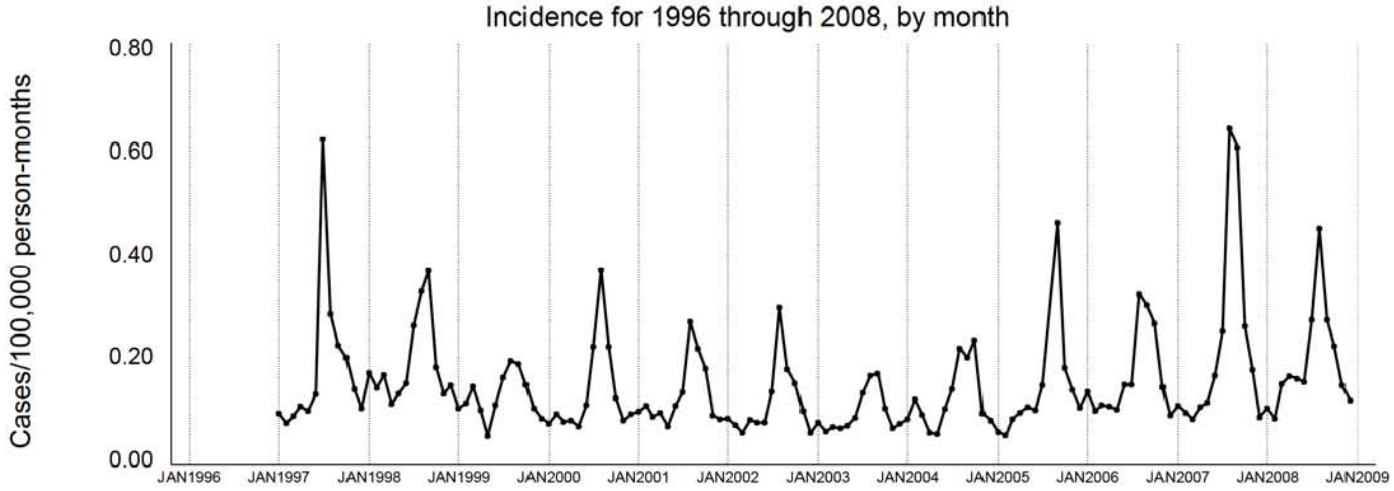
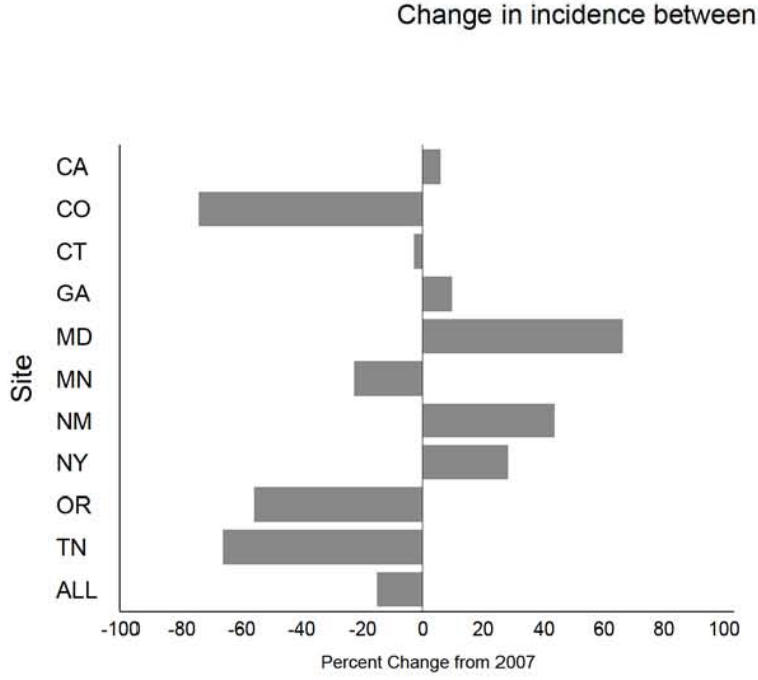


Figure 24 - *Cryptosporidium* Annual Summary (All Sites)





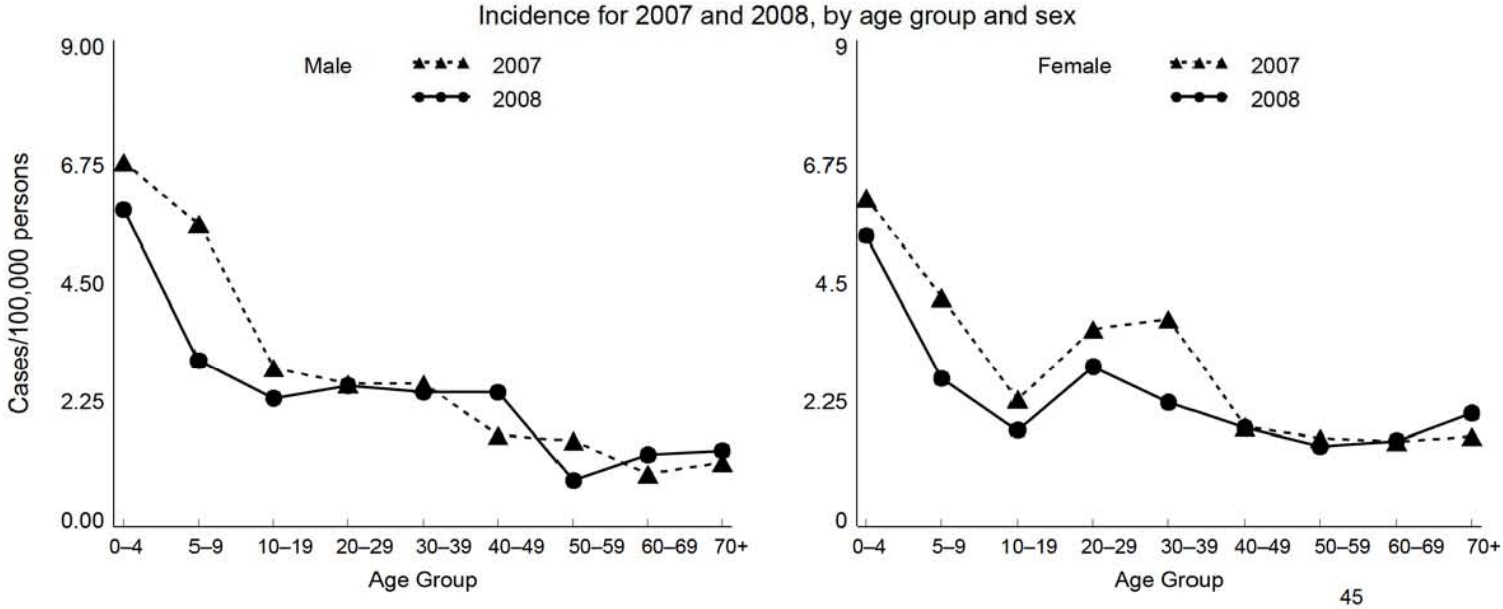
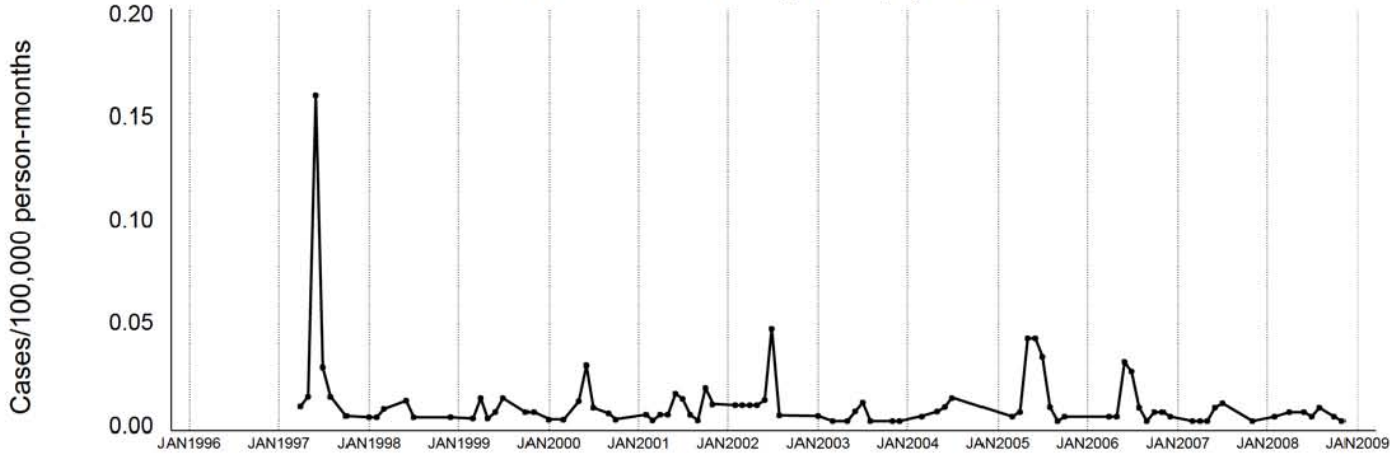
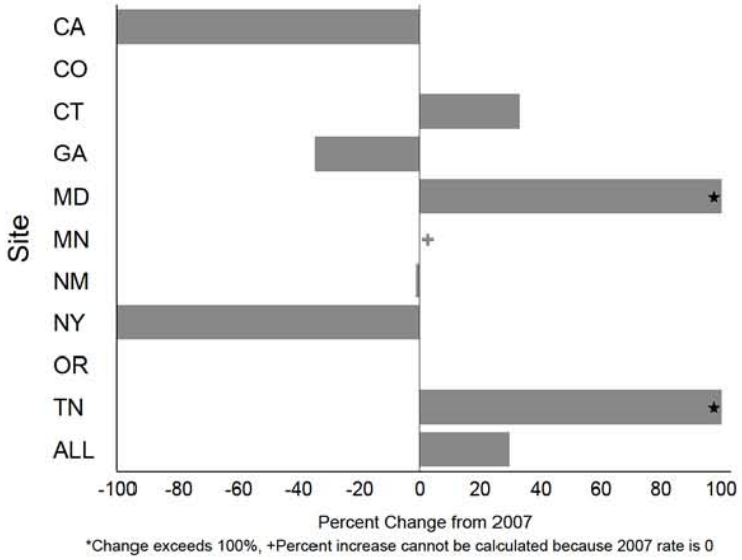


Figure 25 - *Cyclospora* Annual Summary (All Sites)

Incidence for 1996 through 2008, by month



Change in incidence between 2007 and 2008, by site



*Change exceeds 100%, +Percent increase cannot be calculated because 2007 rate is 0

Incidence for 2007 and 2008, by age group and sex

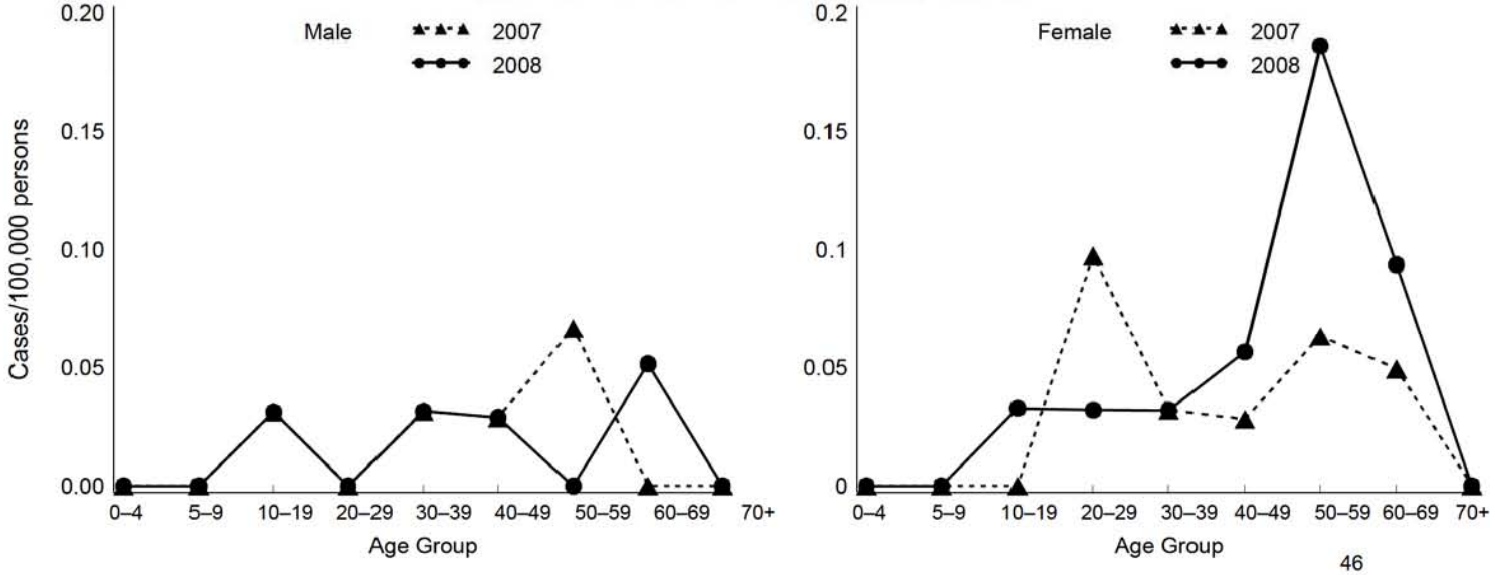


TABLE 11. Number and Percentage* of Hospitalizations, by Pathogen — FoodNet, 2008

	# Hospitalized	# Outpatient	# Unknown	Total # of Cases	% Hospitalized
Bacteria					
Campylobacter	841	4,455	558	5,854	14.4
Listeria	125	10	0	135	92.6
Salmonella	1,986	5,243	229	7,458	26.6
Shigella	512	2,433	98	3,043	16.8
STEC* O157	218	298	2	518	42.1
STEC non-O157	24	215	6	245	9.8
Vibrio	51	82	3	136	37.5
Yersinia	52	108	6	166	31.3
Parasites					
Cryptosporidium	238	760	54	1,052	22.6
Cyclospora	0	17	0	17	0.0
Total	4,047	13,621	956	18,624	21.7

*Shiga toxin-producing *Escherichia coli* .

TABLE 12. Number and Percentage of Hospitalizations, by Age Group and Pathogen — FoodNet, 2008

	<1 year				1–4 years				5–9 years			
Bacteria	# Hospitalized	# Unknown	Total # of Cases	% Hospitalized	# Hospitalized	# Unknown	Total # of Cases	% Hospitalized	# Hospitalized	# Unknown	Total # of Cases	% Hospitalized
Campylobacter	26	14	204	12.7	53	72	609	8.7	34	31	292	11.6
Listeria	18	0	18	100.0	1	0	1	100.0	0	0	0	
Salmonella	213	22	882	24.1	213	35	1,182	18.0	109	15	573	19.0
Shigella	12	3	77	15.6	100	21	838	11.9	124	23	908	13.7
STEC*O157	0	1	11	0.0	44	0	119	37.0	27	0	73	37.0
STEC non-O157	2	0	14	14.3	4	1	70	5.7	1	1	26	3.8
Vibrio	0	0	0		0	0	2	0.0	0	0	2	0.0
Yersinia	10	1	33	30.3	7	0	28	25.0	0	1	7	0.0
Parasites												
Cryptosporidium	3	1	25	12.0	26	5	153	17.0	19	5	87	21.8
Cyclospora	0	0	0		0	0	0		0	0	0	
Total	284	42	1,264	23.2	448	134	3,002	15.6	314	76	1,968	16.0

	10–19 years				20–29 years				30–39 years			
Bacteria	# Hospitalized	# Unknown	Total # of Cases	% Hospitalized	# Hospitalized	# Unknown	Total # of Cases	% Hospitalized	# Hospitalized	# Unknown	Total # of Cases	% Hospitalized
Campylobacter	65	55	574	11.3	94	84	826	11.4	91	79	786	11.6
Listeria	0	0	0		12	0	12	100.0	5	0	8	62.5
Salmonella	171	22	729	23.5	164	31	855	19.2	142	30	678	20.9
Shigella	37	14	266	13.9	72	7	275	26.2	49	11	271	18.1
STEC*O157	42	0	109	38.5	20	1	57	35.1	13	0	23	56.5
STEC non-O157	3	1	48	6.3	2	1	27	7.4	2	0	12	16.7
Vibrio	2	1	5	40.0	1	1	11	9.1	6	0	17	35.3
Yersinia	2	1	16	12.5	3	0	11	27.3	3	0	11	27.3
Parasites												
Cryptosporidium	15	2	126	11.9	39	9	174	22.4	37	15	148	25.0
Cyclospora	0	0	2	0.0	0	0	1	0.0	0	0	2	0.0
Total	337	96	1,875	18.0	407	134	2,249	19.2	348	135	1,956	17.8

*Shiga toxin-producing *Escherichia coli* .

TABLE 12a. Number and Percentage of Hospitalizations, by Age Group and Pathogen — FoodNet, 2008

	40–49 years				50–59 years				60–69 years			
Bacteria	# Hospitalized	# Unknown	Total # of Cases	% Hospitalized	# Hospitalized	# Unknown	Total # of Cases	% Hospitalized	# Hospitalized	# Unknown	Total # of Cases	% Hospitalized
Campylobacter	100	70	847	11.8	113	62	766	14.8	114	52	521	21.9
Listeria	8	0	9	88.9	11	0	11	100.0	23	0	25	92.0
Salmonella	179	27	733	24.4	233	14	682	34.2	204	11	507	40.2
Shigella	30	11	166	18.1	40	5	115	34.8	26	3	78	33.3
STEC*O157	18	0	35	51.4	13	0	27	48.1	13	0	22	59.1
STEC non-O157	3	1	19	15.8	1	0	10	10.0	2	1	8	25.0
Vibrio	8	0	28	28.6	10	0	30	33.3	11	0	18	61.1
Yersinia	6	1	11	54.5	5	0	11	45.5	4	1	19	21.1
Parasites												
Cryptosporidium	40	4	146	27.4	18	7	68	26.5	13	2	56	23.2
Cyclospora	0	0	3	0.0	0	0	6	0.0	0	0	3	0.0
Total	392	114	1,997	19.6	444	88	1,726	25.7	410	70	1,257	32.6

	70–79 years				80+ years			
Bacteria	# Hospitalized	# Unknown	Total # of Cases	% Hospitalized	# Hospitalized	# Unknown	Total # of Cases	% Hospitalized
Campylobacter	93	19	268	34.7	58	19	158	36.7
Listeria	23	0	26	88.5	24	0	25	96.0
Salmonella	191	11	371	51.5	167	6	257	65.0
Shigella	12	0	31	38.7	9	0	16	56.3
STEC*O157	22	0	31	71.0	6	0	11	54.5
STEC non-O157	2	0	7	28.6	2	0	4	50.0
Vibrio	6	0	12	50.0	7	1	11	63.6
Yersinia	6	1	12	50.0	6	0	7	85.7
Parasites								
Cryptosporidium	20	1	45	44.4	8	3	24	33.3
Cyclospora	0	0	0		0	0	0	
Total	375	32	803	48.6	287	29	513	55.9

*Shiga toxin-producing *Escherichia coli* .

TABLE 13. Number and Percentage of Hospitalizations, by Site and Pathogen — FoodNet, 2008

	California*					Colorado*					Connecticut				
Bacteria	# Hospitalized	# Outpatient	# Unknown	Total # of Cases	% Hospitalized	# Hospitalized	# Outpatient	# Unknown	Total # of Cases	% Hospitalized	# Hospitalized	# Outpatient	# Unknown	Total # of Cases	% Hospitalized
Campylobacter	83	611	291	985	8.4	43	344	1	388	11.1	82	433	15	530	15.5
Listeria	17	4	0	21	81.0	4	0	0	4	100.0	14	2	0	16	87.5
Salmonella	109	332	36	477	22.9	68	261	8	337	20.2	103	383	8	494	20.9
Shigella	24	122	13	159	15.1	15	69	1	85	17.6	8	30	2	40	20.0
STEC† O157	14	23	0	37	37.8	29	53	0	82	35.4	11	15	0	26	42.3
STEC non-O157	0	1	0	1	0.0	0	25	0	25	0.0	2	16	0	18	11.1
Vibrio	0	22	1	23	0.0	3	2	0	5	60.0	5	9	0	14	35.7
Yersinia	6	5	0	11	54.5	1	6	0	7	14.3	7	8	0	15	46.7
Parasites															
Cryptosporidium	10	23	10	43	23.3	11	15	1	27	40.7	6	31	4	41	14.6
Cyclospora	0	0	0	0		0	0	0	0		0	4	0	4	0.0
Total	263	1,143	351	1,757	15.0	174	775	11	960	18.1	238	931	29	1,198	19.9

	Georgia					Maryland				
Bacteria	# Hospitalized	# Outpatient	# Unknown	Total # of Cases	% Hospitalized	# Hospitalized	# Outpatient	# Unknown	Total # of Cases	% Hospitalized
Campylobacter	129	526	28	683	18.9	80	278	20	378	21.2
Listeria	23	3	0	26	88.5	17	0	0	17	100.0
Salmonella	622	1579	84	2285	27.2	263	554	36	853	30.8
Shigella	179	894	30	1103	16.2	31	79	7	117	26.5
STEC† O157	28	16	0	44	63.6	15	18	0	33	45.5
STEC non-O157	1	23	3	27	3.7	2	50	1	53	3.8
Vibrio	8	11	0	19	42.1	17	17	1	35	48.6
Yersinia	17	25	3	45	37.8	5	8	1	14	35.7
Parasites										
Cryptosporidium	80	159	19	258	31.0	32	21	2	55	58.2
Cyclospora	0	2	0	2	0.0	0	3	0	3	0.0
Total	1,087	3,238	167	4,492	24.2	462	1,028	68	1,558	29.7

*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 Hospitalizations, by Site and Pathogen — FoodNet, 2008

	Minnesota					New Mexico					New York*				
Bacteria	# Hospitalized	# Outpatient	# Unknown	Total # of Cases	% Hospitalized	# Hospitalized	# Outpatient	# Unknown	Total # of Cases	% Hospitalized	# Hospitalized	# Outpatient	# Unknown	Total # of Cases	% Hospitalized
Campylobacter	120	763	1	884	13.6	62	280	15	357	17.4	85	385	9	479	17.7
Listeria	7	0	0	7	100.0	5	0	0	5	100.0	19	0	0	19	100.0
Salmonella	211	542	2	755	27.9	121	378	19	518	23.4	106	324	3	433	24.5
Shigella	64	247	0	311	20.6	35	110	9	154	22.7	7	26	0	33	21.2
STEC† O157	33	87	0	120	27.5	8	7	0	15	53.3	27	23	1	51	52.9
STEC non-O157	12	47	0	59	20.3	0	27	2	29	0.0	2	15	0	17	11.8
Vibrio	2	6	0	8	25.0	1	1	0	2	50.0	4	3	1	8	50.0
Yersinia	4	13	0	17	23.5	0	2	0	2	0.0	5	14	0	19	26.3
Parasites															
Cryptosporidium	45	189	1	235	19.1	26	141	7	174	14.9	13	100	1	114	11.4
Cyclospora	0	3	0	3	0.0	0	2	0	2	0.0	0	0	0	0	
Total	498	1,897	4	2,399	20.8	258	948	52	1,258	20.5	268	890	15	1,173	22.8

	Oregon					Tennessee				
Bacteria	# Hospitalized	# Outpatient	# Unknown	Total # of Cases	% Hospitalized	# Hospitalized	# Outpatient	# Unknown	Total # of Cases	% Hospitalized
Campylobacter	40	485	165	690	5.8	117	350	13	480	24.4
Listeria	6	0	0	6	100.0	13	1	0	14	92.9
Salmonella	86	311	0	397	21.7	297	579	33	909	32.7
Shigella	14	59	1	74	18.9	135	797	35	967	14.0
STEC† O157	23	33	0	56	41.1	30	23	1	54	55.6
STEC non-O157	1	4	0	5	20.0	4	7	0	11	36.4
Vibrio	2	10	0	12	16.7	9	1	0	10	90.0
Yersinia	4	10	1	15	26.7	3	17	1	21	14.3
Parasites										
Cryptosporidium	4	52	2	58	6.9	11	29	7	47	23.4
Cyclospora	0	0	0	0		0	3	0	3	0.0
Total	180	964	169	1,313	13.7	619	1,807	90	2,516	24.6

*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, 2008

	# Deaths	# Unknown	Total # of Cases	CFR
Bacteria				
Campylobacter	12	839	5,854	0.20
Listeria	23	1	135	17.04
Salmonella	34	450	7,458	0.46
Shigella	1	270	3,043	0.03
STEC*O157	5	6	518	0.97
STEC non-O157	0	3	245	0.00
Vibrio	6	11	136	4.41
Yersinia	1	16	166	0.60
Parasites				
Cryptosporidium	9	79	1,052	0.86
Cyclospora	0	0	17	0.00
Total	91	1,675	18,624	0.49

*Shiga toxin-producing *Escherichia coli*

TABLE 15. Number of Deaths and Case Fatality Rate (CFR), by Age Group and Pathogen — FoodNet, 2008

	<1 years				1–4 years				5–9 years			
Bacteria	# Deaths	# Unknown	Total # of Cases	CFR	# Deaths	# Unknown	Total # of Cases	CFR	# Deaths	# Unknown	Total # of Cases	CFR
Campylobacter	0	21	204	0.00	2	94	609	0.33	1	51	292	0.34
Listeria	2	0	18	11.11	0	0	1	0.00	0	0	0	-
Salmonella	2	65	882	0.23	2	97	1182	0.17	0	32	573	0.00
Shigella	0	4	77	0.00	0	73	838	0.00	0	73	908	0.00
STEC* O157	0	1	11	0.00	3	3	119	2.52	0	0	73	0.00
STEC non-O157	0	0	14	0.00	0	1	70	0.00	0	0	26	0.00
Vibrio	0	0	0	-	0	0	2	0.00	0	1	2	0.00
Yersinia	0	8	33	0.00	0	5	28	0.00	0	2	7	0.00
Parasites												
Cryptosporidium	0	2	25	0.00	0	7	153	0.00	0	5	87	0.00
Cyclospora	0	0	0	-	0	0	0	-	0	0	0	-
Total	4	101	1,264	0.32	7	280	3,002	0.23	1	164	1,968	0.05

	10–19 years				20–29 years				30–39 years			
Bacteria	# Deaths	# Unknown	Total # of Cases	CFR	# Deaths	# Unknown	Total # of Cases	CFR	# Deaths	# Unknown	Total # of Cases	CFR
Campylobacter	0	99	574	0.00	0	122	826	0.00	2	136	786	0.25
Listeria	0	0	0	-	1	0	12	8.33	0	0	8	0.00
Salmonella	0	33	729	0.00	0	53	855	0.00	1	55	678	0.15
Shigella	0	29	266	0.00	0	27	275	0.00	1	27	271	0.37
STEC* O157	0	1	109	0.00	0	1	57	0.00	0	0	23	0.00
STEC non-O157	0	0	48	0.00	0	0	27	0.00	0	0	12	0.00
Vibrio	0	1	5	0.00	0	1	11	0.00	0	2	17	0.00
Yersinia	0	0	16	0.00	0	0	11	0.00	0	0	11	0.00
Parasites												
Cryptosporidium	0	5	126	0.00	0	22	174	0.00	1	20	148	0.68
Cyclospora	0	0	2	0.00	0	0	1	0.00	0	0	2	0.00
Total	0	168	1,875	0.00	1	226	2,249	0.04	5	240	1,956	0.26

*Shiga toxin-producing *Escherichia coli* .

TABLE 15a. Number of Deaths and Case Fatality Rate, by Age Group and Pathogen — FoodNet, 2008

	40–49 years				50–59 years				60–69 years			
Bacteria	# Deaths	# Unknown	Total # of Cases	CFR	# Deaths	# Unknown	Total # of Cases	CFR	# Deaths	# Unknown	Total # of Cases	CFR
Campylobacter	0	99	847	0.00	1	83	766	0.13	2	71	521	0.38
Listeria	1	0	9	11.11	3	0	11	27.27	4	0	25	16.00
Salmonella	4	28	733	0.55	3	27	682	0.44	5	26	507	0.99
Shigella	0	22	166	0.00	0	8	115	0.00	0	6	78	0.00
STEC* O157	0	0	35	0.00	0	0	27	0.00	0	0	22	0.00
STEC non-O157	0	1	19	0.00	0	0	10	0.00	0	1	8	0.00
Vibrio	1	1	28	3.57	2	2	30	6.67	2	0	18	11.11
Yersinia	1	0	11	9.09	0	0	11	0.00	0	0	19	0.00
Parasites												
Cryptosporidium	5	9	146	3.42	0	6	68	0.00	1	2	56	1.79
Cyclospora	0	0	3	0.00	0	0	6	0.00	0	0	3	0.00
Total	12	160	1,997	0.60	9	126	1,726	0.52	14	106	1,257	1.11

	70–79 years				80+ years			
Bacteria	# Deaths	# Unknown	Total # of Cases	CFR	# Deaths	# Unknown	Total # of Cases	CFR
Campylobacter	3	36	268	1.12	1	26	158	0.63
Listeria	4	1	26	15.38	8	0	25	32.00
Salmonella	7	22	371	1.89	10	7	257	3.89
Shigella	0	1	31	0.00	0	0	16	0.00
STEC* O157	1	0	31	3.23	1	0	11	9.09
STEC non-O157	0	0	7	0.00	0	0	4	0.00
Vibrio	1	1	12	8.33	0	2	11	0.00
Yersinia	0	1	12	0.00	0	0	7	0.00
Parasites								
Cryptosporidium	2	1	45	4.44	0	0	24	0.00
Cyclospora	0	0	0	-	0	0	0	-
Total	18	63	803	2.24	20	35	513	3.90

*Shiga toxin-producing *Escherichia coli* .

TABLE 16. Number of Deaths and Case Fatality Rate (CFR), by Site and Pathogen — FoodNet, 2008

	California*				Colorado*				Connecticut				Georgia				Maryland			
Bacteria	# 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
Campylobacter	2	679	985	0.20	0	0	388	0.00	2	9	530	0.38	1	112	683	0.15	1	10	378	0.26
Listeria	3	0	21	14.29	0	0	4	0.00	6	0	16	37.50	3	0	26	11.54	2	0	17	11.76
Salmonella	1	78	477	0.21	1	1	337	0.30	1	6	494	0.20	10	293	2,285	0.44	7	19	853	0.82
Shigella	0	25	159	0.00	0	0	85	0.00	0	0	40	0.00	1	202	1,103	0.09	0	3	117	0.00
STEC†O157	0	0	37	0.00	1	0	82	1.22	0	0	26	0.00	1	5	44	2.27	0	0	33	0.00
STEC non-O157	0	0	1	0.00	0	0	25	0.00	0	0	18	0.00	0	1	27	0.00	0	0	53	0.00
Vibrio	0	8	23	0.00	1	0	5	20.00	0	0	14	0.00	1	2	19	5.26	2	0	35	5.71
Yersinia	1	0	11	9.09	0	0	7	0.00	0	0	15	0.00	0	16	45	0.00	0	0	14	0.00
Parasites																				
Cryptosporidium	0	19	43	0.00	0	0	27	0.00	0	4	41	0.00	8	43	258	3.10	0	0	55	0.00
Cyclospora	0	0	0	-	0	0	0	-	0	0	4	0.00	0	0	2	0.00	0	0	3	0.00
Total	7	809	1,757	0.40	3	1	960	0.31	9	19	1,198	0.75	25	674	4,492	0.56	12	32	1,558	0.77

	Minnesota				New Mexico				New York*				Oregon				Tennessee			
Bacteria	# 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
Campylobacter	1	1	884	0.11	0	14	357	0.00	3	0	479	0.63	1	0	690	0.14	1	14	480	0.21
Listeria	1	0	7	14.29	2	0	5	0.63	3	0	19	15.79	1	0	6	16.67	2	1	14	14.29
Salmonella	8	1	755	1.06	2	18	518	0.39	0	0	433	0.00	3	1	397	0.76	1	33	909	0.11
Shigella	0	0	311	0.00	0	8	154	0.00	0	0	33	0.00	0	0	74	0.00	0	32	967	0.00
STEC†O157	0	0	120	0.00	0	0	15	0.00	1	0	51	1.96	1	0	56	1.79	1	1	54	1.85
STEC non-O157	0	0	59	0.00	0	2	29	0.00	0	0	17	0.00	0	0	5	0.00	0	0	11	0.00
Vibrio	1	0	8	12.50	0	0	2	0.00	0	1	8	0.00	0	0	12	0.00	1	0	10	10.00
Yersinia	0	0	17	0.00	0	0	2	0.00	0	0	19	0.00	0	0	15	0.00	0	0	21	0.00
Parasites																				
Cryptosporidium	1	0	235	0.43	0	6	174	0.00	0	0	114	0.00	0	0	58	0.00	0	7	47	0.00
Cyclospora	0	0	3	0.00	0	0	2	0.00	0	0	0	-	0	0	0	-	0	0	3	0.00
Total	12	2	2,399	0.50	4	48	1,258	0.32	7	1	1,173	0.60	6	1	1,313	0.46	6	88	2,516	0.24

*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 17. Outbreak-related Cases, by Pathogen — FoodNet, 2008

	Total number of cases reported	Outbreak-related cases		Foodborne		Waterborne		Animal contact		Person-to-person		Non Foodborne		Environmental contamination other than food/water		Indeterminante		Other		Unknown	
		#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Bacteria																					
Campylobacter	5,854	33	0.6	25	75.8	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	6.1	0	0.0	6	18.2
Listeria	135	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Salmonella	7,458	584	7.8	520	89.0	2	0.3	0	0.0	2	0.3	6	1.0	0	0.0	11	1.9	10	1.7	33	5.7
Shigella	3,043	411	13.5	0	0.0	2	0.5	0	0.0	70	17.0	0	0.0	0	0.0	268	65.2	32	7.8	39	9.5
STEC* O157	518	136	26.3	71	52.2	0	0.0	0	0.0	17	12.5	0	0.0	6	4.4	0	0.0	37	27.2	5	3.7
STEC non-O157	245	1	0.4	0	0.0	0	0.0	0	0.0	1	100.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Vibrio	136	0	0.0	0	0.00	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Yersinia	166	0	0.0	0	0.00	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	1,052	55	5.2	0	0.0	36	65.5	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	19	34.5	0	0.0
Cyclospora	17	1	5.9	1	100.0	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	18,624	1,221	6.6	617	50.5	40	3.3	0	0.0	90	7.4	6	0.5	6	0.5	281	23.0	98	8.0	83	6.8

*Shiga toxin-producing *Escherichia coli* .

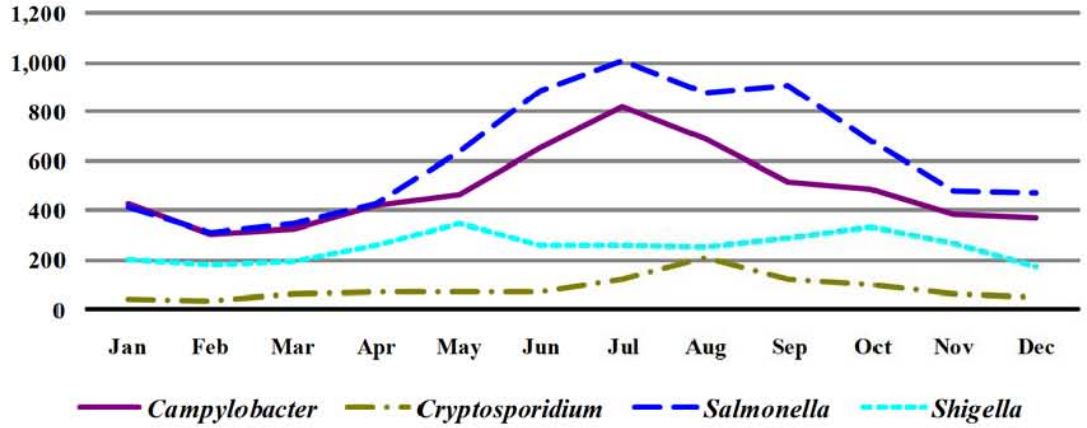
TABLE 18. Frequency of International Travel, by Pathogen — FoodNet, 2008

	Total cases reported	Total cases with travel		Traveled		Did not travel		Unknown travel	
	#	#	%	#	%*	#	%*	#	%
Bacteria									
Campylobacter	5,854	3,258	55.7	577	17.7	2,681	82.3	2,596	44.3
Listeria	135	114	84.4	4	3.5	110	96.5	21	15.6
Salmonella	7,458	5,384	72.2	484	9.0	4,900	91.0	2,074	27.8
Shigella	3,043	1,871	61.5	183	9.8	1,688	90.2	1,172	38.5
STEC† O157	518	487	94.0	15	3.1	472	96.9	31	6.0
STEC non-O157	245	208	84.9	39	18.8	169	81.3	37	15.1
Vibrio	136	102	75.0	11	10.8	91	89.2	34	25.0
Yersinia	166	97	58.4	8	8.2	89	91.8	69	41.6
Parasites									
Cryptosporidium	1,052	686	65.2	75	10.9	611	89.1	366	34.8
Cyclospora	17	14	82.4	3	21.4	11	78.6	3	17.6
Total	**18,624**	**11,521**	**61.9**	**1,321**	**11.5**	**10,200**	**88.5**	**6,034**	**32.4**

*Among cases with known travel status.

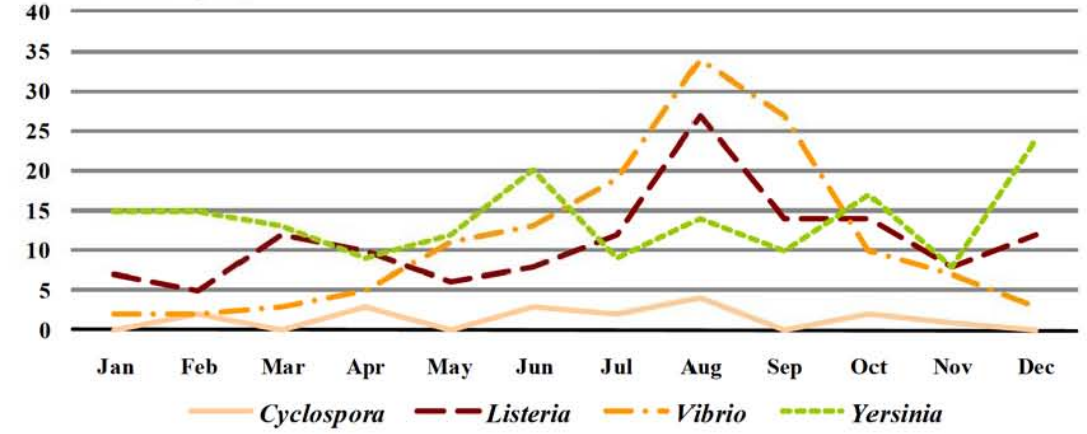
†Shiga toxin-producing *Escherichia coli* .

FIGURE 26. Seasonality of *Campylobacter*, *Cryptosporidium*, *Salmonella*, and *Shigella* Infections — FoodNet, 2008



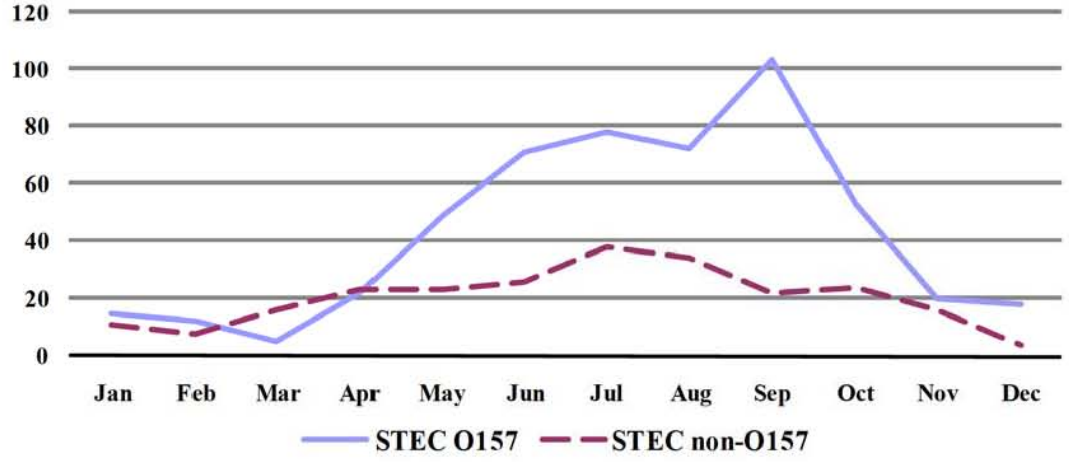
Pathogen	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Campylobacter	427	302	330	420	464	655	818	687	513	484	383	371
Cryptosporidium	46	37	68	75	73	70	126	209	126	102	67	53
Salmonella	411	309	348	428	641	883	1,011	880	909	686	478	474
Shigella	203	178	196	265	352	264	260	254	293	334	267	177

FIGURE 27. Seasonality of *Cycvlospora*, *Listeria*, *Vibrio*, and *Yersinia* Infections — FoodNet, 2008



Pathogen	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Cyclospora	0	2	0	3	0	3	2	4	0	2	1	0
Listeria	7	5	12	10	6	8	12	27	14	14	8	12
Vibrio	2	2	3	5	11	13	19	34	27	10	7	3
Yersinia	15	15	13	9	12	20	9	14	10	17	8	24

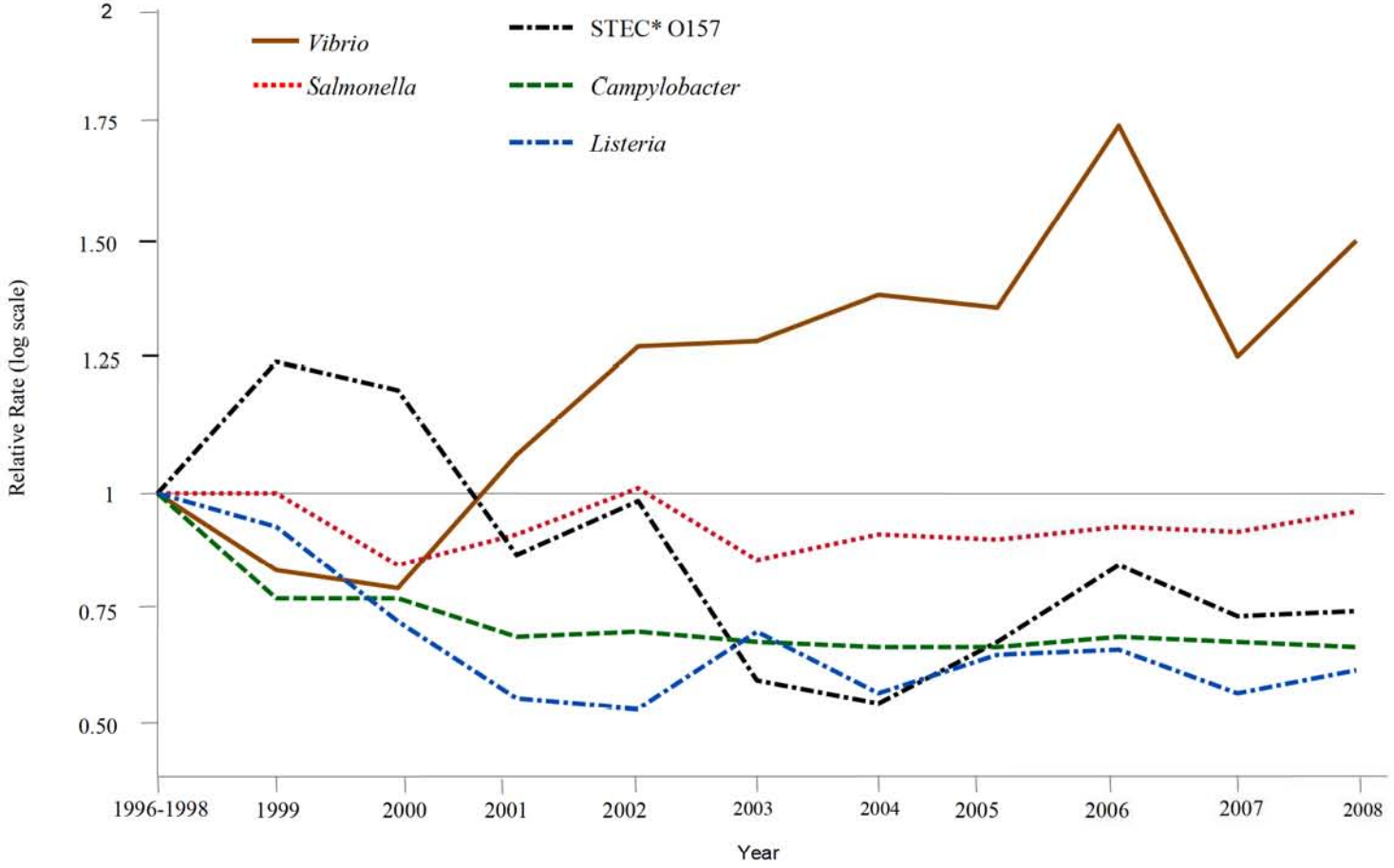
FIGURE 28. Seasonality of STEC* O157 and STEC non-O157 Infections — FoodNet, 2008



*Shiga toxin-producing *Escherichia coli* .

Pathogen	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
STEC O157	15	12	5	22	49	71	78	72	103	53	20	18
STEC non-O157	11	8	16	23	23	26	38	34	22	24	16	4

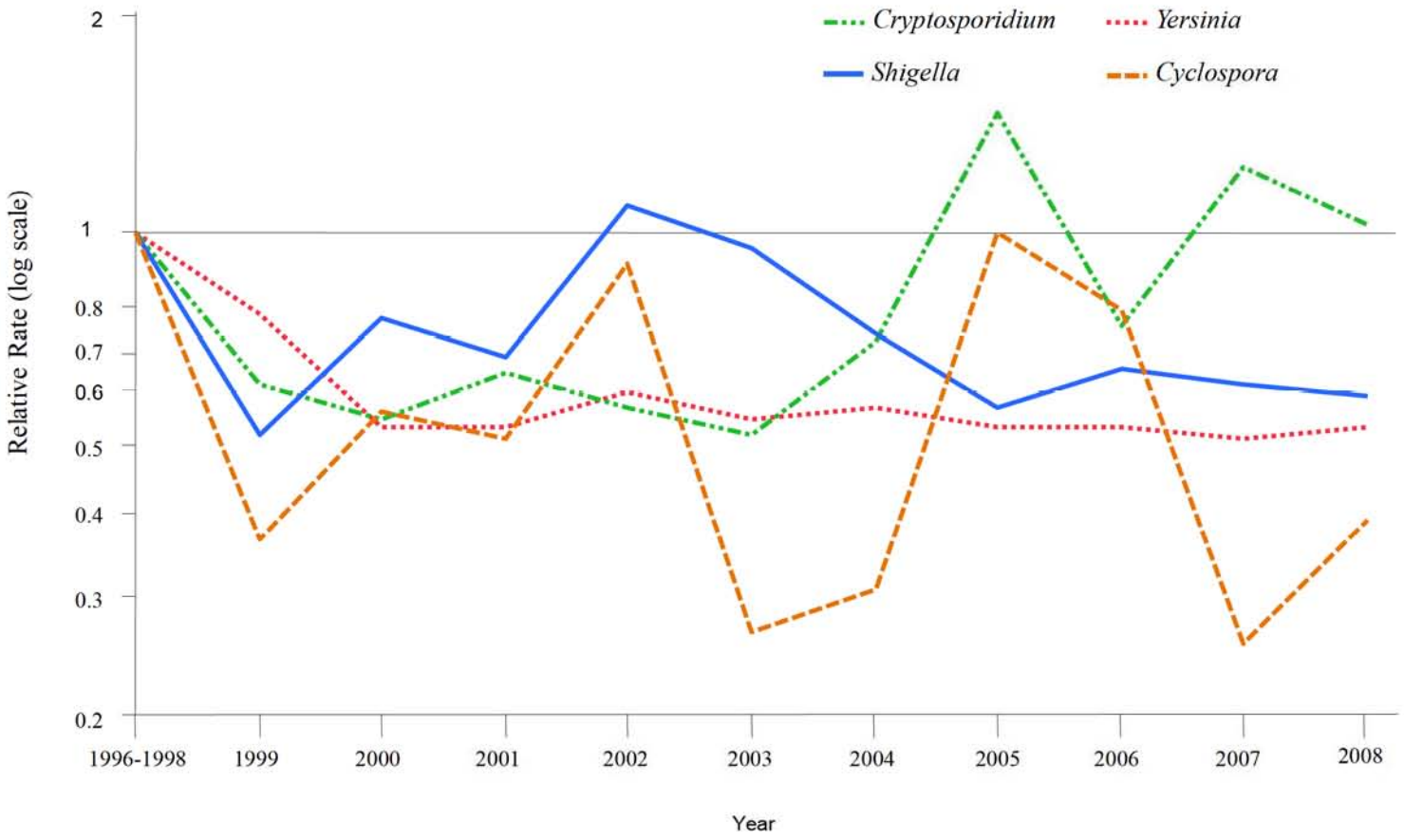
FIGURE 29 . Relative Rates of Laboratory-confirmed Infections with *Campylobacter*, STEC* O157, *Listeria*, *Salmonella*, and *Vibrio* Compared with 1996-1998 Rates, by Year — FoodNet 1996-2008†



* Shiga toxin-producing *Escherichia coli*.

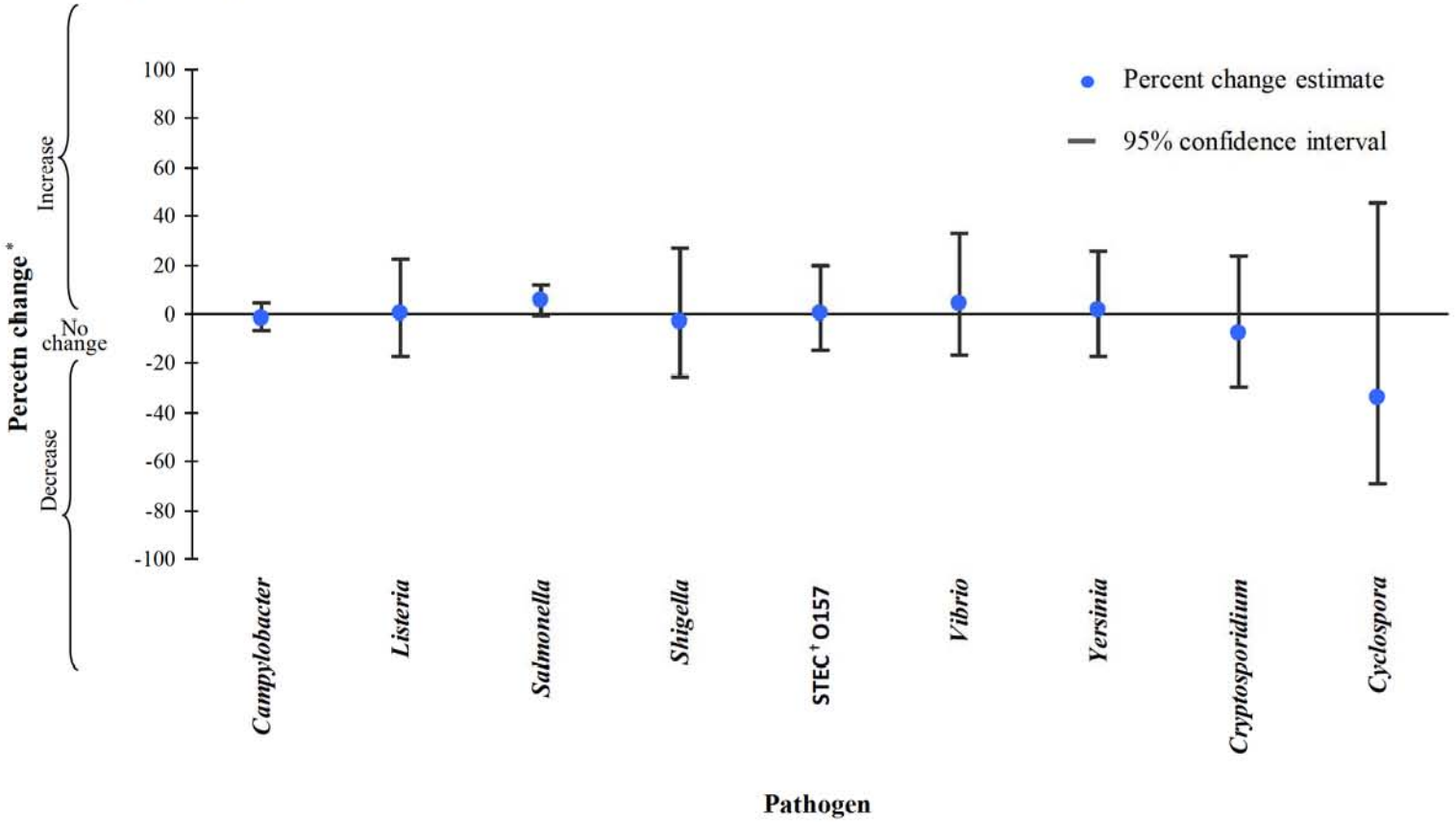
† The position of each line indicates the relative change in the incidence of that pathogen compared with the 1996-1998 incidence. The actual incidences of these infections cannot be determined from this graph.

FIGURE 30. Relative Rates of Laboratory-Confirmed Infections with *Shigella*, *Yersinia*, *Cryptosporidium*, and *Cyclospora* Compared with 1996-1998 Rates, by Year — FoodNet, 1996-2008*



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

FIGURE 31. Percent Change in Incidence of Laboratory-Confirmed Bacterial and Parasitic Infections in 2008 Compared with Average Annual Incidence during 2005-2007, 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 19. Summary of Post-diarrheal Hemolytic Uremic Syndrome (HUS) Cases, All Ages — FoodNet, 1997-2007

	Number of Post-diarrheal HUS Cases	Median Age (range)	Number (%) Female	Median Days (range) of Hospitalization	Number (%) of Deaths	Number (%) of Cases occurring June-September
1997-2006	681	4.5 (0--89)	395 (58%)	12.0 (0--150)	41 (6%)	410 (60%)
2007	106	3.9 (0--83)	65 (62%)	12.5 (2--152)	1 (1%)	55 (52%)

* HUS case definitions used by the National Notifiable Diseases Surveillance System (NNDSS) can be found at: http://www.cdc.gov/ncphi/disss/nndss/casedef/hemolyticcurrent.htm.

Table 20. Results of Microbiologic Testing for Shiga Toxin-producing *Escherichia coli* (STEC) Infection among Post-diarrheal HUS Case-patients — 1997-2007

	1997-2006		2007	
	No. (%)	Total	No. (%)	Total
Diarrhea in 3 weeks before HUS diagnosis / Total patients	681 (88%)	772	105 (84%)	125
Stool specimen obtained/ Total patients with diarrhea	650 (95%)	681	97 (92%)	105
Stool tested for Shiga toxin/ Patients with stool specimen obtained	277 (43%)	650	61 (63%)	97
Stool positive for Shiga toxin/ Patients with stool tested for Shiga toxin	191 (69%)	277	42 (69%)	61
Stool cultured for *E. coli* O157/ Patients with stool specimens obtained	615 (95%)	650	94 (97%)	97
E. coli O157 isolated from stool/ Patients with stool cultured for *E. coli* O157	355 (58%)	615	51 (54%)	94
Stool culture evaluated for non-O157 STEC/ Patients with stool specimen obtained and no evidence of *E. coli* O157	20 (8%)	260	10 (23%)	43
Isolation of non-O157 STEC/ Patients with stool culture evaluated for non-O157 STEC and no evidence of *E. coli* O157	10 (50%)	20	3 (30%)	10
Serum positive for antibodies against *E. coli* / Patients with serum tested for antibodies against *E. coli*†	65* (64%)	102	13 (59%)	22

*Of the 65 positive serum samples, 61 had antibodies against *E. coli* O157 lipopolysacchride (LPS); four had antibodies against *E. coli* O111 LPS.

†Information on serum specimens was not collected before 2000.

Table 21. Number and Incidence Rate* of Post-diarrheal Pediatric HUS cases†, by Site and Age Group — 1997-2007

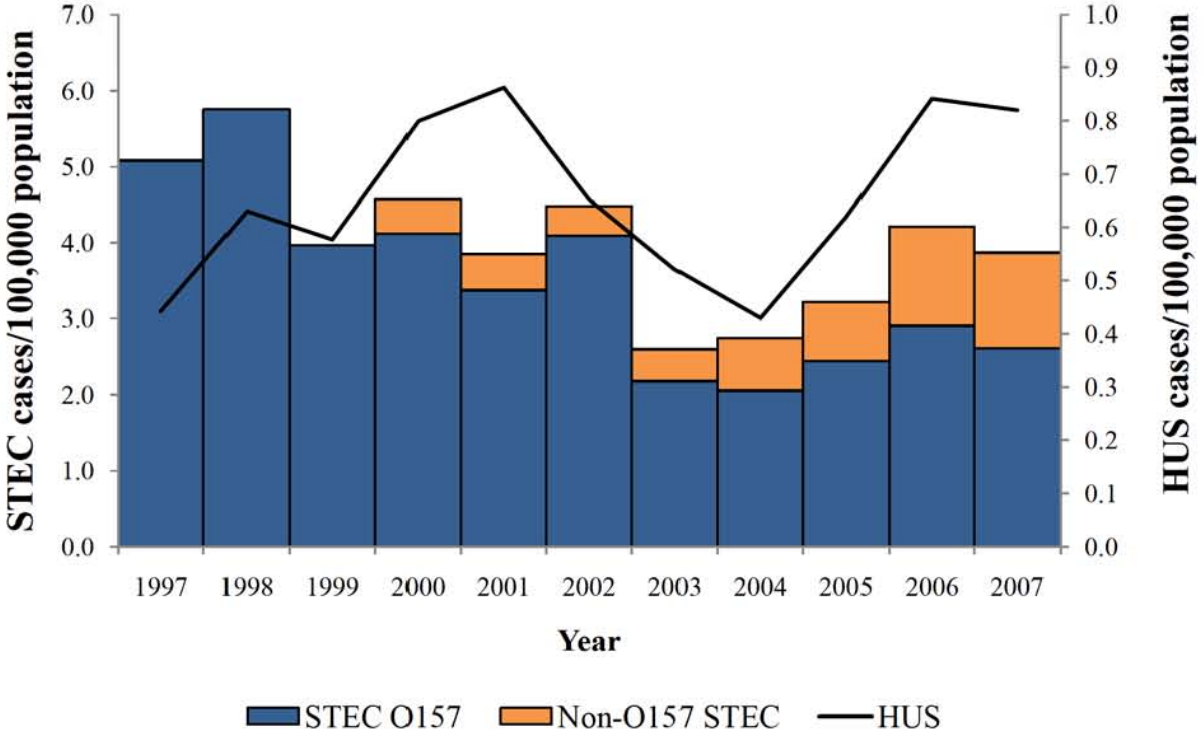
State	Age <5 years		Age 5–14 years		Age 15–17 years		Age <18 years	
	#	Rate	#	Rate	#	Rate	#	Rate
CA	31	1.47	16	0.39	0	0.00	47	0.64
CO	23	1.77	9	0.40	1	0.14	33	0.76
CT	29	1.23	26	0.50	2	0.13	57	0.63
GA	59	0.95	20	0.11	4	0.09	83	0.38
MD	25	0.85	14	0.22	0	0.00	39	0.35
MN	89	2.42	48	0.62	1	0.04	138	0.99
NM	4	0.70	1	0.09	0	0.00	5	0.25
NY	31	1.69	13	0.32	1	0.22	47	0.65
OR	70	2.81	19	0.37	4	0.24	93	1.00
TN	70	2.42	29	0.53	1	0.05	100	0.97
Total	431	1.66	195	0.36	16	0.09	642	0.67

*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 204; NY in 1998, and TN in 2000.

Figure 32. Comparison of Post-diarrheal Incidence Rates of Shiga Toxin-producing *E. coli* (STEC) and Pediatric Hemolytic Uremic Syndrome (HUS) — 1997-2007*



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