

Foodborne (1973–2013) and Waterborne (1971–2013) Disease Outbreaks — United States

Daniel Dewey-Mattia, MPH¹
 Virginia A. Roberts, MSPH¹
 Antonio Vieira, DVM, PhD¹
 Kathleen E. Fullerton, MPH¹

¹Division of Foodborne, Waterborne, and Environmental Diseases, National Center for Emerging and Zoonotic Infectious Diseases, CDC

Preface

CDC collects data on foodborne and waterborne disease outbreaks reported by all U.S. states and territories through the Foodborne Disease Outbreak Surveillance System (FDOSS) (<http://www.cdc.gov/foodsafety/fdoss/surveillance/index.html>) and the Waterborne Disease and Outbreak Surveillance System (WBDOSS) (<http://www.cdc.gov/healthywater/surveillance>), respectively. These two systems are the primary source of national data describing the number of reported outbreaks; outbreak-associated illnesses, hospitalizations, and deaths; etiologic agents; water source or implicated foods; settings of exposure; and other factors associated with recognized foodborne and waterborne disease outbreaks in the United States.

FDOSS and WBDOSS share an enhanced reporting platform, the National Outbreak Reporting System (NORS) (<http://www.cdc.gov/nors>). NORS also collects information on disease outbreaks with modes of transmission other than food and water, including person-to-person contact, animal contact, and environmental contamination.

This report summarizes data on foodborne disease outbreaks reported during 1973–2013 and waterborne disease outbreaks reported during 1971–2013; waterborne disease outbreak data for 2013 are preliminary. This report is a part of the *Summary of Notifiable Noninfectious Conditions and Disease Outbreaks — United States*, which encompasses various surveillance years but is being published in 2016 (1). The *Summary of Notifiable Noninfectious Conditions and Disease Outbreaks* appears in the same volume of *MMWR* as the annual *Summary of Notifiable Infectious Diseases* (2).

Corresponding author: Kathleen E. Fullerton, Division of Foodborne, Waterborne, and Environmental Diseases, National Center for Emerging and Zoonotic Infectious Diseases, CDC. Telephone: 404-718-4714; E-mail: kgf@cdc.gov.

Background

Foodborne Disease Outbreak Surveillance

Foodborne diseases caused by known pathogens result in an estimated 9.4 million illnesses each year in the United States (3). Only a minority of foodborne illnesses, hospitalizations, and deaths occur as part of recognized outbreaks (4). However, information gathered from foodborne disease outbreak surveillance activities provide valuable insights into the agents that cause foodborne illness, types of implicated foods and ingredients, and settings in which transmission occurs.

Surveillance for foodborne disease outbreaks provides insight into the effectiveness of regulations and control measures, helps identify new and emerging pathogens, provides information regarding the food preparation and consumption settings in which outbreaks occur, informs prevention and control measures in the food industry by identifying points of contamination, and can be used to describe trends in outbreaks over time.

Foodborne disease outbreaks have been nationally notifiable since 2010; however, CDC has collected reports of foodborne disease outbreaks through FDOSS since 1973. Initially a paper-based system, FDOSS became web-based in 1998 and was transitioned to NORS in 2009.

Waterborne Disease Outbreak Surveillance

Despite advances in water management and sanitation, waterborne disease and outbreaks continue to occur in the United States. CDC collects data on waterborne disease outbreaks associated with drinking water, recreational water, and other water exposures through WBDOSS. Waterborne disease outbreaks have been nationally notifiable since 2010; however, reports of waterborne disease outbreaks have been collected by CDC since 1971. Initially utilizing a paper-based reporting process, the system transitioned to web-based reporting with the launch of NORS in 2009.

CDC uses waterborne disease outbreak surveillance data to identify the types of etiologic agents, settings, recreational water venues, and drinking water systems associated with waterborne disease outbreaks; inform regulations and public awareness activities to promote healthy swimming and safe drinking water; and establish public health priorities to improve prevention efforts, guidelines, and regulations at the local, state, territorial, and federal levels.

Data Sources

Foodborne Disease Outbreak Surveillance

State, local, and territorial health departments use a standard form (CDC form 52.13, http://www.cdc.gov/nors/pdf/NORS_CDC_5213.pdf) to report foodborne disease outbreaks to CDC. Data requested for each outbreak include reporting state; date of first illness onset; the number of illnesses, hospitalizations, and deaths; the etiology; the implicated food vehicle; the setting of food preparation and consumption; and contributing factors. Multistate outbreaks (i.e., those in which exposure to the implicated food occurred in more than one state) typically are reported to FDOSS by CDC.

Only reports meeting the definition of a foodborne disease outbreak, defined as the occurrence of two or more cases of a similar illness resulting from the ingestion of a common food, are included in this summary. Outbreaks occurring on cruise ships that have both U.S. and international ports and those in which the food was eaten outside the United States, even if the illness occurred in the United States, are not reported to FDOSS.

Laboratory and clinical guidelines for confirming an etiology are specific to each bacterial, chemical/toxin, parasitic, and viral agent (http://www.cdc.gov/foodsafety/outbreaks/investigating-outbreaks/confirming_diagnosis.html). Suspected etiologies are those that do not meet the confirmation guidelines. The cause of the outbreak is categorized as “multiple etiologies” if more than one etiologic agent is reported.

Waterborne Disease Outbreak Surveillance

State, local, and territorial health departments use a standard form (CDC form 52.12, <http://www.cdc.gov/nors/forms.html>) to report waterborne disease outbreaks to CDC. Data requested for each outbreak include reporting state; date of first illness onset; the number of illnesses, hospitalizations, and deaths; the etiology; the type of water exposure (e.g., recreational); the implicated venue or system, the setting of exposure; water quality indicators; and contributing factors.

Only reports meeting the definition of a waterborne disease outbreak, which is the occurrence of two or more cases of a similar illness resulting from exposure to a common water source, are included in this summary. WBDOS includes reports of all types of illness outbreaks associated with water; this includes both gastrointestinal illness outbreaks and respiratory illness outbreaks (e.g., outbreaks of legionellosis, which causes a respiratory illness). Outbreaks occurring on cruise ships and those in which the water exposure occurred outside the United States or its territories, even if the illness occurred in the United States, are not included in WBDOS.

Interpreting Data

Reported outbreaks represent only a small fraction of all foodborne and waterborne illnesses that occur each year and the outbreak data reported here are subject to limitations. Outbreaks caused by certain pathogens or vehicles might be more likely to be recognized, investigated, or reported. Some illnesses reported as sporadic (i.e., not outbreak-associated) are likely not recognized as being part of a reported outbreak or might be part of an undetected outbreak. In addition, all outbreak-related illnesses might not be identified during an investigation, smaller outbreaks might not come to the attention of public health authorities, and some outbreaks might not be investigated or reported to CDC.

Reporting practices for foodborne and waterborne disease outbreaks vary among states and territories, which might have differing definitions or interpretations of which events are reportable and unique laws related to disease outbreak reporting. Thus, variations in reporting rates by state or territory might reflect variations in levels of effort and funding for foodborne and waterborne disease outbreak investigation, rather than true differences in outbreak incidence rates by state. NORS maintains a dynamic database; this report includes data available on May 1, 2015, for foodborne disease outbreaks and May 4, 2015, for waterborne disease outbreaks; data published in this Summary might differ from those published earlier or later.

Methods for Identifying Foodborne and Waterborne Disease Outbreaks

CDC provides guidance for states and other jurisdictions for reporting foodborne and waterborne disease outbreaks (<http://www.cdc.gov/nors/forms.html>). As for all notifiable conditions, reporting to CDC is voluntary, and state and local laws, regulations, and practices vary. For example, CDC advises states to report outbreaks having cases occurring in the same household; however, state, local, or territorial

jurisdictions might determine that these outbreaks do not require investigation or might deem them nonreportable at the state or territorial level.

Publication Criteria

Foodborne disease outbreaks are defined as two or more cases of a similar illness resulting from ingestion of a common food. Waterborne disease outbreaks are defined as two or more cases of a similar illness linked epidemiologically by time and location to exposure to water or water-associated chemicals volatilized into the air.

Highlights

Foodborne Disease Outbreaks

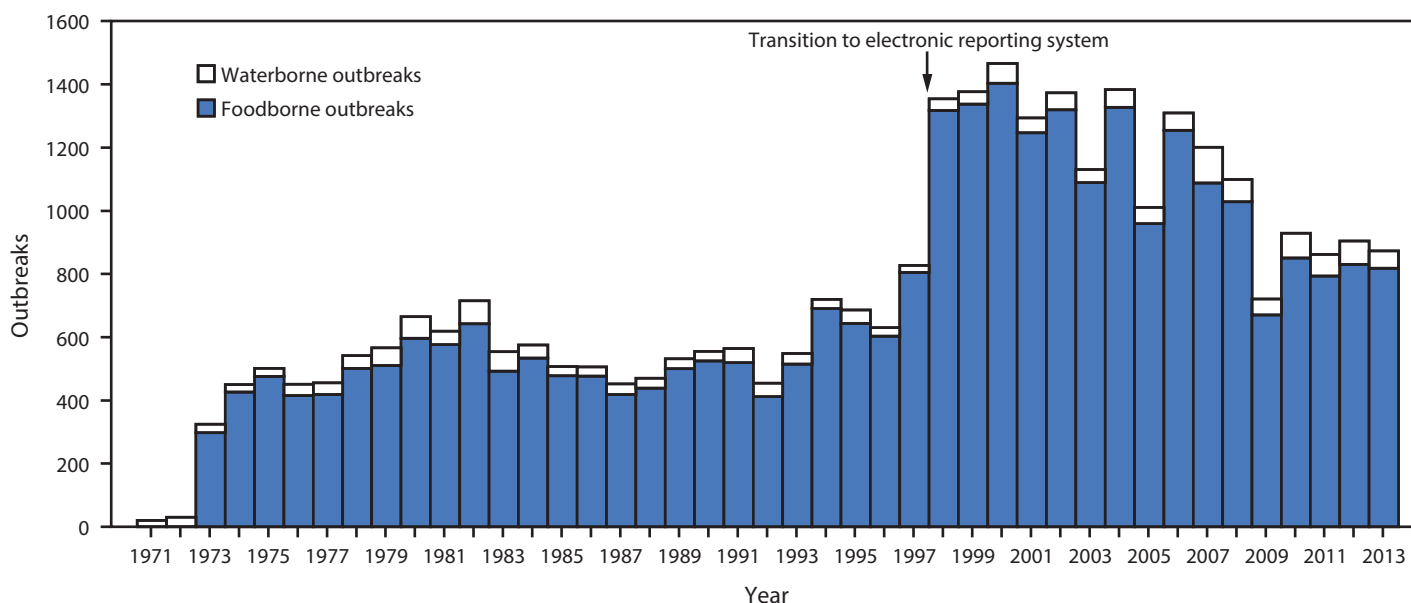
During 1973–2013, CDC received reports of 30,251 foodborne disease outbreaks with 742,945 outbreak-associated illnesses from the 50 states, Puerto Rico, the District of Columbia, and freely associated states/territories. An average of 738 (range: 298–1,404) outbreaks were reported each year (Figure 1). The average annual number of foodborne disease outbreaks reported to CDC increased in 1998 in comparison to previous years, coinciding with the transition to an electronic reporting system,

and decreased in 2009 in comparison to 1998–2008 coinciding with the transition to reporting through NORS. In 2013, a total of 792 single-state exposure outbreaks were reported with 11,786 illnesses by 47 states and Puerto Rico (Table) (Figure 2); an additional 26 multistate outbreaks (i.e., exposure to the implicated food occurred in more than one state) with 1,530 associated illnesses also were reported. CDC periodically publishes more detailed annual summaries describing the implicated foods, etiologic agents, settings, and points of contamination associated with foodborne disease outbreaks (<http://www.cdc.gov/foodsafety/fdoss/data/annual-summaries/index.html>).

Waterborne Disease Outbreaks

During 1971–2013, CDC received reports of 1,957 waterborne disease outbreaks with 642,782 outbreak-associated illnesses from 50 states and six freely associated states/territories. An average of 46 waterborne outbreaks was reported each year (Figure 1). In 2013, a total of 55 outbreaks causing at least 2,824 illnesses occurred in 21 states. No multistate outbreaks were reported; waterborne disease outbreak data for 2013 are preliminary (Table) (Figure 3). CDC periodically publishes more detailed summaries of waterborne disease outbreaks associated with recreational water and of waterborne disease outbreaks associated with drinking water (<http://www.cdc.gov/healthywater/surveillance/surveillance-reports.html>).

FIGURE 1. Number of foodborne and waterborne disease outbreaks reported by year, United States 1971–2013*



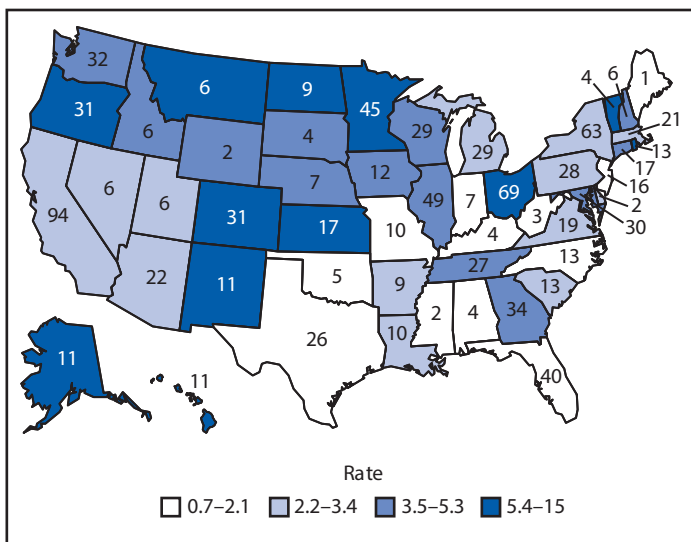
* Waterborne disease outbreak data for 2013 are preliminary. CDC partners with state agencies and the Environmental Protection Agency to review, summarize, and publish waterborne disease outbreak data separately from this report. CDC also reviews, summarizes, and publishes foodborne disease outbreak data separately from this report.

TABLE. Number of reported foodborne and waterborne disease outbreaks and outbreak-associated illnesses, by geographical division and area — United States, 2013*

Area	Foodborne		Waterborne		All	
	Outbreaks	Illnesses	Outbreaks	Illnesses	Outbreaks	Illnesses
United States	818	13,316	55	2,824	873	16,140
New England	44	788	1	140	45	928
Connecticut	13	248	—†	—	13	248
Maine [§]	—	—	—	—	—	—
Massachusetts	14	366	—	—	14	366
New Hampshire	4	70	—	—	4	70
Rhode Island	10	68	1	140	11	208
Vermont	3	36	—	—	3	36
Mid-Atlantic	86	1,054	3	23	89	1,077
New Jersey	10	72	—	—	10	72
New York	51	561	—	—	51	561
Pennsylvania	25	421	3	23	28	444
Eastern North Central	158	2,165	17	2,139	175	4,304
Illinois	39	714	5	1,445	44	2,159
Indiana	6	46	2	23	8	69
Michigan	27	350	1	597	28	947
Ohio	65	723	9	74	74	797
Wisconsin	21	332	—	—	21	332
Western North Central	79	1,403	10	64	89	1,467
Iowa	8	98	3	23	11	121
Kansas	14	356	—	—	14	356
Minnesota	35	604	7	41	42	645
Missouri	8	90	—	—	8	90
Nebraska	6	104	—	—	6	104
North Dakota	7	94	—	—	7	94
South Dakota	1	57	—	—	1	57

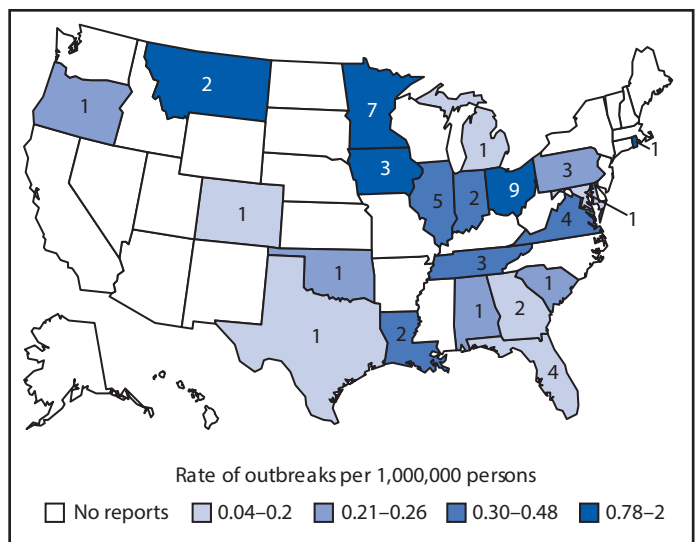
See table footnotes on page 83.

FIGURE 2. Rate* of reported foodborne disease outbreaks and number† of outbreaks, by state — Foodborne Disease Outbreak Surveillance System, United States, 2013



* Incidence of outbreaks per 1 million population based on the 2012 U.S. census estimates. Cutpoints for outbreak rate categories determined by using quartiles.
 † N = 818 (includes 26 multistate outbreaks assigned as an outbreak to each state involved).

FIGURE 3. Rate* of reported waterborne disease outbreaks and number† of outbreaks, by state — Waterborne Disease and Outbreak Surveillance System, United States, 2013



* Incidence of outbreaks per 1 million population based on the 2012 U.S. census estimates. Cutpoints for outbreak rate categories determined by using quartiles.
 † N = 55 (data are preliminary).

TABLE. (Continued) Number of reported foodborne and waterborne disease outbreaks and outbreak-associated illnesses, by geographical division and area — United States, 2013*

Area	Foodborne		Waterborne		All	
	Outbreaks	Illnesses	Outbreaks	Illnesses	Outbreaks	Illnesses
South Atlantic	120	1,622	12	88	132	1,710
Delaware [§]	—	—	—	—	—	—
District of Columbia [§]	—	—	—	—	—	—
Florida	36	323	4	25	40	348
Georgia	27	396	2	10	29	406
Maryland	23	228	1	14	24	242
North Carolina	10	239	—	—	10	239
South Carolina	11	182	1	5	12	187
Virginia	13	254	4	34	17	288
West Virginia [§]	—	—	—	—	—	—
Eastern South Central	30	433	4	64	34	497
Alabama	3	124	1	19	4	143
Kentucky	2	20	—	—	2	20
Mississippi	1	3	—	—	1	3
Tennessee	24	286	3	45	27	331
Western South Central	35	765	4	164	39	929
Arkansas	7	65	—	—	7	65
Louisiana	7	90	2	144	9	234
Oklahoma	5	238	1	17	6	255
Texas	16	372	1	3	17	375
Mountain	67	1,427	3	23	70	1,450
Arizona	18	438	—	—	18	438
Colorado	27	297	1	3	28	300
Idaho	4	19	—	—	4	19
Montana	5	62	2	20	7	82
Nevada	2	430	—	—	2	430
New Mexico	7	122	—	—	7	122
Utah	3	31	—	—	3	31
Wyoming	1	28	—	—	1	28
Pacific	155	1,970	1	119	156	2,089
Alaska	10	66	—	—	10	66
California	81	1,069	—	—	81	1,069
Hawaii	8	192	—	—	8	192
Oregon	28	368	1	119	29	487
Washington	28	333	—	—	28	333
Territories	18	159	—	—	18	159
Puerto Rico	18	159	—	—	18	159
Multistate	26	1,530	—	—	26	1,530

* Waterborne disease outbreak data for 2013 are preliminary. CDC partners with state and territorial agencies and the Environmental Protection Agency to review, summarize, and publish waterborne disease outbreak data separately from this report. CDC reviews, summarizes, and publishes foodborne disease outbreak data separately from this report.

† No data were reported for 2013.

§ No foodborne or waterborne disease outbreaks were reported for 2013.

References

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