

Surveillance for Waterborne Disease Outbreaks and Other Health Events Associated with Recreational Water — United States, 2007–2008

and

Surveillance for Waterborne Disease Outbreaks Associated with Drinking Water — United States, 2007–2008



TABLE 5. Waterborne disease outbreaks associated with drinking water (n = 16), by state/jurisdiction — Waterborne Disease and Outbreak Surveillance System, United States, 2008

State/ Jurisdiction	Month	Class*	Etiology	Predominant illness†	No. of cases [deaths] (n = 1,672 [3]§)	Type of system¶	Deficiency**	Water source	Setting
Colorado	Mar	I	<i>Salmonella</i> Typhimurium	AGI	1,300 [1]	Com	4	Well	Community
Connecticut	Aug	I	<i>Providencia</i> ††	AGI	55 —§§	Com	2	Well	Apartment complex
Georgia	Sep	III	<i>Legionella pneumophila</i> serogroup 1	ARI	6 —	Com	5A	Reservoir	Hospital/Health-care facility
Illinois	Jun	III	<i>L. pneumophila</i> serogroup 1	ARI	4 —	Com	5A	Well	Hospital/Health-care facility
Illinois	Oct	II	<i>Escherichia coli</i> O157:H7	AGI	6 —	Ind	2	Well	Farm
Illinois	Sep	I	<i>Shigella sonnei</i> , <i>Cryptosporidium</i> , <i>Giardia</i>	AGI	41 —	Com	6	Lake	Boat
New Jersey	Aug	III	<i>L. pneumophila</i> serogroup 1	ARI	9 —	Com	5A	Reservoir	Hospital/Health-care facility
New York	Jul	III	<i>L. pneumophila</i> serogroup 1	ARI	13 [1]	Com	5A	Well, river	Seniors housing complex
New York	Aug	IV	<i>L. pneumophila</i> serogroup 1	ARI	19 —	Com	5A	Lake	Assisted living facility
New York	Sep	III	<i>L. pneumophila</i> serogroup 1	ARI	3 [1]	Com	5A	Lake	Nursing home
Oklahoma	Jun	I	Norovirus genogroup 1.4	AGI	62 —	Com	3,4	Well	Neighborhood/Subdivision
Puerto Rico	Apr	II	<i>Cyclospora cayentanensis</i>	AGI	82 —	Com	99A	River	Community/Municipality
Tennessee	Mar	I	Hepatitis A virus	Hep	9 —	Ind	2	Well	Community/Municipality
Tennessee	Aug	I	<i>Salmonella</i> serotype I 4,5,12:i:-	AGI	5 —	Ncom	2	Spring	Private residence
Utah	Jun	III	<i>Campylobacter</i>	AGI	50 —	Ncom	2	Spring	Camp/Cabin
West Virginia	May	I	<i>C. jejuni</i>	AGI	8 —	Ind	2	Well	Private residence

Abbreviations: AGI = acute gastrointestinal illness; ARI = acute respiratory illness; Hep = hepatitis; Com = community; Ncom = noncommunity; Ind = individual; Bottle = commercially bottled water.

* On the basis of epidemiologic, clinical laboratory, and environmental data (e.g., water quality data) provided to CDC.

† The category of illness reported by ≥50% of ill respondents.

§ Deaths are included in the overall case count.

¶ Community and noncommunity water systems are public water systems that have ≥15 service connections or serve an average of ≥25 residents for ≥60 days/year. A community water system serves year-round residents of a community, subdivision, or mobile home park. A noncommunity water system serves an institution, industry, camp, park, hotel, or business and can be nontransient or transient. Nontransient systems serve ≥25 of the same persons for >6 months of the year but not year-round (e.g., factories or schools) whereas transient systems provide water to places in which persons do not remain for long periods of time (e.g., restaurants, highway rest stations, and parks). Individual water systems are small systems not owned or operated by a water utility that have <15 connections or serve <25 persons.

** Deficiency classification for drinking water, water not intended for drinking (excluding recreational water), and water of unknown intent (see Table 2).

†† Six of nine stool specimens tested positive for *Providencia*. Extensive testing concluded that stool specimens were negative for *Salmonella*, *Shigella*, *Campylobacter*, *Escherichia coli*, ova and parasites, and norovirus.

§§ No deaths were reported.

TABLE 6. Waterborne disease outbreaks (n = 12) associated with water not intended for drinking (WNID) (excluding recreational water) and water of unknown intent (WUI), by state — Waterborne Disease and Outbreak Surveillance System, United States, 2007–2008

State	Water type	Month	Year	Class*	Etiology	Predominant illness†	No. of cases [deaths] (n = 79 [4]§)	Deficiency¶	Water source	Setting
Colorado	WUI	Aug	2007	III	<i>Giardia intestinalis</i>	AGI	13 —**	99D	Unknown	Park
Florida	WUI	Mar	2007	IV	<i>Legionella pneumophila</i> serogroup 1	ARI	2 —	5C	Unknown	Membership club
Iowa	WNID	May	2007	IV	Unidentified††	AGI	10 —	12	Stream	State forest
Maryland	WNID	Oct	2007	I	<i>L. pneumophila</i> serogroup 1 ^{§§}	ARI	2 —	5B	Ornamental fountain	Hospital/Health-care facility
Maryland	WNID	Jul	2008	IV	<i>L. pneumophila</i> serogroup 1	ARI	18 —	5B	Unknown¶¶	Community/Municipality
New Jersey	WUI	Jul	2008	IV	<i>L. pneumophila</i> serogroup 1	ARI	2 —	5C	Unknown	Senior housing facility
New York	WNID	Jun	2007	III	<i>L. pneumophila</i> serogroup 1	ARI	2 —	5B	Cooling tower	Community/Municipality
New York	WNID	Jun	2007	III	<i>L. pneumophila</i> serogroup 1	ARI	2 —	5B	Recycled water	Vehicle-washing station***
New York	WUI	Aug	2007	IV	<i>L. pneumophila</i> serogroup 1 <i>L. pneumophila</i> serogroup 7	ARI	2 [2]	5C	Unknown†††	Nursing home
New York	WNID	Sep	2007	III	<i>L. pneumophila</i> serogroup 1	ARI	4 [1]	5B	Cooling tower	Assisted living facility
New York	WNID	Jun	2008	I	<i>L. pneumophila</i> serogroup 1	ARI	12 ^{§§§} [1]	5B	Cooling tower	Community/Municipality
Wyoming	WNID	Apr	2007	IV	Unidentified	AGI	10 —	12	Hydrant, hose	Youth facility

Abbreviations: AGI = acute gastrointestinal illness; ARI = acute respiratory illness.

* On the basis of epidemiologic, clinical laboratory, and environmental data (e.g., water quality data) provided to CDC.

† The category of illness reported by ≥50% of ill respondents.

§ Deaths are included in the overall case count.

¶ Deficiency classification for drinking water, water not intended for drinking (excluding recreational water), and water of unknown intent (see Table 2).

** No deaths were reported.

†† Etiology unidentified; norovirus suspected based upon incubation period, symptoms, and duration of illness.

§§ Outbreak occurred at a federal facility and was investigated independently by the facility.

¶¶ Environmental testing found positive results in samples collected at a cooling tower and a decorative fountain.

*** The outbreak was associated with a mass-transit vehicle washing station.

††† The investigation identified the drinking water system and a cooling tower as possible water exposures in this outbreak.

§§§ Eleven persons received a diagnosis of Legionnaires' disease, and one person received a diagnosis of Pontiac fever.

TABLE 7. Previously unreported outbreaks (n = 70) associated with drinking water, water not intended for drinking, and water of unknown intent, by state — Waterborne Disease and Outbreak Surveillance System, United States, 1973–2002*

State	Month/Year	Class [†]	Etiology	Predominant illness [§]	No. of cases [deaths] (n = 1,522 [237 [¶]])	Deficiency**	Setting
Virginia	Jun 1973	IV	<i>Legionella pneumophila</i>	ARI	12 — ^{††}	5B	Factory/Industrial facility
Virginia	Jul 1973	IV	<i>L. pneumophila</i>	ARI	10 —	5B	Factory/Industrial facility
Pennsylvania	Sep 1974	II	<i>L. pneumophila</i>	ARI	11 —	5C	Hotel/Motel
Kansas	Aug 1975	IV	<i>Legionella</i>	ARI	3 [3]	5C	Hospital/Health-care facility
Connecticut	Nov 1976	I	<i>L. pneumophila</i> serogroup 1	ARI	28 [12]	5B	Community/Municipality
Pennsylvania	Jul 1976	II	<i>Legionella</i>	ARI	182 [29]	5C	Hotel/Motel
California	May 1977	II	<i>Legionella</i>	ARI	49 [15]	5C	Hospital/Health-care facility
Indiana	May 1977	IV	<i>Legionella</i>	ARI	39 [4]	5C	Hotel/Motel/Lodge
Ohio	Jul 1977	II	<i>Legionella</i>	ARI	14 [1]	5C	Community/Municipality
Tennessee	Aug 1977	IV	<i>Legionella</i>	ARI	33 [3]	5C	Community/Municipality
Vermont	May 1977	IV	<i>Legionella</i>	ARI	69 [17]	5C	Community/Municipality
Virginia	Jun 1977	IV	<i>L. micdadei</i>	ARI	16 [2]	5A	Hospital/Health-care facility
Georgia	Jul 1978	III	<i>L. pneumophila</i>	ARI	8 —	5B	Membership club
New York	Aug 1978	IV	<i>L. pneumophila</i> serogroup 1	ARI	57 [3]	5B	Factory/Industrial facility
Tennessee	Aug 1978	I	<i>L. pneumophila</i> serogroup 1	ARI	39 [7]	5B	Hospital/Health-care facility
Texas	Aug 1978	I	<i>L. pneumophila</i> serogroup 1	ARI	18 [2]	5B	Hotel/Motel
Illinois	Dec 1979	III	<i>L. pneumophila</i> serogroup 6	ARI	3 —	5A	Hospital/Health-care facility
New York	Jul 1979	III	<i>L. pneumophila</i>	ARI	6 [1]	5B	Factory/Industrial facility
Pennsylvania	Feb 1979	IV	<i>L. pneumophila</i>	ARI	27 [12]	5C	Hospital/Health-care facility
Wisconsin	Jun 1979	I	<i>L. pneumophila</i> serogroup 1	ARI	13 [4]	5B	Hotel/Motel
California	Mar 1980	III	<i>L. pneumophila</i> serogroup 1	ARI	14 —	5B	Office
California	Dec 1980	III	<i>L. pneumophila</i> serogroup 1, <i>L. dumoffi</i>	ARI	20 —	5C	Hospital/Health-care facility
Connecticut	Dec 1980	IV	<i>L. pneumophila</i>	ARI	36 [5]	5C	Hospital/Health-care facility
Vermont	May 1980	II	<i>L. pneumophila</i> serogroup 1	ARI	85 [16]	5B	Community/Municipality
Washington	Nov 1980	IV	<i>L. dumoffi</i>	ARI	9 [4]	5C	Hospital/Health-care facility
Iowa	Oct 1981	IV	<i>L. pneumophila</i> serogroup 1	ARI	12 [1]	5C	Community/Municipality
New York	Feb 1982	I	<i>L. pneumophila</i> serogroup 1	ARI	11 —	5A	Hospital/Health-care facility
New York	Jun 1982	IV	<i>L. pneumophila</i>	ARI	3 —	5A	Hospital/Health-care facility
Washington	Oct 1982	I	<i>L. pneumophila</i> serogroup 3	ARI	15 [2]	5A	Hospital/Health-care facility
Rhode Island	Jun 1983	I	<i>L. pneumophila</i> serogroup 1	ARI	15 [10]	5B	Hospital/Health-care facility
California	Jan 1984	IV	<i>L. pneumophila</i> , <i>L. dumoffi</i> , <i>L. micdadei</i>	ARI	14 [1]	5A	Hospital/Health-care facility
New York	Apr 1984	III	<i>L. pneumophila</i> serogroup 1	ARI	86 —	5B	Office
Ohio	Apr 1984	IV	<i>L. pneumophila</i> serogroup 1	ARI	7 —	5C	Hospital/Health-care facility
Utah	May 1984	I	<i>L. pneumophila</i> serogroup 1	ARI	4 [1]	5B	Hospital/Health-care facility
Michigan	May 1985	IV	<i>L. pneumophila</i> serogroup 1	ARI	14 [3]	5C	Temporary event
South Dakota	Apr 1985	I	<i>L. pneumophila</i> serogroup 1	ARI	26 [10]	5A	Hospital/Health-care facility
Wisconsin	Aug 1986	I	<i>L. pneumophila</i> serogroup 1	ARI	32 [2]	5B	Community/Municipality
California	Mar 1986	IV	<i>L. pneumophila</i> serogroups 1, 4, 6	ARI	7 [5]	5A	Hospital/Health-care facility
Maryland	May 1986	IV	<i>L. pneumophila</i> serogroup 1	ARI	27 [2]	5C	Store
Arizona	Jan 1987	I	<i>L. pneumophila</i> serogroups 1, 5, 6, 10	ARI	25 [12]	5A	Hospital/Health-care facility
Florida	Jan 1987	III	<i>L. pneumophila</i> serogroup 1	ARI	2 [1]	5A	Hospital/Health-care facility
Washington	May 1987	II	<i>L. micdadei</i> , <i>L. feelei</i> , <i>L. pneumophila</i> serogroup 3	ARI	7 [5]	5A	Hospital/Health-care facility
Michigan	Jul 1987	IV	<i>L. pneumophila</i> serogroup 1	ARI	7 —	5B	Prison/Jail
Pennsylvania	Jul 1987	III	<i>L. pneumophila</i> serogroup 1	ARI	2 [1]	5B	Factory/Industrial facility
Vermont	Oct 1987	IV	<i>L. pneumophila</i> serogroup 1	ARI	27 [3]	5C	Hotel/Motel
California	Apr 1988	III	<i>L. anisa</i>	ARI ^{††}	34 —	5B	Hotel/Motel
California	Jun 1988	IV	<i>L. pneumophila</i> serogroup 1	ARI	3 —	5C	Retirement home
Ohio	Jul 1989	III	<i>L. pneumophila</i> serogroup 1	ARI	38 [11]	5A	Hospital/Health-care facility
Louisiana	Oct 1989	I	<i>L. pneumophila</i> serogroup 1	ARI	33 [2]	5A	Store
New York	Jun 1989	II	<i>L. pneumophila</i> serogroups 1, 6	ARI	7 —	5C	Hospital/Health-care facility
Texas	Apr 1989	II	<i>L. pneumophila</i> serogroup 1	ARI	14 [6]	5A	Hospital/Health-care facility
California	Mar 1991	II	<i>L. pneumophila</i> serogroups 4, 5, 6	ARI	5 —	5C	Hospital/Health-care facility
California	Aug 1991	IV	<i>L. pneumophila</i> serogroup 1	ARI	10 [1]	5C	Office
Utah	Aug 1991	I	<i>L. pneumophila</i> serogroup 1	ARI	11 —	5A	Indoor place of work
Florida	Jan 1992	I	<i>L. pneumophila</i> serogroup 1	ARI	5 —	5B	Hotel/Motel
Ohio	Jun 1992	II	<i>L. pneumophila</i> serogroups 1, 3, 7, <i>L. longbeachae</i>	ARI	52 [2]	5C	Community/Municipality
Pennsylvania	Feb 1992	II	<i>L. pneumophila</i> serogroup 1	ARI	2 —	5C	Factory/Industrial Facility
Massachusetts	Jul 1993	I	<i>L. pneumophila</i> serogroup 1	ARI	11 [3]	5B	Community/Municipality
Rhode Island	Aug 1993	I	<i>L. pneumophila</i> serogroup 1	ARI	17 [2]	5B	Community/Municipality
Connecticut	Apr 1994	I	<i>L. pneumophila</i> serogroup 1	ARI	20 —	5A	Hospital/Health-care facility
Delaware	Jul 1994	I	<i>L. pneumophila</i> serogroup 1	ARI	29 [2]	5B	Hospital/Health-care facility
New York	Jan 1995	I	<i>L. micdadei</i>	ARI	19 [4]	5A	Hospital/Health-care facility
Pennsylvania	Jul 1995	I	<i>L. pneumophila</i> serogroup 1	ARI	22 [3]	5B	Hospital/Health-care facility
Missouri	Sep 1996	III	<i>L. pneumophila</i> serogroup 1	ARI	3 —	5C	Restaurant/Cafeteria
Rhode Island	Aug 1996	III	<i>L. pneumophila</i> serogroup 1	ARI	18 [1]	5B	Community/Municipality
Texas	Apr 1996	III	<i>L. pneumophila</i>	ARI	4 —	5C	Hospital/Health-care facility

See table footnotes on page 48

TABLE 7. (Continued) Previously unreported outbreaks (n = 70) associated with drinking water, water not intended for drinking, and water of unknown intent, by state — Waterborne Disease and Outbreak Surveillance System, United States, 1973–2002*

State	Month	Year	Class [†]	Etiology	Predominant illness [§]	No. of cases[deaths] (n = 1,522 [237 [¶]])	Deficiency**	Setting
California	Nov	1997	II	<i>L. pneumophila</i> serogroup 1	ARI	8 [1]	5C	Community/Municipality
Missouri	Jul	1997	III	<i>L. pneumophila</i> serogroup 1, <i>L. bozemanii</i>	ARI	4 —	5B	Hospital/Health-care facility
Pennsylvania	May	1998	IV	<i>L. pneumophila</i> serogroup 1	ARI	7 —	5B	Community/Municipality
Georgia	Sep	2002	III	<i>Mycobacterium mageritense</i>	Skin	2 —	12	Nail salon

Abbreviations: ARI = acute respiratory illness; Skin = illnesses, conditions, or symptoms related to skin.
 * Previously unreported legionellosis outbreaks included in this table were identified through a review of the published literature on *Legionella* as well as reports from past CDC-led investigations occurring during 1971–2000. Data are presented on the basis of a review and interpretation of available outbreak investigation reports and published articles.
[†] On the basis of epidemiologic, clinical laboratory, and environmental data (e.g., water quality data) provided to CDC.
[§] The category of illness reported by ≥50% of ill respondents.
[¶] Deaths are included in the overall case count.
 ** Deficiency classification for drinking water, water not intended for drinking (excluding recreational water), and water of unknown intent (see Table 2).
^{††} No deaths were reported.
^{§§} Some or all cases might have been Pontiac fever.

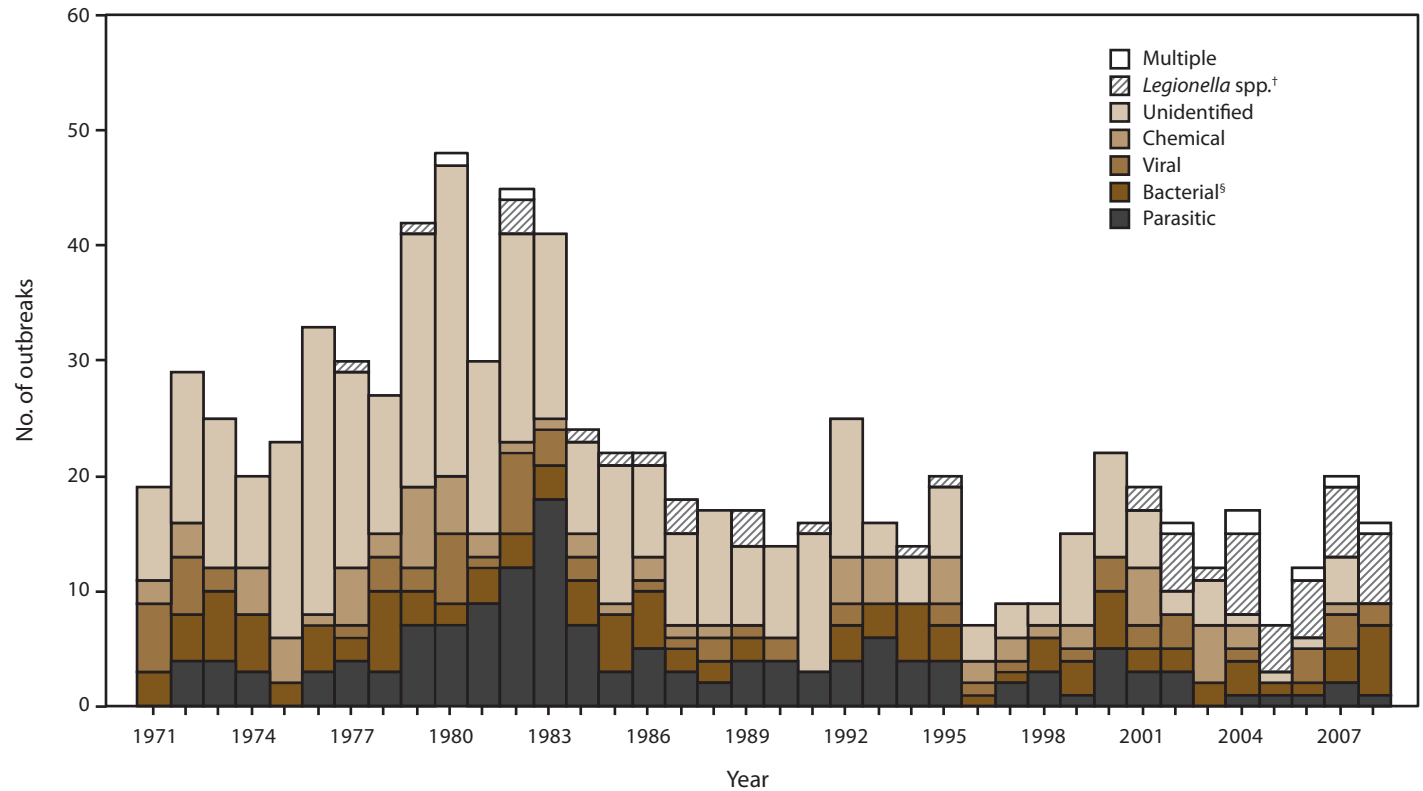
to water containing high levels of sodium hydroxide. No deaths were reported.

Multiple etiologies. Two outbreaks were associated with multiple etiologies and resulted in 270 cases of illness; one outbreak with viral and bacterial agents caused by norovirus genotype I, *Campylobacter*, and *Salmonella* resulted in 229 cases of

illness; one outbreak with parasitic and bacterial agents caused by *Shigella sonnei*, *Giardia intestinalis*, and *Cryptosporidium* resulted in 41 cases of illness. No deaths were reported.

Unidentified etiologies. In four outbreaks an etiologic agent was not identified; however, one outbreak had a suspected

FIGURE 2. Number of waterborne disease outbreaks associated with drinking water (n = 818),* by year and etiology — Waterborne Disease and Outbreak Surveillance System, United States, 1971–2008



* Some outbreaks from prior reporting periods were added, reclassified, or excluded during an extensive review (Craun GF, Brunkard JM, Yoder JS, et al. Causes of outbreaks associated with drinking water in the United States from 1971 to 2006. Clin Microbiol Rev 2010;23:507–28); therefore, data are not comparable to figures in previous reports.
[†] Legionnaires’ disease (LD) was reported to the Waterborne Disease and Outbreak Surveillance System (WBDOSS) beginning in 2001. A review of publications and CDC-led investigations during 1971–2000 resulted in the addition of 17 historic LD drinking water outbreaks to WBDOSS.
[§] Includes all bacteria except *Legionella*.