

Waterborne Disease Outbreaks* Associated with Treated Recreational Water and Untreated Recreational Water, by Year and Jurisdiction — Waterborne Disease and Outbreak Surveillance System, United States, 2011–2012

Treated Recreational Water -									
Jurisdiction	Month	Year	Class*	Etiology	Predominant Illness†	No. cases§	No. hospitalizations¶	Venue	Setting
Alabama	Jun	2011	I	<i>Escherichia coli</i> O157:H7 (C)	AGI	19	3	Interactive fountain(s), pool	Recreational facility
Arizona	Apr	2012	IV	Norovirus (S)	AGI	3	0	Pool	Resort
Colorado	Jul	2011	II	<i>Cryptosporidium hominis</i> laA28R4 (C)	AGI	33	0	Pool	Waterpark
Colorado	Jun	2012	IV	<i>Cryptosporidium</i> sp. (C)	AGI	5	0	Interactive fountain(s), pools, spas	Membership club
Georgia	May	2011	IV	<i>Shigella sonnei</i> subgroup D (C)	AGI	5	1	Pool	Waterpark
Georgia	Oct	2012	III	<i>Legionella pneumophila</i> serogroup 1 (C)	ARI	2	2	Pool, spas	Recreational facility
Idaho	Sep	2011	III	<i>Escherichia coli</i> O157:H7 (C)	AGI	2	2	Fill-and-drain pool††	Private residence
Idaho	Jun	2012	III	<i>Cryptosporidium</i> sp. (C)	AGI	82	3	Pools	Community/Municipal park, membership club, waterpark
Idaho	Aug	2012	IV	<i>Cryptosporidium</i> sp. (C)	AGI	2	0	Pool	Community/Municipality
Illinois	Jun	2011	IV	<i>Cryptosporidium</i> sp. (C)	AGI	23	0	Temporary water slide	Community/Municipal park
Iowa	Mar	2012	III	Norovirus genogroup I (C)	AGI	75	0	Pool, spa, wading pool, water slide	Hotel/Motel, indoor waterpark
Iowa	Aug	2012	IV	<i>Cryptosporidium</i> sp. (C)	AGI	24	0	Wading pool	Community/Municipal park
Kansas	Jul	2011	III	<i>Cryptosporidium</i> sp. (C)	AGI	144	10	Pool	Apartment/Condo
Kansas	Aug	2011	IV	<i>Cryptosporidium</i> sp. (C)	AGI	9	1	Pool	Community/Municipality
Kansas	Apr	2012	III	<i>Legionella</i> sp. (C)	ARI	3	§§	Spa	Hotel/Motel
Kentucky¶¶¶	May	2011	III	<i>Cryptosporidium</i> sp. (C)	AGI	130	13	Pool	Unknown
Louisiana	Dec	2012	IV	<i>Legionella pneumophila</i> (C)	ARI	4	4	Unknown	Unknown

Maryland	Jul	2011	IV	<i>Giardia intestinalis</i> (C)	AGI	21	0	Wading pool	Membership club
Michigan	Jun	2012	IV	<i>Legionella pneumophila</i> serogroup 2 (C)	ARI	9	4	Pool, spa	Private residence
Michigan	Jul	2012	IV	Chemical (pool chemical) (S)***	ARI	3	\$\$	Pool	Unknown
Michigan	Jul	2012	I	<i>Cryptosporidium</i> sp. (C)	AGI	27	0	Pool	Private residence
Michigan	Aug	2012	III	<i>Cryptosporidium parvum</i> IIaA15G2R1 (C)	AGI	9	0	Interactive fountain(s)	County park
Minnesota	Mar	2011	I	<i>Legionella</i> sp. (S)	ARI	48	1	Spa	Recreational facility
Minnesota	Aug	2011	I	<i>Cryptosporidium hominis</i> IaA15R3 (C)	AGI	11	0	Pool	Recreational facility, school/college/university
Minnesota	Mar	2012	I	<i>Cryptosporidium parvum</i> IIaA15G2R1 (C)	AGI	97	1	Pool	Hotel/Motel, indoor waterpark
Minnesota	Mar	2012	I+++	<i>Cryptosporidium parvum</i> IIaA16G3R1 (C)	AGI	43	1	Pool	Hotel/Motel, indoor waterpark
Minnesota	Apr	2012	III	<i>Pseudomonas aeruginosa</i> (S)	Skin	7	0	Pool, spa	Hotel/Motel
Minnesota	Jun	2012	III	<i>Cryptosporidium</i> sp. (C)	AGI	7	2	Pool	Community/Municipality
Minnesota	Jul	2012	II	<i>Cryptosporidium parvum</i> IIaA15G2R1 (C)	AGI	5	1	Swim pond\$\$\$	Community/Municipal park
Minnesota	Jul	2012	II	<i>Cryptosporidium parvum</i> IIaA16G2R2 (C)	AGI	2	0	Interactive fountain(s)	Community/Municipal park
Minnesota	Jul	2012	II	<i>Cryptosporidium parvum</i> IIaA16G2R2 (C)	AGI	2	0	Interactive fountain(s)	Community/Municipality
Minnesota	Aug	2012	II	<i>Cryptosporidium parvum</i> IIaA15G2R1 (C)	AGI	6	0	Pool	Community/Municipality
Minnesota	Aug	2012	I	<i>Cryptosporidium parvum</i> IIaA15G2R1 (C)	AGI	2	1	Pool	Community/Municipality
Minnesota	Nov	2012	III	<i>Legionella</i> sp. (S)	ARI	4	0	Spa	Private residence
Missouri	Jul	2011	III	<i>Cryptosporidium</i> sp. (C)	AGI	38	3	Pool	Waterpark
Missouri	Jul	2011	III	Chloramines (S)	ARI	9	0	Pool, spa	Hotel/Motel
Missouri	Jun	2012	III	<i>Legionella pneumophila</i> serogroup 1 (C)	ARI	3	3	Interactive fountain(s), pool, spa	Resort

Nevada	Oct	2011	III	Chlorine (S)	Skin	12	0	Spa	Hotel/Motel
New Hampshire	Aug	2011	IV	<i>Pseudomonas aeruginosa</i> (C)	Skin	9	0	Spa	Private residence
New York	Jan	2011	III	Chloramines (S)	Skin	4	0	Interactive fountain(s), pool	Indoor waterpark
New York	Apr	2011	III	Chlorine gas (C)	ARI; Eye; Skin	11	0	Pool	Membership club
New York	May	2011	III	Chlorine gas (S)¶¶¶¶	ARI; Eye	3	0	Pool	Recreational facility
New York	Jun	2012	III	Chlorine (C)****	Eye; Skin	30	§§	Wading pool	Community/Municipal park
North Carolina	Sep	2012	I	Norovirus genogroup I (C)	AGI	47	0	Pool	Recreational facility
Ohio	Jan	2011	IV	<i>Cryptosporidium</i> sp. (C)	AGI	87	3	Pool	Hotel/Motel, indoor waterpark
Ohio	Jul	2011	IV	<i>Cryptosporidium</i> sp. (C)++++	AGI	3	1	Pool	Apartment/Condo
Ohio	Jul	2011	IV	<i>Cryptosporidium</i> sp. (C)++++	AGI	2	0	Pool	Membership club
Ohio	Jul	2011	III	<i>Cryptosporidium</i> sp. (C)++++	AGI	7	1	Interactive fountain(s)	Community/Municipal park
Ohio	Jul	2011	IV	<i>Cryptosporidium</i> sp. (C)++++	AGI	19	0	Pool	Amusement park
Ohio	Aug	2011	IV	<i>Cryptosporidium</i> sp. (C)++++	AGI	2	0	Pool	Waterpark
Ohio	Aug	2011	IV	<i>Cryptosporidium</i> sp. (C)	AGI	2	0	Pool	Recreational facility
Ohio	Aug	2011	IV	<i>Cryptosporidium</i> sp. (C)++++	AGI	4	0	Pool	Recreational facility
Ohio	Aug	2011	IV	<i>Cryptosporidium</i> sp. (C)++++	AGI	8	0	Pool	Recreational facility
Ohio	Aug	2011	IV	<i>Cryptosporidium</i> sp. (C)++++	AGI	4	1	Interactive fountain(s)	Community/Municipal park
Ohio	Aug	2011	IV	<i>Cryptosporidium</i> sp. (C)++++	AGI	3	0	Interactive fountain(s)	Community/Municipal park
Ohio	Aug	2011	IV	<i>Cryptosporidium</i> sp. (C)	AGI	2	1	Pool, wading pool	Recreational facility
Ohio	Sep	2011	I	<i>Pseudomonas aeruginosa</i> (C)	Skin§§§§	7	0	Pool, spa	Hotel/Motel
Ohio	Dec	2011	III	<i>Legionella pneumophila</i> serogroup 1 (C)	ARI	2	2	Pool, spa	Membership club
Ohio	Apr	2012	IV	<i>Pseudomonas aeruginosa</i> (S)	Skin§§§§	40	0	Spa	Hotel/Motel
Ohio	Jun	2012	III	Chlorine (C)	Eye; Skin	16	0	Interactive fountain(s), pool, wading pool	Recreational facility
Ohio	Jul	2012	III	<i>Cryptosporidium</i> sp. (C)	AGI	12	1	Pool	Waterpark
Ohio	Dec	2012	IV	<i>Pseudomonas aeruginosa</i> (S)	Skin	4	0	Spa¶¶¶¶	Hotel/Motel

Pennsylvania	Sep	2011	III	<i>Legionella pneumophila</i> serogroup 1 (C)	ARI	6	0	Spa	Hotel/Motel
Pennsylvania	Jan	2012	III	<i>Legionella pneumophila</i> serogroup 1 (C)	ARI	2	2	Spa	Hotel/Motel
Puerto Rico	Dec	2012	III	Norovirus (S)	AGI	18	4	Interactive fountain(s)	Community/Municipal park
South Carolina	Jun	2012	IV	<i>Legionella</i> sp. (C)	ARI	2	1	Pool, spa	Apartment/Condo
Utah	Aug	2012	IV	<i>Cryptosporidium</i> sp. (C)	AGI	2	0	Pool	Waterpark
Virginia	Mar	2012	IV	<i>Pseudomonas aeruginosa</i> (S)	Skin	5	0	Spa	Private residence
Wisconsin	Jul	2011	IV	<i>Cryptosporidium</i> sp. (C)	AGI	16	0	Pool	Community/Municipality

Untreated Recreational Water -

Jurisdiction	Month	Year	Class†	Etiology (C/S)§	Predominant Illness¶	No. cases**	No. hospitalizations	Venue	Setting
California	Apr	2012	IV	Avian schistosomes (S)	Skin	2	§§	Lake/Reservoir	Beach
Colorado	Jul	2012	II	<i>Shigella sonnei</i> subgroup D (C)	AGI	31	2	Lake/Reservoir	Public beach
Connecticut	Jul	2012	II	Norovirus genogroup I (C)	AGI	24	0	Lake/Reservoir	Amusement park
Florida	Apr	2011	I	Norovirus genogroup II (C)	AGI	29	0	Lake/Reservoir	Park
Illinois	Aug	2011	IV	<i>Giardia intestinalis</i> (C)	AGI	10	0	Lake/Reservoir	Membership club
Illinois	Jul	2012	IV	Avian schistosomes (S)	Skin	4	1	Lake/Reservoir	Beach
Illinois	Jul	2012	II	<i>Escherichia coli</i> O111 (C)	AGI	7	0	Lake/Reservoir	Private beach
Illinois	Jul	2012	III	Adenovirus (C)	Eye*****	32	1	Lake/Reservoir	Private beach
Massachusetts	Jul	2011	I	<i>Escherichia coli</i> O157:H7 (C)	AGI	8	3	Ocean+++++	Public beach
Minnesota	Jul	2012	II	<i>Cryptosporidium hominis</i> IbA10G2 (C)	AGI	16	0	Lake/Reservoir	Camp/Cabin
New York	May	2011	III	Avian schistosomes (C)	Skin§§§§§	43	0	Lake/Reservoir	Public beach
New York	Jul	2011	III	Cyanobacterial toxin(s) (C)¶¶¶¶¶	Eye	8	§§	Lake/Reservoir	Private beach, public beach
New York	Jul	2012	IV	Avian schistosomes (S)	Skin	16	§§	Lake/Reservoir	Public beach
North Dakota	Jul	2012	IV	<i>Giardia intestinalis</i> (C)	AGI	3	0	Lake/Reservoir	Public outdoor area
Pennsylvania	Jul	2011	II	<i>Escherichia coli</i> O157:H7 (C)	AGI	16	9	Lake/Reservoir	State park

Texas	Jun	2011	IV	<i>Escherichia coli</i> (C), <i>Plesiomonas shigelloides</i> (C), <i>Shigella sonnei</i> subgroup D (C)	AGI	56	1	Lake/Reservoir	Public outdoor area
Vermont	Jul	2012	IV	Norovirus (S)	AGI	35	0	Lake/Reservoir	State park
Washington	Jul	2012	IV	<i>Shigella sonnei</i> subgroup D (C)	AGI	3	1	Pond	Community/Municipality
Wisconsin	Jul	2011	I	<i>Escherichia coli</i> O111 (C)	AGI	4	0	Lake/Reservoir	Public beach, public outdoor area
Wisconsin	Jul	2012	I	<i>Giardia intestinalis</i> (C), norovirus genogroup I GI_3 (C)	AGI	125	1	Lake/Reservoir	State park
Wisconsin	Jul	2012	II	<i>Escherichia coli</i> O157:H7 (C)	AGI	7	3	Lake/Reservoir	Lake-sandbar

Abbreviations: AGI = acute gastrointestinal illness; ARI = acute respiratory illness; Eye = illnesses, conditions, or symptoms related to the eyes; Skin = illnesses, conditions, or symptoms related to the skin.

* n=90; treated water, n=69; untreated water, n=21

† Based on epidemiologic, clinical laboratory, and environmental data (e.g., water quality data) reported to CDC. For more information, refer to the [strength-of-evidence classification table](#).

§ Provides information about etiologies and whether these were confirmed—denoted as “etiology (C)”—or suspected—denoted as “etiology (S)”. -

¶ The category of illness reported by 50% of ill respondents. All legionellosis outbreaks were categorized as ARI. -

** One outbreak-related death was reported. -

†† Pool was a manufactured venue that is filled with untreated irrigation water. -

§§ No information reported -

¶¶ Exposures to recreational water venues in Ohio were also documented for this outbreak. -

*** Etiology unidentified: disinfection by-products (e.g., chloramines), altered water chemistry, or extremely elevated chlorine levels suspected based on reported data. -

††† Replacement of burned out bulbs for the UV disinfection system was considered a treatment deficiency since there was a chance of the problem being fixed prior to the outbreak. - §§§ Pond was a manufactured venue that is filled with filtered and chlorinated water. -

¶¶¶ Aerosolized disinfectant was also a possible etiology for this outbreak. -

**** Free chlorine (5ppm) and combined chlorine (10ppm) detected in water samples collected during or within 1 day of dates of exposure. -

†††† These nine *Cryptosporidium* outbreaks in Ohio during the summer of 2011 may have been part of a community-wide/state-wide outbreak. -

§§§§ Case-patients reported earaches in addition to dermatologic symptoms -

¶¶¶¶ Spa was a portable venue. -

***** One or more case-patients reported fever, headache, cough, vomiting or diarrhea in addition to eye-related symptoms. -

††††† Venue is a creek that flows into an ocean. -

§§§§§ One or more case-patients reported wound infections and respiratory, gastrointestinal, ear and eye symptoms in addition to skin symptoms. -

¶¶¶¶¶ Microcystin toxin (20 ppb) detected in water samples collected during or within 1 day of dates of exposure. *Anabaena*, *Aphanizomenon*, *Gloetrichia*, *Microcystis*, *Oscillatoria*, *Lyngbya* spp. detected from algal samples. -

