

CRYPTOSPORIDIOSIS

SUMMARY REPORT



2015

NATIONAL NOTIFIABLE DISEASES
SURVEILLANCE SYSTEM, UNITED STATES



Centers for Disease
Control and Prevention
National Center for Emerging and
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Data are presented for cases of cryptosporidiosis for the year 2015 reported to CDC through October 9, 2018.

Findings and conclusions from this report do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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Background

Surveillance Overview: National Cryptosporidiosis Case Surveillance

Cryptosporidiosis is a gastrointestinal illness caused by protozoa of the genus [Cryptosporidium](#), the leading cause of U.S. waterborne disease outbreaks (1) and the third leading cause of U.S. zoonotic enteric illness (2). An estimated 748,000 cryptosporidiosis cases occur annually; this means <2% of cases are nationally notified (3). *Cryptosporidium* infection can be symptomatic or asymptomatic. Immunocompetent patients can experience frequent, non-bloody, watery diarrhea typically lasting up to 2–3 weeks (4). Additional symptoms can include vomiting, nausea, abdominal pain, fever, anorexia, fatigue, and weight loss. Immunocompromised patients can experience profuse watery diarrhea lasting weeks to months or even life-threatening malnutrition and wasting.

Cryptosporidiosis is a [nationally notifiable disease](#); the first full year of reporting was 1995. National data are collected through passive surveillance. Healthcare providers and laboratories that diagnose cryptosporidiosis are mandated to report cases to the local or state health department. The 50 states, territorial, District of Columbia (DC), and New York City health departments, in turn, voluntarily notify CDC of cases via the [National Notifiable Diseases Surveillance System \(NNDSS\)](#). Some states conduct enhanced molecular surveillance of cryptosporidiosis through participation in [CryptoNet](#); CryptoNet data are not presented here.

State, DC, US territory, and Freely Associated State public health agencies voluntarily notify CDC of cryptosporidiosis outbreaks via the [National Outbreak Reporting System \(NORS\)](#). NORS data are not presented here; however, [summaries of data on waterborne disease outbreaks](#) are reported elsewhere.

Methods

Case Definition

The [definition](#) of a confirmed case of cryptosporidiosis has changed over time; the [first national case definition](#) was published in 1995, and the [current case definition](#) was published in 2012. The pre-2011 case definitions classified a case with any laboratory evidence of *Cryptosporidium* infection as a confirmed case.

The 2012 confirmed case definition requires evidence of *Cryptosporidium* organisms or DNA in stool, intestinal fluid, tissue samples, biopsy specimens, or other biological sample by certain laboratory methods with a high positive predictive value (e.g., direct fluorescent antibody [DFA] test, polymerase chain reaction [PCR], enzyme immunoassay [EIA], or light microscopy of stained specimen).

A probable case of cryptosporidiosis is defined as 1) having supportive laboratory test results for *Cryptosporidium* spp. infection using a screening test method, such as immunochromatographic card or rapid card test, or a laboratory test of unknown method or 2) meeting clinical criteria (i.e., diarrhea and one or more of the following: diarrhea duration of ≥ 72 hours, abdominal cramping, vomiting, or anorexia) and being epidemiologically linked to a confirmed case.

A suspect case is defined as having a diarrheal illness and being epidemiologically linked to a probable case. Cases not classified as confirmed, probable, or suspect are classified as unknown.

Analysis

National cryptosporidiosis surveillance data for 2015 were analyzed using R version 3.5.1 and SAS version 9.4. Data cleaning processes included case deduplication and the verification of case status (e.g., confirmed, nonconfirmed). Numbers, percentages, and incidence (cases per 100,000 population) of cryptosporidiosis were calculated in aggregate for the United States and separately for each reporting jurisdiction. Rates were calculated by dividing the number of cryptosporidiosis cases by mid-year census estimates (5–7) and multiplying by 100,000. In addition to analyzing data nationally and by reporting jurisdiction, data were analyzed by region (Northeast, Midwest, South, and West regions), as

defined by the U.S. Census Bureau (8). To account for differences in the seasonal use of recreational water, the West region was further subdivided into Northwest and Southwest.

To examine reporting over time, cryptosporidiosis rates were calculated by year (1995–2015) and case status (confirmed or nonconfirmed). Average annual cryptosporidiosis rates were calculated by demographic variables (e.g., age and sex). Rates were not calculated neither for race and ethnicity because 16.5% of race data and 24.4% of ethnicity data were missing nor by month of symptom onset.

Acknowledgements

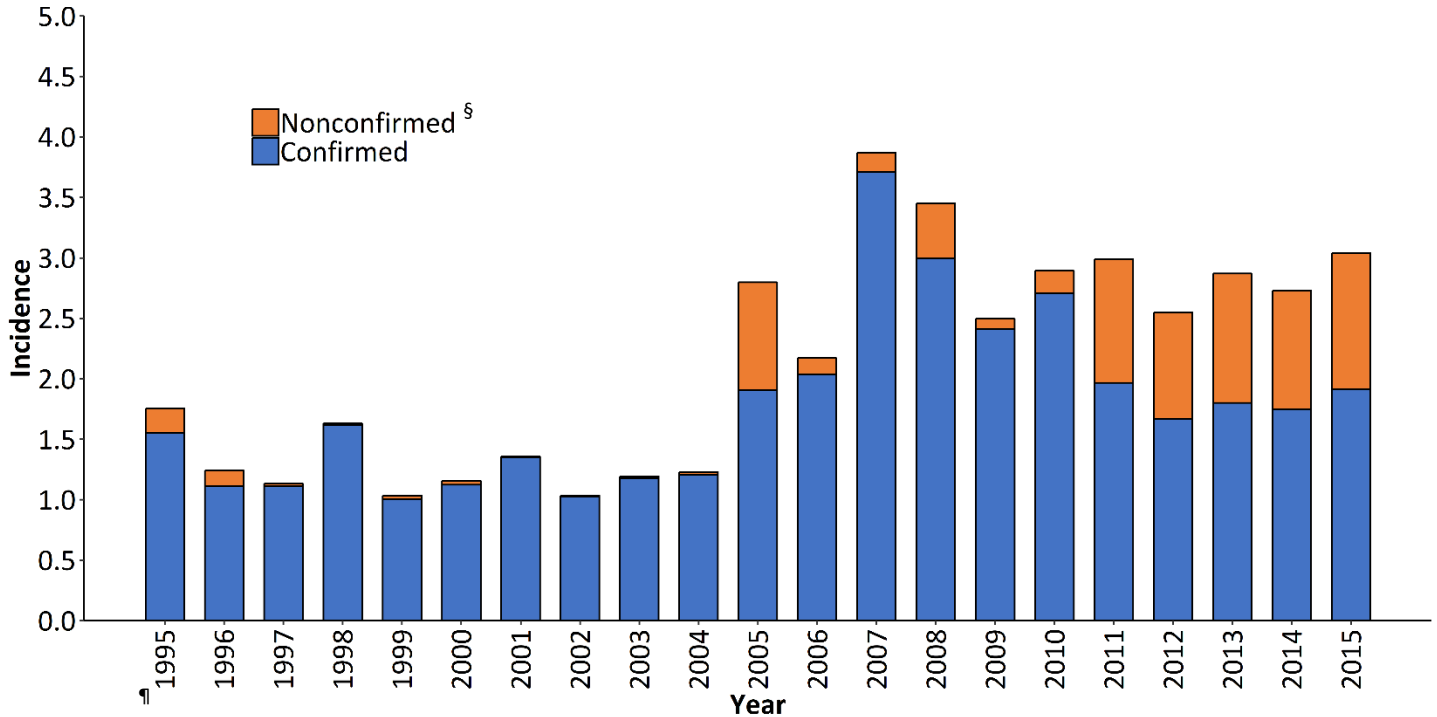
The authors thank the Surveillance and Data Branch, Division of Health Informatics and Surveillance, Center for Surveillance, Epidemiology, and Laboratory Services; Office of Public Health Scientific Services, Centers for Disease Control and Prevention, U.S. Department of Health and Human Services, Atlanta, GA for preparing and aggregating state-based NNDSS data for dissemination.

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Tables and Figures

Figure 1. Incidence* of cryptosporidiosis cases, by year and case classification — National Notifiable Diseases Surveillance System, United States, 1995–2015 (n=130,211) - Download raw data.



* Cases per 100,000 population per year

[§] Probable, suspect, or unknown cases

[¶] First full year of national reporting

After 2004, the overall annual incidence rate of cryptosporidiosis has remained greater than 2.0 per 100,000 population. It is unclear if this reflects a true increase or one or more of the following: U.S. Food and Drug Administration’s 2005 approval of nitazoxanide to treat cryptosporidiosis in immunocompetent patients ages ≥ 12 years and substantial outbreaks (each resulting in $\geq 2,000$ cases) that occurred in 2005 (NYS), 2007 (UT), and 2008 (TX). The consistently increased rate of nonconfirmed cases after 2010 likely reflects changes in the national case definition.

Table 1. Number, percentage *, and incidence[§] of cryptosporidiosis cases, by region and jurisdiction — National Notifiable Diseases Surveillance System, United States, 2015 (n=9,755)

Region/Jurisdiction	No.	%	Incidence	No. of outbreak-associated cases
Northeast	1,264	13.0	2.2	40
Connecticut	82	0.8	2.3	7
Maine	34	0.3	2.6	
Massachusetts	211	2.2	3.1	
New Hampshire	38	0.4	2.9	
New Jersey	86	0.9	1.0	
New York City [¶]	133	1.4	1.5	
New York State [¶]	270	2.8	2.4	27
Pennsylvania	330	3.4	2.6	6
Rhode Island	25	0.3	2.4	
Vermont	55	0.6	8.8	
Midwest	3,471	35.6	5.1	205
Illinois	240	2.5	1.9	98
Indiana	188	1.9	2.8	
Iowa	373	3.8	12.0	3
Kansas	179	1.8	6.2	20
Michigan	238	2.4	2.4	3
Minnesota	319	3.3	5.8	14
Missouri	401	4.1	6.6	
Nebraska	264	2.7	13.9	26
North Dakota	17	0.2	2.3	
Ohio	424	4.3	3.7	34
South Dakota	247	2.5	28.9	
Wisconsin	581	6.0	10.1	7
South	3,696	37.9	3.1	337
Alabama	261	2.7	5.4	51
Arkansas	69	0.7	2.3	
Delaware	15	0.2	1.6	
District of Columbia	24	0.2	3.6	
Florida	856	8.8	4.2	201
Georgia	350	3.6	3.4	
Kentucky	97	1.0	2.2	
Louisiana	133	1.4	2.8	4
Maryland	99	1.0	1.6	1
Mississippi	35	0.4	1.2	
North Carolina	282	2.9	2.8	2
Oklahoma	116	1.2	3.0	11
South Carolina	77	0.8	1.6	3
Tennessee	278	2.8	4.2	12
Texas	740	7.6	2.7	4
Virginia	241	2.5	2.9	48
West Virginia	23	0.2	1.3	
Northwest	495	5.1	3.3	13
Alaska	10	0.1	1.4	
Idaho	95	1.0	5.8	10
Montana	39	0.4	3.8	

Oregon	213	2.2	5.3	2
Washington	110	1.1	1.5	
Wyoming	28	0.3	4.8	1
Southwest	829	8.5	1.4	10
Arizona	62	0.6	0.9	1
California	372	3.8	1.0	
Colorado	136	1.4	2.5	
Hawaii	22	0.2	1.5	5
Nevada	12	0.1	0.4	
New Mexico	52	0.5	2.5	
Utah	173	1.8	5.8	4
Total	9,755	100.0	3.0	605

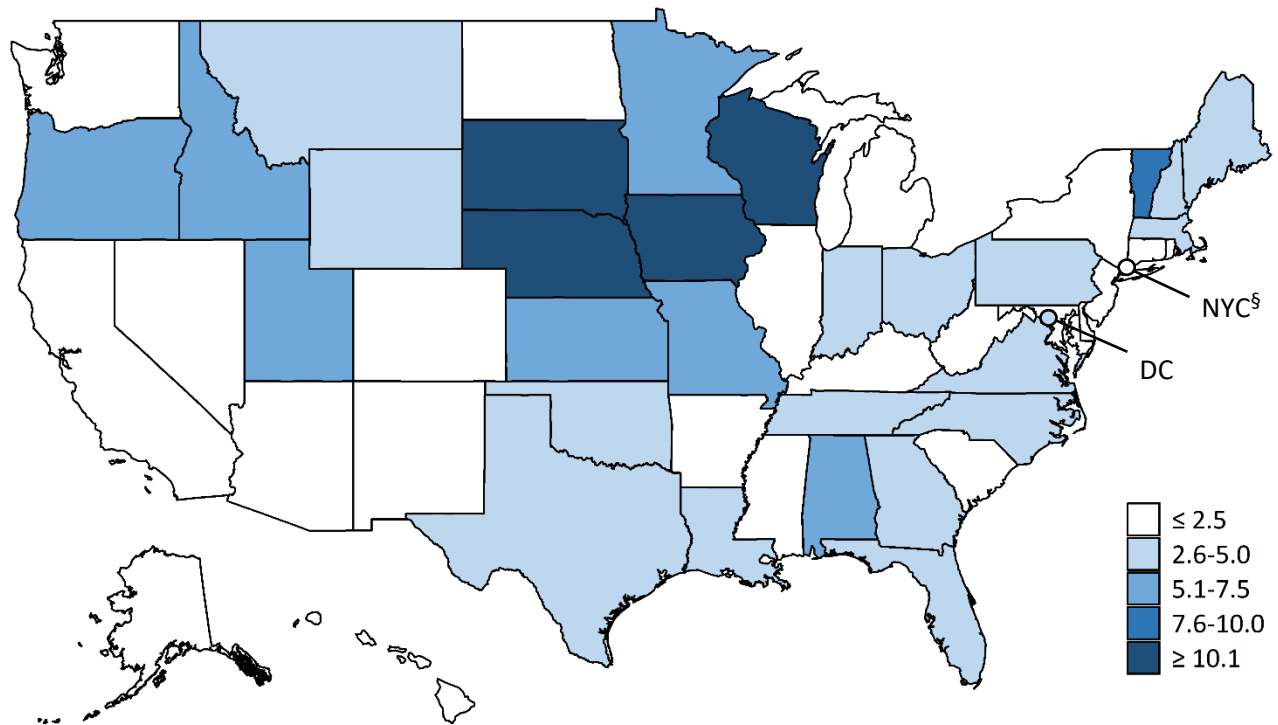
* Percentages might not total 100% because of rounding

§ Cases per 100,000 population

¶ New York State and New York City data are mutually exclusive

By jurisdiction, incidence ranged from 28.9 per 100,000 population in South Dakota to 0.4 per 100,000 population in Nevada. As a region, the Midwest has the greatest overall incidence of 5.1 per 100,000 population. This coincides with this region having some of the highest incidence by jurisdiction. Differences in incidence might reflect differences in risk factors or mode of transmission of *Cryptosporidium*; the magnitude of outbreaks; or the capacity or requirements to detect, investigate, and report cases.

Figure 2. Incidence* of cryptosporidiosis cases, by jurisdiction — National Notifiable Diseases Surveillance System, United States, 2015 (n=9,755) - Download raw data.



* Cases per 100,000 population

§ New York State and New York City data are mutually exclusive

Cryptosporidiosis is geographically widespread across the United States. Although incidence appears to be consistently higher in the northern Midwest states, differences in incidence might reflect differences in risk factors or modes of transmission of *Cryptosporidium*; the magnitude of outbreaks; or the capacity or requirements to detect, investigate, and report cases.

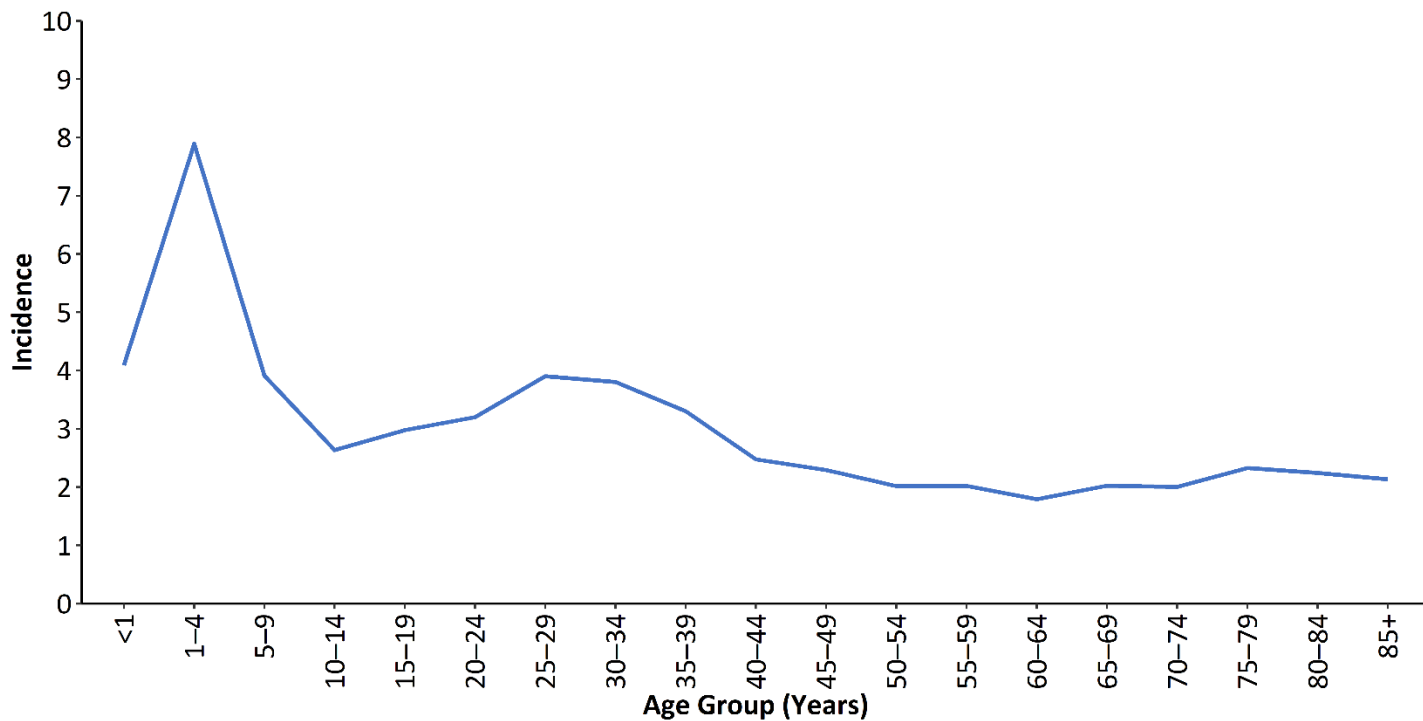
Table 2. Number and percentage* of cryptosporidiosis cases, by selected patient demographic characteristics — National Notifiable Diseases Surveillance System, United States, 2015 (n=9,755)

Characteristic	No.	%
Sex		
Male	4,780	49.0
Female	4,945	50.7
Missing	30	0.3
Race		
American Indian/Alaska Native	49	0.5
Asian/Pacific Islander	114	1.2
Black	902	9.2
White	6,738	69.1
Other	343	3.5
Missing	1,609	16.5
Ethnicity		
Hispanic	807	8.3
Non-Hispanic	6,569	67.3
Missing	2,379	24.4
Total	9,755	100.0

* Percentages might not total 100% because of rounding

More than half of patients (4,945 [50.7%]) were female. Of the 8,146 patients for whom race was reported, 82.7% were white. Of the 7,376 patients for whom ethnicity was reported, 10.9% were Hispanic.

Figure 3. Incidence* of cryptosporidiosis cases, by age group — National Notifiable Diseases Surveillance System, United States, 2015 (n=9,705[§]) - Download raw data.

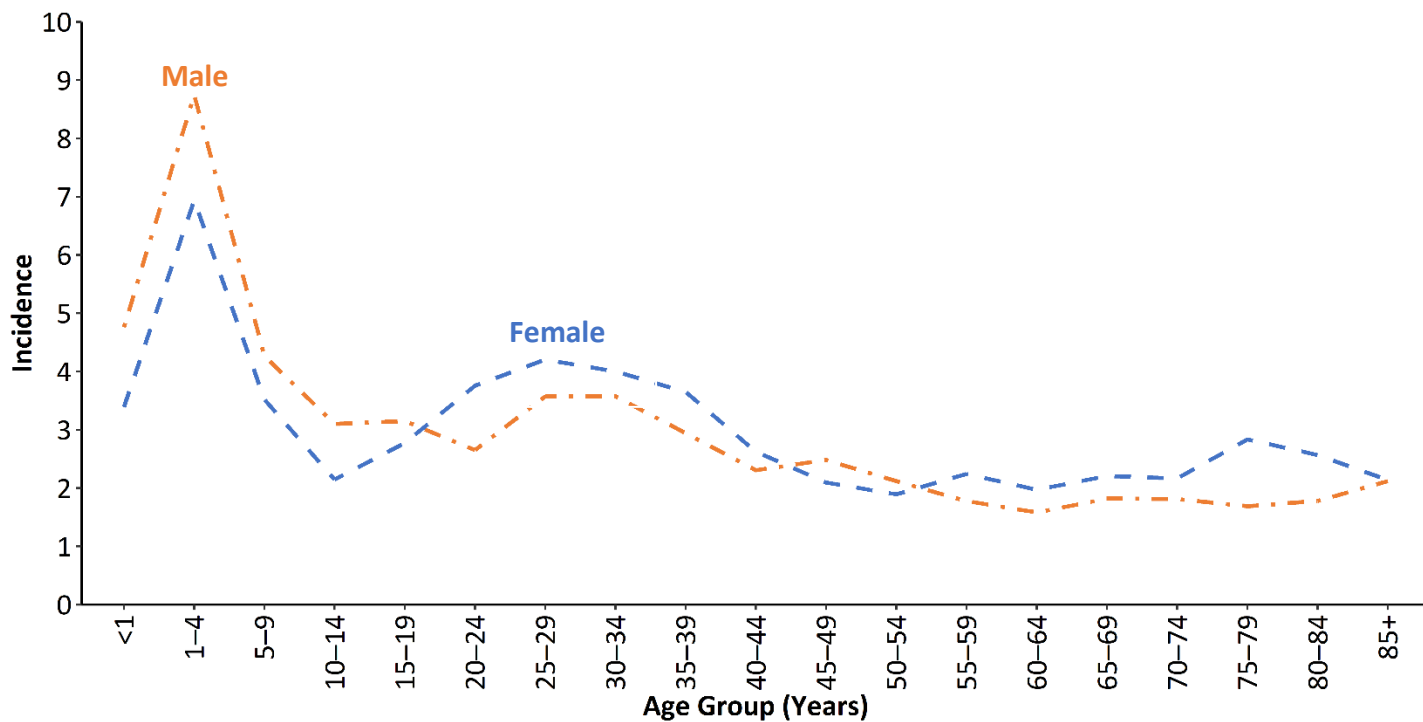


* Cases per 100,000 population

[§] Age data missing for 50 patients

The incidence of cryptosporidiosis cases was highest among patients ages 1–4 years (7.9 cases per 100,000 population), <1 year (4.1), 5–9 years (3.9), and 25–29 years (3.9). This might reflect young children becoming infected and ill and their caregivers subsequently becoming infected after changing diapers of young children or helping them with toileting.

Figure 4. Incidence* of cryptosporidiosis cases, by sex and age group — National Notifiable Diseases Surveillance System, United States, 2015 (n=9,678[§]) - Download raw data.

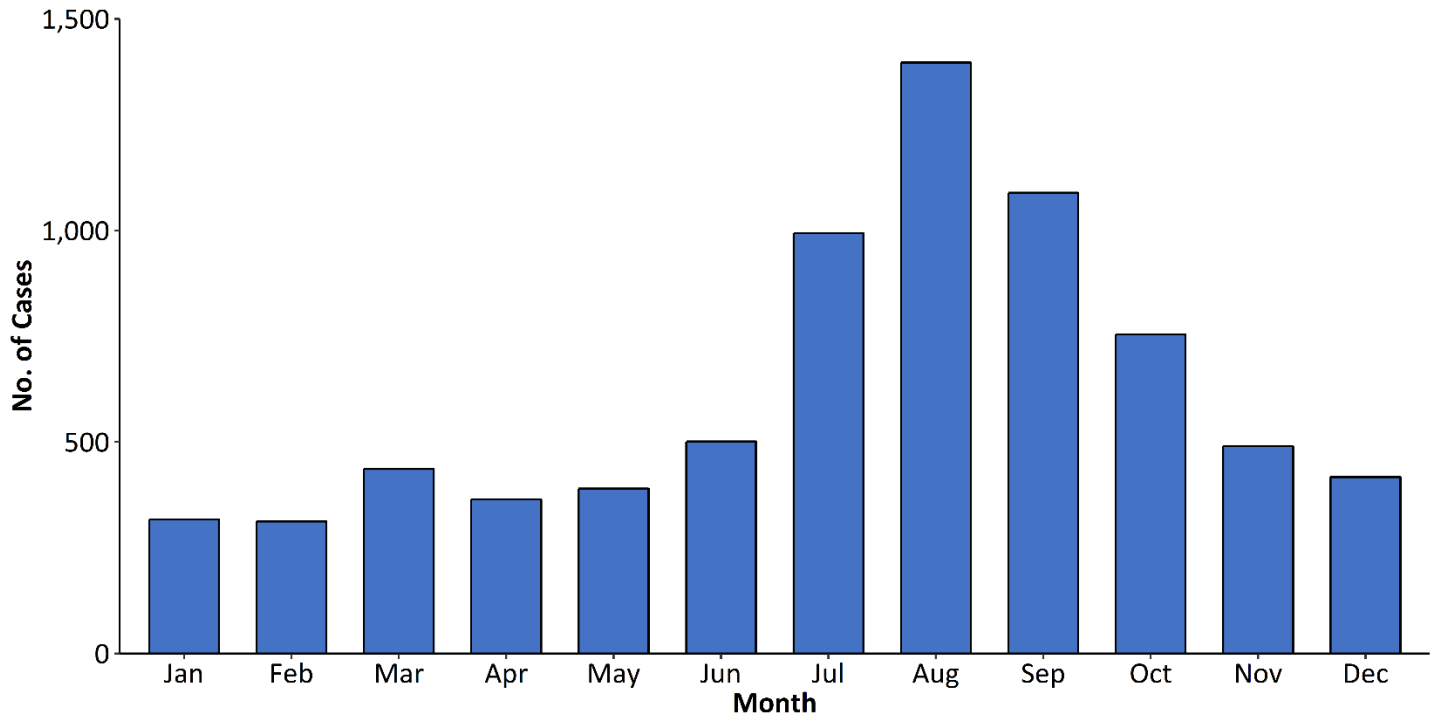


* Cases per 100,000 population

[§] Age or sex data missing for 77 patients

Among both males and females, the highest incidence of cryptosporidiosis was among those ages 1–4 years. Among those ages 20–44 and 55–84 years, rates for females were higher than for males. Differences in age-specific incidence might be due to age-specific differences in risk factors or modes of transmission of *Cryptosporidium*. For example, compared with males, females might be more likely to change diapers of young children or help them with toileting, and thus, more likely to be exposed to *Cryptosporidium*. Additionally, compared with males, females might be more likely to seek healthcare, and thus, more likely to have illness diagnosed and reported as cryptosporidiosis.

Figure 5. Number of cryptosporidiosis cases, by month of symptom onset — National Notifiable Diseases Surveillance System, United States, 2015 (n=7,460*) - Download raw data.



* Month of symptom onset data missing for 2,295 patients

The number of cryptosporidiosis cases was greatest in August (n=1,397) and lowest in February (n=312). The number of cases by month of symptom onset reflect seasonal differences in exposure, such as summertime swimming.