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Annual Epidemiological Report

December 2018

Cryptosporidium infection in Ireland, 2017

Key Facts

- In 2017, 589 cases of cryptosporidiosis were notified in Ireland
- 36 were hospitalised, with no reported deaths
- Consistent with previous years, there was a higher incidence in springtime, in young children and in non HSE-E areas.
- Outbreak and case-based surveillance data are consistent with animal contact being an important risk factor for cryptosporidiosis in Ireland: person-to-person spread also appears to be an important mode of transmission.
- Exposure to water from non public supplies also appears to present a higher risk of cryptosporidiosis; persons who are not served by public water supplies were over-represented among the sporadic cases relative to the distribution of households by water supply type nationally.
- Two outbreaks involving third-level students working on farms were notified; outbreaks involving agricultural/veterinary students have been reported previously, and an advice note has been developed on measures to reduce their risk of zoonotic disease while on farms

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Table of Contents

Background

Cryptosporidiosis is a diarrhoeal disease caused by a parasite (*Cryptosporidium*). Once an animal or person is infected, the parasite lives in the intestine and passes in the stool. The parasite is protected by an outer shell that allows it to survive outside the body for long periods of time and makes it very resistant to chlorine-based disinfectants. It can survive temperatures greater than 70^{o}C. It is found (particularly in water) throughout the world.

Cryptosporidium lives in the intestine of infected humans or animals. Millions of parasites can be released in a single bowel movement from an infected human or animal. It is therefore found in soil, food, water, or surfaces that have been contaminated with human or animal faeces. It is a common cause of waterborne outbreaks of gastroenteritis.

Methods

Disease notification

Cryptosporidiosis is a notifiable disease in Ireland under the Infectious Disease Regulations and cases should be notified to the Medical Officer of Health. Notifications are reported using the Computerised Infectious Disease Reporting system (CIDR) which is described here. Further information on the process of reporting notifiable infectious diseases is available here. The case definition that was in use in 2017 is available here. For this report, data on cases notified to CIDR in 2017 were extracted from CIDR as of 13 November 2018.

Results

Basic epidemiology

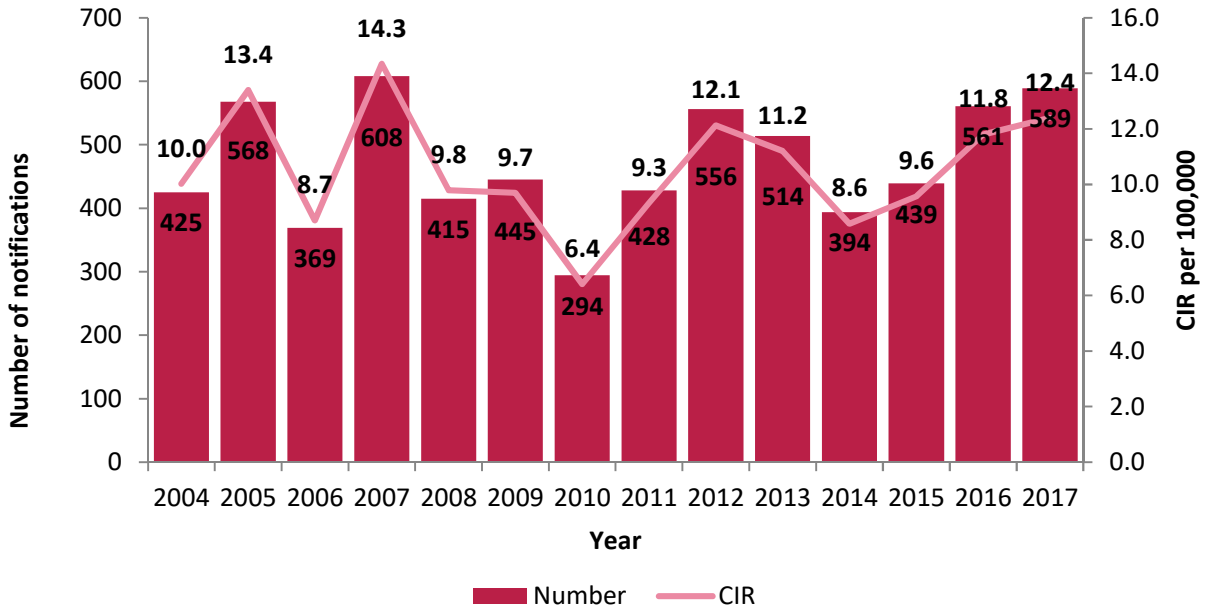
In 2017, 589 cases of cryptosporidiosis were notified in Ireland, a crude incidence rate (CIR) of 12.4 per 100,000 population (Figure 1). This is a 5% increase in the CIR from 2016. Of the notified cases in Ireland in 2017, 36% (n=211) were hospitalised. There were no reported deaths.

Consistent with previous years, the highest age-specific incidence rate was in children under five years of age, with 75 cases per 100,000 population in this age group (Figure 2). While there is likely to be a bias towards testing of diarrhoeal stool specimens from children (as opposed to adults) for *Cryptosporidium,* it is also likely that this distribution reflects, to some extent, a true difference in risk between adults and children.

Compared with 2016, the incidence rate in 2017 was substantially higher in the HSE-M and HSE-S, lower in HSE-NW and HSE-SE, and similar to 2016 in all other areas (Figure 3). As in previous years, there was a strong urban-rural divide, with the HSE-E having the lowest

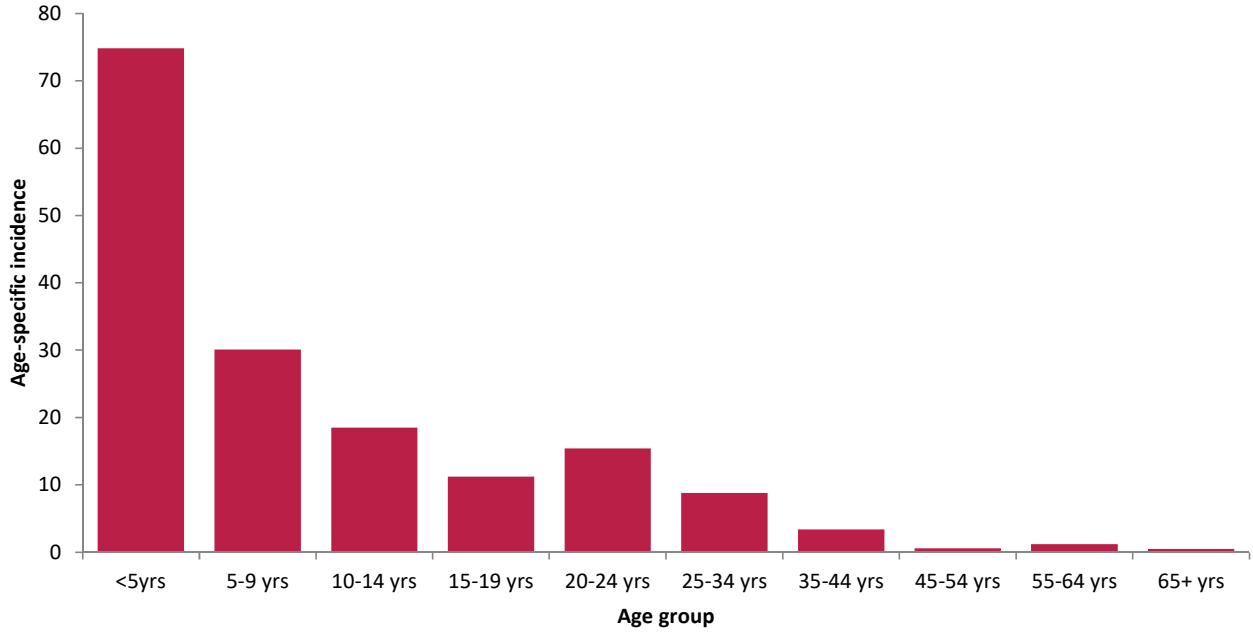
incidence rate (5.0 per 100,000). The HSE-M reported the highest incidence rate (32.5 per 100,000).

Figure 1. Number and CIR per 100,000 population, *Cryptosporidium* infection Ireland 2004-2017



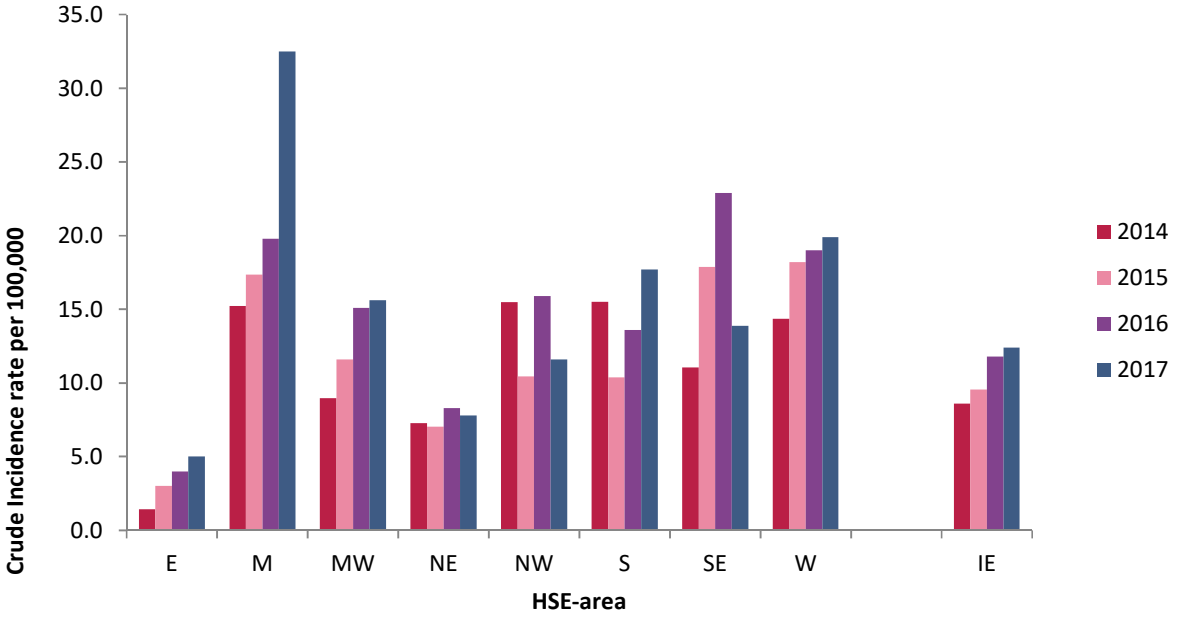
Data source: CIDR

Figure 2. Age-specific incidence rate *Cryptosporidium*, Ireland 2017



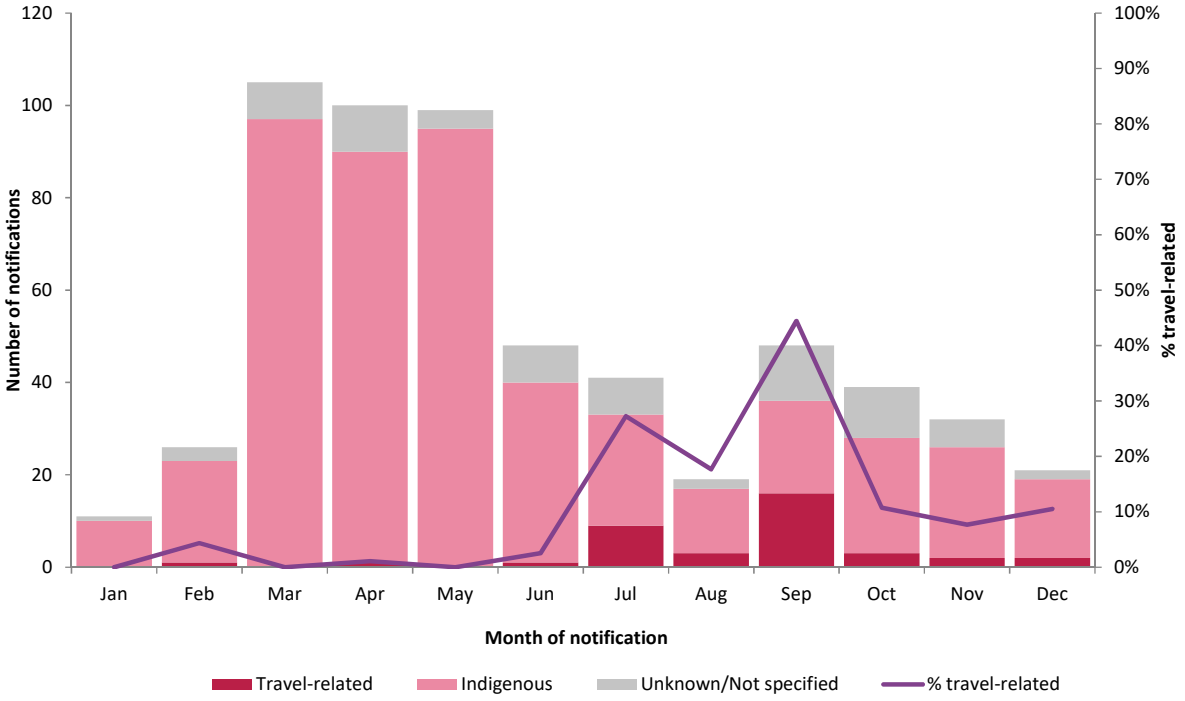
Data source: CIDR

Figure 3. Regional crude incidence rates (CIR) cryptosporidiosis, Ireland, 2014-2017



Data source: CIDR

Figure 4. Seasonal distribution of cryptosporidiosis cases by travel status, Ireland, 2017



Data source: CIDR

As in previous years, the highest number of cases was notified in springtime, peaking

between March and May (corresponding to peak lambing/calving season), followed by a second less intense peak in September-October (Figure 4). In 2017, 7.4% of the cryptosporidiosis cases (n=38) were reported as being acquired abroad (Table 1). This is higher than the percentage of travel-related cases in 2016 (5.9%) but lower than was reported in 2015 (12.7%). Spain was the country most commonly reported for travel-associated cases in 2017 (n=9).

Risk factors

Reviewing case-based enhanced surveillance data, exposure to farm animals or their faeces either by virtue of residence on a farm or by visiting a farm during the potential incubation period was common among cases; 59.1% of cases reported one or both of these exposures (Table 1). This is consistent with the low incidence of cryptosporidiosis among residents in the largely urban HSE-E population and the higher incidence reported in more rural parts of the country. The proportion of cases reporting exposure to pets and swimming pools was similar to last year (Table 1).

Table 2 shows the distribution of notified cases by home water supply type. Persons who are not served by public water supplies have an increased risk of cryptosporidiosis; they are over-represented among cases relative to the distribution of households by water supply type nationally. This was particularly noticeable for private well users (25.4% vs 10.6%, respectively). However, it should be borne in mind that persons whose household drinking water is not from a public supply are more likely to be rural dwellers and therefore may also have a higher likelihood of exposure to farm animals and rural environments which are also likely to increase their risk.

Table 1. Number of cases (and percentage of cases where information available) where selected risk factors were reported for cryptosporidiosis cases (n=589), Ireland, 2017

Risk factor	Yes	No	UNK/NS	% of known
Travel outside of Ireland[a]	38	476	75	7.4%
Lives/cared for on farm	184	340	65	35.1%
Visited farm	163	319	107	33.8%
Lives/works on or visited farm[b]	296	205	88	59.1%
Swimming pool visit	120	387	82	23.7%
Other water based activities	56	356	181	12.7%
Contact with domestic pets	321	172	96	65.1%

Data source: CIDR

[a] *Based on country of infection variable*
[b] *Composite of the two previous variables*

Table 2. Number of cases and percentage of cases where information is available by home water supply type compared to the number and percentage of households by water supply type, Ireland 2017

Home water supply of notified cases	Number of cases	% of known cases	No. households served by these water supply types in the general population 2016 (Census 2016)	% of known households	P value*
Group water scheme (private)	29	5.6%	40952	2.5%	
Group water scheme (public)	25	4.8%	106278	6.5%	
Other	3	0.6%	2281	0.1%	<0.001
Private well	131	25.4%	171926	10.6%	
Public water supply	328	63.6%	1306678	80.3%	
Unknown/not specified	73		69550		
Total	**589**		1697665	100%	

Data source: CIDR

*Comparing the proportion of cases and households served by public water supplies versus all other supply types: X^2=90.68, P<0.001

Outbreaks and clusters

In total 15 cryptosporidiosis outbreaks were reported in 2017 (four general and 11 family outbreaks). Overall, since 2011 there has been an increase in the number of outbreaks notified. This is most likely due to the increased recognition of small family outbreaks following the introduction of enhanced surveillance for cryptosporidiosis cases late in 2010.

Two outbreaks, a university/college outbreak, and a private farm outbreak involved third level students gaining farm experience during their studies. One general outbreak was associated with a childcare facility (Table 3 and Figure 5). And one travel-associated outbreak was associated with a campsite/resort in southern Europe; while the transmission route was not established, the campsite provided recreational access to lakewater and to on-site swimming pools.

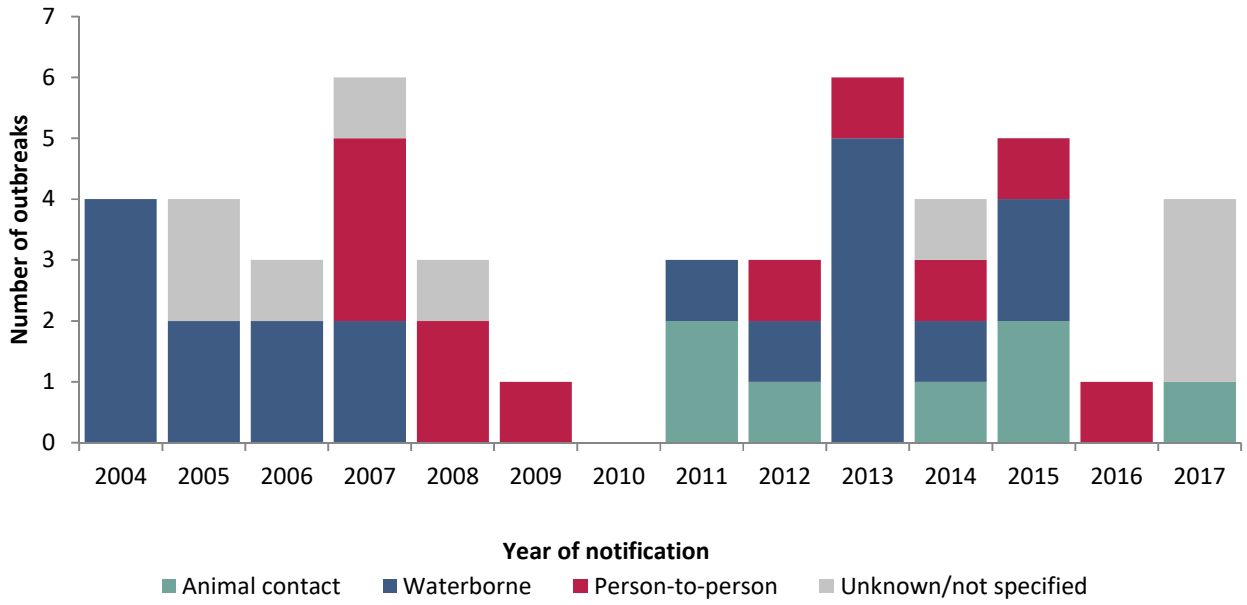
Table 3: Number of outbreaks and number ill by transmission route and location, Ireland 2017

Outbreak location	Person-to-person		Waterborne		Animal/ Environmental contact		UNK/Not specified		Total	
	No. outbreaks	No. ill	No. outbreaks	No. ill	No. outbreaks	No. ill	No. outbreaks	No. ill	**No. outbreaks**	**No. ill**
Childcare facility	0	0	0	0	0	0	1	3	**1**	**3**
Extended family	1	2	0	0	0	0	0	0	**1**	**2**
Private farm	0	0	0	0	1	2	0	0	**1**	**2**
University/College	0	0	0	0	0	0	1	7	**1**	**7**
Private house	2	4	1	3	1	3	6	13	**10**	**23**
Travel related	0	0	0	0	0	0	1	11	**1**	**11**
Total	**3**	**6**	**1**	**3**	**2**	**3**	**9**	**34**	**15**	**46**

Data source: CIDR

Ten of the 11 family outbreaks notified in 2017 occurred in private homes, with one being an extended family outbreak; 25 cases were ill and six were hospitalised. The most common transmission route reported in these outbreaks was by person-person spread (three outbreaks) with one waterborne outbreak, and one outbreak suspected due to animal exposure; the transmission route was unknown for the remaining six family outbreaks (Table 3).

Figure 5. Number of general cryptosporidiosis outbreaks by transmission route and year, Ireland 2004-2017



Data source: CIDR

Note: In this figure, reported transmission routes were grouped for simplicity. Any outbreak where food contributed was reported as foodborne, any outbreak where water contributed was reported as waterborne, any outbreak where animal contact contributed was reported as animal contact. Person-to-person outbreaks include only those outbreaks reported as being due only to person-to-person transmission.

Discussion

While there is no definitive trend for cryptosporidiosis in Ireland since the disease became notifiable, the incidence of cryptosporidiosis in Ireland in 2017 increased compared with 2016, and was the highest reported incidence since 2007. Ireland has consistently reported the highest CIR of any Member State in the European Union since 2012, with the United Kingdom typically reporting the second highest incidence rate.[1] The most recent data available from European Centre for Disease Prevention and Control shows a CIR across the EU of 3.1 per 100,000 in 2015, however, many countries do not have reporting systems for cryptosporidiosis.

The seasonal, age and regional distribution in incidence reported in Ireland in 2017 was also typical of previous years; consistently there has been a higher incidence in springtime, in young children and in non HSE-E areas.

Outbreak and case-based surveillance data are consistent with animal contact being an important risk factor for cryptosporidiosis in Ireland; over half of notified cases reported contact with a farm. Person-to-person spread also appears to be an important mode of transmission. From the enhanced information on CIDR, exposure to water from non public supplies appears to present a higher risk of cryptosporidiosis; persons who are not served by public water supplies were over-represented among the sporadic cases relative to the distribution of households by water supply type nationally.

Outbreaks involving agricultural/veterinary students working on farms have been reported previously, and an advice note has been developed for third level students on measures to reduce their risk of zoonotic disease while on farms http://www.hpsc.ie/a-z/zoonotic/petsandotheranimals/browsebyanimal/farmanimals/File,15342,en.pdf

Further information available on HPSC website

Further information about cryptosporidiosis is available at http://www.hpsc.ie/a-z/gastroenteric/cryptosporidiosis/

Publications on cryptosporidiosis in Ireland available at http://www.hpsc.ie/a-z/gastroenteric/cryptosporidiosis/publications/

Acknowledgements

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References

1. European Food Safety Authority (EFSA), European Centre for Disease Prevention and Control (ECDC). *The Community summary report on trends and sources of zoonoses, zoonotic agents and food-borne outbreaks in the European Union in 2015*. Available at: http://onlinelibrary.wiley.com/doi/10.2903/j.efsa.2016.4634/epdf