



Annual Epidemiological Report

October 2019

Cryptosporidiosis in Ireland, 2018

Key Facts

- In 2018, 629 cases of cryptosporidiosis were notified in Ireland
- 31% of cases were hospitalised. There were 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 suggest that animal contact is an important risk factor for cryptosporidiosis in Ireland
- Exposure to water from non-public supplies also presents a risk of cryptosporidiosis
- Internationally, there is increasing recognition of swimming pools as a potential source of infection. Because *Cryptosporidium* is resistant to chlorine, it can be spread in a chlorinated pool. To limit the spread of disease to others, those with cryptosporidiosis are advised not to swim in recreational water (pools, hot tubs, lakes or rivers, etc.) for at least two weeks after resolution of diarrhoea

Table of Contents

Background.....	3
Methods	3
Disease notification	3
Results	3
Basic epidemiology	3
Risk factors	6
Outbreaks and clusters.....	7
Discussion	9
Further information available on HPSC website	10
Acknowledgements	10
Report prepared by:	10
References.....	10

Background

Cryptosporidiosis is a diarrhoeal disease caused by a parasite (*Cryptosporidium*). Millions of parasites can be released in a single bowel movement from an infected human or animal. 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°C. It has a worldwide distribution, and can be found in soil, food, water, or on surfaces that have been contaminated with human or animal faeces. It is a common cause of waterborne outbreaks of gastroenteritis (both drinking and recreational waters).

Methods

Disease notification

Cryptosporidiosis is a notifiable disease in Ireland under Infectious Disease Regulations. Consequently, all medical practitioners, including clinical directors of diagnostic laboratories, are required to notify the regional Medical Officer of Health(MOH)/Director of Public Health of all cases of cryptosporidiosis. 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 is available [here](#). For this report, data on cases notified to CIDR in 2018 were extracted from CIDR as of 23 August 2019.

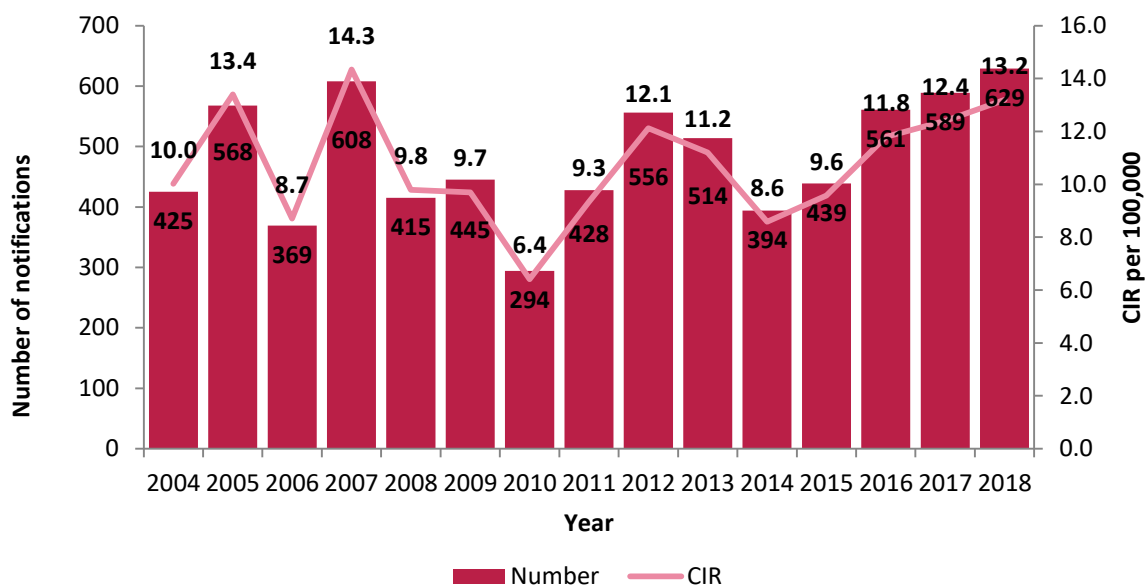
Results

Basic epidemiology

In 2018, 629 cases of cryptosporidiosis were notified in Ireland, a crude incidence rate (CIR) of 13.2 per 100,000 population (Figure 1). This is a 7% increase in the CIR from 2017. One hundred and ninety-six notified cases were hospitalised (31%). There were no reported deaths.

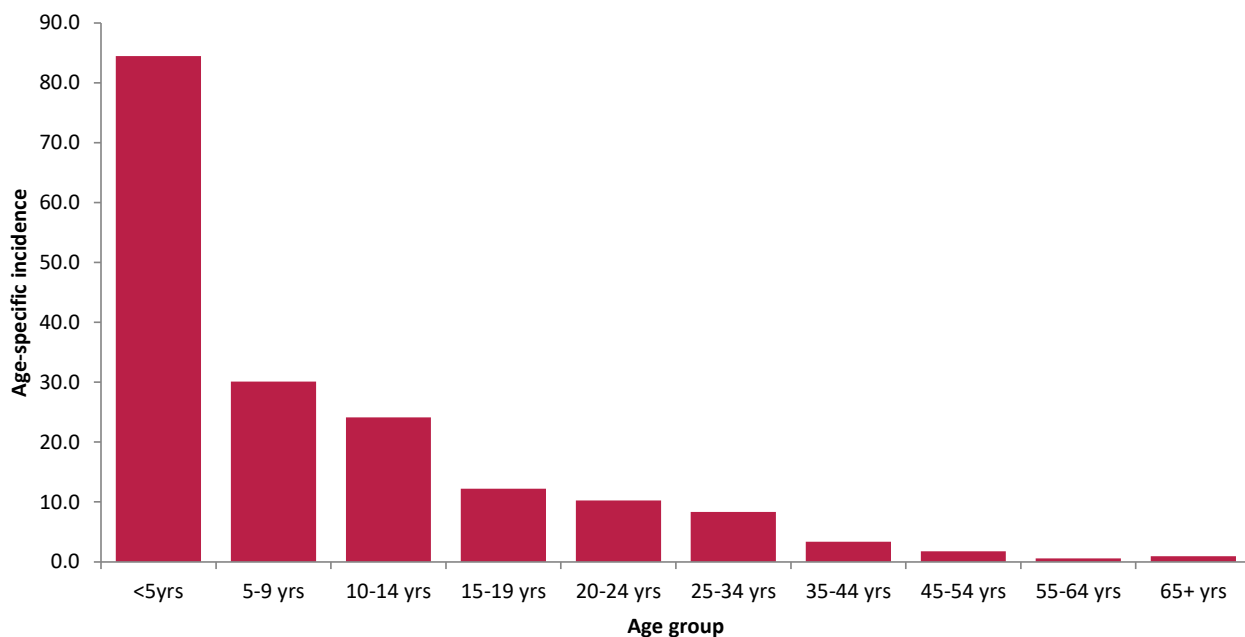
Consistent with previous years, the highest age-specific incidence rate was in children under five years of age, with 85 cases per 100,000 population in this age group (Figure 2). While there is likely to be a bias towards testing of diarrhoeal stool specimens from children (as opposed to adults) for *Cryptosporidium*, it is also likely that this distribution reflects, to some extent, a true difference in risk between adults and children.

Figure 1. Number and CIR cryptosporidiosis per 100,000 population, Ireland, 2004-2018



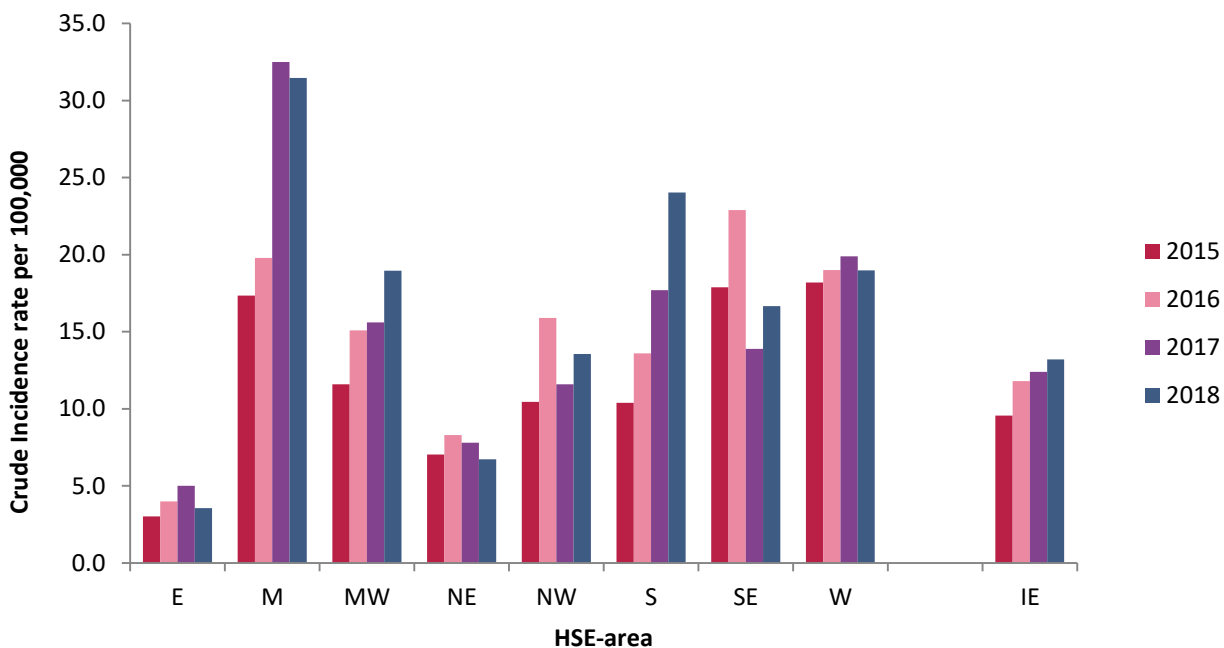
Data source: CIDR

Figure 2. Age-specific incidence rate cryptosporidiosis, Ireland, 2018



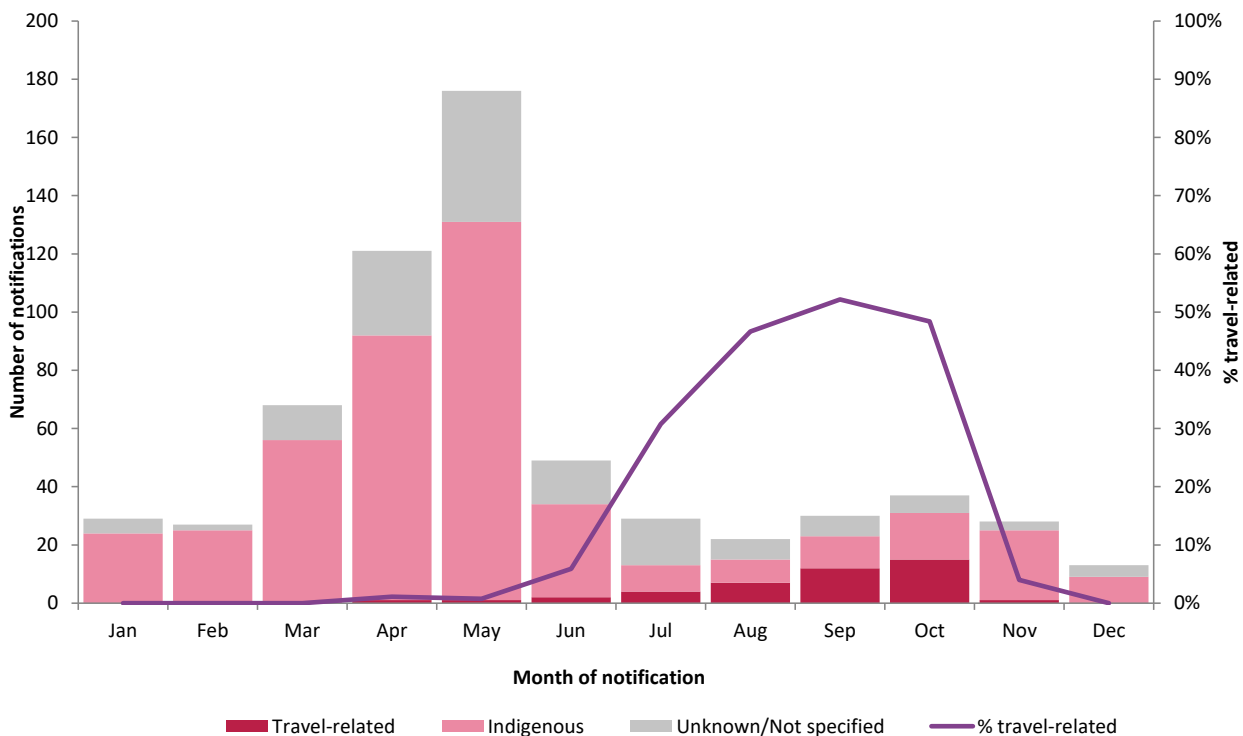
Data source: CIDR

Figure 3. Regional crude incidence rates (CIR) cryptosporidiosis, Ireland, 2015-2018



Data source: CIDR

Figure 4. Seasonal distribution of cryptosporidiosis cases by travel status, Ireland, 2018



Data source: CIDR

As in previous years, there was a strong urban-rural divide, with the HSE-E having the lowest incidence rate (3.6 per 100,000). For the second year in a row, the HSE-M reported the highest incidence rate (31.5 per 100,000), a rate that is statistically significantly higher than all except one other HSE-area. Compared with 2017, the incidence rate in 2018 was substantially higher in the HSE-S and HSE-MW, and lower in HSE-E (Figure 3).

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 2018, 9.0% of the cryptosporidiosis cases (n=43) were reported as being acquired abroad (Table 1). This is higher than the percentage of travel-related cases in 2017 (7.4%) but lower than was reported in 2015 (12.7%). Spain was the country most commonly reported for travel-associated cases in 2018 (n=24), which is, in part, attributable to a travel-associated cryptosporidiosis outbreak in 2018 described later in this report.

Risk factors

Reviewing case-based enhanced surveillance data, exposure to farm animals or their faeces, either by virtue of residing on a farm or of visiting a farm during the potential incubation period, was common among cases; 58.1% 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). Exposure to swimming pools was higher at 30% than the 24% reported in 2017.

Table 1. Number of cases (and percentage of cases where information available) where selected risk factors were reported for cryptosporidiosis cases (n=629), Ireland, 2018

Risk factor	Yes	No	UNK/NS	% of known
Travel outside of Ireland ^a	43	435	151	9.0%
Lives/cared for on farm	167	386	76	30.2%
Visited farm	164	329	136	33.9%
<i>Lives/works on or visited farm^b</i>	296	213	120	58.1%
Swimming pool visit	166	385	78	30.1%
Other water based activities	45	397	187	10.2%
Contact with domestic pets	365	164	100	69.0%

Data source: CIDR

^aBased on country of infection variable

^bComposite of the two previous variables

Table 2 shows the distribution of notified cases by home water supply type. Persons who are not served by public water supplies appear to 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 (24.6% 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 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 2018

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)	20	3.6%	40952	2.5%	<0.001
Group water scheme (public)	30	5.4%	106278	6.5%	
Other	4	0.7%	2281	0.1%	
Private well	136	24.6%	171926	10.6%	
Public water supply	362	65.6%	1306678	80.3%	
Unknown/not specified	77		69550		
Total	629		1697665	100%	

Data source: CIDR

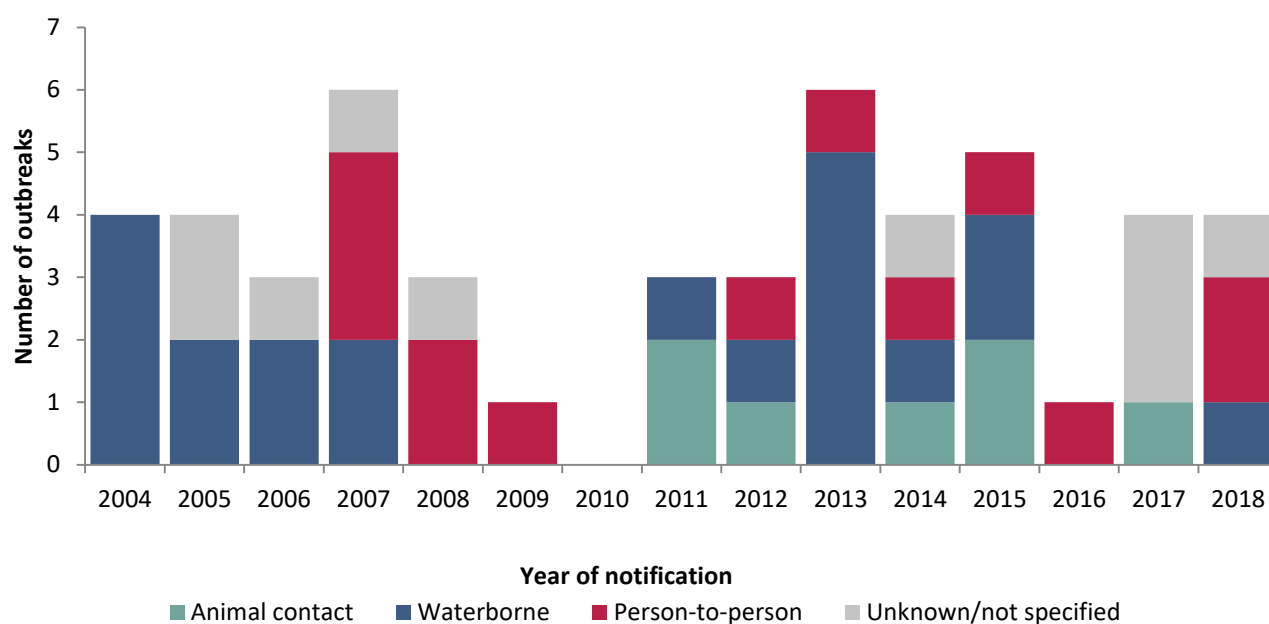
*Comparing the proportion of cases and households served by public water supplies versus all other supply types: $\chi^2=135$, $P<0.001$

Outbreaks and clusters

In total 19 cryptosporidiosis outbreaks were reported in 2018 (four general and 15 family outbreaks). Overall, since 2011 there has been an increase in the number of outbreaks notified. However, this is primarily due to the increased recognition of small family outbreaks following the introduction of enhanced surveillance for cryptosporidiosis cases late in 2010, and the number of general outbreaks notified has remained stable (Figure 5).

One general outbreak with 15 laboratory confirmed cases in the HSE-MW was associated with a childcare facility (CCF) (Table 3 and Figure 5). A second smaller general outbreak in HSE-S was reported associated a CCF and a private home (three ill). Both were reported as being due to person-to-person spread.

The HSE-S reported a general outbreak with five cases in a hotel that was believed to be associated with swimming at the hotel's pool. The one travel-associated outbreak was associated with a campsite/resort in southern Europe; while the transmission route was not established, the campsite's facilities included on-site swimming pools. There were 11 confirmed and 11 probable cases linked to this outbreak among nine families from across Ireland.

Figure 5. Number of general cryptosporidiosis outbreaks by transmission route and year, Ireland 2004-2018

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 (either drinking water or recreational water), 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.

All 15 family outbreaks notified in 2018 occurred in private homes; in total there were 28 persons ill and nine hospitalised. The most common transmission route reported in these outbreaks was by animal contact (four outbreaks), with two waterborne outbreaks and two outbreaks due to person-to-person spread also reported; the transmission route was unknown for the remaining seven family outbreaks (Table 3).

Table 3: Number of outbreaks and number ill by transmission route and location, Ireland 2018

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 +/- private house	2	18	0	0	0	0	0	0	2	18
Hotel	0	0	1	5	0	0	0	0	1	5
Private house	2	4	2	4	4	4	7	16	15	28
Travel related	0	0	0	0	0	0	1	22	1	22
Total	4	22	3	9	4	4	8	38	19	73

Data source: CIDR

Discussion

While there is no definitive overall trend for cryptosporidiosis in Ireland since the disease became notifiable, the incidence of cryptosporidiosis in Ireland in 2018 increased compared with 2017, 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. The most recent data available from European Centre for Disease Prevention and Control shows a CIR across the EU of 3.8 per 100,000 in 2016, however, many countries do not have reporting systems for cryptosporidiosis. In that year, the United Kingdom and Belgium reported the next highest rates at 11.0 and 10.3 per 100,000 compared to Ireland's rate of 11.8 per 100,000.¹

The seasonal, age and regional distribution in incidence reported in Ireland in 2018 was 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. From the enhanced information on CIDR, exposure to water from non-public water supplies appears to present a higher risk of cryptosporidiosis; persons who are not served by public water supplies were over-represented in sporadic cases, relative to the distribution of households by water supply type nationally.

Increasingly, swimming pools are regarded as important settings for cryptosporidiosis outbreaks internationally. Chalmers (2014) reported 35 outbreaks in the United Kingdom over a ten year period associated with recreational water.² And guidance for the investigation of *Cryptosporidium* linked to swimming pools were published in the United Kingdom in 2011.³

In Ireland, since enhanced surveillance for cryptosporidiosis commenced in 2011, a number of swimming pool related outbreaks have been reported, becoming one of the more common locations reported for general cryptosporidiosis outbreaks in Ireland.⁴ The percentage of cases reporting exposure to swimming pools increased slightly in 2018 compared to 2017, reflecting the occurrence of a swimming pool-associated outbreak in the South of Ireland and a travel-related outbreak associated with a campsite in southern Europe where facilities included on-site swimming pools.

The reporting of this travel-related outbreak is not the first time that outbreaks of cryptosporidiosis have been reported among international travellers visiting tourist resorts. In July 2003, an outbreak of cryptosporidiosis was reported among British holidaymakers who were guests at a resort in Majorca. At least 391 cases, of which 214 (55%) were laboratory-confirmed, were reported among English, Welsh, Scottish and Northern Irish tourists who stayed in the hotel. Following a national alert in Ireland, 24 Irish cases, from four different HSE-areas were reported to be linked with this outbreak.⁵

More recently, a cluster of three confirmed and eight probable cases of *Cryptosporidium hominis* were reported in September 2017 among Irish residents who had visited a campsite in Northern Italy.⁴ Similarly, this resort had several pools and also access to a lake, but it was not possible to establish definitely the source of infection. This highlights the continued potential for tourism-associated outbreaks of *Cryptosporidium*.

To limit the spread of disease to others, those with cryptosporidiosis are advised not to swim in recreational water (pools, hot tubs, lakes or rivers, etc.) for at least 2 weeks after resolution of diarrhoea.⁶

Further information available on HPSC website

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

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

Acknowledgements

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Report prepared by:

Patricia Garvey and Lois O'Connor

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