3.2 Cryptosporidiosis

Summary

Number of cases, 2016: 561
Number of cases, 2015: 439
Crude incidence rate, 2016: 11.8/100,000

Cryptosporidium is a protozoal parasite that causes a diarrhoeal illness in humans known as cryptosporidiosis. It is transmitted by the faeco-oral route, with both animals and humans serving as potential reservoirs. Human cryptosporidiosis became a notifiable disease in Ireland in 2004, and the case definition in current use is published on the HPSC website.

In 2016, 561 cases of cryptosporidiosis were notified in Ireland, a crude incidence rate (CIR) of 11.8 per 100,000 population (Figure 1). This is a 23% increase in the CIR from 2015. There is no definitive trend for cryptosporidiosis in Ireland since the disease became notifiable. The most recent data available from ECDC shows a CIR across the EU of 3.1 per 100,000 in 2015, however, many countries do not have reporting systems for cryptosporidiosis. Ireland has reported the highest CIR of any MS since 2012, with the United Kingdom typically reporting the second highest incidence rate.[1] Of the notified cases in Ireland in 2016, 36.9% (n=202) 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 2015, the incidence rate in 2016 increased in all of the eight HSE areas (Figure 3). As in previous years, there was a strong urban-rural divide, with HSE-E having the lowest incidence rate (4.0 per 100,000). Although incidence remains low in HSE-E in 2016, the incidence rate has been increasing over the last three years (Figure 3). HSE-W, HSE-SE and HSE-M reported the highest incidence rates (19.0, 22.9 and 19.8 per 100,000, respectively).

As in previous years, the highest number of cases was notified in spring and peaked in April, followed by a second less intense peak in September (Figure 4). In 2016, 5.9% of the cryptosporidiosis cases (n=30) were reported as being acquired abroad (Table 1). This is lower than the percentage of travel-related cases in 2015 (12.7%) but higher than was reported in 2014 (3.7%). The highest proportion of travel-related cases in 2015 occurred in late summer/early autumn, with France and Spain being the most commonly reported travel-destinations (Figure 4).

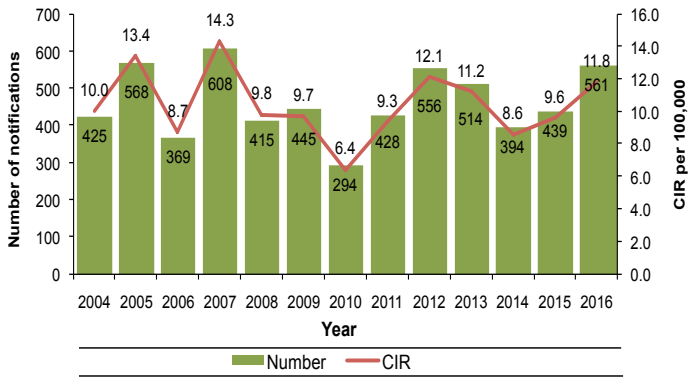

Figure 1. Annual number and crude incidence rate cryptosporidiosis, Ireland, 2004-2016

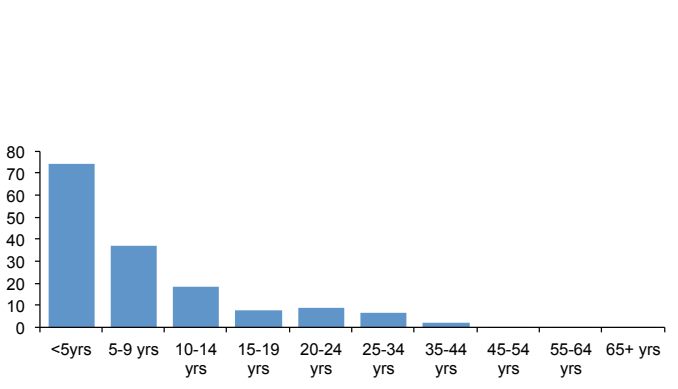

Figure 2. Age-specific incidence rate cryptosporidiosis, Ireland, 2016

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; 63.5% 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 (25.1% and 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.

Outbreaks

In total 20 cryptosporidiosis outbreaks were reported in 2016 (1 general and 19 family outbreaks), similar to the total number reported in 2014 and 2015. Overall since 2011 there has been an increase in the number of outbreaks notified.

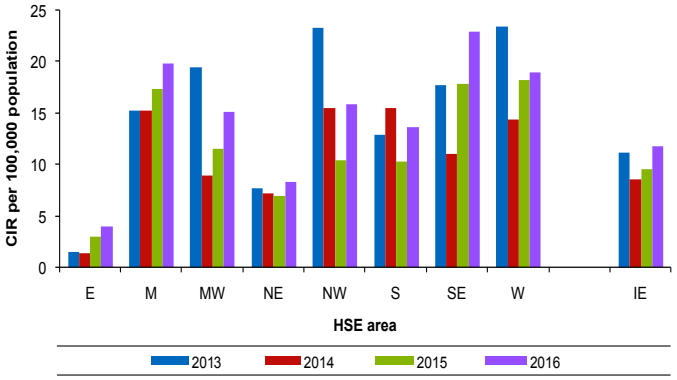

Figure 3. Regional crude incidence rates (CIR) cryptosporidiosis, Ireland, 2013-2016

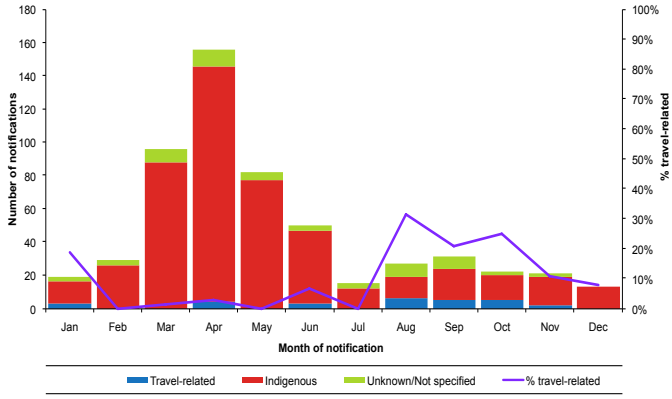

Figure 4. Seasonal distribution of cryptosporidiosis cases based on country of infection, Ireland, 2016

Table 1. Number of cases (and percentage of cases where information available) where selected risk factors were reported for cryptosporidiosis cases (n=561), Ireland, 2016

Risk factor	Yes	No	Unknown / Not specified	% of known
Travel outside of Ireland[a]	30	477	54	5.9%
Lives/cared for on farm	163	345	53	32.1%
Visited farm	183	279	99	39.6%
Lives/works on or visited farm[b]	303	174	84	63.5%
Swimming pool visit	121	375	65	24.4%
Other water based activities	31	353	177	8.1%
Contact with domestic pets	329	162	70	67.0%

[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 2016

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)	30	5.8%	40952	2.5%	
Group water scheme (public)	32	6.2%	106278	6.5%	
Other	1	0.2%	2281	0.1%	<0.001
Private well	130	25.1%	171926	10.6%	
Public water supply	325	62.7%	1306678	80.3%	
Unknown/not specified	43		69550		
Total	**561**		1697665	100%	

*Comparing the proportion of cases and households served by public water supplies versus all other supply types: X^2=100.25, P<0.001

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.

The one general outbreak notified was associated with a childcare facility (Table 3 and Figure 5). This is fewest number of general cryptosporidiosis outbreaks reported in a single year since 2010.

The 19 family outbreaks notified in 2016 occurred in private homes; 43 cases were ill and seven were hospitalised. The most common transmission route reported in these outbreaks was by animal contact (seven outbreaks, 17 persons ill, five hospitalised), followed by person-to-person spread (three outbreaks, seven persons ill and no-one hospitalised), and waterborne (two outbreaks, six persons ill, no-one hospitalised). The transmission route was unknown for the remaining seven family outbreaks; 13 persons ill including two hospitalised cases (Table 3).

Summary

In 2016, the incidence of cryptosporidiosis in Ireland increased compared with 2015, being the highest reported incidence since 2012. It also remains high relative to most other EU countries with surveillance for cryptosporidiosis. The seasonal, age and regional distribution in incidence reported in 2016 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.

References

1.ECDC. Surveillance Atlas of Infectious Diseases. Available at http://atlas.ecdc.europa.eu/public/index.aspx?Dataset=27&FixDataset=1

Table 3: Number of outbreaks and number ill by transmission route and location, Ireland 2016

Outbreak location	Person-to-person		Waterborne		Animal/ Environmental contact		UNK/Not specified		Total	
	No. out-breaks	No. ill	No. outbreaks	No. ill	No. outbreaks	No. ill	No. outbreaks	No. ill	No. outbreaks	No. ill
Childcare facility	1	4	0	0	0	0	0	0	**1**	**4**
Extended family	0	0	0	0	1	5	0	0	**1**	**5**
Private house	3	7	2	6	6	12	6	10	**17**	**35**
Travel related	0	0	0	0	0	0	1	3	**1**	**3**
Total	**4**	**11**	**2**	**6**	**7**	**17**	**7**	**13**	**20**	**47**

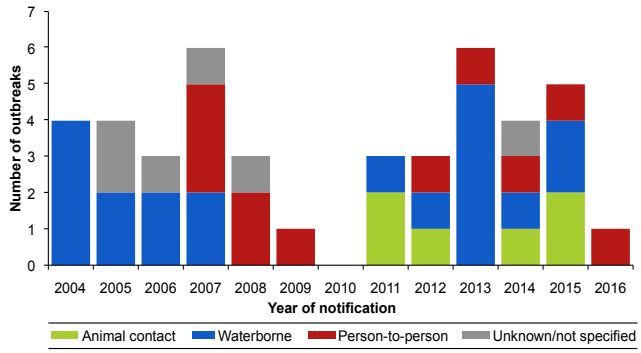

Figure 5. Number of general cryptosporidiosis outbreaks by transmission route and year, Ireland 2004-2016

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.