

# Annual Epidemiological Report

November 2018

## Campylobacter infection in Ireland, 2017

### Key Facts

- Campylobacteriosis is the most common cause of bacterial gastroenteritis in Ireland
- 2,786 cases of campylobacteriosis notified in 2017, an increase of 11% compared with 2016
- Increase appears largely due to a 26% increase in HSE-E
- Highest rate of notification reported in the 0-4 year age group
- Highest CIRs occurred in HSE-SE (76/100,000) and HSE-W (68/100,000); similar to last year, the lowest CIRs were reported by HSE-NW (37/100,000) and -NE (42/100,000)
- Typically, few outbreaks are reported, but interestingly, one general outbreak due to animal contact was reported associated with a college; 12 persons were reported ill
- Where data available, *C. jejuni* has consistently been reported as accounting for more than 90% of notified cases, a species that has, among other sources, been associated with poultry reservoirs
- Our understanding of campylobacteriosis risk factors is derived largely from research studies – it is perhaps time to consider further research towards understanding the exposures and vehicles (e.g. another case control study) or the reservoirs from which cases currently derive (e.g. a source attribution study)
- Falling number of isolates available for typing since the introduction of PCR diagnosis - consideration should be given to ensuring that a representative selection of isolates be banked and typed annually to monitor trends in the strains implicated in human illness in Ireland, and to monitor antimicrobial resistance in these strains

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## Background

Campylobacteriosis is an acute zoonotic bacterial disease characterised by diarrhoea, abdominal pain, malaise, fever, nausea and vomiting. It is the commonest bacterial cause of gastroenteritis in Ireland and Europe.<sup>1</sup>

Symptoms generally last for only a few days, although sometimes recovery can take up to 10 days. Occasionally, arthritis may develop following infection and in very rare instances, a neurological condition known as Guillain-Barré Syndrome (GBS) - demyelinating peripheral neuropathy with ascending weakness - may develop. GBS can last weeks or months. Most people make a full recovery, but some develop more chronic weakness and it can, occasionally, lead to death. It is estimated that approximately one in every 1,000 reported campylobacteriosis cases, leads to Guillain-Barré Syndrome.

Risk factors for campylobacteriosis include handling raw poultry or eating raw or undercooked poultry meat.<sup>2</sup> Drinking contaminated untreated water or unpasteurised milk may also spread campylobacteriosis. Person to person spread is unusual but has been reported. Infection may also be spread from infected dogs or cats.

## Methods

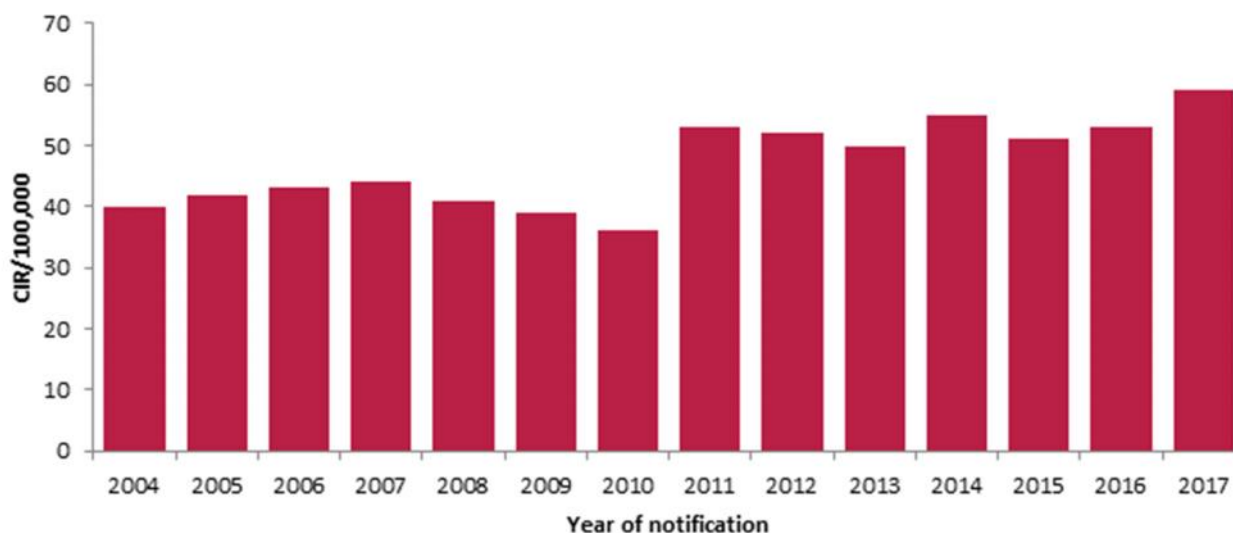
### Disease notification

*Campylobacter* infection 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 at: <http://www.hpsc.ie/a-z/gastroenteric/campylobacter/casedefinitions/Campylobacter%20infection%20v1.8.pdf>. For this report, data on cases notified to CIDR in 2017 were extracted from CIDR as of 3<sup>rd</sup> October 2018.

## Results

### Basic epidemiology

During 2017, 2,786 cases of campylobacteriosis were notified, an increase of 11% compared with 2016. This corresponds to a crude incidence rate of 58.5/100,000 population (Figure 1). Among the 90% (n=2513) of notifications for which patient type was available, 28% (n=704) of cases were hospital inpatients; around 55% were GP patients.

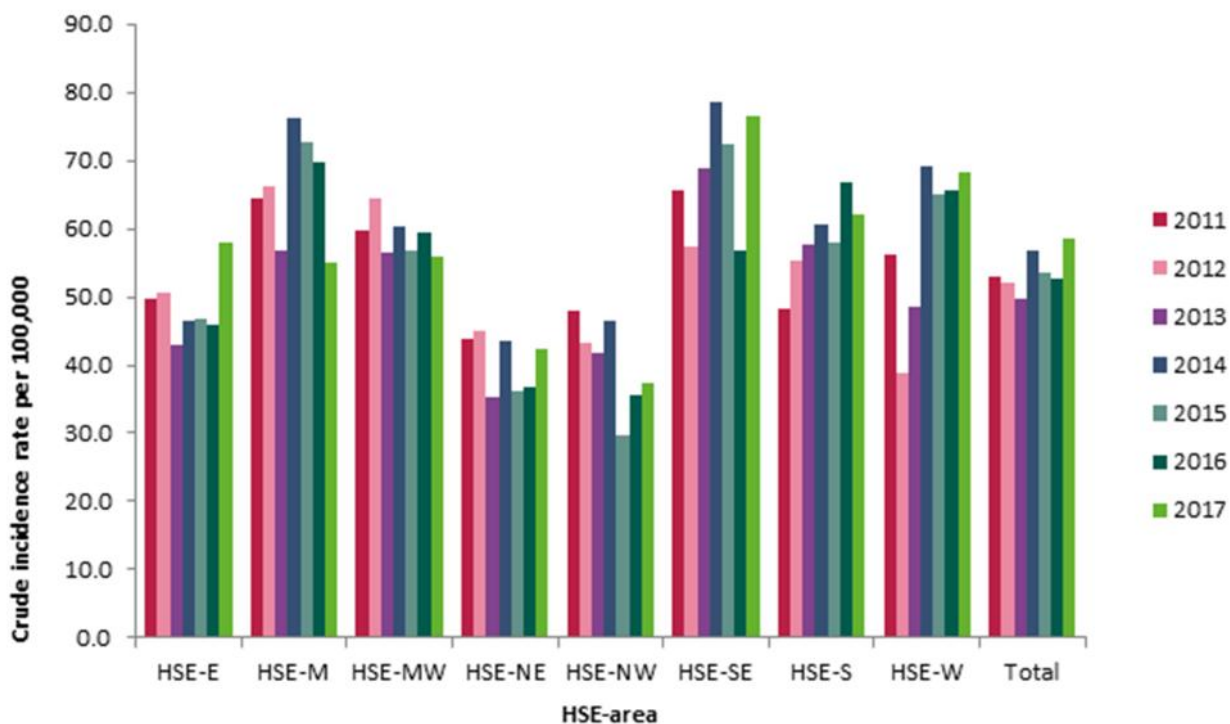
**Figure 1. CIR per 100,000 population, Campylobacter infection in Ireland, 2004-2017**

The increase in the number of cases in 2017 appears largely due to a 26% increase in the number of cases reported in HSE-E, some of which may be accounted for by a change in practice in the Department of Public Health in HSE-E whereby de-duplication was not undertaken on notifications made from August 2017 onwards.

Notwithstanding this, during 2017, the highest CIRs occurred in HSE-SE (76/100,000) and HSE-W (68/100,000); similar to last year, the lowest CIRs were reported by HSE-NW (37/100,000) and -NE (42/100,000) (Figure 2).

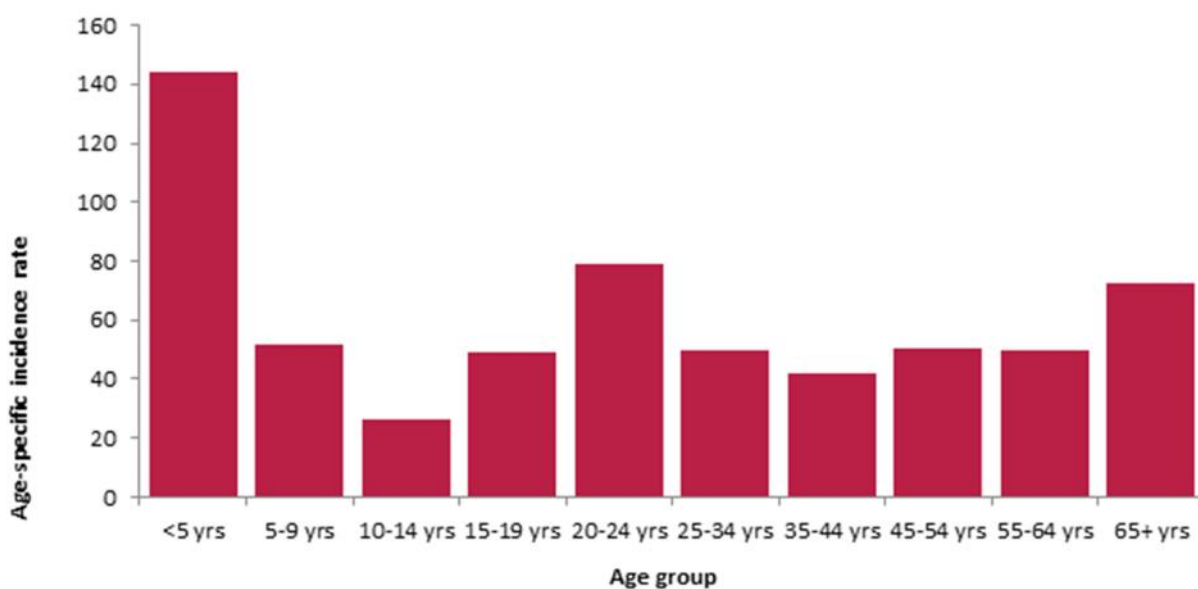
Campylobacteriosis occurs in all age groups with the highest rate of notification reported in the 0-4 year age group (Figure 3). This elevated rate in younger children is a well described characteristic of the disease and is also observed at European level.

**Figure 2. Annual Crude Incidence Rate per 100,000 Population by HSE-area, Campylobacter infection in Ireland 2011-2017**



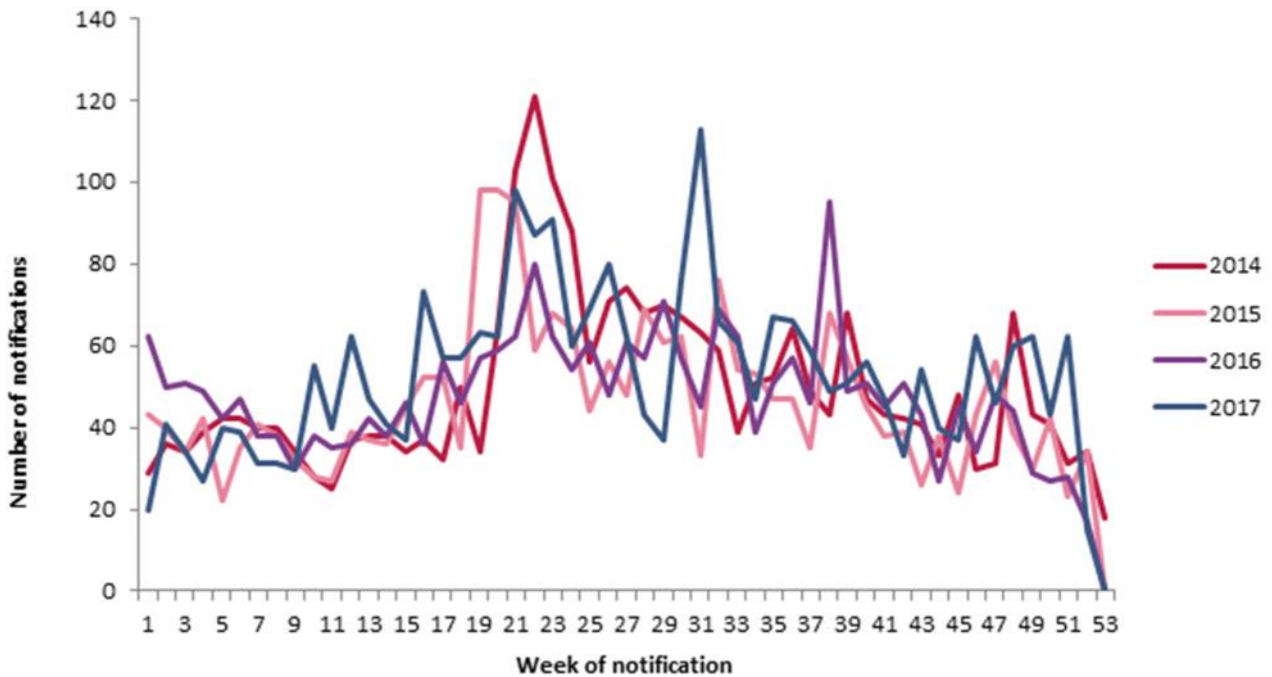
**Note:** From August 2017, *Campylobacter* notifications from HSE-East may over-estimate the number of cases as they are based on laboratory testing results rather than patient episodes. Notifications from HSE-E may also refer to area of laboratory testing rather than area of patient residence.

**Figure 3. Age-specific incidence rate campylobacter, Ireland 2017**



Campylobacteriosis has a well-documented seasonal distribution with a peak in early summer. During 2017, notifications peaked between May and early August (Figure 4).

**Figure 4. Weekly number of campylobacteriosis notifications in Ireland, 2014-2017**



All but nine *Campylobacter* cases notified in Ireland during 2017 were reported as laboratory confirmed. In 2017, just 15% (n=419) of isolates were speciated. Of the 419 speciated isolates, 93% (n=390) were *C. jejuni* and 6% (n=26) were *C. coli*, with fewer than 1% (n=3) being other species.

Country of infection was completed for only 147 cases, of which nineteen were foreign-travel related (13%).

### Outbreaks and clusters

During 2017, there were six notified outbreaks of campylobacteriosis (Table 1). One general outbreak due to animal contact was reported associated with a college; 12 persons were reported ill. Four outbreaks were reported as family outbreaks in private houses with a total of 14 persons ill – two were reported as waterborne and one as due to person-to-person transmission. There was one travel-related *Campylobacter* outbreak with two cases.

**Table 1: Notified *Campylobacteriosis* outbreaks, Ireland 2017**

Outbreak location	Mode of transmission	Number outbreaks	Number of cases
Private house	Waterborne	2	10
	Person-to-person	1	4
	Unknown	1	Not reported
Travel-related	Unknown	1	2
University/College	Animal contact	1	12
<b>Total</b>		<b>6</b>	<b>28</b>

Data source: CIDR

## Discussion

*Campylobacter* remains the most common cause of bacterial gastroenteritis in Ireland and in Europe.<sup>1</sup> This is the seventh consecutive year for which campylobacteriosis levels were elevated compared with rates reported between 2004 and 2010. Increasing use of PCR since 2013 as a primary diagnostic method may have impacted ascertainment rates; however, this would seem not to explain the stepped increase from 2011. During the period 2008-2015, 12 other EU MS (Austria, Estonia, France, Hungary, Italy, Latvia, Lithuania, Malta, Poland, Slovakia, Slovenia and Spain) also reported significantly increasing trends.<sup>1</sup> A detailed times series analyses of *Campylobacter* data 2004-2016 in Ireland, showed that the stepped increase in 2011 was consistently observed in all age groups, and in all but one HSE-area.<sup>3</sup>

Technically, only culture confirmed *Campylobacter* cases were notifiable as confirmed cases in 2017. However, there has been increasing implementation of culture independent methods for *Campylobacter* diagnosis since 2013 (i.e. PCR), and, although not all PCR-diagnosed cases have subsequently been culture confirmed, informally all laboratory diagnosed cases of *Campylobacter* were accepted as notifications. In August 2018, this practice was regularised by the implementation of a revised case definition which accepts a PCR positive as laboratory confirmation of campylobacteriosis.<sup>4</sup>

Moreover, as there is currently no national reference facility for routine typing of *Campylobacter* isolates and only a small number of laboratories speciating isolates, information on *Campylobacter* species in the notification dataset is limited, and has been declining in recent years. However, *C. jejuni* has consistently been reported as accounting for more than 90% of notified cases, a species that has, among other sources, been associated with poultry reservoirs.

Public health investigation of *Campylobacter* cases is not routine which limits information on the role of travel to the data which accompanied the specimen upon submission to the diagnosis laboratory. Travel is believed to be a relatively minor risk factor for campylobacteriosis in Ireland; in a case control study across the island of Ireland, 20% of

cases reported travel outside of the island of Ireland during their potential incubation period.<sup>2</sup> Moreover, travel was not found to be significantly associated with infection after adjustment for other risk factors in the study. Unascertainment of travel as a risk factor was reported previously in the United Kingdom for *Campylobacter* laboratory surveillance data.<sup>5</sup>

Notification of outbreaks of *Campylobacter* are less common than for other bacterial gastrointestinal pathogens; increasingly this is being regarded as a reflection of our inability to detect them as traditionally typing of *Campylobacter* strains has been of limited value. A recent Danish study using whole genome sequencing suggests that *Campylobacter* case clustering and even outbreaks appear to occur more often than previously assumed.<sup>6</sup>

## Public health implications

Despite being the most common bacterial cause of gastroenteritis in Ireland, *Campylobacter* is perhaps the one about which least is known in terms of its epidemiology. Because individual cases are not individually investigated by Departments of Public Health, and few *Campylobacter* outbreaks are reported, our understanding of its risk factors are derived largely from research studies. The last sporadic case control study in Ireland was undertaken in 2002, and given the increasing incidence observed since, it is perhaps time to consider further research towards understanding the exposures and vehicles (e.g. another case control study) or the reservoirs from which cases currently derive (e.g. a source attribution study).

An additional concern is the falling number of isolates available for typing since the introduction of PCR diagnosis. Historically, typing of *Campylobacter* strains has been of limited value for cluster detection and source attribution, but the recent availability of techniques such as whole genome sequencing opens again the possibility for added value from strain typing, such as source attribution studies.<sup>6</sup> Consideration should be given to ensuring that a representative selection of isolates be banked and typed annually to monitor trends in the strains implicated in human illness in Ireland, and to monitor antimicrobial resistance in these strains.

## Further information available on HPSC website

Further information about campylobacteriosis is available at <http://www.hpsc.ie/a-z/gastroenteric/campylobacter/>

Publications on campylobacteriosis in Ireland are available at <http://www.hpsc.ie/a-z/gastroenteric/campylobacter/publications/>



## Acknowledgements

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## Report prepared by:

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