

Annual Epidemiological Report

July 2019

Campylobacter infection in Ireland, 2018

Key Facts

- Most common cause of bacterial gastroenteritis in Ireland
- 9% increase compared with 2017
- Highest rate of notification in the 0-4 year age group
- *C. jejuni* accounted for >90% of cases
- Three small general outbreaks in 2018 reported as foodborne -no sources were identified
- Further research needed to understand the key exposures/vehicles and reservoirs for human infection
- A new Sentinel *Campylobacter* Service at the PHL in Cherry Orchard will collect, culture and bank a representative selection of *Campylobacter* isolates in 2019 and undertake whole genome sequencing.

Suggested citation: HSE Health Protection Surveillance Centre. *Campylobacteriosis in Ireland, 2018*.
Dublin: HSE HPSC; 2019

© HSE Health Protection Surveillance Centre, 2019. Reproduction is authorised, provided source is acknowledged

Table of Contents

Background.....	3
Methods	3
Disease notification	3
Results	3
Basic epidemiology	3
Microbiology.....	6
Outbreaks and clusters.....	6
Discussion	6
Public health implications	7
Further information available on HPSC website	8
Acknowledgements	8
Report prepared by:	8
References.....	8

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.¹

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.² 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

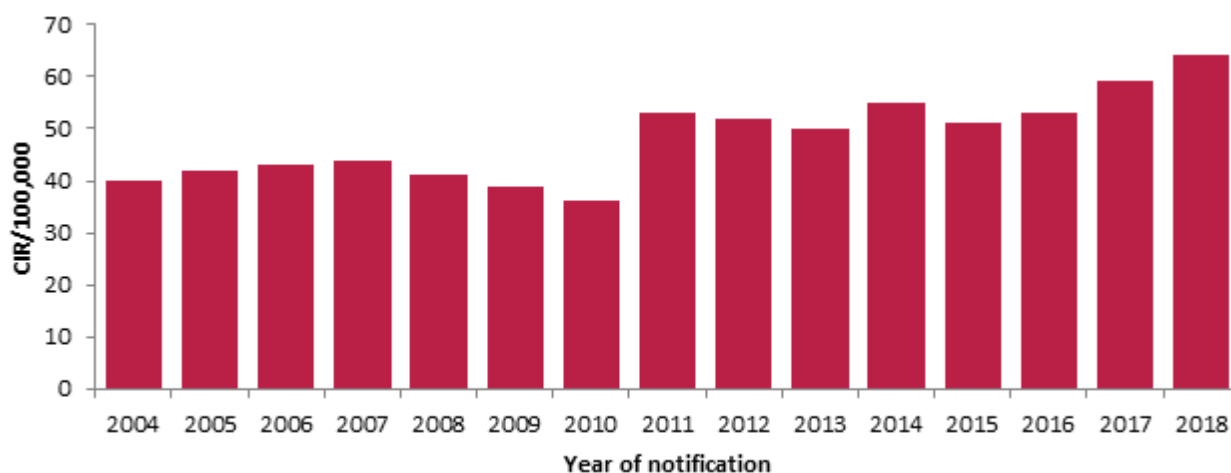
Campylobacter infection is a notifiable disease in Ireland under the Infectious Disease Regulations and cases should be notified to the Medical Officer of Health. Notifications are reported using the Computerised Infectious Disease Reporting system ([CIDR](#)) which is described [here](#). Further information on the process of reporting notifiable infectious diseases is available [here](#). The case definition that was in use in 2018 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 2018 were extracted from CIDR as of June 20th 2019.

Results

Basic epidemiology

During 2018, 3,030 cases of campylobacteriosis were notified, an increase of 8.7% compared with 2017. This corresponds to a crude incidence rate of 63.6/100,000 population (Figure 1). Among the 85% (n=2,567) of notifications for which patient type was available, 28% (n=726) of cases were hospital inpatients; around 51% were GP patients (n=1,315).

Figure 1. CIR per 100,000 population, *Campylobacter* infection in Ireland, 2004-2018

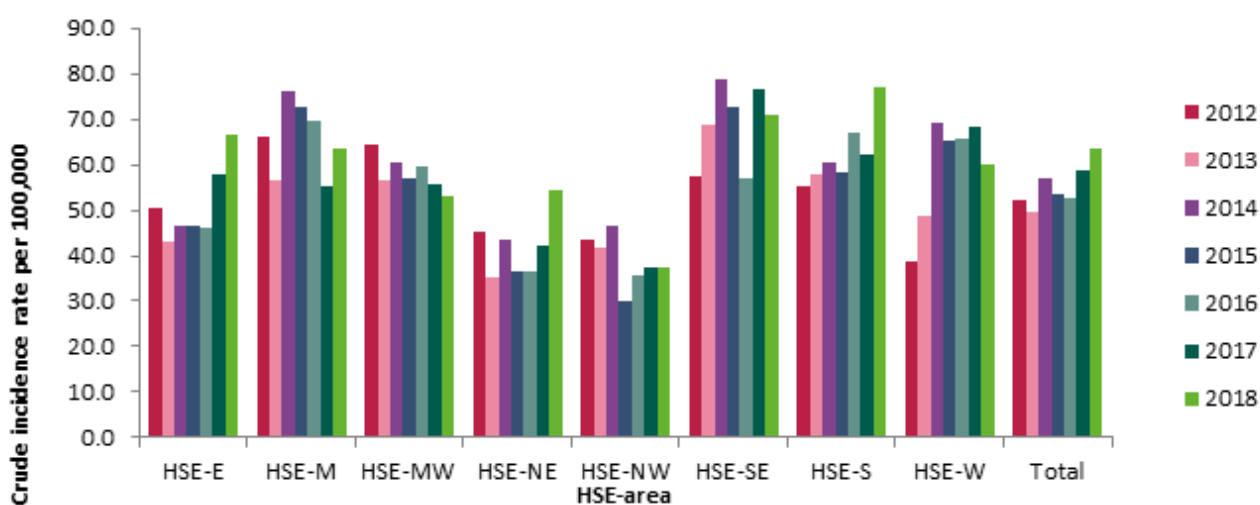


The increase in the number of cases in 2018 appears largely due to increases in the number of cases reported in HSE-NE (+29%), HSE-S (+14%) and HSE-E (+15%).

During 2018, the highest CIRs occurred in HSE-SE (76/100,000) and HSE-S (71/100,000); the lowest CIR was reported by HSE-NW (37/100,000) (Figure 2).

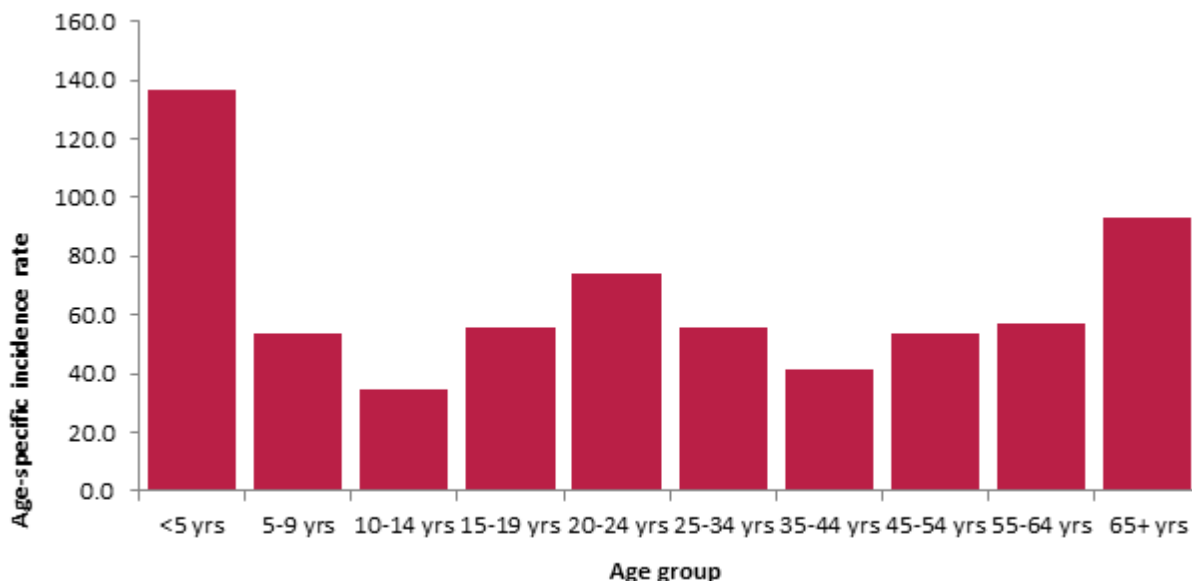
Campylobacteriosis occurs in all age groups with the highest rate of notification reported in the 0-4 year age group (Figure 3). This elevated rate in younger children is a well described characteristic of the disease and is also observed at European level.

Figure 2. Annual crude Incidence rate per 100,000 population by HSE-area, *Campylobacter* infection in Ireland 2011-2018



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.

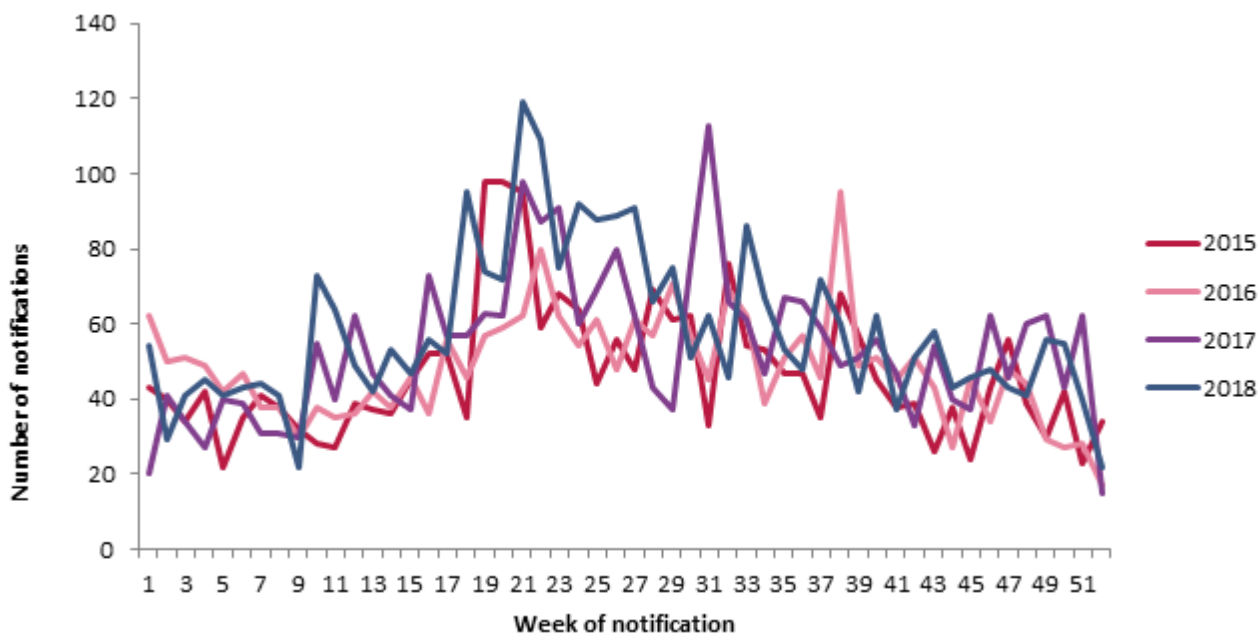
Figure 3. Age-specific incidence rate *Campylobacter*, Ireland 2018



Campylobacteriosis has a well-documented seasonal distribution with a peak from early summer. During 2018, notifications peaked between May and August (Figure 4).

The 'country of infection' variable was completed for only 56 cases, of which twelve were foreign-travel related (21%).

Figure 4. Weekly number of campylobacteriosis notifications in Ireland, 2015-2018



Microbiology

All *Campylobacter* cases notified in Ireland during 2018 were reported as laboratory confirmed but species data were reported for just 13% (n=407). Of the 407 speciated isolates, 92% (n=374) were *C. jejuni* and 7% (n=30) were *C. coli*, with fewer than 1% (n=3) being other species.

Since 2017, the National *Salmonella Shigella* and *Listeria* Reference Laboratory in Galway have generated antimicrobial resistance data on a small number of *Campylobacter* isolates annually. In 2018, data were available on 46 isolates - 41 *C. jejuni*, four *C. coli*, and one *Campylobacter sp.* Fifteen (33%) exhibited resistance to ciprofloxacin, eighteen (39%) to tetracycline with none of the 46 exhibiting resistance to erythromycin.

Outbreaks and clusters

During 2018, there were five notified outbreaks of campylobacteriosis (Table 1). Two general outbreaks in long term care facilities were suspected to be foodborne; 11 people were reported ill between the two outbreaks, three of whom were laboratory confirmed. An outbreak of two laboratory confirmed cases linked to a hotel were also believed to be foodborne.

The remaining two outbreaks comprised a general travel-related outbreak with three confirmed cases and a family outbreak with three laboratory confirmed cases; the transmission route was reported as unknown for both of these outbreaks.

Table 1: Notified Campylobacteriosis Outbreaks, Ireland 2018

Outbreak location	Mode of transmission	Number outbreaks	Number of cases	Number laboratory confirmed
Long term care facility	Foodborne	2	11	3
Hotel	Foodborne	1	2	2
Travel-related	Unknown	1	3	3
Private house	Unknown	1	3	3
Total		5	19	11

Data source: CIDR

Discussion

Campylobacter remains the most common cause of bacterial gastroenteritis in Ireland and in Europe.¹ This is the eighth 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. 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 area³

Historically, as there has been 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.

Under the Zoonoses Directive, Member States have an obligation to report AMR data on at least a proportion of human *Campylobacter* isolates. In the last two years, for the first time, data has been available from the NSSLRL on a small sample of isolates enabling Ireland to at least in part fulfil its EU obligations in this regard.

Travel is believed to be a relatively minor risk factor for campylobacteriosis in Ireland; the available data while limited are consistent with that from a case control study across the island of Ireland published in 2009 when 20% of cases reported travel outside of the island of Ireland during their potential incubation period.²

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.⁴

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 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. case control or ecological studies) 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.⁶ In 2019, a sentinel *Campylobacter*

Reference Service has commenced at the Public Health Laboratory in Cherry Orchard, and we anticipate an improvement in the quality of *Campylobacter* typing data available in 2019.

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

Sincere thanks are extended to all those who participated in the collection of data used in this report. This includes the notifying physicians, public health doctors, surveillance scientists, microbiologists, nurses, laboratory staff and administrative staff.

Report prepared by:

Patrica Garvey

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 2017. Available at: <https://www.efsa.europa.eu/en/efsajournal/pub/5500>
2. [Danis K](#), [Di Renzi M](#), [O'Neill W](#), [Smyth B](#), [McKeown P](#), [Foley B](#), [Tohani V](#), [Devine M](#). Risk factors for sporadic *Campylobacter* infection: an all-Ireland case-control study. [Euro Surveill](#). 2009 Feb 19;14(7). pii: 19123.
3. O'Connor L, McKeown P, Barrasa A, Garvey P. 2018. Epidemiology of *Campylobacter* in Ireland 2004-2016 What has changed?. Presented at RCSI Summer Scientific Meeting, May 2018
4. [Joensen KG](#), [Kuhn KG](#), [Müller L](#), [Björkman JT](#), [Torpdahl M](#), [Engberg J](#), [Holt HM](#), [Nielsen HL](#), [Petersen AM](#), [Ethelberg S](#), [Nielsen EM](#). Whole-genome sequencing of *Campylobacter jejuni* isolated from Danish routine human stool samples reveals surprising degree of clustering. *Clinical microbiology and infection* 2017 Aug 3. pii: S1198-743X(17)30410-X. doi: 10.1016/j.cmi.2017.07.026. [Epub ahead of print]