



Report on Campylobacteriosis in Ireland, 2001

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Introduction

Infections due to *Campylobacter spp* are the most commonly isolated bacterial cause of human gastrointestinal illness in Ireland, the UK and many countries globally with temperate climates. *Campylobacter jejuni* is the predominant species associated with human illness, with the remainder mostly being *C. coli* and *C. lari*.

Campylobacteriosis presents as a diarrhoeal illness. The diarrhoea is often bloody and is frequently associated with acute abdominal pain. Symptoms may subside after a number of days or may persist for weeks. Rarely, some long-term sequelae may develop such as arthritis and approximately one in every 1000 cases leads to a severe neurological disorder called Guillain-Barré Syndrome (GBS).

This review presents data from the third year of the NDSC national survey of the incidence of human campylobacteriosis in Ireland.¹ Valuable information has again been derived regarding the epidemiology of laboratory-confirmed campylobacteriosis which supplements further investigations in this field by the Food Safety Authority of Ireland and other partners in infectious disease surveillance and control.

Methods

NDSC requested public health doctors and laboratories to provide disaggregated information on all laboratory-confirmed cases of campylobacteriosis diagnosed in 2001.

The following minimum dataset was requested: identifier, date of birth/age, sex, address and date of onset/isolation/reporting. In regions where laboratory surveillance systems were in place, this information was requested from their databases. Duplicates were removed where detected. Data were assigned a health board and a county where address was supplied. Analyses were carried out using MS Access and SPSS. Direct methods of standardisation were applied using the Irish population as the standard population. Population data were taken from the 1996 census. Species differentiation of isolates was not requested.

Results

Information on *Campylobacter* was obtained from all Health Boards. Information on age was missing in 3% of cases and information on sex was incomplete in 1% of cases. Those data without age were not presented in age standardised charts.

Incidence

In total, 1286 cases of laboratory-confirmed campylobacteriosis were reported in 2001 in Ireland. This gives a crude incidence rate (CIR) of 35.5 per 100,000 population. This compared with a CIR of 44.5 per 100,000 in 2000 and 57.5 in 1999 (Table 1).

Table 1: Number of cases and CIR by health board in Ireland for 2001 and 2000.

Health Board	2001		2000	
	No of cases	CIR – (incl. 95% C.I.)	No of cases	CIR – (incl. 95% C.I.)
ERHA	481	37.1 [33.8-40.4]	472	36.4 [33.1-39.7]
Midland	65	31.6 [23.9-39.3]	63	30.7 [23.1-38.2]
Mid-Western	62	19.6 [14.7-24.4]	73	23.0 [17.7-28.3]
North Eastern	51	16.7 [12.1-21.2]	51	16.7 [12.1-21.2]
North Western	81	38.4 [30.0-46.8]	100	47.4 [38.1-56.7]
South Eastern	159	40.6 [34.3-46.9]	226	57.7 [50.2-65.3]
Southern	217	39.7 [34.4-45.0]	337	61.6 [55.1-68.2]
Western	170	48.2 [41.0-55.5]	291	82.6 [73.1-92.1]
IRELAND	1286	35.5	1613	44.5

Figure 1 illustrates crude rates (cases/100,000 population) for each health board in Ireland.

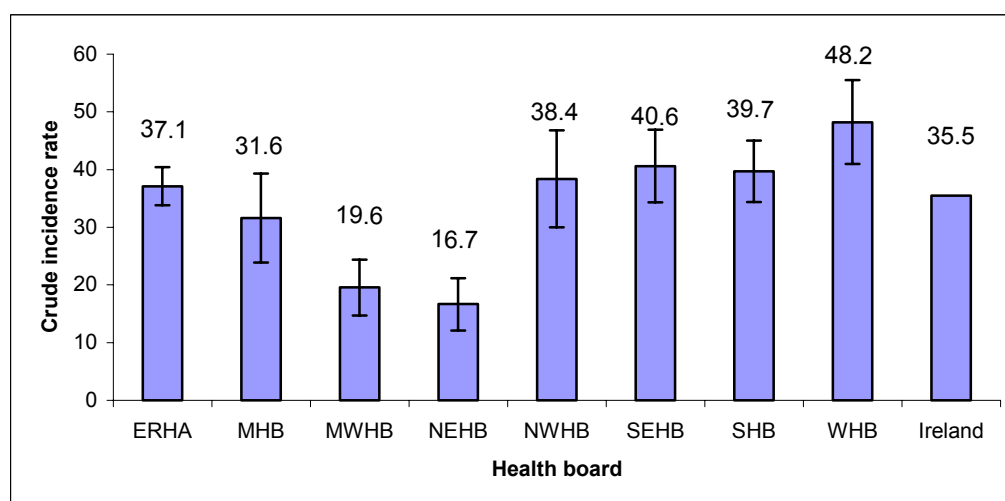


Figure 1. Crude incidence rate (per 100,000 population) of human campylobacteriosis cases in Ireland, 2001 by health board (incl. 95% confidence intervals)

Sex

Males accounted for 55.7% of cases and females 43.2%, (1.2% missing). This ratio was very consistent with data reported in 1999 and 2000. This was a very consistent finding with the same ratio also observed in 2000 and 1999.

Table 2. Number of cases by health board and sex, in 2001.

Health Board	Total	Males	Females	Unknown
ERHA	481	269	210	2
Midland	65	40	22	3
Mid-Western	62	28	34	-
North Eastern	51	27	24	-
North Western	81	50	31	-
South Eastern	159	90	69	-
Southern	217	126	88	3
Western	170	86	77	7
IRELAND	1286	716	555	15

Seasonality

Campylobacter is known to have a well characterised seasonal distribution, with a peak in late spring/early summer seen each year. In 2001, this seasonal pattern remains similar but the characteristic peak seen in previous years was not as pronounced. Figure 2 shows the occurrence of cases by week for Ireland in 2001.

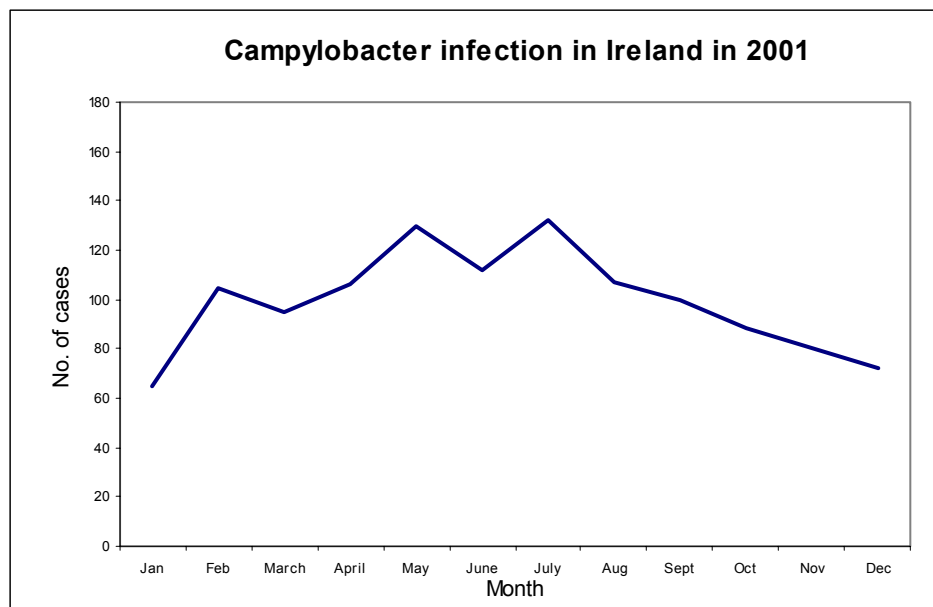


Figure 2: Total cases of campylobacteriosis by month of notification (2001) in Ireland.

Table 3. Cases by month (2001) for each health board in Ireland

	E	M	MW	NE	NW	SE	S	W	Total
Jan	14	5	6	1	5	15	9	11	66
Feb	27	5	7	2	8	21	20	15	105
Mar	29	3	4	6	1	12	24	16	95
Apr	28	10	5	5	7	11	32	8	106
May	40	12	10	7	10	11	23	17	130
Jun	28	7	6	6	10	8	29	18	112
Jul	53	5	5	3	7	22	18	19	132
Aug	45	2	5	4	8	12	14	17	107
Sept	37	3	2	4	9	11	17	17	100
Oct	34	2	9	3	5	11	12	12	88
Nov	26	5	1	3	6	15	10	14	80
Dec	27	6	2	7	5	10	9	6	72
N/K	93	0	0	0	0	0	0	0	93
Total	481	65	62	51	81	159	217	170	1286

Age

Age standardised rates were then calculated to allow comparisons between areas to be made without the confounding effects of age (Figure 3). In 2001, the highest incidence was recorded in the Western region of the country, with the lowest

incidence seen in the North Eastern region. These data are consistent with those observed in 1999 and 2000.

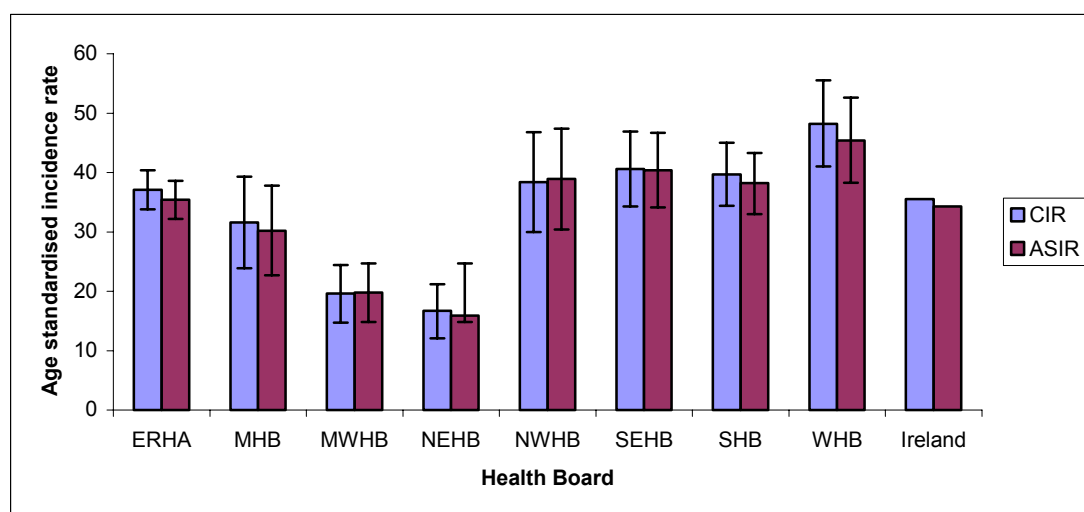


Figure 3: Age standardised incidence rates (ASIR) compared to crude incidence rates (CIR) in each health board, 2001.

Table 4 depicts crude incidence rates (CIR) and age standardised incidence rates (ASIR) (per 100,000 population) by health board in 2001

Table 4. Crude incidence rates (CIR) and Age standardised incidence rates (ASIR) (per 100,000 population) by health board in 2001

Health Board	CIR [95% CI]	ASIR [95% CI]
ERHA	37.1 [33.8-40.4]	35.4 [32.2-38.6]
Midland	31.6 [23.9-39.3]	30.2 [22.7-37.8]
Mid-Western	19.6 [14.7-24.4]	19.8 [14.8-24.7]
North Eastern	16.7 [12.1-21.2]	15.9 [14.8-24.7]
North Western	38.4 [30.0-46.8]	38.9 [30.4-47.4]
South Eastern	40.6 [34.3-46.9]	40.4 [34.1-46.7]
Southern	39.7 [34.4-45.0]	38.2 [33.0-43.4]
Western	48.2 [41.0-55.5]	45.4 [38.3-52.6]
IRELAND	35.5 [33.5-37.4]	

The age-standardised data is mapped and presented in Figure 4 below.

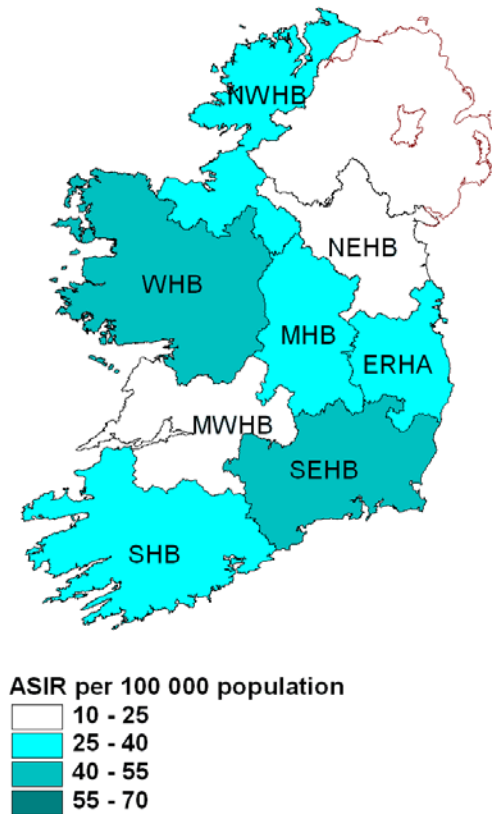


Figure 4. Age-standardised rates of Campylobacteriosis in Ireland by health board, 2001

Table 5 below shows the age distribution of cases by health board.

Table 5. Age-distribution by health board

Age group	E	M	MW	NE	NW	SE	S	W	Total
0-4	93	23	24	7	24	45	65	61	342
5-9	19	4	3	6	7	14	25	11	89
10-14	10	1	2	4	4	7	4	3	35
15-19	14	2	3	2	3	6	13	8	51
20-24	61	5	4	4	5	9	9	16	113
25-34	88	8	11	14	9	25	33	15	203
35-44	66	3	4	5	10	11	17	16	132
45-54	47	4	1	1	6	16	12	3	90
55-64	33	4	1	2	7	8	12	3	70
65+	38	8	9	3	6	17	17	21	119

Below, Figure 5 shows the breakdown of cases in each age group for Ireland.

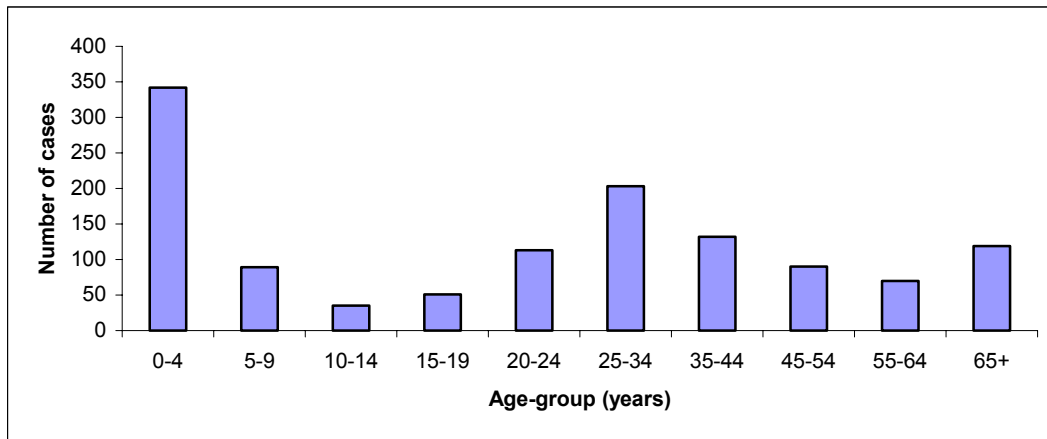


Figure 5. Cases of campylobacteriosis by age group for Ireland in 2001

This demonstrates that there is a large burden of illness in children under 5 years of age, and mirrors the results found in 1999 and 2000. When we examine age specific incidence rates for each age group, the burden of illness in this age group is even more evident (Figure 6)

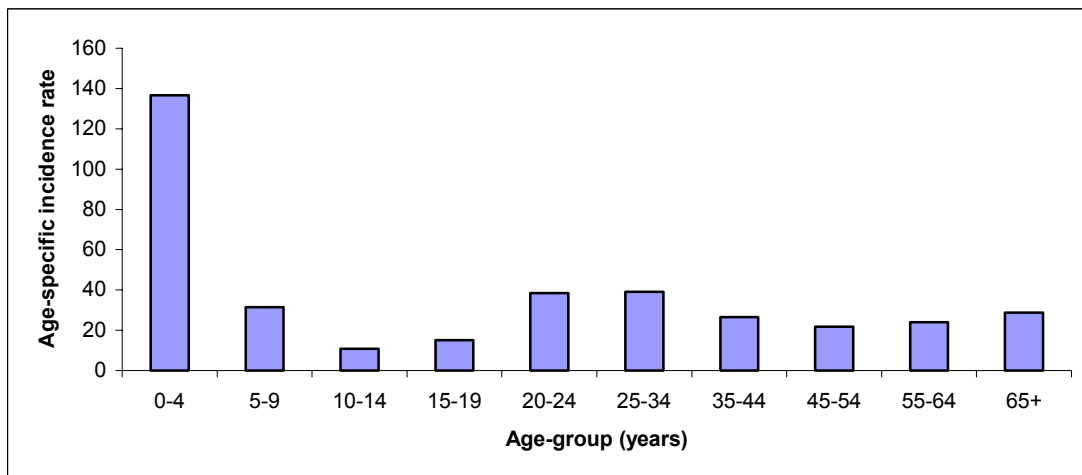


Figure 6. Age specific incidence rates for campylobacteriosis in Ireland, 2001

Sex distribution

The variance in gender distribution that was noted in 1999 and 2000 was again evident from analysis of the data in 2001. In every age-group except 55-64 years there was a predominance of male cases. This is shown in Figure 7 when the data are adjusted for age and sex.

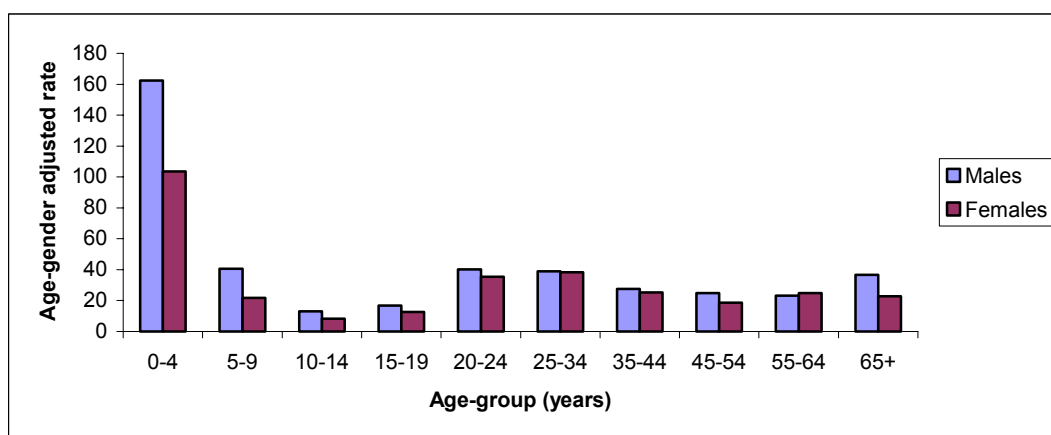


Figure 7: Age-gender adjusted incidence according to age-group in 2001.

Discussion

This review presents data from the third year of the NDSC national survey of the incidence of human campylobacteriosis in Ireland. Valuable information has again been derived regarding the epidemiology of laboratory-confirmed campylobacteriosis. These data reveal a crude incidence rate (CIR) of 35.5 cases per 100,000 persons in Ireland in 2001. Overall a decrease was seen in Ireland when compared with 2000 CIR (44.5/100,000). This decrease was most notable in three health board regions, viz. Western, Southern and South-Eastern. Despite the reduction in numbers however, campylobacteriosis remains the single biggest cause of bacterial gastroenteric infection in Ireland (almost three times the number of salmonellosis cases reported in 2001). It should also be noted that these are laboratory confirmed cases and the real burden of illness is even higher.

Higher rates were seen for the same period in Northern Ireland (52.4/100,000), England and Wales (107.6/100,000) and Scotland (106.1/100,000). These data also represented a decrease from 2000 figures for Northern Ireland and Scotland, however the rates in England and Wales increased for the year 2001.

The burden of human gastrointestinal illness due to *Campylobacter* in Ireland is evident from the data available from three years of this national study and work towards its control has been identified as a priority. To this end, a report was published in 2002 by the Food Safety Authority of Ireland entitled “Control of *Campylobacter* species in the food chain”.¹ This was the work of a multi-disciplinary expert group convened to examine existing knowledge regarding the control and prevention of human infection with *Campylobacter spp*, and also to recommend measures to reduce the risk of infection with this zoonotic organism throughout the food chain. A number of key recommendations have been made in this report including the need for more extensive epidemiological data on human cases of campylobacteriosis in Ireland.

It has been recognised that investigations are needed in Ireland to examine the epidemiology of this organism and attempt to provide answers to the questions that the data presented in this report pose, such as, the high incidence in very young children, the bias towards male cases and the geographical distribution of cases. To address this, it is hoped to conduct a matched case-control study in Ireland later this year to examine risk factors for human cases of *Campylobacter* infection.

Most cases of campylobacteriosis are sporadic and it is thought that the primary mode of transmission is foodborne. Suggested risk factors for infection have included ingestion of undercooked poultry meats and handling raw poultry, but also contact with pets, especially puppies, consumption of unpasteurised milk or dairy products and drinking water from contaminated/ untreated supplies. In addition, the fact that *Campylobacter* has a low infectious dose (500 organisms or less), implies that cross-contamination of ready-to-eat foods by raw meats may be an important source of infection. The role of person-to-person transmission of campylobacteriosis is thought to be very low.

C. jejuni and *C. coli* can be isolated from the intestines of healthy farm animals, poultry, pets and wild birds. These organisms rarely cause disease in these animals and the carriage rate is believed to be quite high, particularly in poultry. The lack of sub-typing information in Ireland has meant that currently it is not possible to trace human cases of campylobacteriosis back through the food chain.

The strong seasonal distribution of human cases of campylobacteriosis is another extremely interesting feature of this disease, with a peak seen in late spring/early summer seen each year. The WHO European Centre for Environment and Health (ECEH) is currently undertaking a European study to examine the effects of global climate change on a number of gastroenteric pathogens including *Campylobacter spp.* From examination of retrospective surveillance and meteorological data from a large number of countries, it is hoped to be able to extrapolate the mechanisms governing the impact of weather and climate on foodborne and waterborne illness.

References

1. www.fsai.ie/publication_list_index.htm

Acknowledgements

NDSC sincerely thanks and acknowledges all those who provided information for the second year of this report on the epidemiology of campylobacteriosis in Ireland. As was the case last year, many medical microbiologists, public health doctors, surveillance scientists and medical scientists made special efforts to obtain their data for this period to allow NDSC complete an accurate and relatively complete database of laboratory-confirmed cases of campylobacteriosis.

We are particularly grateful for the availability of quality information from INFOSCAN (Southern, South Eastern and Mid-Western Health Boards) and LSS (Eastern Health Board) which made data collection very efficient.