
# Annual Report on Campylobacteriosis in Ireland, 2003

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## Introduction

Campylobacteriosis is the commonest bacterial cause of human gastrointestinal illness in Ireland. *C. jejuni* is the predominant species associated with human illness, with the remainder mostly being *C. coli and C. lari.*

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

This review presents data from the fifth year of the NDSC national survey of the incidence of human campylobacteriosis in Ireland.

## Methods

NDSC requested public health doctors and laboratories to provide disaggregated information on all laboratory-confirmed cases of campylobacteriosis diagnosed in 2003.

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 2002 census. Species differentiation of isolates was not requested.

## Results

Information on *Campylobacter* was obtained from all Health Boards. Information on age was missing in 1% of cases and information on gender was incomplete in 5% of cases. Those data without age were not presented in age standardised charts, and without gender were not presented in age-gender standardised charts.

### *Incidence*

In total, 1568 cases of laboratory-confirmed campylobacteriosis were reported in 2003 in Ireland (including six cases in non-residents). This gives a crude incidence rate (CIR) of 39.9 cases per 100,000 population (Table 1). This compared with a CIR of 34.0 cases per 100,000 in 2002. The number of cases by year is shown in Figure 1. Crude rates by health board for 2003 are presented graphically in Figure 2.

***Table 1:*** **Number of cases and CIR per 100,000 population of human campylobacteriosis in Ireland by health board, 2003**.

| Health Board | No of cases | CIR - (incl.95% C.I.) |
|---|---|---|
| **ERHA** | 544 | 38.8 [35.6 - 42.1] |
| **Midland** | 136 | 60.3 [50.2 - 70.5] |
| **Mid-Western** | 103 | 30.3 [24.5 - 36.2] |
| **North Eastern** | 95 | 27.5 [22.0 - 33.1] |
| **North Western** | 52 | 23.5 [17.1 - 29.8] |

| | | |
|---|---|---|
| **South Eastern** | 213 | 50.3 [43.5 - 57.0] |
| **Southern** | 208 | 35.8 [31.0 - 40.7] |
| **Western** | 211 | 55.5 [48.0 - 63.0] |
| **IRELAND** | 1562 | **39.9 [37.9 - 41.9]** |

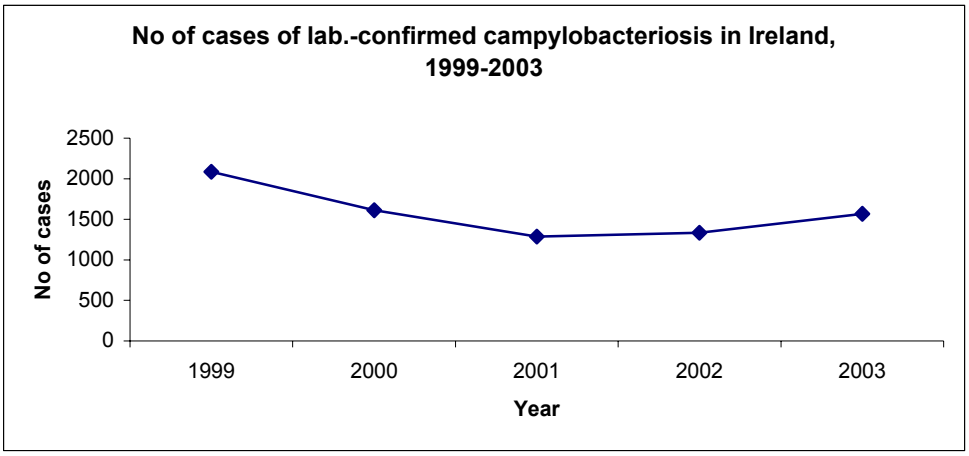


***Figure 1.*** **Number of laboratory confirmed cases of Campylobacteriosis in Ireland, 1999-2003**

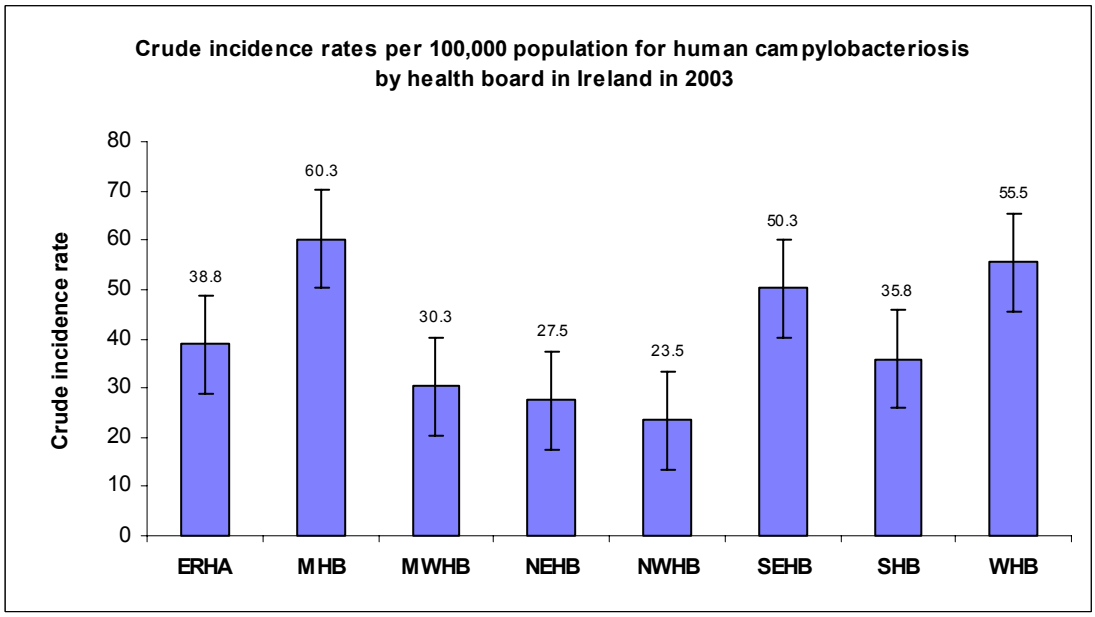


***Figure 2.*** **Crude incidence rates per 100,000 population for human campylobacteriosis by health board in Ireland in 2003**

## *Sex*

Males accounted for 49.4% of cases and females 45.6% (with 5% of cases missing data on gender) as shown in Table 2. This trend of a greater incidence of male cases has been consistently found since this survey began in 1999. The gender distribution by health board is shown in Table 2.

***Table 2.*** **Number of cases by health board and sex, 2003**

| Heath Board | Total | Male | Female | Unknown |
|---|---|---|---|---|
| **ERHA** | 544 | 278 | 261 | 5 |
| **MHB** | 136 | 65 | 64 | 7 |
| **MWHB** | 103 | 59 | 44 | 0 |
| **NEHB** | 95 | 27 | 31 | 37 |
| **NWHB** | 52 | 32 | 20 | 0 |
| **SEHB** | 213 | 102 | 111 | 0 |
| **SHB** | 208 | 109 | 80 | 19 |
| **WHB** | 211 | 100 | 101 | 10 |
| **Non Irish Residents** | 6 | 2 | 4 | 0 |
| **Ireland** | **1568** | **774** | **716** | **78** |

### *Seasonality*

The distribution of cases by month is shown in Figure 3. A rise in cases occurred in May 2003, reaching a peak in July in 2003. Campylobacter is known to have a well characterised seasonal distribution with a peak seen in early summer each year. The seasonal pattern broken down by health board is shown in Table 3.

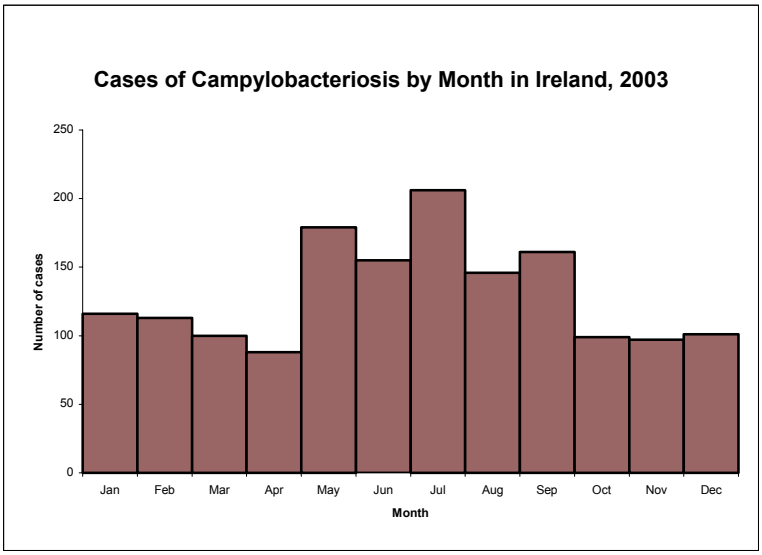


***Figure 3:*** **Total cases of campylobacteriosis by month of notification (2003)**

***Table 3.*** **Cases by month (2003) for each health board in Ireland**

| Month | E | M | MW | NE | NW | SE | S | W | Non Res | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| **Jan** | 39 | 2 | 8 | 8 | 4 | 19 | 13 | 23 | 0 | 116 |
| **Feb** | 31 | 16 | 6 | 9 | 8 | 12 | 16 | 15 | 0 | 113 |
| **Mar** | 38 | 10 | 6 | 5 | 2 | 14 | 10 | 15 | 0 | 100 |
| **Apr** | 33 | 5 | 9 | 5 | 0 | 16 | 11 | 9 | 0 | 88 |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **May** | 61 | 26 | 12 | 7 | 0 | 30 | 23 | 20 | 0 | 179 |
| **Jun** | 37 | 13 | 11 | 5 | 8 | 27 | 24 | 29 | 1 | 155 |
| **Jul** | 75 | 16 | 12 | 14 | 9 | 27 | 26 | 24 | 3 | 206 |
| **Aug** | 48 | 14 | 9 | 12 | 4 | 14 | 22 | 21 | 2 | 146 |
| **Sep** | 69 | 8 | 6 | 12 | 4 | 14 | 27 | 21 | 0 | 161 |
| **Oct** | 34 | 7 | 9 | 6 | 7 | 16 | 11 | 9 | 0 | 99 |
| **Nov** | 39 | 10 | 8 | 3 | 2 | 11 | 10 | 14 | 0 | 97 |
| **Dec** | 40 | 9 | 6 | 5 | 4 | 13 | 15 | 9 | 0 | 101 |
| **NK** | 0 | 0 | 1 | 4 | 0 | 0 | 0 | 2 | 0 | 7 |
| **Total** | **544** | **136** | **103** | **95** | **52** | **213** | **208** | **211** | **6** | **1568** |

### *Age*

Age standardised rates were calculated to allow comparisons to be made between health board regions without the confounding effects of age (Figure 4). In 2003, the highest incidence was recorded in the Midland health board region followed by the Western health board with the lowest incidence rate seen in the NWHB.

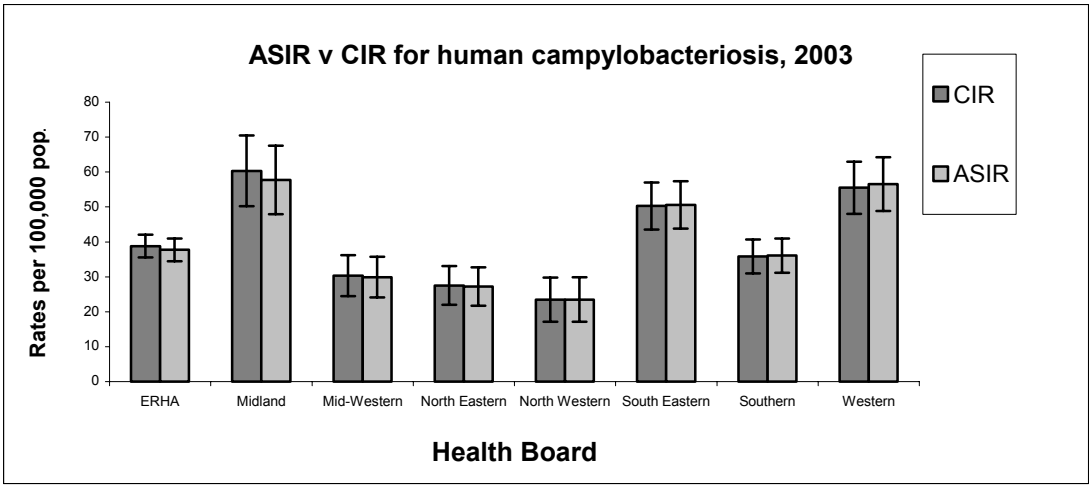


***Figure 4: Age standardised incidence rates (ASIR) compared to crude incidence rates (CIR) in each health board, 2003.***

Table 4 depicts crude incidence rates (CIR) and age standardised incidence rates (ASIR) (per 100,000 population) by health board in 2003

***Table 4.*** **Crude incidence rates (CIR) and age standardised incidence rates (ASIR) (per 100,000 population) by health board in 2003**

| Health Board | CIR [95% C.I.] | ASIR [95% C.I.] |
|---|---|---|
| **ERHA** | 38.8 [35.6 - 42.1] | 37.8 [34.5 - 41.0] |
| **Midland** | 60.3 [50.2 - 70.5] | 57.7 [47.9 - 67.5] |
| **Mid-Western** | 30.3 [24.5 - 36.2] | 29.9 [24.1 - 35.7] |

| | | |
|---|---|---|
| **North Eastern** | 27.5 [22.0 - 33.1] | 27.2 [21.7 - 32.7] |
| **North Western** | 23.5 [17.1 - 29.8] | 23.5 [17.1 - 29.9] |
| **South Eastern** | 50.3 [43.5 - 57.0] | 50.6 [43.8 - 57.4] |
| **Southern** | 35.8 [31.0 - 40.7] | 36.1 [31.2 - 41.0] |
| **Western** | 55.5 [48.0 - 63.0] | 56.5 [48.8 - 64.2] |
| **IRELAND** | **39.9 [37.9 - 41.9]** | |

The age-standardised data are mapped and presented in Figure 5.

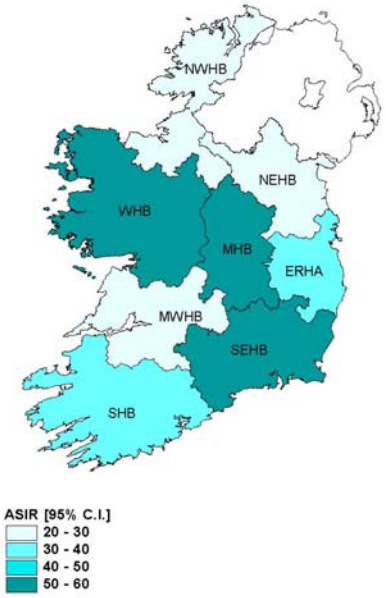


***Figure 5. Age-standardised rates of campylobacteriosis in Ireland by health board, 2003.***

Table 5 shows the breakdown of cases in each age group by health board in Ireland.

***Table 5*. Age distribution of cases by health board, 2003.**

| Age Group (y) | E | M | MW | NE | NW | SE | S | W | Total |
|---|---|---|---|---|---|---|---|---|---|
| **0-4** | 81 | 58 | 30 | 24 | 16 | 56 | 75 | 81 | 421 |
| **05-9** | 23 | 13 | 4 | 7 | 3 | 11 | 13 | 11 | 85 |
| **10-14** | 18 | 5 | 5 | 4 | 1 | 9 | 12 | 10 | 64 |
| **15-19** | 27 | 6 | 4 | 5 | 2 | 10 | 7 | 8 | 69 |
| **20-24** | 58 | 7 | 7 | 12 | 5 | 23 | 18 | 18 | 148 |
| **25-34** | 115 | 18 | 14 | 13 | 3 | 32 | 26 | 22 | 245 |
| **35-44** | 80 | 6 | 14 | 10 | 7 | 17 | 18 | 10 | 163 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **45-54** | 43 | 9 | 4 | 5 | 5 | 12 | 13 | 19 | 112 |
| **55-64** | 34 | 6 | 6 | 8 | 3 | 18 | 8 | 10 | 93 |
| **65+** | 56 | 6 | 13 | 7 | 7 | 25 | 16 | 21 | 152 |

Figure 6 graphs the breakdown of cases by age-group. This demonstrates that there is a large burden of illness in children under 5 years of age, and mirrors the results consistently found since 1999. When we examine age specific incidence rates for each age group, the burden of illness in this age group is even more evident (Figure 7)

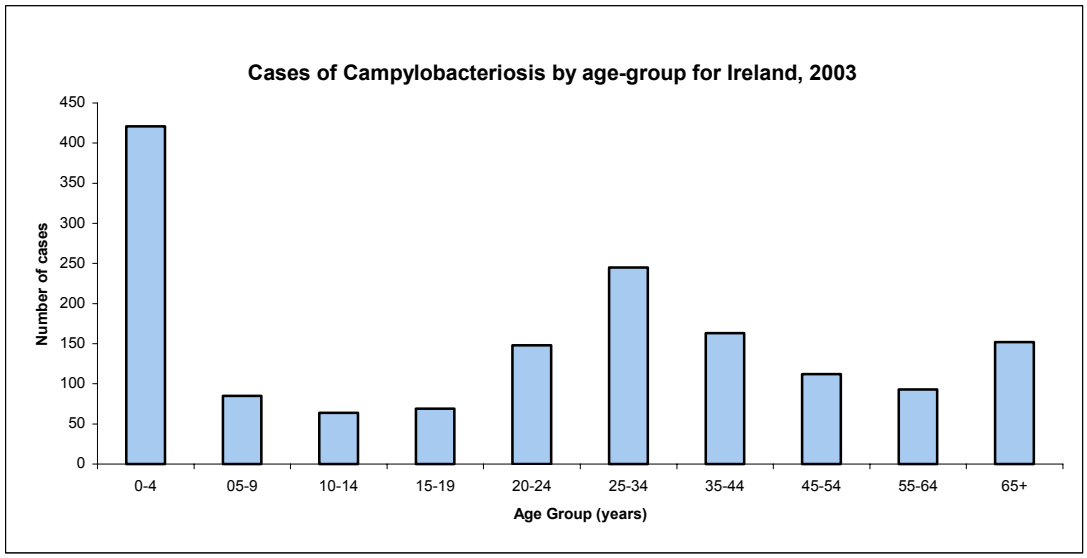


***Figure 6*. Cases of campylobacteriosis by age group for Ireland in 2003**

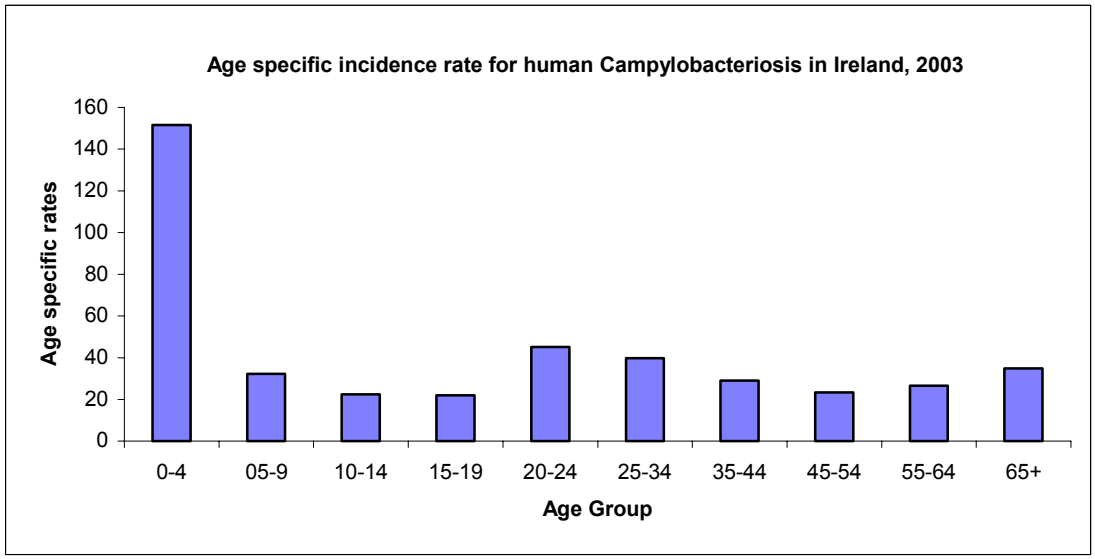


***Figure 7.* Age specific incidence rates for campylobacteriosis in Ireland, 2003**

### *Gender distribution*

The variance in gender distribution that has been noted since 1999 was again evident from analysis of the data in 2003. In almost every age-group, there was a

predominance of male cases. This is shown in Figure 8 when the data are adjusted for age and sex.

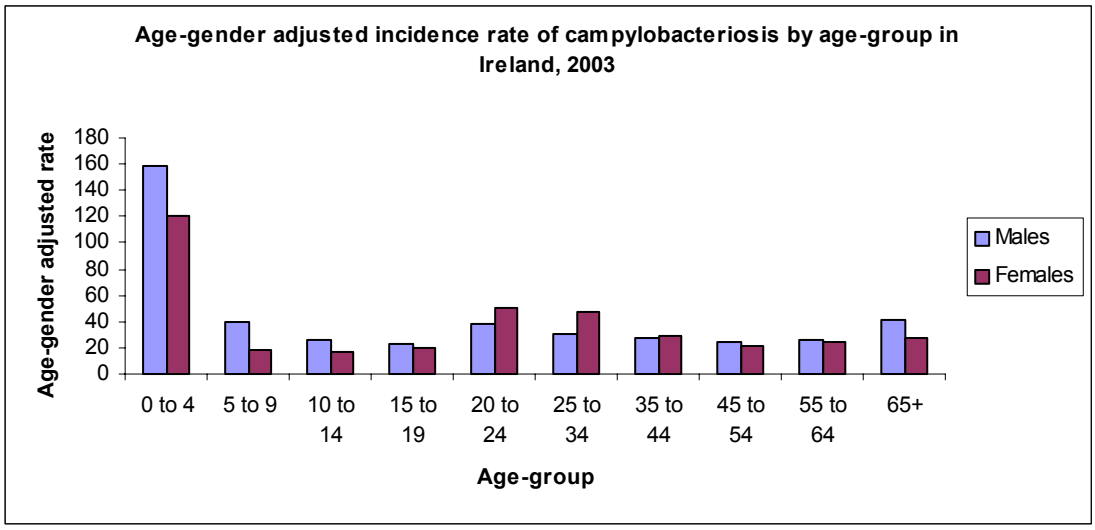


***Figure 8*: Age-gender adjusted incidence according to age-group in 2003.**

## Outbreak data

There were two outbreaks of campylobacteriosis reported to NDSC in 2003. One occurred in a residential institution with 19 people reported ill. The other occurred in a hospital with six cases of illness. The mode of transmission was not determined in these outbreaks, and no food vehicles were identified during the investigations.

## Discussion

The results presented here are from the fifth year of the national survey of the incidence of human campylobacteriosis in Ireland. It is evident from these data that campylobacteriosis remains the greatest cause of bacterial gastroenteric infection in Ireland (3.5 times the number of salmonellosis cases reported in 2003).

The crude incidence rate (CIR) of campylobacteriosis was seen to increase in Ireland in 2003 (39.9 cases/100,000 persons) compared to 2002 (34.0/100,000). This was the highest rate reported in Ireland since 2000. The increase was most notable in the Midland and Western health board regions.

Higher rates were seen in 2003 for Northern Ireland[1] (43.8/100,000), England and Wales[2] (85.4/100,000) and Scotland[3] (87.9/100,000) but these rates represented a decrease from the incidence reported in 2002 for all these countries (*provisional data*).

Some consistent data trends are evolving as the Campylobacter data are analysed year on year. The incidence rate of this pathogen is consistently higher in young children and there is a bias towards male cases in almost all age-groups. A case-control study being conducted in the ERHA region is due to be completed in the coming months. It is hoped to identify and assess risk factors for sporadic cases of human campylobacteriosis in Ireland.

Much work needs to be done to provide answers to many of the epidemiological questions posed by the data presented in this report. Detailed typing data of human isolates is needed to be able to examine relationships between Campylobacter isolates from food, food animals and humans, and to assist in traceback in outbreak investigations. Information on risk factors is needed to inform public health interventions. In recent years, water has been increasingly featured as a potential source of Campylobacter infection internationally, and reports have described associations with swimming in waters contaminated with sewage effluent, drinking of untreated water and consumption of seafood[4,5]. A study in Northern Ireland, revealed significant levels of contamination of untreated surface waters with *Campylobacter spp*[6]. It is hoped that the results of the first Irish case-control study will identify risk factors for sporadic cases of campylobacteriosis in this country.

It is clear that there is a very significant burden of illness caused by this zoonotic agent, with the highest incidence in four years reported in 2003. Efforts by all public health professionals throughout the food chain must continue to aid in our understanding of the complex epidemiology of this globally important pathogen.

## References


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6. Moore JE, Caldwell PS, Millar BC, Murphy PG. Occurrence of Campylobacter spp. in water in Northern Ireland: implications for public health. *Ulster Med J*. (2001) 70:102-7.


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