



Report on *Campylobacter* enteritis in Ireland in 1999

Dominic Whyte & Derval Igoe,

**National Disease Surveillance Centre, Sir Patrick Dun's Hospital,
Dublin**

Introduction:

There has been increasing concern internationally at the level of illness caused by *Campylobacter spp.* Commonly, *Campylobacter jejuni* (*C.jejuni*) and *Campylobacter coli* (*C.coli*) infection is a zoonosis and manifests as a severe enteritis. Data from regional surveillance systems¹ in Ireland have suggested a rise in the incidence of disease caused by *C.jejuni/coli*. This prompted this national review to ascertain information on the epidemiology of laboratory-confirmed campylobacter enteritis in Ireland. This review provides important information to supplement further investigations in this field by the National Disease Surveillance Centre (NDSC), Food Safety Authority of Ireland (FSAI) and other partners in infectious disease surveillance and control. A summary of this analysis was first presented in Trinity College, Dublin in June 2000.

NDSC will prepare a summary for publication in EPI-INSIGHT also, later this year. The following data has been summarised to illustrate the burden of infection in Ireland. It also provides a regional breakdown by each health board. No individual hospital data is identified.

NDSC thanks and acknowledges all those who provided information for the report on campylobacter enteritis in Ireland in 1999 and also the FSAI for their assistance. Many medical microbiologists, public health doctors and medical laboratory 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 campylobacter enteritis. The availability of quality information from INFOSCAN (Southern, South Eastern and Mid-Western Health Boards) and LSS (Eastern Health Board) made data collection very efficient, for which we are grateful.

Methods:

In March 2000, NDSC asked laboratories and/or public health doctors for disaggregate information on all laboratory-confirmed cases of campylobacter enteritis diagnosed in 1999. A 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 database.

Duplicates were removed where detected. Data was assigned a health board where necessary and a county where address was supplied. Analysis was carried out using Access database and STATA. Direct methods of standardisation were applied using the Irish population as the standard population. Population data were taken from the 1996 census.

Information on laboratory methodology and testing protocols was not requested. Differentiation of *C.jejuni* and *C.coli* was not requested.

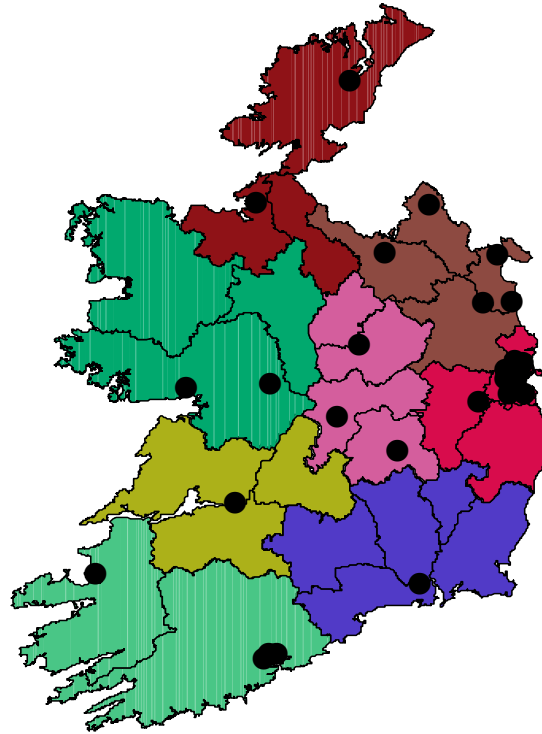


Figure 1: Centres providing data on campylobacter.

Results:

Information on campylobacter was obtained from all Health Boards. Information on age was missing in 12% of cases and information on sex was incomplete in 0.7% of cases. County data was less complete. Data from one health board area were approximated to county level according to the reporting hospital. Data on age was not available on many cases in two health board areas (North Eastern [58%] and Mid-Western [32%]). This had implications for presenting crude rates, and age standardised rates here. Those without age are not seen in age standardised charts. The crude rates are the best indicators of disease burden in these two areas.

In total, 2085 cases of laboratory-confirmed campylobacter enteritis were reported in 1999 in Ireland.

Figure 2 illustrates crude rates (cases/100,000) for each health board in Ireland.

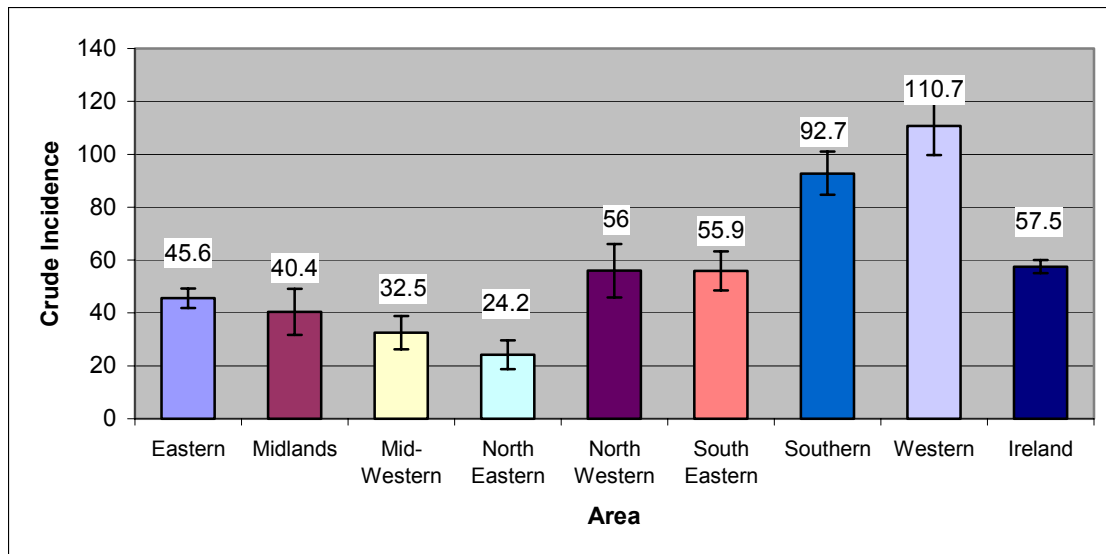


Figure 2: Crude incidence rate (per 100,000) of laboratory-confirmed Campylobacter enteritis in Ireland 1999 by health board (including 95% confidence intervals).

This picture is captured by looking at a map of the health boards in Ireland showing these crude rates.

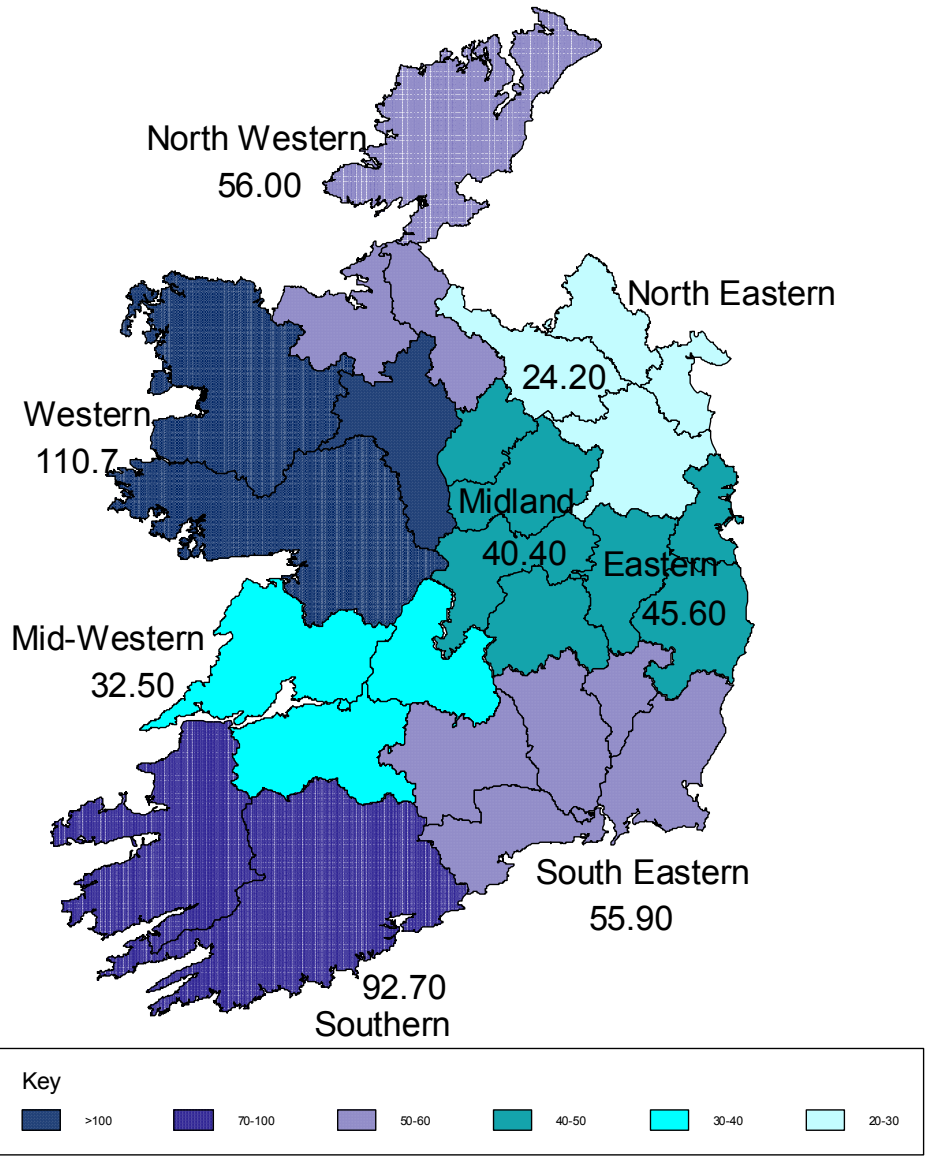


Figure 3: Crude Rates of campylobacter enteritis by health board in 1999.

The number of cases in each health board are shown in Table 1.

Table 1: Number of cases by health board and sex where given, in 1999.

Health Board	n	Males	Females
Eastern	591	360	230
Midland	83	42	40
Mid-Western	103	58	45
North Eastern	74	39	35
North Western	118	69	49
South Eastern	219	129	87
Southern	507	266	237
Western	390	200	185
Ireland	2085	1163	908

Males accounted for 56% of cases (95% Confidence Interval = 53.6-57.9%), females 44% (95% Confidence Interval = 41.4-45.7%), where sex was given. This shows an overall Male:Female ratio of 1.28:1.

Campylobacter has a well characterised seasonal distribution and this is evident when the trend over time is examined. Table 2 shows the cases as they occurred in each health board by month.

Table 2: Cases by month (1999) for each health board in Ireland.

	E	M	MW	NE	NW	SE	S	W	Total
January	38	8	3	5	6	9	34	19	122
February	35	3	13	8	6	8	42	20	135
March	48	8	5	10	9	21	44	43	188
April	41	6	8	8	8	24	29	38	162
May	80	8	28	8	13	33	68	42	280
June	69	17	15	9	17	37	58	52	274
July	68	5	8	4	13	29	50	50	227
August	39	7	15	8	16	17	53	35	190
September	47	8	7	7	8	6	41	29	153
October	33	6	0	5	8	17	34	17	120
November	66	4	0	2	6	7	32	19	136
December	27	3	1	0	8	11	22	26	98
Total	591	83	103	74	118	219	507	390	2085

The trend over time is also demonstrated in figure 4, which shows the occurrence of cases by week for Ireland in 1999.

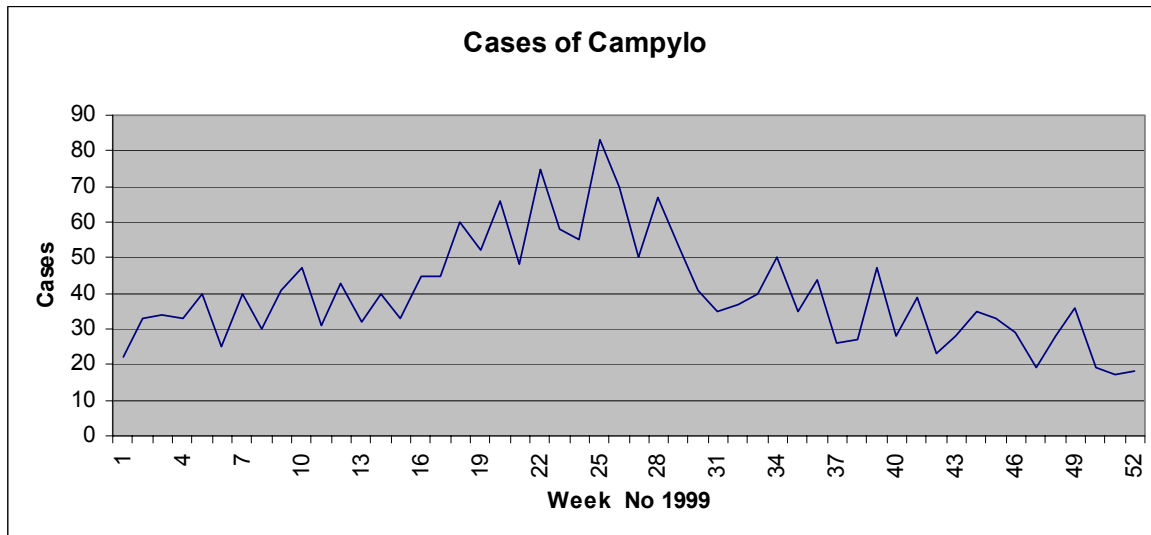


Figure 4: Total cases of campylobacter enteritis by week (1999) in Ireland.

Very often the burden of illness from a pathogen can be distorted by age structure when comparing different areas and countries. To overcome this, age standardised rates are calculated to allow comparisons between areas to be made without the confounding effects of age. This emphasises the importance of date of birth and age in collecting data on disease with surveillance systems.

This difference is illustrated in Figure 5 which shows crude incidence rates for each Health Board and age standardised rates.

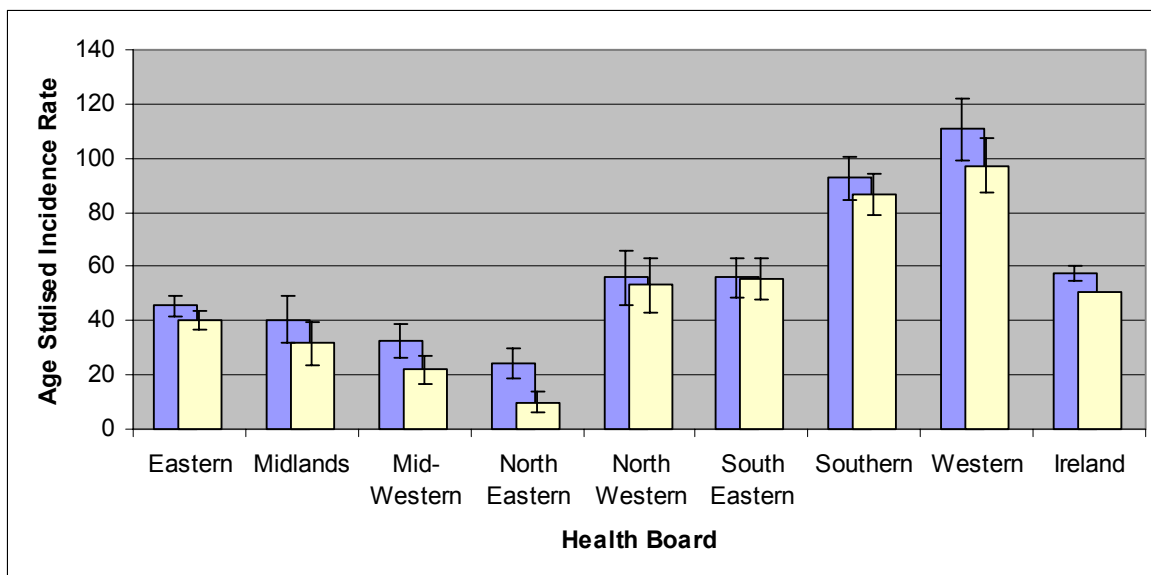


Figure 5: Age standardised rates for campylobacter enteritis in each health board (yellow) in Ireland in 1999, compared to crude incidence rates (blue) (95% confidence intervals included).

Data for each health board is available by age, and period, see charts in Appendix 1. Data on age specific rates is illustrated in Appendix 2.

Below, figure 6 shows the breakdown of cases in each age group for Ireland.

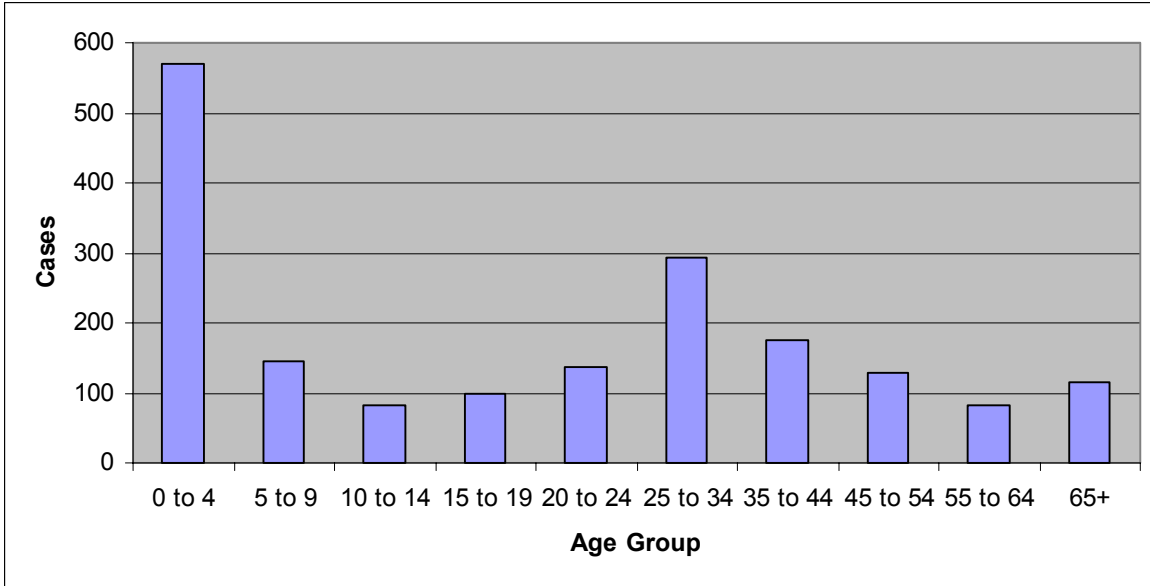


Figure 6: Cases of campylobacter enteritis by age group for Ireland in 1999.

This demonstrates that there is a large burden of illness in children under 5 years of age. When we examine age specific incidence rates for each age group the burden of illness is much more striking (figure 7)

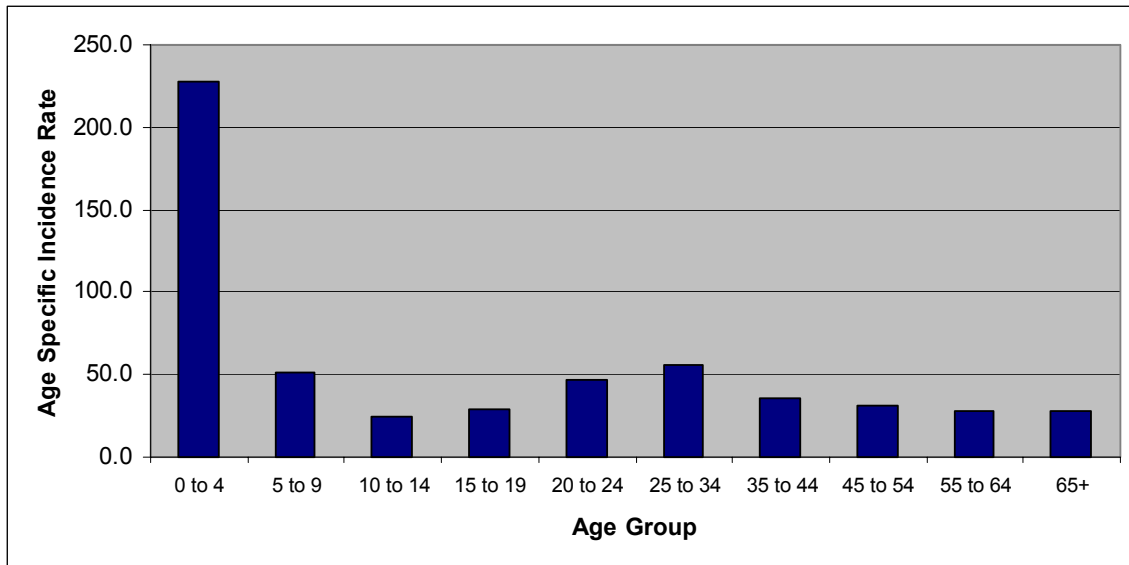


Figure 7: Age specific incidence rates for campylobacter enteritis in Ireland in 1999.

Looking more closely at those cases, the age distribution for children under 5 years is illustrated in figure 8.

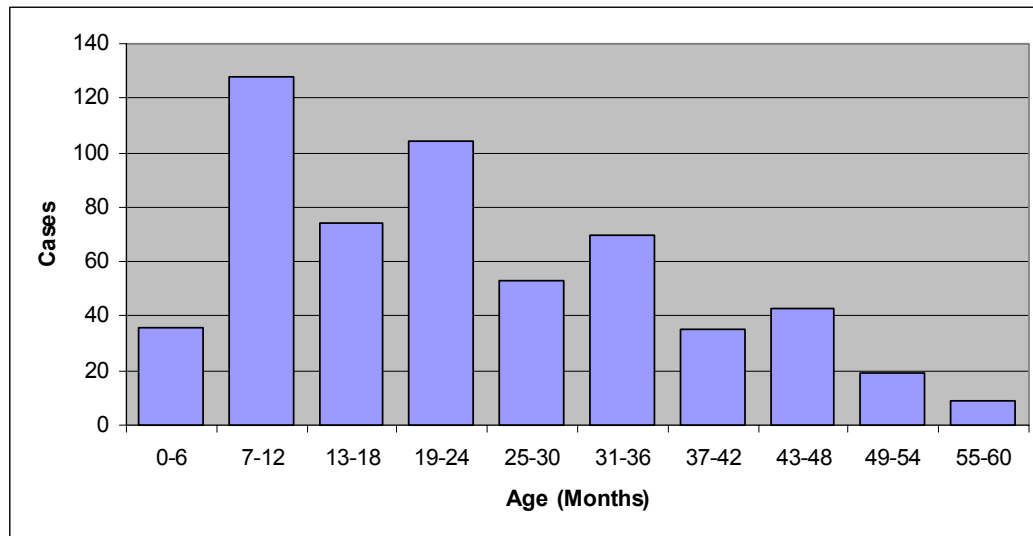


Figure 8: Cases of campylobacter enteritis in children under 5 years in Ireland (1999)

More work will be undertaken to look at campylobacter enteritis in each age group according to sex.

Discussion:

The data reveals a crude incidence rate of 57.5 cases per 100,000 persons, making it the single biggest cause of bacterial food-poisoning in Ireland. This compares with a rate of 51/100,000 in Northern Ireland, 104.9 in England and Wales and 116 in Scotland. It must be reiterated that these are laboratory confirmed cases and the real burden of illness is higher.

Risk factors for campylobacter include poultry and meat handling (cross contamination), contact with pets and occupational exposure. Outbreaks have been documented in some countries associated with water and consumption of raw milk. Pasteurisation does kill the organism. Campylobacteriosis is a serious illness but the symptoms are not so distinct as to allow differentiation from other causes of gastroenteritis. The stool does often contain blood, pus or mucus. There is severe abdominal pain and diarrhoea but vomiting is rare. It can cause bacteraemia and has been linked to the development of Guillain Barré Syndrome.

Further work is needed in Ireland to identify risk factors for those most at risk (those under five years of age) and to examine the reasons for the observed regional variation in incidence. The unusual sex distribution of the illness remains unexplained. NDSC/FSAI will continue working with our partners in surveillance to elicit more answers to these questions.

There can be significant morbidity associated with campylobacteriosis. It is a preventable zoonosis and good quality surveillance is key to enabling an appropriate and timely response to this and other microorganisms causing food poisoning.

References:

1. Whyte, D INFOSCAN 1998; 8: 1.

Appendix 1:

Age Distribution by period											
EHB	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65+	Total
January	11	4	3	1	3	4	2	2	0	1	31
February	14	3	1	1	1	4	4	3	1	1	33
March	4	3	3	1	4	12	7	7	0	1	42
April	5	0	2	2	2	12	7	4	0	4	38
May	12	9	2	3	10	15	9	5	3	4	72
June	17	8	3	4	6	12	7	4	3	3	67
July	9	6	1	6	4	11	7	6	4	3	57
August	7	2	0	1	6	5	5	4	2	3	35
September	6	2	2	6	4	11	5	4	0	2	42
October	7	0	1	1	2	7	3	1	2	5	29
November	13	4	2	6	9	13	3	5	5	2	62
December	3	2	0	1	5	3	4	3	0	0	21
											529

Age Distribution by month for Eastern Health Board 1999 (campylobacter enteritis)

Age Distribution by period											
MWHB	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65+	Total
January	1	1	0	0	0	0	0	0	0	0	2
February	0	0	0	0	1	0	1	0	0	0	2
March	2	0	1	0	0	1	0	0	1	0	5
April	1	0	1	0	0	0	1	1	1	1	6
May	6	3	2	0	3	1	1	2	0	2	20
June	8	1	0	0	1	0	1	1	0	0	12
July	1	2	0	0	0	2	1	0	1	0	7
August	2	3	1	0	0	0	2	0	2	1	11
September	2	0	0	0	0	1	1	1	0	0	5
October	0	0	0	0	0	0	0	0	0	0	0
November	0	0	0	0	0	0	0	0	0	0	0
December	0	0	0	0	0	0	0	0	0	0	0
											70

Age Distribution by month for Mid-Western Health Board 1999 (campylobacter enteritis)

Age Distribution by period											
MHB	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65+	Total
January	2	0	0	1	0	0	0	0	0	0	3
February	0	1	0	0	0	1	0	0	0	0	2
March	4	0	0	0	0	2	0	0	1	0	7
April	0	0	0	0	0	1	0	1	1	1	4
May	1	2	1	0	1	2	0	1	0	0	8
June	2	0	1	0	0	2	0	2	0	2	9
July	1	0	0	0	1	0	1	0	0	1	4
August	4	0	0	0	0	1	2	0	0	0	7
September	2	2	0	1	0	0	1	1	0	1	8
October	4	1	0	1	0	0	0	0	0	0	6
November	1	1	0	0	0	1	1	0	0	0	4
December	0	0	0	1	1	0	1	0	0	0	3
											65

Age Distribution by month for Midland Health Board 1999 (campylobacter enteritis)

Age Distribution by period											
NEHB	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65+	Total
January	1	0	0	1	0	1	0	0	0	0	3
February	1	0	0	0	0	0	0	0	0	0	1
March	1	0	1	1	0	0	1	1	0	0	5
April	1	0	0	0	0	0	3	0	0	1	5
May	1	0	1	0	0	0	0	0	0	0	2
June	1	0	0	0	0	1	0	1	0	0	3
July	0	0	0	0	0	0	0	0	0	0	0
August	1	0	0	0	0	0	0	1	0	1	3
September	1	0	0	0	0	1	1	1	1	0	5
October	0	0	0	0	0	0	1	1	1	0	3
November	0	0	0	1	0	0	0	0	0	0	1
December	0	0	0	0	0	0	0	0	0	0	0
											31

Age Distribution by month for North Eastern Health Board 1999 (campylobacter enteritis)

Age Distribution by period											
NWHB	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65+	Total
January	3	0	1	0	0	0	0	0	1	0	5
February	1	1	0	1	0	3	0	0	0	0	6
March	1	0	0	0	1	2	1	2	0	0	7
April	0	2	1	0	0	3	1	1	0	0	8
May	2	0	0	1	1	3	2	2	0	1	12
June	7	3	0	1	0	1	2	0	1	1	16
July	2	1	1	0	1	2	3	0	1	1	12
August	4	0	1	1	2	2	0	1	3	0	14
September	2	2	0	2	1	0	0	0	0	0	7
October	4	1	0	1	0	1	0	1	0	0	8
November	2	1	0	0	1	0	1	0	1	0	6
December	3	2	0	2	1	0	0	0	0	0	8
											109

Age Distribution by month for North Western Health Board 1999 (campylobacter enteritis)

Age Distribution by period											
SEHB	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65+	Total
January	4	0	1	1	0	1	0	1	1	0	9
February	5	1	0	0	0	1	1	0	0	0	8
March	12	0	0	0	0	2	4	0	0	3	21
April	8	1	1	1	3	4	2	1	0	3	24
May	15	4	0	1	1	3	3	2	0	4	33
June	11	4	0	2	4	6	2	2	2	3	36
July	7	5	3	2	0	4	3	2	1	2	29
August	6	2	0	2	2	2	1	0	0	2	17
September	3	0	0	0	0	1	1	1	0	0	6
October	6	0	3	0	3	1	2	0	0	2	17
November	2	0	0	1	1	1	1	0	0	1	7
December	6	1	0	0	3	1	0	0	0	0	11
											218

Age Distribution by month for South Eastern Health Board 1999 (campylobacter enteritis)

Age Distribution by period											
SHB	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65+	Total
January	11	3	1	0	3	5	2	1	3	1	30
February	14	3	2	4	4	4	3	0	2	0	36
March	20	1	3	2	4	6	3	1	0	1	41
April	11	1	0	2	1	7	3	1	0	0	26
May	22	3	4	6	6	10	2	7	1	1	62
June	24	4	1	1	3	9	5	5	2	3	57
July	13	2	8	1	5	7	3	2	3	6	50
August	19	4	1	3	0	11	7	1	5	1	52
September	17	3	2	2	2	6	2	3	1	1	39
October	7	2	3	3	3	7	3	2	0	1	31
November	9	2	2	0	2	3	4	3	1	4	30
December	3	2	2	3	1	3	1	3	0	0	18
											472

Age Distribution by month for Southern Health Board 1999 (campylobacter enteritis)

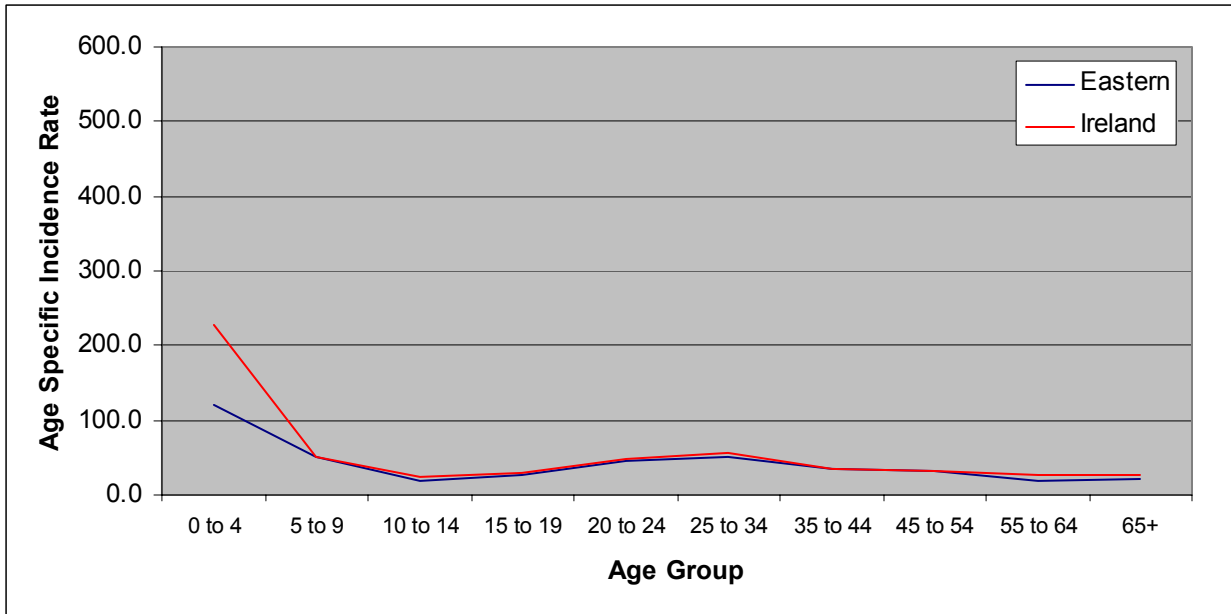
Age Distribution by period											
WHB	0 to 4	5 to 9	10 to 14	15 to 19	20 to 24	25 to 34	35 to 44	45 to 54	55 to 64	65+	Total
January	5	1	2	1	0	1	3	0	1	3	17
February	8	1	2	1	1	4	1	1	1	0	20
March	25	4	0	0	0	2	0	1	1	4	37
April	11	2	0	1	3	1	3	2	2	2	27
May	14	3	2	0	1	5	2	1	1	5	34
June	15	2	1	4	0	9	4	5	4	7	51
July	13	3	1	3	3	5	5	3	3	4	43
August	9	1	4	2	1	5	0	2	4	3	31
September	9	2	0	1	4	1	4	1	0	2	24
October	5	2	0	1	1	5	0	1	1	0	16
November	6	1	0	0	0	4	0	3	2	1	17
December	8	0	0	0	0	4	2	1	4	4	23
											340

Age Distribution by month for Western Health Board 1999 (campylobacter enteritis)

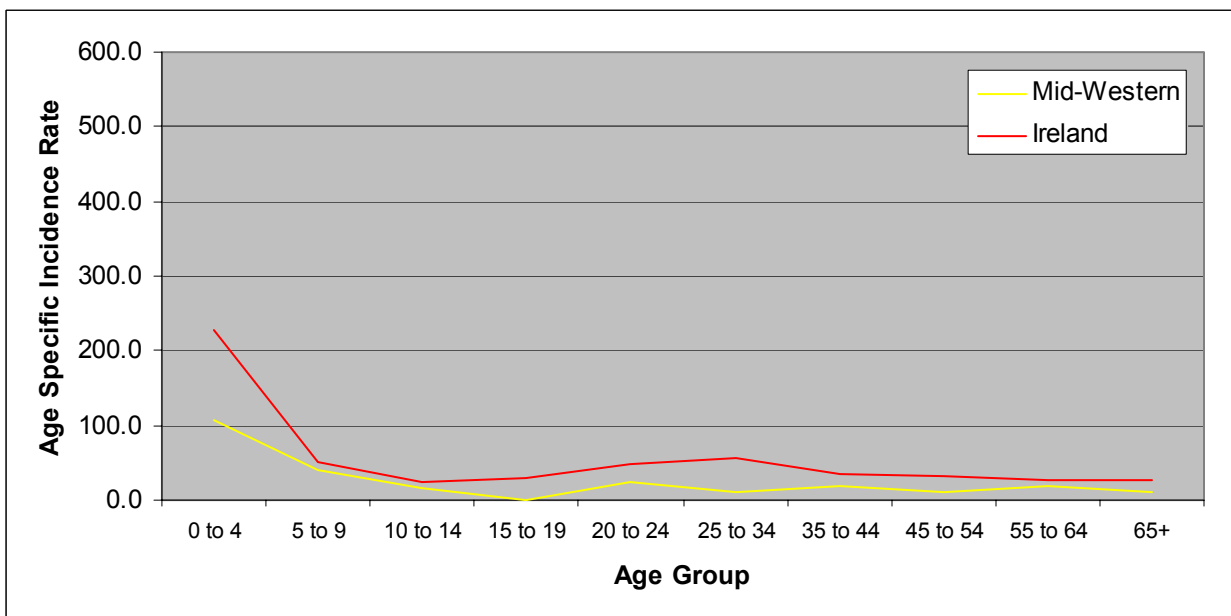
Appendix 2:

Age specific incidence rates were calculated for each health board to illustrate the relative burden of illness in each age group.

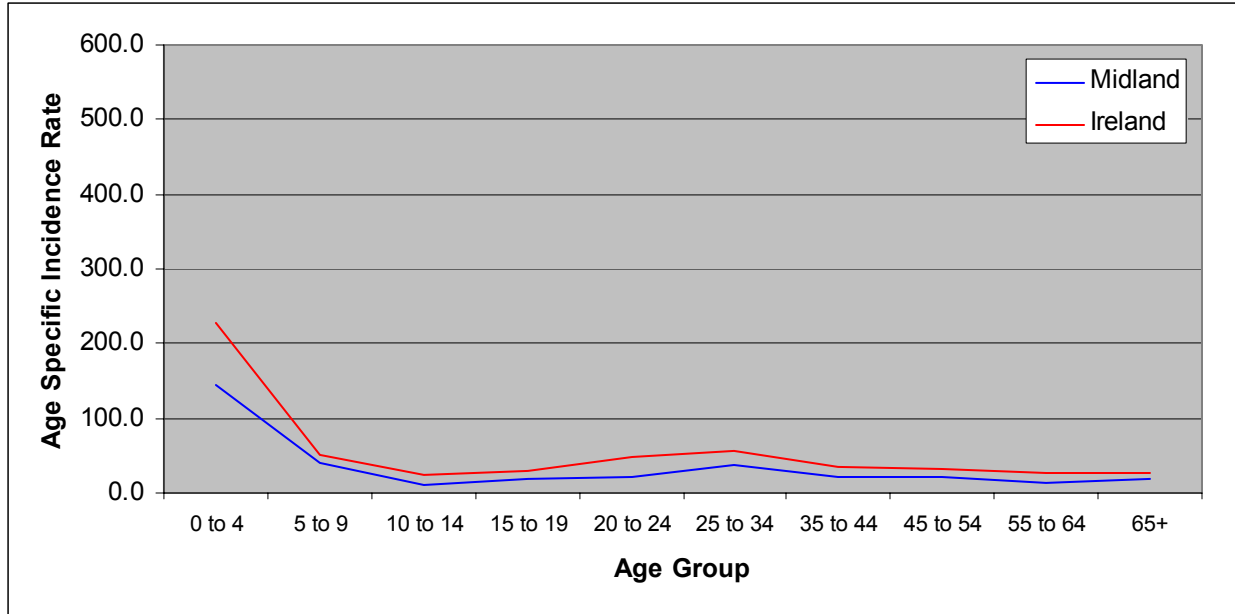
Age specific incidence rate for each age group in Eastern Health Board compared to Ireland (total) for campylobacter enteritis in Ireland in 1999.



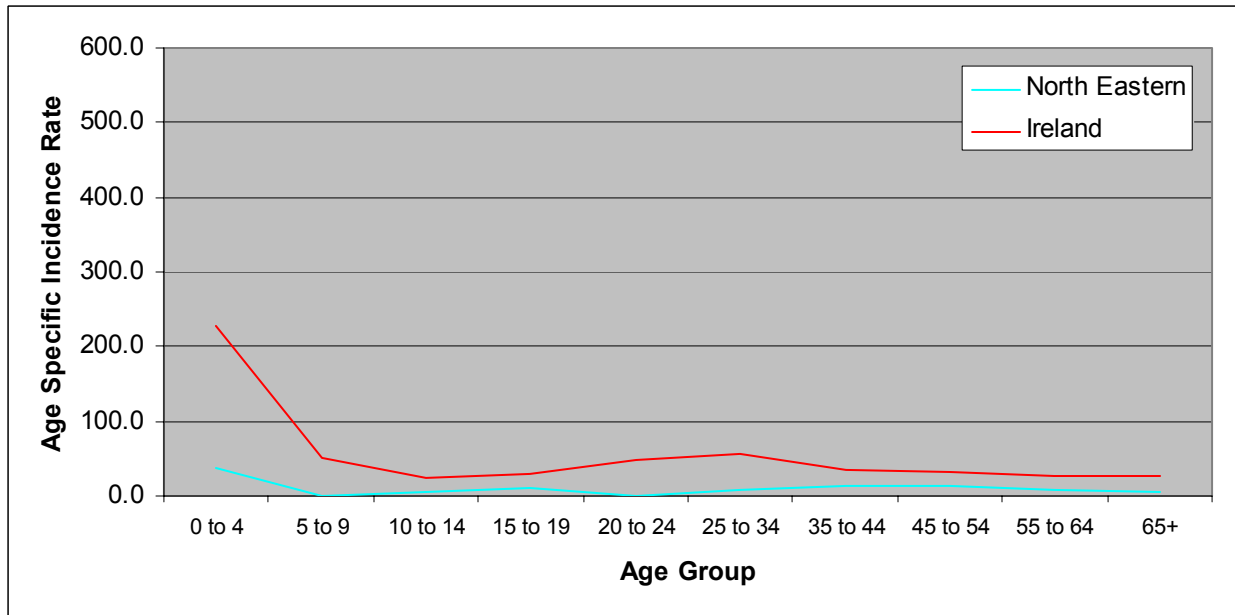
Age specific incidence rate for each age group in Mid-Western Health Board compared to Ireland (total) for campylobacter enteritis in Ireland in 1999.



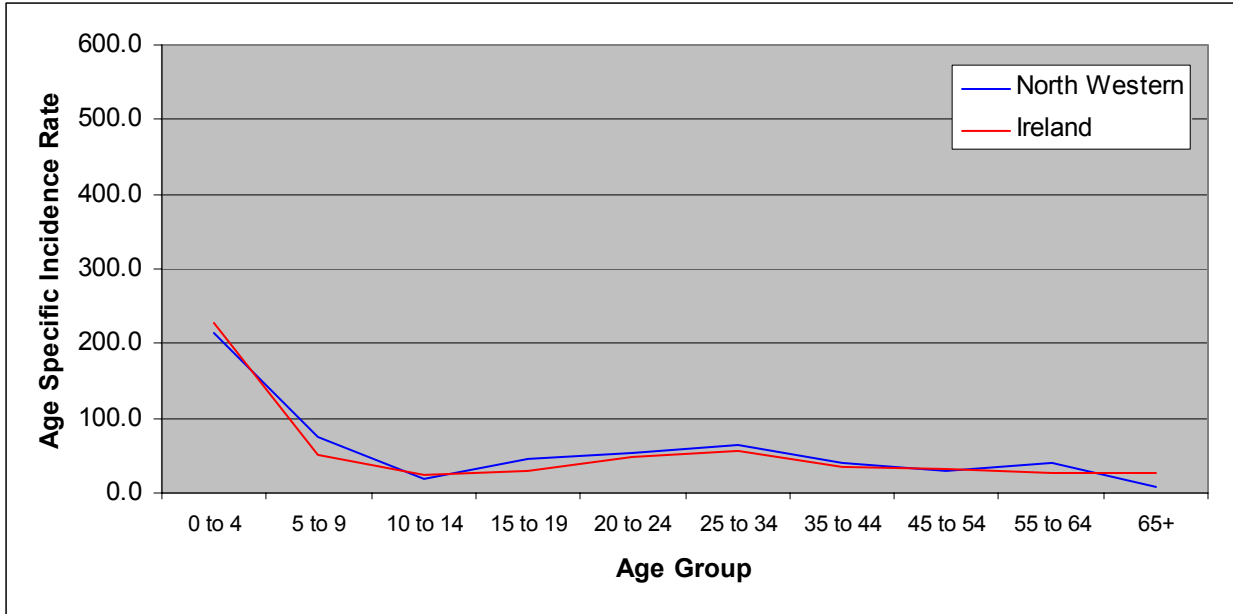
Age specific incidence rate for each age group in Midland Health Board compared to Ireland (total) for campylobacter enteritis in Ireland in 1999.



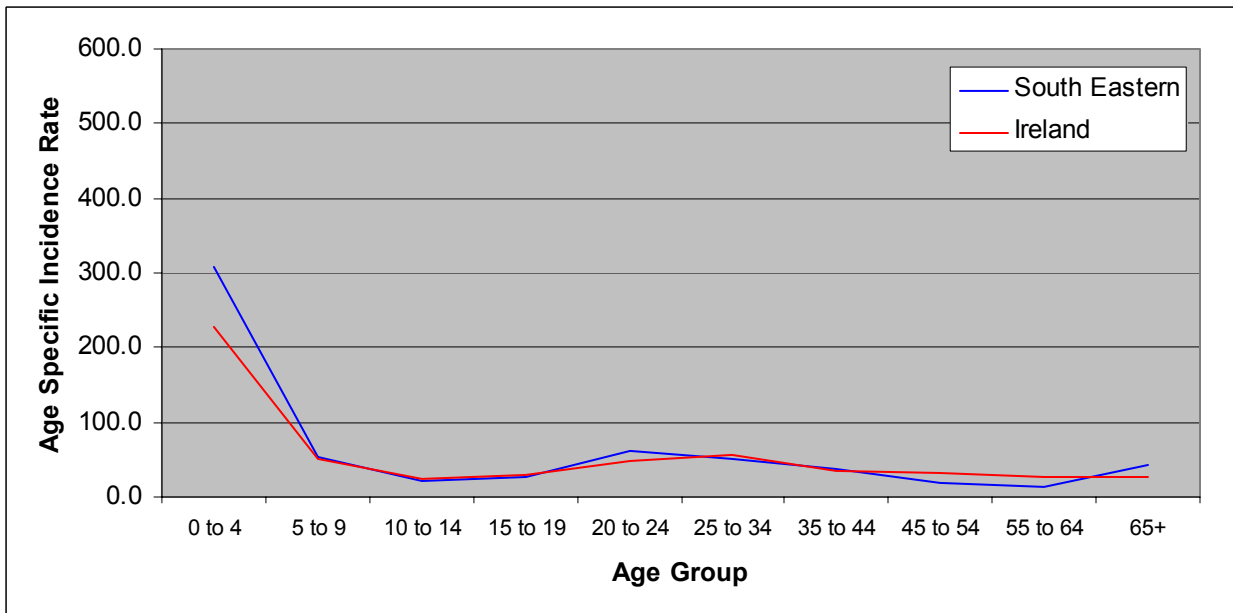
Age specific incidence rate for each age group in North Eastern Health Board compared to Ireland (total) for campylobacter enteritis in Ireland in 1999.



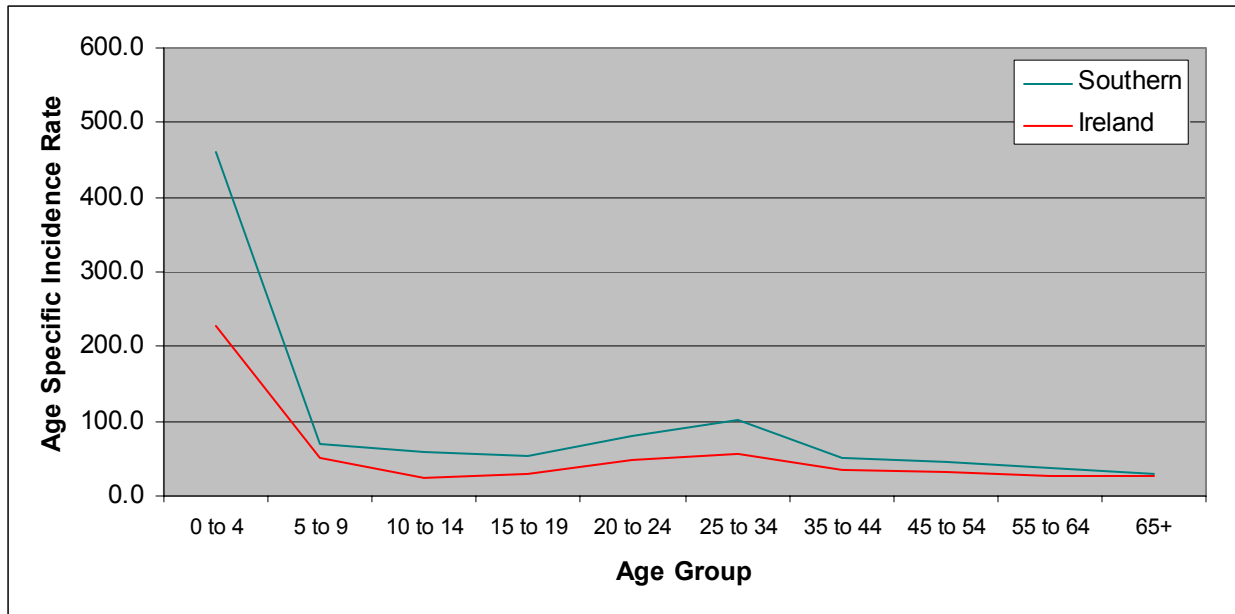
Age specific incidence rate for each age group in North Western Health Board compared to Ireland (total) for campylobacter enteritis in Ireland in 1999.



Age specific incidence rate for each age group in South Eastern Health Board compared to Ireland (total) for campylobacter enteritis in Ireland in 1999.



Age specific incidence rate for each age group in Southern Health Board compared to Ireland (total) for campylobacter enteritis in Ireland in 1999.



Age specific incidence rate for each age group in Western Health Board compared to Ireland (total) for campylobacter enteritis in Ireland in 1999.

