Epidemiology of Verotoxigenic *E. coli* O157 in Ireland, 1999

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Introduction
Verocytotoxin producing *Escherichia coli (VTEC)* of which E coli O157:H7 is the most common member, has emerged over the past decade as a serious global public health concern. Verocytotoxigenic E coli are capable of producing toxins that give rise to a wide range of symptoms including, non-bloody diarrhoea, haemorrhagic colitis, haemolytic uraemic syndrome and thrombotic thrombocytopenic purpura.

In Ireland, *E. coli* O157:H7 is not a notifiable disease. However, clinical microbiologists report suspect cases to public health colleagues so that appropriate public health action can be taken. In 1999, NDSC, in co-operation with the Directors of Public Health, established a surveillance system for VTEC O157. Since 1999, Specialists in Public Health Medicine and Area Medical officers have participated in a system whereby a standard dataset of information is collected on each case identified and reported to the National Disease Surveillance Centre. This information includes socio-demographic data, clinical data, possible risk factors and information on links between cases.

The case definitions that have been used in this system are as follows:

Clinical description
An infection of variable severity characterised by diarrhoea (often bloody) and abdominal cramps. Illness may be complicated by haemolytic uraemic syndrome (HUS) or thrombotic thrombocytopenic purpura (TTP); asymptomatic infections may also occur and are included as cases.

Suspected:
A case of post-diarrhoeal HUS or TTP
Probable:

- A case with isolation of *E coli* O157 from a clinical specimen (asymptomatic or symptomatic), pending confirmation of H7 or Shiga toxin or
- A clinically compatible case that is epidemiologically linked to a confirmed or probable case

Confirmed
A case that has isolation of *E coli* O157:H7 from a specimen or isolation of Shiga toxin-producing *E coli* O157:NM from a clinical specimen
Probable cases that were subsequently confirmed as not H7 or Shiga toxin producing were removed from the database.

Results
In 1999, 51 definite cases of *E coli* O157:H7 were reported, giving a crude incidence rate of 1.4 per 100,000 population. In addition, one probable case of VTEC O157 was identified. Subsequent analysis refers to the 51 definite cases.

Table 1: Number of cases of *E coli* O157:H7and crude incidence rate in Ireland, 1996-1999

Year	Number of reported cases	Crude incidence rate per 100,000 population
1996	8	0.22
1997	31	0.85
1998	76	2.1
1999	51	1.41

The age standardised incidence rate varied by health board as follows:

Table 2: Number of cases, crude incidence rate and age standardised incidence rate with 95% confidence intervals by health board, Ireland, 1999.

Health Board	Number cases	Crude incidence rate Per 100,000	Age standardised incidence rate per 100,000 [95% CI]
EHB	9	0.7	0.7 [0.2-1.1]
MHB	9	4.4	5.8 [2.5-9.1]
MWHB	12	3.8	3.9 [1.7-6.0]
NWHB	2	0.9	1.0 [0.4-2.3]
SEHB	6	1.5	1.5 [0.3-2.7]
SHB	9	1.6	1.7 [0.6-2.7]
WHB	4	0.6	0.5 [0.2-1.2]
NEHB	0	0	0
Total	51	1.4	

Twenty five (49%) cases occurred in females and 26 (51%) occurred in males. Most cases occurred in young children, with a second peak in the 25 to 44 year age group.

Table 3: Number (%) of cases of *E coli* O157:H7 in each age group, Ireland, 1999.

Age group	Number of cases	Percent
< 1 years	1	2
1-4 years	20	39.2
5-9 years	7	13.7
10-14 years	1	2
15-24 years	3	5.9
25-44 years	12	23.5
45-64 years	3	5.9
65 + years	4	7.8
Total	51	

The age specific incidence rate is shown in Figure 1

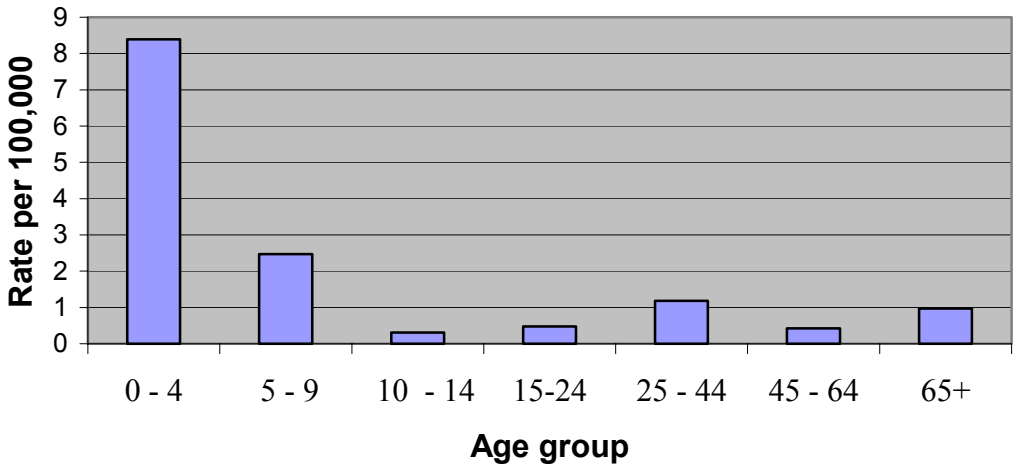


Figure 1: Age specific incidence rate of *E coli* O157:H7, Ireland 1999.

Clinical features
In total 43 (84.5%) of cases had symptoms, and 8 (15.7%) were asymptomatic. Reported symptoms included bloody diarrhoea in 20, and haemolytic uraemic syndrome (HUS) in 3 cases. The three cases of HUS occurred in children, ranging in age from 1 to 8 years. All three children recovered from their illness. One person died, but the cause of death was related to co-morbidity.

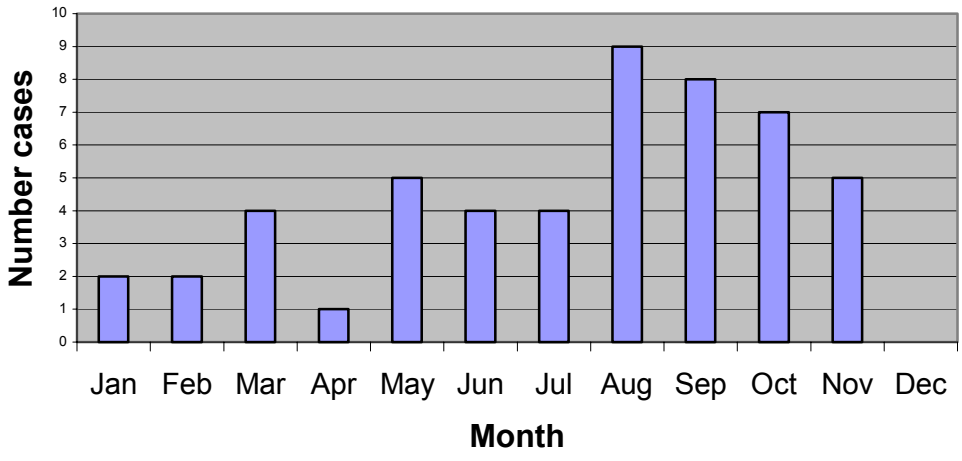
Laboratory findings
Phage typing of isolates/strains showed that 17 cases were PT 21/28 (33.3%) and 34 cases were PT 32 (66.7%). The majority of cases of PT 21/28 occurred in cases resident in the Mid Western Health Board region.

Table 4: Phage types of cases of *E coli* O157:H7 by health board, Ireland, 1999.

Health Board	N PT 21/28	N PT 32
EHB	4	5
MHB	0	9
MWHB	10	2
NWHB	0	2
SEHB	0	6
SHB	3	6
WHB	0	4
Total	17	34

The highest number of cases were identified in the late summer (Figure 2)

Figure 2: Cases of *E coli* O157:H7 by month of onset of symptoms (or of diagnosis, if asymptomatic), Ireland, 1999.



Many of the cases identified in 1999 occurred in association with other cases. In all, nine family outbreaks of *E coli* O157:H7 were detected in 1999. No generalised outbreaks of *E coli* O157:H7 were detected, although there was a generalised crèche based outbreak of *E coli* O26.

The first year of information from this enhanced surveillance system has allowed us to describe the epidemiology of *E coli* O157:H7 in Ireland. It is hoped to expand the system to include non-O157 toxin producing *E coli* in the near future.

Acknowledgements
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