Disease Surveillance Report of HPSC, Ireland

Epi-Insight

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Contents

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VTEC still significant cause of illness despite small drop in cases

Data for 2007 shows that there were 115 confirmed cases of Verotoxigenic E. coli (VTEC) notified in Ireland during 2007, a 25% drop when compared with the previous year.

Good hygiene practices are a crucial element of the management of outbreaks in crèches.

However, when 52 probable cases associated with a single outbreak are considered, a slight increase of nine cases is seen, giving a total of 167 for 2007 and a crude incidence rate (CIR) of 3.9 per 100,000, as shown in table 1. This means that Ireland has now the third highest level of reported VTEC illness in the EU.[1]

There was a decrease in the number of confirmed VTEC cases among both VTEC O157 and non-O157 infections. The ratio between the serogroups was similar to 2006 - 78% of confirmed cases in 2006 were VTEC O157 compare with 82% in 2007.

As in previous years, VTEC O157 was the most common serogroup reported among confirmed cases with 94 notifications. There were 13 cases of VTEC O26, with eight additional cases of other serogroups. One VTEC O157 case was co-infected with a VTEC O103 strain and one VTEC O26 case was co-infected with a VTEC O113 strain. Although not notifiable, one additional HUS case was reported as a suspected VTEC case.

Table 2 shows the verotoxin and phage typing results for VTEC isolates referred to the HSE PHL Dublin Mid Leinster, Cherry Orchard Hospital. As in previous years, PT32 was the commonest phage type reported accounting for 47% of the confirmed VTEC O157 reported. The second most common phage type this year was PT51.

The verotoxin profiles of VTEC strains were similar to those seen in previous years. Eighty-two per cent of VTEC O157 strains carried the genes for VT2 only while 18% carried the genes for both VT1 and VT2 as shown in table 2. In contrast, 61% of non-O157 VTEC isolates carried the genes for VT1 only, 35% for VT2 only, and 4% VT1 and VT2.

Information on symptoms was available for 158 notified cases. One hundred and thirty-six cases (86%) were reported as symptomatic, and reported symptoms included bloody diarrhoea in 40 cases. Unlike more common forms of gastroenteritis such as norovirus, VTEC illness can be particularly severe with up to 10% of patients developing haemolytic uraemic syndrome (HUS), which is the most common cause of kidney failure in children. There were five VTEC-associated HUS cases reported in 2007, a drop on the previous two years when 17 cases each, were reported. HUS cases ranged in age from 1 to 7 years, and notably, two HUS cases were associated with non-O157 VTEC - one VTEC O145 and one Ungroupable strain. The reporting of asymptomatic cases reflects the more extensive investigation of outbreaks that occurs now when compared even with 4-5 years ago.

Table 1. Number and crude incidence rates confirmed and probable VTEC, Ireland 2004-2007

Year	Confirmed cases	Probable cases	Total VTEC	CIR VTEC* (95% CI)
2004	61	0	61	1.4 (1.1-1.8)
2005	125	0	125	3.0 (2.4-3.5)
2006	153	5	158	3.7 (3.2-4.3)
2007	115	52	167	3.9 (3.3-4.5)

** Data from the 2006 census were used to calculate rates*

In 2008, provisional data suggests that drinking water from houses with private wells may be a highly significant factor in the increased number of VTEC cases reported.

Regional variation was noted in the numbers of cases reported, as shown in table 3. The highest incidence rate for VTEC overall was reported in the HSE-NW - in part due to the 52 probable cases reported which were associated with an outbreak during August 2007. However, even when only confirmed cases are included, the incidence rate was 7.2 per 100,000. The HSE-M also reported a relatively high incidence rate of 7.2 per 100,000.

The HSE-E and HSE-NW reported the highest numbers of non-O157 VTEC infections, as shown table 3. While it is possible that this reflects a true geographical difference in risk, it is more likely that this to some extent reflects regional differences in laboratory diagnostic practice for non-O157 infections.

The more urban HSE-E has consistently reported a lower incidence rate than other regions, which suggests that rural exposure is an important risk factor for VTEC infection in Ireland.

People in rural areas can be exposed to VTEC through direct contact with farm animals, their faeces, their environments, consumption of raw milk, or exposure to well water contaminated with agricultural runoff. Untreated drinking water from private wells has repeatedly been highlighted as a risk factor for VTEC infection in Ireland [2, 3, 4] In 2008, provisional data suggests that drinking water from private wells may be a highly significant factor in the increased number of VTEC cases reported.[5,6]

Twenty-one VTEC outbreaks were reported in 2007 – 67 of the 115 confirmed cases notified, plus the 52 probable cases. Four outbreaks were described as general outbreaks and 17 as family outbreaks. Sixteen were due to VTEC O157, three due to VTEC O26, one was caused by an Ungroupable strain and one was a mixed VTEC strain outbreak. The suspected modes of transmission reported are listed in table 4.

For one general outbreak and for one sporadic case in 2007, examination of water from the private wells of the affected households confirmed the presence of E. coli O157. For the general outbreak, the separate private wells of adjacent homes were contaminated. Drinking water from untreated private water supplies remains a very important risk factor for VTEC infection in Ireland.

Table 2. Verotoxin and phage typing results for VTEC isolates referred to the PHL HSE Dublin Mid Leinster, Cherry Orchard Hospital in 2007

Serogroup	PT	VT1 only	VT2 only	VT1 & VT2	Total
O157	2	0	5	0	5
	4	0	5	0	5
	8	0	0	9	9
	14	0	7	0	7
	31	0	1	0	1
	32	0	37	7	44
	33	0	1	0	1
	34	0	1	0	1
	43	0	1	0	1
	51	0	12	0	12
	21/28	0	5	1	6
	RDNC	0	1	0	1
	N/K	0	1	0	1
O26	-	12	0	1	13
O ungroupable	-	1	4	0	5
O103	-	0	1	0	1
O111		1	0	0	1
O113	-	0	1	0	1
O128	-	0	1	0	1
O145	-	0	1	0	1
Total	-	14	85	18	117

Note that for fifty-two probable cases reported on the basis of epidemiological linkage, isolates were not available for typing. Table 3 includes all strains isolated from mixed VTEC infections. All phage typing was undertaken at the HPA Laboratory of Enteric Pathogens (LEP), Colindale, UK

Table 3. Number of confirmed and probable VTEC cases by quarter and HSE area, crude incidence rate and age-standardised incidence rate by HSE area, Ireland 2007

Quarter	E	M	MW	NE	NW	SE	S	W	Total
Q1	2	0	0	2	4	0	0	2	10
Q2	4	5	6	4	1	3	2	0	25
Q3	6	12	9	5	59‡	4	9	3	107‡
Q4	7	1	2	1	5	2	3	4	25
VTEC O157	11	18	15	11	60‡	8	13	9	145‡
Non-O157 VTEC	8	0	1	3	9	1	1	0	20
Mixed infection	0	0	1	1	0	0	0	0	2
Total	19	18	17	12	69‡	9	14	9	167
CIR VTEC* (95% CI)	1.3 (0.7-1.8)	7.2 (3.9-10.5)	4.7 2.5-7.0)	3.0 (1.3-4.8)	29.1 (22.2-36.0) ‡	2.0 (0.7-3.2)	2.3 (1.1-3.4)	2.2 (0.8-3.6)	3.9 (3.3-4.5)

**Rates calculated using CSO census 2006*

‡ Includes 52 probable cases linked to a VTEC O157 outbreak

> *VTEC can also be spread from person-to-person and was the most common suspected mode of transmission for VTEC outbreaks reported in 2007.*

Table 4. VTEC outbreaks in Ireland 2007 by suspected mode of transmission

Suspected mode of transmission*	Number of outbreaks	Number confirmed cases	Number ill
Animal contact	1	4	1
Foodborne	1	4	56
Person-to-person	9	34	27
Waterborne	2	10	8
Unknown/Not specified	8	19	11
Total	**21**	**71**	**103**

VTEC can also be spread from person-to-person and was the most common suspected mode of transmission for VTEC outbreaks reported in 2007. In particular, there were two outbreaks in crèches -with 11 people reported ill - where person-to-person spread was believed to have been the primary mode of transmission. Infections can spread quite easily between young children, who are particularly at risk of severe complications following VTEC infection. Therefore, good hygiene practices, and excluding infected children, are crucial elements of the management of outbreaks in crèches.

A general outbreak linked to a hotel in the HSE-NW highlighted the potential for international outbreaks where people from different countries congregate and emphasizes the importance of good communication with partner agencies in other jurisdictions. In this instance, the first reported cases were from Northern Ireland and in the end only one of the four confirmed cases was from the Republic of Ireland. The outbreak control team identified 52 probable cases of VTEC among other guests. This highlights the fact that reporting of laboratory confirmed cases will sometimes only give a partial representation of the case distribution within an outbreak. Foodborne transmission was suspected although no specific food was implicated during investigations.

Molecular typing is now being used more often during outbreak investigations. Laboratory investigations during this particular outbreak showed the value of molecular typing methods by distinguishing between cases which were known to be epidemiologically linked to the outbreak location, and other unrelated E coli O157 cases which were occurring both locally and across Ireland during the same time period. Such studies can save both time and resources by targeting public health action towards those cases which are truly part of the outbreak.

The methodology and references for this article are available from the authors, by contacting info@hpsc.ie and the full scientific version of this Report is available at http://www.ndsc.ie/hpsc/A-Z/Gastroenteric/VTEC/Publications/AnnualReportsonEpidemiologyofVerotoxigenicEcoliO157/

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In Brief...

HPSC consults on dealing with deceased

New draft guidelines on avoiding the risk of disease from deceased individuals have been released for consultation by HPSC.

Although less than 1% of all deaths in Ireland are linked to a known or suspected infection, it is vital that mortuary workers, the funeral industry, healthcare workers and the public are aware of the potential risks of coming into contact with deceased individuals. However, infectious disease in the living remains a far greater threat than diseases in the dead.

The guidelines are available at www.hpsc.ie and any comments should be made to hpscconsultation@hse.ie by 31st March 2009.

ECDC visits Ireland

A delegation from the European Centre for Disease Control (ECDC) paid a three day visit to Ireland, in February to exchange experiences and information about preparedness for public health emergencies.

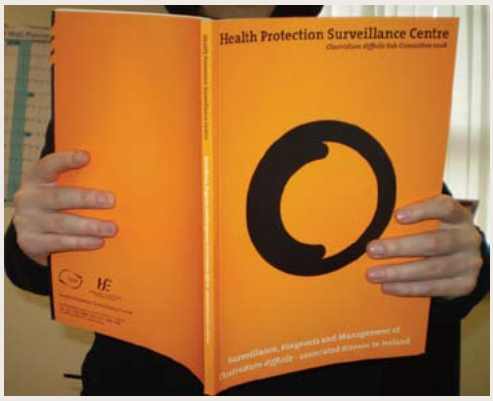
Led by Dr Pedro Arias Bohigas, ECDC's Head of Epidemic Intelligence and Emergency Operations Centre, the delegation visited the National Emergency Co-ordination Centre, based at the Department of Agriculture, which will be used in the event of a national public health emergency. The delegation also reviewed HPSC's crisis plans and discussed national arrangements for managing public health emergencies. Contributions were made by Dr Eibhlin Connolly and Chris Fitzgerald from the Department of Health and Children, Dr Kevin Kelleher and Gavin Maguire from the HSE and HPSC director Dr Darina O'Flanagan.

The visit was part of an ECDC plan to visit member states to improve levels of knowledge, exchange experiences and facilitate collaboration.

Left to right: Chris Fitzgerald DOHC, Dr Kevin Kelleher HSE, Dr Alanka Kraigher National Health Institute, Slovenia, Dr Pedro Arias Bohigas ECDC, Margaret Fitzgerald, Myles Houlden, Dr Derval Igoe all HPSC, Hakim Khenniche ECDC and Dr Eibhlin Connolly DOHC.

1607 cases of Clostridium difficile reported in 2008

1607 cases of Clostridium difficile-associated disease (CDAD) were reported to the Health Protection Surveillance Centre in 2008, giving a national crude incidence rate (CIR) of 37.9 cases per 100,000 population, as shown in table 1. Recurrent CDAD cases are not notifiable.



National Clostridium difficile guidelines are available from the HPSC.

All new CDAD cases were laboratory confirmed. As *Clostridium difficile* only became a notifiable disease in Ireland – under the category of acute infectious gastroenteritis - on 4th May 2008, this figure accounts for eight months of the year. Table 1 provides an estimate for the expected number of cases and the projected CIR in a full year.

A CDAD case is defined as a patient two years or older, to whom one or more of the following criteria applies:

- Diarrhoeal stools or toxic megacolon, with either a positive laboratory assay for *C. difficile* toxin A (TcdA) and/or toxin B (TcdB) in stools or a toxin-producing *C. difficile* organism detected in stool via culture or other means.
- Pseudomembranous colitis (PMC) revealed by lower gastrointestinal endoscopy.
- Colonic histopathology characteristic of *C. difficile* infection (with or without diarrhoea) on a specimen obtained during endoscopy, colectomy or autopsy).

More cases were notified in females - 61% - and in older patients, as shown in figure 1. The over 65 age category has the highest calculated age specific incidence rate (ASIR) at 245 per 100,000, and the highest overall incidence rate. 1147 of the national total were aged 65 or over and oldest person to contact CDAD was 103.

Table 1. CDAD in Ireland by HSE area 2008

HSE Region	No. Cases	CIR incl. 95% CI	Estimated No. Cases**	Estimated CIR incl. 95% CI**
East	758	50.5 [46.9 - 54.1]	1126	75.1 [70.7-79.5]
Midlands	37	14.7 [10.0 - 19.4]	55	21.9 [16.1-27.6]
Mid West	80	22.2 [17.3 - 27.0]	119	33.0 [27.0-39.0]
North east	36	9.1 [6.2 - 12.1]	53	13.5 [9.8-17.1]
North West	95	40.1 [32.0 - 48.1]	141	59.5 [50.0-69.3]
South East	122	26.5 [21.8 - 31.2]	181	39.3 [33.6-45.0]
South	256	41.2 [36.2 - 46.3]	380	61.2 [55.0-67.3]
West	223	53.8 [46.8 - 60.9]	331	80.0 [71.3-88.5]
Total	**1607**	**37.9 [36.0 - 39.8]**	**2388**	**56.32 [54.1-58.6]**

*Rates calculated using 2006 census data
**Using the number of notifications over this 35 week period, the estimated CIR for a 52 week period has been calculated

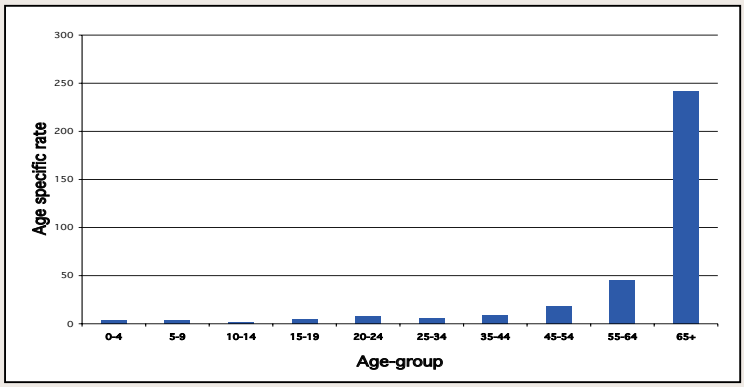


Figure 1: Age-specific incidence rate of CDAD in Ireland, Weeks 19-53 2008, per 100,000 populations

Table 2: C. difficile associated outbreaks, Weeks 01 – 53, 2008

Region	Organism/ Pathogen	Type	Transmission mode	Location	Number ill
E	*C difficile*	General	P-P	Hospital	42
S	*C difficile*	General	Not Specified	Comm. Hosp/Long-stay	8
S	*C difficile*	General	P-P	Hospital	5
S	*C difficile*	General	Unknown	Hospital	11
S	*C difficile* and Norovirus	General	P-P and Airborne	Residential institution	12
W	*C difficile*	General	Unknown	Hospital	18

Patients classified as "hospital inpatient" had the highest occurrence of cases accounting for 52.7% of all cases notified. Of the remaining, 6% were classified as GP patients, 2.7% hospital outpatient, 1.2% 'other', 0.3% hospital day patient and 27% as either "not specified" or "unknown". Healthcare institutions reported the most cases of CDAD (53%). This information represents the location of patient at diagnosis only. Enhanced information is required to determine the onset and origin of infection.

Five *Clostridium difficile* outbreaks and one mixed *C. difficile* and Norovirus outbreak were notified in 2008, as shown in table 2. All notified CDAD outbreaks were health-care associated.

For now, seasonal trends are indistinguishable as the dataset is not complete. Identification of seasonal patterns is also hindered by late notifications and batch notifications from some institutions. Regional CIR varies greatly, which may be due to differences in testing criteria and/or available testing facilities.

National guidelines for the surveillance, diagnosis, management, prevention and control of CDAD in Ireland are available at www.hpsc.ie/hpsc/A-Z/Gastroenteric/Clostridiumdifficile/

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