

Surveillance of Infectious Disease Outbreaks in Ireland, 2005

Key points

- 175 infectious disease outbreaks, of which 161 were gastroenteric/ infectious intestinal disease (IID) outbreaks were notified in 2005, which was a decrease on 2004
- The IID outbreaks were responsible for at least 2591 cases of illness
- Viral gastroenteritis caused by norovirus (NV) continues to be the most common cause of IID outbreaks (60% of IID outbreaks confirmed/suspected NV)
- The majority of IID outbreaks (61%) were reported to have occurred in healthcare settings

Introduction

The principal objective of the national outbreak surveillance system is to gain information on the epidemiology of all outbreaks of infectious disease in Ireland.

More specific objectives include measuring the burden of illness caused by outbreaks, identifying high-risk groups in the population and estimating the workload involved in the management of outbreaks. The information gathered can be used to inform public health professionals on the causes and factors contributing to outbreaks, to target prevention strategies and to monitor the effectiveness of prevention programmes.

Outbreak definition

An outbreak of infection or foodborne illness may be defined as two or more linked cases of the same illness or the situation where the observed number of cases exceeds the expected number, or a single case of disease caused by a significant pathogen. Outbreaks may be confined to some of the members of one family or may be more widespread and involve cases either locally, nationally or internationally.

Methods

Since 1st January 2004, outbreaks or "unusual clusters of changing patterns of illness" became notifiable under the Amendment to the Infectious Diseases Regulations.¹ (see outbreak definition in box above). Since that date, medical practitioners and clinical directors of diagnostic laboratories are required to notify to the medical officer of health any unusual clusters or changing patterns of illness, and individual cases thereof, that may be of public health concern.

Table 1. All outbreaks of ID, number of IID outbreaks and total numbers ill in IID outbreaks reported by health board (2005).

HSE Area	No. Outbreaks	Outbreak rate per 100,000 pop	No. ill in all outbreaks	No. of IID outbreaks
HSE-E	65	4.6	1534	61
HSE-M	10	4.4	117	9
HSE-MW	7	2.1	35	7
HSE-NE	13	3.8	125	12
HSE-NW	11	5	148	10
HSE-SE	31	7.3	477	31
HSE-S	31	5.3	255	25
HSE-W	7	1.8	57	6
Total	175	2.8	2748	161

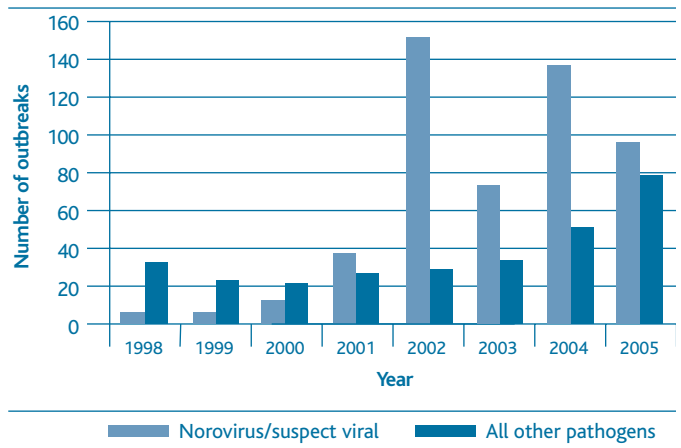


Figure 1. Number of outbreaks by year and by pathogen, 1998-2005 (Data prior to July 2001 provided by FSAI)

In addition since 1st January 2004, all outbreak data are being entered into the CIDR system database (either directly by the HSE-region, if that region has gone live onto CIDR) or indirectly by staff in HPSC.

Results

During 2005, 175 outbreaks of infectious disease were reported to HPSC, of which 161 were gastrointestinal/infectious intestinal disease (IID) outbreaks. The IID outbreaks were responsible for at least 2591 people becoming ill, and there were 205 reported hospitalisations. The regional distribution of all outbreaks of infectious disease, and those specifically IID are detailed in table 1. The highest number of outbreaks was reported from the HSE-ER region (n=65), although the highest outbreak rate was in the HSE-S (7.3/100,000). The lowest rate was reported from the HSE-W (1.8/100,000).

Causative Pathogen

The breakdown of IID and non-IID outbreaks by pathogen are outlined in Tables 2 and 3 respectively. The overall numbers of IID outbreaks reported, decreased compared with 2004. Continuing the trend observed in previous years, the IID outbreaks in 2005 have been dominated by norovirus/ suspect viral outbreaks, accounting for 60% of all IID outbreaks reported in 2005 (Figure 1). The largest single outbreak reported in 2005 was a norovirus outbreak in a hospital involving 187 people.

After norovirus, the next most commonly reported outbreaks were EHEC, *Salmonella enterica*, *Campylobacter* and *Cryptosporidium*.

There were 20 outbreaks of EHEC (19 VTEC) reported in 2005, four general and 16 family outbreaks. The largest VTEC outbreak involved a significant investigation and occurred at a private house/crèche in the HSE-MW. Nine cases were ill and 18 cases in total were confirmed positive for *E. coli* (VTEC) O157 (VT 2 positive) infection. Two cases with Haemolytic Uraemic Syndrome were hospitalised. Cases ranged in age from ten months to sixty-two years. Results from a case-control study indicated that potential exposure to drinking water from a vulnerable local private group water scheme was a risk¹.

Seventeen outbreaks of *S. enterica* were reported in 2005, affecting a total of 52 people and resulting in 12 hospitalisations. There were three general and 14 family outbreaks. Three outbreaks were travel related with the Czech Republic, Tunisia and Spain cited as the countries of infection.

The number of outbreaks reported that were attributable to *Campylobacter* rose from one in 2004 to eight in 2005. All eight outbreaks were family outbreaks, and the suspected mode of transmission recorded was foodborne (5), person-to-person (2) and unknown (1).

There were six outbreaks of cryptosporidiosis in 2005: four general and two family outbreaks. The largest outbreak reported was a community outbreak affecting 31 people in the Carlow town area. The mode of transmission was suspected as waterborne although only low levels of cryptosporidium were found in the town water supplies. A boil water notice was issued and subsequently lifted when sampling confirmed that the town supply was free from cryptosporidium.²

Table 2. Pathogens associated with IID outbreaks notified in 2005

Disease	Number of outbreaks	Number ill
Noroviral Infection	61	1891
Suspected Norovirus	32	297
EHEC	20	53
Salmonella	17	52
Campylobacter	8	17
Unknown	8	119
Cryptosporidium	6	49
Norovirus & C. difficile	3	32
C. difficile	2	20
Shigellosis	2	44
Giardiasis	1	3
Rotavirus	1	14
Total	161	2591

Fourteen outbreaks of non-IID/gastroenteric diseases were notified in 2005. Table 3 outlines the pathogens implicated and numbers ill. Further details on the non-IID outbreaks are available in the individual disease chapters. It is hoped that surveillance data on these outbreaks will improve in the coming years.

Mode of Transmission

Similar to previous years, person-to-person spread is the mode of transmission reported for the majority of outbreaks of IID in 2005 (table 4). Most of these outbreaks were due to norovirus/ suspect viral. Like 2004, the foodborne route was the second most frequently suspected mode of transmission and was identified in over 12 outbreaks in 2005. For many outbreaks more than one mode of transmission was suspected.

Location

As in previous years, the commonest location in which outbreaks occurred in 2005 was healthcare settings (table 5). 61% of all reported IID outbreaks occurred in these settings. Nine outbreaks were associated with foreign travel in 2005 compared to only one travel associated outbreak in 2004. Salmonella accounted for three of these outbreaks followed by Norovirus (2), EHEC (2), Cryptosporidium (1) and Shigella (1).

Seasonal distribution

When the IID outbreaks in 2005 are analysed by month of onset of illness of first case, it is seen that the majority of outbreaks occurred in the first 4 months of the year (Figure 2). This peak is attributable to the number of Norovirus outbreaks that occurred at this time. Norovirus was previously

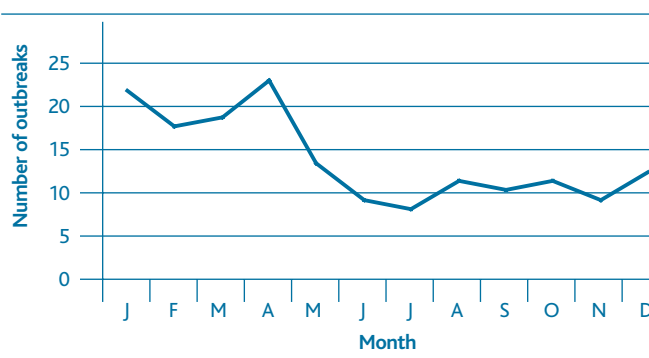


Figure 2. Seasonal distribution of IID outbreaks, 2005.

known as "Winter Vomiting" disease due to the increase in outbreaks that would occur during winter months.

Discussion

In 2005, all outbreaks of infectious diseases became notifiable for the first time, under the new Infectious Diseases Legislation.³ There was an decrease in the overall number of outbreaks reported nationally in 2005, with 161 outbreaks of IID notified, compared to 169 in 2004.

As observed in recent years, viral gastroenteritis, principally caused by norovirus, accounted for the majority of outbreaks reported in 2005 (60% of IID outbreaks confirmed/suspected NV). Detailed molecular detection and typing of norovirus isolates was introduced by the National Virus Reference Laboratory (NVRL) in 2003, which has enabled us to study in much greater detail the molecular epidemiology of strains causing outbreaks. This data is routinely submitted to the European network 'Divine-net', which is an extension of the previous network entitled "Foodborne Viruses in Europe".⁴ Divine-net aims to merge epidemiological and virological data on outbreaks of viral gastroenteritis, including norovirus, across Europe.

In 2005 travel associated outbreaks were a significant feature. In total nine outbreaks were travel associated, including a large norovirus outbreak on a cruise ship that affected 95 individuals.

An outbreak of shigellosis associated with travel to Egypt was identified in June 2005 involving over half the passengers on a flight from Luxor, in Egypt. The Egyptian authorities were

Table 3. Non-IID outbreaks notified in 2005

Disease	Number of outbreaks	Number ill
Mumps	6	39
HiB	1	2
Influenza A	1	42
Influenza B	1	33
Legionellosis	1	NK
Tuberculosis	1	8
Probable Varicella	1	9
Scabies	1	4
Suspected streptococcal infection	1	20
Total	14	157

Table 5. IID Outbreaks by location, 2005.

Location	Number of IID Outbreaks
Hospital	59
Residential Institution	40
Private House	38
Travel Related	9
Community outbreak	4
Hotel	3
Not Specified	3
Other	3
Creche	1
Public House	1
Total	161

alerted and appropriate measures were put in place. Subsequent investigations could not conclusively identify the source of infection.⁵

In October 2005 Health Protection Scotland identified an international outbreak of *S. Goldcoast* infection in tourists returning from Majorca. An alert through Enter-Net and the European Commission’s Early Warning and Response System (EWRS) led to an international response with active case finding. In total 148 cases were identified in 10 different countries – including six cases in Ireland. Despite extensive investigations the source of infection was not identified. The outbreak was declared over on the 1st December 2005.

Outbreak data has been entered into the CIDR system since the beginning of 2004, therefore real time data on outbreaks is available to all CIDR users nationally as they go-live on the system. With the continued national roll-out of CIDR, it is hoped enhanced surveillance data on all outbreaks of infectious disease will be even more timely and complete as users enter their own outbreak data.

This will enable epidemiological, microbiological and environmental data relating to the outbreak to be shared locally and nationally, and should greatly assist in the management and control of outbreaks, as well as allowing analysis of the national data to inform future public health policies.

Table 4. Principal mode of transmission reported in outbreaks of IID (2005).

Primary Mode of Transmission	Number of IID Outbreaks
Person-to-person	106
Unknown	20
Foodborne	12
Not Specified	8
P-P and Animal	3
P-P and FB	3
P-P and WB	3
FB and Animal	2
FB and Airborne	1
FB and WB	1
P-P and Airborne	1
Waterborne	1
Total	161

References

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Acknowledgements

We wish to sincerely thank all the contributors to the national outbreak surveillance system, namely, Directors of Public Health, Specialists in Public Health Medicine, Senior/ and Area Medical Officers, Surveillance Scientists, Clinical Microbiologists, Medical laboratory scientists and Environmental Health Officers.