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Annual Report on Infectious Disease Outbreaks in Ireland, 2004

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Introduction

Outbreak investigations aim to identify the source of the outbreak, institute control measures and prevent additional cases. The information gathered during outbreak investigations can be used to determine possible ways of preventing future outbreaks. 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.

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 2004, 187 outbreaks of infectious disease were reported to HPSC, of which 169 were gastrointestinal/ infectious intestinal disease (IID) outbreaks. The IID outbreaks were responsible for at least 4008 people becoming ill, and there were 115 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 ERHA region (n=67), although the highest outbreak rates were in the SHB and NEHB (both 6.9/100,000). The lowest rate was reported from the Western health board region (1.8/100,000).

Table 1. All outbreaks of ID, number of IID outbreaks and total numbers ill in IID outbreaks reported by health board (2004).

Health Board	Number of Outbreaks	Outbreak rate per 100,000 pop.	No. ill in all outbreaks	No. of IID outbreaks
ERHA	67	4.8	1949	61
MHB	9	4.0	218	9
MWHB	8	2.4	290	8
NEHB	21	6.1	315	19
NWHB	12	5.4	336	8

SEHB	23	5.4	390	21
SHB	40	6.9	569	36
WHB	7	1.8	85	7
Total	**187**	**4.8**	**4152**	**169**

Causative Pathogen

The breakdown of IID and non-IID outbreaks by pathogen are outlined in Tables 2 and 3 respectively. In 2004, as has been the trend since the year 2000, the IID outbreaks have been dominated by norovirus/ suspect viral outbreaks, comprising 81% of all IID outbreaks in 2004 (Figure 1). The overall numbers of IID outbreaks reported, increased compared with 2003.

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

There were ten outbreaks of EHEC reported in 2004, one general and nine family outbreaks. The general outbreak involved a significant investigation and occurred at a sports event in June 2004. Four cases were confirmed as *E. coli* (VTEC) O157 (VT1 and VT 2 positive) infection. Three cases were hospitalised. Cases ranged in age from twelve to forty-nine years. Epidemiological, environmental and microbiological investigations implicated the consumption of water from the sports club as the cause of the outbreak. Consumption of this water was prohibited as soon as it was confirmed as a possible source of infection and this action effectively ended the outbreak.

Interestingly, a microbiological and/or epidemiological link with waterborne transmission was also found for a number of the family outbreaks/clusters of VTEC in 2004. In addition, contact with animals was also suspected for a number of the waterborne outbreaks.

There were eight outbreaks of *S. enterica* reported, one general, six family outbreaks, and one small outbreak was deemed to be travel-associated. The general outbreak was caused by *S*. Typhimurium and occurred in a restaurant in the WHB region. Ten persons became ill, and the food implicated in the outbreak epidemiologically, was tiramisu dessert. The restaurant was closed during the investigation and subsequently no additional cases were identified.

There were five outbreaks of cryptosporidiosis reported in 2004, four general and one family outbreak. All the general outbreaks were reported as waterborne.

Two outbreaks of shigellosis were notified, one general and one family outbreak. The general outbreak occurred in a crèche and eleven children were reported ill.

Eighteen outbreaks of non-IID/gastroenteric diseases were notified in 2004, which is the highest numbers reported since we initiated surveillance of all infectious disease outbreaks. 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.

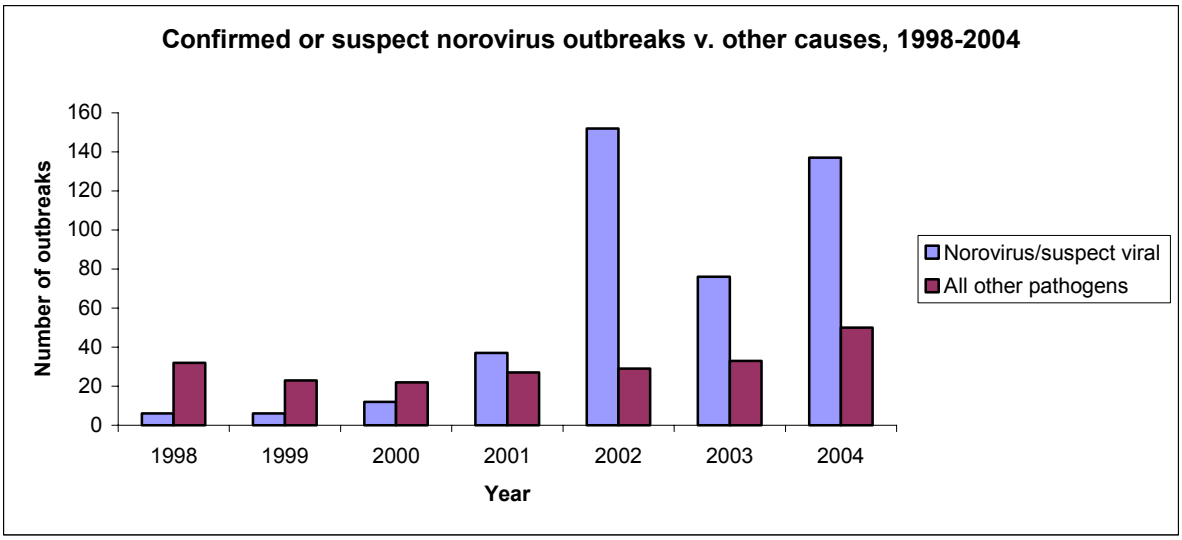

Figure 1. Number of outbreaks by year and by pathogen, 1998-2004
(Data prior to July 2001 provided by FSAI)

Table 2. **Pathogens associated with IID outbreaks notified in 2004.**

Disease	Number of outbreaks	Number ill
Noroviral Infection	78	2838
Suspect norovirus	59	1038
Enterohaemorrhagic *Escherichia coli*	10	17
Salmonellosis	8	30
Cryptosporidiosis	5	25
Shigellosis	2	15
Campylobacter infection	1	2
Giardiasis	1	2
Rotavirus	1	5
C. difficile	1	11
Unknown	3	25
Total	**169**	**4008**

Table 3. **Non–IID outbreaks notified in 2004**

Disease	Number of outbreaks	Number ill
Hepatitis A (acute)	3	8
Measles	2	7
Mumps	2	16
Hepatitis B (acute and chronic)	1	3
Leptospirosis	1	5
Vancomycin Resistant Enterococci	1	n/a
Meningococcal disease	1	3
Tuberculosis	1	3
Chickenpox	1	3
MRSA	1	4
Respiratory suspected viral	1	65
Suspected Rubella/Parvovirus	1	11
Suspected Scabies	1	5
Not identified	1	11

TOTAL	**18**	**144**

Mode of Transmission

Similar to previous years, the principal mode of transmission was reported to be person-to-person spread in the majority of outbreaks of IID reported in 2004 (Table 4). Most of these outbreaks were due to norovirus/ suspect viral.

There were twelve outbreaks where the primary mode of transmission was described as foodborne, and six outbreaks were deemed to be waterborne in 2004, compared to 2003 when there no reports of waterborne outbreaks. There was also an increase in the number of outbreaks reported to be due to contact with livestock compared with 2003.

Table 4. Principal mode of transmission reported in outbreaks of IID (2004).

Primary Mode of Transmission	Number of IID Outbreaks
Person to person	136
Foodborne	12
Waterborne	6
Animal contact	3
Not Specified	12
Total	**169**

Location

Similar to the trend which first emerged in 2002, the commonest location in which outbreaks occurred in 2004 was healthcare settings (Table 5). 69% of all reported outbreaks occurred in these settings. The greatest number of people ill was also associated with outbreaks in the health-care sector.

Table 5. IID Outbreaks by location, 2004.

Location	Number of IID Outbreaks
Hospital	68
Residential institution	49
Private house	17
Hotel	12
Not Specified	7
Other	6
School	4
Restaurant / Cafe	3
Crèche	1
Public house	1
Travel related	1
Total	**169**

Seasonal distribution

When the IID outbreaks in 2004 are analysed by month of onset of illness of first case, it is seen that the majority of outbreaks occurred in the winter months of November and December (Figure 2). This is not surprising as the majority of outbreaks of norovirus occur during the winter season.

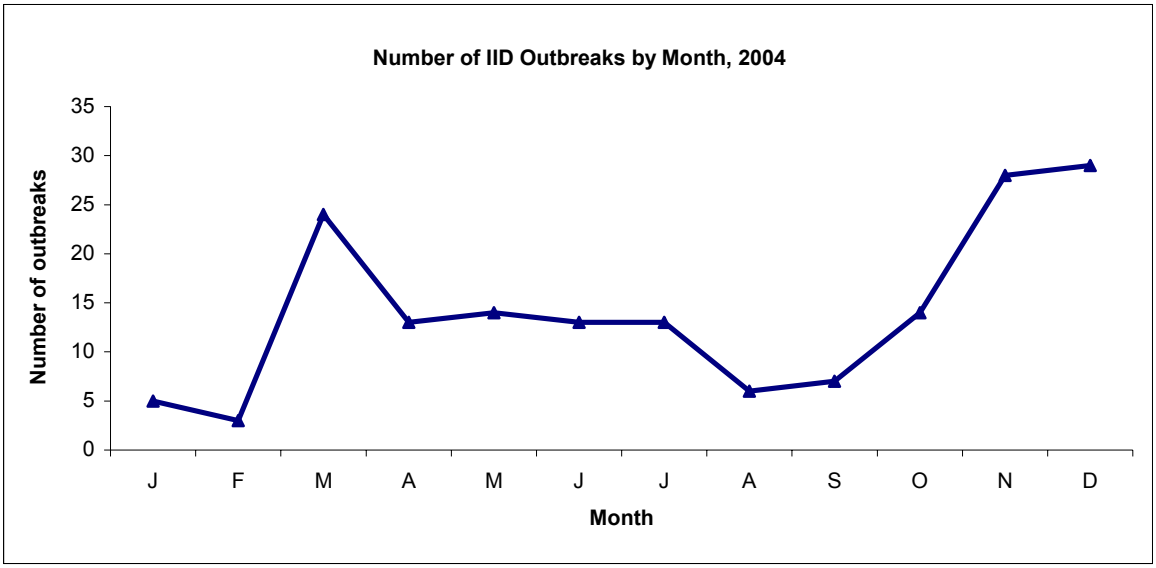

Figure 2. Seasonal distribution of IID outbreaks, 2004.

Discussion

In 2004, all outbreaks of infectious diseases became notifiable for the first time, under the new Infectious Diseases Legislation.[1] There was an increase in the overall number of outbreaks reported nationally in 2004, with 169 outbreaks of IID notified, compared to 102 in 2003. In addition, the highest number of non-IID outbreaks since the surveillance system commenced was notified in 2004 (n=18).

The 2004 outbreak data continues the trend in recent years of a predominance of outbreaks of viral gastroenteritis, principally caused by norovirus (81% 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 in Ireland.

A one-year North-South study funded by FSPB, coordinated jointly between HPSC and NVRL in the ROI, commenced in 2004. The aim of this study was to merge epidemiological and virological data on norovirus outbreaks on the island of Ireland by genotyping and obtaining sequence date from one sample of every outbreak detected North and South for a one-year period. The study is due to be completed in October 2005 and will be published shortly thereafter. Some interesting trends have emerged from preliminary analysis of the data such as the emergence of the GII-4 (2004 variant) so-called "Jam" strain in the winter season of 2004.[2]
This strain was originally detected in Europe at an outbreak of NV at an international scout jamboree held in the Netherlands in the summer of 2004[3], but has subsequently

been detected across Europe and in Japan and Taiwan. This variant had been recognised in Australia during the 2004 southern hemisphere winter season.[4]

In 2004, Ireland also joined the European network 'Divine-net', which is an extension of the previous network entitled "Foodborne Viruses in Europe".[5] This network aims to merge epidemiological and virological data on outbreaks of viral gastroenteritis, including norovirus, across Europe.

Water was seen to be an important mode of transmission from analysis of the 2004 data, with a general cross-health board outbreak of VTEC O157, as well as a number of smaller family outbreaks confirmed/suspected to be waterborne. In addition, four small general outbreaks of cryptosporidiosis were considered to be waterborne. With the potential for a substantial number of people to be exposed in such outbreaks, the message must be reinforced that untreated water supplies, particularly from private wells, may pose a significant risk to public health.

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. It is hoped that as national roll-out on CIDR is achieved, 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.

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