



Annual Report on Outbreaks of Infectious Intestinal Disease (IID) in Ireland, 2002

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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 objectives of the national outbreak surveillance system are 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 July 2001, public health professionals are requested to report all investigated outbreaks of infectious intestinal disease to NDSC using a preliminary notification form (by fax or email). A follow-up investigation form and/or final report is then forwarded by the lead investigator at the end of the investigation. The data collected include information on the source of reporting of the outbreak, the extent of the outbreak, mode of transmission, location, pathogen involved, laboratory investigation, morbidity and mortality data, suspected vehicle and factors contributing to the outbreak. These data are stored and analysed in a Microsoft Access database in NDSC.

Results

During 2002, 188 outbreaks of infectious gastrointestinal disease were reported to NDSC, resulting in at least 8027 people becoming ill. 1296 people were reported to have been hospitalised (16%). Table 1 shows the regional distribution of outbreaks during 2002. The majority of outbreaks were reported from the ERHA region (n=83).

Table 1. Number of outbreaks of IID and total numbers ill reported by health board (2002).

Health Board	Number of Outbreaks	Number ill
ERHA	83	4316
SEHB	32	1386
MHB	19	368
SHB	17	1008
MWHB	12	433

NEHB	9	219
NWHB	9	102
WHB	7	195
Total	188	8027

Causative Pathogen

The most notable feature of analysis of the IID outbreak data from 2002 is the dramatic increase in the number of outbreaks either confirmed or suspected to be due to norovirus. This is most evident in Figure 1 when outbreak data from 1998 to 2002 are examined. The breakdown of the 2002 outbreaks by pathogen is shown in Table 2. Noroviruses are seen to account for 154/188 (82%) of all outbreaks of IID reported to NDSC in 2002 (see Figure 2). This compared to 2001 when suspect or confirmed norovirus accounted for 58% of all IID outbreaks. Other viral causes of outbreaks in 2002 included rotavirus, adenovirus and suspect enterovirus.

After norovirus, the next most commonly reported outbreaks were *Salmonella enterica* and *E. coli* O157. All of the *E. coli* outbreaks occurred in private homes and were identified as part of active case finding during epidemiological investigations of single cases. There was an increase in the number of *S. enterica* outbreaks reported compared to 2001. Two were identified as *S. Typhimurium*, two as *S. Enteritidis* and serotyping information was not available on the other three. There was one small general outbreak of salmonellosis that occurred in a residential institution, with all of the remainder being family outbreaks. There was one outbreak of *Campylobacter jejuni* reported in 2002, associated with eating in a restaurant.

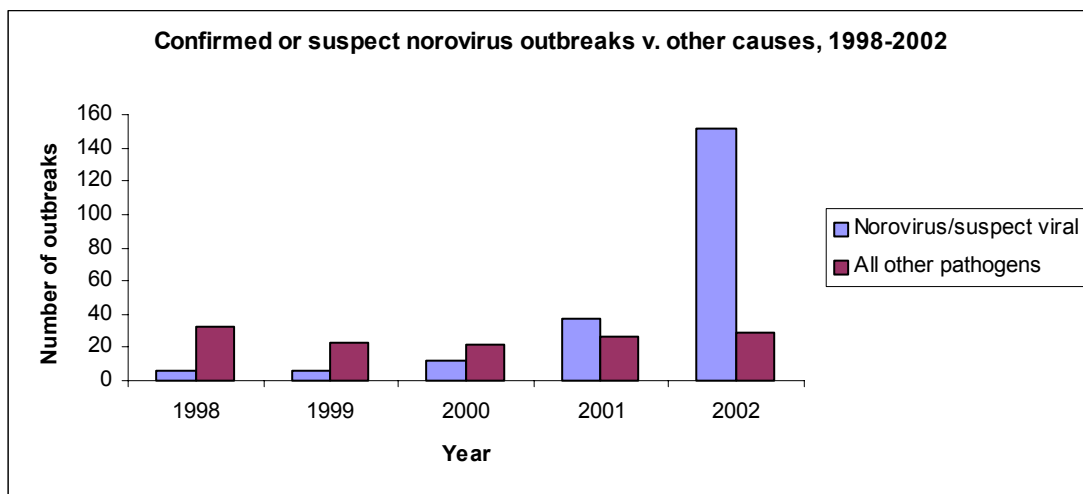


Figure 1. Number of outbreaks by year and by pathogen, 1998-2002
(Data prior to July 2001 provided by FSAI)

Table 2. Pathogens associated with outbreaks with numbers ill, 2002.

Pathogen	Number of Outbreaks	Number ill
Norovirus	98	6776
Suspect Viral	56	881
<i>Salmonella sp</i>	7	27
<i>E. coli</i> O157	7	19
<i>Cryptosporidium sp</i>	3	63

Rotavirus	2	18
Adenovirus	1	11
<i>Campylobacter jejuni</i>	1	7
<i>Clostridium difficile</i>	1	6
Enterovirus (suspect)	1	132
<i>Shigella sonnei</i>	1	4
<i>Staph. aureus</i>	1	7
Not known	9	76
Total	188	8027

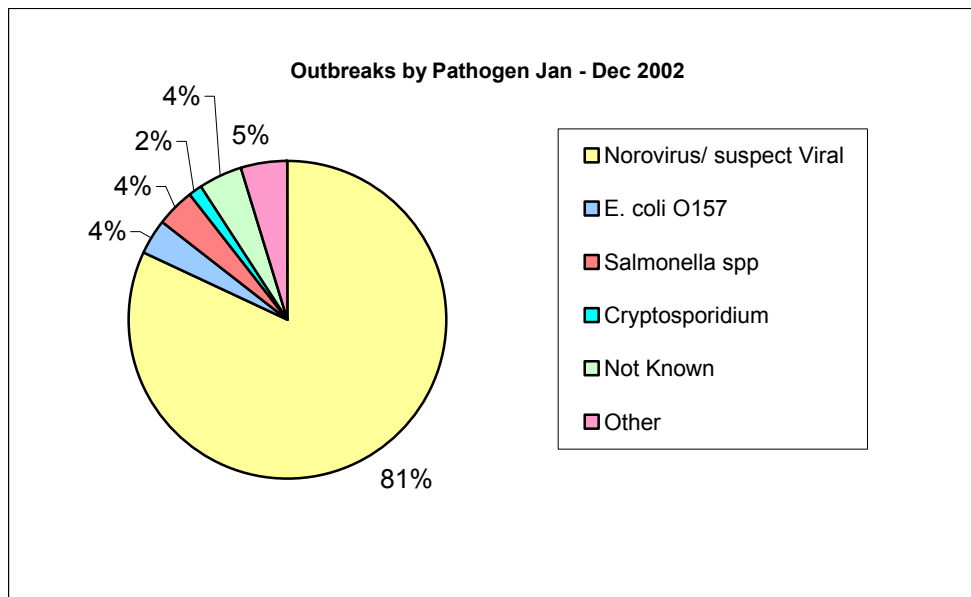


Figure 2. Outbreaks of IID reported in 2002 by pathogen

Mode of Transmission

In the majority of outbreaks of IID in 2002, the principal mode of transmission of the illness was reported as person-to-person (Table 3). Not surprisingly, the majority of outbreaks with this mode of transmission were norovirus/suspect viral as shown in Figure 3. This also serves to explain the high attack rates in these outbreaks.

Table 3. Principal mode of transmission reported in outbreaks of IID (2002).

Mode of Transmission	Number of Outbreaks
Foodborne	7
Person-to-person	185
P-P/Foodborne	4
Waterborne	3
Waterborne/Animal	1
Unknown	8
Total	188

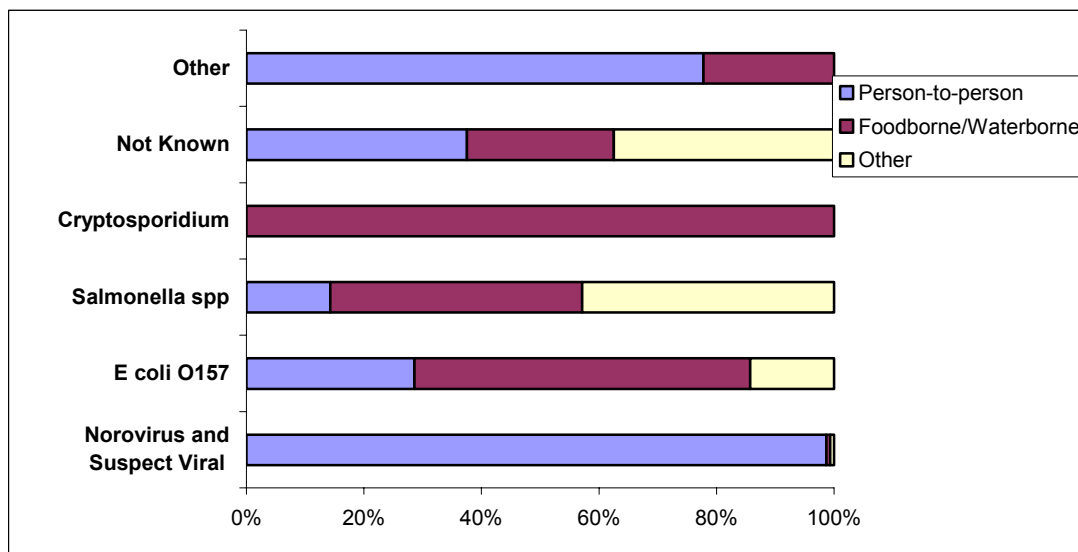


Figure 3. Number of outbreaks by pathogen and mode of transmission (2002).

Location

As is seen in Table 4, the commonest location that outbreaks occurred in 2002 was health-care settings i.e. hospitals and residential institutions. 72% of all reported outbreaks occurred in these settings. The greatest number of people ill were also associated with outbreaks in these locations, with over 5000 people known to be ill as a result of outbreaks in the hospital sector alone.

Table 4. Outbreaks by location and numbers ill, 2002.

Location	Number of Outbreaks	Numbers ill
Hospital	72	5373
Residential institution	63	1638
Private house	14	47
Crèche	13	167
Hotel	11	452
Restaurant/café	4	37
School	4	181
Tour bus	1	15

Public house	1	7
Other	5	110
Total	188	8027

Seasonal distribution

When the outbreaks in 2002 are analysed by month of reporting, it is seen that the majority of outbreaks occurred in January-February followed by another peak in September (Figure 4). Many of the norovirus outbreaks in hospitals and residential institutions occurred in the early months of 2002. The peak in September was linked to another wave of norovirus outbreaks in health-care settings as well as outbreaks of viral gastroenteritis linked to the tourist industry i.e. hotels and tour-bus outbreaks.

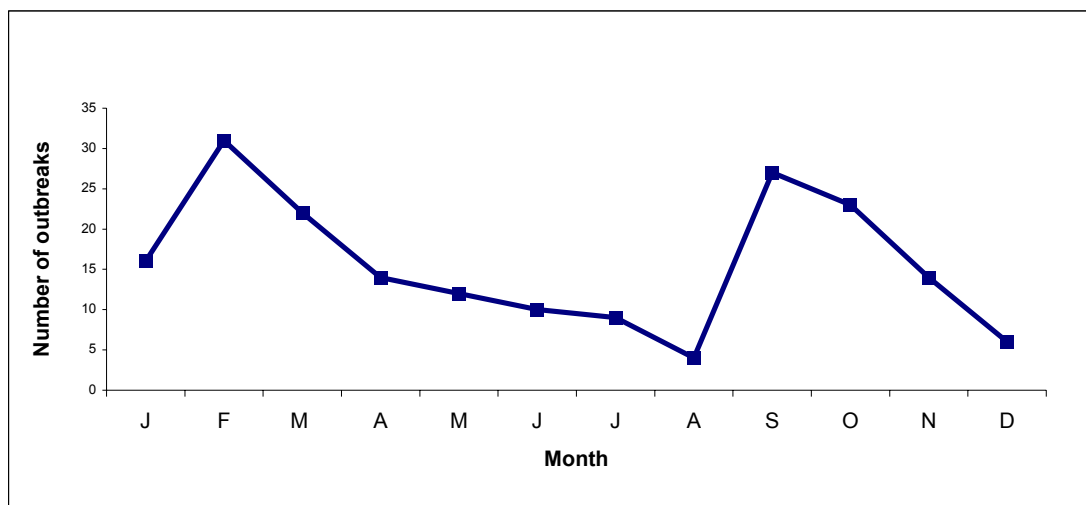


Figure 4. Seasonal distribution of IID outbreaks, 2002.

Discussion

In 2002, there was a very significant rise in the number of IID outbreaks reported to NDSC compared to previous years. From 1998 to 2000, there was on average 34 outbreaks of IID reported each year. This increased to 64 outbreaks in 2001, and rose further to 188 outbreaks in 2002. This figure represents all investigated and reported IID outbreaks and is possibly even an under-estimate of the true figure.

The dramatic increase in outbreak reporting in 2002 was due undoubtedly to the large upsurge in norovirus outbreaks that occurred. Eighty-two percent of all reported outbreaks were either suspected or confirmed to be caused by norovirus. Seventy percent of all outbreaks occurred in health-care settings and there was significant morbidity associated with these outbreaks with at least 7650 people reported ill.

In 2002 there was an epidemic of viral gastroenteritis due to norovirus seen across Europe, and Ireland was part of this wave of outbreaks¹. Typing studies carried out in the UK reported that a new variant of the commonly circulating Lordsdale virus (genogroup II4) was responsible for these outbreaks².

There are a number of features of the virus that can explain the explosive nature of the outbreaks that were seen. Norovirus has a low infectious dose, can survive in the environment and be easily transmitted from person-to-person often by aerosolisation of viral particles during episodes of vomiting. Congregate and enclosed settings are perfect environments for the virus to spread. With the added factor of a vulnerable

population in health-care settings, it is not surprising that these locations are prone to outbreaks of this virus.

In light of the epidemic of norovirus outbreaks that seriously affected, in particular, the acute hospital sector in 2002, a Viral Gastroenteritis sub-committee of the NDSC Scientific Advisory Committee was established. One of the main Terms of Reference was to develop national guidelines to assist professionals in managing outbreaks of noroviruses in healthcare settings. These guidelines³ were published and launched by the Minister for Health and Children in December 2003.

Only 11% of outbreaks had a bacterial aetiology in 2003. The most commonly isolated pathogens were *Salmonella enterica* and *E. coli* O157. All of these outbreaks were small in size and the majority were family outbreaks. This is also reflected in the low percentage of outbreaks deemed to be foodborne in 2002 (just 6%).

There were three outbreaks that were reported to have a waterborne mode of transmission (all *Cryptosporidium sp*) and one with a waterborne and animal-contact transmission route (family outbreak of *E. coli* O157). Sixty-three individuals were reported ill as a result of the three *Cryptosporidium sp* outbreaks. The potential for significant numbers of people including vulnerable populations to be affected in waterborne outbreaks reinforces the need for stringent early control measures to be implemented in these events.

Outbreak investigations are an important and challenging component of epidemiology and public health, and help to identify the source of the outbreak, institute control measures and prevent additional cases. Extremely valuable information has been derived from analyses of the national IID outbreak data in 2002. As was clearly seen in light of the norovirus epidemic, the information collated from the outbreak data was used to formulate national guidelines on the management of these outbreaks in order to reduce the overall burden of illness due to this pathogen.

References

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