



Annual Report on Outbreaks of Infectious Intestinal Disease (IID) in Ireland, 2001

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Introduction

Investigation of outbreaks of infectious diseases is one of the most important and challenging components of public health. 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 Food Safety Authority of Ireland (FSAI) was responsible for initiating the first enteric outbreak system in Ireland in 1998 and commenced collection on outbreaks of illness caused by infectious intestinal disease (IID) in that year.

In July 2001, the National Disease Surveillance Centre (NDSC) took over this function and set up a national surveillance system for all outbreaks of infectious disease in Ireland. The data for 2001 was therefore gathered by FSAI and NDSC.

Objectives of surveillance

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 estimating the burden of illness caused by outbreaks, identifying high-risk groups in the population and to 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 definitions

Outbreak

Two or more linked cases thought to have a common exposure who experience a similar illness, or proven infection. Outbreaks may be general or confined to one household (family) and may involve cases locally, nationally and internationally.

General Outbreak

An outbreak affecting members of more than one private residence or residents of an institution.

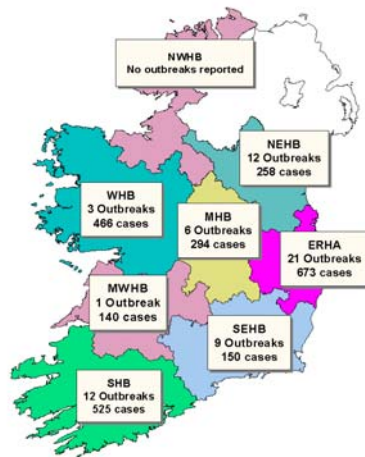
Methods of surveillance of outbreaks

Since July 2001, outbreaks are notified to NDSC by a public health professional using a preliminary notification form (by fax or email). A full report is then forwarded by the lead investigator once more complete data are available. 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, suspect vehicle and factors contributing to the outbreak. These data are then stored and analysed in a Microsoft Access database.

Results

During 2001, 64 outbreaks of infectious gastrointestinal disease were reported in Ireland, resulting in 2506 people becoming ill. 81 people were reported to have been hospitalised (3%). Figure 1 shows the regional distribution of outbreaks during 2001.

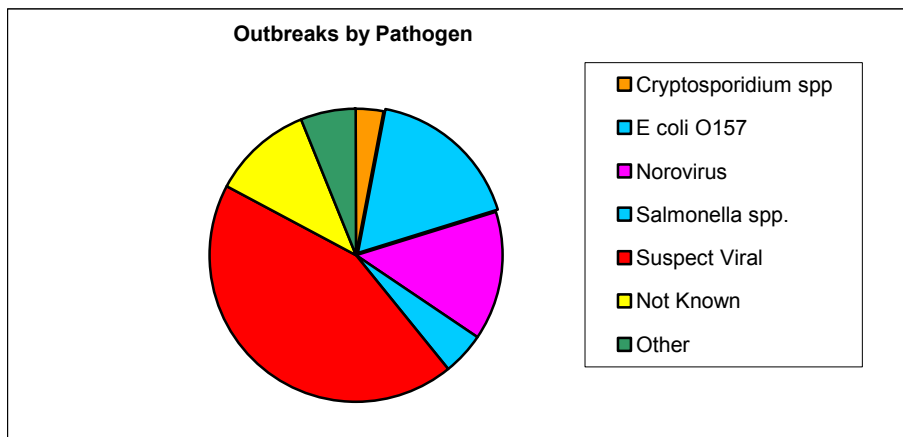
Figure 1. Number of outbreaks of IID and total numbers ill in each health board area (2001).



Causative Pathogen

One of the prominent features of the outbreaks reported in 2001 was the proportion due, or suspected as being due to gastroenteric viruses (Figure 2). Norovirus (NV) - the virus responsible for Winter Vomiting Disease, previously known as “Norwalk-like virus” or Small Round Structured Virus - was confirmed as being responsible for nine (14%) outbreaks of IID. Another 28 outbreaks were not laboratory-confirmed but were suspected as having a viral cause, meaning that 58% of outbreaks were either confirmed NV, or suspected viral in aetiology. *E. coli* O157 accounted for eleven outbreaks (17% of the reported total). Ten of these outbreaks occurred in private homes and one was associated with a crèche. There were three outbreaks due to *Salmonella enterica*. Two of these, (the outbreaks caused by *S. Heidelberg* and *S. Enteritidis*) were both due to person-to person transmission and the outbreak due to *S. Typhimurium* was confined to one household and thought to be associated with animal contact. There were two *Cryptosporidium* spp outbreaks; both of these had a waterborne route of transmission. The first report of an outbreak due to *Campylobacter* spp was received in 2001.

Figure 2. Outbreaks of IID reported in 2001 by pathogen



When the number of people becoming ill as a result of reported outbreaks of IID is examined, viral or suspected viral causes were responsible for 2203 cases of illness, representing 88% of those becoming ill. Bacterial and protozoal causes account for just approximately three percent of reported illness (Table 2).

Table 2. Number of Cases of Illness arising as a result of Outbreaks of IID, by Pathogens: 2001.

Pathogen	No of Outbreaks	No ill
<i>Campylobacter</i> spp	1	14
<i>Cryptosporidium</i> spp	2	6
<i>E. coli</i> O157	11	42
Norovirus	9	802
Rotavirus	1	7
<i>Salmonella</i> Enteritidis	1	7
<i>Salmonella</i> Heidelberg	1	2
<i>Salmonella</i> Typhimurium	1	2
<i>Shigella sonnei</i>	1	4
<i>Staph aureus</i>	1	5
Suspect Viral	28	1401
Not Known	7	214
Total	64	2506

Mode of Transmission

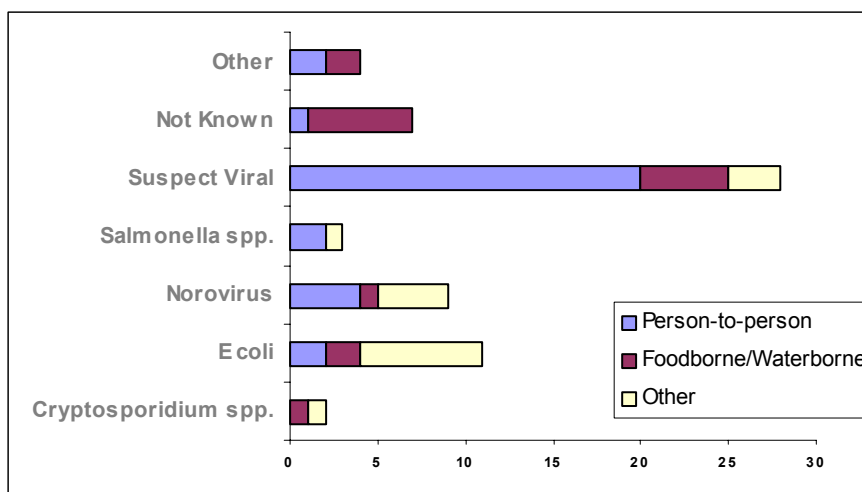
In 2001, the majority of outbreaks of IID were associated with person-to-person transmission or person-to-person transmission in conjunction with foodborne/ waterborne transmission (as seen in Table 3). Interestingly however, when the number of people ill is examined, a suspect waterborne or combined waterborne/ person-to-person mode of transmission was seen to account for the majority of cases ill (36% of cases). The route of transmission was not known in a quarter of the reported outbreaks.

Table 3. Number of Cases of Illness arising as a result of Outbreaks of IID, by Mode of Transmission (2001).

Mode of Transmission	No of Outbreaks	No ill
Person-to-person	18	357
Foodborne	10	143
Waterborne	3	417
P-P/Animal	2	4
P-P/Airborne	1	45
P-P/Foodborne	10	205
P-P/Waterborne	2	493
Waterborne/Animal	1	2
Foodborne/Waterborne	1	150
Unknown	16	690
Total	64	2506

It is also very interesting to examine the mode of transmission by pathogen (as seen in Figure 3). The role of person-to-person spread is seen to explain the high attack rates in the confirmed or suspect noroviral outbreaks.

Figure 3. Number of Outbreaks of IID by pathogen and by Mode of Transmission (2001).



Location

Excluding private households, hotels were the commonest cited location of outbreaks of IID during 2001 (Table 4). Hotel outbreaks were also responsible for causing the greatest number of people to become ill. Residential homes and hospitals were the next most common outbreak settings.

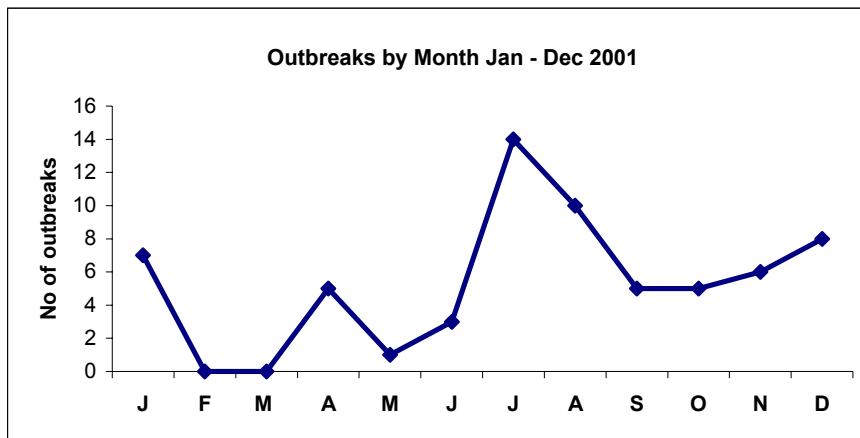
Table 4. Number of Cases of Illness arising as a result of Outbreaks of IID, by Location in 2001.

Location	No of Outbreaks	No ill
Crèche	3	29
Hospital	7	117
Hotel	15	1228
Private House	16	47
Residential Institution	9	556
Restaurant/Café	6	163
School	2	73
Staff Canteen	2	58
Other	4	235
Total	64	2506

Seasonal distribution

When the outbreaks are analysed in terms of seasonality, it is noted that in 2001 the largest number of outbreaks occurred in the summer months, with a peak seen in July (as shown in Figure 4). Many of the noroviral outbreaks associated with tourist settings occurred during this period.

Figure 4. Number of outbreaks of IID reported by month, 2001.



Conclusions

In Ireland in 2001 the number of outbreaks reported was 64 which is an increase over the previous three years where there was an average of 34 outbreaks reported each year. This database includes information on all reported outbreaks of IID but there is still likely to be a considerable degree of under-reporting of outbreaks as many family outbreaks are not formally investigated and hence not reported at national level.

One of the most striking features of the analysis of the outbreak data in 2001 has been the emergence of viruses as a prime cause of outbreaks of gastroenteritis. Over half of all reported outbreaks were shown to either be confirmed norovirus or suspect viral aetiology. The significant morbidity associated with these viral outbreaks is evident as the data reveals that confirmed or suspected viral causes were responsible for 2203 cases of illness in 2001, representing 88% of those becoming ill in outbreaks of IID. Undoubtedly the true burden of illness due to this pathogen is even higher than this.

Another interesting feature of these viral outbreaks is the range of locations in which they occurred. Outbreaks were seen to occur in healthcare settings (hospitals and nursing homes) and were also associated with commercial catering/ tourist settings such as hotels and restaurants. Because of this viral outbreaks were noted to take place throughout the year, with the majority occurring in the summer months.

The importance of water as a mode of transmission is also evident from the data presented here. Just seven outbreaks were associated with a suspect waterborne or waterborne combined with another route of transmission, however these outbreaks were seen to account for over 40% of all cases reported ill during outbreaks of IID

In recent years, with the advent of food safety agencies in Ireland such as the Food Safety Authority and the Food Safety Promotion Board (*Safefood*), many efforts are being made to reduce the burden of illness due to foodborne disease in this country and in many areas significant advances have been made e.g. Salmonella control programmes.

However, as we become better at controlling the threat of some aetiological agents of IID, other threats will emerge to pose new challenges. We must consider and safeguard to the greatest possible degree, the quality of our drinking water. We must become better at identifying outbreaks by newer agents as well as those well known to us. Effectively formulated policy depends on high quality data. As the quality of data improves, particularly in relation to the factors contributing to outbreaks of IID, so will our ability to control and prevent such disease outbreaks.

Acknowledgements

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