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Influenza Vaccination Uptake

In Ireland, annual influenza vaccination is recommended for a number of at-risk adults and children, including all persons 65 years of age or older. Influenza and its related illnesses remain a major cause of preventable morbidity and mortality in the elderly worldwide. Among the elderly, vaccination is thought to reduce influenza-related morbidity by 60% and influenza-related mortality by 70-80%.

Influenza vaccination is free for all GMS patients. Since mid-2001, all individuals aged 70 years and over are eligible for a medical card. Approximately 50% of the population aged 65 to 69 years have medical cards (source GMS Payments Board).

A study was undertaken to determine flu vaccine uptake among GMS patients (aged 65 years or older) for the 2003-2004 flu season.

Methodology

Information was obtained from the GMS Payments Board on the number of patients ⩾65 years of age registered with the board, as well as the numbers of patients vaccinated with flu vaccine (by age group and health board) between 1st September 2003 and 31st January 2004 (time of maximum flu vaccine uptake). Influenza uptake rates by age group and health board were calculated based on the average number of patients registered with the GMS during the time frame.

Results

The average uptake for influenza vaccination nationally in GMS patients aged 65 years and older was 62.2%. There was wide variation in vaccination coverage between the health boards (range 58.7%-66.7%). Nationally, the highest uptake (68%) was among those 75 years of age or older (table 1).

Table 1. National average influenza immunisation uptake, 2003-2004

Age Group (Years)	% Uptake
65-69	52
70-74	59
75+	68

Discussion

Although flu vaccine is recommended for all individuals 65 years of age or older, it is evident that there is unequal uptake amongst elderly medical card holders, with only the most elderly achieving relatively high uptake rates. Reasons for inadequate vaccination uptake rates, particularly among the 'young elderly' (65-74 years age group) are unclear. Some studies have reported lack of awareness of self-risk associated with influenza disease, distrust of vaccinations or disbelief in vaccine efficacy, and inadequate strength of recommendations from health professionals.

Key Points

- In Ireland, influenza vaccine uptake rates among elderly GMS patients (≥65 years of age) show regional and age group variation.
- Additional studies are needed to identify reasons for this.
- Health professionals should encourage and facilitate access to vaccination for their at-risk patients.
- Work on increasing awareness within the wider community about the value of influenza vaccine should be supported as part of efforts to increase vaccine coverage.

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References on request.

First Case of Influenza Identified

The National Virus Reference Laboratory (NVRL) has identified the first case of influenza A virus this winter. The case was detected in week 40, 2004 by the GP sentinel surveillance system, which reports weekly on the number of patients with flu-like illness. Subtyping and antigenic characterisation of this isolate is underway.

The current level of influenza activity is low in both Ireland and Europe, with only sporadic cases of laboratory-confirmed influenza being reported.[1]

Reference

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Surveillance of Outbreaks of Infectious Intestinal Disease in Ireland, 2002

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 (IID) 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 8,027 people becoming ill. The number of people reported to have been hospitalised was 1,296 (16%). Table 1 shows the regional distribution of outbreaks during 2002. Most of the 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	No 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 (figure 2). This compares 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* O157 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. Sixty-three individuals were reported ill as a result of three reported *Cryptosporidium sp* outbreaks.

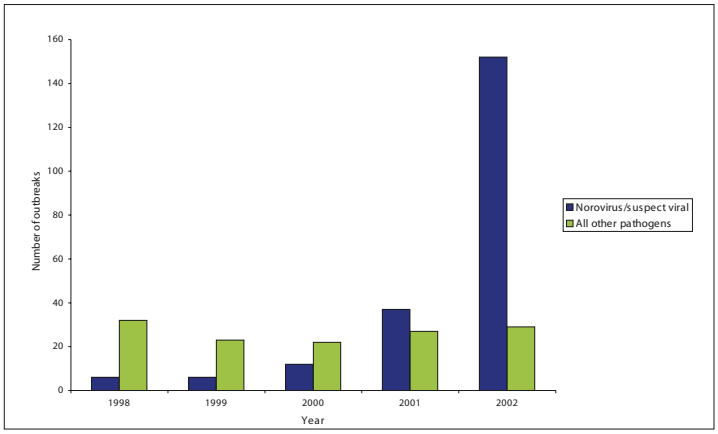

Figure 1. Confirmed or suspect norovirus outbreaks versus other causes, 1998-2002 (Data prior to July 2001 provided by FSAI)

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

Pathogen	No of outbreaks	Number ill
Norovirus	98	6776
Suspect viral	56	881
Salmonella sp	7	27
E. coli O157	7	19
Cryptosporidium sp	3	63
Rotavirus	2	18
Adenovirus	1	11
Campylobacter jejuni	1	7
Clostridium difficile	1	6
Enterovirus (suspect)	1	132
Shigella sonnei	1	4
Staph. aureus	1	7
Not known	9	76
Total	**188**	**8027**

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. 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).

Location

As is seen in table 4, the commonest location where outbreaks occurred in 2002 was health-care settings i.e. hospitals and residential institutions. The majority (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 5,000 people known to be ill as a result of outbreaks in the hospital sector alone.

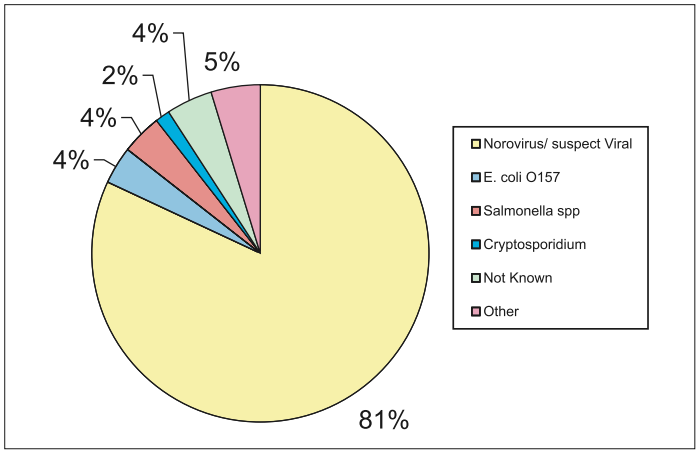

Figure 2. Outbreaks of IID reported in 2002 by pathogen

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

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

Location	No 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.

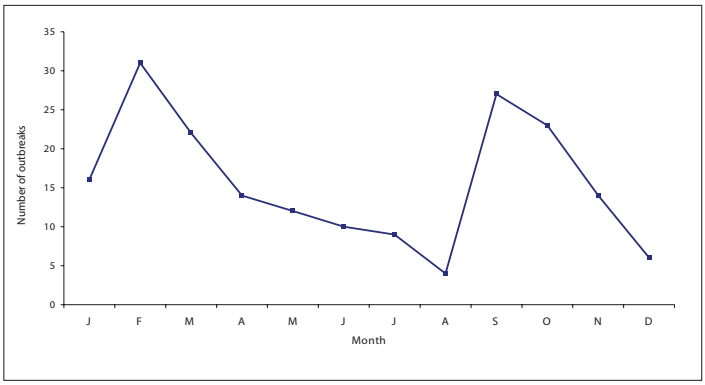

Figure 4. Seasonal distribution of IID outbreaks, 2002.

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 were 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 outbreaks that were investigated and reported and is possibly even an underestimate of the true figure.

The dramatic increase in outbreak reporting in 2002 was due mainly 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 7,650 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 outbreaks.[1] Typing studies carried out in the UK reported that a new variant of the commonly circulating Lordsdale virus (genogroup II4) was responsible for these outbreaks.[2] 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 guidelines[3] were published and launched by the Minister for Health and Children in December 2003.

Only 11% of outbreaks had a bacterial aetiology in 2002. 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%).

The importance of water as a mode of transmission was again evident in 2002. 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.

Barbara Foley, Fiona Cloak and Paul McKeown, NDSC

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Acknowledgements

We wish to thank all the contributors to the national outbreak surveillance system, namely, directors of public health, specialists in public health medicine, senior/area medical officers, surveillance scientists, clinical microbiologists, medical laboratory scientists and environmental health officers.

Human Listeriosis in Ireland

Human listeriosis is one of the most serious human foodborne bacterial infections. In the US, it was estimated that listeriosis accounted for over a quarter of all deaths due to foodborne infections.[1]

Human listeriosis is mainly foodborne (with onward vertical transmission to the foetus/neonate in the case of pregnancy-associated cases); animal-to-person transmission is a less important route of infection. Incubation periods of up to 70 days have been reported following a single exposure to the implicated vehicle, but the average incubation period is in the region of 3-4 weeks. *Listeria monocytogenes* is ubiquitous in the environment. It has been detected in a variety of raw foods, such as uncooked meats and vegetables, as well as in processed foods contaminated post-processing, such as soft cheeses and ready-to-eat meats, both of which have been implicated internationally in outbreaks.[2] Concern centres on refrigerated foods as unlike other foodborne pathogens, *Listeria* can multiply at refrigeration temperatures.

While the population as a whole is frequently exposed to *L. monocytogenes*, the disease affects primarily pregnant women, newborns, and adults with weakened immune systems. Symptoms include fever, muscle aches, and sometimes gastrointestinal symptoms such as nausea or diarrhoea. Infections frequently result in meningitis and/or septicaemia. Infected pregnant women usually only experience a mild, flu-like illness but listeriosis during pregnancy can lead to premature delivery, intrauterine death or septicaemia/meningitis in the newborn.

Methods

Because listeriosis was not listed as a notifiable disease before January 1st 2004, two other sources of data are used here to describe the epidemiology of human listeriosis in Ireland over the last 5 years. Firstly, data are reported from an annual survey of hospital laboratories conducted to establish the number of human *Listeria* isolations each year in Ireland. In addition, a system for collecting enhanced information on listeriosis cases was established in 1999. Since then, information has been received from Departments of Public Health on clinical manifestation and factors that may have contributed to illness (e.g. pregnancy, underlying illness, history of consumption of high risk foods) for 20 listeriosis cases. Census data for 2002 were used for calculation of incidence rate and the register of births for Ireland was used to calculate incidence in pregnancy-associated cases.

Results

Between 2000 and 2003, data were received on 26 laboratory isolations of *L. monocytogenes* from human specimens, an average of 6.5 cases per annum (0.17 per 100,000 population per annum).

Table 1. Number of reports of listeriosis, 1999-2003

Year	Laboratory Reports[a]	Enhanced Dataset
1999	N/A	4
2000	7	2
2001	7	6
2002	6	5
2003	6	3

[a] data collected from hospital laboratories as part of annual laboratory survey conducted to fulfil the requirement of the zoonosis directive

Between 1999 and 2003, clinical and possible risk factor information was collected on 20 cases reported to the enhanced surveillance system by Departments of Public Health (table 1). The remaining analyses are based on this enhanced information.

Risk factors for listeriosis

It is well established that listeriosis occurs mainly in elderly individuals, persons with underlying illness or other vulnerable groups such as pregnant women or neonates. Eight of the cases reported to the enhanced surveillance system between 1999 and 2003 were reported as pregnancy/neonatal cases, indicating a rate of at least 2.8/100,000 live births over the five years. Of these, illness was reported in 5 of the infants while in three cases, it was the mother who experienced symptoms. Age at disease onset ranged from 0 to 40 days in the infants.

The remaining twelve cases were non-pregnancy associated adult cases. In this group, 50% of cases were male and the age range was 29-79 years (median 60.5 years). Nine (75%) were reported either as elderly (≥65 year of age) or as suffering from an underlying illness that predisposed them to listeriosis. The remaining 3 cases were over 55 years.

Morbidity and mortality

The most severe symptoms associated with human listeriosis include septicaemia and meningitis, leading in some instances to death. Sixty per cent of cases reported to the enhanced surveillance system experienced meningitis and/or septicaemia (table 2). There was one reported fatality; an adult patient died from bacterial meningitis due to *L. monocytogenes* in 2000.[3]

Table 2. Number and percentage listeriosis cases by clinical manifestation, 1999-2003

Clinical Manifestation	Adult/Juvenile cases	Pregnancy Neonatal Cases	Total	%
Meningitis	2	3	5	25%
Septicemia	3	2	5	25%
Meningitis and septicemia	2	0	2	10%
Other symptoms	5	3	8	40%

Discussion

While the number of cases of listeriosis is small in comparison with other bacterial causes of food poisoning, the high morbidity and mortality associated with this infection make it of high public health concern. It is evident from the data presented that certain population groups are more vulnerable to infection with *L. monocytogenes* and that the bacterium causes a high level of morbidity in these patients. Moreover, the increasing proportion of susceptible people in our society, be it due to old age or immunosuppression, may give rise to more disease in the future.

Human listeriosis became a notifiable disease on January 1st 2004. Since then, 8 human cases of listeriosis have been notified to NDSC (provisional data up to 15th October 2004). It is timely to remind those in at-risk groups, e.g. pregnant women, the elderly and those with underlying illness to avoid foods known to be high-risk, including certain soft cheeses, pâté and pre-packed salads.

Patricia Garvey and Paul McKeown

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