Ionad Naisiunta Faire Galair

EPI-INSIGHT

DISEASE SURVEILLANCE REPORT OF NDSC, IRELAND

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In Partnership for Prevention and Protection

Contents:

Outbreak of VTEC O157 in the North Eastern Health Board

On 16th February 2004 a senior area medical officer in the North Eastern Health Board was notified of a child with haemolytic uraemic syndrome. The child, aged 16 months, had been ill since 6th February and was verotoxin producing *E. coli* verotoxin 2 (VTEC VT_2) positive on faecal culture. Investigations carried out by area medical officers and environmental health officers included clinical, food, travel, human and animal contacts, and environmental history.

The family home was used as a sessional pre-school for about 30 children. However, the pre-school had been closed since the start of this child's illness. Household water was from a private well. Screening for VTEC was offered to all family members and to all children attending the pre-school. A sample of water from the house was sent for microbiological examination. Hygiene advice was given to all contacts.

Results showed that one other family member was VTEC VT_2 positive on faecal screening. The water supply to this household also contained VT_2 positive VTEC. The family was advised not to consume or use the domestic water supply. The index case recovered and was discharged home. This sessional pre-school has not re-opened but, if it is to re-open, neither positive family member will be allowed to have contact with pre-school attendees until full microbiological clearance has been obtained. Fortunately none of the pre-school children consumed water from this household as it was school policy that each child brings their own food and drink.

This outbreak illustrates the danger posed by contaminated private wells. It is fortuitous that a major outbreak did not occur in this instance.

Dr Peter Finnegan, Specialist in Public Health Medicine

Report on Zoonoses in Ireland 2000 and 2001

The Food Safety Authority of Ireland (FSAI) has published the first national zoonosis report, *Report on Zoonoses in Ireland 2000 & 2001*. The report was a joint collaboration between the FSAI, the National Disease Surveillance Centre and the Department of Agriculture and Food. It brings together for the first time human, food and foodstuffs, and veterinary data on the important zoonotic diseases in Ireland.

Foodborne infectious disease can be introduced at many points along the food chain. Since its prevention is so reliant on the close collaboration and co-operation of a wide range of different professional groups, a multidisciplinary approach that aims to follow clues from an incident or outbreak, upstream to food and veterinary sources, is now internationally accepted best practice. Combining microbiological and epidemiological evidence provides proof as to the cause of an outbreak.

Familiarity with the distribution of pathogens, their transmission and disease syndromes through the routine collection of surveillance data is a crucial way in which we can be prepared to recognise their appearance and propagation. It is only by knowing where the food production system is most liable to fail, that targeted preventive measures are likely to be effective. Over the last six years information on human salmonellosis, VTEC and outbreaks of infectious intestinal disease (IID) in Ireland has been gathered in a relatively standard way and so comparisons during this period are valid.

During the period covered by this report (2000 and 2001), there was a reduction in the number of human cases of many IID pathogens. In particular, the report highlights the welcome fall in the number of cases of human salmonellosis, coinciding with the decline in the number of cases of *S*. Typhimurium. The reduction in levels of illness in Ireland associated with this serovar is especially welcome as there has been an increase in the occurrence of antimicrobial resistant strains among *S*. Typhimurium isolates. Conversely the number of human cases of *S*. Enteritidis increased during 2000 and 2001 and it became the predominant *S. enterica* serovar.

The same period saw a noticeable decline in the number of cases of human campylobacteriosis. This is the commonest foodborne bacterial pathogen in Ireland affecting children under the age of five in particular.

The downward trend in human salmonellosis observed during the period of this report and continuing into 2002, has been reversed in 2003 (NDSC, unpublished data), demonstrating the need for continual vigilance. There has also been a slight increase in the number of cases of food poisoning notified. This shows that we only hold these diseases in finely balanced check. Failure to observe the simplest of hygiene rules (effective handwashing, adequate storage and cooking of food and prevention of cross contamination) will result in their upsurge.

Paul Mckeown, NDSC

The Report on Zoonoses in Ireland 2000 & 2001 is available at http://www.fsai.ie/publications/reports/Zoonoses_report.pdf

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Antibiotic Consumption in Ireland, 1993 to 2002

Introduction and Methods

Surveillance of antimicrobial utilisation has been identified as a key component in antimicrobial resistance strategies, including the WHO Global Strategy of Containment of Antimicrobial Resistance and the Strategy for the Control of Antimicrobial Resistance in Ireland (SARI).

European Surveillance of Antimicrobial Consumption (EASC) aims to construct an inventory of antibiotic usage in the EU at national level by collating data from both community and hospital care areas on a quarterly basis. Hospital antibiotic consumption data are not currently available for Ireland.

In order to facilitate international comparisons, consumption is expressed as Defined Daily Dose (DDD) per 1000 inhabitants per day (DID). DDD is defined as the assumed average maintenance dose per day for a drug used for its main indication in adults. ESAC also uses the WHO Anatomical Therapeutic Chemical (ATC) index to classify drugs through systematic hierarchical levels. For example systemic antibiotics are classed as J01, beta-lactam antibiotics as J01C and broad-spectrum penicillins as J01CA.

In August 2003, NDSC purchased Irish pharmaceutical sales and prescription data from a commercial organisation specialising in pharmaceutical market intelligence, IMS Health. This dataset contains wholesaler to retail pharmacy sales data from 1993 to 2002 by quarter and includes sales of all pharmaceutical products from more than 95% of wholesalers and manufacturers in Ireland. An automated data-extraction protocol was devised at NDSC to obtain the appropriate ATC/DDD outputs for antibiotics.

Results

The mean overall level of antibiotic consumption in ambulatory care from 1993 to 2002 was 18.2 DID. However, there was an increase in total antibiotic consumption over these ten years, from 16.3 DID in 1993 to 20.3 DID in 2002 (figure 1). Penicillins accounted for the largest proportion of antibiotics used (10.6 DID in 2002, 52% of total), followed by tetracylines (3.5 DID, 17%), macrolides (2.6 DID, 13%), cephalosporins (1.9 DID, 10%), sulphonamides (0.9 DID, 5%) and quinolones (0.6 DID, 3%).

The proportion of different classes of penicillins used in Ireland is shown in figure 2. Penicillin/beta-lactamase inhibitor combinations (e.g. amoxicillin/clavulanate) accounted for the largest proportion (5.41 DID in 2002, 51% of total penicillin use). Broad-spectrum penicillins, such as ampicillin and amoxicillin, accounted for 3.59 DID in 2002 (34%) followed by beta-lactamase resistant penicillins, such as cloxacillin and flucloxacillin (0.84 DID, 8%), and narrow spectrum penicillins, such as benzylpenicillin (0.8 DID, 7%). There was a steady increase in the proportion of penicillin use accounted for by penicillin/beta-lactamase inhibitor combinations from 29% in 1993 to 51% in 2002.

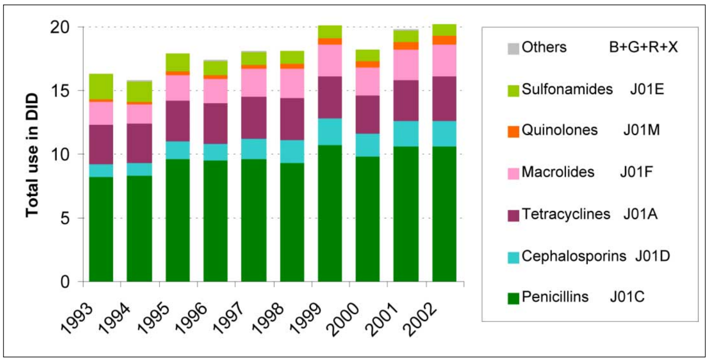

Figure 1. Total ambulatory care antibiotic consumption in Ireland, 1993-2002

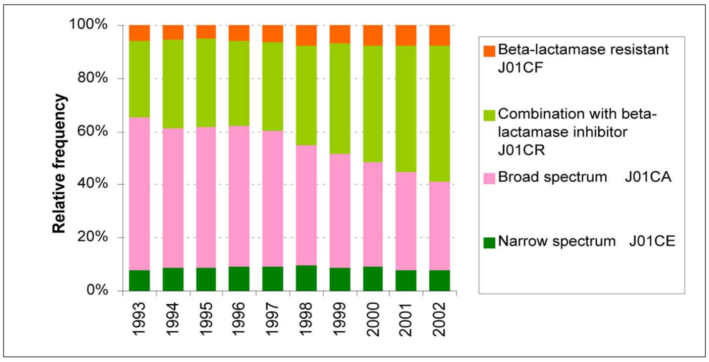

Figure 2. Relative frequency of penicillin consumption in ambulatory care in Ireland by ATC classification, 1993-2002

The proportion of different classes of cephalosporins used in Ireland is shown in figure 3. There was a steady increase in the proportion of cephalosporin use accounted for by second generation cephalosporins, from 60% in 1993 to 78% in 2002.

Figure 4 shows the seasonal variation in total antibiotic use by quarter. Overall antibiotic use was highest during the winter months. The mean difference between troughs (quarters 2 and 3) and peaks (quarters 1 and 4) in antibiotic use was 19.4% (range 11.3% to 25.6%).

The overall antibiotic use in ESAC participating countries in 2001 is shown in figure 5. There was a 3-fold difference in antibiotic use between the countries reporting the lowest use (The Netherlands, 10 DID) to the highest (France, 33 DID).

Figure 3. Relative frequency of cephalosporin consumption in ambulatory care in Ireland by drug class, 1993-2002

Discussion

Although the IMS database used in this report is very comprehensive the data do have some limitations. Firstly, the data are based on pharmacy wholesale data, rather than on individual prescriptions. Thus they cannot be used to determine the actual number of antibiotic courses taken and do not provide information on dose or duration of therapy. Secondly, factors such as

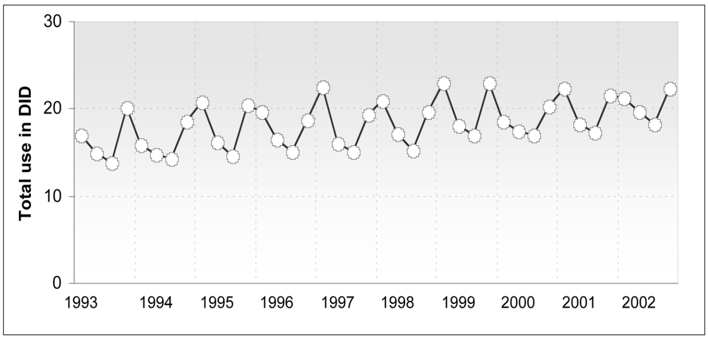

Figure 4. Seasonal variation in ambulatory care antibiotic consumption in Ireland, 1993-2002

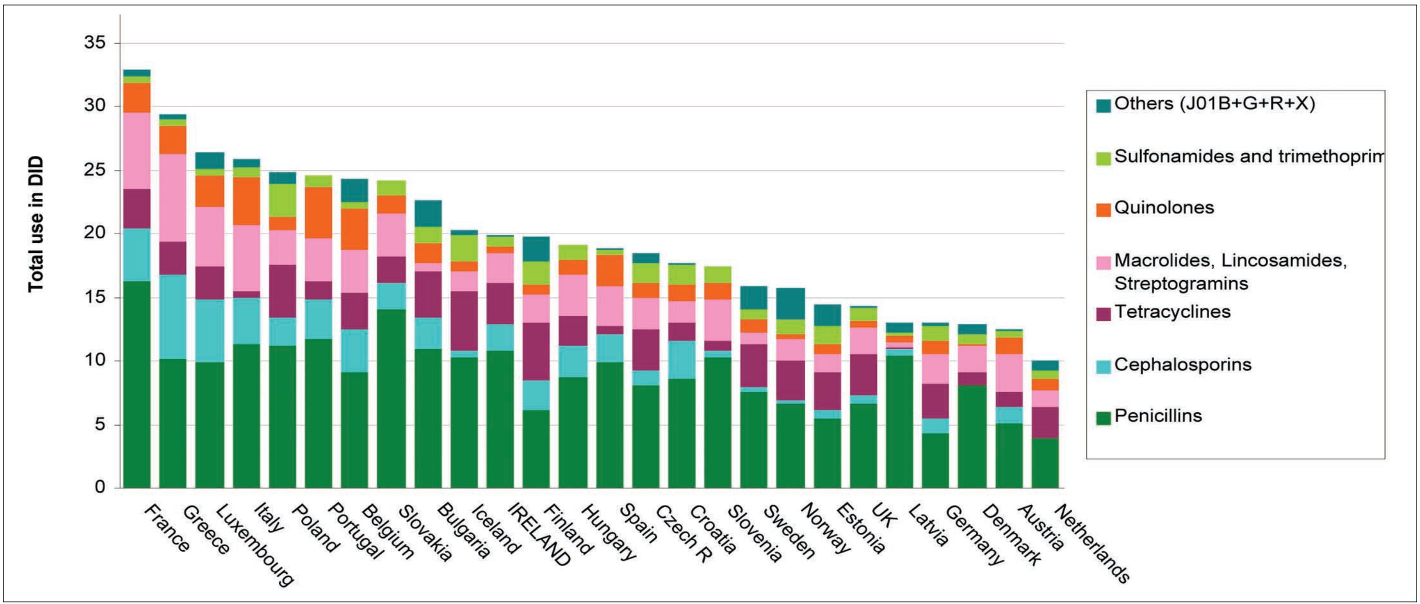

Figure 5. Ambulatory care antibiotic consumption in ESAC participating countries, 2001[1]
[1]Data source: ESAC; All data are provisional; Data for Iceland and Bulgaria include hospital consumption

stockpiling of antibiotics in pharmacies and drug wastage (e.g. when antibiotics pass their sell-by date) may introduce biases. The current databases do not facilitate the correction of these biases. Nevertheless the data do show consistency over time and similar data sources have been successfully used to calculate antibiotic consumption in other countries.

DDD values for a given antibiotic are based on an assumed average adult dose for a moderate severity of infection and may not reflect current recommended or prescribed daily doses. Because it is based on an adult dose DDD may underestimate the overall antibiotic use in a country, such as Ireland, with a relatively young population. Nevertheless DDD is the only standardised measure that provides an estimate of the proportion of the population treated with a given antibiotic.

The overall level of antibiotic use in this report places Ireland in the medium-range of usage among ESAC participants, similar to Finland, Hungary and Spain. ESAC data for Spain only include reimbursement data and exclude data on drugs sold over-the-counter, which are known to account for a large proportion of antibiotic use in Spain.[1] Preliminary data from a survey of household antibiotic use, carried out as part of a larger study in a number of European countries, suggest that over-the-counter acquisition of antibiotics is relatively rare in Ireland (R Cunney *et al*, unpublished data).

There is a direct relationship between the level of antibiotic use in the community and the level of antibiotic resistance. This has been demonstrated for beta-lactam antibiotic use and penicillin resistance in *Streptococcus pneumoniae* in a number of European countries.[2] A similar association has been shown for macrolide use and resistance in group A streptococci.[3] In general the ESAC participants reporting the lowest levels of antibiotic consumption are those with the lowest levels of antibiotic resistance, while the reverse is true of those reporting the highest levels of antibiotic consumption.

The pattern of antibiotic consumption also impacts on antibiotic resistance levels. Predominant use of narrow spectrum penicillins and first generation cephalosporins is generally found in the ESAC participating countries with the lowest levels of antibiotic resistance (H Goossens *et al*, unpublished data). In contrast there is predominant use of penicillin/beta-lactamase combinations, other broad spectrum penicillins and second generation cephalosporins in Ireland, a pattern more typical of countries with higher levels of antibiotic resistance. This may account for the level of penicillin-non-susceptible *S. pneumoniae* reported to the European Antimicrobial Resistance Surveillance System (EARSS): 11.5% of Irish isolates in 2002 were non-susceptible, compared to less than 1% in Norway and the Netherlands, 2% in Sweden and 4% in Denmark (data: EARSS, www.earss.rivm.nl).

Seasonal variation in antibiotic consumption has been observed in all ESAC participating countries and is most likely related to increased prescribing for respiratory tract infections during the winter months. Countries with high levels of antibiotic consumption and resistance generally show a very marked seasonal fluctuation (>30% difference between winter and summer months), compared to those with low levels (<25% fluctuation). The mean seasonal fluctuation for Ireland over ten years was 19.3%. However, these data need to be interpreted with caution as antibiotic purchasing practices by pharmacies may affect data on seasonality. For example, antibiotics purchased during quarter three may not be dispensed until quarter four, flattening the seasonality curve.

Promoting the prudent use of antibiotics requires education of prescribers, patients and the general public. The data presented in this report suggest that this should focus on prescribing for respiratory tract infections, particularly during the winter months, and promoting the use of narrow spectrum "first line" antibiotics ahead of broader spectrum "second line" agents. Such an approach has been shown to reduce antibiotic resistance in a number of countries, including Iceland and Canada.[4,5]

Robert Cunney and Ajay Oza, NDSC

Acknowledgements
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Dengue Fever

Since January 1st 2004, Indonesia has reported more than 23,000 hospitalised cases of suspected dengue fever, including over 350 deaths to the World Health Organisation (WHO). The majority of these cases are from provinces in Java, South Kalimantan, South Sulawesi, Bali, East and West Nusa Tenggara and Aceh.

Dengue fever is a severe, flu-like viral illness that affects infants, young children and adults, but seldom causes death. It is transmitted by the bite of an infected mosquito. *Aedes* mosquitoes are most commonly associated with dengue fever. They tend to bite more during the daytime and at dawn and dusk. They are found commonly throughout the tropics and subtropics and are endemic in about 100 countries.

Clinical Features

The illness is generally milder in children than in adults. The typical illness is unpleasant with fever, chills, headache, backache and prostration (extreme exhaustion). The illness can typically last up to ten days. Full recovery is usual.

In certain circumstances, the disease may progress to dengue haemorrhagic fever (DHF) or dengue shock syndrome (DSS) both of which can be fatal. However, these complications are rare in travellers to endemic areas, being more common in people who live in endemic areas and have been repeatedly exposed to the virus.

Dengue fever cannot be prevented by vaccination or medication. The only way to reduce the risk of being infected is by avoiding mosquito bites.

Dengue has increased considerably over the last few decades, particularly in urban and semi-urban areas. WHO now estimate that there might be as many as 50 million cases worldwide each year.

Prevention and Control

At present, the only method of controlling or preventing dengue and DHF is to combat the mosquitoes that carry the virus. The mosquito responsible tends to breed primarily in containers that can hold stagnant water such as earthenware jars, concrete cisterns used for domestic water storage, discarded plastic food containers, used automobile tyres and other items that collect rainwater. Control measures in affected countries have been largely directed at destroying habitats where mosquitoes might lay their eggs and the use of insecticide to directly kill mosquitoes and their larvae.

Protection for Travellers

The best way for travellers to endemic areas to avoid dengue fever is to avoid being bitten by mosquitoes. The table below highlights the most appropriate preventative measures:

Time: As dengue is associated with a day-biting mosquito; precautions to reduce bites should be taken at all times during the day, and at dawn and dusk.

Risky areas: Avoid areas where mosquitoes are likely to be found, i.e. near water including ponds, outdoor swimming pools, lakes and marshes.

Use mosquito repellents: Spray onto exposed skin whenever you are in an area where mosquitoes may be present. Repellents applied to clothing, shoes, tents, mosquito nets and other gear will enhance protection. Your local pharmacist can advise you on the most suitable preparation to use.

Dress safely: If in areas where mosquitoes are likely, wear long sleeves, long trousers, socks and closed shoes.

Indoors: Mosquito bites can be reduced by air conditioning, insect-proof screens on windows and doors and spraying the room with insecticide.

Mosquito nets: Bed nets and cot nets can be used if necessary, as an additional precaution.

Taking these simple measures will also help to protect you against other mosquito-borne diseases such as malaria and West Nile fever .

Paul McKeown, NDSC

Salmonella Monthly Report (February 2004):

Strains are allocated to months based on the date of receipt of the isolate from the referring laboratory. These figures are provisional as work may not be finished on particular strains at the time of publication. Data are provided courtesy of Prof Martin Cormican and Dr Geraldine Corbett-Feeney, NSRL.

Health Board	E	M	MW	NE	NW	SE	S	W	Total
S. Albany	1	0	0	0	0	0	0	0	1
S. Chester	0	0	0	0	0	1	0	0	1
S. Enteritidis	4	0	0	2	0	0	0	0	6
S. Havana	4	0	0	0	0	0	0	0	4
S. Typhi	1	0	0	0	0	0	0	0	1
S. Typhimurium	1	2	1	1	0	0	0	0	5
S. Wien	0	0	0	0	0	0	0	1	1
Unnamed	1	0	0	0	0	0	0	0	1
Total	**12**	**2**	**1**	**3**	**0**	**1**	**0**	**1**	**20**