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Two Outbreaks of Illness due to *E. coli* O157:H7 in Dublin

Two outbreaks of gastrointestinal illness due to Verocytotoxin producing *Escherichia coli* O157 occurred over the summer in Dublin, and were investigated by the Department of Public Health, Eastern Regional Health Authority. Multidisciplinary outbreak control teams with representatives from public health, environmental health, clinical microbiology from the Public Health Laboratory, South Western Area Health Board and supported by the Food Safety Authority of Ireland and the National Disease Surveillance Centre investigated and managed these outbreaks.

One outbreak was centred in a restaurant associated with a hotel with initial cases of illness appearing at the end of July. A case was defined as a person who had eaten in the restaurant between 22 July and 27 August and subsequently had:

- Laboratory-confirmed Verocytotoxin producing *Escherichia coli* O157 infection (a confirmed case)
- Bloody diarrhoea (a probable case)
- Diarrhoea with or without vomiting (a possible case).

This outbreak produced five confirmed cases, 12 probable cases and a number of possible cases. The restaurant closed voluntarily on August 27th pending investigation. A review of hygiene measures and training was undertaken.

The Public Health Laboratory in Cherry Orchard definitively identified the organism responsible as being Verocytotoxin producing *E. coli* O157 VT1 and VT2. Phage type was confirmed as PT 8 at the Laboratory of Enteric Pathogens, Colindale, London. An analytical study to determine the cause and likely method of transmission is currently underway.

At about the same time, a second outbreak of illness due to Verocytotoxin producing *Escherichia coli* O157 occurred in another Dublin hotel. In this outbreak, three confirmed cases of *E. coli* O157 VT2 positive, PT21/28, occurred on three consecutive days at the end of July and the beginning of August. These were the only cases to be confirmed despite extensive trawling of other guests at the hotel and its functions. A review of hygiene measures and training was undertaken in the hotel. During the outbreak, a casual foodhandler was found to be asymptomatically excreting *E. coli* O157: but this was subsequently found not to be the same phage type as the outbreak strain.

Sporadic Case of SARS in Singapore

In Singapore, a 27-year-old medical researcher has been diagnosed with severe acute respiratory syndrome (SARS). He had clinical signs consistent with a diagnosis of SARS. Laboratory tests were reported as positive for SARS and another WHO laboratory in the SARS network confirmed this to be a case of SARS coronavirus (CoV) infection.[1]

An 11-member international panel investigated the case. The patient had no history of travel to other SARS-affected areas and no history of contact with SARS patients. He worked on the West Nile virus at a laboratory that was conducting research on live SARS coronavirus. They concluded that cross-contamination of West Nile virus samples with the SARS virus in the laboratory was the most likely source of infection. They also identified inappropriate laboratory practices that contributed to the accident and made several recommendations for their correction. A full report on their findings and recommendations is available at www.moh.gov.sg/sars/pdf/ Report_SARS_Biosafety.pdf

WHO advises that Singapore continues to be a safe destination for travellers.[1]

References

1. WHO. Severe acute respiratory syndrome (SARS) in Singapore - update. Available at http://www.who.int/csr /don/2003_09_16/en/

Influenza Outbreak in a Dublin School

An influenza outbreak has been reported in a school in Dublin. The outbreak is being investigated and managed by the Department of Public Health, Eastern Regional Health Authority. In mid-late September a number of children and a staff member were ill with a flu-like illness. Samples from 7 cases were sent to the National Virus Reference Laboratory for analysis, of which 4 have been confirmed as Influenza A (H3N2). Investigations are ongoing to determine if the Influenza A (H3N2) virus identified is similar to the A (H3N2) strain of the 2003/2004 influenza vaccine. These are the first confirmed cases of influenza in Ireland this season.

On 24th September 2003, Micheál Martin, Minister for Health and Children, launched this season's Influenza Vaccination Campaign. The campaign is aimed at people in 'at risk' groups e.g persons 65 years and older, and people with chronic respiratory or cardiac disease. In Ireland, vaccination is also advised for healthcare staff who are in direct patient contact. WHO has called for people in high-risk groups and health care workers caring for them to be vaccinated as a matter of urgency. This strategy would reduce the burden of influenza and reduce cases of respiratory disease that could be mistaken for SARS or raise suspicions requiring costly investigations.[1]

Reference

1. WHO. Influenza vaccination for the 2003-2004 season: recommendations in the context of concern about SARS. Available at www.who.int/csr/disease/influenza/sars/en/print.html

Tuberculosis in Ireland, 2001

Introduction

Since 1998, all information concerning TB notifications in Ireland has been reported by each of the health boards to the National Disease Surveillance Centre (NDSC) for analysis. Beginning on January 1st 2000, this information has included enhanced surveillance data based on the minimum dataset reported to EuroTB, the European agency that collates national TB data within Europe and contributes that data to the WHO global TB control programme. The resulting National Tuberculosis Surveillance System (NTBSS) was set up following consultation between NDSC, the eight health boards and the National Tuberculosis (TB) Advisory Group.

Materials and Methods

For each individual case of tuberculosis notified in 2001, an enhanced notification form was completed by public health doctors, using the available clinical, microbiological, histological and epidemiological data. These forms were then collated in the regional Departments of Public Health. In all but one health board, data were also entered onto an Epi Info 6 database locally and an anonymised version of each database was submitted to NDSC on a quarterly basis. A single health board submitted anonymised facsimiles of enhanced TB forms directly to NDSC. All cases were then collated at a national level on a single Epi Info database for detailed analysis. Reports summarising results were produced on a quarterly basis by NDSC. Information on all cases was updated in late 2002 / early 2003 by each health board to include outcome data.

Population figures, used as the dominator, were taken from the 2002 census of population. The 95% confidence intervals were used to compare rates between groups of interest. Direct methods of standardisation were used to allow comparison of rates between geographical areas using the Irish population as the standard population.

As in previous years, the case definitions used were as recommended by the National Tuberculosis (TB) Working Group.[1]

- A **notified case** of TB refers to clinically active disease due to infection with organisms of the *Mycobacterium tuberculosis* complex (*M. tuberculosis, M. bovis, M. africanum*). Active disease is presumed if the patient is commenced on a full curative course of anti-tuberculosis chemotherapy. Persons placed on chemoprophylaxis for preventive treatment or infected by mycobacterium other than *M. tuberculosis* complex are not included as cases.
- **Pulmonary TB** is defined as a laboratory-confirmed case – either a positive smear, histology or culture of a respiratory sample – with or without radiological abnormalities consistent with active pulmonary TB *or* a case where the physician takes the decision that the patient's clinical symptoms and/or radiological signs are compatible with pulmonary TB.
- **Extrapulmonary TB** is defined as a patient with a smear, culture or histological specimen, from an extrapulmonary site, that is positive for *M. tuberculosis* complex *or* a case with clinical signs of active extrapulmonary disease in conjunction with a decision taken by the attending physician to treat the patient with a full curative course of anti-tuberculosis chemotherapy.
- **Primary TB** is defined as a patient with a negative smear, culture or histology specimen but who has radiological signs of hilar lymphadenopathy on chest x-ray and a positive skin test or there was clinical evidence that led the physician to treat the patient with a curative course of antituberculosis chemotherapy.

Results

Three hundred and seventy eight cases of TB were notified in 2001, giving a notification rate of 9.6/100,000 population. This represents a 4.3% decrease on the corresponding figure in 2000 (395 cases: 10.1/100,000) (table 1). Two hundred and forty cases were male (63.5%) and 137 were female (36.2%). The gender of one case was not stated.

The highest age standardised TB incidence rates were seen in the Eastern Regional Health Authority and the Southern Health Board at 12.4 per 100,000 population each (table 2). The Midland Health Board had the lowest rate at 3.1/100,000. The rates in the MHB, SEHB and NWHB were significantly lower than the national age standardised incidence rate (9.6 per 100,000).

Table 1: Notified TB cases in Ireland, 1991 – 2001, with 3-year moving average, 1992 - 2000

Year	Number	Crude rate per 100,000	3 year moving average
1991	640	18.2	
1992	604	17.1	612
1993	598	16.9	581
1994	524	14.5	526
1995	458	12.6	469
1996	434	12.0	436
1997	416	11.5	423
1998	424	11.7	433
1999	469	12.9	439
2000	395	10.1	409
2001	378	9.6	

Table 2: Total and age standardised incidence rates [95% confidence interval (CI)] for TB in Ireland by health board, 2001

Health Board	TB cases	Age standardised incidence rate	95% CI
ERHA	173	12.4	10.4–14.2
MHB	7	3.1	0.8-5.3
MWHB	24	6.9	4.2-9.7
NEHB	38	11.3	7.7-14.9
NWHB	13	5.4	2.5-8.4
SEHB	17	4.1	2.1-6.0
SHB	72	12.4	9.6-15.3
WHB	34	8.5	5.6-11.4
Ireland	378	9.6	8.7-10.6

The average age of those diagnosed with TB was 45.2 years with a range from one to 93 years.

The age- and sex-specific incidence rates per 100,000 population in Ireland, in 2001 are illustrated in figure 1. The highest rate was observed in those over 65 years.

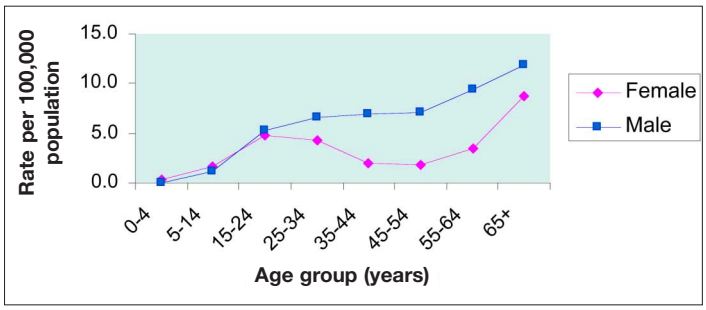

Figure 1: Age- and sex-specific TB incidence rates in Ireland, 2001

Geographic origin

Sixty three (16.7%) of the patients diagnosed with TB were born outside Ireland. This represents a 43.2% increase on last year (n = 44). Twenty seven were born in Africa, 23 in Asia, 9 in Europe, one in South America. The country of origin was unknown in 3 cases.

Diagnostic details

Of the 378 TB notifications, 223 (59.0%) were definite cases which were culture confirmed. Two hundred and fifty two cases were pulmonary (66.7%), 90 cases were extrapulmonary (23.8%) and 35 cases were pulmonary and extrapulmonary TB (9.3%). There was one case of primary TB (0.3%). The diagnostic breakdown in each health board is shown in table 3.

Table 3: Diagnostic categories of TB by health board, 2001

Health Board	Pulmonary	Pulmonary and extrapulmonary	Extrapulmonary	Primary	Total
ERHA	115	16	41	1	173
MHB	5	1	1	0	7
MWHB	17	1	6	0	24
NEHB	24	5	9	0	38
NWHB	9	2	2	0	13
SEHB	11	3	3	0	17
SHB	44	7	21	0	72
WHB	27	0	7	0	34
Total	252	35	90	1	378

Of the 287 TB cases with a pulmonary disease component, 128 (44.6%) were sputum positive.

Of the 212 definite culture-confirmed cases, 204 (96.2%) of isolates were *M. tuberculosis*, seven (3.3%) were *M. bovis* and one (0.5%) was *M. africanum.*

Resistance

Resistance was documented in fourteen cases out of a total of 204 *M. tuberculosis* isolates (6.9%). Mono-resistance to isoniazid was recorded in four cases, mono-resistance to streptomycin in three cases and mono-resistance to pyrazinamide in one case. Three cases were resistant to isoniazid and streptomycin and one case was resistant to isoniazid, streptomycin and ethambutol. In 2001, two multi-drug resistant TB cases, defined as resistance to at least isoniazid and rifampicin, were notified. Six of the drug-resistant cases were born outside Ireland.

HIV status

Seven patients were reported as having HIV in association with TB. Six of these cases had pulmonary TB and one had extrapulmonary TB. Five were culture positive for *M. tuberculosis.* None of these cases were resistant to any standard TB drugs. There were two deaths in this group. One death was attributed to TB.

Outcome

The outcome was recorded in 225 cases (59.5%) in 2001. One hundred and eighty eight of these cases (83.6%) completed treatment. Eleven patients (4.9%) were recorded as being lost to follow up. There were 19 deaths (8.4%) recorded. Five deaths were attributed to TB. A summary profile of the epidemiology of TB in Ireland from 1999 to 2001 is shown in table 4.

Table 4. Summary of epidemiology of TB in Ireland, 1999 – 2001

	1999*	2000†	2001†
Total number of cases	469	395	378
Notification rate (per 100,000)	12.9	10.1	9.6
Foreign born TB patients	65	44	63
% culture positive patients	55.4	58.0	56.1
M. tuberculosis	242	222	204
M. bovis	11	2	7
M. africanum	-	3	1
% smear positive pulmonary cases	38.0	47.2	44.6
Monoresistance to isoniazid	4	2	4
Monoresistance to streptomycin	0	1	3
Monoresistance to pyrizinamide	0	1	1
Multi drug resistant cases	2	2	2
Deaths attributed to TB	9	6	5

* based on 1996 census of population † based on 2002 census of population

Discussion

In Ireland, the year 2001 saw a 4.3% decrease in the TB notification rate when compared to 2000. There was an increase in the percentage of cases who were born outside Ireland (16.7% vs 11.1% in 2000). However, this percentage remains low when compared to that in other European countries. Differences in age standardised TB incidence rates persist between health board areas (figure 2). In 2001, the ERHA and the SHB had the highest rates of TB. In 2000, TB rates were highest in the MWHB and the SHB. Rates were below the national average in the MHB, MWHB, NWHB, SEHB and WHB in 2001. There were two cases of multi-drug resistant TB which is the same as the 2000 figure. As in 2000, only sixty percent of all cases had outcome information recorded.

In the future, the introduction of the Computerised Infectious Disease Reporting (CIDR) system will provide a framework whereby all TB data from a variety of media (paper form, Epi Info 6 and Epi 2000 databases) will be available in a single database. This will not only facilitate more timely reporting but also allow comparisons between data over a number of years.

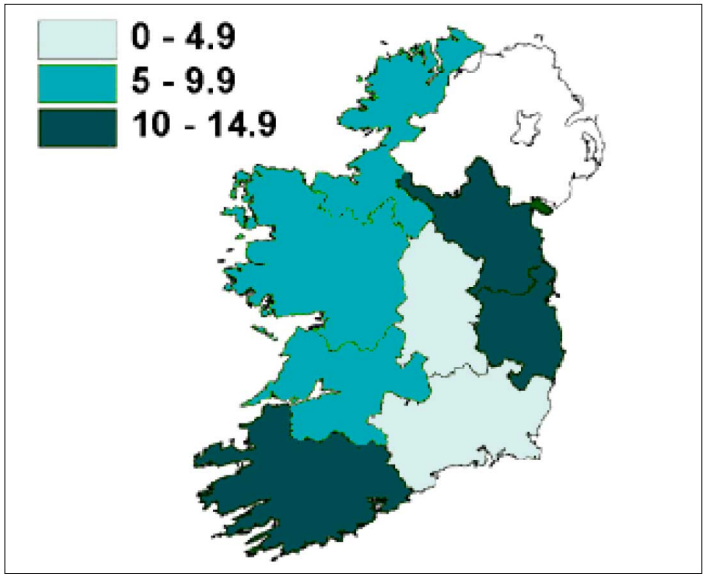

Figure 2: Age standardised incidence rates (per 100,000 population) in Ireland by health board, 2001

Micheal Carton, Lorraine Hickey and Joan O'Donnell, NDSC.

Acknowledgements

We would like to thank all those who participated in the collection of information including the notifying physicians, public health doctors, surveillance scientists, microbiologists, nurses, laboratory and administrative staff.

References

1. Department of Health (Ireland). Report of the Working Party on Tuberculosis 1996: Government Publications.

CIDR Update

NDSC and its partners in public health and clinical laboratories, in conjunction with Fujitsu Consulting, are now nearing completion of the development of the Computerised Infectious Disease Reporting (CIDR) system. This system will utilise state of the art technology to capture information on infectious diseases from multiple sources across the country and will support local, regional and national management and control of infectious diseases.

The emergence of Severe Acute Respiratory Syndrome (SARS) earlier this year underlined the need for the development of systems such as CIDR to support the collection and dissemination of timely and accurate information on new and re-emergent infectious diseases as well as on existing diseases.

The CIDR system has been built using the latest .NET development environment with SQL Server 2000 as the backend database and makes extensive use of XML technology, in line with the inter-operability requirements of e-government initiatives.

Access to the CIDR system will be provided via the Government Virtual Private Network (G-VPN). This provides a cost-effective network with increased security and enhanced bandwidth for public sector organisations, including the health service. Other health agencies utilising this network include the General Medical Services Payments Board (GMS-PB) and the General Registry Office (GRO). Public health departments, community care offices and clinical microbiology laboratories will enter and retrieve infectious disease information from CIDR via standard browser software on their personal computers. No additional software will be required.

To ensure that information within CIDR is stored and accessed appropriately, the core system is firewall-protected and access to the system is limited to authorised users. In addition to usernames and passwords these users will require authentication provided by unique key fob tokens. Information transmitted from local PCs to the core system will be protected by 128-bit encryption.

The information in CIDR will come from two principal sources:

- Notifications of infectious diseases from clinicians and general practitioners will be registered on the system by public health doctors in community care offices and public health departments.

- Clinical microbiology laboratories in hospitals will upload files exported from their laboratory information systems into CIDR, again using standard browser software. These files will be transformed and translated by the core system in the CIDR format. To ensure that this is done accurately and that the files exported by the laboratory information system contain the appropriate information, CIDR users will be able to view uploaded data in its unmodified state and after transformation/ translation. Laboratories will authorise all information prior to its release for view by public health and other CIDR partners.

The information collected and stored by CIDR will be available for analysis utilising a report writing / business intelligence application called 'Business Objects'. This is a leading application of its type that enables information to be retrieved from complex relational databases in a user-friendly fashion and which leaves the underlying data safe. As with the CIDR application itself, viewing and analysing CIDR information with 'Business Objects' will require only standard browser software locally.

To understand how information from multiple sources is associated in CIDR it is necessary to be familiar with a few key concepts. CIDR is effectively a register of 'events' of infectious diseases in individual patients. Multiple 'reports' from various sources (clinicians or laboratories) are associated or linked to the appropriate 'event' for the person in question. Whether reports relate to a given 'event' of infectious disease in an individual is dependent on the disease or organism in question. For example, events of food poisoning associated with salmonella infection would typically be of short duration whereas an event of hepatitis C infection could be of considerably greater duration.

Key Concepts in CIDR

Multiple REPORTS relate to a given event in a given individual

An EVENT is the same episode of disease in an individual i.e. within a given timeframe

CIDR is a PERSON-based system

An OUTBREAK relates to multiple instances of disease in individuals within a given location/timeframe

The CIDR system will be implemented on a pilot basis in January 2004 by public health and laboratories in the North Eastern Health Board, by four reference laboratories (the MRSA Reference Laboratory in St James's Hospital, the Meningococcal Reference Laboratory in Temple Street Hospital, the Salmonella Reference Laboratory in University College Hospital Galway, and the National Virus Reference Laboratory in University College Dublin), and by NDSC. This pilot implementation will allow the impact of CIDR to be assessed prior to the system being made available for national implementation later in 2004.

John Brazil and Derval Igoe, NDSC

Salmonella Monthly Report (August 2003):

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.Anatum	2	0	0	0	0	0	0	0	**2**
S. Braenderup	1	0	0	0	0	0	0	0	**1**
S.Brandenberg	0	0	0	0	0	0	1	0	**1**
S.Corvallis	1	0	0	0	0	0	0	0	**1**
S.Enteritidis	10	3	6	2	2	5	7	3	**38**
S.Hadar	0	0	1	6	0	0	0	0	**7**
S.Heidelberg	1	0	0	0	0	0	0	0	**1**
S.Infantis	1	0	0	0	0	0	0	1	**2**
S.Kentucky	0	0	0	0	0	5	0	0	**5**
Paratyphi A	1	0	0	0	0	0	0	0	**1**
Paratyphi B	0	0	0	0	0	0	1	0	**1**
S.Saintpaul	0	1	0	0	0	0	0	0	**1**
S.Typhi	1	0	0	0	0	0	0	0	**1**
S.Typhimurium	9	4	0	1	2	2	0	3	**21**
S.Virchow	1	0	0	0	0	0	0	0	**1**
Unnamed	0	1	0	0	0	0	0	0	**1**
Total	**28**	**9**	**7**	**9**	**4**	**12**	**9**	**7**	**85**