Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

July 2006

Volume 7 Issue 7

hpsc EPI-Insight

Disease Surveillance Report of HPSC, Ireland

ISSN: 1393-9548

Contents

Health Protection Surveillance Centre

25-27 Middle Gardiner St
Dublin 1, Ireland

Ph +353 1 876 5300
Fx +353 1 856 1299
E info@mailx.hse.ie
www.hpsc.ie

Immunisation Uptake in Ireland, 2005

Introduction

The current Irish childhood immunisation schedule recommends one dose of vaccine against tuberculosis (BCG vaccine) at birth or by one month of age[1] and three doses of vaccines against diphtheria (D_3), pertussis (P_3), tetanus (T_3), *Haemophilus influenzae* type b (Hib_3), polio ($Polio_3$) and meningococcal ($MenC_3$) at 2, 4 and 6 months of age. Between 12 and 15 months of age the first dose of MMR should be given. A booster dose of DTaP/Polio and the second dose of MMR should be given at 4-5 years of age. To control vaccine-preventable diseases it is recommended that at least 95% of children complete the childhood immunisation schedule.

Immunisation uptake statistics presented below, relate to the proportion of children born between 01/01/2004 & 31/12/2004 and those born between 01/01/2003 & 31/12/2003, which completed the recommended immunisation schedule by 12 or 24 months in 2005.

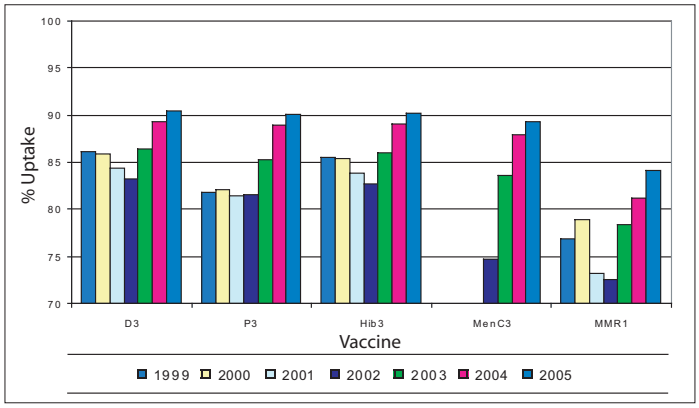

Figure 1. National annual immunisation uptake rates at 24 months
Note scale ranges from 70-100%
MMR_1 2005 uptake figure is not complete as one HSE Area was unable to provide MMR_1 data for Quarter 4 2005.
Since T_3 uptake identical to D_3 uptake only D_3 uptake figures presented and since $Polio_3$ uptake almost identical to Hib_3 uptake only Hib_3 figures presented.

Immunisation uptake rates at 12 months

National uptake rates for D_3, P_3, T_3, Hib_3, $Polio_3$ and $MenC_3$ in children 12 months of age in 2005 were 85%. This was an improvement of 2% compared to 2004 (83%). National rates were 87% in Quarter 4 (Q4)-2005; this is the highest uptake at 12 months reported since the collation of these statistics commenced in 2000. Uptake rates in 2005, by HSE Area, are presented in Table 1.

BCG uptake data were available from five of the eight HSE Areas[2], which represent a third of the national birth cohort. Where data were available national BCG uptake was 93% in 2005, compared to 91% in 2004.

Immunisation uptake rates at 24 months

National uptake rates at 24 months of age in 2005 for D_3, P_3, T_3, Hib_3 and $Polio_3$ were 90% and 89% for $MenC_3$ (Fig.1). Uptake of D_3, P_3, T_3, Hib_3, $Polio_3$ and $MenC_3$ ranged from 86-88% in the Eastern Area to 96% in the Midland Area (table 1). Six of the eight HSE Areas had 90% or greater uptake for all these vaccines. The 95% target was reached for D_3, P_3, T_3, Hib_3, $Polio_3$ and $MenC_3$ in the Midland Area in all 4 quarters in 2005 and for D_3, P_3, T_3, Hib_3 and $Polio_3$ in the North Western Area during Q3-2005.

During 2005 MMR_1 uptake was 84% nationally. However, data in Q4-2005 were only available for 7 of the 8 HSE Areas. During Q4-2005 MMR_1 uptake was 95% in the Midland Area.

Discussion

National uptake rates at both 12 & 24 months increased by 1-2% in 2005 compared to 2004. The 2005 figures at both 12 & 24 months are the highest reported since collation of data commenced in 2000 and 1999, respectively. With the exception of MMR_1, uptake rates at 24 months were 90% or greater in 6 of the 8 HSE Areas. In the Midland Area the target rate of 95% was reached for MMR_1 during Q4-2005. This is the first time any HSE Area reached the target of 95% for MMR_1 since the collation of these statistics commenced in 1999. These continued improvements in uptake rates are encouraging. However, In 2005, national uptake rates at 24 months for D_3, P_3, T_3, Hib_3, $Polio_3$ and $MenC_3$ were 5-6% below the target rates while MMR was 11% below the target rate. Therefore further improvements are necessary to achieve the 95% target rate nationally for all vaccines.

Continued on page 4

Introduction

Antimicrobial resistance (AMR) among bacteria causing invasive infections is a global public health concern. The European Antimicrobial Resistance Surveillance System (EARSS) monitors the occurrence of antibiotic resistance in major pathogens throughout Europe.[1]

The level of meticillin-resistant *Staphylococcus aureus* (MRSA) in Ireland is one of the highest reporting to EARSS. Levels of penicillin-non-susceptible *Streptococcus pneumoniae* (PNSP) and vancomycin-resistant enterococci (VRE) are moderately high. While resistance in invasive isolates of *Escherichia coli* to third-generation cephalosporins is comparatively low, resistance to fluoroquinolone (FQREC) is increasing.[2]

Through EARSS, AMR is monitored for nearly all of the patient population in Ireland. Additional information (enhanced data) is collected on a voluntary basis for a sample of the entire EARSS dataset. This report covers the first two years (2004 & 2005) of enhanced data collected on EARSS pathogens causing bloodstream infection (BSI).

Method

Clinical and scientific staff at the microbiology departments of contributing institutions completed a questionnaire for each isolate from blood-culture under the EARSS protocol on a quarterly basis.[3] SPSS was used for statistical analysis in order to determine which factors contribute to the meticillin resistance of isolates in patients having *S. aureus* BSI.

Results

The eleven laboratories, which contributed data over the two years, provide diagnostic services for 29 hospitals: 6 specialist centres, 10 acute general hospitals (incl. private) and 13 single speciality hospitals (incl. hospices). Enhanced data were collected on 2,011 EARSS isolates, (29% of the complete EARSS dataset from 2004 and 2005). Data for *Klebsiella pneumoniae* (14 isolates) and *Pseudomonas aeruginosa* (20 isolates) are not analysed here as data collection for these pathogens only began in the last quarter of 2005. Breakdown of the resistance profiles of the remaining 1,977 isolates is shown in table 1.

Table 1. Total of number of isolates for each EARSS pathogen and their major resistance profiles

Organism	Number (Percent resistant)
Staphylococcus aureus	847
meticillin/oxacillin resistant	377 (45%)
Streptococcus pneumoniae	194
penicillin non-susceptible	27 (14%)
Escherichia coli	621
fluoroquinolone resistant	104 (17%)
Enterococci	315
Enterococcus faecalis	162
vancomycin resistant	1 (1%)
Enterococcus faecium	153
vancomycin resistant	42 (27%)
TOTAL	**1,977**

Table 2 shows the factors affecting each organism. Overall, 54% of the BSI were in males, with *E. coli* BSI being more common in females. The mean overall age for all patients was 60.5 years.

Length of stay (LOS) is here defined as the number of days spent by a patient in the hospital before a positive specimen is taken. Short LOS prior to detection of BSI indicates that the infection is more likely to have been community-acquired; for example, the median LOS was 0.0 days for *S. pneumoniae* in contrast to 15.5 days for enterococcal BSI.

One or more risk factors were reported in 80% of the records. Malignancies were reported in 23% of the cases. Stay in intensive care unit (ICU), recent surgery and haemodialysis were the next three most commonly reported risk factors. Alcohol abuse was noted as the most common "other" risk factor.

Central venous catheter (CVC) was the primary source in 29% of all *S. aureus* and 24% of all enterococcal BSI. Where a primary source was recorded for *S. pneumoniae* BSI, this was almost always the respiratory tract. Urinary tract was the primary source in 38% of all *E. coli* BSI. Intra-abdominal/GI tract was the primary source in 23% of all enterococcal and 21% of *E. coli* BSI. Primary source was unknown for 612 (31%) of the isolates.

In the small number of cases where a secondary focus for *S. aureus* was identified, bone/joints and the cardiovascular system (endocarditis) were the organs/systems involved.

Each factor was examined in isolation with regard to meticillin resistance in *S. aureus* BSI (table 3). The mean ages for MRSA (65.8 years) and meticillin-sensitive *S. aureus* (MSSA, 48.3 years) were significantly different. The median length of stay, prior to a positive blood culture, of MRSA (10.0 days) and MSSA (2.0 days) were significantly different. Of the patients treated in ICU, significantly more had MRSA (18%) than MSSA (10%) BSI. Gender, presence of a secondary focus, number of known risk factors and CVC as primary source were not statistically different between the two groups of patients. Respiratory tract as a primary source was significantly associated with MRSA (11% *vs.* 6% for MSSA) and skin/soft tissue with MSSA (15% *vs.* 7% for MRSA).

In a multivariate model, with a predictive value of 67%, the following remained significant predictors of MRSA BSI: age in years (Odds Ratio = 1.04, $p < 0.001$), LOS in days (OR = 1.00, $p = 0.015$) and ICU-stay (OR = 1.58, $p = 0.036$), while skin/soft tissue as primary source significantly reduced the chances of the isolate being MRSA (OR = 0.56, $p = 0.038$).

Discussion

While the number of hospitals participating in this enhanced bacteraemia survey is small, the number of records examined represents 29% of all isolates investigated under the EARSS

Table 2. EARSS pathogens and their major resistance profiles with data on factors (where not stated the values represent number of isolates)

Factor		S. aureus	MRSA	S. pneumoniae	PNSP	E. coli	FQREC	Enterococci	VRE
Demographic	Gender female (%)	40%	39%	45%	41%	56%	43%	42%	35%
	Mean age in years	59.3	66.4	52.9	62.4	64.9	64.8	60	55.4
LOS	Median LOS in days	4.0	10.0	0.0	0.0	1.0	7.5	15.5	16.0
Risk factors	Diabetes	45	27	4	2	25	4	15	1
	Haemodialysis	123	63	3	2	17	9	27	4
	Immunosuppressive drugs	51	20	5	1	50	14	27	7
	IV drug use	43	6	7		2		5	
	Major trauma	22	9			3		9	1
	Other immunosuppressive illness	32	14	9	2	23	5	16	3
	Malignancies	124	62	19	2	113	23	57	5
	Recent surgery	120	62	3	1	58	14	75	7
	Solid organ transplant	13	6			12	7	6	2
	Stay in ICU	116	67	12	3	59	13	93	12
	Other risk factors	209	105	23	5	128	24	78	10
Primary source	CVC	247	112		1	27	6	75	15
	Intra-abdominal / GI tract	11	9	2		131	22	73	14
	Non-surgical wound	14	9					3	
	Peripheral venous catheter	25	10					1	
	Respiratory tract	70	41	135	18	14	4	7	
	Skin or soft tissue	96	25	1		3	2	11	
	Surgical wound	34	16			12	3	5	1
	Urinary tract without catheter	18	11			238	36	10	
	Urinary catheter	11	6			43	14	12	1
	Other source	26	6			4		6	1
	Unknown	295	132	56	8	149	17	112	11
Secondary foci	Abscess	10	1			5		4	
	Bone or joint	18	5					2	
	Cardiovascular system	20	9	2				3	
	Central nervous system	2	2	6					
	Other foci	15	7			7		3	1
Total		**847**	**377**	**194**	**27**	**621**	**104**	**315**	**43**

Table 3. Univariate analysis of factors associated with S. aureus BSI

	MRSA (n = 377)		MSSA (n = 470)		P-value
Mean age, years	65.8		48.3		<0.001
Median length of stay, days	10.0		2.0		0.01
Gender = female	146	39%	191	41%	0.538
Stay in ICU	67	18%	49	10%	0.002
Presence of secondary focus	22	6%	36	8%	0.294
Number of risk factors					
0	74	20%	113	24%	
1	215	57%	243	52%	0.252
2	68	18%	92	20%	
>2	20	5%	21	4%	
Primary source					
CVC	112	30%	134	29%	0.717
Respiratory tract	41	11%	29	6%	0.015
Skin/soft tissue	25	7%	71	15%	<0.001
Surgical wound	16	4%	18	4%	0.765
Other	51	14%	54	12%	0.378
Unknown	132	35%	163	35%	0.938

MRSA is a predominantly hospital-acquired pathogen, longer LOS would result in patients acquiring MRSA. Hence LOS is significant in the statistical analysis. Studying the data for a single institution over successive quarters could explain the dynamics of the rates of *S. aureus* and MRSA in a hospital over time, and thus help guide their control.

CVC as primary source is the most common source of *S. aureus* BSI and is equally relevant to both MRSA and MSSA. The same applies for recent surgery as a risk factor. Surveillance of catheter-related BSI and surgical site infection would help to provide a better epidemiological profile of these invasive pathogens.

protocol in Ireland over the two years. This probably reflects an overrepresentation by larger hospitals and the surveillance scheme would benefit by the addition of more acute general hospitals.

In the first year's report it was suggested that centres treating older patients and having greater use of ICU wards would be expected to consistently have a higher than the national average proportion of MRSA.[4] In contrast, centres routinely treating patients with skin/soft tissue infections would be expected to have a lower than the national average proportions of MRSA. The statistical analyses in this report support that suggestion. Since

Ajay Oza and Robert Cunney on behalf of hospitals participating in the Enhanced Bacteraemia Surveillance.

Acknowledgments
Stephen Murchan and the Irish EARSS Steering Group for the provision of the EARSS dataset.

References on request.

Immunisation Uptake in Ireland, 2005 (cont. page 1)

Acknowledgements
HPSC would like to thank the Departments of Public Health in the HSE Areas for providing these data. Particular thanks to the specialists in public health, surveillance scientists, immunisation co-ordinators and system analysts for their help.

Sarah Gee, Margaret Fitzgerald and Suzanne Cotter, HPSC

[1] BCG vaccine is routinely administered within the neonatal period in six of the eight HSE Areas. In the Western and Southern (Cork only) Areas, BCG is administered to older children and at risk groups.

[2] BCG uptake data at 12 months is not available in the Western and Southern Areas (Cork), for reason outlined above. In the North Eastern and Eastern Areas BCG vaccination uptake data is not readily available for national reporting purposes.

Table 1. Annual immunisation uptake rates by HSE Area for children 12 and 24 months of age in 2005

HSE Area	% Uptake at 12 months						% Uptake at 24 months					
	Cohort born 01/01/2004 - 31/12/2004						Cohort born 01/01/2003 - 31/12/2003					
	D3	P3	Hib3	Polio3	MenC3	BCG	D3	P3	Hib3	Polio3	MenC3	MMR 1**
Eastern	81	81	81	81	80	na	88	87	87	87	86	78**
Midland	91	91	91	91	91	89	96	96	96	96	96	93
Mid-Western	87	87	87	87	87	93	90	90	90	90	90	86
North Eastern	90	90	90	90	89	na	93	92	93	93	92	89
North Western	90	90	90	90	89	90	94	93	93	94	92	89
South Eastern	87	87	87	87	87	97	91	91	91	91	90	86
Southern	85	85	85	85	85	90†	91	91	91	91	90	85
Western	87	87	87	87	85	na	92	91	92	92	89	83
Ireland	**85**	**85**	**85**	**85**	**85**	**93***	**90**	**90**	**90**	**90**	**89**	**84****

Since T_3 uptake identical to D_3 uptake only D_3 uptake figures presented

†HSE Southern - part coverage of neonatal BCG (i.e. Kerry only)

*Based on data from five of the eight HSE Areas

**HSE-Eastern MMR_1 figure is based on data from Quarter 1-3 2005 as Quarter 4 2005 MMR_1 data was not available as a result the national MMR_1 figure is not complete
na=not available

Measles outbreak in Germany

Since January 2006, two large, and apparently unlinked, measles outbreaks have been reported in Germany, one in the greater Stuttgart area and the other in the Northrhine-Westphalia region.

German health authorities are investigating and managing the outbreaks. In the affected regions, parents, care persons, doctors, schools and child care facilities have been alerted and reminded of the need for all children to be fully immunised with MMR.

Travellers to Germany

All individuals travelling to Germany from Ireland, and born after 1978, should ensure that they have been vaccinated against measles, preferably with 2 doses of measles containing vaccine such as MMR. Any individuals who develop a rash illness following travel to Germany should seek medical attention.

Further information may be obtained from: www.hpsc.ie/News/Title,1668,en.html

Outbreak of Legionnaires' Disease in Pamplona, Spain

EWGLINET (The European Working Group for Legionella Infection) has alerted the HPSC of an outbreak of Legionnaires' disease in Pamplona, in Northern Spain.

As of June 8th 2006, 139 cases have been confirmed in local residents, over half have been hospitalised. There have been no deaths to date. No cases have been reported in tourists or other non-Spanish citizens

Investigation of the outbreak revealed that most early cases were associated with four local cooling towers. The towers were shut down on June 5th, removing the risk to the public of continued exposure to legionella bacteria.

Legionnaires' Disease (Incubation period: 2 to 10 days) can result in severe pneumonia. Symptoms can include fever, headache, abdominal pain, diarrhoea, and non-productive cough. Deaths may occur in 10-15% of otherwise healthy individuals and may be higher in some groups of patients e.g. immunosuppressed persons.

It is advisable that anyone who visited Pamplona between mid May and mid-June 2006 would seek medical advice if he/she develops symptoms similar to those above. They should inform the GP that they have visited Pamplona and that an outbreak of Legionnaires' disease has occurred there.

Clinicians should consider the possibility of Legionnaires' disease in all patients with a diagnosis of community-acquired pneumonia and in those developing symptoms within 14 days of returning from an area where Legionnaires Disease has been reported.

More information on Legionellosis is available at www.hpsc.ie/A-Z/Respiratory/Legionellosis/