

EUROPEAN ANTIMICROBIAL RESISTANCE SURVEILLANCE SYSTEM (EARSS)



Quarter 4, 2001

March, 2002

Quarter 4 analysis

In Quarter 4 (Q4), 2001, twenty laboratories participated in the *Staphylococcus aureus* arm of the study and twenty-one laboratories participated in the *Streptococcus pneumoniae* component. In addition to reporting data to the National Disease Surveillance Centre (NDSC), participating laboratories referred methicillin-resistant *S. aureus* (MRSA) isolates to the MRSA Reference Laboratory (MRSARL) at St. James's Hospital and both penicillin-susceptible *S. pneumoniae* (PSSP) and penicillin-non-susceptible *S. pneumoniae* (PRSP/PNSP) isolates to the Pneumococcal Referral Laboratory, Beaumont/RCSI.

For the purpose of this analysis, Part 1 describes results of data returned from participating laboratories and Part 2 describes results from isolates sent to referral laboratories. The full list of laboratories currently participating is printed overleaf.

Staphylococcus aureus

Part 1: Data from Participating Laboratories

A total of 217 episodes of *S. aureus* bacteraemia were reported. Isolates from 80 episodes (36.9%) with *S. aureus* bacteraemia were resistant to methicillin. Three laboratories did not report any episode of *S. aureus* bacteraemia during the quarter.

In comparison, there were 170 isolates in Q4, 2000 yielding 42.9% MRSA. The MRSA rate for the year 2000 was 38.8%.

All isolates were susceptible to vancomycin. Susceptibility test results were available for ciprofloxacin on 130 isolates, for erythromycin on 171 isolates and for gentamicin on 172 isolates. Ciprofloxacin, erythromycin and gentamicin resistance rates were 42% (n=55), 38% (n=65) and 15% (n=26) respectively.

Part 2: Data from MRSA Reference Laboratory

Seventy-three MRSA isolates from 72 patients were referred to MRSARL for further evaluation. No data were available on 7 isolates. Antibigram results are shown in table 1.

Minimum inhibitory concentration (MIC) results (determined by Etest) were available on 73 isolates. The majority of isolates (80%, 58/73) exhibited oxacillin MIC values of >256 mg/L. All isolates exhibited vancomycin MIC values of <4 mg/L.

Streptococcus pneumoniae

Part 1: Data from Participating Laboratories

Fifty-one *S. pneumoniae* isolates were reported. Isolates from seven patients (13.7%) with *S. pneumoniae* bacteraemia/meningitis were non-susceptible to penicillin

(PNSP). Eight laboratories did not report any episodes of *S. pneumoniae* bacteraemia/meningitis in this quarter.

In comparison, there were 54 isolates in Q4, 2000 yielding 20.4% PNSP. The PNSP rate for the year 2000 was 12.7%.

Table 1. Antibigram results of MRSA isolates (n=73) referred to MRSARL during Q4 2001.

Antibiotic	S	%	I	%	R	%
Chloramphenicol	73	100	0	0	0	0
Ciprofloxacin	3	4	0	0	70	96
Erythromycin	9	12	0	0	64	88
Fusidic Acid	62	85	8	11	2	4
Gentamicin	48	66	0	0	25	34
Lincomycin	56	77	0	0	17	23
Mupirocin	53	73	19	26	1	1
Rifampicin	72	99	1	1	0	0
Tetracycline	71	97	0	0	2	3
Trimethoprim	63	86*	1	1*	9	13*
Vancomycin	73	100	0	0	0	0

S-Susceptible, I-Intermediate, R-Resistant

* Figures have been rounded down and do not add up to 100%

Part 2: Data from Pneumococcal Referral Laboratory

Thirty-three isolates were referred to Beaumont/RCSI. No data were available on 18 isolates, including one determined to be non-susceptible (in-house Etest result for this isolate was 0.75mg/L). Five PNSP isolates exhibited low-level penicillin resistance ($0.1 \leq \text{MIC} \leq 1 \text{mg/L}$). One isolate with high-level resistance ($\geq 2 \text{mg/L}$) to penicillin was detected. All 33 *S. pneumoniae* isolates exhibited ciprofloxacin MIC values of $\leq 2 \text{mg/L}$, which is interpreted as intermediate according to the latest BSAC criteria (there is no "susceptible" category for ciprofloxacin against *S. pneumoniae*) and cefotaxime MIC values of $\leq 1 \text{mg/L}$.

Table 2. Susceptibility category based on MIC data on *S. pneumoniae* isolates (n=33) referred to RCSI or laboratories during Q4, 2001.

	MIC (mg/L)		
	S	I	R
Penicillin	≤ 0.06	0.12-1.0	≥ 2
	27	5	1
Cefotaxime	≤ 1		≥ 2
	33		0
Ciprofloxacin		≤ 2	≥ 4
		33	0

National MRSA Reference Laboratory

The National Methicillin-Resistant *Staphylococcus aureus* Reference Laboratory (MRSARL) was opened by Mr Micheál Martin T.D., Minister for Health and Children on 23rd January 2002. This purpose-built facility has been established on the St James's Hospital Campus to address the problem of methicillin-resistant *Staphylococcus aureus* (MRSA) in Ireland. When fully operational, MRSARL will offer a range of services to Irish laboratories to assist in control of MRSA. These services will include epidemiological typing using both phenotypic and molecular methods and investigation of rates of resistance to current and new antibiotics.

Development of the MRSARL service will take place on a phased basis. The first phase of building and preliminary equipping is complete and staff recruitment and training are underway. At present, MRSARL is providing additional laboratory data on MRSA isolates submitted by Irish participants to the European Antimicrobial Resistance Surveillance System. In addition to oxacillin and vancomycin minimum inhibitory concentration determinations, these isolates are investigated by susceptibility testing (to provide participants with information on rates of resistance to clinically useful antibiotics) and by antibiogram-resistogram (AR) typing.

AR typing will be the first phase of the epidemiological typing service provided by MRSARL. To ensure that this typing service provides the epidemiological information that MRSARL users require, it is envisaged that a pilot study will be undertaken in collaboration with a small number of laboratories who will be requested to provide epidemiologically defined isolates. This study will evaluate how the typing system performs in the local clinical context. The next phase of development will be phage typing and molecular analysis (on selected isolates). Initially, molecular typing will be by pulsed field gel electrophoresis following macro-restriction of intact chromosomal DNA. The third phase of development will be resistance gene detection using the polymerase chain reaction.

Although MRSARL is not yet ready to offer a 'routine' epidemiological typing service, laboratories experiencing acute problems with MRSA are invited to contact the laboratory if they wish to submit isolates for epidemiological investigation (by AR typing) or to discuss isolates exhibiting problems with methicillin resistance detection or identification. The Director of MRSARL is Professor Conor Keane and the Chief Medical Scientist is Dr Angela Rossney. The National MRSA Reference Laboratory can be contacted by telephone at (01) 4103662 or by email at mrsarl@stjames.ie.

EARSS protocol / Referral of isolates

The EARSS protocol, according to the latest EARSS manual (2001) requires that only data on the first isolate of *S. aureus* per patient per quarter be submitted. Please note that this is slightly different to the original protocol (EARSS manual 1998) that requested data on first isolate of each strain from each patient.

Laboratories are reminded that in order to comply with the EARSS protocol all pneumococcal isolates should go to the Pneumococcal Referral Laboratory at Beaumont/RCSI and MRSA isolates only should go to the National MRSA Reference Laboratory at St James's Hospital.

New Pathogens

Data collection on the new pathogens, *Escherichia coli* and *Enterococcus faecalis* / *Enterococcus faecium*, has started from 1st January 2002 for those laboratories that have agreed to participate in the first instance.

A revised version of the ESBL document prepared by Prof Martin Cormican and Dr Dearbhaile Morris from NUI Galway is being distributed along with this newsletter. They can provide a positive-control strain if required and are happy to examine any isolates in which ESBL production is suspected.

Laboratories that report data to EARSS via WHONET and are participating in this expansion will need to contact NDSC in order to update their WHONET laboratory configuration to facilitate data entry for the new pathogens.

WHONET5/BacLink

We are happy to assist laboratories wishing to report their data to EARSS directly via WHONET or a text file downloaded from their laboratory information system that can be translated into a WHONET file via BacLink.

Three years of EARSS in Ireland

The EARSS programme in Ireland has been in operation since January 1999. We now have 3 full years of data on invasive *S. aureus* and *S. pneumoniae* infections. In addition to the annual report, we will be preparing a report on the overall results generated to date. We would like to acknowledge the contribution to EARSS made by all participating laboratories over the past 3 years.

Welcome to Blanchardstown

We would like to welcome the participation of the James Connolly Memorial Hospital in Blanchardstown, the latest hospital to join the EARSS programme.

Farewell to Stef Bronzwaer

Finally, on behalf of all involved in the EARSS programme in Ireland, we would like to thank Stef Bronzwaer, the EARSS Project Leader at RIVM, for all his hard work and support over the past few years and wish him all the best in his new position at the Infectious Diseases Unit of the European Union Directorate General (DG-Sanco) in Luxembourg.

Prepared by Stephen Murchan and the EARSS Steering Committee (Prof Martin Cormican, Dr Robert Cunney, Dr Lynda Fenelon, Prof Hilary Humphreys, Prof Conor Keane, Dr Olive Murphy, Dr Darina O Flanagan and Dr Angela Rossney).

Participant Laboratories: Adelaide, Meath and National Children's Hospital, Tallaght; Beaumont Hospital, Dublin; Bon Secours Hospital, Cork; Bon Secours Hospital, Glasnevin; Cavan General Hospital; Cherry Orchard Hospital, Dublin; Cork University Hospital; Letterkenny General Hospital; Limerick Regional Hospital; Mater Misericordiae Hospital, Dublin; Mercy Hospital, Cork; Mullingar General Hospital; Our Lady's Hospital for Sick Children, Crumlin; Rotunda Hospital, Dublin; Sligo General Hospital; St Columcille's Hospital, Loughlinstown; St James's Hospital, Dublin; St Vincent's Hospital, Dublin; Tralee General Hospital; Temple St Hospital, Dublin; University College Hospital, Galway; Waterford Regional Hospital.