

A Strategy for the Control of
Antimicrobial Resistance in Ireland

S A R I

SARI Progress Report

January 2005

SARI National Committee

1. Executive Summary

The Strategy for the Control of Antimicrobial Resistance in Ireland (SARI) was launched in 2001. This outlined the scale of antimicrobial resistance in Ireland and provided a plan for improved surveillance and intervention to control and prevent infections caused by antimicrobial resistant microbes. National, regional and specialist sub-committees have been established to oversee the implementation of SARI. Currently, the Department of Health and Children (DoHC) allocates approximately €4.5 million annually for SARI, but much of this to date has had to be used to redress long standing infrastructural deficits such as shortages in infection control nurses, surveillance scientists, clinical microbiologists, and inadequate information technology systems.

In 2003, the National SARI Committee, which is based at the DoHC, was provided with €584,000, to identify pilots for projects that might subsequently be applied nationally. These projects are ongoing and were chosen on the basis of submissions that were relevant to national SARI recommendations, i.e. that they had an educational value, were feasible, and had multi-disciplinary involvement. Reports on these projects will be available in mid-2005. The National SARI Committee has not received allocated funds since 2003.

The allocation of funds to the regions has resulted in the establishment of a variety of groups and committees for the implementation of SARI. These include infection control committees, the appointment of infection control nurses, training of a variety of healthcare professionals, audit of antimicrobial use, participation in the European Antimicrobial Resistance Surveillance Scheme (EARSS) and the appointment of pharmacists with a special remit for the monitoring of antimicrobial use.

There are five SARI sub-committees that cover hospital and community antibiotic stewardship, surveillance of antimicrobial resistance, infection control and prevention, and surveillance of antimicrobial consumption. Amongst the achievements of these sub-committees are the re-drafting of MRSA control guidelines, greater liaison with,

and the provision of educational materials for general practitioners, the development of antibiotic guidelines, involving a cascade approach, for implementation in hospitals, and participation by Ireland in the European Surveillance of Antimicrobial Consumption (ESAC) surveillance network.

Two national meetings have taken place, one in December 2003 that was confined to SARI, and the other in November 2004, which involved colleagues in Northern Ireland, associated with the Antimicrobial Resistance Action Programme (AMRAP). While both these meetings confirmed the significant activity that is ongoing in the implementation of SARI, the 2004 meeting in particular highlighted the gap there is between progress in the Republic and in Northern Ireland, where the infrastructure and numbers of relevant personnel are significantly greater. Also, because of better liaison between hospital and community units, there has been more activity on the control of antimicrobial resistance in the community in Northern Ireland.

The infection control and antibiotic stewardship sub-committees jointly developed a questionnaire on infection control, occupational health resources and antibiotic stewardship that was circulated to all the acute hospitals. This has confirmed that, although there have been some improvements since the 1999 North/South MRSA study, there remain a number of deficits in the numbers of infection control nurses (15% of hospitals have no on-site access to one) and the number of microbiologists (53% of hospitals do not have an on-site microbiologist), facilities (only 9 hospitals have negative pressure ventilation facilities) and surveillance (approximately a third of hospitals only are conducting surgical site surveillance).

Priorities for 2005 and beyond include improving the infrastructure in terms of physical resources and personnel, identifying infection control and infection prevention as a national health priority, e.g. implementation of hand hygiene and MRSA guidelines, educational initiatives for both healthcare workers and the general public on antibiotic use and extending further the surveillance of bloodstream infection and hospital antibiotic consumption. However, the cap on the employment of additional personnel in the public sector militates against achieving success in many of these areas. Improvements in the physical infrastructure of many of our

healthcare facilities, including the building of new hospital units, is also very necessary as it will provide better facilities in which to care for patients, with a corresponding reduction in the likelihood of those patients acquiring hospital-acquired infection.

2. SARI Funding

- **Regional Funding**

The principal funding for SARI is allocated on a regional basis. The annual allocation to each Health Board/Authority region is based on the population in that region, with additional weighting for the Eastern Regional Health Authority to account for the concentration of specialist services within that region. The amount of funding provided for SARI was based on the recommendations in the original SARI report, particularly the recommendations for additional staffing in specialist areas related to SARI. The funding is specified for SARI implementation in the annual allocation to Health Boards/Authority.

The approximate funds allocated to SARI since its launch are:

- 2001: €2,539,000
- 2002: €4,383,000 (€1,844,000 increase on 2001)
- 2003: €4,506,000 (2002 allocation plus 2.8% inflation)
- 2004: €4,632,000 (2003 allocation plus 2.8% inflation)

Regional funding for 2005 has remained the same, with a further small increase to allow for inflation. However, because of this, it is not possible to develop further certain areas or to correct the major infrastructure deficit. The allocations to each Health Board/Authority, rounded to the nearest €1,000, are given in table 1.

Table 1: Regional SARI funding, 2001-2004, in Euros (rounded to nearest €1,000)

Health Board/Authority	2001	2002	2003	2004
ERHA	908,000	1,568,000	1,612,000	1,657,000
MHB	152,000	257,000	265,000	272,000
MWHB	216,000	376,000	386,000	397,000
NEHB	216,000	371,000	381,000	392,000
NWHB	146,000	253,000	260,000	268,000
SEHB	273,000	473,000	486,000	500,000
SHB	381,000	659,000	677,000	696,000
WHB	248,000	427,000	439,000	451,000
Total	2,539,000	4,383,000	4,506,000	4,632,000

A number of issues have arisen regarding regional SARI funding. Most of these relate to access to funds at regional and hospital level, and ensuring that funds allocated to SARI were used only for SARI implementation. The cap on recruitment in the health service, introduced in 2003, has delayed the filling of many of the specialist posts allocated under regional funding. These issues are dealt with later in more detail in the section on SARI Regional Committees and the report on the 2003 National SARI Implementation Meeting.

In February 2004 the DoHC wrote to all Health Board/Authorities seeking a detailed account of how SARI funding had been allocated in their region, including what specialist posts had been created and how many of these posts had been filled. The DoHC also instructed each region to ensure that funding for posts that had not been filled be used for capital expenditures, such as laboratory resources for standardised susceptibility testing, hospital isolation rooms, hand hygiene facilities and educational initiatives. Each region was also instructed to ensure that the regional SARI committee included a finance officer with responsibility for ensuring appropriate allocation of regional SARI funding.

- **National Funding**

The DoHC provided €584,000 in 2003 to fund priority areas for development identified by the SARI National Committee. As this was a once-off provision, and given the time constraints in allocating this funding, the National Committee decided to use this funding for SARI projects that were relevant to national level SARI implementation. A request for tenders was circulated and 21 submissions received, including research projects, capital projects and requests for additional personnel. The submissions were scored according to four criteria

- Relevance to national SARI recommendations: 50%
- Educational value: 20%
- Feasibility: 20%
- Multi-disciplinary involvement: 10%

Funding was approved for 11 projects, which are detailed in table 2.

Table 2: National level projects funded in 2003

Submitted by	Project	Funding
SARI Community Antibiotic Stewardship Working Group	Pilot project on promotion of rational antibiotic prescribing in general practice	€62,503
SARI Antimicrobial Consumption Working Group	Antimicrobial consumption surveillance at the National Centre for Pharmacoconomics	€59,199
Midland Health Board	Promotion of rational antibiotic prescribing in hospitals	€60,000
Central Veterinary Research Laboratory	Surveillance of antimicrobial resistance in human bacteria of animal origin	€29,200
SHB Regional SARI Committee	Surveillance of antimicrobial resistance and antibiotic consumption in primary care	€51,000
Cork University Hospital	Surveillance of antimicrobial resistance in pneumococci	€37,800
University College Hospital, Galway	Defining antimicrobial prescribing knowledge, attitudes and behaviours	€60,000
St Vincent's University Hospital, Dublin	MRSA surveillance and influence of environmental factors in MRSA acquisition	€51,193

Submitted by	Project	Funding
Infection Control Nurses Association	Development of infection control education services at RCSI	€60,000
MRSA Reference Laboratory	Surveillance of glycopeptide resistance among Irish MRSA isolates	€62,433
South Eastern Health Board	Development and implementation of guidelines for prevention of intravascular catheter sepsis	€27,800
Total		€561,128

Many of the projects did not get underway until 2004, principally as a result of difficulties arising from the cap on recruitment in the health service. Similar funding or follow up support for these projects has not been made available for 2004 and 2005.

3. Regional SARI implementation

The following reports on SARI implementation in each Health Board/Authority region are based on reports presented by each SARI Regional Committee at the SARI National Implementation Meeting, held in Tullamore in December 2003, and from the reports received in response to the DoHC request for details of regional SARI funding allocation in February 2004 (see section on Regional Funding above).

1: SARI Implementation in the Eastern Regional Health Authority

ERHA Infection Control Advisory Committee

The Infection Control Advisory Committee (ICAC) was set up by the ERHA Director of Public Health in February 2001 and was given a broad remit for infection control, which includes advice on the regional implementation of SARI. The multidisciplinary committee meets quarterly and communicates with the National SARI Committee, ERHA administration and with the professional groups represented on the committee. Dr Eleanor McNamara, Consultant Microbiologist at Cherry Orchard Hospital and St James's Hospital chairs the ICAC.

In December 2001 the ICAC produced a document “Implementation Strategy, 2002-2004”, which outlined the requirements for SARI implementation in ERHA, including personnel, training, information technology, surveillance and financial costs. A review of submissions and recommendations was produced in June 2002. This review included recommendations for training of relevant health professionals, realistic strategy objectives and, most importantly, the appointment of a five-member core group of health professionals with responsibility for SARI in ERHA.

SARI Funding Allocation in the ERHA

A total of €1,568,000 was available for SARI implementation in ERHA in 2002. Of this €895,160 was allocated for the appointment of 23.5 infection control nurses, €266,640 was allocated for the appointment of six laboratory surveillance scientists and €133,500 was allocated for training of relevant health professionals.

In 2003 there was €1,612,000 (corrected to the nearest €1,000) available for SARI implementation in the ERHA and €761,545 of this remained unspent due to designated SARI personnel posts not being filled. Unfilled posts comprised 10.5 infection control nurse posts, two surveillance scientist posts and the five-member ERHA SARI core group. Combined with the €272,700 carried over from 2002 this meant that there was €1,034,245 SARI funding in the ERHA that remained unspent between 2002 and 2003. The ICAC identified laboratory equipment *as a priority* for implementation of NCCLS (a standardised laboratory susceptibility testing method) as a suitable capital expenditure for unspent SARI funds and €385,883 was requested for this purpose in 2003. ERHA agreed to release unspent SARI funds for NCCLS equipment in 2004.

2: SARI Implementation in the Midland Health Board (MHB)

MHB Regional SARI Committee

Dr Phil Jennings, Specialist in Public Health Medicine, chairs the regional SARI committee. The committee includes:

- Chief Medical Scientists
- Chief Pharmacist

- Consultant Microbiologist
- Consultant Pathologist
- Consultant Haematologist
- Infection Control Nurse
- Specialist in Public Health Medicine
- Surveillance Scientist

SARI funding and allocation

There was €152,000 available for SARI implementation in MHB in 2001, which was increased to €257,000 in 2002.

SARI funding was allocated to the following:

- Infection Control Nurses (1.5 posts)
- Laboratory scientist (1 post)
- Clerical Officer support for laboratories (3 posts)
- Laboratory IT Developments
- Automated Laboratory System (Vitek analyser)
- Training
- Audit of antibiotic charting
- Antibiotic Prescribing Guidelines
- New prescribing chart developed for the three sites

A number of posts remain unfilled due to the employment ceiling within the MHB region.

SARI implementation

The SARI National Committee, through SARI national level funding, provided €60,000 to fund a pilot project on promotion of prudent antibiotic prescribing in hospitals.

A half-time locum consultant microbiologist was appointed to the MHB in 2003.

3: SARI Implementation in the Mid Western Health Board (MWHB)

MWHB Regional SARI Committee

The regional SARI committee was set up in 2002 and includes public health, hospital administration, hospital clinician, laboratory, pharmacy, general practice, dental and infection control representatives. Dr Kevin Kelleher, Director of Public Health for the MWHB, chairs the committee.

The key priorities identified by the SARI regional committee are:

- Establishment of infection control teams and infection control committees at all hospitals in the MWHB
- Two full time consultant microbiologist posts
- Appointment of additional infection control nurses
- Regional collection and analysis of antibiotic prescribing, and surveillance of antimicrobial resistance data
- Education of doctors regarding prudent antibiotic prescribing-

SARI funding and allocation

Available SARI funding in MWHB was €216,000 in 2001, €376,000 in 2002 and €386,000 in 2003 (figures rounded to nearest €1,000).

Funding allocations to date include:

- Additional infection control nurses at the Mid-Western Regional Hospital, Ennis General and Nenagh General hospitals
- Administrative support, for consultant microbiologist posts
- Laboratory surveillance scientist post at the Mid-Western Regional Hospital
- Capital expenditure
 - Information technology equipment
 - Hospital environmental cleaning equipment
 - Laboratory equipment

The additional infection control nurses, surveillance scientist and administrative support posts are now in place. Funding has been approved for one consultant microbiologist post, which is due to be filled in 2005

SARI implementation

Steps have been taken to improve surveillance of antimicrobial resistance and antibiotic prescribing data. A review of evidence-based guidelines has been undertaken, with a view to developing regional antibiotic guidelines.

Filling the consultant microbiologist posts and establishing hospital infection control teams have been identified as key priorities for future SARI implementation in MWHB.

In 2004 MWHB published data on *Staphylococcus aureus* bacteraemia in each hospital in the region for 2002 and 2003. The report showed a significant fall in the rate of methicillin-sensitive *S aureus* bacteraemia over the two years. The rate of methicillin-resistant *S aureus* bacteraemia remained stable and was close to the average rate for the entire country.

4: SARI Implementation in the North Eastern Health Board (NEHB)

NEHB Regional SARI Committee

The regional committee was established in October 2001 and is chaired by Dr Rosemary Curran, Consultant Microbiologist at Cavan/Monaghan General Hospitals.

SARI funding allocations

There was €216,000 available for SARI funding in NEHB in 2001, €371,000 in 2002 and €381,000 in 2003.

Much of the 2002 allocation was used to fund externally performed microbiology tests for Monaghan General Hospital. Much of the 2003 allocation appears to have been used for the general hospital budget at Cavan General Hospital.

NEHB SARI activities

Current surveillance activities include:

- MRSA surveillance
- Participation in EARSS
 - Cavan/Monaghan General Hospitals and Our Lady of Lourdes Hospital Drogheda currently participate in EARSS.
- NEHB quarterly surveillance newsletter

A database on community antimicrobial prescribing is being established, with a view to developing a regional antibiotic formulary.

Future priorities for the NEHB

- Installation of microbiology laboratory information systems
 - Restricted reporting of antimicrobial susceptibility results
- Appointment of laboratory surveillance scientists
- Establishment of hospital infection control teams
 - Healthcare-associated infection surveillance
- Establishment of Hospital Drugs and Therapeutics Committees
 - Development of antibiotic policies
- Local/regional/national information network.

5: SARI Implementation in the North Western Health Board (NWHB)

NWHB Regional SARI Committee

The regional committee is chaired by Dr Anthony Breslin, Specialist in Public Health Medicine.

NWHB SARI funding allocations

There was €146,000 available for SARI funding in NWHB in 2001, increased to €253,000 in 2002. There was virtually no increase in regional SARI funding for 2003, other than a small increase to account for inflation.

NWHB SARI activities

The following posts were identified as priorities for SARI funding in NWHB:

- Research assistant at the Department of Public Health
- Two laboratory-based surveillance scientists (Sligo General Hospital and Letterkenny General Hospital)
- Pharmacist
- Two infection control nurses
- Consultant microbiologist at Letterkenny General Hospital

The research assistant post at the Department of Public Health and the surveillance scientist post at Letterkenny General Hospital were filled. The remaining posts have not been filled due to the cap on recruitment.

6: SARI Implementation in the South Eastern Health Board (SEHB)

SEHB Regional SARI Committee

The SEHB Regional SARI Committee was established in June 2002 and is chaired by Dr Anne Moloney, consultant microbiologist at Waterford Regional Hospital.

SARI funding allocations in SEHB

There was €273,000 available for SARI funding in SEHB in 2001 and the regional allocation of funding during 2001 included one infection control nurse and one laboratory surveillance scientist.

In 2002 there was €473,000 available and the allocation included:

- Two infection control nurse posts (one at Waterford Regional Hospital, one community-based post for Carlow/Kilkenny)
- One laboratory scientist
- A research officer, based at the Department of Public Health
- A hospital pharmacist
- IT equipment for infection control
- Laboratory interface IT equipment for NCCLS implementation

There was no additional funding available for 2003. However, unspent funding from 2002 was allocated for capital expenditure on laboratory and IT equipment. Funding was also allocated for a community pharmacist post, although this has not yet been filled.

There is a designated person responsible for allocation and monitoring of regional SARI funding in SEHB, in consultation with the regional SARI committee. All funding is currently allocated to posts assigned to SARI and other support costs (training, education, computers, printers, expenses, facility improvements). Only one designated SARI post remains unfilled (administrative support post), but the saving from this was used to fund SARI-related non-pay costs, as detailed above.

SARI implementation in SEHB

NCCLS standardised susceptibility testing is in place for the region.

An infection control nurse has been appointed with responsibility for long term care facilities, including developing and implementing infection control policies for such facilities. A second infection control nurse, appointed under SARI, is assisting the development of regional infection control policies and surveillance of healthcare-associated infection.

Hospital-based ward pharmacists are involved in antibiotic stewardship initiatives, such as monitoring of aminoglycoside therapy.

A regional enhanced bacteraemia surveillance system is being set up for *Staphylococcus aureus*/MRSA bacteraemia. A regional surveillance system for catheter-related sepsis is also being established, which was funded from the National SARI Committee allocation for 2003.

7: SARI Implementation in the Southern Health Board

SHB Regional SARI Committee

The regional committee is chaired by Dr Olive Murphy, Consultant Microbiologist at Bon Secours Hospital, Cork. The committee meets quarterly and agrees funding requirements and regional SARI initiatives. The committee develops an annual plan and also submits an annual report to the Southern Health Board and SARI National Committee. Currently there are three subcommittees that report to the SHB regional SARI committee:

- Antimicrobial resistance surveillance subcommittee
- Antibiotic consumption surveillance subcommittee
- Hospital acquired infection surveillance subcommittee

SARI funding allocations

There was €381,000 available for SARI funding in SHB in 2001. Of this €273,000 was allocated for the following posts at Cork University Hospital group:

- Laboratory scientist (basic grade)
- Senior laboratory scientist
- Clinical pharmacist
- Two clerical staff (posts not yet filled)
- Infection control nurse
- Consultant microbiologist (0.5 full time equivalent)

Remaining unspent funds from 2001 were carried over into 2002.

There was €659,000 available for SARI implementation in SHB in 2002, with some additional monies carried over from 2001. This funding was allocated as follows:

- Cork University Hospital group
 - Zone reader for NCCLS susceptibility testing
- Bantry Hospital
 - Infection control nurse (0.5 full time equivalent)

- Tralee General Hospital
 - Surveillance scientist
 - Pharmacist (0.5 full time equivalent)
 - Infection control nurse (0.5 full time equivalent)
 - Zone reader for NCCLS susceptibility testing
- South Infirmary, Cork
 - Laboratory incubator
- Mercy Hospital, Cork
 - Surveillance scientist
 - Pharmacist (0.5 full time equivalent)
 - Infection control nurse (0.5 full time equivalent)
 - Zone reader for NCCLS susceptibility testing
 - Computer for surveillance
- Bon Secours Hospital, Cork
 - Surveillance scientist (0.5 full time equivalent)
 - Zone reader for NCCLS susceptibility testing
- Department of Public Health
 - Public health specialist (0.5 full time equivalent)
 - Grade IV surveillance assistant

The allocated posts at Bantry Hospital, Tralee General Hospital and the Department of Public Health were not filled and the zone reader for Tralee General Hospital was not purchased, leaving a surplus of €153,500 from unfilled posts and unspent capital expenditure. The regional SARI committee has requested the return of any unspent SARI funding from these institutions.

SHB SARI activities

Three projects in the SHB region received national level SARI funding from the SARI National Committee in 2003:

- SARI Community Antibiotic Stewardship Working Group
 - €63,000 for pilot project of promotion of prudent antibiotic prescribing in general practice
- UCC Department of Primary Care

- €51,000 for surveillance of antimicrobial resistance in general practice
- Cork University Hospital, Department of Microbiology
 - €38,000 for surveillance of resistance in community-acquired *Streptococcus pneumoniae*

The following infrastructure is now in place for SARI implementation in SHB:

- Equipment
 - Automated zone readers for susceptibility testing in 4 laboratories
 - Hospital acquired infection surveillance system (Form recognition) in 3 hospitals
- Personnel
 - Additional consultant microbiologist (0.5)
 - Laboratory surveillance scientists in 4 laboratories
 - Surveillance scientist (0.5) and surveillance assistant in Department of Public Health
 - Pharmacists in 3 hospitals
 - Infection control Clinical Nurse Managers in 4 hospitals
 - Clerical support in 1 hospital

SARI related activities for 2004:

- All laboratories to introduce NCCLS methodology
- Laboratory AMR surveillance to be developed
- System for monitoring antimicrobial use to be developed
- HAI surveillance project to commence
- Nationally funded projects to commence
- Communication network with GPs, Consultants, NCHDs etc to be developed

8: SARI Implementation in the Western Health Board

WHB Regional SARI Committee

Dr Diarmuid O'Donovan, Director of Public Health, chairs the regional committee.

SARI funding allocations

There was €248,000 available for SARI funding in WHB in 2001, increased to €427,000 in 2002. In 2003, the allocation was €439,000.

A. Portlincula Hospital, Ballinasloe

2001: €38,092 (appointment of CNM2 Infection Control Nurse)

2002: €63,092 total (additional €25,000 used to employ 0.5WTE Medical Scientist, who has helped develop the introduction of standardised antibiotic susceptibility testing).

The next priority is the implementation of an infection control package, which will assist in monitoring the incidence of healthcare associated infection. Increased pharmacy support and the appointment of a Surveillance Scientist are further priorities.

B. Roscommon County Hospital

2001: €38,000 - used to implement NCCLS guidelines (computer hardware, reagents and growth media)

2002: €88,000 (additional €50,000, facilitating the appointment of a Medical Scientist)

Funding has been used to provide additional handwashing stations and replacement of roller towels across the hospital, and the implementation of the Laboratory

Information System. Priorities are the appointment of an Infection Control Nurse - recruitment difficulties have prevented this to date. The hospital has identified as a target the production of timely and accurate data on antimicrobial resistance, in particular with respect to Urinary Tract Infections.

C. Mayo General Hospital (MGH), Castlebar

2001: €38,000 (appointment of Infection Control Nurse)

2002: €88,000 (additional €50,000, facilitating the appointment of a Medical Scientist)

There is currently a shortfall in both pay and non-pay costs for these posts, and MGH would therefore prioritise addressing this shortfall. The Pharmacy Department is currently working on developing formularies and a 0.5WTE Clinical Pharmacy post will be required to support this work.

D. Galway Regional Hospitals, (GRH, i.e. University College Hospital, Galway and Merlin Park)

Funding breakdown is not available.

In general, the following points were made in relation to GRH:

- The key role of the Infection Control Nurse
- The importance of investing in information systems
- The need for increased pharmacy support

The over-riding priority for GRH has been identified as the appointment of an additional Consultant Microbiologist for regional coordination of SARI. Financial clearance has not yet been received.

4. SARI Subcommittees

Infection Control Subcommittee

This sub-committee which met for the first time in August 2002 and is chaired by Professor Hilary Humphreys, represents a broad range of professional groups. In addition to participating in the drafting of the SARI Hospital Survey (see section 6), the first two main objectives of the group were to draft guidelines on hand hygiene and begin the process of revising the 1995 guidelines for the control of methicillin-resistant *Staphylococcus aureus* (MRSA) in hospitals and other health care settings.

National hand hygiene guidelines were finalised in mid-2004 and a formal launch of the guidelines is planned for early 2005. The guidelines draw on a wide body of international evidence and best practice and include recommendations on appropriate hand hygiene facilities, selection of hand hygiene agents, occupational health issues, corporate responsibility, education and audit. Implementation of the guidelines has been identified as a priority for SARI implementation in 2005.

The sub-committee discussed at some length the format and nature of new guidelines on the control of MRSA. Recent years have seen the revision of MRSA guidelines in other countries and the sub-committee felt that it was unnecessary to draft new guidelines *ab initio*. Consequently, it was decided to draft guidelines from those that are already available and which are evidenced-based. In particular, after some consideration, the sub-committee felt that it was not feasible for the group to undertake a rigorous systematic literature review as has occurred in the UK and elsewhere, because of the time that would be involved, the resources that would be required to do this, and the belief that as the evidence in this area is descriptive, this exercise would not alter the main conclusions derived from an update of the 1995 Irish guidelines and a review of other guidelines available internationally. A draft version of the updated guidelines was distributed for consultation in late 2004, with a view to publication of the final guidelines by mid-2005.

Community Antibiotic Stewardship Subcommittee

Prof Colin Bradley, Professor of General Practice at University College Cork, chairs the SARI Community Antibiotic Stewardship Subcommittee. The subcommittee includes General Practitioners, microbiologists, a pharmacist and pharmaceutical industry and consumer representatives. The subcommittee's activities include:

- Interaction and liaison with other national and regional groups
- Development of education materials for patients
- Development of educational materials for doctors
- Development of prescribing guidelines
- Feedback for GPs on antibiotic prescribing
- Information for GPs on antibiotic resistance patterns
- Specific educational initiatives

A GP educational initiative was established in 2003 involving four GP CME groups. These groups collect data on antibiotic prescribing, including the reasons for prescribing, and this data informs detailed group discussion on antibiotic choices, clinical indications for antibiotics and other factors that influence prescribing.

These discussions will be used to develop strategies for limiting patient demand for and inappropriate prescribing of antibiotics. Once this pilot project is completed these strategies will be made available to GP CME groups and SARI Regional Committees across the country.

The subcommittee is also developing prescribing guidelines for GPs and patient educational materials, based on examples of best practice and guidelines from other countries.

Hospital Antibiotic Stewardship Subcommittee

Dr Edmond Smyth, Consultant Microbiologist at Beaumont Hospital, Dublin, chairs the SARI Hospital Antibiotic Stewardship Subcommittee. The subcommittee's remit includes:

- Developing guidance on education of health professionals regarding prudent antibiotic use in hospitals
- Developing guidance on antibiotic stewardship programmes for Irish hospitals
- Developing guidance on prudent antibiotic prescribing in the hospital setting, including
 - Empiric antibiotic policy development
 - Diagnostic guidelines
 - Guidelines on directed antibiotic therapy

The subcommittee developed guidelines on hospital antibiotic stewardship, with a cascade approach to implementation in Irish hospitals. The guidelines include recommendations on a variety of stewardship interventions, including:

- Structures and staffing for antibiotic stewardship
- Strategies for optimising antibiotic therapy
- Local antibiotic formularies, policies and guidelines
- Point of prescribing interventions
- Appropriate use of diagnostics
- Prescriber education

The subcommittee examined the role of infectious disease pharmacists in promoting rational antibiotic use and is also examining options for the training of additional clinical pharmacists in infectious diseases/antibiotic liaison. The subcommittee also examined potential educational interventions for doctors in training and is developing educational tools and interventions to be incorporated into General Professional and Higher Specialist training.

Antimicrobial Resistance Surveillance Subcommittee

This subcommittee, which is chaired by Dr Robert Cunney, has produced a series of recommendations for development of AMR surveillance in Ireland. The key recommendations are:

- AMR surveillance programmes should follow the objectives and general principals set out in the World Health Organisation document “Surveillance standards for antimicrobial resistance”
- AMR surveillance should include appropriate denominator data
- All diagnostic microbiology laboratories should participate in the European Antimicrobial Resistance Surveillance System (EARSS)
- AMR surveillance based on routine laboratory data should be based on EARSS methodology
- National AMR surveillance should be based on targeted surveillance of key pathogens
- National AMR surveillance should be based on a minimal core dataset
- Specific laboratory resources will need to be in place to facilitate comprehensive AMR surveillance, i.e.
 - Standardised susceptibility testing (NCCLS)
 - Electronic data collection (CIDR)
 - Laboratory surveillance personnel
- Periodic prevalence studies should be used to determine resistance levels among key community-acquired pathogens
- Reference laboratory support will be required for effective AMR surveillance
- Human AMR surveillance should be linked to AMR surveillance of pathogens of non-human origin

EARSS in Ireland was expanded in 2003 to include 28 laboratories, representing over 95% of the population, and further expanded in 2004 to include 36 laboratories. Enhanced surveillance of EARSS pathogens was piloted during the fourth quarter of 2003 and formally commenced in quarter 1 2004. Data on the source of bacteraemia and other clinical factors are collected and linked to EARSS laboratory data.

Extension of enhanced bacteraemia surveillance to all regions has been identified as a priority for SARI implementation for 2005.

Details of EARSS in Ireland and data on antimicrobial resistance surveillance, including enhanced surveillance of bacteraemia, is available on the NDSC website (www.ndsc.ie).

Antimicrobial Consumption Surveillance Subcommittee

This subcommittee, which is chaired by Dr Robert Cunney has produced a set of draft recommendations on development of surveillance of antimicrobial consumption (AMC) in Ireland. The document sets out the key requirements for AMC surveillance. Participation in the European Surveillance of Antimicrobial Consumption (ESAC) surveillance network should form the basis of AMC surveillance in Ireland.

Ireland's participation in ESAC is coordinated by NDSC. Quarterly retrospective data is provided on community antimicrobial consumption, based on pharmacy wholesale data. SARI national level funding in 2003 included the appointment of a pharmacist at the National Centre for Pharmacoeconomics (NCPE) at St James Hospital to analyse data on antimicrobial consumption from the GMS database. Preliminary data from this has been submitted to ESAC and a number of collaborative projects between NDSC and NCPE commenced in 2004. Data on antimicrobial prescribing within the GMS scheme are available from the NCPE website (www.ncpe.ie).

Collection of hospital antimicrobial consumption data commenced on a pilot basis in 2004. Seven hospitals initially provided quarterly data for 2003, using ESAC definitions. Extension of hospital antimicrobial consumption surveillance to all hospitals has been identified as a priority for SARI implementation in 2005.

Detailed results of antibiotic consumption data can be found in the SARI section of the NDSC website at www.ndsc.ie.

5. National Implementation Meetings

National Implementation Meeting, 2003

A one-day meeting was held in Tullamore in December 2003 to review implementation of SARI to date. The meeting brought together representatives from the SARI National Committee, Regional Committees, Subcommittees, Department of Health and Children (DoHC), Health Board/Authority management and others involved in SARI implementation at local, regional and national levels. Dr James Kiely, Chief Medical Officer at DoHC, opened the meeting. The morning session included updates from the SARI National Committee and each Regional Committee and Subcommittee. Dr Stef Bronzwaer presented an overview of AMR strategies in Europe and Dr Hugh Webb presented an update on the Northern Ireland Antimicrobial Resistance Action Plan (AMRAP).

For the afternoon session, participants divided into discussion groups to review SARI implementation under a series of headings, including key priorities for regional SARI funding and implementation, key priorities for the SARI national committee and areas requiring national guidelines. The main recommendations from the discussion groups included:

- Appointment of additional key personnel, as recommended in the SARI report
- Accountability, transparency and strict ring-fencing of funding for SARI
- Improvements in laboratory resources, including reference laboratories
- More strategic direction from the SARI National Committee
- Improved communication between national and regional committees
- Educational materials on prudent antibiotic use
- National guidelines on isolation precautions for antibiotic-resistance organisms, *C. difficile*, MRSA, VRE, hand hygiene and environmental cleaning in healthcare settings

A full report of the meeting is available in the SARI section of the NDSC website at www.ndsc.ie.

Joint SARI/AMRAP Meeting, 2004

The second National SARI meeting was held in Dundalk in December 2004 and was organised in conjunction with AMRAP. Dr. Eibhlin Connolly (Deputy Chief Medical Officer, DOH & C, Dublin) and Dr. Lorraine Doherty (Senior Medical Officer, DHSSPS, Belfast) officially opened the meeting.

Dr Hugh Webb outlined the considerable progress that is being made in Northern Ireland with regard to the implementation of AMRAP, including the appointment of “AMRAP nurses” and various strategies to enhance professional and public education, including at primary school level. A recent GP survey indicated that 41% of individuals have received antibiotics in the last 12 months, with high demand in those aged between 16 and 24 years of age, those with free prescription entitlement, and parents with young children. These findings highlight the need for a major public education programme. Two advertisements, to be shown on television in early 2005, on prudent antibiotic use and hand hygiene have been developed. Other initiatives include GP educational tools and a survey of telephone prescribing, the collecting of further epidemiological data on extended spectrum β -lactamases, and trend analysis for MRSA prevalence.

Dr Jan Kluytmans presented a review of control of MRSA in the Netherlands. This presentation emphasised the importance of control as MRSA results in extended length of stay in hospitals and increased healthcare costs. In the Netherlands, there has been an increase in the number of isolates in the last couple of years, but this may be partly due to new or improved detection methods. However, Dr. Kluytmans had not experienced a case of MRSA bloodstream infection in 10 years in a hospital with over 1400 beds. The Netherlands’ approach to MRSA control is active screening of both staff, and patients at risk, with strict isolation, including the use of masks and caps.

Julie McCarroll, Lesley Edgar and Tim Wyatt presented details of antimicrobial resistance, antimicrobial consumption and bacterial surveillance in Northern Ireland.

All laboratories report voluntarily their resistance rates, and bloodstream figures are published quarterly. Six of the nine laboratories are participating in EARSS. The Central Service Agency is capable of capturing all antibiotic prescriptions. Although antibiotic costs have increased by 5% in the last year, they have decreased as an overall proportion of drug costs. Recent features of antimicrobial prescribing include a reduction in the prescribing of cephalosporins by 26%, a reduction in the prescribing of macrolides by 12% and a reduction in the prescribing of penicillins by 15%. In terms of the number of prescriptions, amoxicillin is the most commonly prescribed agent, but in terms of expense, minocycline accounts for the largest sum expended on antibiotics, largely because it is used for the treatment of acne. Future priorities include determining risk factors for MRSA acquisition, and accessing data on secondary care prescribing.

Prof Hilary Humphreys presented an update on SARI implementation and Dr Robert Cunney presented the results of the SARI hospital survey. These are detailed elsewhere in this document.

In the afternoon attendees were divided among five discussion groups, each considering a separate aspect of control of antimicrobial resistance:

- Prudent antibiotic use in the community
- Prudent antibiotic use in hospitals
- Infection control
- Surveillance
- Public and prescriber education

Each group was given two questions to debate and prepare consensus responses, which were shared with all attendees during the closing plenary session. Details of the responses from each group are included in the full meeting report, available at www.ndsc.ie.

6: SARI Hospital Survey

The SARI Infection Control Subcommittee and the SARI Antibiotic Stewardship Subcommittee developed a survey questionnaire on infection control, antibiotic stewardship and occupational health resources in acute hospitals. Survey questionnaires were sent to the chief executives of 68 acute hospitals in September 2003 with reminder letters and telephone contact for non-responders. All responses were received by the end of December 2003.

The survey showed an improvement in a number of areas since the 1999 North/South MRSA study and the launch of SARI in 2001. For example:

- Since 2001 the number of infection control nurses in Irish hospitals had increased from 31 to 66 full time equivalents (FTE)
- Since 2001 the number of microbiologists in Irish hospitals had increased from 15.5 to 24.5 FTE
- Although only 55% of hospitals had written antibiotic guidelines, this represents an improvement from 41% in 1999
- In 1999 13% of hospitals had no isolation rooms available for infection control purposes, compared to 5% in 2003

The survey showed that there are still personnel and infrastructural deficits in relation to infection control, antibiotic stewardship and occupational health in Irish hospitals.

For example:

- 15% of hospitals had no on-site access to an infection control nurse
- 53% of hospitals had no on-site access to a consultant microbiologist
- 73% of hospitals had an on-site infection control committee, but only 9 of 66 had designated administrative support
- 30% of hospitals only were conducting surgical site infection surveillance
- Although 95% of hospitals had isolation facilities, only 9 hospitals had negative pressure ventilation facilities and there were only 52 such rooms in the Republic in total
- Only 23% of hospitals routinely reported local antibiotic susceptibility data back to clinicians

- 39% of hospitals had carried out local audits of antibiotic prescribing, but only six hospitals routinely reported antibiotic prescribing data back to clinicians

A detailed report of the survey findings is available in the SARI section of the NDSC website at www.ndsc.ie.

Priorities for 2005

The SARI National Committee has identified the following priorities for 2005:

A Infrastructure:

- Removal of the cap on employment for specialist personnel required for SARI implementation, including microbiologists, ICNs, laboratory/surveillance scientists, clinical pharmacists and public health specialists
- Improved physical infrastructure in hospitals, with particular emphasis on hand hygiene facilities and isolation rooms
- Identification of infection control as a priority at both national and hospital management levels and the implementation of measures to ensure corporate responsibility for infection control by hospital administrators and chief executives

B Specific and immediate interventions

- Implementation of the SARI Hand Hygiene and MRSA guidelines
- Educational initiatives, including prescriber education, national public awareness campaigns and infection control education for hospital managers
- Extend the enhanced bacteraemia surveillance system to build on the success of EARSS, and to identify major risk factors for infection with antibiotic resistant bacteria.
- Collection of hospital antibiotic consumption data from many more if not most hospitals, in line with European Surveillance of Antimicrobial Consumption (ESAC) protocols

- Participation in the prevalence study on healthcare-associated infection being organised by the UK DOH (previously carried out in 1992/1993, in which 7 Irish hospitals participated)

Conclusions and future directions

Whilst there has been considerable progress on tackling antimicrobial resistance since the launch of SARI in 2001, such as the improvements in infrastructure and the establishment at regional level of active SARI Committees, much remains to be done. We await the appointment of more key personnel in relevant areas such as consultant microbiologists, infection control nurses and others, the implementation of a standardised approach to antimicrobial susceptibility testing, and the extension of local or pilot initiatives on antimicrobial prescribing. Furthermore, we need to establish a national surveillance system for nosocomial infections that builds upon the success of the EARSS programme. At present surveillance is conducted locally in some centres but is not standardised, and therefore there is no national data on the true impact of healthcare-associated infection. These developments must be accompanied by improvements in the physical infrastructure and facilities of many hospitals and healthcare facilities. For example, more isolation facilities are required in many acute hospitals and when planning new units, we need to give greater consideration to design features that will optimise infection prevention.

Whilst progress in all these areas is possible, it will require continued commitment with appropriate funding. Unfortunately, the bio-evolutionary capacity of pathogens, in particular healthcare-associated bacteria, means that there is continuous change and adaptation by microbes with the likelihood of new antimicrobial resistant pathogens emerging. Consequently, in the first instance, we need to prevent antimicrobial resistant rates increasing and subsequently we need to work harder to try to lower the prevalence of resistance amongst such pathogens as *Staphylococcus aureus*, enterococci and other important pathogens. Finally, education needs to be a continuous theme of the SARI implementation programme. This must include on-going education of all healthcare professionals and the public to reiterate the

importance of this area and the valuable resource that antibiotics represent, so that antimicrobial resistance can be curbed.

Hilary Humphreys and Robert Cunney on behalf of the National SARI Committee

January 2005