



## **Strama Annual Report 2007**

### **Strama's remit and organisation**

Strama has been given the remit of promoting transdisciplinary collaboration in the effort to safeguard the availability of effective antibiotics in human and veterinary bacterial infections, and to initiate measures that primarily affect human health. The Swedish government has given Strama, in collaboration with the Swedish Institute for Infectious Disease Control, the specific task of carrying out a review of current national systems for monitoring antibiotic consumption and resistance. The review should lead to recommendations for the future structure of national monitoring and should include proposals for the financing of such a system. This work is in progress and will be finally published in 2008.

The base for Strama's national activities consists of a coordinating office located in the premises of the Swedish Institute for Infectious Disease Control, a management group of national experts, and county-organised local Strama groups. A number of these have been allocated tasks and funding from the relevant county council, but most remain unfunded.

### **Interdisciplinary coordination**

Strama has initiated regular meetings with the Swedish Board of Health and Welfare and the Swedish Institute for Infectious Disease Control in order to coordinate the campaign against antibiotic resistance, as laid down in the Swedish Government Bill 2005/06:50. Regular collaboration takes place with the Swedish Medical Products Agency, primarily through joint workshops, in order to formulate new treatment guidelines for various infective conditions. Strama has been co-opted onto several meetings because of the zoonosis potential of MRSA and ESBL resistance. As a result of MRSA outbreaks in veterinary hospitals, Strama has collaborated closely with several public authorities.

A reference group consisting of representatives from local Strama groups has met during the year to share information and discuss priorities. The Swedish Reference Group for Antibiotics and its constituent sections has a continuous exchange of information with Strama.

Strama has provided support for the Swedish Association of Local Authorities and Regions (SKL) ahead of deciding on strategies to combat healthcare-associated infections, and a protocol will be drawn up in a collaboration between SKL, healthcare hygiene representatives and Strama's secondary care network. In addition, Strama participates in a working group at SKL, which is to put forward proposals for a permanent system for the continuous registration of healthcare-associated infections.

Strama has instigated a collaboration with a group of dentists, with the aim of discovering the patterns of antibiotic use and resistance in dental practice. Indications for antibiotic prophylaxis and the lack of guidelines and consensus documents have been identified as priority areas, and the group has started to work on these issues. At the 2007 Annual Dental Congress, a joint presentation was made under the title of "Antibiotics in Dental Care – time to start some Strama-work?"

Against the background of high antibiotic prescribing in the elderly, Strama has initiated a collaboration with representatives of the speciality of geriatric medicine. The aim is to arrange joint educational meetings and to discuss the relevant quality aspects of antibiotic use in the elderly.

Strama has also been consulted during the Patient Data Inquiry and has thereby been able to confirm that the proposals would facilitate, with IT support, the implementation of quality assurance instruments for the monitoring of antibiotic resistance and antibiotic usage. Quality tools of this type would also ensure that the use of antibiotics is rational, safe and compatible with the relevant guidelines at county and prescriber levels.

## **Developments in antibiotic consumption and resistance**

After falling for many years, the total sales of antibiotics in Sweden have been rising for the past three years. Detailed analyses of the causes of this rise are essential, and these are in progress. There is nothing to suggest that increasing ill-health has played a part. Several factors may be involved, e.g. the attitudes of prescribers and the general public to antibiotic prescribing. Prescribing is highest in the three large city regions, which implies that access to healthcare may be a contributory factor. It is primarily dispensing to children under the age of 15 that has increased. Many of Strama's activities have been focused on increasing awareness of childhood infections, e.g. by developing teaching materials for nursery schools and parents. Consumption in the oldest age group remains high, and during the year Strama has organised further theme days in Malmö and Sundsvall, focusing on infections in elderly care home residents.

Even though antibiotic consumption is now thought to be rising, Sweden still has one of the lowest consumption rates in the EU. Despite this, the prevalence of antibiotic resistant bacteria continues to rise. Strama is monitoring this development in a close collaboration with the Swedish Institute for Infectious Disease Control and its Antibiotic Resistance Group. 1 137 cases of methicillin-resistant staphylococci (MRSA) were reported during the year, a provisional rise of 8% on 2006. This rise cannot be blamed on any individual large outbreaks, as none have been reported. The fact that the average age has fallen may suggest that MRSA infections outside the healthcare system are on the increase, irrespective of whether the infection is acquired in Sweden or abroad. A detailed analysis of the apparently altered MRSA epidemiology must be carried out, and this should include an investigation into the link between previous antibiotic treatment and community-acquired MRSA infection in Sweden. The first sizeable outbreak in recent years of vancomycin-resistant enterococci was reported in the autumn of 2007.

In the past, bacteria with ESBL resistance had rarely been seen in Sweden but are now rapidly increasing. Resistance means that certain groups of antibiotics that have had long use in the treatment of common infections such as urinary tract infections, post-laparotomy infections and septicaemia are no longer effective. Bacteria with ESBL are often resistant to other antibiotics as well, and because of this multiresistance are particularly difficult to treat. Large and small outbreaks with spread of bacteria with ESBL resistance have occurred in Sweden. The well-documented international consequences of this are increased mortality, prolonged inpatient stay and rising hospital costs. In Sweden however, there is a lack of systematic studies into the consequences of antibiotic resistance. In February 2007 ESBL was made notifiable under the Swedish Communicable Diseases Act, and a total of 2 101 cases were reported during 2007. No county or region was spared.

## **Strama's remit according to its directive**

The following is a concise description of Strama's activities in relation to the areas defined by its directive.

*Strama shall, based upon the national and international monitoring and analysis of the prevalence of antibiotic resistance and consumption, actively promote measures that primarily affect human health*

The increase in ESBL-producing bacteria is worrying. The bacteria occur both in the community and in hospitals, and several outbreaks have been reported. In an attempt to put a brake on the trend, Strama has drawn up an action plan based on evidence and on the experience of experts appointed by public authorities and organisations. The programme will be widely distributed throughout the healthcare system, and Strama is of the opinion that the measures should be introduced immediately and be fully implemented by the end of 2008 at the latest.

*Strama shall actively promote research into issues related to antibiotic resistance where the need for new knowledge has been identified.*

### **Ear infections**

During the year, a study was initiated in three counties into acute otitis media involving perforation of the eardrum in children aged 2-16 yrs. The study is looking into the aetiology and healing process in perforation where antibiotics are withheld. Data from 1000 medical records will be collated and analysed for the complication risk of acute otitis media.

### **Urinary tract infection**

Urinary tract infections are one of the commonest reasons for prescribing antibiotics. Use is particularly high in care of the elderly, and in many cases it is unnecessary, e.g. in the condition of asymptomatic bacteriuria (ABU), which has been studied with support of Strama's project funding. A scientific paper about the link between incontinence and ABU has been accepted for publication in the Scandinavian Journal of Infectious Diseases.

Work on Strama's clinical trial continued during 2007. The study compares one and two weeks' treatment of acute pyelonephritis in women. Twenty departments of infectious diseases are taking part in this randomised, placebo-controlled and double blind study. 173 patients had been included by the end of 2007.

The results of a study initiated by Strama and carried out in Kronoberg County were presented at a European congress during the year. The study investigated whether antibiotic resistance can regress if antibiotic consumption is reduced. Despite a radical reduction (85%) in the prescribing of one particular antibiotic against urinary tract infection (trimethoprim), no clinically significant effect on the bacteria that cause urinary tract infection was detected.

### **Hygiene in nursery schools**

A trial is being carried out in Gothenburg in which a hygiene nurse is attached to nursery schools. Strama, in collaboration with the University of Gothenburg, is supporting the trial evaluation, which is being carried out in two parts. So far, the hygiene nurse has visited about 120 nursery schools in Gothenburg (out of a planned 350). Hygiene rounds have been carried out, followed by large-group discussions and training in illness and infection at nursery schools. Nursery schools continuously report absence registration to the responsible hygiene nurse. The trial is to be completed in October 2009.

### **Intensive care**

ICU-Strama's collaboration and integration with the Swedish Intensive Care Register was instigated a couple of years ago. Procedures were developed in 2007 for the downloading of microbiological data linked to personal identity number from three dif-

ferent laboratory systems. In parallel with this, the work of collating data related to antibiotic consumption, demography and key data has continued, with the aim of preventing healthcare-associated infections.

*Strama shall collate and actively disseminate information relating to antibiotic resistance to stakeholders in healthcare and local authority care, as well as to decision-makers in public authorities, the general public and the media.*

### **Web site and reports**

Strama continually provides statistics on antibiotic sales and resistance patterns on its web site: [www.strama.se](http://www.strama.se). The web site also provides complete presentations, accounts of meetings and summaries of national and international scientific papers in the field. About 40 000 hits have been registered by the web site during 2007. Since October 2007, Strama's media-watch has monitored the number of references in the press. According to this, 75 articles about or statements from Strama have appeared between October and December.

Strama presented the Swedres annual report for the sixth year in a row, in collaboration with the Institute for Infectious Disease Control (SMI). The report contains all the available statistics on antibiotic consumption and resistance in Sweden, together with examples of local and national projects. The report is in English, and it is used, amongst other things, for the international dissemination of information about Swedish efforts to combat antibiotic resistance. Swedres is produced in collaboration with the Swedish National Veterinary Institute which has a corresponding veterinary report, SVARM, in the same publication.

Strama continuously monitors a large number of scientific journals in order to keep abreast of international research. Particularly interesting research is published in "Strama-nytt" (Strama-News) which is distributed via the web site to about a thousand subscribers.

Data from Strama's previously completed point prevalence study in secondary care was evaluated during 2007. The analysis showed improvements in prescribing patterns in two of the three main intervention areas – the duration of prophylaxis in surgery diminished, as did the use of quinolones in women with cystitis. Treatment patterns in community-acquired pneumonia remained unchanged.

### **Workshops and education days**

During 2007, the final background documents were drawn up alongside treatment recommendations from the workshop on lower urinary tract infections held in 2006 by the Medical Products Agency in collaboration with Strama. A summary has been prepared and will be published in *Läkartidningen* (Journal of the Swedish Medical Association). A symposium entitled "Cystitis in women – a troublesome triviality" will be held during Riksstämman (the Swedish Annual Medical Congress). Strama had its own stand at the Riksstämman, with informational material and the opportunity to hold discussions with experts from the workshops. A workshop was held in November 2007 in collaboration with the Medical Products Agency on the treatment of lower respiratory tract infections in children and adults in primary care. The consensus treatment recommendations are currently being summarised.

This year's education days for members of the local Strama groups saw the participation of around a hundred members. Theme days entitled "Healthcare-related infections and antibiotic resistance can be curbed" were arranged in Malmö and Sundsvall. This activity took place in collaboration with the Institute for Infectious Disease Control, the Board of Health and Welfare, SKL and the Swedish Association for Infection Control

(SAIC). The aim is to assemble decision-makers from local authority care and the healthcare services to discuss how healthcare-related infections and antibiotic resistance can be curbed within care of the elderly, e.g. by highlighting examples of excellence and emphasising the importance of good collaboration. A further similar day is planned in Gothenburg for 2008.

### **Scientific articles**

A summary of Strama's activities between 1995 and 2005 was made in 2007. The article was published in February 2008 in *Lancet Infectious Diseases*. A corresponding review was written for Jönköping County and published in *Quality Management in Health Care* 2007.

An article describing the medical and financial consequences of MRSA has been published in *Läkartidningen*. The final account of the project on childhood infections was presented during the year in a dissertation. The study showed that children in municipalities with high antibiotic prescribing rates were not subject to higher rates of illness than those in municipalities with low prescribing rates. Two articles were published during the year, and a further article resulting from the project is planned for 2009. Data from a study of ear infections in southern Sweden was published in 2007. The study provides support for the current treatment guidelines, suggesting that antibiotics have a very limited effect on acute otitis media between the ages of 2 and 16.

Parts of ICU-Strama were presented during the year in a dissertation. The thesis describes the use of antibiotics and the development of antibiotic resistance in Swedish intensive care and is based on studies carried out in a collaboration between ICU-Strama, the Institute for Infectious Disease Control and the Faculty of Health Sciences of Linköping University.

In a collaboration with five European university hospitals, an infection control programme has been used to establish the level and quality of antibiotic use and the pattern of healthcare-related infection. The work has been presented in three scientific articles.

*Strama shall work for the practical implementation of knowledge gained in the field of antibiotic resistance by changing the attitude and behaviour of prescribers, other relevant professional groups and the general public.*

The quality assurance group of the Swedish Association of General Practice has devised quality indicators for a variety of infections. A system for simple quality assessment of the work of primary healthcare centres has been developed in Jönköping County. Strama is supporting this work, which will become available nationally to all users outside Jönköping County during 2008. This web-based instrument enables comparisons in the management of common infections to be made between different units. Work has begun to make it possible to monitor the indications for the treatment of infection in primary care in Sweden. Annual extraction of data from the computerised medical record systems of 20-40 health centres is planned. A system for the automatic extraction of data relevant to consultations for infection is being gradually introduced. Tenders have been invited for computerised medical record extraction software. A network of health centres is being developed for the annual extraction of data, starting in 2008.

Qualitative interviews pertaining to basic hygiene procedures have been carried out with different groups of specialist doctors in several counties. The interviews have been put into print, and the analysis has commenced.

In another qualitative study, hospital doctors have been interviewed about antibiotic resistance. This analysis is also in progress and will continue in 2008.

There is a need for simple training material for GPs in the field of paediatric infections. Work has started during the year on the development of this type of material which should be ready in 2008 and which will be followed by theme days/educational input in 2009.

A questionnaire on how, and in what form, discussion of antibiotic resistance takes place has been sent to course organisers of relevant medical undergraduate courses. A review of medical foundation and specialist training courses shows that their content is not particularly high. Because Strama has considered providing training material for doctors, suitable ways of providing this have been looked at.

*Strama shall work for the development of programmes of action at regional and national levels with concrete aims, measures and audit methods adapted for practical implementation.*

In September 2004, the Board of Health and Welfare held a workshop on MRSA in the community. The task of summarising the findings was given to Strama in the autumn of 2006. The material is divided into four areas: Child care, Definitions, Care of the Elderly and Other Community Aspects. Four groups have continued to work on the material during 2007, with the aim of compiling this into a knowledge base.

A working group, by remit from the SAIC, has started to revise the "Protocol for infection control standards in adult care homes". The work has been done with financial support from Strama. The protocol is the third revision of the protocol (KIKHOS) that was developed in 1998 by a working group within SAIC (then known as SASIC). The final version of the protocol is not quite ready.

In order to strengthen its local activity, Strama has written to the heads of county councils and primary care to point out that the organisation of the effort to prevent antibiotic resistance requires the provision of the necessary financial and human resources. In the letter, Strama highlights the increasing problem of antibiotic resistance and the need to make antibiotic utilisation policy an integral part of the work to improve patient safety and quality of care.

*Strama shall allocate and administer the funds it receives from central government for measures needed to fulfil the tasks that the strategy group has been set by this ordinance, and to monitor organisations that have received state funding.*

The local Strama groups have been given the opportunity to seek funding for local projects. 880 000 SEK was allocated in 2007 to the following projects:

- Reduced overuse of antibiotics in primary care by means of improved diagnosis of viral respiratory tract pathogens.
- A study of how the population of the urinary tract pathogen Escherichia Coli in Kronoberg County changed during a large-scale intervention with a discontinuation of trimethoprim prescribing.
- A Nordic interview study of MRSA in the community.
- Resistant gut bacteria in travellers.
- The prevalence of ESBL-producing Enterobacteriaceae in imported and domestically produced foods.
- Improved diagnosis of urinary tract infection in nursing home patients; IL-6 as a marker of treatment indication.
- IT support for the assessment of antibiotic use and healthcare-related infection at Karolinska University Hospital.

*Strama shall be active internationally in the field of antibiotic resistance.*

### **Collaboration with European authorities**

Strama's chairman has taken part in meetings with the European Centre for Disease Prevention and Control (ECDC) entitled "National Focal Points for Antimicrobial Resistance" and in a hearing on antibiotic resistance at the European Parliament. During 2007, Strama has also collaborated in two country visits (Greece and Germany) made by the ECDC regarding measures to combat antibiotic resistance. At the initiative of Strama's chairman, discussions have been held between the leadership of ECDC and EMEA (the European Medicines Agency), which resulted in a joint project between these two authorities to look at the imbalance between the development of resistance in Europe and the development of new antibiotics. Strama's chairman has taken part in the collaboration between Slovenia, France, the Czech Republic and Sweden that aims to coordinate activities related to antibiotic resistance under the EU-chairmanship of each respective country. Strama has contributed to the preparation of a "council recommendation" on work with healthcare-related infections.

### **The WHO**

Strama has regular contact at different levels of the WHO. In association with the World Health Assembly's work in May 2007 on the resolution on Rational Use of Medicines, Strama's chairman took part in a technical briefing at which Strama was presented as an example of how activities promoting the rational use of medicines can be organised.

### **Monitoring antibiotic consumption and resistance**

Strama has, during 2007, continued as the Swedish representative on ESAC (European Surveillance of Antimicrobial Consumption). In 2007, as in previous years, ESAC has collected antibiotic consumption data from all participating countries. Sweden is also taking part in the sub-projects in primary and secondary care which started in 2006.

The Swedish ICU-Strama model has been further developed for European application within the EU-financed IPSE project "Improving surveillance and controlling antibiotic resistance in ICUs".

Sweden is actively participating in the GRACE project (Genomics to combat antibiotic resistance in community-acquired lower respiratory infections) as the hub of the twelve European countries involved. The project examines how lower respiratory tract infections are managed in Swedish primary care. Ten primary care centres, spread nationwide, registered all patients consulting for lower respiratory tract infections during two separate periods. Symptoms, clinical findings, investigations and treatment were recorded, and the patients completed a diary for 4 weeks. Data from 300 Swedish patients, and a total of 3 600 European patients, are being compiled. A randomised and controlled study of the diagnosis and treatment of lower respiratory tract infections represents another part of the project and was started this year. Six Swedish centres are taking part, together with ten European countries. Apart from the registration of patient history and clinical data, the study includes taking samples for culture, blood tests and X-rays. Follow-up is done with spirometry, microbiology cultures and blood tests. The study was started in the autumn of 2007 and will continue until 2009.