

European Science Foundation

Standing Committee for the European Medical Research Councils (EMRC)

ESF EMRC EXPLORATORY WORKSHOP

Antibiotic Prescribing Quality Indicators

Antwerp, Belgium, 7-9 September 2005



Scientific Report

**Samuel Coenen, Matus Ferech and Herman Goossens
University of Antwerp, Antwerp, Belgium**

Table of content

1. Executive summary	4
2. Partners.....	6
3. Scientific content of the meeting.....	10
Workshop rationale	10
Workshop preparation	11
Workshop format and process	12
4. Outcome.....	14
Summary of achievements.....	14
Agreed action points	14
5. References	15
6. Final program	17
Wednesday 7 September 2005	17
Thursday 8 September 2005	17
Friday 9 September 2005	18
7. Final list of participants.....	19
Convenors:	19
ESF Representative:.....	19
Secretariat Coordinators:	19
Participants:	19
8. Statistical information on participants.....	22
Represented countries.....	22
Gender distribution	22

1. Executive summary

In the context of increasing antimicrobial resistance the ESF Exploratory Workshop on Antibiotic Prescribing Quality Indicators' main objective was to develop valid prescribing quality indicators of antibiotic use in ambulatory care, c.q. explicitly defined measurable items of antibiotic prescribing giving a possible indication of the level of prescribing quality focussing on different aspects of prescribing quality, and relevant for clinical practice and not just easy to measure. In addition we aimed to produce these indicators on the basis of present and future ESAC (European Surveillance on Antimicrobial Consumption; www.ua.ac.be/ESAC) data. The workshop provided a unique opportunity to build on the interdisciplinary expertise within Euro DURG (European Drug Utilisation Research Group; www.eurodurg.com), GRIN (General Practice Respiratory Infections Network), BAPCOC (Belgian Antibiotic Policy Coordination Committee; www.bapcoc.be), WHO (World Health Organisation; www.who.int), ESAC and other experts in this field.

A scientific advisory board was set up to prepare the workshop. Members of Euro DURG (Flora Haaijer-Ruskamp, Robert Vander Stichele), GRIN (Paul Little, Theo Verheij) and of the ESAC MT (Samuel Coenen, Matus Ferech, Herman Goossens) decided that the programme of the workshop should allow discussing the development of antibiotic prescribing quality indicators from both the perspective of professionals and policy makers and should result in ESAC based antibiotic prescribing quality indicators, a roadmap for the development of antibiotic prescribing quality indicators in general and a research agenda for the assessment of the validity of antibiotic prescribing quality indicators in particular.

The workshop included smaller work groups and plenary sessions (see final program). A series of background presentations in plenary sessions helped to set the scene and to prepare for the following discussions in small groups. For the break out sessions the participants were split up in advance in two groups with similar distribution of gender and affiliation, and wide variation in nationalities. Each group was facilitated by one member of the scientific advisory board, with two other members serving as rapporteurs. In plenary sessions, results of the work groups were presented, compared and discussed by all participants. These sessions were tape-recorded.

After two days of relevant background presentations, constructive feedback and fruitful discussions we ended up with a useful set of proposed indicators related to the quality of antibiotic prescribing in ambulatory care and some

so-called structural indicators. A list of proposed antibiotic prescribing quality indicators was developed using a general format (see Annex 1: General format of the indicators) and further elaborated by Samuel Coenen and Matus Ferech, based on the audio-recording (see Annex 2: List of proposed indicators) after the workshop. All participants have been asked to score the proposed indicators in a way similar to the scoring during the workshop itself. A final set of indicators will be prepared after processing the scores, comments and suggestions of the participants on the list of proposed indicators. The results of this validation procedure will also be submitted as an abstract for ESCMID 2006 and the outcome of the workshop submitted as a scientific paper to a peer reviewed journal.

The final set of indicators will be posted on the ESAC website, and we will report the indicator values for 2003 and 2004 to all countries in ESAC according to the final set of indicators in January and April 2006 respectively. Once available, identifying temporal trends and regional differences in antibiotic prescribing quality indicators could trigger action and investigation. Benchmarking by comparisons between countries could be an important stimulus to quality improvement. Also, development, implementation and evaluation of guidelines require information on antibiotic prescribing quality, and collection of this information will inform local or national prescribing policies.

Finally, we established a network of interested general practitioners, microbiologists, infectious diseases specialists, pharmacists, drug utilisation methodologists and policy makers, representing BAPCOC, ESAC, Euro DURG, GRIN and WHO Europe.

Keywords relating to the proposed workshop topic

Antibiotic use, antimicrobial resistance, pharmaco-epidemiology, quality indicators.

Suggested citation

Coenen S, Ferech M, Goossens H. ESF EMRC Exploratory Workshop: Antibiotic Prescribing Quality Indicators. Scientific Report. Antwerp, University of Antwerp, 2005.

2. Partners

The workshop proposed by ESAC (European Surveillance of Antimicrobial Consumption; www.ua.ac.be/esac) builds on the interdisciplinary expertise within Euro DURG (European Drug Utilisation Research Group; www.eurodurg.com), GRIN (General Practice Respiratory Infections Network) BAPCOC (Belgian Antibiotic Policy Coordination Committee; www.bapcoc.be), and WHO (World Health Organisation; www.who.int) Europe.

Euro DURG has originated from a group of "temporary" expert WHO advisors. There have always been strong links to WHO European Office, and its committee has always been broadly representative, geographically and professionally. Euro DURG cooperates with international and national drug regulatory authorities, such as the WHO and the European Union, European Council, health insurance agencies, the pharmaceutical industry, academic departments and professional bodies.

Its constitution defines drug utilisation research and pharmaco-epidemiological research as research on the quantitative and qualitative aspects of drug use and therapy, the determinants of drug use and the effects on patients specifically and on the population in general.

The foundation of Euro DURG and its constitution take into account the growing importance of population related drug utilisation research and of research on quality and cost containment of therapy. The ongoing deep political changes in Europe need not only multinational drug utilisation research but research on a European level. The Euro DURG mission is the promotion of drug utilisation research as a means of improving use of drugs by providing an international forum for communication and cooperation between people interested in drug utilisation research.

To achieve its mission, the Euro DURG may encourage communication and cooperation between scientists in several disciplines interested in researching drug utilization and pharmaco-epidemiology, work towards the adoption of standards for international and national drug use research methodology, accounting for the need to measure regional variations in drug utilisation across Europe, maximise the potential of the information available on drug utilization for improving patient care, and promote the incorporation of drug utilization research and its applications in educational programmes.

GRIN is an international network of researchers with a special interest in the management of respiratory infections in general practice. Members aim to

share expertise on the study of diagnosis and treatment, in particular the antibiotic treatment, of respiratory infections. GRIN concentrates on questions that have clear relevance to primary care and an added value from an international setting. The network facilitates contacts and collaboration between researchers in different countries by arranging workshops and seminars, planning and carrying out joint study projects, disseminating information to support evidence-based practice, using a multi-professional approach.

BAPCOC is a scientific body in Belgium jointly set up by the the FPS (Federal Public Service) of Health, Food Chain Safety and the Environment, the FPS of Social Security and the former Federal Ministry of Agriculture to implement the need of an integrated approach to control the emergence of antibiotic resistance.¹ It was officially established in July 1999² and aims to provide a legal forum for experts in antibiotic resistance and the use of antibiotics. Its mission has statutorily been defined as collecting data and reporting on antibiotic use and resistance in human and animal microbial flora and pathogens; informing the public, health care workers and authorities on the evolution of antibiotic resistance and antibiotic use in different Belgian ecosystems and on the risks of inappropriate use of antibacterials; advising the appropriate authorities on detecting and monitoring of antibiotic resistance, monitoring the use of antibiotics in different ecosystems, production of guidelines for therapeutic and prophylactic antibiotic use, implementing international recommendations in Belgium, fostering research on development and transfer of antibiotic resistance between bacteria and across ecosystems.

To this purpose, working parties and a technical unit with the following assignments were set up within BAPCOC. For example the working parties "Ambulatory Care" and "Hospital Care" have been producing and spreading evidence-based therapeutic guidelines, mainly on acute respiratory infections (<http://www.health.fgov.be/antibiotics>, <http://www.infohealth.be>, <http://www.riziv.fgov.be/care/nl/doctors> or <http://www.riziv.fgov.be/care/fr/doctors>), the working party "Sensitisation and education" organised four large scale health education campaigns about antibiotic resistance and inappropriate use of antibiotics during the December-March periods of 2000-2005; the working party "Commission for reimbursement of medicinal products " issued recommendations for several fluoroquinolone molecules and for the group of macrolides and lincosamides;

the working party "European conference on antibiotic use in Europe" published the conclusions of this conference in a comprehensive report on the ESAC web site; the other working parties include « Veterinary Medicine», "ESAC-Belgium", and "Hospital hygiene".

The **WHO** is the United Nations specialized agency for health. It was established on 7 April 1948. WHO's objective, as set out in its Constitution, is the attainment by all peoples of the highest possible level of health. Health is defined in WHO's Constitution as a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. WHO's goal in medicines is to help save lives and improve health by ensuring the quality, efficacy, safety and rational use of medicines, including traditional medicines, and by promoting equitable and sustainable access to essential medicines, particularly for the poor and disadvantaged. Our vision is that people everywhere have access to the essential medicines they need; that the medicines are safe, effective, and of good quality; and that the medicines are prescribed and used rationally.

Within the WHO Action Programme on Essential Drugs a substantial part of the effort has been devoted to the rational use of antimicrobials both in developed and developing countries.^{3 4}

On November 15, 2001, a Council Recommendation¹ stated that specific strategies should pursue to collect data on antibiotic use. **ESAC** granted by DG/SANCO of the European Commission (project number: 2001/SID/136), is an international network of national surveillance systems, aiming to collect comparable and reliable antibiotic use data. During the pilot phase of ESAC, a data collection system was developed in 32 participating European countries and standardised national data of antibiotic consumption for the period 1997-2001 were assembled in a European database.⁵ ESAC opted for the ATC (Anatomic Therapeutic Chemical) classification system and the DDD (Defined Daily Doses) measurement unit, developed by the WHO Collaborating Centre for Drug Statistics Methodology (WHO, 2002).⁶

At the moment on the ESAC website 2002 data are available on total outpatient antibiotic use as well as on the use of major antibiotic groups in 26 European countries in DID (DDD per 1000 inhabitants per day).⁷ A striking finding was the marked differences in antibiotic prescribing in primary care in Europe, which was also found by Cars et al..⁸ In general, antibiotic use was highest in southern and eastern Europe, and lowest in northern Europe. In most countries, we observed a growing use of the newer

(i.e. broad-spectrum) antibiotics, such as amoxicillin/clavulanic acid, the new macrolides and quinolones to the detriment of the older (narrower-spectrum) penicillins and cephalosporins. However, the narrow spectrum penicillins and the first generation cephalosporins, are still widely prescribed for the treatment of community-acquired infections in certain northern European countries. Total outpatient penicillin (ATC group J01C) use in 2002 varied with a factor of 4.2 between the country with the highest (16.3 DID in France) and lowest (3.9 DID in the Netherlands) penicillin use. Total outpatient quinolone (ATC group J01M) use in 2002 varied with a factor of 21.2 between the country with the highest (3.76 DID in Italy) and the country with the lowest (0.17 DID in Denmark) quinolone use.

The seasonal fluctuation of outpatient antibiotic use was assessed as well in 10 European countries, which provided quarterly data for the whole period 1997-2002. High seasonal fluctuations were observed in southern and eastern European countries, while in northern European countries the increase in antibiotic use during winter was limited. In all but one country (Portugal) we found no seasonal variation of ciprofloxacin use (data not shown), suggesting that this drug was used mainly for treatment of urinary tract infections. Fluctuations in prescriptions for ciprofloxacin in this country are consistent with it being administered as therapy of adult patients with winter seasonal infections, particularly those of the respiratory tract. We suggest that a low seasonal fluctuation of the earlier quinolones, such as ciprofloxacin, is a good marker of restrained use.

Now one of ESAC's main deliveries is to develop health indicators of antibiotic use based on consumption data, to validate these indicators by linkage to resistance patterns (European Antimicrobial Resistance Surveillance System database), incidence and outcome of infectious diseases and evidence-based guidelines and to use a set of core indicators to give feedback of the antibiotic consumption in the participating countries. Additionally, it is the intention of ESAC to deepen the knowledge of antibiotic consumption by focussing on specific consumption groups and/or pattern during a limited time period in collaboration with those countries where the appropriate data are available. In ambulatory care, detailed data will be collected on the consumption in specific age and sex categories, specific prescriber groups, specific high consumers groups (nursing homes, day care centres) and for specific indications (in collaboration with existing networks of sentinel practices).

3. Scientific content of the meeting

Workshop rationale

Quality assessment and improvement in health care is a major issue in many countries. Information on health care is being demanded by policy makers, health-care professionals and the general public. With the majority of doctor-patient encounters in general practice resulting in a prescription for drug treatment, the quality of prescribing in general practice is an important issue. Prescribing also has a major influence on well being and accounts for a substantial part of health care expenditure.⁹

The above statements hold truth for antibiotic use as well. Antibiotic resistance is a major European and global public health problem, and international efforts are needed to counteract the emergence of resistance. There is a wealth of information on the prevalence of resistance in human pathogens, and these data show that there are substantial geographic differences of the proportion of resistance to various classes of antibiotics in Europe.¹⁰ While in Northern European countries, rates of resistance remain low; in Southern and Central European countries these rates are reaching alarming levels. Antibiotic consumption is increasingly recognised as the main driver for resistance and differential selection pressure of antibiotics agents may be responsible for some of these observed differences.¹¹ The largest volumes of antibiotic prescriptions for systemic use are prescribed in primary care, and respiratory tract infections are the most common indication. Monitoring antibiotic use should accompany surveillance programmes on antibiotic resistance.

In the proposed workshop we aim at developing valid prescribing quality indicators of antibiotic use in ambulatory care that can be produced on the basis of present and future ESAC data. This is one of ESAC's main deliveries (see 2. Partners). The expected outcome of the proposed workshop are a set of valid antibiotic prescribing quality indicators, c.q. explicitly defined measurable items of antibiotic prescribing giving a possible indication of the level of prescribing quality^{12 13} focussing on different aspects of prescribing quality (effectiveness, safety, appropriateness and costs;¹⁴ compliance and persistence), and relevant for clinical practice and not just easy to measure.¹⁵ Once available, identifying temporal trends and regional differences in antibiotic prescribing quality indicators could trigger action and investigation. Benchmarking by comparisons between countries could be an important

stimulus to quality improvement. Also, development, implementation and evaluation of guidelines require information on antibiotic prescribing quality, and collection of this information will inform local or national prescribing policies.

The proposed workshop's deliverables were deemed feasible. The design for a set of European community health indicators was reported by the ECHI (European Community Health Indicators) project in 2001 (ECHI, 2001),¹⁶ and a successful example has been set by the CHILD (Child Health Indicators of Life and Development) report to the European Commission (Rigby, 2002).¹⁷ Furthermore we took into account the recommendations of DURQUIM (Drug Utilisation Research Quality Indicator Meeting May 2004) regarding a framework for prescribing quality indicators, focussing on classification of prescribing indicators, data sources and limitations, validity of indicators, and use and interpretation of indicators.¹⁸

Workshop preparation

In 2005, a scientific advisory board was set up to prepare the workshop. Members of Euro DURG (Flora Haaijer-Ruskamp, Robert Vander Stichele), GRIN (Paul Little, Theo Verheij) and of the ESAC MT (Samuel Coenen, Matus Ferech, Herman Goossens) met in Leiden for a preparatory meeting. The ESAC MT presented the concept of an ESF Exploratory Workshop, including the objectives, the proposed programme, the list of participants and the budget, and the methodology, the database and the results of ESAC. The framework for constructing (antibiotic) prescribing quality indicators was introduced by Euro DURG. Examples of the use of antibiotic prescribing quality indicators in ambulatory care, c.q. general practice, were given by GRIN.

These presentations were discussed, reviewed, and it was decided to perform a systematic literature search in bibliographic databases, reference lists, and personal files for relevant publications and to use the adjusted/updated presentations as background presentations during the workshop.

A major point of discussion was the exact scope of the initiative. After all, the (validity) requirements for antibiotic prescribing quality indicators differ between indicators to be used only by professionals and so-called public indicators. It was decided that the programme of the workshop should allow discussing the development of antibiotic prescribing quality indicators from both the perspective of professionals and policy makers and should result in

ESAC based antibiotic prescribing quality indicators, a roadmap for the development of antibiotic prescribing quality indicators in general and a research agenda for the assessment of the validity of antibiotic prescribing quality indicators in particular.

A final programme was established to meet these objectives and the proposed list of participants was completed with other experts in the field of prescribing quality indicators development. A publication strategy was agreed upon.

Workshop format and process

The workshop included smaller work groups and plenary sessions (see final program). A series of background presentations in plenary sessions helped to set the scene and to prepare for the following discussions in small groups. For the break out sessions the participants were split up in advance in two groups with similar distribution of gender and affiliation, and wide variation in nationalities. Each group was facilitated by one member of the scientific advisory board, with two other members serving as rapporteurs. In plenary sessions, results of the work groups were presented, compared and discussed by all participants. These sessions were tape-recorded.

To stimulate discussion, before the first breakout session, all participants were asked to act as a panel of experts and to score for each of the antibiotic prescribing quality indicators suggested within the Health Monitoring Programme¹⁹ the statement: "How valid is the indicator for measuring the quality of antibiotic prescribing?" using an appropriateness scale ranging from 1 (extremely invalid), over (uncertain) to 9 (extremely valid) (cf. the UCLA-RAND appropriateness method^{20 21}). After revisiting the background presentations by means of a set of predefined questions the group's scoring was fed back to the panellists for each group to assess whether the indicators suggested within the Health Monitoring Programme could be used as antibiotic prescribing quality indicators.

The second breakout session was introduced by the presentation of the ESAC database and proposed ESAC based antibiotic prescribing quality indicators and replaced by a long final plenary session devoted to the development of a list of proposed antibiotic prescribing quality indicators using a general format (see Annex 1: General format of the indicators). In addition a small part of this final session was devoted to a discussion on further steps and strategies to enhance the development of antibiotic prescribing quality indicators and a publication strategy.

It was agreed that the list of proposed indicators would be further elaborated by Samuel Coenen and Matus Ferech, based on the audio-recording (see Annex 2: List of proposed indicators) and that all participants would be asked to score the proposed indicators in a way similar to the scoring during the workshop itself. After the workshop all participants received a document containing a list of 22 prescribing indicators and 2 structural indicators, described in a way that allowed them to be read and scored on their own (therefore some parts of the description was repeated). They were asked to score for each indicator to what extent in their opinion ...

1. the indicator is relevant to reducing antimicrobial resistance
2. the indicator is clinically relevant to the patient health benefit
3. the indicator is relevant to cost-effectiveness
4. the indicator is relevant to public health policy makers

... using a scale ranging from 1 (= completely disagree), over 5 (= uncertain) to 9 (= completely agree).

The results of this validation procedure would be submitted as an abstract for ESCMID 2006 and the outcome of the workshop submitted as a scientific paper to a peer reviewed journal.

4. Assessment of the results, contribution to the future direction of the field, outcome

Summary of achievements

- A network of interested general practitioners, microbiologists, infectious diseases specialists, pharmacists, drug utilisation methodologists and policy makers, representing BAPCOC, ESAC, Euro DURG, GRIN and WHO Europe, was established.
- A list of ESAC based antibiotic prescribing quality indicators was proposed during. Each indicator was described using a general format (see Annex 1: General format of the indicators). This list was further elaborated after the workshop (see Annex 2: List of proposed indicators)
- Appropriate dissemination of the workshop outcome was discussed.

Agreed action points

- Circulating the list of proposed indicators for scoring to all workshop participants and to interested persons who could not attend (October 2005).
- Continued collection of relevant literature, in particular empirical studies on the development, validity assessment and the effect of antibiotic prescribing quality indicators (continues).
- Analysing the scores, comments and suggestions to prepare a final set of indicators a to draft a scientific paper (continues).
- Consulting statistician for the indicators describing time trends (continues).
- Posting of the final set of indicators on the ESAC website (December 2005).
- Reporting the indicator values for 2003 to all countries in ESAC according to the final set of indicators (January 2006).
- Reporting the indicator values for 2004 to all countries in ESAC according to the final set of indicators (April 2006).

5. References

1. Council recommendation of 15 November 2001 on the prudent use of antimicrobial agents in human medicine. *Official Journal of the European Communities L34* 2002;45:13-6.
2. Koninklijk Besluit van 26 april 1999 houdende de oprichting van een commissie voor de coördinatie van het antibioticabeleid. *Belgisch Staatsblad* 31 juli 1999.
3. WHO Medicines Strategy 2004-2007: Countries at the core. Geneva, World Health Organization, 2004.
4. WHO Expert Committee on the Use of Essential Drugs. The selection and use of essential medicines: report of the WHO Expert Committee (including the 13 Model List of Essential Medicines.) WHO technical report series, no. 920. Geneva, World Health Organization, 2004.
5. Vander Stichele R, Elseviers M, Ferech M, Blot S, Goossens H. European Surveillance of Antimicrobial Consumption (ESAC): Data Collection Performance and Methodological Approach. *Br J Clin Pharmacol* 2004;58:419-28.
6. WHO Collaborating Centre for Drug Statistics Methodology. Anatomical Therapeutic Chemical (ATC) classification system: Guidelines for ATC classification and DDD assignment.
7. Goossens H, Ferech M, Stichele RV, Elseviers M, Group. atEP. Outpatient antibiotic use in Europe and association with resistance: a cross-national database study. *Lancet* 2005;365:579-87.
8. Cars O, Mölstad S, Melander S. Variation in antibiotic use in the European Union. *Lancet* 2001;357:1851-1853.
9. Pont L, Denig P, van der Molen T, van der Veen W, Haaijer-Ruskamp F. Validity of performance indicators for assessing prescribing quality: the case of asthma. *Eur J Clin Pharmacol* 2004;59:833-840.
10. Goossens H, Sprenger MJW. Community acquired infections and bacterial resistance. *BMJ* 1998;317:654-7.
11. Bronzwaer S, Cars O, Büchholz U, Mölstad S, Goettsch W, Veldhuijzen I, et al. A European study on the relationship between antimicrobial use and antimicrobial resistance. *Emerg Infect Dis* 2000;3:278-82.
12. Campbell S, Braspenning J, Hutchinson A, Marshall M. Improving the quality of health care: Research methods used in developing and applying quality indicators in primary care. *BMJ* 2003;326:816-19.

13. *Ontwikkeling van indicatoren op basis van evidence-based richtlijnen (Development of indicators based on evidence-based guidelines):* Kwaliteitsinstituut voor de gezondheidszorg CBO, 2002.
14. Holden J, Wilson R. The quality of prescribing in general practice. 1996; 9(5):17. *Int J Health Care Qual Assur* 1996;9:17-23.
15. Avery A. Appropriate prescribing in general practice: development of the indicators. *Qual Saf Health Care* 1998;7(3):123-.
16. group EECHIW. Design for a set of European Community Health Indicators: final report by the ECHI project. Bilthoven, The Netherlands: National Institute of Public Health and the Environment (RIVM), 2001.
17. Rigby M, Köhler L. Child Health Indicators and Development (CHILD): report to the European Commission. Staffordshire, United Kingdom: Centre for Health Planning and Management, 2002.
18. Hoven J, Haaijer-Ruskamp F, Vander Stichele R. Indicators of prescribing quality in drug utilisation research: report of a European meeting (DURQUIM, 13-15 May 2004). *Eur J Clin Pharmacol* 2005;60:831-34.
19. EURO-MED-STAT. The library of European Union Pharmaceutical Indicators: Expenditure and Utilisation Indicators. Final version, March 2004.
20. Shekelle P, Kahan J, Bernstein S, Leape L, Kamberg C, Park R. The reproducibility of a method to identify the overuse and underuse of procedures. *N Engl J Med* 1998;338:1888-95.
21. Fitch K, Bernstein SJ, Aguilar MD, Burnand B, LaCalle JR, Lazaro P, et al. The RAND/UCLA Appropriateness Method User's Manual: RAND/UCLA, 2001 (<http://www.rand.org/publications/MR/MR1269/>).

6. Final program

Wednesday 7 September 2005

19:00 Welcome reception for ESF workshop participants

Thursday 8 September 2005

Chaired by **Herman Goossens** and **Samuel Coenen**

09:00 Welcome (**Herman Goossens**)

09:10 **Presentation of the European Science Foundation (ESF)**
Benno Hinnekint (Standing Committee for European Medical Research Councils)

09:20 **Objectives and deliverables** (**Samuel Coenen**)

09:30 **Development of (antibiotic) prescribing QI** (**Flora Haaijer** and **Robert Vander Stichele**)
Recommendations regarding a framework or taxonomy for (antibiotic) prescribing QI will be discussed, focussing on classification of (antibiotic) prescribing QI, incl. dimensions of quality, data sources and limitations, development, use and interpretation of indicators.

10:45 Coffee break

11:00 **The evidence base for antibiotic prescribing QI: guidelines for RTI in Europe** (**Theo Verheij** and **Chris Butler**)
In the context of increasing antimicrobial resistance guidelines to improve antibiotic prescribing for respiratory tract infections in ambulatory care will be discussed in terms of content, evidence base and national, regional and European applicability.

12:00 **Indicators of antibiotic use at the EU level** (**Samuel Coenen**)
Examples of indicators of antibiotic use will be presented, focusing on the suggestions made under the Health Monitoring Programme (DG Sanco).

12:30 Lunch

Chaired by **Herman Goossens** and **Kathleen Holloway**

14:00 **Antibiotic prescribing QI in developing countries** (**Kathleen Holloway**)
Antibiotic prescribing quality indicators for developing countries will be discussed from the perspective of WHO, focusing on methodological issues.

14:30 **The development of antibiotic prescribing QI**
We will brainstorm on ideal antibiotic prescribing QI in small groups.

Group I is chaired by **Robert Vander Stichele** (**Paul Little** and **Samuel Coenen** are rapporteurs).

Group II is chaired by **Theo Verheij** (**Chris Butler** and **Herman Goossens** are rapporteurs).

16:30 Coffee Break

17:00 **General discussion and conclusions** (**Paul Little** and **Chris Butler**)
Bringing ideas together in plenary session.

18:00 End of day 1 of the ESF workshop

20:00 Dinner



Friday 9 September 2005

Chaired by **Herman Goossens** and **Samuel Coenen**

- 09:00 *Welcome* (**Herman Goossens**)
- 09:10 **Objectives and deliverables** (**Samuel Coenen**)
- 09:30 **ESAC database and limitations** (**Matus Ferech**)
The characteristics of the data available in the ESAC database will be presented, including examples to demonstrate possibilities and limitations.
- 10:30 *Coffee break*
- 11:00 **ESAC based antibiotic prescribing quality indicators** (**Samuel Coenen** and **Matus Ferech**)
In an interactive session the ESAC database will be questioned to explore validity, use and interpretation of ESAC based antibiotic prescribing quality indicators.
- 12:30 *Lunch*
- 14:00 **The development of ESAC based antibiotic prescribing QI**
We will brainstorm on ESAC based antibiotic prescribing QI in small groups.
- Group I** is chaired by **Robert Vander Stichele** (**Paul Little** and **Samuel Coenen** are rapporteurs).
Group II is chaired by **Theo Verheij** (**Chris Butler** and **Herman Goossens** are rapporteurs).
- 16:00 *Coffee Break*
- 16:30 **General discussion and conclusions** (**Paul Little** and **Chris Butler**)
Bringing ideas together in plenary session.
- 18:00 End of day 2 of the ESF Workshop
- Evening *Departure*

7. Final list of participants

Convenors:

1. **Samuel COENEN**
FWO-Vlaanderen & ESAC
Department of General Practice
University of Antwerp
Campus Drie Eiken
Universiteitsplein 1
2610 Antwerp
Belgium
Tel: +32 3 820 25 25
Fax: +32 3 820 25 26
Email: samuel.coenen@ua.ac.be
2. **Herman GOOSSENS**
ESAC
Laboratory of Microbiology
University of Antwerp
Universiteitsplein 1
2610 Antwerp
Belgium
Tel: +32 38 202 751
Fax: +32 3820 2752
Email: herman.goossens@uza.be

ESF Representative:

3. **Benno HINNEKINT**
Fonds voor Wetenschappelijk Onderzoek -
Vlaanderen FWO
Egmontstraat 5
1000 Brussels
Belgium
Tel: +32 2 550 15 31
Fax: +32 2 5125890
Email: [hinnekint@fwo.be](mailto:hinnekind@fwo.be)

Secretariat Coordinators:

4. **Katerina DVORAKOVA**
Laboratory of Microbiology
University of Antwerp
Universiteitsplein 1
2610 Antwerp
Belgium
Tel: + 32 3 820 27 50
Fax: + 32 3 820 27 51
Email: katerina.dvorakova@ua.ac.be
5. **Tine Sterckx**
Laboratory of Microbiology
University of Antwerp
Universiteitsplein 1
2610 Antwerp
Belgium
Tel: + 32 3 820 27 50
Fax: + 32 3 820 27 51
Email: tine.stercks@ua.ac.be

Participants:

6. **Morten ANDERSEN**
Research Unit for General Practice
University of Southern Denmark
Winsløwparken 19
5000 Odense
Denmark
Tel: + 45 65573791
Fax: + 45 65916089
Email: mandersen@health.sdu.dk
7. **Ariana ANDRASEVIC**
Clinical Microbiology
University Hospital for Infectious Diseases
Mirogojska 8
10 000 Zagreb
Croatia
Tel: + 385 1 46 03 222
Fax: + 385 1 46 78 235
Email: arjana.andrasevic@zg.tel.hr
8. **Sandra BERZINA**
Latvian University
Medical Microbiology
Gertrudes Str. 26-1
LV 1011, Riga
Latvia
Tel: + 371 9190941
Email: stradini@hotmail.com
9. **Chris BUTLER**
Health Centre Maelfa
Department of General Practise
University of Wales College of Medicine
Llanedeyrn
Cardiff CF23 9PN
United Kingdom
Tel: + 44 29 20541133 ext 247
Fax: + 44 29 20540129
Email: butlercc@cf.ac.uk
10. **José CAMPOS**
Ministerio de Sanidad Carlos III
Department of Diagnostic Microbiology
Centro Nacional Microbiología
Instituto de Salud 'Carlos III'
Cra. Pozuelo
28220 Majadahonda
Spain
Tel: + 34 91 50 97 901
Fax: + 34 91 50 97 966
Email: jcampos@isciii.es
11. **Carl CAUWENBERGH**
National Institute of Sickness and Invalidity
Insurance (RIZIV)
Tervurenlaan 211
Bureau T649
1150 Brussels
Belgium
Tel: + 32 2 739 73 35
Email: Carl.Cauwenbergh@riziv.fgov.be

- 12. Philippe CAVALIE**
Agence Française de Sécurité Sanitaire
des Produits de Santé
Direction de l'Evaluation de la Publicité et
des Produits Cosmétiques et Biocides
143-147, Bd Anatole France
93285 Saint Denis Cedex
France
Tel: + 33 1 55 87 38 72
Fax: + 33 1 55 87 38 22
Email: philippe.cavalié@afssaps.sante.fr
- 13. Milan CIZMAN**
Department of Infectious Diseases
University Medical Centre Ljubljana
Japljeva 2
1525 Ljubljana
Slovenia
Tel: + 38 61 52 22 110
Fax: + 38 61 23 02 781
Email: milan.cizman@mf.uni-lj.si
- 14. Peter DAVEY**
Health Informatics Centre
Mackenzie Building
Kirsty Semple Way
Dundee DD2 4BF
United Kingdom
Tel: + 44 1382 420000
Fax: + 44 1382 420010
Email: p.g.davey@chs.dundee.ac.uk
- 15. Matus FEREC**
Laboratory of Microbiology
University of Antwerp
Universiteitsplein 1
2610 Antwerp
Belgium
Tel: + 32 3 820 27 50
Fax: + 32 3 820 27 51
Email: matus.ferech@ua.ac.be
- 16. Pawel GREZESIOWSKI**
Prevention of Infection Department
National Institute of Public Health
Chelmska Street 30/34
00-725 Warsaw
Poland
Tel: + 48 22 85 15 205
Fax: + 48 22 84 12 949
Email: paolo@cls.edu.pl
- 17. Flora HAAIJER-RUSKAMP**
Rijks Universiteit Groningen
Ant. Deusinglaan 1
9713 AV Groningen
Netherlands
Tel: + 31 50 363 32 16
Email: F.M.Haaiker-Ruskamp@med.rug.nl
- 18. Erik HENDRICKX**
Scientific Institute of Public Health
Juliette Wytsmansteet 14
B 1050 Brussels
Belgium
Tel: + 32 2 6425 402
Email: erik.hendrickx@iph.fgov.be
- 19. Kathleen HOLLOWAY**
Medical Officer for Policy, Access and
Rational Use, WHO
Department of Medicines Policy and
Standards
20 Avenue Appia
CH-1211, Geneva
Switzerland
Tel: + 41 22 791 2336
Fax: + 41 22 791 4167
Email: hollowayk@who.int
- 20. Robert JANGKNEG**
Maasland Ziekenhuis
Clinical pharmacie/Clinical pharmacologist
P.O. Box 5500
6130 MB Sittard
Netherlands
Tel: + 31 464 59 77 09
Fax: +31 46 459 7971
Email: R.Janknegt@orbisconcern.nl
- 21. Paul LITTLE**
Community Clinical Sciences (Primary
Medical Care Group)
Aldermoor Health Centre
University of Southampton
Southampton SO15 6ST
United Kingdom
Tel: + 44 2380 241062
Fax: + 44 2380 701125
Email: psl3@soton.ac.uk
- 22. Raf MERTENS**
Landsbond der Christelijke Mutualiteiten
Haachtsesteenweg 579
1031 Brussels
Belgium
Tel: + 32 2 246 49 61
Email: Raf.Mertens@cm.be
- 23. Sigvard MÖLSTAD**
Unit of research and development in primary
care
Qulturum
551 85 Jönköping
Sweden
Tel: + 46 36-325209
Fax: + 46 36-325210
Email: Sigvard.molstad@ltjkg.se
- 24. Dominique MONNET**
National Centre for Hospital Hygiène
Division of Microbiology
Statens Serum Institut
5 Artillerivej
2300 Copenhagen S
Denmark
Tel: + 45 32 68 81 90
Fax: + 45 32 68 38 87
Email: dom@ssi.dk
- 25. Arno MULLER**
Service d'hygiène hospitalière
CHU j. Minjoz
25030 Besançon Cedex
France
Tel: + 33 3 8166 9017
Email: arnomuller@club-internet.fr

26. Ulla-Maija RAUTAKORPI

STAKES/FinOHTA
Lintulahdenkuja 4
PO Box 220
00531 Helsinki
Finland
Tel: + 358 9 3967 2678
Email: ulla-maija.rautakorpi@stakes.fi

27. Hege SALVESEN BLIX

Norwegian Institute of Public Health
Postboks 4404 Nydalen
0403 Oslo
Norway
Tel: + 47 22 16 98 05
Fax: + 47 22 35 36 05
Email: hege.salvesen.blix@fhi.no

28. Rolanda VALINTELIENE

Public Health Research Department
Institute of Hygiene
Didzioji 22
2001 Vilnius
Lithuania
Tel: + 37 05 26 18 390
Fax: + 37 05 26 24 663
Email: rolanda.valinteliene@hi.lt

29. Robert VANDER STICHELE

Heymans Institute of Pharmacology
Medical School
University of Gent
De Pintelaan 185
9000 Gent
Belgium
Tel: + 32 9 240 33 36
Fax: + 32 9 240 49 88
Email: Robert.VanderStichele@ugent.be

30. Theo VERHEIJ

Julius Center for Health Sciences and Primary Care
Str.6.109
P.O.Box 85060
3508 AB Utrecht
Netherlands
Tel: + 31 30 253 81 88
Fax: + 31 30 253 90 28
Email: t.j.m.verheij@med.uu.nl

31. Jiri VLCEK

Faculty of Pharmacy Hradec Kralove
Charles University in Prague
Heyrovského 1203
500 05 Hradec Králové
Czech Republic
Tel: + 420495067111
Fax: + 420495518002
Email: vlcek@faf.cuni.cz

8. Statistical information on participants

Represented countries

Represented countries	by affiliation	by nationality	of participants
Belgium	10	8*	
Croatia	1	1	
Czech Republic	1	3	
Denmark	2	1	
Finland	1	1	
France	2	3	
Latvia	1	1	
Lithuania	1	1	
Norway	1	1	
Poland	1	1	
Slovenia	1	1	
Spain	1	1	
Sweden	1	1	
Switzerland	1		
The Netherlands	3	3	
United Kingdom	3	4**	

* including Benno Hinnekint, ESF representative and two administrative persons

** representing Scotland, England and Wales

Gender distribution

Male/Female participants 22/9