

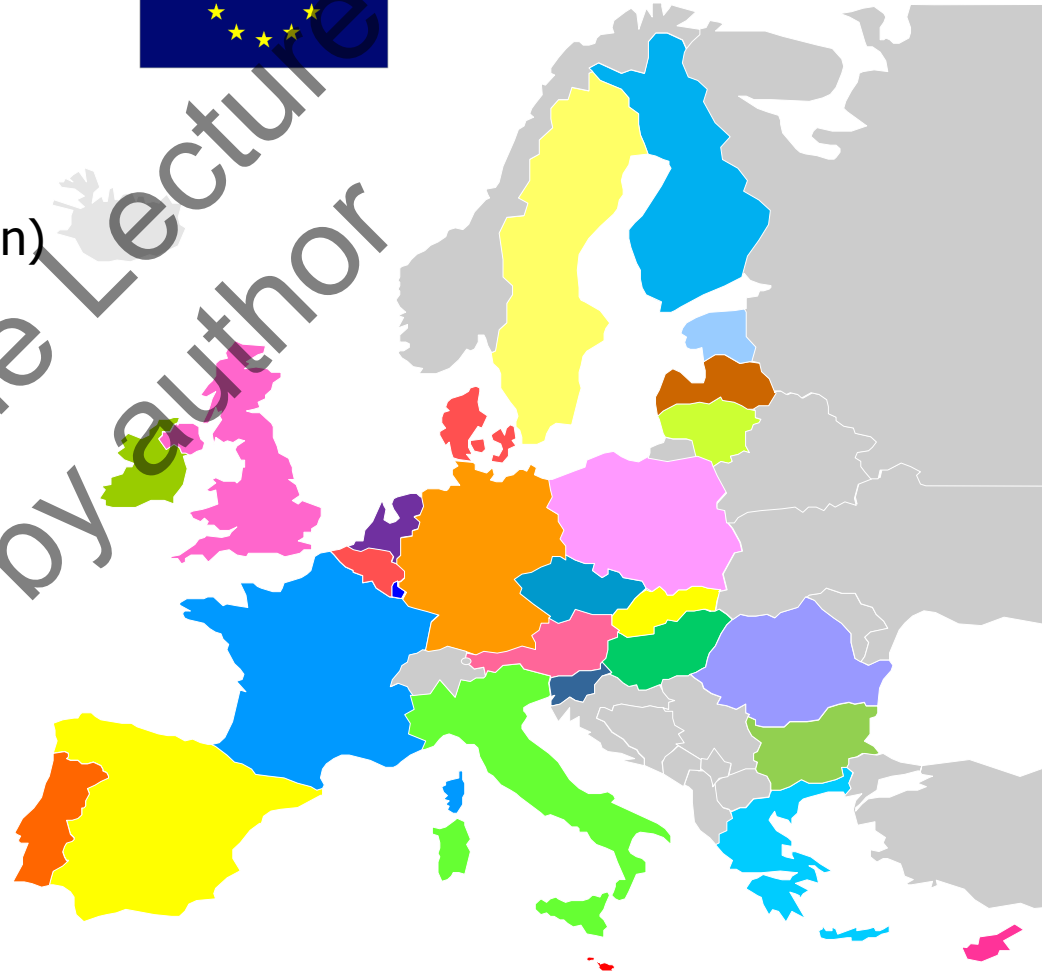


ECDC's actions to combat antimicrobial resistance

Dominique L. Monnet, PharmD PhD
European Centre for Disease Prevention and Control
Neusiedl am See (Austria), 8 April 2010

What is the European Union?

- 27 Member States
- 23 official languages
- > 500 million inhabitants
(per country: 416,333 – 81.7 million)
- €25,100 GDP/capita
(per country : 10,400 – 69,300)
- A patchwork of cultures!

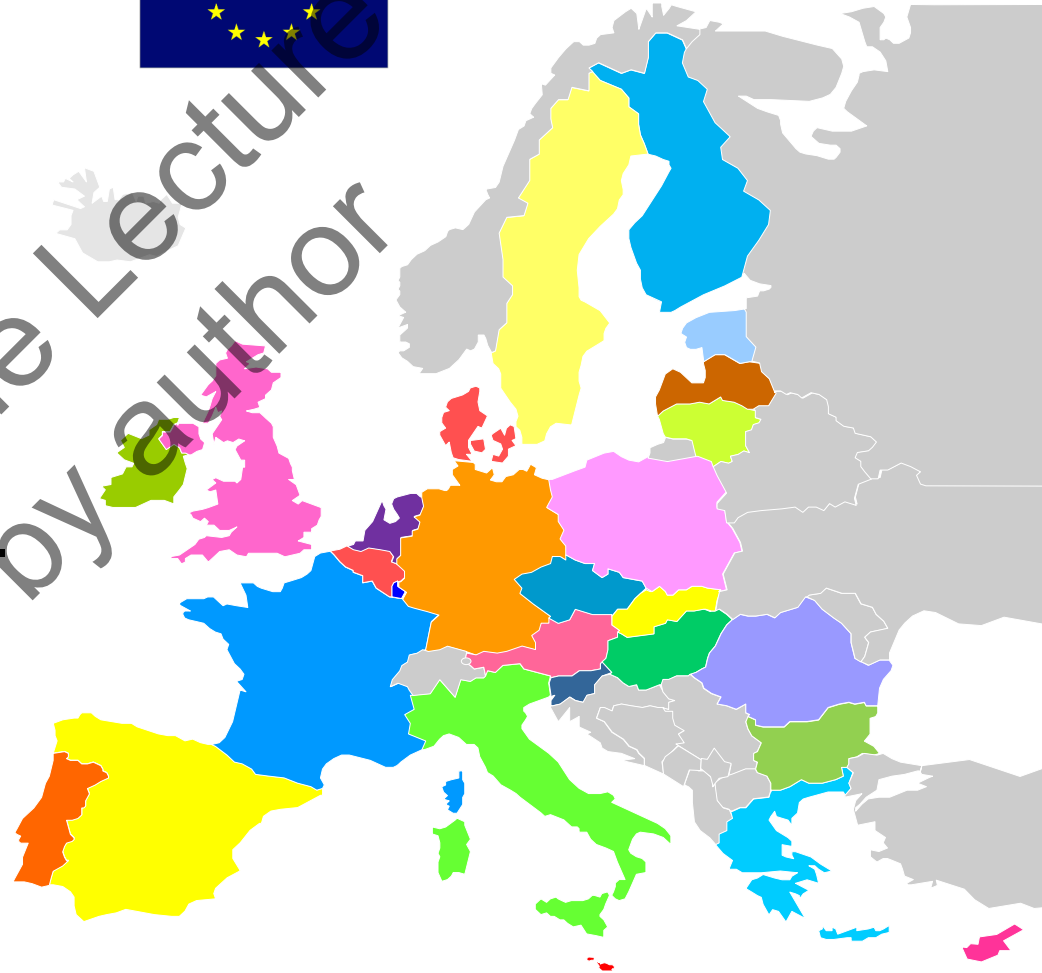


1 € = 1.36 US\$

Healthcare resources in the EU



- %GDP for healthcare:
approx. 6 to 11%
- Physicians:
27 to 200 per 100,000 inh.
- Nurses:
327 to 1550 per 100,000 inh.
- Ratio nurses/physicians:
1.6 to 36



Expanded Europe – the five freedoms in the European Union

1. Free movement of people*
2. Free movement of services*
3. Free movement of goods*
4. Free movement of monies*

5. Free movement of **microbes**

* Adapted from 'Summary of Legislation — Internal Market'
<http://europa.eu.int/scadplus/leg/en/s70000.htm>



Why was ECDC established?

A young EU agency dedicated to the prevention and control of communicable diseases

- Emerging and re-emerging communicable diseases revitalised through globalisation, bio-terrorism, interconnectivity, and an EU without internal borders
- Health implications in an enlarging EU
- Strengthen EU public health capacity to help meet EU citizen's concerns



ESCMPD Online Lecture Library © by author

What is ECDC?

"An independent agency, named the European Centre for Disease Prevention and Control ..."

— ECDC Founding Regulation (851/2004)

A European Union Agency which:

- is a member of the European Union (EU) family;
- covers EU 27, EEA/EFTA countries;
- reaches out to other countries beyond the EU 27 through Neighbourhood Policy and DG RELEX;
- supports and promotes global health security (role in International Health Regulations);
- is financed through EU budget;
- is based in Stockholm, Sweden.



What is the role of ECDC in its Founding Regulation?

... to identify, assess and communicate current and emerging health threats to human health from communicable diseases.

— ECDC Founding Regulation (851/2004), Article 3

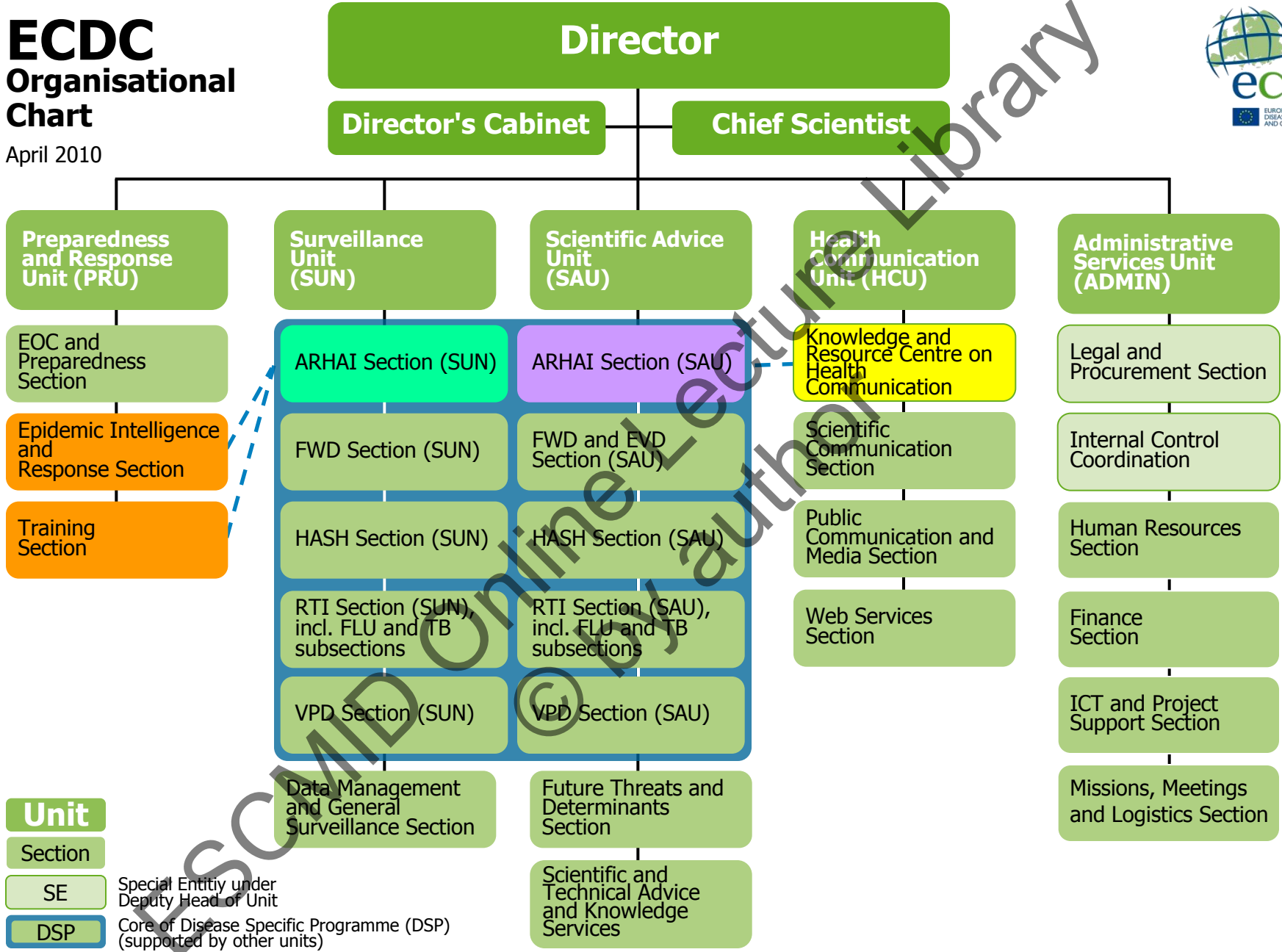
- EU-level disease surveillance and epidemic intelligence
- Scientific opinions and studies
- Early Warning System and response
- Technical assistance and training
- Communication to scientific community
- Communication to the public



ECDC:
A **scientific**
and
technical
institute

ECDC Organisational Chart

April 2010



Unit

Section

SE

DSP

Special Entity under Deputy Head of Unit

Core of Disease Specific Programme (DSP) (supported by other units)

Antimicrobial Resistance and Healthcare-Associated Infections (ARHAI) Team



Scientific Advice Unit, ARHAI Section

- Dominique L. Monnet, Senior Expert AMR & HAI, Coordinator
- Marc Struelens, Senior Expert AMR & HAI
- Anna-Pelagia Magiorakos, Expert AMR & HAI
- Adoración Navarro Torné, Scientific Officer AMR & HAI
- J. Todd Weber, CDC liaison to ECDC (part time)
- Andrea Bukšárová, Secretary (part time)



Surveillance Unit, ARHAI Section

- Carl Suetens, Senior Expert HAI, Deputy Coordinator
- Ole E. Heuer, Senior Expert AMR
- Klaus Weist, Seconded National Expert HAI
- Carlo Gagliotti, Expert AMR
- Luciana Muresan, Secretary (part time)
- *Expert HAI (2010)*
- *Senior Expert Antimicrobial Consumption (2010)*



Health Communication Unit

- Sarah Earnshaw, Information Officer (part time)



Preparedness and Response Unit

- Jas Mantero, Expert (part time)

Healthcare-associated infections, antimicrobial resistance: Overlapping, but not identical

Healthcare-associated infections

Antimicrobial resistance

Community-acquired infections

ESCMID Online Lecture Library © by author

What Does “Antimicrobial Resistance” Represent?

Several, inter-related compartments of healthcare, i.e. patients in primary care, hospitals, nursing homes and long-term care facilities, food animals, food, environment)

Many types of infection, i.e. respiratory tract, urinary tract, skin and soft tissue, bloodstream, surgical site, related to medical devices, etc.)

Many bacteria/microorganisms

Many antimicrobials and mechanisms of resistance

Patients with infections due to resistant bacteria!

Main actions to prevent and control antimicrobial resistance

Prudent use of antimicrobials

(only when needed, correct dose, dose intervals, duration)



Infection control

(hand hygiene, screening, isolation)



New antibiotics

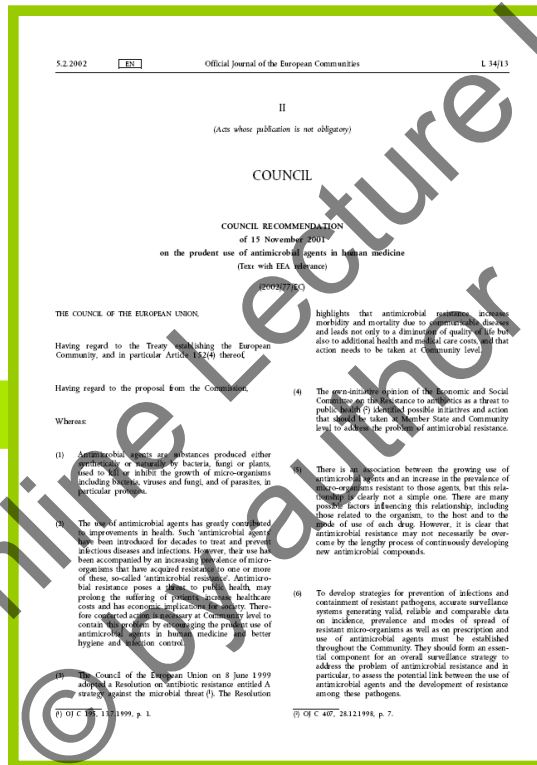
(with a novel mechanism of action, research, development)



Council Recommendation on the prudent use of antimicrobial agents, 2001




Photo: Stuart Chalmers, CC-BY



Council Recommendation of
15 November 2001 on the
prudent use of antimicrobial
agents in human medicine
(2002/77/EC)

Council Recommendations and Conclusions, 2008-2009

 EN

COUNCIL OF
THE EUROPEAN UNION

Council Conclusions on Antimicrobial Resistance (AMR)

*28th EMPLOYMENT, SOCIAL POLICY, HEALTH AND
CONSUMER AFFAIRS Council meeting*

Luxembourg, 10 June 2008

The Council adopted the following conclusions:

"The Council of the European Union

1. **RECALLS** that Article 152 of the Treaty establishing the European Community states that Community action in the field of public health is to complement national policies and be directed to ensure a high level of human health protection. This Community action shall fully respect the responsibilities of the Member States for the organisation and delivery of health services and medical care.
2. **RECALLS** the Council Recommendation (2002/77/EC) on the prudent use of antimicrobial agents in human medicine¹.
3. **NOTES** that the first Report² from the Commission on the basis of Member States' reports on the implementation of the Council Recommendation showed that most Member States had taken a variety of actions, as requested by the recommendation, however there remained numerous areas where only limited action had been undertaken.

¹ doc. 14751/01
² doc. 5427/06 Report from the Commission to the Council on the basis of Member States' reports on the implementation of the Council Recommendation (2002/77/EC) on the prudent use of antimicrobial agents in human medicine (sec(2005) 1745)

EN

3.7.2009 EN Official Journal of the European Union C 151/1

I
(Recommendations, recommendations and opinions)

RECOMMENDATIONS
COUNCIL


COUNCIL RECOMMENDATION
of 9 June 2009
on patient safety, including the prevention and control of healthcare associated infections
(2009/C 151/01)

THE COUNCIL OF THE EUROPEAN UNION,
Having regard to the Treaty establishing the European Community, and in particular the second subparagraph of Article 152(4) thereof,
Having regard to the proposal from the Commission,
Having regard to the opinion of the European Parliament,
Having regard to the opinion of the European Economic and Social Committee (1),
Having regard to the opinion of the Committee of the Regions (2),
Whereas:

- (1) Article 152 of the Treaty provides that Community action, which shall complement national policies, shall be directed towards improving public health, preventing human disease and disease, and promoting access of care to human health;
- (2) It is estimated that in Member States between 8% and 12% of patients admitted to hospital suffer from adverse events while receiving healthcare (3);
- (3) The European Centre for Disease Prevention and Control (ECDC) has estimated that, on average, healthcare associated infections occur in one hospitalised patient every 20 days to say 4.1 million patients a year in the EU (4);
- (4) The Commission, through the research framework programme for technological development (5) supports work on patient safety carried out by the World Health Organization (WHO) through its World Alliance for Patient Safety, the Council of Europe and the Organisation for Economic Co-operation and Development (OECD);
- (5) The Commission, in its White Paper 'Together for Health: A Strategic Approach for the EU 2005-2017' of 23 October 2007, identifies patient safety as an area for action;
- (6) The Commission, in its White Paper 'Together for Health: A Strategic Approach for the EU 2005-2017' of 23 October 2007, identifies patient safety as an area for action;
- (7) The Commission, in its White Paper 'Together for Health: A Strategic Approach for the EU 2005-2017' of 23 October 2007, identifies patient safety as an area for action;
- (8) The Commission, in its White Paper 'Together for Health: A Strategic Approach for the EU 2005-2017' of 23 October 2007, identifies patient safety as an area for action;

(1) Opinion of 21 April 2009 (not yet published in the Official Journal).
(2) Opinion of 23 March 2009 (not yet published in the Official Journal).
(3) Opinion of 21 April 2009 (not yet published in the Official Journal).
(4) Technical report 'Improving Patient Safety in the EU' prepared for the European Commission, published 2008 by the ECDC Co-operation.

(5) Decision No 1831/2004/EC of the European Parliament and of the Council of 18 December 2004 concerning the research framework programme of the European Community for research, technological development and demonstration activities (2005-2011) (OJ L 31, 30.12.2004, p. 1).

 EN

COUNCIL OF
THE EUROPEAN UNION

Council Conclusions on innovative incentives for effective antibiotics

*2900th EMPLOYMENT, SOCIAL POLICY, HEALTH AND
CONSUMER AFFAIRS Council meeting*

Brussels, 1 December 2009

"The Council adopted the following conclusions:

Notes here: In this document, the term "antibiotics" encompasses medicinal products produced either synthetically or naturally used to kill or inhibit the growth of bacteria as well as those with alternative mechanisms of action e.g. effect on bacterial virulence. In this context, alternative methods for prevention and control of infections should also be taken into account.

1. **RECALLS** the Community Strategy against antimicrobial resistance (COM(2001) 0333);
2. **RECALLS** the Council Recommendation of 15 November 2001 on the prudent use of antimicrobial agents in human medicine¹;
3. **RECALLS** the Council Conclusions on antimicrobial resistance of 10 June 2008²;
4. **RECALLS** the Council Recommendation of 9 June 2009 on patient safety, including the prevention and control of healthcare associated infections³;
5. **RECALLS** the WHO report (2004) Priority Medicines for Europe and the World⁴

¹ OJ L 34, 5.2.2002, p. 13.
² 9457/08.
³ OJ C 151, 3.7.2009, p. 1.
⁴ http://webq3bdoc.who.int/hq/2004/WHO_EDM_PAR_2004.7.pdf.

P R E S S

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EN

Council Conclusions on Antimicrobial Resistance (AMR) (10 June 2008)

Council Recommendation of 9 June 2009 on patient safety, including the prevention and control of healthcare associated infections (2009/C 151/01)

Council Conclusions on innovative incentives for effective antibiotics (1 December 2009)

Implementation of National Intersectoral Coordination Mechanisms on AMR



Antimicrobial Resistance and Healthcare-Associated Infections (ARHAI) at ECDC

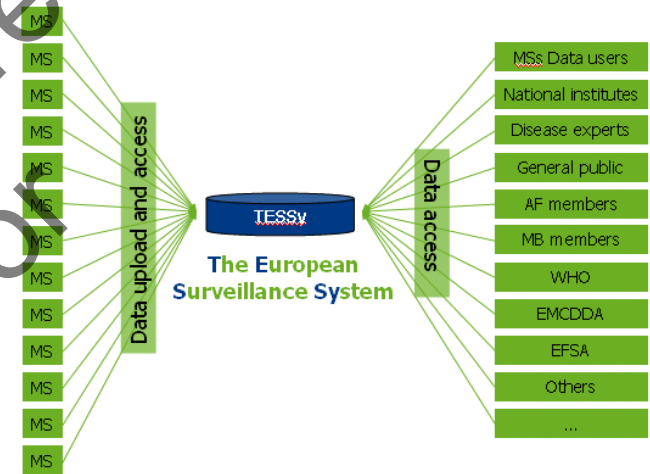
	Antimicrobial resistance	Antimicrobial consumption	Antimicrobial stewardship	Healthcare-associated infections	Alcohol hand rub consumption	Infection control
Surveillance of outcomes						
Indicators for structures & processes						
Ad-hoc studies						
Guidance & risk assessments						
Coordination & capacity building						
Communication						
Training						

Antimicrobial Resistance and Healthcare-Associated Infections (ARHAI) at ECDC

	Antimicrobial resistance (AMR)	Antimicrobial consumption	Antimicrobial stewardship	Healthcare-associated infect. (HAI)	Alcohol hand rub consumption	Infection control (IC)
Surveillance of outcomes	Formerly EARSS			Formerly IPSE + PPS		
Surveillance of determinants		ESAC + PPS	Indicators		Indicators	
Ad-hoc studies	<i>C. difficile</i> survey (ECDIS)	ECDC-EMA Joint Report			Review of national hand hygiene campaigns	
Guidance & risk assessments	<i>C. difficile</i> , MRSA, KPC&XDR	Guidance on prevention and control of HAI Guidance on antimicrobial stewardship				
Coordination & capacity building	MRSA typing	Meetings of National Focal Points & Country visits				
		Meetings of Surveillance Contact Points & Country visits (training)				
Communication	European Antibiotic Awareness Day				Collaboration with WHO on hand hygiene	
Training	Short course on prevention and control of MDRO			Assessment of IC training needs Short course on PPS Short course on HAI epidemiology		

Surveillance

- **Healthcare-associated infections**
integrated since 2008
- **Antimicrobial resistance (formerly EARSS)**
integrated since 1st January 2010
- **Antimicrobial consumption (ESAC)** outsourced to Univ. of Antwerp until December 2010
- **Contribution to standardisation of antimicrobial susceptibility testing (EUCAST)**
- **European point prevalence survey on HAI and antibiotic use (2010 onwards-2011)**



Collaboration with other agencies

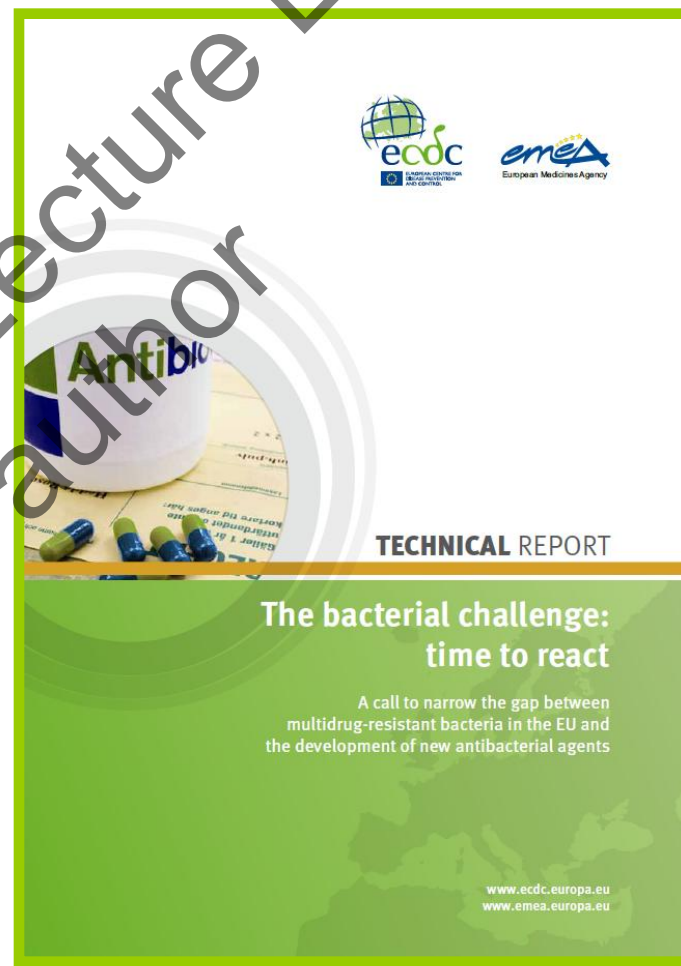
- **EFSA:** Use of antibiotic resistance genes as marker genes in genetically modified plants (March 2009)
- **EFSA:** Assessment of the public health significance of MRSA in animals and foods (27 March 2009)
- **EFSA & EMEA:** Joint risk assessment on MRSA in livestock, companion animals and food (May 2009)
- **EFSA, EMEA and SCENIHR:** Joint report on AMR in zoonotic infections (16 November 2009)
- **EMEA:** Joint Report
"The bacterial challenge: time to react"
(17 September 2009)



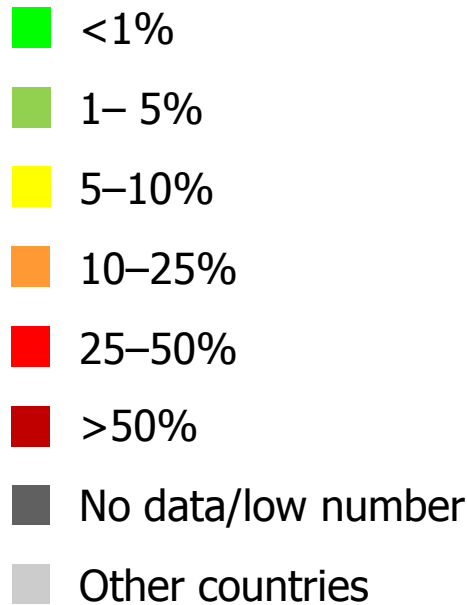
ECDC/EMA Joint Technical Report

“The bacterial challenge: time to react”

- There is a gap between the burden of infections due to MDR bacteria and the development of new antibiotics to tackle this problem.
- There is a particular lack of new agents to treat infections due to MDR bacteria, in particular MDR Gram-negative bacteria
- A European and global strategy to address this gap is urgently needed

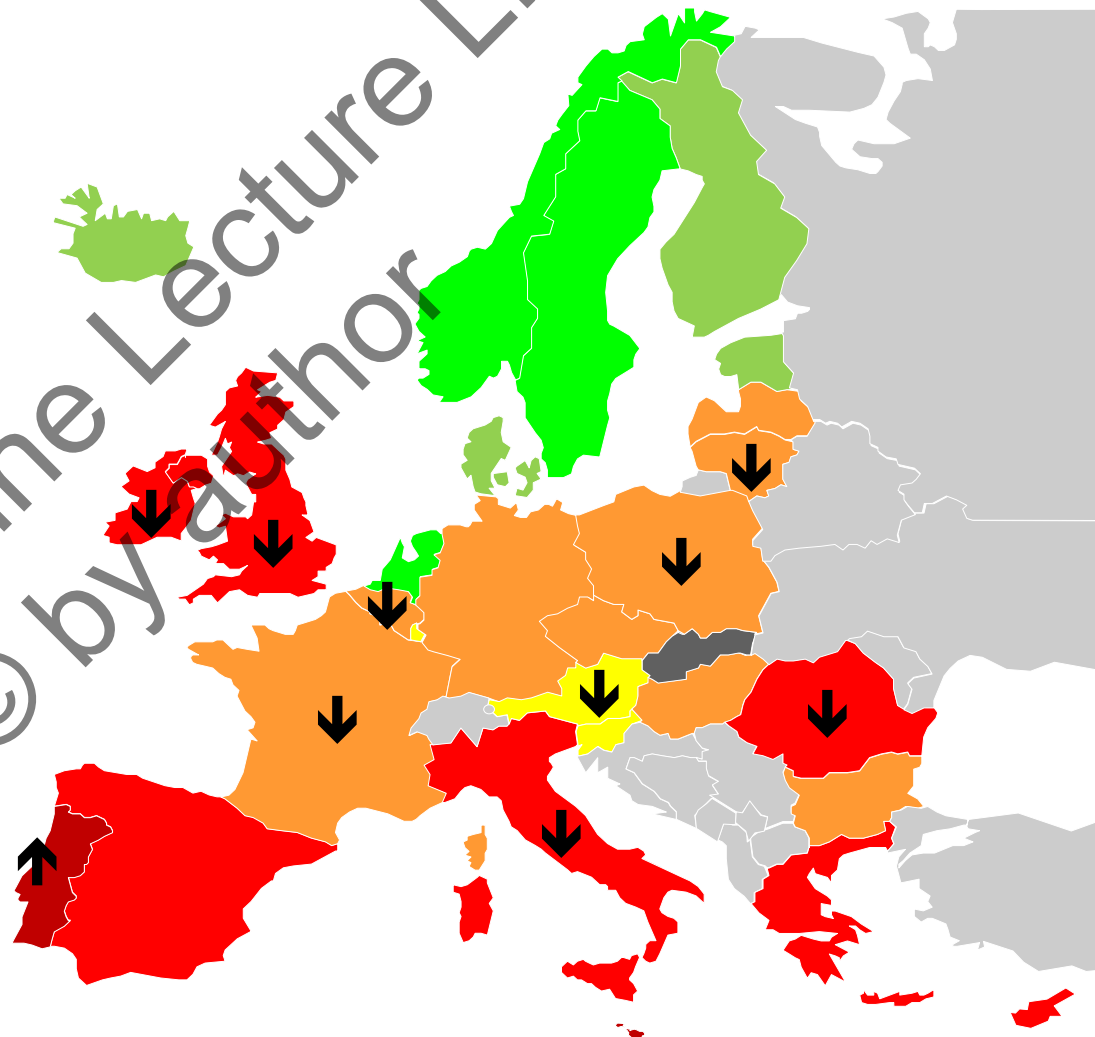


Methicillin-resistant *Staphylococcus aureus* (MRSA), blood and CSF, 2008

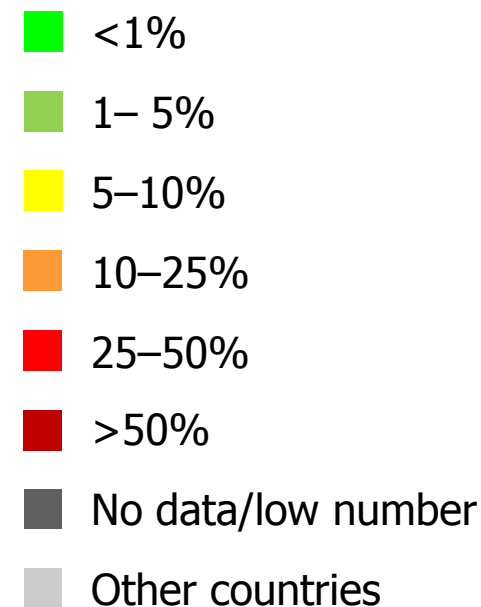


Country with:

- ↑ Significant increase (2005-2008)
- ↓ Significant decrease (2005-2008)

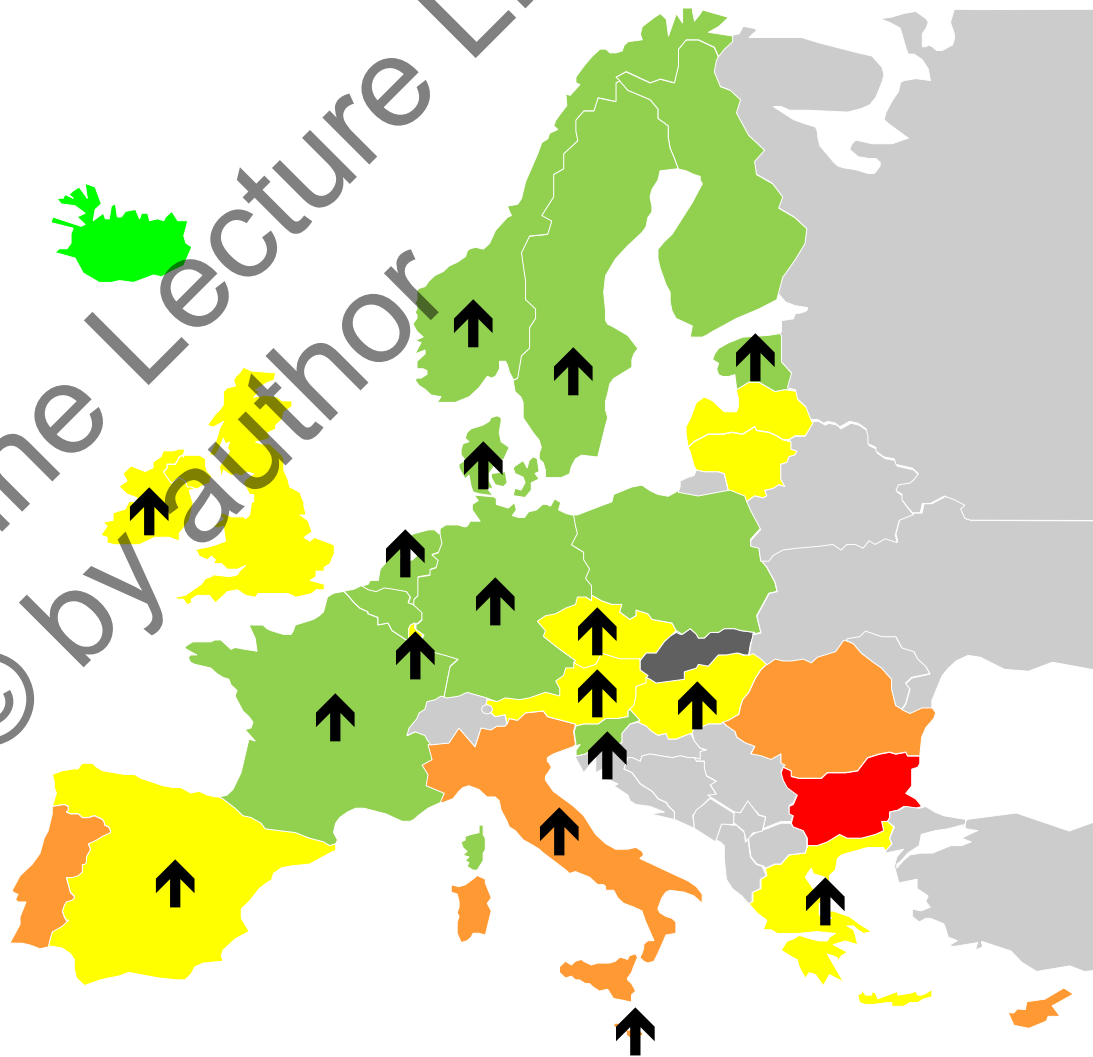


Third-generation cephalosporin-resistant *Escherichia coli*, blood and CSF, 2008



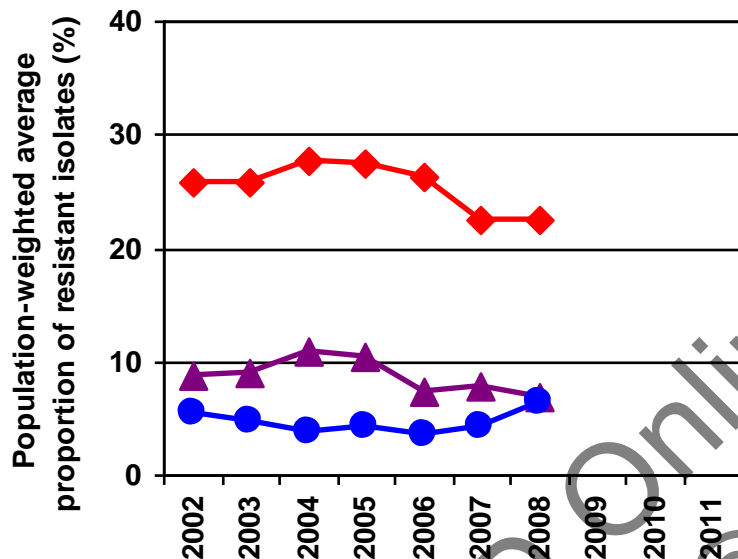
Country with:

- ↑ Significant increase (2005-2008)
- ↓ Significant decrease (2005-2008)



Population-weighted, average % resistant isolates among bacteria from bloodstream infections, EU, Iceland and Norway, 2002-2008

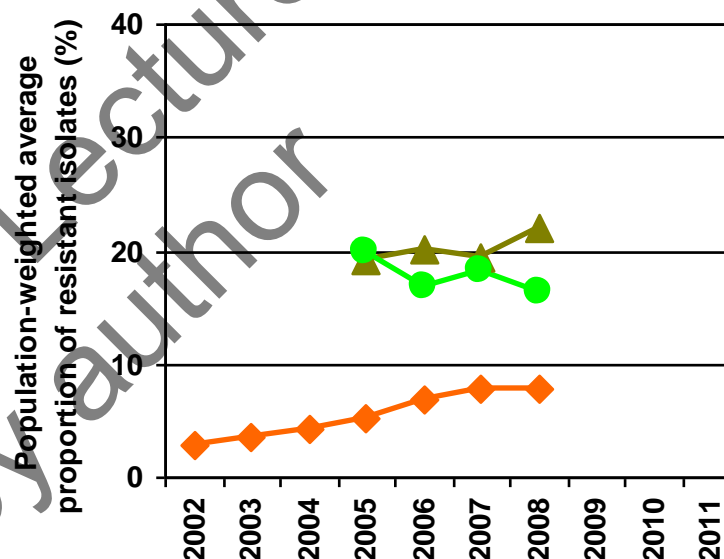
Gram-positive bacteria



- ◆ Methicillin-resistant *S. aureus* (MRSA)
- ▲ Vancomycin-resistant *E. faecium*
- Penicillin-resistant *S. pneumoniae**

*Excluding Greece, which did not report data.

Gram-negative bacteria



- ◆ Third-gen. cephalosporin-resistant *E. coli*
- ▲ Third-gen. ceph.-resistant *K. pneumoniae***
- Carbapenem-resistant *P. aeruginosa***

**Excluding Belgium and Slovakia, which did not report data.

Burden of multidrug-resistant (MDR) bacteria in the EU, Iceland and Norway

Human burden

Infections (6 most frequent MDR bacteria, 4 main types of infection)

approx. 400,000 / year

Attributable deaths

approx. 25,000 / year

Extra hospital days

approx. 2.5 million / year

Economic burden

Extra in-hospital costs

approx. € 900 million / year

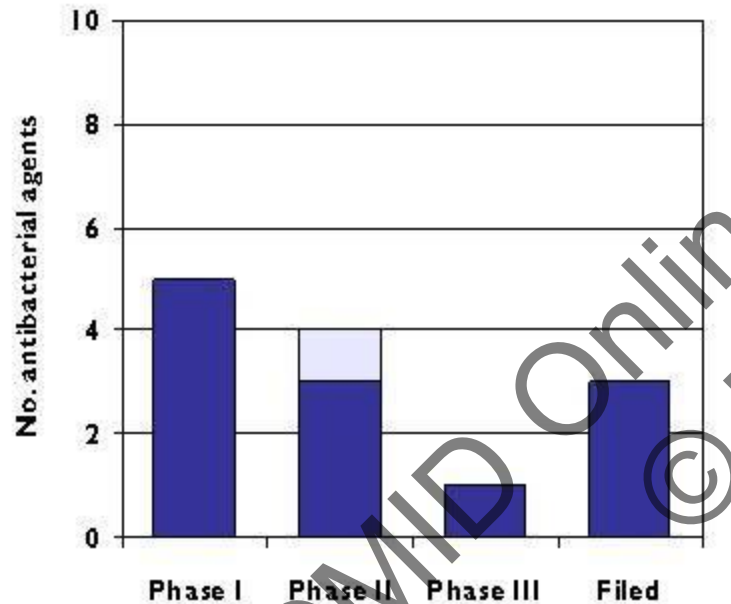
Productivity losses

approx. € 600 million / year

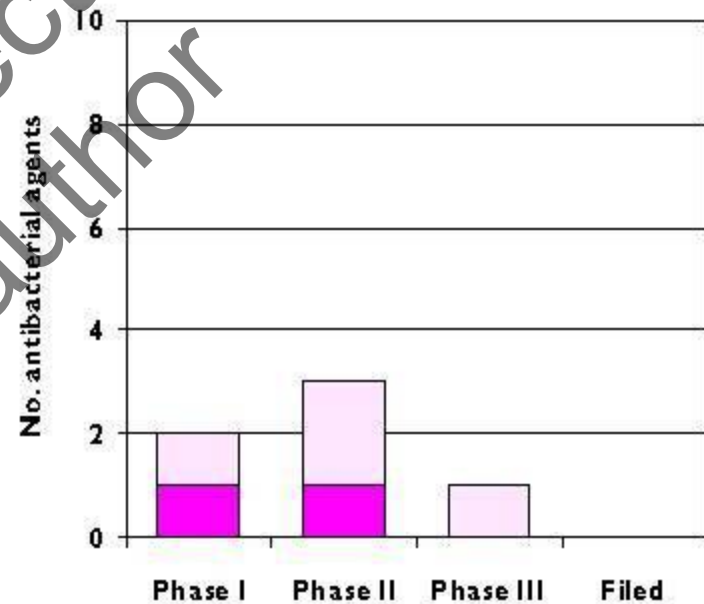
Limitation: these are underestimates.

15 novel, systemically administered antibacterial agents in the pipeline

13 agents against Gram-positive bacteria



6 agents against Gram-negative bacteria

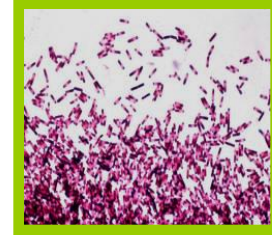


■ Demonstrated *in vitro* activity based on actual data
 □ Assumed *in vitro* activity based on known class effects or mechanisms of action

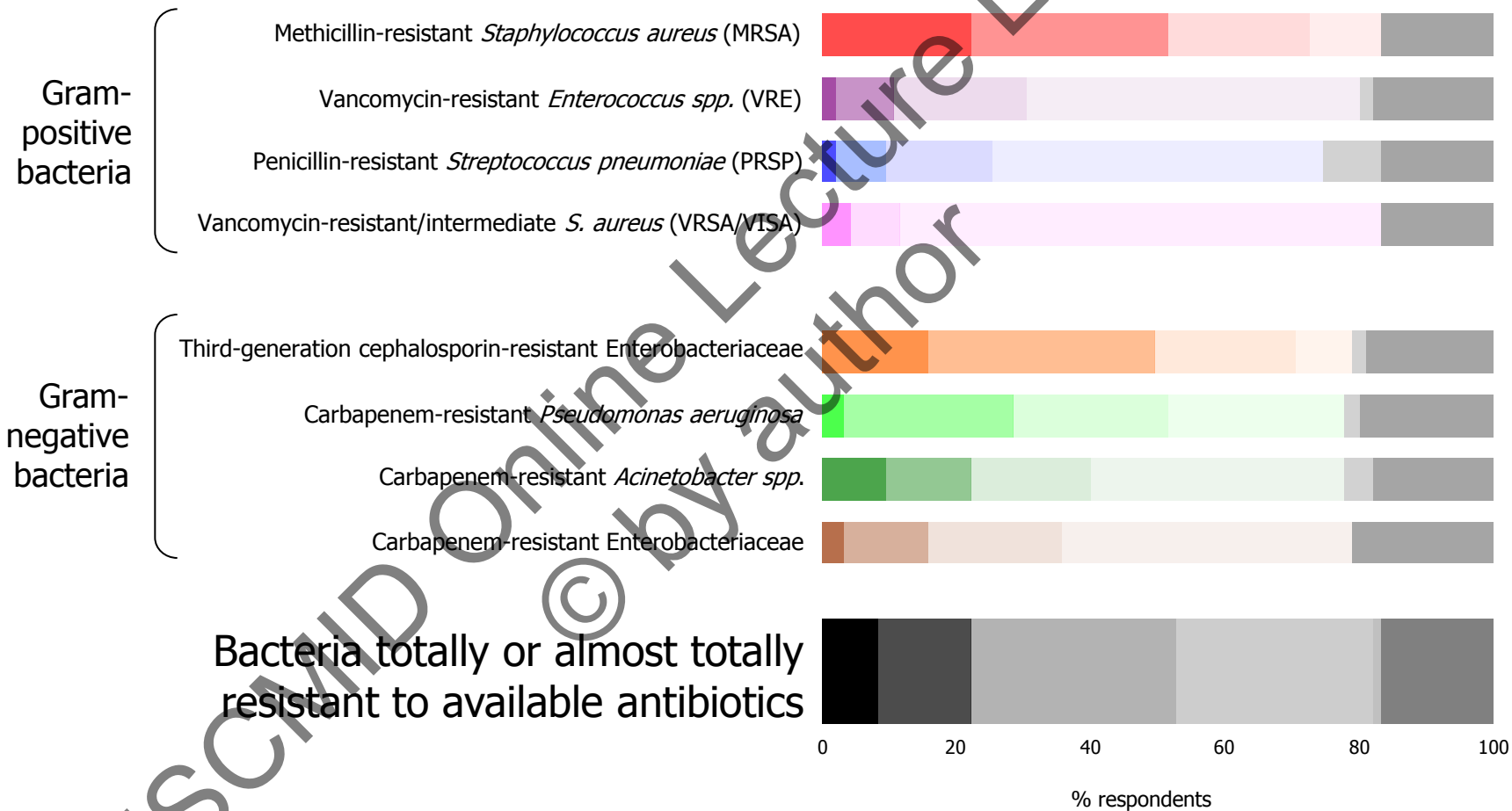
■ Demonstrated *in vitro* activity based on actual data
 □ Assumed *in vitro* activity based on known class properties or mechanisms of action

Ad-hoc studies, 2009-2010

- European ***Clostridium difficile*** infection survey (ECDIS, Nov. 2008): preliminary results at ECCMID, *manuscript submitted*
- Survey on **MRSA CC398** in Europe (2008): preliminary results at ECCMID, *manuscript in preparation*
- Survey on the experience of **European intensivists** with MDR bacteria and with last line antibiotics (Eurosurveillance 2009 & *2nd manuscript in preparation*).



Survey of European intensive care specialists on experience with infections due to resistant bacteria, 2009



No. treated patients during past 6 months: ■ >10 patients ■ 3-10 patients ■ 1-2 patients ■ 0 ■ Do not know ■ Missing

Euroroundups: reviews on the situation in Europe

- ***Clostridium difficile* 027** (2008):
Kuijper E, et al. Euro Surveill 2008 Jul 31;13(31).
- **Oseltamivir use** (2008):
Kramarz P, et al. Euro Surveill 2009 Feb 5;14(5).
- **Use of 7-valent pneumococcal vaccine (PCV7) in Europe, incl. vaccination schemes (2001-2007):**
De Carvalho Gomes H, et al. Euro Surveill 2009 Mar 26;14(12).
- **National hand hygiene campaigns in Europe (2000-2009):**
Magiorakos AP, et al. Euro Surveill Apr 30;14(17).
- **Country highlights on hand hygiene (2010)**
- **Combating MRSA in Europe (2010)**
- **Over-the-counter use (2010)**



<http://www.eurosurveillance.org/>



Guidance for prevention and control, 2006-2010

- ***Clostridium difficile***: background document Kuijper EJ, et al. Clin Microbiol Infect 2006 Oct;12 Suppl 6:2-18 guidance for prevention and control Vonberg RP, et al. Clin Microbiol Infect 2008 May;14 Suppl 5:2-20.
- **MRSA**: background document (*submitted*), review of national guidelines (*in preparation*), guidance for prevention and control of MRSA in hospitals (*in preparation*) and in the community (2010)
- **KPC-producing *Klebsiella pneumoniae* and other extensively drug-resistant (XDR) bacteria**: risk assessment & interim guidance for prevention and control (2010), European survey?
- **Prevention and control of healthcare-associated infections, and antimicrobial stewardship, incl. indicators (2010 onwards)**



Support to the Commission

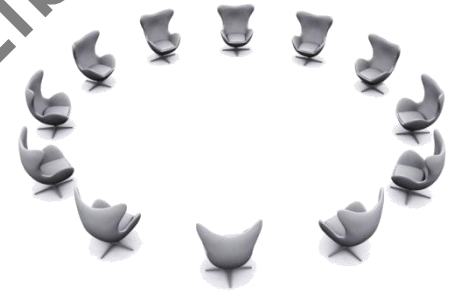
- Scientific input and comments on the successive versions of the Draft proposal for a Council Recommendation on patient safety and quality of health services, including the prevention and control of HAI and corresponding impact assessment paper (2007-2008)
- Scientific support for developing country questionnaires to **report on the implementation of Council Recommendation 2002/77/EC** (2008, to be published: 9 April 2010)
- Scientific support on **Eurobarometer survey on AMR and antibiotics** (Nov.-Dec 2009, to be published: 9 April 2010)



Coordination, 2007-2010

Network of National AMR Focal Points

(representing national Intersectoral Coordination Mechanisms, i.e. National committees)



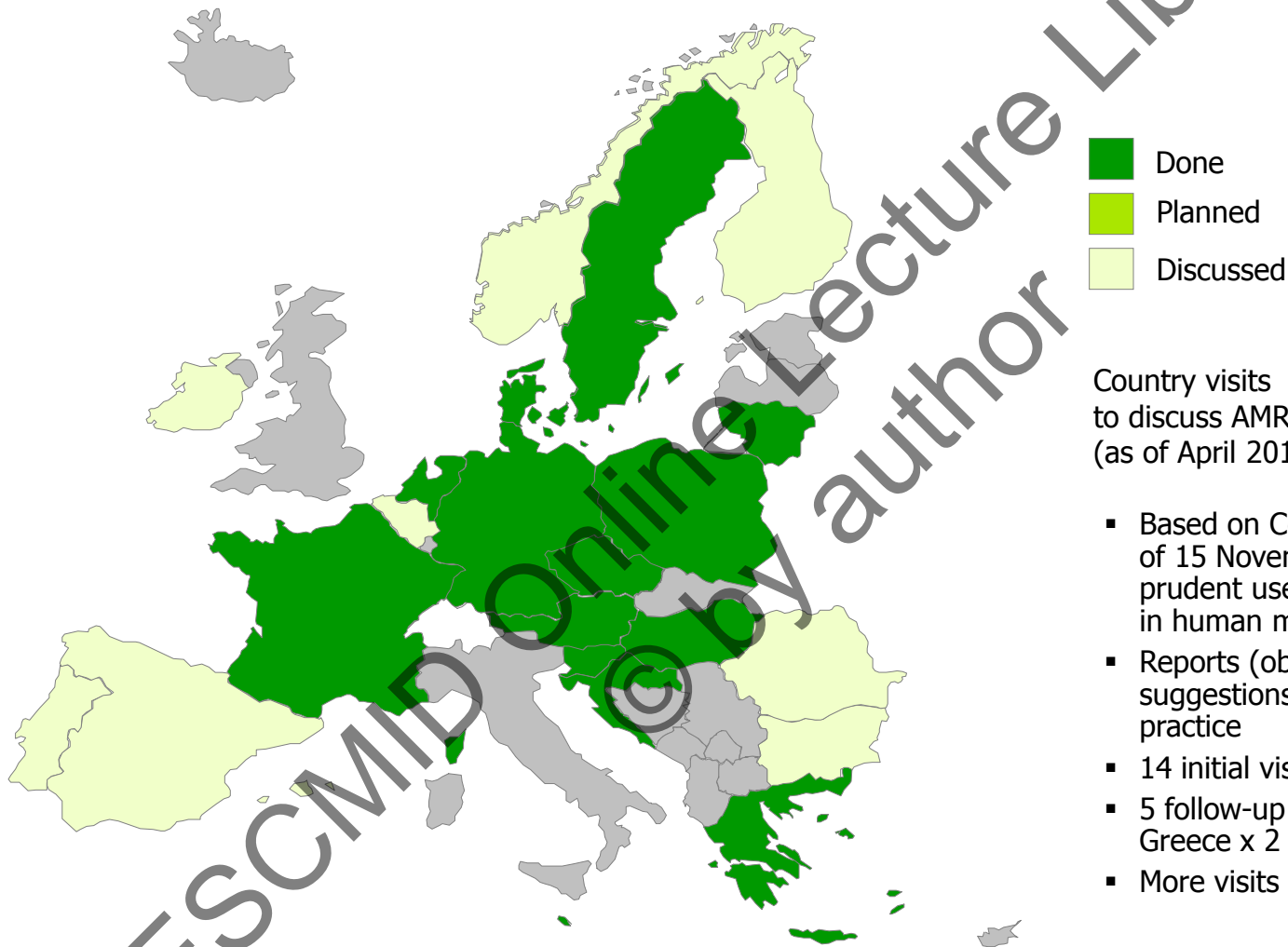
Meet twice a year since September 2007

Meetings in 2010:

- Stockholm, 21-22 April 2010 (together with Competent Bodies for Communication)
- Madrid, 2-4 June 2010 (followed by 5th International Conference on Patient Safety)
- Brussels, 8-10 November 2010 (followed by workshops and EU Conference on AMR & HAI)

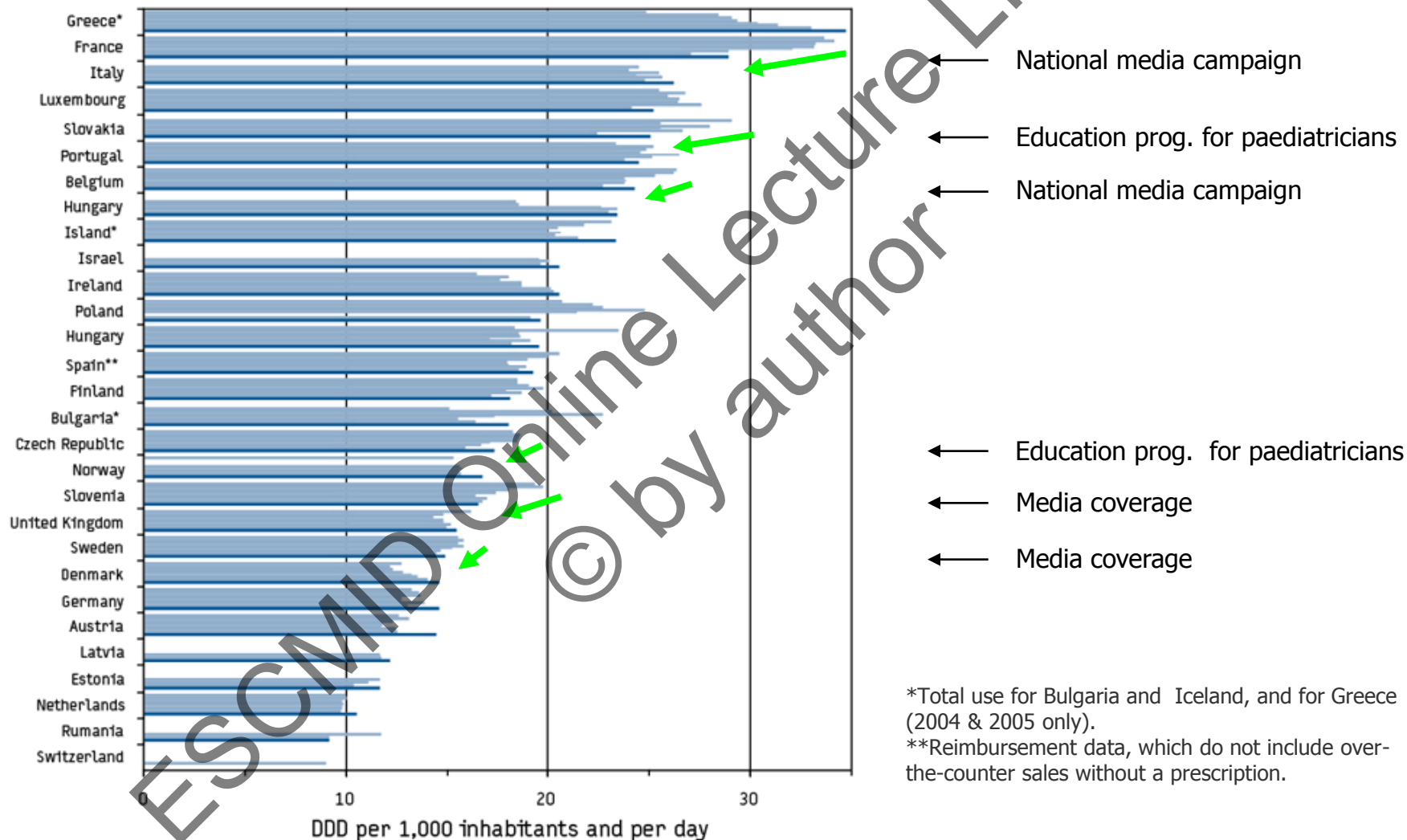


Country visits to discuss antimicrobial resistance (AMR) issues, 2006-2010

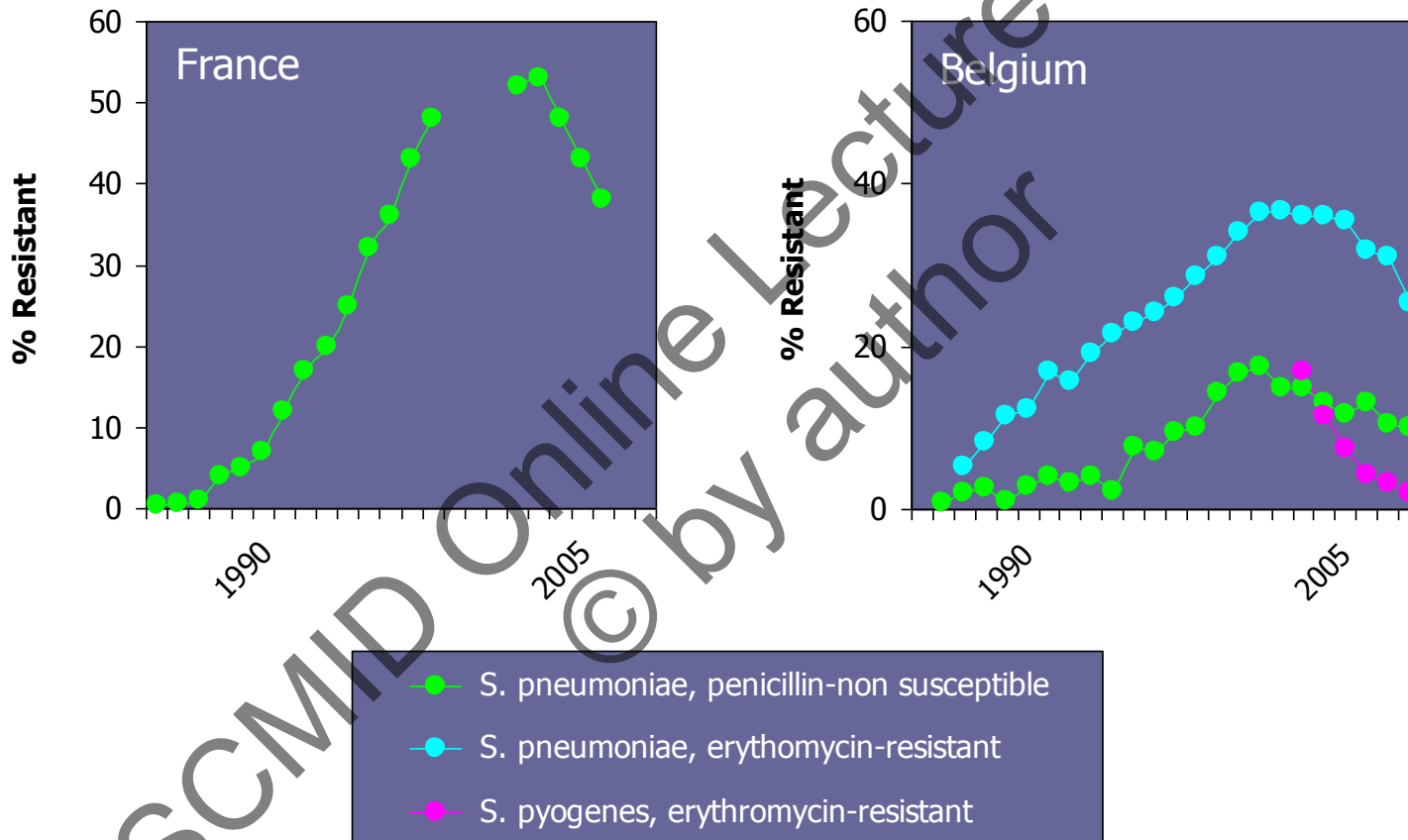


- Based on Council Recommendation of 15 November 2001 on the prudent use of antimicrobial agents in human medicine (2002/77/EC)
- Reports (observations, conclusions, suggestions, examples of best practice)
- 14 initial visits (see map)
- 5 follow-up visits (Czech Rep., Greece x 2 and Hungary x 2)
- More visits in 2010

Total outpatient antibiotic use (ATC J01) in 29 European countries, 1998-2005



Decreases in antimicrobial resistance following national media campaigns



18 November 2010

EUROPEAN ANTIBIOTIC AWARENESS DAY



A European Health Initiative



2008

- Materials for general public
- 32 countries participated

2009

- Materials for primary care prescribers
- Website translated in all EU languages
- TV spots developed

2010

- Focus on hospital prescribers
- Will match Get Smart week in the United States



COLD? FLU?



GET WELL WITHOUT ANTIBIOTICS

18 November 2009

For more information, visit antibiotic.ecdc.europa.eu

18 November 2010

Focus on hospital prescribers

EUROPEAN
ANTIBIOTIC
AWARENESS DAY



A European Health Initiative



Distribution of EAAD packs

- Explanatory cover letter
- Concepts, key messages, campaign materials, dissemination strategy
- Feed-back form (2 copies)

Session on Saturday morning

- Detailed presentation by Sarah Earnshaw

Feed-back form

- Complete one form yourself and return by the end of the course
- Consult and obtain feed-back from one prescriber in your hospital, return form by e-mail/fax by 23 April

Review panel

- Consider whether you would like to be part of this panel to advise on adapting campaign materials in view of feed-back