

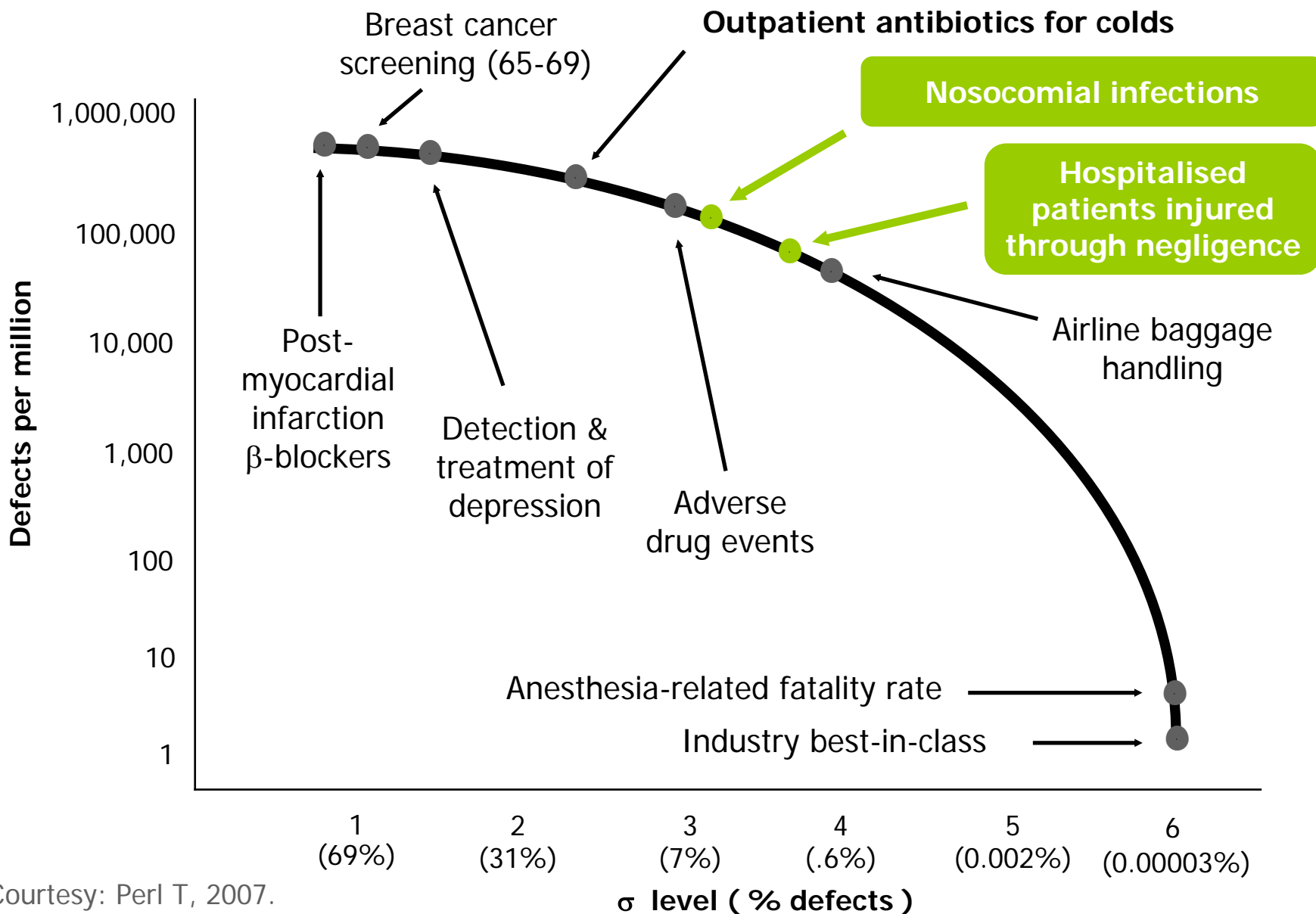


Scientific perspective on the microbial threat to patient safety in Europe

Dominique L. Monnet, Senior Expert and Programme Coordinator
European Centre for Disease Prevention and Control

Madrid, 3 June 2010

Six sigma quality comparisons defect rates



Courtesy: Perl T, 2007.

Antimicrobial resistance: a patient safety issue

Emergence, selection and spread of resistant bacteria is a threat to patient safety in hospitals.

- Antibiotic resistance frequently leads to a delay in administration of appropriate antibiotic therapy
- Inappropriate or delayed antibiotic therapy in patients with severe infections is associated with worse patient outcomes, and sometimes death
- Infections with antibiotic-resistant bacteria result in increased patient morbidity and mortality, as well as increased hospital length of stay

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.

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)

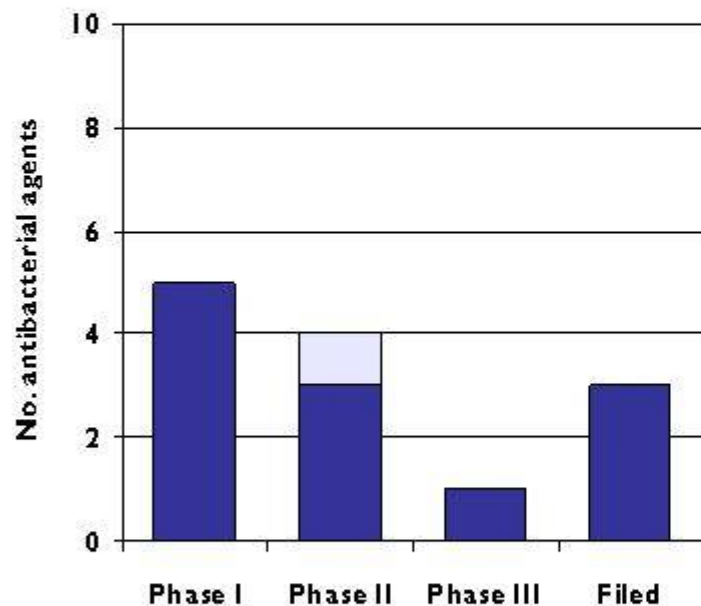


New antibiotics
(with a novel mechanism of action, research, development)



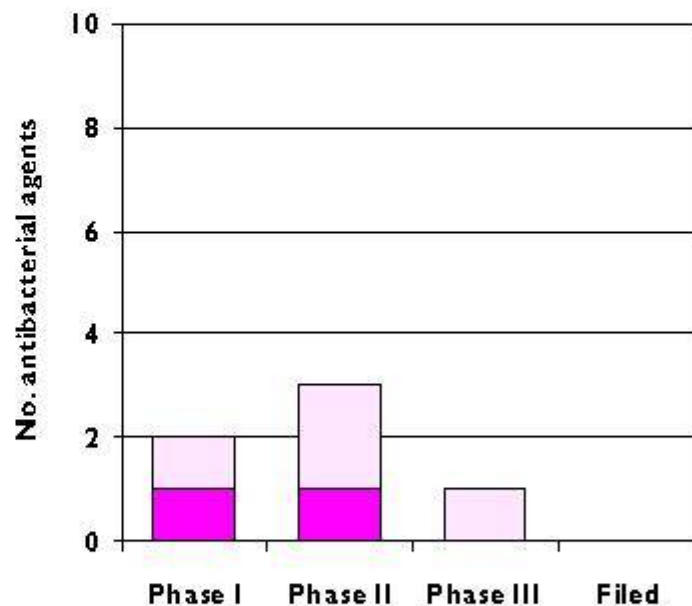
15 novel, systemically administered antibacterial agents in the pipeline

13 agents against Gram-positive bacteria



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

6 agents against Gram-negative bacteria



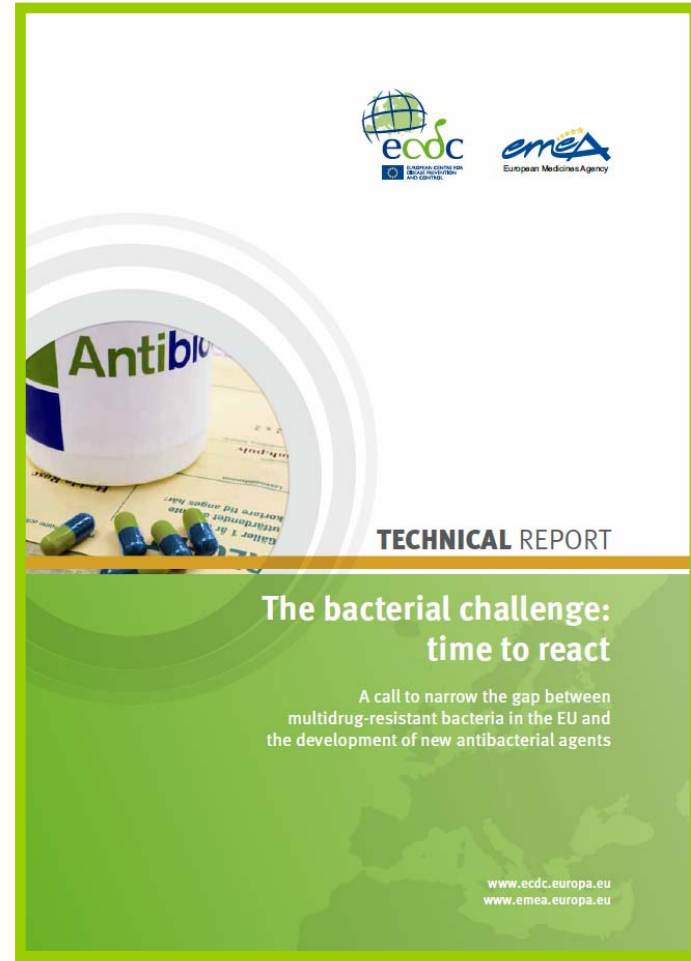
- Demonstrated *in vitro* activity based on actual data
- Assumed *in vitro* activity based on known class properties or mechanisms of action

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



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



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COUNCIL OF THE EUROPEAN UNION

Council Conclusions on Antimicrobial Resistance (AMR)

28th6th 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. 3427/06 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 (sec2005) 1745)

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

1
(Regulations, 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⁽¹⁾,
Having regard to the opinion of the European Economic and Social Committee⁽²⁾,
Having regard to the opinion of the Committee of the Regions⁽³⁾,
Whereas:

- (1) Article 152 of the Treaty provides that Community action, which shall complement national policies, shall be directed towards improving public health, preserving human fitness and disease, and eliminating sources of danger 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⁽⁴⁾.
- (3) The European Centre for Disease Prevention and Control (ECDC) has estimated that, on average, healthcare associated infections occur in one hospitalised patient in 30, due to no way 4,1 million patients a year in the
- (4) The Commission, through the seventh framework programme for research and development⁽⁵⁾ supports research in health systems, in particular in the quality of healthcare provision under the Health Theme, including a focus on patient safety. The latter is also given particular attention under the Information and Communication Technology Theme.
- (5) The Commission, in its White Paper 'Together for Health: A Strategic Approach for the EU' 2006-2017 of 23 October 2007, identifies patient safety as an area for action.
- (6) Decision No 1912/2004/EC of the European Parliament and of the Council of 12 December 2004 concerning the seventh framework programme of the European Community for research, technological development and demonstration activities (2007-2013) (OJ L 318, 30.12.2004, p. 1).

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

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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:

Nota bene: 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

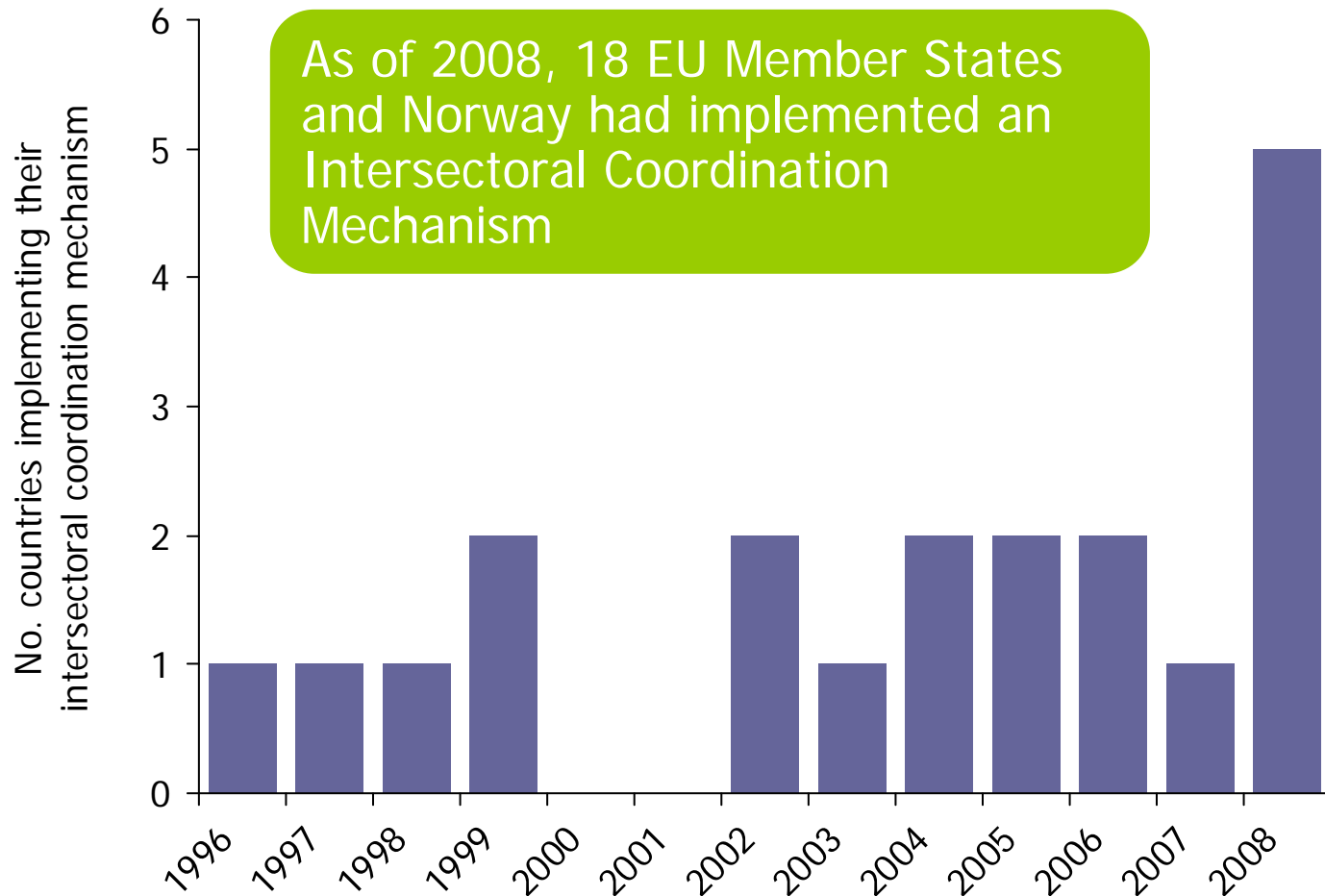
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Council Conclusions on innovative incentives for effective antibiotics (1 December 2009)

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

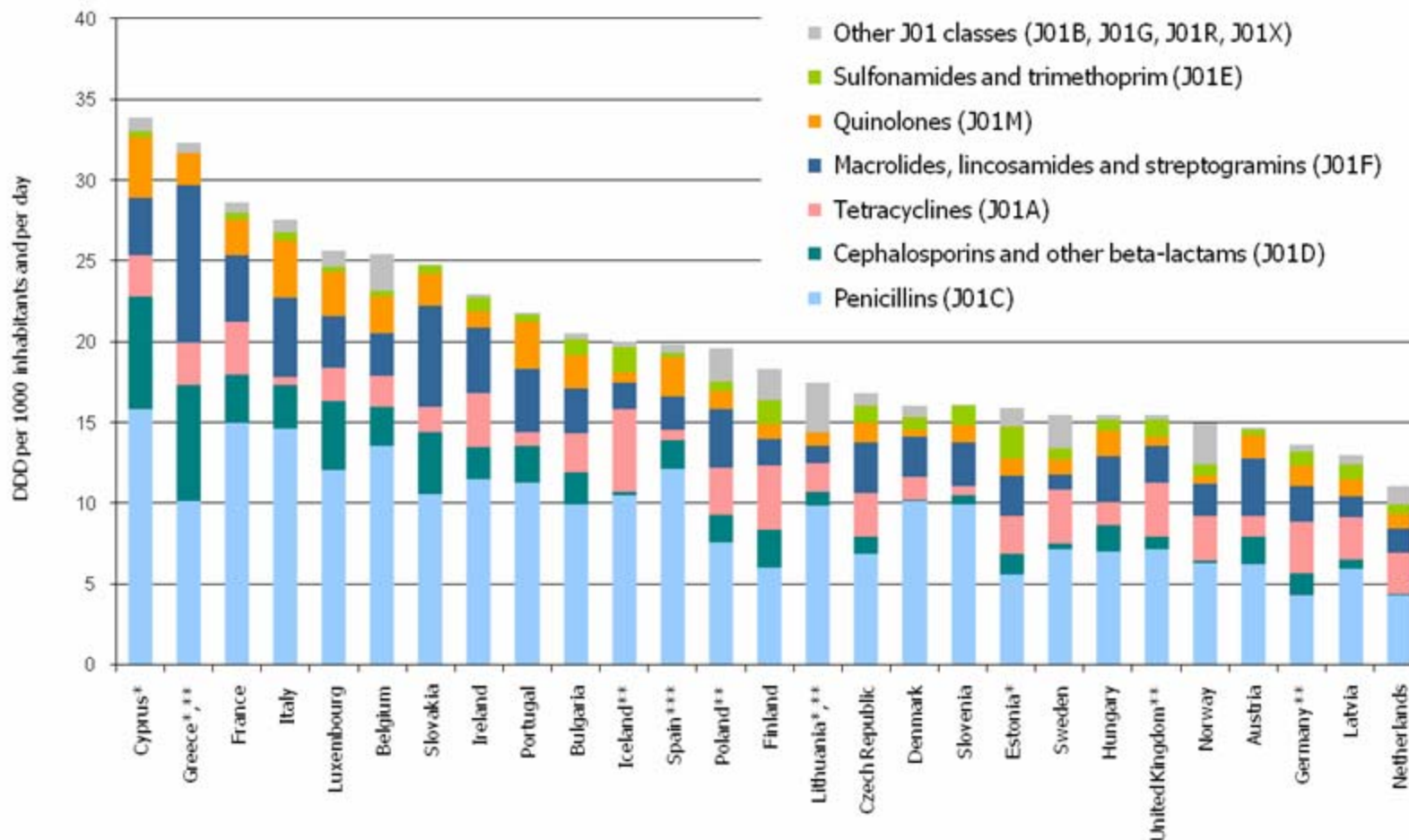
Implementation of National Intersectoral Coordination Mechanisms on AMR



Outpatients



Antibiotic prescribing and consumption vary between European countries, 2007

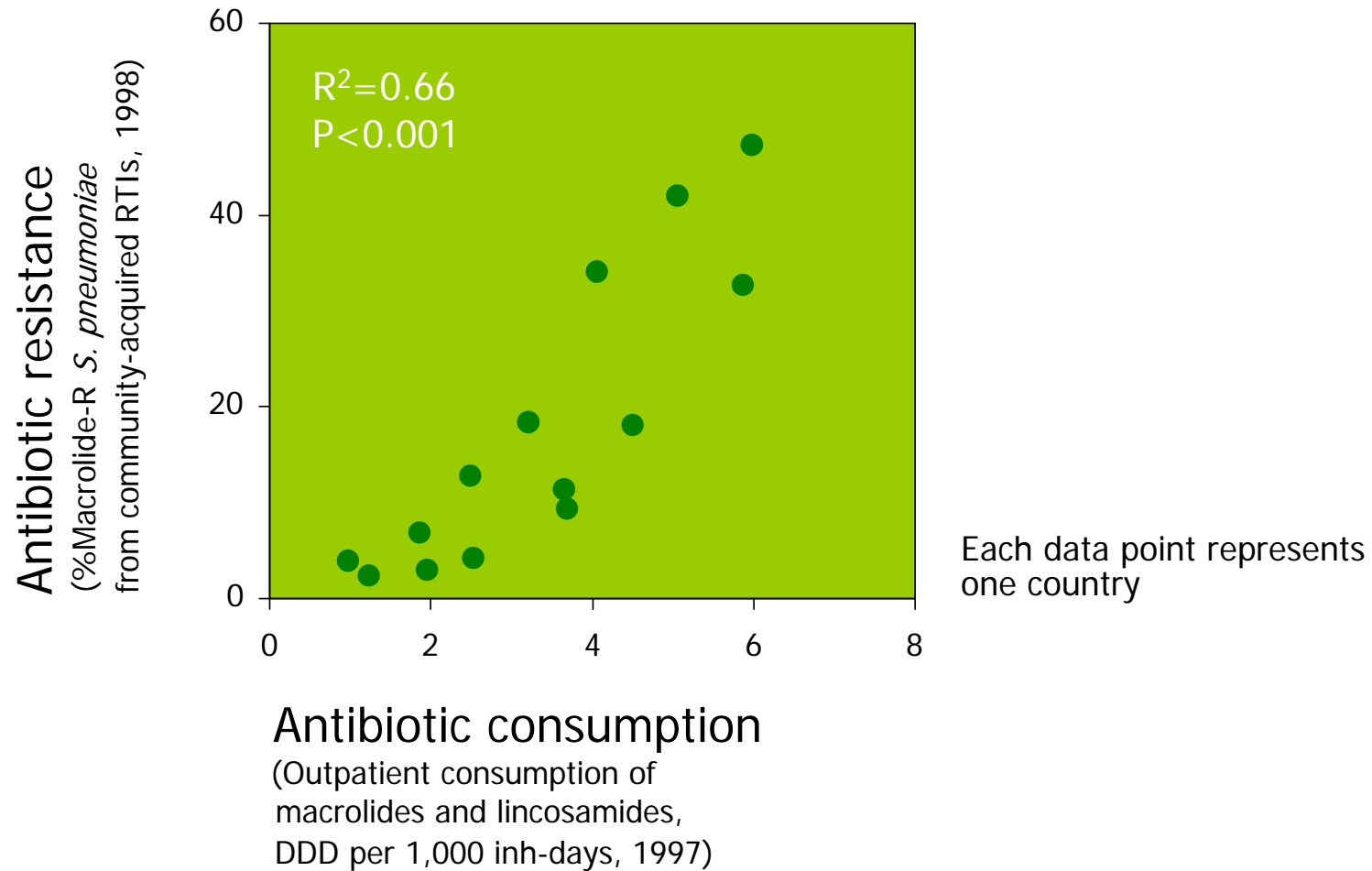


*Total use, i.e. including inpatients, for Cyprus, Estonia, Greece and Lithuania.

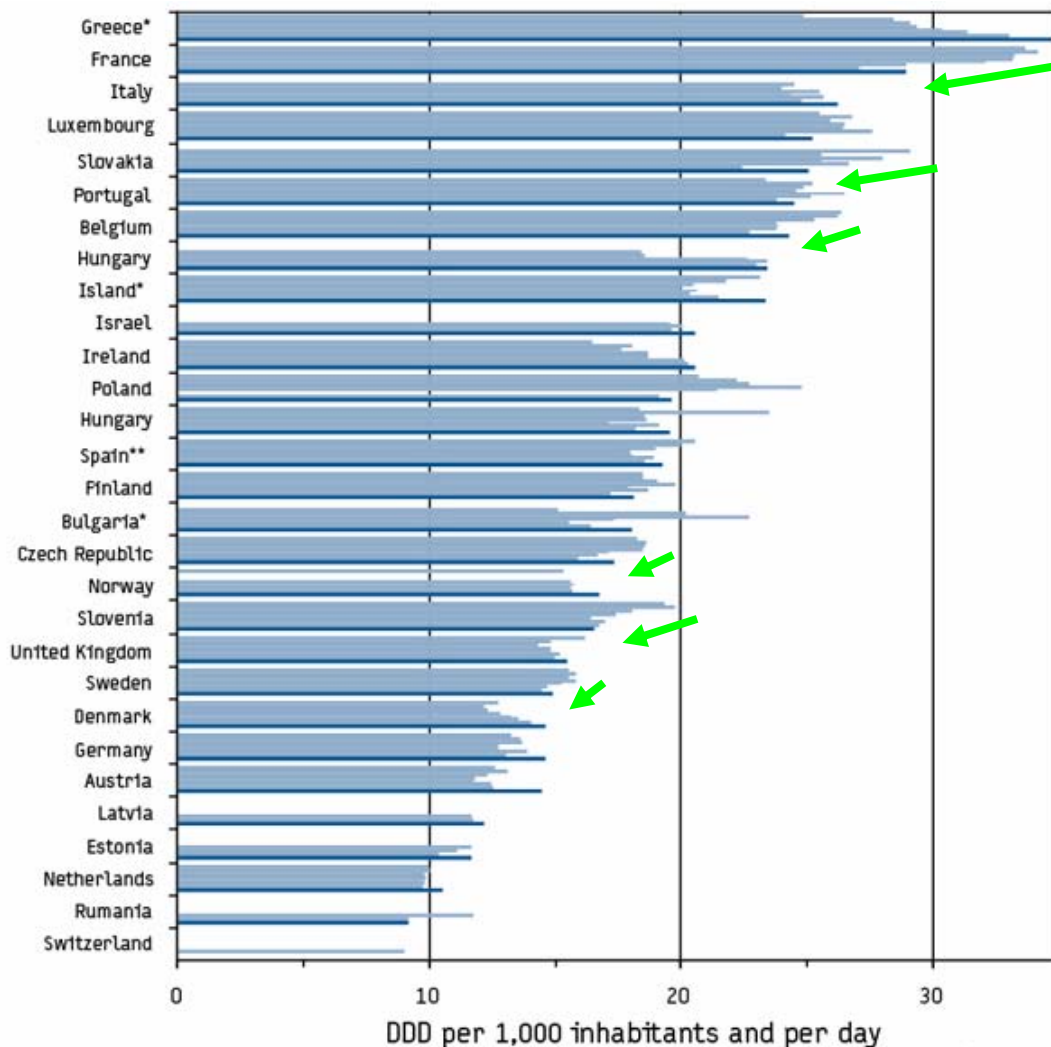
**2006 data for Germany, Greece, Iceland and Lithuania; 2005 data for Poland and United Kingdom.

***Reimbursement data, which do not include over-the-counter sales without prescription.

Relationship between antibiotic use and resistance in the community



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



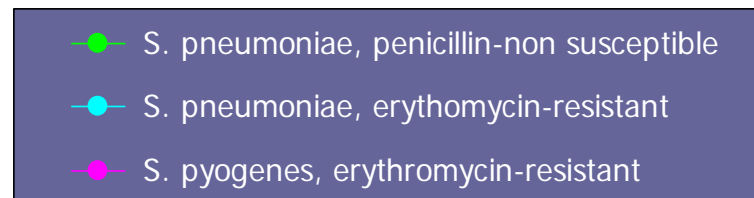
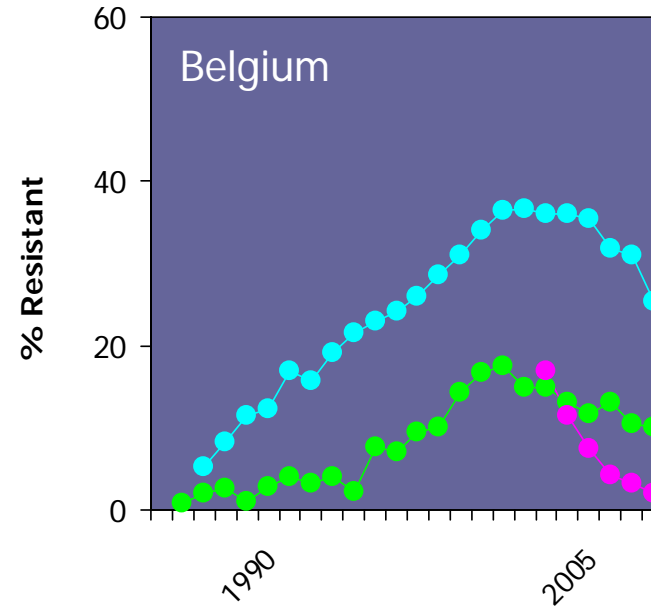
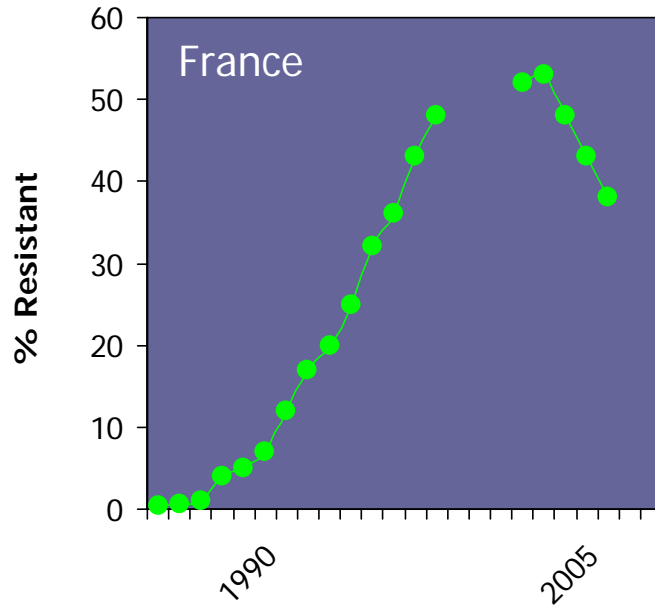
- ← National media campaign
- ← Education prog. for paediatricians
- ← National media campaign

- ← Education prog. for paediatricians
- ← Media coverage
- ← Media coverage

*Total use for Bulgaria and Iceland, and for Greece (2004 & 2005 only).

**Reimbursement data, which do not include over-the-counter sales without a prescription.

Decreases in antimicrobial resistance following national media campaigns



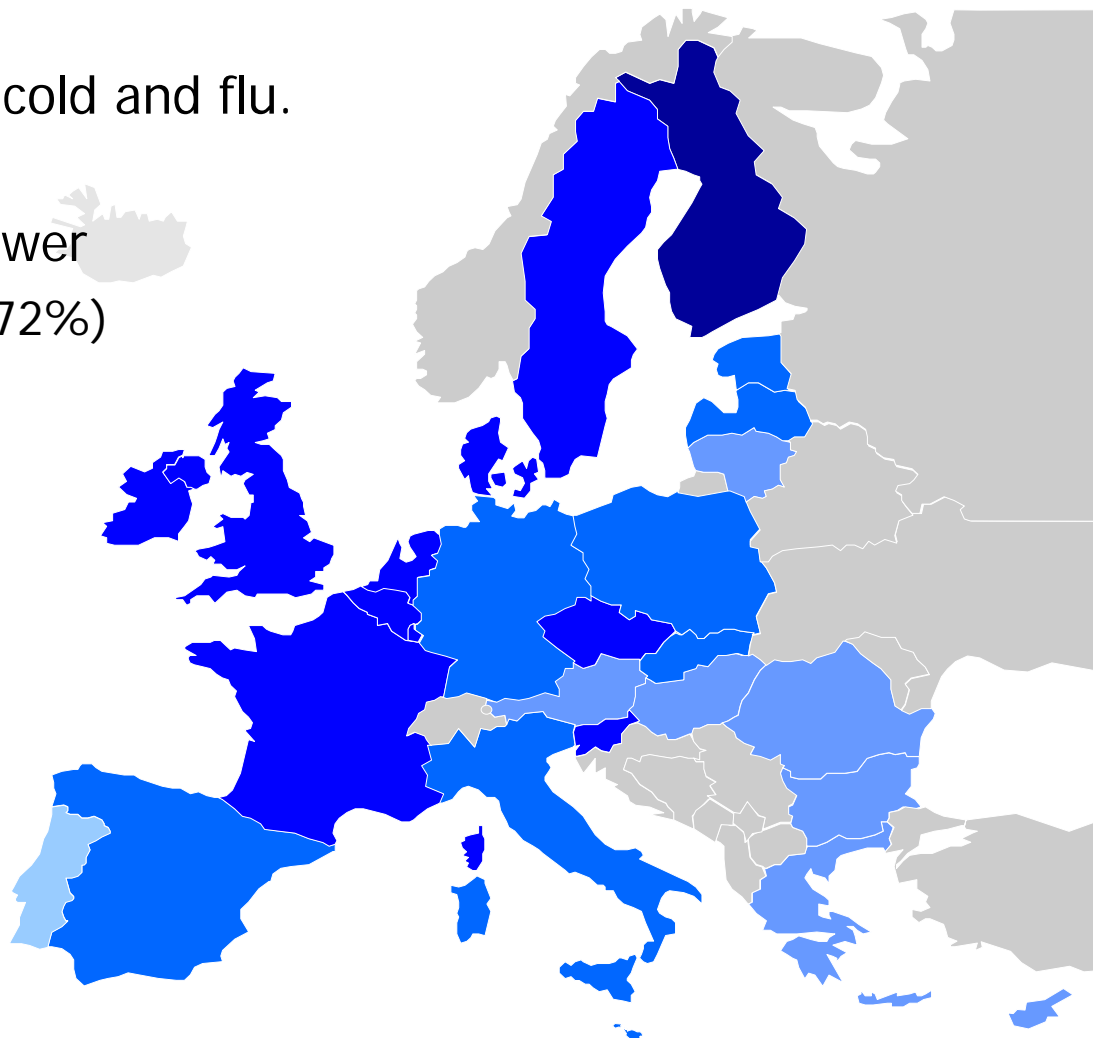
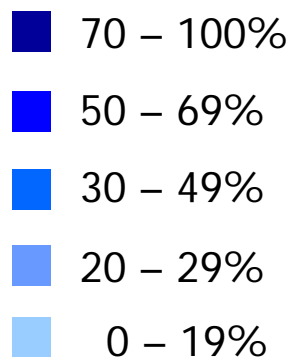
Eurobarometer Opinion Poll, November-December 2009



Antibiotics are effective against cold and flu.

True or false?

% respondents with correct answer
(i.e., "false"): 46% (range: 18 – 72%)



18 November

EUROPEAN ANTIBIOTIC AWARENESS DAY



A European Health Initiative

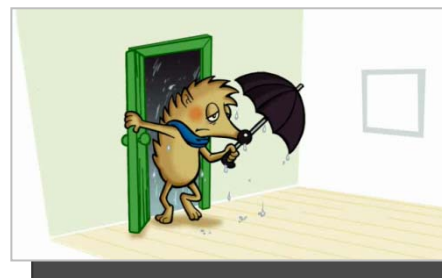


COLD? FLU?



2008

- Materials for general public
- 32 countries participated



2009

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



GET WELL
WITHOUT
ANTIBIOTICS

18 November
2009

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

Hospitals



Photo: Luis Garcia

Modern medicine is not possible without effective antimicrobials



Hip replacement

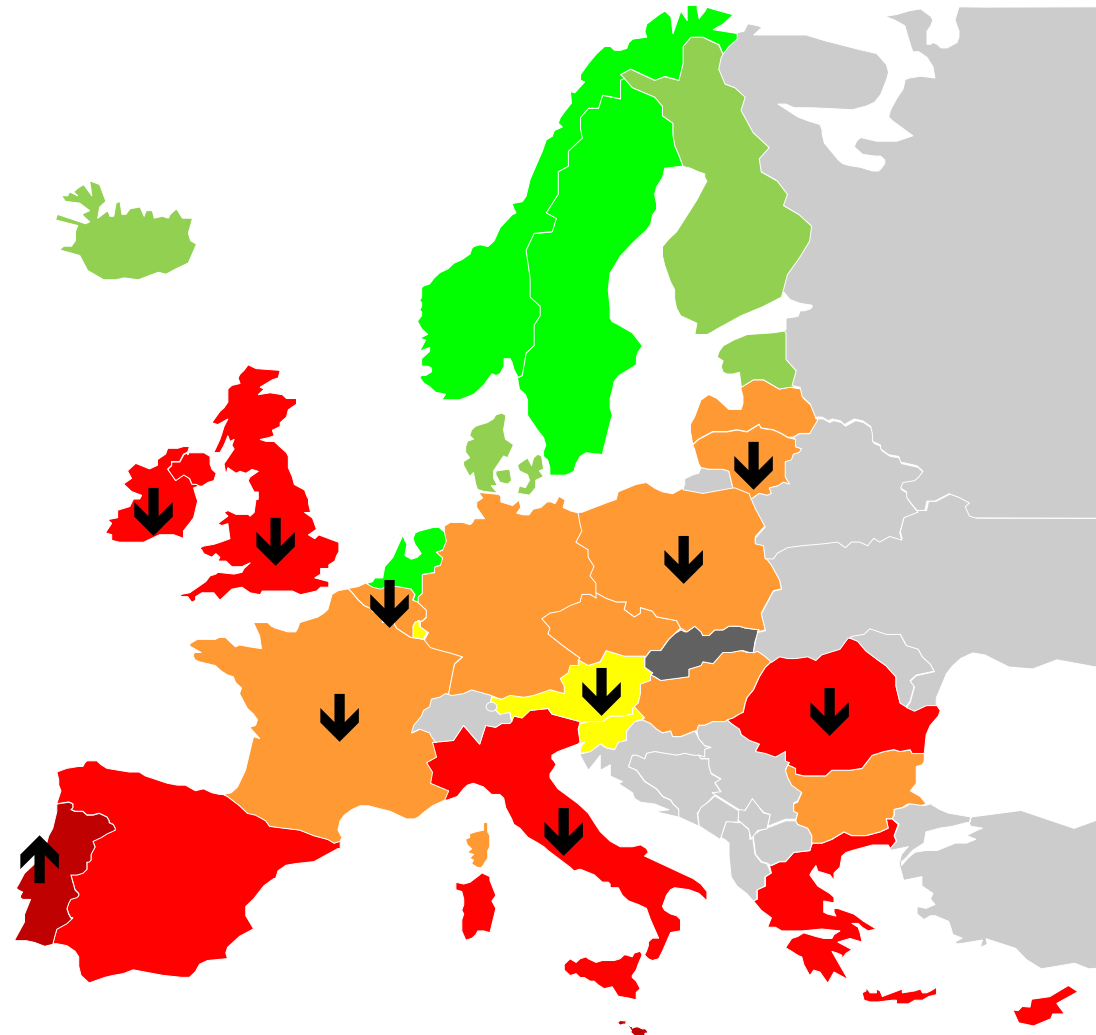
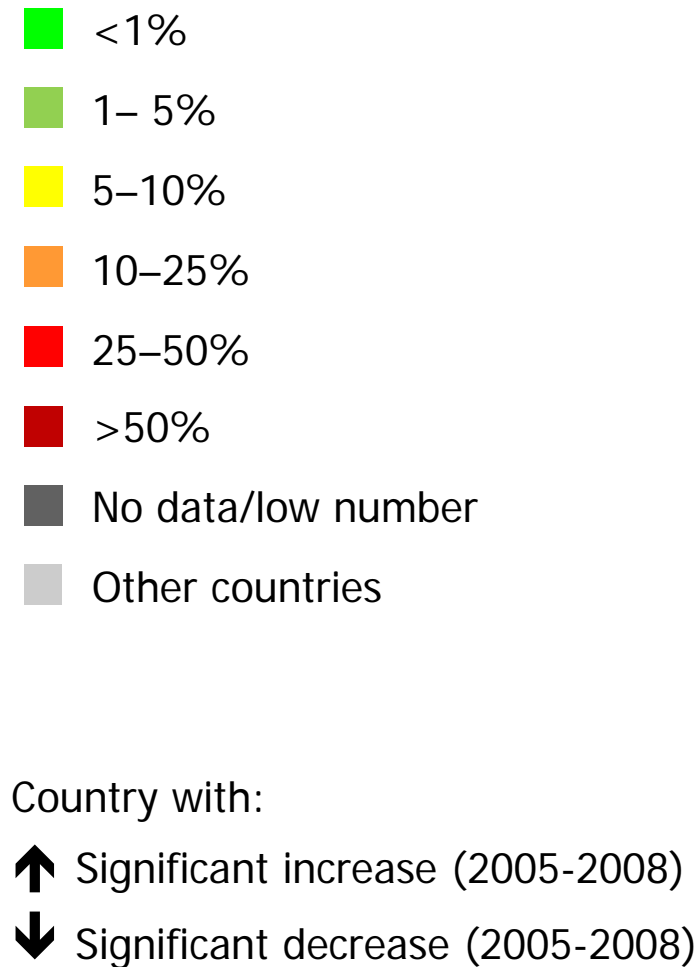
Organ transplants

Cancer chemotherapy

Intensive care

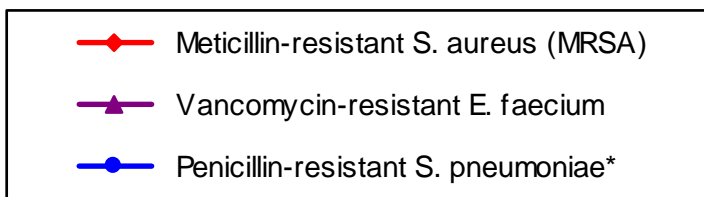
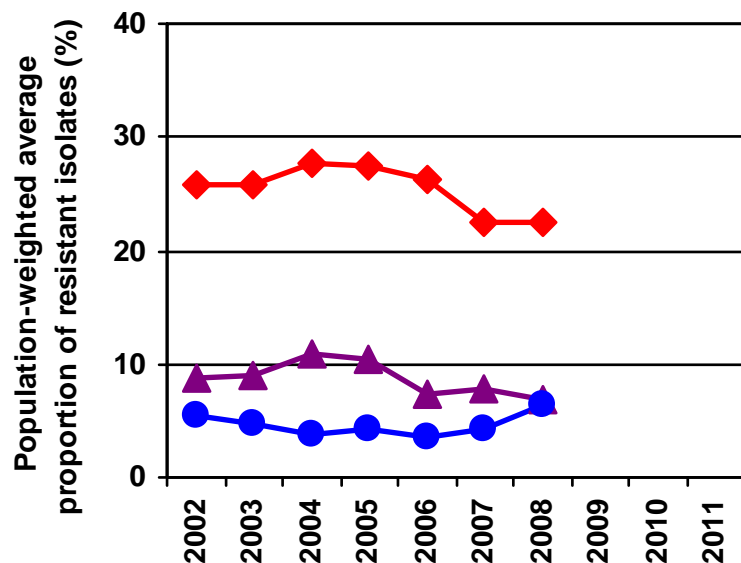
Care of preterm babies

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



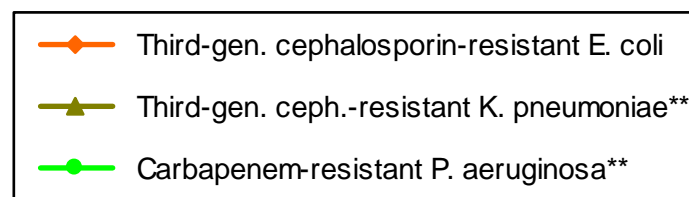
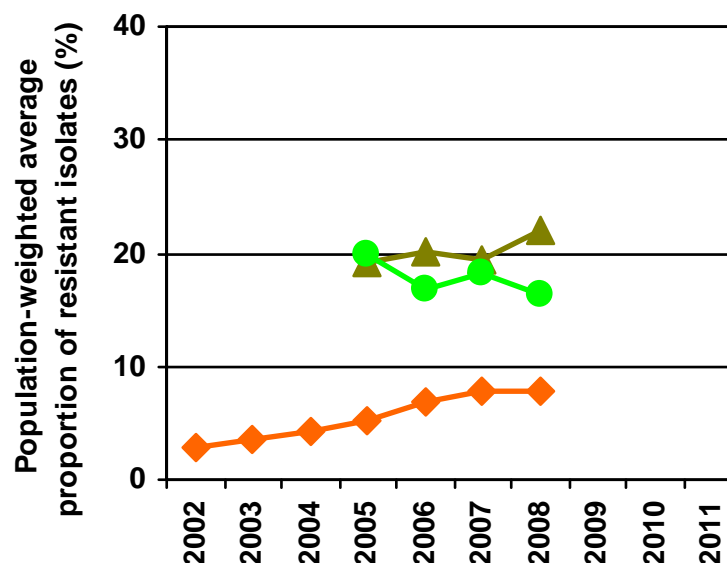
Population-weighted, average %resistant isolates among bacteria from bloodstream infections, EU, Iceland and Norway, 2002-2008

Gram-positive bacteria



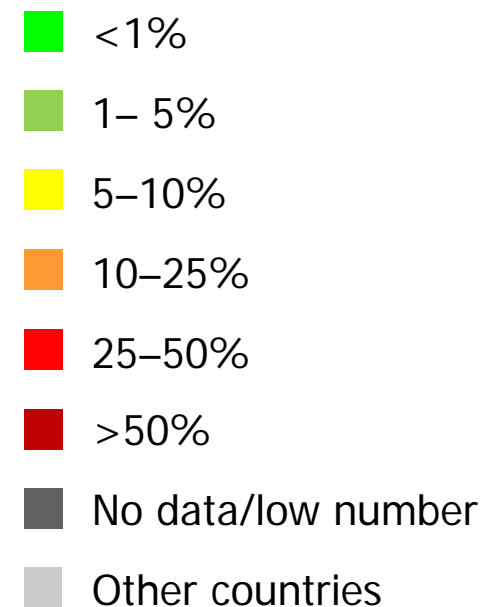
*Excluding Greece, which did not report data.

Gram-negative bacteria



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

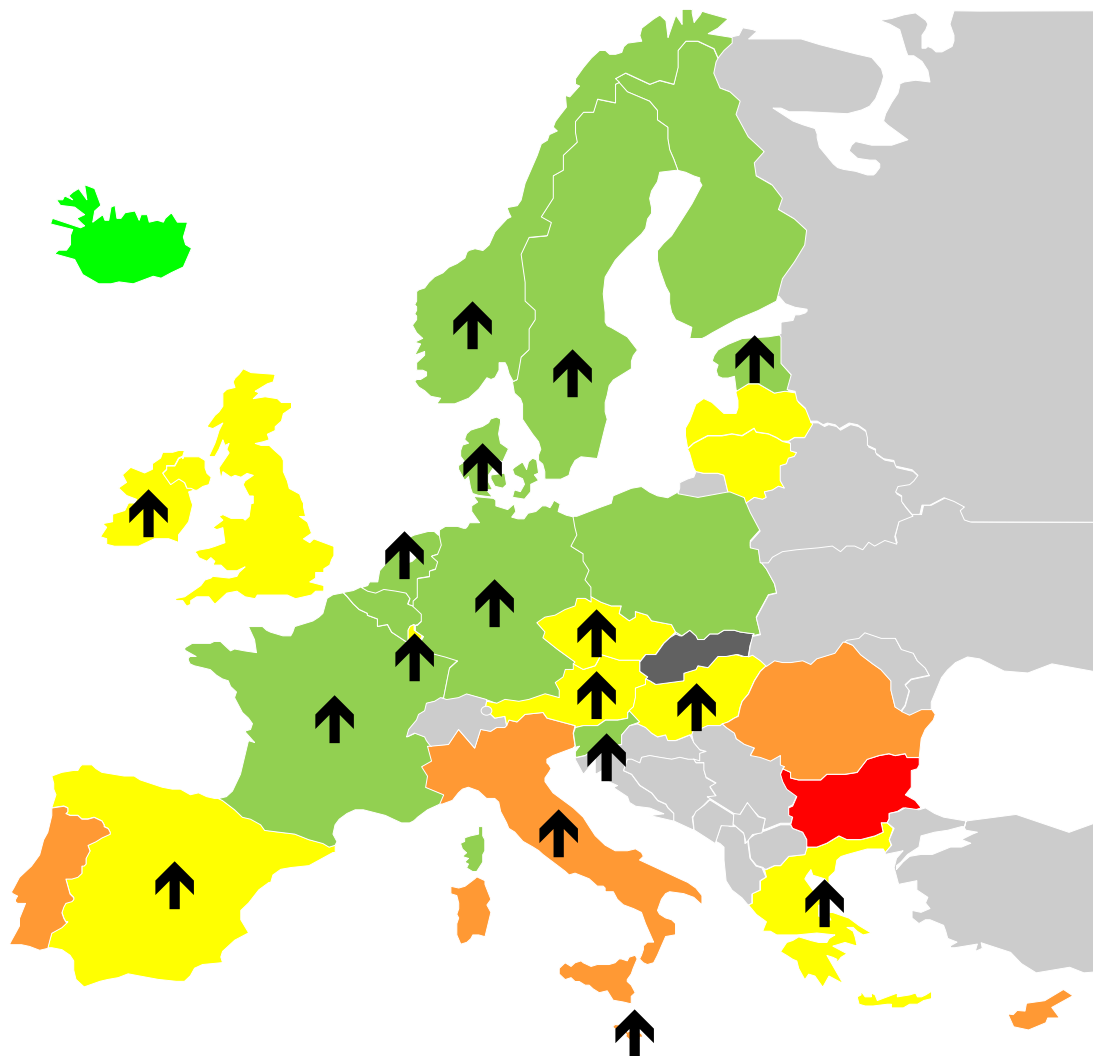
Third-generation cephalosporin-resistant *Escherichia coli*, blood and CSF, 2008



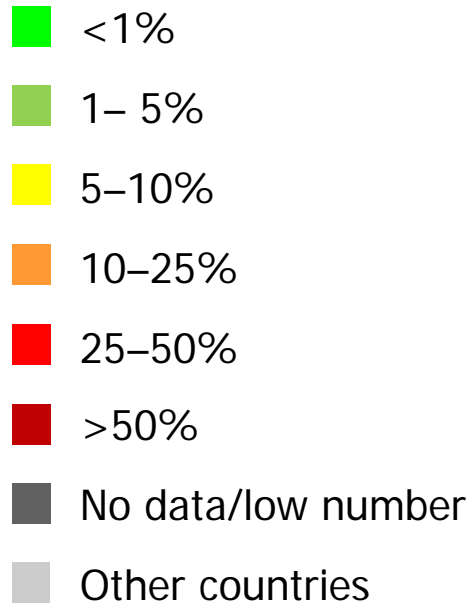
Country with:

↑ Significant increase (2005-2008)

↓ Significant decrease (2005-2008)



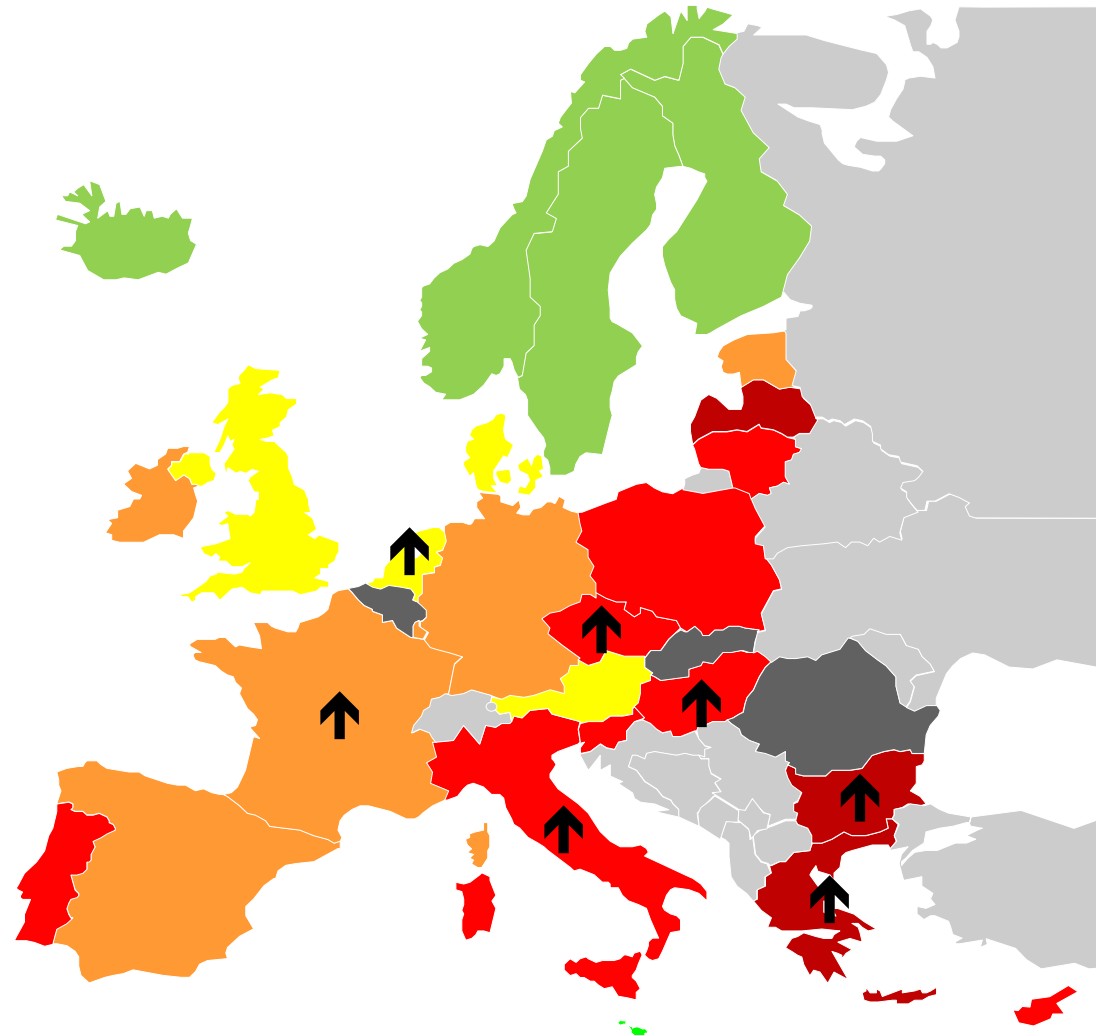
Third-generation cephalosporin-resistant *Klebsiella pneumoniae*, blood and CSF, 2008



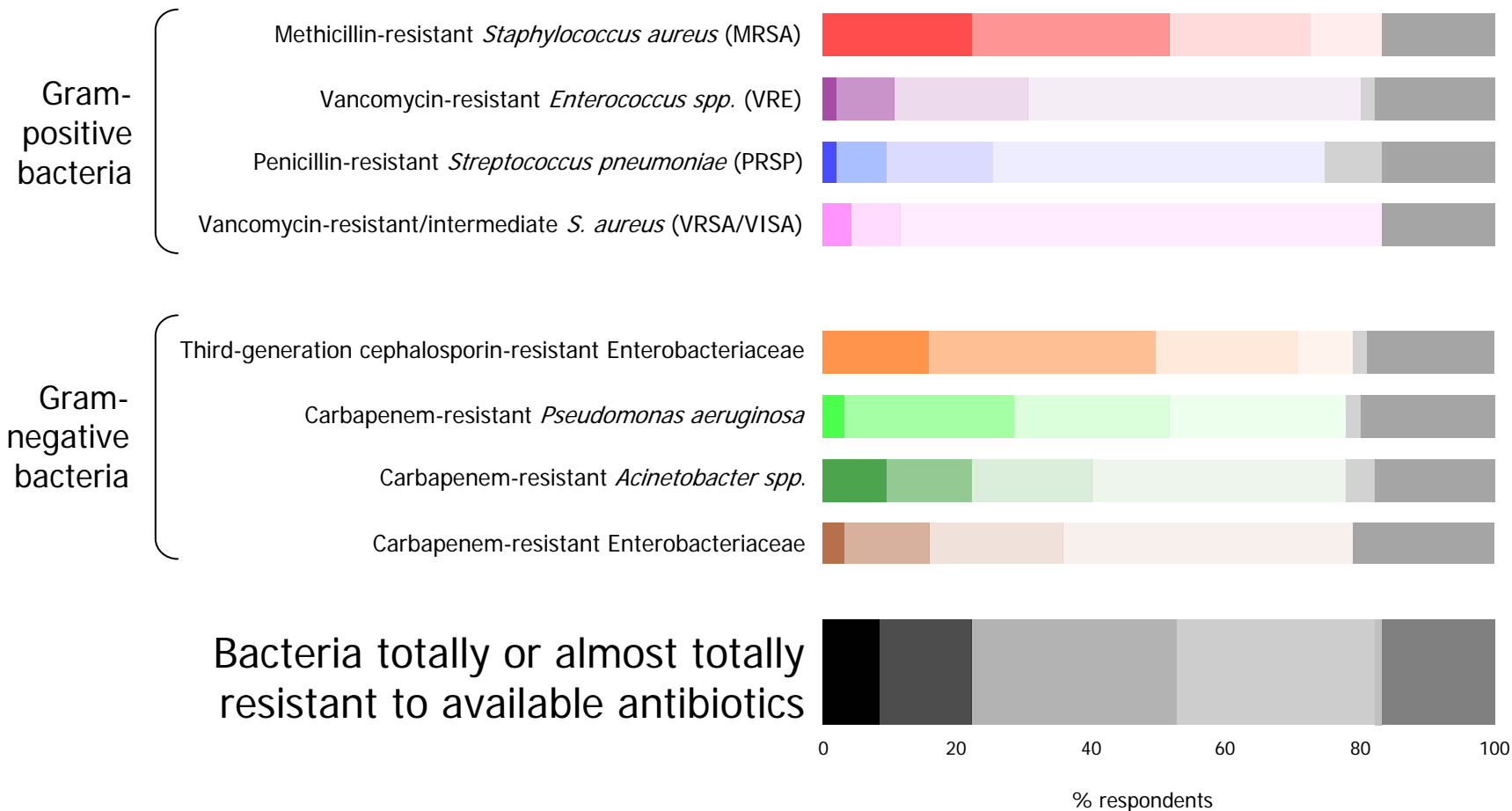
Country with:

↑ Significant increase (2005-2008)

↓ Significant decrease (2005-2008)



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

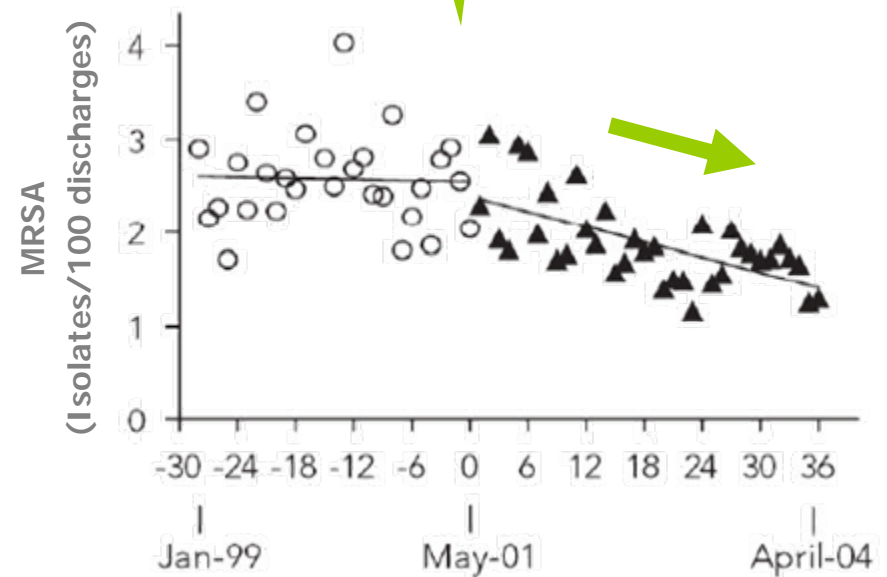
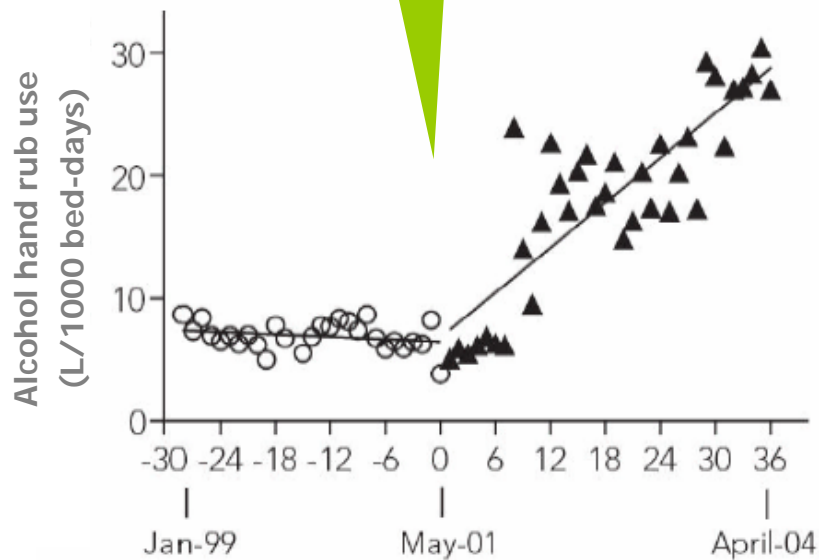
Carbapenemase-producing *Enterobacteriaceae* in Europe

On 5 May 2010, ECDC's Advisory Forum gave ECDC the mandate to perform an assessment of the risks for European patients of spread of carbapenemase-producing *Klebsiella pneumoniae* and other *Enterobacteriaceae*

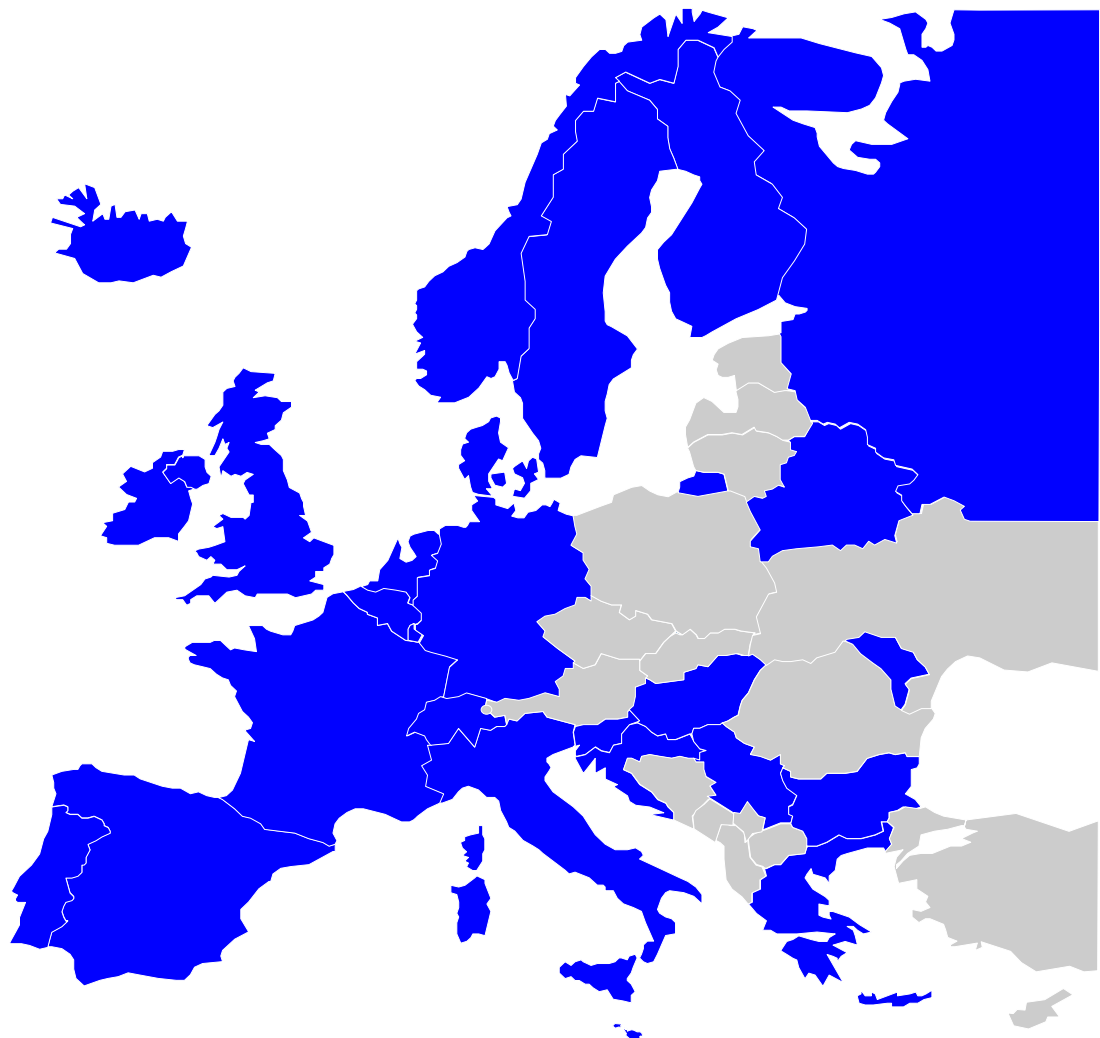


Infection control programmes control antimicrobial resistance in hospitals

Introduction of MRSA control programme including alcohol-based hand disinfection



WHO First Global Patient Safety Challenge in Europe, 2005-2010



- European countries that have pledged their support to implement hand hygiene and other actions as a mean of combating HAI

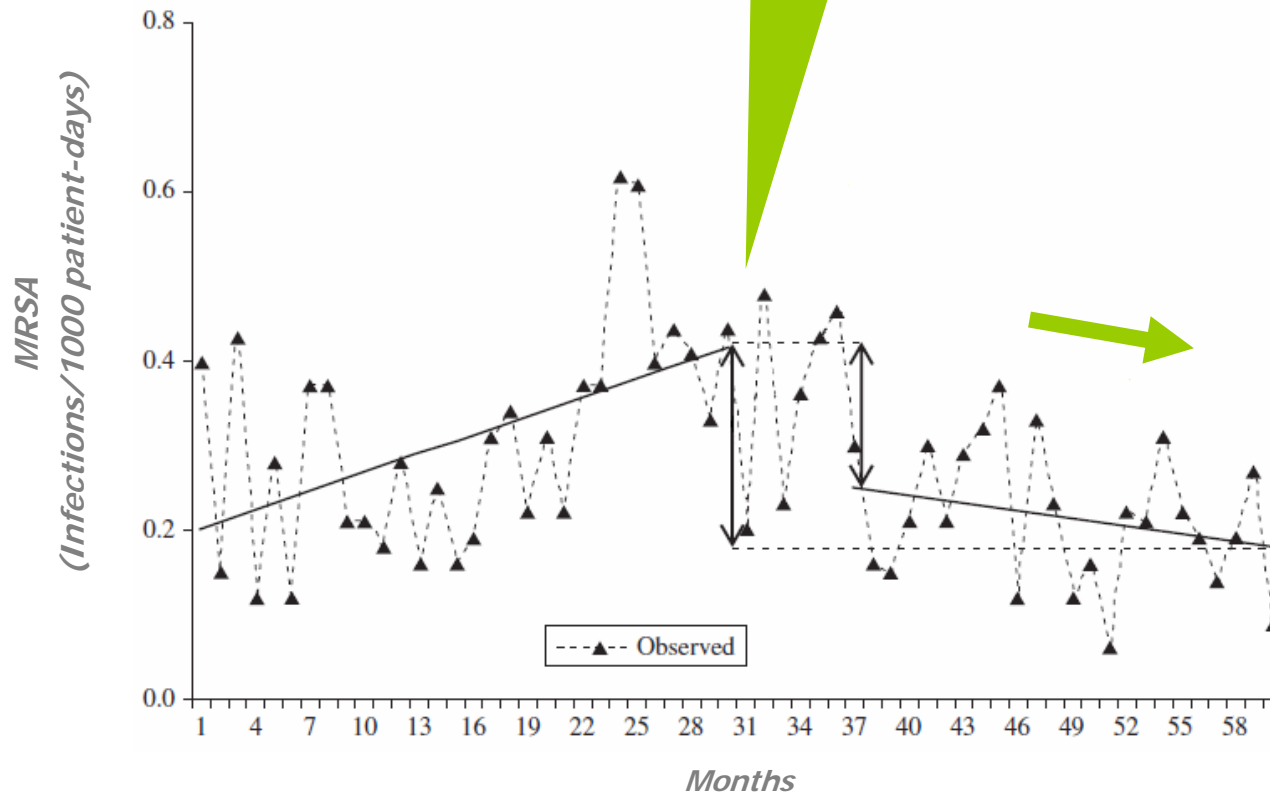
National hand hygiene campaigns in European countries, 2000-2009

- Survey among 30 countries (all EU Member States plus candidate countries)
- 13 countries had had national hand hygiene campaigns
- 3 countries were organizing a campaign
- 10 countries only had regional campaigns that included hospital-based activities
- Published in support of WHO campaign "SAVE LIVES: Clean Your Hands", 5 May 2009



Infection control programmes control antimicrobial resistance in hospitals

Introduction of MRSA control programme including screening at admission and isolation of MRSA-positive patients



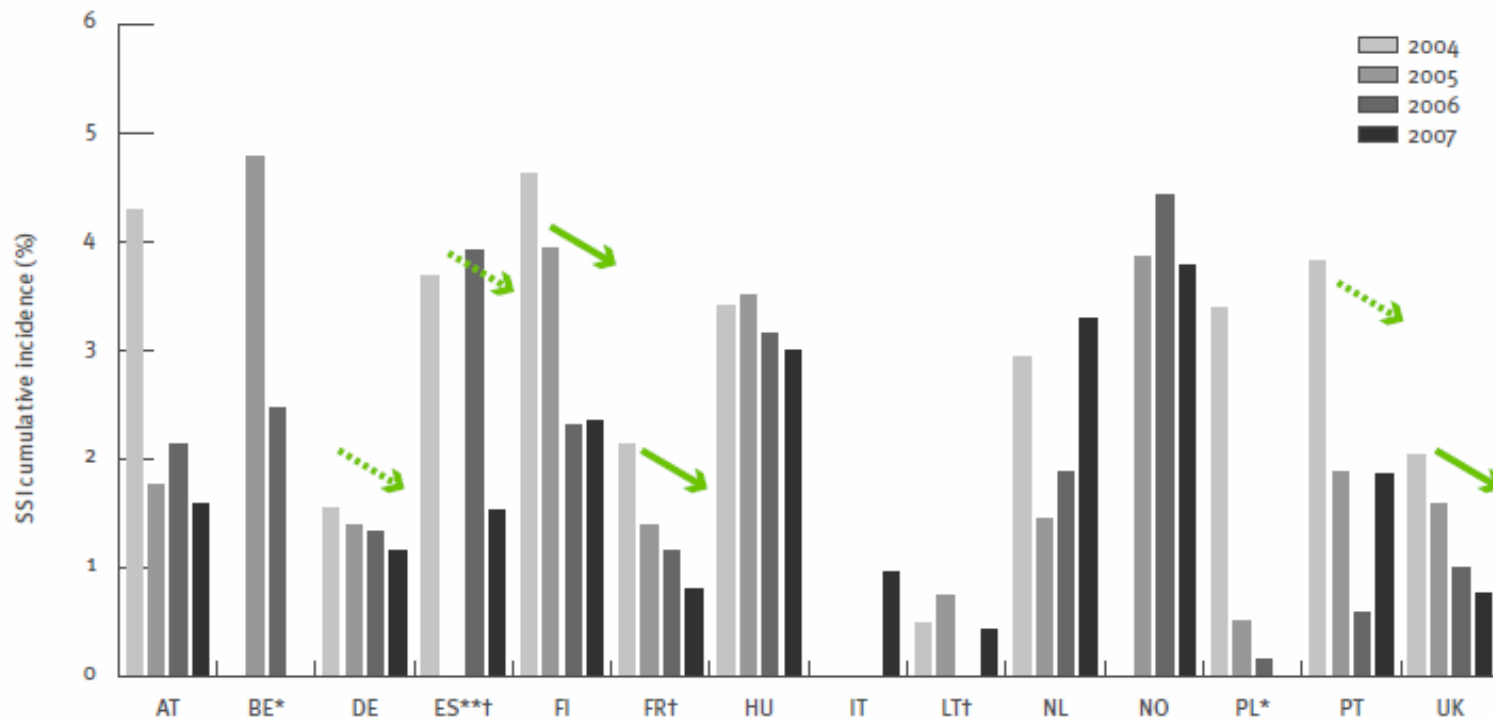
Guidance for prevention and control, 2006-2010

- *Clostridium difficile* (2006-2008)
- Meticillin-resistant *Staphylococcus aureus* (MRSA) (2010)
- Prevention and control of healthcare-associated infections, incl. indicators (2010 onwards)
- Antimicrobial stewardship, incl. indicators (2010 onwards)



Surveillance of healthcare-associated infections (HAI) and benchmarking contributes to control

Trends in cumulative incidence of surgical site infections (SSI) in hip prosthesis surgery (HPRO) by country 2004–2007



Source: Country reports.

* Belgium and Poland did not submit data for 2007, trends were not analysed.

** New surveillance network in Spain since 2006.

† Corrected data for Spain in 2006, France in 2004, Lithuania in 2005.

Arrows indicate significant trends (full line $p < 0.001$; dotted line $p < 0.05$).

ECDC surveillance of healthcare-associated infections (HAI)

- Surgical site infections
- HAI in intensive care units
- HAI in long-term care facilities
- European point prevalence survey on HAI and antibiotic use (2010 onwards-2011)

Participation in 2010

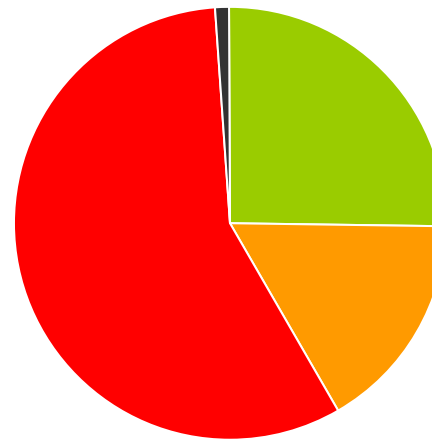
- Surgical site infection only
- Intensive care only
- Both
- Piloting
- Does not participate



Antibiotic use in European hospitals: point prevalence surveys

- Since 2006, web-based reporting system
- Information on therapy/prophylaxis and anatomic site
- 30% [range: 19-59%] patients were receiving antibiotics

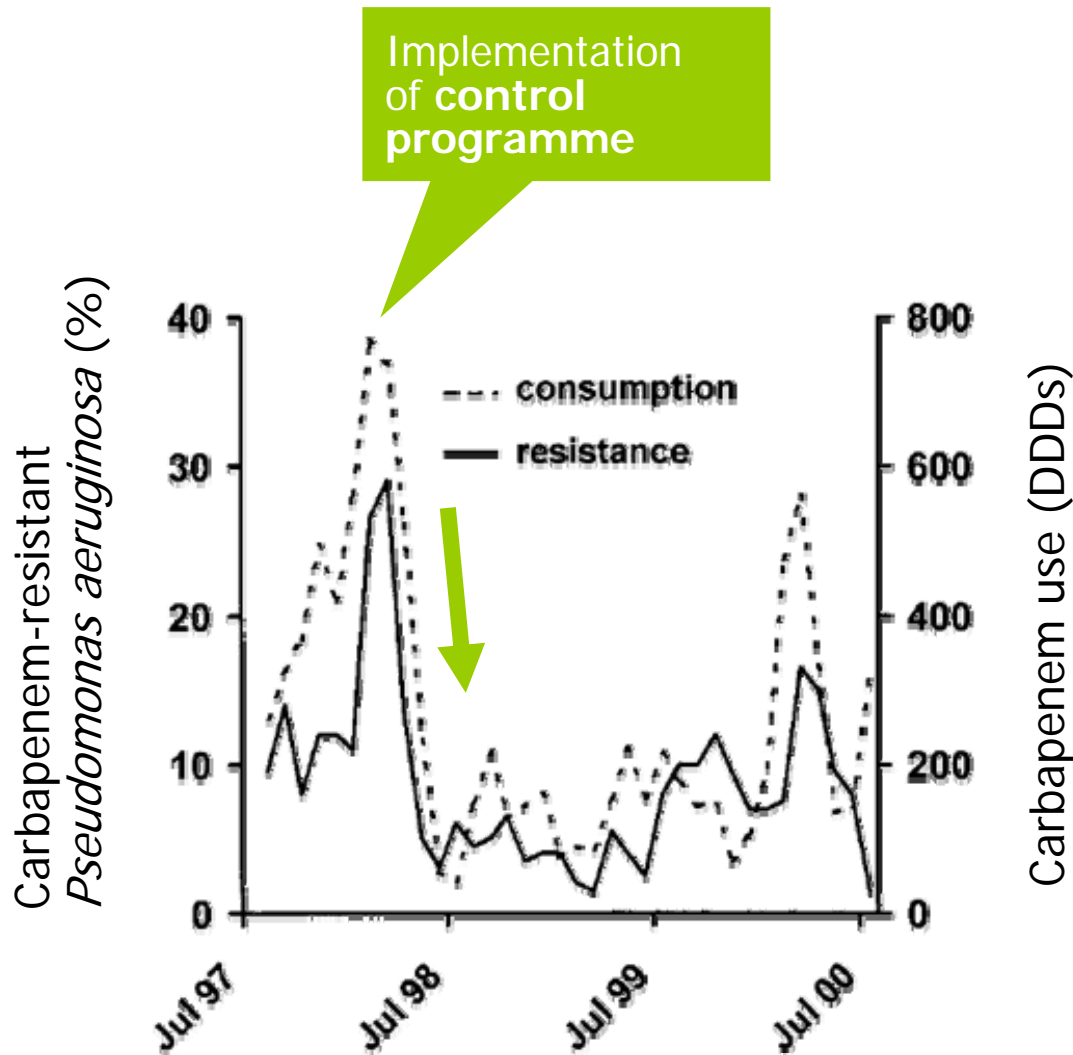
- **60%**
**peri-operative
antibiotic
prophylaxis
courses
> 1 day**



- 1 Dose
- 1 Day
- > 1 Day
- n.a.

- Part of **European point prevalence survey**
on healthcare-associated infections and antibiotic use
(2010 onwards)

Antimicrobial consumption drives antimicrobial resistance in hospitals



18 November 2010

EUROPEAN ANTIBIOTIC AWARENESS DAY



A European Health Initiative 

2010: Focus on hospital prescribers



- Also hospital drug committees, antibiotic committees, hospital management, hospital pharmacists
- Specific key messages, slogans and visuals
- Focus on appropriate antibiotic use
- Support country activities
- European event in Brussels
- Will match the U.S. Get Smart week

EUROPEAN ANTIBIOTIC AWARENESS DAY



A European Health Initiative

Font:

English



- Home
- About the day
- Toolkits
- Media
- Country activities
- Contact

- General public
- Primary care prescribers
- Hospital prescribers

European Antibiotic Awareness Day is marked on 18 November 2010 to promote prudent antibiotics use in hospitals.

What is the problem?
Antibiotic resistance is now an everyday problem in all hospitals across Europe.

What is driving this problem?
Inappropriate prescribing of antibiotics in hospitals is driving development of resistance.

How can the problem be addressed?
Make targeted antibiotic prescribing a strategic priority in hospitals.

COUNTRY ACTIVITIES



View national web pages and campaign materials

VIDEO



Discover all the videos



General public

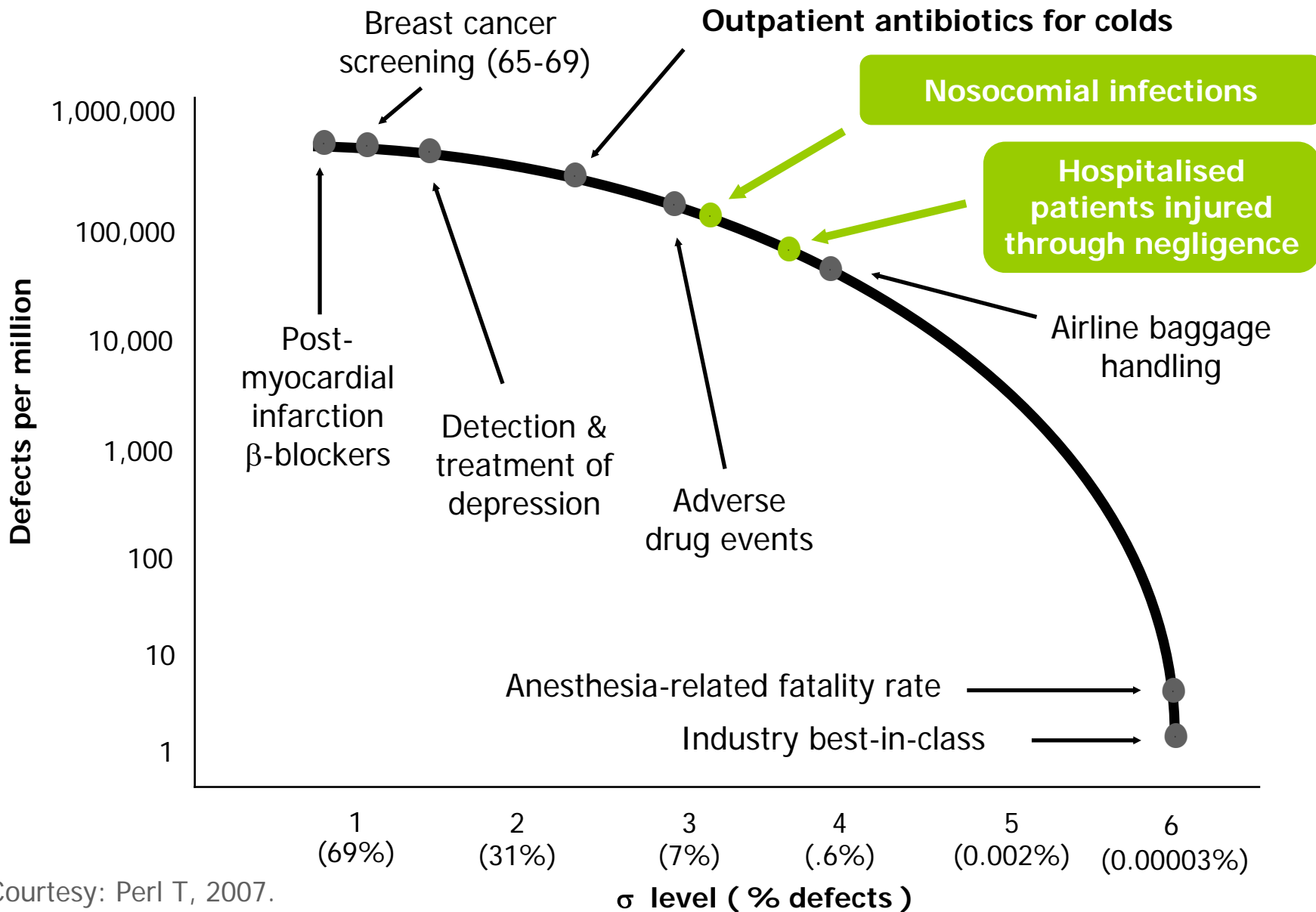


Primary care prescribers



Hospital prescribers

Six sigma quality comparisons defect rates



Courtesy: Perl T, 2007.

18 November 2008

EUROPEAN ANTIBIOTIC AWARENESS DAY



A European Health Initiative



Thank you!

