



# ECDC initiatives on surveillance, prevention and control of antimicrobial resistance

Dominique L. Monnet, on behalf of ECDC Antimicrobial Resistance and Healthcare-Associated Infections (ARHAI) Programme

Madrid, 10 November 2015

# Antimicrobial resistance (AMR): what does it mean?

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

Many different genes and mechanisms of resistance

Spread of clones...

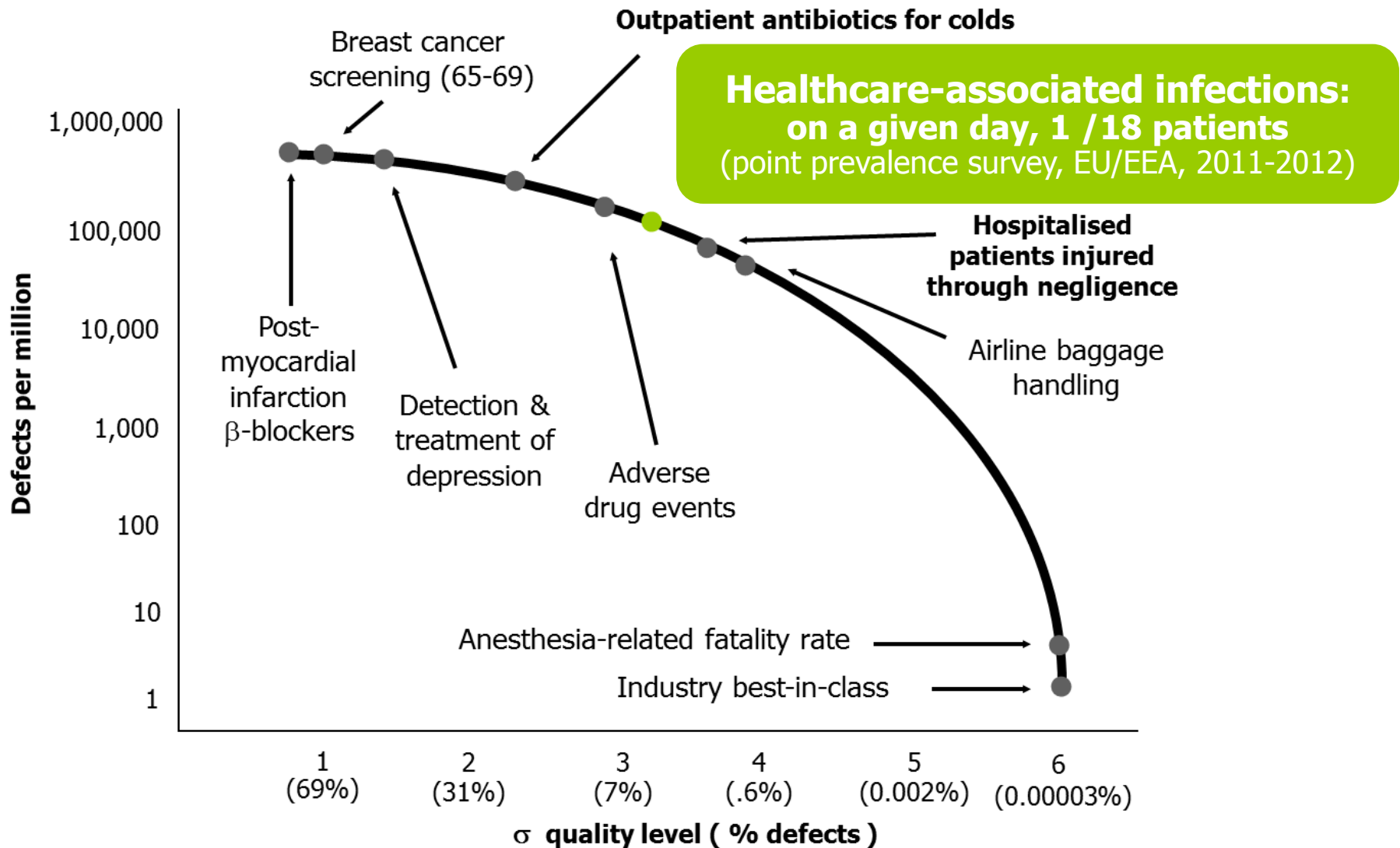
... and of resistance genes between bacteria...

# Patients with infections due to antimicrobial-resistant bacteria



Source: **ECDC** [https://storify.com/EAAD\\_EU/patient-stories](https://storify.com/EAAD_EU/patient-stories), "Antibiotic – Kill or Cure?" ([http://www.electricsky.com/catalogue\\_detail.aspx?program=17](http://www.electricsky.com/catalogue_detail.aspx?program=17)), ABC – Four Corners "Rise of the Superbugs" (<http://www.abc.net.au/4corners/stories/2012/10/29/3618608.htm>), IDSA ([http://www.idsociety.org/Addie\\_Rerecich/](http://www.idsociety.org/Addie_Rerecich/)).

# ECDC PPS in European acute care hospitals, 2011-2012: comparing with other risks



# ECDC – European Centre for Disease Prevention and Control



- An agency of the European Union, located in Stockholm, Sweden
- Founded in 2005; nearly 300 employees in 2015
- Mandate to 'identify, assess and communicate current and emerging threats to human health from communicable diseases'
- European Union (EU) (28) and European Economic Area (EEA) (3) = 31 countries with a total of more than 500 million people



# European Centre for Disease Prevention and Control

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## Antimicrobial Resistance and Healthcare-associated Infections

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## Emerging and Vector-borne Diseases

## Food- and Waterborne Diseases and Zoonoses

## Influenza

## HIV, Sexually Transmitted Infections and viral Hepatitis

## Tuberculosis

## Vaccine-preventable

## Antimicrobial Resistance and Healthcare-associated Infections Programme

The programme on Antimicrobial Resistance and Healthcare-Associated Infections (ARHAI) covers two major public health issues:

- **Antimicrobial Resistance (AMR)**, i.e. the ability of microorganisms to become resistant to one or several antimicrobial agents used for therapy or prophylaxis;
- **Healthcare-Associated Infections (HAI)**, i.e. all infections associated with patient care, in particular hospitals and long-term care facilities.



The ARHAI programme focuses on 4 areas of public health: surveillance, response and scientific advice, training and communication to address the threat of antimicrobial resistance and healthcare-associated infections.

[Read more about the programme](#)

### IN FOCUS

#### ECDC, EFSA and EMA publish the first integrated analysis of antimicrobial consumption and resistance data from humans and animals

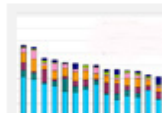


For the first time, the consumption of antimicrobial agents and occurrence of antimicrobial resistance in bacteria from humans and food-producing animals in Europe were analysed in an integrated manner by three EU agencies: the European Centre for Disease Prevention and Control (ECDC), the European Food Safety Authority (EFSA) and the European Medicines Agency (EMA).

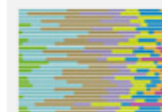
### INTERACTIVE DATABASES



[Antimicrobial resistance interactive database \(EARS-Net\)](#)



[Antimicrobial consumption interactive database \(ESAC-Net\)](#)



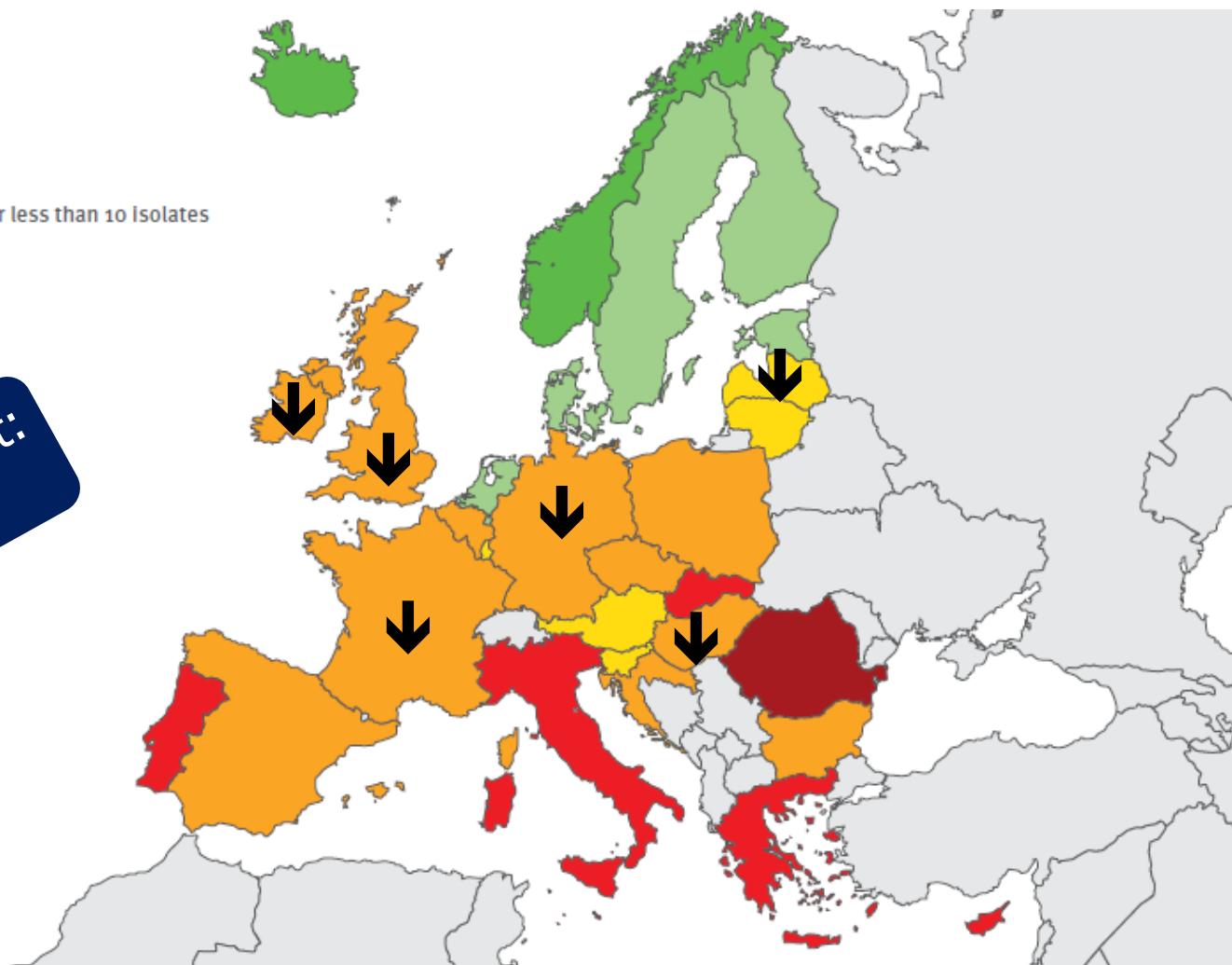
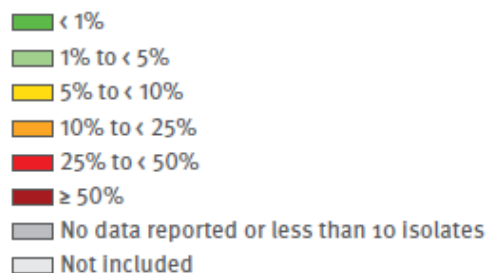
[Point prevalence survey interactive database \(HAI-Net PPS\)](#)

### GUIDANCE



[Directory of online resources: Prevention and control of antimicrobial resistance and healthcare-associated infections](#)

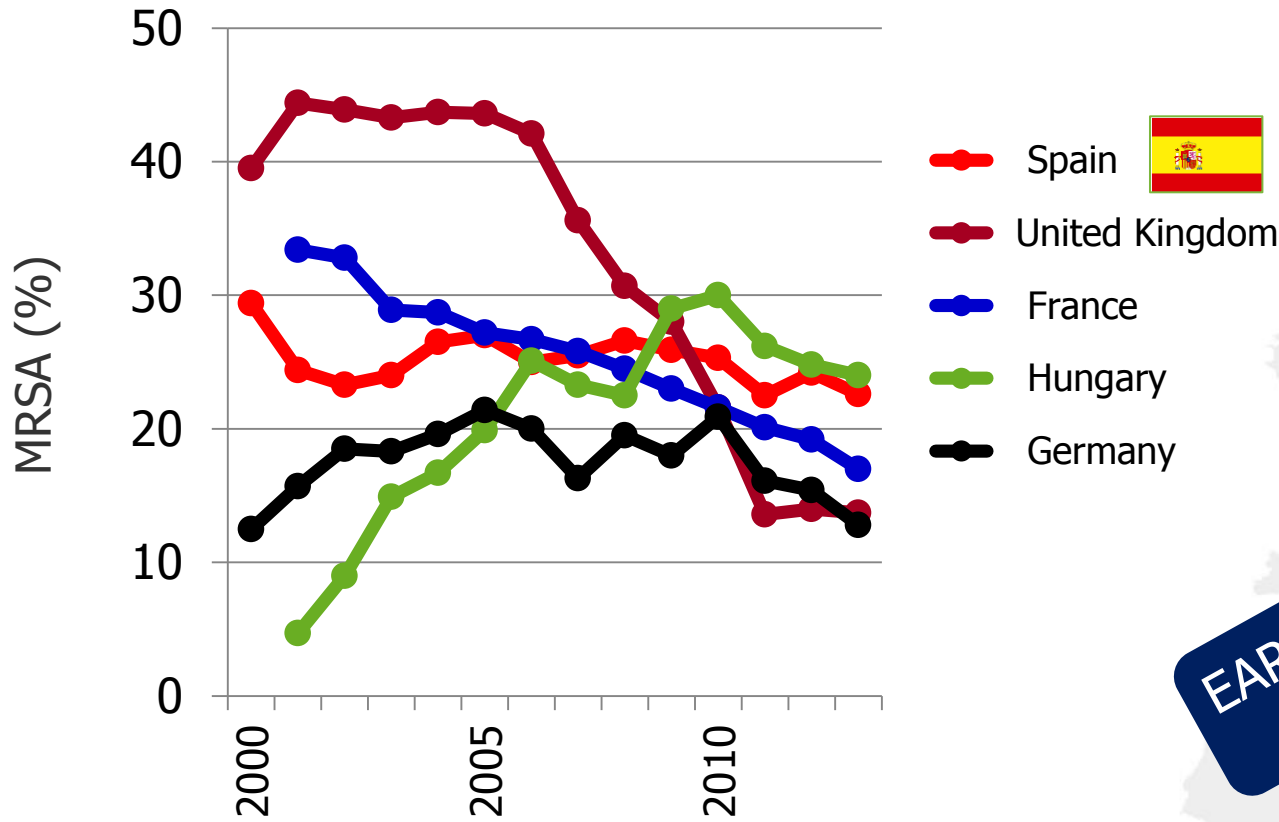
# *Staphylococcus aureus*: percentage of invasive isolates resistant to meticillin (MRSA); EU/EEA, 2013



**EARS-Net 2014 report:  
16 Nov. 2015**

Non-visible countries  
 ↓  
 ■ Liechtenstein  
 ■ Luxembourg  
 ■ Malta

# *Staphylococcus aureus*: percentage of invasive isolates resistant to meticillin (MRSA), selected EU/EEA countries, 2000-2013

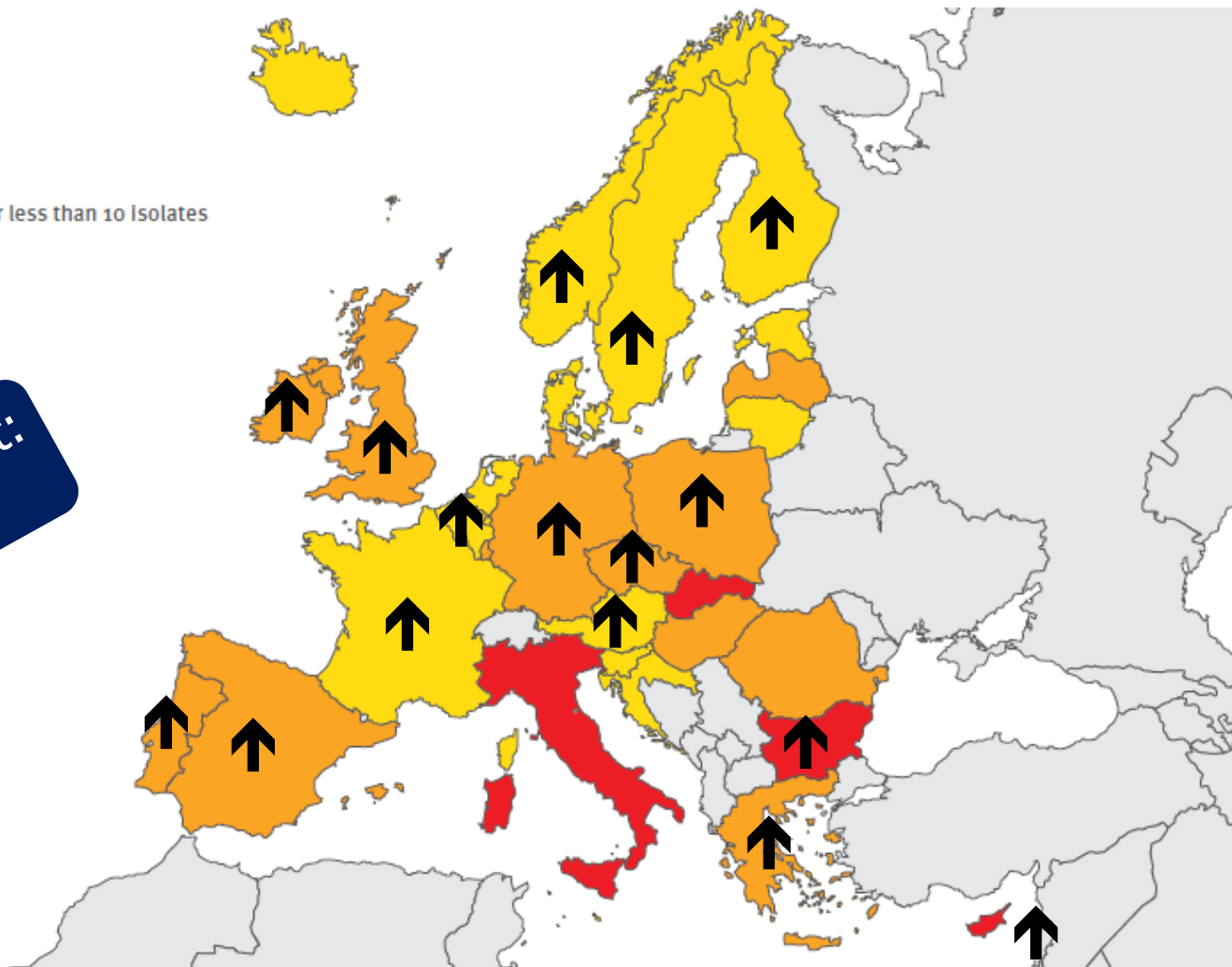
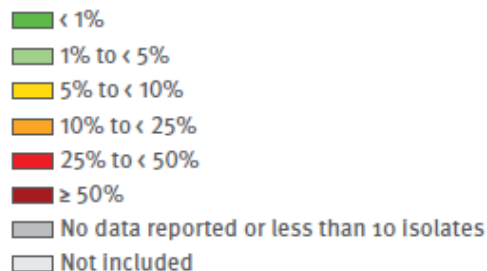


**EARS-Net 2014 report:  
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# *Escherichia coli*: percentage of invasive isolates resistant to third-generation cephalosporins; EU/EEA, 2013



**EARS-Net 2014 report:  
16 Nov. 2015**

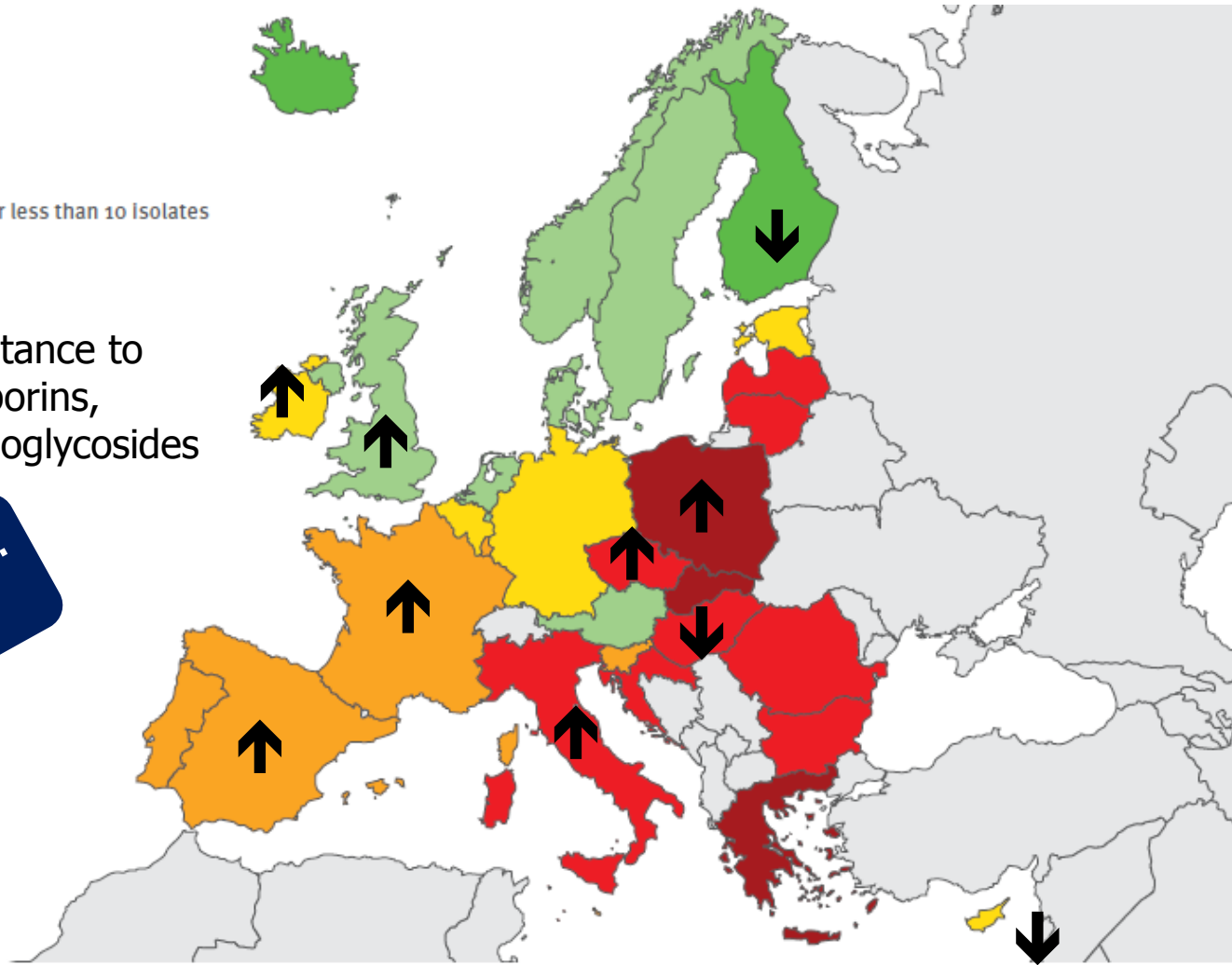
# *Klebsiella pneumoniae*: percentage of invasive isolates with combined resistance\*; EU/EEA, 2013



\*Combined resistance: resistance to third-generation cephalosporins, fluoroquinolones and aminoglycosides

**EARS-Net 2014 report:  
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Non-visible countries  
■ Liechtenstein  
■ Luxembourg  
■ Malta



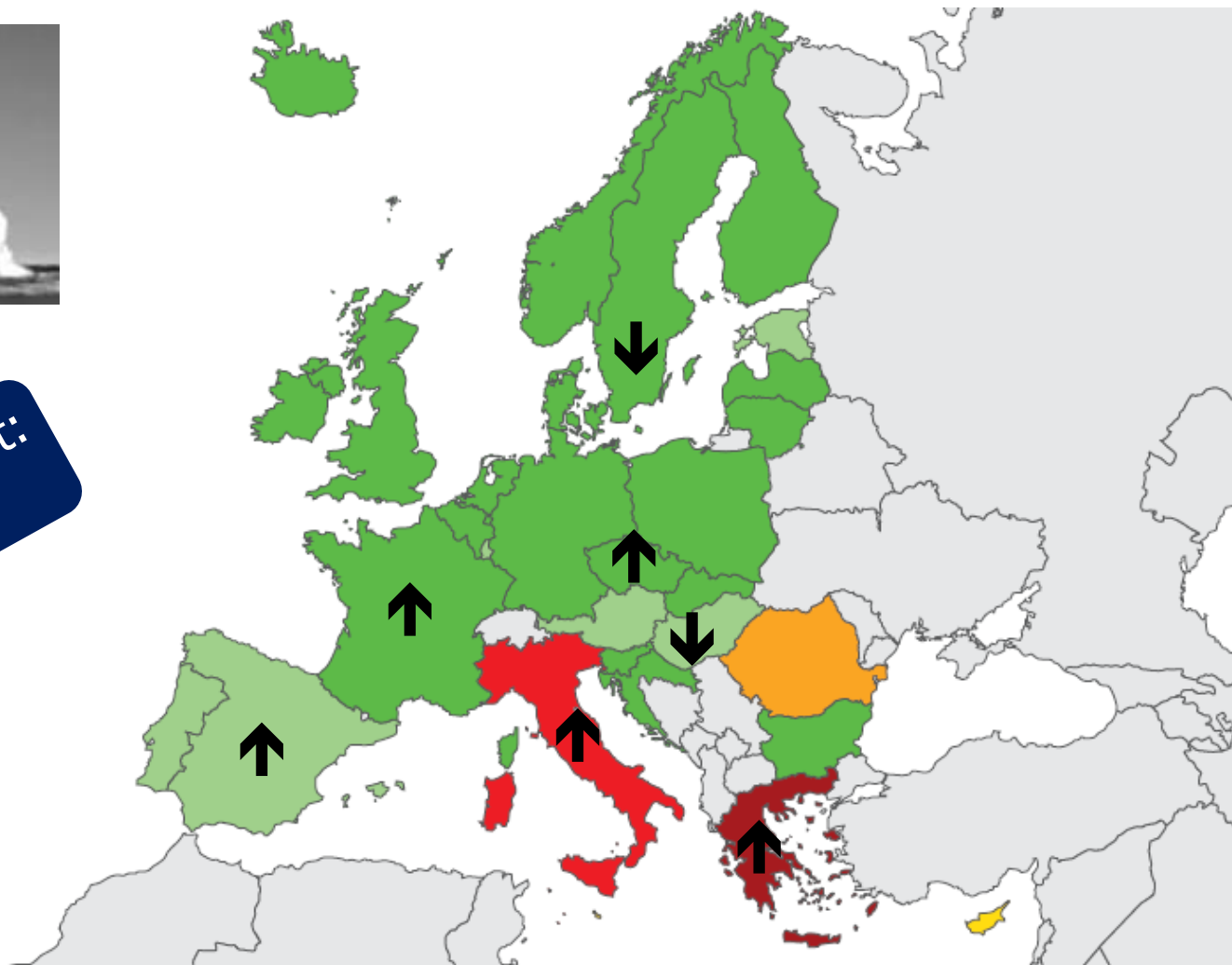
# *Klebsiella pneumoniae*: percentage of invasive isolates resistant to carbapenems; EU/EEA, 2013



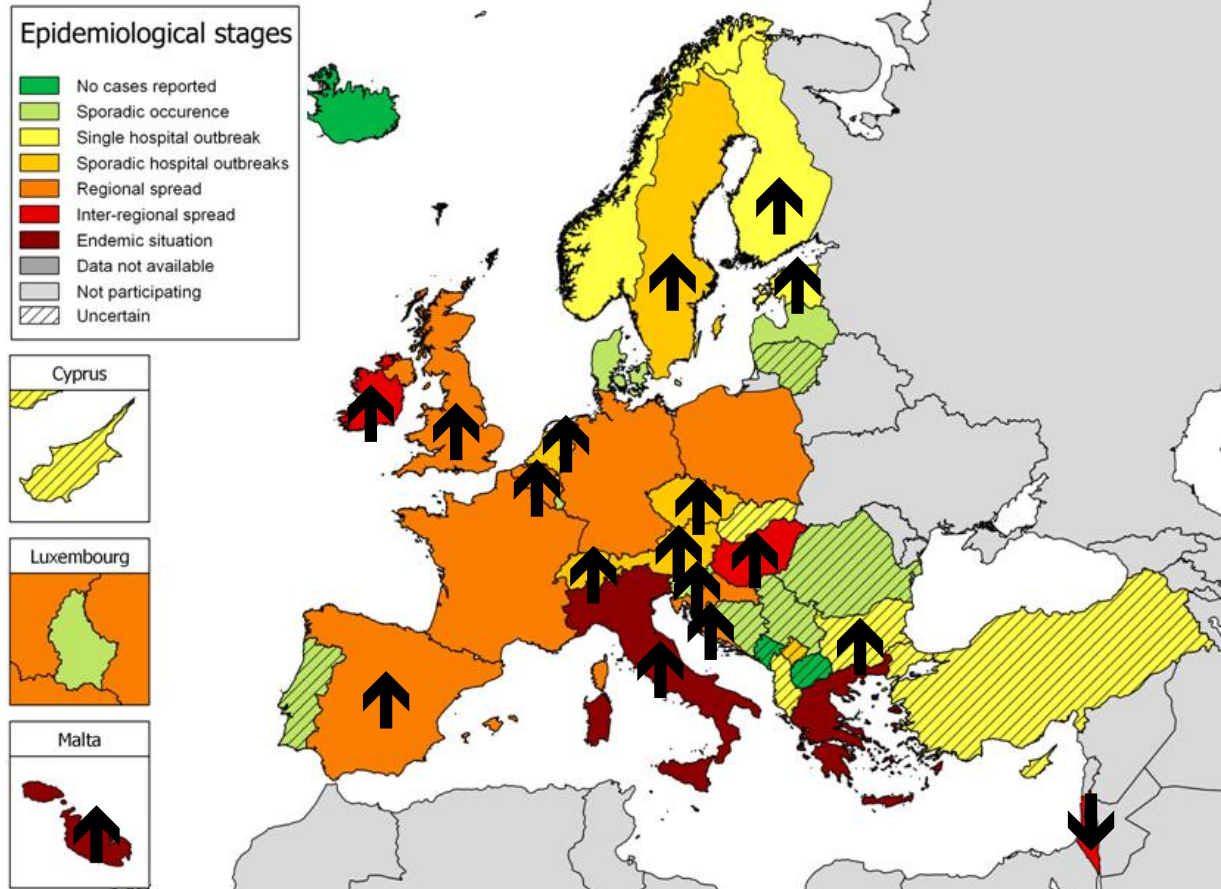
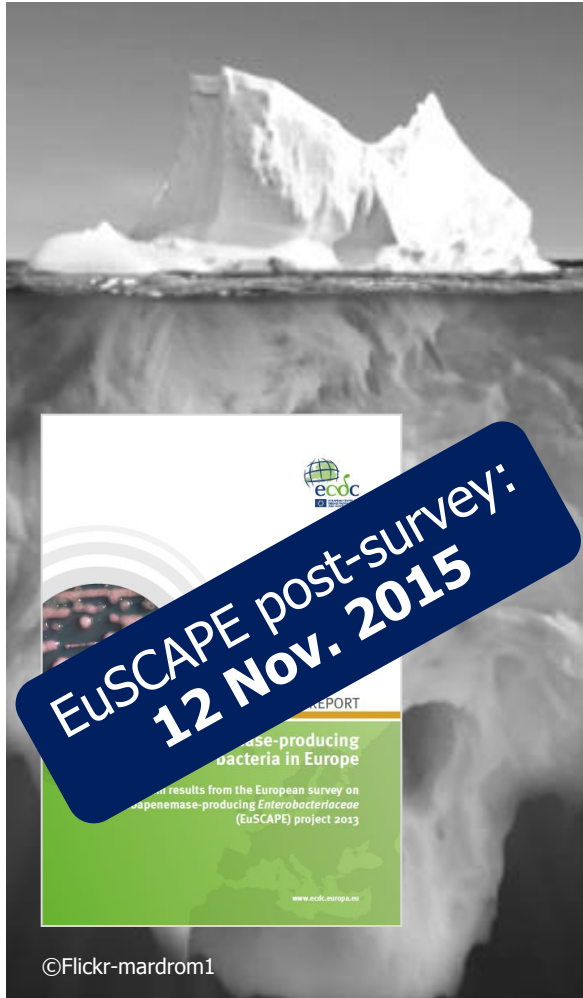
EARS-Net 2014 report:  
16 Nov. 2015

Non-visible countries

- Liechtenstein
- Luxembourg
- Malta



# Country self-assessment of stages for spread of carbapenemase-producing *Enterobacteriaceae* (all isolates), 2010 and 2013



# ECDC risk assessment on the spread of carbapenemase-producing *Enterobacteriaceae*: risk factors for patient infection or colonisation



- **Prior use of antimicrobials**

- Any antimicrobial
- **Carbapenems** (associated with a high risk estimate)
- Other antimicrobials (fluoroquinolones, cephalosporins, anti-pseudomonal penicillins, metronidazole)

- **Cross-border transfer of patients**

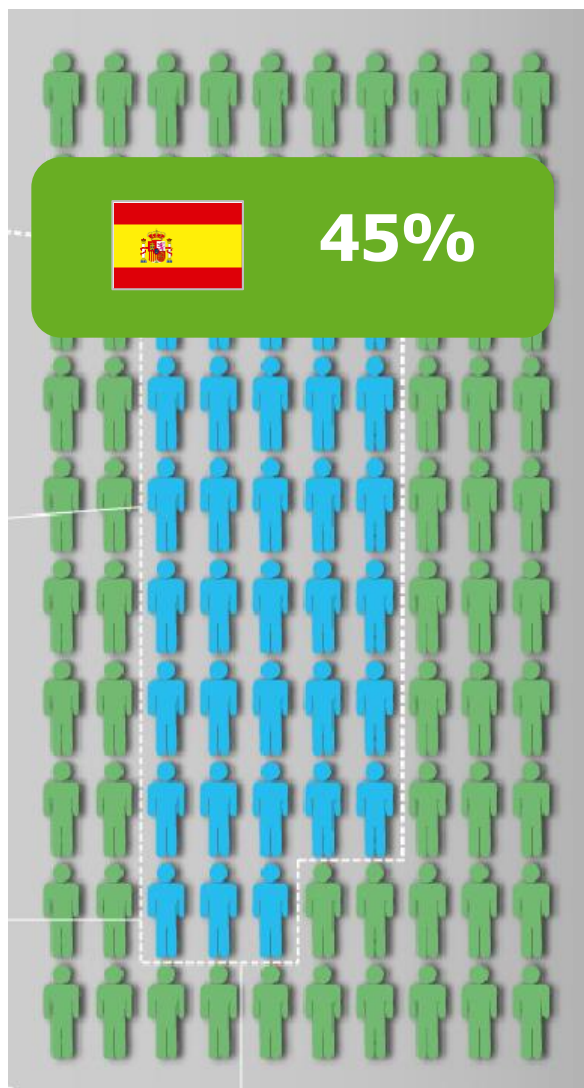
Strong evidence that it is associated with risk for transmission when:

- Patients are transferred from countries with high rates of CPE to healthcare facilities in other countries
- Patients had received medical care abroad in areas with high rates of CPE

- **Transfer of patients within units of same hospital**

- Immunosuppression, severity of illness, invasive procedures

# Antimicrobial use in EU/EEA hospitals






## Prevalence of antimicrobial use in acute care hospitals (ECDC PPS)

On any given day in EU/EEA hospitals 33% patients [range: 21-55%]

## Antibiotic consumption in the hospital sector

(DDD per 1,000 inhabitants per day, ESAC-Net)

Antimicrobial group (ATC code)	Trends in antimicrobial consumption, 2009–2013	Average annual change 2009–2013	Statistical significance
<b>Total, antibiotics (J01)</b>		-0.02	n. s.
<b>Carbapenems (J01DH)</b>		0.003	significant
<b>Polymyxins (J01XB)</b>		0.002	significant

# ***Klebsiella pneumoniae*: % of invasive isolates with resistance to all antibiotic groups under surveillance\*, EU/EEA, 2013**

\*Third-generation cephalosporins, fluoroquinolones, aminoglycosides, carbapenems **and colistin**).

Only among isolates that were tested for susceptibility to all these antibiotic groups were included.

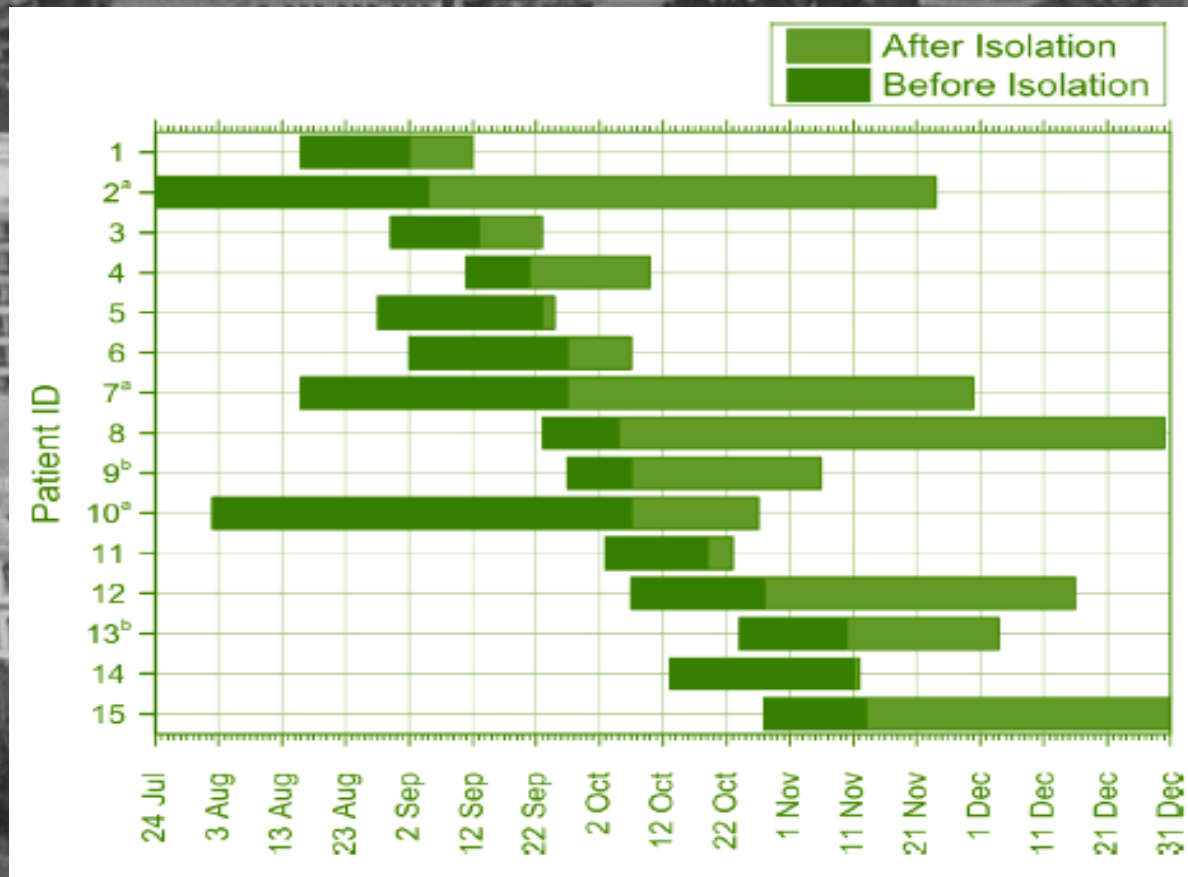
**EARS-Net 2014 report:  
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- < 1%
- 1 to < 5%
- 5 to < 10%
- 10 to < 25%
- No data reported

(i.e., less than 10 reported isolates were tested for susceptibility to all these antibiotic groups)



# Outbreak of pandrug-resistant VIM-1 *Providencia stuartii*, Sept.-Nov. 2011





# Modern medicine: not possible without effective antibiotics

Hip / knee replacement

Organ transplant

Cancer chemotherapy

Intensive care

Care of preterm babies

# Main actions to prevent and control antimicrobial resistance (AMR)



**New antimicrobial agents**  
(with a novel mechanism of action,  
research, development)



**Infection prevention and control**  
(hand hygiene, screening, isolation)



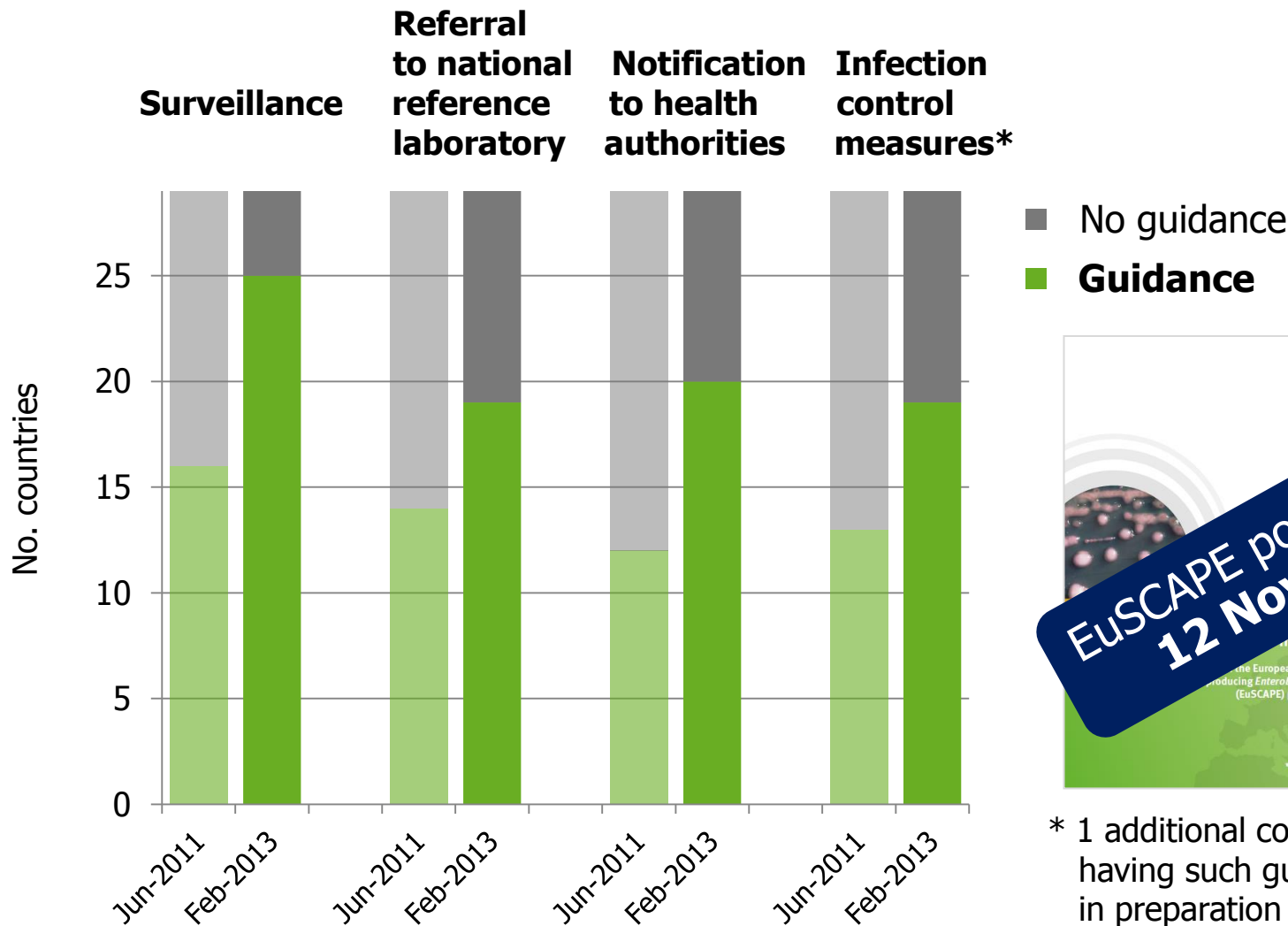
**Prudent use of antimicrobial agents**  
(only when needed, correct dose,  
correct dose intervals, correct duration)

# Hospitals



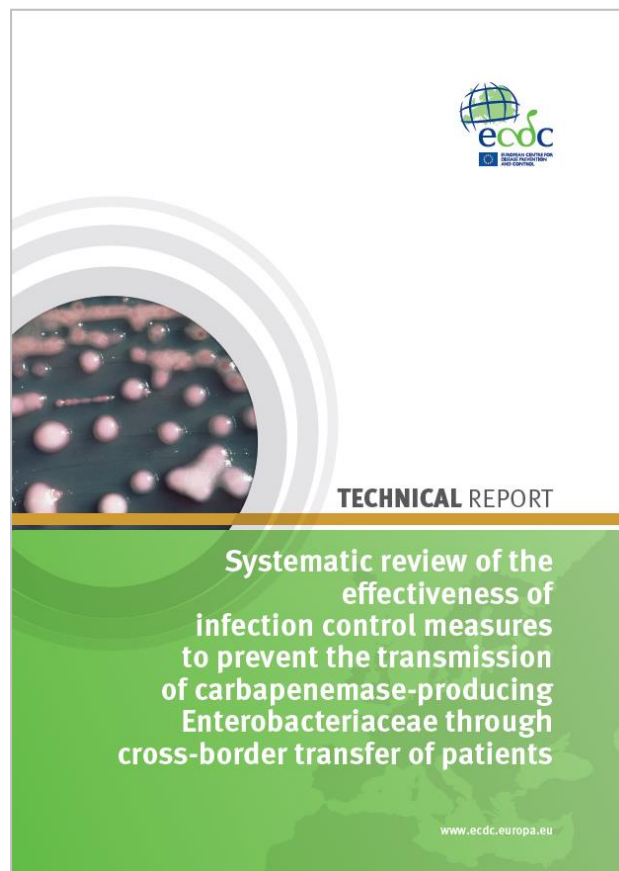
Photo: Luis García

# Availability of national guidance documents on CPE, 2011 & 2013



\* 1 additional country reported having such guidance in preparation in 2013.

# Infection control measures to prevent the spread of carbapenemase-producing *Enterobacteriaceae* (CPE) through cross-border transfer of patients



Scientific evidence for the effectiveness of:

- Hand hygiene, patient isolation, patient cohorting, nursing (or staff) cohorting (similar to dedicated nursing), environmental cleaning, staff education, case notification/flagging, contact tracing and antibiotic restriction
- Early implementation of active surveillance by rectal screening for CPE carriage upon admission to hospital, or specific wards/units, or during outbreaks
- Pre-emptive isolation on admission, dedicated nursing or other types of dedicated care by staff members, contact precautions (gloves and gowns)

Healthcare-associated  
infections

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HAI-Net Annual Reports

Point prevalence survey

PPS interactive database

Directory: Guidance on  
prevention and controlMRSA: Guidance on  
infection prevention and  
controlCDI: Guidance on infection  
prevention and controlCRE: Guidance on infection  
prevention and control

## CRE: Guidance on infection prevention and control

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Directory of guidance on prevention and control of Carbapenem-resistant *Enterobacteriaceae*, published by ECDC, EU/EEA Member States, international and national agencies and professional societies

## AGENCIES

## EUROPEAN CENTRE FOR DISEASE PREVENTION AND CONTROL (ECDC)

- Systematic review of the effectiveness of infection control measures to prevent the transmission of carbapenemase-producing *Enterobacteriaceae* through cross-border transfer of patients (2014)
- Risk assessment on the spread of carbapenemase-producing *Enterobacteriaceae* (CPE) through patient transfer between healthcare facilities, with special emphasis on cross-border transfer (2011)

## US CENTERS FOR DISEASE CONTROL AND PREVENTION (CDC)

- CDC 2012 CRE Toolkit - Guidance for Control of Carbapenem-resistant *Enterobacteriaceae* (CRE)

## US AGENCY FOR HEALTHCARE RESEARCH AND QUALITY (AHRQ)

- Carbapenem-resistant *Enterobacteriaceae* (CRE) Control and Prevention Toolkit



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## PROFESSIONAL SOCIETIES

## EUROPEAN SOCIETY OF CLINICAL MICROBIOLOGY AND INFECTIOUS DISEASES (ESCMID)

Suggestions for infection and control of carbapenemase-producing *Enterobacteriaceae* are part of the guidelines on multidrug-resistant Gram-negative bacteria (ESCMID, 2013)

- ESCMID guidelines for the management of the infection control measures to reduce transmission of multidrug-resistant Gram-negative bacteria in hospitalized patients

## MEMBER STATES

## AUSTRIA

Control of carbapenemase-producing *Enterobacteriaceae* in Austria (Ministry of Health, 2011)

- CPE – Carbapenemase produzierende Enterobakterien in Österreich - Carbapenemasen Kontrollieren

## CZECH REPUBLIC

Control of imported cases of colonisation and/or infection by carbapenemase-producing *Enterobacteriaceae* (Ministry of Health, 2012)

- Kontrola výskytu importovaných případů kolonizace a/nebo infekce enterobakteriemi produkujícími karbapenemázu (CPE – Carbapenemase Producing *Enterobacteriaceae*)

## FINLAND

Guidance for the handling of infections by multiresistant bacteria. This document includes guidance for infection prevention and control of carbapenem resistant *Enterobacteriaceae* (Terveyden ja hyvinvoinnin laitos – THL, 2014)

- Ohje moniresistenttien mikrobien tartunnantorjunnasta.

## FRANCE

Prevention of cross-transmission of emerging highly resistant bacteria. This document includes guidance targeting carbapenemase-producing *Enterobacteriaceae* (Haute Conseil de la Santé Publique, 2013)

- Prévention de la transmission croisée des 'Bactéries Hautement Résistantes aux antibiotiques émergentes' (BHRé)

## GERMANY

Infection control measures for infections or colonisation by multidrug-resistant Gram-negative bacteria. This document applies to carbapenem-resistant *Enterobacteriaceae* (Robert Koch Institute, Commission for Hospital Hygiene and Infection Prevention, 2012)

- Hygienemaßnahmen bei Infektionen oder Besiedlung mit multiresistenten gramnegativen Stäbchen

## GREECE

Action plan for the management of infections by multidrug-resistant Gram-negative pathogens in healthcare settings 'Prokroustis' Guidance on infection prevention and control of carbapenem-resistant *Enterobacteriaceae* is a part of the national action plan. (Hellenic Centre for Disease Control and Prevention, 2010)

- Σχέδιο δράσης για την αντιμετώπιση λοιμώξεων από πολυανθεκτικά Gram-αρνητικά παθογόνα σε χώρους παροχής υπηρεσιών υγείας 'Προκρούστης'

## HUNGARY

Guidance of National Center for Epidemiology on identification and prevention of spread of carbapenemase-producing *Enterobacteriaceae* in healthcare facilities (National Center for Epidemiology, 2011)

- Az Országos Epidemiológiai Központ ajánlása a karbapenemáz-termelő enterobacteriaceae törzsek azonosítására és terjedésük megelőzésére az egészségügyi intézményekben

## IRELAND

Guidance for detection and infection prevention and control of carbapenem-resistant *Enterobacteriaceae* is part of the guidelines on multidrug-resistant organisms (Royal College of Physicians / HSE Quality and Safety, 2012)

- Guidelines for the Prevention and Control of Multi-drug resistant organisms (MDRO) excluding MRSA in the healthcare setting

## ITALY

Surveillance and control of infections caused by carbapenemase producing bacteria (CPE) (Ministry of Health, 2013)

- Sorveglianza, e controllo delle infezioni da batteri produttori di carbapenemasi (CPE)

## NETHERLANDS

Guidelines for multidrug-resistant microorganisms (MDRO). This document includes guidance for infection prevention and control of carbapenem resistant *Enterobacteriaceae*. (Working Party on Infection Prevention, National Institute for Public Health and the Environment, 2011; updated 2013)

- WIP-richtlijn BRMO (Bijzonder Resistente Micro-Organismen)

## NORWAY

Prevention and control of transmission of multidrug-resistant Gram-negative and ESBL-producing bacteria in healthcare facilities. This document applies to carbapenemase-producing *Enterobacteriaceae*. (Norwegian Institute of Public Health, 2009)

- Forebygging og kontroll av spredning av multiresistente gramnegative stavbakterier og ESBL-holdige bakterier i helseinstitusjoner

## POLAND

Recommendations for the control of sporadic cases and outbreaks caused by Gram negative bacteria of the family *Enterobacteriaceae*. This document focuses on carbapenemase-producing *Enterobacteriaceae*. (Ministry of Health, 2012)

- Zalecenia dotyczące postępowania w przypadku zachorowań sporadycznych i ognisk epidemicznych wywołanych przez Gram ujemne pałeczki z rodziny *Enterobacteriaceae*

## SLOVAK REPUBLIC

Guidance for the diagnosis, prevention and control of infections by bacteria with clinically and epidemiologically important resistance mechanisms. This document includes guidance targeting MRSA (Ministry of Health, 2014)

- OU MZ SR pre diagnostiku a protiepidemické opatrenia pri výskyte bakteriálnych pôvodcov infekčných ochorení s klinicky a epidemiologicky významnými mechanizmami rezistencie

## SLOVENIA

Recommendations for the control of ESBL-positive bacteria and carbapenemase-positive bacteria (Ministry of Health - National Commission for the prevention and control of healthcare associated infections, 2010)

- Priporočila za preprečevanje širjenja ESBL pozitivnih bakterij in karbapenemaza pozitivnih bakterij

## SPAIN

Prevention and control against infection with carbapenemase-producing *Enterobacteriaceae* (Autonomous Community of Madrid, 2013)

- Plan de Prevencion y control frente a la infección por enterobacterias productoras de carbapenemasas (EPC) en la Comunidad de Madrid

## SWEDEN

ESBL-producing enterobacteria - Knowledge base with draft notices to limit the spread of *Enterobacteriaceae* with ESBL. This document applies to carbapenemase-producing *Enterobacteriaceae* (Public Health Agency of Sweden, 2013)

- ESBL-producerande tarmbakterier – Kunsakspunderlag med förslag till handläggning för att begränsa spridningen av *Enterobacteriaceae* med ESBL

## UNITED KINGDOM

Expert advice on the management of colonisation or infection due to carbapenemase-producing *Enterobacteriaceae* in England, to prevent or reduce their spread into (and within) health and residential care settings (Public Health England, 2013)

- Acute trust toolkit for the early detection, management and control of carbapenemase-producing *Enterobacteriaceae*

Set of recommendations based on scientific evidence (where available) and consensus of expert opinion to prevent cross-transmission of carbapenemase-producing *Enterobacteriaceae* within acute healthcare settings in Scotland. Supporting materials include, e.g. a prevention and management toolkit for inpatient areas (Health Protection Scotland, 2013)

- Interim guidance: Non-prescribing control measures to prevent cross transmission of Carbapenemase-Producing *Enterobacteriaceae* in acute settings

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- Directory: Guidance on prevention and control**
- [MRSA: Guidance on infection prevention and control](#)
- [CDI: Guidance on infection prevention and control](#)
- [CRE: Guidance on infection prevention and control](#)
- [Guidance on organisation of infection prevention and control](#)
- [Guidance on hand hygiene in healthcare](#)
- [Guidance on healthcare-associated and ventilator-associated pneumonia](#)
- [Antimicrobial resistance strategies and action plans](#)
- WHO "SAVE LIVES: Clean Your Hands": 2015**

## Directory of online resources for prevention and control of antimicrobial resistance (AMR) and healthcare-associated infections (HAI)



The directory lists strategies, action plans and guidance documents on the prevention and control of antimicrobial resistance and healthcare-associated infections, which are available online.

These documents were published by ECDC, EU/EEA Member States, international and national agencies and professional societies to support healthcare professionals, hospital administrators and public health professionals.

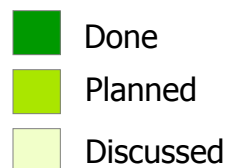
In addition, the directory now also lists ongoing research projects and their corresponding websites.

ECDC welcomes suggestions and further information on existing guidance. Comments can be provided to: [arhai@ecdc.europa.eu](mailto:arhai@ecdc.europa.eu).



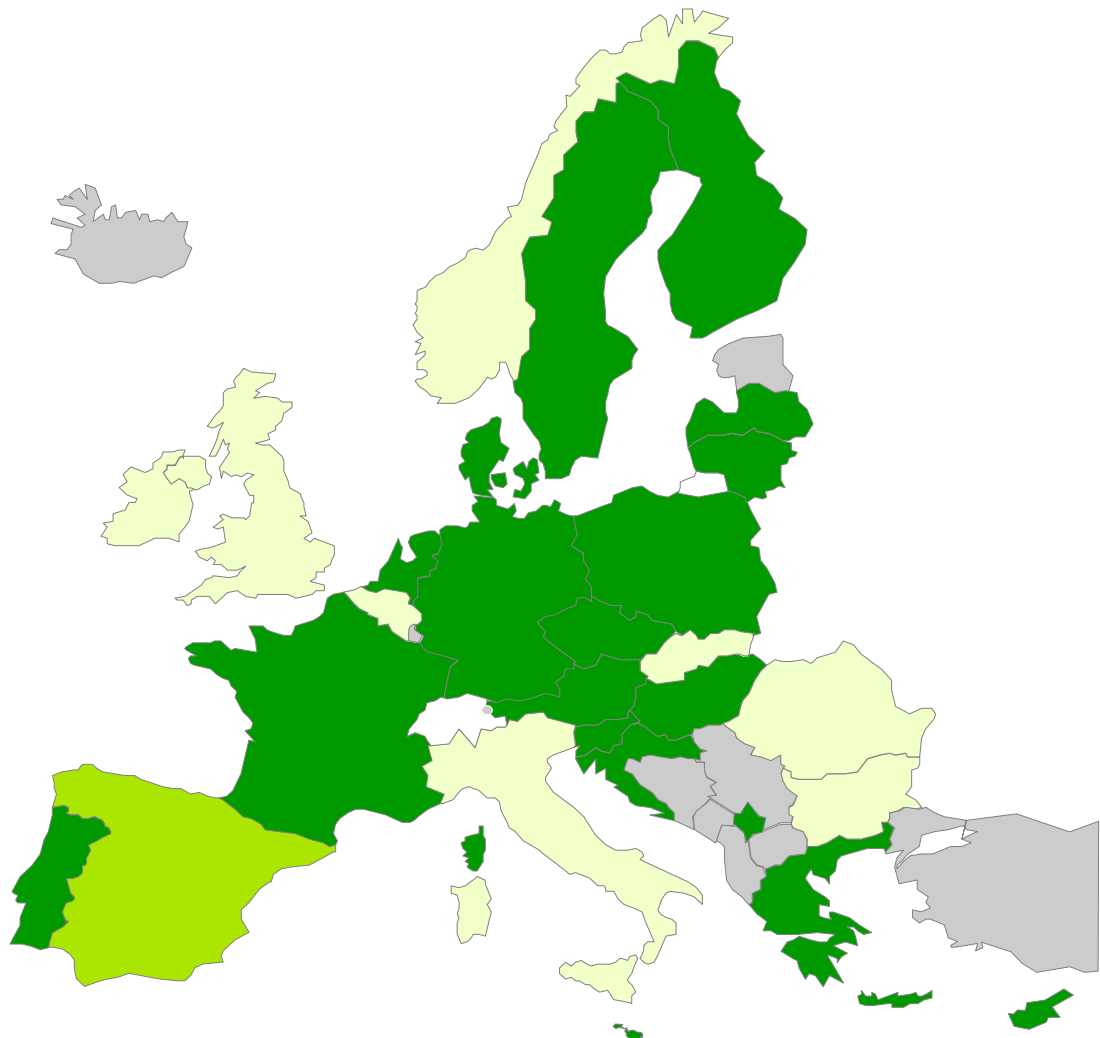
Strategies, action plans and projects on AMR and HAI	Prevention and control of multidrug-resistant organisms and <i>Clostridium difficile</i>	Prevention and control of healthcare-associated infections
 <a href="#">Antimicrobial resistance strategies and action plans</a>	 <a href="#">Carbapenem-resistant Enterobacteriaceae (CRE)</a>	 <a href="#">Organisation of infection prevention and control</a>
	 <a href="#">Meticillin-resistant Staphylococcus aureus (MRSA)</a>	 <a href="#">Hand hygiene in healthcare</a>
	 <a href="#">Clostridium difficile (CDI)</a>	 <a href="#">Healthcare-associated and ventilator-associated pneumonia</a>

# Country visits to discuss antimicrobial resistance (AMR) issues, 2006-2015



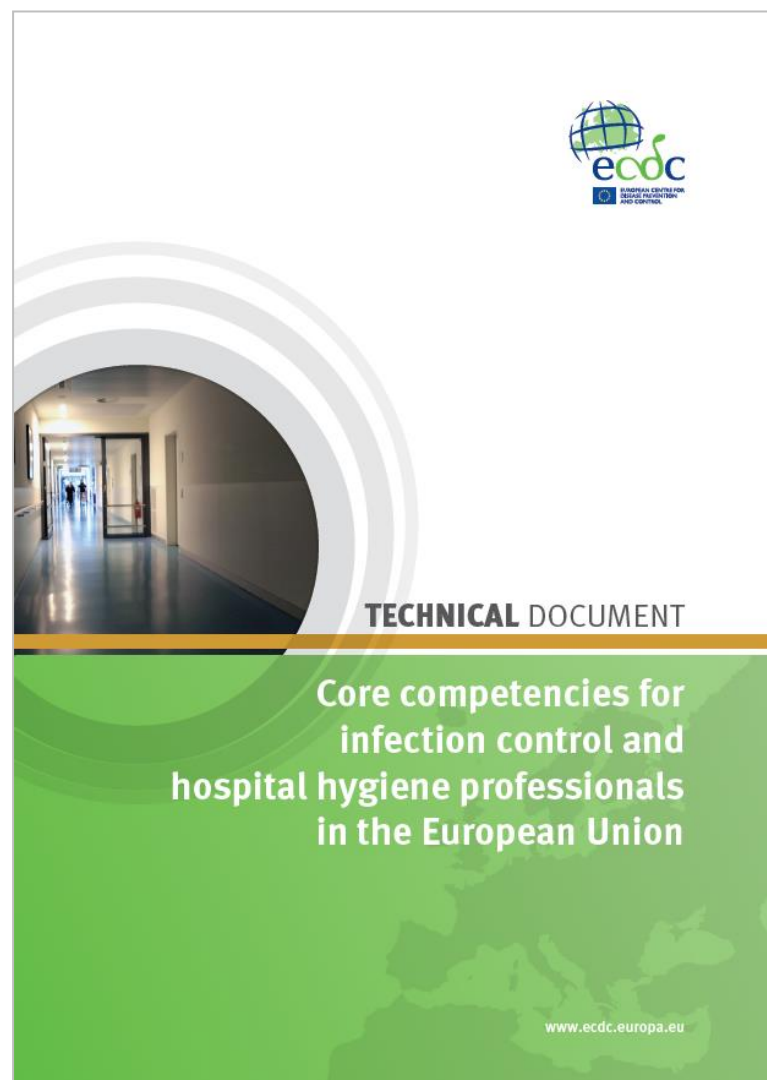
Country visits  
to discuss AMR issues  
(as of November 2015)

- 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)
- 19 initial visits (see map)
- 5 follow-up visits (Czech Rep., Greece x 2 and Hungary x 2)
- **3 additional visits budgeted for 2016**





# Core competencies for infection control and hospital hygiene professionals



- **2 levels**
  - Introductory (junior specialist)
  - Expert (senior specialist)
- **4 areas**
  - Programme management
  - Quality improvement
  - Surveillance of healthcare-associated infections and investigation of outbreaks
  - Infection control activities
- **16 domains**

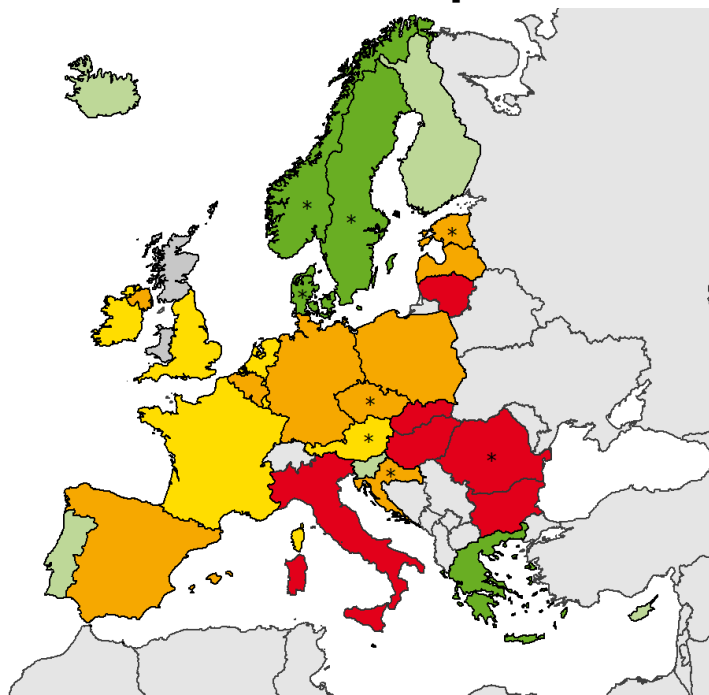
# ECDC PPS in European acute care hospitals, 2011-2012: structure and process indicators

- Alcohol hand rub consumption
- Beds in single rooms
- Infection prevention and control staff (nurses, doctors)

## Alcohol hand rub consumption

Alcohol hand rub consumption (L/1000 patient days)

- <10
- 10-19.9
- 20-29.9
- 30-39.9
- $\geq 40$
- No data
- Not included

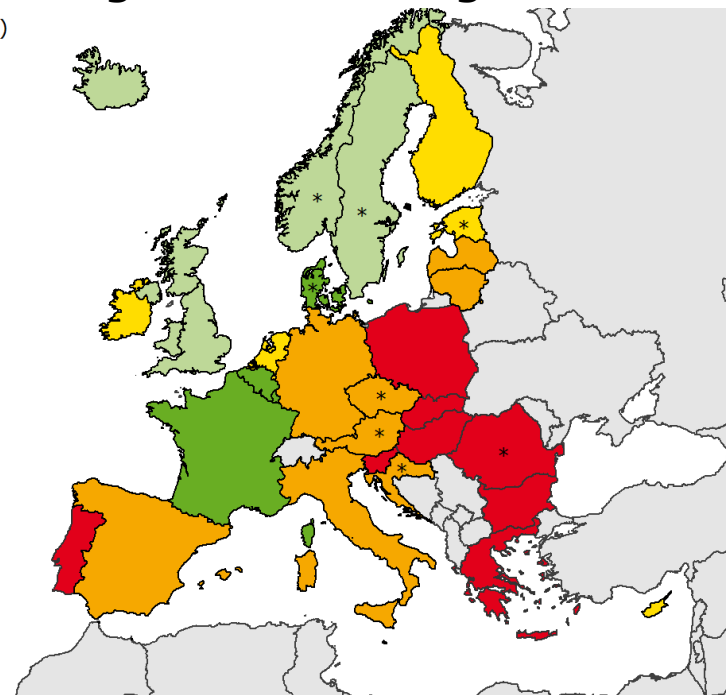


## Percentage of beds in single rooms

Single-room beds (%)

- <5
- 5 to <10
- 10 to <20
- 20 to <30
- $\geq 30$
- Not included

Non-visible countries  
• Liechtenstein  
• Luxembourg  
• Malta



# Hospital-wide indicators of infection prevention and control



## Hospital organisation, management, and structure for prevention of health-care-associated infection: a systematic review and expert consensus



*Walter Zingg, Alison Holmes, Markus Dettenkofer, Tim Goetting, Federica Secci, Lauren Clack, Benedetta Allegranzi, Anna-Pelagia Magiorakos, Didier Pittet, for the systematic review and evidence-based guidance on organization of hospital infection control programmes (SIGHT) study group\**

Despite control efforts, the burden of health-care-associated infections in Europe is high and leads to around 37 000 deaths each year. We did a systematic review to identify crucial elements for the organisation of effective infection-prevention programmes in hospitals and key components for implementation of monitoring. 92 studies published from 1996 to 2012 were assessed and ten key components identified: organisation of infection control at the hospital level; bed occupancy, staffing, workload, and employment of pool or agency nurses; availability of and ease of access to materials and equipment and optimum ergonomics; appropriate use of guidelines; education and training; auditing; surveillance and feedback; multimodal and multidisciplinary prevention programmes that include behavioural change; engagement of champions; and positive organisational culture. These components comprise manageable and widely applicable ways to reduce health-care-associated infections and improve patients' safety.

**Lancet Infect Dis 2014**

Published Online  
November 11, 2014  
[http://dx.doi.org/10.1016/S1473-3099\(14\)70854-0](http://dx.doi.org/10.1016/S1473-3099(14)70854-0)

\*Further contributors are listed in the Acknowledgments section

Infection Control Programme,  
University of Geneva Hospitals  
and Faculty of Medicine,  
Geneva, Switzerland

- Systematic review & expert opinion  
=> 10 key components and proposed indicators

# Indicators for hospital antimicrobial stewardship programmes



- **3 domains:**
  - infrastructure
  - policy and practice
  - monitoring and feedback

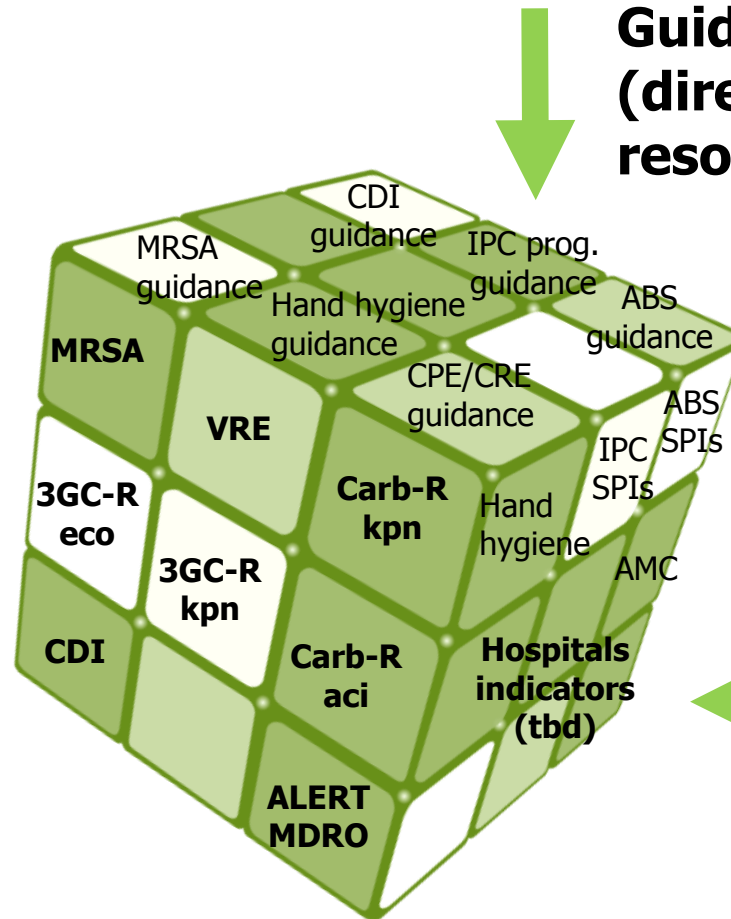
- **17 “core” indicators** essential to fully characterise all aspects of antimicrobial stewardship programmes

- **16 “supplemental” indicators**

CORE Indicators for hospital antimicrobial stewardship programs		
Infrastructure	1.	Does your facility have a formal <b>antimicrobial stewardship programme</b> accountable for ensuring appropriate antimicrobial use?
	2.	Does your facility have a <b>formal organizational structure</b> responsible for antimicrobial stewardship (e.g., a multidisciplinary committee focused on appropriate antimicrobial use, pharmacy committee, patient safety committee or other relevant structure)?
	3.	Is an antimicrobial stewardship <b>team</b> available at your facility (e.g., greater than one staff member supporting clinical decisions to ensure appropriate antimicrobial use)?
	4.	Is there a physician identified as a <b>leader</b> for antimicrobial stewardship activities at your facility?
	5.	Is there a <b>pharmacist</b> responsible for ensuring appropriate antimicrobial use at your facility?
	6.	Does your facility provide any <b>salary support</b> for dedicated time for antimicrobial stewardship activities (e.g., percentage of full-time equivalent (FTE) for ensuring appropriate antimicrobial use)?
	7.	Does your facility have the <b>IT capability</b> to support the needs of the antimicrobial stewardship activities?
Policy and Practice	8.	Does your facility have <b>facility-specific treatment recommendations</b> based on local antimicrobial susceptibility to assist with antimicrobial selection for common clinical conditions?
	9.	Does your facility have a written policy that requires prescribers to <b>document an indication</b> in the medical record or during order entry for all antimicrobial prescriptions?
	10.	Is it routine practice for specified antimicrobial agents to be approved by a physician or pharmacist in your facility (e.g., <b>pre-authorization</b> )?
	11.	Is there a formal procedure for a physician, pharmacist, or other staff member to review the appropriateness of an antimicrobial at or after 48 hours from the initial order ( <b>post-prescription review</b> )?
Monitoring and Feedback	12.	Has your facility produced a <b>cumulative antimicrobial susceptibility report</b> in the past year?
	13.	Does your facility <b>monitor if the indication</b> is captured in the medical record for all antimicrobial prescriptions?
	14.	Does your facility audit or <b>review surgical antimicrobial prophylaxis</b> choice and duration?
	15.	Are results of antimicrobial audits or reviews <b>communicated directly</b> with prescribers?
	16.	Does your facility <b>monitor antimicrobial use</b> by grams [Defined Daily Dose (DDD)] or counts [Days of Therapy (DOT)] of antimicrobial(s) by patients per days?
	17.	Has an <b>annual report</b> focused on antimicrobial stewardship (summary antimicrobial use and/or practices improvement initiatives) been produced for your facility in the past year?

# 2<sup>nd</sup> ECDC point prevalence survey (PPS), 2016-2017 – an integrated approach for surveillance, prevention and control of HAI and AMR in European acute care hospitals

**Outcome indicators (HAI, selected MDROs)**



**Guidance (directory of online resources)**



**Structure and process indicators (incl. antimicrobial consumption)**



# Outpatients

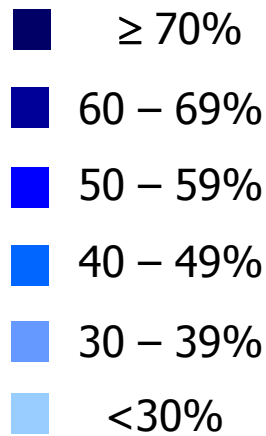


# Eurobarometer opinion poll, May-June 2013

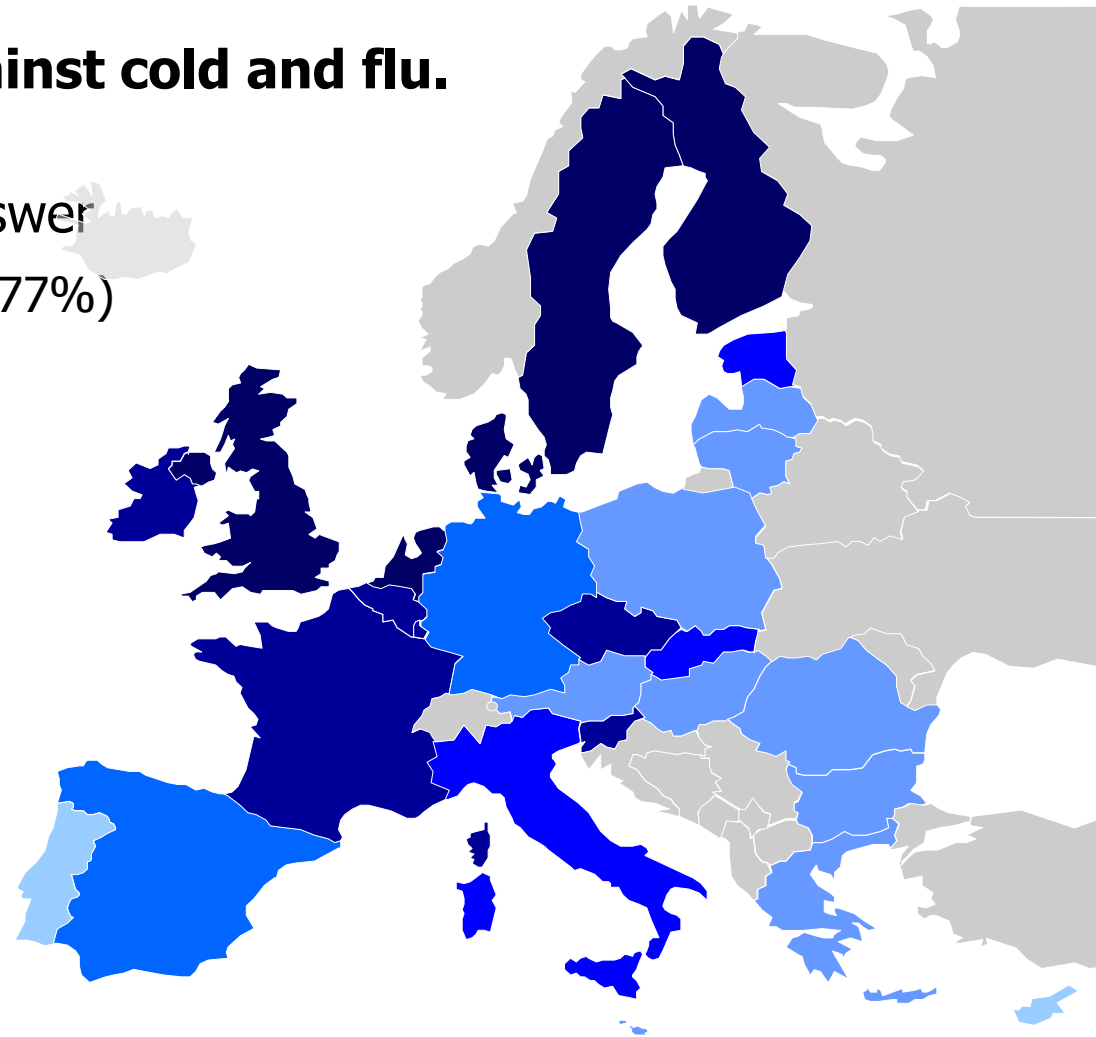


## Antibiotics are effective against cold and flu. True or false?

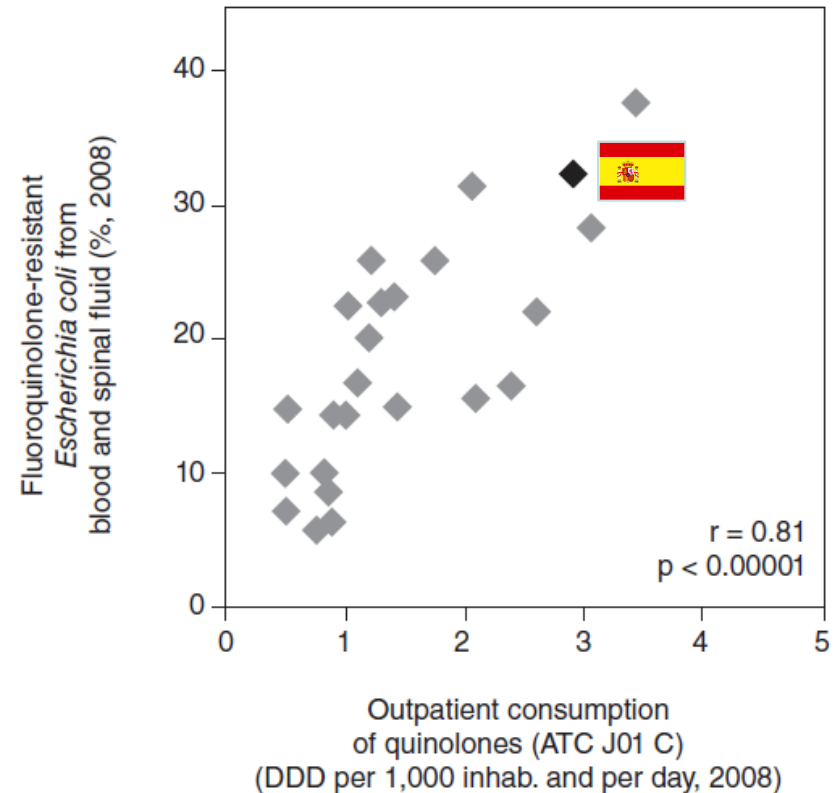
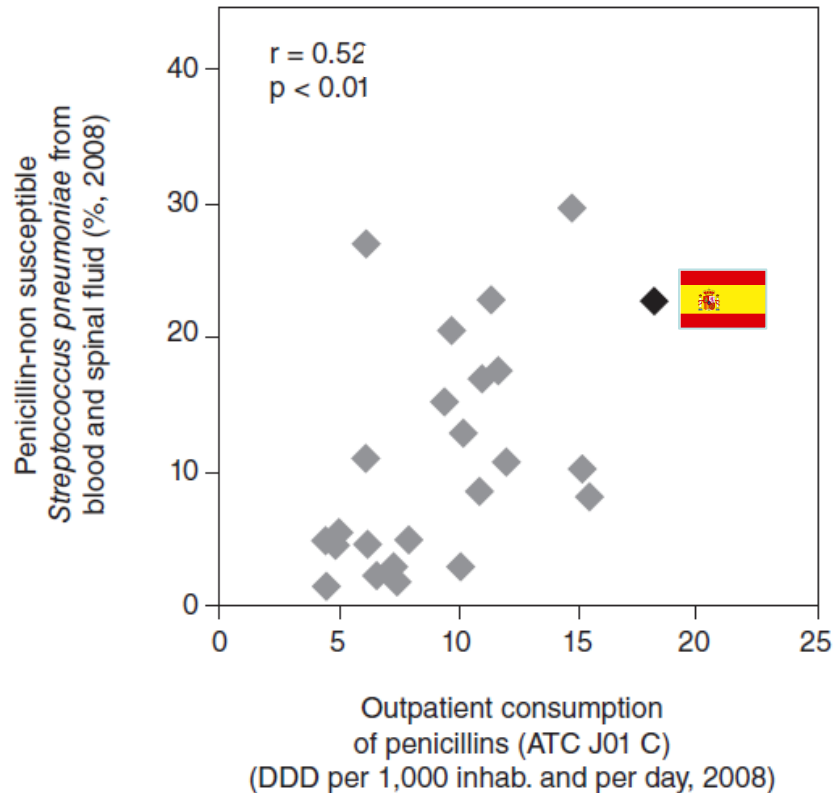
% respondents with correct answer  
(i.e., "false"): 52% (range: 24 – 77%)



 **44%**

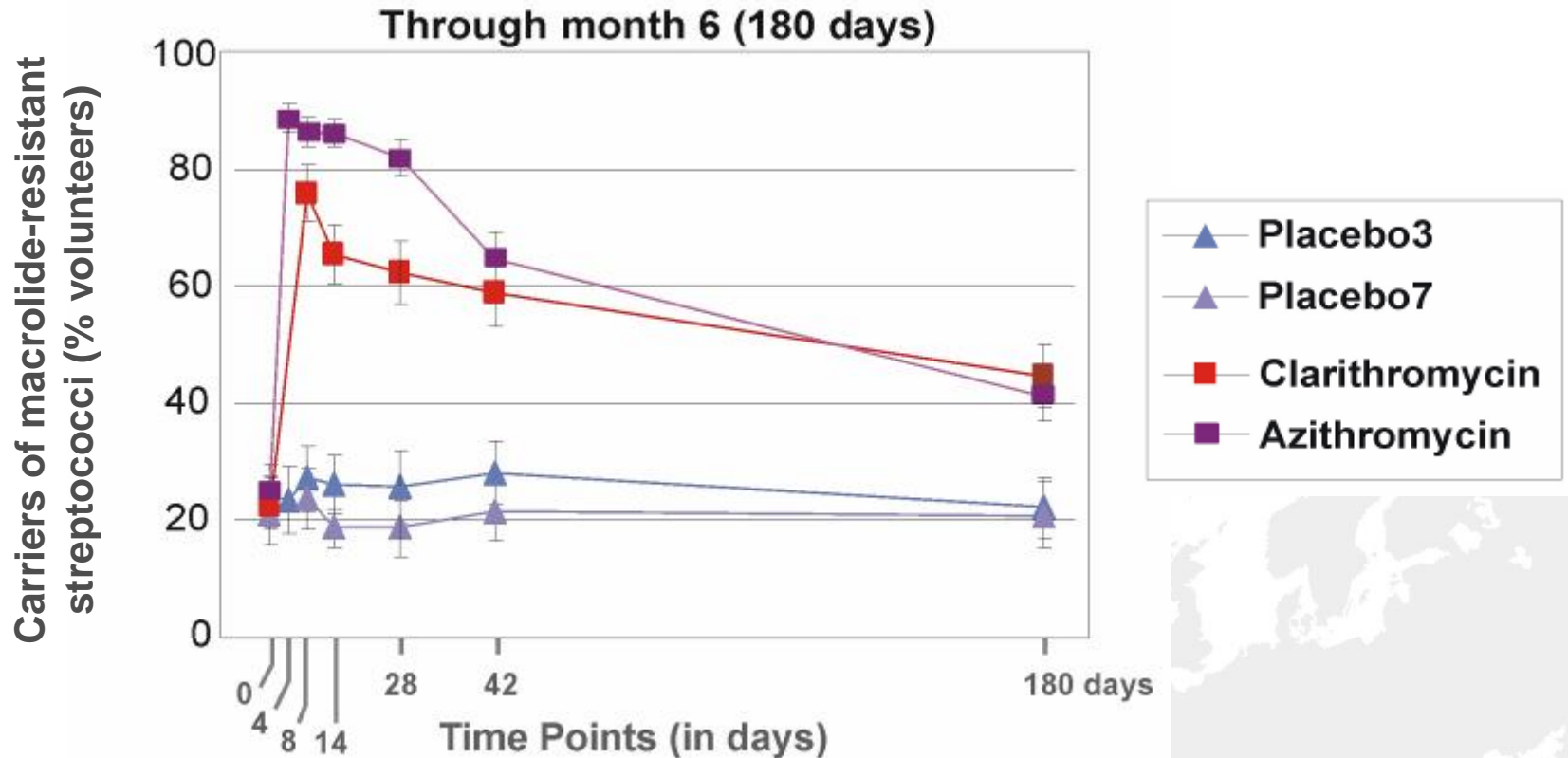


# Relationship between antibiotic use and resistance in the community

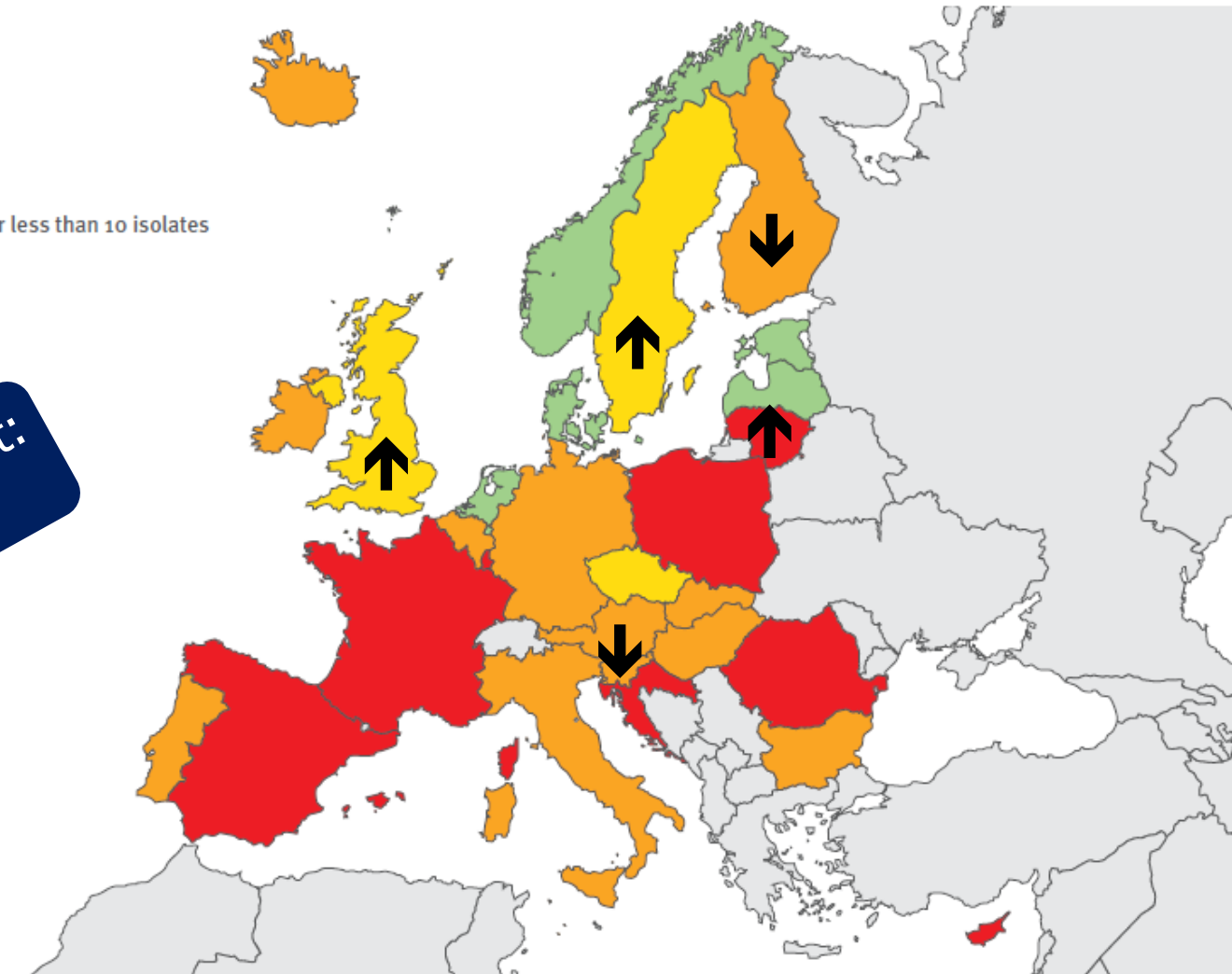
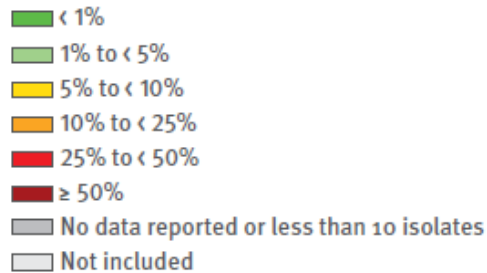




# Carriage of resistant bacteria following exposure to antibiotics



# *Streptococcus pneumoniae*: percentage of invasive isolates not susceptible to macrolides; EU/EEA, 2013



EARS-Net 2014 report:  
16 Nov. 2015

# Food animals



## COMPARISON OF CONSUMPTION IN HUMANS AND FOOD-PRODUCING ANIMALS

**Comparison of biomass-corrected consumption of antimicrobials (milligrams per kilogram estimated biomass) in humans and animals by country in 26 EU/EEA countries in 2012**

**Total consumption in 2012 (expressed in mg/kg of estimated biomass)**

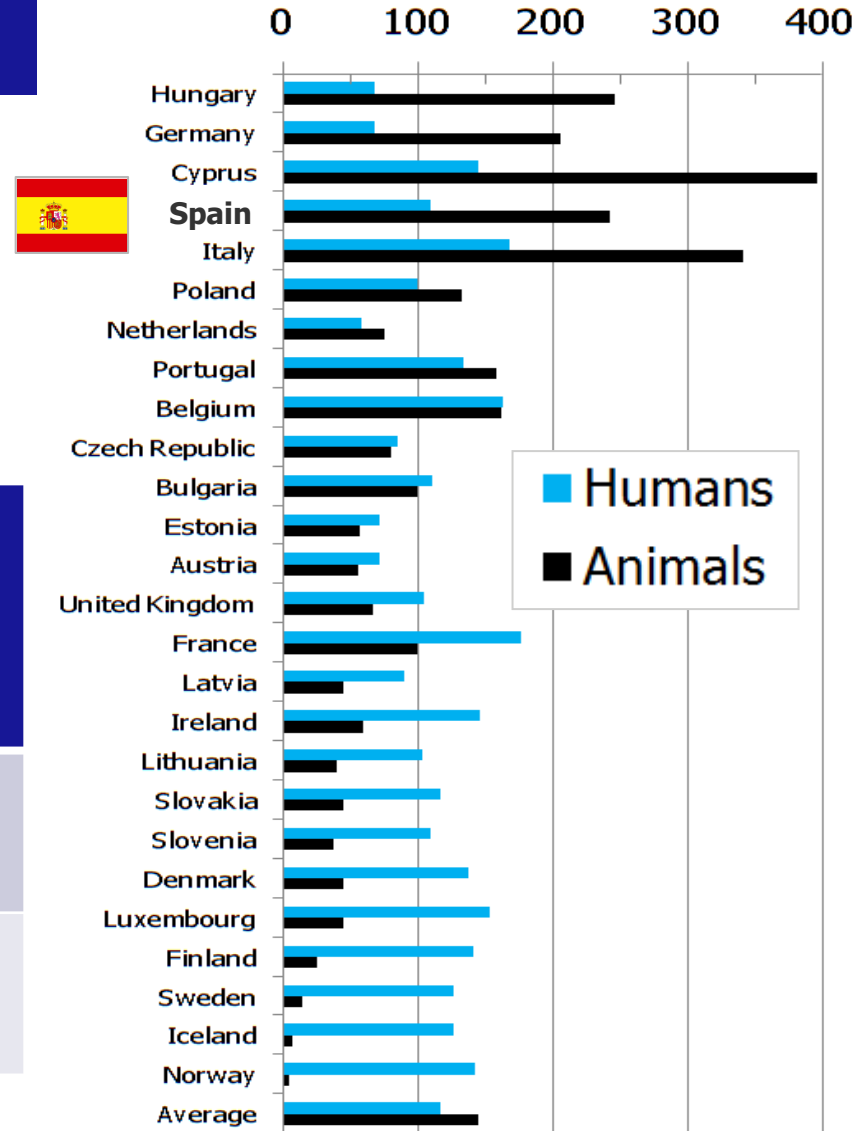
**In humans**

**116.4 mg/kg**  
(range: 56.7 – 175.8 mg/kg)

**In animals**

**144.0 mg/kg**  
(range: 3.8 – 396.5 mg/kg)

mg/kg biomass





**Humans + Animals = One Health**

**Prudent use of antibiotics:  
Everyone is responsible!**

# DÍA EUROPEO PARA EL USO PRUDENTE DE LOS ANTIBIÓTICOS



UNA INICIATIVA EUROPEA  
PARA LA SALUD

español (es) ▼



Planifique una campaña

Para los médicos

Infórmate

Participa

Campañas en Europa

Noticias

Acerca del día

No te automediques con  
antibióticos

Nueva infografía

Relatos de pacientes

Datos e informes

¿Qué es la resistencia a los  
antibióticos?

Tuits #EAAD

#EAAD Tweets

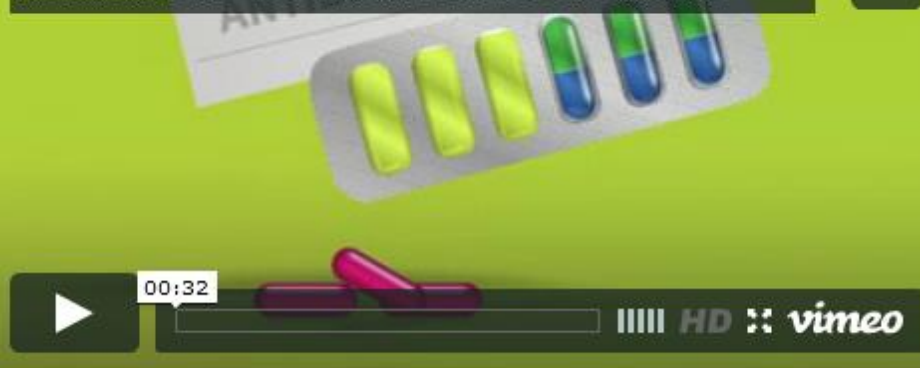
Últimas noticias

New EMA report shows encouraging trends in veterinary use of antibiotics 06 Nov 2015

New EAAD infographic on the spread of antibiotic resistance – Now available in all the official EU languages 05 Nov 2015



Uno de cada seis europeos no es consciente de que el mal uso de los antibióticos los hace menos eficaces.



¿Qué es la resistencia a los antibióticos y el uso prudente de los antibióticos? ¿Cómo se utilizan los antibióticos de forma responsable? Ver relatos de los pacientes, infografías y vídeos

# European Antibiotic Awareness Day, 2008-2015

- 2008 **Toolkit for the general public**  
32 countries participated
- 2009 **Toolkit for primary care prescribers**
- 2010 **Toolkit for hospital prescribers and hospitals**  
Matched Get Smart week in the U.S. and the campaign in Canada
- 2011 Patient stories and Euronews movie  
Social media guidance  
37 countries participated
- 2012 Collaboration with WHO/Europe:  
43 countries participated  
First EAAD Twitter chat  
Australia becomes a partner
- 2013 Start work on self-medication with antibiotics, with PGEU and CPME  
Training module and pilot course
- 2014 **Revised toolkit for the general public on self-medication with antibiotics**  
New Zealand becomes a partner  
European Twitter chat  
Global Twitter conversation
- 2015 Partner with the first World Antibiotic Awareness Week

**EUROPEAN  
ANTIBIOTIC  
AWARENESS DAY**



A European Health Initiative



**COLD? FLU?**



**GET WELL  
WITHOUT  
ANTIBIOTICS**

**EUROPEAN  
ANTIBIOTIC  
AWARENESS DAY**



A European Health Initiative

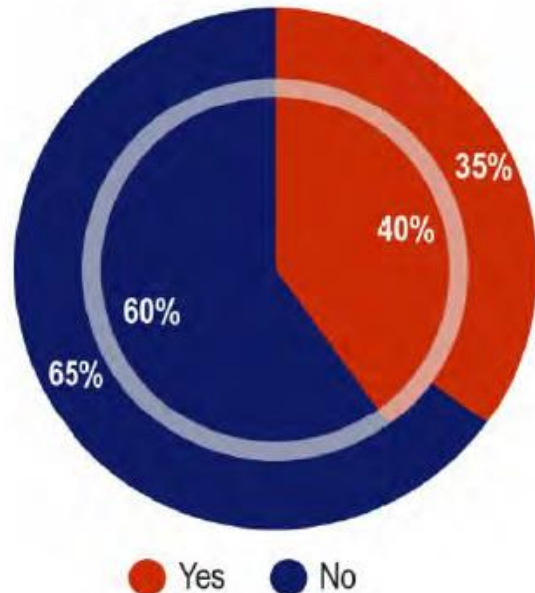


For more information, visit  
[antibiotic.ecdc.europa.eu](http://antibiotic.ecdc.europa.eu)

# Behaviour of European citizens, 2009-2013: oral antibiotics vs. smoking

## Taking antibiotics

(orally, in the last 12 months)

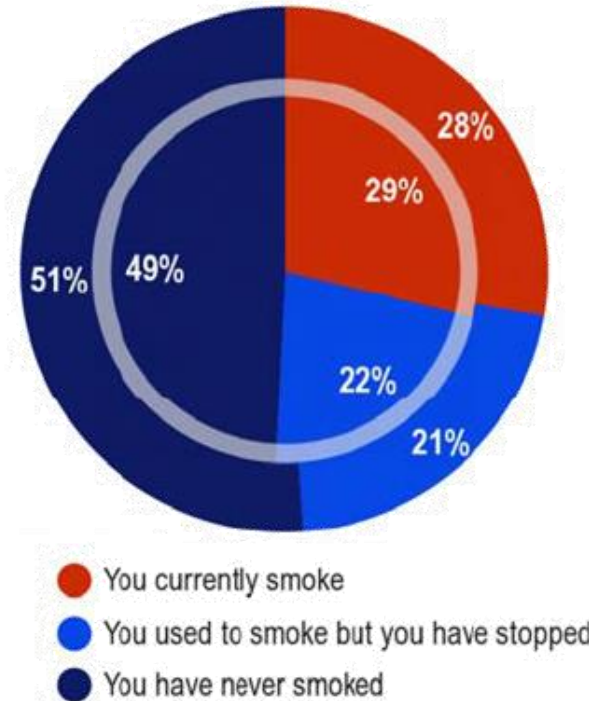


Inner pie : 2009 (EB72.5 11-12)

Outer pie : 2013 (EB79.4 05-06)

## Smoking

(cigarettes, cigars or a pipe)

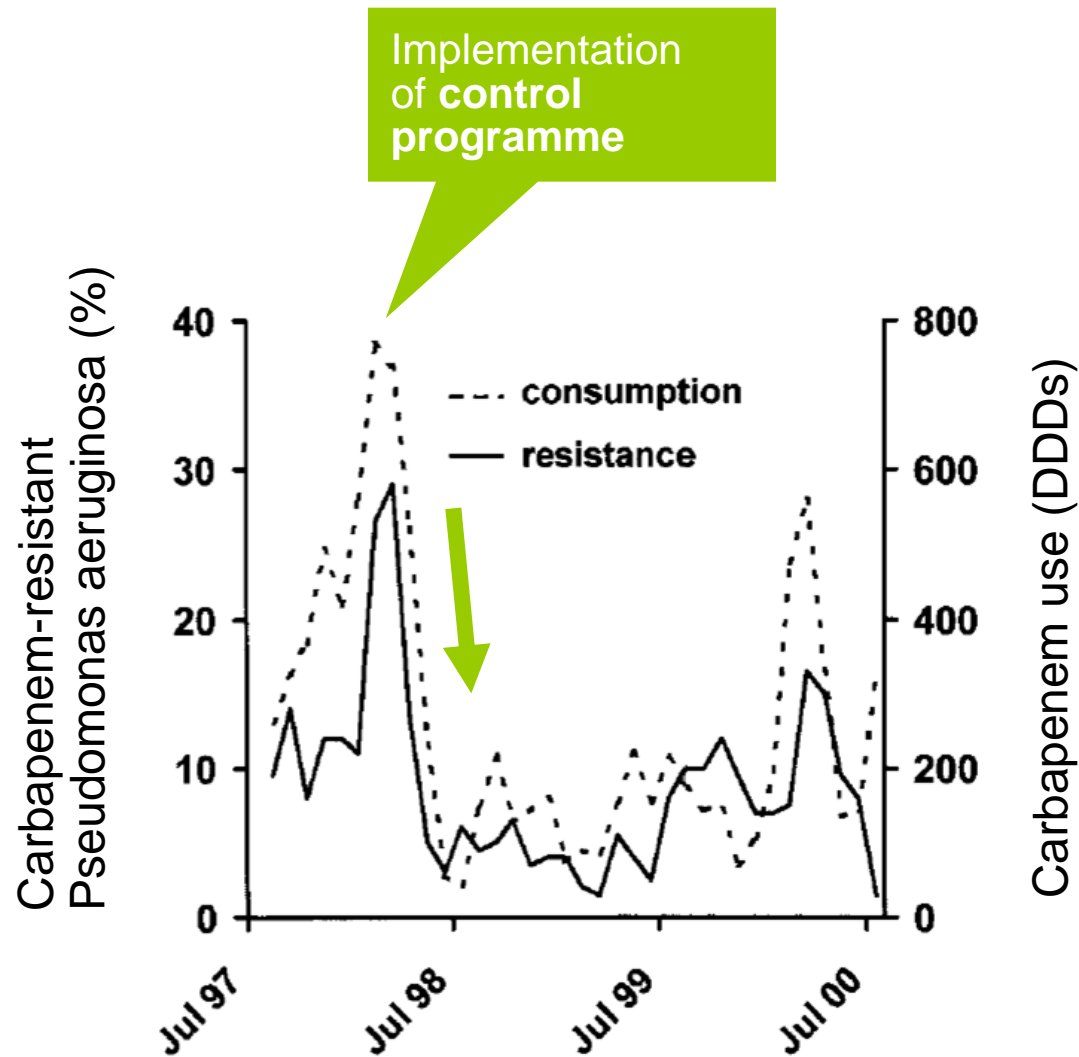


Inner pie : EB72.3 Oct. 2009

Outer pie : EB77.1 Feb.-Mar. 2012



# Antimicrobial consumption drives antimicrobial resistance in hospitals



# European Antibiotic Awareness Day: translated materials for hospital prescribers

## Antibióticos: utilícnese con precaución

Prescripción de antibióticos: lista de verificación de cosas que debe recordar

- ¿Se han hecho los cultivos adecuados antes de instaurar el tratamiento antibiótico?
- ¿Exigen los resultados del cultivo iniciar un tratamiento con antibióticos o modificar el tratamiento en uso?
- ¿Cuál es la duración óptima de la antibioterapia para tratar este tipo de infección en este paciente?
- ¿Cuál es la dosis de antibiótico adecuada para tratar este tipo de infección en este paciente?
- ¿Se ajusta la elección del tratamiento antibiótico al perfil de resistencia a los antibióticos de su hospital (antibiograma)?
- ¿Ha consultado con algún especialista en enfermedades infecciosas, microbiólogo o farmacéutico?

Check list

EUROPEAN  
ANTIBIOTIC  
AWARENESS DAY



A European Health Initiative



Trattamento antibiotico  
dirigido

Web banner

Prelevare campioni per le  
colture prima di iniziare la  
terapia antibiotica



EUROPEAN  
ANTIBIOTIC  
AWARENESS DAY

Screen saver

# WORLD ANTIBIOTIC AWARENESS WEEK

16-22 NOVEMBER 2015

ANTIBIOTICS  
HANDLE WITH CARE



World Health  
Organization

## EUROPEAN ANTIBIOTIC AWARENESS DAY



A EUROPEAN  
HEALTH INITIATIVE

18 November 2015



Website: <http://antibiotic.ecdc.europa.eu>

Facebook: EAAD.EU

Twitter chat: @EAAD\_EU

Global Twitter chat:

#EAAD

#AntibioticResistance