



The use of antibiotics in humans in the EU – assessing the community and hospital settings

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Every day patients-global problem



A European Health Initiative 

European Antibiotic Awareness Day Patient Stories Paolo (Italy)



Paolo is a 55 year old University Prof Rome, Italy. In August of 2010, Paolo motor-boating alone to Ponza, a small island off the coast of Italy. After arrival in Ponza, he felt that he had symptoms of a urinary tract infection, but did not pay too much attention at the time, because he thought it could have been due to dehydration from the summer heat.

After a while, however, he developed symptoms with shaking chills and the symptoms of a urinary tract infection intensified. He consulted with his brother-in-law, a general medical doctor and was prescribed antibiotics in Ponza. His brother-in-law

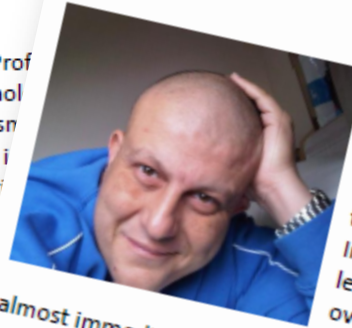
recommended he take ciprofloxacin, a fluoroquinolone antibiotic which is one of the most commonly used antibiotics for urinary tract infections. Ciprofloxacin can be taken orally and is easy to take and is usually effective in treating urinary tract infections. Paolo's condition did not improve over the next three days and his fever persisted. Despite this, he continued the course of ciprofloxacin for a week in the hope of being well enough to motor-boat back to Rome and undergo a physical examination and laboratory tests.

Paolo was on the island of Ponza where there was no possibility of getting a sample of his urine to better understand which antibiotics the bacteria was sensitive to. He was aware that it would be important to know the results of the tests in order for a doctor to prescribe the correct antibiotic.



A European Health Initiative 

European Antibiotic Awareness Day Patient Stories Mohammed (UK)



My name is Mohammed and I'm 37 years old. I grew up in the UK but have spent the last 10 years based in Cairo, running a software development company. I have a lot of family in Egypt so living out there and travelling back and forth to the UK has been great fun. In April 2011, I was diagnosed with acute myeloid leukaemia, a type of cancer where your body overproduces white blood cells and your immune system stops working properly. I started treatment and it was very painful – you mostly just feel unwell and extremely uncomfortable. These can be both

almost immediately. Leukaemia itself isn't that painful – you mostly just feel unwell and extremely uncomfortable. These can be both very uncomfortable and extremely dangerous. While I was in hospital having my second cycle of chemotherapy, I developed a high fever which the doctors struggled to control with regular antibiotics. For three days my temperature spiked uncontrollably, reaching dangerous levels as high as 40°C. Having realised there was something unusual about my infection, the doctors eventually managed to bring the fever under control using a specific combination of high-dose antibiotics. At that point the unknown nature of the infection was really scary; we were dealing with the leukaemia but no-one knew what had caused the fevers.

Further investigations showed that I had an infection with a bacterium called *Escherichia coli* (*E. coli*), which normally lives in the intestine. For reasons unknown to my doctors, I was carrying a very resistant type of *E. coli*. No one knows for certain where I got this very resistant type of bug from, or how long it's been lying dormant in my intestine. The doctors thought I might have picked it up in Egypt because similar resistance types were also found there and that is where I was when my chemotherapy had weakened my immune system.

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



Human burden

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

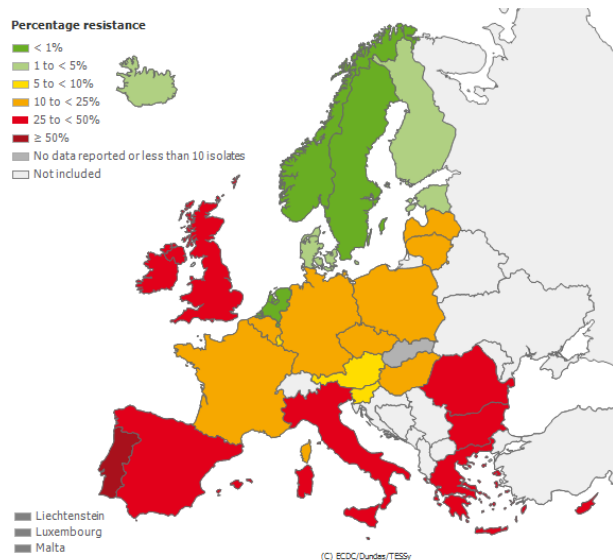
	approx.	400,000 / year
Attributable deaths	approx.	25,000 / year
Extra hospital days	approx.	2.5 million / year

Economic burden

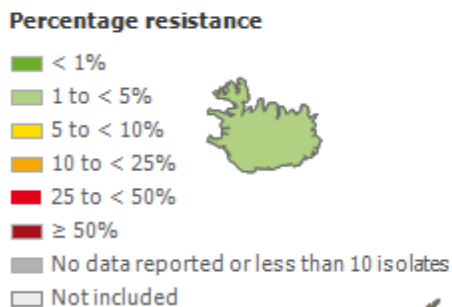
Extra in-hospital costs	approx.	€ 900 million / year
Productivity losses	approx.	€ 600 million / year

Limitation: these are underestimates.

Staphylococcus aureus: percentage of invasive isolates resistant to meticillin (MRSA); EU/EEA, 2008–2011

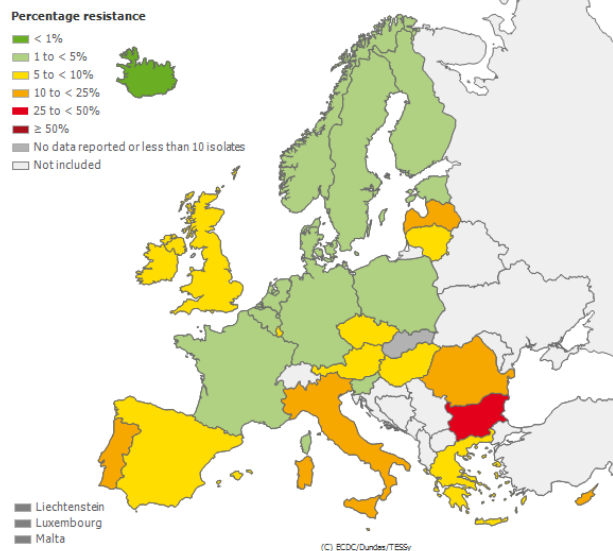


2008

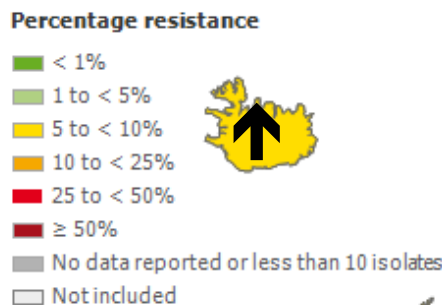


2011

Escherichia coli: percentage of invasive isolates resistant to third-generation cephalosporins; EU/EEA, 2008–2011



2008



2011

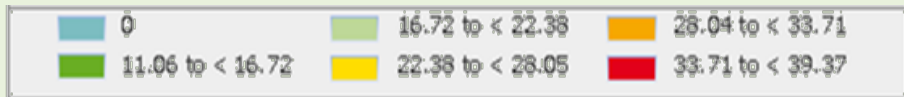
Consumption of antibiotics for systemic use (ATC group J01) in the community* ; EU/EEA, 2010

No data reported
Not included

Liechtenstein
Luxembourg
Malta

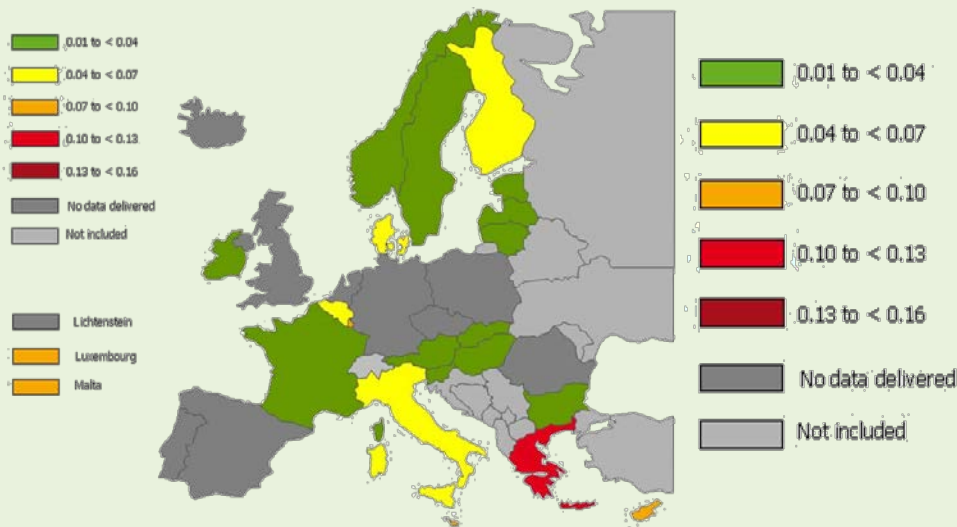


*in Defined Daily Doses per 1000 inhabitants and per day



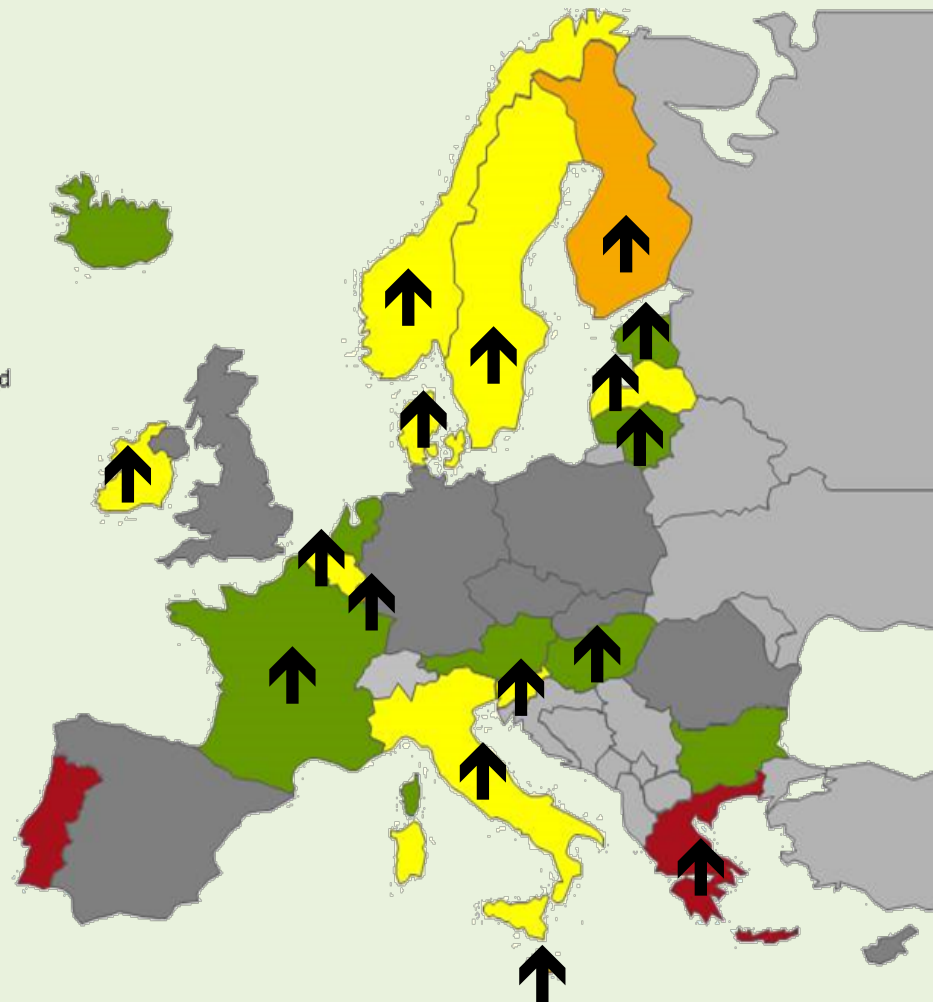
Greece and Iceland:
includes both community and hospital sector
Spain: reimbursement data that do not include
over-the-counter sales without a prescription

Carbapenem consumption* (for the large majority in hospitals); EU/EEA, 2007–2010



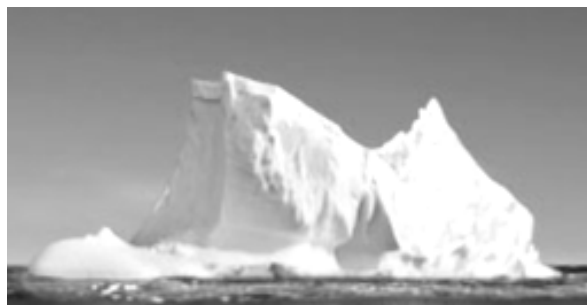
2007

2010

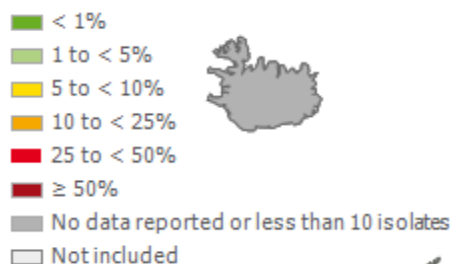


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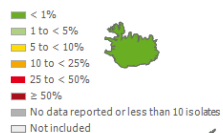
Klebsiella pneumoniae: percentage of invasive isolates resistant to carbapenems; EU/EEA, 2008–2011



Percentage resistance



Percentage resistance



■ Liechtenstein
■ Luxembourg
■ Malta

(C) ECDC/Dundas/TESSy

2008

2011

■ Liechtenstein
■ Luxembourg
■ Malta

(C) ECDC/Dundas/TESSy

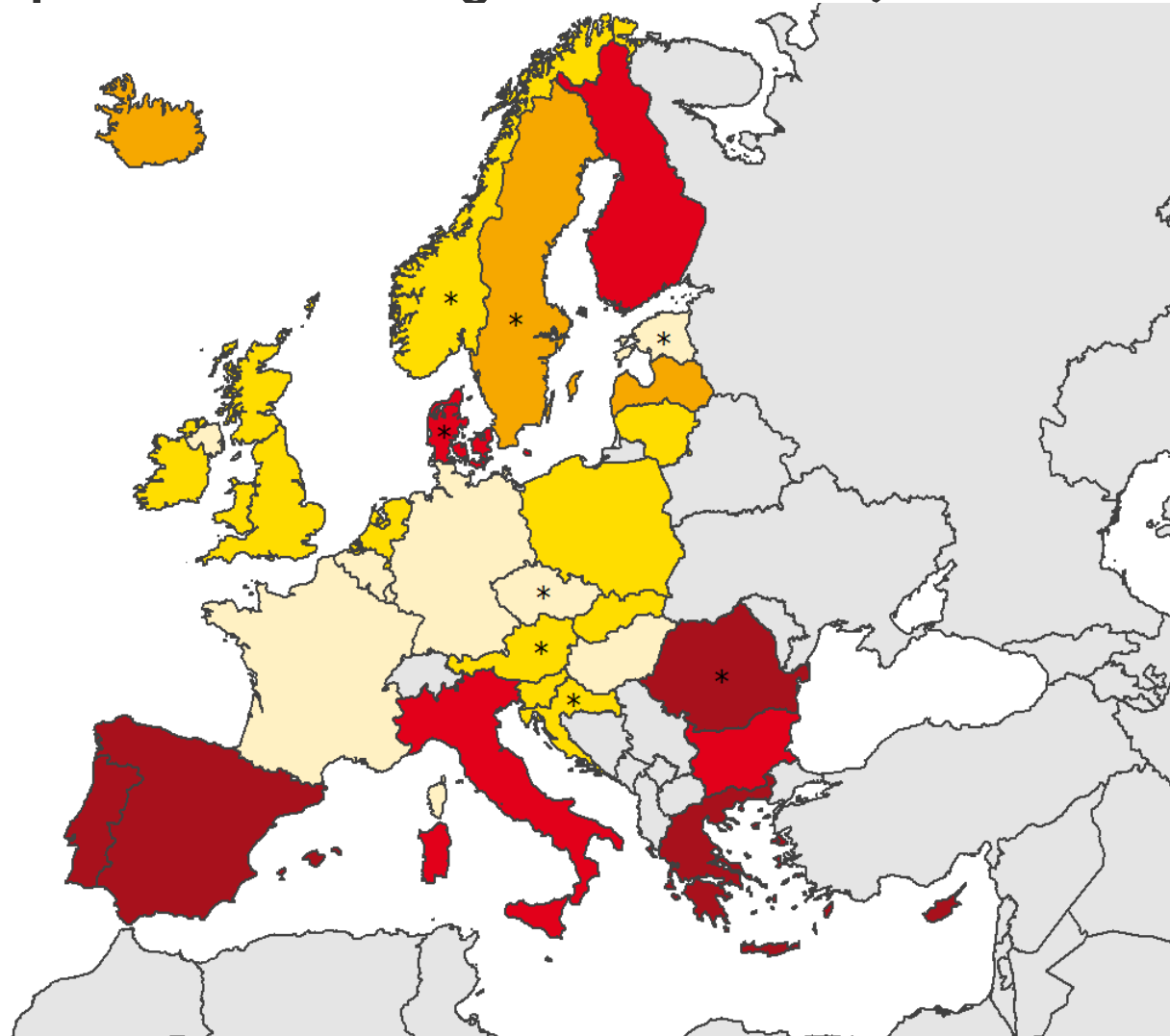
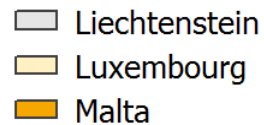
ECDC-PPS in hospitals 2011-2012

Prevalence of antimicrobial use in acute care hospitals (percentage of patients receiving antimicrobials)

Patients on
antimicrobials (%)



Non-visible countries



**PPS data representativeness was poor in Austria, Croatia, Czech Republic, Estonia, Norway and Romania and very poor in Denmark and Sweden.*

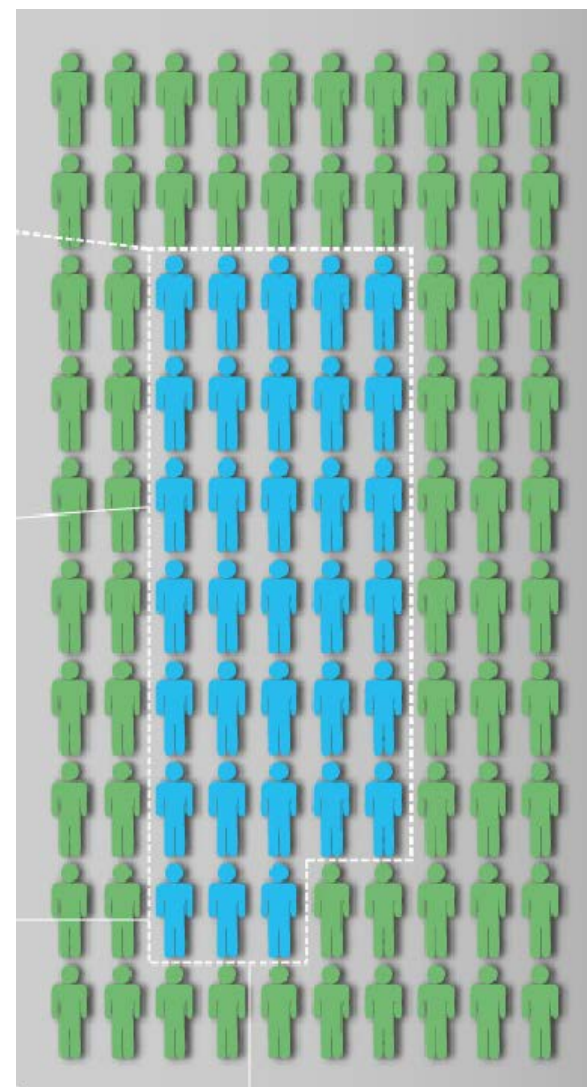
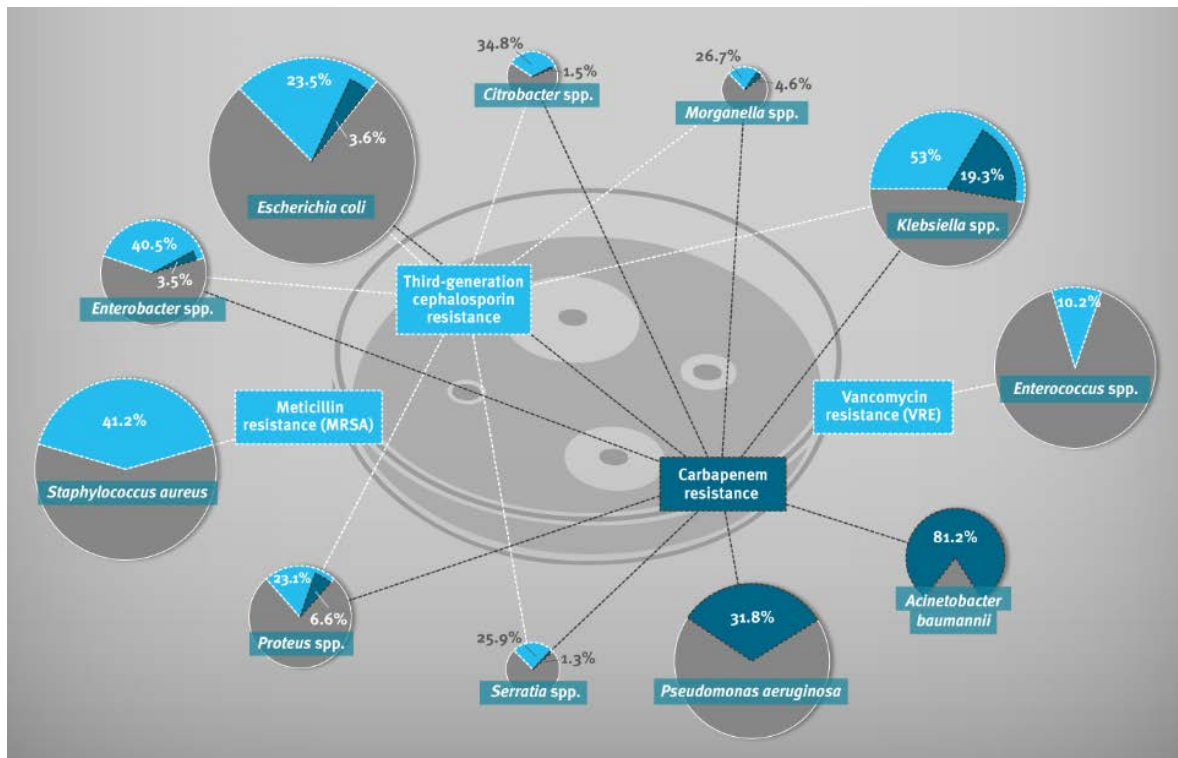
Source: ECDC. Point prevalence survey. July 2013.

http://www.ecdc.europa.eu/en/publications/Publications/Forms/ECDC_DispForm.aspx?ID=1155

Antimicrobial use

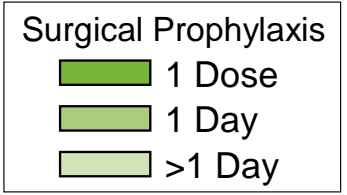
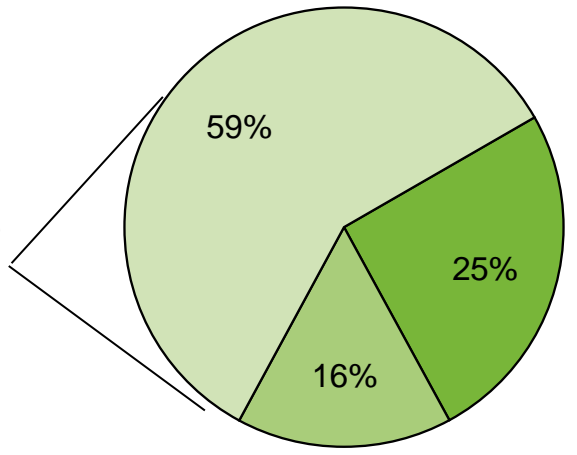
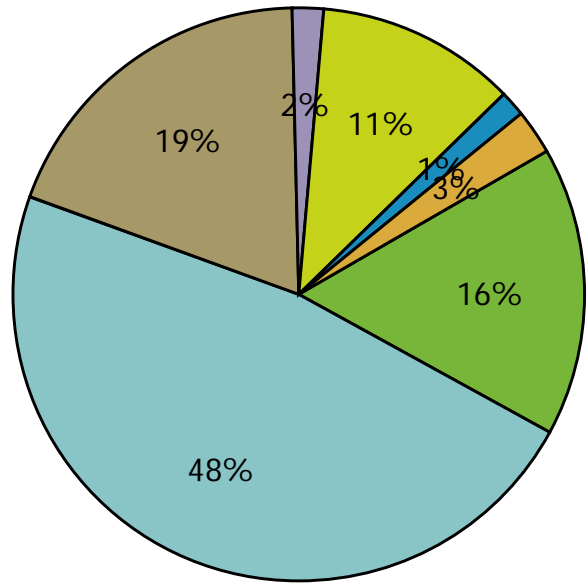
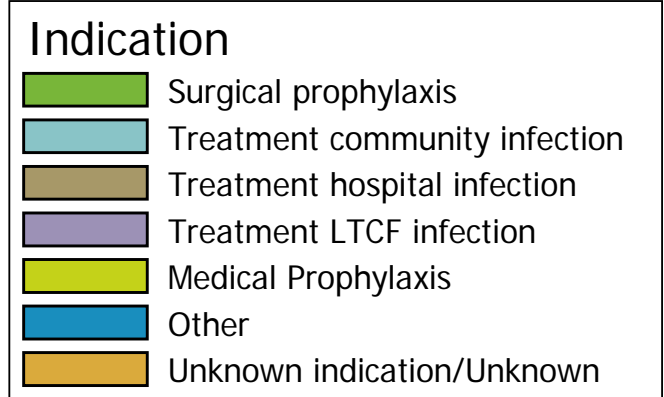
On any given day in EU/EEA hospitals
33% patients [range: 21-55%]

Antimicrobial resistance



Pre-operative prophylaxis longer than 24 hours

ECDC PPS 2011–2012



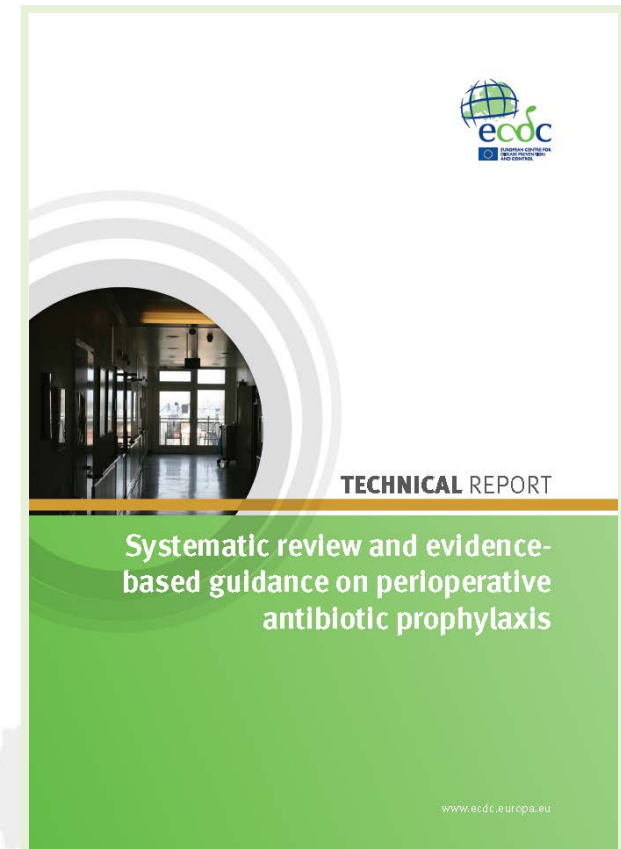
Systematic review on national guidelines in 34 European countries

Five HAI: SSI, VAP, CAUTI, CLABSI, *C. difficile* infection

- 101 national guidelines total for prevention
- 8 countries reported none
- 14 countries for all 5 HAI
- Strength of recommendation is reported only in 56%
- ECDC guidance: Vonberg et al. 2008. "Infection control measures to limit the spread of *Clostridium difficile*"
- 16 different guidelines for *C. difficile*; variable recommendations

ECDC guidance for prevention and control of AMR and HAI

- Prevention and control of *Clostridium difficile* infections. (Vonberg et al. CMI,2008)
- ECDC Evidence-based risk assessment on the spread of carbapenemase-producing Enterobacteriaceae (CPE)(2011)
- Evidence-based guidance on perioperative antibiotic prophylaxis (June, 2013)
- SIGHT: Systematic review and evidence-based guidance on the organisation of hospital infection control programmes (*in press*)
- Develop common indicators for hospital antimicrobial stewardship programmes(2014)
- Infection control measures for patients transferred across borders: focus on MDR Enterobacteriaceae (in preparation)



Way forward: how to work together to promote prudent use?

ECDC will continue to:

- Develop risk assessments and evidence-based guidance to support EU Member States (e.g. new threats)
- Support dissemination and of evidence-based best practices for prudent use, antimicrobial stewardship and infection control within Member States
- Repository of existing guidelines on ECDC website
- Develop, integrate and link more indicators into surveillance protocols for ESAC-Net, HAI-Net and EARS-Net

Thank you!

EUROPEAN ANTIBIOTIC AWARENESS DAY



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HEALTH INITIATIVE

18 November 2013



Website: <http://antibiotic.ecdc.europa.eu>
Facebook: EAAD.EU
Twitter: @EAAD_EU (#EAAD)

Acknowledgments



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- ❖ Antoon Gijssens and Nicole Heine, European Commission
- ❖ PROHIBIT Consortium
- ❖ ECDC contact points for HAI-Net, ESAC-Net, EARS-Net
- ❖ ECDC PPS contact points





Number and composition of intersectoral committees (ICM)

