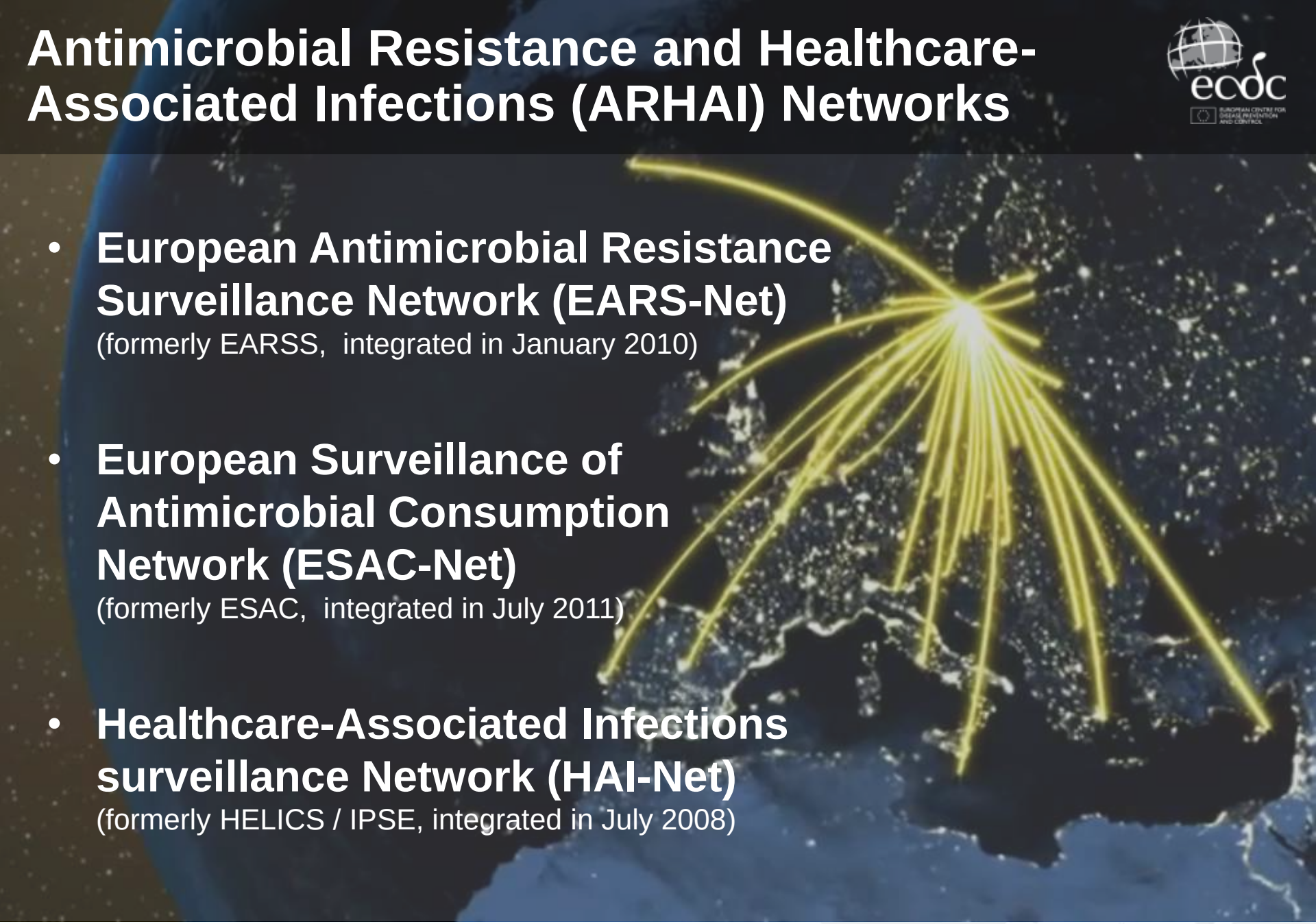
Prevention and control of antimicrobial resistance in healthcare settings: raising awareness about best practices

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

Brussels, 22 November 2017

Antimicrobial Resistance and Healthcare-Associated Infections (ARHAI) Networks

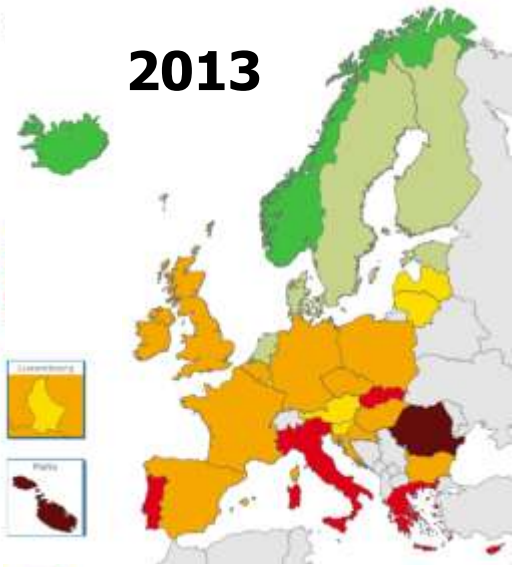


- **European Antimicrobial Resistance Surveillance Network (EARS-Net)**
  (formerly EARSS, integrated in January 2010)

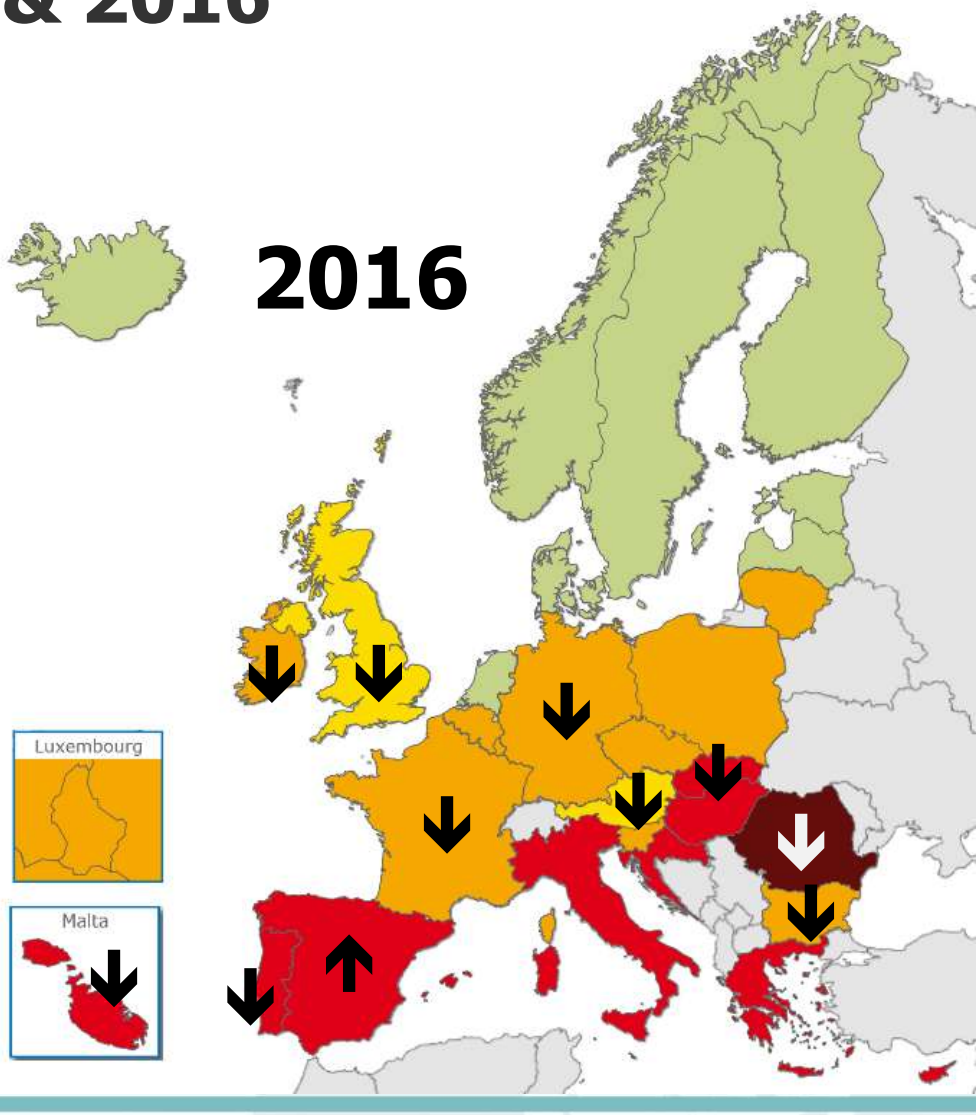
- **European Surveillance of Antimicrobial Consumption Network (ESAC-Net)**
  (formerly ESAC, integrated in July 2011)

- **Healthcare-Associated Infections surveillance Network (HAI-Net)**
  (formerly HELICS / IPSE, integrated in July 2008)

Staphylococcus aureus: % of invasive isolates with resistance to meticillin (MRSA), EU/EEA, 2013 & 2016



< 1%
1% to <5%
5% to <10%
10% to <25%
25% to <50%
≥ 50 %
Less than 10 isolates reported
No data

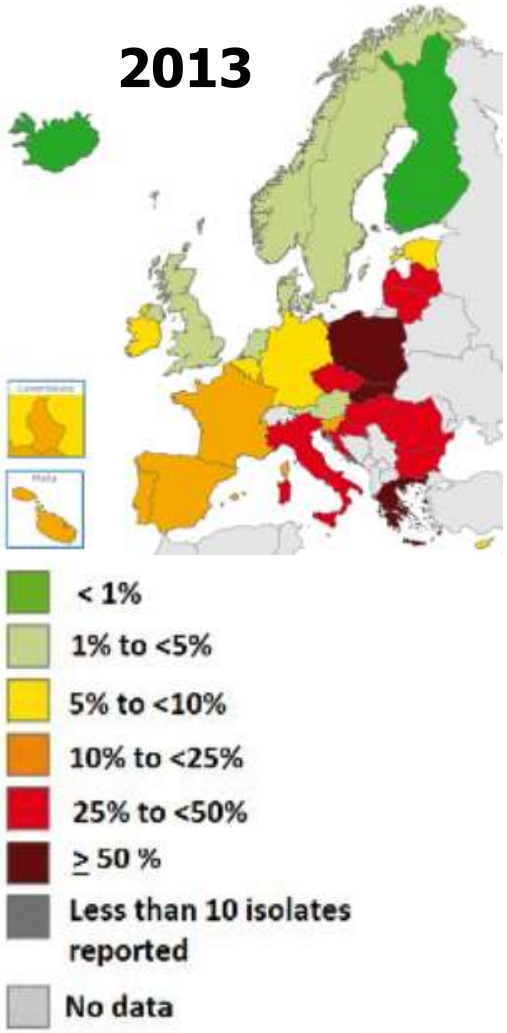


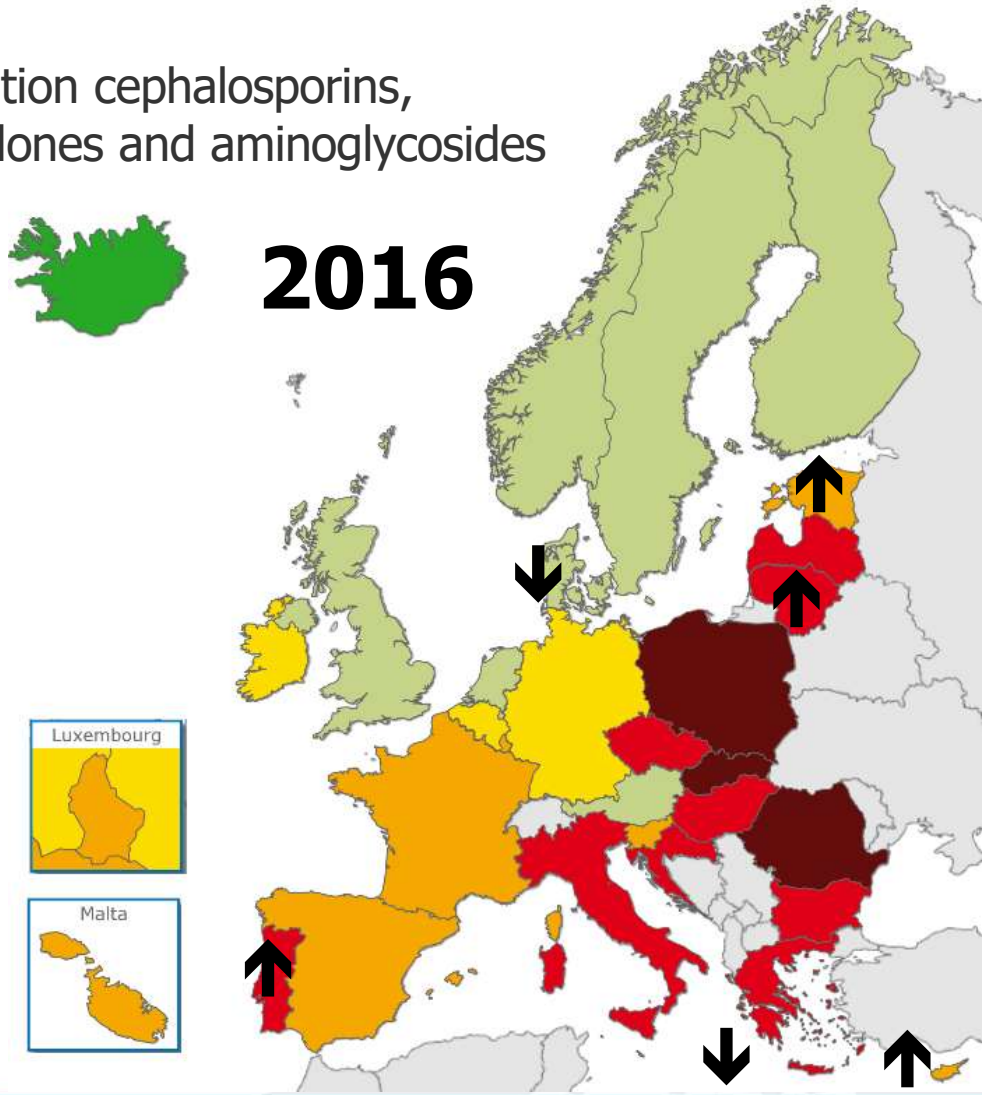
Source: EARS-Net, 2017.

The symbols ↑ and ↓ indicate a significant increasing or decreasing trend for the period 2013-2016, respectively. These trends were calculated on laboratories that consistently reported during this period.

Klebsiella pneumoniae: % of invasive isolates with combined resistance* EU/EEA, 2013 & 2016

*Third-generation cephalosporins, fluoroquinolones and aminoglycosides



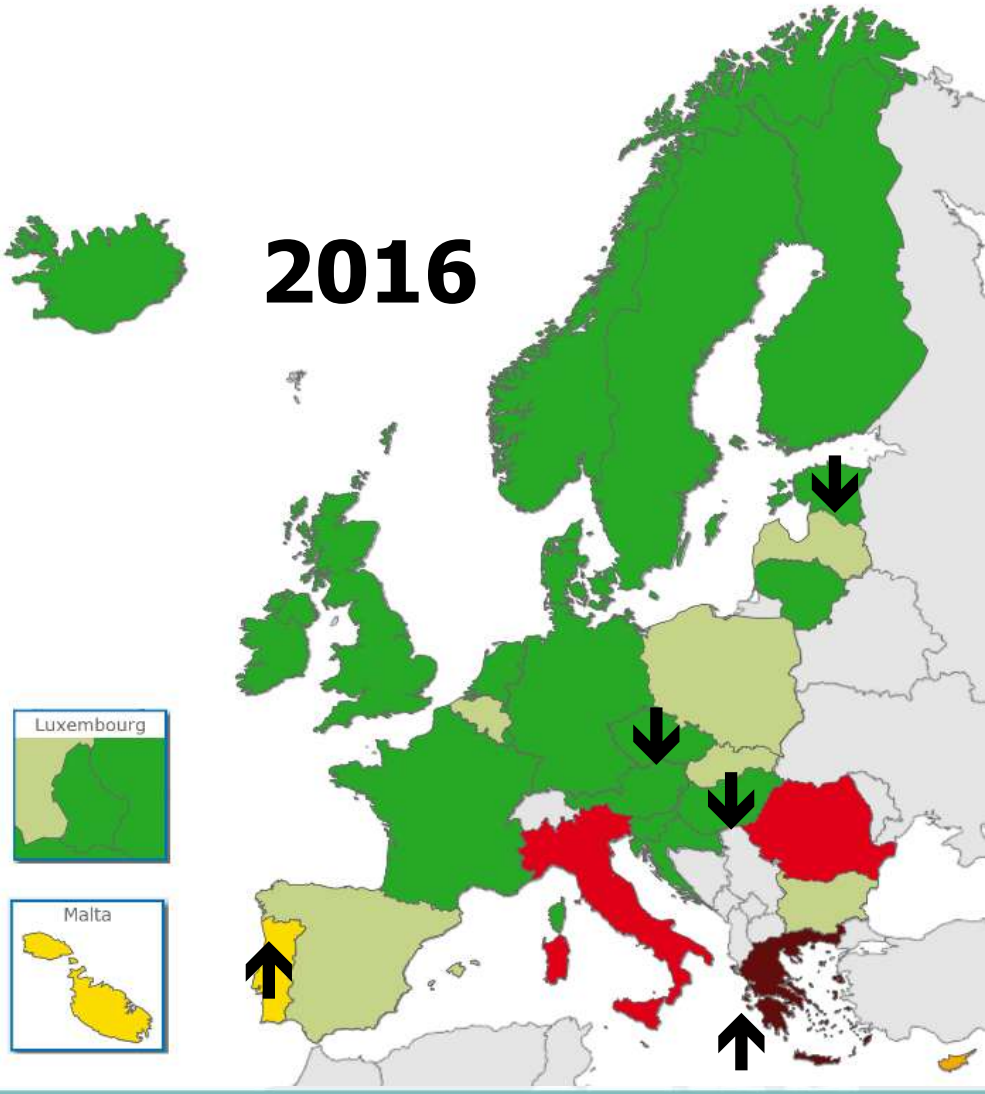


Source: EARS-Net, 2017.

The symbols ↑ and ↓ indicate a significant increasing or decreasing trend for the period 2013-2016, respectively. These trends were calculated on laboratories that consistently reported during this period.

Klebsiella pneumoniae: % of invasive isolates with resistance to carbapenems EU/EEA, 2013 & 2016

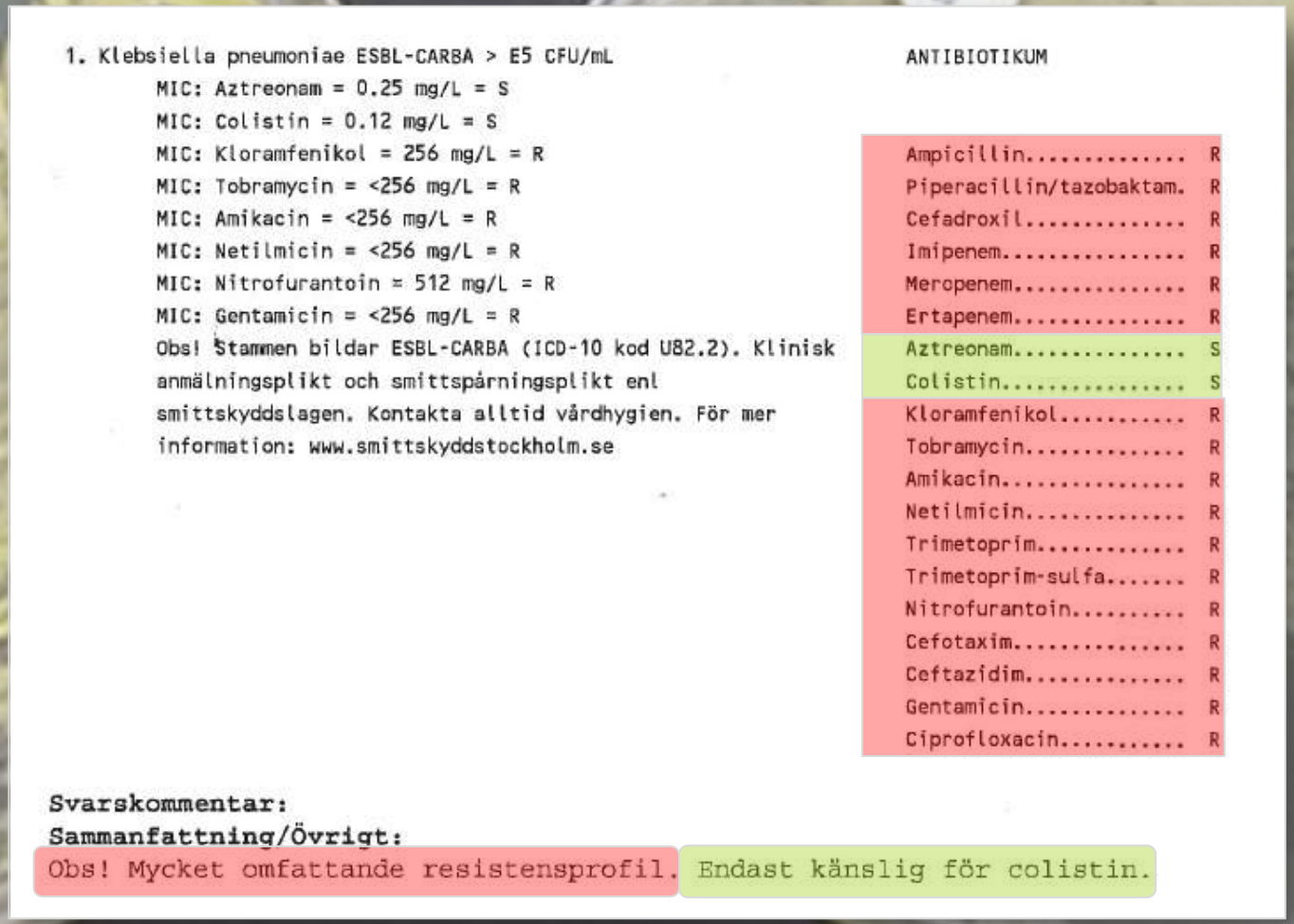
< 1%
1% to <5%
5% to <10%
10% to <25%
25% to <50%
≥ 50 %
Less than 10 isolates reported
No data



Source: EARS-Net, 2017.

The symbols ↑ and ↓ indicate a significant increasing or decreasing trend for the period 2013-2016, respectively. These trends were calculated on laboratories that consistently reported during this period.

Carbapenem-resistant infections: a challenge for appropriate patient therapy



1. Klebsiella pneumoniae ESBL-CARBA > E5 CFU/mL

MIC: Aztreonam = 0.25 mg/L = S
MIC: Colistin = 0.12 mg/L = S
MIC: Kloramfenikol = 256 mg/L = R
MIC: Tobramycin = <256 mg/L = R
MIC: Amikacin = <256 mg/L = R
MIC: Netilmicin = <256 mg/L = R
MIC: Nitrofurantoin = 512 mg/L = R
MIC: Gentamicin = <256 mg/L = R
Obs! Stammen bildar ESBL-CARBA (ICD-10 kod U82.2). Klinisk anmälningsplikt och smittspårningsplikt enl smittskyddslagen. Kontakta alltid vårdhygien. För mer information: www.smittskyddstockholm.se

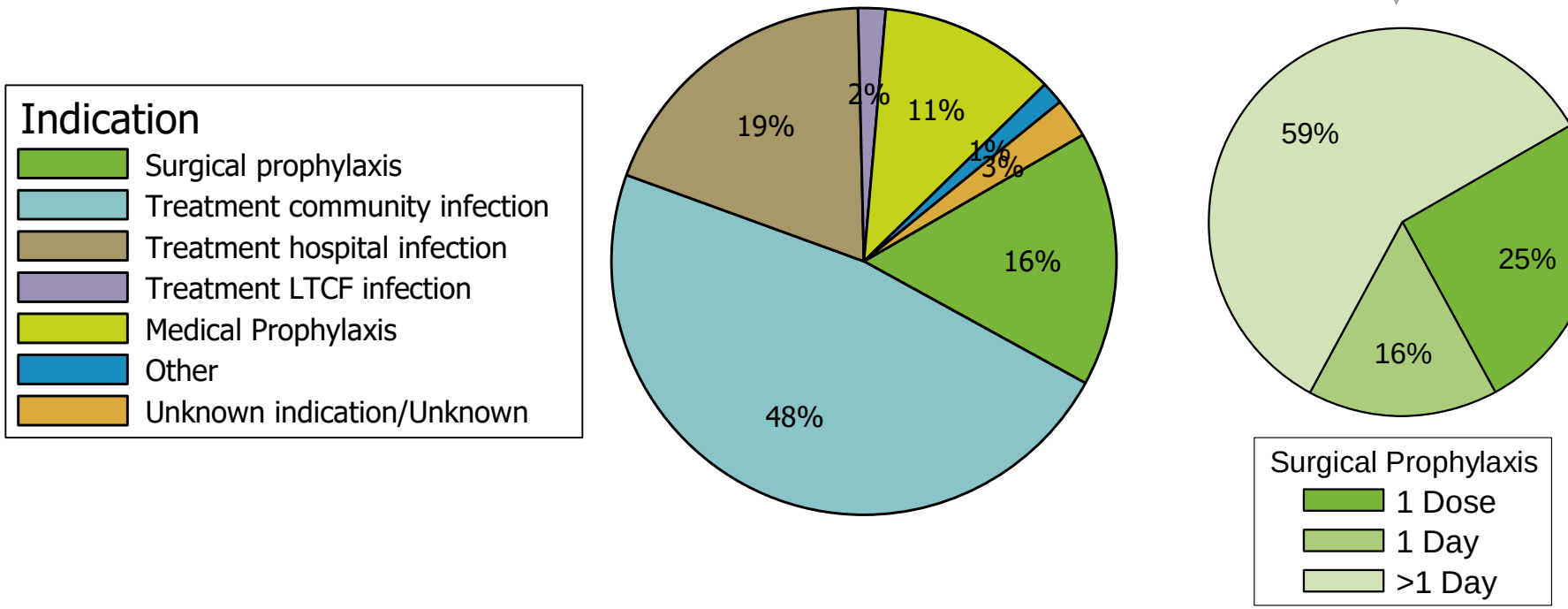
ANTIBIOTIKUM	
Ampicillin.....	R
Piperacillin/tazobaktam.	R
Cefadroxil.....	R
Imipenem.....	R
Meropenem.....	R
Ertapenem.....	R
Aztreonam.....	S
Colistin.....	S
Kloramfenikol.....	R
Tobramycin.....	R
Amikacin.....	R
Netilmicin.....	R
Trimetoprim.....	R
Trimetoprim-sulfa.....	R
Nitrofurantoin.....	R
Cefotaxim.....	R
Ceftazidim.....	R
Gentamicin.....	R
Ciprofloxacin.....	R

Svarskommentar:
Sammanfattning/Övrigt:
Obs! Mycket omfattande resistensprofil. Endast känslig för colistin.

Courtesy: C. Giske. Karolinska University Hospital, Stockholm, Swede.n Photo: www.microbiologie.info.

ECDC point prevalence survey, 2011-2012: antimicrobial use in European acute care hospitals

- On any given day: 33% patients [range: 21-55%]
- **59% of surgical prophylaxis > 1 day**



Source: ECDC report, July 2013.

Consumption of last-line antibiotics in the hospital sector, EU/EEA, 2012-2016

Carbapenems

(DDD per 1000 inh. and per day)

Country	2016	Trends in consumption of carbapenems, 2012–2016
Bulgaria	0.028	↑
Poland	0.022	
Netherlands	0.020	
Latvia	0.034	↑
France	0.033	
Norway	0.040	
Hungary	0.048	↑
Lithuania	0.053	↑
Slovakia	0.055	↑
Romania	0.059*	↑
Estonia	0.064	↑
Sweden	0.051	
EU/EEA	**0.052**	
Italy	0.040	
Finland (a)	0.090	
Belgium	0.063	
Slovenia	0.071	
United Kingdom	0.068	
Croatia	0.084	↑
Denmark	0.079	
Luxembourg	0.102	
Ireland	0.081	
Malta	0.113	↑
Cyprus	0.141*	↑
Portugal (b)	0.124	↓
Greece	0.180	

Polymyxins (mainly colistin)

(DDD per 1000 inh. and per day)

Country	2016	Trends in consumption of polymyxins, 2012–2016
Finland (a)	0	
Lithuania	0	
Norway	0.001	
Sweden	0.001	
Latvia	0.002	
Netherlands	0.002	
Bulgaria	0.004	↑
Estonia	0.005	
Luxembourg	0.005	
Denmark	0.006	↑
Ireland	0.006	↓
United Kingdom	0.006	
France	0.007	↓
Belgium	0.008	
Slovenia	0.008	↑
Hungary	0.010	↑
EU/EEA	**0.016**	
Malta	0.016	↑
Croatia	0.017	
Cyprus	0.019*	
Portugal (b)	0.022	
Romania	0.026*	↑
Italy	0.027	↑
Poland	0.034	
Slovakia	0.035	↑
Greece	0.102	↑

* Cyprus and Romania: total care data, including consumption in the community. These data were not used to calculate the EU/EEA population-weighted average.

(a) Finland: data include consumption in remote primary healthcare centres and nursing homes.

(b) Portugal: data relate to public hospitals only.

Source: ESAC-Net, 2017. The symbols ↑ and ↓ indicate a significant increasing or decreasing trend for the period 2012-2016, respectively.

Klebsiella pneumoniae: % of invasive isolates with combined resistance to carbapenems and colistin, EU/EEA, 2016

- < 1%
- 1% to <5%
- 5% to <10%
- 10% to <25%
- 25% to <50%
- ≥ 50 %
- Less than 10 isolates reported
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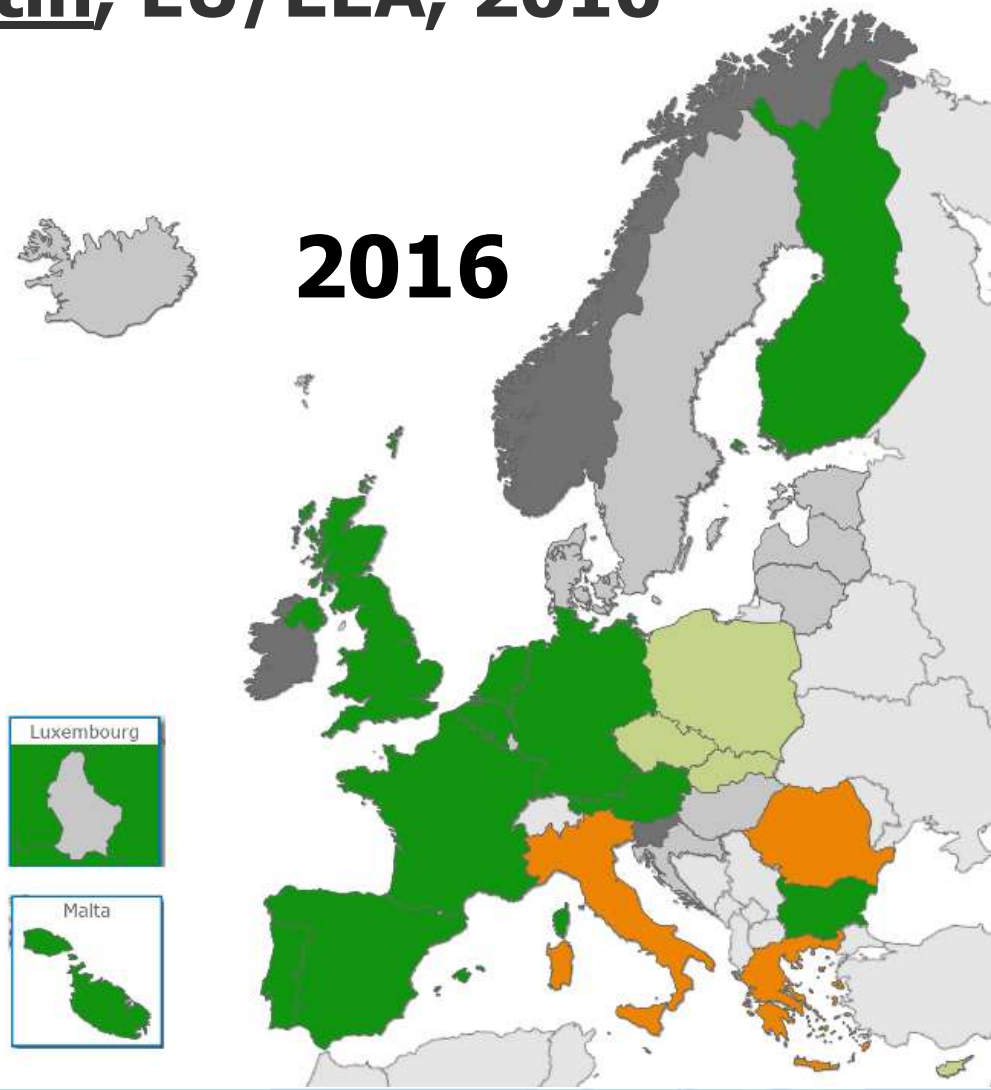


Source: EARS-Net, 2017

All isolates tested for carbapenem susceptibility were included in the denominator to limit the effect of sequential testing.

Publications & data

Examples

- *Mycobacterium chimaera* cardiovascular infections linked to heater-cooler devices
- *Candida auris* infection
- *optrA* (transferable oxazolidinone and chloramphenicol resistance)

Epidemic Intelligence Information System (EPIS)

tool

The Epidemic Intelligence Information System (EPIS) is a web-based communication platform that allows nominated public health experts to exchange technical information to assess whether current and emerging public health threats have a potential impact in the European Union (EU).

Download

EPIS - specific privacy statement - 2016 - EN - [PDF-106.53 KB]

Access Epis

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)

EU Guidelines for the prudent use of antimicrobials in human health (June 2017)

CONTENTS

https://ec.europa.eu/health/amr/action_eu_en

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

tool

The directory lists strategies, guidance documents and training courses on the prevention and control of antimicrobial resistance and healthcare-associated infections 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 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 .

Guidelines for specific infections and organisms

Healthcare-associated infections | Multidrug-resistant organisms


Carbapenem-resistant Enterobacteriaceae (CRE)


Methicillin-resistant Staphylococcus aureus (MRSA)

Prevention and control measures in healthcare settings

Strategies, action plans, projects | Prudent use of antibiotics | Infection and control measures | Training

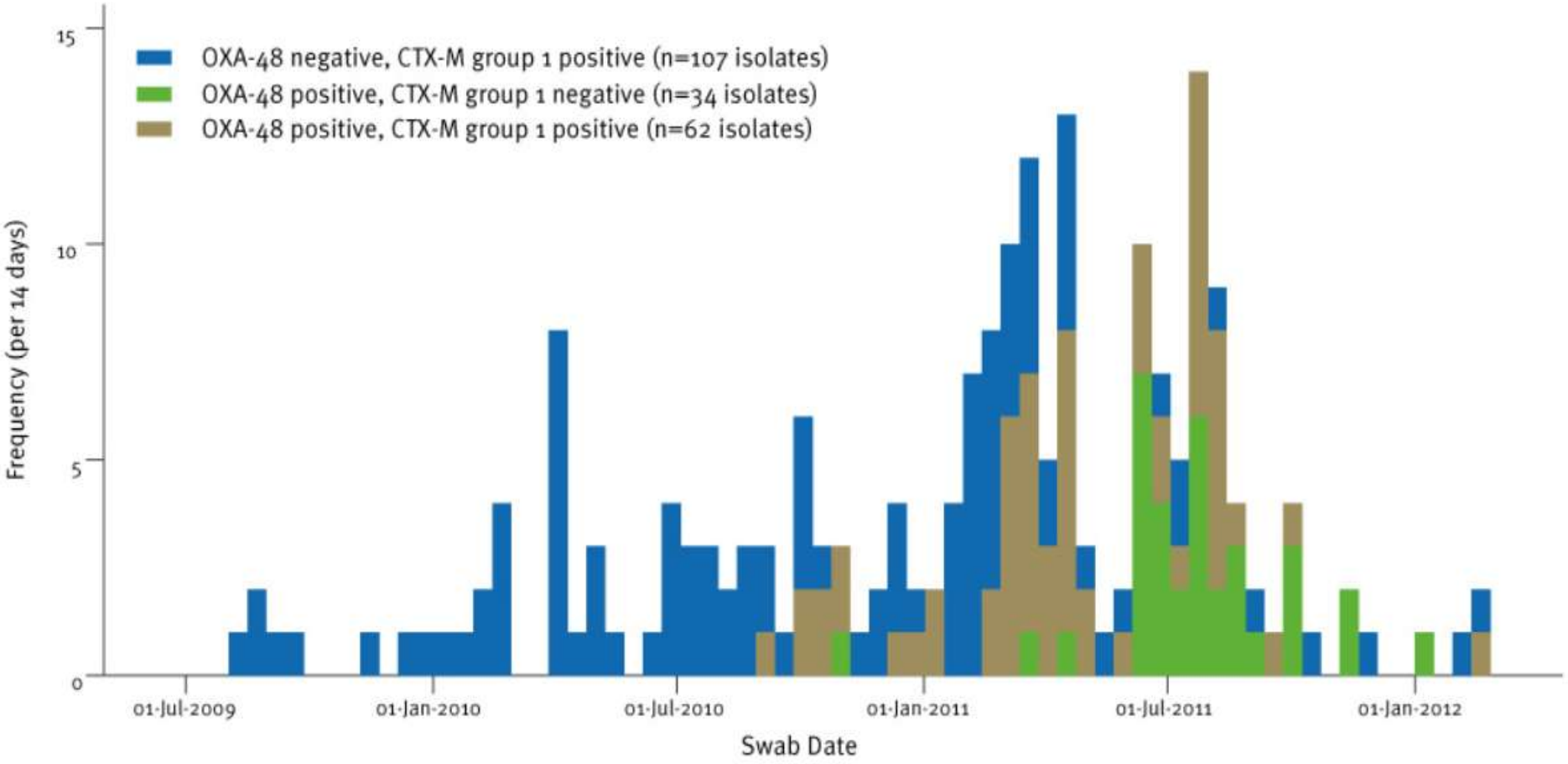

Antimicrobial resistance strategies and action plans


Projects on antimicrobial resistance and healthcare-associated infections

Update :
15 Nov. 2017

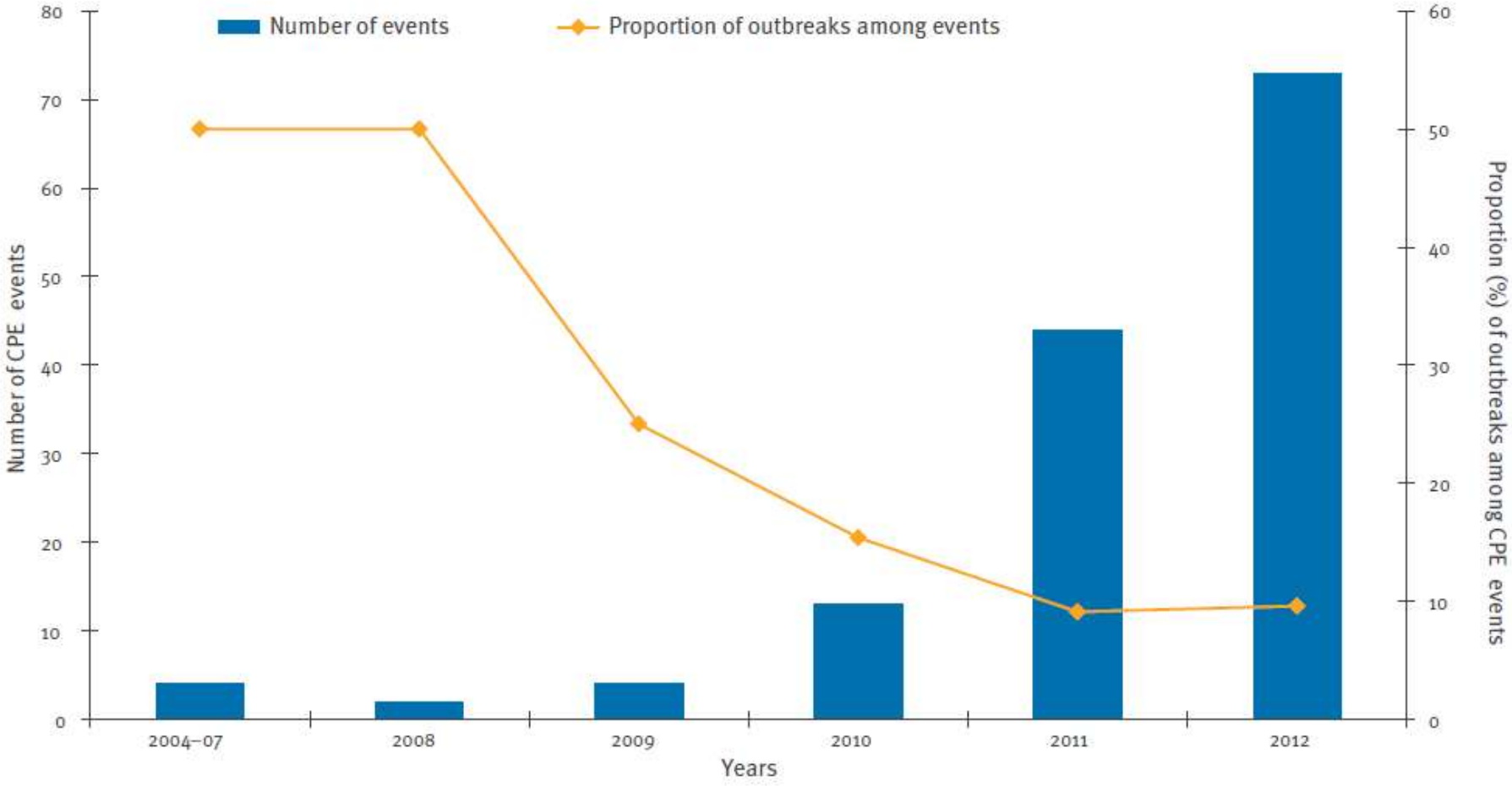
https://ecdc.europa.eu/en/publications-data/directory-online-resources-prevention-and-control-antimicrobial-resistance-amr

Control of an outbreak of OXA-48-producing *Enterobacteriaceae*, Maastad Hosp., Rotterdam (NL), 2009-2012



Source: Dautzenberg MJ, et al. Eurosurveillance (6 March 2014).

Carbapenemase-producing *Enterobacteriaceae*: long-term control of hospital outbreaks in Paris, France, 2004-2012

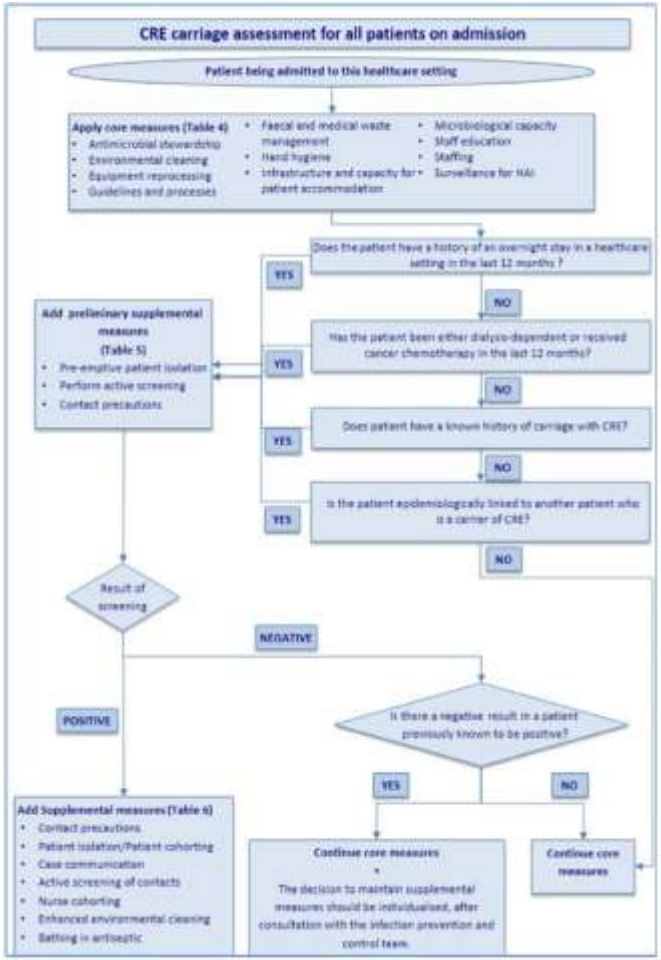


A CPE event was defined as one index case (respectively defined as infected or colonised with CPE), followed or not by secondary case(s).

Source: Fournier S, et al. Eurosurveillance (15 May 2014).

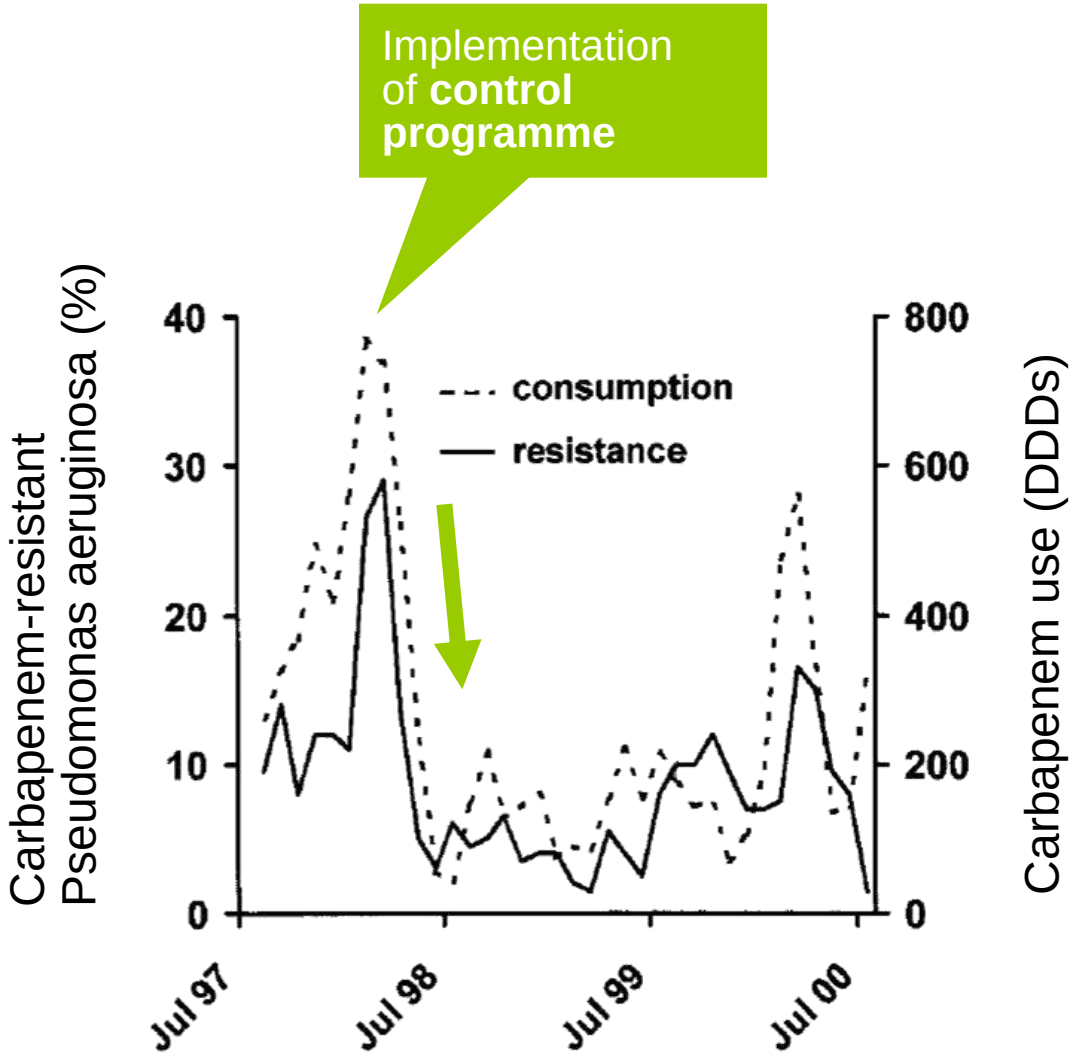
Infection prevention and control measures and tools to prevent entry of carbapenem-resistant *Enterobacteriaceae* (CRE) into healthcare settings: ECDC guidance

- **Core measures**
- Profile for **"at risk" patients** who require supplemental measures
- **Preliminary supplemental measures** (at admission, for "at risk" patients)
- **Supplemental measures** (for confirmed CRE-positive patients)



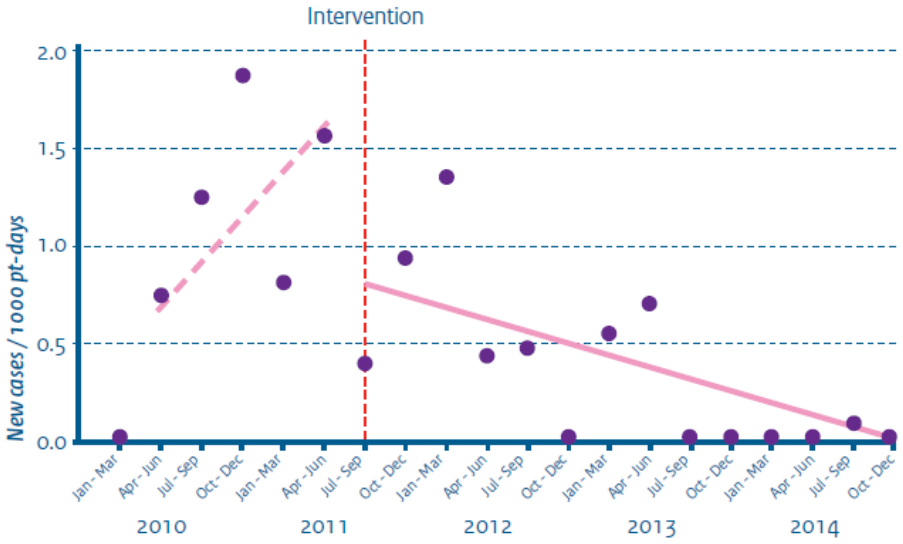
Source: Magiorakos *et al.* Antimicrob Resist Infect Control (15 November 2017).

Antimicrobial consumption drives antimicrobial resistance in hospitals

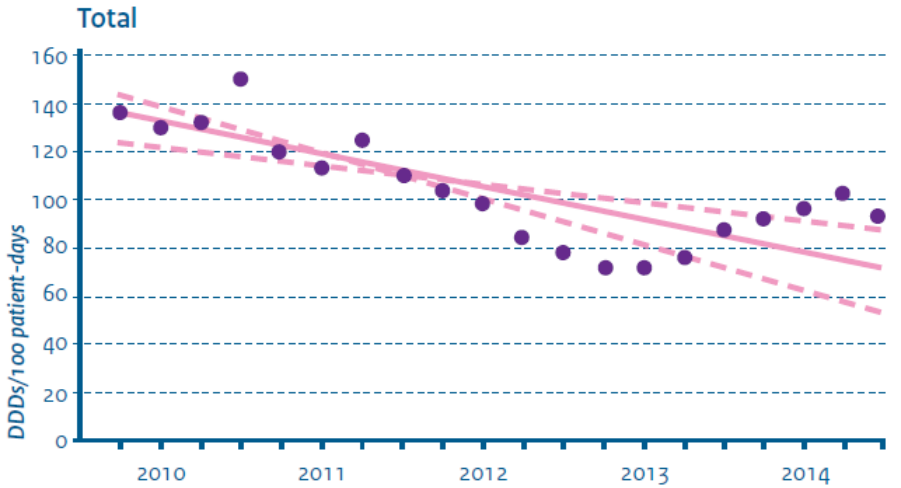


Source: Lepper PM, et al. Antimicrob Agents Chemother 2002 Sep;46(9):2920-5.

Intervention to control carbapenem-resistant *Klebsiella pneumoniae*, onco-haematology unit, Greece, 2011-2014



Incidence Rate of CP-Kp BSIs Before and After Intervention



Total Antibiotic consumption

Source: AMR Next, 2016. https://www.government.nl/documents/leaflets/2016/04/18/factsheet-eu-antimicrobial-resistance-one-health-ministerial-conference-2016

Example of national initiative on surgical prophylaxis, Belgium, 1997

- Royal Decree: reimbursement of prophylactic antibiotics by surgical procedure, 1997
- Prophylaxis given when indicated:
  from 92.3% (1992-1996)
  to 95.3% (1998-1999)
- Prolonged administration:
  from 19.8% to 9.9%
- Use of more than one antibiotic per procedure:
  from 16.3% to 5.5%


Photo: Thorsten Schmidt, 2006.

Source: Carsauw H, et al. ICHE 2000; 21: 89 & Goossens H, et al. 40th ICAAC, 2000, abstr. O-111.

EUROPEAN ANTIBIOTIC AWARENESS DAY

A EUROPEAN HEALTH INITIATIVE

English (en)

Plan a campaign | For healthcare workers | Get informed | Get involved | Campaigns in Europe | News | About

Communicating to professionals in hospitals and long-term care facilities

Up to half of all antibiotic use in hospitals is unnecessary of inappropriate. Antibiotic misuse in hospitals is a major driver of antibiotics resistance. What can be done?

View materials

New communication toolkit | Patient stories | Data and reports

#KeepAntibioticsWorking: join us on social media!

As a healthcare professional, **what can you do to keep antibiotics working?** What can a patient association do to contribute? What can policymakers do at European level? What can a parent do? Everyone can join the campaign on European Antibiotics Awareness Day- posting his/her own **message**, **picture** or **video** using the **#KeepAntibioticsWorking** hashtag. Tell the world what you do, in your professional or personal life, at individual or collective level, to use antibiotics responsibly and **#KeepAntibioticsWorking!**

Read about the #KeepAntibioticsWorking campaign

https://antibiotic.ecdc.europa.eu

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Home > For healthcare workers > Materials for professionals in hospitals and other healthcare settings

- For healthcare workers
- Materials for primary care prescribers
- **Materials for professionals in hospitals and other healthcare settings**

Materials for professionals in hospitals and other healthcare settings

Materials for professionals in hospitals and other healthcare settings, such as long-term care facilities, who have different roles and influence in the use of antibiotics in such settings.

All | Prescribers | Nurses | Long-term care | Intensive care unit | Other professionals

General key messages for healthcare professionals in hospitals and other healthcare settings

Data

Factsheet for professionals in hospitals and other healthcare settings

factsheet, information material, toolkit material

Data

Infographics about antibiotic stewardship programmes

infographic, information material, toolkit material

https://antibiotic.ecdc.europa.eu

New EAAD toolkit (1)

- **Objective**
  - to support efforts to increase prudent use of antibiotics in hospitals and other healthcare settings through dissemination of evidence-based educational and information materials.
- Review of the scientific literature by ECDC experts (**"evidence-based"**, 111 references) and extensive consultation and editing process.
- Some of the messages are indicated to be **"expert consensus"**: agreement reached by ECDC experts, EAAD Technical Advisory Committee members, and other external experts and stakeholders.

New EAAD toolkit (2)

- **Key messages**
- Primary target audience: **professionals in hospitals and other healthcare settings**, who have different roles and influence in the use of antibiotics in such settings:
  - Managers/administrators,
  - Infectious disease specialists,
  - Infection prevention and control professionals,
  - Epidemiologists,
  - Prescribers,
  - Junior doctors and students,
  - Pharmacists,
  - Nurses,
  - Clinical microbiologists,
  - Professionals in emergency departments,
  - Professionals in intensive care units,
  - Professionals in long-term care facilities

Key messages for professionals in hospitals and other healthcare settings

All prescribers

Healthcare professionals in hospitals and other healthcare settings

Hospital infectious disease specialists

Hospital managers / administrators

Infection prevention and control professionals and hospital epidemiologists

Key messages for hospital

Key messages for hospital managers / administrators

Tasks

1. Your tasks related to improving antibiotic use include [31,42,56,71,75]:

a) Establishing a multidisciplinary team for your hospital antibiotic stewardship programme. This team should include infectious disease specialists, clinical microbiologists and pharmacists, and should receive dedicated funding and resources;

b) Supporting implementation of antibiotic guidelines and infection prevention and control measures;

c) Implementing targeted educational activities and training that:

i. optimise the diagnostic and therapeutic management of patients;

Things you should know

Things you can do in your hospital or institution

New EAAD materials

- Aim at creating a **sense of individual responsibility** in tackling antibiotic resistance and at **empowering professionals to take action**.

- Include one slogan, linking all materials: **"Antibiotics: handle with care".**

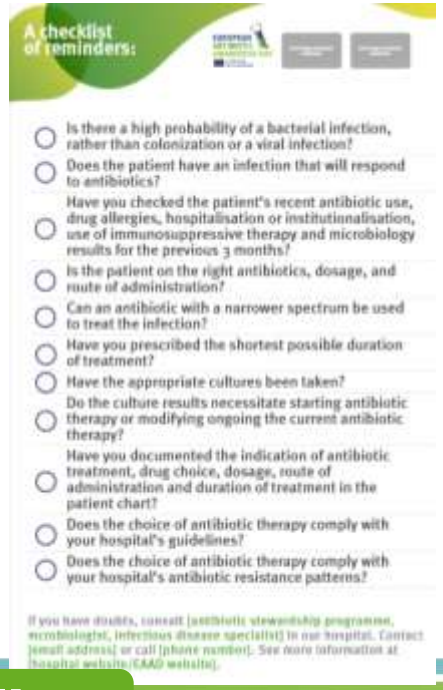
- Available in Adobe InDesign, Microsoft Word and Microsoft PowerPoint, which makes it easy to adapt them by anyone with experience in any of these three software packages.

- Need to be adapted to national contexts to better respond to specific communication needs.

Posters

https://antibiotic.ecdc.europa.eu

Letters



Checklists

Leaflets

https://antibiotic.ecdc.europa.eu

A forward look

- **Burden of antimicrobial resistance (AMR) for the EU/EEA** (Q2 2018)
- **Annual update on AMR and antimicrobial consumption in humans in the EU/EEA** (November 2018)
- **ECDC point prevalence surveys of HAIs, AMR and antimicrobial use in European acute care hospitals and in long-term care facilities, 2016-2017** (ECDC publications, November 2018)
- Contribution to the implementation of the **European One Health Action Plan against Antimicrobial Resistance (AMR)**

Thank you!

EUROPEAN ANTIBIOTIC AWARENESS DAY

A EUROPEAN HEALTH INITIATIVE

18 November 2017

EU event, Brussels, 15 November 2017

E-mail: EAAD@ecdc.europa.eu
Website: https://antibiotic.ecdc.europa.eu
Facebook: EAAD.EU
Twitter: @EAAD_EU (#EAAD)
Global Twitter: #AntibioticResistance

ecdc

WORLD ANTIBIOTIC AWARENESS WEEK

13-19 NOVEMBER 2017

ANTIBIOTICS HANDLE WITH CARE