



One Health Network on Antimicrobial Resistance (AMR)

AMR epidemiological situation: ECDC update

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

Brussels, 5 February 2018

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

Antimicrobial Resistance and Healthcare-Associated Infections (ARHAI) Networks

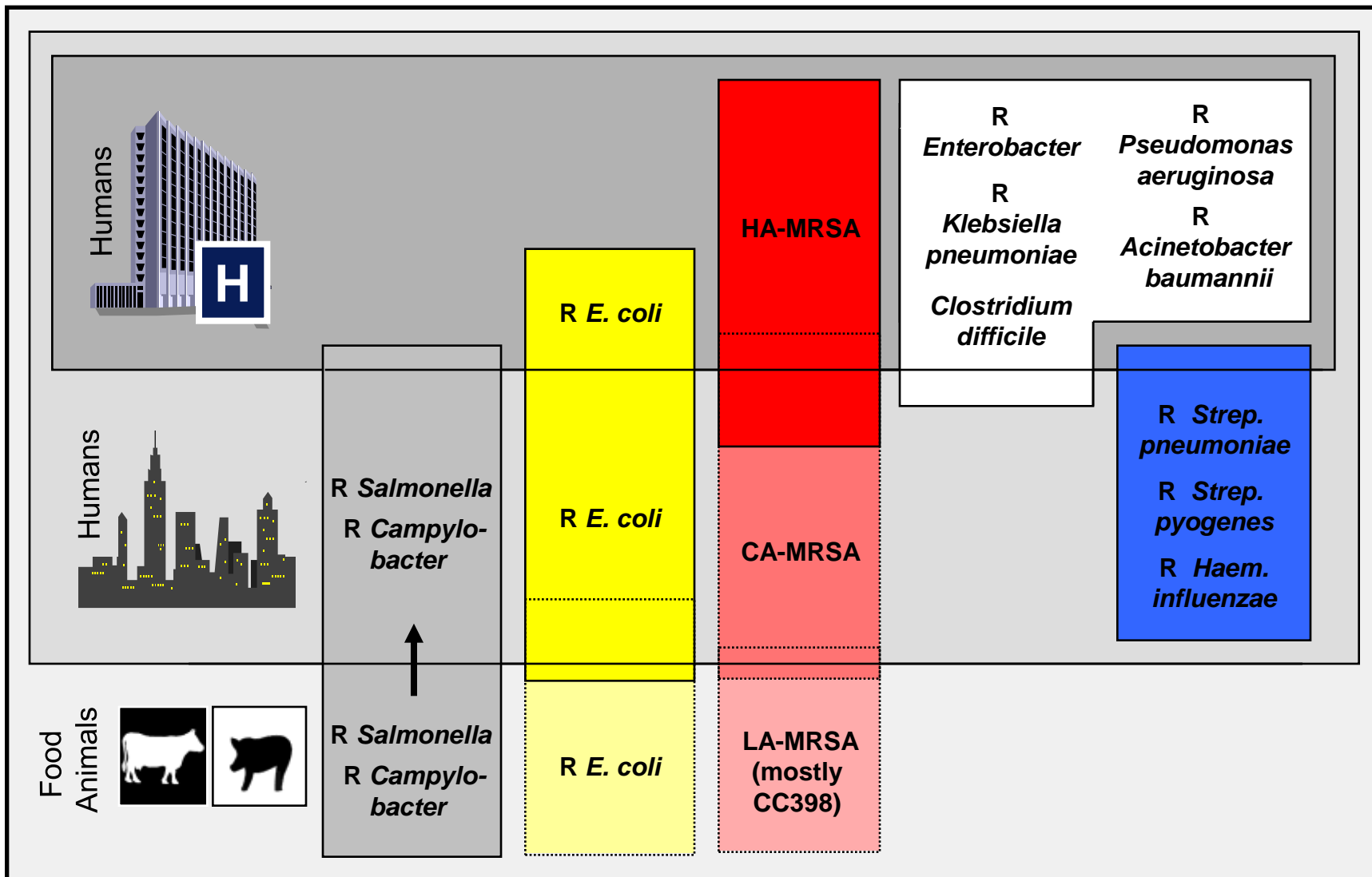
- **European Antimicrobial Resistance Surveillance Network (EARS-Net)**
(formerly EARSS, integrated in January 2010)
- **European Surveillance of Antimicrobial Consumption Network (ESAC-Net)**
(formerly ESAC, integrated in July 2011)
- **Healthcare-Associated Infections surveillance Network (HAI-Net)**
(formerly HELICS / IPSE, integrated in July 2008)

Participation in ECDC networks: No. of EU/EEA countries reporting data to TESSy



Network	Type of surveillance	No. countries	Year
EARS-Net	AMR (<i>S.aureus</i> , <i>E. coli</i> , <i>K. pneumoniae</i> , etc.)	30	2016
FWD-Net	AMR (<i>Salmonella</i> spp.)	24	2015
	AMR (<i>Campylobacter</i> spp.)	19	
ESAC-Net	Antimicrobial consumption – Community	29	2016
	Antimicrobial consumption – Hospital sector	23	
HAI-Net	2nd PPS of HAI and antimicrobial use (incl. AMR)	28	2016-2017
	Surgical site infections (incl. AMR)	16	2015
	HAI in intensive care units (incl. AMR)	15	2015
	HAI and antimicrobial use in LTCFs (incl. AMR)	23	2016-2017
	<i>Clostridium difficile</i> infections	20	2016

Compartments of antimicrobial resistance



Community

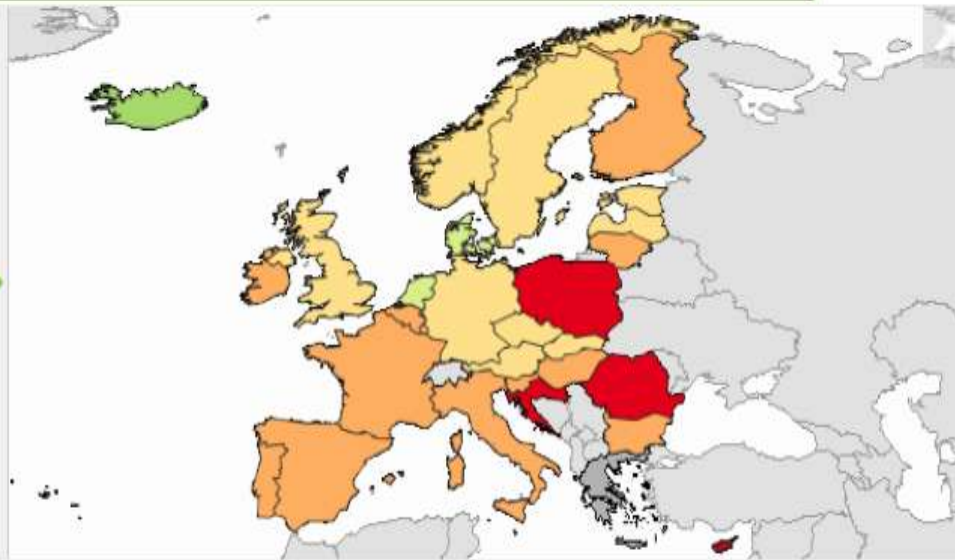


Antimicrobial resistance ▾ Streptococcus pneumoniae ▾ Macrolides ▾ Resistant (R) isolates proportion ▾

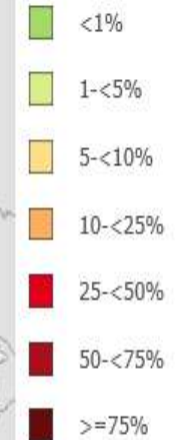
2016 ▾



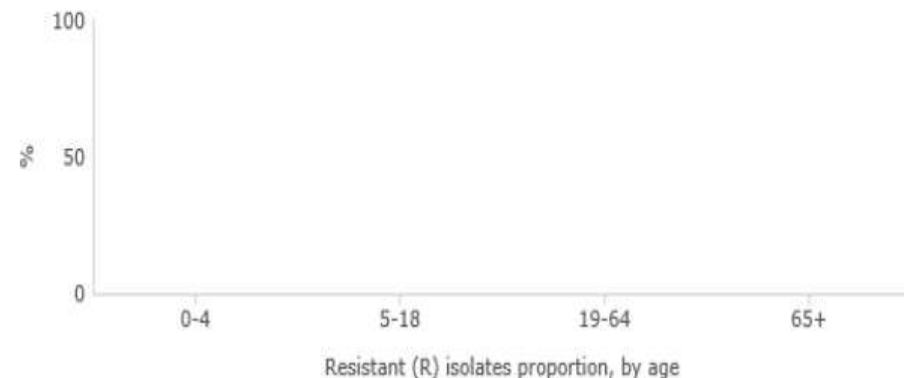
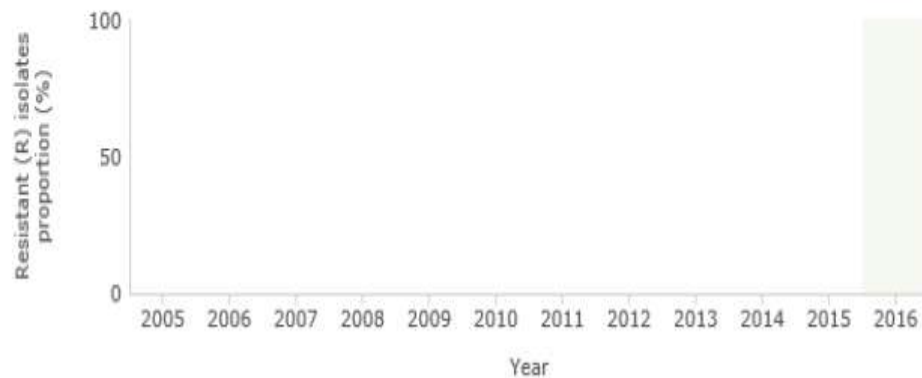
Region	Resistant (R) isolates proportion (%)
Austria	8.6
Belgium	15.7
Bulgaria	21.9
Croatia	33.8
Cyprus	60.0
Czech Republic	7.2
Denmark	4.8
Estonia	7.0
Finland	11.4



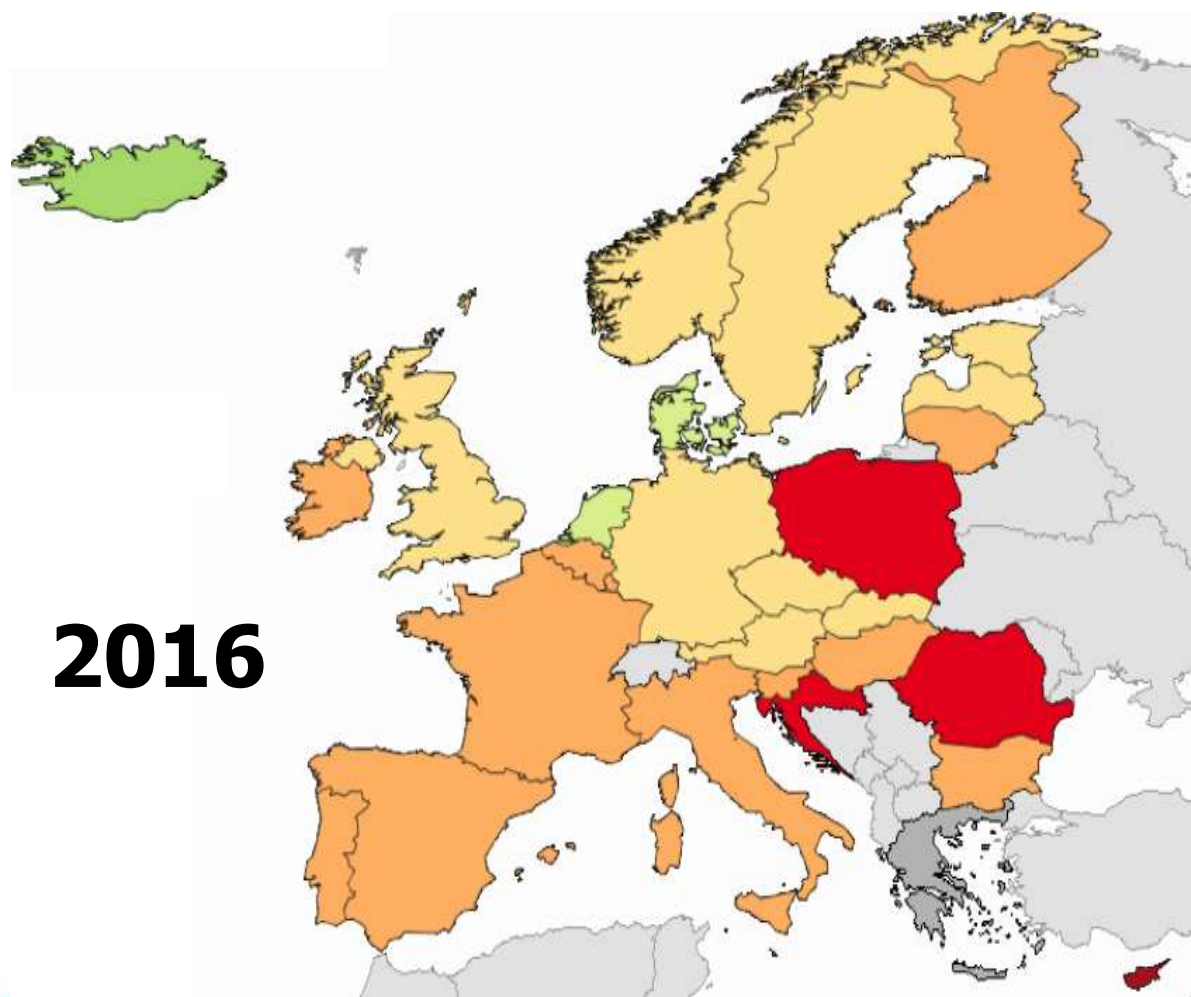
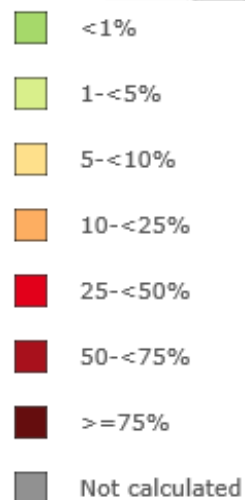
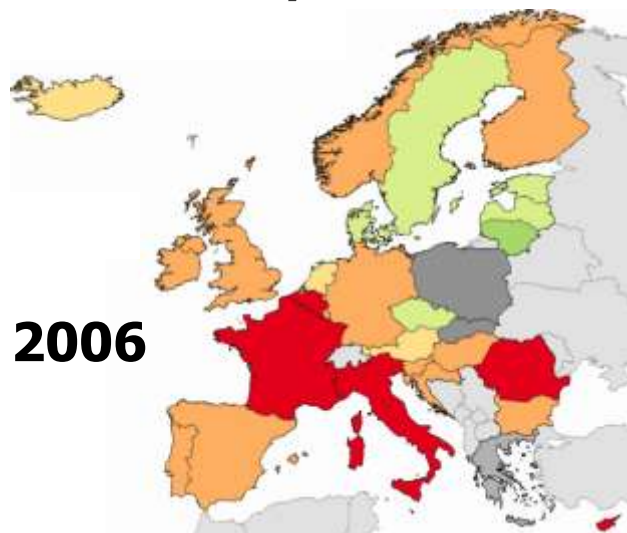
Resistant (R) isolates proportion (%)



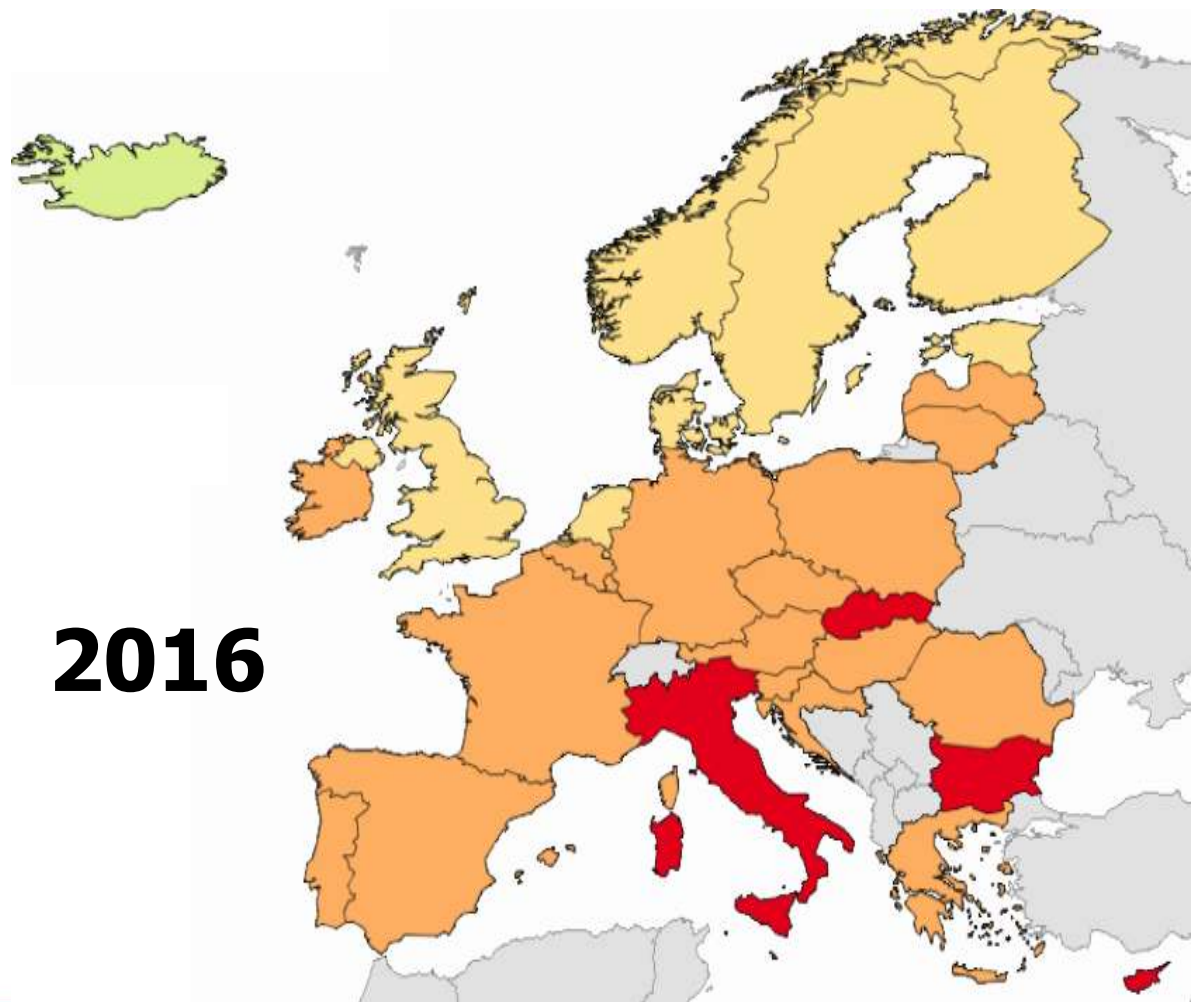
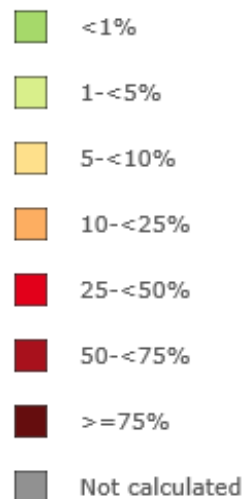
Resistant (R) isolates proportion, by age ▾ Bar ▾



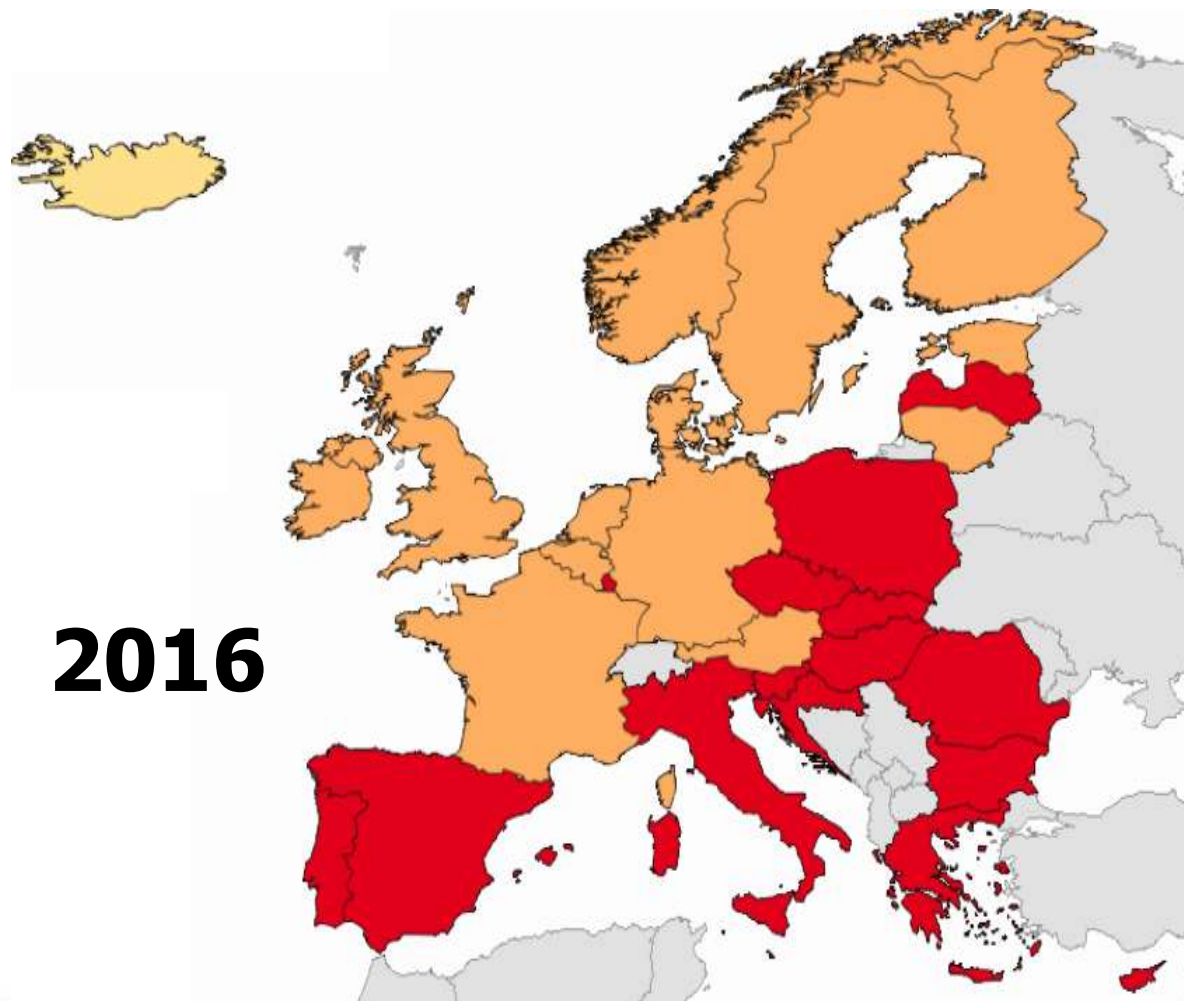
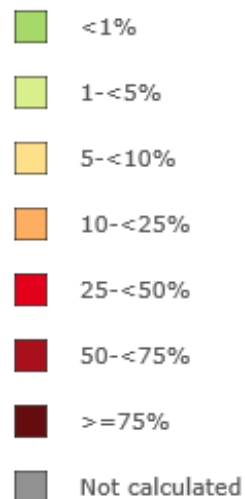
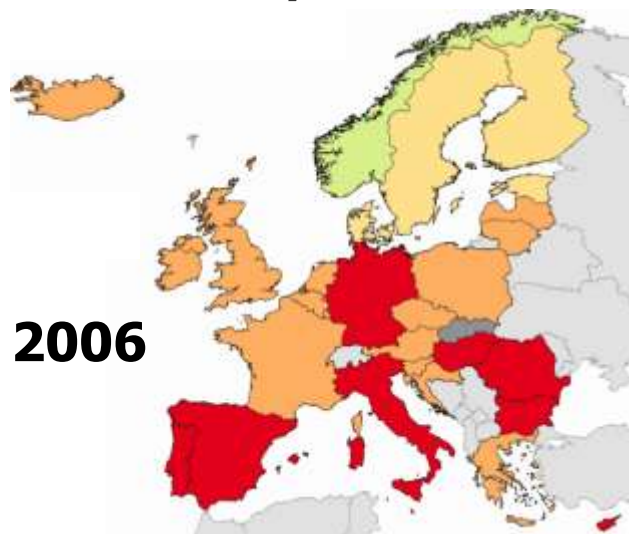
Streptococcus pneumoniae: % of invasive isolates with resistance to macrolides, EU/EEA, 2006 & 2016



Escherichia coli: percentage of invasive isolates resistant to third-generation cephalosporins, EU/EEA, 2006 & 2016



Escherichia coli: percentage of invasive isolates resistant to fluoroquinolones, EU/EEA, 2006 & 2016



Hospitals

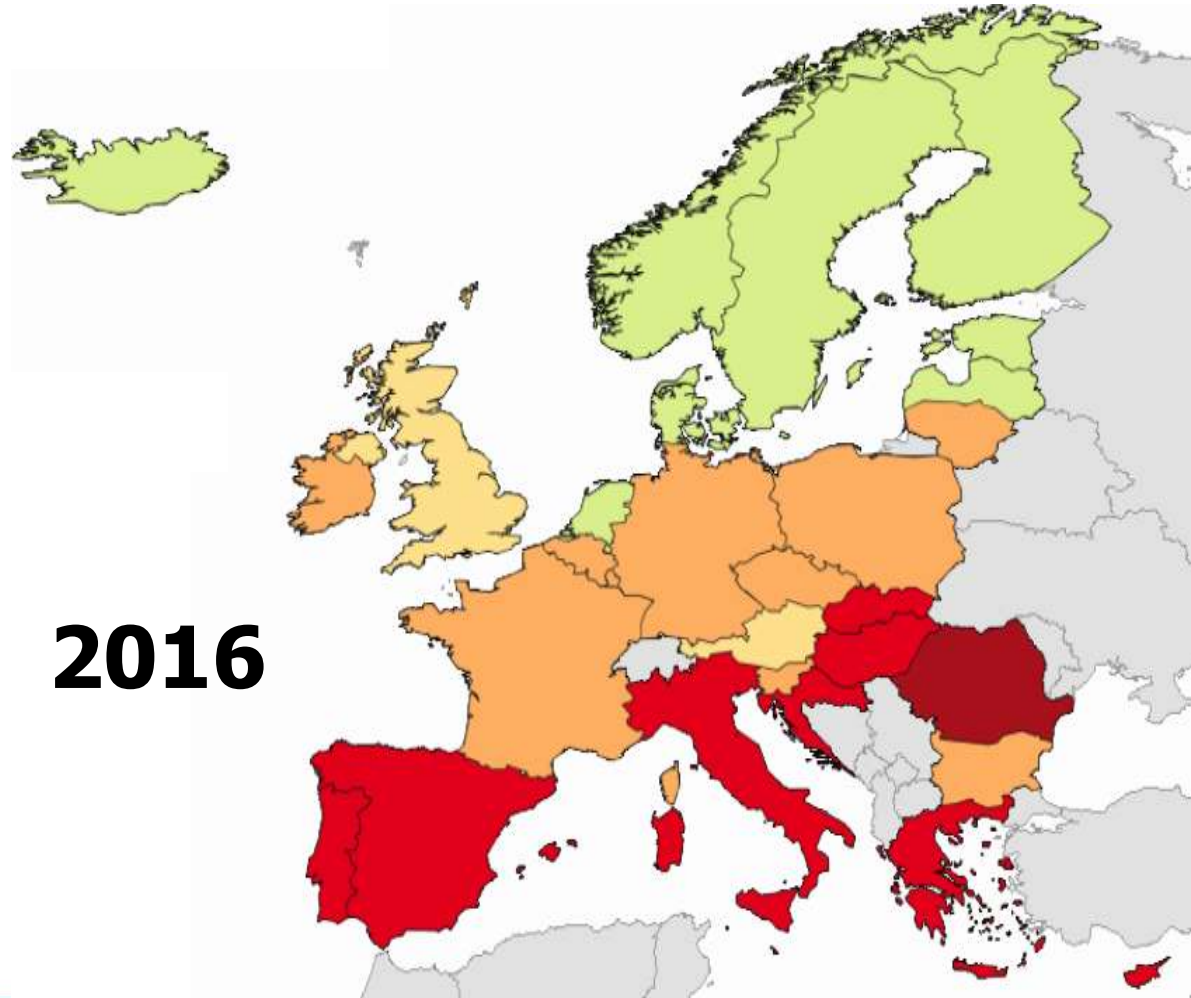
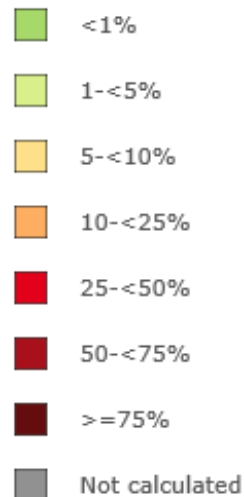


Photo: Luis García

Staphylococcus aureus: % of invasive isolates with resistance to meticillin (MRSA), EU/EEA, 2006 & 2016



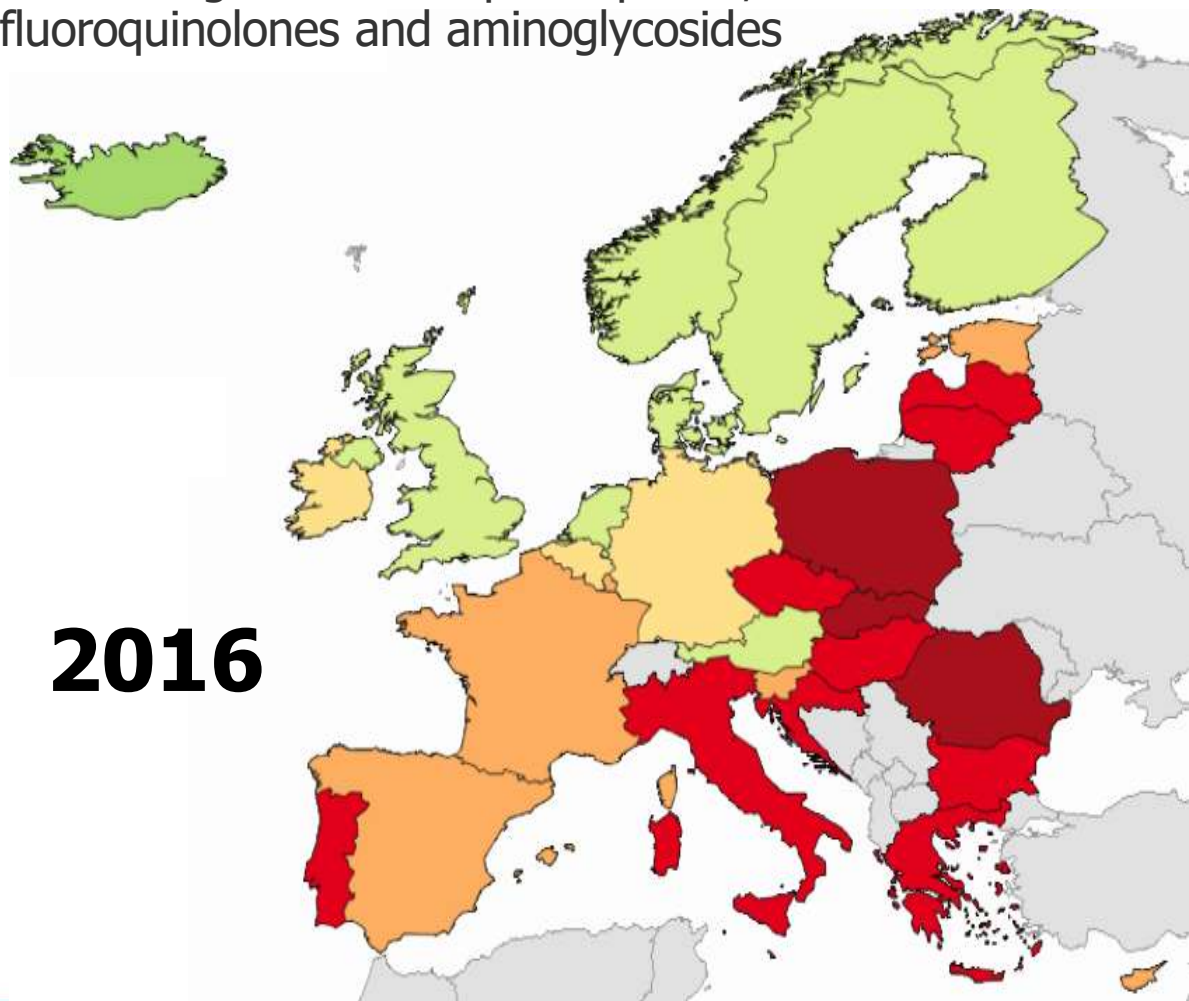
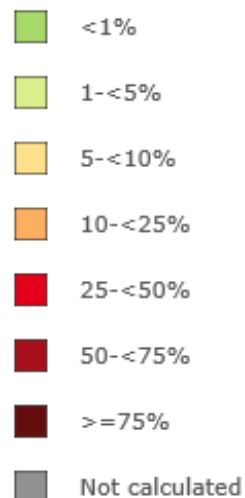
2006



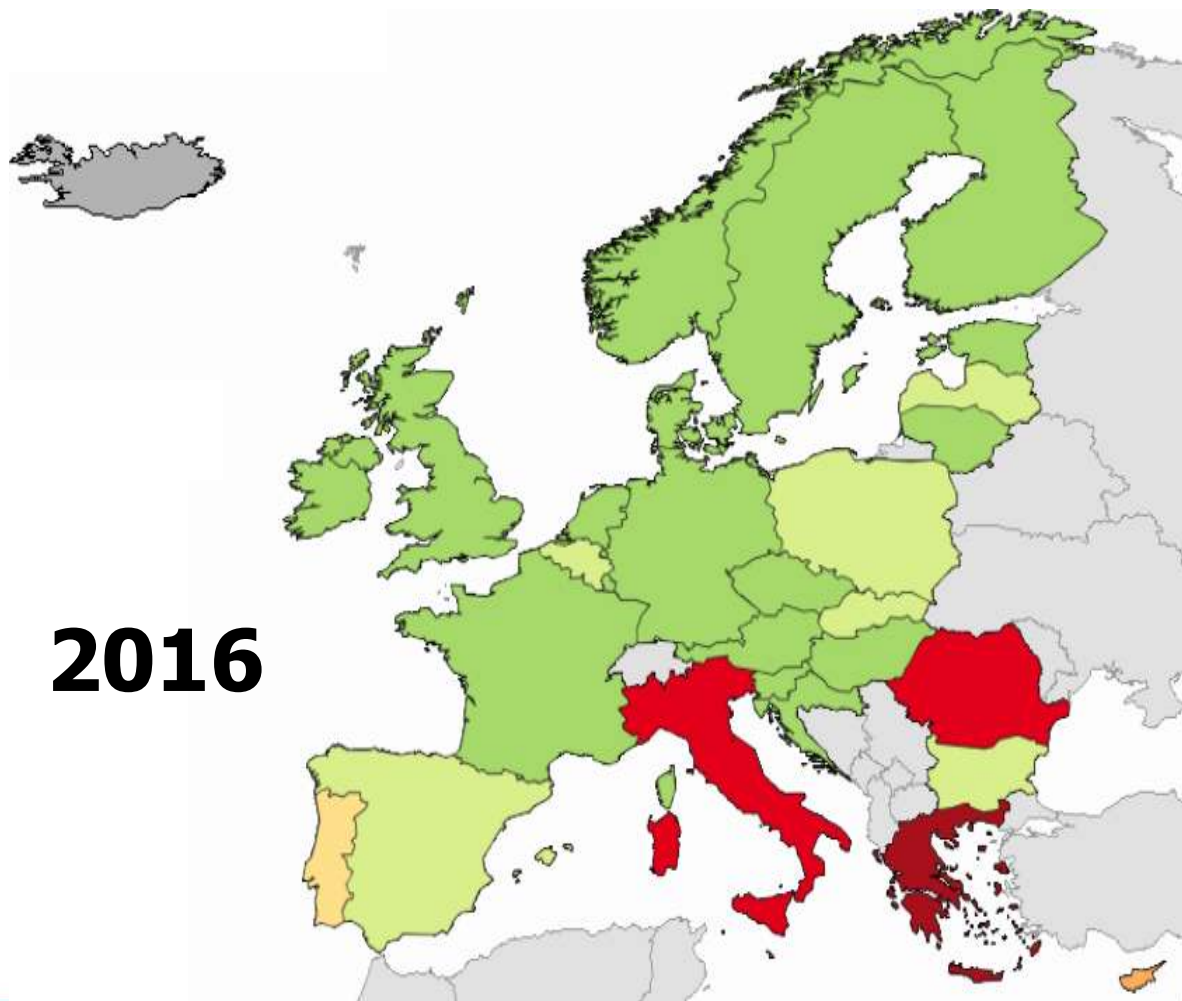
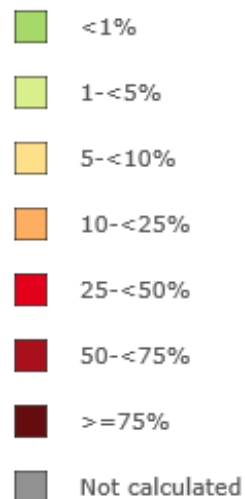
2016

Klebsiella pneumoniae: % of invasive isolates with combined resistance*, EU/EEA, 2006 & 2016

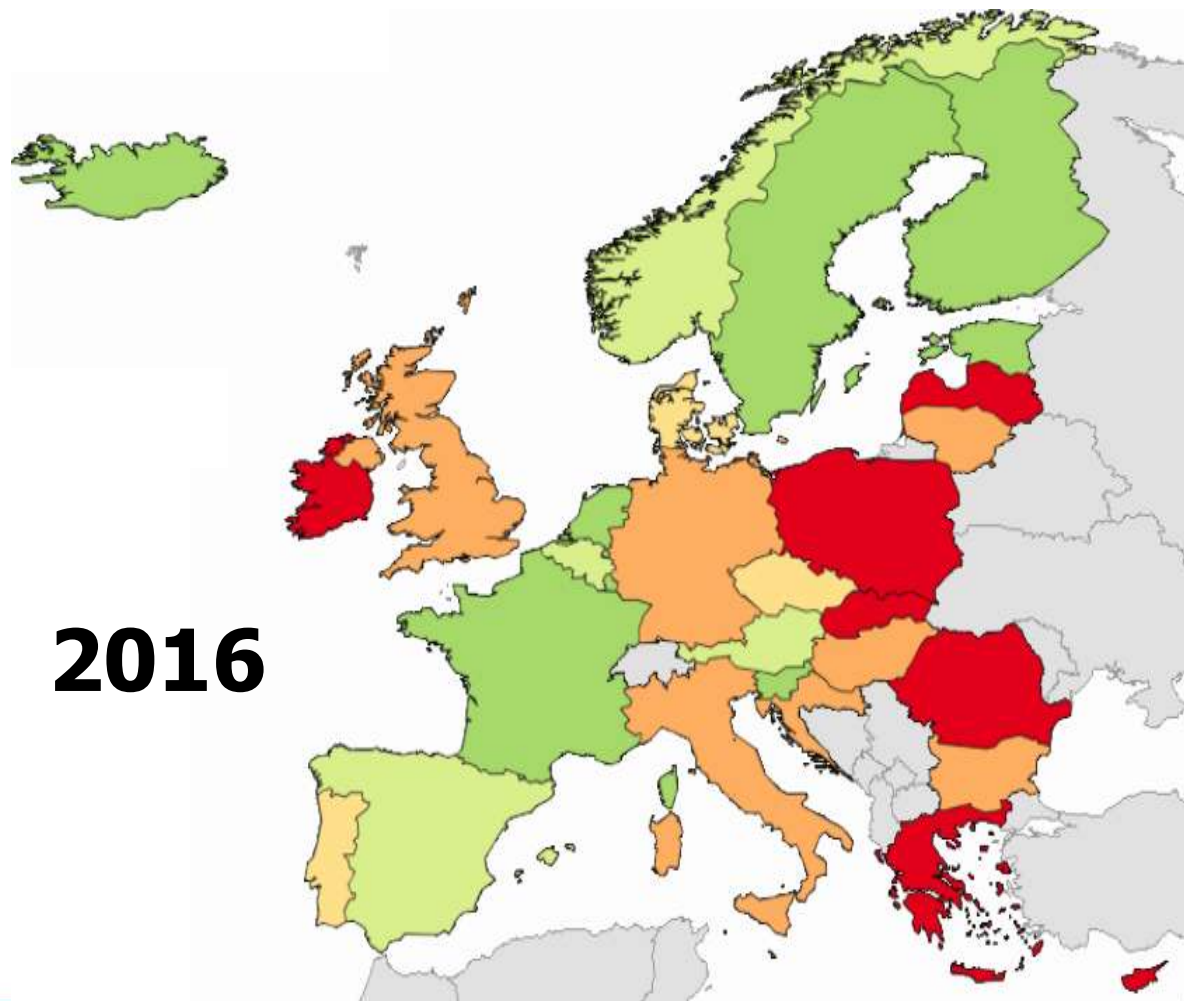
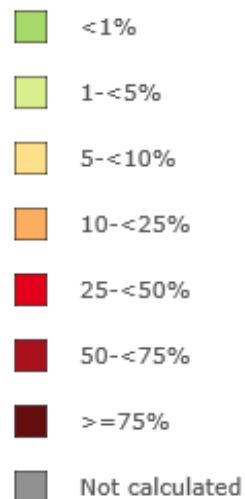
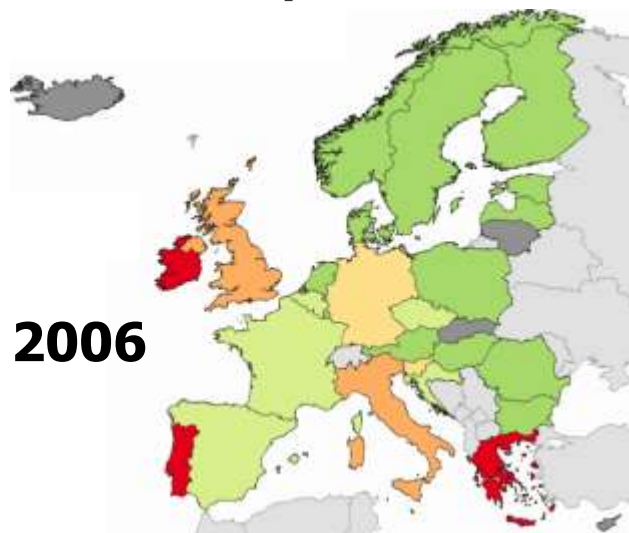
*Third-generation cephalosporins, fluoroquinolones and aminoglycosides



Klebsiella pneumoniae: % of invasive isolates with resistance to carbapenems, EU/EEA, 2006 & 2016



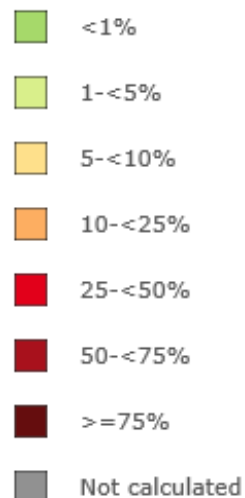
Enterococcus faecium: % of invasive isolates with resistance to vancomycin, EU/EEA, 2006 & 2016



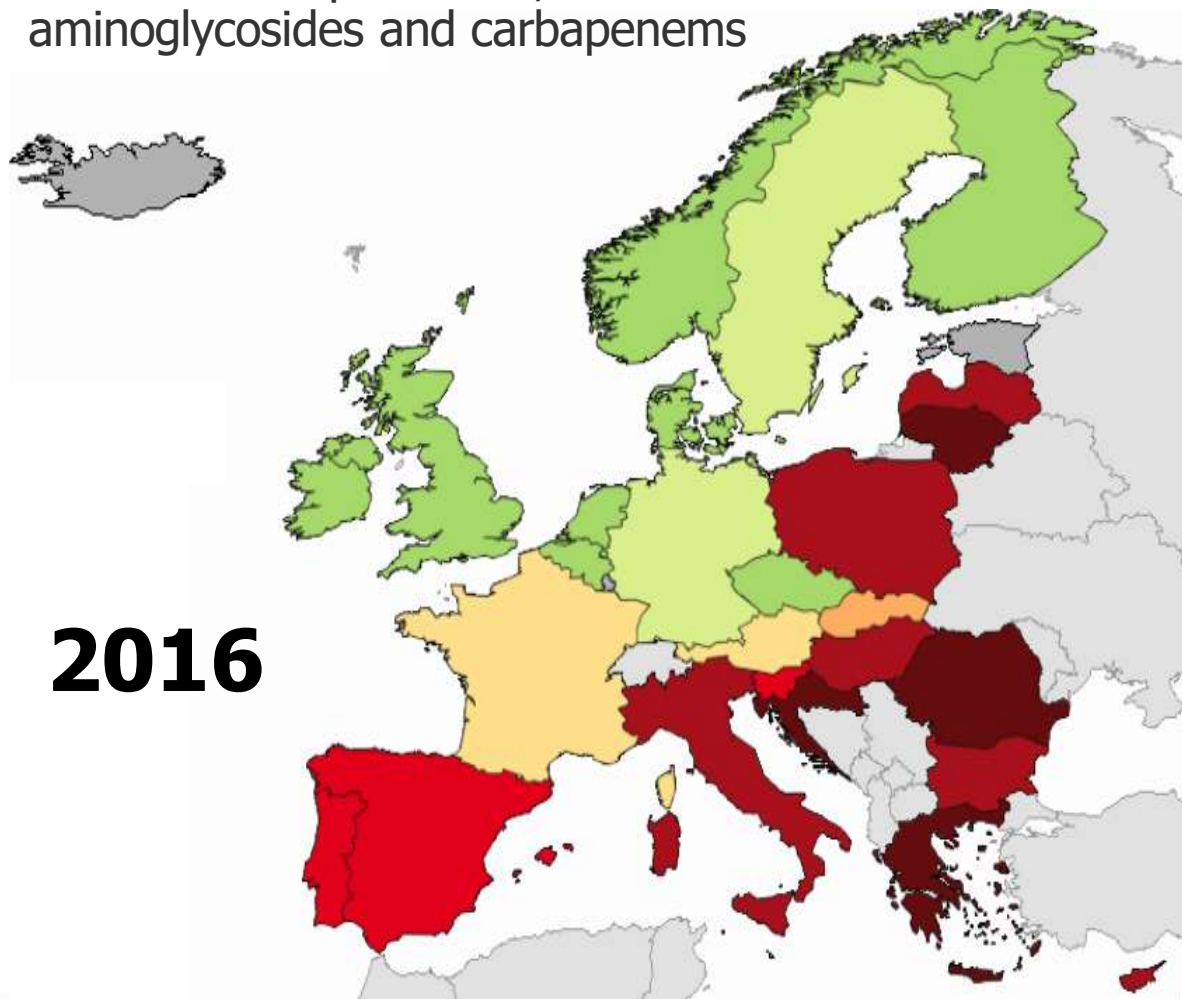
Acinetobacter spp.: % of invasive isolates with combined resistance*, EU/EEA, 2012 & 2016

*Fluoroquinolones,
aminoglycosides and carbapenems

2012



2016





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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 ▶



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[← Surveillance and disease data](#)

Antimicrobial consumption database (ESAC-Net)

tool



The ESAC-Net interactive database provides European reference data on antimicrobial consumption, both in the community and the hospital sector. The reports of the database are provided through the European Surveillance System (TESSy). The [Anatomical Therapeutic Chemical \(ATC\) classification system](#) is used for the allocation of antimicrobials in groups. Data are presented up to the fourth level of this classification.

Country overview ▶

Overview of antimicrobial consumption in Europe - interactive reports per country and year

Data source overview ▶

Data source overview of antimicrobial consumption in Europe, all countries and years

Geographical distribution ▶

Distribution of consumption by type of antimicrobial, type of care, year

Quality indicators for consumption in the community ▶

Distribution by antimicrobial group ▶

Distribution of antimicrobial

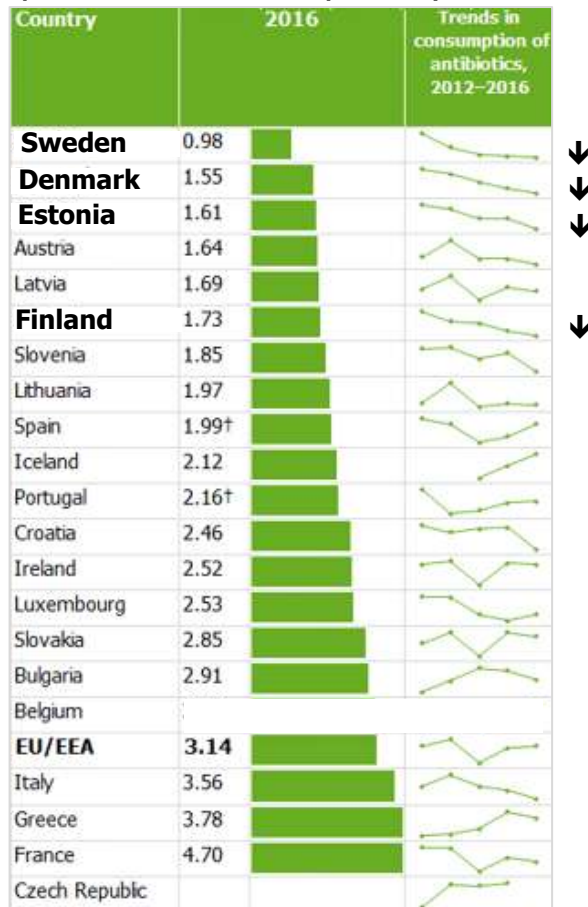
Rates by country ▶

Interactive reports by antimicrobial type of care year

Defined daily doses (DDD) per 1000 inh. and per day



Packages per 1000 inh. and per day



- * Total care data, including the hospital sector.
- † Reimbursement data (i.e. not including consumption without a prescription and other non-reimbursed courses).

Consumption of antibiotics for systemic use (ATC group J01) in the community, EU/EEA, 2012-2016

Consumption of antibiotics for systemic use (ATC J01) in the hospital sector, EU/EEA, 2012-2016 (DDD per 1000 inhabitants and per day)

Country	2012	2013	2014	2015	2016	Trends in antimicrobial consumption, 2012-2016
Netherlands	0.96	0.95	0.95	0.98	0.97	
Hungary	1.23	1.20	1.25	1.23	1.18	
Poland			1.43	1.43	1.36	
Norway	1.44	1.39	1.41	1.40	1.38	
Portugal (b)	1.46	1.64	1.55	1.57	1.58	
Belgium	1.71	1.67	1.60	1.67	1.63	
Bulgaria	1.37	1.38	1.40	1.37	1.63	
Sweden	1.65	1.67	1.57	1.67	1.65	
Slovenia	1.56	1.55	1.61	1.68	1.69	↑
Estonia	2.00	1.79	1.81	1.74	1.70	↓
Luxembourg	2.02	2.00	1.81	1.78	1.73	↓
Ireland	1.76	1.79	1.66	1.91	1.83	
Croatia	1.97	1.79	1.85	1.90	1.87	
Denmark	1.78	2.02	2.13	2.34	1.99	
EU/EEA	1.95	2.03	2.00	2.04	2.06	
Latvia	2.24	2.28	2.24	2.24	2.10	
France	2.12	2.17	2.20	2.18	2.19	
Greece	1.90	2.00	2.11	2.14	2.39	↑
Italy	2.40	2.16	2.15	2.36	2.47	
Slovakia	2.02	2.30	2.47	2.40	2.49	
Finland (a)	2.79	2.77	2.64	2.50	2.52	↓
United Kingdom		2.45	2.59	2.55	2.58	
Lithuania	2.39	2.39	2.35	2.54	2.59	
Malta	1.44	1.75	2.18	2.86	2.89	↑

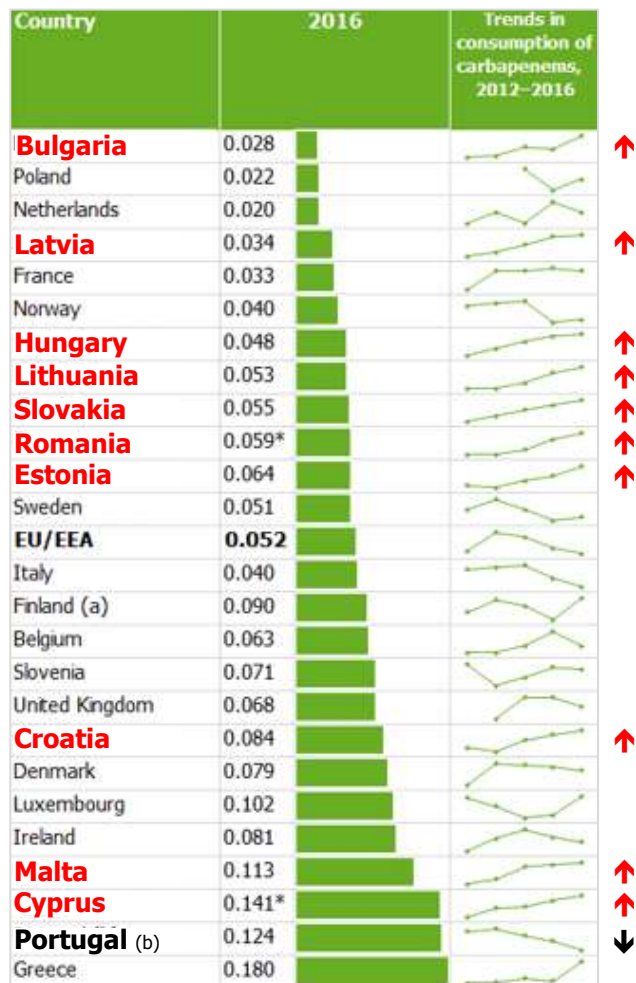
(a) Finland: data include consumption in remote primary healthcare centres and nursing homes.

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

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

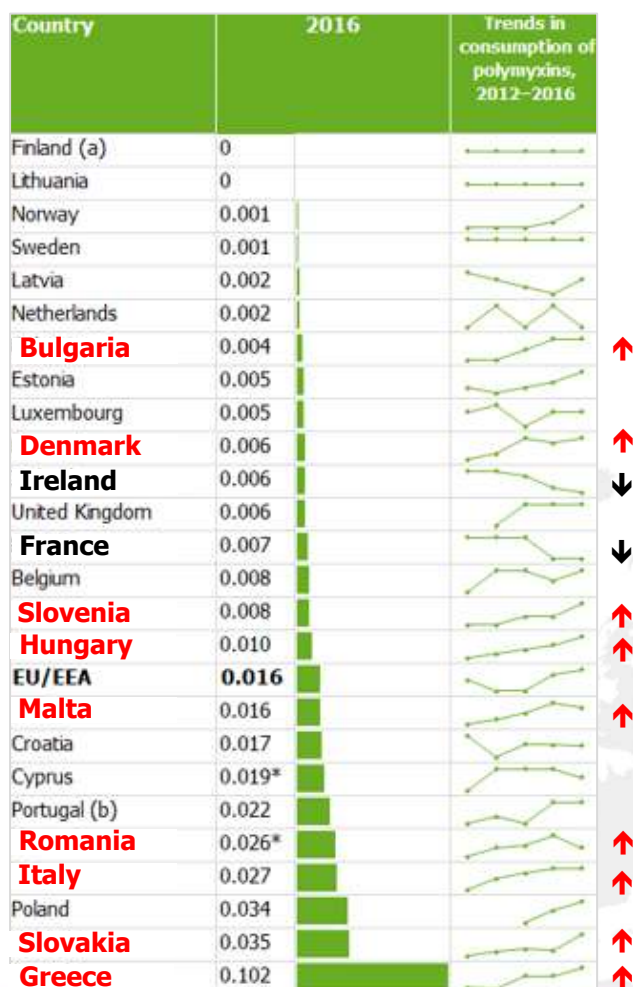
Carbapenems

(DDD per 1000 inh. and per day)



Polymyxins (mainly colistin)

(DDD per 1000 inh. and per day)



* 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.



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, EUVEEA 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



National strategies and action plans on antimicrobial resistance



GLOBAL

WORLD HEALTH ORGANIZATION (WHO) AND WHO MEMBER STATES

- [Global action plan on antimicrobial resistance \(2019\)](#) ⁺
- [Manual for developing national action plans, library of national action plans, and support tool including templates \(2019\)](#) ⁺

EUROPE

WHO/EUROPE MEMBER STATES

- [European strategic action plan on antibiotic resistance \(2017\)](#) ⁺

COUNCIL OF THE EUROPEAN UNION (EU)

- [Council recommendation of 10 November 2001 on the prudent use of antimicrobial agents in human medicine \(2002/771/EC\)](#) ⁺

EUROPEAN COMMISSION

- [European One Health Action Plan against Antimicrobial Resistance \(AMR\) \(European Commission, 2017\)](#) ⁺
- [Action plan against the rising threats from Antimicrobial Resistance \(COM\(2015\) 742\)](#) ⁺
- [Action on antimicrobial resistance at EU level](#) ⁺

EU/EEA MEMBER STATES

AUSTRIA

- [National action on antimicrobial resistance \(Ministry of Health, 2014\)](#) ⁺
[Nationaler Aktionsplan zur Antibiotikaresistenz](#) ⁺

CZECH REPUBLIC

- [Action Plan of the National Antibiotic Programme for the period 2011-2015 \(Ministry of Health, 2011\)](#) ⁺
[Akční plán Národního antibiotického programu pro období 2011-2015 \(Ministerstvo zdravotnictví, 2011\)](#) ⁺

CYPRUS

- [National strategy of Cyprus against microbial resistance to antibiotics \(Ministry of Health, 2012\)](#) ⁺
[Εθνική Στρατηγική Μάχη για την Αντιμικροβιακή Αντίσταση, για Antibiotics](#) ⁺

DENMARK

- [National action plan on antimicrobial resistance \(Indenrigs- og Sundhedsministeriet, Ministeriet for Fødevarer, Landbrug og Fiskeri, 2010\)](#) ⁺
[Fælles antibiotika og resistenshandlingsplan](#) ⁺

FRANCE

- [Interministerial roadmap for controlling antimicrobial resistance \(Ministry of Solidarity and Health, 2019\)](#) ⁺
[Interministérielle roadmap for controlling antimicrobial resistance](#) ⁺

GERMANY

- [National action plan on prevention of antimicrobial resistance \(Die Bundesregierung, 2015\)](#) ⁺
[GAP 2020 – Antibiotika-Resistenzsenkungsplan zum Wohl von Mensch und Tier](#) ⁺
[GAP 2020 – Fighting antibiotic resistance for the good of both humans and animals \(English version\)](#) ⁺

GREECE

- [National Action Plan "Proctusis" \(Hellenic Center for Disease Control and Prevention, 2016\)](#) ⁺
[Σχέδιο δράσης "Proctusis"](#) ⁺
- [National Action Plan \(2008-2012\) \(Hellenic Center for Disease Control and Prevention, 2008\)](#) ⁺
[Εθνικό Σχέδιο Δράσης για την Αντιμικροβιακή Αντίσταση και Αντιβίωση σε νέα λοιμώξεις και λοιμώξεις, Τροπικά, Υπερθερμία, 2008-2012](#) ⁺

IRELAND

- [Ireland National Action Plan on Antimicrobial Resistance 2017-2020 – NAP \(Department of Health, 2017\)](#) ⁺
[Ireland National Action Plan on Antimicrobial Resistance 2017-2020 – NAP](#) ⁺

ITALY

- [National Plan against Antimicrobial Resistance 2017-2020 \(Ministry of Health, 2017\)](#) ⁺
[Piano Nazionale di Contrasto dell'Antimicrobica Resistenza \(PNCAR\) 2017-2020](#) ⁺
- [Opuscolo – PNCAR – Piano nazionale di contrasto dell'antimicrobica resistenza 2017-2020](#) ⁺
- [Leaflet – PNCAR – National action plan on antimicrobial resistance 2017-2020](#) ⁺

NETHERLANDS

- [Dutch National Action Plan on AMR \(Ministry of Health, Welfare and Sport, 2011\)](#) ⁺
[Kamerstuk over strategie antimicrobiële resistentie](#) ⁺
[Letter to parliament about the approach to antibiotic resistance](#) ⁺

NORWAY

- [Action plan against antibiotic resistance in healthcare \(Helse- og omsorgsdepartementet, 2015\)](#) ⁺
[Handlingsplan mot antibiotikaresistens i helsevesen](#) ⁺
- [National strategy against antibiotic resistance \(2015-2020\) \(Norwegian Ministry, 2015\)](#) ⁺
[Nasjonal strategi mot Antibiotikaresistens 2015-2020](#) ⁺
[National Strategy against Antibiotic Resistance 2015-2020 \(English version\)](#) ⁺

PORTUGAL

- [Programme on prevention and control of infection and antimicrobial resistance \(Directorate-General of Health, Ministry of Health, 2012\) \(Programa de Prevenção e Controlo de Infecções e Resistências aos Antimicrobianos Orientações Programáticas\)](#) ⁺
[Resolução do Programa Nacional de Prevenção e Controlo de Infecções e de Resistência a Antimicrobianos \(PNCIRA\) \(OGDI/DG\) de 2013\(2014\)](#) ⁺
- [National Action Plan for the Reduction of Antibiotic Use in Animals \(Food and Veterinary Directorate-General, Ministry of Agriculture and Sea, 2013\)](#) ⁺
[Plano de Ação Nacional para a Redução do Uso de Antibióticos nos Animais](#) ⁺

SPAIN

- [Strategic Action Plan to reduce the risk selection and dissemination of antibiotic resistance \(Ministry of Health, Social Services and Equality, Spanish Agency of Medicines and Medical Devices, 2014\)](#) ⁺
[Plan estratégico y de acción para reducir el riesgo de selección y diseminación de resistencias a los antibióticos](#) ⁺
[Strategic action plan for the prevention of the antimicrobial resistance selection and dissemination of antibiotic resistance \(English version\)](#) ⁺
- [Plan Nacional de Resistencia a los Antibióticos \(PRAN\)](#) ⁺

SWEDEN

- [Swedish strategy to combat antibiotic resistance \(Government of Sweden, 2016\)](#) ⁺
[Swedish strategy to combat antibiotic resistance \(2016\)](#) ⁺
- [Swedish strategy for antibiotic resistance \(2015\)](#) ⁺
- [Swedish strategy for antibiotic resistance – Sáttis \(2016\)](#) ⁺
- [National strategy on prevention of antimicrobial resistance and health-care-associated infections \(Government of Sweden, 2005\)](#) ⁺
[Strategi för att samordnat arbete mot antibiotikaresistens och vårdrelaterade infektioner \(2005\)](#) ⁺

UNITED KINGDOM

- [UK 5 Year Antimicrobial Resistance \(AMR\) Strategy 2013-2018. Annual progress report and implementation plan, 2014 \(HM Government, 2014\)](#) ⁺
- [UK Five Year Antimicrobial Resistance Strategy 2013 to 2018 \(Department of Health, 2013\)](#) ⁺

COUNTRIES OUTSIDE THE EU/EEA

CANADA

- [Antimicrobial Resistance and Use in Canada: A Federal Framework for Action \(Government of Canada, 2014\)](#) ⁺
- [Federal Action Plan on Antimicrobial Resistance and Use in Canada: Building on the Federal Framework for Action \(Public Health Agency of Canada, 2013\)](#) ⁺

SWITZERLAND

- [Strategy on Antibiotic Resistance Switzerland \(The Federal Council, 2011\)](#) ⁺
- [Strategie Antibiotikaresistenz Schweiz \(Der Bundesrat, 2011\)](#) ⁺
- [Strategie Antibiotikaresistenz Italien \(Le Conseil National, 2015\)](#) ⁺

UNITED STATES OF AMERICA

- [Executive Order – Combating Antibiotic-Resistant Bacteria \(The White House, 2014\)](#) ⁺
- [National Strategy for Combating Antibiotics – Resistant Bacteria \(The White House, 2014\)](#) ⁺



< Preparedness

ECDC Country visits reports

National strategies and action plans

Country visits reports



Following an official invitation by the Member States, an ECDC team conducts visits and meetings to discuss AMR issues in the country with the overall objective of providing an evidence-based assessment of the situation regarding prevention and control of AMR through prudent use of antibiotics and infection control. The page shows the ECDC country visit reports.

Italy



Publication

ECDC country visit to Italy to discuss antimicrobial resistance issues

mission report - 12 Dec 2017

An ECDC team conducted visits and meetings to Italy on 9-13 January 2017 to specifically discuss and assess the situation in the country regarding prevention and control of AMR.

Observations from this ECDC country visit confirm that the AMR situation in Italian hospitals and regions poses a major public health threat to the country. If the current trends of carbapenem resistance and colistin resistance in gram-negative bacteria such as *Klebsiella pneumoniae* and *A. baumannii* are not reversed, key medical interventions will be compromised in the near future.

📄 [ECDC country visit to Italy to discuss antimicrobial resistance issues - EN - \[PDF-573.62 KB\]](#)

🏷️ Antibiotic/Antimicrobial resistance (AMR) | Italy

2018

- Annual update on AMR and antimicrobial consumption in humans in the EU/EEA. Both data from EARS-Net and ESAC-Net (**NEW**) as part of the ECDC ATLAS, EARS-Net 2017 report, ESAC-Net 2017 HTML format on ECDC website (**NEW**) (October 2018)
- **NEW** - Burden of antimicrobial resistance (AMR) for the EU/EEA (November 2018)
- **NEW** - ECDC point prevalence surveys of HAIs, AMR and antimicrobial use in European acute care hospitals and in long-term care facilities, 2016-2017 (November 2018)
- **NEW** - Launch of project on whole genome sequencing (WGS)-based surveillance of carbapenem- and/or colistin-resistant *Enterobacteriaceae* (EURGen-Net)

2019

- **NEW** - ECDC comprehensive AMR report (November 2019)

Thank you!

EUROPEAN ANTIBIOTIC AWARENESS DAY



A EUROPEAN
HEALTH INITIATIVE

18 November 2018

E-mail: EAAD@ecdc.europa.eu
Website: <https://antibiotic.ecdc.europa.eu>
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Twitter: [@EAAD_EU \(#EAAD\)](https://twitter.com/EAAD_EU)
Global Twitter: [#AntibioticResistance](https://twitter.com/AntibioticResistance)



WORLD ANTIBIOTIC AWARENESS WEEK

NOVEMBER 2018

**ANTIBIOTICS
HANDLE WITH CARE**

