

European Centre for Disease Prevention and Control

Antimicrobial resistance in the EU: update for the Council of European Dentists

Dominique L. Monnet, ECDC

CED General Meeting, Brussels, 16 November 2018

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)

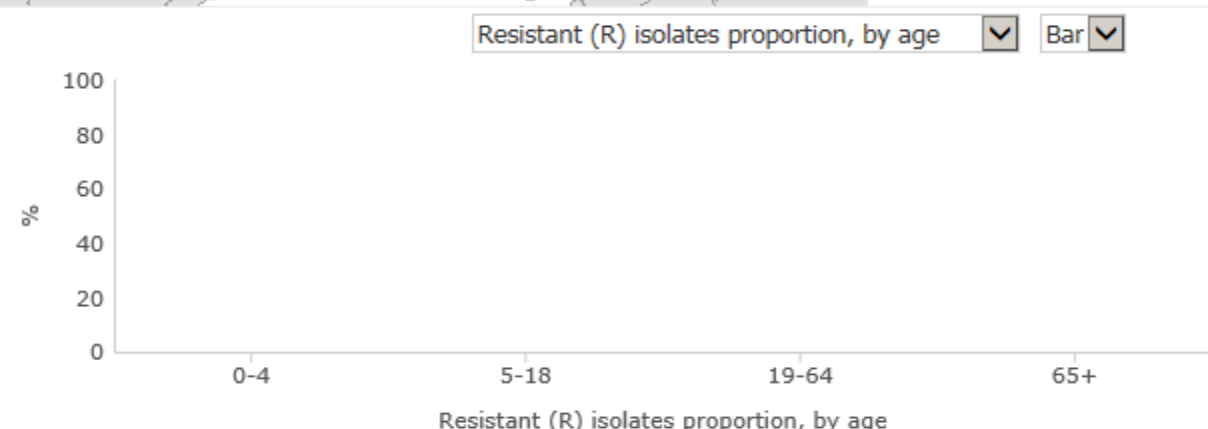
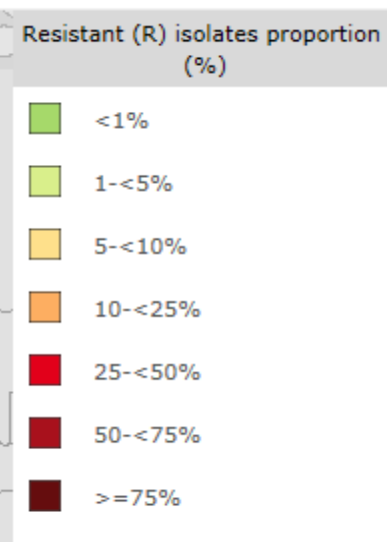
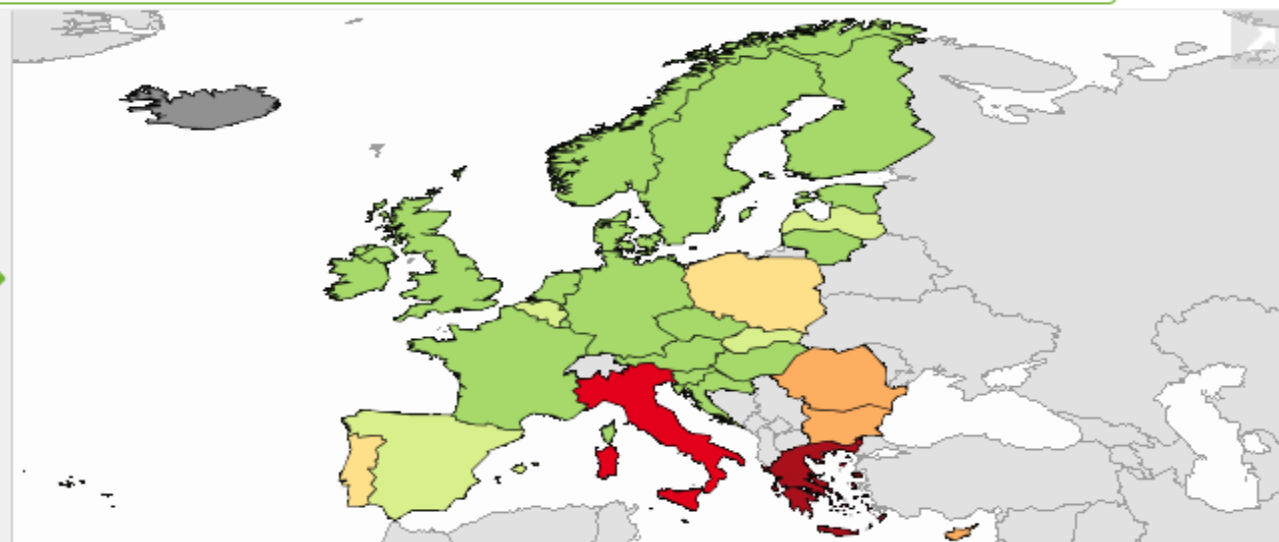
Surveillance Atlas of Infectious Diseases

Antimicrobial resistance ▼ Klebsiella pneumoniae ▼ Carbapenems ▼ Resistant (R) isolates proportion ▼

► ◀◀ 2017 ▶▶



Region	Resistant (R) isolates proportion (%)
Austria	1.0
Belgium	1.1
Bulgaria	12.4
Croatia	0.0
Cyprus	15.5
Czech Republic	0.4
Denmark	0.3
Estonia	0.0
Finland	0.3
France	0.7



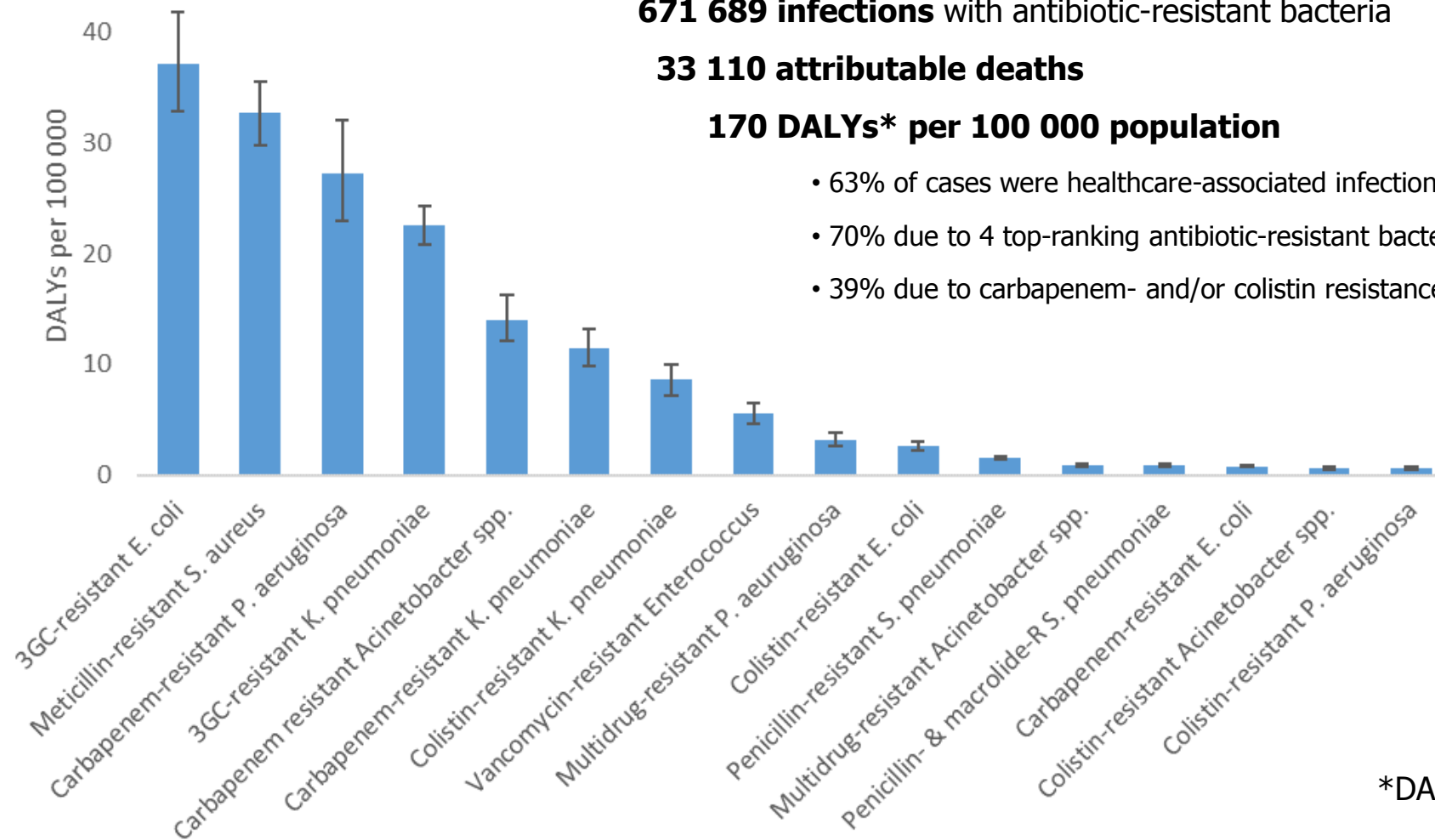
Estimated burden of infections with antibiotic-resistant bacteria, EU/EEA, 2015

671 689 infections with antibiotic-resistant bacteria

33 110 attributable deaths

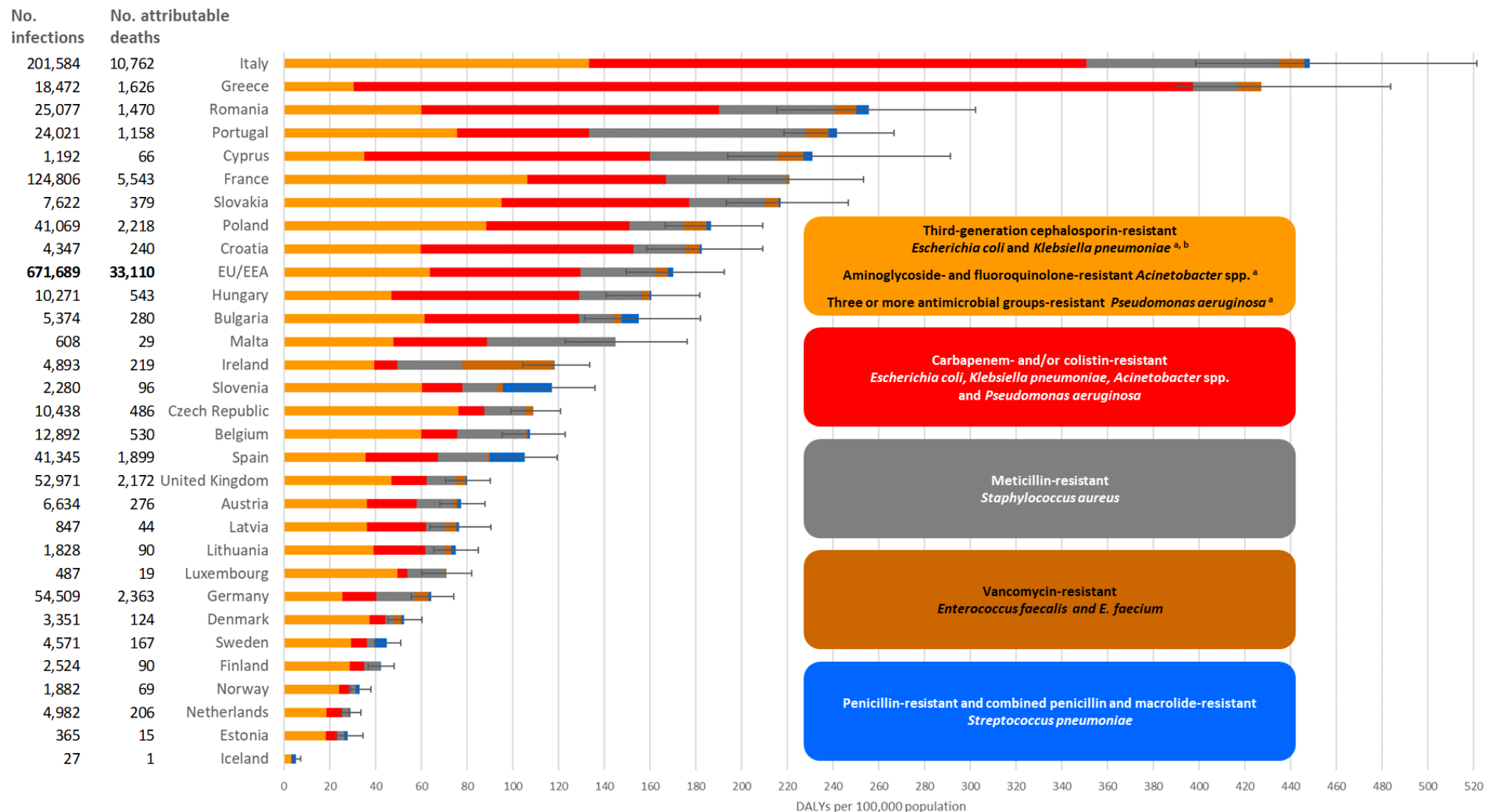
170 DALYs* per 100 000 population

- 63% of cases were healthcare-associated infections, representing 75% of total burden (DALYs)
- 70% due to 4 top-ranking antibiotic-resistant bacteria
- 39% due to carbapenem- and/or colistin resistance

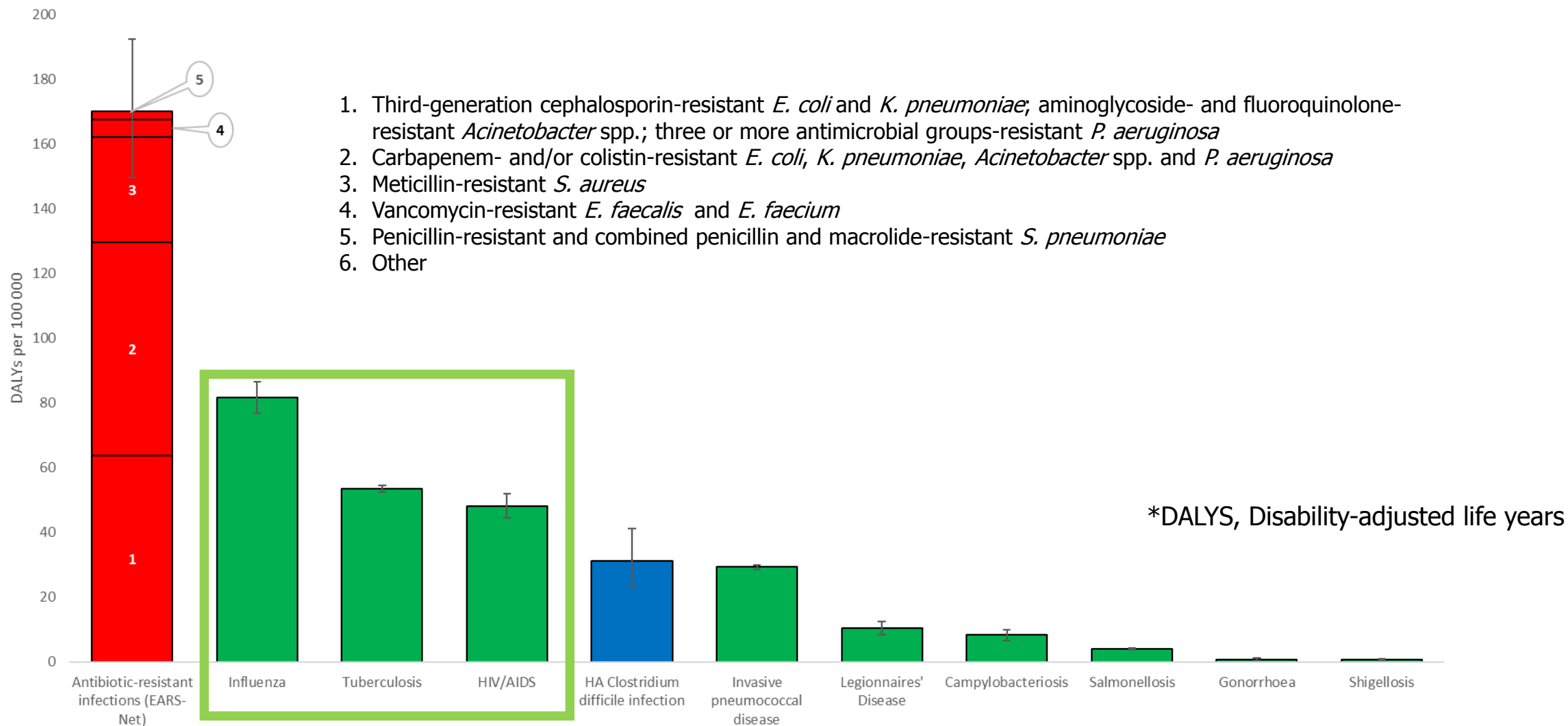


*DALYS, Disability-adjusted life years

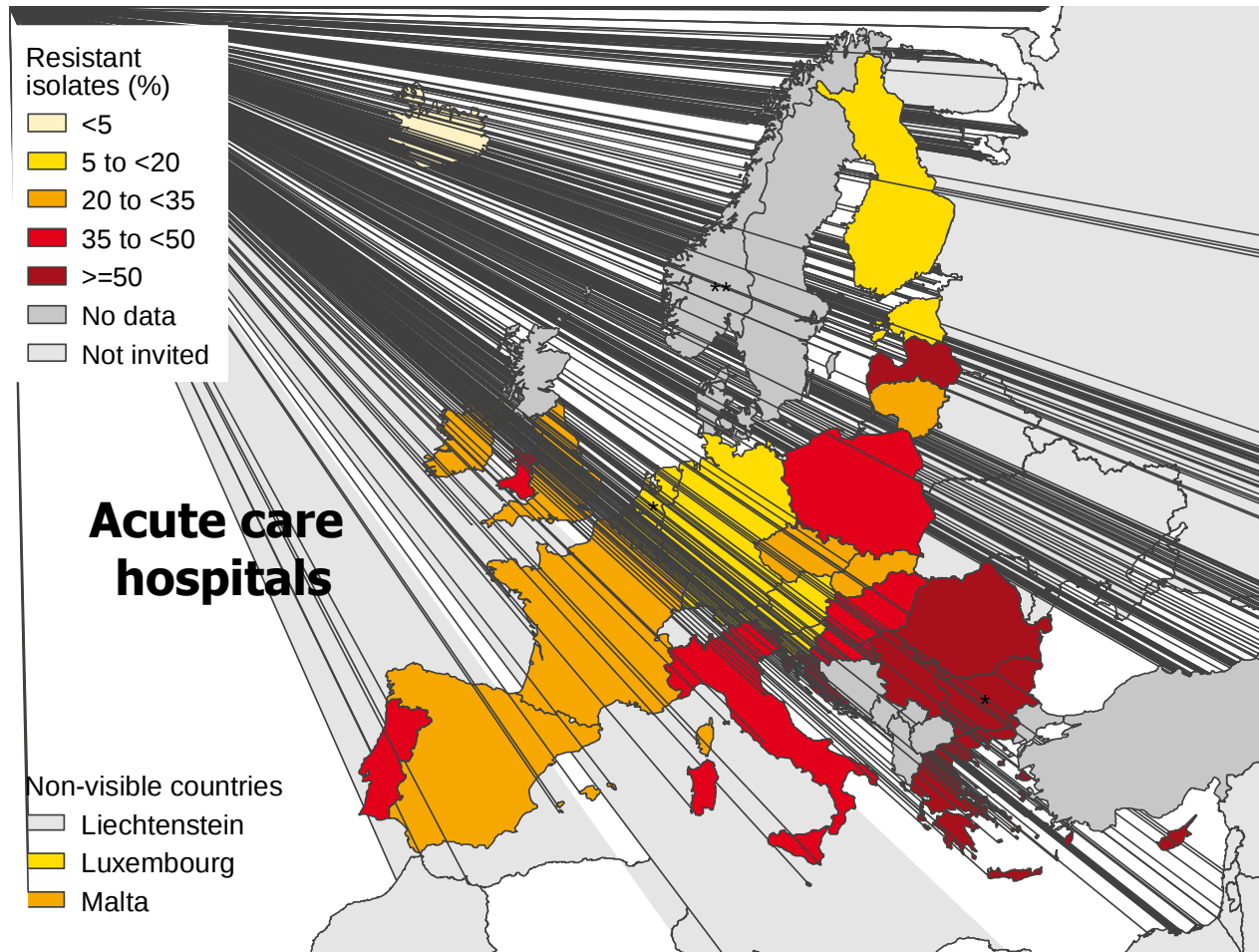
Estimated burden of infections with antibiotic-resistant bacteria, age-group standardised, EU/EEA, 2015



Burden of infections with antibiotic-resistant bacteria is comparable to burden of influenza, TB & HIV/AIDS combined



Composite index* of antimicrobial resistance (AMR) in healthcare-associated infections from acute care hospitals and long-term care facilities, EU/EEA countries and Serbia, 2016-2017

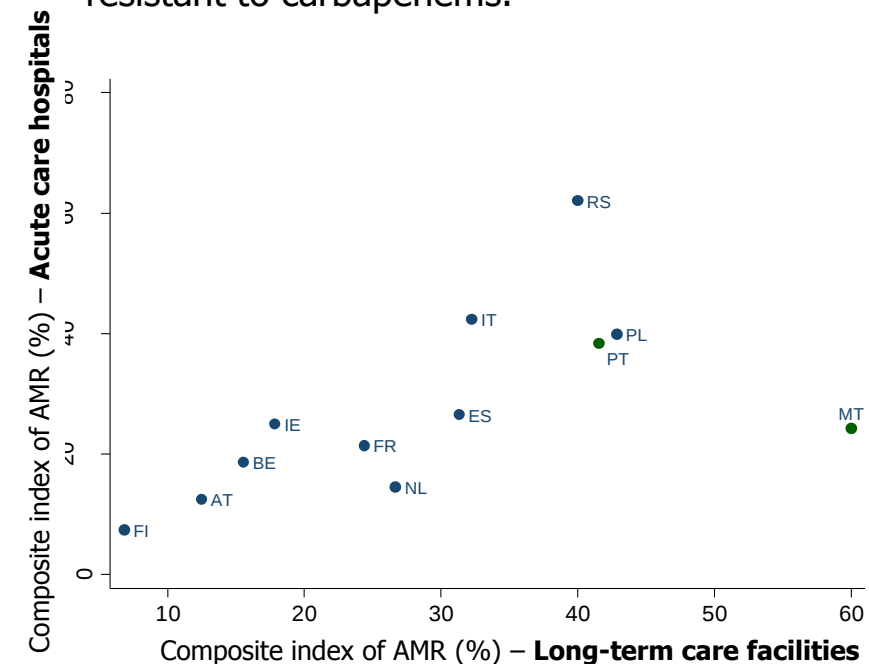


* Bulgaria and the Netherlands: poor national representativeness of acute care hospital sample;
 ** Norway: national protocol;
 Norway and UK-Scotland did not collect microbiological data..

Source: Suetens C, et al. Eurosurveillance 15 November 2018.

*Percentage of isolates resistant to first-level antimicrobial resistance markers in healthcare-associated infections, i.e.:

- *Staphylococcus aureus* resistant to methicillin (MRSA),
- *Enterococcus faecium* and *Enterococcus faecalis* resistant to vancomycin,
- Enterobacteriaceae resistant to third-generation cephalosporins,
- *Pseudomonas aeruginosa* and *Acinetobacter baumannii* resistant to carbapenems.



Main actions to prevent and control antimicrobial resistance



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



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



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



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Home > All topics: A to Z > Antimicrobial consumption > Surveillance and disease data > Antimicrobial consumption database > Geographical distribution

< Antimicrobial consumption database

Country overview

Data source overview

Geographical distribution

Quality indicators for consumption in the community

Distribution by antimicrobial group

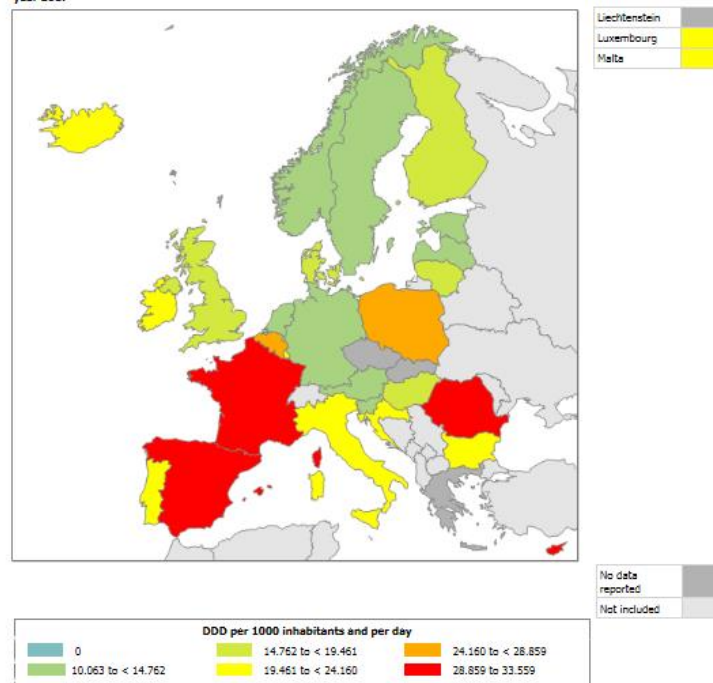
Rates by country

Trend by country



Geographical distribution of the consumption of Antibacterials for systemic use (ATC group J01) in the community (primary care sector) in Europe, reporting year 2017

Consumption of Antibacterials for systemic use (ATC group J01) in the community (primary care sector) in Europe, reporting year 2017



Consumption of antibiotics for systemic use (ATC group J01) in the community, EU/EEA, 2013-2017

Country	2013	2014	2015	2016	2017		Trends in antimicrobial consumption, 2013–2017	Average annual change 2013–2017	Statistically significant trend
Netherlands	10.8	10.6	10.7	10.4	10.1			-0.17	↓
Estonia	11.7	11.7	12.0	11.9	11.5			-0.01	
Sweden	13.0	13.0	12.3	12.0	11.6			-0.38	↓
Germany	15.8	14.6	14.4	14.1	13.7			-0.44	↓
Austria	16.3	13.9	13.9	13.3	14.0			-0.52	
Slovenia	14.5	14.2	14.5	13.9	14.0			-0.34	
Latvia	13.5	12.6	13.3	13.2	14.3			0.22	
Norway	16.2	15.9	15.8	15.2	14.7			-0.37	↓
Finland	18.3	18.1	17.2	16.5	14.9			-0.85	↓
Denmark	16.4	15.9	16.1	15.9	15.0			-0.28	
Hungary	15.5	16.2	17.0	15.4	15.6			-0.05	
Lithuania	18.5	16.0	16.7	16.6	16.8			-0.29	
UK	20.6	20.8	20.1	19.6	19.1			-0.43	↓
Portugal	19.6	20.3	21.3	21.6	20.3			0.26	
Croatia	21.1	21.4	21.8	20.7	20.5			-0.19	
Bulgaria	19.9	21.2	21.4	19.8	21.5			0.18	
Iceland	21.9*	19.3	19.9	20.7	21.5			N/A	
EU/EEA	22.3	21.9	22.4	22.8	21.8			-0.01	
Ireland	23.7	23.0	25.3	24.2	22.9			-0.03	
Italy	28.6	27.8	27.5	26.9	23.4			-1.14	↓
Malta	23.8	23.7	21.6	21.2	23.4			-0.32	
Luxembourg	27.7	25.8	26.3	25.5	24.1			-0.74	↓
Belgium	27.4	27.2	27.7	27.5	25.9			-0.26	
Poland	23.6	22.8	26.2	24.0	27.0			0.79	
Romania	31.6*	31.2*	33.3*	29.5*	29.1*			-0.67	
France	30.1	29.0	29.9	30.3	29.2			-0.05	
Spain	20.3†	21.6†	22.2†	32.9	32.0			N/A	
Cyprus	28.2*	26.1*	31.1*	32.7*	33.6*			1.73	
Czech Republic	18.9	19.1	19.5					N/A	
Greece	32.2	35.1	36.1	36.3				N/A	
Slovakia	23.6	20.9	24.5	23.6				N/A	

Defined daily doses (DDDs)
per 1000 inhabitants and per day

* Total care data, including the hospital sector.

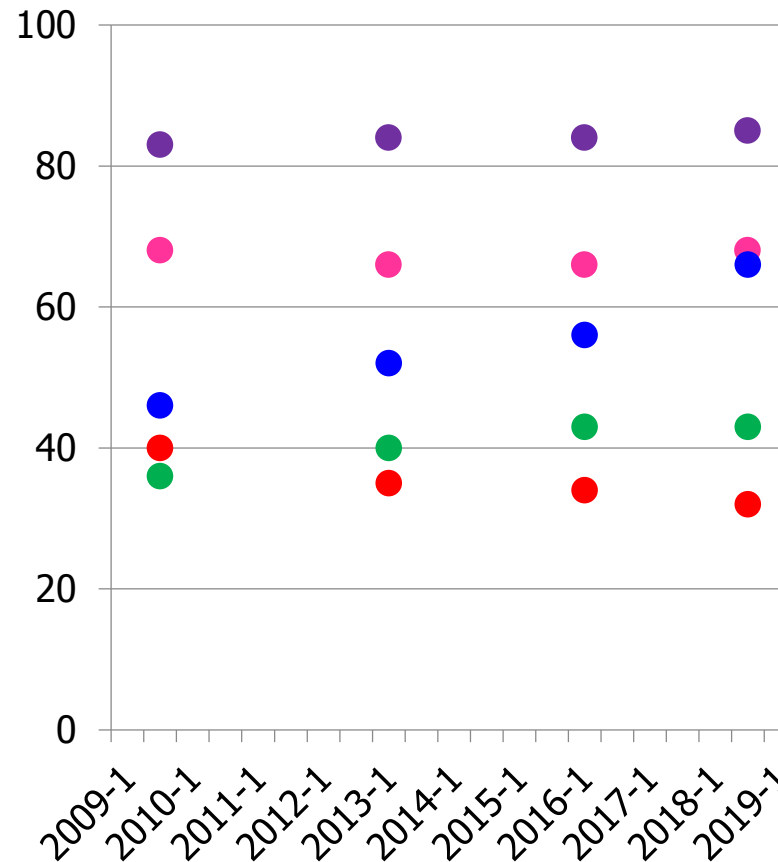
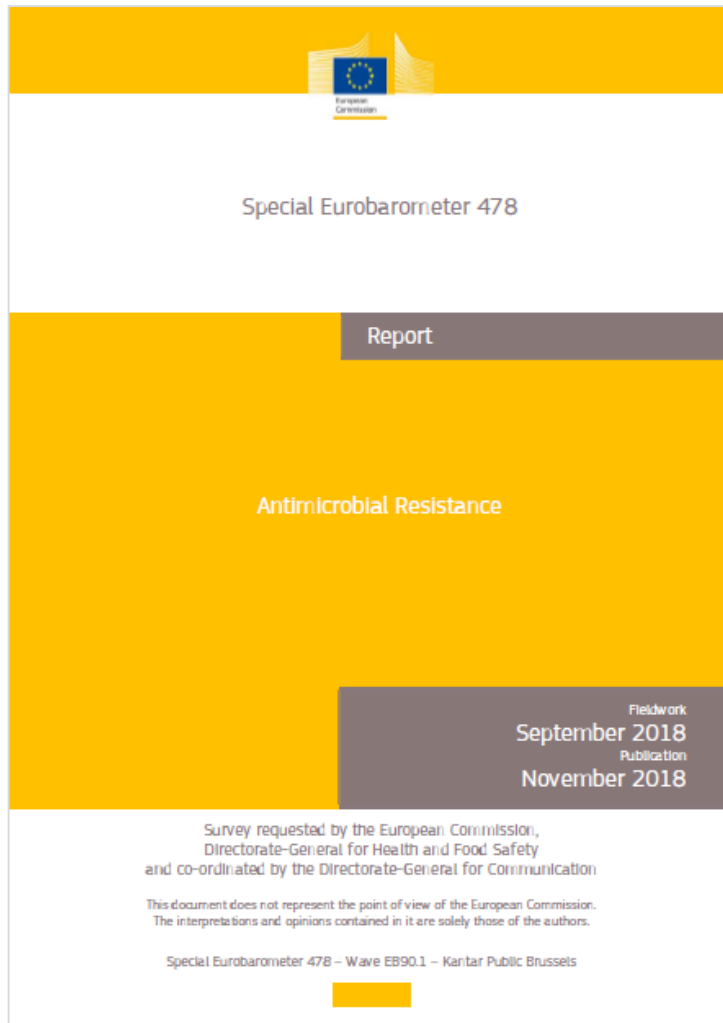
† Reimbursement data (i.e. not including consumption without a prescription and other non-reimbursed courses).

N/A = not applicable; linear regression was not applied due to missing data, changes in the type of data or changes of sector for which data were reported (community versus total care data) between 2013 and 2017.

The symbol ↓ indicates statistically significant decreasing trends.

EU/EEA refers to the corresponding population-weighted mean consumption.

Special Eurobarometer "Antimicrobial Resistance", 2010, 2013, 2016 & 2018

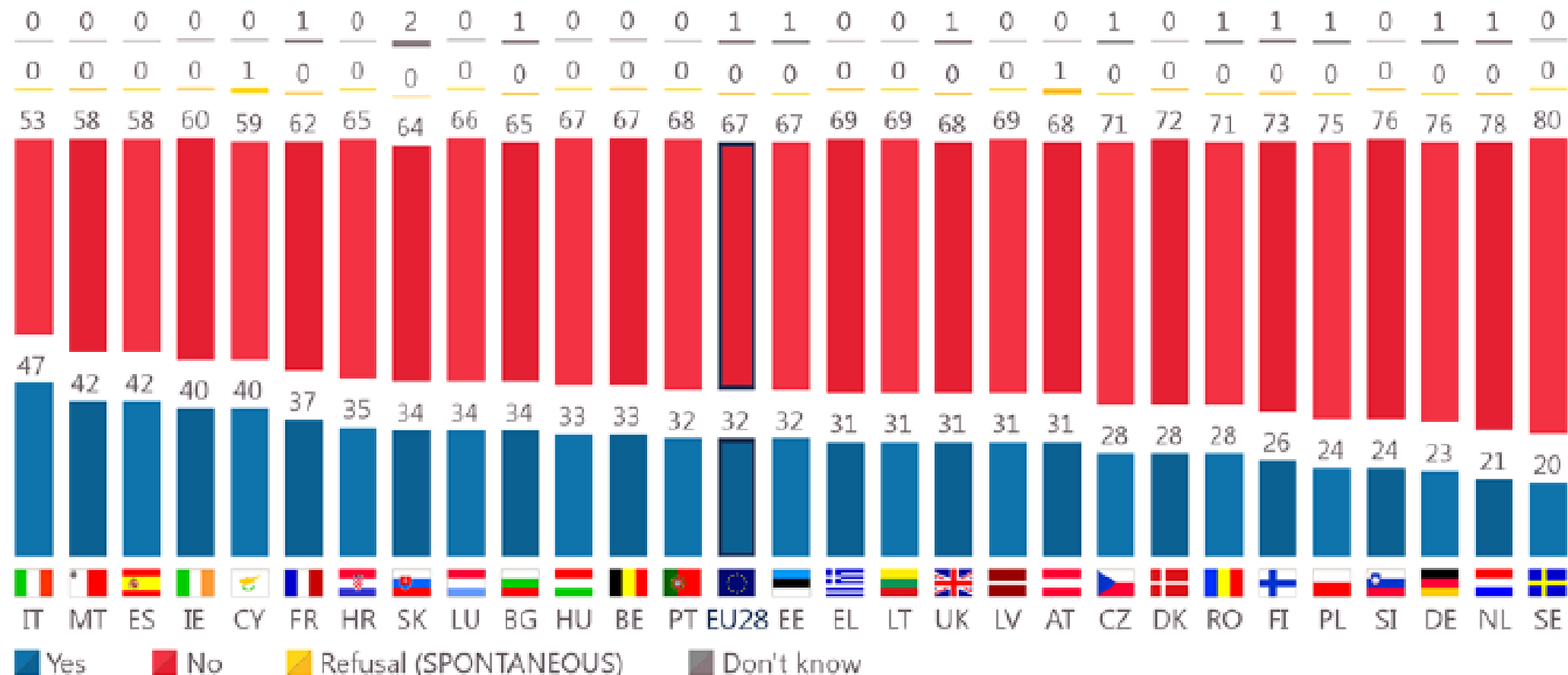


- Unnecessary use of antibiotics makes them ineffective
- Taking antibiotics often has side-effects such as diarrhea
- Antibiotics are [not] effective against cold and flu
- Antibiotics [do not] kill viruses
- Took antibiotics in the last 12 months

Special Eurobarometer "Antimicrobial Resistance", 2018



QC1 Have you taken any antibiotics orally such as tablets, powder or syrups in the last 12 months? (%)

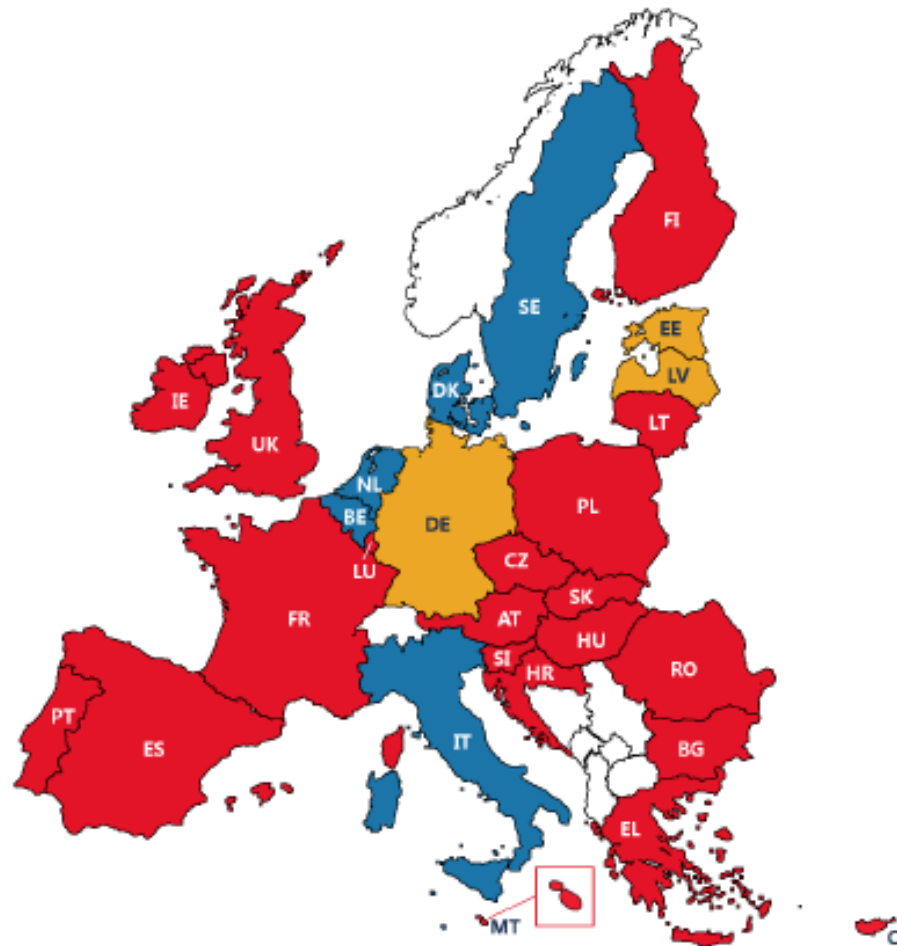


Special Eurobarometer "Antimicrobial Resistance", 2018



DK		28	▲ 5
IT		47	▲ 4
SE		20	▲ 2
NL		21	▲ 1
BE		33	▲ 1
EE		32	=
LV		31	=
DE		23	=
CY		40	▼ 1
HR		35	▼ 1
AT		31	▼ 1
PT		32	▼ 1
SK		34	▼ 1
HU		33	▼ 1
SI		24	▼ 1
EU28		32	▼ 2
FR		37	▼ 2
LT		31	▼ 4
IE		40	▼ 4
UK		31	▼ 4
PL		24	▼ 4
ES		42	▼ 5
CZ		28	▼ 5
FI		26	▼ 5
BG		34	▼ 5
MT		42	▼ 6
LU		34	▼ 7
EL		31	▼ 7
RO		28	▼ 10

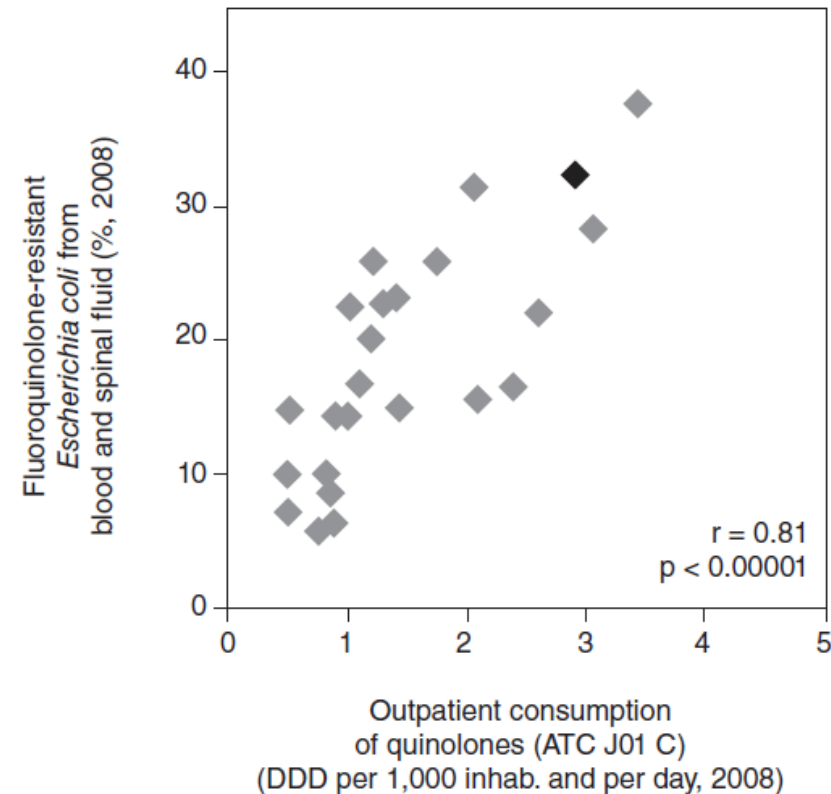
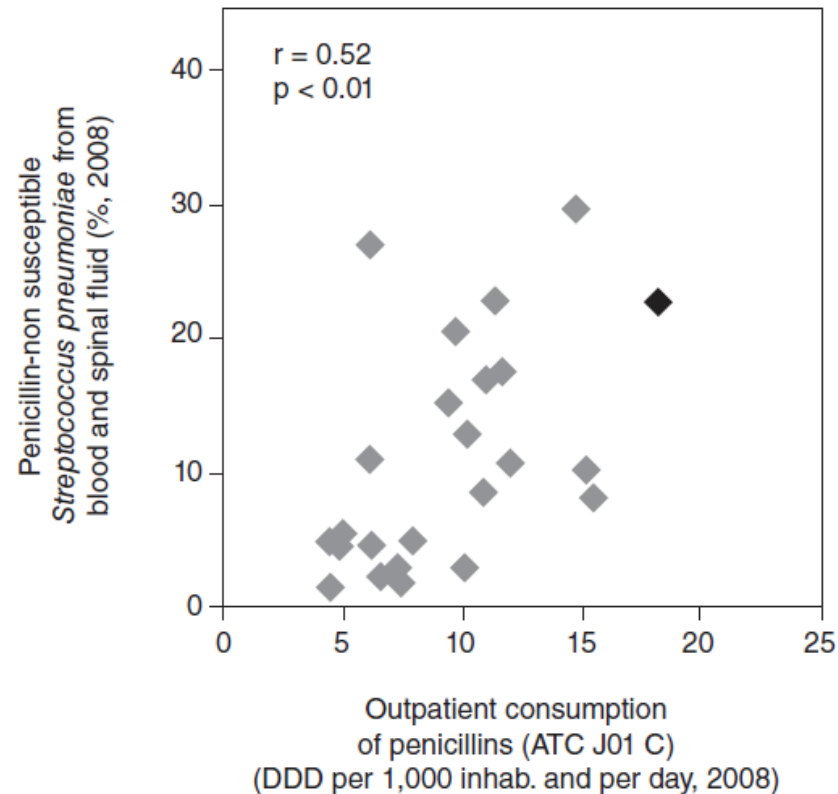
Map Legend
 Increase
 Stable
 Decrease



September 2018 - April 2016

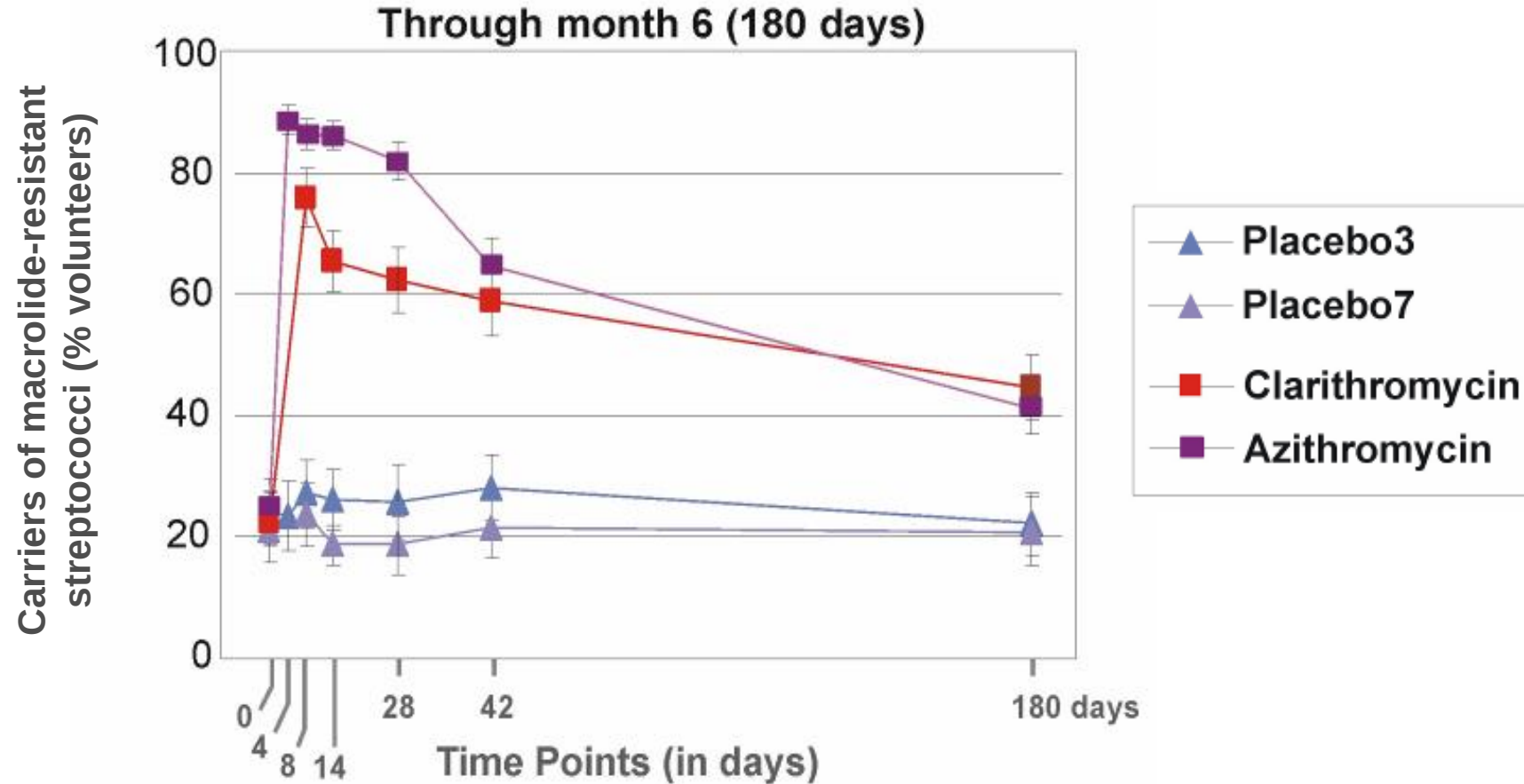
QC1 Have you taken any antibiotics orally such as tablets, powder or syrups in the last 12 months? (%)

Relationship between antibiotic use and resistance in the community

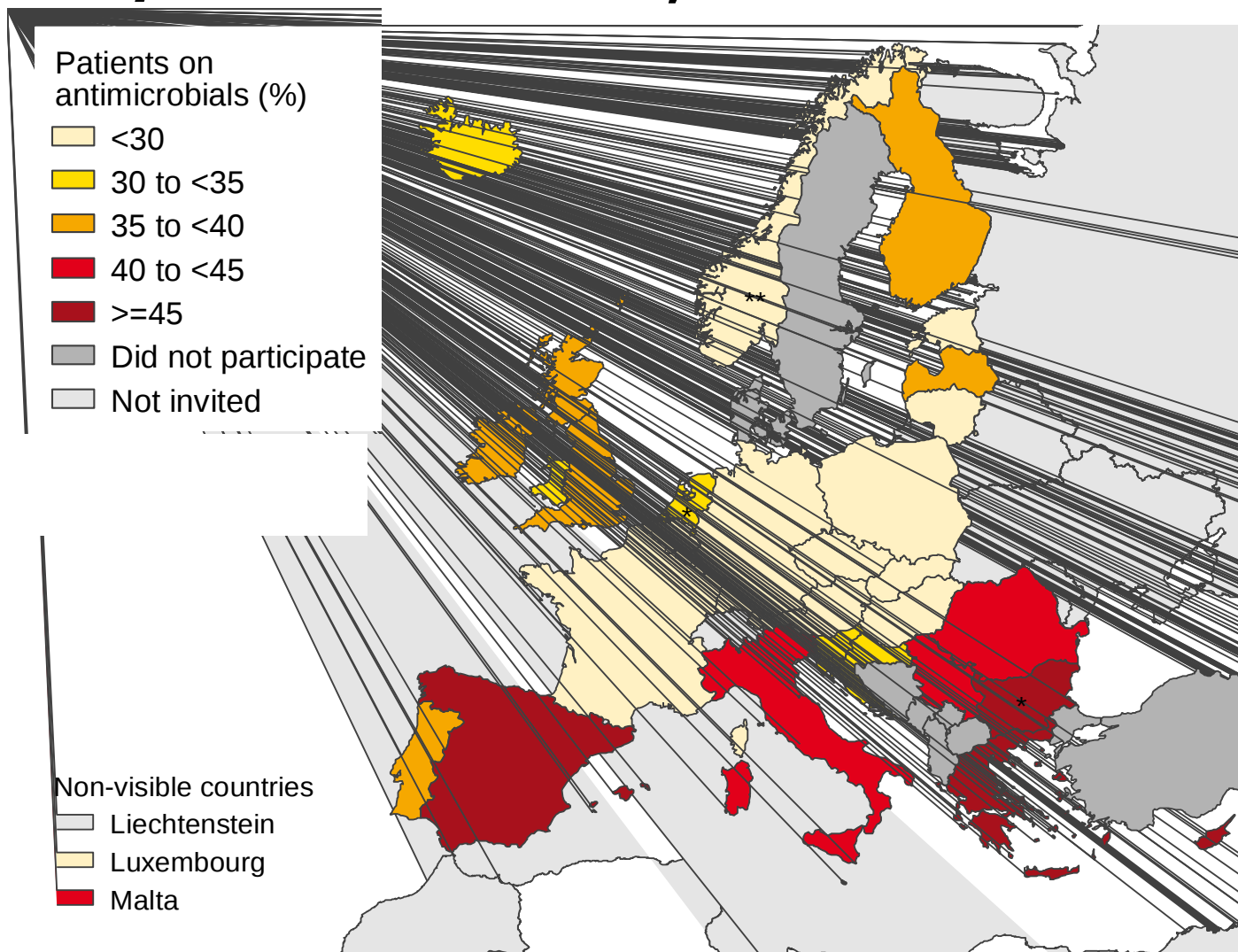


Spain only reports data on reimbursed antibiotic prescription to ESAC. To better represent antibiotic sales and therefore exposure of the Spanish population to antibiotics correction factors were applied to ESAC data based on Campos J, et al. J Antimicrob Chemother. 2007;60:698-701-11.

Carriage of resistant bacteria following exposure to antibiotics



Prevalence of antimicrobial use in acute care hospitals, EU/EEA and Serbia, 2016-2017



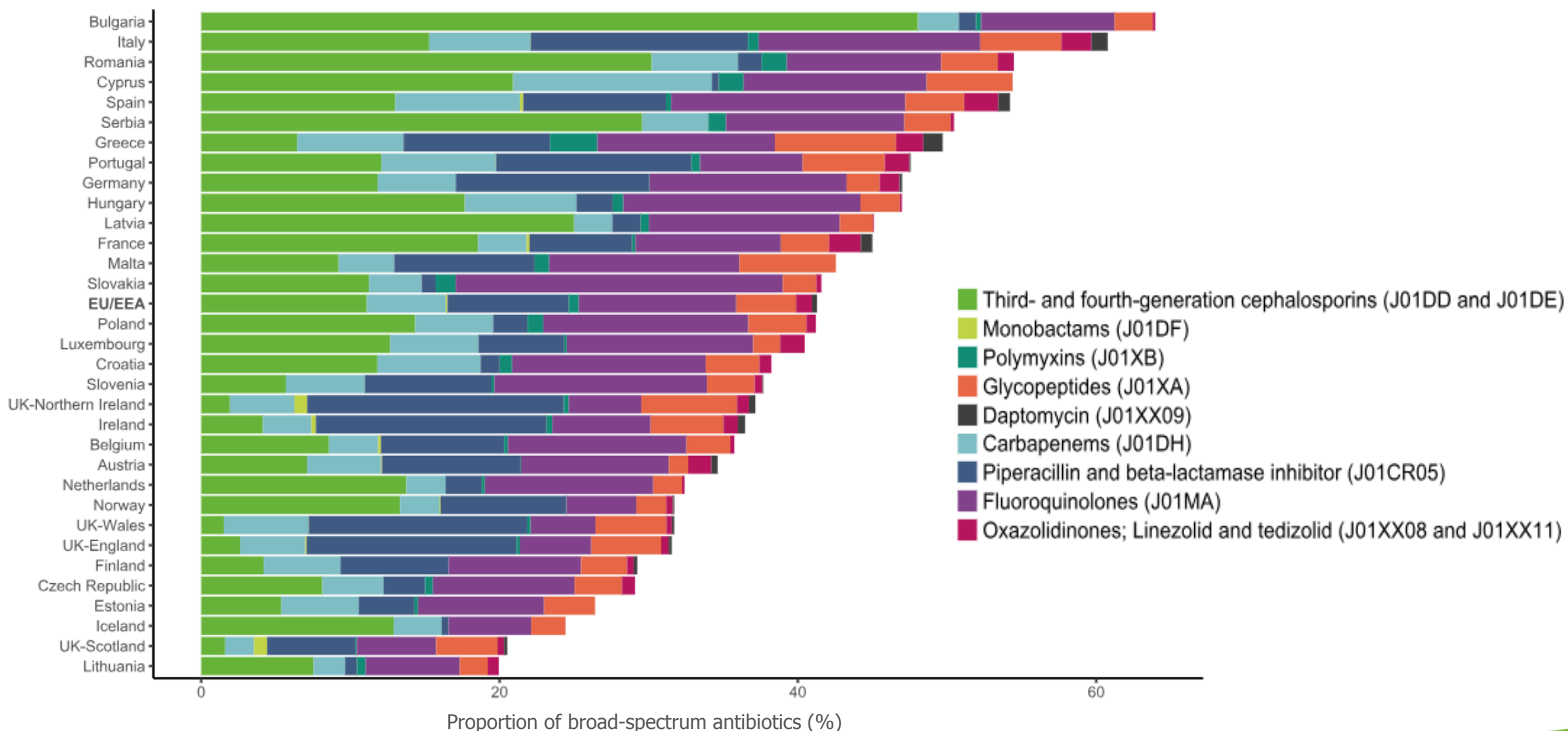
1 in 3
patients
in acute care hospitals
in EU/EEA countries
received
at least one
antimicrobial
on any given day

* Bulgaria, the Netherlands: poor national representativeness of acute care hospital sample;

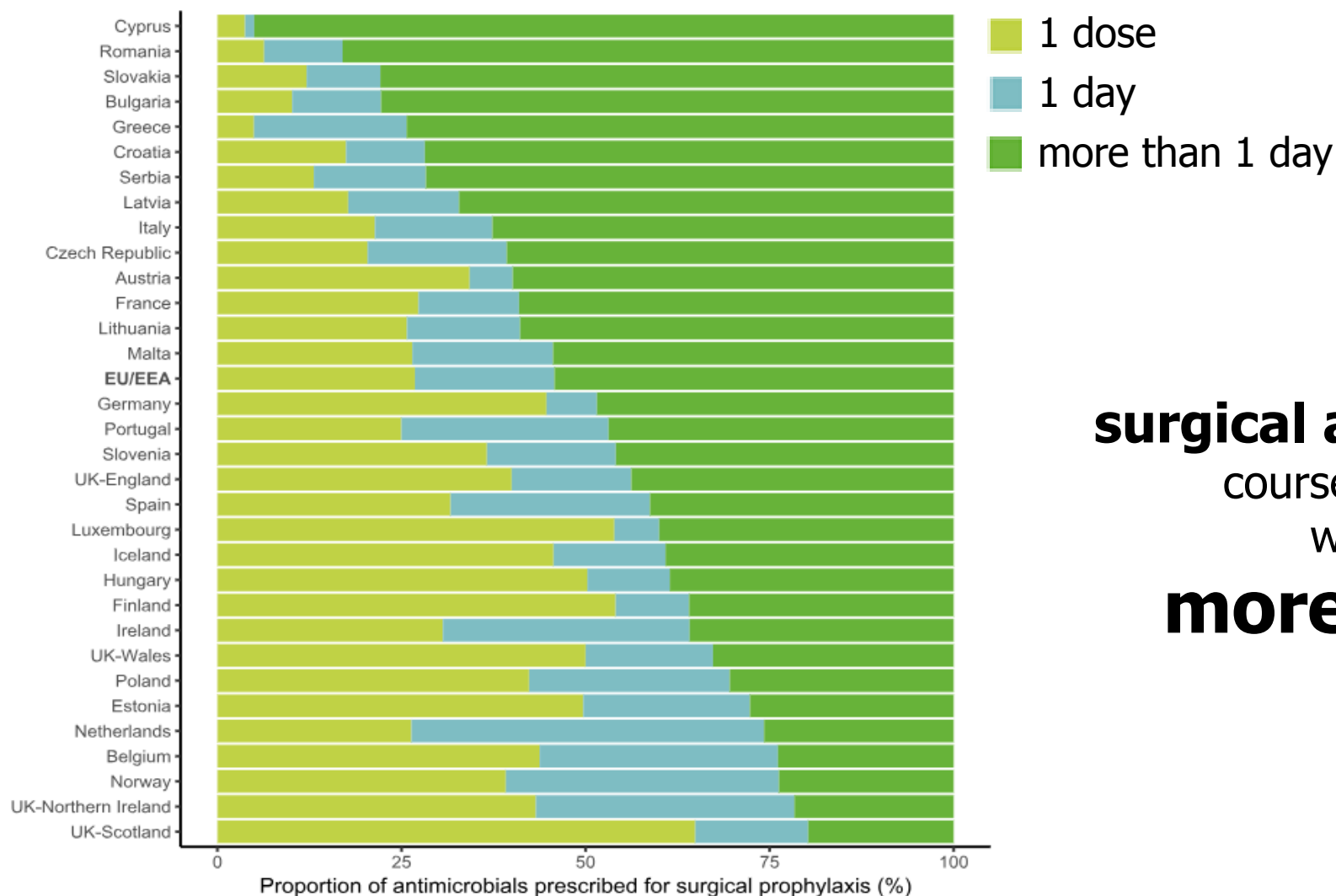
** Norway: national protocol.

Source: Plachouras D, et al. Eurosurveillance 15 November 2018

Proportion of broad-spectrum antibiotics in acute care hospitals, EU/EEA countries & Serbia, 2016–2017



Surgical antibiotic prophylaxis in acute care hospitals, by duration (single dose, one day, more than one day), EU/EEA countries and Serbia, 2016-2017



54%
surgical antibiotic prophylaxis
courses in EU/EEA countries
were prescribed for
more than one day

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



1.7.2017 EN Official Journal of the European Union C 212/1

II
(Information)

INFORMATION FROM EUROPEAN UNION INSTITUTIONS, BODIES, OFFICES
AND AGENCIES

EUROPEAN COMMISSION

COMMISSION NOTICE
EU Guidelines for the prudent use of antimicrobials in human health
(2017/C 212/01)

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1. INTRODUCTION

Antimicrobial resistance (AMR) is a priority for the Commission which adopted in 2011 an action plan against the rising threat of antimicrobial resistance. Progress towards more prudent use of antimicrobials in both humans and animals were key objectives. Guidelines on prudent use of antimicrobials in veterinary medicines were published in 2015⁽¹⁾. In 2016 Council Conclusions on the next steps under a One Health approach to combat antimicrobial resistance called on the Commission and Member States to develop European Union guidelines on prudent use of antimicrobials in human medicine to support national guidelines and recommendations⁽²⁾.

⁽¹⁾ Guidelines for the prudent use of antimicrobials in veterinary medicine (OJ C 299, 11.9.2015, p. 7).
⁽²⁾ Council conclusions on the next steps under a One Health approach to combat antimicrobial resistance 17 June 2016
<http://www.consilium.europa.eu/en/press/press-releases/2016/06/17-4pco-conclusions-antimicrobial-resistance/>



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 or inappropriate. Antibiotic misuse in hospitals is a major driver of antibiotic 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 Antibiotic 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>

Main actions to prevent and control antimicrobial resistance



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

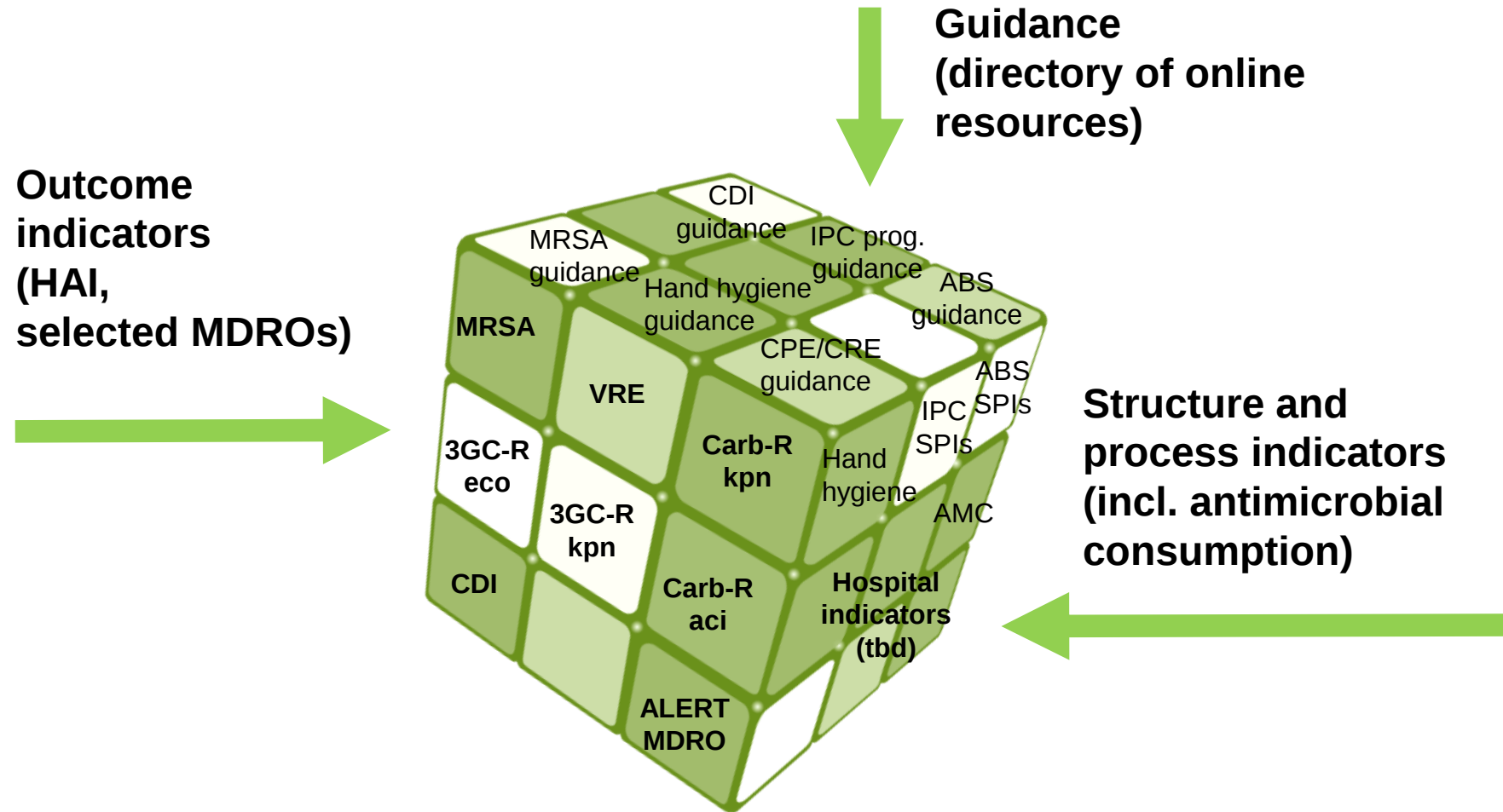


Infection prevention and control
(hand hygiene, screening, isolation)



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

2nd ECDC point prevalence survey (PPS) of healthcare-associated infections and antimicrobial use in European acute care hospitals, 2016-2017





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< Publications & data

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



Core requirements in healthcare settings ▶

- Organisation of infection prevention and control ▶
- Hand hygiene ▶
- Infection prevention and control in dentistry ▶



Training ▶

- Training courses on infection prevention and control (IPC) ▶
- Training courses on antimicrobial stewardship ▶
- Training courses on the prevention of antimicrobial resistance ▶



Strategies, action plans and European projects ▶

- Strategies and action plans on antimicrobial resistance ▶
- European projects on antimicrobial resistance and healthcare-associated infections ▶



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> [Infection prevention and control in dentistry](#)

← Core requirements in
healthcare settings

Organisation of infection
prevention and control

Hand hygiene

**Infection prevention and
control in dentistry**

Infection prevention and control in dentistry



In collaboration with the Council of European Dentists (CED)



Public transportation (buses, metro)

- **Porto (Portugal)**
 - 36% of 199 buses with MRSA
 - 2 of 3 major clones are the same as in hospitals
 - Association between proportion of MRSA contamination and bus serving more than 3 hospitals
- **Midwestern U.S. (urban)**
 - 63% of 40 buses with MRSA
- **New York Subway**
 - *Acinetobacter baumannii* at 220/466 stations sampled



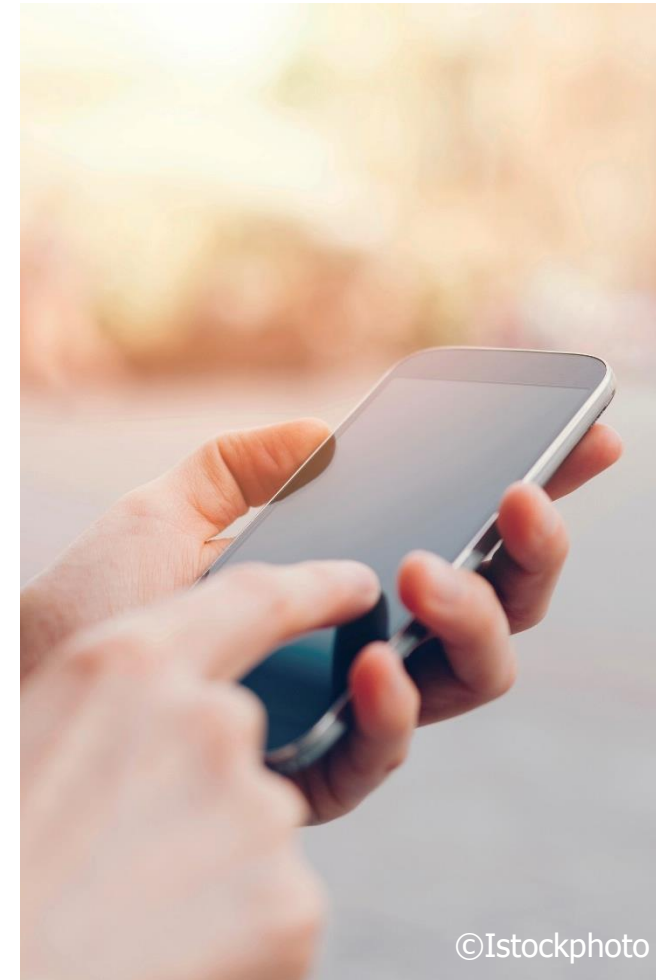
Mobile communication devices

- **Review of literature**

- 9-25% mobile communication devices with pathogenic bacteria
- 0-10% with MRSA

- **UK**

- 16% of 390 mobile phones in 12 cities contaminated with *E. coli* (London School of Hygiene and Tropical Medicine and Queen Mary, University of London)



Thank you!

EUROPEAN ANTIBIOTIC AWARENESS DAY



A EUROPEAN
HEALTH INITIATIVE

18 November 2018

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Twitter: [@EAAD_EU](https://twitter.com/EAAD_EU) (#EAAD #KeepAntibioticsWorking)
Global Twitter: [#AntibioticResistance](https://twitter.com/EAAD_EU)