Surveillance of antimicrobial resistance and antimicrobial consumption in Europe

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European Centre for Disease Prevention and Control
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What is ECDC and its role?

"An independent agency, named the European Centre for Disease Prevention and Control ..."

... to identify, assess and communicate current and emerging health threats to human health from communicable diseases.
— ECDC Founding Regulation (851/2004), Article 3

- EU-level disease surveillance and epidemic intelligence
- Scientific opinions and studies
- Early Warning System and response
- Technical assistance and training
- Communication to scientific community and the public
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European Antimicrobial Resistance Surveillance Network (EARS-Net)

- Since 1999, as the European Antimicrobial Resistance Surveillance System (EARSS) financed by grants from the European Commission (DG SANCO) to the Dutch National Institute for Public Health and the Environment (RIVM), followed by a grant from ECDC until December 2009
- Coordinated by ECDC since January 2010
- 28 EU Member States, Iceland and Norway
- Microbiology and epidemiology contact points in each country
- Coordination Group (European experts)
- Interactive database (on ECDC website): 1999-2012

Staphylococcus aureus: percentage of invasive isolates resistant to meticillin (MRSA); EU/EEA, 2012

The symbols ▲ and ▼ indicate a significant increasing or decreasing trend for the period 2009-2012, respectively. These trends were calculated on laboratories that consistently reported during 2009-2012.

Source: EARS-Net, 2013
Paolo
(Italy)

http://antibiotic.ecdc.europa.eu
*Escherichia coli*: percentage of invasive isolates resistant to third-generation cephalosporins; EU/EEA, 2012

The symbols † and ‡ indicate a significant increasing or decreasing trend for the period 2009-2012, respectively. These trends were calculated on laboratories that consistently reported during 2009-2012.

Source: EARS-Net, 2013
Escherichia coli: percentage of invasive isolates resistant to fluoroquinolones; EU/EEA, 2012

The symbols ↑ and ↓ indicate a significant increasing or decreasing trend for the period 2009-2012, respectively. These trends were calculated on laboratories that consistently reported during 2009-2012.

Source: EARS-Net, 2013
Modern medicine: not possible without effective antibiotics

- Hip / knee replacement
- Organ transplant
- Cancer chemotherapy
- Intensive care
- Care of preterm babies
Klebsiella pneumoniae: percentage of invasive isolates with combined resistance*; EU/EEA, 2012

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

The symbols ↑ and ↓ indicate a significant increasing or decreasing trend for the period 2009-2012, respectively. These trends were calculated on laboratories that consistently reported during 2009-2012.
*Klebsiella pneumoniae*: percentage of **invasive isolates** resistant to carbapenems; EU/EEA, 2012

The symbols \( \uparrow \) and \( \downarrow \) indicate a significant increasing or decreasing trend for the period 2009-2012, respectively. These trends were calculated on laboratories that consistently reported during 2009-2012.

Source: EARS-Net, 2013
Country self-assessment of stages for spread of carbapenemase-producing Enterobacteriaceae (all isolates), 2010 and 2013

The symbols ↑ and ↓ indicate a positive or negative change in stage between 2010 and 2013. This change could only be indicated for countries that reported for both years.

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

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**DATA IN FOCUS**

**Data on antimicrobial consumption from EU/EEA countries now available from the ESAC-Net interactive database**

A new interactive database allows the display of selected data on antimicrobial consumption in different formats such as tables, maps and figures. The database includes data on antimicrobial consumption in EU Member States from 1997 to 2010 and ECDC will update it every year.

In addition to the database, ECDC also launches the first ESAC-Net report on antimicrobial consumption surveillance in Europe.

**ESAC-Net interactive database**

**ESAC-Net report**

European Surveillance of Antimicrobial Consumption Network (ESAC-Net)

- Since 2001, as the European Surveillance of Antimicrobial Consumption (ESAC) project financed by grants from the European Commission (DG SANCO) to the University of Antwerp, followed by grants from ECDC until June 2011
- Coordinated by ECDC since July 2011
- 28 EU Member States, Iceland and Norway
- Contact points in each country
- Coordination Group (European experts)
- Data on antimicrobial consumption in the primary care sector and in the hospital sector
- Interactive database (on ECDC website): 1997-2011

Consumption of antibiotics for systemic use (ATC group J01) in the community*; EU/EEA, 2011

DDD per 1,000 inhabitants and per day

Cyprus, Iceland, Lithuania and Slovakia: includes both community and hospital sector

Romania and Spain: reimbursement data that do not include over-the-counter sales without a prescription

Source: ESAC-Net, 2014
Consumption of antibiotics for systemic use (ATC group J01) in the community*; EU/EEA, 2011

Packages per 1,000 inhabitants and per day

Iceland, Lithuania and Slovakia:
includes both community and hospital sector

Spain:
reimbursement data that do not include
over-the-counter sales without a prescription

Source: ESAC-Net, 2014
Relationship between antibiotic use and resistance in the community

\[ R^2 = 0.54 \]
\[ P = 0.006 \]

\[ R^2 = 0.63 \]
\[ P = 0.001 \]

Healthcare-Associated Infections surveillance Network (HAI-Net)

- Since 2000, as the HELICS project and then the IPSE project, both financed by grants from the European Commission (DG SANCO) to Claude Bernard University Lyon I, France
- Coordinated by ECDC since July 2008

- Coordination Groups (European experts) and contact points in participating countries

- Modules:
  - Point prevalence survey (PPS): 30 countries
  - Surgical site infections (SSIs): 13 countries
  - HAI in intensive care units: 14 countries
  - HAI in long-term care facilities (LTCFs) (HALT-2, outsourced), 24 countries


ECDC point prevalence survey, 2011-2012

Antimicrobial use

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

Antimicrobial resistance

Source: ECDC surveillance report (PPS), July 2013. Infographics: A. Haeger, ECDC.
Country visits to discuss antimicrobial resistance (AMR) issues, 2006-2014

- 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)
- 18 initial visits (see map)
- 5 follow-up visits (Czech Rep., Greece x 2 and Hungary x 2)
- 2 additional visits budgeted for 2014
European Antibiotic Awareness Day, 2008-2014

2008  Materials for the general public
       32 countries participated

2009  Materials for primary care prescribers

2010  Materials for hospital prescribers and hospitals
       Matched Get Smart week in the U.S. and the campaign in Canada

2011  Patient stories and Euronews movie
       37 countries participated

2012  Collaboration with WHO/Europe
       43 countries participated
       Matched campaigns in the U.S., Canada and Australia

2013-2014
New theme: self-medication with antibiotics
       Collaboration with WHO/Europe, student assoc., CPME, PGEU
       Collaboration with more countries

Antimicrobial resistance: a continuum of risks and actions throughout life

Surveillance; Early warning and response

- Food safety
- Environment
- Personal and home hygiene

- Increase public awareness
- Guidance for professionals
- Build capacity
- Promote vaccination
- Promote research

- Guidance for professionals
- Build capacity
- Training
- Increase awareness
- Promote research

New antibiotics
European Commission action plan to combat AMR, 2011

Based on preparatory work
- Staff working paper 2009 and public consultation
- Council conclusions on AMR
- EP resolutions on AMR

Holistic approach
- public health
- consumer safety
- food safety
- non therapeutic use
- environment
- animal health & welfare

Objective: combat the rising threat of AMR
- to reduce and prevent the spread of AMR
- to preserve the ability to treat and prevent microbial infections

Action plan against the rising threats from Antimicrobial Resistance (COM (2011) 748)

Update on implementation: 11 Dec. 2013
Antibiotics kill viruses. True or false?

% respondents with correct answer (i.e., “false”): 40% (range: 15 – 74%)

Humans + Animals = One Health

Prudent use of antibiotics:
Everyone is responsible!