Résistance aux antibiotiques : une impasse thérapeutique ?
Implications nationales et internationales

Stratégie et action européennes

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Methicillin-resistant *Staphylococcus aureus* (MRSA) in Europe, 1990-1991

- <3%
- 3 – 9%
- 10 – 29%
- >30%
- Did not participate

Meticillin-resistant *Staphylococcus aureus* (MRSA) in one hospital in Paris (all isolates) and in Denmark (blood isolates), 1960-1995

- Increased awareness about hospital hygiene
- More rational use of broad-spectrum antibiotics

Antimicrobial resistance is a **major European and global problem**

- Set up **surveillance for antimicrobial resistance and consumption of antimicrobial agents**
- Pharmaceutical companies should be encouraged to develop **new antimicrobial agents**, but these will not solve the problem in the near future
- **Coordinated research** on antimicrobial resistance: high priority
- Encourage the adoption of a wide range of measures to promote **prudent use of antimicrobial agents**
- A way should be found to **review progress** with these recommendations and proposals

Antibiotic consumption in primary care, 15 EU countries, 1997

Community strategy against antimicrobial resistance, 2001

15 action points

- **Surveillance**: 2 action points
  - Antimicrobial resistance (human+vet.)
  - Antimicrobial consumption (all sectors)

- **Prevention**: 8 action points, e.g.
  - AMR information for market authorisation (human+vet.)
  - Education campaigns
  - Prescription-only rule
  - Prevention programmes, incl. immunisation
  - Monitoring of residues in foods
  - Phase out antimicrobial growth promoters

- **Research and product development**: (3 points)

- **International cooperation**: (2 action points)

Commission Implementing Decision of 8 August 2012 amending Decision 2002/253/EC laying down case definitions for reporting communicable diseases...


Council Recommendation of 9 June 2009 on patient safety, including the prevention and control of healthcare associated infections (2009/C 151/01)
Directive on medicinal products, 2001 &
Regulation on additives for use in animal
nutrition, 2003


What is the role of ECDC in its Founding Regulation?

... 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
- Communication to the public

Council Conclusions on Antimicrobial Resistance (AMR) (10 June 2008)

Council Conclusions on innovative incentives for effective antibiotics (1 December 2009)

Council Conclusions on the impact of antimicrobial resistance in the human health sector and in the veterinary sector—a “One Health” perspective (22 June 2012)
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
European Commission action plan to combat AMR, 2011: overall aims

- To mitigate the risk of developing AMR in humans from the use of antimicrobials both in humans and animals by effectively ensuring across the EU their appropriate use, and promoting microbiological diagnosis as the means to determine, to the extent possible, the need for antimicrobials
- To put in place effective ways to prevent microbial infections and their spread
- To develop effective antimicrobials or alternatives for treatment of human and animal infections
- To join forces with international partners to contain the risks of spreading AMR form international trade and travel and via the environment
- To reinforce research to develop the scientific basis and innovative means to combat AMR
- To improve communication, education and training
Reports on implementation of Council Recommendations & Eurobarometer, 2010-2012

2nd report from the Commission to the Council on the basis of Member States’ reports on the implementation of the Council Recommendation 2002/77/EC

Special Eurobarometer 338 “Antimicrobial resistance” (9 April 2010)

1st report from the Commission to the Council on the basis of Member States’ reports on the implementation of the Council Recommendation 2009/C 151/01
Implementation of National Intectoral Coordination Mechanisms on AMR

As of 2008, 18 EU Member States and Norway had implemented an Intersectoral Coordination Mechanism.

Antibiotics obtained without a prescription
EU Member States, 2002 & 2009

Eurobarometer Opinion Poll, November-December 2009

Antibiotics kill viruses. True or false?

% respondents with correct answer (i.e., “false”): 36% (range: 14 – 73%)

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

France
4.8 packages per 1,000 inhabitants and per day
1.8 package per inhabitant and per year

*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

Source: ESAC-Net, 2012
The symbols ↗ and ↘ indicate a continuous increase or decrease for the period 2008-2010, respectively. These trends were reported only for countries that consistently reported during 2008-2010.
Staphylococcus aureus: percentage of invasive isolates resistant to meticillin (MRSA); EU/EEA, 2008–2011

The symbols ↑ and ↓ indicate a significant increasing or decreasing trend for the period 2008-2011, respectively. These trends were calculated on laboratories that consistently reported during 2008-2011.

Source: EARS-Net, 2012
Escherichia coli: percentage of invasive isolates resistant to third-generation cephalosporins; EU/EEA, 2008–2011

The symbols \( \uparrow \) and \( \downarrow \) indicate a significant increasing or decreasing trend for the period 2008-2011, respectively. These trends were calculated on laboratories that consistently reported during 2008-2011.
Klebsiella pneumoniae: percentage of invasive isolates with combined resistance*; EU/EEA, 2008–2011

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

Source: EARS-Net, 2012

The symbols ↑ and ↓ indicate a significant increasing or decreasing trend for the period 2008-2011, respectively. These trends were calculated on laboratories that consistently reported during 2008-2011.
Consumption of antibiotics for systemic use (ATC group J01) in the hospital sector; EU/EEA, 2010

* Finland: data include consumption in remote primary health care centres and nursing homes.

** Portugal: data only correspond to public hospitals

Defined Daily Doses per 1000 inhabitants and per day

Source: ESAC-Net, 2012
Carbapenem consumption* (for the large majority in hospitals); EU/EEA, 2007–2010

*in Defined Daily Doses per 1000 inhabitants and per day

Source: ESAC-Net, 2012

The symbols ↑ and ↓ indicate a significant increase or decrease between 2007 and 2010, respectively. These trends are indicated only for countries that reported relevant data for both 2007 and 2010.
**Klebsiella pneumoniae:** percentage of invasive isolates resistant to carbapenems; EU/EEA, 2008–2011

The symbols ↑ and ↓ indicate a significant increasing or decreasing trend for the period 2008-2011, respectively. These trends were calculated on laboratories that consistently reported during 2008-2011.

Source: EARS-Net, 2012
ECDC risk assessments: NDM-1 and carbapenemase-producing *Enterobacteriaceae*

**New Delhi metallo-beta-lactamase 1–producing *Enterobacteriaceae*: emergence and response in Europe**

**Source:** ECDC, 2010 & 2011.
## Antimicrobial Resistance and Healthcare-Associated Infections (ARHAI) Programme

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*EPIS AMR-HAI: Interactive database & Reports*
Main actions to prevent and control antibiotic resistance

**Prudent use of antibiotics**
(only when needed, correct dose, correct dose intervals, correct duration)

**Infection control**
(hand hygiene, screening, isolation)

**New antibiotics**
(with a novel mechanism of action, research, development)
European Commission action plan to combat AMR, 2011: 12 key actions

**Human medicine**
1. Appropriate use
4. Prevention infections
6. New antibiotics
9. Surveillance

**Human + Veterinary**
8. International cooperation
11. Research & Innovation
12. Communication, education

**Veterinary medicine**
2. Appropriate use
5. Prevention infections
7. Need for new antibiotics
10. Surveillance