

Fact 1. Antibiotic resistance is an increasingly serious public health problem in Europe

The emergence, spread and selection of antibiotic-resistant bacteria is a threat to patient safety in hospitals^{1,2} because:

- Infections with antibiotic-resistant bacteria result in increased patient morbidity and mortality, as well as increased hospital length of stay⁴⁻⁵;
- Antibiotic resistance frequently leads to a delay in appropriate antibiotic therapy⁶;
- Inappropriate or delayed antibiotic therapy in patients with severe infections is associated with worse patient outcomes and sometimes death⁷⁻⁹.

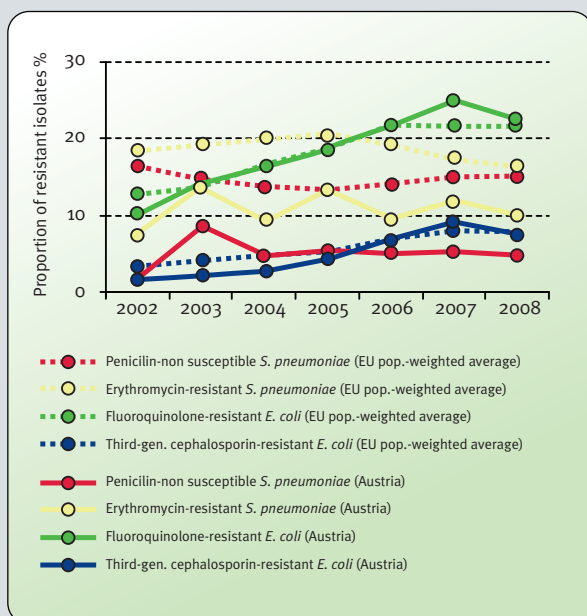


Figure 1. Trends of antibiotic resistance in *S. pneumoniae* and *E. coli* as an EU population weighted average, 2002-2008. Source: EARSS, 2009.

[Instructions on how to adapt the graph to national data are included in the guidance note]

Fact 2. Misuse of antibiotics in hospitals is one of the factors driving antibiotic resistance

Patients who are hospitalised have a high probability of receiving an antibiotic¹⁰ and 50% of all antibiotic use in hospitals can be inappropriate^{2,11}. Misuse of antibiotics in hospitals is one of the main factors driving development of antibiotic resistance¹²⁻¹⁴.

Misuse of antibiotics can include any of the following¹⁵:

- When antibiotics are prescribed unnecessarily;
- When antibiotic administration is delayed in critically ill patients;
- When broad-spectrum antibiotics are used too generously, or when narrow-spectrum antibiotics are used incorrectly;
- When the dose of antibiotics is lower or higher than appropriate for the specific patient;
- When the duration of antibiotic treatment is too short or too long;
- When antibiotic treatment is not streamlined according to microbiological culture data results.

Fact 3. Benefits of prudent antibiotic use

Prudent use of antibiotics can prevent the emergence and selection of antibiotic-resistant bacteria^{2,14,16-18} and decreasing antibiotic use has been shown to result in lower incidence of *Clostridium difficile* infections^{2,16,19}.

Antibiotic resistance

Facts and figures

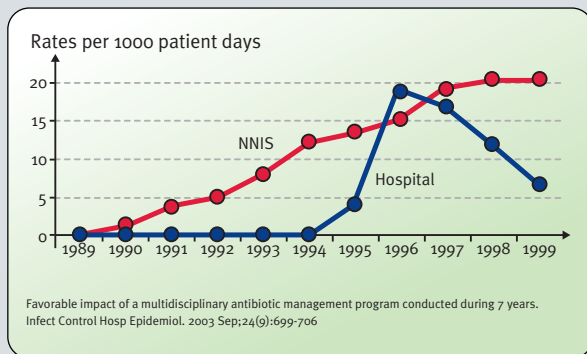


Figure 2. Rates of Vancomycin-resistant *Enterococci* in hospital before and after implementation of the antibiotic management program compared with rates in National Nosocomial Infections Surveillance (NNIS) System* hospitals of similar size. Source: Carling P, et al 2003¹⁶.

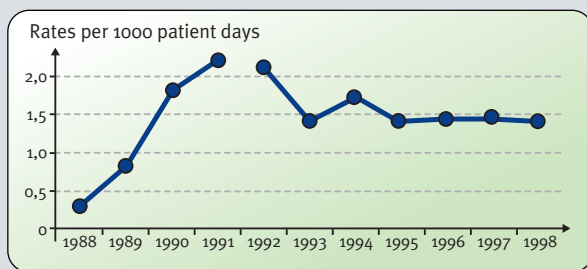


Figure 3. Rates of nosocomial *Clostridium difficile*, expressed per 1,000 patient-days, before and after implementation of the antibiotic management program. Source: Carling P, et al 2003¹⁶.

Fact 4. Multifaceted strategies can result in prudent antibiotic use

As part of multifaceted strategies certain measures may result in better antibiotic prescribing practices and decreasing antibiotic resistance in hospitals. Multifaceted strategies include use of ongoing education, evidence-based hospital antibiotic guidelines and policies, restrictive measures and consultations from infectious disease physicians, microbiologists and pharmacists^{2, 16, 20}.

Measures to promote prudent use of antibiotics include^{16, 20, 21, 22}:

- Continuous education of prescribers and specialists included in comprehensive hospital strategies²;
- Evidence-based hospital antibiotic guidelines and policies^{2, 16, 20};
- Monitoring of hospital antibiotic resistance and antibiotic use data to guide empiric antibiotic therapy in severely ill patients²¹;
- Administering the correct timing and optimal duration of antibiotic prophylaxis for surgery²²;
- For some indications, using shorter rather than longer duration of treatment^{12, 23-24};
- Taking microbiological samples before initiating empiric antibiotic therapy, monitoring culture results and streamlining antibiotic treatment based on the culture results²⁵.

1. European Antimicrobial Resistance Surveillance System [database on the Internet]. RIVM. 2009 [cited March 30, 2010]. Available from: <http://www.rivm.nl/earss/database/>. 2. Davey P, Brown E, Fenelon L, Finch R, Gould I, Hartman G, et al. Interventions to improve antibiotic prescribing practices for hospital inpatients. Cochrane Database Syst Rev. 2005(4):CD003543. 3. Bartlett JG, Onderdonk AB, Cisneros RL, Kasper DL. Clindamycin-associated colitis due to a toxin-producing species of Clostridium in hamsters. J Infect Dis. 1977 Nov;136(5):701-5. 4. Cosgrove SE, Carmeli Y. The impact of antimicrobial resistance on health and economic outcomes. Clin Infect Dis. 2003 Jun 1;36(11):1433-7. 5. Roberts RR, Hota B, Ahmad I, Scott RD, 2nd, Foster SD, Abbasi F, et al. Hospital and societal costs of antimicrobial-resistant infections in a Chicago teaching hospital: implications for antibiotic stewardship. Clin Infect Dis. 2009 Oct 15;49(8):1175-84. 6. Kollef MH, Sherman G, Ward S, Fraser VJ. 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