

“It’s time to act: the EU engagement against antimicrobial resistance”

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Antimicrobial resistance is a wide and complex concept, which involves different competences in the framework of veterinary public health.

Monitoring and surveillance of antimicrobial resistance have the following main objectives:

- detect **emergence**, and understand **dissemination** of AMR.
- provide data relevant for **risk assessment**
- plan **interventions** and measure their effects.

According to this strategy, at European level the three agencies competent in this sector (EFSA - European Food Safety Authority, ECDC - European Center for Disease prevention and Control and EMA - European Medicines Agency) are carrying out several activities, some of them summarised below.

Analysis of antimicrobial use and resistance (JIACRA)

Following the publication of the first report in 2015, the second ECDC/EFSA/EMA joint report on the integrated analysis of antimicrobial consumption (AMC) and antimicrobial resistance (AMR) in bacteria from humans and food-producing animals addressed data obtained by the Agencies’ EU-wide surveillance networks for 2013–2015 (EFSA Journal 2017;15(7):4872,135 pp. doi:10.2903/j.efsa.2017.4872). AMC in both sectors, expressed in mg/kg of estimated biomass, were compared at country and European level. Substantial variations between countries were observed in both sectors

Univariate and multivariate analyses were applied to study associations between AMC and AMR. In 2014, the average AMC was higher in animals (152 mg/kg) than in humans (124 mg/kg), but the opposite applied to the median AMC (67 and 118 mg/kg, respectively). In 18 of 28 countries, AMC was lower in animals than in humans. Univariate analysis showed statistically-significant associations between AMC and AMR for fluoroquinolones and *Escherichia coli* in both sectors, for 3rd- and 4th-generation cephalosporins and *E. coli* in humans, and tetracyclines and polymyxins and *E. coli* in animals. In humans, there was a statistically-significant association between AMC and AMR for carbapenems and polymyxins in *Klebsiella pneumoniae*. Consumption of macrolides in animals was significantly associated with macrolide resistance in *Campylobacter coli* in animals and humans.

Multivariate analyses demonstrated that 3rd- and 4th-generation cephalosporin and fluoroquinolone resistance in *E. coli* from humans was associated with corresponding AMC in humans, whereas resistance to fluoroquinolones in *Salmonella* spp. and *Campylobacter* spp. from humans was related to consumption of fluoroquinolones in animals. These results suggest that from a ‘One-health’ perspective, there is potential in both sectors to further develop prudent use of antimicrobials and thereby reduce AMR.

Joint EFSA-EMA opinion on the reduction of the need to use antimicrobials in animal husbandry (RONAFA)

This Scientific Opinion (EFSA Journal 2017;15(1):4666, 245 pp. doi:10.2903/j.efsa.2017.4666) was published by EFSA and EMA following the request of the European Commission to review measures taken in the EU to reduce the need for and use of antimicrobials in food-producing animals, and the resultant impacts on antimicrobial resistance (AMR).

Reduction strategies have been implemented successfully in some Member States. Such strategies include national reduction targets, benchmarking of antimicrobial use, controls on prescribing and restrictions on use of specific critically important antimicrobials, together with improvements to animal husbandry and disease prevention and control measures. Due to the multiplicity of factors contributing to AMR, the impact of any single measure is difficult to quantify, although there is evidence of an association between reduction in antimicrobial use and reduced AMR. To minimise antimicrobial use, a multifaceted integrated approach should be implemented, adapted to local circumstances.

Recommended options include: development of national strategies; harmonised systems for monitoring antimicrobial use and AMR development; establishing national targets for antimicrobial use reduction; use of on-farm health plans; increasing the responsibility of veterinarians for antimicrobial prescribing; training, education and raising public awareness; increasing the availability of rapid and reliable diagnostics; improving husbandry and management procedures for disease prevention and control; rethinking livestock production systems to reduce inherent disease risk.

Joint ECDC-EFSA-EMA opinion on outcome indicators on surveillance of AMR and use of antimicrobials

This is also a joint opinion by ECDC, EFSA and EMA, which have established a list of harmonised outcome indicators to assist European Union Member States in assessing their progress in reducing the use of antimicrobials and antimicrobial resistance (AMR) in both humans and food-producing animals (EFSA Journal 2017;15(10):5017, 70 pp. <https://doi.org/10.2903/j.efsa.2017.5017>ISSN:1831-4732).

For humans, the indicators for antimicrobial consumption include: total consumption of all antimicrobials for systemic use, ratio of community consumption of certain classes of broad-spectrum to narrow-spectrum antimicrobials, and consumption of a series of both broad- and narrow-spectrum antimicrobials frequently used in healthcare settings. Proposed indicators for AMR in humans are: meticillin-resistant *Staphylococcus aureus* and 3rd-generation cephalosporin-resistant *Escherichia coli*, *Klebsiella pneumoniae* resistant to several important antimicrobials, penicillin- and macrolide-resistant *Streptococcus pneumoniae*, and emerging carbapenem-resistant *Klebsiella pneumoniae*. For food-producing animals, indicators for antimicrobial consumption include: overall sales of veterinary antimicrobials, sales of 3rd- and 4th-generation cephalosporins, sales of quinolones, and sales of polymyxins. Finally, indicators for AMR in food-producing animals are proposed: full susceptibility to a predefined panel of antimicrobials, proportion of samples containing ESBL-/AmpC-producing *E. coli*, multi-drug resistance, and resistance to ciprofloxacin, in indicator *E. coli*. For all sectors the chosen indicators, which should be reconsidered at least every five years, are expected to be valid tools in monitoring antimicrobial consumption and AMR.