Rapport de l'EFSA sur la résistance aux antibiotiques des bactéries zoonotiques et commensales en 2012

Summary

Zoonoses are infections and diseases that are transmissible between animals and humans. Infection can be acquired directly from animals, or through the ingestion of contaminated foodstuffs. The severity of these diseases in humans can vary from mild symptoms to life-threatening conditions. The zoonotic bacteria that are resistant to antimicrobials are of special concern, since they might compromise the effective treatment of infections in humans. In order to follow the occurrence of antimicrobial resistance in zoonotic bacteria isolated from humans, animals and food in the European Union, information is collected and analysed from the European Union Member States.In 2012, 26 Member States reported data on antimicrobial resistance in zoonotic bacteria to the European Commission and the European Food Safety Authority, and 19 Member States submitted data to the European Centre for Disease Prevention and Control. In addition, three other European countries provided information. Assisted by its contractors, the Animal Health and Veterinary Laboratories Agency in the United Kingdom and the University of Hasselt in Belgium, the European Food Safety Authority and the European Centre for Disease Prevention and Control analysed the data, the results of which are published in this European Union Summary Report on antimicrobial resistance. Information on resistance was reported regarding Salmonella and Campylobacter isolates from human cases, food and animals, whereas data on indicator Escherichia coli and indicator enterococci isolates related only to animals and food. Information was reported by some Member States on the occurrence of methicillin-resistant Staphylococcus aureus in animals and food; the antimicrobial susceptibility of methicillin-resistant Staphylococcus aureus isolates was additionally reported by two countries.
Data on antimicrobial resistance in isolates from human cases were mainly interpreted by using clinical breakpoints, while the quantitative data on antimicrobial resistance in isolates from food and animals were assessed using harmonised epidemiological cut-off values that detect microbiological resistance, i.e. reduced susceptibility to the antimicrobials tested, as well as using clinical breakpoints where considered appropriate. Direct comparisons should only be made between isolates from different sources using the same measure of determining resistance (i.e. by applying the same breakpoint).

The reporting of antimicrobial resistance data at isolate-based level by a significant number of Member States allowed the second analysis at the European Union level of multi-resistance and co-resistance patterns to critically important antimicrobials in both human and animal isolates. Detailed analyses of multidrug resistance in certain Salmonella serovars, including analysis of high-level resistance to ciprofloxacin and pentavalent resistance, were possible for Member States reporting isolate-based data and included for the first time in the report. In addition, for certain bacterial species, antimicrobial resistance data could be analysed at the production-type level, such as broilers, laying hens and breeders of Gallus gallus, which allows the analysis of the data to be fine-tuned.

Antimicrobial resistance was commonly detected in isolates of Salmonella and Campylobacter from human cases as well as from food-producing animals and food in the European Union. This was also the case for indicator (commensal) Escherichia coli isolated from animals and food. For many of the antimicrobials, the levels of resistance varied greatly between different Member States.

In the European Union, the occurrence of resistance in Salmonella isolates from cases of salmonellosis in humans was high for ampicillin, streptomycin, sulfonamides and tetracyclines and moderate for nalidixic acid, with high levels of multi-drug resistance observed in some countries. Resistance to the critically important antimicrobials for human

medicine, cefotaxime (a third-generation cephalosporin) and ciprofloxacin (a fluoroquinolone), was relatively low, although the resistance levels for ciprofloxacin were generally higher in countries using more sensitive interpretive criteria, such as epidemiological cut-off values. Co-resistance to ciprofloxacin and cefotaxime among Salmonella isolates was very low. The resistance levels also differed substantially between the three most commonly reported serovars, with higher resistance to ciprofloxacin, gentamicin and nalidixic acid observed in Salmonella Enteritidis than in Salmonella Typhimurium and monophasic Salmonella Typhimurium and the opposite for the other antimicrobials.

There was a high level of resistance to ampicillin, ciprofloxacin, nalidixic acid and tetracyclines among Campylobacter isolates from human cases, with high and very high levels of multi-drug resistance observed in some countries. The levels of resistance to erythromycin in human Campylobacter jejuni isolates was overall low, but moderately high in Campylobacter coli. Very high resistance levels to ciprofloxacin were reported in human Campylobacter isolates, with increasing trends observed in several Member States.

Almost one in six human Campylobacter coli isolates were also resistant to both erythromycin and ciprofloxacin, which is worrying as these two antimicrobials are the clinically most important for treatment of Campylobacteriosis in humans.

The high proportions of Salmonella, Campylobacter and indicator Escherichia coli isolates exhibiting 'microbiological resistance' or reduced susceptibility to fluoroquinolones (ciprofloxacin) remain of concern. In Salmonella spp. isolates of food and animal origin, the highest occurrence of resistance to ciprofloxacin was noted in fattening turkeys, broiler meat, turkeys and broilers of Gallus gallus, where the proportion of such isolates varied between 46.0 % and 86.2 % in the reporting Member State group. Ciprofloxacin resistance was recorded more often in broilers than in breeders and laying hens. Two Member States demonstrated a significant increasing trend for ciprofloxacin and nalidixic acid resistance and one a decreasing trend for both antimicrobials in Salmonella species from Gallus gallus over the period from 2006 to 2012. Considering the indicator Escherichia coli isolates, the levels of ciprofloxacin resistance observed in isolates from broilers and pigs were 52.7 % and 7.5 %, respectively. Furthermore, high to extremely high resistance to fluoroquinolones was commonly observed in Campylobacter isolates from Gallus gallus and broiler meat, as well as from pigs and cattle, at levels ranging from 32.0 % (Campylobacter coli from pigs) to 82.7 % (Campylobacter coli from meat from broilers).

Resistance to the third-generation cephalosporin cefotaxime was observed in Salmonella spp. isolates from Gallus gallus, turkeys, pigs, cattle and meat derived from broilers, pigs and bovine at very low or low levels varying between 0.4 % and 4.5 %, as well as in indicator Escherichia coli isolates from Gallus gallus, pigs and cattle at low or moderate levels ranging from 1.4 % to 10.2 %. Resistance to erythromycin was detected in Campylobacter isolates from Gallus gallus, pigs, cattle and broiler meat at levels of 0.4 % (Campylobacter jejuni from Gallus gallus) to 23.9 % (Campylobacter coli from pigs).

Among Salmonella isolates from meat and animals, microbiological resistance to tetracyclines, ampicillin and sulfonamides was reported at levels of 9.5 % to 66.7 % and it was higher in isolates from pigs and turkeys than in those from broilers, laying hens, breeding hens and cattle. Resistance to ciprofloxacin and nalidixic acid was higher in Salmonella isolates from fattening turkeys and broilers (41.5-86.2 %) than it was in isolates from breeding hens, laying hens, pigs or cattle (5.8-25.5 %). In isolates of Campylobacter from meat and animals, resistance was commonly detected to tetracyclines at levels up to 76.8 %, whereas much lower resistance was reported to gentamicin (levels lower than 4.1 %).

Among indicator Escherichia coli from broilers and pigs, microbiological resistance to tetracyclines, ampicillin and sulfonamides was commonly reported at levels of 29.5 % to 54.7 %, resistance levels being lower in laying hens (18.3 % to 25.2 %). In the case of cattle, levels of resistance to these antimicrobials fell within the range 34.7 % to 46.7 % in younger age groups, mainly fattening veal calves, but values were lower in older cattle, mainly adult cows. In general, resistance levels were lower among isolates from cattle and layers than in isolates from broilers and pigs.

Multi-resistance (reduced susceptibility to at least three antimicrobial classes according to epidemiological cut-off values) was generally high in Salmonella isolates from broilers, pigs and cattle in those countries reporting isolate-based data. However, co-resistance/reduced susceptibility to the clinically important antimicrobials ciprofloxacin and cefotaxime in the same isolate was detected in very few isolates of Salmonella species. Multi-resistance was either not detected or reported at very low or low levels in Campylobacter jejuni isolates from broilers, and co-resistance to ciprofloxacin and erythromycin at the same time was reported at low levels. High-level ciprofloxacin resistance was observed in a limited number of Salmonella isolates, notably belonging to the serovars Kentucky and Infantis, from broilers, laying hens and turkeys, but not in isolates from pigs or cattle, although it was detected in isolates from pig meat. A small number of serovars, including notably the serovar Infantis, displayed pentavalent resistance, which is potentially significant because certain Salmonella serovars which have shown epidemic spread have shown such pentavalent resistance in the past.

Several statistically significant national trends in resistance levels in isolates from animals were observed. Among Salmonella isolates, more decreasing than increasing trends were found, whereas in the case of Campylobacter, the statistically significant national trends were mostly increasing.