ANTIMICROBIALS

Use of antibiotics in animals and people

C. NUNAN and R. Young (*VR*, November 7, 2015, pp 468-469) responded extensively to my letter on the use of antibiotics in animals and people (*VR*, September 19, 2015, pp 292-293). My reference to the European Surveillance of Veterinary Antimicrobial Consumption (ESVAC) data was directly to the figures used in the editorial by J. W. Scannell and A. Bruce (*VR*, August 15, 2015, vol 177, pp 168-170), from ESVAC (2013). An updated report has since been published (ESVAC 2015) and the latest data from the year 2013 are as follows: the UK 62.1 mg/population correction unit (pcu)/year (compared with 51.2 mg/pcu/year in 2011), the Netherlands 69.9 mg/pcu/year (113.9 mg/pcu/year in 2011), Denmark 44.9 mg/pcu/year (42.6 mg/pcu/year in 2011), and Italy 301.61 mg/pcu/year (369.7 mg/pcu/year in 2011). There have been some substantial changes with both the Dutch and Italians reducing their use, and the UK and Danes increasing theirs, but there are still some substantial differences in use between EU member states, and the UK still remains in the lower-user half of the EU, with 20.6 per cent of the Italian usage. The ESVAC committee, run by the European Medicines Agency, is an ongoing system in development in the EU, which it is hoped will eventually provide answers to the antimicrobial use and resistance issues in veterinary medicine in the future. It is not just the quantity of antibiotic used that is important but the type of antibiotic, such as the third- and fourth-generation cephalosporins, which can be more significant medically and also politically.

Hence, my main point regarding the transmission of extended-spectrum beta lactamases (ESBLs) from animals and food to people and their association with clinical infections in people was that this is an end point; the final risk of significance from transfer of resistance from animal contact and food consumption and its actual impact on clinical infections in people. There has been much speculation on the 'potential' risk of transference of bacteria carrying resistance genes in transferable plasmids to people from food or directly from contact with animals, but are these resistance genes actually causing disease issues in people; that is, are they of any real significance? Being similar is not being identical genetically, and potential does not mean actual or factual. One would expect similar resistance genes to be selected for by similar antibiotic use, but the use of genetic identification to determine the actual attribution of transmission has taken the speculation out of the equation and allowed for a quantifiable assessment.

In addition to the paper by Wu and others (2013) and the Swedish Veterinary Antimicrobial Resistance Monitoring data for 2014 (SVARM 2015) referred to in my original letter, the Danish Integrated Antimicrobial Resistance Monitoring and Research Programme 2014 report (DANMAP 2015) has recently described findings in Denmark with regard to ESBL gene resistance attribution/transmission to clinical blood infections in people from locally produced and imported meat. It found that one of 241 ESBLs in people was identical genetically to food-related ESBLs; an ESBL (ST23, CTX-M-1) found in chicken meat. This confirms the significance and relative accuracy of the two original reports (see Table 1). Significantly, no carbapenemase-resistant genes were found in the 870 meat samples (453 Danish meat samples and 417 imported meat samples) (DANMAP 2015).

To date, we can estimate that the combined attribution of ESBLs from animals and food to people associated with clinical infections is two in 747; that is, 0.27 per cent (sd ± 0.21) and, therefore, 99.73 per cent (sd ± 0.24) of ESBL clinical infections can be attributed to human use of antimicrobials, especially in hospitals (as the third- and fourth-

TABLE 1: Combined ESBL results attribution to animals and food and those in clinical infections in people

Reference	Member states involved	Number of human ESBL genes tested	Number of animal ESBL genes identical	Percentage animal/human ESBL genes identical
Wu and others (2013)	UK, The Netherlands, Germany	127	0	0
SVARM 2014 (2015)	Sweden	379	1	0.26
DANMAP 2014 (2015)	Denmark	241	1	0.41
Total	**5**	**747**	**2**	**0.27 (sd ± 0.21)**

generation cephalosporins are administered by injection) and care facilities among the elderly. In the Danish study, the average age of patients was 70 years and the average age of those dying from these blood infections was 75 years (range 47 to 97 years).

Further data may be developed in more member states in time regarding ESBL transmission, which might change the figures a little, but the Danes concluded that 'consumption of meat may currently be considered an insignificant source for the human infections' (DANMAP 2015). So, the transmission of resistance ESBL genes to people from animals and food that are actually associated with disease in people is surprisingly small, based on these data.

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Notes