HM Government

Executive summary

UK One Health Report

Joint report on antibiotic use and antibiotic resistance, 2013–2017

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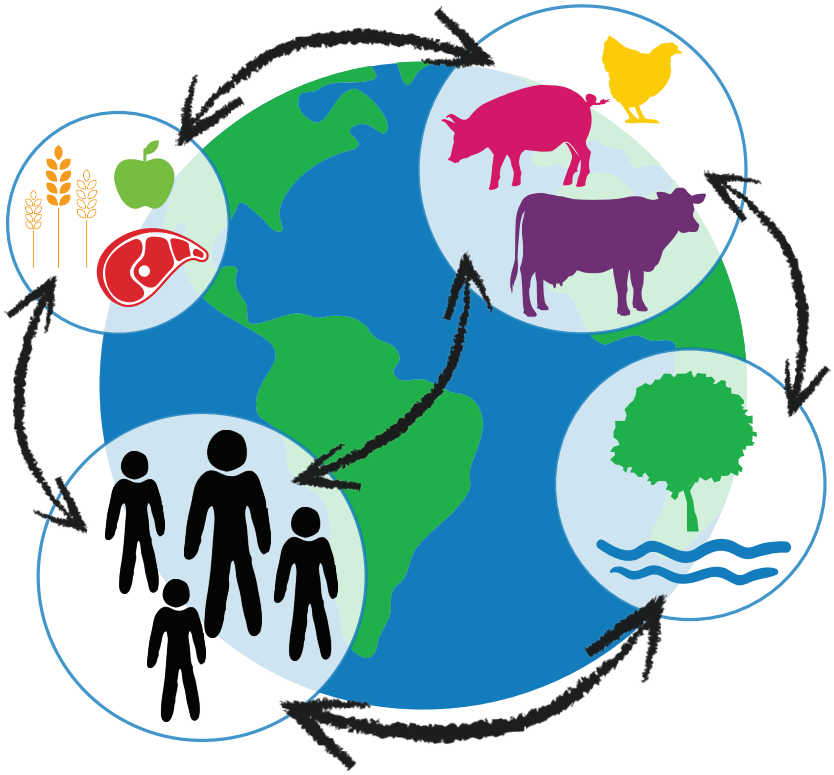


Antibiotic Use and Resistance in People and Animals between 2013 and 2017

Key points

Antibiotic Use

*In mg/kg**

• Based on use per 'bodyweight', there was a reduction of 40% in food-producing animals (from 62 mg/kg to 37 mg/kg) and 9% in people (from 135 mg/kg to 123 mg/kg).

By weight of active ingredient

• Total use/sales in tonnes dropped by 19% from 957 to 773 tonnes.

• In 2017, use in people was 491 tonnes and sales for use in animals (food-producing animals**, horses and pets) were 282 tonnes.

• Use in people represented 55% of all use/sales in 2013 and 64% in 2017.

• Overall, 89% (17 tonnes) of highest priority critically important antibiotics were used in people. Their use increased in people by 8% and decreased in animals by 51%.

Antibiotic Resistance

• For food-producing animals, no resistance was detected in *E. coli* or *Salmonella* spp. to colistin, and very low*** or no resistance was detected respectively to 3rd generation cephalosporins. There was low resistance level to fluoroquinolones for *E. coli* and only very low resistance level for *Salmonella* spp.

• For people, resistance level to 3rd generation cephalosporins and to fluoroquinolones was moderate for *E. coli*, and was low and moderate respectively for *Salmonella* spp. Resistance level to colistin was low in both *E. coli* and *Salmonella* spp.

• For people, retail chicken meat and food-producing animals, resistance level to fluoroquinolones was high for *Campylobacter jejuni.* Resistance to erythromycin was low in *C. jejuni* isolates from people and retail chicken meat and very low in isolates from food-producing animals.

Notes:

* mg/kg: is the milligrams of active ingredient of antibiotics sold/used per kilogram of bodyweight of food-producing animals or people in the UK.

** Food-producing animals: poultry and pigs for *E. coli* and *Salmonella* spp; poultry for *Campylobacter.*

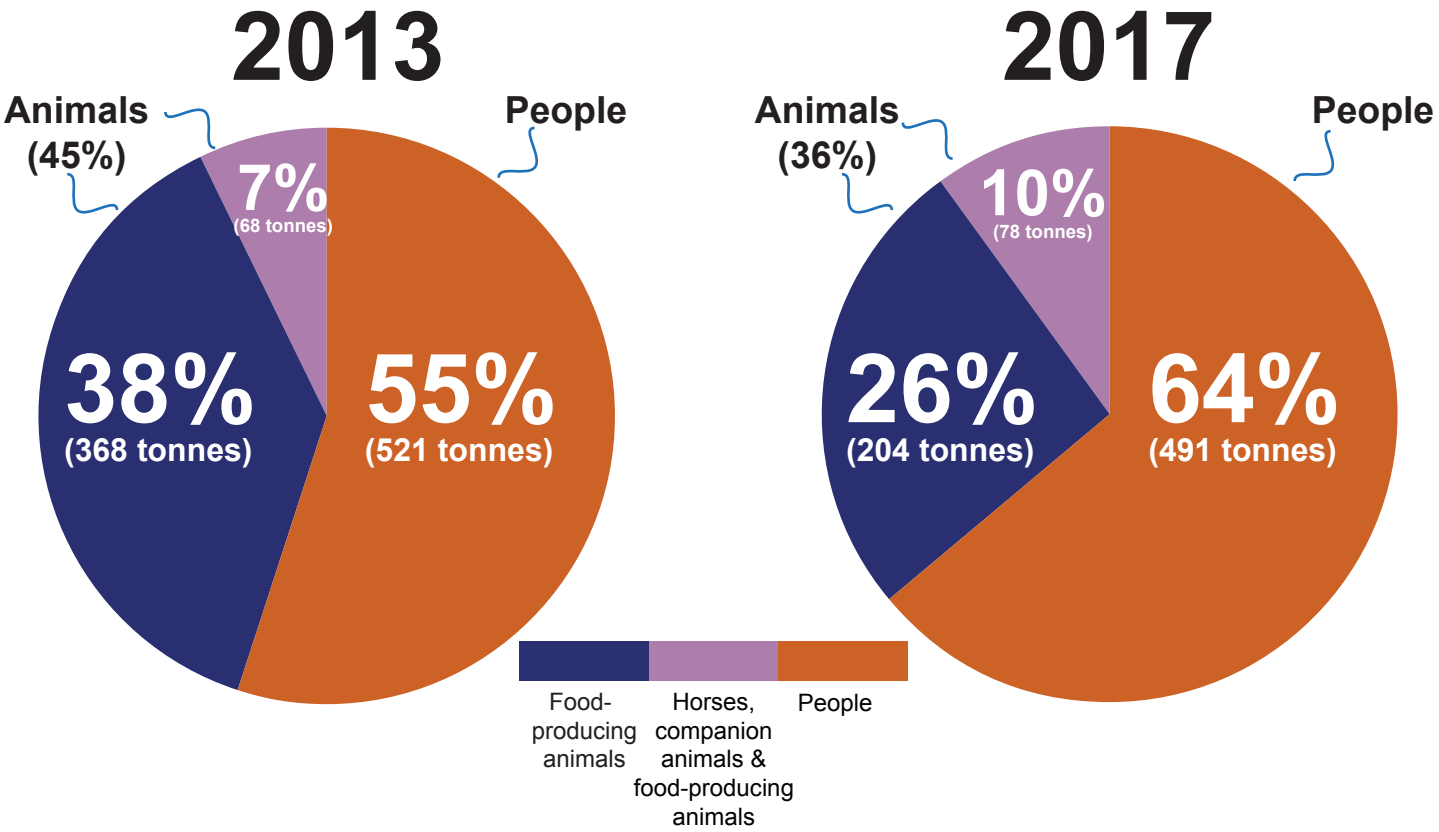
*** Resistance levels are based on the classification in the European Union summary reports by the European Food Safety Authority. Definitions of very low to high are: Very low (0.1-1%); Low (>1%-10%); Moderate (>10%-20%); High (>20-50%).

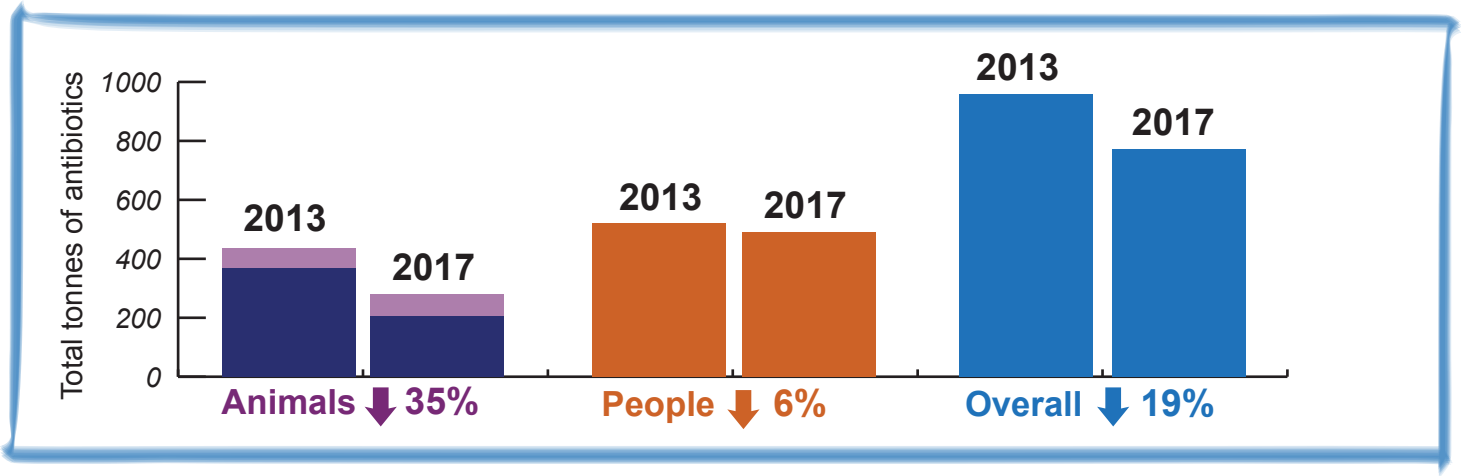
Antibiotic Use

Reductions in total tonnes between 2013 and 2017

In 2017, a total of 773 tonnes* of antibiotic active ingredients was dispensed in the UK for use in people and animals. This represents an overall reduction of 19% between 2013 and 2017. Tonnage used dropped by 6% in people (521 to 491* tonnes; excluding private prescriptions) and by 35% in animals (436 to 282 tonnes) over this period.

Of the 773 tonnes, 64% was for use in people, 26% for use in food-producing animals only and 10% for use in companion animals and horses, but also in food-producing animals. Of the 64% prescribed for human use, approximately 80% was used in the community and 20% in hospitals. Of the 36% sold for use in animals, 72% was for use in food-producing animals only and 28% for use in horses, companion animals and also allowed for food-producing animals.



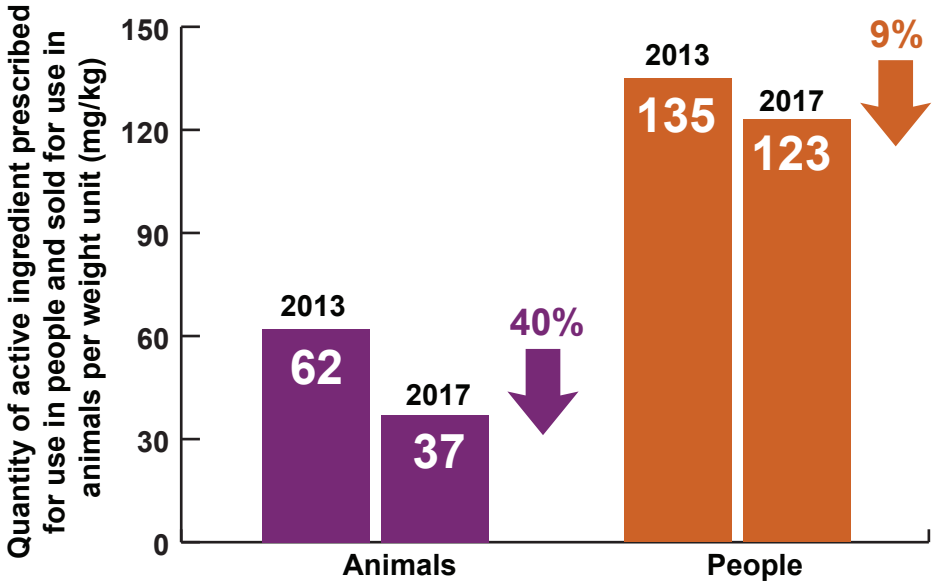


* For the human sector, usage data include all publicly funded prescriptions in primary and secondary care, but not from the private sector. Therefore, this figure does not cover all human use as there is no method to collect private prescriptions.

Antibiotic Use

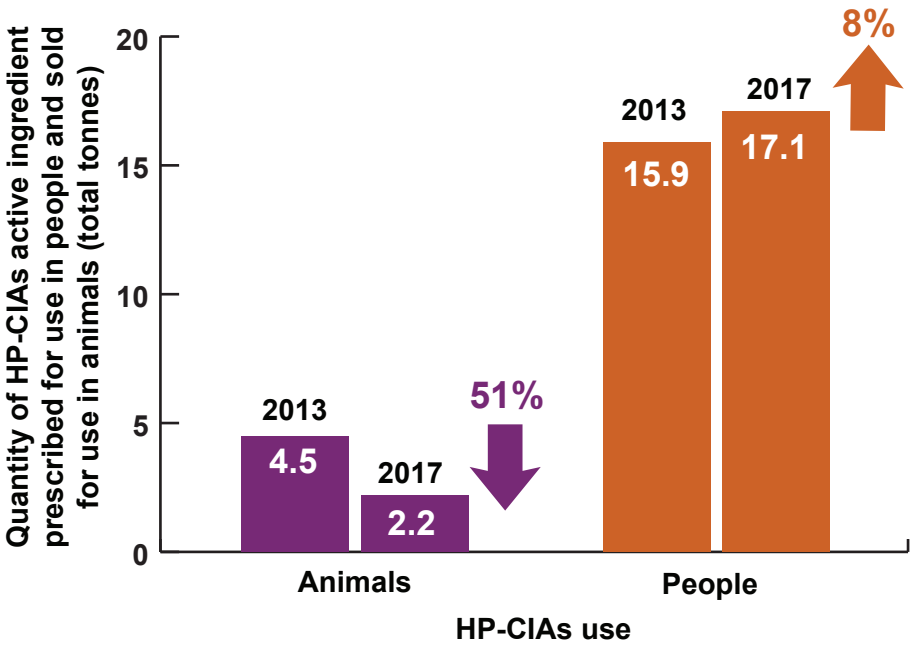
Reductions in mg/kg between 2013 and 2017

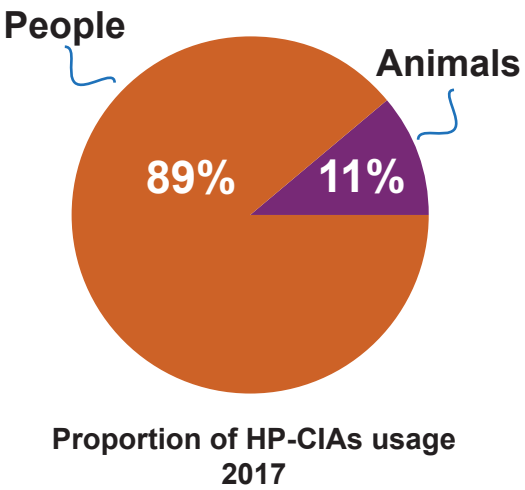
When the tonnage is corrected for bodyweight and population size of humans and animals at the likely time of treatment, the amount used in people was 123 mg/kg and the amount used in food-producing animals was 37 mg/kg. This represents a reduction of 9% and 40% respectively when compared to 2013 levels.



Total tonnes of HP-CIAs used between 2013 and 2017

Overall, 19.3 tonnes of antibiotics (2.5% of total UK use) classed as highest priority critically important (HP-CIAs*) were prescribed or sold for use in people and animals of which 89% was used in people and 11% in animals. Sales of HP-CIAs for use in animals was 2.2 tonnes (0.8% of total sales for use in animals); a drop of 51% compared to 2013. In people, HP-CIAs use was estimated at 17.1 tonnes (3.5% of total human use); an increase of 8% compared to 2013.





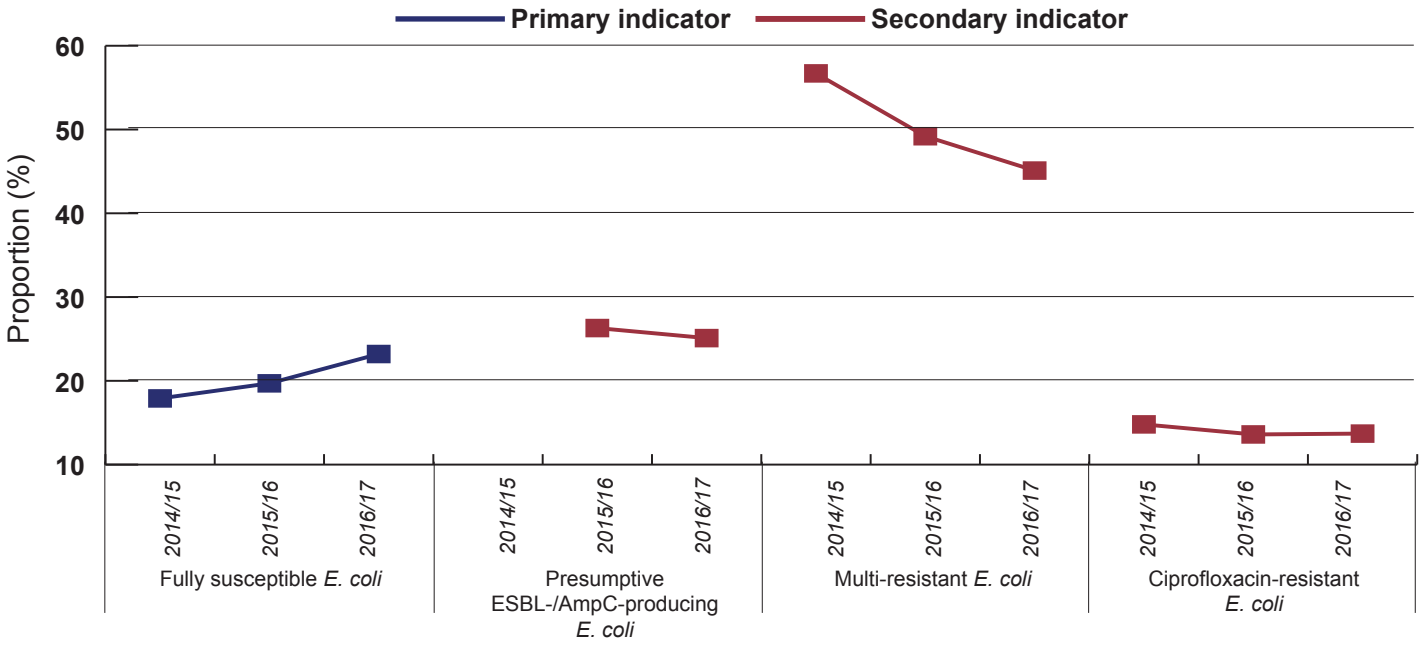
** HP-CIAs include the following three classes: 3rd and 4th generation cephalosporins, fluoroquinolones and colistin.*

Antibiotic Resistance

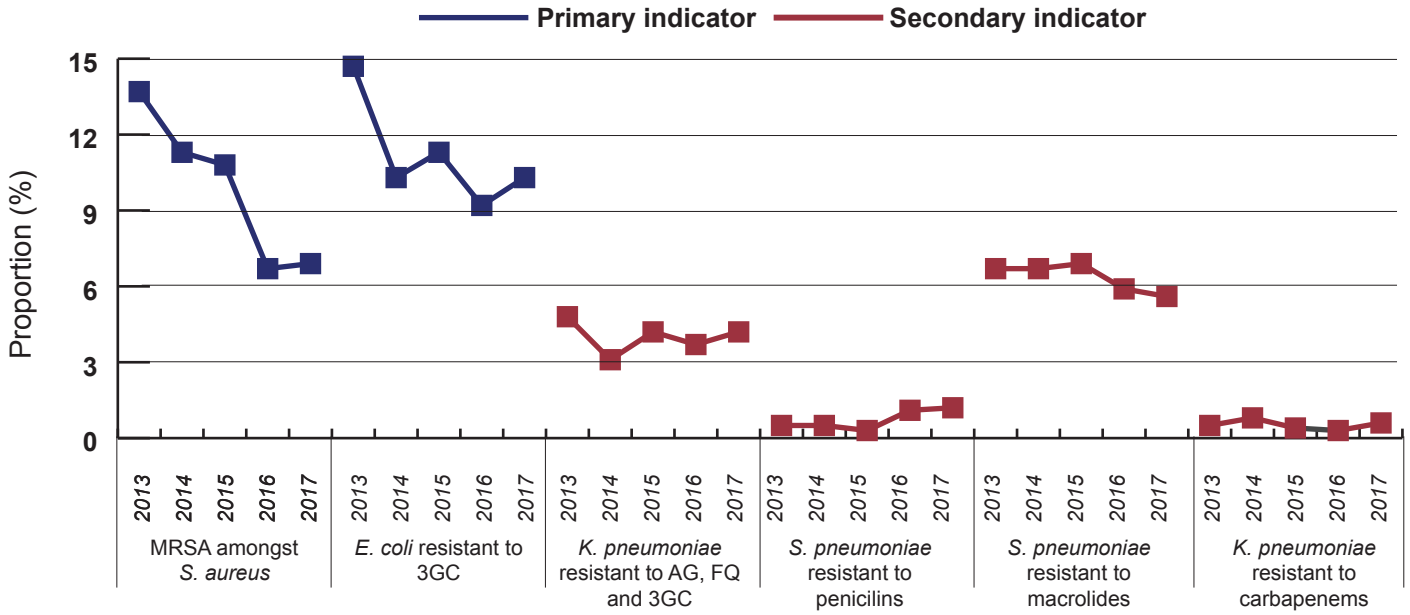
EU harmonised indicators for AMR

The European Centre for Disease Prevention and Control, the European Food Safety Authority and the European Medicines Agency have published a recommended set of harmonised primary and secondary key outcome indicators for monitoring antibiotic resistance in food-producing animals and humans in the EU Member States. In the UK, the majority of indicators have either reduced or were stable between 2013 and 2017.

Indicators for resistance in bacterial isolates from **food-producing animals**



Indicators for resistance in bacterial isolates from **people**



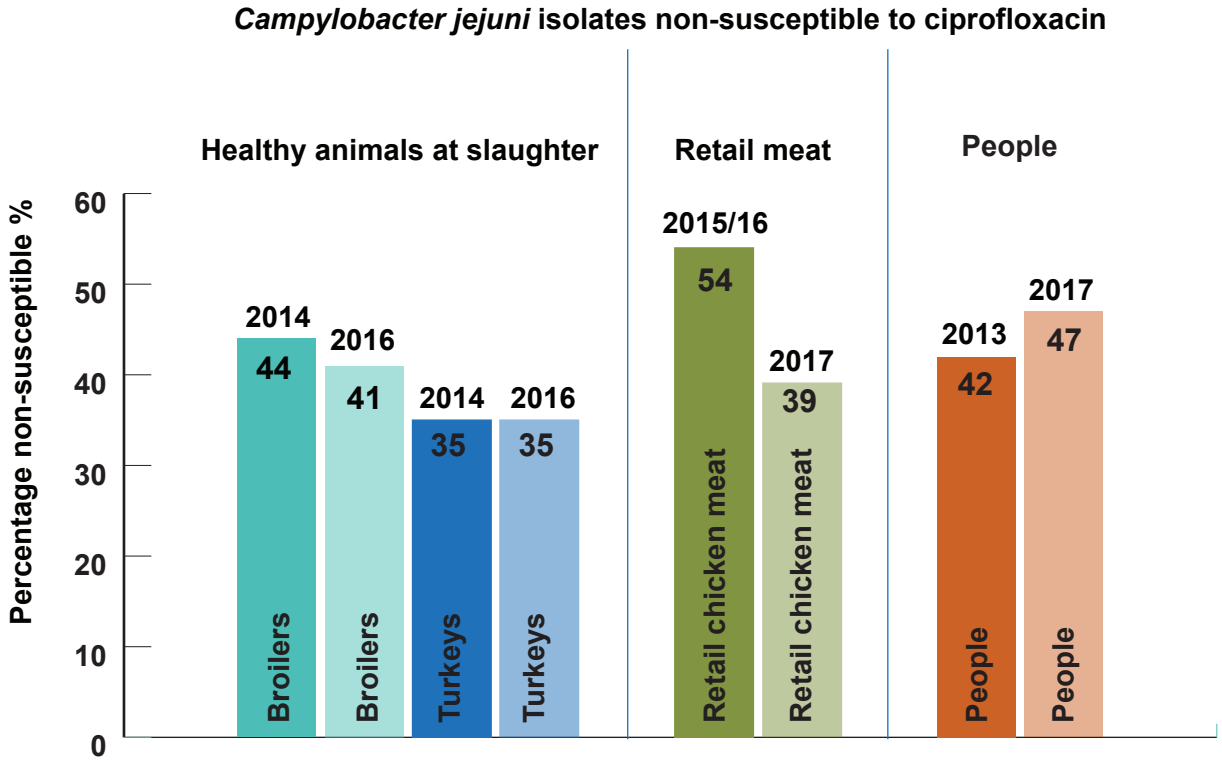
E. coli - Escherichia coli
S. aureus - Staphylococcus aureus
K. pneumoniae - Klebsiella pneumoniae

S. pneumoniae - Streptococcus pneumoniae
3GC - 3rd generation cephalosporins
AG, FQ - aminoglycosides, fluoroquinolones

Antibiotic Resistance

Campylobacter jejuni

Ciprofloxacin
In isolates from broilers and turkeys at slaughter and chicken meat at retail, the level of resistance to ciprofloxacin decreased or remained stable between the two study years, whereas it increased in people.



Erythromycin
All isolates obtained from healthy broiler and turkey samples from the abattoir showed <1% resistance to erythromycin in both year one and two of sampling.
The level of decreased-susceptibility in *C. jejuni* isolates obtained from retail chicken meat samples increased from 0% in 2015-16 to 7.6% in 2017.
In human *C. jejuni* isolates, non-susceptibility to erythromycin increased from 2.5% in 2015 to 3.4% in 2017.

Note: Results from healthy animals at slaughter are interpreted using EUCAST human Clinical Break Point (CBP); those from retail meat are interpreted using EUCAST epidemiological cut-off value (ECOFF); and results from humans are interpreted using CBP.

Salmonella spp.

Resistance levels in non-typhoidal *Salmonella* spp. isolates to HP-CIAs were low (<2%) or not detected in samples from poultry farms (broilers, layer hens, turkeys) in 2016.
The proportion of human *Salmonella* spp. isolates tested that were non-susceptible (intermediate and resistant) to HP-CIAs decreased for colistin (from 6% to 3%), but increased for ciprofloxacin (from 4% to 14%), cefotaxime (from 1% to 2%) and ceftazidime (from 0% to 4%) between 2013 and 2017. However, this may result from the changes in serovars identified in humans between 2014 and 2017, as well as the change in susceptibility testing practice over this time.

Antibiotic Resistance

Escherichia coli

Between 2014 and 2017, no resistance to the HP-CIAs colistin, cefotaxime and ceftazidime was detected in *E. coli* isolates from broilers, turkeys and pigs at slaughter. Resistance levels to HP-CIA ciprofloxacin were low (<7%) in *E. coli* isolates from broilers, turkeys and pigs.
In 2017, 1% of human *E. coli* blood isolates were non-susceptible to colistin, 20% to ciprofloxacin, and 12% to 3rd generation cephalosporins.

ESBL-/AmpC-/cabapenemase-producing *E. coli*

Samples from animals at slaughter and meat at retail were tested for presence of extended-spectrum β-lactamase (ESBL-) and AmpC β-lactamase (AmpC-) producing *E. coli*. Between 22%-25% of pig, 30% of broiler and 5% of turkey samples collected at slaughter yielded ESBL-/AmpC-producing *E. coli*. Samples from beef and pork at retail yielded 1-2% ESBL-/AmpC-producing *E.coli*; for chicken meat, this was 45%.
None of the *E. coli* isolates from pigs, broilers and turkeys were presumptive carbapenemase-producers.