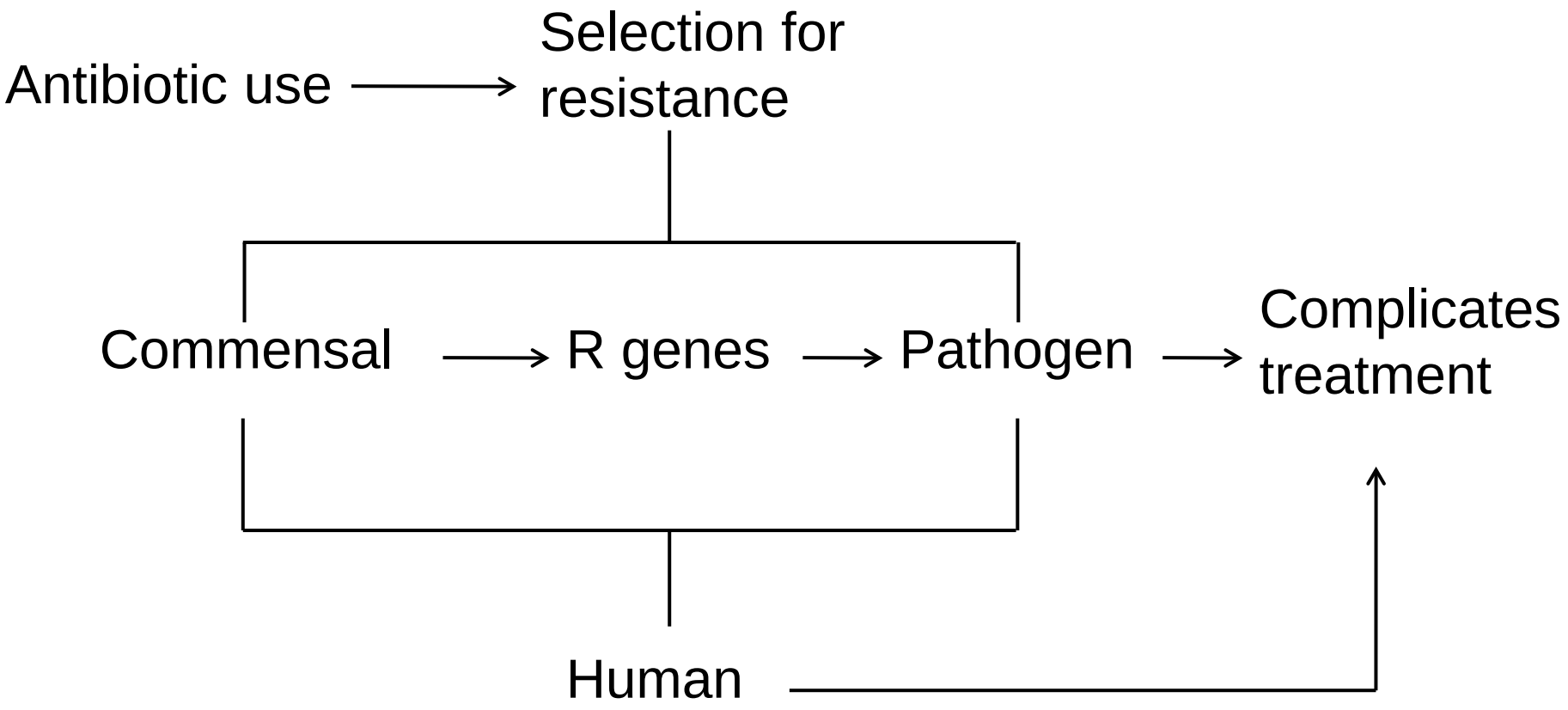
The UK 2013-18 AMR Strategy and Experience in Tackling AMR

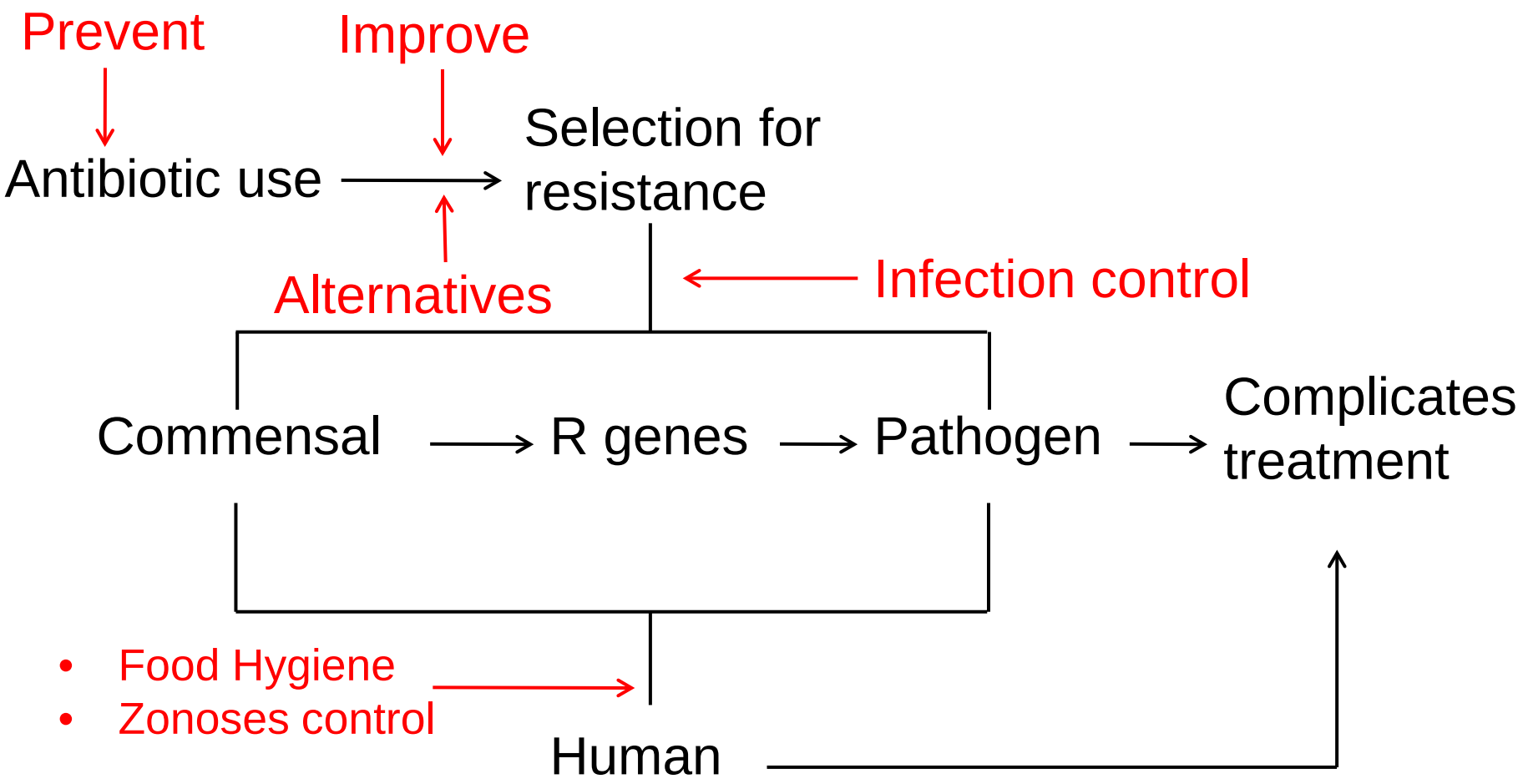
Presented by: Prof. Peter Borriello
Date: November 2018

- Working hypothesis
- Strategy adopted
- Tactics employed
- Animal v Human

The working Hypothesis



The working Hypothesis

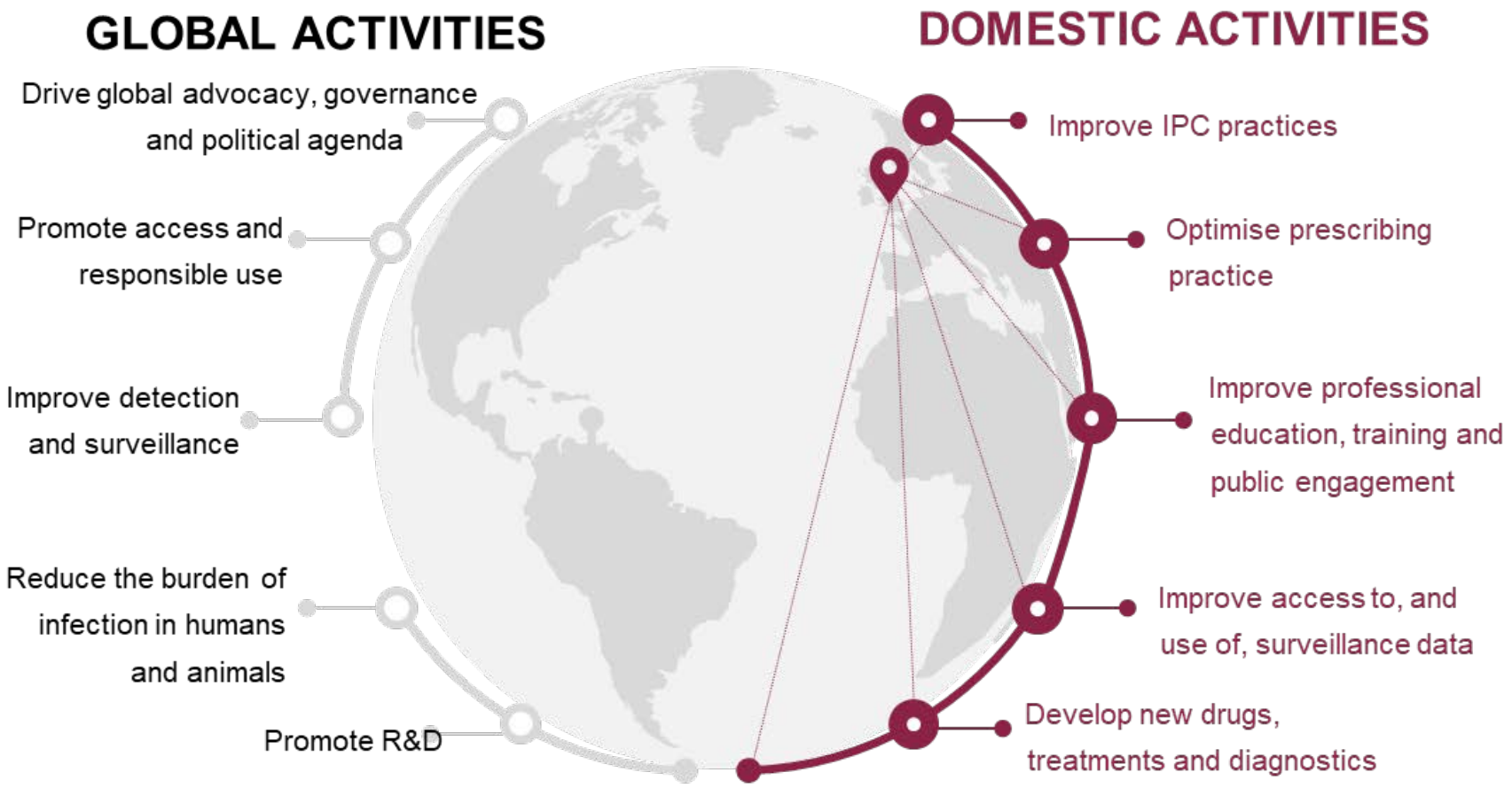


UK 5 year AMR strategy:

1. Improving infection prevention and control
2. Optimising prescribing
3. Improving professional education, training, public engagement.
4. Developing new drugs, treatments, diagnostics.
5. Increased access to/use of surveillance data.
6. Identification and prioritisation of AMR research needs.
7. Strengthened international collaboration

Figure 2. UK efforts to tackle AMR include global and domestic activities, identifying drivers of AMR emergence and spread

Veterinary Medicines Directorate



Key International Leadership/Advocacy

WHA / WHO: 2014/15

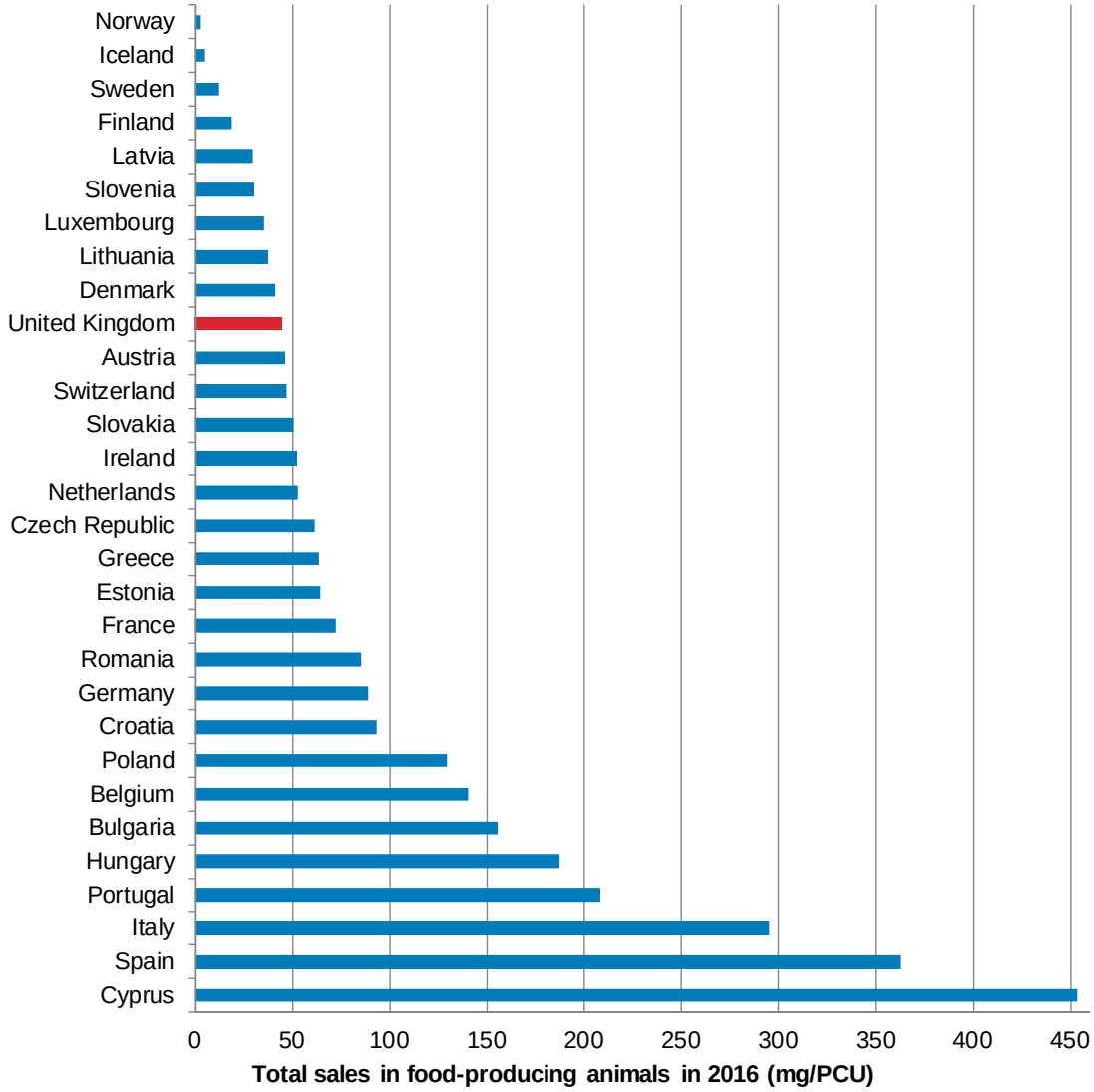
UN: 2016

G7 / G20: 2017

O’Neill Report

Sales
Use
Resistance

Quantity of antibiotics sold for use in livestock for 30 European countries as reported by ESVAC; mg active substance sold per population correction unit (mg/PCU); 2016



Consumption of antibiotics for systemic use (ATC group J01) in the community and hospital sector in Europe as reported by ESAC-Net; 2016

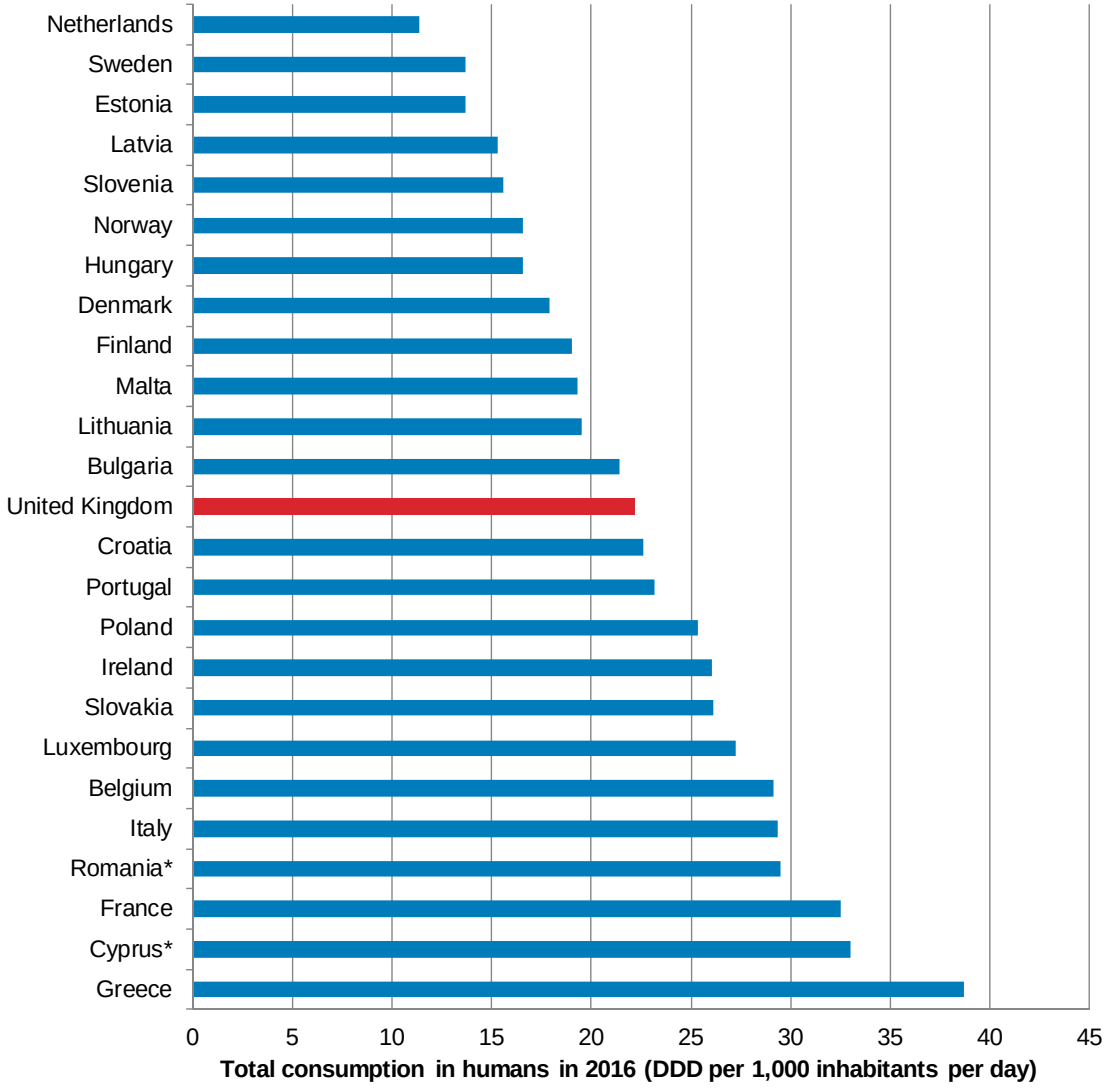
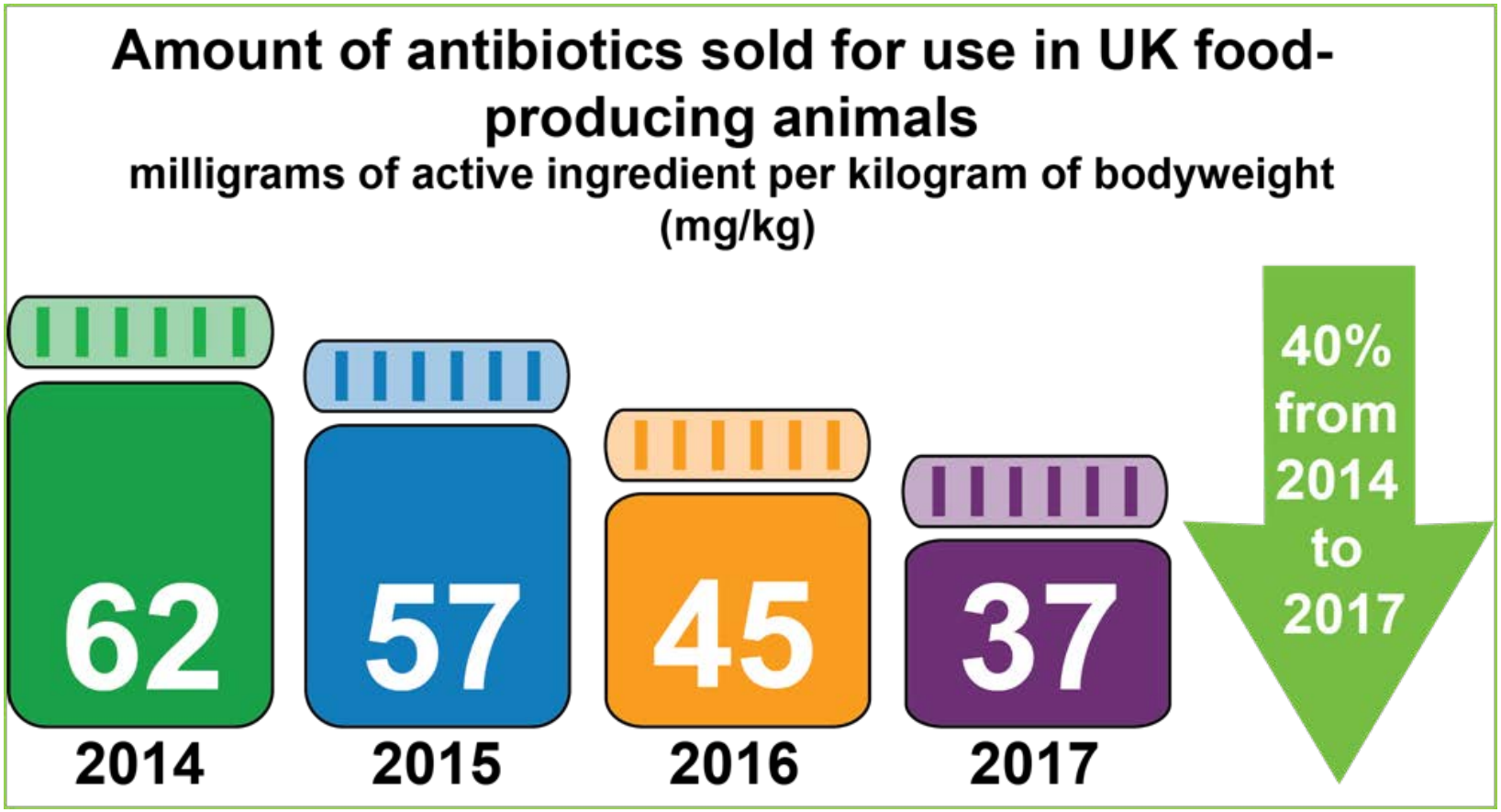
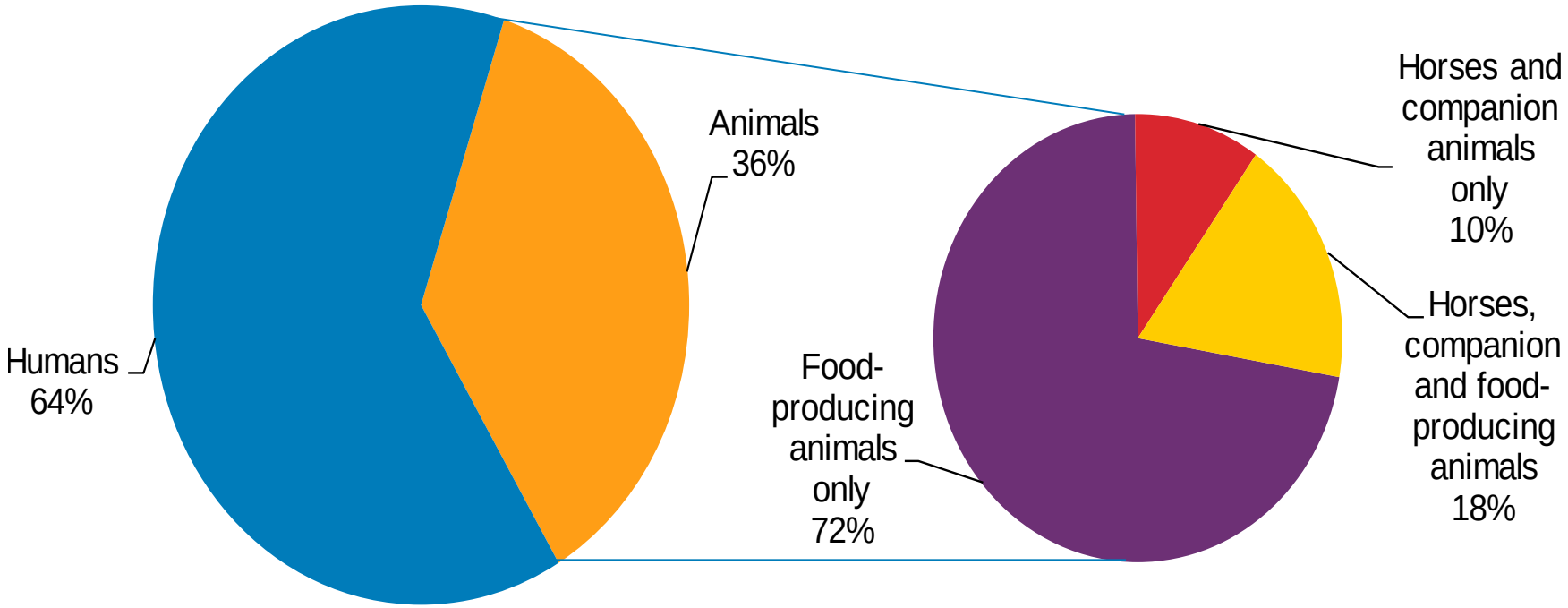


Figure 6. Sales of Antibiotics in UK food-producing animals

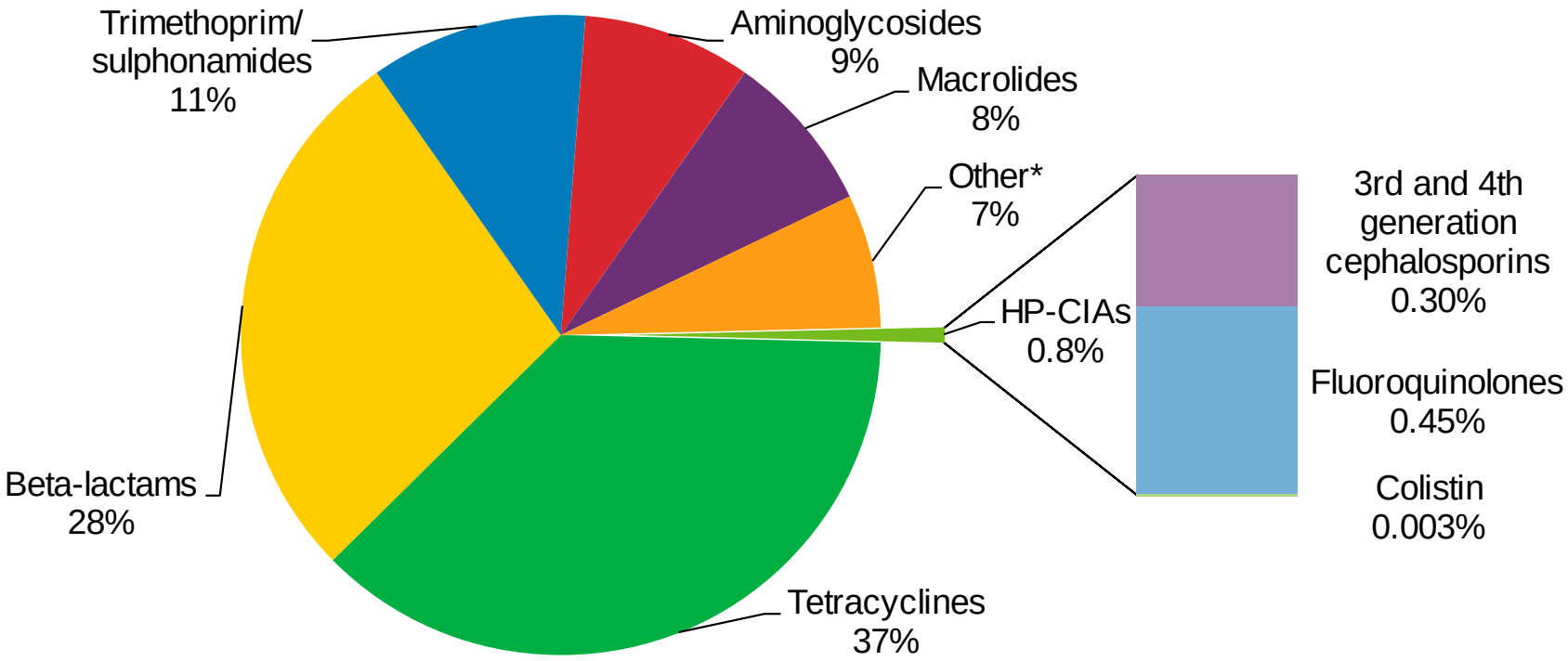


Comparison of antibiotics sold for use in people and animals (UK 2017)



Sales of Antibiotics

Active ingredient (% tonnes) of total antibiotics sold for all animal species by antibiotic class, 2017



* Amphenicols, lincomycin, pleuromutilins, polymyxins (excluding colistin) and steroidal antibiotics.

Source: Fig. 1.3; p. 19

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Sales of Antibiotics

Trends of antibiotic sales by
highest priority critically important antibiotic for use in food-producing animals and adjusted for animal population (mg/kg), 2013-2017

	2013	2014	2015	2016	2017	Compared with 2016	Compared with 2013
Sales of all antibiotics (mg/kg)	62	62	57	45	37	↓ 18%	↓ 40%
FQ* (mg/kg)	0.36	0.35	0.34	0.23	0.16	↓ 30%	↓ 55%
3/4 gen ceph* (mg/kg)	0.18	0.19	0.17	0.15	0.12	↓ 21%	↓ 32%
Colistin (mg/kg)	0.11	0.12	0.12	0.02	0.001	↓ 94%	↓ 99%

* FQ: fluoroquinolones; 3/4 gen ceph: 3rd and 4th generation cephalosporins

Source: p. 7

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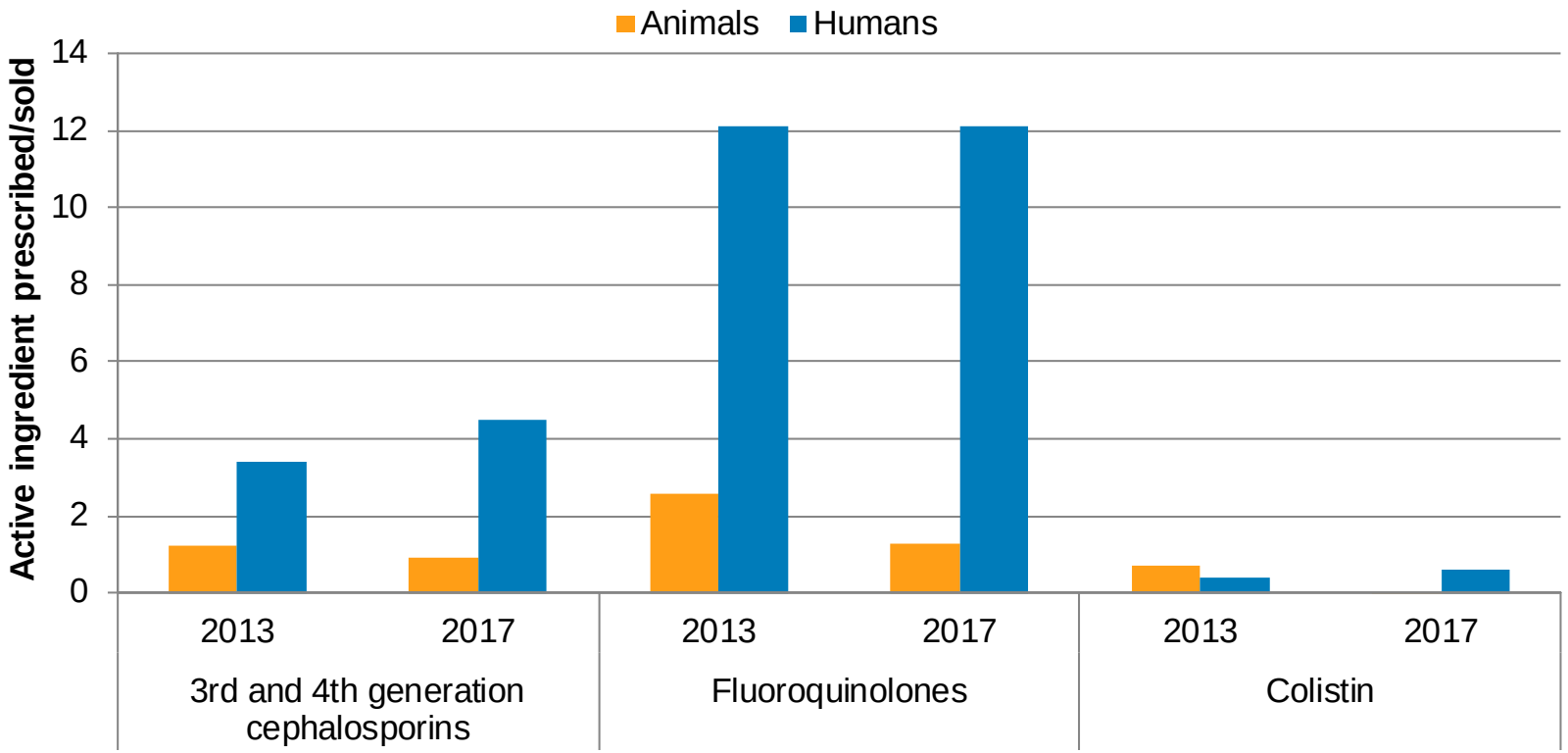
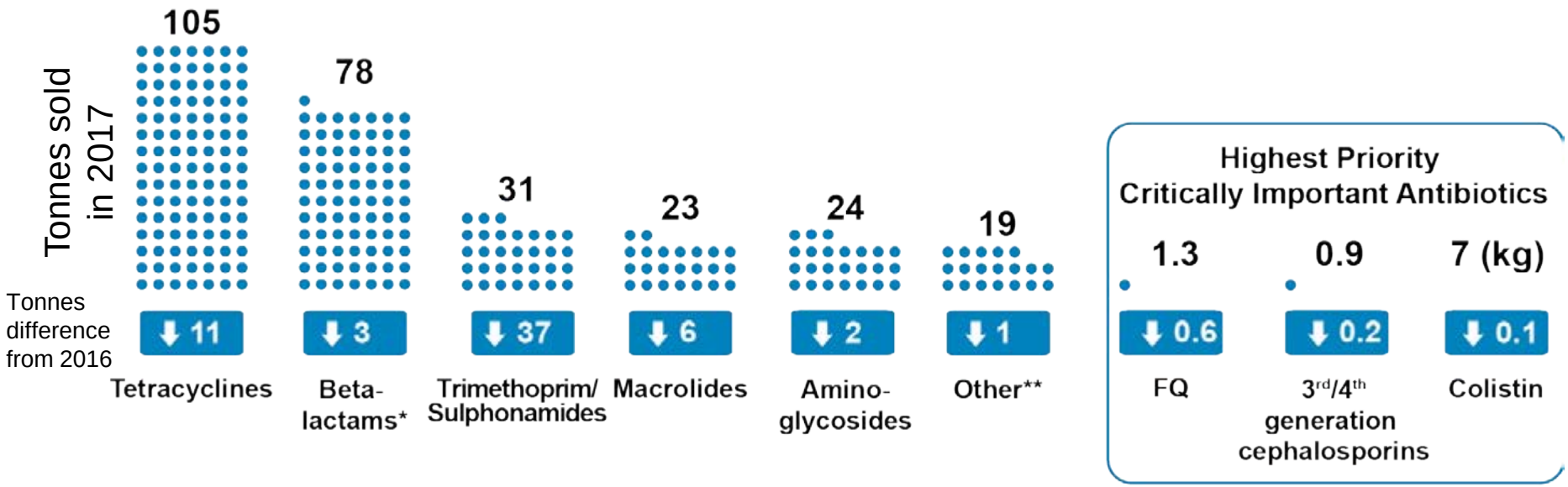
People v Animals for tonnes active ingredient of HP-CIAs.



Sales of Antibiotics

Total sales (tonnes) of active ingredient for all animal species by antibiotic class, 2017



●: 1 tonne

FQ: fluoroquinolones

* Includes 3rd and 4th generation cephalosporins

** Includes amphenicols, lincomycins, pleuromutilins, steroidal antibiotics and polymyxins (including colistin)

Source: p. 7

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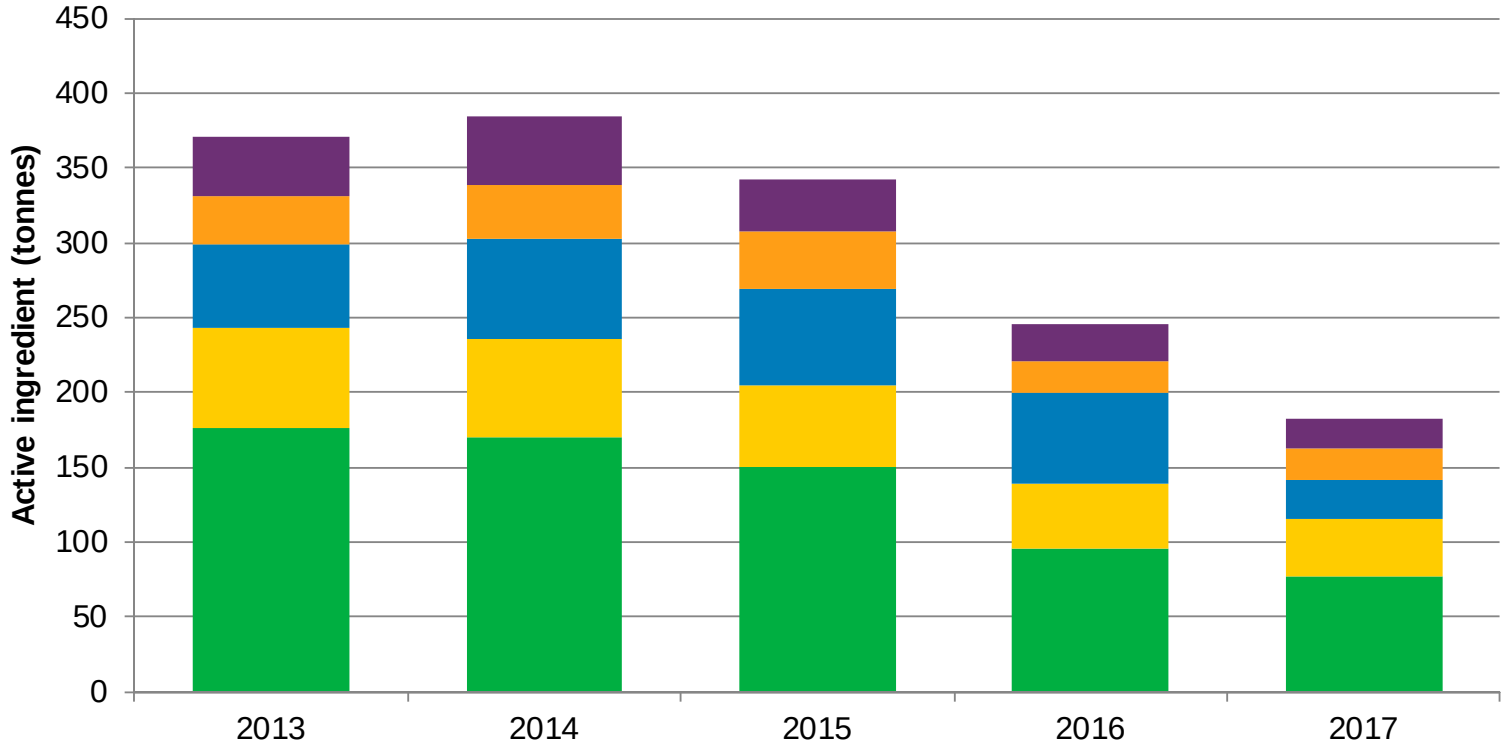
Sales of Antibiotics

Combined sales of premix and oral/water antibiotic products (tonnes of active ingredient), tetracyclines, beta-lactams, trimethoprim/ sulphonamides, other*, macrolides, 2013–2017



*Aminoglycosides, fluoroquinolones, amphenicols, lincomycins, pleuromutilins, polymyxins and steroidal antibiotics

Source: Fig. 1.7; p. 23

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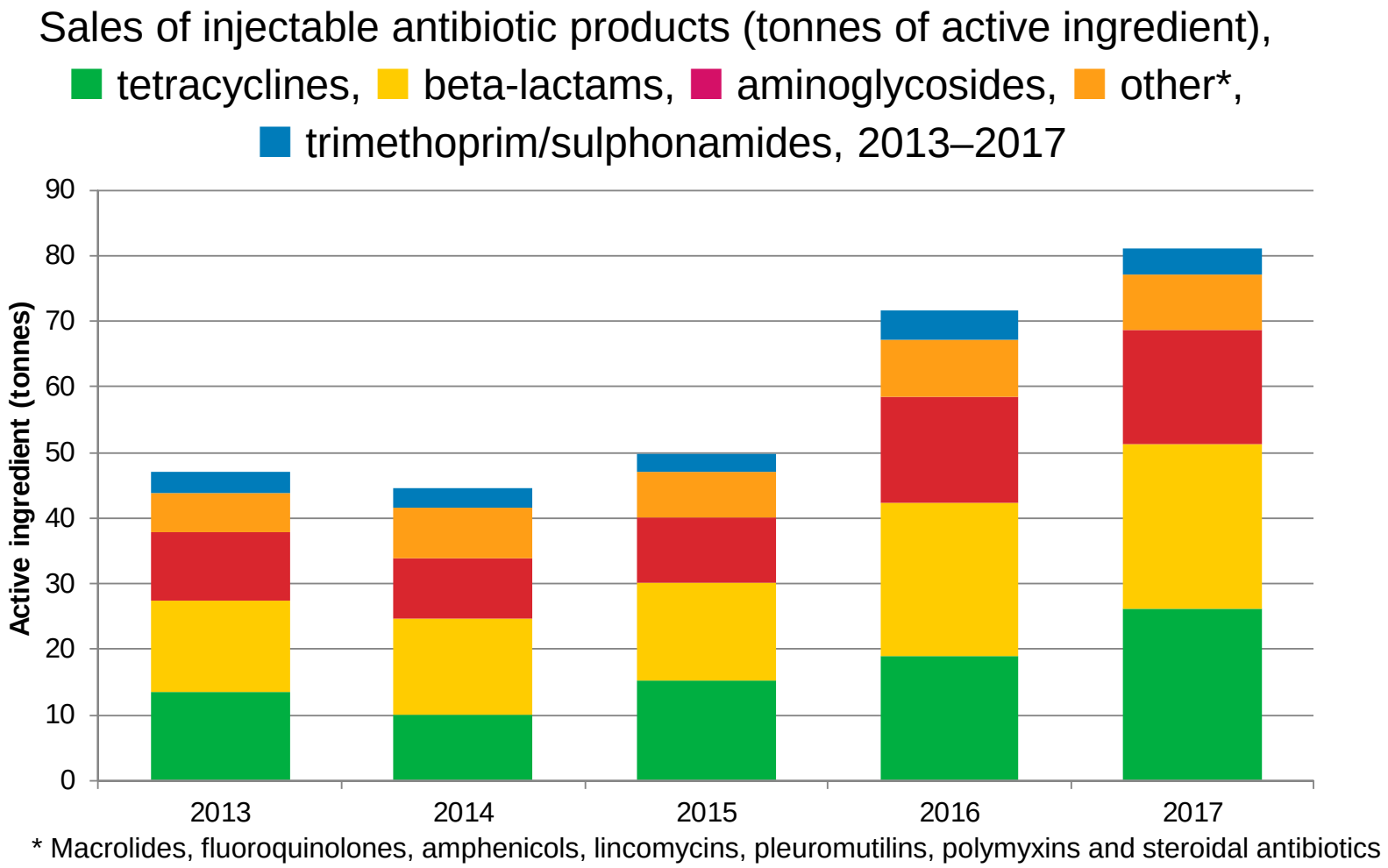
Sales of Antibiotics



* Macrolides, fluoroquinolones, amphenicols, lincomycins, pleuromutilins, polymyxins and steroidal antibiotics

Source: Fig. 1.8; p. 24

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Total sales ↓

All antibiotic classes ↓

(HP-CIAs now 0.8% of sales)

In feed/water use ↓

Injectables ↑

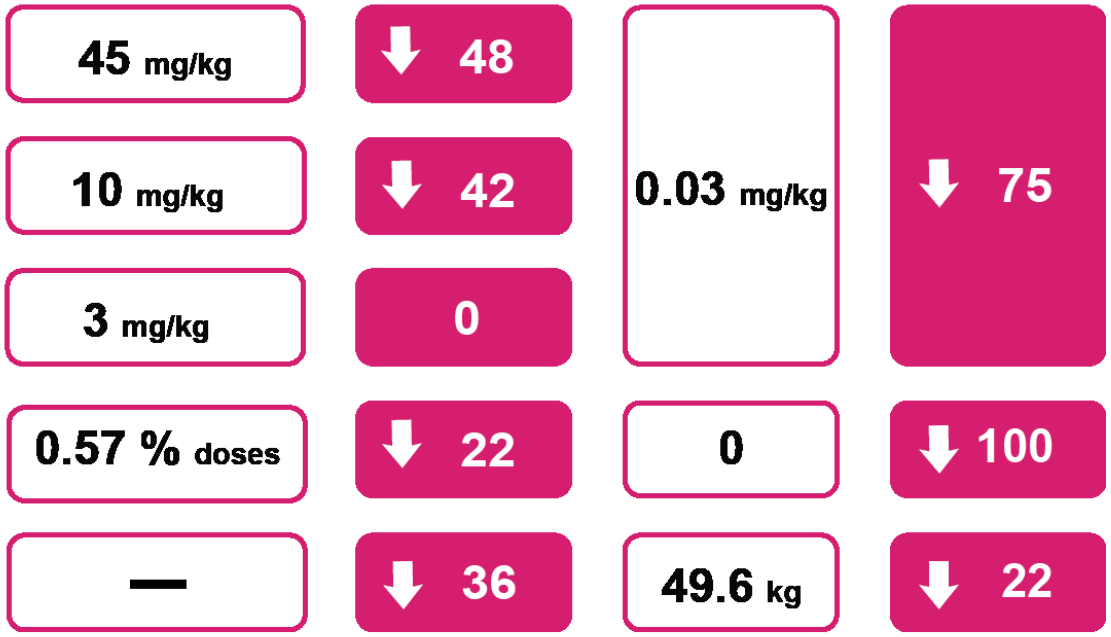
Sales

Use

Resistance

Antibiotic Usage Data

Antibiotic usage by food-producing animal species, 2017 compared with 2016



Source: p. 8

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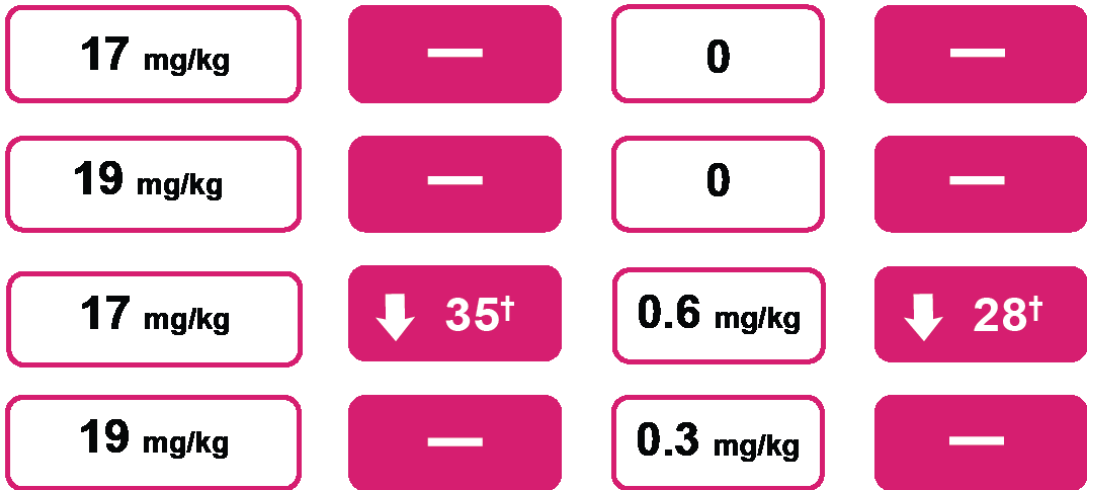
Antibiotic Usage Data

Antibiotic usage by food-producing animal species, 2017 compared with 2016



Source: p. 8

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Antibiotic Usage Data

Antibiotic usage in pigs and meat poultry, 2014-2017

	2014 (mg/kg)	2015 (mg/kg)	2016 (mg/kg)	2017 (mg/kg)	Compared with 2015 (pigs) or 2014 (meat poultry)
Pigs	—	278	183	131	⬇ 53%
Turkeys	220	200	86	45	⬇ 79%
Broilers	49	27	17	10	⬇ 80%
Ducks	15	8	3	3	⬇ 78%

Source: p. 8

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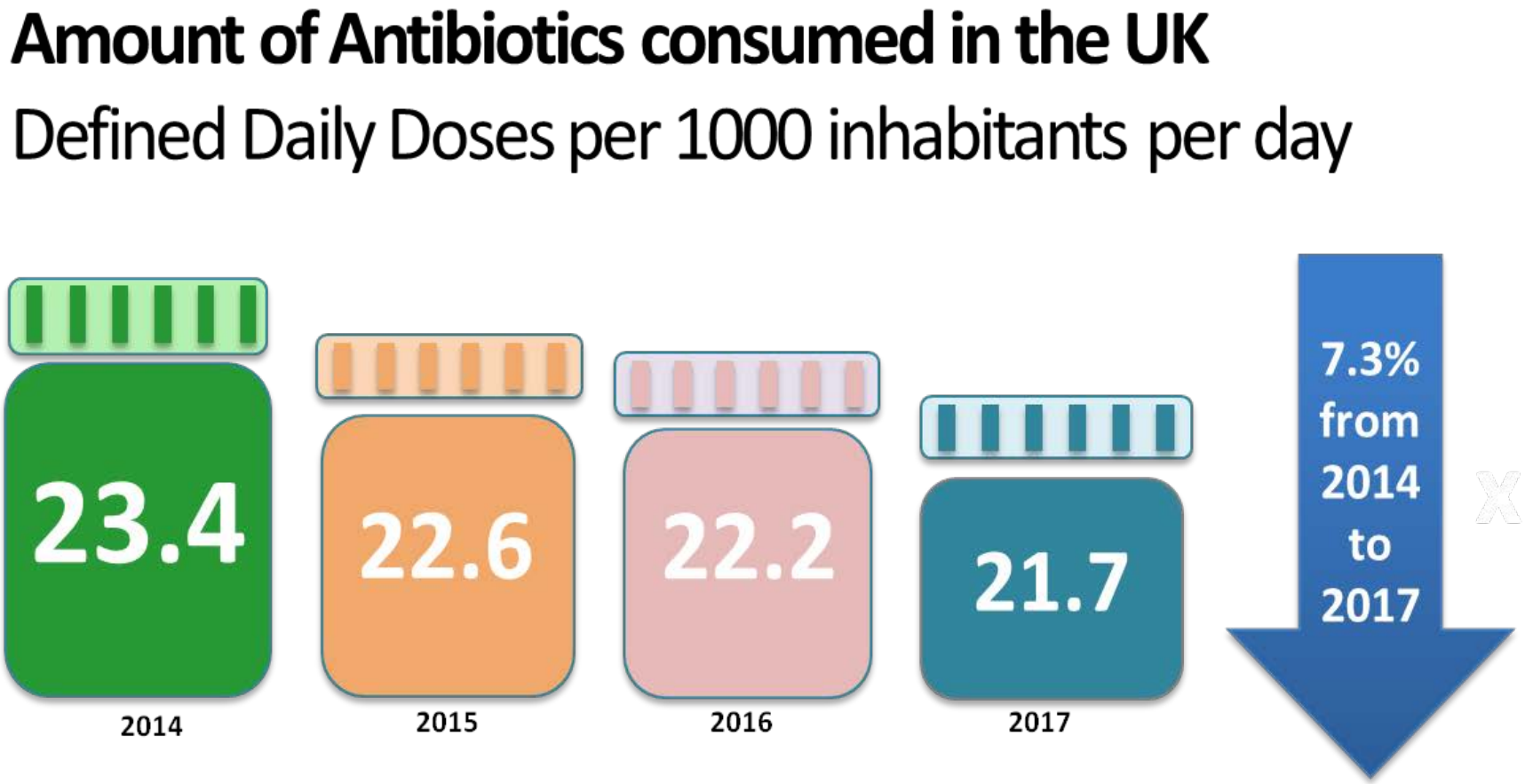
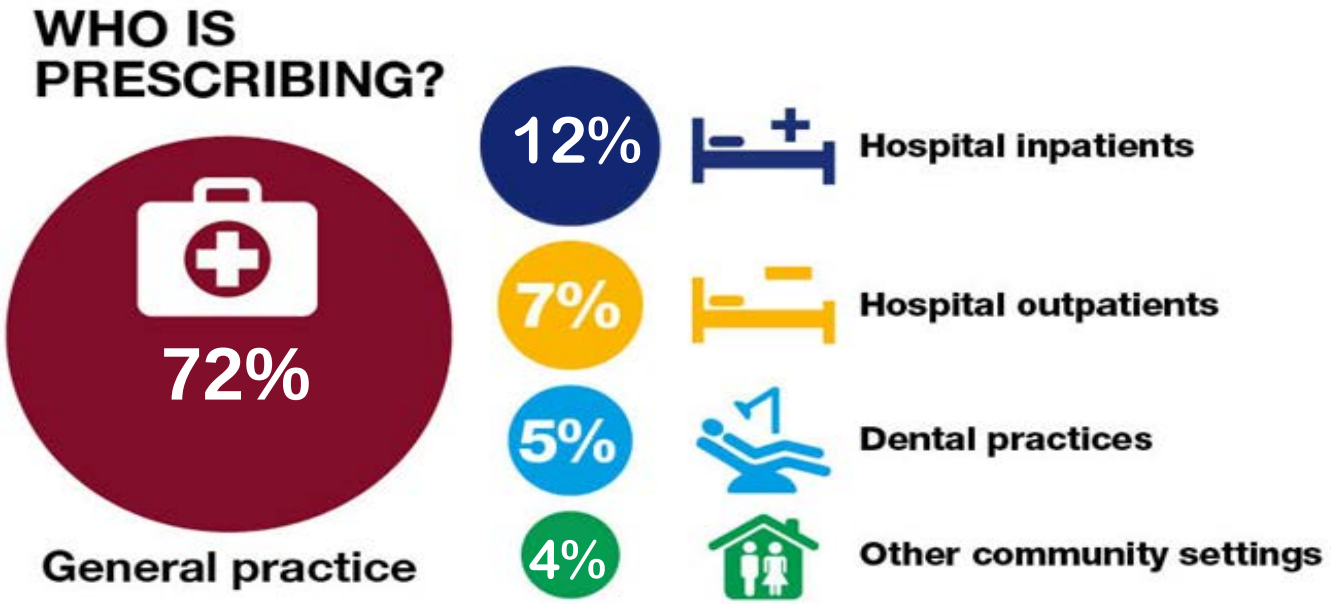
Figure 4. Antibiotic consumption in the UK (human sector)



Prescribing settings

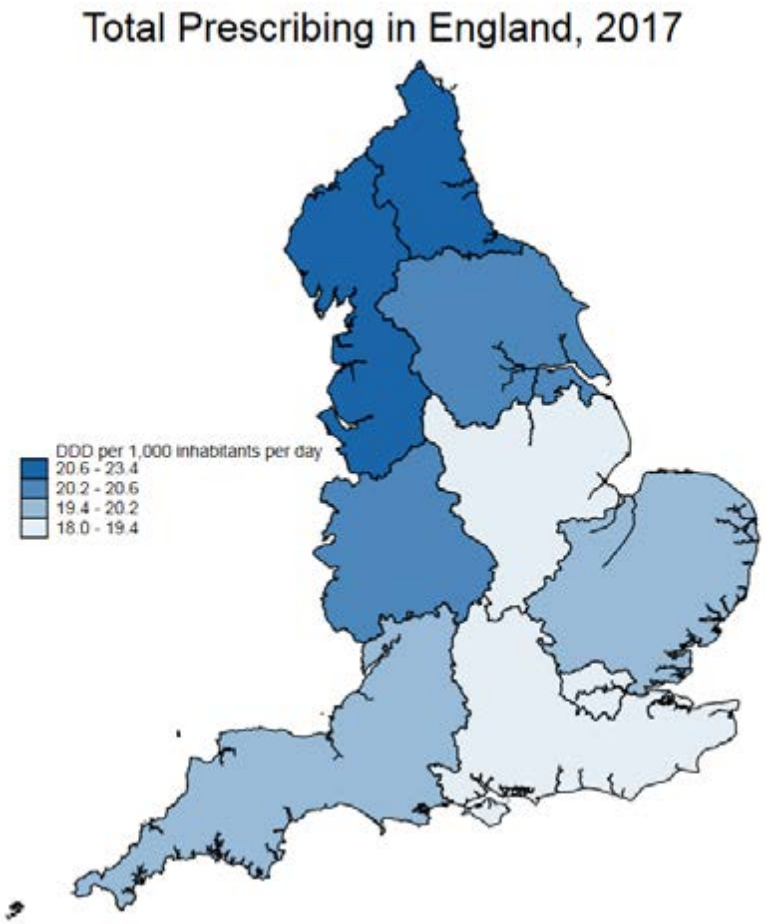
Antibiotic prescribing predominantly occurs in community settings.



Regional Variation in Antibiotic Use

Substantial regional variation in antibiotic use occurs.

This can be viewed at CCG, GP and Trust level at PHE Fingertips AMR local indicators https://fingertips.phe.org.uk/profile/amr-local-indicators



Reducing inappropriate prescribing is key

20% of antibiotics are prescribed inappropriately

- **Acute cough:**

41% prescribed vs ideal of 10%

- **Bronchitis:**

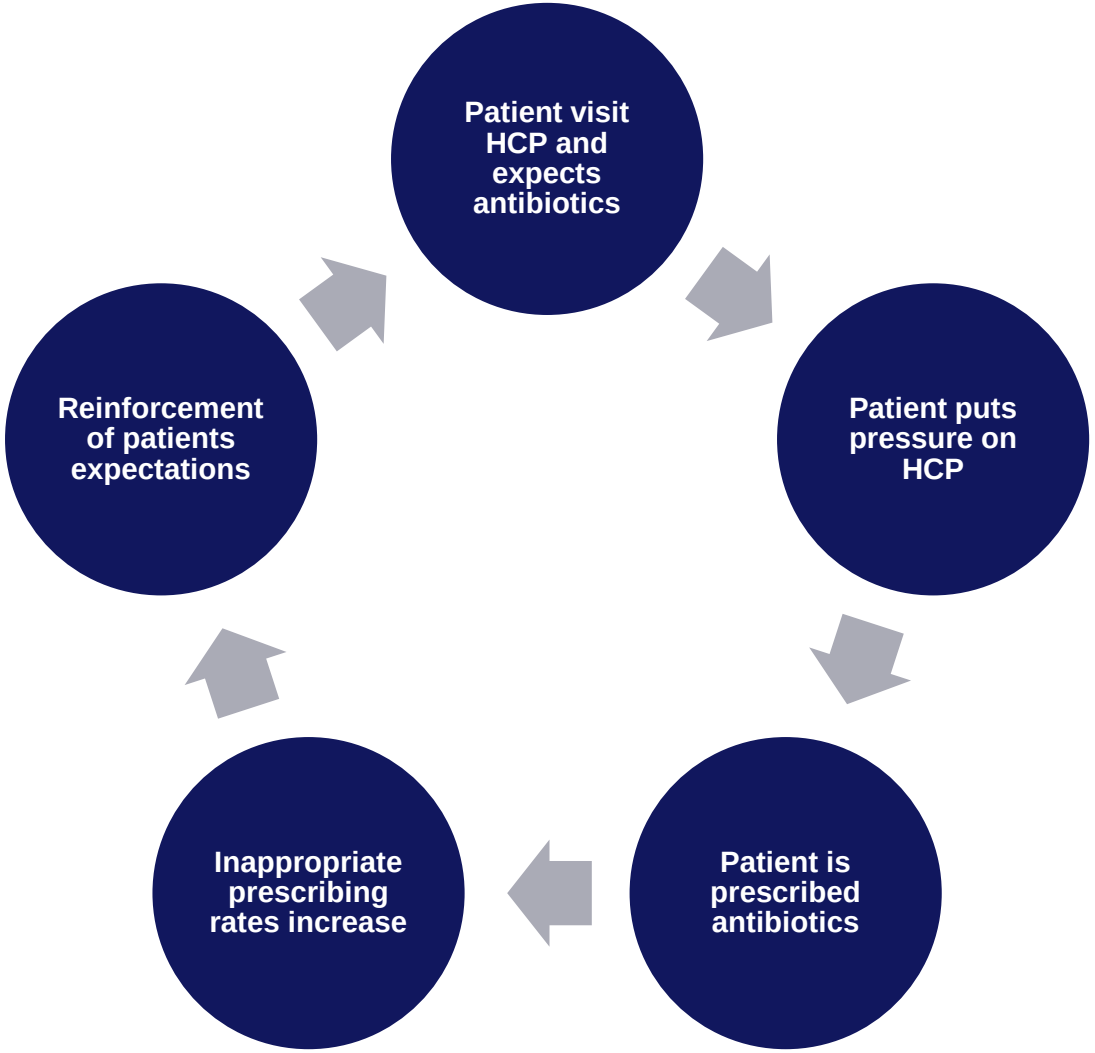
82% prescribed vs ideal of 13%

- **Rhinosinusitis:**

88% prescribed vs ideal of 11%

- **Sore throat:**

59% prescribed vs ideal of 13%



Sales

Use

Resistance

EU Harmonised Monitoring of AMR

Testing carried out on *E. coli* isolates from pigs collected as part of the EU Harmonised Monitoring Scheme, 2017 and 2015

Source: p. 9

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EU Harmonised Monitoring of AMR

Testing carried out on *E. coli* isolates from pigs collected as part of the EU Harmonised Monitoring Scheme, 2017 and 2015

*To note this testing does not identify the type or number of ESBLs present.

Source: p. 9

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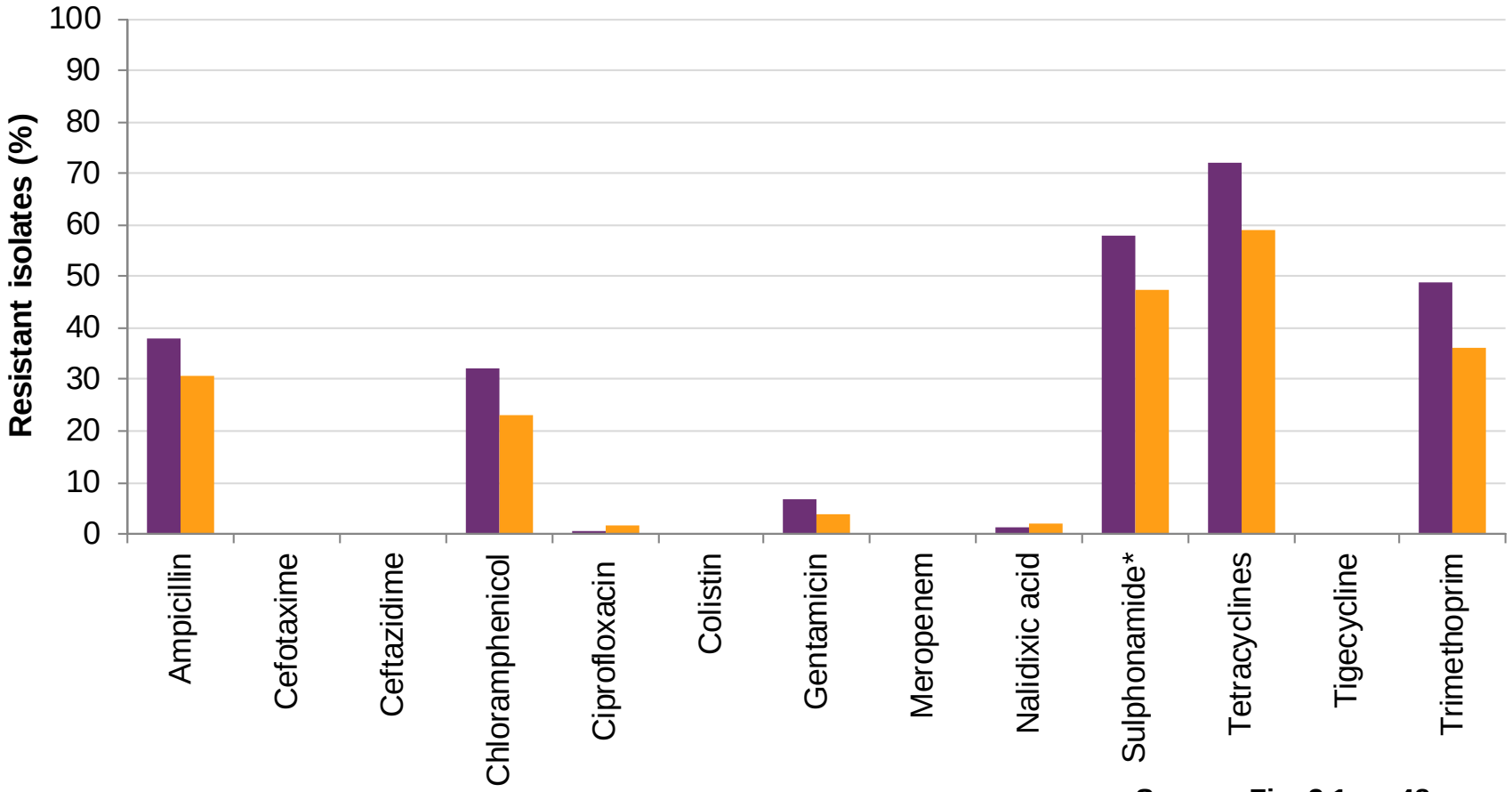
EU Harmonised Monitoring of AMR

Percentage resistance (interpreted using EUCAST CBPs) in *E. coli* isolates from healthy pigs at slaughter, 2015 (■; n=150) and 2017 (■; n=186)



*Interpreted using EUCAST ECOFF values as no CBP value is available

Source: Fig. 3.1; p. 48

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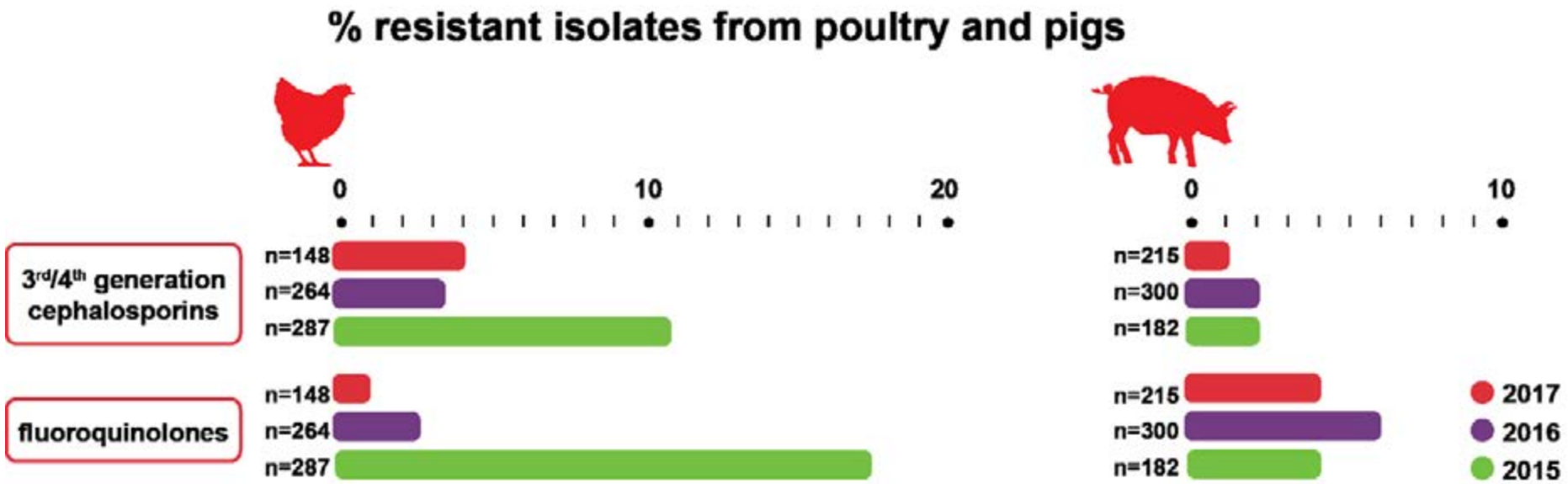
Clinical Surveillance of AMR

Percentage of resistant *E.coli* isolates from poultry and pigs from clinical surveillance, 2015-2017



Source: p. 10

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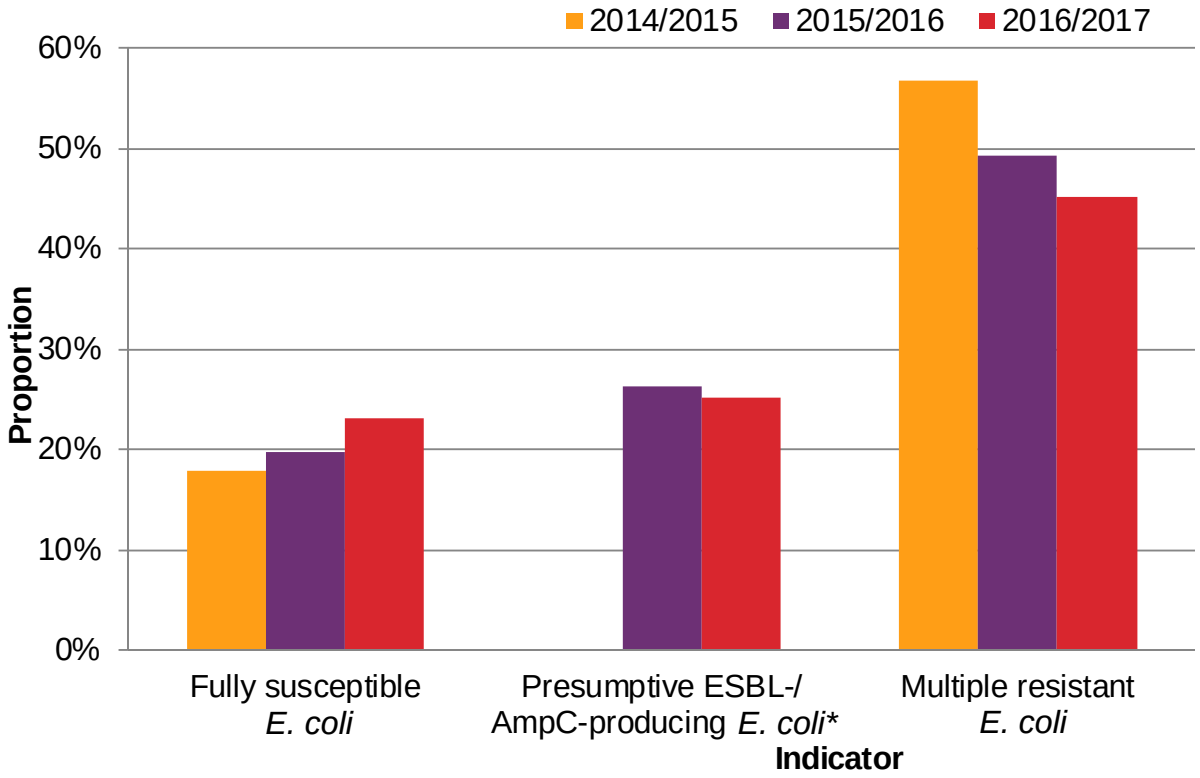
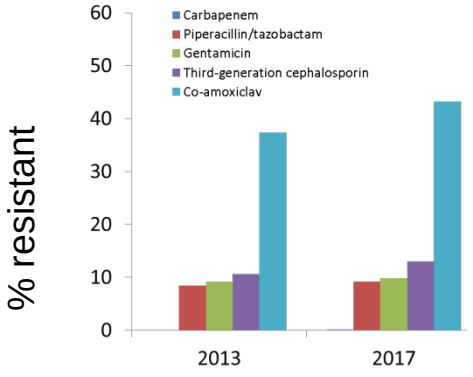
Recommended primary (proportion of fully susceptible *E. coli* isolates) and secondary indicators (proportion of presumptive ESBL-/ AmpC-producing *E. coli* isolates, proportion of multi-resistant *E. coli* isolates and proportion of ciprofloxacin-resistant *E. coli* isolates) for the animal AMR monitoring in the UK; 2014–2017



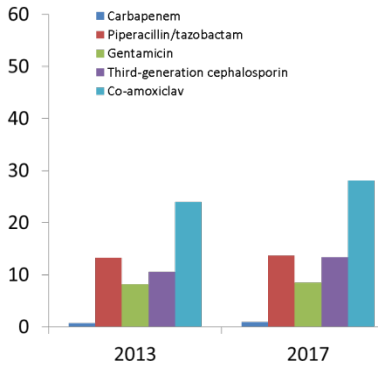
* Data not available for 2014/2015

Overview of AMR in BSI from 2013 to 2017

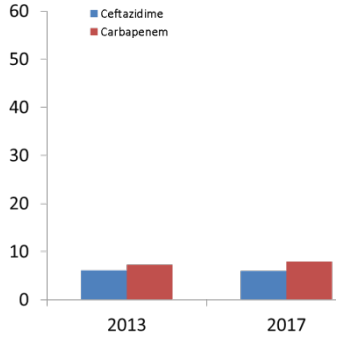
Antibiotic resistance in bacterial bloodstream infections has remained broadly stable over the last 5 years, most likely reflecting the impact of antimicrobial stewardship.



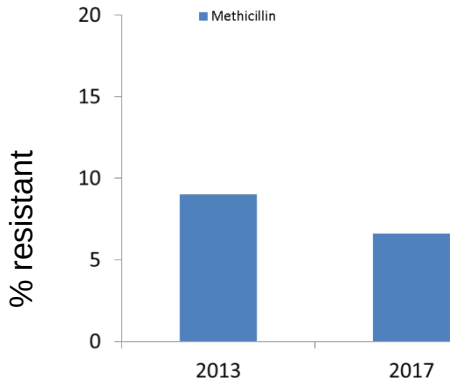
E. coli



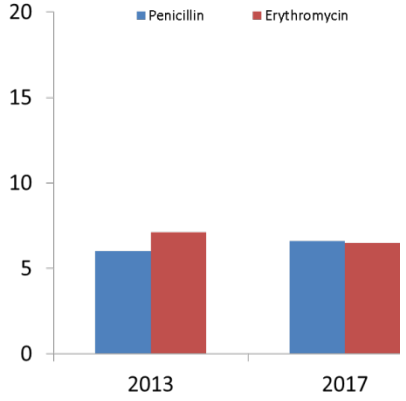
K. pneumoniae



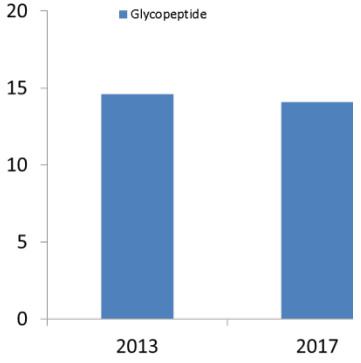
Pseudomonas spp.

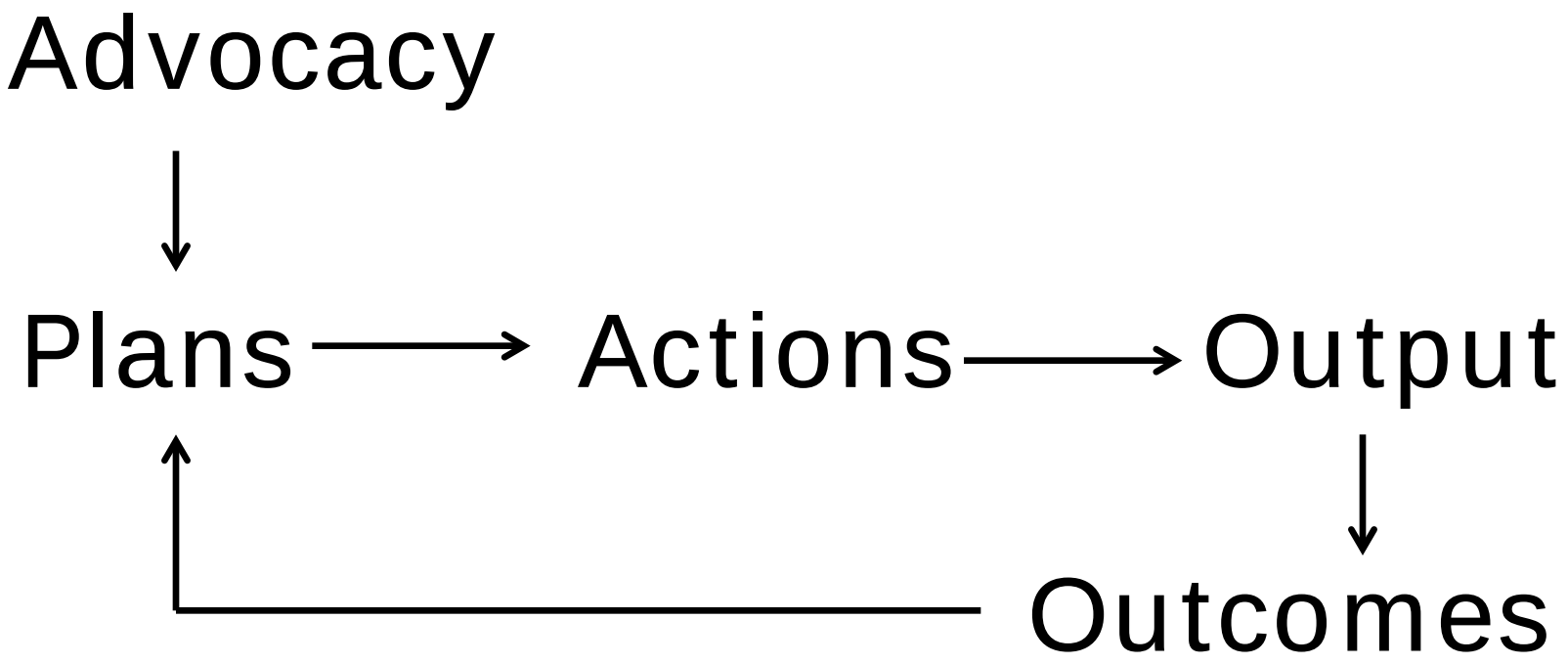


S. aureus



S. pneumoniae



Enterococcus spp.

How Did We Ensure: