Public Services Delivery
Scotland

NHS SCOTLAND

Scottish One Health Antimicrobial Use and Antimicrobial Resistance in 2025

An Official Statistics statistical release for Scotland

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Antimicrobial Resistance and Healthcare Associated Infection
An NHS Scotland Assure Service

Public Health Scotland

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About this release

This is a joint release by Antimicrobial Resistance and Healthcare Associated Infection (ARHAI) Scotland part of Public Services Delivery Scotland (PSD Scotland) and Public Health Scotland (PHS) on Scottish One Health Antimicrobial Use and Antimicrobial Resistance (SONAAR) in 2025.

This report reflects some of the key work delivered by ARHAI Scotland and PHS to tackle antimicrobial resistance (AMR) during 2025, including progress towards the strategic objectives outlined in the UK AMR National Action Plan "Confronting Antimicrobial Resistance" 2024 to 2029. It provides data and intelligence on antibiotic use and resistance in humans in Scotland during 2025. To support delivery of the UK AMR NAP ambitions, the report includes data on the Scottish national indicators for antibiotic use for primary care, secondary care and dental care, progress towards the healthcare associated infection standard for reducing healthcare associated *E. coli* bacteraemia, and analysis on indicators of health inequalities.

This One Health report also provides information on antibiotic use and resistance in animals, using data from Scotland's Rural College (SRUC) and Small Animal Veterinary Surveillance Network (SAVSNET). This year's report also includes findings from a Food Standards Scotland UK PATH-SAFE study comparing antimicrobial resistance in *E. coli* from raw pet food and raw meat for human consumption.

Main report

Antibiotic use in humans

- Total antibiotic use in humans decreased by 9.2% between 2024 and 2025, to 19.8 defined daily doses per 1,000 inhabitants per day (DIDs) and was below the UK AMR NAP 2024 to 2029 target 4a threshold (20.8 DIDs) for reducing total antibiotic use by 5% from the 2019/20 financial year baseline.
- In 2025, 81.7% of antibiotic use occurred in primary care, and 18.3% in secondary care.
- Access antibiotics (recommended for first line treatment) accounted for 68.1% of total antibiotic use in 2025, increasing from 67.3% in 2024 but remained below the UK AMR NAP target 4b of 70% by 2029.
- Following UK-wide agreement, methenamine is now excluded from total antimicrobial use and UK AMR NAP calculations and is reported separately. In 2025, methenamine use increased by 47.9% from 2024 to 1.8 DIDs, with prescribing occurring predominantly in primary care.
- In primary care (excluding dental):
    - Antibiotic use in primary care (excluding dental) decreased by 10.5% between 2024 and 2025, to 15.4 DIDs. The number of antibiotic items also decreased by 12.1%, to 1.7 items per 1,000 inhabitants per day.
    - In 2025, 66.8% of antibiotic defined daily doses (DDDs) in primary care (excluding dental) were from the Access category, compared to 66.0% in 2024.
    - There was a 3% increase in the prescribing of a five-day course of amoxicillin compared to 2024 (78.4% in 2025 compared to 76.1% in 2024), this is below the 2029 target of 90%. There was a 12.2% increase in the prescribing of a five-day course of doxycycline compared to 2024 (47.8% in 2025 compared to 42.6% in 2024), this is below the 2029 target of 60%.
    - There was no change in the prescribing of three-day courses of trimethoprim compared to 2024 (79.7% in 2025 compared to 79.6% in 2024), this is below the 2029 target of 85%. There was a 4.3% increase in the prescribing of a three-day course of nitrofurantoin compared to 2024 (55.4% in 2025 compared to 53.1 in 2024), this is below the 2029 target of 85%.

- There was a combined 2.5% increase in the prescribing of co-amoxiclav and ciprofloxacin courses in 2025 compared to 2024 (5% in 2025 compared to 4.8% in 2024), and this remains above the 2029 target of 3%.
- Antibiotic use varied across population groups. In 2025, the rate was highest among people aged 65 years and over (23.8 DIDs). The rate among females was 15.9 DIDs, compared to 11.8 DIDs in males. 43.7% of primary care antibiotic DDDs were prescribed to people living in the 40% most deprived areas of Scotland, although differences in health need, age profile and multimorbidity should be considered when interpreting these findings.

- In secondary care:
  - Total antibiotic use in acute hospitals decreased by 2.4% between 2024 and 2025, to 1,375.9 DDDs per 1,000 total occupied bed days. Access antibiotics accounted for 66.3% of acute hospital antibiotic use, compared to 65.4% in 2024.
  - There was a 0.3% increase in IV antibiotic use in acute hospitals in 2025 (430.2 DDDs of IV antibiotics per 1,000 occupied bed days compared to 429.1 DDDs of IV antibiotics per 1,000 occupied bed days in 2024) and remains above the FY 2019/2020 baseline target.

- In dental care:
  - Dental antibiotic prescribing decreased by 4.3% in 2025 compared to 2024 (0.69 DIDs, compared to 0.73 DIDs in 2024), but remains above the FY 2019/2020 baseline target of 0.60 DIDs.

Antibiotic use in companion animals

- Companion animal AMU data were obtained from 27 veterinary practice premises in Scotland contributing voluntarily to SAVSNET. Antimicrobial prescribing decreased in both dogs and cats in 2025. At least one antimicrobial was prescribed in 15.0% of dog consultations, down from 18.2% in 2024, and in 10.8% of cat consultations, down from 13.4%.

- Use of highest priority critically important antimicrobials (HP-CIAs) in cats continued to decrease, from 6.2% of antimicrobial prescriptions in 2024 to 3.6% in 2025, compared with 28.0% in 2019. HP-CIA prescribing in dogs remained relatively steady at 3.7% in 2025.
- Administration route differed between dogs and cats. Topical preparations were most commonly prescribed in dogs (55.9%), whereas tablets were most common in cats (40.9%). Oral liquid and injectable preparations were used more frequently in cats than dogs.
- Beta-lactam/beta-lactamase inhibitor combinations were the most commonly prescribed antimicrobial group in both dogs and cats, accounting for 31.0% of prescriptions in dogs and 49.7% in cats in 2025. Amphenicols were the next most frequently prescribed group (19.8% in dogs,14.1% in cats).

Antimicrobial resistance in humans

- For the specified set of drug-resistant infections included in UK AMR NAP target 1a, there were an estimated 851 drug resistant bacteraemia in 2025, 25.3% above the 2019/20 baseline of 679. The increase compared with the baseline was largely driven by third-generation cephalosporin resistant *E. coli* and *K. pneumoniae* and by meticillin resistant *Staphylococcus aureus* (MRSA).
- The burden of antimicrobial-resistant bacteraemia was higher in older adults and males. In 2025, 68.2% of cases occurred in people aged 65 years and over and 57.5% in males. The incidence in those aged 65 and over was 48.9 per 100,000 population, compared with 6.8 in those aged 15-64 and 2.0 in those aged under 15.
- Antimicrobial-resistant bacteraemia also varied by deprivation. 45.0% of cases occurred among people living in the 40% most deprived areas of Scotland, and incidence was higher in the most deprived quintile (19.9 per 100,000 population) than in the least deprived quintile (11.4 per 100,000 population).
- The majority of AMR bacteraemia cases occurred in large urban and other urban areas in Scotland (73.8%). Remote rural and accessible rural areas accounted for 5.6% and 12.9% of cases, respectively.
- For the Gram-negative bloodstream infections included in UK AMR NAP target 1b (*E. coli*, *Klebsiella* spp. and *P. aeruginosa*), there were 6,046 cases in 2025, 1.7% above the 2019/20 financial year baseline of 5,943, indicating that the year-ending 2025 count therefore remained above the baseline.

- The Scottish supplementary target for healthcare-associated *E. coli* bacteraemia was also exceeded. In 2025, there were 2,559 healthcare-associated *E. coli* bacteraemia cases, 12.7% above the financial year 2023/24 baseline of 2,270.
- *E. coli* remained the most common Gram-negative bacteraemia, with 4,592 cases reported in 2025, a 5.0% increase in incidence compared with 2024. Since 2020, the incidence of *E. coli* bacteraemia has increased by an average of 0.9% per year.
- *K. pneumoniae* bacteraemia also increased to 900 cases in 2025, from 857 cases in 2024. Although there was no change in the incidence rate between 2024 and 2025, incidence has increased by an average of 4.1% per year since 2020. There was no increasing or decreasing trend for *K. oxytoca*, *P. aeruginosa* or *Acinetobacter* spp.
- The burden of Gram-negative bacteraemia was generally concentrated in older adults and males. 72.7% of *E. coli*, 66.8% of *K. pneumoniae*, 70.2% of *K. oxytoca* and 72.6% of *P. aeruginosa* bacteraemias occurred in people aged 65 years and over.
- In 2025, the percentage of bacteraemia cases occurring among people living in the 40% most deprived areas of Scotland was 45.4% for *E. coli*, 50.0% for *K. pneumoniae*, 43.6% for *K. oxytoca*, 46.9% for *P. aeruginosa* and 52.2% for *Acinetobacter* spp.
- The majority of Gram-negative bacteraemia cases occurred in large urban and other urban areas, although both rural and remote areas also contributed a measurable proportion of cases across all five organisms.
- Between 2024 and 2025, resistance decreased for co-amoxiclav in *E. coli*, from 48.1% to 45.0%, and for ceftazidime in *P. aeruginosa*, from 10.1% to 2.5%. There was no change in resistance to the other key antibiotics assessed over this period.
- Between 2019 and 2025, *E. coli* showed increasing trend in resistance to ceftazidime and cefotaxime/ceftriaxone, while co-amoxiclav resistance decreased. *K. pneumoniae* showed increasing trend in resistance to ceftazidime, cefotaxime/ceftriaxone, ciprofloxacin and trimethoprim. *K. oxytoca* showed an increasing trend in ceftazidime resistance, while no increasing or decreasing resistance trends were observed for *P. aeruginosa* or *Acinetobacter* spp.

- In 2025, there were 170,612 episodes of *E. coli* isolated from urine, compared with 171,123 in 2024. Between 2024 and 2025, resistance to amoxicillin/ampicillin, cefotaxime/ceftriaxone, ciprofloxacin and co-amoxiclav increased. There was no change in resistance to ceftazidime, meropenem, nitrofurantoin or trimethoprim.
- In 2025, there were 275 cases of carbapenemase-producing organisms (CPO) reported in Scotland, compared with 223 in 2024. The incidence was 5.0 per 100,000 population, a 23.3% increase from 2024.
- In 2025, 90.9% of CPOs were carbapenemase-producing Enterobacterales (CPE). The most frequently detected carbapenemase genes in Enterobacterales were OXA-48-like and NDM. In non-fermenters, the most frequently detected genes were combinations containing OXA-51 and OXA-23, and NDM.
- CPO burden varied across population groups. 58.9% of cases were female, while incidence was higher in people aged 65 years and over (11.1 per 100,000) than in those aged under 65 years (3.4 per 100,000).
- In 2025, 49.6% of CPO cases occurred among people living in the 40% most deprived areas of Scotland, and incidence was higher in the most deprived areas (6.7 per 100,000 population) than in the least deprived areas (3.72 per 100,000 population).
- Most CPO cases occurred in large urban and other urban areas, which together accounted for 80.9% of cases in 2025.
- In 2025, there were 1,701 *Staphylococcus aureus* bacteraemia (SAB) cases, of which 4.2% were meticillin-resistant *Staphylococcus aureus* (MRSA) bacteraemia.
- Between 2019 and 2025, MRSA bacteraemia showed an increasing trend in trimethoprim resistance, while there was no increasing or decreasing trend in resistance to daptomycin or fusidic acid. For MSSA, fusidic acid resistance decreased over the same period.
- In 2025, the incidence of *Enterococcus faecalis* and *Enterococcus faecium* bacteraemia was 9.0 and 6.4 per 100,000 population, respectively, with no change between 2024 and 2025. However, *E. faecium* bacteraemia incidence has increased by an average of 4.0% each year since 2019.

- Vancomycin resistance was reported in 33.1% of *E. faecium* blood isolates. There was no change in resistance to high level gentamycin, teicoplanin or vancomycin in *E. faecalis* blood isolates between 2024 and 2025.
- Between 2019 and 2025, *E. faecium* showed a decreasing trend in resistance to vancomycin and teicoplanin, but an increasing trend in high-level gentamicin resistance. No increasing or decreasing resistance trends were observed for the key antibiotics assessed in *E. faecalis*.
- For *Streptococcus pyogenes* (Group A Streptococcus) bacteraemia, resistance in 2025 was 10.2% to clindamycin, 15.4% to macrolides and 55.5% to tetracycline/doxycycline. No penicillin resistance was reported between 2019 and 2025.
- In 2025, 602 instances of unusual AMR phenotypes were reported through the AMR Early Warning System, supporting early identification and response to emerging resistance.
- Additionally, 7 confirmed *Candidozyma auris* (*C. auris*) cases were reported in Scotland between 2023 and 2025, including 3 cases in 2025. All had recent healthcare exposure outside Scotland, with no evidence of onward transmission in Scotland. Public Health Scotland (PHS) led on a project to develop national guidance for *C. auris* during 2025 with publication anticipated in late 2026.

Antimicrobial resistance in *Salmonella*

In humans, resistance in non-typhoidal *Salmonella* to key antibiotics remained unchanged between 2024 and 2025.

In animals, resistance to ampicillin, streptomycin, sulphonamides and tetracycline decreased between 2024 and 2025. Resistance to ciprofloxacin remained unchanged compared to 2024.

Antimicrobial resistance in animals

The percentage of multi drug resistant (MDR) *E. coli* isolates reported in healthy livestock was unchanged between 2024 and 2025, remaining higher in poultry and pigs than in cattle and sheep, in which MDR is low.

Among high priority critically important antimicrobials (HP-CIAs), resistance remained generally low. Carbapenem resistance was not detected in any livestock species and Ciprofloxacin resistance was detected only in poultry. Among non HP-CIAs, resistance remained highest in poultry and pigs for several antimicrobials, including co-trimoxazole and tetracycline, while gentamicin resistance in *E. coli* isolates from healthy poultry decreased from 10.5% in 2024 to 5.0% in 2025.

Food Standards Scotland: Antimicrobial resistance in *E. coli* from raw pet food (funded by UK PATH-SAFE)

- *E. coli* from commercial raw pet food showed a higher burden of antimicrobial resistance than *E. coli* from raw meat for human consumption.
- Multidrug resistance was more common in raw pet food isolates: 29.4% were resistant to 5 or more antibiotic classes compared with only 6.6% of isolates from raw meat.

Background

Antimicrobial Resistance (AMR) arises when microorganisms, such as bacteria, develop the ability to withstand antimicrobial treatments making infections harder to treat which could result in severe disease and potentially death.

Antimicrobial use (AMU) and spread of infection in humans, animals and the environment contribute to the development of resistant infections. A 'One Health' coordinated cross sectoral response is needed to address the threat from AMR.

The purpose of this report is to present the outputs of ARHAI Scotland and Public Health Scotland's role in providing intelligence to support optimisation of AMU and containment and control of AMR across all sectors through development of epidemiological evidence on trends in AMU and AMR. This is intended to inform local and national initiatives and interventions in human and animal health.

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Further Information

Find out more in the full report. Data and background information from this publication are available from our web page. The next release of this publication will be November 2027.

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