

Scottish One Health Antimicrobial Use and Antimicrobial Resistance in 2023

An Official Statistics statistical release for Scotland

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About this release

This release is by Antimicrobial Resistance and Healthcare Associated Infection (ARHAI) Scotland part of NHS National Services Scotland (NSS).

This report reflects some of the key work delivered by ARHAI Scotland to tackle antimicrobial resistance (AMR) during 2023.

Data are provided relating to antibiotic use and resistance to antibiotics in humans in Scotland during 2023. The report also provides information on antibiotic use and resistance in animals, using data from Scotland's Rural College (SRUC) and the Small Animal Veterinary Surveillance Network (SAVSNET).

Main points

Antibiotic use in humans

- Total antibiotic use in humans increased by 5.1% between 2022 and 2023. This was 1.5% higher in 2023 compared to 2019.
- Access antibiotics (recommended for first line treatment) accounted for 64.5% of total antibiotic use, compared to 64.3% in 2022 and 61.0% in 2019.
- Antibiotic use in primary care, where the majority of antibiotic use in humans occurs, increased by 5.1% since 2022. This was 1.4% higher in 2023 compared to 2019.
- 31.2% of the Scottish population received at least one course of antibiotics in primary care in 2023.

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- In 2023, antibiotic use in acute hospitals increased by 5.5% since 2022, but this was 0.9% lower compared to 2019.

Antibiotic use in companion animals

- Among the small number of participating veterinary practices in Scotland, the percentage of consultations for dogs and cats resulting in prescription of at least one antimicrobial has decreased between 2019 and 2023, by 11.5% for dogs, and by 25.0% for cats.
- The proportion of prescriptions which were highest priority critically important antimicrobials (designated as critically important to human health) has decreased by 31.5% since 2019 for cats but has remained stable for dogs.
- **Scotland's Healthy Animals website** continues to offer guidance for vets and animal keepers on disease avoidance and antibiotic stewardship.

Antimicrobial resistance in humans

- In 2023, there were 5,744 episodes of bacteraemia in Scotland caused by five key Gram-negative pathogens. *Escherichia coli* was the most common cause of Gram-negative bacteraemia. Between 2022 and 2023, the incidence of *Klebsiella oxytoca* and *Klebsiella pneumoniae* bacteraemia increased by 27.4% and 12.5% respectively.
- Between 2022 and 2023, resistance to key antibiotics in Gram-negative bacteraemia has remained stable except for *E. coli*, where resistance to temocillin decreased.
- Between 2019 and 2023, the resistance of *E. coli* bacteraemia to co-amoxiclav and trimethoprim decreased, and the resistance of *K. pneumoniae* bacteraemia to cefotaxime/ceftriaxone and ceftazidime increased.
- *E. coli* was the most frequently reported organism in urinary isolates, with 167,603 episodes reported in 2023.
- Between 2022 and 2023, resistance of *E. coli* urinary isolates increased to key antibiotics including amoxicillin/ampicillin, cefotaxime/ceftriaxone, ceftazidime, ciprofloxacin, gentamicin, piperacillin-tazobactam and trimethoprim.
- There were 157 cases of carbapenemase-producing organisms (CPO) reported in Scotland, compared to 121 in 2022. The incidence of CPOs increased by 29.8% between 2022 and 2023 and was 30.1% higher than in 2019.
- In 2023, 86.0% of CPOs identified were carbapenemase-producing Enterobacterales (CPE). The most frequently detected carbapenemase genes for CPEs were oxacillinase (OXA)-48-like and New Delhi Metallo-beta-lactamase (NDM).

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- Vancomycin resistance was reported in 30.8% of *E. faecium* blood isolates. Vancomycin resistance has remained stable in *E. faecium* blood isolates between 2022 and 2023.
- In 2023, the annual *Streptococcus pyogenes* (Group A *Streptococcus*) bacteraemia incidence was 6.7 per 100,000 population, 89.2% higher than 2022 and 84.0% higher than 2019. Resistance to penicillin has not been reported in *S. pyogenes* blood isolates.
- There were an estimated 4,392 antimicrobial resistant infections in 2023, compared with 4,376 in 2018. Therefore, the UK AMR NAP 2019-24 ambition to reduce the incidence of a specified set of drug-resistant infections by 10% by 2024 has not been achieved.

Antimicrobial resistance in *Salmonella*

- In animals, resistance to key antibiotics remained stable between 2022 and 2023.
- In humans, resistance to ampicillin, ciprofloxacin and streptomycin remained stable between 2022 and 2023. Resistance to tetracycline and sulphonamides decreased between 2022 and 2023.

Antimicrobial resistance in animals

- The percentage of multi drug resistant (MDR) *E. coli* isolates reported was higher in poultry and pigs than in cattle and sheep, where MDR remains low.
- In poultry, ciprofloxacin resistance decreased from 14.3% in 2022 to 3.6% in 2023.

Background

Antimicrobial Resistance (AMR) arises when micro-organisms, 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 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's role in providing intelligence to support optimisation of antimicrobial use and containment and control of AMR across all sectors through development of epidemiological evidence on trends in antimicrobial use and resistance. This is intended to inform local and national initiatives and interventions in human and animal health.

Contact

William Malcolm

Pharmaceutical Advisor (SONAAR Programme Lead)

NSS.ARHAISONAAR@nhs.scot

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 2025.