Antimicrobial resistance in clinical *Staphylococcus aureus* and *S. pseudintermedius* from companion animals across the UK (2018 - 2024)

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Background

Coagulase-positive staphylococci, including *S. aureus* (SA) and *S. pseudintermedius* (SP), are common skin commensals in humans and animals, capable of causing clinical infections exacerbated by antimicrobial resistance (AMR). The potential for inter-species transmission (1), and for animals acting as reservoirs for AMR genes (2), highlights the need for companion animal-level surveillance of these organisms, which is not routinely conducted in the UK. Laboratory derived antimicrobial susceptibility testing (AST) data are an untapped source of information on AMR, which could fulfil surveillance needs.

Methods

Data: five UK veterinary diagnostic laboratories' AST results via the Small Animal Veterinary Surveillance Network (**SAVSNET**) for the **Vet-CLINAMR project**.

Filtered to: SA and SP, canine & feline, skin & soft tissue/ear/urine samples, 2018-2024.

AMR & **MDR:** classified per Magiorakos *et al*. (2012) (3). Methicillin resistant SA *(*MRSA) = resistance to oxacillin/cefoxitin, and SP (MRSP) = resistance to oxacillin.

A quartile bivariate postcode map plotted MDR distribution in staphylococci (UK).
Mixed-effects logistic regression accounting for lab ID and practice postcode assessed MDR over time (sig $p<0.05$).

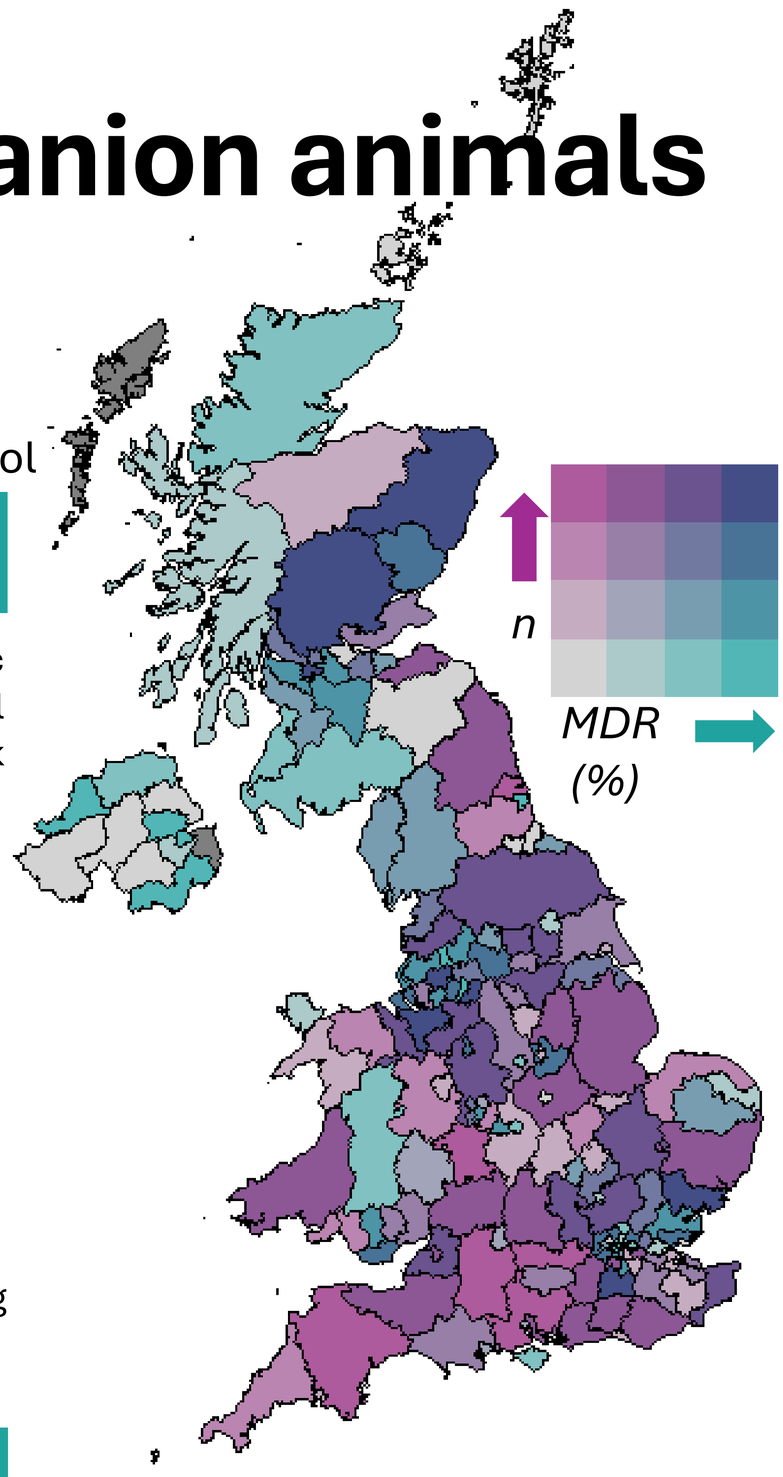
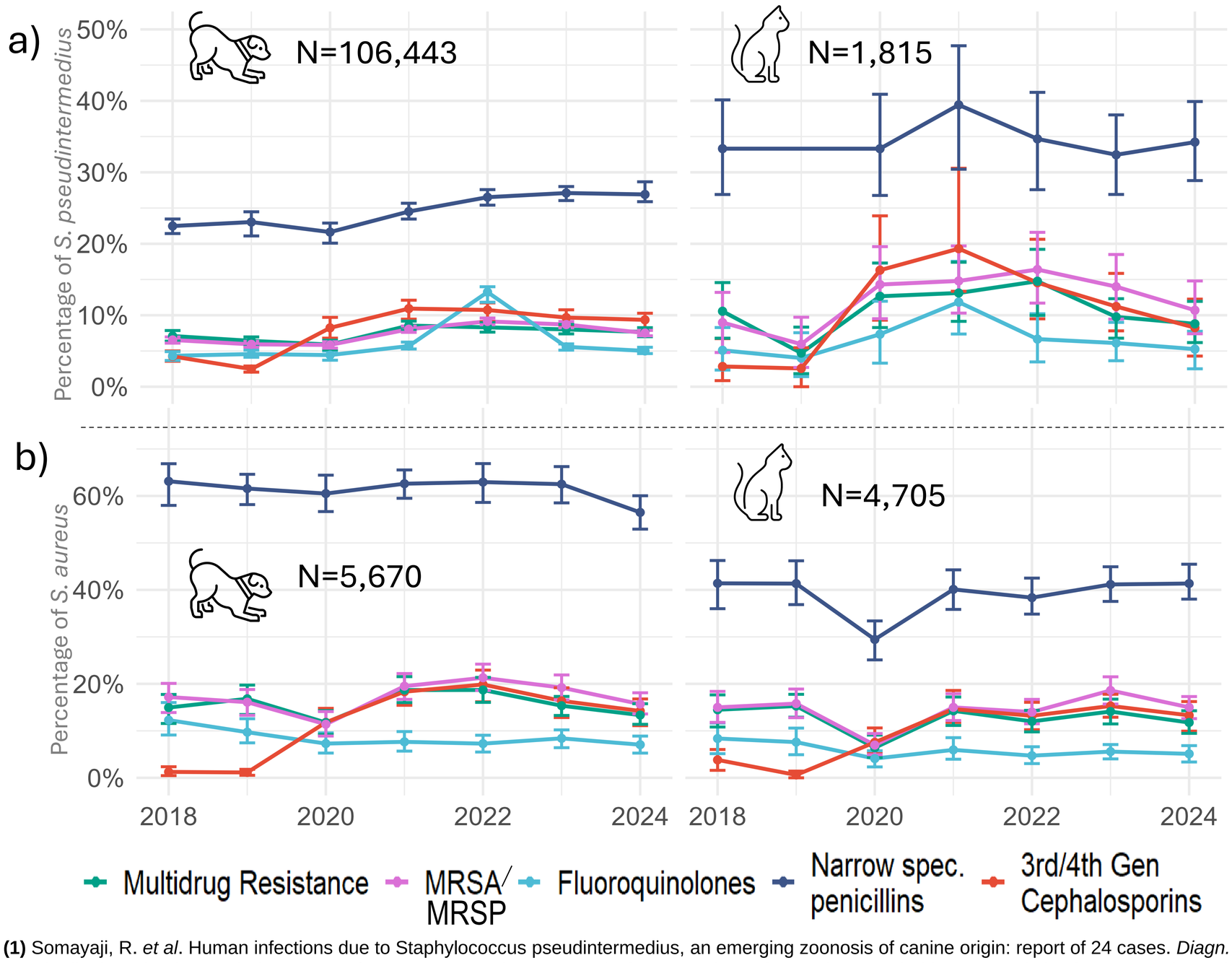


Fig 1. Multidrug resistance (MDR) in coagulase positive staphylococci across the UK *(n=recorded isolates, MDR =prevalence within region)*

Key findings

Data from **108,249 SA** and **10,375 SP** isolates were processed. Methicillin resistance in canine SP peaked in 2022 (OR = 1.37, 95% CI: 1.25–1.51, $p < 0.01$), then declined toward baseline by 2024 (OR = 1.11, 95% CI: 1.01–1.22, $p = 0.04$). MDR followed a similar trend (2022 OR = 1.68, 95% CI: 1.52–1.87, $p < 0.01$; 2024 OR = 1.50, 95% CI: 1.35–1.66, $p<0.01$), though decline was less pronounced (Fig 2). Trends observed in SP resistance were not significant, nor were any feline models.

Fig 2. Resistance to fluoroquinolones, narrow spectrum penicillins, oxacillin (MRSP/ MRSA), and 3rd/4th generation cephalosporins, as well as multidrug resistance (MDR) in (a) SP and (b) SA isolates from canine and feline sources recorded 2018-2024.



Conclusions

Lab-based data provides a possible route to national surveillance of AMR in companion animals in the UK, subject to data validation. Variability in lab methods, data structure, and interpretation of results, were noted limitations. Staphylococcal MDR & methicillin resistance recorded via SAVSNET increased ⬆ from 2018 but has been decreasing towards baseline ⬇ since 2022. Several regions had higher recorded MDR - Northeast and East of Scotland, and parts of Northern and South East England.

Acknowledgements

The VetCLIN-AMR project was funded by the VMD through the National Biosurveillance Network.

Veterinary Medicines Directorate

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