Antimicrobial sensitivity of New Zealand canine and feline urinary tract isolates

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Urinary tract infections are one of the most common reasons for veterinarians to prescribe antibiotics to cats and dogs. These drugs are often prescribed empirically either in the absence of or while awaiting the results of culture and antimicrobial susceptibility testing (AST). The bacteria causing urinary tract infections in companion animals and their antimicrobial susceptibility can vary significantly between countries and over time. Local data, which is regularly updated, is therefore critical for informing empirical prescribing guidelines, monitoring for the emergence of antimicrobial resistance (AMR) and contributing to antimicrobial stewardship initiatives.

Since May 2022, the Ministry for Primary Industries has been collecting AST data from the commercial veterinary laboratories in New Zealand as part of an AMR surveillance programme. This dataset was used to describe the bacterial species detected in urinary tract samples from cats and dogs and the susceptibility of these isolates to commonly tested antimicrobials.

Escherichia coli was the most common isolate in both cats and dogs (Figure 1 and 2). *Staphylococcus intermedius* group and *Proteus mirabilis* were also common isolates in canine samples with *Enterococcus* spp. and coagulase-negative *Staphylococcus* spp. being more common in cats. These results are similar to that reported in overseas studies.

Figure 1. Bacteria isolated from canine urinary tract samples in New Zealand diagnostic laboratories between May 2022 and September 2023. For presentation purposes, bacterial species other than the most common isolates are grouped at the genus level or as 'other' gram-positive or -negative bacteria.

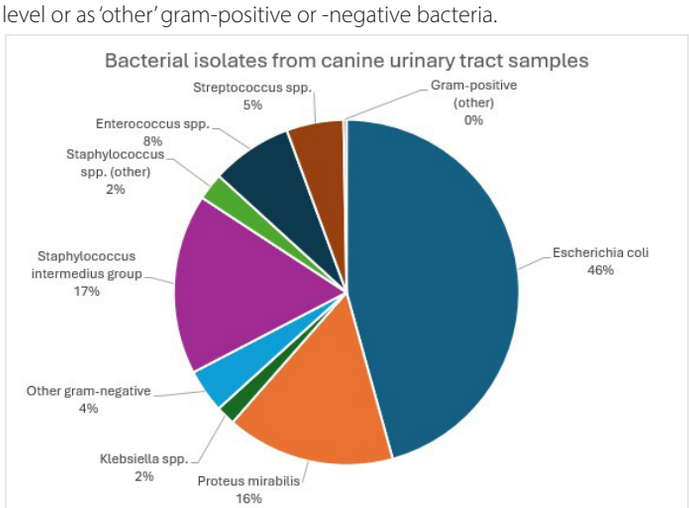
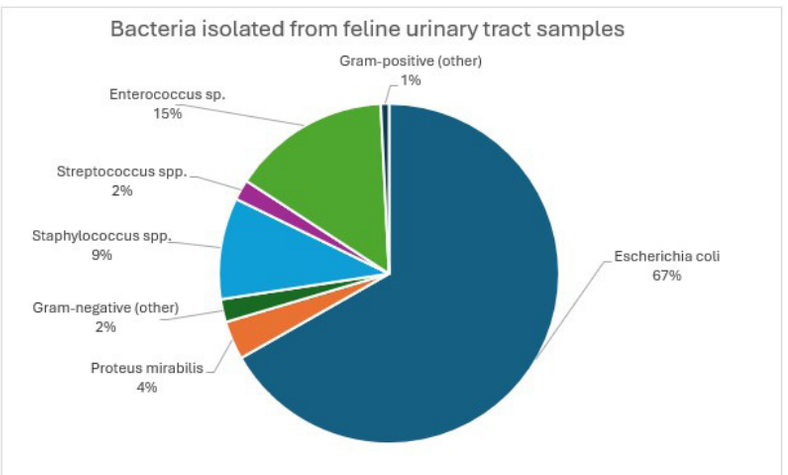


Figure 2. Bacteria isolated from feline urinary tract samples in New Zealand diagnostic laboratories between May 2022 and September 2023. For presentation purposes, bacterial species other than the most common isolates are grouped at the genus level or as 'other' gram-positive or -negative bacteria.



Multiple drug resistance (MDR), defined as resistance to three or more antimicrobial classes, was detected in 8.4% of canine *E.coli* and 6.9% of feline *E.coli*. MDR was also relatively common in canine *Enterococcus* spp. (9.5%). Methicillin resistance was detected in 4.9% of canine *S. pseudintermedius* group and methicillin resistant *Staphylococcus aureus* were detected in a small number of canine and feline samples. Distinct differences in the antimicrobial susceptibility of gram-negative rods compared to gram-positive cocci were noted in both cats and dogs. Examination of diff-quick stained sediment preparations in cases of cystitis to identify whether rods or cocci are present would therefore enhance selection of antimicrobials in cases where empirical treatment is being considered.

Table 1. Susceptibility of canine and feline gram-negative and gram-positive urinary tract isolates to commonly tested antimicrobials. Results are presented as the percentage of isolates fully susceptible (ie. excluding intermediate and resistant test results) to the antimicrobial with the proportion of susceptible isolates/total number of isolates tested given underneath. Antimicrobials are coloured in accordance with the NZVA's traffic light system for antibiotic use.

		Penicillin	Amoxi-clav	Cephalothin	Tetracycline	TMS	Enrofloxacin
Canine isolates	Gram -ve rods	NT	84.5% 1256/1486	61.1% 908/1486	65.2% 968/1485	91.6% 1361/1483	94.8% 1409/1486
	Gram +ve cocci	49.9% 241/483	95% 677/713	72.1% 515/714	73.8% 518/715	69.1% 493/713	75.7% 541/715
Feline isolates	Gram -ve rods	NT	85.2% 797/935	62.8% 587/935	84.1% 786/935	94.2% 880/934	96.3% 899/934
	Gram +ve cocci	80.2% 195/243	97.8% 308/315	37.8% 118/312	76.5% 241/315	38.9% 121/311	60% 189/315

Amoxi-clav=Amoxicillin-clavulanic acid; TMS=Trimethoprim-sulfamethoxazole

Compared to overseas countries, the incidence of AMR in canine and feline urinary tract samples in New Zealand appears relatively low. However there has been an apparent increase in AMR from previous data published on canine urinary tract isolates in New Zealand (McMeekin *et al.* 2017). This highlights the need to regularly monitor and report on AMR trends and the importance of continuing to address and improve our antimicrobial stewardship in this country.

Reference

McMeekin CH, Hill KE, Gibson IR, Bridges JP, Benschop J. Antimicrobial resistance patterns of bacteria isolated from canine urinary samples submitted to a New Zealand veterinary diagnostic laboratory between 2005-2012. *New Zealand Veterinary Journal* 65: 99-104, 2017