

Evaluation of antimicrobial usage in dogs and cats at a veterinary teaching hospital in Germany in 2017 and 2018



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Introduction

In contrast to food producing animals where documentation of usage of antimicrobials (AM) is regulated by law, antimicrobial usage (AMU) in dogs and cats is monitored only sparsely.

Using data of heterogenic sources for evaluating AMU has been previously demonstrated for clinical routine data in different countries and insurance data with different evaluating methods.

The aim of this study was to provide results about AMU in dogs and cats at the Clinic for Small Animals (CfSA), University of Veterinary Medicine Hannover (TiHo), including quantitative indices about AMU and information about differences in treating dogs and cats. This study is based on previous research on AMU in horses in Germany and uses the same method for data management and analyses [1] as well as using data, which is generated by an electronic practice management software.

Material and Methodes:

- Study type: Re-evaluation of entire case reports
- Study period: from 1 January 2017 to 31 December 2018
- 180,530 documented drug applications (dogs: 139,994; cats: 40,536)

Results

- 24,794 AM applications documented for 4,677 dogs
 - 2017: 10,857 AM applications for 2,253 dogs
 - 2018: 13,937 AM applications for 2,424 dogs
- 7,396 AM applications documented for 1,409 cats
 - 2017: 3,163 AM applications for 657 cats
 - 2018: 4,233 AM applications for 752 cats
- Penicillins, nitroimidazoles and quinolones used most often in 2017 and 2018, respectively

Table 1: Documented number of antimicrobial active ingredients used in dogs and cats in 2017 and 2018 at the Clinic for Small Animals, TiHo

Antimicrobial group and active ingredient	Dogs			Cats		
	2017	2018	Total documented applications (%)	2017	2018	Total documented applications (%)
Aminoglycoside	226	189	415(1.63%)	22	22	44(0.59%)
Penicillins	6,036	7,562	13,598(53.50%)	2,098	2,801	4,899(65.77%)
Cephalosporin	315	388	703(2.77%)	51	88	139(1.87%)
Amphenicol	235	247	482(1.90%)	48	46	94(1.26%)
Quinolones	709	1,029	1,738(6.84%)	200	262	462(6.20%)
Fusidic acid	4	4	8(0.03%)	1	-	1(0.01%)
Lincosamide	162	178	340(1.34%)	51	28	79(1.06%)
Macrolide	9	19	28(0.11%)	-	-	-(-)
Nitroimidazole	2,433	3,367	5,800(22.82%)	560	835	1,395(18.73%)
Polypeptide	169	200	369(1.45%)	25	28	53(0.71%)
Sulfonamide	216	248	464(1.83%)	4	23	27(0.36%)
Tetracycline	440	567	1,007(3.96%)	118	111	229(3.07%)
Trimethoprim	215	248	463(1.82%)	4	23	27(0.36%)
Total	11,169	14,246	25,415(100.0%)	3,182	4,267	7,449(100.0%)

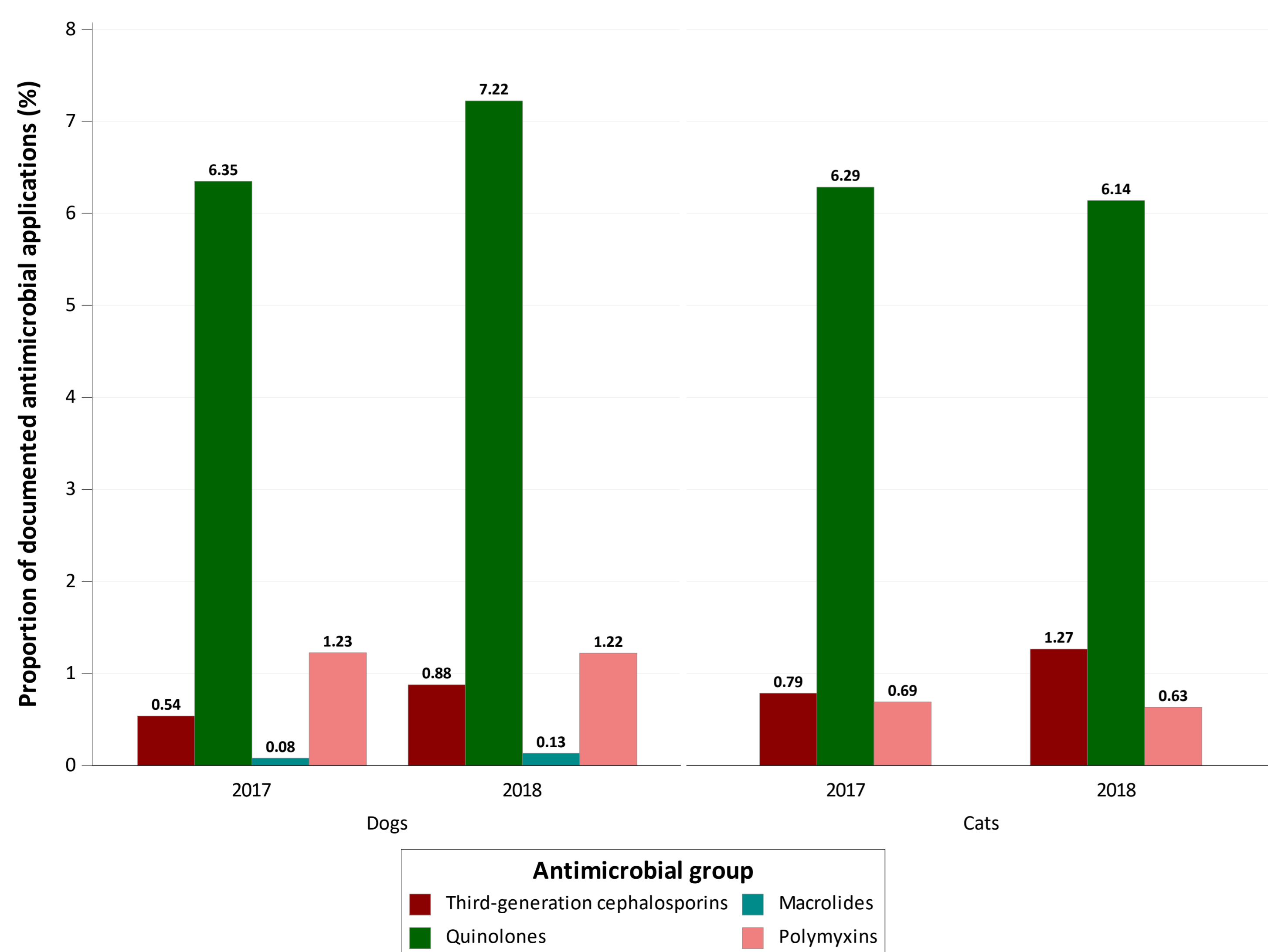


Figure 1: Proportion of documented antimicrobial applications of Critically Important Antibiotics (CIA) - Highest Priority [2] for dogs and cats over the two year study period at the Clinic for Small Animals, TiHo

Discussion

Despite this study shows a slight decline in proportion of prescribed AMs, there is no significant difference in the proportion of prescribed AMs between 2017 and 2018 (OR 1.01; KI 0.98 – 1.03) and treated dogs and cats in 2017 (OR 0.97; KI 0.92 – 1.01) and 2018 (OR 0.97; KI 0.94 – 1.01), respectively. The increasing number of documented AM applications and rising amount is associated with the growing number of animals treated. In addition, results show that most commonly prescribed AM groups were the same for dogs and cats in 2017 and 2018, respectively and remain the same between 2017 and 2018.

Only 1st and 3rd generation cephalosporins were documented, with 1st generation displaying the most frequent application.

This study shows that the method described for horses [1] is transferrable for investigation of AMU in other animal species.

Conclusion

Since there is no significant difference in AM applications between 2017 and 2018 and ranking in most commonly used AMs at the CfSA, data can be used as a baseline to evaluate how changes in in-house guidelines and future legal requirements have an impact on the prescribing culture. Data generated within the CfSA should be evaluated annually.

References

[1] Schnepf et al.: Antimicrobial Usage in Horses: The Use of Electronic Data, Data Curation, and First Results, *Frontiers in Veterinary Science* 7, 2020

[2] World Health Organization: Critically important antimicrobials for human medicine: 5th revision 2016: ranking of medically important antimicrobials for risk management of antimicrobial resistance due to non-human use, 2017