



Antimicrobial Drug Use In Companion Animals



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- Professor of Epidemiology and Infection Control / Colorado State University
- Professor of Epidemiology / Colorado School of Public Health
- Director of Infection Control / James L. Voss Veterinary Teaching Hospital
 - Control of Resistant Bacterial Infections and Promote AMD Stewardship
- Research Focus: Infectious Diseases and Antimicrobial Resistance
 - Food producing animals, especially cattle
 - Companion Animals
- American College of Veterinary Internal Medicine
 - Chair & Author: Consensus Statements on Antimicrobial Drug Use



Antimicrobial Drug Use in Companion Animals

1. What are your primary disease challenges that result in antibiotics being used for prevention, control, or treatment?
2. What are non-antibiotic control measures used for these disease challenges?
3. What antibiotic control measures are used for these diseases?



What are your primary disease challenges that result in antibiotics being used for prevention, control, or treatment?

- **Companion Animals** = Dogs, Cats, Horses (mainly)
- **Much** more likely to mimic AMD uses found in humans in comparison to food producing animals
 - Examples: Legal, but off-label use of drugs such as Carbapenems, Chloramphenicol, Linezolid, Tigecycline, Vancomycin, Quinupristin/Dalfopristin
- **People Are Much** more likely to have direct and indirect contact with companion animals in comparison to food producing animals
 - Food Safety Control Measures limit foodborne exposures
 - Rare physical exposure to food animals in modern society
 - Limited potential for indirect (environmental) exposures to food animals



Common



<http://naradanews.com/wp-content/uploads/2016/07/big-dog-licking-woman-face.jpg>

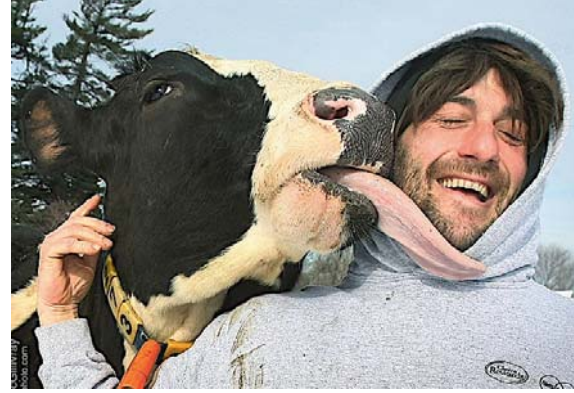


<http://thedoghouse.com/10-things-never-say-dog-owner/>



<http://www.catsster.com/wp-content/uploads/2015/06/2012-1224-catsster-tips-sleeping-3.jpg>

UnCommon



<http://www.atwphoto.com/CowLick.jpg>

"Do you think it's time Bossie started sleeping on the floor?"



<http://www.verbotomy.com/jimage400/cow.gif>



1. What are disease challenges that result in antibiotics being used for prevention, control, or treatment?

- 2001 Mail Survey
- AVMA veterinarians randomly selected from throughout U.S. from 7 Self-declared practice categories
 - Large animal exclusive - LGANEXC
 - Large animal predominant - LGANPRED
 - Other private practice - OTHER
 - Mixed - MIXED
 - Equine exclusive - EQUINE
 - Small Animal predominant - SMANPRED
 - Small Animal exclusive - SMANEXC
- Response = 4,652 / 12,955 (35.4%)



Pick One Species: How Commonly Did You Treat With AMDs for Problems in These Body Systems During the Past Year?



Average Rank	Bovine-Beef	Bovine-Dairy	Equine	Canine	Feline
Rank 1 (Most Common)	Respiratory Tract	Mammary Gland	Respiratory Tract	Integument/Skin	Urinary Tract
Rank 2	Digestive Tract	Respiratory Tract	Reproductive Tract	Ear and Eye	Respiratory Tract
Rank 3	Reproductive Tract	Reproductive Tract	Integument/Skin	Urinary Tract	Integument/Skin
Rank 4	Mammary Gland	Digestive Tract	Musculoskeletal System	Digestive Tract	Ear and Eye
Rank 5	Ear and Eye	Musculoskeletal System	Ear and Eye	Respiratory Tract	Digestive Tract
Rank 6	Musculoskeletal System	Urinary Tract	Digestive Tract	Musculoskeletal System	Musculoskeletal System
Rank 7	Urinary Tract	Ear and Eye	Neurological System	Reproductive Tract	Reproductive Tract
Rank 8	Neurological System	Integument/Skin	Urinary Tract	Mammary Gland	Mammary Gland
Rank 9 (Least Common)	Integument/Skin	Neurological System	Mammary Gland	Neurological System	Neurological System

 Digestive Tract

 Mammary Gland

 Reproductive Tract

 Ear and Eye

 Musculoskeletal System

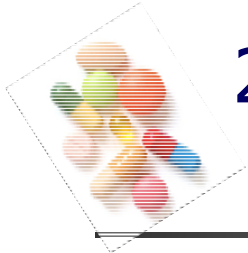
 Respiratory Tract

 Integument/Skin

 Neurological System

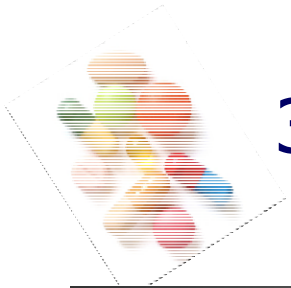
 Urinary Tract

Q4.2



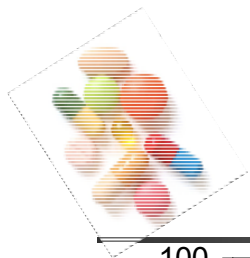
2. What are non-antibiotic control measures used for these disease challenges?

- Limited...
- Respiratory vaccines – imperfect efficacy
- Novel Treatments for Atopy/Skin infections (ex.)
 - Monoclonal antibody that specifically targets and neutralizes interleukin-31 (IL-31)
 - CYTOPOINT™ - Zoetis
 - Vaccination with liposome-nucleic acid complexes
 - Immunostimulatory
- Urinary – nothing currently
- Reproductive tract – currently limited

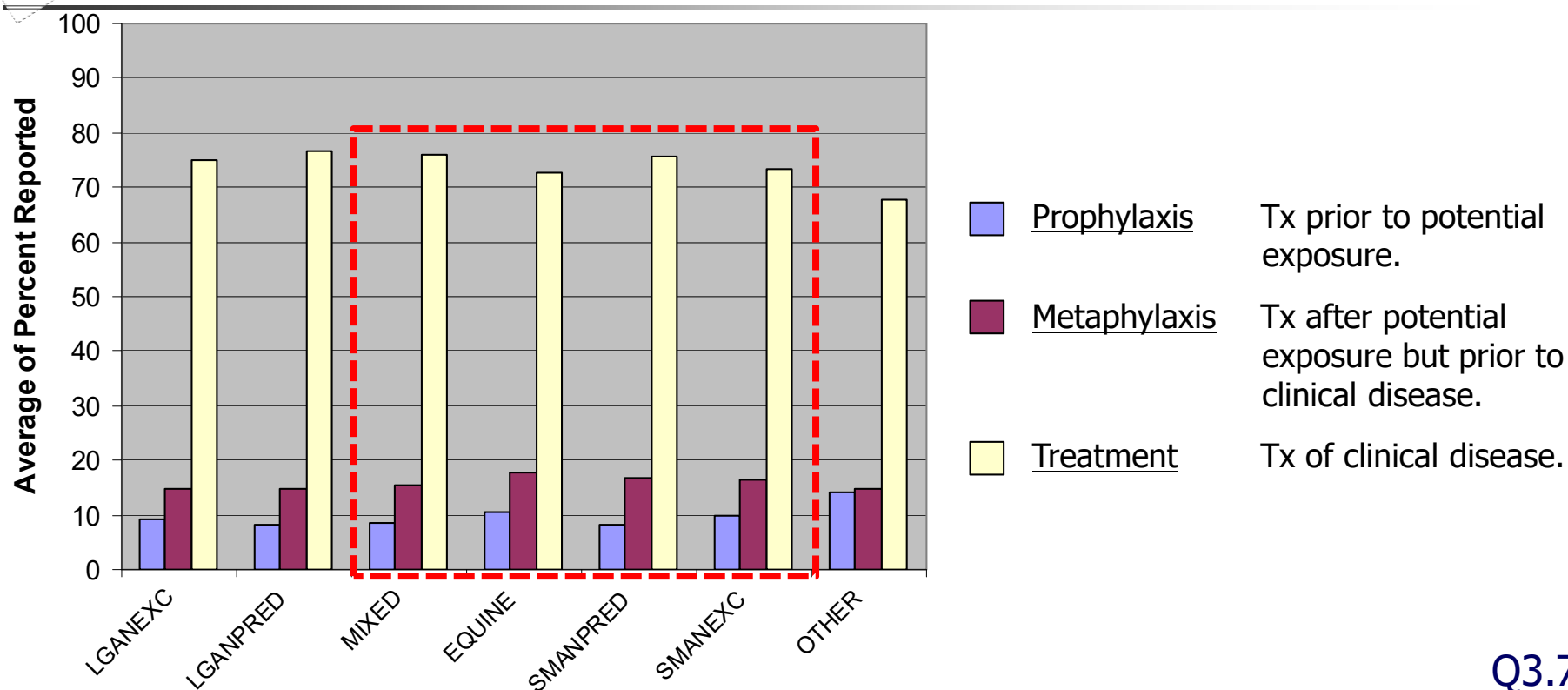


3. What antibiotic control measures are used for these diseases?



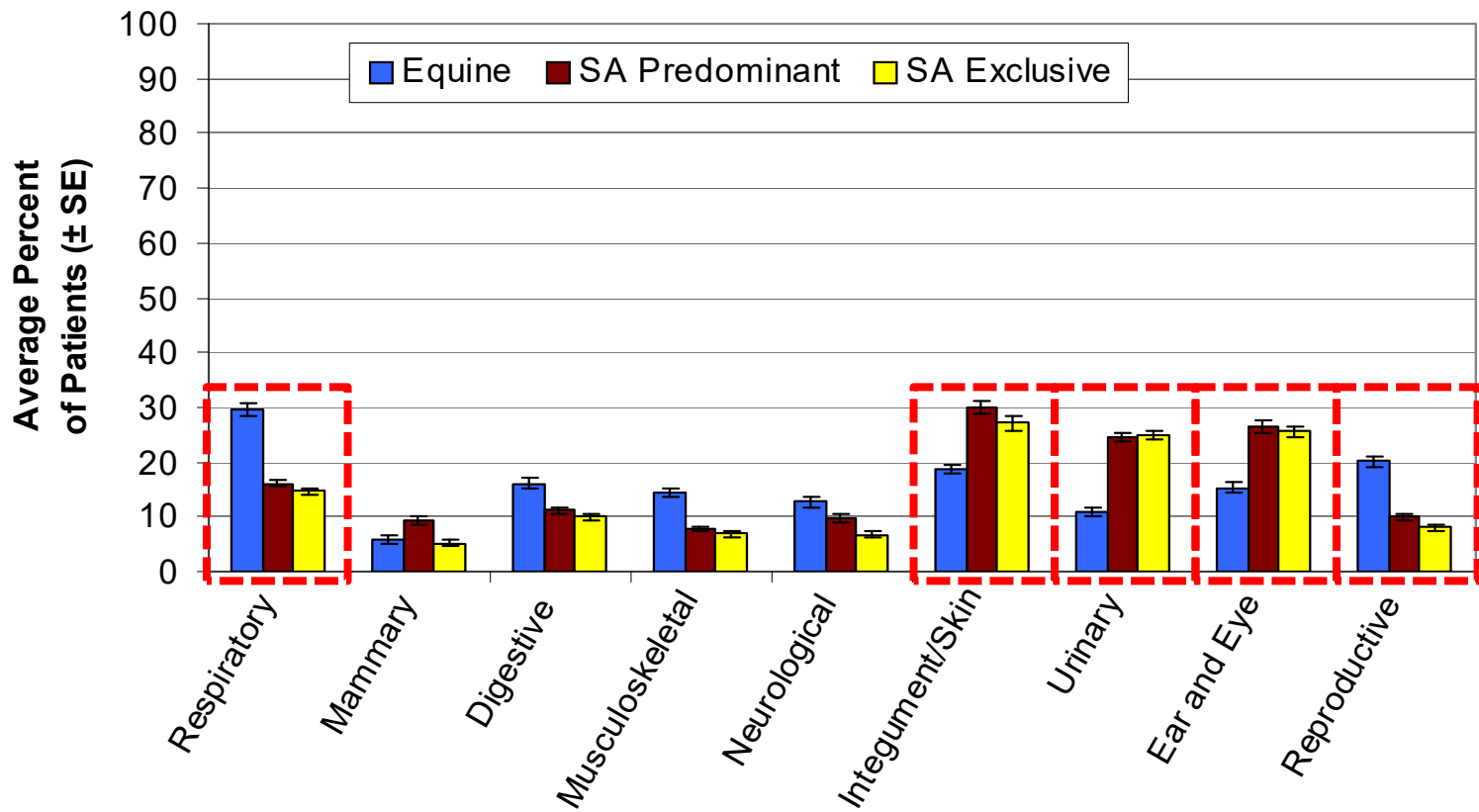


Reasons for Antimicrobial Drug Prescriptions (past 12 mo)





Patients in Which Perceived AMR Affects Choice of Drugs



Q3.4



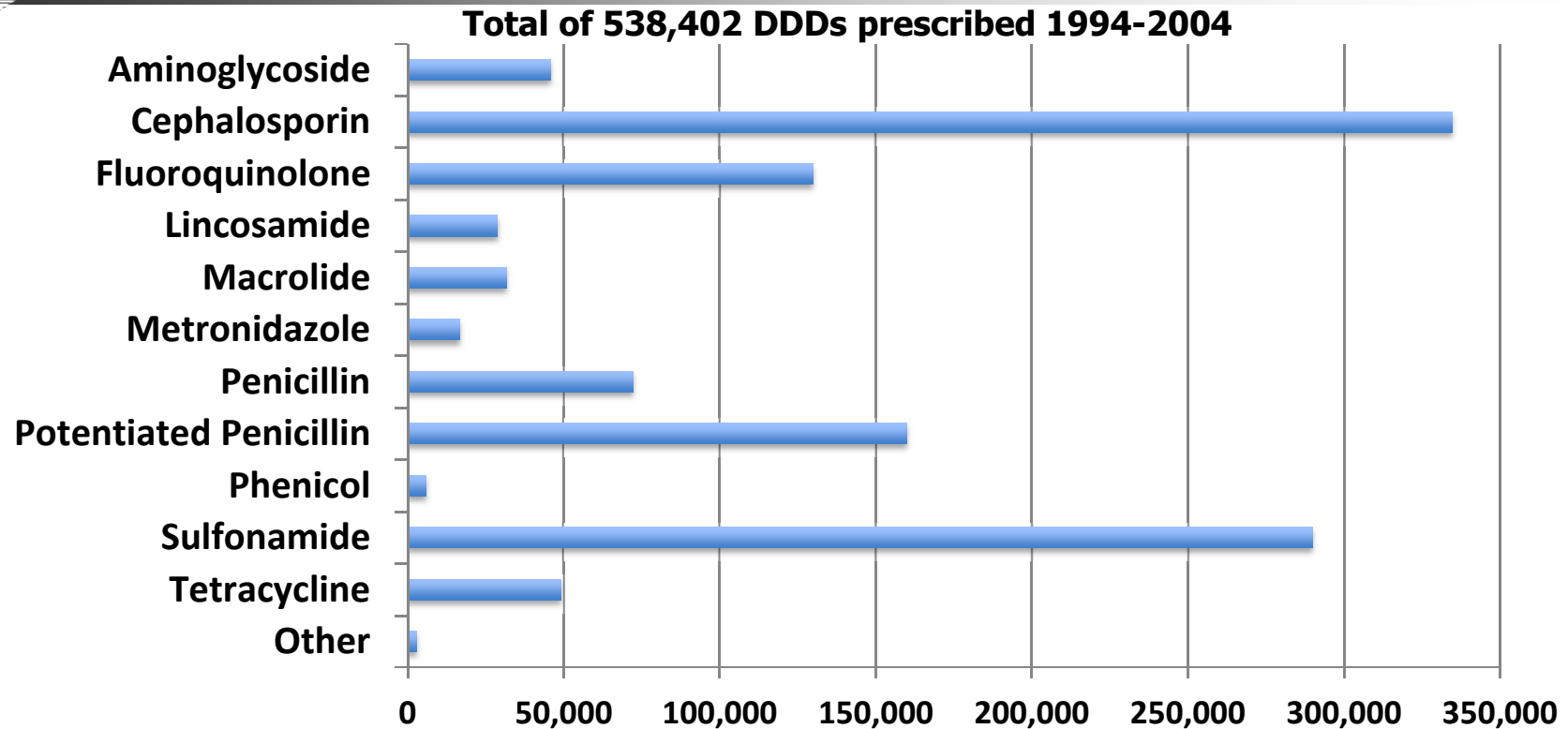
Summary of AMD Use in Hospitalized Patients James L. Voss Veterinary Teaching Hospital (1994-2007)

Species	¹ Admissions	² Received AMD	³ Percent AMD	⁴ DDD _{SUM}	⁵ DDD _{UD}	⁶ DDD _{MED}	⁷ DDHoD _{MED}
Equine	13,929	8,105	58.2%	184,675	243	1.27	0.14
Canine	44,603	24,329	54.5%	324,636	428	2.36	0.47
Feline	12,245	3,868	31.6%	39,946	53	3.29	1.10

- *1. Number of patients admitted to the hospital for at least one day.
- 2. Number of patients that received at least one antimicrobial drug (AMD) and were hospitalized at least one day.
- *3. Percent of hospitalized patients that received at least one AMD.
- 4. The sum of the Defined Daily Dose for patients receiving antimicrobials and hospitalized at least one day.
- *5. Usage Density: Defined Daily Dose per 100 total patients hospitalized for at least one day.
- *6. Median Defined Daily Dose for patients receiving antimicrobials and hospitalized for at least one day.
- 7. Defined Daily Dose per Hospitalized Day for patients receiving antimicrobials and hospitalized for at least one day.



DDDs Prescribed, by Drug Class JLV-VTH Inpatients (1994-2007)





Inpatients Receiving AMD Prescriptions, by Species and Drug Class (1994-2007)

- **Canine** (n=24,329)
 - **50.1% cephalosporin (n=12,194)**
 - 8.6% potentiated penicillin (n=2,095)
 - 4.5% cephalosporin/potentiated penicillin (n=1,090)

- **Feline** (n=3,868)
 - **30.6% potentiated penicillin (n=1,185)**
 - **26.7% cephalosporin (n=1,032)**
 - 9.6% cephalosporin/potentiated penicillin (n=371)

- **Equine** (n=8,105)
 - **17.4% aminoglycoside/penicillin (n=1,413)**
 - **11.3% penicillin (n=917)**
 - **11.3% sulfonamide (n=679)**
 - 7.6% aminoglycoside/penicillin/sulfonamide (n=619)



Treatment Guidelines & Consensus Statements



2005

Antimicrobial Drug Use in Veterinary Medicine

Paul S. Morley, Michael D. Apley, Thomas E. Besser, Derek P. Burney, Paula J. Fedorka-Cray, Mark G. Papich, Josie L. Traub-Dargatz, and J. Scott Weese

2015

ACVIM Consensus Statement on Therapeutic Antimicrobial Use in Animals and Antimicrobial Resistance

J.S. Weese, S. Giguère, L. Guardabassi, P.S. Morley, M. Papich, D.R. Ricciuto, and J.E. Sykes



Vet Dermatol 2014; 25: 163–e43

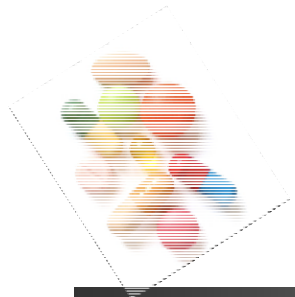
DOI: 10.1111/vde.12118

Guidelines for the diagnosis and antimicrobial therapy of canine superficial bacterial folliculitis (Antimicrobial Guidelines Working Group of the International Society for Companion Animal Infectious Diseases)

Andrew Hillier*, David H. Lloyd†, J. Scott Weese‡, Joseph M. Blondeau§, Dawn Boothe¶, Edward Breitschwerdt**, Luca Guardabassi††, Mark G. Papich**, Shelley Rankin‡‡, John D. Turnidge§§ and Jane E. Sykes¶¶

Antimicrobial Use Guidelines for Treatment of Urinary Tract Disease in Dogs and Cats: Antimicrobial Guidelines Working Group of the International Society for Companion Animal Infectious Diseases

J. Scott Weese,¹ Joseph M. Blondeau,² Dawn Boothe,³ Edward B. Breitschwerdt,⁴ Luca Guardabassi,⁵ Andrew Hillier,⁶ David H. Lloyd,⁷ Mark G. Papich,⁴ Shelley C. Rankin,⁸ John D. Turnidge,^{9,10} and Jane E. Sykes¹¹

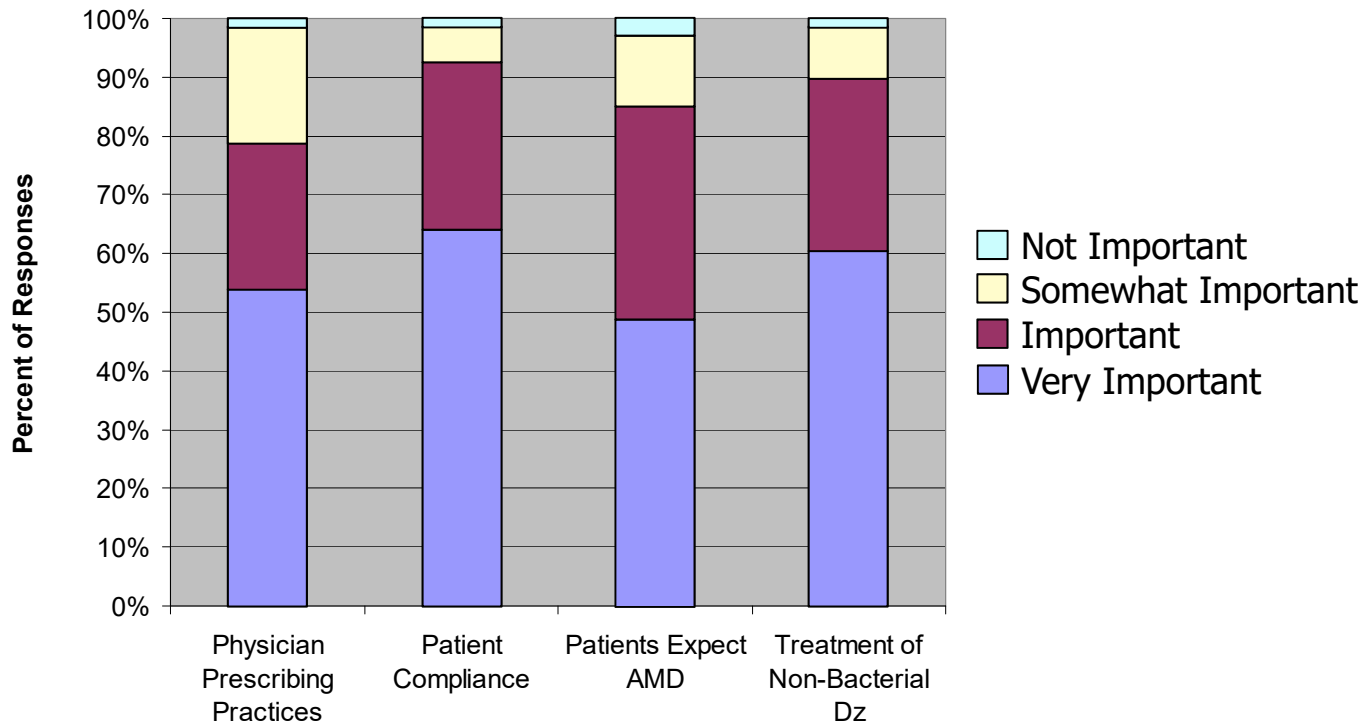


Veterinarians' Attitudes Regarding Sources of AMR





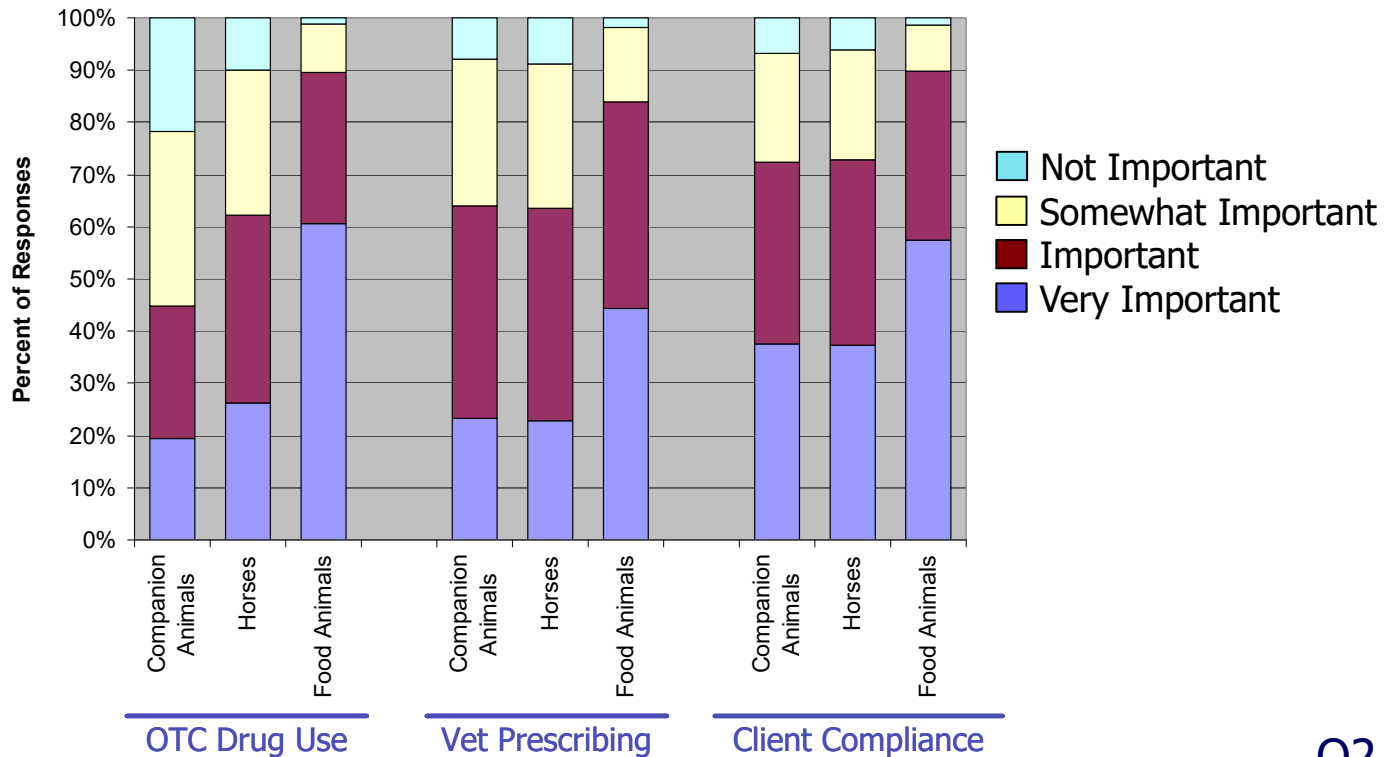
In your opinion, how important are these aspects of AMD use in humans as contributors to development of antimicrobial drug resistance (in animals or humans)?



Q2.2



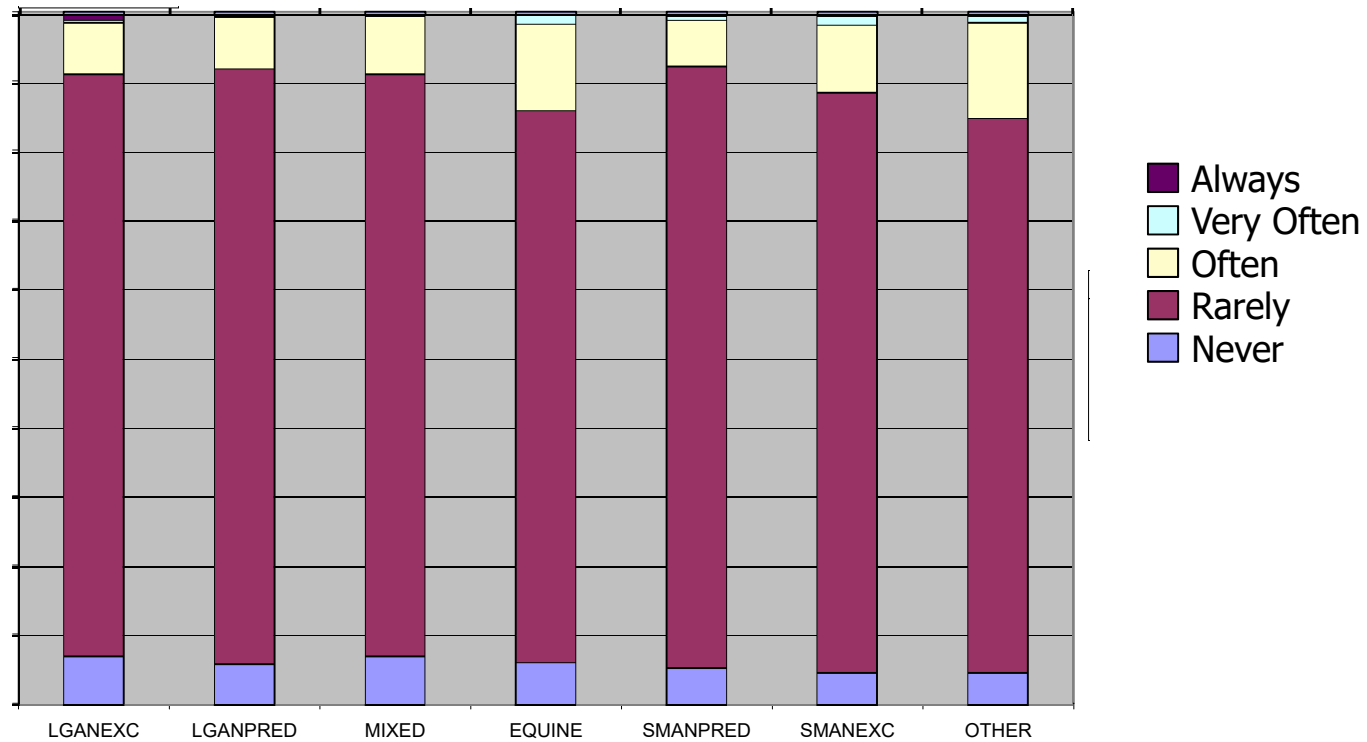
In your opinion, how important are these aspects of AMD use in animals as contributors to development of antimicrobial drug resistance (in animals or humans)?



Q2.2



Do Your Antimicrobial Use Practices as a Veterinarian Lead to the Development of Antimicrobial Resistance in Bacteria?

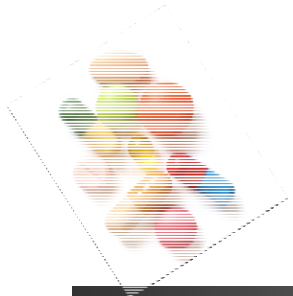




Take-Away About Veterinarians' Attitudes Regarding Sources of AMR

Veterinarians Said:

- Use in humans (physician prescribing, etc) was considered most harmful
- Use by other veterinarians was also believed to promote AMR
 - Most in Food Animals
 - Least in Companion Animals
- My own use rarely/never promotes AMR



Thank You



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