



# Communicating AMR

One Health (Small Animal) Perspective

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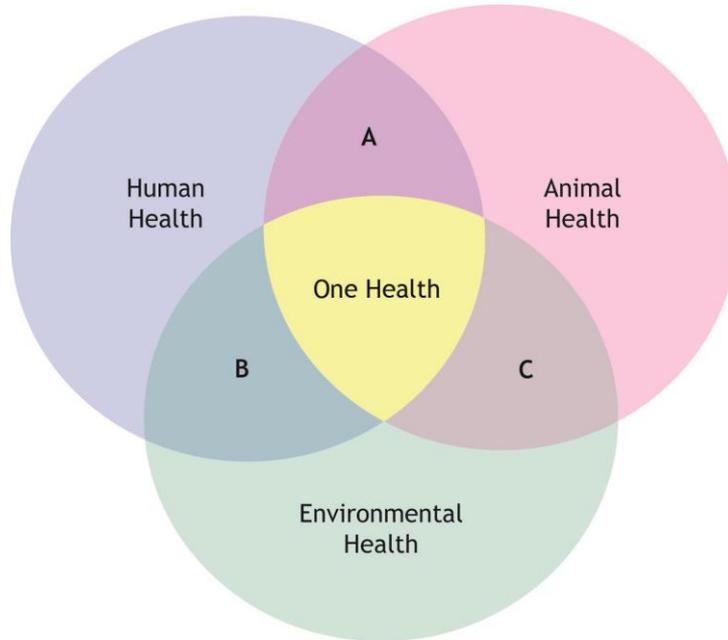
# Land Acknowledgement



We humbly acknowledge that Johns Hopkins University is located on the traditional and contemporary homelands of indigenous peoples. Our campus resides on unceded lands of the Piscataway and Susquehannock peoples. We recognize the enduring presence of more than 7,000 indigenous peoples in Baltimore City, including the Piscataway, Lumbee, and Eastern Band of Cherokee community members. As we gather from places across the country and globe, we honor and recognize indigenous people of our homelands.

Together, we acknowledge the history of genocide and ongoing systemic inequities while respecting treaties made on this territory as a step towards reconciliation and strengthening relationships with indigenous peoples. We give thanks to the past, present and future stewards of this land and respect all tribal nation's sovereignty and right to self-determination. We aim to hold ourselves and the university community accountable to tribal nations.

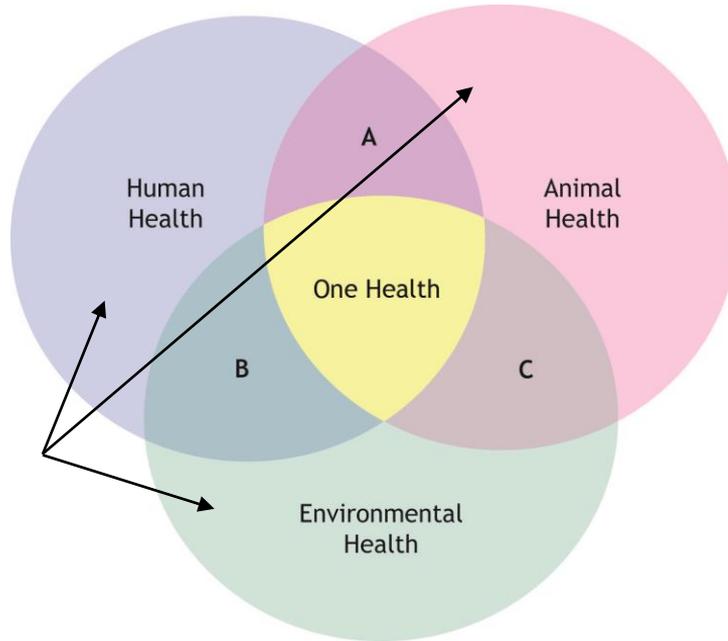
# One Health perspective on AMR



- (A) Studies or programs relating factors between animal and human health
- (B) Studies or programs relating factors between environmental and human health
- (C) Studies or programs relating factors between animal and environmental health, including natural and built environments and plant health



# One Health perspective on AMR

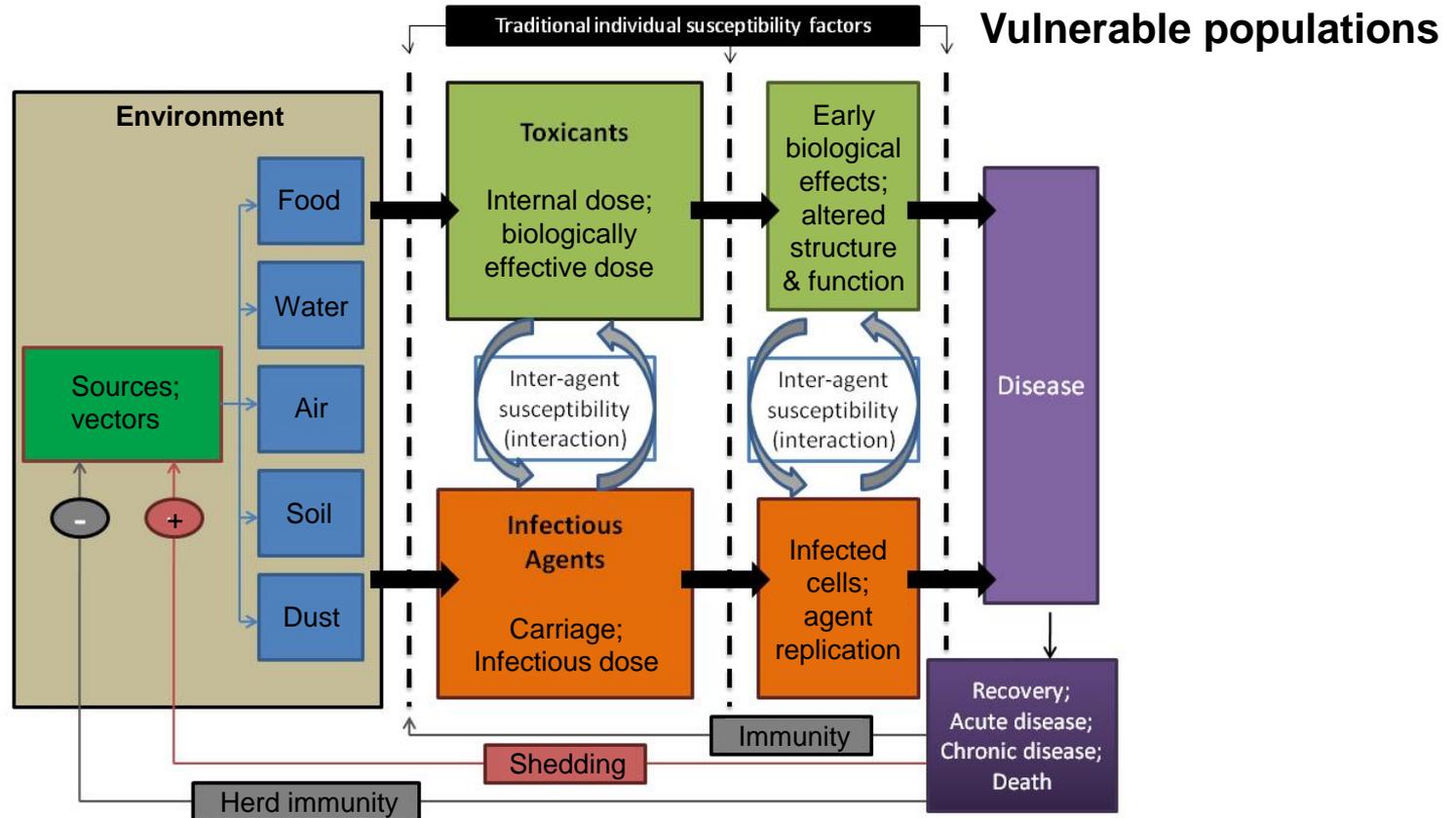


*Lack of shared responsibility to address challenges*

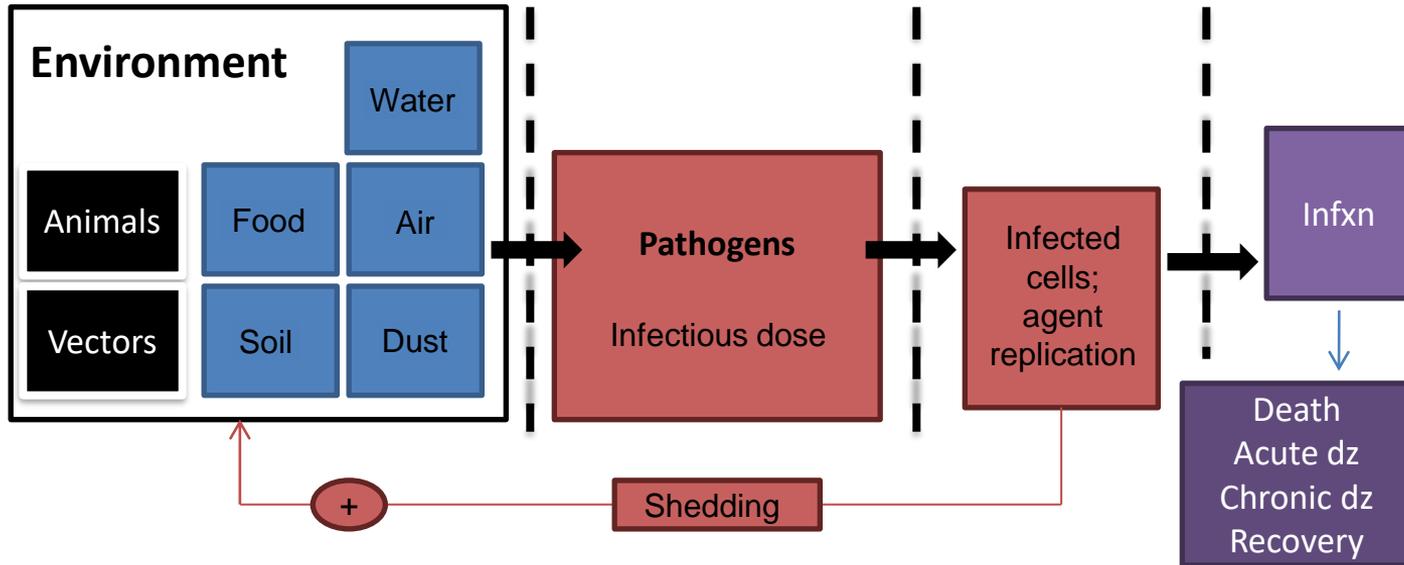
*Potential disconnect for communication strategies*

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# Complex science: Pathogens in the Environmental Health Paradigm

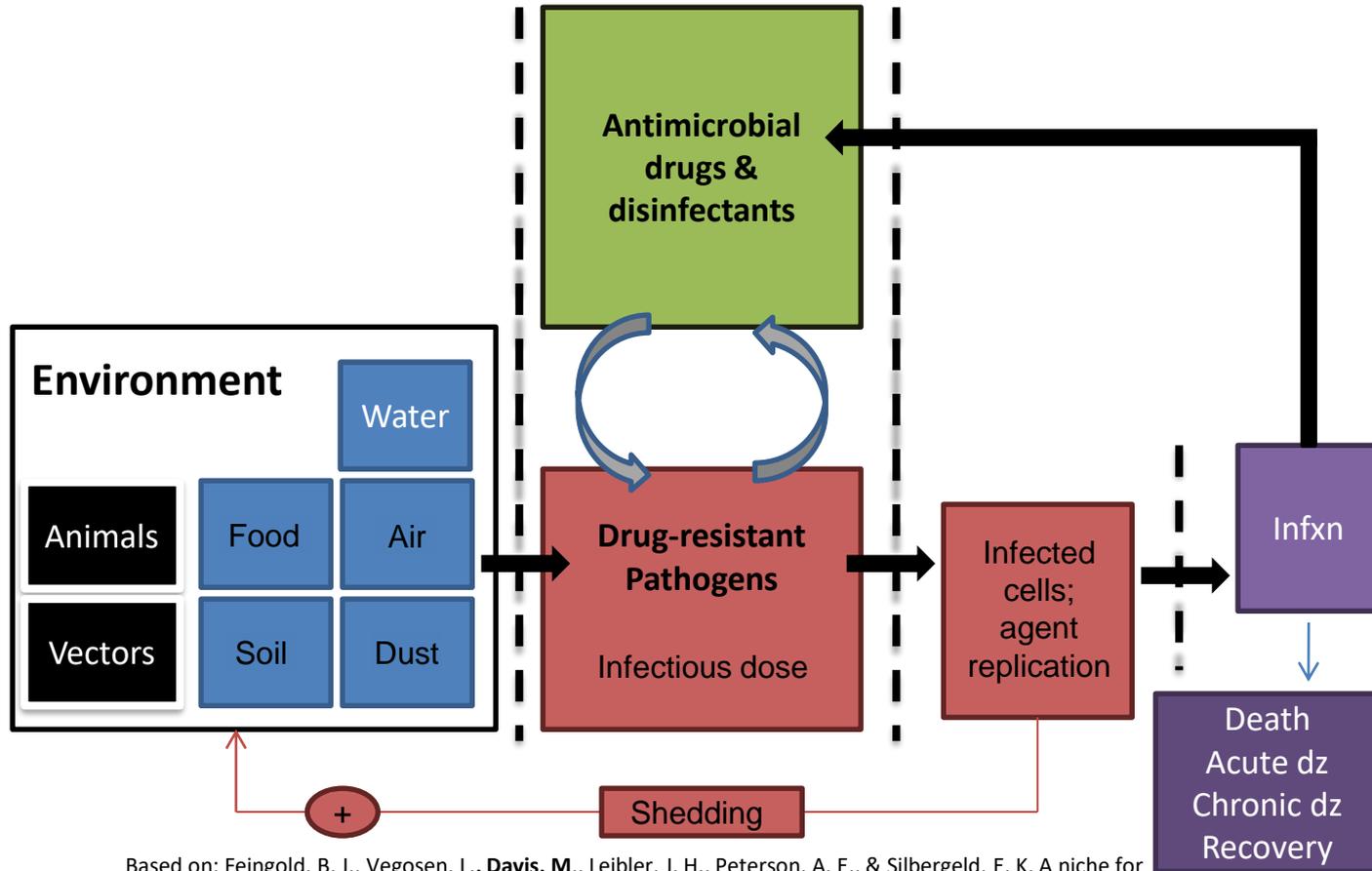


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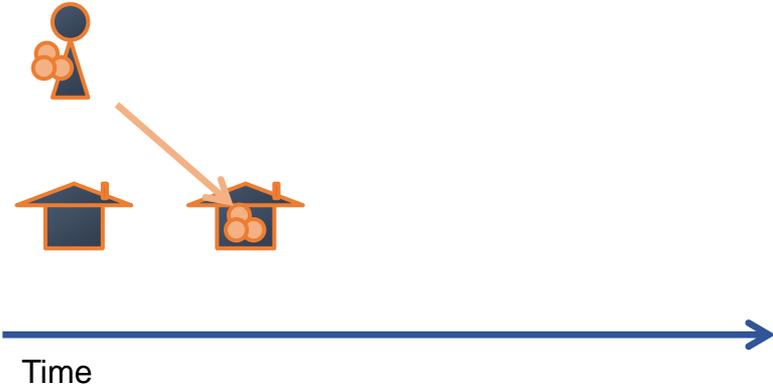
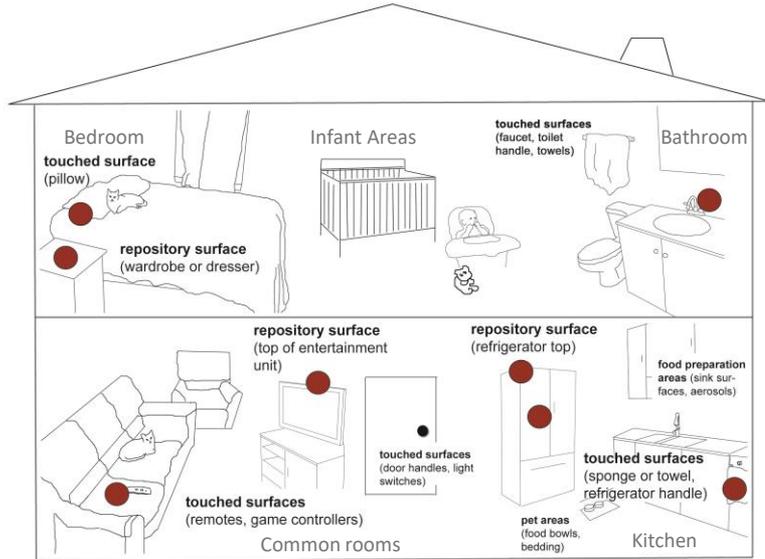
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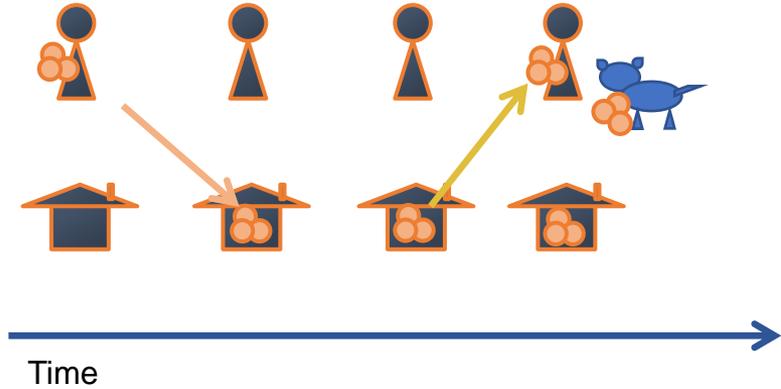
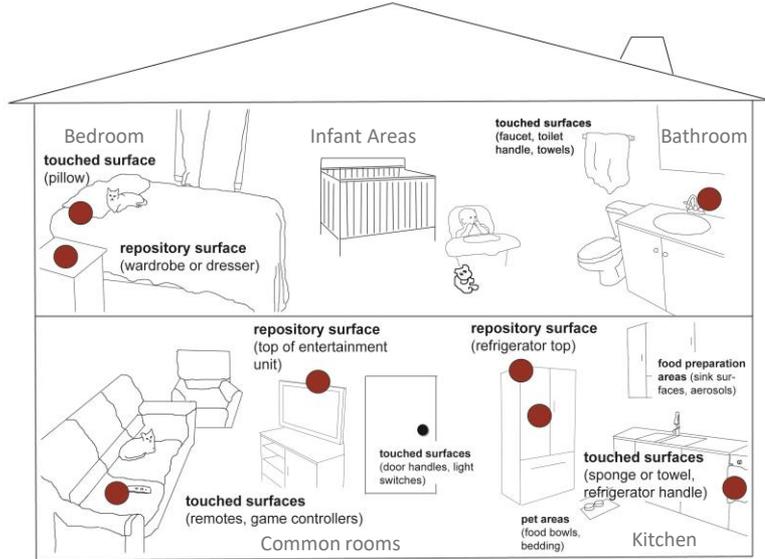
# Case: MRSA in Households



Home contamination with MRSA can be a reservoir to expose both people and pets



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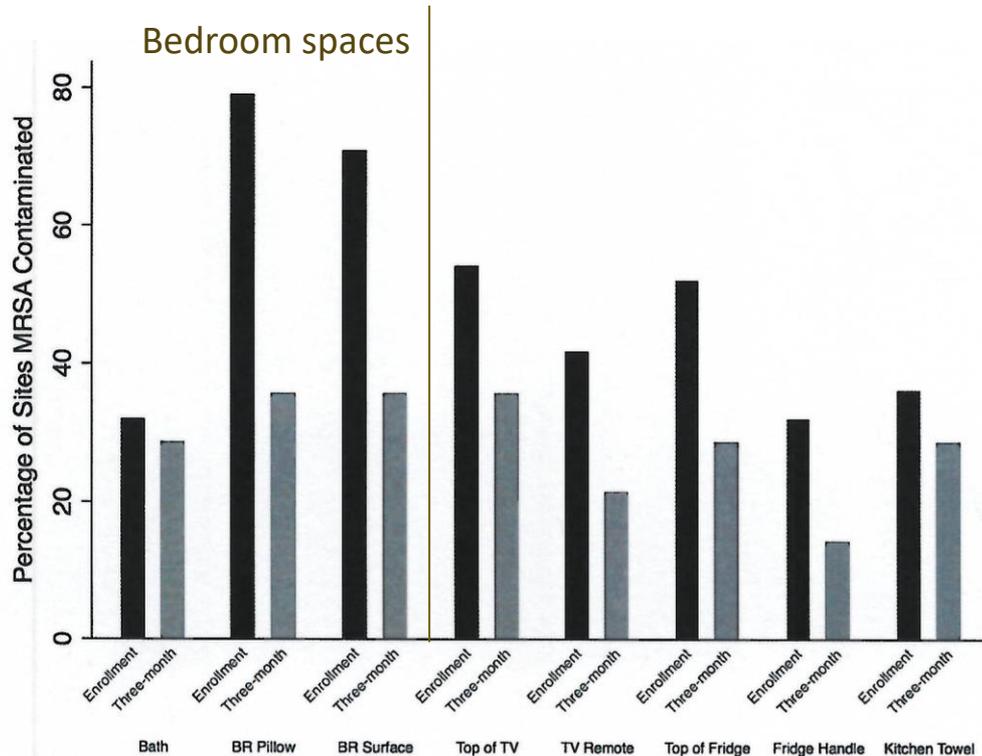


Home contamination with MRSA can be a reservoir to expose both people and pets

# MRSA contamination in homes of people with recent infxn



Jonathan  
Shahbazian



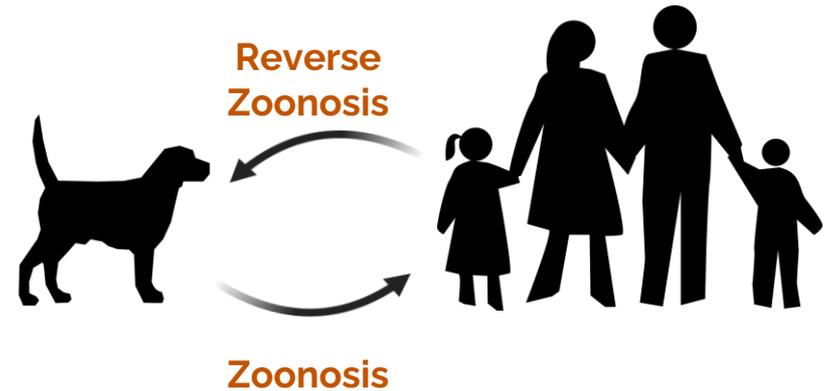
**FIG 1** Percentage of sites contaminated with MRSA at the enrollment visit (baseline) and the 3-month visit. Samples were collected from eight standardized locations in the common room, kitchen, and bedroom (BR) of each household.

## Risk factors for **multidrug resistance**:

- Human or pet use of antimicrobial drugs
- Use of disinfectants on EPA list of MRSA-cidal products
- Rural residence



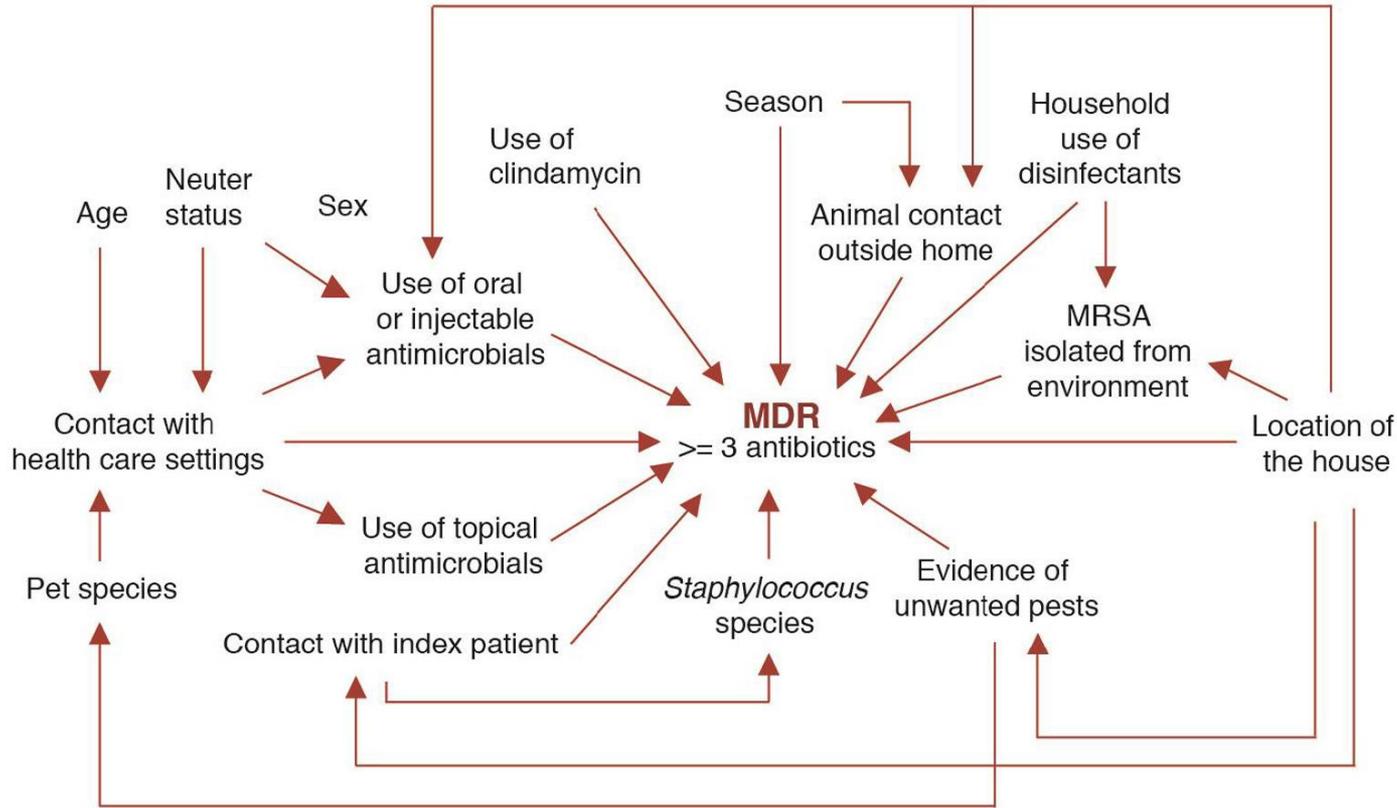
# Companion animals (dogs, cats, pocket pets, etc.)



# Pet Outcomes: Multidrug resistance



Cusi Ferradas

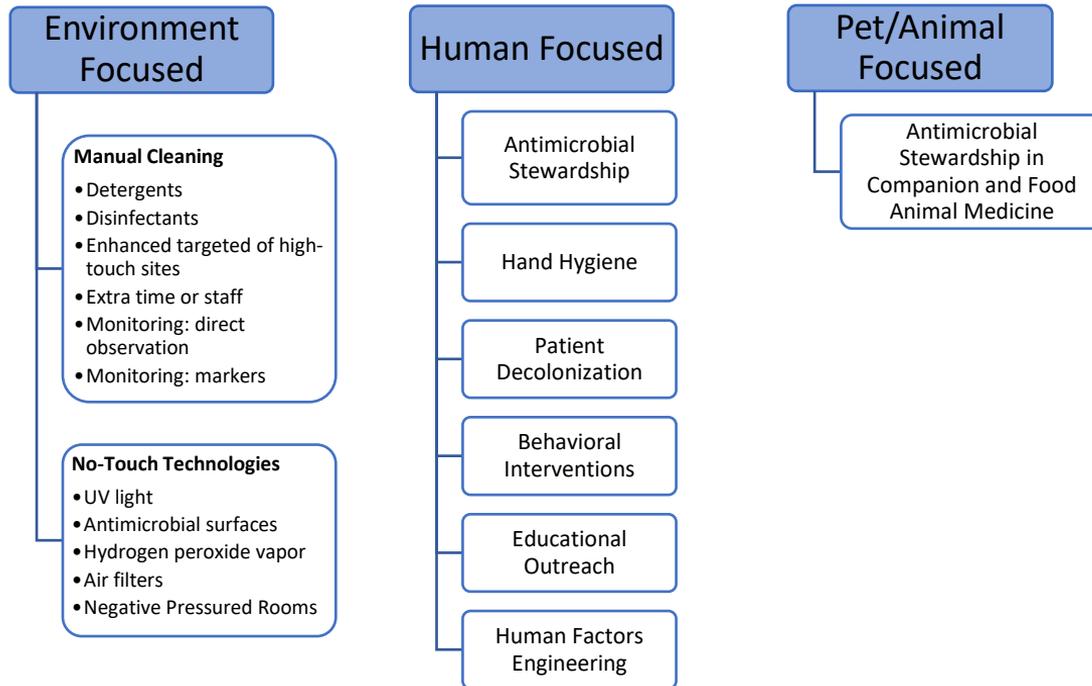


# Pet Outcomes: MRSA in pets and the environment

House ID	Sample	Pet species	N of MRSA positive / Total N in the house	spa type	MDR	fox	amk	e	cip	gm	cc	sxt	tet	Concordant (N)*	Total N of antimicrobials tested*	Percent concordance
A	Pet	Dog	1/5	t334	Yes	■	■	■	■					8	11	73%
	Environment	-	-	t216	-	■	■	■	■	■	■					
B	Pet	Cat	1/1	t008	Yes	■	■	■						10	11	91%
	Environment	-	-	t008	-	■	■	■				■				
C	Pet	Cat 1	2/2	t008	Yes	■	■	■		■				9	11	82%
		Cat 2		t008	Yes	■	■	■								
	Environment	-	-	t008	-	■	■	■	■							
D	Pet	Cat 1	2/13	t008	Yes	■	■	■	■					11	11	100%
		Cat 2		t008	Yes	■	■	■	■							
	Environment	-	-	t008	-	■	■	■	■							
E	Pet	Dog	1/1	t12500	Yes	■	■	■		■	■			10	11	91%
	Environment	-	-	t12500	-	■	■	■		■	■					
F	Pet	Dog	1/1	t216	No	■	■							9	11	82%
	Environment	-	-	t216	-	■	■		■				■			
G	Pet	Dog	1/1	t216	No	■	■							9	11	82%
		Cat	1/1	t216	No	■	■									
	Environment	-	-	t216	-	■	■	■			■					
H	Pet	Dog	1/1	t121	Yes	■	■	■		■				10	11	91%
	Environment	-	-	t121	-	■	■	■	■	■						

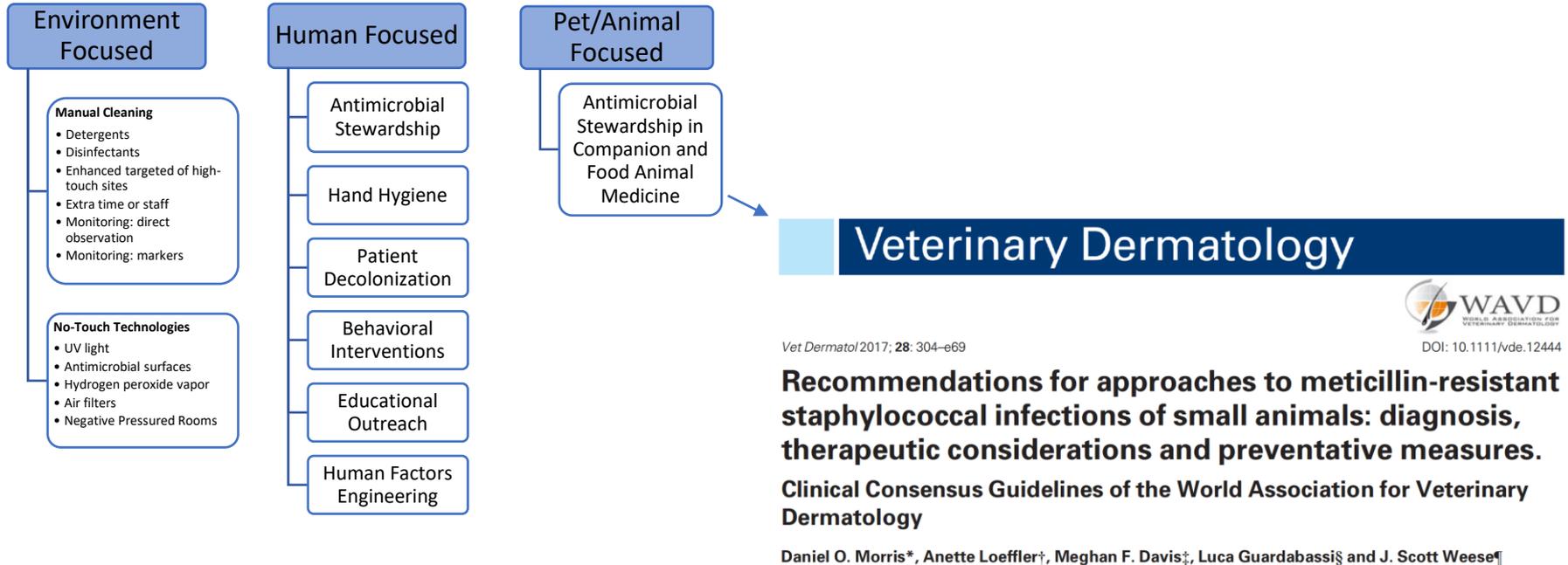


# One Health infection control domains



Kathryn Dalton

# One Health infection control domains



# Communication Stakeholders and Process



Image source: EPA

**Academic institutions & organizations**  
Scientific evidence, guidelines, best practices

# Public perceptions of veterinarians v. physicians

- ▶ Favorable public perceptions of veterinarians compared to physicians
- ▶ Veterinarians: approachable, sensitive, sympathetic, patient and understanding
- ▶ Physicians: proud, arrogant and overconfident

Table 2. Comparison of the ratings for physicians and veterinarians.

	Physicians		Veterinarians		<i>t</i>	<i>df</i>	<i>p</i>	<i>d</i>
	Unweighted (n = 606)	Weighted (n = 758)	Unweighted (n = 606)	Weighted (n = 758)				
	Mean (SD)	Mean (SD)	Mean (SD)	Mean (SD)				
Proud	7.30 (1.53)	7.32 (1.57)	6.93 (1.70)	6.92 (1.71)	7.107	757	<0.001	1.141
Arrogant	4.89 (2.35)	4.88 (2.35)	3.35 (2.25)	3.01 (2.11)	22.357	757	<0.001	0.838
Sensitive	5.59 (2.01)	5.37 (2.04)	6.89 (1.92)	6.98 (1.83)	-20.62	757	<0.001	0.831
Sympathetic	6.36 (1.82)	6.12 (1.80)	7.39 (1.65)	7.50 (1.54)	-19.659	757	<0.001	0.825
Approachable	6.33 (1.71)	6.14 (1.63)	7.28 (1.55)	7.40 (1.44)	-20.536	757	<0.001	0.819
Patient	5.68 (2.04)	5.47 (2.02)	6.84 (1.83)	6.94 (1.85)	-17.398	757	<0.001	0.760
Overconfident	5.15 (2.36)	5.06 (2.34)	3.77 (2.35)	3.38 (2.20)	20.986	757	<0.001	0.740
Understanding	6.40 (1.84)	6.29 (1.74)	7.33 (1.66)	7.39 (1.54)	-16.868	757	<0.001	0.670
Punctual	5.54 (2.17)	5.43 (2.15)	6.63 (1.68)	6.70 (1.62)	-16.820	757	<0.001	0.667
Likable	6.51 (1.64)	6.39 (1.62)	7.28 (1.57)	7.39 (1.46)	-16.714	757	<0.001	0.649
Respectful	6.68 (1.70)	6.52 (1.71)	7.42 (1.55)	7.50 (1.44)	-15.657	757	<0.001	0.620
Caring	6.72 (1.66)	6.59 (1.70)	7.42 (1.62)	7.55 (1.49)	-15.908	757	<0.001	0.599
Attentive	6.69 (1.73)	6.52 (1.73)	7.38 (1.62)	7.42 (1.58)	-14.410	757	<0.001	0.543
Helpful	6.72 (1.74)	6.63 (1.68)	7.41 (1.57)	7.45 (1.56)	-13.045	757	<0.001	0.505
Unpleasant	3.83 (2.23)	3.70 (2.13)	2.99 (2.23)	2.69 (2.07)	14.933	757	<0.001	0.480
Thorough	6.67 (1.75)	6.69 (1.74)	7.25 (1.63)	7.39 (1.54)	-12.344	757	<0.001	0.427
Greedy	4.33 (2.32)	4.15 (2.28)	3.65 (2.41)	3.27 (2.33)	11.718	757	<0.001	0.382
Ethical	6.83 (1.71)	6.77 (1.70)	7.29 (1.62)	7.39 (1.54)	-9.975	757	<0.001	0.382
Honest	6.92 (1.51)	6.82 (1.53)	7.13 (1.57)	7.21 (1.50)	-7.397	757	<0.001	0.257
Competent	7.06 (1.60)	7.02 (1.58)	7.34 (1.54)	7.41 (1.49)	-7.500	757	<0.001	0.253
Inefficient	3.71 (2.15)	3.45 (2.05)	3.30 (2.21)	3.01 (2.05)	7.160	757	<0.001	0.215
Confident	7.45 (1.51)	7.48 (1.47)	7.19 (1.56)	7.22 (1.50)	5.333	757	<0.001	0.175
Rational	7.00 (1.52)	7.00 (1.52)	7.17 (1.62)	7.26 (1.55)	-5.157	757	<0.001	0.170
Skilled	7.29 (1.56)	7.32 (1.52)	7.43 (1.52)	7.54 (1.48)	-4.235	757	<0.001	0.146
Scientific	7.05 (1.63)	7.07 (1.61)	7.00 (1.71)	7.10 (1.65)	-0.550	757	0.583	0.018

# Key stakeholders: veterinary and animal care workforce

- ▶ 1577 U.S. veterinary and animal care workers
- ▶ July to October 2020 (COVID-19 Pandemic)
- ▶ Queried
  - ▶ **Communication / Knowledge sources**
  - ▶ Training, Knowledge & Confidence
  - ▶ Job roles & changes with pandemic
  - ▶ Contact with co-workers and public
  - ▶ PPE use
  - ▶ Threat, Efficacy and Barriers
  - ▶ Readiness, Willingness, Ability to Respond

Table 1. Job and Demographic Characteristics (N=1,577)

<i>Characteristics</i>	<i>n (%)</i>
<b>Job role</b>	
Small animal medicine veterinarian	600 (38)
Small animal medicine technician/assistant	496 (32)
Small animal medicine support staff	77 (5)
Medicine – other veterinarian	80 (5)
Medicine – other technician/assistant	0 (0)
Medicine – other support staff	3 (0)
Animal shelter/control	122 (8)
Zoo/wildlife	47 (3)
Other <sup>a</sup>	129 (8)
<b>Time in job, years</b>	
Minimum	0
Median (IQR)	5 (2 to 12)
Maximum	46
<b>Leadership role</b>	
Yes	895 (57)
<b>Age, years</b>	
Under 40 years	816 (52)
40 years or older	755 (48)
Prefer not to say	4 (0)
<b>Gender</b>	
Male	156 (10)
Female	1,395 (89)
Other/prefer not to say	23 (1)

<sup>a</sup>Laboratory animal, industry, government, academia, or other professions.  
Abbreviations: IQR, interquartile range.



Kathryn Dalton  
Sharmaine Miller  
David Marquez

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- ▶ July

- ▶ Questionnaire

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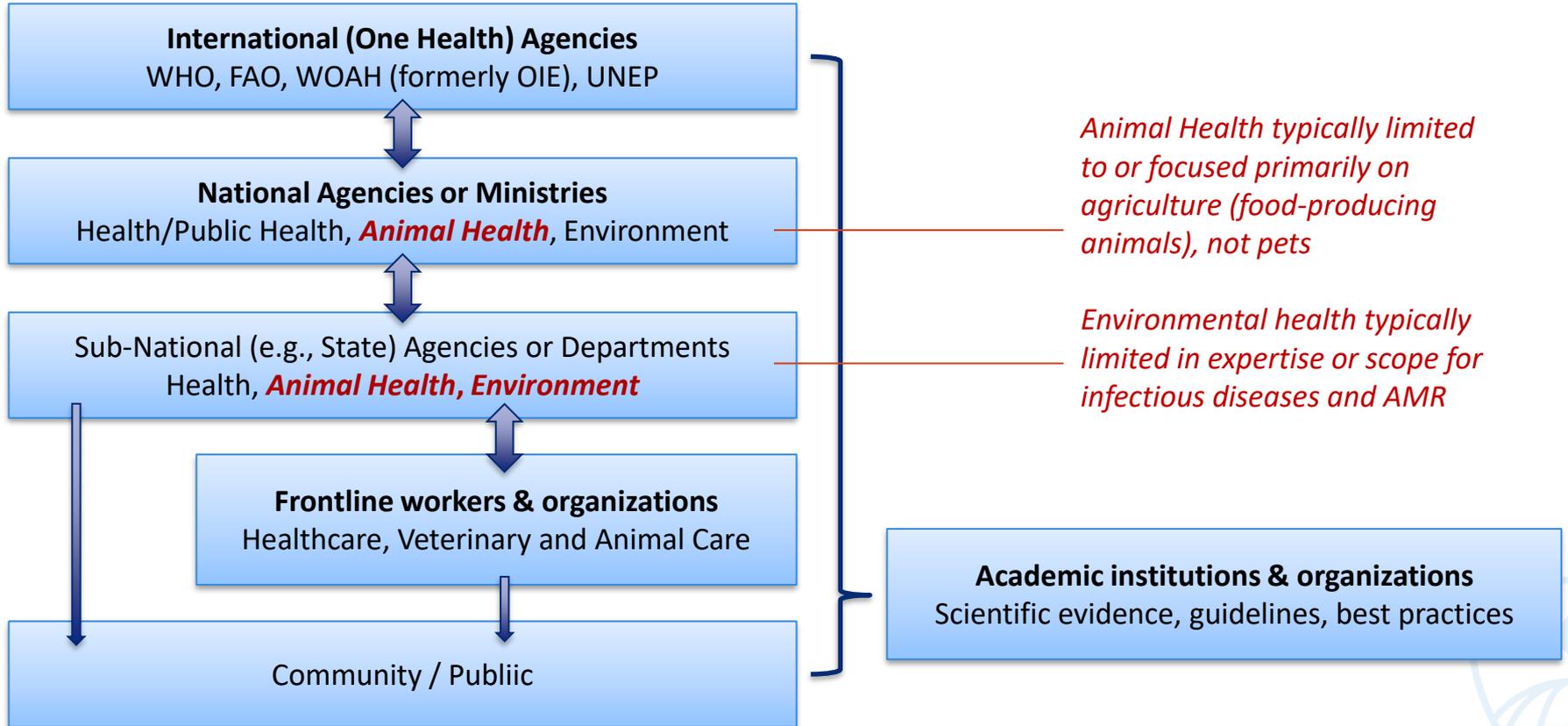
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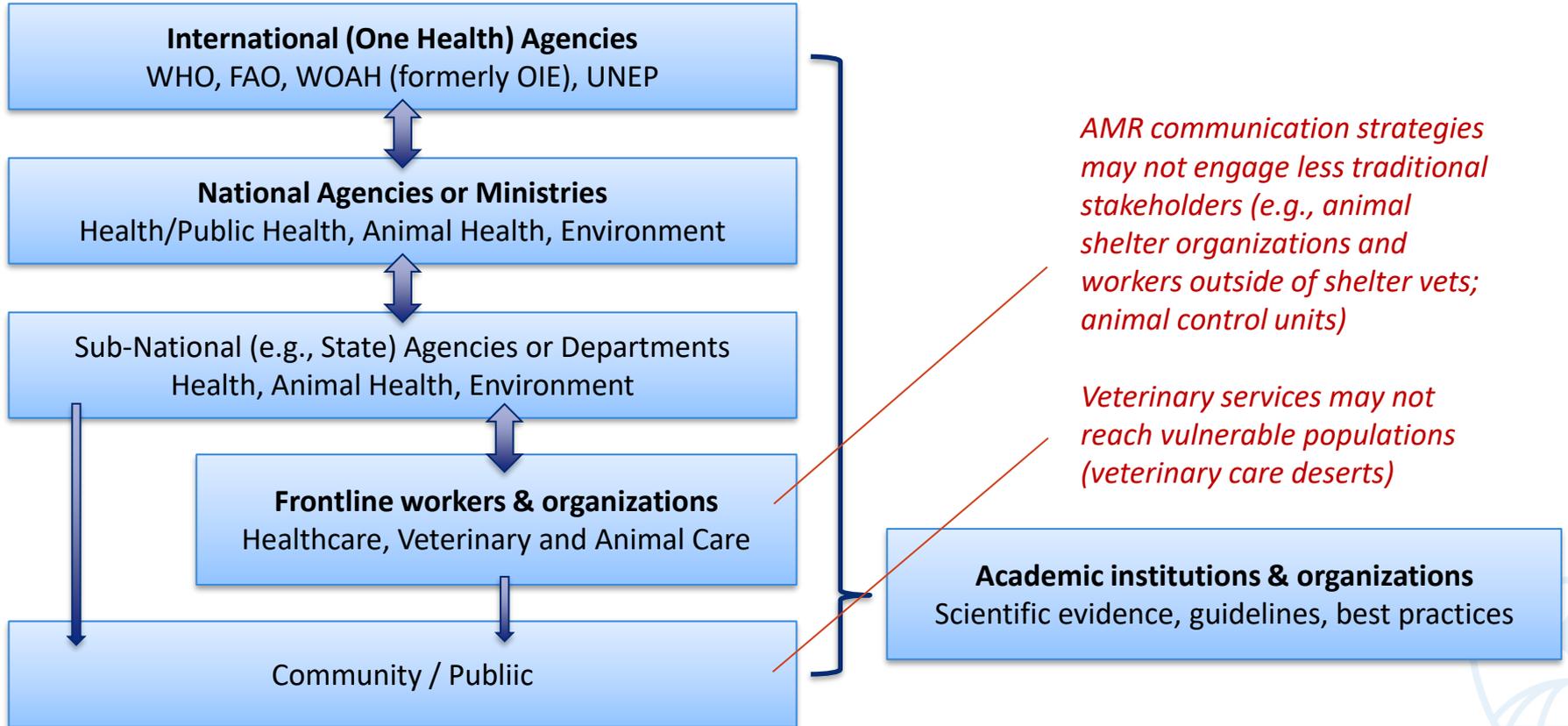


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# Communication Stakeholders and Process



# Communication Stakeholders and Process



# Conclusions

- ▶ Communication strategies for AMR should engage diverse One Health stakeholders
  - ▶ Including animal care workers outside of veterinarians and allied professionals
  - ▶ Including strategies for engagement tailored to the stakeholder group
- ▶ Veterinary and animal care workers may be a trusted source of information
  - ▶ Particularly small animal practitioners and allied professionals
  - ▶ Leverage established chains of communication
- ▶ Addressing barriers and gaps may enhance AMR communication strategies
  - ▶ Including companion animal health more explicitly in national and sub-national agencies
  - ▶ Engaging environmental health stakeholders more fully in AMR control and communication strategies



Still scratching your head?

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