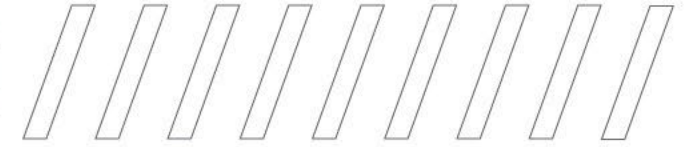


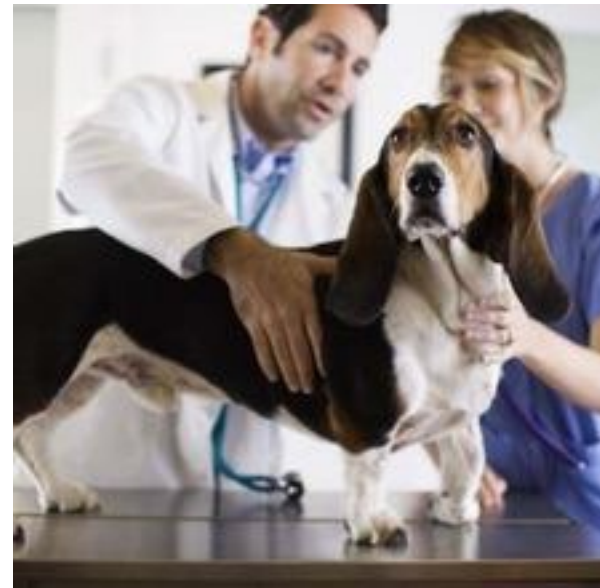
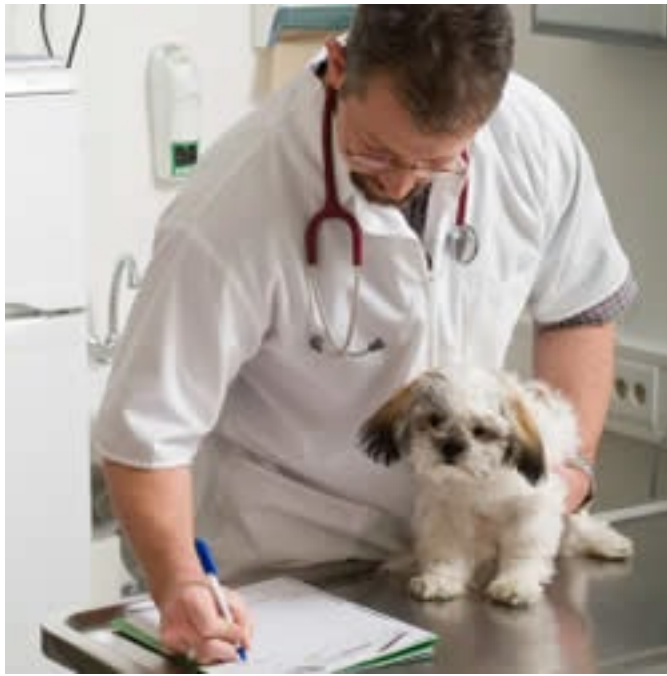


**VETERINARY MEDICINE**



# Understanding (& leading) a One Health Charge


Jared D. Taylor, DVM, MPH, PhD, DACVIM(LA), DACVPM  
Professor, Oklahoma State University  
College of Veterinary Medicine





# SMART HEALTH CHOICES

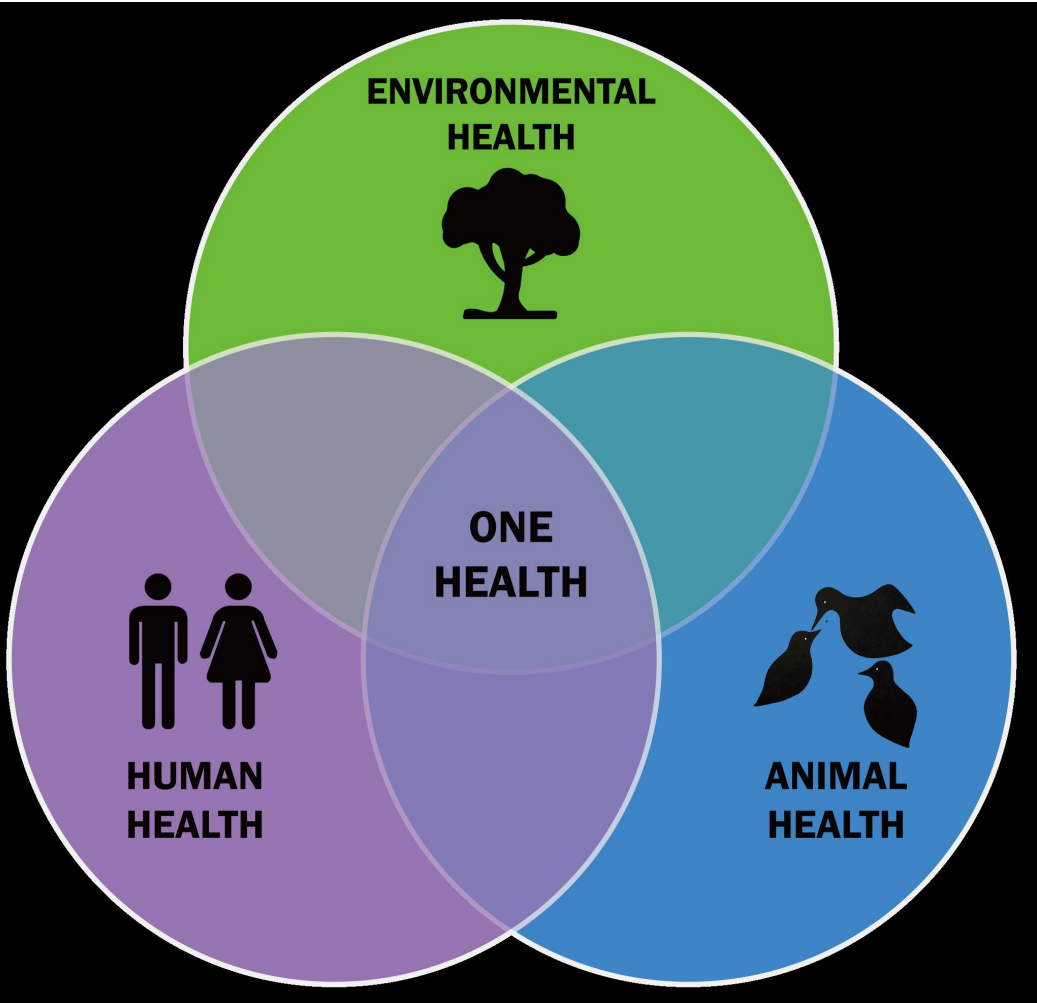
making sense of health advice



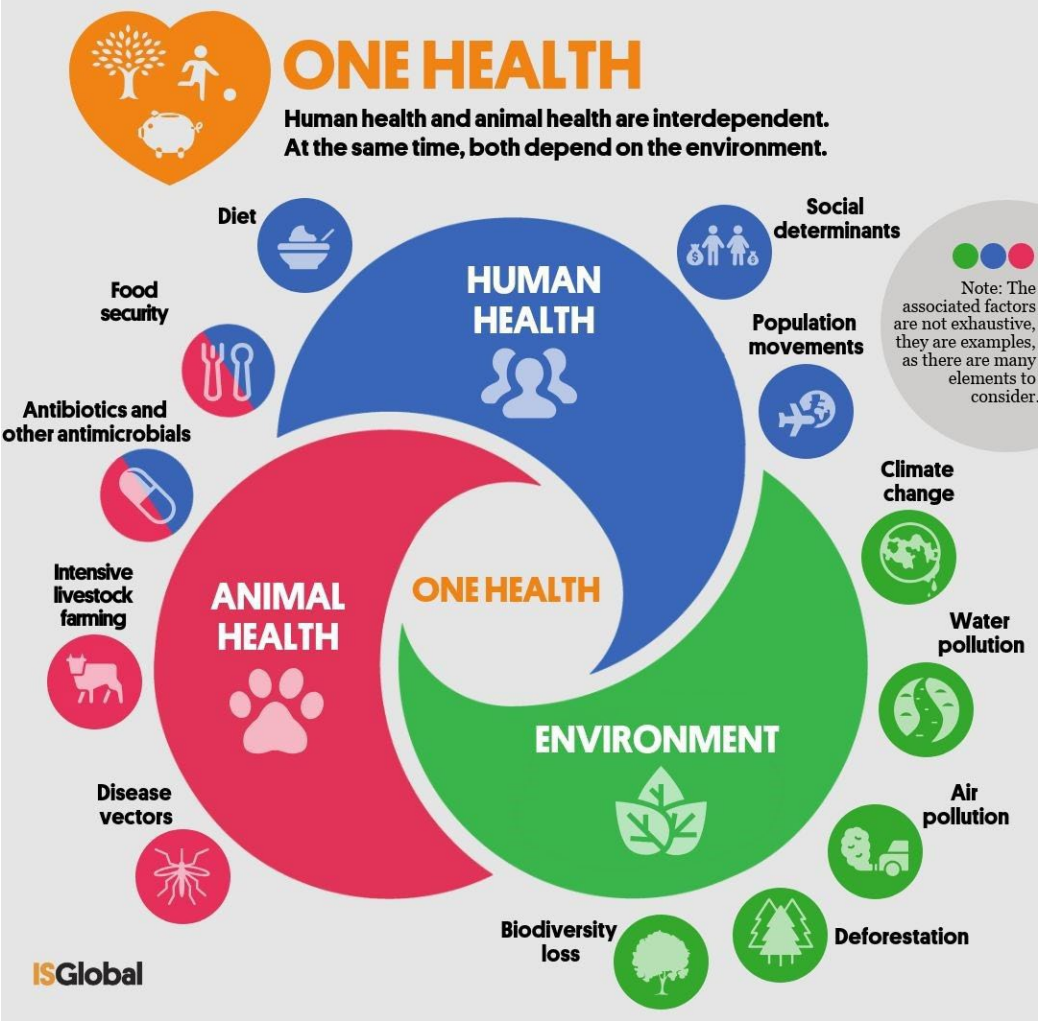
Professor Les Irwig, Judy Irwig,  
Dr Lyndal Trevena, Melissa Sweet





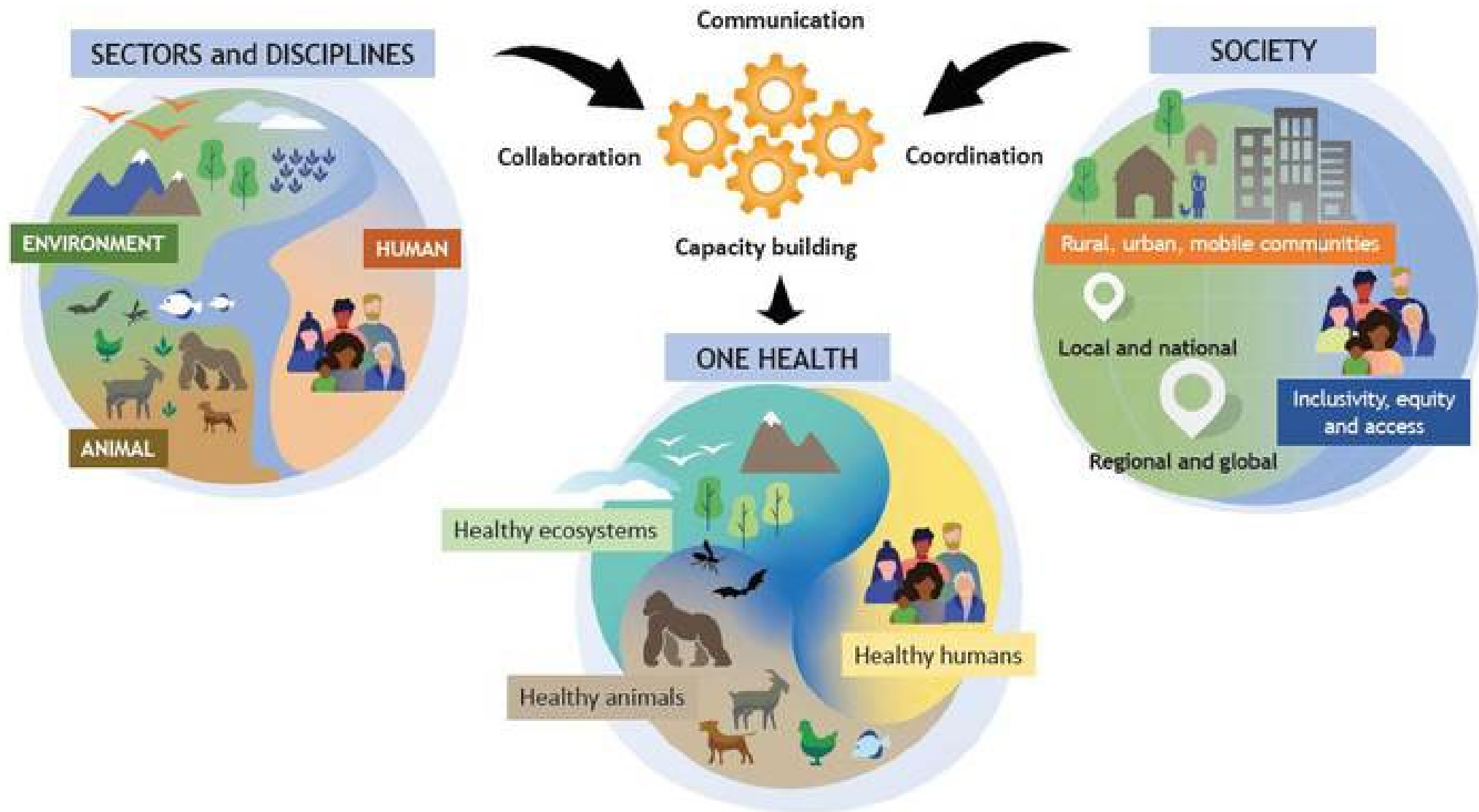


By Thddbfk - Own work, CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=81872126>



<https://www.isglobal.org/en/-/one-health-una-sola-salud->





# Scope of One Health

Agricultural production and land use  
Animals as Sentinels for Environmental agent and contaminants detection and response  
Antimicrobial resistance mitigation  
Biodiversity / Conservation Medicine  
Climate change and impacts of climate on health of animals, ecosystems, and humans  
Clinical medicine needs for interrelationship between the health professions  
Communications and outreach  
Comparative Medicine: commonality of diseases among people and animals such as cancer, obesity, and diabetes  
Disaster preparedness and response  
Disease surveillance, prevention and response, both infectious (zoonotic) and chronic / non-communicable diseases  
Economics / Complex Systems, Civil Society  
Environmental Health  
Food Safety and Security  
Global trade, commerce and security  
Human - Animal bond  
Natural Resources Conservation  
Occupational Health Risks  
Plant / Soil health  
Professional education and training of the Next Generation of One Health professionals  
Public policy and regulation  
Research, both basic and translational  
Vector-Borne Diseases  
Water Safety and Security  
Welfare / Well-being of animals, humans, ecosystems and planet

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# One Health: Antimicrobial resistance

## Role of medically important antimicrobials

- In food animals
- In companion animals

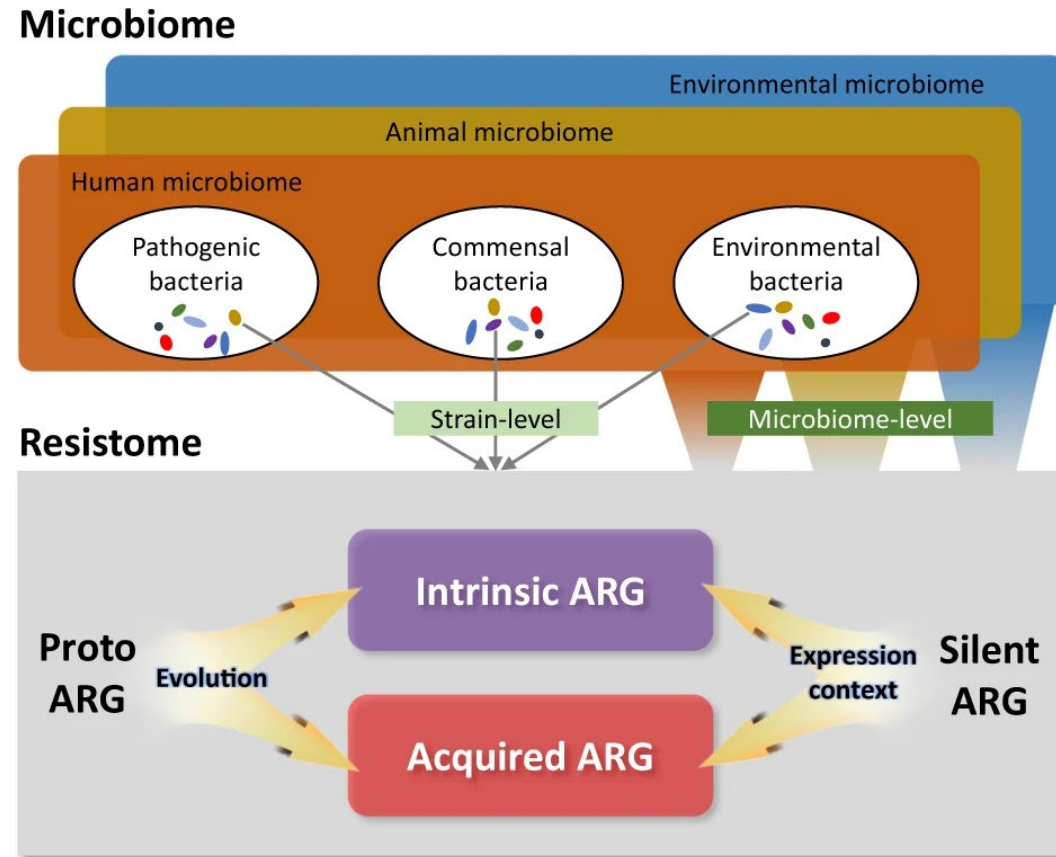
## Role of non-medically important antimicrobials

- Ionophores

Direct selection vs. “Global resistome”



# One Health: Antimicrobial resistance



Concept of the antibiotic resistome from the One-Health perspective.

From: [Antibiotic resistome from the One-Health perspective: understanding and controlling antimicrobial resistance transmission](#)





# One Health: Environmental Health

## Role of animal agriculture in

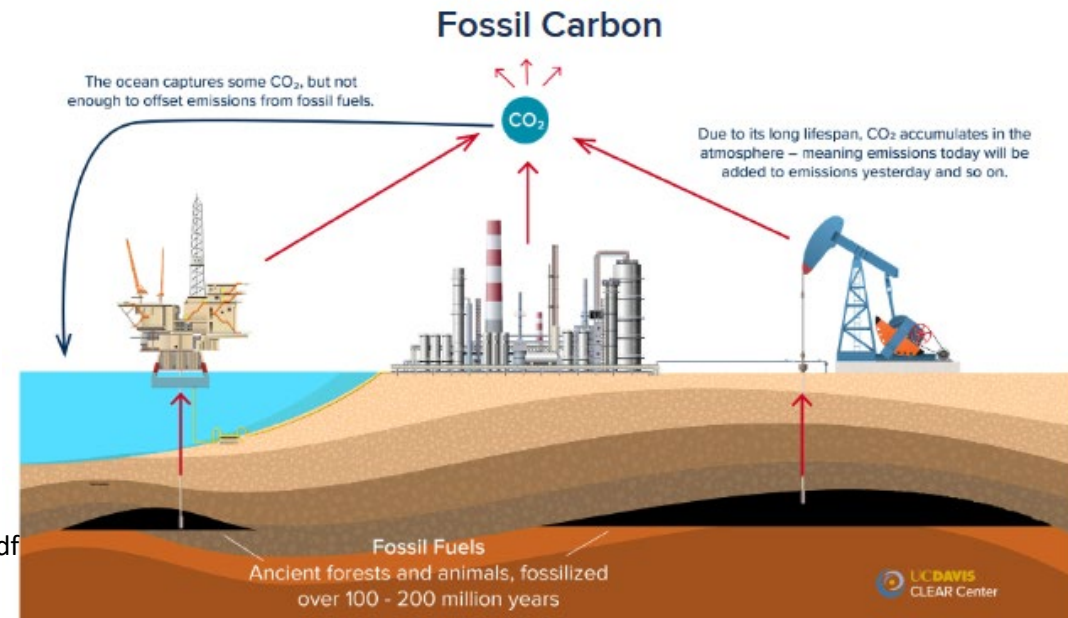
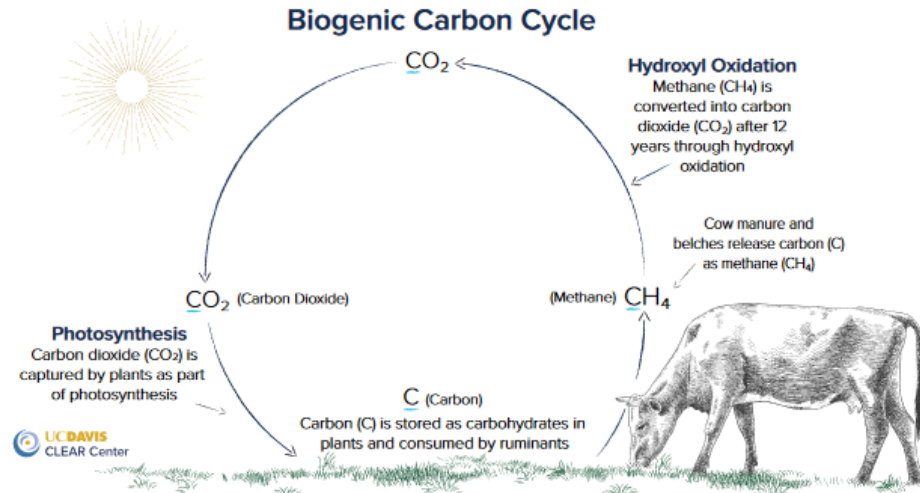
- Land usage/ deforestation
- Climate change

## Role of urbanization/ suburbanization

- Loss of biodiversity
- Increased interaction with disease vectors



# One Health: Environmental Health



[https://clear.ucdavis.edu/sites/g/files/dgvnsk7876/files/inline-files/CLEAR-Center-Methane-Cows-Climate-Change-Sep-2-20\\_6.pdf](https://clear.ucdavis.edu/sites/g/files/dgvnsk7876/files/inline-files/CLEAR-Center-Methane-Cows-Climate-Change-Sep-2-20_6.pdf)



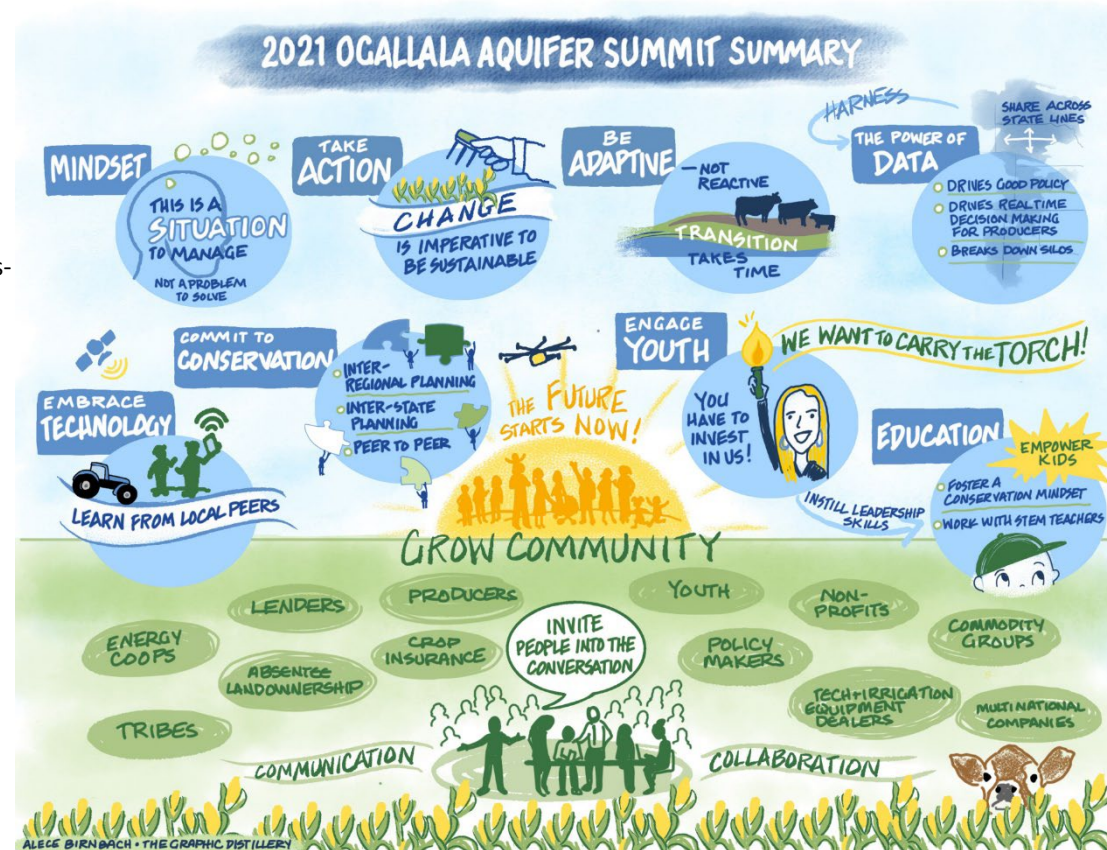
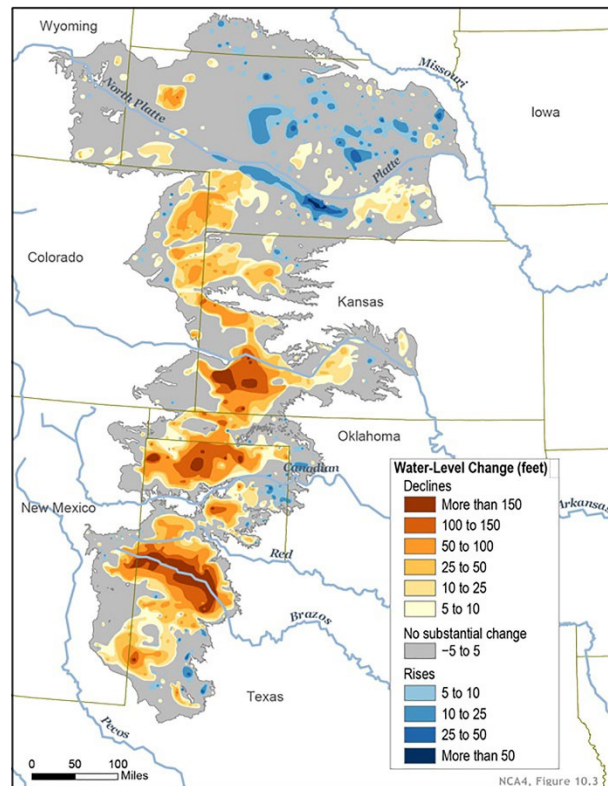
# One Health: Water usage

## The Next Disaster Coming to the Great Plains

Acute scarcity drives the search for water underground. But the West's major aquifers are in trouble, too.

By Lucas Bessire

<https://www.theatlantic.com/ideas/archive/2021/12/kansas-aquifer-ogallala-water-crisis-drought/621007/>



<https://agrilifetoday.tamu.edu/2021/03/19/ogallala-aquifer-situation-to-manage-not-problem-to-solve/>



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# One Health

## Holistic view on health

- Multiple aspects
  - Disease
  - Food safety & security
  - Water security
  - Mental health
  - Economic viability
  - Equity & sustainability
- Multiple levels
  - International, national, state, local
- Multiple disciplines
  - Public health, medical, veterinary, animal science, entomology, environmental science, engineering, climate science, many more





# One HEALTH

- Prevention >>> “curing” after the fact
- Health >>> absence of disease
- The whole system >>> Sum of the parts





# One Health: Challenges & opportunities

- Developing shared vocabulary and understanding
- Generating REAL buy-in
- Establishing (and maintaining) collaboration/ breaking down silos
- Turning words (and plans) into meaningful action

## Opportunities

- International, National, State & University support
- American Recovery & Reinvestment Act
- Appreciation for Vet Med expertise, capabilities, and challenges within the profession





# One Health in Action at OSU





# One Health in Action at OSU





# One Health in Action at OSU

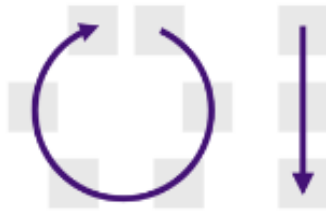
- OSU rankings in UN Sustainable Development Goals:
- 7<sup>th</sup> for SDG #2 (zero hunger)
- 41<sup>st</sup> for SDG #17 (Partnerships)
- 63<sup>rd</sup> for SDG #6 (Clean water & sanitation)
- 72<sup>nd</sup> for SDG #11 (Sustainable cities & communities)
- 72<sup>nd</sup> overall among 1,600 universities



# One Health in Action at OSU

## Oklahoma One-Health Institute (OK-OHI)

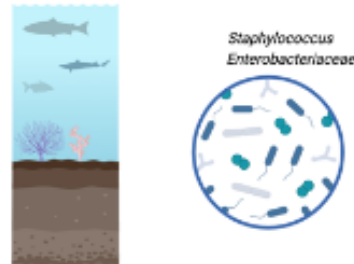
### One Health Interconnected Hubs



#### Mission

1. Incubate interdisciplinary projects
2. Develop new curricula and certificate programs
3. Formulate branding and funding strategies
4. Bioinformatics and biostatistics resources

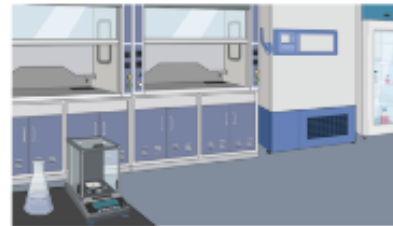
### Community-Health Resilience



#### Mission

1. Support sustainable water/natural resources
2. Microbiome/alternative medicine
3. Community health through paramedicine
4. Focus on emerging and zoonotic pathogens

### Translational Innovation incubator



#### Mission

1. Coordinate cross-disciplinary projects
2. Foster facility creations/ GMP compliance
3. Create AI medical innovation center
4. Advance clinical trials in animal and human patients

### Global One Health Collaboratory's



#### Mission

1. Develop international research and educational centers
2. Create international fellowships/internships
3. Develop digital repositories/platforms
4. Symposium/Extension

# One Health in Action at OSU

## Research collaboration

- CVM, CHS, VPR
  - Required at least one member from CVM, CHS, and other OSU college
- 7 One Health research projects funded
  - Antimicrobial resistance in extensive cattle production systems

