

One Health: Shared Human, Non-Human Animals, and Ecosystem Health

Synopsis of ILR Course

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Today's One Health Story



Why should One Health be important to you?

First: Some Definitions

- **Health:** WHO's definition is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.
- One Health is a unifying concept that human, non-human animals and ecosystem (environmental) sustainability are deeply linked and co-dependent.
 - It leads to better health and well-being of communities, financial savings and improved ecosystem services as a result of better cooperation.



Brief History: Human and Animal Health as One

Religion, Culture, Healing Arts and Medical Education

Ancient Human Health Depended on Animal Powers, Foods and Products

3200 BC Animal Power Gift to Egyptian Gods



Indian Healer in Animal Skin to Capture Animal Powers



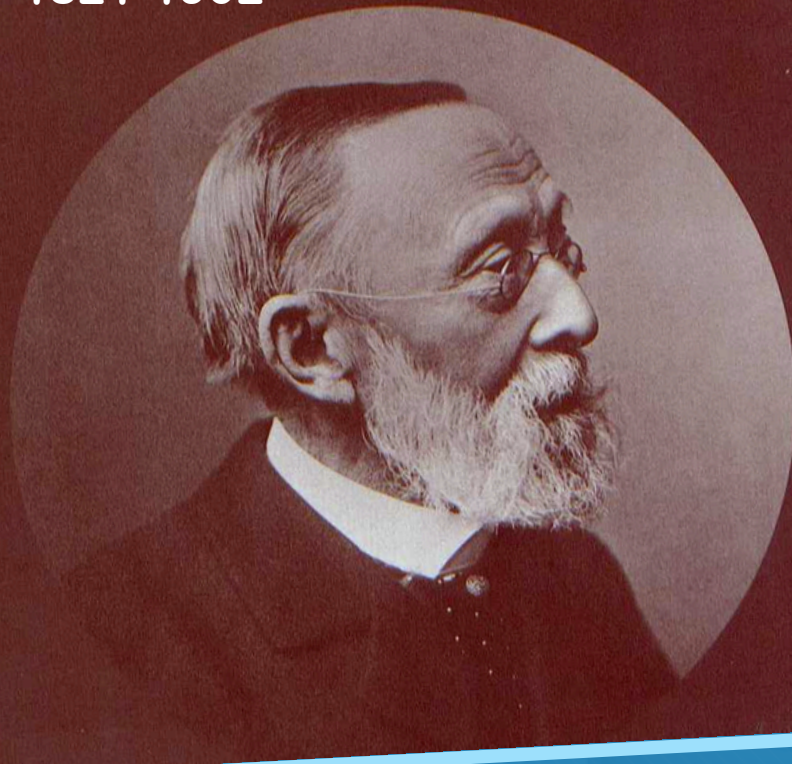
Indian healers wore animal skins to capture an animal's special powers.

‘Medicine on
a Grand Scale’:

Rudolf Virchow,
Liberalism, and
the Public Health

1821-1902

Ian F McNeely



1800's-- Father of Modern Medical Pathology Dr. Rudolf Virchow

*“Between animal and human
medicine there is no dividing
line—nor should there be.
The object is different but
the experience obtained
constitutes the basis of all
medicine.”*

1800s Shared Education: Medical, Natural Sciences & Vet Med.

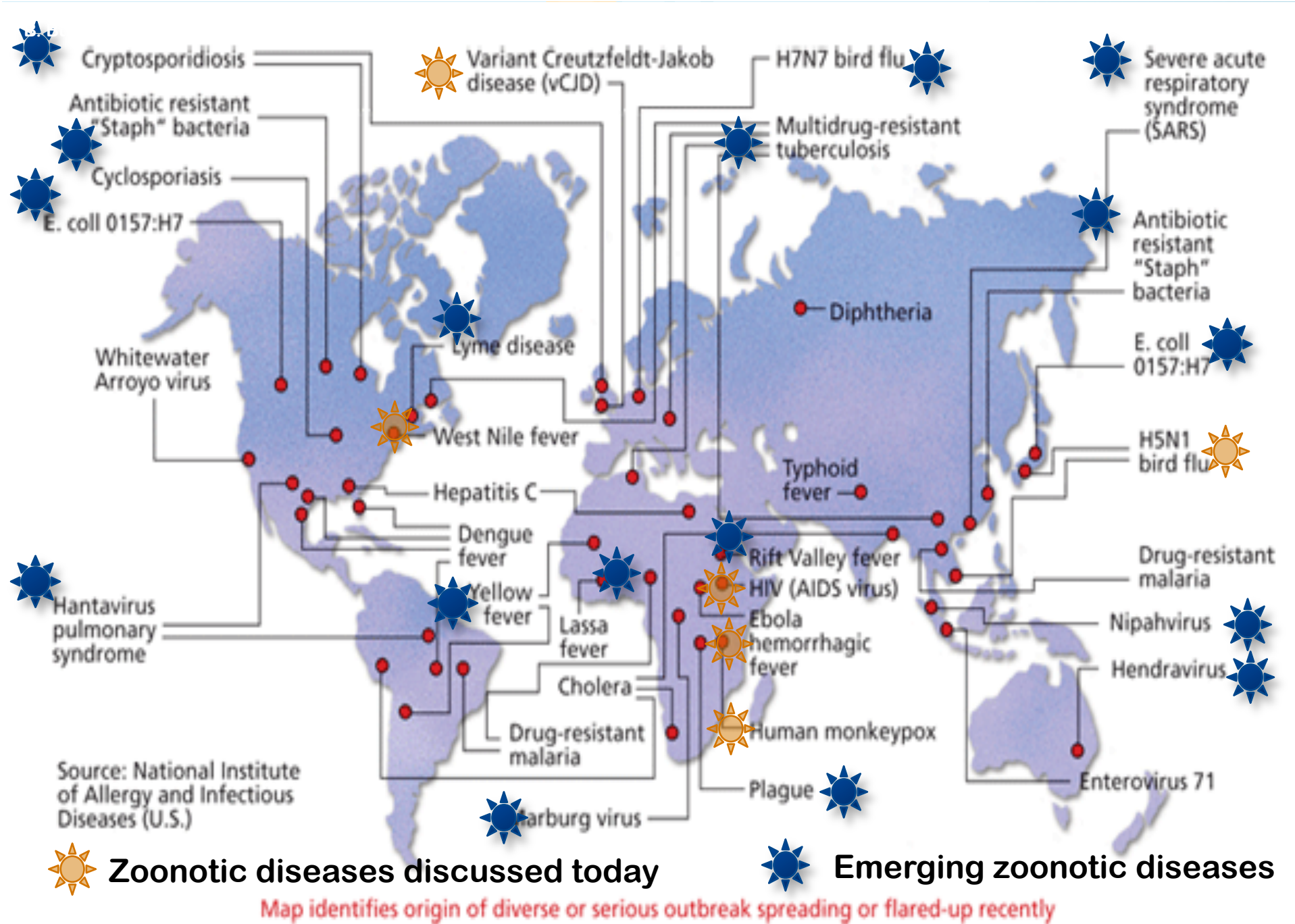


**Genetic
and
Biological
Factors**

**Social,
Political, and
Economic
Factors**

**Emerging
Zoonotic
Infectious
Diseases**

**Loss of
Ecosystem
Services**





1900s-2000s: Unprecedented Emergence of Diseases: Why?

Airline travel, poverty/displaced peoples, animal trade,
human behaviors, disrupted ecosystems, microbial
adaptation/mutation,



Our Connected World *Airline Routes*



PNAS, 2004

◆ Increasing international travel and trade, human-made and natural disasters



◆ Increasing movement of people and animals- wars & famine



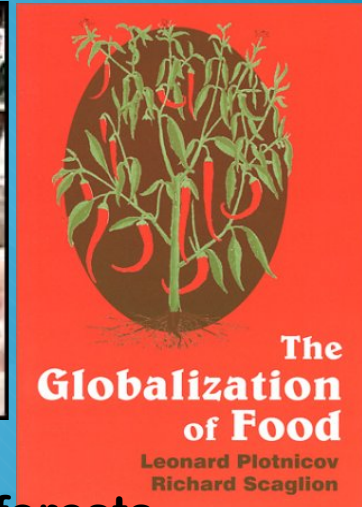
Globalization of the Food Supply



Developing country: poorer food standards



Nipah Virus outbreak in Asian
Large swine production near forests



- ◆ Demands growing globally for animal food products
- ◆ Centralized processing of food and feeds
- ◆ International spread of zoonotic diseases, toxins (melamine) and prions (mis-folded proteins of “Mad Cow Disease” emerged early 1900s)

Airplane Hitchhikers

Increasing Spread of Disease Vectors



West Nile Virus
***Related to Yellow
Fever & Dengue
Fever***

***1999: Never
detected before in
Western Hemisphere***

International Trade-- Exotic Animals Spreading Diseases

- ◆ 4 million birds
- ◆ 700,000 reptiles
- ◆ 50,000 primates
- ◆ Illegal trade unknown – estimated worth: \$5-7 billion

- Wildlife Conservation Society



Human Behavior Increasing Zoonotic Disease Spread



African Gambian Rat

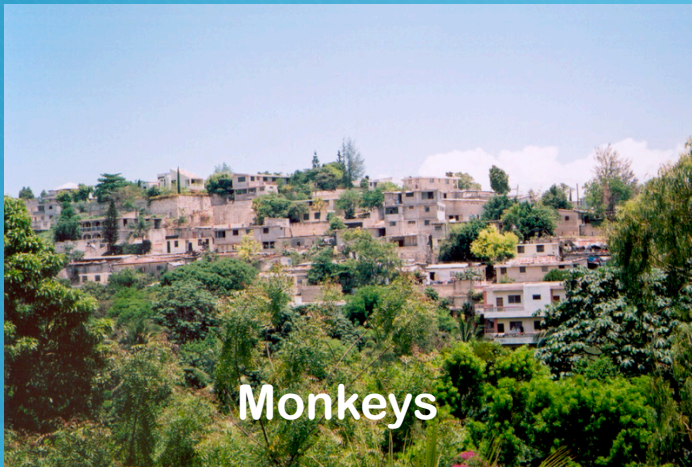


PHOTO: Monkeypox case (Getty Images: CDC)



<http://pawtenders.com/is-a-pocket-pet-right-for-you/>

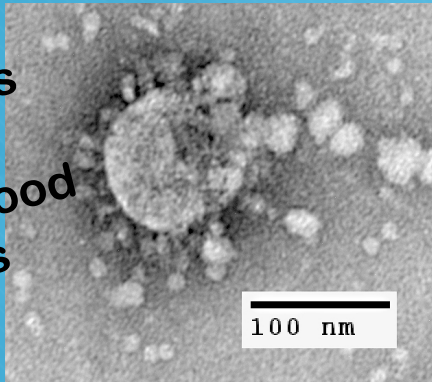
Human Behavior: Encroachment on Animal Habitat & Altering Ecosystems



- ◆ Human population overlapping wildlife habitat increasing human interaction with domestic and wild/exotic animals
- ◆ Changing ecosystems and altering their beneficial services to prevent new diseases

Multi-Species & Microbial Adaptation

Civet Cats
at Asian
animal food
markets



Coronavirus > Severe
Acute Respiratory
Syndrome (SARS)



Birds to people;
Human-Bird-Swine
mixing bowl

Influenza Virus >
Highly Pathogenic
Avian Influenza; and
“Swine Flu”

- ◆ Animal viruses infect humans by ability to jump species and adapt through selection, mutation, and recombination to become pathogenic (disease causing)

Multi-Species & Microbial Adaptation



- ◆ Emergence of HIV-AIDS & Ebola from animals caused by bush meat consumption & trade

<http://vimeo.com/4984959>



Urgency developed to adopt a One Health approach

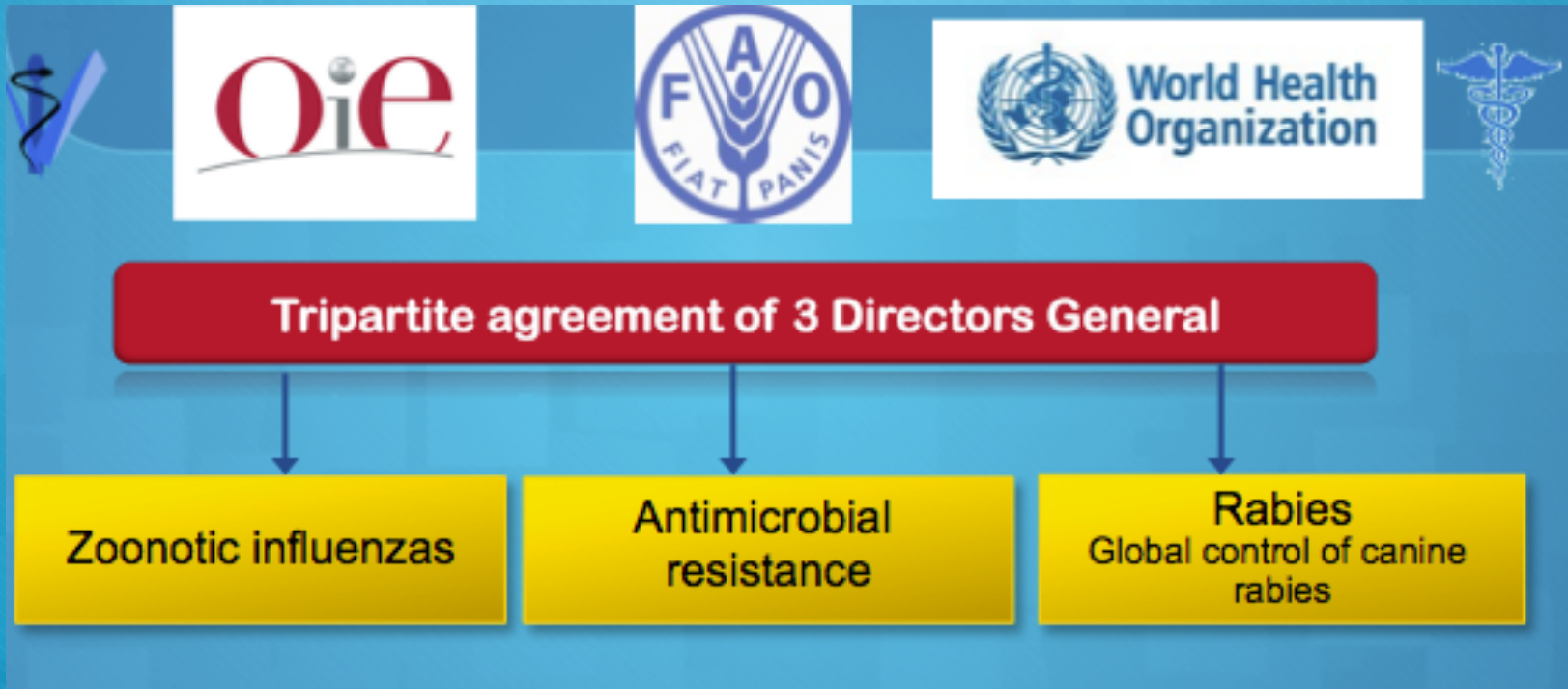
We are at a crossroads of humanity and
urgently need to work differently

21st Century Re-discovery: *One Health*

*Inextricable interdependence of
human, animal & ecosystem health*



Unprecedented International One Health Efforts



One Health

People, Animals, and
the Environment



EDITED BY
Ronald M. Atlas and Stanley Maloy

2014 American Society for Microbiology Press

- One Health: What is it and why is it important?
 - The value of the OH Approach
 - Zoonotic and environmental drivers of emerging infectious disease
 - OH and antibiotic resistance
 - Disease surveillance
 - Making OH a reality
 - Case studies; lessons learned
- 74 Worldwide Contributors**

2015

84 Worldwide Contributors

A practical book examining the origins of One Health and describing how to put policy into practice.

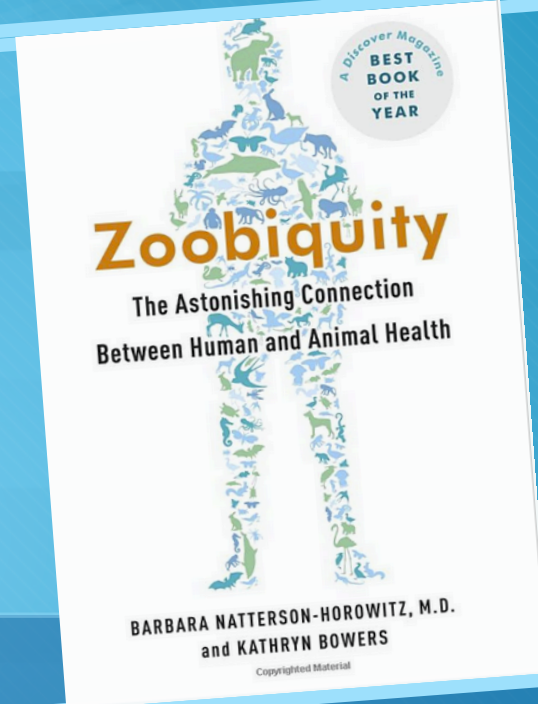
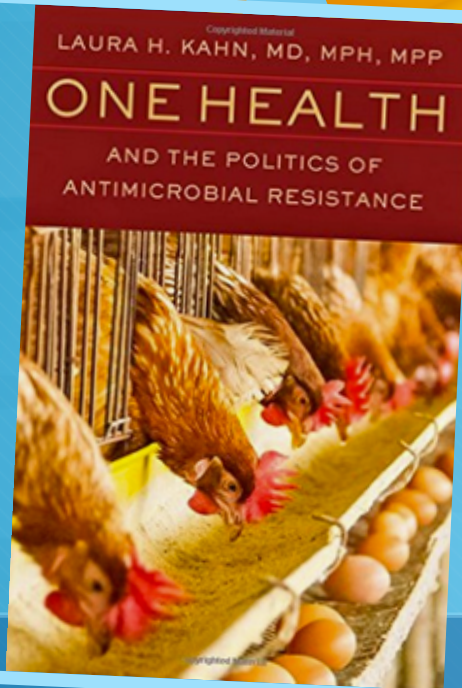
- Part 1** Theoretical Foundations
- Part 2:** Methods for the Assessment
of the Animal-Human Linkages
- Part 3:** Case Studies from Research
to Policy and Practice
- Part 4:** Capacity Building, Public
Engagement and Conceptual
Outlook

One Health

The Theory and Practice
of Integrated Health
Approaches

Edited by
Jakob Zinsstag
Esther Schelling
David Waltner-Toews
Maxine Whittaker
Marcel Tanner





Two Physicians: Dr. Laura Kahn and
Dr. Barbara Natterson-Horowitz

*Leaders breaking down traditional silos
separating human and
animal health disciplines*

Vet. Med. informing human medicine

Dinosaurs suffered from cancer

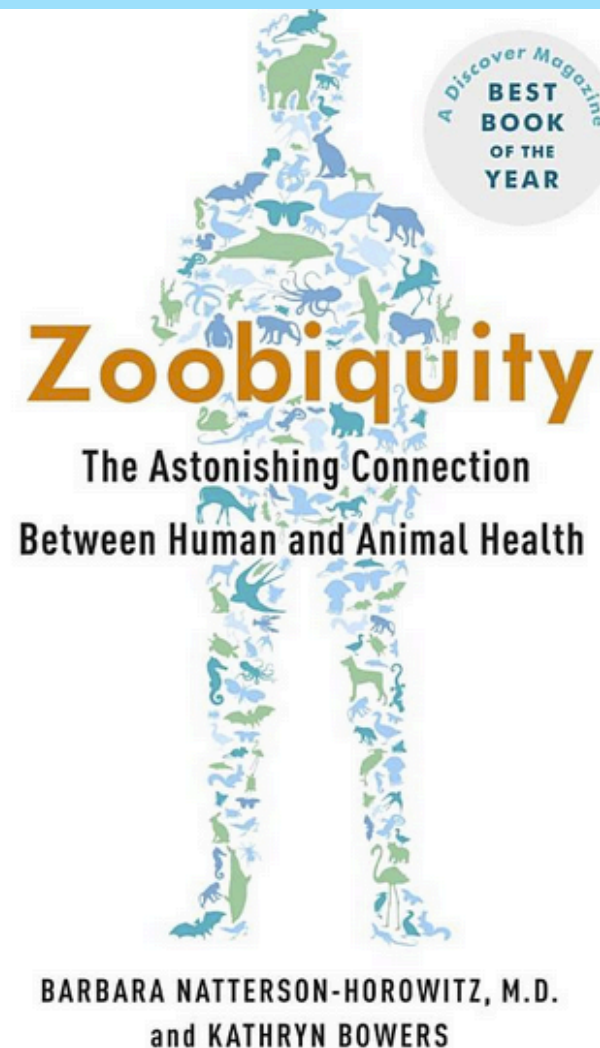
Koalas can catch STD *Chlamydia*

Reindeer seek narcotic escape
in hallucinogenic mushrooms

Stallions self-mutilate

Gorillas experience clinical
depression

Oral transfusions of animal feces
cures their diarrhea



One Health in Action

Reduced acute and chronic disease \$\$\$

Improved mental & community health \$\$\$

Environmental planners

Medical health educators

Veterinarians

Social scientists

Sustainability experts



Community members

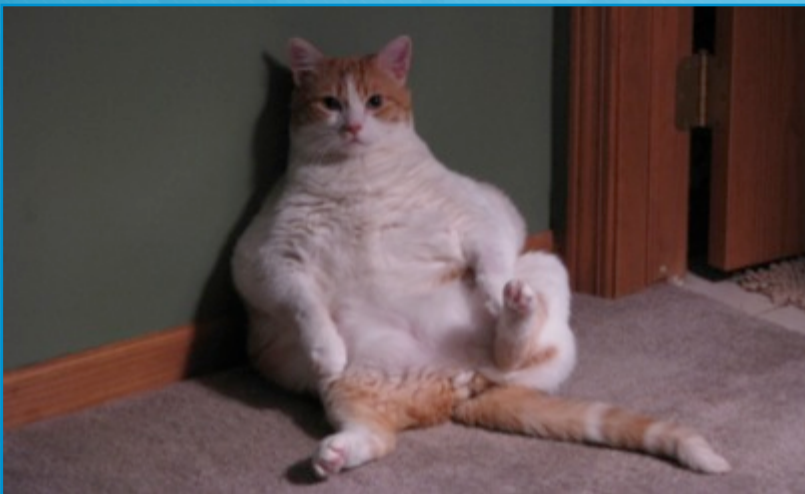
Urban planners

Government policy makers

Municipal animal services

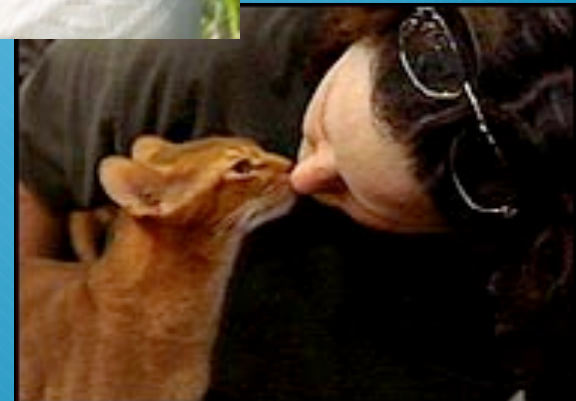
Corporations, NGOs

Shared Obesity & Diabetes Epidemic



Human-Animal Bonds

Improving Health & Well-Being



Cruelty to Animals & Violence to Humans

*Cruelty
to Animals
and
Interpersonal
Violence*

“Cruelty to animals is often part of the landscapes of violence and at times shows a strong link to destructive interpersonal relationships.”

RECENT RESEARCH
AND APPLICATIONS

EDITED BY

RANDALL LOCKWOOD AND FRANK R. ASCIONE

“There is growing evidence that childhood cruelty towards animals is often a precursor to cruelty to other humans.”

Alan M. Beck, coauthor of *Between Pets and People: The Importance of Animal Companionship*



One Health: why is it important to you?

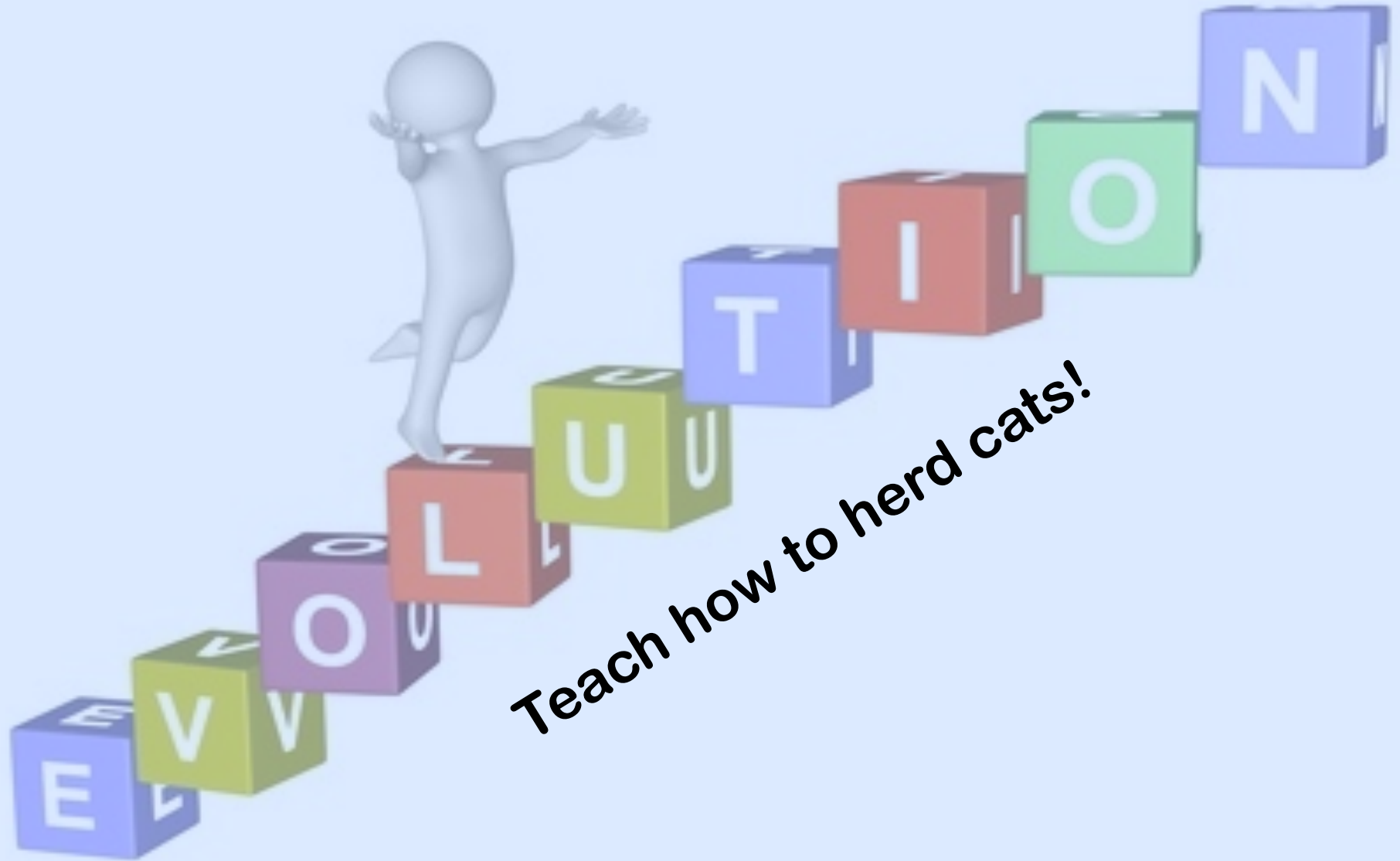
From complex “wicked” health problems to healthy communities like SaddleBrooke



<https://www.youtube.com/watch?v=p2GGZI4KMYQ>

Our Societal Challenge:
**How to bring together
different expertise
and interests to solve health
concerns?**





Teach how to herd cats!

Looking at Health Education Differently



Evolution: The One Health Practitioner

**Medical
Sciences**

Political Science

Humanities

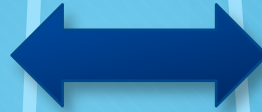
STEM



**Emerging career
One Health profile**



New UA School of Veterinary Medicine



**New One Health Practitioner
Professional Career Path
*DVM + Doctor of Nursing Practice***

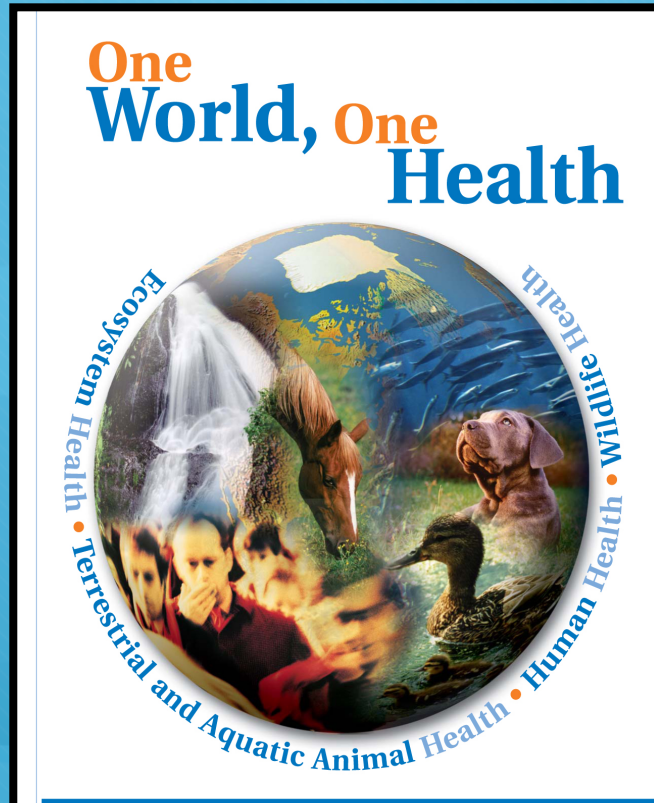
To Meet Underserved Populations in U.S and
Low to Middle Income Countries

What's in our future?



BOTTOM LINE:

“.... the health of people, wild and domestic animals, and ecosystems – share a common fate.”



Improving Health for All

- **Health:** WHO's definition is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.
- **One Health** is a unifying concept that human, non-human animals and ecosystem (environmental) sustainability are deeply linked and co-dependent.
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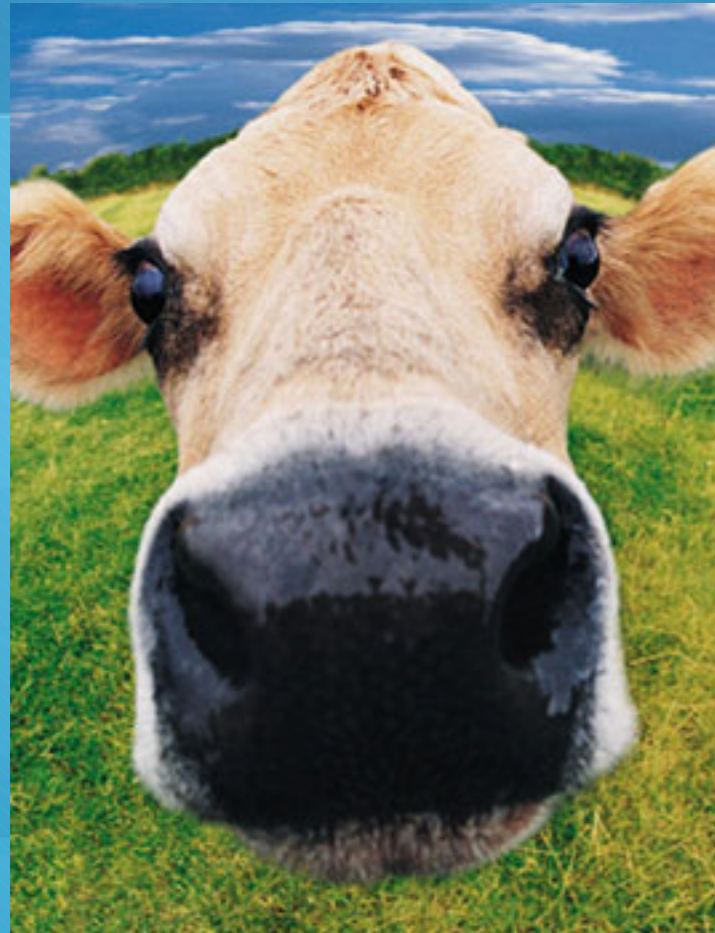
It's All *One Health*





**THANK YOU FOR ATTENDING
FREETHINKERS**

Questions?



Exercise: Rabies Outbreak in SaddleBrooke

- Coyotes, Bob Cats, Havalinas & Deer
- Pets in danger if not currently vaccinated
- County recommends killing all the wildlife
- In a One Health approach, how would you try to solving this problem?

