Animals as Sentinels of Human Health

In early 2010 ducks began to disappear in Northern Nigeria.

Months later, public health officials learned that hundred of children had become sick, and two villages 1/4 had died within the past year.

An investigative team found unsafe levels of lead inside most of the homes and community wells, which was the cause of the spike in mortality rates (caused by unsafe gold mining practices).

When asked, the villagers noted there were unusual deaths of ducks in the months prior.

This missing clue could have alerted officials of the crisis earlier.

https://www.cdc.gov/onehealth/in-action/lead-poisoning.html

Other examples of veterinarians protecting the health and welfare of animals, and thus also protecting the health of humans.

Zoonotic Diseases

- 6 out of every 10 known infectious diseases in people are spread from animals.
- 3 out of every 4 new or emerging infectious disease in people are spread from animals.

Most dangerous zoonotic diseases in the US:
- Lyme disease & Rocky Mountain spotted fever.
- West Nile, Dengue, malaria, and chikungunya.
- Salmonella.
- E. Coli.

https://www.cdc.gov/onehealth/basics/zoonotic-diseases.html
ANTIBIOTIC RESISTANCE
THE GLOBAL THREAT

Antibiotic resistance – when bacteria change and cause antibiotics to fail – is happening RIGHT NOW, across the world

The full impact is unknown. There is no system in place to track antibiotic resistance globally.

Without urgent action, many modern medicines could become obsolete, turning even common infections into deadly threats.

A GROWING CRISIS WORLDWIDE

In the EUROPEAN UNION, antibiotic resistance causes 25,000 deaths per year and 2.5m extra hospital days.

In INDIA, over 58,000 babies died in one year as a result of infection with resistant bacteria usually passed on from their mothers.

In THAILAND, antibiotic resistance causes 38,000+ deaths per year and 3.2m hospital days.

In the UNITED STATES, antibiotic resistance causes 23,000+ deaths per year and >2.0m illnesses.

CAUSES OF ANTIBIOTIC RESISTANCE

- Over-prescribing of antibiotics
- Patients not taking antibiotics as prescribed
- Unnecessary antibiotics used in agriculture
- Poor infection control in hospitals and clinics
- Poor hygiene and sanitation practices
- Lack of rapid laboratory tests

HOW CAN WE STOP IT?

1. Improve labs:
Countries need medical labs to identify bacteria and choose the right drugs to treat them.

2. Collect and share data:
Countries need systems to track cases and report results globally to make better policy decisions.

3. Use antibiotics wisely:
To ensure antibiotics are here when we need them, they must be prescribed and taken correctly now.

4. Take measures to prevent infections:
Especially in healthcare settings, good infection control practices are critical to stopping spread of resistant germs.

Antibiotics and Resistance

- In many countries antibiotics are unregulated and are available over the counter without a prescription
- The number of new antibiotics being approved has steadily decreased over the past 30 years
  - Drug manufacturers are focusing on more expensive medications to develop, such as cancer treatments
- Nearly 2 million Americans develop healthcare-related infections per year
  - From these 99,000 deaths result, mostly due to antibacterial-resistant pathogens

Learn More
- http://www.cdc.gov/getsmart
- http://www.cdc.gov/drugresistance

References:
If you are interested in learning more about One Health and the interconnectedness between human health, animal health, and the environment, see the resources below:

**Mobile Apps**
- TravWell
- Tickborne Diseases
- Can I Eat This?

**Websites**
- Mobile Apps: https://www.cdc.gov/ncezid/multimedia/mobile-apps.html
- CDC: https://www.cdc.gov/onehealth/index.html
- AVMA: https://www.avma.org
- OIE: https://www.oie.int
- CDC: https://www.cdc.gov

**Books**
- One Health: People, Animals, and the Environment
- The Omnivore's Dilemma
- One Health: The Human-Animal-Environment Interfaces in Emerging Infectious Diseases

**Journal Articles**
- Towards a conceptual framework to support one-health research for policy on emerging zoonoses
- Impacts of biodiversity on the emergence and transmission of infectious diseases
- Tickborne Diseases: a One Health perspective

**Environment**
- About 68% of Californians will have increased vulnerability for West Nile virus by 2050.
- Incidences of Lyme Disease doubled from 1991 to 2015.
- Increased cases of vector-borne diseases such as Lyme Disease, Malaria, Zika Virus, and West Nile Virus.
- As temperature rises, the range of ticks carrying Lyme Disease will expand.
ONE HEALTH

The health of people is connected to the health of animals and the environment.
This connection requires a multisectoral, One Health approach to improve health for all.

Epidemiologists
Microbiologists
Infectious Disease Specialists
Veterinarians
Ecologists
Public Health Professionals
Medical Doctors