

# ONE HEALTH CONCEPT AND INITIATIVES



# INTRODUCTION

- ❖ Although the term “One Health” is fairly new, the concept has long been recognized both nationally and globally.
- ❖ Since the 1800s, scientists have noted the **similarity in disease processes among animals and humans**, but human and animal medicine were practiced separately until the 20<sup>th</sup> century.
- ❖ In recent years, through the support of key individuals and vital events, the **One Health concept** has **gained more recognition in the public health and animal health communities**.

# HISTORY

- **Edward Jenner** found that **milkmaids exposed to cowpox** that were not infected with smallpox.
- From this discovery, produced first successful vaccine to prevent smallpox.
- E. Jenner, first using dead vaccine **to prevent hog cholera** – open the way to produce vaccine to prevent **Rickettsia and Polio diseases in man.**

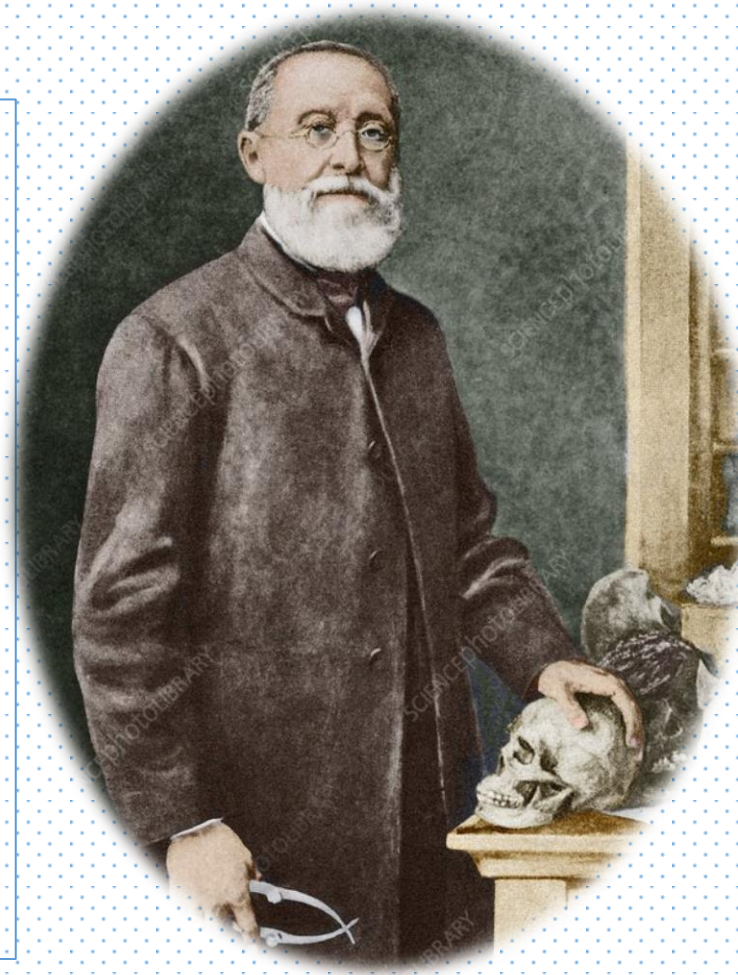


1749 – 1823

**Sir Edward Jenner**

**Rudolf Virchow, MD:** Most prominent physicians of the 19<sup>th</sup> century

- ❖ German pathologist: **linkages between human and veterinary medicine** while studying a roundworm, *Trichinella spiralis*, in swine.
- ❖ **Coined the term “zoonosis”**.
- ❖ Advocated for the importance of improved veterinary education.
- ❖ Emphasized, “Between animal and human medicine there are no dividing lines—nor should there be. The object is different but the experience obtained constitutes the basis of all medicine.”



1821-1902

- **Sir Louis Pasteur** – French.
- Regarded as **father of Immunology**.
- Produced **vaccine to prevent rabies**.
- Linked **medicine and veterinary** medicine.



**Sir Louis Pasteur  
(1822-1895)**

- **Sir Robert Koch**, German physician.
- Established the field of bacteria.
- Studied on **TB, *Vibrio cholerae*, Anthrax.**
- Nobel in medicine.
- Linked medicine with vet. medicine, especially study on ***Bacillus anthracis*.**



**Sir Robert Koch  
(1843-1910)**

- **Sir William Osler**, Canadian physician
- Established the field of vet. pathology as an academic disciplinary in North American.
- **Father of Veterinary Pathology**
- A deep interest in the linkages between human and veterinary medicine.
- Trained with many well-known physicians and veterinarians, including Dr. Virchow.
- His first publications was titled, “**The Relation of Animals to Man.**”
- Sir W. Osler was **first to use: “One Medicine”** in literature.



**Sir William Osler (1849-1919)**

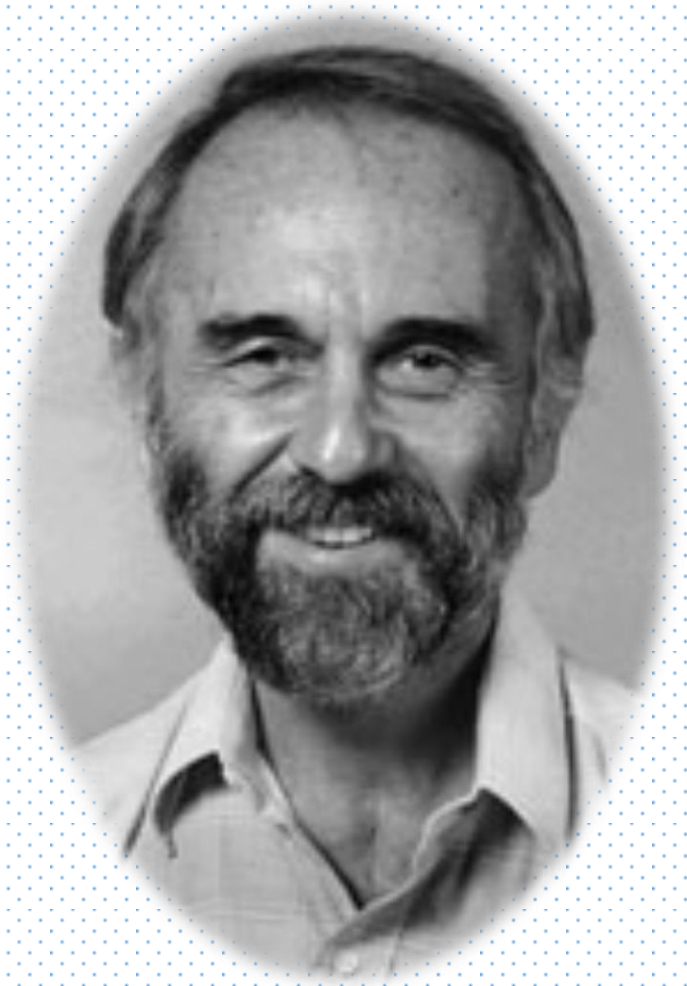
- **Theobald Smith** and **F.L. Kilbourne** first discovered arthropod play a role vector (1893)
- 
- Demonstrated *Boophilus* transmission *Babesia bigemina* parasite caused disease in cattle
- Based on this discovery, Walter Reed **found the vector of Yellow fever.**



**Sir Theobald Smith  
(1859-1934)**



- **Sir Calvin Schwabe** DVM, ScD, MPH: Made many important contributions to veterinary epidemiology (**Father of Veterinary Epidemiology**).
- Studied zoonotic parasitic diseases and directed the programs on hydatid disease and other parasitic diseases.
- 1964: proposed that veterinary and human health professionals collaborate to combat zoonotic diseases.
- In 1966: the **founding chair of Department of Epidemiology and Preventive Medicine at the Veterinary School** (University of California Davis).
- In his textbook, ***Veterinary Medicine and Human Health***, he coined the term “One Medicine.”



**Sir Calvin Schwabe  
(1927-2006)**

- **James H. Steele**, DVM, MPH, American veterinarian recognized as **“the father of Veterinary Public Health”**
- **Founded the Veterinary Public Health Division at CDC in 1947.**
- **He understood the important role of animals in the epidemiology of zoonotic diseases.**
- **Recognized that good animal health is important for good public health.**
- **The Division played an important role in the public health response to diseases such as rabies, brucellosis, salmonellosis, Q fever, bovine tuberculosis, and leptospirosis.**



1913-2013

## **Manhattan Principles on “One World, One Health”**

**(The Wildlife Conservation Society, 2004)**

- 1. Recognize the essential link between human, domestic animal and wildlife health.**
- 2. Recognize that decisions regarding land and water use have real implications for health.**
- 3. Include wildlife health science as an essential component of global disease prevention, surveillance, monitoring, control and mitigation.**
- 4. Recognize that human health programs can greatly contribute to conservation efforts.**
- 5. Devise adaptive, holistic and forward-looking approaches to the prevention, surveillance, monitoring, control and mitigation of emerging and resurging diseases.**
- 6. Seek opportunities to take part in biodiversity conservation perspectives and human needs.**

- 7. Reduce the demand and to regulate the international live wildlife and bush meat trade.**
- 8. Restrict the mass culling of free-ranging wildlife species for disease control.**
- 9. Increase investment in the global human and animal health infrastructure.**
- 10. Form collaborative relationships among governments, local people, and the private and public sectors to meet the challenges of global health and biodiversity conservation.**
- 11. Provide adequate resources and support for global wildlife health surveillance networks.**
- 12. Invest in educating and raising awareness among the world's people and in influencing the policy process.**

**2007 :**

- ❖ **International Ministerial Conference on Avian and Pandemic Influenza, New Delhi, India**
- ❖ **The One Health Approach is Recommended for Pandemic Preparedness**
- ❖ **During this meeting, governments were encouraged to further develop the One Health concept by building linkages between human and animal health systems for pandemic preparedness and human security.**

**2008:**

- ❖ **International Ministerial Conference on Avian and Pandemic Influenza in Sharm el-Sheikh, Egypt.**
- ❖ **One Health becomes a recommended approach.**
- ❖ **Endorsed a new strategy for fighting avian influenza and other infectious diseases, one that focuses infectious disease control in areas where animals, humans, and ecosystems meet.**

**2009:**

- ❖ **The Environmental and Zoonotic Infectious Diseases hosted the One World, in Winnipeg, Manitoba**
- ❖ **The key recommendations emerged for actions that countries could take to advance the concepts of One Health.**

**2010:**

- ❖ **The European Union published the “Outcome and Impact Assessment of the Global Response to the Avian Influenza Crisis” report.**
- ❖ **This report states, “The European Union has already taken new initiatives under the One Health umbrella and will continue to do so in the coming years.”**
- ❖ **The report emphasizes the need to translate the One Health concept into practical policies and strategies that promote the cross-sectoral collaboration.**



- **2012:**

- ❖ **The Global Risk Forum sponsors the first One Health Summit held in Davos, Switzerland.**
- ❖ **The Summit presented the One Health concept as a way to manage health threats, focusing on food safety and security.**
- ❖ **The conference ended by approving the “Davos One Health Action Plan,” which pinpointed ways to improve public health through multi-sectoral and multi-stakeholder cooperation.**

**2013:**

- ❖ **2<sup>nd</sup> International One Health Congress is held in conjunction with the Prince Mahidol Award Conference.**
- ❖ **The conference encouraged collaboration across disciplines to promote effective policy development related to human, animal, and environmental health.**

# The One Health Concept

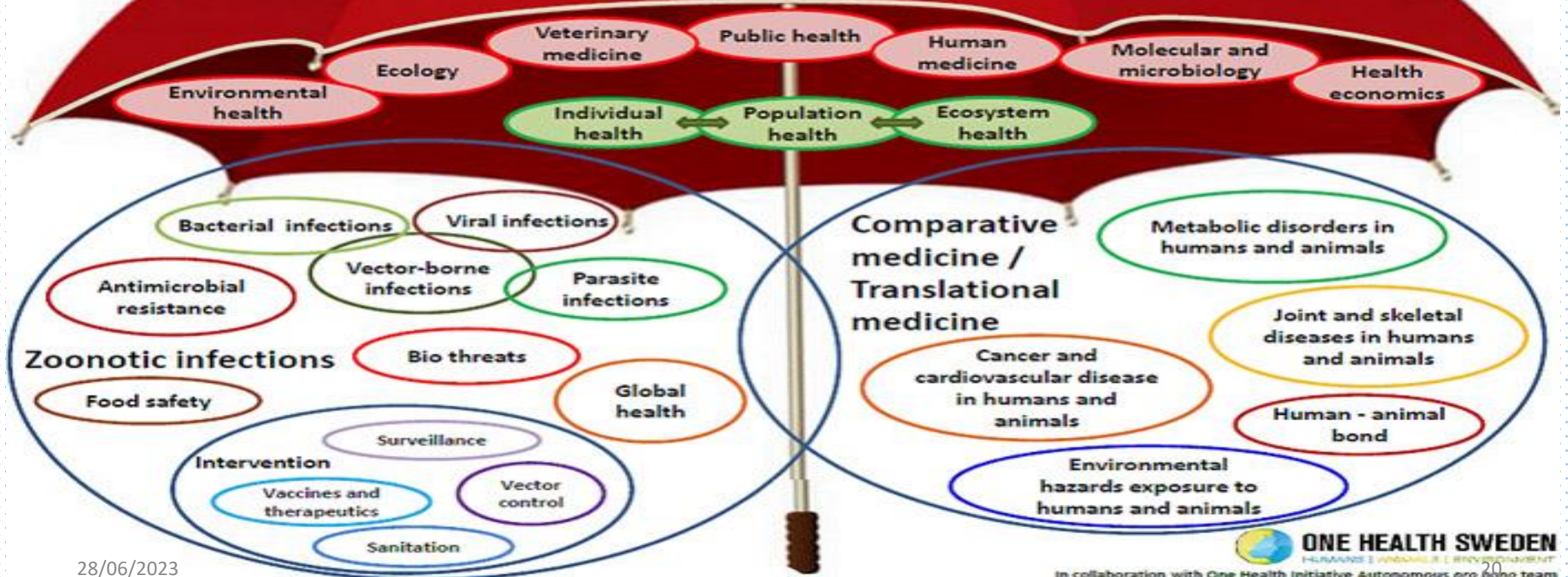
- ❖ **ONE HEALTH** means “a collaborative, multisectoral, and transdisciplinary approach—working at the local, regional, national, and global levels—with the goal of achieving optimal health outcomes recognizing the interconnection between people, animals, plants, and their shared environment”.
- ❖ “One Health (formerly called One Medicine) is **dedicated to improving the lives of all species**—human and animal—through the integration of human medicine, veterinary medicine and environmental science.”
- ❖ The areas of work in which a One Health approach is particularly relevant:
  - Food safety
  - The control of zoonoses
  - Combatting antibiotic resistance

28/06/2023

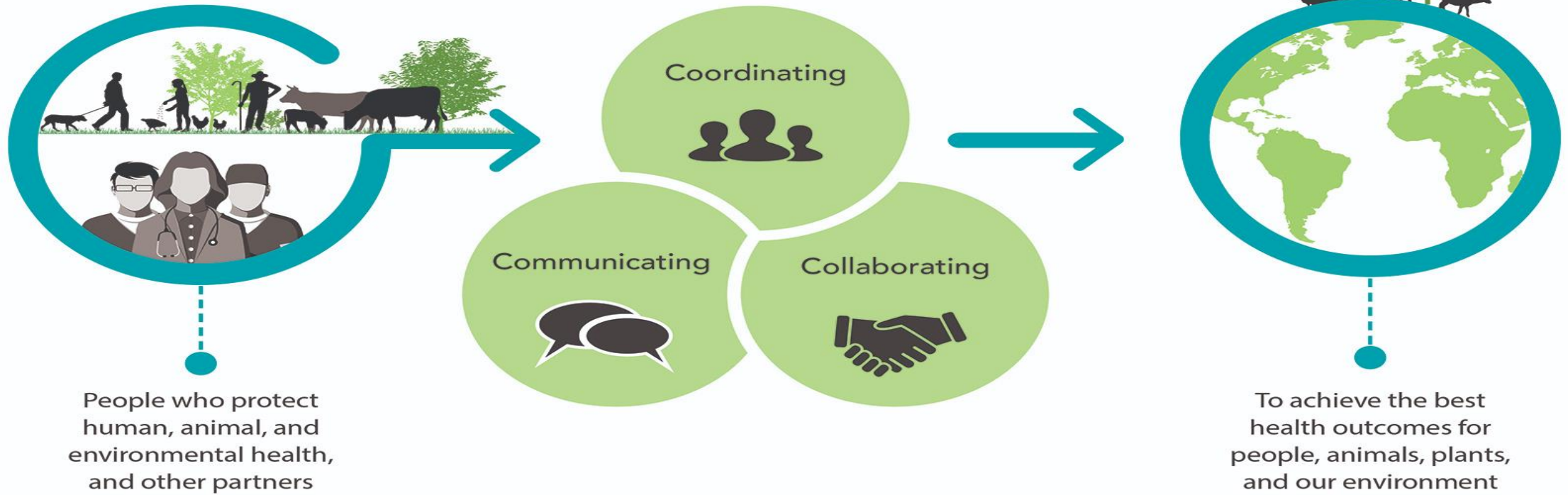


CONNECTING HUMAN, ANIMAL, AND ENVIRONMENTAL HEALTH

# One Health



# One Health



# Efforts to achieve One Health

- ❖ **Joint educational efforts** between human medical, veterinary medical schools, and schools of public health and the environment.
- ❖ **Joint communication efforts** in journals, at conferences, and via allied health networks.
- ❖ **Joint efforts in clinical care** through the assessment, treatment and prevention of cross-species disease transmission.
- ❖ **Joint cross-species disease surveillance** and control efforts in public health

- ❖ **Joint efforts in better understanding of cross-species disease transmission** through comparative medicine and environmental research.
- ❖ **Joint efforts in the development and evaluation** of new diagnostic methods, medicines and vaccines for the prevention and control of diseases across species.
- ❖ **Joint efforts to inform and educate political leaders** and the public sector through accurate media publications.

# Organizations working on one health

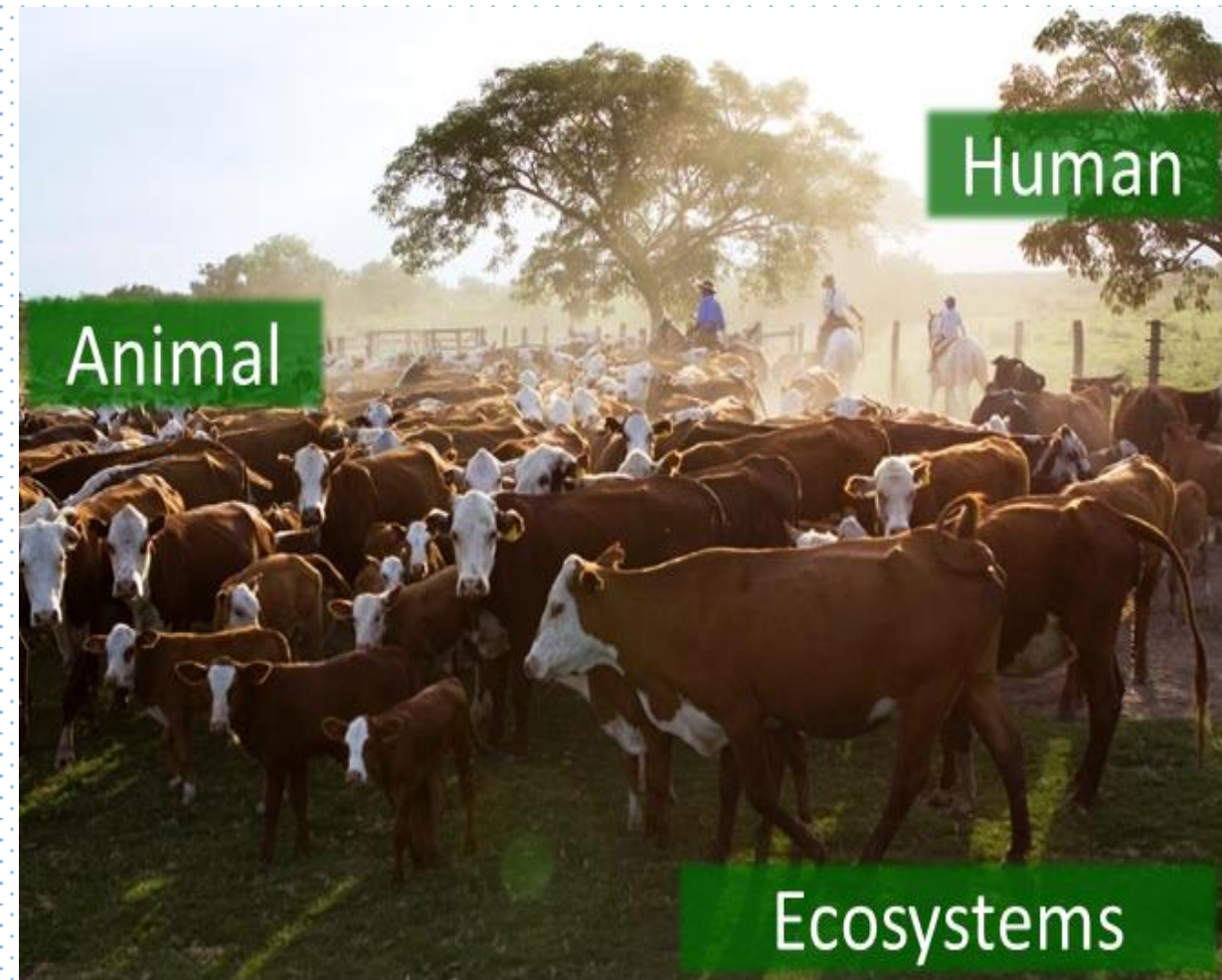
- **World Health Organization (WHO)**
- **Food and Agriculture Organization (FAO)**
- **World Organization for Animal Health (OIE)**
- **One Health Initiative (founded in 2006)**
- **US Centers for Disease Control**
- **Eco-Health Alliance**
- ❖ **South East Asia One Health University Network (SEAOHUN)**
- ❖ **Indonesia One Health University Network (INDOHUN)**
- ❖ **Malaysia One Health University Network (MyOHUN)**
- ❖ **Thailand One Health University Network (THOHUN)**
- ❖ **Vietnam One Health University Network (VOHUN)**



# Possible members of a one health team

- ❖ **Veterinarian**
- ❖ **Physician**
- ❖ **Nurse**
- ❖ **Public Health Worker**
- ❖ **Epidemiologist**
- ❖ **Wildlife Scientists**
- ❖ **Local Leader/Politician**
- ❖ **Environmental Health Worker**
- ❖ **Ecologist**
- ❖ **Social Scientist**

- ❖ **Economist**
- ❖ **Communications Specialist**
- ❖ **Emergency Responder**
- ❖ **Laboratorian**
- ❖ **Pharmacist**
- ❖ **Logistician**
- ❖ **Public Affairs/Marketing**
- ❖ **Information Technologist**



Human

Animal

Ecosystems

ONE HEALTH

28/06/2023

# ONE HEALTH

**BY PROTECTING ANIMALS, WE PRESERVE OUR FUTURE**

Animal and human sectors work together to protect health and ensure food safety and security

60%

of human pathogens are of animal origin

5

new human diseases appear each year

20%

of animal production losses are caused by diseases globally

With regards to animal health, veterinarians are key players of the 'One Health' concept

*Early detection of diseases and infections at animal source can prevent their transmission to humans or introduction of pathogens into the food chain*

**FROM FARM**  
*Healthy animals raised in humane conditions*

**PRODUCTION**

- Surveillance, prevention and control of animal diseases
- Animal welfare management to ensure robust and healthier animals
- Feed quality control
- Safe use of veterinary drugs

**TRANSPORT**

- Only healthy animals transported
- Animals health and welfare monitored during the journey from the farm to the slaughterhouse

**SLAUGHTERHOUSE**

**PROCESSING, STORAGE AND DISTRIBUTION**

- Before slaughter**
  - Analysis of the health data from the farm
  - Clinical examination
- After slaughter**
  - Inspection of the carcass
  - Laboratory analysis

**SUPERMARKET RESTAURANT**

- Verification of hygiene
- Cold chain integrity

**TO FORK**  
*Safe food for consumers*

**THROUGHOUT THE FOOD CHAIN**  
*Veterinarians are responsible for regulations on animal health, animal welfare, traceability, food safety and safe trade of animal products*

**Open cooperation with all the actors involved along the food chain is essential**

WORLD ORGANISATION FOR ANIMAL HEALTH  
*Protecting animals. Preserving our future.*

## Domestic animals, wildlife and humans face similar health threats



**oie** WORLD ORGANISATION FOR ANIMAL HEALTH  
Protecting animals, preserving our future

60% of existing human infectious diseases are zoonotic



At least 75% of emerging infectious diseases of humans (including Ebola, HIV, and influenza) have an animal origin

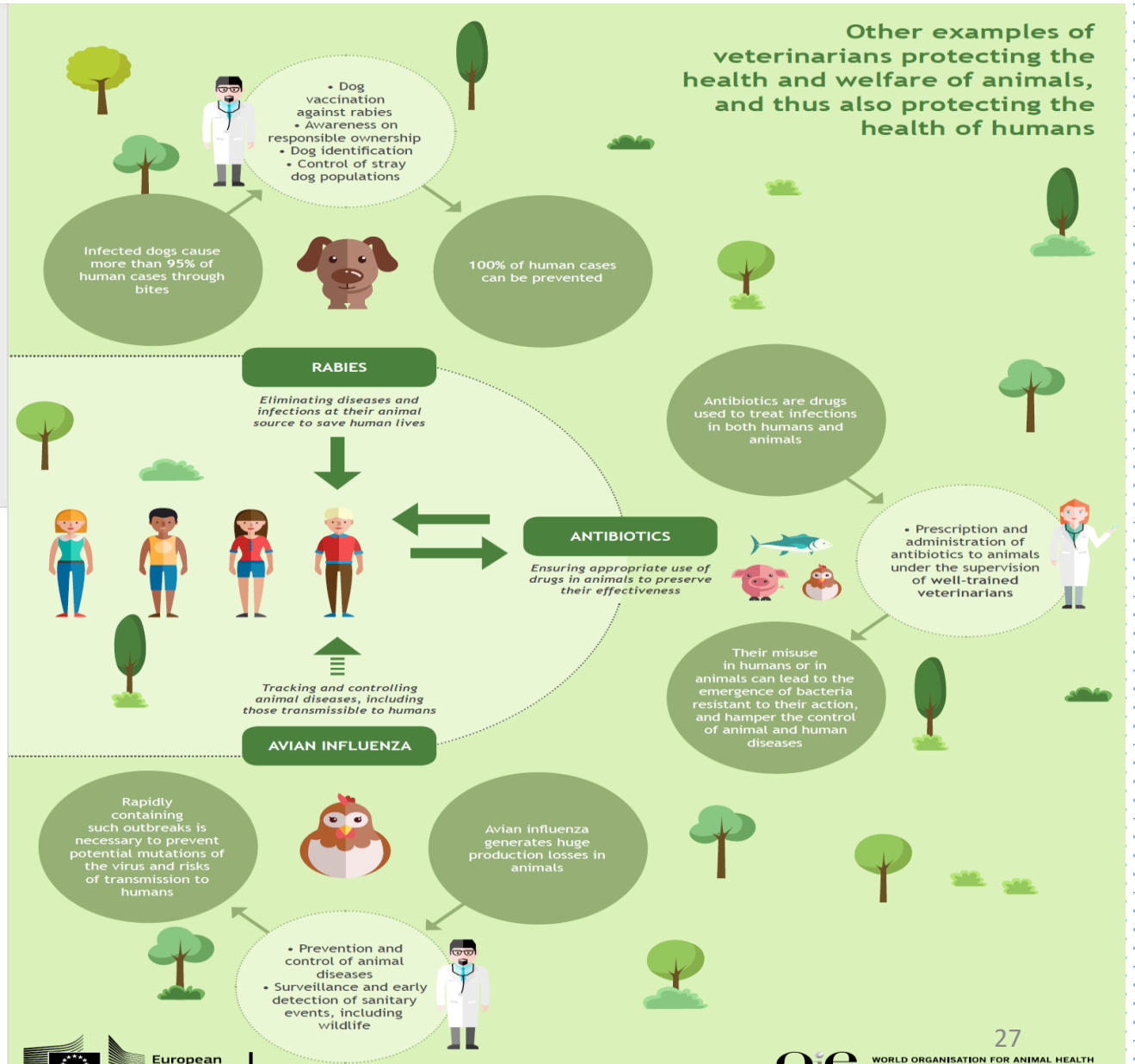


5 new human diseases appear every year. Three are of animal origin



28/06/2023

80% of agents with potential bioterrorist use are zoonotic pathogens



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

# ONE HEALTH IN ACTION: A SUCCESS STORY



In the southwestern U.S. and Mexico, brown dog ticks can carry a germ that causes Rocky Mountain spotted fever in people and dogs.



In Arizona, free-roaming dogs were spreading infected ticks. Many people got sick and some died from Rocky Mountain spotted fever.



Public health and animal health officials used long-lasting tick collars on dogs, regular pesticide applications around homes, community education, and provided free spay and neuter clinics for dogs.



After only 4 months, 99% of dogs were tick-free in the community. The number of people who had Rocky Mountain spotted fever went down in the community.

# Looking ahead: How a One Health Approach BETTER PREPARES US



More testing and monitoring  
to detect illnesses in animals  
and people...



...and farms following  
standards to protect  
animals, the people  
who work there, and  
the farm environment...



...could help prevent  
an influenza pandemic.