

# ROLE OF ANIMALS IN TRANSMISSION OF ZOOZOSES

## **Part I: Domesticated animals; Domesticated animals and Cold-blooded animals**

Dr. R.S.TAYDE

Assistant Professor

Dept. of VPH & Epidemiology

Co.V.Sc. & A.H., Mhow, Indore (M.P.)

# 1. Domesticated animals

- The role of **domestic animals** in the epidemiology of many zoonoses, particularly the direct zoonoses, **cyclozoonoses** and metazoonoses is highly important. Cyclozoonoses such as hydatidosis can be transmitted from dogs and sheep.
- Unhygienic conditions of lairages and cattle sheds are responsible for transmission of many important infectious diseases.
- In both urban and rural areas, a number of animal species are becoming popular as household **pets** which may be a source of infection for their owners.
- Keeping dogs as pets may be responsible for rabies, *Toxocara canis* infestation and leptospirosis if proper care is not taken.
- Cats act as reservoirs for toxoplasmosis and cat scratch disease.
- Domestic animals harbour many infectious diseases in subclinical form.

## 2. Domicialated animals

- Domicialated animals are those who live in close association with human dwelling, e.g. rats, rodents, mice, bandicoots, badger etc.
- These animals play great role in **transmission as well as maintenance** of numerous zoonoses.
- **Pulmonary or bubonic plague**, for instance, is an excellent example of such zoonoses wherein rodents act as source/reservoir for plague bacilli.
- These animals also serve as reservoirs for **leptospirosis, tularaemia, rabies, murine typhus, Q fever** etc.
- Increase in **population density, inadequate sanitary measures, easy access to garbage** and food material etc. in urban area, and **improved methods of agriculture**, decrease in number of their natural enemy etc. in rural area, has resulted in **severe increase in the population of these animals** and so also the **threat of spread** of zoonotic diseases.

### 3. Cold-blooded animals

- **Cold-blooded animals or Poikilothermic vertebrates** play an important role in the epidemiology of the zoonoses.
- Among these, the most important species involved in zoonoses are various fishes, lizards, snakes, toads, turtles and frogs.
- Saprophytes and many others have been isolated from the tissues of cold-blooded vertebrates.
- E.g.,
  - ✓ *Erysipelothrix insidiosa* in **marine fishes**
  - ✓ *Clostridium botulinum* type E, *C. septicum*, *C. sporogenes* and *C. perfringens* in **fishes**;
  - ✓ *Listeria monocytogenes*, *Vibrio parahaemolyticus* in **fish and fish products**

- Other zoonotic infections having association with cold-blooded animals are
  - ✓ Tularemia, brucellosis and leishmaniasis in **lizards**;
  - ✓ Aeromonas in fishes and leptospira in **snakes**.
- Most studied zoonotic agents of poikilotherms is **Salmonellae** and have been isolated from the intestines of **fishes, snakes and tortoises**. Salmonellae are also found in **lizards and frogs**.

# ROLE OF ANIMALS IN TRANSMISSION OF ZOOSES

## Part II: **Wild mammals and birds**

Dr. R.S.TAYDE

Assistant Professor

Dept. of VPH & Epidemiology

Co.V.Sc. & A.H., Mhow, Indore (M.P.)

## Role of Wild mammals and birds

- **Changing demographics** along with the **need for more food** has pushed the human population into new habitats that were once the domain of free ranging species.
- These new habitats **put humans and livestock at risk of new infections** which have been endemic to that habitat.
- The removal of free-ranging and captive wildlife from their natural habitat may bring **silent or latent infections** that manifest their pathogenic properties in stressed animals or in other species that are in contact with the infectious agent for the first time.
- Among the most important wild vertebrates involved in zoonoses are **rats, mice and monkeys**. Only a few other wild animal species such as **bats, foxes, wolves, skunks** or wild animals used for food are known to be involved in transmission of infections directly to man.

- **Wild mammals** play a role in zoonoses chiefly as **reservoir hosts** of arthropod-borne infections.
  - ✓ **Monkeys** may be reservoirs of yellow fever, monkey pox and other viruses.
  - ✓ **Wild ungulates** such as mule, deer, white-tailed deer, wapiti and bison were reported to harbour *Sarcocystis*.
- Other important zoonotic infections reported from wild mammals includes:
  - ✓ Toxoplasmosis in captive animals;
  - ✓ Brucellosis in raccoons;
  - ✓ Leptospirosis in zoo animals;
  - ✓ Yersiniosis in wood mouse,
  - ✓ Tuberculosis in farmed deer;
  - ✓ Brucellosis and tuberculosis in bison;
  - ✓ Brucellosis, yersiniosis, tularemia, listeriosis and leptospirosis in field hares
  - ✓ Salmonellosis in opossums.
- Humans have traditionally been thought to be only natural host of *Mycobacterium leprae*. However, five cases of human leprosy have been reported from Texas whose only contact with *M. leprae* may have been through long term close association with armadillos (*Dasypus novemcinctus*).



- A number of **viral pathogens** have been reported to affect wild animals and humans e.g.
  - ✓ adenovirus of deer,
  - ✓ bovine spongiform encephalopathy,
  - ✓ chikungunya,
  - ✓ Crimean-Congo hemorrhagic fever,
  - ✓ dengue,
  - ✓ hantavirus,
  - ✓ feline immunodeficiency virus,
  - ✓ Japanese encephalitis,
  - ✓ lassa,
  - ✓ rabies,
  - ✓ rotavirus,
  - ✓ Venezuelan equine encephalitis,
  - ✓ morbilli viruses of sea lions and horses.

- The wild birds especially migratory birds play a crucial role in the transmission of zoonotic infections.
- *Salmonella* spp., *Campylobacter jejuni*, *Mycobacterium avium* have been isolated from wild birds.
- *Yersinia* spp. were isolated from faeces of black-headed gulls and swallows.
- Tick vectors of zoonoses such as tick typhus, Crimean haemorrhagic fever, Q fever and tularemia could be recovered from birds flying between Africa and Europe or Asia.
- It is speculated that the introduction of Kyasanoor forest disease into India was due to migratory birds and a tick vector, *Haemophysalis spinigera*.`