

Ensuring Health & Sustainability in Europe:

Doctors and Veterinarians emphasize “prevention is better than cure”

Session II

Ensuring health and welfare of people and animals in a globalized environment

HOW TO PREVENT ZOOONOTIC DISEASE OUTBREAKS IN A GLOBALISED ENVIRONMENT

O. Mangana-Vougiouka, DVM, PhD
Brussels, Belgium 7 April 2014





Zoonoses. 1

- WHO defines zoonoses as “**diseases and infections that are naturally transmitted between vertebrate animals and humans**”
- Zoonoses continue their considerable social and economic impact among humans and the livestock
- The globalization of infectious diseases particularly zoonotic, is a phenomenon of increased international attention



Zoonoses. 2

- According to WHO, at least 61% of all human pathogens are zoonotic, and have represented the 75% of all emerging pathogens during the past decade
- The number and the significance of zoonoses are increasing due to:
 - ❖ global travelling and trade of humans, animals and goods
 - ❖ improvement of medical and veterinary knowledge
 - ❖ development of diagnostic methodologies
 - ❖ adaptation of ancient pathological agents in new hosts
 - ❖ close coexistence between humans and animals
 - ❖ discovering and investigating of new territories

Zoonoses. 3

- Some zoonoses have a significant role in public health as well as in animal health, e.g. *brucellosis, leptospirosis, salmonellosis*
- Other have a significant role in animal health and finances but a minor role in public health, e.g. *foot-and-mouth disease*





Zoonoses. 4

- Some zoonoses cause similar clinical symptoms in humans and animals, e.g. *rabies*
Others cause different symptoms, e.g. *Newcastle disease*
- Some ones infect humans accidentally (*Orf virus*)
others cause severe epidemics (*Rift valley fever*)
- Other zoonoses are rare but with tragic consequences (*Marbourg*)

Zoonoses. 5

Professionals and groups at high risk

- Animal -breeders and their families
- Veterinarians
- Laboratory workers
- Physicians
- Hospital staff
- Immunosuppressive persons
- Butchers
- Hunters
- Foresters
- Ecologists
- Employees of zoo
- Transporters
- Merchant of domestic and wild animals
- Tourists
- Campers

Aetiological agents

- Viruses: e.g. *rabies, avian influenza (AI)*
- Bacteria: e.g. *brucellosis, salmonellosis*
- Fungi: e.g. *dermatophytosis*
- Chlamydia and Rickettsia: e.g. *psittacosis, Q fever*
- Parasites: e.g. *leishmaniasis, trichinelosis*
- Prions: e.g. *BSE*



Modes of transmission. 1

- **Direct contact :**

- Animal bites (*rabies*)
- Coexistence with infected animals e.g. *avian influenza*
- Manipulation of infected animal materials (carcasses, organs etc.)
- Skin touch (*dermatophytosis*)



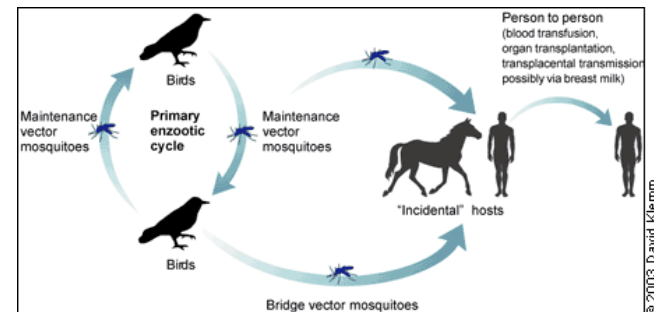
Modes of transmission. 2

- **Indirect contact -Mechanical transmission**
 - Movements of infected human or animals
 - Transportation of infected animal products
 - Movement of contaminated vehicles
 - Airborne transportation of infected dust or aerosol
- **Insect bites** *e.g. West Nile fever, leishmaniasis*
- **Transplantation of human organs** *e.g. rabies*



Main modes of infection

- Through respiratory system: inhalation of aerosol (*AI*), or infected dust (*Q Fever*)
- Through digestive system: consumption of infected food (*salmonellosis*)
- By the skin following insect or animal bites
- Through organ transplantation





Current lifestyle practices

- Current lifestyle potentially supports emergence and transmission of zoonoses and other infectious diseases
- ❖ People travel easily and frequently using any transport mean
- ❖ Movements of animals and goods globally is much more easier than in the past



Other causes supporting the emergence of zoonoses

- **Great changes of the last decades, such as:**
 - ❖ Increasing urbanization
 - ❖ Movement of populations and immigration
 - ❖ Close coexistence between humans and animals
 - ❖ Intensification of food animal production
 - ❖ Intensification of food animal and animal products international trade
 - ❖ Unsafe production, processing and use of food of animal origin



Consequences of the zoonoses

- **In public health**

illness, deaths, disabilities

- **In animal health**

illness, abortions, deaths

- **Economic consequences**



Economic consequences

In humans

- ❖ Loss in human's income due to illness
- ❖ Loss in man-day
- ❖ Loss in productivity
- ❖ Hospitalization costs
- ❖ Cost due to probable disabilities

In animals

- ❖ Losses in the livestock due to deaths, abortions, deduction in meat, milk production and other animal products as skin, hair etc.
- **Expenses for the control of zoonoses**



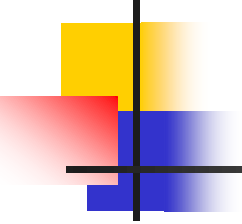
Main measures to prevent zoonotic disease outbreaks. 1

- Early and correct diagnosis
Well equipped and organized laboratory diagnosis of the medical and veterinary sectors
- Well operating epidemiological surveillance systems
- Intersectoral/interprofessional collaboration/coordination among public health, animal health and other interrelated sectors
- Early notification of the disease, especially between neighbouring countries, as well as to international organizations (EU, WHO, OIE, FAO)

Main measures to prevent zoonoses outbreaks. 2

- Organization of vaccination campaigns (*e.g. oral vaccination of wild-life for the control of rabies*)
- Interventions to the spread of the disease, between :
 - *animals to humans,*
 - *wild to domestic animals,*
 - *human to human*
- Protection of free territories
- Keeping strictly the rules of EU, WHO, OIE, FAO for food processing
- Respecting of rules in international trade of animals food and travelling of humans





Supportive measures to prevent zoonoses outbreaks

- Public awareness campaigns for zoonotic diseases prevention and control
- Specialised training for physicians, veterinarians, biologists and other personnel in charge of the prevention and control of zoonoses
- Coordination between governmental and non-governmental organizations

Rabies: preventing a new outbreak

- It is a zoonosis with world-wide distribution
 - Causes 55000 deaths every year
- Preventable by vaccination campaigns:
- Vaccination of domestic animals
 - Oral vaccination of wild-life
- Intersectoral collaboration between veterinary and medical sectors
 - Public awareness
 - Collaboration of neighbouring countries
 - Keeping strictly pet travel regulations



© D. Briggs, Kansas State University



Conclusion-Recommendations. 1

- Respecting actions/ measures proposed as above, at country or EU level could help preventing zoonotic risks or spread of a disease in case of emergence
- There is a need of global strategic approach
- Such global concept should be guided by key-principles on the adoption of multidisciplinary, multisectoral and multinational policies and activities

Conclusion-Recommendations. 2

- Solid intersectoral collaboration and coordination among sectors is of paramount importance together with the establishment of timely information exchange on disease occurrence, early effective epidemiological surveillance and early warning systems' operation



Thank you for your attention