

Addendum

Session 1

Impact of emerging diseases in the tropics

Dominique Martinez

CIRAD – Control of exotic and emerging animal diseases
Email: Dominique.martinez@cirad.fr

Emerging infectious diseases (EID) are defined as new infectious diseases resulting from the evolution or change of an existing pathogen or parasite resulting in a change of host range, vector, pathogenicity or strain; or the occurrence of a previously unrecognized disease (HIV, BSE, SARS, Hendra, Nipah...). Alternatively, a re-emerging disease is a known infectious disease that shifts or expands its geographical range, its host range or significantly increases in incidence. (PPR, Bluetongue).

These last 20 years, an acceleration of the rate of emergence or re-emergence has been observed in all continents with huge economic as well as public health impacts. The tropical and sub-tropical regions are at high risk of an EID to occur especially as vector-borne and zoonotic pathogens from wildlife are concerned.

The drivers of emergence are multiple. Tropical regions are concentrating the highest poverty (more than 4 billion poor) in the world, and this population is quickly increasing. Two more billion poor are expected in 2020 with an accelerating urbanization and major changes in production systems and pressure on the environment (deforestation...). Poverty is associated with poor sanitary conditions and a weakness of veterinary public health in their ability to quickly detect and control diseases. The development of urban and peri-urban farming associated with urban migrations increases animal-human contact and the potential for the rapid spread of a zoonotic event. Animal movements and international trade of animals and products in a global world market represent a main driver of quick long distance spread. Climate and environmental changes also strongly influence the dynamics of pathogens.

However, tropical regions also have a real potential since more than 70% of world domestic animal populations are located there, and the global demand in animal products has a 3% annual growth, creating real opportunities for animal production. This is of particular importance since 70% of the poor rely strongly on animal production. But at the same time, any EID event has a devastating impact both at the

macro-economic level and on the micro-economy of these populations.

EID have various impacts along the value chain from the producers, transporters, processors and retailers, on trade barriers, and on public health (zoonosis). Depending on the disease and the production system stricken, the proportion of each type of impact is different. Zoonotic pandemic threats such as SARS had a major systemic impact whereas public health finally accounted for only 2%. H5N1 also had a major systemic impact due to the fear of consumers about safety of poultry products even in countries or continents (Americas) not affected. For other groups of diseases such as Bluetongue in northern Europe or Rift Valley fever in the horn of Africa, ban of export was the major impact. In all cases, the economical cost proves to be important or even huge, but comprehensive economic studies are scarce and often case limited. However, detailed economical studies when available, demonstrate a clear positive benefit-cost ratio (BCR) of disease control. Even the world eradication of rinderpest which took almost 50 years for a cost evaluated of 610 million US\$ shows a positive BCR even without taking into account the very significant impact on veterinary services organization. Controlling a disease after its emergence is nevertheless extremely costly and the ideal situation is to avoid its introduction or at least to have a quick and efficient detection and control system in place in the event of an outbreak. Comprehensive studies done by the Australian Biosecurity Centre on a set of major EID also demonstrated the high BCR for the animal industry, of investment in research and surveillance (understanding epidemiology and risk factors, surveillance, diagnostic...).

In conclusion, the increase of EID events these last 20 years induced major economic losses, strongly impacting the micro-economy of households in developing countries and representing a major factor aggravating poverty. This underlines the importance of major investments needed to develop efficient networks of animal and zoonotic disease surveillance and control, supported by the high BCR of such investments in veterinary public health.