



Food and Agriculture Organization of the United Nations



ONE HEALTH
Integrating wildlife, livestock,
environmental, and public health



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Multi-sectoral cooperation = One Health

- **OWOH programmes and collaborative efforts**
- **Drivers, impacts & trends**
- **Cross cutting issues**
- **Institutional & sectoral issues**
- **Regional Players**
- **Paradigm shift**
- **Funding**
- **Conclusions**

SE Asia Regional Wildlife
Research Needs Workshop





OWOH Manhattan Principles

- Developed by WCS in 2004 in New York
- Increasingly being adopted to address pathogen jumps between animals and humans
- Holistic approach encompassing interfaces among the human, animal and ecosystem health domains
- Proposes an international, interdisciplinary, cross-sectoral approach to disease emergence and control

29 September 2004
New York Symposium
*"Building Interdisciplinary
Bridges to Health in a
'Globalized World' "*

15 November 2004
Bangkok Workshop
*"Beyond Zoonoses: The
Threat of Emerging Disease
to Human Security and
Conservation, and the Imp-
lications for Public Policy"*

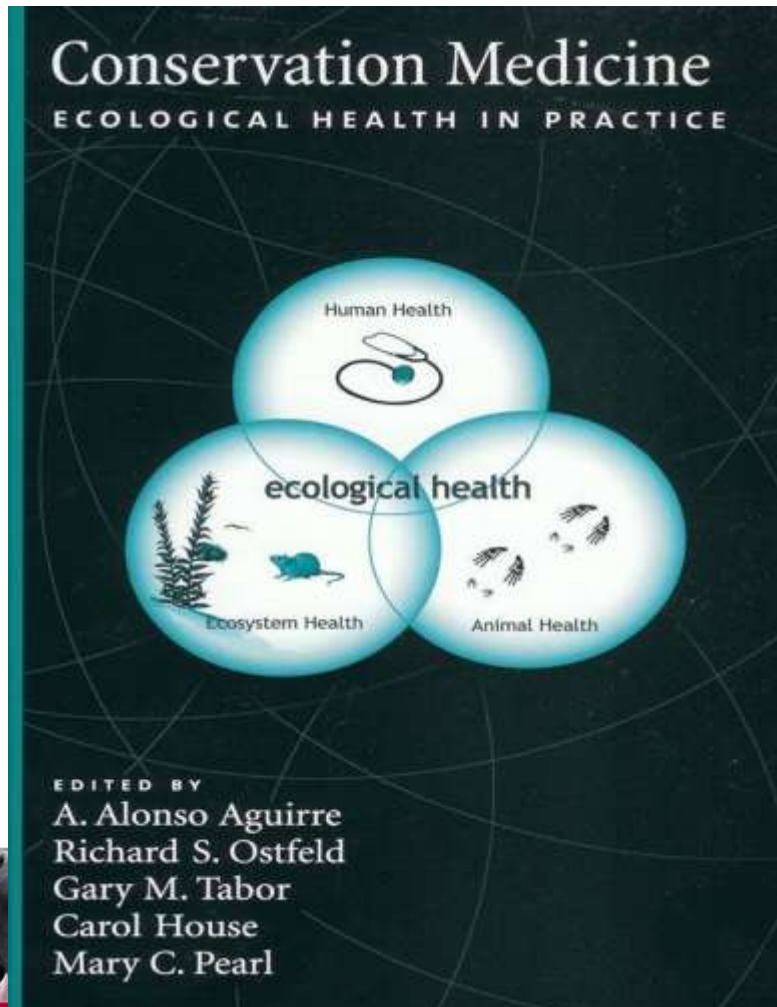
15-17 November 2004
China Workshop
*"Beyond Zoonoses: The
Threat of Emerging Disease
to Human Health, Agriculture
and Conservation: Imp-
lications for Public Policy"*

2-4 October 2007
Brazil Workshop
*"Healthy Ecosystems,
Livestock and Human
Livelihoods: An Innovative
Public-Private Partnership"
("Ecosystemas, Animais
Silvestres E Meio De Vida
Humano Saudáveis: Uma
Parceria Pública-Privada
Inovadora")*





Conservation Medicine



- An emerging discipline, which studies the **links between animal, human, and ecosystem health**
- The need evolved from the recognition of a **crisis**: increasing levels of disease driven by human-induced environmental degradation
- CM is **transdisciplinary**, bringing together scientists, veterinarians, public health physicians, and resource managers





International Organisations & Ministerial Meetings

- New Delhi recommendation, Dec 2007
 - HPAI is entrenched in several countries & still a priority
 - Continued risk of re-emergence and pandemic flu
 - Also recognition HPAI is one of many other E/rEIDs
 - Address the larger issue of EIDs at animal-human-ecosystem interface using OWOH approach
- Planning meeting in Geneva (FAO, WHO, OIE, UNICEF with UNSIC and WB) June 2008 to discuss strategy development
- Sharm El Sheikh Ministerial Conference on HPAI & EID's October 2008 - Joint Strategic Framework (FAO-WHO-OIE-UNICEF-WB) presented
- Expert Consultation – One World One Health- From Ideas to Action- March 2009 Winnipeg



FAO/OIE/WHO
GLEWS
GLOBAL EARLY WARNING SYSTEM



One Health approach

- A number of regional and international initiatives have been launched to bring together wildlife, livestock and human health issues under a multi-sector banner to better deal with emerging diseases and development issues.
 - **Animal and Human Health for Environment and Development AHEAD www.wcs-ahead.org/**
 - **One World One Health™ WCS Global Health programme**
 - **One Health initiative www.onehealthinitiative.com/**
 - **FAO,OIE,WHO,UNICEF and WORLD BANK One Health**
 - **USAID**



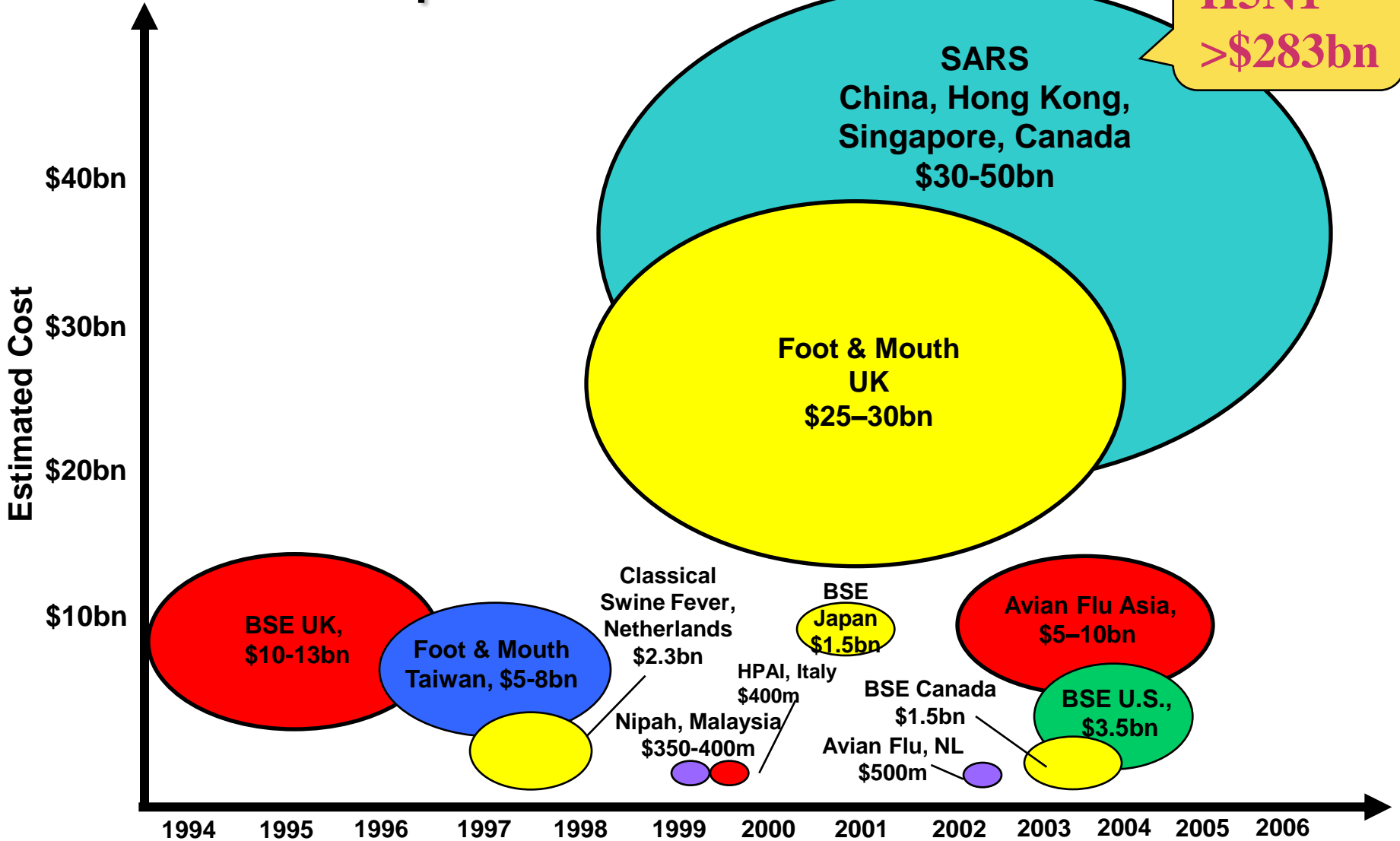


Disease emergence - ecological process

- **Pathogen evolution is being driven by anthropogenic environmental changes & intensified livestock production**
- **Anthropogenic environmental changes increase emergence & transmission rates within or between populations**
- **Most EIDs are caused by old pathogens**
- **Occurs within a background of enormous pathogen diversity & historically, among a large host diversity**
- **Selection pressure for dominance of those strains adapted to survive in the modified environments**



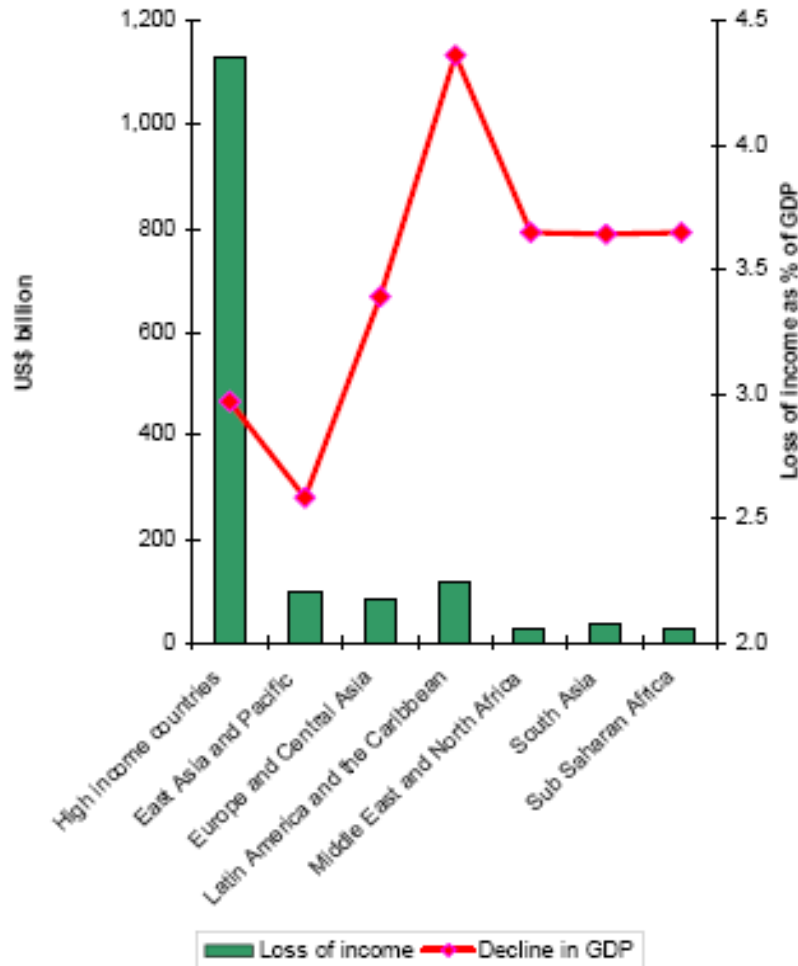
Economic Impact of EIDs





Impact of pandemic influenza

In a moderately severe pandemic, high-income economies lose the most income but developing economies are hardest-hit



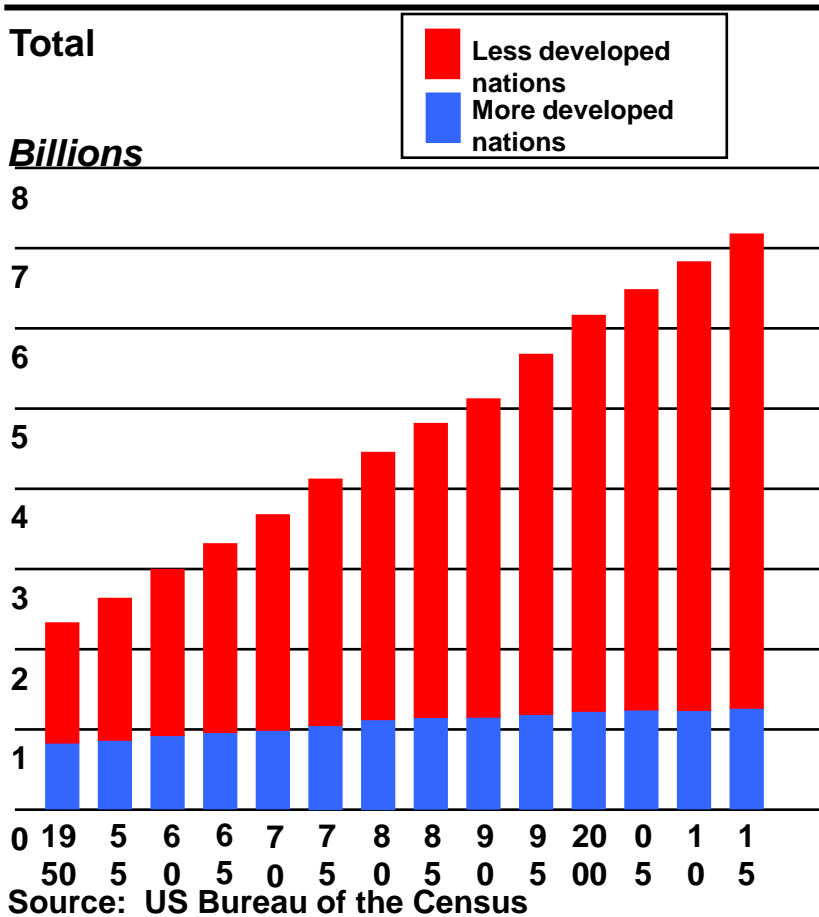
- Loss to the global economy
 - US\$2 trillion
- Prevention is cost-beneficial





Drivers of emergence & spread-The Human Element

Global Population: 1950-2015



- >90% population growth in Africa, Asia and L. America
- Poverty on the rise
- Rapid economic development
- Huge demand for livestock
- Rapid evolution of farming systems
- Climate Change
- Globalized trade & transport



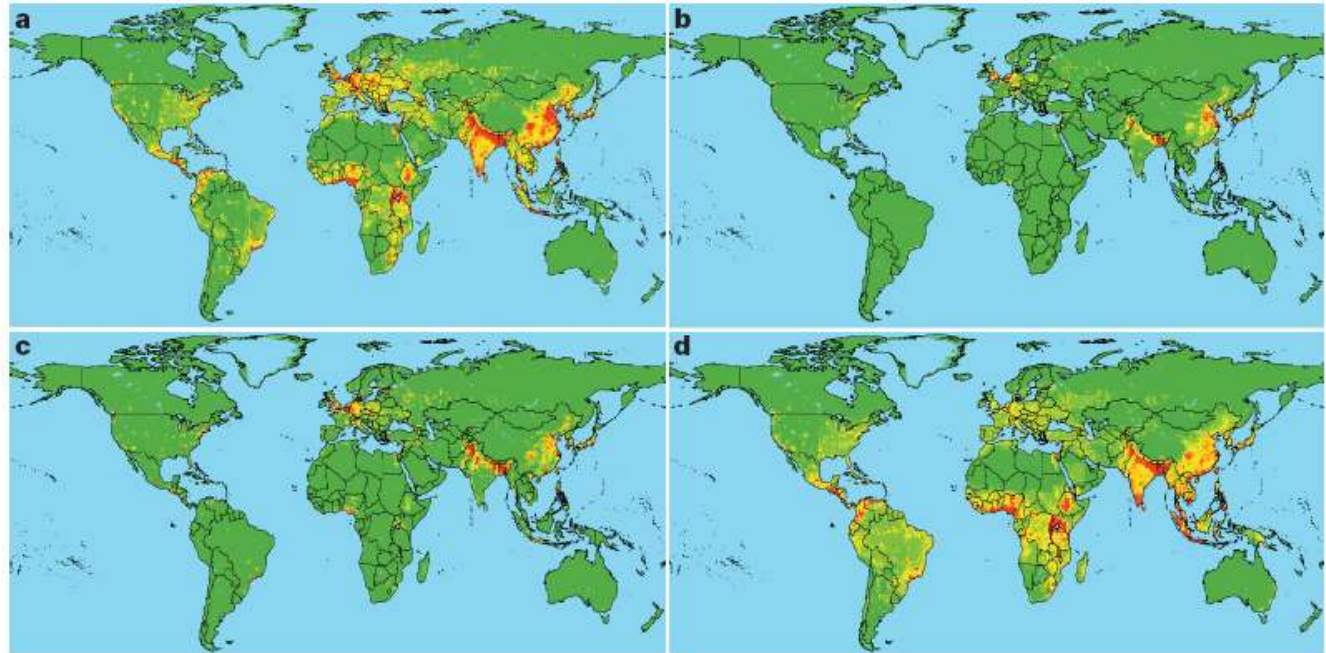
Global trends in emerging infectious diseases

Kate E. Jones¹, Nikkita G. Patel², Marc A. Levy³, Adam Storeygard^{3†}, Deborah Balk^{3†}, John L. Gittleman⁴ & Peter Daszak²

A-Zoonotic/wild

B-Zoonotic/domestic

Figure 3 | Global distribution of relative risk of an EID event. Maps are derived for EID events caused by **a**, zoonotic pathogens from wildlife, **b**, zoonotic pathogens from non-wildlife, **c**, drug-resistant pathogens and **d**, vector-borne pathogens. The relative risk is calculated from regression coefficients and variable values in Table 1 (omitting the variable measuring reporting effort), categorized by standard deviations from the mean and mapped on a linear scale from green (lower values) to red (higher values).



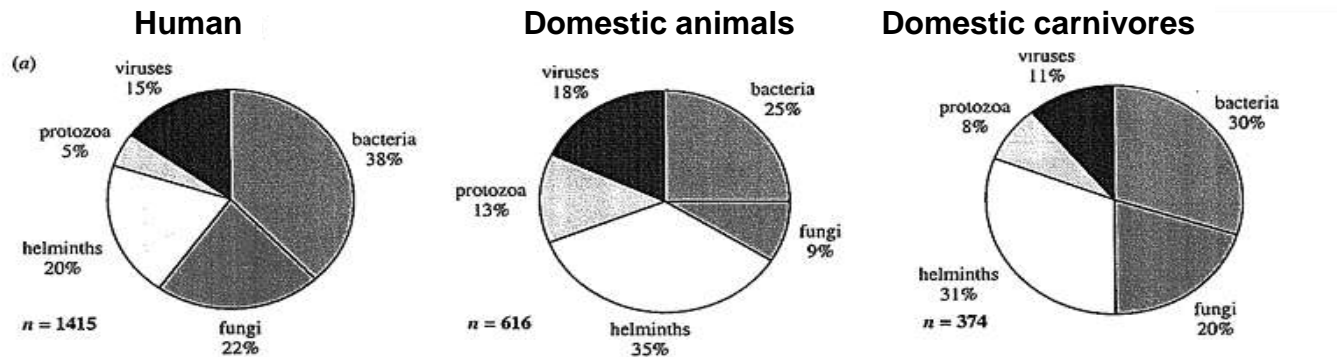
C-Drug resistant

D-Vector-borne

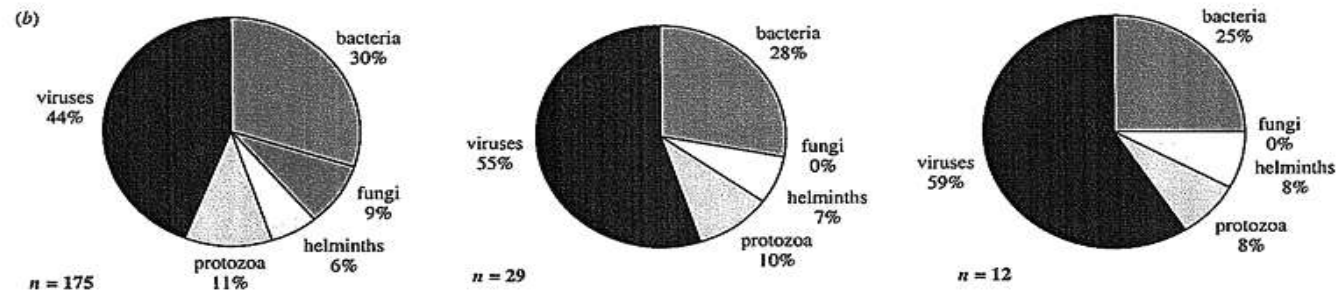


Pathogen risk factors

All pathogens



EIDs



OIE list

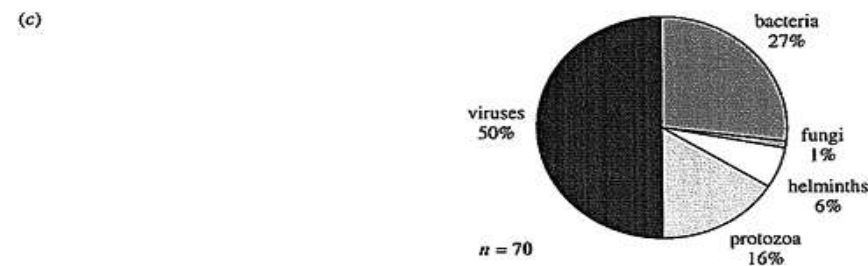
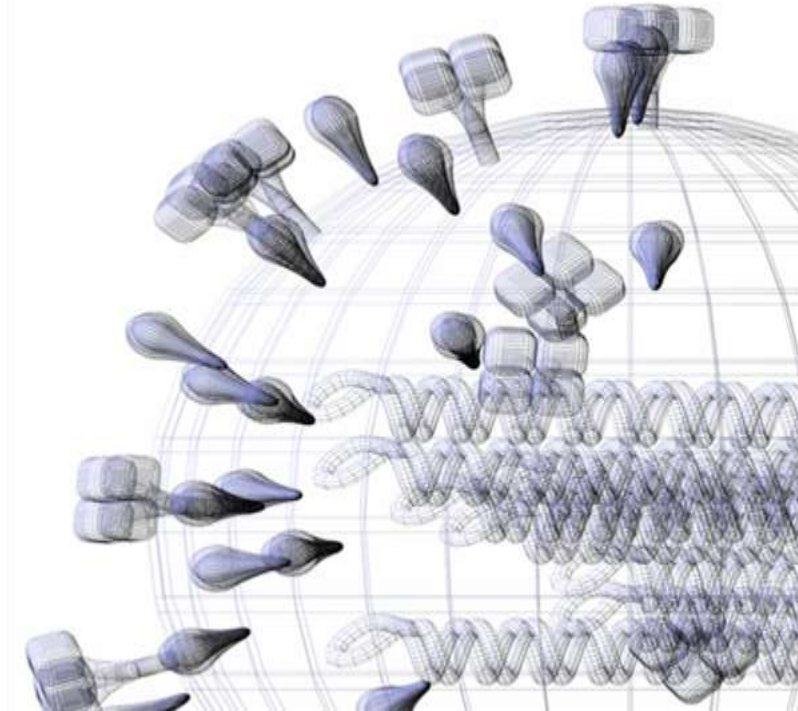


Figure 1. Taxonomic classification of (a) all human, livestock and domestic carnivore pathogens, (b) emerging pathogens and (c) OIE-listed pathogens



Viruses

- **Both DNA and RNA viruses represented**
- **RNA highly likely as EID**
 - **High mutation rate, no repair mechanisms**
 - **Small, Ubiquitous, Intrusive**
 - **Ebola, Marburg, Nipah, Hendra, Lassa, Hanta, Influenza, Polio, Hepatitis, FMD, West Nile, Rabies, Yellow fever, SARS**



*Cleaveland, S., Laurenson, M.K. & Taylor, L.H (2001).
Phil. Trans. R. Soc. Lond. 356, 991-999*





Lessons learned -managing HPAI H5N1 requires us to address...

- Economic development & disease
- Disease control & livelihoods
- Role of wildlife & transmission
- Understanding epidemiology
- Effective communication strategies
- Cross-sectoral collaboration
- Political commitment





Cross cutting issues

- Surveillance at the 3 health domains
- Disease outbreak prevention & control
- Maintaining biodiversity and ecosystem services
- Conservation of species
- Biosecurity
- Bioterrorism
- Socio-economics
- Development issues
- Communications strategies
- Private-public partnerships
- Monitoring and evaluation





Goal

Diminish the threat & minimize the global impact of epidemics & pandemics due to highly infectious & pathogenic diseases of humans & animals

Broader vision

- Public health and food safety
- Food security
- Livelihoods of poor and vulnerable people
- Protection of animal resources





Institutional Issues

■ Guiding Principles

- Country level - intersectoral collaboration & political commitment
- Country, regional and international levels coordinated action that brings together those working on human, animal and ecosystems health
- International level - draw on international institution unique mandates & experts
- Permitting rapid engagement stakeholders, including regional organizations, in order to respond effectively to a variety of disease threats





Current Sectoral Issues

The Wildlife Health Sector

- **Government**
 - **Wildlife Authorities**
 - Some authorities invest in wildlife health capacity for management. Legal mechanisms for mandates over wildlife sometimes conflict with Veterinary mandates.
 - **Veterinary Authorities**
 - Some authorities invest in wildlife health capacity, majority do not but deal with wildlife disease epidemics unless livestock involved and often inadequately without consulting wildlife authorities.
 - **Human Health Authorities**
 - Act independently of veterinary and wildlife sectors in the majority of countries – some attempts to bridge through agencies like US and Regional Centers for Disease Control
- **Private Sector**
 - Some private sector capacity in certain regions but very limited.
- **Academic**
 - Some academic support to Wildlife Health through University Departments





Some Key International Players

The Wildlife Health Sector

- **International**
 - **FAO EMPRES wildlife unit**
 - **OIE Wildlife Working Group**
 - **WCS Global Health Programme**
 - **IUCN SSC Wildlife Health Specialist Group**
 - **Wildlife Trust US**
 - **Zoological Society London Wildlife Health Programme**
 - **Centre for Conservation Medicine Tufts**
 - **National Wildlife Health Centre USGS**
 - **Wildlife Disease Association**
 - **CIRAD EMVT**





Conclusions

*The increase in the number of threats posed to the health of humans and animals is driven by a set of global factors, including **demographic pressures**; the availability, use and **management of natural resources**; **climate change**; **globalisation**; and the **increased demand for animal-source protein** by the world's rising middle-income class*

*However, the common link is **PEOPLE !***





All future efforts will involve the human dimension

- It is widely acknowledged that human behaviour underpins emerging infectious disease (EID) events, and that multiple interrelated global factors drive these processes
- We must demonstrate how lives in urban, suburban, & rural areas are dependent on ecological health and ecosystem services
- Scientific knowledge alone does not change human behavior
- Change requires research, **education**, experience, & most importantly, **understanding & integrating cultural dimensions & priorities**



Animal, human, and environmental health are inextricably connected through the ecological realities governing life





The Challenge

- All future efforts will involve the human dimension
- We must demonstrate how lives in urban, suburban, & rural areas are dependent on ecological health in & around where humans dwell
- Scientific knowledge alone does not change human behavior
- Change requires research, education, experience, & most importantly, understanding cultural dimensions





Funding

- **Major Donors**
 - **European Commission**
 - **USAID**
 - **World Bank**
 - **Wellcome**
 - **Gates Foundation**
 - **Etc.**

- **Conservation agencies & departments with interest in funding wildlife health initiatives**
 - **WWF**
 - **Conservation International**
 - **WCS**
 - **DEFRA UK (Darwin Initiative, JNCC and VLA)**
 - **Government of India**
 - **Etc.**





CONCLUSIONS

- **Wildlife Health Sector has very weak capacity in most of the world and there is poor integration across the health and environment field in most countries**
- **A number of key institutions exist but there is a lot of duplication of activities and conflict.**
- **An attempt is being made to bridge the multisectoral gaps through an integrated health approach but principle is confused to some extent**
- **Funding is improving in this sector but still very small compared to main health sectors**





Conclusions

- Multidisciplinary, multisectoral and multi-partnerships
- Builds on HPAI successes and lessons learned
- Global challenge, requiring global solutions
- Stakeholders buy in and ownership important



Thank You

