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
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


- Expert Consultation – One World One Health- From Ideas to Action- March 2009 Winnipeg
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.

  - One World One Health™ WCS Global Health programme
  - One Health initiative [www.onehealthinitiative.com/](http://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

- **SARS**
  - China, Hong Kong, Singapore, Canada
  - Estimated Cost: $30-50bn

- **Foot & Mouth**
  - UK
  - Estimated Cost: $25–30bn

- **BSE UK**
  - $10–13bn

- **Foot & Mouth Taiwan**
  - $5–8bn

- **Classical Swine Fever**
  - Netherlands
  - $2.3bn

- **Avian Flu Asia**
  - Estimated Cost: $5–10bn

- **BSE Japan**
  - $1.5bn

- **BSE Canada**
  - $1.5bn

- **Avian Flu, NL**
  - $500m

- **Avian Flu, NL**
  - $400m

- **H5N1**
  - Estimated Cost: $>283bn

- **BSE U.S.**
  - $3.5bn

- **Nipah, Malaysia**
  - $350-400m

- **HPAI, Italy**
  - $400m

- **Avian Flu, NL**
  - $500m

- **H1N1?**
Impact of pandemic influenza

- Loss to the global economy
  - US$2 trillion

- Prevention is cost-beneficial
Drivers of emergence & spread - The Human Element


- >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

Source: US Bureau of the Census
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).
Pathogen risk factors

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

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
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!
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.

All future efforts will involve the human dimension.
Animal, human, and environmental health are inextricably connected through the ecological realities governing life.
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 the 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