

# ZOO NOSES WATCH

TRACKING HUMAN-ANIMAL INTERFACE

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## Message from Chairperson, RCZI

Epidemic and endemic zoonoses constitute significant global public health challenges. Limited technical capacity and lack of evidence to support scientific decision making are major bottlenecks on the road to control these challenges. As an interdisciplinary platform, RCZI plans to work through intersectoral barriers and provide comprehensive & evidence based technical support to zoonoses prevention and control efforts. PHFI is honored to be the national nodal agency for RCZI. We are committed to extending support of our institutional networks to this initiative. This newsletter is part of RCZI's commitment to wide dissemination of information and updates related to zoonoses. We wish this endeavor all the best.

**Prof. K Srinath Reddy**  
President, PHFI &  
Chairperson, RCZI

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## Roadmap to Combat ZOO NOSES in India

Zoonotic diseases are of growing national and international significance with regard to health, food safety, trade, security and economics. Prevention and control requires a multidimensional, integrated, systemwide approach.

Recognizing the urgency and need for stronger coordination between sectors, the "Roadmap to Combat Zoonoses in India Initiative" (RCZI) was launched in June 2008, with Public Health Foundation of India (PHFI) as the national nodal agency. Core technical partners of the initiative include PHFI, University of North Carolina (UNC) Chapel Hill, North Carolina State University (NCSU) & RTI International.

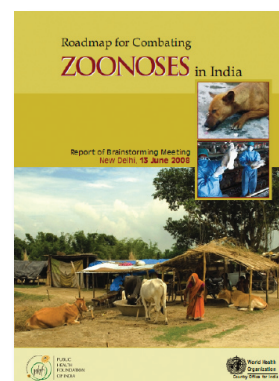
RCZI engages experts from human and animal health, wildlife, vector bionomics, social and environmental sciences, and research, academic and implementation agencies in public, private and technical arenas in India. The initiative aims at specific outcomes for a system wide collaboration for mutual benefit & measures that would complement and feed into the mainstream systems. It will explore newer paradigms and approaches to combat zoonotic infections with collaborative research and training programs as starting points. Key strategies include:

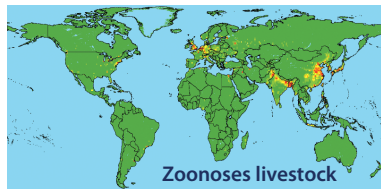
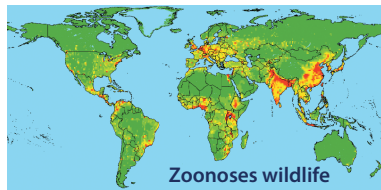
1. Establishing coordination mechanisms to strengthen multisectoral collaboration.
2. Advocacy & communication to raise awareness on zoonoses and their impact amongst various stakeholders and sections of society.
3. Foster collaborative research networks, undertake research and capacity building focused on 'One Health' concept (linking all sectors ranging from human health to animal, wildlife, social and environmental sectors).

*RCZI mission is to "explore newer paradigms and approaches to combat zoonotic infections with collaborative research and training programs ... specific outcomes would complement and feed into the mainstream systems"*

A national joint working group has been formed, engaging all relevant partners to guide realization of the vision and mission of RCZI. Partner institutions are PHFI, UNC, NCSU, RTI, NICD, ICMR, ICAR, IVRI, Wildlife Institute of India, WHO, International Livestock Research Institute & IDRC Canada. ■

*Proceedings of the meeting available on request.*





Ref: Jones et al. Nature 2008

<http://www.conservationmedicine.org/>

**“The main hotspots were located in low latitude regions, like South Asia and South-East Asia, which were not the financial focus of global funds to prevent the spread of EIDs.”**

## INDIA: A Hot-Spot for Emerging Infectious Diseases

Zoological Society of London along with researchers from Georgia and New York analyzed 335 emerging diseases from 1940 to 2004 to study links between emergence of infectious diseases with population density, climate change, latitude and bio-diversity. Modelling was used to identify emerging infectious disease (EID) ‘hot-spots’ on a global map which could be used to predict potential sites for future disease outbreaks.

The main ‘hotspots’ were located in low latitude regions like South Asia and South-East Asia, which have not been the focus of global funds to prevent spread of EIDs. EID events were found to be dominated by zoonoses (60.3%); majority of which (71.8%) originated in wildlife (eg. Ebola virus) and had increased significantly over time. EID outbreaks in these regions can be lethal given the current absence of resistance among humans.

Peter Daszak, a co-author and Executive Director of the Consortium for Conservation Medicine opined that “world’s public health

resources are misallocated;” if we look into the global resources pool to fight EIDs, “most are focused on rich countries that can afford surveillance, but most hotspots are in developing countries. If we look at the high impact diseases of the future, we’re missing the point.” Major recommendations of the study include increased focus on conservation efforts to reduce man-wildlife conflict and redistribution of global resources to tackle EIDs.

At least 11 pathogens have emerged or re-emerged in India during 1992-2009, majority of animal origin. Risk factors for emergence reside in multiple sectors. Emergence and spread of H5N1 has clearly demonstrated the vulnerability of the system. The study reiterates need for urgent, targeted and multisectoral preparedness and response to EIDs. Integrated Disease Surveillance Project, National Rural Health Mission, International Health Regulations (2005), networks of veterinary & wildlife institutions are some opportunities at hand. ■

## BOVINE TUBERCULOSIS: A Neglected Zoonoses Revisited

Infection due to *Mycobacterium bovis* typically occurs in cattle but has been reported in other animals including dogs, cats, swine, rabbits, birds and man. Several investigators have stressed the zoonotic potential of bovine tuberculosis but very limited data is available from Asian countries including India.

A recent study conducted at the Central Military Veterinary Laboratory, analyzed different specimens from cattle suspected to have bovine tuberculosis. *M. bovis* was isolated in milk in 15% of the samples. Isolation of *M. bovis* or *M. tuberculosis* from apparently healthy cattle is indicative of subclinical infection in the herd. Further, isolation of a significant number of *M. tuberculosis* from cattle suggests possible

human-to-cattle transmissions which need to be confirmed by prospective studies.

Other studies have identified mixed infections in both human (8.7%) and animal specimen (35.7%). Detection of mixed infection with these mycobacteria in humans and bovines denotes potential transmission of these pathogens from humans to cattle (zoonosis) and vice versa (reverse zoonosis).

Veterinarians in India have often expressed concern regarding the impact of this neglected disease on human and animal health as well as economic and social consequences. RCZI Initiative is in discussion with leading veterinary and wildlife institutions to undertake wider studies to understand the extent of this problem. ■

*Isolation of Mycobacterium bovis & M. tuberculosis from cattle of some farms in north India - Possible relevance in human health. IJMR 2008; 128:26-31*  
<http://www.icmr.nic.in/ijmr/2008/july/0706.pdf>

*Bovine tuberculosis in India: Potential basis for zoonoses. Tuberculosis 2005; 85 (5): 421-428*

## MYSTERY FEVER: Is 'One Health' the Answer

An illness of mysterious fever with high case fatality was reported from district Nadia, north of West Bengal's capital, Kolkata, between 11th and 28th April, 2007. The episode again stimulated the need for a collaborative inter-disciplinary research and community based interventions. Patients presented with symptoms of high fever, headache, vomiting, disorientation and respiratory distress leading to death. All five cases died within 3-10 days of onset of illness. Initial impressions pointed towards a new strain of dengue. However, blood samples of three dead patients tested positive for Nipah virus by RT-PCR at the National Institute of Virology, Pune.

Epidemiological analysis of the five deaths showed that three cases belonged to Betai village (index case, wife and brother-close contacts), while two were from Krishnanagar town (also with history of close contact with index cases). Although the index case did not give any history of travel to Bangladesh, the border is just about 5 km away from the village, where an



Image courtesy: [http://www.doh.state.fl.us/Environment/community/One\\_Health/OneHealth.html](http://www.doh.state.fl.us/Environment/community/One_Health/OneHealth.html)

outbreak of Nipah virus was confirmed during the same period.

A similar episode of Nipah outbreak was reported from district Siliguri, West Bengal during January and February, 2001 which killed around 45 people, following an outbreak in Bangladesh. Retrospective analysis of the episode revealed that there was clustering of cases in a hospital located in that area. Observations during this episode suggested that human-to-human spread had possibly occurred as most patients were either hospital employees or visitors. Current evidence suggests that "bats are reservoirs of nipah virus and can infect pigs and that both can infect humans". Also as per local residents, bats are common in the locality and sometimes also bite.

Evidence generated from these outbreaks of Nipah have repeatedly suggested close linkage of the disease to human-animal interface and pointed towards disequilibrium in biodiversity. Understanding the epidemiology of virus in its landscape ecosystem and linking it to effective prevention and control efforts requires a close collaboration and cooperation between human and animal health experts, wildlife experts and ecologists. The situation is a perfect dispensation for functional collaboration among sectors within the 'One Health' paradigm. Hence the impending need to promote the concept of 'One Health', founded on the belief that human and animal diseases need to be considered and treated together. ■

*"There is a need to promote the concept of 'one health', founded on the belief that human and animal diseases need to be considered and treated together"*

## Knowledge of Zoonoses Among Clinicians

Under-diagnosis and under-reporting of zoonotic diseases is a significant problem in most countries. Researchers in Tanzania investigated the knowledge of medical practitioners as a potential contributing factor. It was found that medical practitioners in rural health facilities had less knowledge of transmission of sleeping sickness and clinical features of anthrax and rabies in humans compared to their urban counterparts. In both areas the practitioners had poor knowledge of clinical features and transmission of echinococcosis and diagnosis of bovine tuberculosis in humans.

They concluded that medical practitioners' knowledge of zoonotic diseases could be a contributing factor to their under-diagnosis and under-reporting in Tanzania. They recommended refresher courses particularly for practitioners in rural areas and increasing emphasis on zoonotic diseases in medical curricula. Veterinary and medical collaboration should be strengthened to enable more effective control of zoonotic diseases.

RCZI Initiative has taken cues actively from these studies and the recommendations of expert consultations. The initiative is currently developing short training packages with support of leading Indian and international veterinary and wildlife institutions. As a long term capacity building strategy, the initiative is also revisiting medical and veterinary curriculum in India to advocate suitable revisions that ensure greater emphasis and focus on zoonoses. ■

Read full article at *Biomedcentral Knowledge of causes, clinical features and diagnosis of com-mon zoonoses among medical practitioners in Tanzania BMC Infectious Diseases* 2008, 8:162  
<http://www.biomedcentral.com/1471-2334/8/162>

## Transforming a Dual Burden into a Dual Benefit



Ref: *The Control of Neglected Zoonotic Diseases: A route to poverty alleviation*, WHO Geneva 2005  
<http://sapppp.org/PhotoGallery/photo-slide-shows/SAGP03-home-based-broiler-farming-gp-prevalent-in-kesla-block/index.html>

Researchers in Mongolia calculated the cost effectiveness of the impact of mass vaccination of livestock on livestock productivity and human health. The intervention model consisted of a 10-year livestock mass vaccination campaign using Rev1 livestock vaccine for small ruminants and S19 livestock vaccine for cattle against brucellosis.

The share of cost of cattle vaccination was allocated between public health and agricultural sectors proportional to their benefits. It was found that benefits to livestock sector and control of brucellosis were profitable to both the sectors and the cost-effectiveness of human brucellosis control was falling into the WHO band of highly cost-effective intervention. This is an

excellent model that approaches 'one health' functional convergence between human and animal health sectors. Similar models can also be used in Indian context, especially at local levels.

One such model of opportunity exists in Kesla, Madhya Pradesh where tribal and dalit women's self help groups have been introduced to home-based broiler farming as a means of livelihood. This initiative is backed by training of SHGs, weekly visits of supervisors to provide immunization and other care for broiler and guaranteed markets for their produce through cooperatives. Safe farming practices have resulted in healthy chicken and prevention of pathogens from crossing the species barrier. ■

## INFO CORNER

### RABIES: Frequently Asked Questions

#### What to do when bitten by a dog?

- All contacted areas of the body and all wounds should be immediately and thoroughly cleaned with soap, water and an antiseptic preparation should be applied.
- The wound is not to be sutured.
- In case of a bite, after immediate treatment take the person to a hospital for required cleaning and assessment for requirement of rabies immunization.

#### When to get immunized for Rabies?

- **Post Exposure:** After contact with animals, which are rabid or suspected to be rabid.
- **Pre Exposure:** Required for high risk people like veterinary surgeons, hunters, animal keepers, butchers or before going to an area in which rabies is endemic.

#### Are there any conditions when the rabies vaccine should not be taken?

- All persons must receive the vaccine after exposure. If a person is known to be allergic to any vaccine constituents, then the vaccine is to be administered under supervision with ready measures for managing allergic reactions.
- Avoid prophylactic use in children, adolescents, pregnant women & adults on treatment for any acute illness.
- Avoid pre exposure vaccine if person is known to be allergic to any vaccine constituents.
- Avoid further immunization in case of any complication. ■

(Adapted from <http://health.indiamart.com/kidshealth/vaccine/rabies-vaccine.html>)

**WEB RESOURCES ON ZOO NOSES**

**World Health Organization**  
 Webpage lists Information, alerts and institutions working on Zoonoses.  
[\(http://www.who.int/zoonoses/en/\)](http://www.who.int/zoonoses/en/)

**World Organization for Animal Health**  
 Website on animal diseases prevention and control.  
<http://www.oie.int>

**Food & Agriculture Organization (FAO)**  
 Provides information on agriculture, forestry and fisheries.  
<http://www.fao.org>

**U.S. Geological Survey (USGS)**  
 The Biological Resources Discipline (BRD) of the USGS provides scientific information on technologies needed to support management and conservation of biological resources.  
<http://biology.usgs.gov/>

**International Veterinary Information Service**  
 Provides free access to information on veterinary medicine  
<http://www.ivis.org/home.asp>

