

# REPORT



## Consultative Workshop on Regional Epidemiology and Laboratory Networking in the SAARC Region

27-29 July 2011, Kathmandu, Nepal





Dr Prabhakar Pathak, Director General, Department of Livestock Services, Nepal giving his opening remark during inaugural session



Ms BuiThi Lan, FAO Representative, Nepal and Bhutan giving her welcome address during inaugural session

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## Acronyms and abbreviations

AI	Avian Influenza
ASEAN	Association of South East Asian Nations
AWHN	Australian Wildlife Health Network
BSE	Bovine Spongiform Encephalopathy
BSL	Bio-safety level
CSF	Classical Swine Fever
CVO	Chief Veterinary Officer
DLD	Department of Livestock Development
DLS	Department of Livestock Services
ECTAD	Emergency Centre for Transboundary Animal Diseases
EMPRES	Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases
EPT	Emerging Pandemic Threats
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FETP	Field Epidemiology Training Programme
FETPV	Field Epidemiology Training Programme for Veterinarians
FMD	Foot and Mouth Disease
GDP	Gross Domestic Product
GF-TADs	Global Framework for the progressive control of Transboundary Animal Diseases
GIS	Geographical Information System
GISN	Global Influenza Surveillance Network
GLiPHA	Global Livestock Production and Health Atlas
GLEWS	Global Early Warning System
GLP	Good Laboratory Practices
GOARN	Global Outbreak Alert and Response Network
GPS	Global Positioning System
GREP	Global Rinderpest Eradication Programme
H	Haemagglutinin
HA	Haemagglutination
HI	Haemagglutination Inhibition
HPAI	Highly Pathogenic Avian Influenza
HPED	Highly Pathogenic and Emerging Diseases
INFOSAN	International Food Safety Authorities Network

LDIS	Livestock Disease Information System
LIMS	Laboratory Information Management System
N	Neuraminidase
NADRES	National Animal Disease Referral Expert System
NCPB	National Control Programme on Brucellosis
ND	Newcastle Disease
OFFLU	OIE-FAO Network of Expertise on Avian Influenza
OIE	World Organisation for Animal Health (Office International des Epizooties)
PCP	Progressive Control Pathway
PCR	Polymerase Chain Reaction
PD-FMD	Project Directorate on Foot and Mouth Disease
PPR	Peste des Petits Ruminants
PVS	Performance of Veterinary Services
FAO-RAP	FAO Regional Office for Asia and the Pacific
RBPT	Rose Bengal Plate Agglutination Test
RCM	Regional Coordination Mechanism
REC	Regional Epidemiology Centre
RLDL	Regional Leading Diagnostic Laboratory
RSU	Regional Support Unit
SAARC	South Asian Association for Regional Cooperation
SAFETYNET	South East Asia Field Epidemiology and Technology Network
SARS	Severe Acute Respiratory Syndrome
SEACFMD	South East Asia plus China FMD Control Campaign
SMS	Short Messaging Service
SOP	Standard Operating Procedure
STANDZ	Stop Animal Diseases and Zoonoses
TEPHINET	Training Programmes in Epidemiology and Public Health Interventions Network
WHO	World Health Organization
WWF	World Wildlife Fund

## Summary

The South Asian Association for Regional Cooperation (SAARC) and the Food and Agricultural Organization of the United Nations (FAO) jointly established a Regional Support Unit (RSU) with in FAO in Kathmandu, Nepal, financially supported by European Commission (EC) in 2010. The overall objective is to strengthen and empower SAARC in its ability to prevent, control and/or eradicate highly pathogenic and emerging diseases (HPEDs), including highly pathogenic avian influenza (HPAI), through improved veterinary and public health services and inter-sectoral collaboration on a regional basis. The FAO in close collaboration with the SAARC is implementing a project OSRO/RAS/901/EC - "Regional cooperation programme on HPEDs in South Asia (SAARC component)" to achieve the above goals. It is the first institutional mechanism under GF-TADs framework at the regional level in SAARC region.

Based on the recommendations from the inception and high level workshops organised during September-October 2010 and January 2011, respectively, a "Consultative Workshop on Regional Epidemiology and Laboratory Networking in the SAARC Region" was organized from 27 to 29 July 2011 at Kathmandu, Nepal. The consultative workshop aimed mainly to identify the national epidemiology units and information system, mechanisms for regional coordination of the epidemiology and laboratory networks for facilitating timely information sharing between the member states and to forge more effective responses against HPED/TADs control. The workshop was attended by 43 country participants from the eight SAARC Member States and seven resource persons from various organisations including FAO, WHO and OIE. These participants included epidemiology and laboratory experts or focal points from wildlife departments and communication sector.

Presentations were made on the mandates and progress made on 'regional cooperation programme on HPEDs in South Asia', importance of epidemiology networking in the region, South East Asia plus China foot and mouth disease (SEACFMD) networking in Association of South East Asian Nations (ASEAN), epidemiology networking at human-animal interface, regional coordination mechanism for animal health in ASEAN, information system such as FAO's *TADinfo*, Livestock Disease Information System (LDIS) in Bangladesh and National Animal Disease Referral Expert System (NADRES) in India, EMPRESi-Asia, laboratory networking, wildlife disease surveillance, and communication strategy for HPEDs. Country presentations were made on the HPED control and the epidemiology and laboratory settings in the SAARC member countries by the participants from each country. These presentations were followed by structured group discussions on epidemiology networking, information system and HPEDs control and laboratory networking and communications. The outcomes of the group discussions were presented to the house with recommendations.

**Considering that:**

- The impact of HPEDs and TADs crises on public health, the agricultural sector, trade and the livelihoods of small holders particularly in the SAARC region is well recognized.
- No one nation can effectively prevent or control HPEDs and TADs alone without regionally coordinated and harmonized activities.
- No designated national epidemiology unit, centre or facility exists in many countries in the region and even more so at the sub-national level.
- Epidemiology capacity in most member states in the region is weak; some have none or very few trained epidemiologists, and those trained may be not in the right place.
- Multi-sectoral and multi-disciplinary collaboration even between the main stakeholder at animal-human-ecosystem interface is still lacking or weak.
- Socio-economic drivers make cross-border movement of animals and animal products very difficult to control or monitor.
- Sharing of disease outbreak or surveillance information between the Member States is uncommon.
- Robust surveillance system of animal diseases and reporting mechanism is either non-existent or weak or limited to only one or two diseases.
- Computerised animal disease information system (storage and analysis) is only partially implemented, and that too in some countries only.
- The One Health approach promoted by FAO-OIE-WHO needs to be progressively adopted at country and regional levels to address the problem of HPED and TADs at the human, animal and ecosystem health domains.

**It is recommended that:**

1. A functional and sustainable regional epidemiology networking mechanism for the region be established.
2. A national epidemiology network be identified or set up including networking with the sub-national units/centre with clear roles at each level by the respective member countries.<sup>1</sup>
3. REC/RSU facilitate capacity building of national epidemiology networks through training and technical support; such as fielding participants to FETPV trainings and consultancies as and when requested by Governments.
4. Enhanced national passive surveillance system and reporting mechanisms including a secure disease information system (e.g. *TADinfo*) in the member states is established or strengthened.
5. Case definitions for the reportable diseases are developed for uniformity of reporting.

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<sup>1</sup>(National epidemiology units/centres were identified by the country participants as the ones responsible for data collection, analysis or compilation and dissemination at the national level. However, these are not necessarily endorsed by the respective Ministry/Government of the respective country. RSU will need to get the endorsement from the respective Governments of all national epidemiology units/centres to be designated as national epidemiology focal points)



6. The veterinary authorities are encouraged to undertake epidemiological studies to promote and enable evidence based policy decisions by the policy makers for prevention and control of HPEDs/TADs by the Member States in the region.
7. Information sharing on HPEDs/TADs between the Members States on 'real time' basis is put in place and facilitated through the REC.
8. Formal linkages and mechanisms be developed between the veterinary epidemiology unit and the departments, agencies or organisations concerned with wildlife conservation and wildlife disease surveillance.
9. In order to enhance efficient exchange of information the countries in the region are encouraged to use a uniform national disease information system such as *TADinfo*. Those countries using other disease information systems (e.g. LDIS for Bangladesh and NADRES for India) are encouraged to make these systems compatible with *TADinfo*.
10. National laboratory networks be identified or set up including networking with sub-national laboratories with clear roles at each level by the respective member countries
11. The national laboratories for HPEDs/TADs in all member states be strengthened with respect to equipment.
12. Laboratory information management system be established in all Member States.
13. Mechanisms for effective linkage between national laboratory network and epidemiology network are developed with clear mandates and responsibilities of both the networks to facilitate efficient surveillance and outbreak investigations. Appropriate SOPs should be developed for the purpose.
14. Uniform disease reporting formats are developed for use by all the Member States.
15. FMD Progressive Control Pathway approach may be used as a model to develop control strategies for other priority HPEDs/TADs in the region
16. Member countries review or update their legislative provisions to support HPEDs/TADs control in the respective countries.
17. A consultative workshop with the national experts from the Member States be conducted to develop regional plans for each of the priority TADs, beginning with FMD and PPR.
18. HPAI communication models may be adopted for developing national and regional communication strategies for HPEDs and other priority TADs.
19. The member states establish monitoring and evaluation mechanisms for communication in HPEDs and TADs control.

## Background

Remarkable improvement in responding to the highly pathogenic avian influenza (HPAI) outbreaks in South Asia has been made in recent years; however the disease is still prevalent in countries in the Indo-Gangetic plains of South Asian region. The disease has become endemic in some of the countries in the region. Due to globalisation and increased movement, the threat of transboundary animal diseases and the emergence of new diseases affecting human health are increasing. Highly pathogenic and emerging diseases (HPEDs) such as HPAI, foot and mouth disease (FMD) and *peste des petits ruminants* (PPR) are impacting on the socio-economic fabric and public health of the people of the countries in the SAARC region.

Realising these complex problems, the Food and Agricultural Organization of the United Nations (FAO) facilitated the establishment of a SAARC Regional Support Unit in FAO's sub regional ECTAD unit, Kathmandu, Nepal with the financial support from European Commission (EC). The overall objective of the Regional Support Unit (RSU) is strengthening and empowerment of SAARC in its ability to prevent, control and or eradicate HPEDs, including HPAI, through improved veterinary and public health services and inter-sectoral collaboration on a regional basis. Towards this end, the FAO in close collaboration with SAARC is implementing a project OSRO/RAS/901/EC - "Regional cooperation programme on HPEDs in South Asia (SAARC component)". The RSU comprises of a Regional Epidemiology Centre (REC) and a laboratory coordination mechanism to coordinate and support the networking of the national epidemiology units and laboratories. It is hoped that these components of RSU will facilitate timely information sharing between the member states and improve the laboratory capacities to forge more effective responses against HPED control.

The inception workshop of 'Regional Cooperation Programme on Highly Pathogenic and Emerging Diseases (HPEDs) in South Asia (SAARC component)' held between 30 September and 1 October 2010 made a number of recommendations related to i) the mechanism for long term sustainability of the regional mechanism (RSU and REC), ii) the training needs to cover all aspects of disease control (epidemiology, diagnosis, geographical information system (GIS), risk analysis, etc and identification of *TADinfo* as a common disease information system, and iii) harmonised diagnostic procedures and standards.

Following this, a high level regional consultation on control of priority transboundary animal and other emerging infectious diseases in South Asia was held between 13 and 14 January 2011 which was attended by high level participants from the concerned Ministries of the participating countries including Secretaries and Director Generals. The consultation meeting came up with the following related recommendations; i) the RSU under SAARC umbrella establishes the epidemiology and laboratory networks to address the threat of HPEDs, ii) from the regional perspective, the REC facilitates, through consultative process, harmonization of disease control approaches including risk-based surveillance and outbreak investigation that are technically acceptable, economical, practical and sustainable, iii) the REC promotes the SAARC countries to establish an animal disease reporting system or may continue with existing disease information systems that support safe,

confidential and rapid sharing of information about disease and the causative agents at bilateral, multilateral, or sub-regional levels, iv) the RSU promotes the establishment of regional and national networks of leading diagnostic laboratories for HPEDs (FMD, PPR, HPAI) and other priority diseases (e.g. brucellosis) including identifying their functions, v) the RSU promotes the countries to embark upon a common progressive control pathway (PCP) for FMD and other priority diseases, and develop roadmaps through technical support from international partners under the Global Framework for the progressive control of Transboundary Animal Diseases (GF-TADs) mechanism. Later a 'Consultation for establishing a network of Regional Leading Diagnostic Laboratories in South Asia' was held from 2 to 4 March 2011 at Kathmandu, Nepal primarily with the objective to consider ways of strengthening cooperation, through formation of regional laboratory networks (disease surveillance and diagnosis) and harmonization of laboratory protocols to control priority TADs in SAARC member countries.

To take forward the mandate of the HPED project and the recommendations from the inception and high level workshops, a consultative workshop was organized from 27 to 29 July 2011 involving the epidemiology and laboratory experts of animal health and wildlife sectors from SAARC member countries, WHO and OIE.

**The main objectives of the consultative workshop were to:**

- i. Sensitise the relevant participants and stakeholders on the broad workplan of the RSU, REC and leading laboratories.
- ii. Identify the national epidemiology units in the different SAARC Member States and also document the weaknesses and strengths of such units in the different countries.
- iii. Identify the animal disease information systems being used by the different SAARC member states with possible harmonization of a common system for the countries.
- iv. Advocate on the development of roadmaps for the control of priority HPEDs/TADs in SAARC Member States.
- v. Develop relevant recommendations for the project and the Member States to implement.

## DAY ONE

### Inaugural session

The proceedings of the inaugural and other sessions of the workshop were conducted as per the agenda attached as Annex III. The workshop was attended by 43 country participants from SAARC member states and seven resource persons from outside RSU. The list of participants is attached as Annex IV.

The inaugural session commenced with a welcome address by Ms BuiThi Lan, FAO representative in Nepal and Bhutan. While welcoming the participants to the workshop she expressed her appreciation to the EU for financial support to the project. She emphasized the importance of the workshop in the present context as the region is grappling with HPAI and other HPED issues. The demand on sharing of information and coordinated approach at the sub-regional, regional, and global level is also becoming increasingly more important. She also stated that multi-sectoral and multi-disciplinary collaboration is the strategy to achieve the objective and FAO places very high priority on such collaboration.

Dr Mohinder Oberoi, Sub-regional ECTAD Manager and RSU Coordinator, Kathmandu in his introductory remarks on the workshop, highlighted the salient features of the project 'Regional cooperation programme on highly pathogenic and emerging diseases (HPED) in South Asia' which will initially target for building SAARC's capacity to control FMD, PPR and HPAI. He informed that the RSU was established by FAO within the framework of ECTAD to create a formal institutional mechanism under the ambit of SAARC to share, coordinate and communicate information on early warning, early detection, and early response to the emerging and re-emerging transboundary animal diseases having significant socio-economic and public health impacts. It will also facilitate effective and meaningful coordination between the SAARC Member States, WHO, OIE and other partners to combat the potential emerging pandemic threats (EPT).

The RSU will house the Regional Epidemiology Centre (REC) and the diagnostic laboratories coordination networks. The former would build capacity of the Member States in collecting, storing, processing, analysing and reporting information to take informed decision not only at the regional level but at all strategic and operational levels in the individual member states. The laboratory networking would ensure strengthening of leading laboratories on FMD, PPR and HPAI in India, Bangladesh and Pakistan, respectively. Effective coordination among the regional and national laboratories and harmonization of test protocols and standard operating procedures (SOPs) are expected to be put in place. These activities are expected to facilitate effective control of the above selected priority diseases. He cited the Global Rinderpest Eradication Programme (GREP) as a well tested effective coordination mechanism which helped the eradication of the dreaded disease and formed the basis for confidence and interest for launching more programmes for eradication of other infectious diseases but also gave an impetus for devising strategies for HPEDs especially HPAI in the recent past. In view of the economic impact of the HPEDs on livestock production, the SAARC identified three animal diseases in the meetings of Chief Veterinary Officers of the region

which emphasised on the regional collaboration and information sharing for the progressive control of the above diseases.

Dr Prabhakar Pathak, Director General, Department of Livestock Services, Ministry of Agriculture and Cooperatives, Nepal in his address, emphasized that inter-sectoral collaboration is instrumental to the control of HPEDs in South Asia where different types of farming systems including subsistence and mixed farming having no or very little bio-security measures, close contacts between human and animals have made this region more vulnerable to HPEDs. Further, emphasizing the need for close multi-disciplinary collaboration, he opined that increasing international trade and travelling, environmental and climatic changes, encroaching wildlife habitats and intensification of livestock farming has increased the risk of emerging HPEDs manifolds. However, he hoped that functional RSU and regional epidemiology and laboratory networks would help us in building the capacities to control emerging diseases at source. While concluding his address, he also shared Nepal government's experiences in responding to HPAI outbreaks during last two years which badly impacted the economy and trade. He also informed that some of the other infectious diseases the country is concerned about include classical swine fever (CSF), Newcastle disease (ND), PPR and FMD and hoped that timely diagnosis and proper response can minimize their negative impacts.

## **Technical session I : Epidemiology networking for informed decision making in control of HPEDs**

### **SAARC-Regional Support Unit and Regional Epidemiology Centre: Background, mandate and progress made**

The session started with a presentation by Dr Mohinder Oberoi who gave the background, an overview of mandate of the RSU and the REC along with the progress made in implementation of the project so far. In his presentation, he observed that the RSU is the first institutional mechanism under GF-TADs framework at the regional level. The HPED project will target TADs that are jeopardising food security and have a negative impact on livelihoods of poor farmers including but not limited to HPAI, FMD and PPR. The potential risk factors which may lead to emergence or re-emergence of infectious diseases in this region were highlighted. The project will support establishment of common disease information system to be housed in REC and various training sessions will also be organized in the field of epidemiology and laboratory diagnosis for capacity building and integration of national laboratory and epidemiology units for early warning, early detection, and early reaction to HPEDs. Various stages of foot and mouth disease progressive control pathway (FMD-PCP) based on control measures and infrastructure available with the countries was discussed. The progress made so far by the project was highlighted as under;

- i) The RSU and REC have been established in Kathmandu,
- ii) The Regional Leading Diagnostic Laboratories were identified-National Reference Laboratory for Poultry Diseases, Islamabad, Pakistan for HPAI and Project Directorate for foot and mouth



disease, Mukteswar, India for FMD have been identified and made functional. The Government of Bangladesh is yet to designate the Regional Leading Diagnostic Laboratory (RLDL) for PPR, and

- iii) The core project staff based in Kathmandu, Nepal has been recruited.

The workshops and training programmes in RLDL held since the commencement of the project were enlisted.

### **Importance of epidemiological networking for the region**

Dr Pasang Tshering, REC Coordinator, RSU, Kathmandu while describing the importance of epidemiological networking for the region explained the concept of networking and how networks can help marshal evidence and increase the influence of good quality evidence in making policy decisions. He gave a background on the necessity and utility of epidemiology networks and showcased how networking could finally lead to the eradication of rinderpest from the globe. He also described success stories of some global and regional networks like global early warning system (GLEWS), OIE-FAO laboratory network on animal influenza (OFFLU), global influenza surveillance network (GISN), global outbreak alert response network (GOARN), international food safety authorities network (INFOSAN), Australian wildlife health network (AWHN), etc in the control of human and animal diseases. He further explained how the RSU/REC will facilitate setting up a functional epidemiology network and support epidemiology capacity building with the help of a graphic illustration. Later, while proposing establishment of an uniform information system, for the whole region including establishment of a robust passive surveillance system and reporting mechanism (e.g. *TADinfo* developed by FAO which is user friendly with inbuilt mapping facility), he narrated its importance in detail.

### **SEACFMD and networking in South East Asia and China**

Dr Andrew Davis, Programme Coordinator from OIE Sub-Regional Representation for South East Asia, Bangkok discussed the importance of networking using SEACFMD as a model. The SEACFMD was established in 1997 with an objective to coordinate animal disease control activities between ASEAN countries, provide technical advice, ensure coherent strategies, and seek political and financial support to achieve FMD freedom in the region by the year 2020. The scope of this network has now broadened to other TADs and zoonoses. The coordination mechanism between the National FMD Coordinator and three focal points namely, EpiNet, LabNet and Communication for the control and eradication of FMD included regular meetings between EpiNet and LabNet coordinators, sub commission and OIE ad-hoc group in addition to participation in the international reference laboratory networking meetings. SEACFMD is now in phase-IV (2011-2015) funded by AusAid initiative on 'Stop Animal Diseases and Zoonoses' (STANDZ). This network also collaborates with other projects funded by different donors in the same field. The reporting and epidemiological analysis of data generated through ASEAN Regional Animal Health Information System and the current situation regarding collaboration in FMD research in South East Asia as well as participation

of private sectors in their campaigns was highlighted. The role of network of OIE reference laboratories especially FMD OIE Reference laboratory was discussed in relation to FMD control. The future plans for eradication of FMD from the region by 2020 was expected to be achieved through strategies which include reduction of FMD prevalence by targeting hotspots and critical points, pursuing zoning in the most advanced area of FMD control, maintaining and expanding FMD free zones, and vaccination as a primary means to reduce prevalence and cut-down transmission supported by advocacy and public awareness campaigns.

### **Epidemiology networking for disease surveillance and response at the human-animal interface**

Dr Ravi Kiran Kafle, National Professional Officer, Communicable Diseases Surveillance and Response, Disease Surveillance and Epidemiology Unit, WHO Country office for Nepal gave a presentation on epidemiology networking for disease surveillance and response at the human-animal interface. He highlighted on the threats being posed by emerging infectious diseases (EIDs) of zoonotic importance. The need to develop a system to monitor the pathogens at human, animal and wildlife interface was essential to ensure global health security. He discussed the goal of the Asia Pacific Strategy for Emerging Diseases (APSED). This is to build sustainable national and regional capacities and partnerships to ensure public health security through preparedness planning, prevention, early detection and rapid response to emerging diseases and other public health emergencies. WHO Collaborating Centre for field epidemiology to enhance the epidemiological capacity in South East Asia Region was enlisted and the most important collaborating centre known as Thai Field Epidemiology Training Programme (FETP), is functioning since 1980. Many veterinarians have been trained for public health purposes and assistance has been provided to FAO to institutionalise Field Epidemiology Training Programme for Veterinarians (FETPV). Two other WHO Collaborating Centres are located in India. WHO encouraged networking of health professionals who attended field epidemiology courses at the WHO Collaborating Centres. Brief roles played by other epidemiological networks such as Training Programmes in Epidemiology and Public Health Interventions Network (TEPHINET), SafetyNet, International Epidemiological Association (IEA), GOARN, GISN, INFOSAN, Global Food-borne Infection Network (GFIN), and GLEWS were highlighted. The Global Public Health Intelligence Network (GPHIN) gathers real-time information on outbreaks. In responding to emerging diseases and zoonoses the animal health or public health sector alone cannot address the problems and rapid sharing of information, materials and inter-country collaboration is crucial apart from strengthening surveillance and response, laboratory capacity and health care infrastructure to deal with infectious diseases, i.e. core capacity development in line with International Health Regulations (IHR) 2005.

### **Establishment of a Regional Coordination Mechanism (RCM) for Animal Health and Zoonoses in ASEAN**

Dr Reildrin Morales, Animal Health Officer, Regional Support Unit (RSU), ECTAD, FAORAP made a presentation on 'Establishment of a Regional Coordination Mechanism (RCM) for Animal Health and Zoonoses in ASEAN'. He gave brief background information of ASEAN Sectoral Working Group on Livestock (ASWGL). Following the recommendation of a "Study on Strengthening ASEAN

Regional Coordination on Animal Health and Zoonoses" the establishment of ASEAN Regional Cooperation Mechanism (RCM) was endorsed by ASWGL in its 18th Meeting held in May 2010 and a task force was created which, after thorough discussion through a consultative process finally agreed to submit a proposal titled "ASEAN Coordinating Centre for Animal Health and Zoonoses (ACCAHZ)" to special Senior Officials Meeting (SOM) for their endorsement in July 2011. The role of the Regional Support Unit (RSU) established under EU HPED Project (ASEAN Component) was to strengthen regional cooperation, disease response capacity, and policy development through sustained coordination and partnership with the stakeholders. Regional Epidemiology Network and Regional Laboratory Networks under the unit have roles in achieving the overall objective of strengthening and empowering ASEAN in their ability to prevent, control and eradicate HPED, including HPAI, through improved veterinary and public health services and inter-sectoral collaboration on a regional basis.

### **Risk based surveillance in relation to HPEDs**

Dr Muhammad Akram, REC Assistant Coordinator, RSU/ECTAD, Kathmandu, Nepal discussed the risk based surveillance in relation to HPEDs and the rationale for surveillance programme in the context of international obligations under WTO's SPS agreement and emerging and re-emerging diseases scenario. Justification for risk based surveillance programme in SAARC region for HPEDs was highlighted while taking into account the basic principles that the technique should be technically acceptable, economical, practicable and sustainable. The risk based surveillance can be applied to support strategic and operational decision making. Using prior information about the probability or consequence of disease occurrence, confidence or detection thresholds can be set for future surveillance activities. Various types of risk based surveillance systems, their components and scope were discussed. If applied properly, risk-based surveillance allows reduced overall sample size and lower overall cost for same level of confidence and sensitivity of a surveillance system.

### **Technical Session II: Country presentations on prevention and control plans for HPAI, FMD, PPR and brucellosis and national epidemiology networks**

The proceedings of the session started with presentations by the member countries on prevention and control plans for HPAI, FMD, PPR, and brucellosis, and national epidemiology networks based on the guidelines provided.

#### **Afghanistan**

The Afghanistan country presentation was made by Dr M Nazief Shaghasy, Epidemiology Information Officer, Veterinary Department. The government operates 44 veterinary field units and about 892 units are being operated by various national and international NGOs. Foot and mouth disease, PPR and brucellosis are endemic and HPAI was reported in March 2, 2006 for first time but there has been no outbreak since 2007. The FMD causes huge economic losses approximately to the tune of \$160 million per annum. The serotypes present are O, A and Asia-I. Afghanistan is placed at Stage '0' of FMD-PCP but it is ready to go on to stage 1. No official policy for the control

of FMD and PPR exist but vaccination is extensively used by private sector and NGOs. FAO has initiated a cross border project between Afghanistan and Pakistan for surveillance of HPAI. About 30 000 samples have been collected from 16 districts and has been subjected to rapid test, HI and HA and PCR. Avian influenza H9N2 virus was detected. Avian Influenza surveillance system has been planned in 15 wetland provinces to collect 1 500 samples from domestic and wild birds. Mandatory reporting of disease under a contract scheme is in place in addition to sampling done under Government-FAO joint programme to diagnose the disease using ELISA and PCR. Stamping out policy in infected area is being observed while compensation is paid for culling during HPAI (H5NI) outbreak. Vaccination against H9N2 is practiced in surveillance zone.

Brucellosis is endemic in the country. FAO has started a project in January 2011 and collected about 300 aborted fetuses for diagnosis from 14 provinces. Similarly, more than 1 400 sera samples from human and animals were also collected for diagnosis of brucellosis. Sero-surveillance will continue and 59 000 sheep will be vaccinated in coming days under a pilot project.

Major achievements so far include renovation of poultry diagnostic laboratory for HPAI and establishment of epidemiology information website and mechanism for notifiable disease reporting and publishing of booklets on HPAI bio-security, farm management and posters and pamphlets.

Major challenges include inadequate vaccine, low motivation of farmers to have their animals vaccinated and no vaccine monitoring plan to ensure vaccine quality.

## **Bangladesh**

The Bangladesh country paper was presented by Dr Md Mehedi Hossain, Senior Scientific Officer, Central Disease Investigation Laboratory, Department of Livestock Services, Dhaka. Disease control in the country is legally backed by i) Animal Disease Act, ii) Animal Quarantine Act, iii) Slaughter Act, and iv) Animal and Fish Feed Act. Preparation of highly pathogenic avian influenza control plan was started in 2005 which was then adopted as national plan in April 2006. Formulation of a 2<sup>nd</sup> plan is under progress. The objectives of this plan include the strengthening of institutional capacity to control or eradicate HPAI/H5N1 from Bangladesh through stamping out while promoting behavioural changes to reduce HPAI transmission in animals and minimising the negative socio-economic and environmental impact and strengthening bilateral, regional and international collaboration.

Foot and mouth disease is endemic and a major concern for the livestock sector in Bangladesh. The predominant serotype prevalent in the country is 'O'. Bangladesh is at stage 1 in PCP-FMD roadmap. Formulation of FMD control strategy is underway which would include: surveillance, vaccination, animal movement management, communication management and implementation arrangements. *Peste des petits ruminants* is also endemic in Bangladesh and vaccination is practiced to control it using the local 'Tito' strain of virus. Brucellosis is prevalent in Bangladesh though prevalence rate is unknown. Regular screening is practiced in organised breeding farms. Positive cases are segregated. No national control plan is yet initiated.

A Central Epidemiology Unit under the control of Chief Veterinary Officer (CVO), Bangladesh was established in 2007 under the aegis of FAO, Bangladesh. The unit is linked with Upazila Livestock Offices at sub-district level, District Livestock Office at district level, and Divisional Livestock Office at division level. The unit is also linked with Central Disease Investigation Laboratory, Field Disease Investigation Laboratories and District Veterinary Hospital Laboratories. Active and passive surveillance system is in place. Outbreak investigation of different diseases is done by the unit in collaboration with extension services and laboratories.

The SMS gateway system is used for alert on HPAI outbreaks. *TADinfo* system is used to report to OIE on HPAI and GIS is used for mapping of diseases. A Livestock Disease Information System (LDIS) has been developed with the help of FAO and is under trial stage. The information is being shared with stakeholders through workshops, seminars, meetings etc.

## **Bhutan**

The Bhutan country paper was presented by Dr Basant Sharma, Regional Veterinary Officer, Regional Livestock Development Centre. The veterinary services in Bhutan were formally evaluated in 2009 using OIE PVS tool and based on Gap Analysis report, a project worth Nu 368 million (USD 8.5 million) has been formulated to strengthen veterinary services in Bhutan. The first outbreak of HPAI-H5N1 clade 2.2 was reported in February 2010 among backyard poultry in a village about 5 miles from India-Bhutan border. The birds were culled and buried, coops were dismantled and eggs and materials destroyed as a stamping out measure. No new cases have been detected thereafter.

The FMD is a notifiable disease and endemic in 18 of 20 districts in the country. Type O is the most frequently encountered serotype. Type C has not been detected since 1993. The last FMD outbreak during the year was reported on 20th June 2011. The first outbreak of PPR was recorded in June, 2010 among 'Tsedar' (rescued animals from slaughter houses by religious people) goats maintained in a southern district bordering India. Lineage IV PPR virus had been detected as the strain of the virus. The flock was confined in the area and no new case was reported thereafter.

The prevalence of sero-positive cases of brucellosis is less than two percent, that too mostly in the imported animals. No case has been reported since 2006. Regular screening of breeding stock and imported animals is undertaken using Rose Bengal plate agglutination test (RBPT) and ELISA.

Bhutan has prepared national plans for control of HPAI and FMD in 2005. The National FMD Control Plan was updated in 2008 where as National Influenza Pandemic Preparedness and Response Plan has been updated in 2010. National FMD Control Programme comprised of risk based zonation (high, medium, low), calf hood immunization, corridor vaccination and creation of buffer zones (15 km buffer zone along international borders), creation of herd immunity (80 percent), quarantine and movement control, ring vaccination during outbreak, outbreak investigation and



virus typing, training and awareness, and mandatory reporting of FMD.

National vaccination plan for haemorrhagic septicaemia, black quarter (BQ) and anthrax exist although there are no comprehensive control plans documented for these diseases, however these are all notifiable diseases in Bhutan. Similarly sero-surveillance has been made compulsory after every three years for rinderpest to ensure freedom.

There is no independent epidemiology laboratory in the country, however there are four levels of laboratories in the country, i.e. national, regional, sub-regional and district level. National and regional laboratories have separate epidemiology section within them. Most of the epidemiological data are generated at the district level through district livestock offices (DLOs)/ district veterinary hospitals (DVHs) which is punched into web based *TADinfo* at the district and regional level. The reports are generated on annual basis at national level, quarterly at regional level and monthly at district level. These reports are shared with all institutions related to livestock development at various levels. Outbreaks are reported using flash reports. The reports and outbreaks are updated on the Ministry's website and information concerning public health is informed through national media.

Bhutan has also enacted number of legislations to support disease control which include i) Livestock Act of Bhutan 2001, ii) Livestock Rules and Regulations 2008, iii) National Extension Policy 2001, v) Animal Health Policy 2011 (Draft) and vi) Disease control guidelines for TADs. The important constraints Bhutan is facing in controlling TADs include strong religious sentiments and traditional system of livestock rearing, scattered settlements and difficult terrain, inadequate logistics, financial and human resources, inadequate diagnostic capacity of the national laboratory, porous international borders and limited capacity in wildlife intervention.

It was recommended that the laboratories and epidemiology units should be under the same umbrella so that coordination and linkage in terms of surveillance, disease investigation and sharing of information are easier. Similarly, it is recommended that information and communication units at the national and regional laboratories should be strengthened.

## India

The country paper on India was presented by Dr Rajendra G Bambal, Assistant Commissioner, Department of Animal Husbandry, Dairying and Fisheries, Ministry of Agriculture, Government of India. He gave brief profile of livestock and veterinary infrastructure including the availability of various levels of biosafety laboratories and human resources in the country.

India is endemic for FMD (O, A and Asia 1) and PPR. Systematic vaccination coverage and embargo on trade in animals and animal products are adopted as control measures. National foot and mouth disease Control Programme (FMD-CP) has been in place since Fifth Five Year Plan (1974-79) on limited scale and cost sharing basis. Intensive FMD Control Programme was launched in 2003 with 100 percent Central Government assistance in 54 districts in eight States and five Union Territories. The scope of FMD-CP was extended in 2010 to additional 167 districts covering a total of 221 districts and all cattle and buffaloes are vaccinated in the target districts. Under the Project Directorate on FMD at Mukteswar, sero-monitoring and sero-surveillance is being undertaken in the country.

The PPR outbreaks occur in many parts of the country and systematic vaccination has resulted in reduction in the number of outbreaks from 1017 in 2005 to 300 in 2010. National Control Programme on PPR is being implemented in phases since August 2010. The first phase (2010-13) will cover south-western States and second phase (2013-17) will cover the entire country.

Bovine brucellosis is endemic in all states of India. A 'National Control Programme on Brucellosis (NCPB)' has been initiated from August 2010. The programme envisages mass screening of animals to ascertain the exact incidence of the disease in an area/village/block/district of state and vaccination of all female calves between 6-8 months of age in all areas where incidence is high.

Most recently, two outbreaks of avian influenza were reported in a Government Duck Farm at R.K. Nagar and Government Poultry Farm Gandhinagar in Agartala (Tripura) on 17 February and 6 March 2011, respectively. The outbreaks were limited to the affected farms only and the country declared itself free from avian influenza on 4 July 2011. The strategy for HPAI control includes immediate notification of the infected and surveillance zone, deployment of rapid response teams (RRTs) for culling of all poultry within 3 km radius of infected premises and intensive human health surveillance in the area of operation. Ban on movement of poultry and poultry products from the infected/notified sites while strengthening of border posts to stop illegal movement across borders are essential components of the strategy. Public awareness and provision of personal protection equipment (PPE) kits, N-95 masks and antiviral to the outbreak spots and immediate compensation to the owner of the farm to be culled are part of the HPAI control strategy. Post-operation surveillance before declaration of freedom is included in the control strategy.

The veterinary services are backed by suitable central and state legislations which include i) Animal Disease Control Act, ii) Indian Veterinary Council Act (1984), iii) Livestock importation (Amendment) Act, 2001 and iv) the Prevention and Control of Infectious and Contagious Diseases in Animals Act, 2009.

### **Maldives**

The country presentation for Maldives was made by Ms Aminath Hawau, Zoological Officer, Ministry of Fisheries and Agriculture. The Republic of Maldives comprises of 1020 islands and has no border with any country. There is a small livestock population and few poultry farms in Maldives. They didn't experience any outbreak of FMD, highly pathogenic avian influenza or any other zoonotic disease for the last three years. Facilities for the diagnosis of TADs are available in the National Health Laboratory. Animal surveillance and investigation is ongoing. The HPAI surveillance is done by keeping a track on the movement of the migratory birds. A monthly surveillance report is sent by the Island Office to Ministry of Fisheries and Agriculture. As Maldives is a major importing country there is a need to control TADs at its entry point, so plant and animal quarantine regulations are in place. Import of live birds from HPAI affected nations is prohibited. Good surveillance and response system is functional for human sector.

Ministry of Fisheries and Agriculture (MOFA) has developed national guidelines to prevent avian influenza in consultation with WHO and FAO. Following these guidelines, two laboratories in Male have been identified for human (Indira Gandhi Medical Hospital) and animal samples (National Health Laboratory) and training in sample collection, packaging material and PPE in case of an outbreak have been provided. A BSL-2 polymerase chain reaction (PCR) diagnostic laboratory is operational.

Specific challenges for Maldives include inadequate trained animal health and laboratory staff and lack of financial resources.

### **Nepal**

The country presentation for Nepal was made by Dr Vijay Chandra Jha, Chief, National FMD and TADs Laboratory with a brief country livestock profile. National disease notification system is in place for notifiable diseases. The country is endemic for FMD, PPR, classical swine fever (CSF) and Newcastle disease (ND). Highly pathogenic avian influenza outbreaks were recorded in 2009 and 2010. Diagnostic capabilities exist for various TADs including avian influenza, PPR, FMD, CSF, ND, and blue tongue. However, vaccine production capabilities are limited to PPR, classical swine fever (lapinised vaccine), and Newcastle disease.

The first outbreak of HPAI/H5N1 was reported in backyard chicken in Jhapa district in eastern Nepal on 8 January 2009 followed by second outbreak in a different village development council (VDC) of the same district on 17 February 2009. Kaski district experienced outbreak on 26 January 2010 which spread to Rupendehi, Chitwan, Dang, Nawalparasi, Banke and Kailali districts. The high risk period for occurrence of disease is January to March. Migratory birds and illegal trans-border movement and importation of live chicken are believed to be responsible for spread of HPAI. The control strategy for HPAI include stamping out of birds up to 3 km radius (infected zone) from the epi-centre, intensification of active surveillance in 7 km radius outside the infected zone, cleaning and disinfection, movement control, quarantine inspection inside the country, import ban on poultry and poultry products from infected countries, compensation, no vaccination and no treatment of affected birds.

The FMD is endemic throughout the country and serotypes O, A and Asia-1 are involved. It causes economic losses to the tune of US\$ 66 million per annum. Prophylactic vaccination is the control strategy for FMD. Trivalent vaccine (O, A and Asia1) imported from India is used for routine vaccination. Zones have been established based on endemicity and mass vaccination campaigns in phases in high endemic zones (Terai and valley) have been launched. Strategic vaccination along with animal movement control in medium endemic zones (mid-hills) and animal movement control in low endemic zones (high mountains) is practiced.

The PPR caused huge economic losses to the country since its first appearance in 1995. The control strategy for PPR include mass vaccination in high endemic zone (cross border areas, highways, corridors), point vaccination of migratory flocks in strategic locations and compulsory vaccination of all goats at the border quarantine check-posts, and animal movement control and ring vaccination in the infected zone. Sero-monitoring of vaccinated animals is undertaken to check the efficacy of vaccine. The future plan for control of PPR include increase in coverage of vaccination, standardization of PPR pen side test for field diagnosis, development of heat stable PPR vaccine capability.

Two studies showed prevalence of brucellosis in the Koshi hills as 3.7 percent and 2.7 percent, respectively. The sero-prevalence of brucellosis in cattle (n=246) and buffaloes (n=161) were found to be 1.28 percent and 1.93 percent, respectively in eastern Nepal. There are reports of human brucellosis in the people working in the pig farms and in the shepherds in Nepal. There is no specific surveillance or control programme for brucellosis. The Central Veterinary Laboratory (CVL) performs diagnostic tests such as RBPT, serum agglutination test (SAT) and enzyme linked immunosorbent assay (ELISA) for the detection of Brucella antibody, however, all the 5 Regional Veterinary Laboratories use RBPT test for diagnosis of brucellosis. Vaccination against brucellosis has not been practiced so far.

## **Pakistan**

The country paper on Pakistan was presented by Dr Rafiq ul Hassan Usmani, Animal Husbandry Commissioner, Ministry of Commerce, Islamabad. A brief account on country profile on livestock and its contribution to the economy of the country was presented.

Many transboundary animal diseases such as HPAI, FMD, PPR and brucellosis are prevalent across the country. First outbreak of HPAI H7N3 was reported in 1995 followed by next span of outbreaks of H9N2 in 1998. The H7N3 outbreak reappeared in 2000 in layer flocks. Recent spell of HPAI H7N3 and H5N1 (last outbreak in June 2008) outbreaks started in November 2003 in Karachi in layers and spread to breeding stocks and caused huge economic losses while involving one human death. National Contingency Plan for AI and strategy for the control of HPAI were first developed in 2004. The salient features of the plan and strategy include national and international collaboration, establishment of nation-wide AI surveillance network, up-gradation of AI diagnostic facilities, support to development and testing of AI-vaccines, imparting field and laboratory staff training and development of awareness schemes regarding bio-security and vaccination measures. Pakistan's Five Years national programme for prevention and control of HPAI (2006-2011) has now been terminated due to devolution of Ministry of Livestock and Dairy Development to provinces which has also raised questions about its implementation aspects.

The FMD is endemic but mostly in cattle and buffaloes. The most prevalent serotype is O (70 percent) followed by Asia1 (25 percent) and A (5 percent). Live animal markets, common drinking water ponds and movement of animals within country and across the international borders are major sources of disease spread. The economic loss due to FMD was estimated at Pakistani Rs. 6 billion in 2005. The FAO's Regional Project on control of TADs in Central Asia which includes Pakistan is in place since 2004 and is at Stage-1 of the PCP-FMD roadmap. Control plan is in place and high risk pockets and control options have been identified. Three year's (2011-2014) national project on Progressive Control of FMD funded by United States Department of Agriculture (USDA) and to be implemented by FAO is likely to be launched very soon. The main components of this programme include strengthening the laboratory capacity for FMD diagnosis, strengthening surveillance and response mechanism, demonstration of benefits of early and consistent immunization against FMD.

## **Sri Lanka**

The country paper on Sri Lanka was presented by Dr Wedasinghe Nihal, Provincial Director (North Central Province), Department of Animal Production and Health (DAPH). Foot and mouth disease, brucellosis and black quarter (BQ) are the most prevalent infectious diseases in the country. Highly pathogenic avian influenza and PPR have never been reported in Sri Lanka. The DAPH, Department of Wildlife Conservation Centre (DWLC), Ministry of Health, environmental authorities and local authorities coordinate among each other for joint action against TADs. Sri Lanka Exotic Disease Emergency Plan (SEDEP) is in place to combat the TADs.



The FMD is endemic in the country however, FMD eradication by 2020 is the target following PCP-FMD- strategy which includes routine vaccination in targeted areas, active surveillance and combating outbreaks. Sri Lanka has strong political support for TADs control backed by effective legislation and media in addition to vaccine production locally and the capacity of vaccine matching with field strains. The efforts are however, sometime thwarted by presence of sylvatic FMD cycles, poor farming practices and resource constraints.

Brucellosis has been reported from the state farms. The animals are culled if prevalence is less than 5 percent and vaccinated if prevalence is more than 5 percent. In the field, vaccination is practiced along with farmer education.

A national level committee has been established following 'One Health' concept for sharing of information with health authorities. Provincial veterinary public health units have been established in Eastern Province and field veterinary units have been strengthened with their capacity building.

## DAY TWO

### Technical session III: Information system: Central to epidemiology networking

#### Introduction to Information Systems and *TADinfo*

A presentation was made by Dr Ravi Dissanayake, Disease Information Data Expert of the Regional Support Unit, FAO Sub-regional ECTAD, Kathmandu, Nepal. The importance of having an animal health information system and salient features were first described. There are essentially five components of any animal health information system whether it is at national, regional or global level. These are data gathering, data collation, data storage and management, data analysis and reporting. Therefore, animal health information system is not just a computerized database; rather it is the entire process of collection, storage, managing, analysing and reporting information in accordance with the needs of a particular country. The information system should make sharing of information between the countries easy so as to facilitate networking.

*TADinfo* is a veterinary data management system developed as a part of FAO's Emergency Prevention System (EMPRES) programme, fully dedicated to animal and zoonotic disease information management and analysis. The key feature of *TADinfo* is that data entry and analytical interfaces are simple and user-friendly and it has the ability to produce different outputs such as printed reports, tables and maps. Data analysis is also extremely flexible. Being global information system (GIS)-based, initially it has to be customized with country geographic data before it can be put into use. There are five modules to store different types of data - field observations, abattoir observations, active disease surveillance, livestock census and vaccination modules. Besides, it has data management, system configuration, and administrative tools modules. Data backup, restoration of backup files, export and import of data in excel format is also possible. In system configuration new localities could be added easily with global positioning system (GPS) locations. Fifty five countries in the world have received *TADinfo* software and several countries have adopted it as their national animal health information system. Bhutan, Vietnam and Ghana have started using *TADinfo* as web-based system.

#### Livestock disease information system (LDIS) used in Bangladesh

The presentation was made by Mr S K Mahabub Ahmed (Milon), Web Manager, FAO - Technical Unit, Avian Influenza Programme, Dhaka, Bangladesh. The objective of having a web based information system in Bangladesh is to i) recognize trends in diseases of livestock, ii) intervene in outbreak or epidemic, iii) decentralize data entry, iv) reduce paper work, v) for timely reporting and effective analysis, vi) improve the reporting system through internet quickly, vii) early detection of different diseases and rapid control actions and viii) for easy access through web from remote places. It was reported that LDIS is user friendly and has pages for data entry, data view, report, data export, and disease updates. Reports could be generated by area, species, disease, vaccines and treatment wise. In addition, artificial insemination and livestock data also could be entered in to the system. Data analysis could generate tables, charts and graphs. However, there

is no inbuilt GIS capability. The LDIS is being used for reporting all livestock diseases except avian influenza for which Bangladesh uses *TADinfo*. Field officers who enter information through the internet have the facility to contact epidemiology unit through LDIS for any updates or advice which makes the system more dynamic.

### **National Animal Disease Referral Expert System (NADRES)**

The presentation on the National Animal Disease Referral Expert System (NADRES) developed at Project Directorate on Animal Disease Monitoring and Surveillance (PD\_ADMAS) was made by Dr M R Gajendragad, Principal Scientist, PD\_ADMAS, Bangalore, India. The NADRES is a web-based interactive relational database software ([www.nadres.res.in](http://www.nadres.res.in)) launched in 2005. The software is GIS based animal health information databank. NADRES was preceded by 'National Animal Health Information System (NAHIS) and 'weather based animal disease forecasts" systems.

He discussed the data gathering pattern and different factors that influence disease occurrence in India such as agro-climatic zones, temperature, rainfall, land utilization, and ecological factors. The data flow on animal diseases was elaborated-from field veterinarians to the district level and then to the State level which comes in monthly, species wise compiled format. The NADRES consists of four modules (i) administrator module, (ii) interface module, (iii) data entry module for livestock disease and population profile, meteorological data, sampling survey and (iv) forecasting module.

Currently, the NADRES has 79 200 outbreak data categorized year-wise, month-wise and species-wise and arranged at district level from 1987 to 2011. This data has been linked with the risk factor of each disease. Outputs from this system comes in different ways like ranking of diseases, district level monthly disease outbreak details in maps, graphs, charts and tables. In future it is hoped to add comprehensive data reporting inputs to bring out new version of NADRES which will enable online data entry by the collaborating units using the NADRES server maintained at PD\_ADMAS.

### **EMPRESi-Asia: Web-based platform and database**

Dr Pawin Padungtod, Regional Laboratory Network Coordinator, ECTAD, FAO RAP made a presentation on EMPRES-i Asia. EMPRES-i Asia is a web-based disease tracking information system of FAO (<http://ectad-asia.fao.org/ea-server>) which fosters information sharing among key stake holders on a common platform by early reporting of disease events and tracking rumours. It also improves sub-regional activities by data integration, data analysis, including rapid risk assessment and early warning. It shares research protocols, scientific papers and maintains a forum for discussions. EMPRES-i has GIS mapping and analysis tools, document management system and a forum for discussion. Information sources of EMPRES-i comprises of a disease tracking module which gets information from OIE reports, FAO field officers, national animal health authorities and other sources. The surveillance module gathers information from research groups while the genetic module gets information from OpenFlu database. It has advanced GIS functionalities

like spatial analysis tools which can perform proximity analysis and zonal analysis. It further provides facilities to analyse disease trends, risks and to correlate livestock and demographic data as it has an integrated database called the Global Livestock Production and Health Atlas (GLiPHA). General and country-specific discussion forums of it serve as a place to discuss disease information in detail. There are three user levels such as public users, authenticated users and administrators who have different access levels to EMPRES-i.

## **Technical session IV: Laboratory networking, communication and wildlife disease surveillance**

### **Role of laboratory networking in the epidemiology of highly pathogenic emerging diseases (HPEDs)**

Dr Venkatasubbarao Mandava, Laboratory Coordinator, RSU/Sub Regional ECTAD, Kathmandu, Nepal made a presentation on the topic. The objectives, core functions, role of laboratory networks in the disease surveillance system, management of networks, quality assurance of laboratories, existing networks in the region and proposed network for the SAARC region were elaborated. The primary objective of the laboratory network is the timely diagnosis of HPEDs and understanding the ecology and evolution of variants of disease agents quickly. Laboratory network can backstop the surveillance network in assessing the temporal and spatial patterns of a disease prompting to improve control measures. It is essential to assess the efficacy of vaccines and to demonstrate freedom from clinical disease in a country, zone or a compartment. He emphasised the implementation of standardized protocols and tests in the laboratories network and harmonisation of such standardized test and protocols in the region under a stringent monitoring system. The management of laboratory network requires substantial co-ordination through secure regional laboratory network website and monthly teleconferences. A strong proficiency testing and quality assurance system at the networked laboratories was also proposed.

The two functional regional leading diagnostic laboratory networks already exist in the region include, i) FMD regional leading diagnostic laboratory at PD-FMD, Mukteswar, India and ii) the National Avian Influenza Surveillance Network in Islamabad, Pakistan. The SAARC regional leading diagnostic laboratories network will require strengthening in terms of bio-safety measures, diagnostic capacity and infrastructure. The weaknesses, constraints and challenges for the effective laboratory networks in the SAARC region were described and the activities and initiatives taken by RSU to build the capacity of the laboratory professionals in the region were elaborated. Emphasis was laid upon the collaboration required between laboratories and epidemiological surveillance networks to share information and also understand each others' work, needs and challenges.

### **Wildlife disease surveillance and networking**

Dr Jennifer Siembieda, from EMPRES Wildlife Health and Ecology Unit, FAO Rome made a presentation on the wildlife disease surveillance and networking. She gave a brief background on the role of wildlife in disease emergence and FAO strategies to combat these diseases. The Emergency Prevention System (EMPRES) Wildlife Health and Ecology Unit at the FAO was established to investigate the role of wildlife in disease dynamics at the livestock-wildlife-human interface and to establish collaborations that enable FAO to promote, coordinate, finance, technically support, and implement programmes surrounding capacity building and training, wildlife disease surveillance and data standardisation and information sharing. The major activities of the unit include organising capacity building and training programmes for various stakeholders on epidemiology, wildlife biology and ecology, habitat use and migration ecology, population monitoring methods,

disease surveillance and outbreak investigation strategies. A "Scientific Taskforce on Wildlife Diseases" was constituted with a vision to support an integrated approach to managing the health of ecosystems, wildlife, livestock and people within the "One Health" framework. Wildlife surveillance activities for a range of diseases have already started in more than 40 countries.

Wildlife surveillance, surveillance plan, surveillance process and response and communication were elaborated. Around 525 transmitters were deployed in 24 species of both migratory and resident ducks, geese and gulls in 12 countries to study HPAI H5N1 in the endemic and outbreak countries and the important flyways. For the first time, investigations at outbreak sites in Turkey conducted by the wildlife unit could establish close link for the three out of the five outbreaks to introduction of infectious materials (feathers and viscera) from hunted wild birds into backyard poultry.

Wildlife Health Event Reporter (WHER) developed by United States Geological Survey (USGS) and partners and being used by biologists, veterinarians and scientists to document wildlife mortalities with or without disease information was explained. The EMPRES-i has been modified to accommodate wildlife disease outbreak data and wildlife surveillance data including negative results. It is real-time reporting of potentially reportable or non-reportable disease events in wildlife. In the future, as further wildlife surveillance is implemented at a global level by governments, NGOs, researchers and international organizations, the data management will become critical for the best use of such data in the context of disease prevention, control, food safety, protecting livelihoods and ensuring the health of livestock, wildlife and people.

### **HPED communication strategy for emerging infectious diseases in the region**

Mr Prakash Nayak, Communication Expert, RSU/Sub Regional ECTAD, Kathmandu, Nepal gave a brief description of the Regional Communication Strategy Framework for emerging infectious diseases in SAARC region agreed at FAO RAP level after a series of consultations held earlier. After stressing on the over arching themes, the guiding principles of the regional strategy (2010-15) were elaborated;

- Prevention and control of EIDs is an international public health good and requires strong political and financial commitments at national, regional and international levels.
- Action should be on existing institutions and their mandates wherever possible and draw on lessons learned to refine strategies and interventions.
- A multi-disciplinary approach is needed to integrate technical, social, political, policy and regulatory issues in addressing EIDs.
- Pro-poor interventions for infectious disease control must be supported to ensure that the livelihoods, food security and health of farmers and other industry participants are protected and improved.



- Because risks of the EIDs will persist, there is a need to strengthen national and international disease prevention and emergency response capabilities.

The Regional Strategy Framework for Communication for Emerging Infectious Diseases in Asia and Pacific and its five goals were then explained. These include, a) strategy, b) content, c) capacity, d) research and e) monitoring and evaluation which could be adapted while framing country specific communication strategy on HPEDs. Country specific issues, constraints and opportunities arising for handling emerging and re-emerging transboundary diseases at individuals/households, community and decision making levels were discussed during the presentation.

### **Technical session V: Group works on national epidemiology networks, information systems including wildlife disease surveillance**

The participants were divided into four groups to discuss on four broad topics related with epidemiology, information system and disease control. A guideline for each group was provided to lead the discussions. At the end of the group discussions, the groups made presentations on the outcomes which are presented below. The group work finding details are in Annex I.

#### **Summary of the Group discussion: Day two**

Most countries were using some form of disease information database system. Most countries in the region have been exposed to *TADinfo* through training by FAO but only few are using it as national system. Among those adopting *TADinfo*, Bhutan is using a web-based system and Sri Lanka is using it as stand alone at the central level. Countries like Nepal, Bangladesh, Pakistan although received a configured *TADinfo* system from FAO are either using in some limited area or for a particular disease. India has been using NADRES but yet to be used at national level. Similarly, Bangladesh has recently developed their own system called LDIS which is under testing stage.

The country participants indicated their national epidemiology unit/centre or focal points. It was agreed that RSU will have to follow up with the respective countries to get an official confirmation of the national epidemiology units and the focal points. The groups also felt that epidemiological evidences are not used for influencing policy decisions and disease information is rarely shared between the Member States for various reasons. There is also lack of proper legislation and although all countries have preparedness plan for HPAI only few countries have national plans for the prevention and control of other HPEDs/TADs. The group felt the need for information sharing between the Member States and regional harmonization of control programmes for HPEDs/TADs in the region.

## DAY THREE

### Technical session VI: One Health

#### FAO's One Health strategy

Dr Subhash Morzaria, Regional Manager, ECTAD, FAO- RAP made a presentation on the FAO's One Health strategy. He stated that One Health is not very well understood especially at political and ground level although there seems to be lot of interest on the approach. While narrating the FAO's role in food security and elimination of hunger from the globe, he opined that there is an increase in the emergence of many diseases causing huge economic losses and causing concern to public health. There are many drivers for the emergence or re-emergence of TADs and the world is very much concerned about these emerging diseases. HPAI outbreaks triggered the 'One Health' concept and truly drew the attention of the international community because of human pandemic threat. International Ministerial Conference on Animal and Pandemic Influenza (IMCAPI) held in New Delhi in 2007 specifically recommended that international community address the issue of all emerging infectious diseases rather than addressing HPAI alone in the greater context of animal, human and ecosystem interface under the broad umbrella of 'One World One Health' concept.

An interagency document covering FAO, OIE, and WHO collaboration to address the health risks at the animal-human-ecosystem interfaces had been developed which defines the clear roles and responsibilities of collaborating partners to combat emerging and re-emerging diseases. It also emphasizes the need to identify the role of wildlife in the emergence of new pathogens in humans and to understand the disease ecology which is just beyond the disease epidemiology. It promotes cross-sectoral and intra-sectoral collaboration. Public health and animal health sectors in many countries do work together and many international organizations like FAO, OIE and WHO collaborate at global level. Studies have clearly indicated huge socio-economic impact of HPAI. The document identifies the cross cutting issues and intend to enhance the generic capacity of the countries working with the governments at the ministerial level to tackle their own priority diseases and to foster the collaborations at the regional levels through their representative fora like SAARC and ASEAN in this region and at international level through agencies like FAO, OIE, WHO, USAID, etc. On the contribution of FAO to the 'One Health' approach it was pointed out that FAO was observing this approach since 20 years through the EMPRES programme. FAO established partnership with OIE and developed GF-TADs framework to address the transboundary animal diseases since 2004. Joint FAO-OIE-WHO initiative on HPEDs and the launch of GLEWS in 2004 are examples of collaboration outside the FAO. Collaboration with USAID on emerging pandemic threats (EPT) programme is also going on. Within FAO, many sectors dealing with different aspects such as food security, food safety, animal health, wildlife, socio-economics, value chains and global health are following internal multidisciplinary approach and collaborate with each other closely.

## Assessment of Epidemiology networks in the member countries of SAARC

An assessment of the countries in the SAARC region to detect, communicate and respond to highly pathogenic emerging diseases (HPEDs) was carried out using a questionnaire developed by the REC. The overall objective of the assessment was to generate base line information on the current status of epidemiology in the SAARC region which will facilitate strengthening of the epidemiological services in the region. The responses obtained from the participants of the workshop are summarised below:

**Status of HPEDs in the SAARC region:** The selected priority diseases viz. FMD, PPR, HPAI and brucellosis are endemic in certain parts of the region. The countries with shared porous borders, like Afghanistan, Pakistan, India, Bangladesh, Bhutan and Nepal are invariably at risk for these diseases. Bhutan appears to be free of PPR and brucellosis but is potentially at risk for such diseases due to porous borders with neighbouring countries. Similarly, Nepal has sporadic outbreaks of HPAI and brucellosis. Though Sri Lanka is an island, it is endemic for FMD and brucellosis but free from PPR and HPAI. Maldives is free from all the selected HPEDs.

**Status of national/sub national epidemiology units:** Every country in South Asia has a national epidemiology unit but none of the unit is managed by qualified/trained epidemiologist. All countries have invariable number of sub-national epidemiology units except Bangladesh, Maldives and Nepal where no sub-national units exist.

**Availability of human resources in epidemiology:** Despite the availability of qualified epidemiologists in some of the countries, only a few of them are dedicated to epidemiology unit. Most of the units are manned by field veterinarians followed by epidemiologists and data managers at national level.

**Clinical and laboratory based diagnosis of HPEDs:** Laboratories backstop the epidemiology units at national level in most of the countries. In India and Pakistan, laboratories provide backstopping at sub-national level as well. All the countries in the region claimed to have laboratory based diagnosis of HPAI while 20 percent and 45 percent diagnosis of HPAI in Pakistan and Afghanistan, respectively are clinical based.

**Disease information, disease investigation and disease reporting mechanism:** All the countries except Maldives use disease information system which include Microsoft Access, TADinfo, LDIS, SMS Gateway, GIS, Epi Info system at least for one or more HPEDs, especially HPAI. All countries have claimed to use case definition of OIE for selected diseases for diagnosis of HPEDs including HPAI, FMD and PPR. The disease investigation mechanisms involved the field and laboratory staff usually under a special arrangement in case of outbreaks. At least four of the eight countries (Bhutan, India, Nepal and Pakistan) in the region have mechanism in place for flash reporting of HPEDs to the national epidemiology unit. Three of the eight countries (Afghanistan, Bangladesh and Sri Lanka) report daily, two (Nepal and Sri Lanka) on weekly basis and six on

monthly basis (Bangladesh, Bhutan, India, Nepal, Pakistan and Sri Lanka). Bhutan reports HPEDs on quarterly and yearly basis while India and Nepal report selected HPEDs on six monthly and annual basis to the national epidemiology unit.

***Use of epidemiological evidences for policy making and epidemiological techniques:***

All countries claimed to use epidemiology information for policy making except Pakistan wherein it is used partially to make policies for HPEDs control. All countries in South Asia used one or more techniques of participatory, sero-surveillance and abattoir monitoring for disease monitoring. All the countries except Afghanistan and Bangladesh in this region use sero-surveillance to monitor the disease followed by participatory disease search. Abattoirs are used only by India, Bhutan and Sri Lanka for disease monitoring.

***Development project(s) surrounding training in epidemiology completed during the***

***last 5 years:*** Bangladesh, Bhutan, Nepal and Maldives have no development project completed through their own and or international assistance during the last five years. The other countries in the region have, however completed one or more projects to enhance the epidemiological capacities of their professionals.

***HPED control initiatives:***

All countries, except Afghanistan, Sri Lanka and Maldives have prepared a contingency plan for HPAI duly backed by legislation. India has launched a scheme 'Livestock health and disease control' which includes FMD, PPR and brucellosis. Bhutan has prepared in addition to HPAI, a national FMD control programme 2005 and rabies control plan. All member states have established quarantine stations to reduce the risk of spread of HPEDs. A number of countries have established vaccine banks for emergencies for control of different TADs including HPAI/H5N1, FMD and brucellosis.

***Status of trade in livestock and their products:***

All countries in the region trade in live animals and animal products both regionally and internationally especially with Europe, ASEAN, Middle East, China and USA. Meat and dairy products constitute the major imports while other products make the larger proportion of exports from the countries of this region. A significant number of live animals are informally traded within the region.

***Application of "One Health" concept in the SAARC countries:***

"One Health" concept is applied at state and central level in India with Ministry of Health and Family Welfare through joint monitoring committee for HPAI while event based information is shared with Department of Health Services at all levels in Bangladesh. The information is shared with other stakeholders by Chief Veterinary Officer (CVO) as and when necessary in Pakistan. The workshops, seminars and monthly meetings are the sources of information sharing in Afghanistan. Bhutan shares information with concerned departments and ministries in case of disease outbreaks. Sri Lanka has a national level steering committee to share information with health authorities, police, media, etc.

**Gaps, constraints and bottlenecks for HPEDs control as identified by the SAARC countries:** The constraints include lack of trained epidemiologists and financial resources, non existence of formally institutionalised epidemiology units, non existence of formal system for exchange of information between neighbouring countries, inappropriate organisation structure; poor legislation, poor laboratory facilities and poor flow of information from wildlife departments.

**Measures identified by the member countries to bridge the gaps for HPEDs control:** The measures to bridge the gaps include capacity building in epidemiology through FAO/OIE, priority allocation of operational and financial resources to epidemiology, establishment of dedicated epidemiology units even at the grass root level equipped with trained manpower, establishment of online reporting system and exchange of information between neighbouring countries, re-organization of the existing structure, strengthening of laboratories and establishment of wildlife health screening and surveillance system and harmonization of reporting and analysis system at regional level.

## **Technical session VII: Group work on laboratory networking and communication**

The participants were divided into four groups to discuss on four broad topics related with laboratory, wildlife and communication issues. Guidelines for each group were provided to lead the discussions. The details of the group discussions are presented in Annex II.

### **Summary of the Group discussion on day three**

The groups pointed out that there is no legal framework for laboratory networking in the member states in the region. The groups listed various laboratories in their countries both at central and sub-national level. It was recommended that countries strengthen national level HPED diagnostic laboratories in the respective countries and there is a need to share information on disease agents between the national laboratories. Suggestions were made on having proficiency testing between the SAARC laboratories and developing common standard operating procedures (SOPs) for the national laboratories in the region. It was also agreed that national epidemiology unit/centre take the lead in surveillance and disease outbreak investigations but in close coordination with the laboratory units. SOPs should be developed for identifying clear roles and responsibilities between the national epidemiology and laboratory units during outbreak investigations including incorporation of other appropriate stakeholders like wildlife veterinarians, wildlife experts or biologists, public health personnel, etc. It was also felt that a uniform and harmonized laboratory information system be promoted in the region for proper storage and sharing of laboratory information.

Communication in other HEPDs apart from HPAI was found to be inadequate. Communication professionals in the concerned Ministries/Departments were inadequate or non-existent and this component need to be strengthened. The group felt that the existing HPAI communication model may be expanded to other priority HPEDs as well and a regional communication mechanism has to be developed.

## Recommendations and way forward

After three days of deliberations the following recommendations were drawn and presented.

### Considering that

- The impact of HPEDs and TADs crises on public health, the agricultural sector, trade and the livelihoods of small holders particularly in the SAARC region is well recognized.
- No one nation can effectively prevent or control HPEDs and TADs alone without regionally coordinated and harmonized activities.
- No designated national epidemiology unit, centre or facility exists in many countries in the region and even more so at the sub-national level.
- Epidemiology capacity in most Member States in the region is weak; some have none or very few trained epidemiologists, and those trained may not be in the right place.
- Multi-sectoral and multi-disciplinary collaboration even between the main stakeholders at animal-human-ecology interface is still lacking or weak.
- Socio-economic drivers make cross-border movement of animals and animal products very difficult to control or monitor.
- Sharing of disease outbreak or surveillance information between the Member States is uncommon.
- Robust surveillance system of animal diseases and reporting mechanism is either non-existent or weak or limited to only one or two diseases.
- Computerized animal disease information system (storage and analysis) is only partially implemented, and that too in some countries only.
- The One Health approach promoted by FAO-OIE-WHO needs to be progressively adapted at country and regional levels to address the problem of HPED and TADs at the human, animal and ecosystem health domains.



**It is recommended that**

1. A functional and sustainable regional epidemiology networking mechanism for the region be established.
2. A national epidemiology network be identified or set up including networking with the sub-national units/centres with clear roles at each level by the respective member countries.<sup>2</sup>
3. REC/RSU facilitate capacity building of national epidemiology networks through training and technical support; such as fielding participants to FETPV trainings and consultancies as and when requested by Governments.
4. Enhanced national passive surveillance system and reporting mechanisms including a secure disease information system (e.g *TADinfo*) in the Member States is established or strengthened.
5. Case definitions for the reportable diseases are developed for uniformity of reporting.
6. The veterinary authorities are encouraged to undertake epidemiological studies to promote and enable evidence based policy decisions by the policy makers for prevention and control of HPEDs/TADs by the member states in the region.
7. Information sharing on HPEDs/TADs between the member states on 'real time' basis is put in place and facilitated through the REC.
8. Formal linkages and mechanisms be developed between the veterinary epidemiology unit and the departments, agencies or organizations concerned with wildlife conservation and wildlife disease surveillance.
9. In order to enhance efficient exchange of information the countries in the region are encouraged to use a uniform national disease information system such as *TADinfo*. Those countries using other disease information systems (e.g. LDIS for Bangladesh and NADRES for India) are encouraged to make these systems compatible with *TADinfo*.
10. National laboratory networks be identified or set up including networking with sub-national laboratories with clear roles at each level by the respective member countries.
11. The national laboratories for HPEDs/TADs in all Member States be strengthened with respect to equipment.

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<sup>2</sup>(National epidemiology units/centres were identified by the country participants as the ones responsible for data collection, analysis or compilation and dissemination at the national level. However, these are not necessarily endorsed by the respective Ministry/ Government of the respective country. RSU will need to get the endorsement from the respective Governments of all national epidemiology units/centres to be designated as national epidemiology focal points)

12. Laboratory information management system be established in all Member States.
13. Mechanisms for effective linkage between national laboratory network and epidemiology network are developed with clear mandates and responsibilities of both the networks to facilitate efficient surveillance and outbreak investigations. Appropriate SOPs should be developed for the purpose.
14. Uniform disease reporting formats are developed for use by all the Member States.
15. The FMD Progressive Control Pathway approach may be used as a model to develop control strategies for other priority HPEDs/TADs in the region.
16. Member countries review or update their legislative provisions to support HPEDs/TADs control in the respective countries.
17. A consultative workshop with the national experts from the Member States be conducted to develop regional plans for each of the priority TADs, beginning with FMD and PPR.
18. HPAI communication models may be adopted for developing national and regional communication strategies for HPEDs and other priority TADs.
19. The Member States establish monitoring and evaluation mechanisms for communication in HPEDs and TADs control.

## Closing session

At the concluding session Dr Giap Dang, Senior Programme Manager, trade section in the EU Embassy in Nepal appreciated the efforts of FAO and cautioned that lot of years will be required to come to working together effectively. He expressed his appreciation on the initiation of the networking activities at the regional level. He also anticipated that the next stage of the project would be based on response strategy consisting of responsibility and rationale to deal with all issues the region was facing. The cooperation between the EU and the SAARC materialized into development projects by FAO, OIE and WHO which he believed was a good starting point for further cooperation in the region. In the end he thanked the participants and appreciated the organizers of the workshop for efficiently conducting the proceedings and was optimistic that EU-SAARC cooperation would go a long way.

Dr Subhash Morzaria, Regional Manager, ECTAD-RAP in his closing remarks stated that both ASEAN and SAARC regions had endorsed the establishment of the regional support units after a series of consultations basically to promote the principles of GF-TADs framework and it was also encouraging to see that both the regional forums agreed to support activities of RSU, REC, epidemiology and surveillance networking. Although it was a small step it was very clear that we would be working with a heterogeneous group of countries in terms of their level of capacities and we need to enhance their capacities to a uniform level to address the TADs. The workshop closed with remarks of Dr Morzaria thanking the Government of Nepal for extending their kind hospitality, EU for their financial support and the organizers of the workshop. He also thanked for the active participation of the experts and the participants during the deliberations of the workshop so that we could come out with a report to be used for workable solutions for TADs control.

## Group work findings on epidemiology networking

### Group I: National Animal Disease Information System

#### Discussion points

- a) Different components of disease information system
- b) Top down reporting system
- c) Step to ensure quality of epidemiological data
- d) Type of data analysis features for disease information system
- e) Feedback from national epidemiology units/centres to the field units/centre and other stakeholders including decision making
- f) Key features for disease information system

#### Current status of the country

##### a) Animal disease information system

Country	Status
<b>Afghanistan</b>	TAD <i>info</i> and Epi Info are at initial stage
<b>Bangladesh</b>	SMS gateway and TAD <i>info</i> are being used for HPAI
<b>Bhutan</b>	TAD <i>info</i> (web Based), Epi Info and Arc GIS are being used
<b>India</b>	NADRES is being used since 1987
<b>Maldives</b>	No system is being used
<b>Nepal</b>	Microsoft Access is being used since last 10 years and limited use of TAD <i>info</i> . Toll free call system is also in place
<b>Pakistan</b>	TAD <i>info</i> is being used since 2005-2006
<b>Sri Lanka</b>	TAD <i>info</i> and Excel spread sheet are being used since 2006

**b) Top down reporting system**

Country	Status
Bangladesh	SMS gateway works for HPAI but not all diseases and laboratory confirmations are reported top down
India	Data are compiled on monthly basis and exact dates of disease occurrence are missing
Nepal	Monthly compilations for all diseases except for HPAI for which weekly reporting is desired

**c) Step to ensure quality of epidemiological data**

- Susceptible populations are needed to be included in the disease information reporting format
- Uniform disease reporting format are needed to be introduced throughout the member countries in the region
- Outbreak cases and place of occurrence are needed to be reported
- Under and over reporting are needed to be avoided

**d) Type of data analysis features for disease information system**

- Spatial and temporal pattern of disease
- Window for population epidemiology studies
- Disease forecasting mechanism
- Risk analysis system

**e) Feedback from national epidemiology units/centres to the field units/centre and other stakeholders including decision making**

- Media person is needed to create awareness and flash news
- Poultry farmers are needed to be involved in the disease reporting system
- Back reporting should be within specified period
- Information sharing on TADs among all the member countries needed to be ensured in case of outbreak

**f) Key features for disease information system**

- Key profile on disease and population to cover all aspects of analysis including environmental data and eco-patho zones should be included
- Key information on zoonotic diseases should be included

**Recommendation of the group on the choice of disease information system at national level**

- i. Common disease reporting format and outbreak investigation format for all SAARC member countries
- ii. TADinfo web-based system for all SAARC member countries
- iii. Standard uniform case definitions (for TADs) among SAARC member countries
- iv. Disease information system should be open source

**Group-2: Epidemiology networking**

**Discussion points**

- a) Identification of national epidemiology networks
- b) Wildlife surveillance
- c) Anticipated key activities for regional epidemiology network for SAARC region
- d) Sustainability of regional epidemiology network
- e) Surveillance system existing in the country for early warning, early detection and early reaction

**a) Identification of national epidemiology networks and (b) wildlife surveillance current status of the country**

Country	Status
<b>Afghanistan</b>	<ul style="list-style-type: none"> <li>● Director General, Animal Health and Livestock is the Focal Person</li> <li>● One person from each province is responsible for epidemiology reporting</li> <li>● No authorized person at national level for disease reporting</li> <li>● No wildlife surveillance as no department exists that could deal with wildlife conservation</li> </ul>
<b>Bangladesh</b>	<ul style="list-style-type: none"> <li>● Chief Veterinary Officer, Epidemiology Unit, Department of Livestock services, Dhaka is the focal Person</li> <li>● Human resource, financial resources and logistics are the main constraints at all level</li> <li>● No structure for wildlife surveillance and reporting</li> <li>● There is Forest Research Institute under Department of Forestry which looks after matters of wildlife</li> </ul>
<b>Bhutan</b>	<ul style="list-style-type: none"> <li>● Head of Epidemiology Unit, National Centre for Animal Health, Thimphu is the focal person</li> <li>● Have regional livestock development centres</li> </ul>



Country	Status
	<ul style="list-style-type: none"> <li>● Human resource, financial resources and logistics are the main constraints at all level</li> <li>● Wildlife disease survey are done by Department of Forestry and Park Service but no structured wildlife disease surveillance</li> <li>● Wildlife surveys are submitted to epidemiology unit regularly</li> </ul>
<b>India</b>	<ul style="list-style-type: none"> <li>● Animal Husbandry Commissioner, Department of Animal Husbandry, Dairying and Fisheries, New Delhi is the focal person</li> <li>● Epidemiology unit within directorate of Animal Husbandry at State level who is responsible for reporting to central unit</li> <li>● Human resource constraints at all levels, lack of trained staff</li> <li>● Wildlife surveillance as needed in collaboration with Ministry of Environment and Forest and state veterinarians</li> </ul>
<b>Maldives</b>	<ul style="list-style-type: none"> <li>● Director General, Centre for Community Health and Diseases, Male is the focal person for veterinary epidemiology as well</li> <li>● Constraints include-lack of trained staff, geographical separation of islands and funds</li> <li>● No wildlife surveillance and no proposal/plan is under consideration</li> </ul>
<b>Nepal</b>	<ul style="list-style-type: none"> <li>● Chief of Epidemiology Centre, Directorate of Animal Health, Department of Livestock Services, Kathmandu is the focal person</li> <li>● Regional Veterinary Laboratories also act as regional epidemiology units</li> <li>● No structured wildlife disease surveillance, however some surveys have been done on ad-hoc basis</li> <li>● No integrated wildlife disease reporting however, informal reporting does occur upon request</li> </ul>
<b>Pakistan</b>	<ul style="list-style-type: none"> <li>● Director General, National Veterinary Laboratories, Islamabad is the focal person</li> <li>● Sub-national epidemiology units do exist but reporting to National Epidemiology Unit is informal</li> <li>● Human resources, financial resources and logistics are the main constraints at all level</li> <li>● Wild life disease survey are done by Department of Wildlife but no structured wildlife disease surveillance and no formal integration of disease reporting</li> </ul>

Country	Status
<b>Sri Lanka</b>	<ul style="list-style-type: none"> <li>● Director General, Department of Animal Production and Health (Epidemiology Unit), Peradeniya is the focal person</li> <li>● Human resources and financial resources are the main constraints at all level</li> <li>● Department of Wildlife Conservation is responsible for wildlife matters but no regular wildlife surveillance</li> </ul>

**c) Anticipated key activities for regional epidemiology network for SAARC region**

- An epidemiology network is important for integration of epidemiological information at regional level
- Information sharing on TADs including wildlife diseases among the bordering countries through focal persons is needed and Regional Epidemiology Centre may facilitate this process
- Immediate notification on the lines as required by OIE is needed
- REC should develop a website for information sharing

**d) Sustainability of regional epidemiology network**

- A sustainable regional epidemiology network for regional cooperation and disease information sharing system is needed to be developed

**e) Surveillance system existing in the country for early warning, early detection and early reaction**

- Passive surveillance system is in place for all diseases in all SAARC Member States
- Active surveillance system exists only for few selected diseases, especially HPAI
- Trained manpower and financial resources are required

**Group-3: Epidemiology information for evidence based decision making (current status and proposals)**

**Current practice in SAARC countries**

- a) Host-agent-environment triad is partially implemented
- b) Development of strategy for control and prevention of disease-most of the countries in SAARC have strategies for HPAI and few have for other HPEDs as well but not implemented due to lack of resources (finances and trained manpower) and inadequate legislation
- c) Practice of convincing the policy makers for resource allocation and mobilization based on epidemiological evidence is partially followed
- d) Sharing of epidemiology information is not practiced with neighbouring countries at desired level

- e) Mechanism to authenticate the information provided by the private sector for its incorporation in national data is not existing and information from private sector on disease information is rarely added in to the national data base due to issue of reliability and verifiability of data

#### **Proposal/Recommendations**

- i. Host-agent-environment triad analysis should be implemented and required capacity building for epidemiology analysis should be enhanced
- ii. Financial support for implementation of HPEDs strategies and capacity building of the national staff
- iii. Policy makers should be convinced based on epidemiological evidences through effective communication and advocacy
- iv. Epidemiology information should be shared with neighbouring countries through RSU to fine tune the respective national disease control strategy
- v. Mechanism should be developed to authenticate the information provided by the private sector by training, capacity building and legislation
- vi. Identify, register train the private sector for proper reporting of epidemiological information and to integrate in to national data base

#### **Group-4: HPED Control (HPAI, FMD, PPR, brucellosis): Policies and strategies, constraints including economic, social and welfare issues**

##### **Current status in the region**

##### **a) Legislation**

The available legislative provisions for prevention and control of HPED in majority of the member countries are deficient while it is adequate in others.

##### **b) Policy**

- For HPAI control, the member countries have specific policy document as well as country plan and strategies
- With respect to FMD, all the countries have specific control plan though not complete but intend to implement PCP-FMD (Afghanistan and Pakistan are already on the way of implementation)
- Except India and Pakistan, the member countries do not have any specific policy document for PPR control, though Nepal and Bangladesh have control programmes
- None of the member countries have control policy for brucellosis (India has plan for brucellosis control)
- No action plans are available except HPAI in any member country

### **Constraints**

- Lack of appropriate movement control, cross border information sharing and quarantine facilities among many member countries
- Non-availability of the quality vaccines, matching the local strains, in required quantities
- Resource constraint
- The member countries do not have adequate financial resources to operate any planned control program for some of the priority HPEDs like FMD
- Inadequate trained human resources to carryout prevention and control of HPEDs
- The resistance of social group against stamping out operation and restocking issues are getting a social issue and needs serious attention in some of the member countries

### **c) Developing Regional Framework**

- Encourage member countries to develop their country plan for control and containment of HPEDs
- The development of regional framework and implementation plan may be considered by a group in a consultative workshop

### **Recommendations**

The member countries are encouraged to provide necessary legislative backup for the control of HPEDs.

## Group work findings on laboratory networking and communication

### Group I: Organization of regional laboratory networks

Steps in establishment and maintenance of national and regional laboratory network

General-No policy/legal framework for laboratory networking

<b>Afghanistan</b>	Central Laboratory-1, Regional laboratories- 5, Provincial laboratories- 16
<b>Bangladesh</b>	National level -BLRI-Reference Laboratory-1 and Central Disease Investigation Laboratory-1 Regional Laboratories (Field Disease Investigation Laboratories)-8 District Laboratories- Upazila-64, responsible for taking the samples
<b>Bhutan</b>	National laboratory -National Veterinary Research Laboratory, National Centre for Animal Health Regional Livestock Development Centres- 4, District level - District Veterinary Laboratories-20
<b>India</b>	Central Level -1, Regional Disease Diagnostic Laboratories-5 High Security Animal Diseases Laboratory- Bhopal- OIE reference laboratory for avian influenza FMD laboratory (FAO Reference Centre) network exists State level-Two tier system at the state and district levels
<b>Maldives</b>	National Health Laboratory under the Department of Health No Laboratory for animal health
<b>Nepal</b>	Central level-Central Veterinary Laboratory, National FMD and TADs Laboratory and National Avian Laboratory Regional laboratories-5, District laboratory- basic
<b>Pakistan</b>	Federal Level -National Veterinary Laboratory- Reference laboratory Provincial laboratories send the sample for confirmation to Avian laboratory Province level - Livestock Department diagnostic laboratory to Avian laboratory District level -District/Regional laboratory
<b>Sri Lanka</b>	Central laboratory-1, District laboratories-18

## **Recommendations of the group**

### **Identify the regional laboratories**

- Clear and specific role of such laboratory

### **National policy and legislation is needed**

- Clear cut and specific role in each tier of the laboratory
- Each level of laboratory must be able to diagnose the disease

### **Strengthening Leading Laboratory at Regional level**

- Leading laboratories- a) FMD- India, b) HPAI- Pakistan, c) PPR-Bangladesh
- Coordinate with the central laboratory in each country

### **Central level**

- Head of the laboratory/Director/CVO-Focal point for coordination in the member country
- Strengthen national level HPED diagnostic laboratory in each country
- Such laboratory will share information with similar laboratory in member countries

### **Monitoring and evaluation of network**

- Proficiency testing between the SAARC laboratories
- Common SOP between the SAARC countries
- Sharing of the samples for reconfirmation

### **Status of national laboratory networks to respond to epidemiology-surveillance network**

- Capable to diagnose at least the three priority HPEDs
- Revisit the organization structure for separate laboratory cadre of staff

### **Barriers/constraint**

- Availability of reagents, inadequate resources, difficulty in continued education

## **Group II: Linkages of laboratory networking with surveillance activities**

### **How is disease surveillance activities conducted?**

- Epidemiology unit takes the lead in surveillance activities in most countries (lead by CVO)
- Surveillance team also composes of field worker, field veterinarian, epidemiologist and laboratory expert



- The information is collected in structured format and all relevant information is exchanged (disease incidence/prevalence, other parameters) between the laboratory and the epidemiology units in most countries
- Epidemiology unit in collaboration with the laboratory personnel designs the survey taking in to consideration the high risk areas

### **Who collects the laboratory samples and submits to the laboratory?**

For HPAI H5N1

- Field veterinarians (Bangladesh, Afghanistan)
- Laboratory personnel (Maldives)
- Veterinary vigilance team and field staff (Bhutan)
- Emergency disease investigation team veterinary and laboratory persons (Nepal)
- In charge Veterinary dispensary and disease investigation officers (India)
- Field teams, laboratory personnel (Pakistan)
- Veterinary investigation officer (Sri Lanka)

**Other diseases: field staff, veterinary surgeon, epidemiologist, laboratory person and/or veterinary investigation officer**

### **Constraints or issues**

Lack of field personnel, shortage of trained man power, logistic support, farmers not reporting cases, case definition not defined, absence of a proper plan and strategy

How is animal disease outbreak investigated?

For HPAI H5N1: Epidemiology unit takes the lead in outbreak investigations

Outbreak investigation team comprises of field worker, outbreak investigation officer, para-veterinarians, representatives from the district livestock sector, field veterinarian, epidemiologist and laboratory expert

All information relevant to the outbreak are shared between the epidemiology unit and the laboratories

Who collects the laboratory samples and submits to the laboratory?

The procedure is same as for surveillance

### **Constraints**

Maintaining the cold chain, lack of awareness of disease and remoteness of outbreak area leads to the following: untimely submission of samples, accessibility to the outbreak areas and delayed reporting

### **Proposal on strengthening linkages between the laboratory and surveillance activities**

- Specific training on epidemiology is recommended in order to have competent and skilled persons to carry out investigation and surveillance
- There should be specific teams for outbreak investigation and surveillance
- Epidemiology units at various levels
- Samples should be collected by laboratory trained professionals
- There should be a close linkage between the laboratory and epidemiology units through framing of clear SOPs
- Have both laboratory and epidemiology units under the same authority
- Have regular meetings between epidemiology and laboratory units
- During an outbreak investigation and surveillance, the team will comprise epidemiologist, wildlife veterinarians, wildlife expert/biologists, etc and this can be clarified in the SOP

### **For mechanisms in sharing of information between the laboratory and epidemiology**

- Integrated disease information system should be established
- Create discussion forums via the internet
- Strengthen information communication technologies (ICTs)
- There needs to be linkage between wildlife group and laboratory/epidemiology as these groups collect wildlife samples also

### **Group III: Laboratory information management system and data sharing**

#### **Review existing laboratory information management systems in the countries**

- Book management of laboratory information in most countries
- Minimum exchange of information within the line agencies
- No specific electronic information system in all the countries. Data is partially stored and maintained in the computers (commonly Microsoft software)
- Book maintenance of record to be continued with the introduction of acceptable laboratory information management system (LIMS) with feature of data exchange. However, the book management of data should be improved with the help of good laboratory practices (GLP) concepts

#### **Review the data requirement for laboratory management information system**

- Sample and sample storage data, test reports, laboratory tests data (analytical data), quality assurance data

- Personal data and the level of training and inventory data
- Specification data
- SOPs and protocols
- Proficiency test data, inter laboratory comparison data, linkages data with contact address, etc

#### **Laboratory information management operations**

- Work flow and data recording support
- Flexible architecture and smart data exchange interfaces to be used in regulated environment

#### **Operational features**

- Sample details management
- Assay data management
- Electronic laboratory note book and data mining

#### **Compliance of regulatory issues**

- Categorization and classification of data for compliance of regulatory issues
- Regulating the information as per GLP requirement
- Approach to change/add/delete/retrieve data should be defined, approved at the higher level (system for tracking and change of information)
- Regulated environment for data management and exchange

#### **Feasibility for use of LIMS in storing data and records**

- Sounds feasible however, unified and harmonized approach is required

#### **Financial Resources**

- In view of the group, financial constraints of the member countries need that the activities should be supported by international agencies

#### **General Recommendation**

- The group was of the opinion that all the countries should be encouraged to establish LIMS in their national laboratories and laboratory network to a feasible level to smartly maintain and use the data and to facilitate the linkages between the laboratories and surveillance networks

#### **Group IV: Existing communication mechanisms**

##### **Existing mechanism to handle outbreak communication**

- Communication mechanism exist in all member countries
- The communication mechanism is best for HPAI
- For other HPEDs the existing mechanism of outbreak communication is inadequate in most of the countries

##### **Existing communication activities to handle HPED**

- Existing communication activities to handle HPAI at local and national level are better than other HPEDs
- For all other HPEDs the communication activities at the regional level do not exist

##### **Monitoring mechanism to oversee communication activities**

- In all the member countries, there is no formal, regular and direct monitoring mechanism
- There is no check on over reporting or misinterpretation by media which may lead to significant impact on livestock industry

##### **Capacity of professional staff in tune with One Health**

- The capacity of professional staff in tune with One Health is inadequate
- Being a multidisciplinary phenomenon, there are several operational difficulties
- There is a weak or insufficient communication mechanism between various ministries/ department (except may be in Bhutan)

##### **Recommendations**

- i. The mechanism of communication for HPAI was found better as compared to other HPEDs
- ii. The HPAI communication model may be expanded to other HPEDs
- iii. Regional communication mechanism should be established
- iv. There is a need to establish strong monitoring mechanism at the national level
- v. The capacity of communication professional in tune with One Health need to be strengthened

## Agenda

DAY-1

27 July 2011 (Wednesday)

Time	Theme	Speaker
08:30-09:00	Registration of Participants	
09:00-09:30	Inauguration and Opening	
	Welcome address	Ms BuiThi Lan, FAO Representative, Nepal
	Introduction to the workshop and expected outputs	Dr Mohinder Oberoi, FAO
	Opening remarks	Dr Giap Dang, Senior Programme Manager, EU Nepal
	Opening remarks	Dr Prabhakar Pathak, Director General, DLS, Nepal
09:30-10:10	Photo Session and Tea/Coffee Break	
<b>Technical Session I</b>	<b>Epidemiology networking for informed decision making in the control of HPEDs</b>	
10:10-10:30	Workshop setting and adoption of agenda	Dr Pasang Tshering, FAO
10:30-11:00	Regional Support Unit and Regional Epidemiology Centre-background, mandates and workplan	Dr Mohinder Oberoi, FAO
11:00-11:30	Importance of epidemiological networking for the region	Dr Pasang Tshering, FAO
11:30-12:00	SEACFMD networking in South East Asian Nations	Dr Andrew Davis, OIE, Bangkok, Thailand
12:00 -12:30	Epidemiology networking for disease surveillance and response at the human-animal interface	Dr Ravi Kafle, WHO, Nepal
12:30-13:30	Lunch	
13:30-14:00	Establishment of a Regional Coordination Mechanism (RCM) for Animal Health and Zoonoses in ASEAN	Dr Reildrin Morales, FAO
14:00-14:30	Risk based surveillance in relation to HPEDs	Dr Muhammad Akram, FAO

Time	Theme	Speaker
<b>Technical Session II</b>	<b>Country presentations</b>	
14:30-15:30	Country presentations on prevention and control plans for HPAI, FMD, PPR, and brucellosis, and national epidemiology networks of the respective SAARC Member States <ul style="list-style-type: none"> <li>• Afghanistan</li> <li>• Bangladesh</li> <li>• Bhutan</li> <li>• India</li> </ul> Discussion	Dr M Nazief, Shaghasy Dr Md. Mehedi Hossain Dr Basant Sharma Dr Rajendra G Bambal
15:30-16:00	Tea/Coffee Break	
16:00-17:00	Country presentations continued ..... <ul style="list-style-type: none"> <li>• Maldives</li> <li>• Nepal</li> <li>• Pakistan</li> <li>• Sri Lanka</li> </ul> Discussion	Ms Aminath Hawau Dr Vijay Chandra Jha Dr Rafiq ul Hassan Usmani Dr Wedasinghe Nihal
17:00	End of day's session	

**DAY-2**

**28 July 2011 (Thursday)**

<b>Technical Session III</b>	<b>Information system: Central to epidemiology networking</b>	
09:00-09:20	Introduction to information systems including <i>TADinfo</i>	Dr Ravi Dissanayake, FAO
09:20-09:40	Livestock Diseases Information System (LDIS) in Bangladesh	Mr SK Mahabub Ahmed Milon, FAO
09:40-10:00	National Animal Disease Referral Expert System (NADRES) in India	Dr M R Gajendragad, PD_ADMAS, India
10:00-10:20	EMPRESi-Asia: web-based platform and database	Dr Pawin Padungtod, FAO
10:20-10:30	Discussion	
10:30-11:00	Tea/Coffee Break	
<b>Technical Session IV</b>	<b>Laboratory networking, communication and wildlife disease surveillance</b>	
11:00-11.30	Role of laboratory networking in the epidemiology of HPEDs	Dr Venkatasubbarao Mandava, FAO
11:30-12:00	Wildlife disease surveillance/networking	Dr Jennifer Siembieda, FAO
12:00-12:30	HPED communication strategy for the region	Mr Prakash Nayak, FAO
12:30-12:45	Discussion	
12:45-14:00	Lunch	

<b>Technical Session V</b>	<b>Group works on national epidemiology facilitators networks, information system including wildlife disease surveillance</b>	<b>Facilitators</b>
14:00 - 15:30	Group 1: National animal disease information system Group 2: Epidemiology networking Group 3: Epidemiology information for evidence based decision making (current status and proposal) Group 4: HPED control (HPAI, FMD, PPR, brucellosis) policies and strategies. Constraints including economic, social and welfare issues	Dr Ravi Dissanayake, FAO  Dr Pasang Tshering, FAO Dr Muhammad Akram, FAO  Dr Venkatasubbarao Mandava, FAO
15:30-16:00	Tea/Coffee Break	
16:00-17:00	Group presentations and discussion	

**DAY-3****29 July 2011 (Friday)**

<b>Technical Session VI</b>	<b>One Health</b>	
09:00-09:30	FAO's strategy for One Health	Dr Subhash Morzaria, FAO
09:30-10:30	Epidemiology status assessment questionnaire filling by country representatives	Dr Muhammad Akram, FAO
10:30-11:00	Tea/Coffee Break	
<b>Technical Session VII</b>	<b>Group work on laboratory networking and communication</b>	<b>Facilitators</b>
11:00-12:30	Group 1: Organization of regional laboratory networks Group 2: Linkages of laboratory networking with surveillance activities Group 3: Laboratory information management system and data sharing Group 4: Existing communication mechanisms	Dr Venkatasubbarao Mandava, FAO Dr Pasang Tshering, FAO Dr Muhammad Akram, FAO Dr Venkatasubbarao Mandava, FAO Dr Ravi Dissanayake, FAO Mr Prakash Nayak, FAO
12:30-13:30	Group presentations and discussion	
13:30-14:30	Lunch	
<b>Technical Session VIII</b>	<b>Recommendations</b>	
14:30-15:00	Recommendations and way forward	Dr Pasang Tshering, FAO
15:00-15:30	Closing remarks	Dr Giap Dang, Senior Programme Officer, EU, Nepal Dr Subhash Morzaria, FAO



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Officials from Afghanistan participating during a group work session



Sri Lankan Officials participating during a group work session

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